Records of the Australian Museum (1991) Supplement 13 (Part 1). ISBN 0 7305 8743 6

The Families and Genera of Marine Gammaridean Amphipoda (Except Marine Gammaroids)

Part 1

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ABSTRACT. Keys, diagnoses and lists of species are presented for the marine families and genera of Gammaridea except those marine gammaroids treated by Barnard & Barnard (1983). This work is a handbook for the identification of gammaridean amphipods to generic level through the use of artificial (non-phylogenetic) keys at the family-group level which lead to subsidiary keys to the genera of families or family groups. Genera in polytypic families are diagnosed and described sufficiently to fit the taxonomic complications within each group. Diagnoses of families are limited to those characters departing from a gammaridean model which is diagnosed in words and illustrations; hence some families may have identical diagnoses. Therefore, cross-comparisons to similar families are made an organic part of each diagnosis. Family descriptions amplify the generalities of family characters. Relationships are identified not at phylogenetic level but in terms of possible confusion in making identifications. The reader must cross-compare relationships among the several families that might be mentioned as part of the diagnoses because, to save space, all possible combinations are not replicated at every possible node. The same comparative method is generally but not exclusively used for the genera of each family. Multiple keys are provided for some of the more difficult families; taxa are often cited more than once in a key. A pictorial key to families operates with the same proviso that only the deviations from the model gammaridean are depicted. The pictorial key is arranged in reverse order so that the most anomalous taxa appear first and those closest to the model diagnosis are placed at the end. This progression follows the idea that the most deviant taxa are the easiest to identify to family level. The master key to families has the endpoints necessary to identify marine gammaroids by reference to Barnard & Barnard (1983); the two works are constructed in parallel fashion. Families, and genera within families, are organised alphabetically. An index provides the principal reference for each genus and species. Where necessary, each taxon is supplied with notes on removals or major changes since 1965 which have not become common

knowledge, or which are implemented herein. Each genus is supplied with a list of species and selected references. A geographic code, applied to each species, can be identified in the lists and maps of Barnard & Barnard (1983). A bibliography includes many publications not cited in the text but omits the marine gammaroids except for items published since 1980 which were not included in Barnard & Barnard (1983). Effective use of this handbook requires memorisation of a gammaridean model, skill in dissection following directions supplied herein, familiarity with the glossary, and acceptance of the idea that keys and diagnoses are only aids, not absolute endpoints.

Contents (of Part 1)

Keys and diagnoses, with illustrations, to the families and genera of marine gammaridean Amphipoda are presented here in the form of a handbook. A handbook represents the subject in a condensed fashion which abbreviates many of the topics of concern that would be more fully elaborated in a definitive monographic treatise; for example, taxal diagnoses are abbreviated by reference to a basic model diagnosis, descriptions and variables are pared to the essential minimum, synonymies include only principal references and species are only listed but neither diagnosed nor provided with keys. The taxa are largely presented in alphabetical rather than in phyletic order to assist in rapidly locating endpoints in keys. Illustrations are reduced to representations.

This work comprises an update to Barnard (1969) and forms a companion to the work by Barnard & Barnard (1983) which treated all freshwater gammarideans and all marine Gammaridea in the section Gammarida. None of that material is repeated herein but the main family keys here are constructed to contain all marine components of those volumes; marine gammarideans are herein called 'Gammarida'. The various classificatory levels of Gammarida are found in the glossary and their adjectives are Gammaridan, gammaroid and gammarid.

Since 1969, when J.L. Barnard monographed this suborder, the number of families has increased from 54 to 91, the number of genera from 670 to 1055 and the number of species from 3300 to 5733 (J.L. Barnard, 1959d and subsequent files). Stebbing's (1906) and Barnard's (1969c) general arrangement of families has been radically altered and reorganised into superfamilies and many new families and subfamilies by Bulycheva (1957), Bousfield (1973, 1977, 1978, 1982a, 1983), J.L. Barnard (1972b, 1973b, 1974), and Barnard & Drummond (1982), but superfamilies are so difficult to diagnose that it remains easier to write a handbook for identification of genera with focus at family level. Superfamilies, infraorders and sections are therefore ignored as an overall classificatory scheme but a few of the categories are taken up where we have found them useful, such as grouping together the various families assignable to Amphilochoidea, Corophioidea (Corophiida), Gammarida, Haustorioidea, and Talitroidea, so that subsidiary and supergroup keys can be provided. Of the 91 families recognised herein, those we treat are listed in our table of contents, whereas List 1 delineates families we cannot yet recognise and List 2 lists family groups found in Barnard & Barnard (1983). Once an amphipod has been identified to family level in the keys the relevant family is found in alphabetical order rather than in phyletic order. The discovery of many additional species and genera since 1969 has required a considerable emendation of familial and generic limits. The near absence of phyletic monographs at family level and the plethora of faunal

compilations widely scattered in the literature have hindered advances in classification of the group. The principal reorganisations mentioned above have been based largely on existent literature and therefore are in contention and suffer widely from ignorance of morphology at many critical points. Ready identification of taxa not only by nonspecialists but even by experts remains extremely difficult because of the large number of yet undiscovered species and genera.

List 1. Families not recognised or otherwise treated herein, with their synonyms or other remarks; for bibliographic citations to freshwater families, see Barnard & Barnard (1983):

Acanthonotozomatidae Stebbing (1906) = Iphimediidae
Amathillopsidae Pirlot (1934) = Iphimediidae
Anatylidae Bulycheva (1955) = Dexaminidae
Aoridae Stebbing (1899a) = Corophiida
Astyridae Pirlot (1934) = Stilipedidae
Atylidae Liljeborg (1865a) = Dexaminidae
Beaudettiidae J.L. Barnard (1965a)= Gammarida
Calliopiidae Sars (1895) = Eusiridae
Corophiidae Dana (1849), valid family but treated herein under Corophiida
Dorbanellidae Schellenberg (1925b) = Dexaminidae
Dulichiidae Dana (1849) = Podoceridae
Hadziidae S. Karaman (1943) = Gammarida
Ingolfiellidae, not included
Isaeidae Dana (1855) = Corophiida
Ischyroceridae Stebbing (1899), valid family, treated herein as Corophiida
Jassidae Stebbing (1906) = Ischyroceridae
Lepechinellidae Schellenberg (1926a) = Dexaminidae
Melitidae Bousfield (1973) = Gammarida
Metopidae Stebbing (1899a) = Stenothoidae
Neomegamphopidae Myers (1981d) = Corophiida
Niphargidae S. Karaman (1943) = Gammarida
Ochlesidae Stebbing (1910a) = hazily valid subfamily of Iphimediidae
Paraleptamphopidae Bousfield (1983), see Eusiridae herein
Paramphithoidae Stebbing (1906) = Iphimediidae
Photidae Boeck (1872) = Corophiida
Pontogammaridae Bousfield (1977) = Gammarida
Pontogeneiidae Stebbing (1906) = Eusiridae
Prophliantidae Nicholls (1939) = Dexaminidae
Pseudomegamphopidae Myers (1988) = Corophiida
Talitridae Rafinesque (1815), valid terrestrial family, not included
Thaumatelsonidae Gurjanova (1938b) = Stenothoidae
Tironidae Stebbing (1906) = Synopiidae
Typhlogammaridae Bousfield (1977) = Gammarida
Uristidae Hurley (1963) = Lysianassidae

List 2. Families or family groups treated by Barnard & Barnard (1983):

Anisogammaridae Bousfield, 1977
Argissidae Walker, 1904
Artesiidae Holsinger, 1980
Bogidiellidae Hertzog, 1936
Calliopiidae Sars, 1895 (= Gammarellidae)
Caspicolidae Birstein, 1945
Crangonyctidae Bousfield, 1973
Gammarellidae Bousfield, 1977 (= Calliopiidae)
Gammarida complex
Gammaridae Leach, 1813
Gammaroporeidae Bousfield, 1979
Hadziidae S. Karaman, 1943
Hyalellidae Bulycheva, 1957
Macrohectopidae Sowinsky, 1915
Megaluropidae Thomas & Barnard, 1987a
Melitidae Bousfield, 1973
Melphidippidae Stebbing, 1899a
Mesogammaridae Bousfield, 1977
Neoniphargidae Bousfield, 1977
Niphargidae S. Karaman, 1943
Paracrangonyctidae Bousfield, 1982
Paramelitidae Bousfield, 1977
Perthiidae Williams & Barnard, 1988
Phreatogammaridae Bousfield, 1982
Pontogammaridae Bousfield, 1977
Pontoporeiidae Dana, 1853
Salentinellidae Bousfield, 1977
Typhlogammaridae Bousfield, 1977

The present compilation remains at best a stopgap. Specialists recognise that much exploration and discovery remain to be accomplished in the Amphipoda (witness the numerous new taxa discovered since 1965 [when Barnard, 1969c was written]). Few specialists are satisfied with current classification at familial levels. Several genera remain confused, not only for the lack of clear description of their type species but for the obviously erroneous inclusion of several of the species. Few studies on variability have been published and the criteria to be applied at generic and familial levels have rarely been tested even by dialectic means. Cladistic studies at family and superfamily level were just being started as late as 1986.

No radical changes in classification at family level are proposed herein, but numerous problems are noted. The purpose of this handbook is to assemble the families and genera within a scheme that provides rapidly usable (and thus simplified) means for their identification regardless of their phyletic position. In this way the keys coincide with the published literature at generic level only and may be of greater help than would be a brief, completely revised system, which might not stand the test of time. This work may be of greatest use to those students who must make generic determinations of their material without adequate library facilities; it should restrict bibliographic needs to small numbers of publications which can be borrowed more easily than can the entire literature. An index to the species of Gammaridea (J.L. Barnard, 1958a, out of print) may be of some help. An expanded and more useful index is now in preparation. The index to species herein may be of some help. Indispensable references remain: Stebbing (1888, 1906), and Sars (1895).

Brief sections on distribution, faunules, and evolution are presented in hopes of stimulating further inquiry

into these fascinating but poorly studied topics. Our knowledge of anatomy (especially musculature), functional morphology, behaviour, food habits, indeed general ecology, is rudimentary.

The identification system utilised herein requires familiarity with a basic gammaridean plan similar to that exemplified by some members of the Gammaridae. These gammarids may be near the most primitive grade of living Amphipoda; if not (see Barnard & Barnard, 1983 for other ideas), we continue to find that they represent the best basic 'outgroup' that fairly represents the full complexity of primitive gammaridean amphipods. A knowledge of their structure is vital to an understanding of the unfolding of the complex network of specialisations found in other gammaridean families. The lines of evolution from gammarid-like ancestors, so ill understood, are not only manifold but they confuse identification procedures. Amphipoda are now well noted for their general evolutionary plan which proceeds from complex ancestral kinds to simplified derived kinds bearing many reductions or losses of complexity. At times the specialist is confronted with thefeeling that most of the 'missing links' in Amphipoda are still alive. Only a few families are so remote morphologically from the basic gammaridean plan that they are instantly recognisable because of their unusual synapomorphies.

The basic gammaridean is described, and illustrated in Figs 1 and 2. Families other than the Gammaridae are provided with short diagnoses which include only definitive and exclusive differences from the basic gammaridean. To some extent in this revision we have tried to identify synapomorphies but we remain constrained to identify many taxa by character combinations that include symplesiomorphies. Some of these diagnoses are identical among several families. Those taxa are then further distinguished by comparison of their descriptions which are noted as 'See' and by reference to paragraphs on 'Relationships'. Part of each diagnosis is a reference to a related (or superficially similar) family.

Diagnostic characters of the families are illustrated in a group of boxes (Figs 2–21). Instructions for identification procedures using these tools are presented in the following pages.

Not only do we present this work to aid in the identification of gammaridean genera but we are keenly interested in presenting chapters on morphology, evolutionary trends, geographic distribution and prospecti that are the direct outgrowth of our studies. These discussions are the natural output of working taxonomists and contain a great amount of original material that results from a combined 65 man-years of taxonomic study by the writers. We hope through these discussions to illuminate many of the problems we have encountered, to stimulate the interest of our colleagues in pursuing some of these matters which do not readily surface within the context of the identification manual, and to recruit and enlist the interest of newcomers to this burgeoning field of study, the taxonomy, systematics, ecology and evolution of Amphipoda.

Because each of these subjects would require a book of its own, our presentation is strongly encapsulated and devoid of citations so as not to overload our bibliography with non-taxonomic works. Most of the ideas are familiar to our colleagues who will understand that the material is directed to the newcomer we are trying to reach. Most of the statistical citations in our biogeographic discussions are original and updated from the 1969 version of this work.

Limitations

Search of the literature ceased on 1 July 1986 although articles were occasionally added after that time if they were easily absorbed into the context of the work. Obviously, many articles in the 1984 to 1986 time period may have been overlooked because of sluggish abstracting sources.

Most of the illustrative work was accomplished prior to 1978 so that taxa added after about 1975, unless of familial magnitude, are not adequately represented in the figures.

Acknowledgments

The same persons acknowledged by Barnard & Barnard (1983) gave us the same impetus and assistance for this work and we thank them wholeheartedly. At Smithsonian Institution we must thank especially Janice Clark who worked assiduously on our morphological and key-construction problems and who, through great expertise, helped design and regulate our computer systems that handle information. On the latter topic we must also thank Reginald Creighton who introduced both Clark and Barnard into the world of the computer many years ago. Over the years our laboratory assistants have been Elizabeth B. Harrison, Wendy K. Brown, Margaret B. Cairns, Patricia B. Crowe, Lori A. Jackintell, Marisa Castagliola Consoli and Kimberly R. Cleary, and we owe to them thanks for the dedication and patience to expand and maintain our control of the literature and distributions of species; about 70% of the illustrations were created by Carolyn Cox during the years 1975 to 1978; the maps to geographic codes cited herein with each species and published by Barnard & Barnard (1983) were created by Debra Horner and Marisa C. Consoli in 1979, and adapted for this publication by Helen Stoddart and Tom Trnski of the Australian Museum. Linda Lutz of Vicksburg, Mississippi, put the final polish on figures that had to be created after July 1986 to round out earlier work.

We thank Charline M. Barnard who in 1948 originally designed the Crawford file system and created in 1970 the geographic listing methods employed by Barnard & Barnard (1983) and herein.

We thank the following colleagues who gave

generously of their time and expertise in discussing various problems with us or looking at parts of the manuscript: Gloria Alonso (Argentina), Denise Bellan-Santini (France), Thomas E. Bowman (Washington, D.C.), Margaret M. Drummond (Australia), J. Holsinger (Virginia), Diana Laubitz (Canada), J.K. Lowry (Australia), P.G. Moore (England), A.A. Myers (Ireland), James Darwin Thomas (Florida), W. Vader (Norway), L. Watling (Maine), and W.D. Williams (Australia).

We are indebted to our editors, Jim Lowry and Jenny Gates, for their thorough and painstaking production of our work.

We thank especially Richard S. Cowan and Porter M. Kier, former directors of the Museum of Natural History who provided funds for illustrations and much encouragement from 1970 to 1978; David Challinor, former Assistant Secretary for Science for funds and moral support; and especially to S. Dillon Ripley, former Secretary of the Smithsonian Institution, who for 20 years supported this kind of work and its funding.

This study commenced in 1973. The first author is ultimately responsible for the entire work because the second author was not able to read the later drafts but was able to complete his preliminary workup of the following families before he had to withdraw from the project about 1981: Ampeliscidae, Amphilochidae, Bateidae, Colomastigidae, Cressidae, Eusiridae, Hyperiopsidae, Iphimediidae, Kuriidae, Leucothoidae, Pardaliscidae, Pleustidae and Vitjazianidae. These were revised after 1980 by the first author with new data found in literature published after that date.

Methods and Terms

This construction is based on an extensive bibliography of the Gammaridea and a double-entry system of species and genera citations which is cross-referenced to the bibliography. The double-entry system, named the "Crawford-file-system" is the property of the first author and takes its name from a citation system used by certain research psychologists in the 1940's. The card-slips include every citation in the literature to a gammaridean as far as known since 1758. Principal sources have been the "Zoological Record", the Smithsonian Library, the Library of Congress, many other libraries in America, Europe, Africa, Asia, New Zealand and Australia, the "Amphipod Newsletter" produced through the good offices of benevolent colleagues W. Vader and L. Watling, and the gratuitous receipt of articles sent to the first author since 1948 when the citational systems were commenced. The Crawford file is a double entry system in which the nomenclature of a species can be traced through a duplicate file that records any changes and cites the modern name of each species and genus. Each valuable (taxonomically or biogeographically pertinent) citation of gammaridean amphipod species published since 1758 is printed on a record slip which can be alphabetised and sorted. Each slip bears the name of amphipod, author, date, pages, figures and modern name. Much of this system has now been computerised and similar new files were commenced in 1978 that keep records on distribution of each species. Record keeping of distributions is limited to citations within the 'world-zone-system' put forth by Barnard & Barnard (1983); that system divides the world into 800 zones and then regroups the smaller zones into 200 larger zones. Barnard & Barnard (1983) did not publish all of the possible zone applications because Gammaridea do not occur in some of the smaller zones nor have we divided our information into some of the smaller, less useful zones as yet. Flexibility is still required until a grasp of amphipod distributions has been completed. All species have been assigned, at the minimum, a group-zone code and we are now expanding those files to record all of the minor zones in which a species has been reliably recorded. The latter implication refers to our inability to recheck all identifications and our conservative attitude in temporarily rejecting identifications that are geographically aberrant or otherwise untrustworthy. Except for our own use of the term 'zone' to identify our own constructs of regions in our own computer files we try to constrain the use of the word 'zone' herein to identify bathymetric levels; we mix together zones, areas, and regions in our biogeographic presentation by their self-explanatory names; thus 'bathyal' is a zone of depth, whereas 'Caribbean' is a region or area which, in Barnard & Barnard (1983), is subdivided into many arbitrary zones given 3-number identification codes.

The literature of all known species of Gammaridea as of July 1986 has therefore been inspected with the use of the record keeping systems. The type species of each genus has been determined and the original descriptions plus subsequent expositions have been studied for each genus. All other species have also been studied and an attempt has been made to assign each to its proper genus. However, we have not necessarily devoted any time to determining species synonyms, rather we have spent time simply determining the generic veracity of each species, and we leave it to others to determine the validity of species which are not the type species of a genus. In the past two or three decades improvements to amphipod taxonomy have been so revolutionary that many early descriptions of species have become almost worthless. Ultimate clarification of many species must come now and in the future from meticulous restudy of old materials in the process of working out new generic monographs on a global basis. This will require more specialisation in so-called 'smaller' groups at generic level, in contrast to faunistic studies at subordinal level.

Generic diagnoses are based on type species but other species assigned to the genus may have anomalies discussed under 'Variables'. Keys to genera within families are structured around the type species of each genus and are not perfectly attuned to the variations of other species included with the genus in question. The main key to families is also based on the type species

of each genus, as depicted in the literature, but a limitation to the family key is that only about half of the genera have been run through the family key on a trial basis. Keys are fashioned so that some genera are found at more than one endpoint because one or more characters might be variable or in contention. We therefore have removed the normal 'part' designations from the taxa in the keys because the word 'part' does not necessarily mean that the genus has species divided into two or more sections of the key. A genus may be found in several places in a key for several reasons; one of the most important reasons might be the difficulty of making a value judgment about a character expressed in the sequence leading to the endpoint.

We are able to improve the report by J.L. Barnard (1969c) by widely expanding diagnoses of genera, realigning many taxa, and reporting the names of all species in each genus as best we can determine. The citation for each species includes the original describer and our selection of the best references to the species. The appended number in brackets [000] refers to the geographic classification found by number or map in Barnard & Barnard (1983).

Names of families are given authors and dates. A synonymy for families is provided only where there are problems to be noted such as misspellings, the presence of more than one synonym, or for certain recently described families where sources might be apparent to us but not to our readers. Superfamilial names are not authored in our opinion and we doubt they are at family level either.

Space saving devices: 'Sars' refers to G.O. Sars; the G.O. is omitted except in the temporal vicinity of M. Sars (1858), the only paper George Ossian Sars' father, Michael Sars, wrote; initials for G.S. Karaman are omitted because his father, Stanko Karaman, did not write marine amphipod papers; initials of J.L. Barnard are omitted on co-authored papers because K.H. Barnard did not co-author any papers; '*et alia*' is used on 3-author papers except in some situations of ethics or courtesy; species is written out, thus disguising plurality: plural cases are shown as species(s).

Figures

Except for a few, the figures were completed in 1978. They are labelled with capital letters for specific names found in the legends or with lower case letters and numbers found in the master Legend below. Figures 1 to 21 are labelled more extensively with names of families and family groups in capitals and small capitals and morphological parts that are difficult to recognise are labelled with lower case letters and numbers found in the master Legend below.

To avoid crowding, morphological parts that are easily recognisable are not labelled; the observer will soon become familiar with the shapes of most mouthparts, gnathopods, pereopods, urosomes and uropods by study of Figure 1. For example a 3-lobate mouthpart is always a maxilla 1 unless otherwise labelled; a 2-lobate mouthpart is always a maxilla 2 unless otherwise labelled. Where confusing, gnathopods and pereopods are labelled with the numbers 1 through 7. Uropod 3, telson and labrum are often labelled because of confusing appearances. The sparsity of labels should provide good practice at recognising morphological parts, a necessary skill in the dissections, recognition of disjointed parts and use of the literature.

Legend

Capital letters refer to specific names in each figure legend. Numbers refer to metameric conditions. Lower case letters are as follows: a – antenna; b – prebuccal lateral; c – coxa; calc – calceolus; d – dorsal; e – epimeron; epi – epistome; f – accessory flagellum; g – gnathopod; gg – gnathopods 1-2; h – head; i – inner; j – variable letter described in pertinent figure legends, known as a wild-card letter; k – raker spines of mandibles; l – lower lip (labium); m – mandible; n – molar of mandible; 0 – absent; o – outer; p – pereopod; q – cuticle; r – uropod; s – maxilliped; t – telson; u – labrum or upper lip; ur – urosome; v – ventral; w – palp; x – maxilla; y – pleopod; z – gill.

Classification

Classification only at family level is attempted here. This classification only validates the various families but does not try to organise them into higher groups nor to show any relationships other than superficial, often convergent similarities that would give trouble to an identifier. A classification at superfamily level has been attempted by Bousfield (1977, 1978, 1983). Such students as Bulycheva (1957), Barnard & Drummond (1982) and J.L. Barnard (1972b, 1973b, 1974) have organised various groups into superfamilies but as yet these are not amenable to our system of keys and methods of identification. The detection of a superfamily identification from a dissected specimen of amphipod is rarely possible because in our opinion superfamily concepts are more tenuous than those of families. Some of the concepts are based solely on behaviour. Even at family level, the identification of synapomorphic character states limited to single families and amenable to gross morphological analysis and rapid identification has not been well established. Very few of the gross character states we use in our keys are synapomorphies at familial level and therefore we propose no classification from our keys nor assignments to superfamilies. To reiterate, our presentation is simply an artificial way to identify genera by using gross characters easy to observe. For these reasons we have written keys with endpoints at families or family groups.

Status of Gammaridean Systematics

More than 5700 species in about 1060 genera are known currently in the Gammaridea. Of these about 1200 species in 235 genera are of freshwater provenance, but many of those genera also are marine. The rate of description of new species continues unabated and, at 110 per year, well exceeds the average description of 40 per year that occurred between 1906 and 1956. Since 1965 (when J.L. Barnard, 1969c was written) our knowledge of faunas has increased immensely. The following faunistic works have been issued: Great Britain (Lincoln, 1979a), New England (Bousfield, 1973), Mediterranean (Ruffo, 1982+), Madagascar (Ledoyer, 1982b, 1986), Fiji (Myers, 1985c), New Zealand intertidal (J.L. Barnard, 1972b), Hawaii shallow water (J.L. Barnard, 1970a), and South Africa (Griffiths, 1976). The magnificent work of Sars (1895), supported by that of Chevreux & Fage (1925), and the works by Lincoln (1979a) and Ruffo (1982+) now bring the west European faunule into almost complete definition. Ruffo is about to issue his final part of the Mediterranean monograph. Unfortunately, the excellent taxonomic status of north Atlantic amphipods has not been well exploited in making advances in ecological, physiological and genetical studies, although many of those special studies so far undertaken have been pursued in the north-eastern Atlantic. In contrast, some very sophisticated work has been undertaken in freshwater amphipods of Europe (see details in Barnard & Barnard, 1983).

Intensive work has been accomplished in antarctic seas (see Lowry & Bullock, 1976, for catalogue) but the fauna there needs to be placed on a Sarsian basis with full illustrations and descriptions. The works of Chevreux (1906c, 1912b) are notable for that region, but numerous sticky problems resulting from other studies have not been clarified there. Excellent modern works by Bellan-Santini, Ledoyer and Thurston, and valuable revisions at family and subfamily level by Watling (and Holman), and Lowry (and Stoddart) have cleared up many tangles.

The remaining faunas besides western Europe, South Africa, New England, Hawaii, Fiji and Madagascar are poorly known. Although an imbalanced emphasis on the deepsea was occurring in the early 1960's that activity has collapsed.

Since 1965 the number of active marine systematists has increased substantially. Notable marine or anchialine productivity has been accomplished by Andres, Bellan-Santini, Bousfield, Conlan, Dickinson, Drummond, Griffiths, Just, Karaman, Krapp-Schickel, Ledoyer, Lincoln, Lowry, Moore, Myers, Rabindranath, Ruffo, Stock, Stoddart, Thomas, Thurston and Barnard. Notable contributions to classifications have come from the pens of De Broyer, Laubitz, Olerod, Tzvetkova and Watling. Other active new workers at press-time are: Alonso, Dauvin, Hirayama, Ishimaru, Kamihira and Morino.

Morphological Terminology

The taxonomic presentation of gammaridean morphology is almost always stated in subjective terms: in words and phrases which, through experience, taxonomists have come to understand and visualise easily, but which are difficult to convey with mensurative precision. There is no current solution to this difficulty but taxonomists may eventually be able to compile an illustrated handbook in which all possible shapes and relative proportions can be figured, named and coded. Drs J.K. Lowry and J.L. Barnard are in the process of compiling this atlas. Identifications may then be amenable to mechanical analysis and stored in computer memories and accessed rapidly by a 'mouse'. Meanwhile, one must work with terms such as 'strong, large, small, feeble, weak, minute, elongate, shortened' and various adjectives with the modifier 'sub', such as 'subquadrate' and ' subacute'. We have used these terms throughout this handbook, but have attempted to provide illustrations as a demonstration of their extent, because the degree varies in the different families. A Glossary is provided. For example, gnathopods of the genus *Apherusa* are 'feeble' in comparison to those of its analogue *Calliopius*, but they are scarcely as feeble as the gnathopods of the Iphimediidae. The term 'subacute' apparently has come to mean a shape that has the overall appearance of sharpness but which terminally is softly rounded. The term 'subconical' apparently refers to a 2-dimensional, rather than a geometric cone but the adjective is not necessarily synonymous with 'subacute', for a subconical process may have a subacute apex. The term 'quadrate' has often been applied to a squared-off shape of an otherwise imperfect rectangle or in simpler fashion as reference to one pair of sides occurring at right angles to each other. 'Subquadrate' should refer to sides not precisely at right angles to each other but also seems to have reference to a quadrate shape with softly rounded corners and imperfect squares.

The terms 'vestigial' and 'rudimentary' have their uses, for a mathematical definition in each case might be more involved, confusing and time consuming than is the process of learning these conditions through trial and error.

A decision as to whether a gnathopod is simple or subchelate is occasionally difficult to make and definitions to classify all borderline cases are almost impossible to compose. There are no terms to describe all of the stages between fully subchelate and fully simple and gammaridean students may eventually encounter difficulties arising from dogmatic use of such all-or-none terms. For example, two subfamilies of Lysianassidae have been described which are partly based on a subchelate or simple gnathopod 1, but there are several borderline cases and several genera in one subfamily which seem to have stronger affinities with genera in the other subfamily than with members of their own group. The contrast between the concepts of cleft telson and entire telson is far too strong to describe all intermediate stages and the two terms tend to condition

the human observer to a reliance on the alternatives as highly significant, whereas numerous exceptions to this significance are apparent (e.g., the outdated differences between Eusiridae and Calliopiidae).

We have not standardised our use of terms such as 'carpus' (article 5) and 'propodus' (article 6) of thoracic legs and often refer to them as articles 5 and 6. The literature is not standardised on this usage and the identifier must know all systems in any event. Many other terms, for example 'pereonite' (thoracic segment), are not used consistently for the same reasons. We have, however, used the term 'article' consistently for the division of an appendage and restricted the word 'segment' to identify a division of the body or soma. We have not followed such suggestions as the remaking of references to setae and we continue to differentiate between a thin flexible seta (= 'seta') and a thick inflexible seta (= 'spine'). This does not follow common practice as found in Decapoda, for example, but follows a century of practice in amphipod taxonomy.

Names for the gammaridean abdomen and its parts are not standardised. All six segments of the abdomen are frequently called the 'pleon', but 'pleonites' 4 to 6 are often called 'urosome' and numbered as 'urosomites' ('uronites') 1 to 3. Pleonites 1 to 3 are rarely called the 'metasome' but frequently are called the 'mesosome'. However, the term 'mesosome' should be synonymous with pereon.

Shape and proportion in seemingly infinite array are often more important to the taxonomist than are qualitative and numerical expressions, but one day we may be able to convert shape and proportion to precise formulations.

Morphology of a Gammaridean Amphipod

Amphipods, like tanaids and isopods, lack a carapace covering the thorax, so that seven definitive thoracic segments (pereonites) are visible (as in other Peracarida the 'old' first thoracic segment with its appendage [maxilliped] has become fused to the head). Gammaridean and hyperiidean Amphipoda may be recognised by their possession of three pairs of pleopods (swimmerets) and two or three pairs of uropods on the pleon (abdomen). The fairly consistent presence of at least six pairs of thoracic appendages, five-plus pairs of gills and four pairs of brood lamellae in females are definitive characters of Gammaridea and Hyperiidea.

The condition of the head in the Gammaridea is highly variable and thus useful to the taxonomist, but its morphology is often left undescribed. The 'basic' gammaridean generally has the head about as long as 1.5 pereonites but it varies in different families and their genera from much shorter than the first pereonite to as long as the first three pereonites combined. The elongate head is especially noticeable in the Ampeliscidae, Phoxocephalidae (including the visor-like rostrum), Synopiidae and Oedicerotidae. In the latter two families the head is considered 'massive' because it is not only elongate but very deep. Other families, such as the Stegocephalidae may have deep heads but they are much shorter than the first three pereonites combined. Recognition of Synopiidae is almost fully dependent on the final confirmation of a 'massive' head. Most members of that group have a massive head primarily because pereonites 1 to 3 are so short that the head appears relatively large by comparison.

The absence of eyes is rarely of taxonomic concern other than at the specific level; indeed several sublittoral oculate species are known to have eyeless populations in bathyal depths.

The presence and/or condition of the cephalic rostrum is only occasionally conservative at the familial level (e.g., Phoxocephalidae, Synopiidae). Its presence is of relatively uniform value at the generic level (example of an exception is *Bathymedon*) and its shape is often of good specific value.

Antennae – the head bears two pairs of antennae. The first three articles of the first pair are known as the peduncle, the remaining smaller articles the flagellum. In some groups of amphipods a callynophore (Lowry, 1986) occurs at the base of the flagellum. The callynophore may be present in the male and female or only in the male. It is located medially and usually contains many tranverse rows of aesthetascs which group together to form a brush. In many species an accessory flagellum demonstrates the biramous derivation of the appendage; when present, it sprouts from the end of the third peduncular article and may be elongate or reduced. Although appearing to be of minor importance, the condition of the accessory flagellum is crucial to amphipod systematics and is useful especially at familial and generic levels. The second antennae bear five peduncular articles, followed by a single flagellum. The flagella of both antennal pairs may bear, especially in males, sensory appendages, such as aesthetascs and calceoli. Male antennae often are longer than those of females.

Frequently families and genera have been defined as lacking accessory flagella and then have been shown to have some members bearing extremely small 1-articulate pieces. Allowance should be made by the observer so as to admit to genera and families those species with microscopic remnants of accessory flagella that have heretofore been overlooked.

Calceoli are tiny sense organs attached to the antennae. They have been surveyed by Lincoln & Hurley (1981) who found at least nine kinds which can be correlated with nine different family or superfamily groups. However, the majority of amphipod genera and species have lost their calceoli and so calceoli are almost useless except to the phylogeneticist.

The mouthparts are composed of the following structures; they are highly variable intergenerically and their morphology is important for classification:

Upper lip – a single lobe or flap anterior to the mouth. In about 10% of known species the anterior cephalic surface above the upper lip (labrum) is produced into a point, keel, or lobe known as the epistome. Its function is unknown. In a few families, especially Lysianassidae,

the upper lip has a keel projecting anteriorly and usually separated from the epistomal region by a deep slit or sinus. Occasionally both epistome and upper lip are produced together and occasionally they are fully amalgamated.

Lower lip – a bilaterally symmetrical complex forming a partition behind the mouth. Also known as a labium, the lower lip is composed of at least a pair of lateral lobes, having their lateral extremities produced, often acutely and often bearing apicomedially a tiny cusp enclosing the meatus of a salivary duct. About half of the known gammarideans has a pair of medial lobes on the lower lip.

Mandibles – a pair of appendages attached lateral to the mouth; with the upper and lower lips they form a box around the mouth, permitting buccal closure. The mandibles are powerful and difficult to remove because of their large muscles. Mandibles generally have their anterodistal ends (incisors) cut into a series of teeth for biting; just proximal to the distal teeth may be an articulated process, also toothed, the lacinia mobilis (accessory plate) which may occur on only one or none of the mandibles. A molar with a grinding surface often occurs on the medioventral surface of the mandible. It may be ridged and toothed (triturative), or smooth, or be completely absent, especially in inquilinous amphipods having the mandibles elongated for 'piercing and sucking'. (Recently, so-called piercing and sucking amphipods of the family Anamixidae, have been determined to be specialised filter feeders, the function of filtering being transfered to antennae, maxillipeds and gnathopods in the piercing and sucking stage). Most Gammaridea have a 3-articulate palp attached to the dorsolateral surface of the mandible, the palp being used to clean the bases of the antennae. Its absence is moderately frequent and often of familial importance, but its reduction to two or one articles is uncommon.

First maxillae – these are situated posterior to the lower lip. This pair of appendages is small, each bearing a medial free lobe, an outer lobe with heavy spines, and attached to the outer lobe a palp composed of one or two articles, occasionally reduced in size or absent.

Second maxillae – these are two pairs of lobes behind the first maxillae, each composed of simple medial and lateral plates, occasionally reduced to one plate or absent, rarely with the outer lobe attached to the inner by a basal geniculation or extension. Basal articles of maxillae and maxillipeds are present but rarely are of taxonomic importance. The presence or absence of an oblique row of setae on the dorsal face of the inner plate often has strong taxonomic significance.

Maxillipeds – one pair of appendages posterior to the maxillae, each side of the maxilliped is formed of an inner (proximal) lobe, an outer (distal) lobe and a palp of two to four articles, rarely absent in Gammaridea, but always absent in the pelagic and often inquilinous Hyperiidea and in cyamid Caprellidea. Some species of the Iphimediidae (Ochlesinae), lacking such palps, are assigned to the Gammaridea on the basis of their resemblance to Gammaridea in other morphological features and their supposed benthic habits. In peracaridan phylogeny the maxillipeds were originally the first pair of thoracic legs, but they have become incorporated into the cephalic complex; in some talitrids such as *Orchestoidea*, the lines of fusion of this thoracic segment to the head are still apparent but in most amphipods such external demarcation is obscure.

Pereon (thorax) – almost invariably bears seven pairs of legs. The first two pairs are called gnathopods (or gamopods) and usually are prehensile, having the seventh article (dactyl) folded back on the sixth article (propodus, hand or palmar article). Rarely in gnathopod 1 is there sexual dimorphism but the male often has greatly enlarged second gnathopods. In some gammaridean groups an enlarged gnathopod 2 is used primarily for grasping the female during copulatory amplexus. The male mounts the dorsal side of the female, projects the gnathopods around her body and hooks them into her fifth coxae. The pair of animals then swims, darts among algae, or rests until the female molts (possibly as much as three days after amplexus), at which time the male emits spermatophores (sacs of spermatozoa) that pass from the ventral side of his seventh pereon segment into the pouch formed by the female brood lamellae. Ecdysis of the female is taking place during this time period and immediately thereafter she lays eggs through two genital pores on the sternite of thoracic segment 5. The pores normally are so small and heavily chitinised that the eggs cannot be laid until ecdysis occurs and the pore openings become soft and pliable. How the spermatophores pass from male to female is unknown but they may be assisted by gnathopods or pereopods. The ventral side of pereonite 7 in the male bears two minute penial projections, often spinose. Occasionally they are hidden by small gills attached to the coxae of this segment.

Studies since 1965 have discovered more and more uses for an enlarged male gnathopod 2, particularly threat display and specialised feeding. A seemingly endless variety of gnathopodal shapes may reflect the numerous functions of these appendages.

Within a genus of gammaridean amphipods, the taxonomic recognition of species often depends on the shape of male gnathopod 2; hence, it is difficult to identify females specifically because taxonomists have not studied minute differences in females and made them basic to identification. Unfortunately no improvement in this situation has occurred since 1965 and it has indeed grown worse because more and more taxa have been described in which females have not been subjected to rigorous identification (the worst example is the recognition of male Anamixidae all having a Leucothoides-morph which is essentially unidentifiable at specific level). The second gnathopods of juveniles and females often are alike; during maturation the male second gnathopods commence an increase in size and a morphological differentiation, with changes taking place during each instar, even long after the attainment of sexual maturity. This has resulted occasionally in taxonomic confusion because some of these instars

have been described as distinct species. A few species are known to have radically distinct phenotypes especially in the terminal male. Dominance in gnathopodal size and complexity occasionally is shifted to gnathopod 1 (axial reversal, example aoroid Corophioidea).

Thoracic appendages have seven articles (segments), the proximal member of which is the coxa or sideplate. A few gammarideans (e.g., Bateidae) have reduced numbers of articles on various thoracic appendages. Coxae are of greater taxonomic importance in gammaridean Amphipoda than in most other Malacostraca and in many species are structurally more an integral part of the trunk than simply an article of the appendage. They resemble ventral pleuron-like extensions of segments and thereby contribute to the appearance of lateral compression in the body plan. They are numbered from one to seven, with numbers 1 and 2 belonging with gnathopods 1 to 2 and numbers 3 to 7 with pereopods 3 to 7.

Gills – thoracic and generally attached to the medial surfaces of coxae 2 to 7, occasionally only on 2 to 6, or 3 to 6 and 3 to 5. Gill structures have been used occasionally for specific and generic distinctions but their conditions have been ignored in most Gammaridea and require extensive study. Gills are often well known in those genera in which accessory tube-like branchial appendages have been discovered or where the primary gills are extraordinarily plaited or folded.

Male reproductive appendages generally occur as a small pair of projections of the seventh pereonal sternite; occasionally they are spinose. Other sternal teeth, keels and flanges appear to be of rare occurrence (e.g., Aoridae, Eophliantidae).

Oostegites – in females the medial surfaces of coxae 2 to 5 (or 3 to 4 only) carry brood lamellae (oostegites). They are simple buds in young females, but as body growth proceeds they become longer and more heavily setose and are interlocked by their setae to form a cradle (brood pouch) enclosing the eggs. As the female increases in age and size, the number of eggs laid after each molt becomes larger. Some amphipods lay such large yolky eggs that a young female can carry only one of them; at terminal growth she may be able to carry three or four. Not all of the extruded eggs hatch; mortality of about 25 to 50% may occur even before hatching; stunted degenerating eggs often may be seen in the broods (as well as commensals such as spherical choniostomatid copepods and reniform ostracods). Some large Amphipoda lay and carry more than 200 eggs at a time. Brood lamellae of the female, like gills, also have been largely ignored taxonomically although a great deal of variation occurs in their shape, setosity, and terminal ornamentation of the setae. They and the gills may be of assistance in tracing phylogenetic relationships among families and superfamilies of Gammaridea.

Commencing with leg 3, the thoracic appendages are termed pereopods (walking legs), so that five pairs of thoracic legs represent pereopods (many specialists commence numbering pereopods with gnathopod 1). There is justification in distinguishing gnathopods by name because of their specialisation in analogy to the pereopods of other Crustacea (e.g., posterior maxillipeds of decapods). Pereopods 3 to 4 are useful in cleaning the gnathopods and other anterior appendages and as a balance when alighting from a swim. The last three pairs appear rather immobile and less adapted for walking than in isopods. Many amphipods are poorly balanced for walking, hence their mobility usually depends on swimming. Their body plan, however, permits a motility (hence the common name 'scuds' for amphipods) through dense masses of hydroids and algae. Amphipoda with large coxae (large lateral shield) often swim sideways, resulting in the old appellation 'side swimmers' for amphipods. Perhaps this is one of the reasons why amphipods are one of the most abundant macroscopic crustacean groups in algae and other anastomoses.

Some Amphipoda living on the sea bottom have immensely elongated pereopods, which are spread out in the fashion of a spider and prevent the amphipod from sinking into the mud. To lower the centre of gravity the body of the amphipod hangs upside down in its cradle of legs or the amphipod uses them to dig quickly into the substrate and form a food particle trap (for example, *Gibberosus*).

A few families of Gammaridea have the habit of burrowing into benthic sediments and their pereopods are armed densely with strong spines which aid in burrowing. Elongate flexible setae, as well as stiff spine-like setae may occur on pereopods 5 to 7 of fossorial Amphipoda. Even though a few other nonfossorial Amphipoda, such as Ampeliscidae, have these elongate setae, the term 'fossorial pereopods' is usefully applied to the condition. The Glossary contains a moderately precise definition of fossorial pereopods.

Six or seven families of amphipods construct dwelling tubes. All of these are placed here in the Corophiida except for the Ampeliscidae. The cylindrical or flattened tubes are spun from strands of material ('silk') secreted and probably manipulated by pereopods 3 to 4. The tubes may be limp (*Ampelisca*) and lay prone on the bottom or they may be stiff and erect and attached to rocks (*Photis*) or stuffed into the substrate (*Cerapus*). Mud is occasionally used to reinforce the walls of the erect tubes but *Cerapus* can build stiff tubes from organic matter cemented by amphipod silk.

Glands of domiciliary Amphipoda appear to be concentrated mainly, if not exclusively, in pereopods 3 to 4. They are found most heavily concentrated in article 2, often in article 4 and occasionally in other articles. Glands usually appear to be composed of densely packed, 'yolky' tissue, often posterior to the main muscles of article 2, often composed of morula-like bodies, and often of different colour than the muscles or other tissues, even in specimens preserved in alcohol; they are frequently yellow, ochre, orange or purple. Apparently a duct carries the secretion to a meatus located subterminally on the dactyl. The meatus is very difficult to see and not limited to domiciliary Gammaridea because many other Amphipoda seem to have a dactylar

meatus but lack conspicuous glands. The presence of these glands may be a useful clue by assisting in the identification of several genera in Ischyroceridae, Corophiidae and Ampithoidae that otherwise resemble nondomiciliary Amphipoda. Complete reliance cannot be made on them as familial characters, for all members of domiciliary families do not necessarily have glandular pereopods and very few species have actually been examined for their presence. Some phoxocephalids, haustoriids, and argissids have conspicuous glands in pereopods 3 to 7 and in the posterior body.

Most domiciliary amphipods, except for the Ampeliscidae, have somewhat depressed bodies, shortened pereopods, and have better crawling ability than do non-tube builders. They can be observed emerging from their closely crowded tubes, their antennae apparently being used digitally in a search for particles of food. Ampeliscid amphipods lie upside down in their tubes and project their strongly setose antennae as filtering organs through a slit in the tube. A few benthic gammarideans have been reported as predators largely on tiny prey but some pelagic amphipods catch large prey. Scattered species in many families have prehensile adaptations on pereopods apparently for clinging to hosts and substrate or for catching prey.

After hatching, young amphipods are like adults (Amphipoda do not have larvae as do most crustaceans) and are carried about for a few hours or days in the brood pouch. In the early stages molting and growth are rapid; a young amphipod may first molt, while still in the brood pouch, within a day or two after hatching. As growth proceeds rates of molting and growth decrease, so that adults may molt every 20 to 30 days and in some striking instances only every six months or so. Few amphipods have been studied for their molting rates; of those examined it has been determined that sexual maturity is often reached at about the sixth molt (commencing the seventh instar); the animals are fertile yet the secondary sexual characters are rudimentary; male gnathopods may be poorly developed and oostegites are just beginning to develop in the female. Some amphipods are known to live through at least 13 instars, the females laying a brood of eggs during the last five or six or in alternative instars; however, terminal adult females (gerontics) may lose their brood plates, apparently fail to lay eggs, and develop aberrances of an andromorphic nature. Occasionally, these stages have been described as distinct species; they are sometimes called intersexes but transformational hermaphrodites are now known. A few species reflect both sexes in their secondary sexual characteristics.

Many Amphipoda have the unfortunate habit of eating their exoskeletons after ecdysis so that it is difficult to trace their molting sequence in the laboratory. One must watch them continuously in order to obtain ecdysial casts. Because the average instar appears to last about two weeks, the average maximum length of life is expected to exceed six months but a few species in polar and deep-sea regions are estimated to live five or more years. Often the structure of the next instar may be seen within an appendage. Such replication within the present organ can be confusing to taxonomists and lead to the description of supernumerary parts.

Pleopods – are paired biramous appendages on the first three segments of the pleon, the rami multi-segmented and strongly setose. Minute coupling hooks on the medial edges of the peduncles are used to engage the pairs of pleopods for coordinated paddling. Amphipoda usually are good swimmers. Even burrowing amphipods swim well and phoxocephalid males have the habit of leaving their burrows at night and swimming to the sea surface from depths as great as 100 m. They will swarm around a light suspended in the water and there is some evidence of lunar periodicity in this behaviour. They may be ascending in search of females even though the latter rarely swim to a night-light. Such swimming behaviour may be a dispersal mechanism, especially in groups having a low proportion of males. Some pelagic species apparently undergo great vertical migration; several deep-sea amphipods caught at night near the surface have been found to have alimentary tracts full of benthic sediments. Occasional deep-sea amphipods not yet proved to be vertical migrators have been found in seabird crops.

Variation in pleopods is rarely of sufficient extent to be used in generic or familial definitions except for Phliantidae, Talitroidea and some Corophiidae. Pleopodal morphology, nevertheless, has been neglected and may afford some help in taxonomic distinctions.

Urosome – there is justification in restricting the term pleon (= pleosome, metasome or inaccurately mesosome) to the first three abdominal segments bearing pleopods and utilising the term *urosome* for the last three abdominal segments bearing uropods. 'All' Malacostraca have at least one pair of uropods, that pair of appendages on abdominal segment 6. Malacostracans generally have five pairs of pleopods on segments 1 to 5, but in noncaprellidean amphipods the appendages of segments 4 and 5 resemble the terminal uropod and thus are called uropods 1 and 2. Uropods in many malacostracans are still used for swimming although in different fashion from pleopods, but uropods 1 to 2 in Amphipoda appear to be used primarily for strengthening the caudal portion of the body to permit jumping or flipping by rapid flexion of the urosome. Occasionally armaments on uropods 1 to 2 are used to facilitate ecdysis of anterior appendages. In many Gammaridea, the third uropods still bear 'swimming' setae, and may be used for paddling or as rudders. Males especially have natatory third uropods. But the vast majority of Gammaridea probably do not use the third uropod for active swimming and the appendage is often reduced or occasionally absent in sedentary species. Caprellidea have lost all but a vestige of the abdomen and its appendages.

Telson – a flap attached to the sixth pleonite above the anus. It is of primary taxonomic value, depending on whether it is cleft into two lobes, fused into a single flap, elongate, fleshy, or ornate.

In comparison to crustacean groups such as the Isopoda, the body plan of the Gammaridea is

conservative. Examples of extreme deviation from the laterally compressed body with enlarged coxal plates occur in a few families in which the body has become dorsally depressed (Corophiidae, Cheluridae, Podoceridae). Two or more of the urosomal segments have become fused in the Ampeliscidae, Cheluridae, Dexaminidae and Kuriidae. Coxae have become deformed or enlarged in some Lysianassidae, Stilipedidae and Hyperiopsidae. The body is shortened and puliciform in some Haustoriidae and immensely globular in some Lysianassidae. In the Podoceridae the first urosomal segment has become elongated and in the Eophliantidae and Colomastigidae the body becomes subcylindrical as in tanaids.

Major ornaments, of taxonomic value generally at the specific level, include the frequent occurrence of a rostrum, the differentiation of lateral cephalic lobes, the presence of processes on the peduncles of the antennae (especially the Iphimediidae and lepechinellid Dexaminidae), and the cuspidation of the pleonal epimera. Dorsal ornamentation is most common among cold-water Gammaridea and occurs in the form of teeth and cusps on the pereonites and pleonites. The first urosomite is often ornamented even in genera without other display.

Morphological Evolution of the Amphipoda

Amphipoda comprise four unusual suborders: (1) the Gammaridea, primarily benthic, with perhaps 20% pelagic and demersal species, but having apparently radiated a half dozen or more times into a gradational suborder; (2) the Hyperiidea, marked by fully pelagic (free or inquilinous) habits; (3) the Caprellidea (skeleton shrimps or 'marine praying mantises'), perhaps evolved from podocerid gammarideans, characterised by extremely thin tubular bodies, reduction in abdomen, reduction in two pairs of pereopods, increased cephalisation and primarily adapted to a sedentary life in epifaunal anastomoses, but through secondary body depression within the caprellidean scheme (like *Temnophlias* in the gammaridean scheme) the cetacean ectoparasites Cyamidae evolved, essentially comprising a fifth major group of Amphipoda; and finally (4) the Ingolfiellidea, apparently undergoing development in association with troglobitic conditions but occasionally returning to marine niches yet open to those organisms with vestigial pleopods, often bearing cephalic 'ocular' scales and with, perhaps other special ecological adaptations. Some workers place Ingolfiellidea in the Gammaridea.

Even though Amphipoda have radiated into more than 120 families the major diversity can probably be visualised in terms of about 25 kinds. Some of these typological centres may be described by the following adjectives: corophioid, ingolfiellid, caprellid, cyamid, six kinds of hyperiid, gammaridan, haustorioid, eusirid, liljeborgiid, lysianassid, colomastigid, eophliantid, phliantid, talitroid, stenothoid, amphilochid-leucothoid, ampeliscid-dexaminid, iphimediid, stegocephalid, synopiid and pardaliscid.

Certain outgrowths of these centres form radical morphs but they fail to qualify as typological centres because (1) their relationships are not discontinuous or (2) they have not radiated strongly. The Cheluridae are an example of a radical morph with presumed relationships to other Corophioidea and low internal diversity; they are not considered as a typological centre. The Colomastigidae, though of low diversity, have discontinuous relationships with other Amphipoda and are, therefore, considered as a typological centre. The eusirids (not necessarily the type genus) have clear relationships to another centre but have radiated so strongly that they must be considered a typological group, even though they are as presently composed, clearly polyphyletic. Our concept of these centres on current knowledge is weak and open to extensive revision as we come to understand the micromorphology, anatomy, and chemistry of the various Amphipoda.

On numerous occasions parallel adaptations and convergent evolution have resulted in similar but independently derived functional morphologies in Amphipoda. These concern cylindricalisation of bodies (Eophliantidae, Podoceridae, Colomastigidae), cylindricalisation of heads (Cheluridae and Eophliantidae), dorsoventral flattening of body (*Temnophlias*, *Podocerus* and Cyamidae), development of tube building glands (Ampeliscidae and Corophioidea), loss of maxillipedal palps (Hyperiidea, some Ochlesinae, Cyamidae, and some Lysianassidae), and in many minor ways. But, for example, the diversity does have a measure of constriction in that Amphipoda have never evolved as fully as have the Copepoda into numerous parasitic modes nor are there many rapacious or errant predator amphipods in the benthic realm. Predators do occur in the nektonic Hyperiidea and Gammaridea but none of the former and few of the latter have returned to a benthic orientation. Several benthic Gammaridea have lately been shown to be predators but their prey is extremely small (e.g. copepods). Although few Isopoda have any degree of lateral compression, whereas many Gammaridea do have dorsoventral depression, the Isopoda would seem to be the more highly diversified because they have cylindrical representatives (*Astacilla*) and fully evolved parasites (Epicaridea). In contrast, the Amphipoda are far more diverse than certain other orders of Peracarida, such as the Cumacea and the Tanaidacea. Thirteen families of Gammaridea alone are more or less inquilinous.

Various members of the Gammaridae (more properly the section Gammarida) have been considered at times as the most primitive of living amphipods. Barnard & Barnard (1983: 8,25) present the alternative view that Corophiida could just as well be the primitive root of Amphipoda. Gammarida (and some primitive Corophiida) display most of the basic gammaridean morphology but the strong development of the lateral shield (Gurjanova, 1962: 11-26), composed of coxae or pereopodal wings in many gammarids, suggests that they have strongly

differentiated from a precursor lacking such a shield. If pereopodal tube-spinning glands represent a secondary development in Amphipoda, then many of the corophioid genera that might be considered as close to a shieldless precursor, have probably undergone a secondary reversion by a reduction of the lateral shield. Other groups with reduced lateral shield (Eophliantidae, Podoceridae, Colomastigidae) apparently do not stand close to the primitive amphipod model because of vastly modified mouthparts or of so-called pygidisation, the solidification of the urosome and its appendages by segmental coalescence or loss of uropodal rami and peduncles. Of course, other peracarids without lateral shield may also have tube-spinning glands (tanaidaceans) and the primitive amphipod may have been in the glandular line, but we consider this only a coincidence and not good evidence of origins. There are sufficient intergrades in telsonic morphology between corophioids and gammarids to make this evolutionary direction very attractive. Several corophioids are almost perfect replicas of the basic gammaridean except for their fleshy telsonic nobs. One has to balance at least three alternatives, (1) whether the coalesced telson represents a full segment lost in phylogeny or (2) whether the lobed telson of gammarids represents a pair of appendages long lost, or (3) neither. This problem is fundamental to other crustacean orders and one is impressed that the uncleft, solid telson is the most common, thus suggesting that it is either more primitive or at least more successful functionally. The telson in Amphipoda is not a conservative feature by any means, and our understanding of it as an evolutionary marker will not be clarified until we understand its function. Several cycles of morphological development, whether by advancement or regression are apparent. If the fleshy corophioid telson develops lobes in advanced species then it would be difficult to distinguish from poorly lobed or entire 'subfleshy' members of the Gammarida. Extreme flattening, full clefting and elongation then occur in other gammaridans and various derived families, but coalescence of the lobes and shortening occur again and again. In some haustorioids the telsonic lobes become fully disjunct basally, each lobe appearing as a vestigial appendage.

The complete pygidisation of most gammarideans, in the sense of having the last three pairs of abdominal appendages formed into relatively inflexible, posteriorly directed uropods, obstructs our detection of an ancestor in any other living order of Peracarida, where only the final pair of appendages is formed into uropods. The reduction or loss of uropods, pleopods, and most of the abdomen in Caprellidea is clearly a secondary development. Several good intergrades occur in this procession from Gammaridea to Caprellidea in such taxa as the Podocerinae, Caprogammaridae and *Cercops*, a caprellidean. Most Caprellidea further have thoracic somite 2 (free segment 1 of other Amphipoda) coalesced with the head, and have a reduction in pereopods 3 to 4, gills and brood plates. If the lateral shield or its functional substitute by means of tubicoly, serve as partial protection for brood and gills in Gammaridea, then Caprellidea, with their complete loss of lateral shield must have some other protection, perhaps reflective of their habitats or behaviour. The brood lamellae of caprellids seem to be more strongly cornified than those of gammarideans. The lateral shield has also been suggested by Gurjanova (1962: 11-26) to be a frictional-flotational support for those Amphipoda known to swim in peculiar fashion on their sides. Thus the lateral shield, formed of coxae and articular wings on pereopods, may serve as a kortnozzle (a tube directing the propeller-wash of ships) in reverse by channelling water ahead of the pleopods.

Good swimmers obviously occur in the Hyperiidea, for they are all pelagonts; nevertheless, reductions of the lateral shield is a major trend within that group. Hence, natatorial correlation to the lateral shield is far from universal. The loss of pleopods in Amphipoda is a mark of the sedentary life of Caprellidea, and the terrestrial habits of a few talitroids. Their reduction in ingolfiellids is unexplained but may have some relationship to an interstitial or troglobitic life. A few other inquilinous or sedentary gammarideans have reduced pleopods, but they are otherwise remarkably conservative in most domicolous, fossorial and inquilinous amphipods, presumably because they are often used for creating water currents.

Function of the last pair of uropods is presumed to be in propulsion and ruddering as in other peracaridans, but uropods 1 to 2 have seemingly little function except as strengtheners for the urosome during explosive flexation that is a part of jumping behaviour. Were this the sole function of uropods 1 to 2 the maintenance of at least a small degree of articular flexibility of the uropodal peduncles and rami would seem incongruous. Progressive coalescence of uropods 1 to 2 with the ventral margins of their segments would afford a strong ventral pad to be used as a jumping buffer. Perhaps the small degree of flexibility provides a better shock absorber than would a must solid urosome. The increase in ornamentation of uropods on certain fossorial species indicates at least a minimal function in the digging process, but perhaps this ornamentation primarily prevents coarse particles from being lodged in the cracks between uropods and segmental venters. Paddle-like expansion of rami on uropods 1 to 2 in a few groups (e.g., Synopiidae) points to a swimming function. A few observations on swimming suggest that the uropods, despite their restricted flexibility, can be laterally splayed and serve in balance or braking during the end of a gliding motion. Uropods in some amphipods have been reported to assist in dragging off ecdysial casts of anterior appendages.

Reduction of uropod 3 and reduction or rigidification of the urosome occur in various tube dwellers (e.g., Corophiidae), inquilines (some lysianassids, cressids, stenothoids, possibly kuriids, dexaminids, etc.), tunnel makers (Eophliantidae) and some of those amphipods with semipermanent flexion of the abdomen (Phliantidae). Presumably jumping, swimming, and protection from

unwanted particles have been reduced in importance in these species while there is substituted an adaptation towards more favourable leverage for burrowing into tissues (plant or animal), maintaining special protective attitudes in tubes or channels and in streamlining. Rigidification often occurs without decrease in urosomal or uropodal size. The tube-dwelling Ampeliscidae and the inquilinous Dexaminidae have urosomites 2 to 3 coalesced while the lignivorous Cheluridae have the urosome greatly increased in size and the uropods greatly enlarged or modified. Jumping ability, even underwater, is very strong in the Cheluridae.

The ecological linkages to urosomal evolution in the Gammaridea are manifold; no single solution to functional adaptation has been necessary. The segmented urosome is a remarkably stable feature of the Amphipoda; the urosome and its three pairs of uropods are a revolutionary feature unique to Amphipoda. It has undergone only one major reduction (Caprellidea), yet has imprinted upon it numerous adaptive features while maintaining a minimal structural stability, thus attesting to its development as a major part of the success of amphipods. Like the mandibles, its basic conservativeness has probably been a factor in the successful dispersal of amphipods into many niches.

Development of a dorsal shield in a few Gammaridea has been discussed by Gurjanova (1962: 11-26). This feature is simply an extreme dorsoventral depression of the body and a splaying of the coxae in the Phliantidae. The abdomen is flexed under the thorax possibly as an additional protection to the ventrum owing to removal of the lateral shield. Many isopods, without flexed abdomen, do not appear to require this protection, so there may be other reasons for phliantid flexion. Gurjanova points out possible precursors to phliantids in the calliopiid genera *Chosroes* and *Sancho* but those genera must yet be strongly segregated from phliantids because they have fully developed mouthparts and uropods. They probably should be allocated to a new family in order to qualify the development of a dorsal shield as a major, albeit rare, adaptation of Amphipoda. Dorsal shielding is also seen in the eusirid *Amphithopsis* and it thereby forms a strong link among other Eusiridae, the two quixotic genera, and is conducted into the Laphystiopsidae. To some extent body depression also occurs in a few Podoceridae and this seems negatively significant in light of their presumed derivation from tubicolous corophiids having lost the tube-spinning glands. This loss may be correlated with such dorsal shielding because both methods of protection would seem unnecessary together.

Temnophlias, a 'phliantid', has also been included by Gurjanova as a member of the progression from *Amphithopsis* through *Sancho* into the Phliantidae but another suggestion might be made: that *Temnophlias* is really a cylindrical organism with secondary pleuronisation of the pereonites similar to munnid isopods. It may have affinities with the Eophliantidae, the most strongly developed of the cylindrical gammarideans. Cylindricality and dorsal shielding are difficult to separate because various corophiids, chelurids, and aorids have always been considered to be depressed organisms rather than cylindroid (Stebbing, 1906, general theme). Both terms partially apply to these groups. But one may consider that these organisms have substituted domiciliary habits in the form of tube building or burrowing for the true lateral shield and that dorsal depression is a consequence of cylindricalisation that cannot be carried too far without rendering the organism positionally unstable. Some depression is required for the organism to maintain a crawling equilibrium. Gurjanova appears to regard Phliantidae (dorsal shields) and Eophliantidae as cohesive, but eophliantids are strikingly cylindrical. There is now evidence that eophliantids are phycophilous burrowers and this would correspond with the habitats of other families living in diverse kinds of 'tunnels'. The spherical heads and cylindrical, rotatable necks of eophliantids and biancolinids are suggestive of limnoriid isopods and are presumably associated with the tunnelling habit. They strongly contrast with Phliantidae morphologically but, there is one small difficulty in completely segregating the two families in that one phliantid is known to be a lignivore. One must presume that phliantids are not tunnelling lignivores on morphological evidence alone.

The cylindroid Colomastigidae also may be thought of as tunnellers or domiciliaries because they probably inhabit tests or tissues of sessile invertebrates. But inquilinous behaviour is scarcely confined to cylindroid amphipods. Anamixids and dexaminids, both with strong lateral shields, are undoubted inquilines because of their known ascidiophilous behaviour (*Anamixis,* Anamixidae, and *Polycheria*, Dexaminidae). In neither genus, however, do piercing and sucking mouthparts necessarily indicate consumption of host tissue; *Anamixis* is known to gather together and consume food already collected by the ascidian and *Polycheria* is assumed to filter feed after once digging a burrow in the test of the ascidian host. So-called piercing and sucking mouthparts are common in many other gammarideans such as Iphimediidae and various Lysianassidae.

The evolution of eurypody on gnathopods in primitive amphipods was far from immutably fixed. In returning to a slender condition (stenopody), the marks of a grasping function have been left, with few exceptions. Return to stenopody, hence enfeeblement, of gnathopods among Amphipoda has been recognised as either primitive or advanced. This suggests that gnathopod evolution, especially of gnathopod 2, was basic to the amphipod plan, but once in place, the original enlargement alone was unnecessary and was modified many times during adaptive radiation.

Reduction in size of gnathopods must have come fairly early in gammaridean evolution, for several genera of the Gammaridae and Corophioidea have the gnathopodal size reduced. Some of the functional value of size may have been replaced by increased setosity. All but two of the eight families standing near the Gammaridae have the gnathopods enfeebled. Liljeborgiidae retained the

enlarged gnathopods, and among other reasons, this fact supports the odd thesis that the inquilinous line of Amphilochidae-Leucothoidae-Stenothoidae has some relationship to the Liljeborgiidae. The three connected families, despite the presence of other morphological degradations, have not lost the presence or potentiality of large second gnathopods. Some zoologists would undoubtedly call this situation of enlarged gnathopods 'adaptational'; obviously this is true but the function of enlarged gnathopods can be highly varied. The maintenance of enlarged gnathopods in many members of the Eusiridae-Calliopiidae-Pleustidae is also further confirmation of their strong relationships to the basic gammaridean. The position of the Oedicerotidae, unusually close to the Gammaridae, reflects their enlarged gnathopods. In the several families presumed to have evolved out of a eusirid stock, the gnathopods have become enfeebled. Marine talitroideans maintain the enlarged gnathopod 2 but terrestrial members often return to the stenopodous condition even though gnathopod 2 has obviously not returned to a walking function because of its peculiar morphology.

The seemingly primitive members of the corophioid stock also maintain the enlarged gnathopod 2 but the advanced members show either an axial reversal, a shift of domination to gnathopod 1, or an enfeeblement. Potentiality for enlarged gnathopod 2 is fully maintained in the Ampithoidae and Ischyroceridae and the ultimate peculiarity is reached in the Cheluridae, one species of which has gnathopod 1 expanded into a fully prehensile appendage like that of *Maera*. Although some of the most diverse and, thus, presumably successful shallow-water (and primarily tropical) genera have the fully enlarged and prehensile gnathopod 2, the trend in gammaridean evolution has been a secondary return to stenopody. Retention of the primitively enlarged gnathopod 2, in the Podoceridae and the Caprellidea, even the Cyamidea, is one more mark of their relationship. Those very successful tropical gammaridean genera with enlarged gnathopod 2 (in males) occur in several distinct evolutionary lines: *Elasmopus*, *Maera* and *Ceradocus* in the Gammaridea; *Hyale* in the Talitroidea; *Gammaropsis* in the Corophioidea; *Podocerus* in the Podoceridae; the inquilinous *Stenothoe* in the Stenothoidae and *Leucothoe* in the Leucothoidae. These genera clearly have their highest diversity in the tropics and subtropics whether they had their origin there or not. The ecologist's attention should be drawn to this curious matter.

Nontropical gammarideans with enlarged gnathopod 2 are particularly conspicuous in the demersal eusirids, the liljeborgiids, various stenothoids and the Gammaridae.

Correlations of mandibular functions with morphology are poorly understood. Biting, chewing, grinding, piercing, and rasping functions are obvious, but mandibular variations are far more numerous than just those five categories. Gammaridean amphipods have been thought of primarily as omnivorous, feeding on debris and detritus, carrion and dead plant fragments. The basic mandible seems to be adapted to biting off chunks with the incisors and grinding those chunks with the molarial rasp. The lack of emphasis on herbivorous habits of Gammaridea in the literature is surprising in view of the properly adapted mandibles and the strong infestation of marine plants by amphipods. Macroscopic algae and marine grasses infested with amphipods only occasionally show gross cropping or evidence of bites having been removed. Stomach contents of a few phycophilous amphipods demonstrate that they probably feed on microscopic epiphytes. Undoubtedly the larger and slower growing algae have evolved mechanisms to limit the success of marine herbivores. Microscopic epiphytes presumably survive through rapid growth while the total amphipod population may be restricted by the seasonality of epiphytes; probably a balance is thus maintained in ways similar to the diatom-copepod cycle of the pelagic realm. Amphipods may benefit the macrophytes by cleaning their surfaces of infesting epiphytes.

The microherbivorous amphipod with biting-rasping mandible and enlarged male gnathopod 2 may be the basic member of the amphipodan organisation. To suggest that the level bottom scavenging amphipod evolved first and invaded epifloras later would presume that cellulase secretion was not an original part of the amphipod plan. The grossly compressed bodies of the basic amphipod also attest to a preadaptation for nestling and gliding among anastomoses. Steele (*in litteris*) has pointed out the arrangement of forward and backward pointing groups of pereopods that adapts amphipods so admirably to a grasping benthic function. That this ungainly organism was later able to invade a host of other habitats seemingly unsuitable to a flea-like morphology suggests that in the course of their evolution numerous 'hidden' adaptations accrued. Some of these may be circumstantial: high prodigality ('success by numerical pressure'), and low genetic plasticity that maintains a broad adaptability to feeding conditions. A more efficient mechanism than the basic mandible may be imagined for cropping micro-epiphytes without radical changes in the general structure. The maintenance of that basic mandible throughout so many families and genera of amphipods, which obviously have put it to numerous functions, suggests that one key to success of amphipods is their potentially omnivorous habit.

In the dispersal to level bottoms, amphipodan functional morphology almost invariably changed; the successful Ampeliscidae build tubes; the Phoxocephalidae-Haustoriidae and Oedicerotidae dig burrows and often become much broadened in their bodies; other genera, like *Listriella*, have obtained special associations with infaunal members of the level bottoms.

Almost all of the greater Corophioidea, the tubicolous amphipods, have maintained the basic mandible, palp included. Even the wood 'boring' Cheluridae are able to rasp wood with the basic mandible. The greater Talitroidea have maintained the rasping mandible although the palp has been lost.

Presumably one function of the palp is the cleaning of the anterior cephalic space between the antennae. Amphipods without palp often have few antennal setae projecting into that space to trap particles and we have observed amphipods in life cleaning that space with gnathopod 1.

The trend to a distinct change in mandibular morphology is seen in some Gammaridae and even more strongly in some of the families closely associated with the Gammaridae, such as the Liljeborgiidae, Eusiridae and Phoxocephalidae-Haustoriidae. Loss of trituration surface and reduction in size of molar are almost universal in the Liljeborgiidae, but the reasons are not yet apparent as the ecology of the group is poorly known; various burrowers in the Phoxocephalidae, Haustoriidae and Oedicerotidae have smoothed-off molars and several of those genera have enormously enlarged molars covered with a setular velvet. Such molars are also seen in the Synopiidae. They may have some relationship to the fossorial or semifossorial habit of processing mineral grains. But in those large fossorial families the normal mandible is retained by numerous genera. We have seen in life the upside-down amphipod *Gibberosus* clean grains with mouthparts and legs without use of mandibles. The strongest changes in mandibular morphology occur in those families presumed to be inquilines. In one way or another these families have adapted to 'piercing and sucking' or possibly to the scraping of slime but even some inquilinous amphipods maintain the biting and grinding functions. The mandible of *Polycheria* may be used for burrowing into the tests of tunicates for domiciliary purposes, but our field observations of many live amphipods cast doubt on any conclusions about function based on morphology. After digging its home, *Polycheria* then engages in filter feeding. Indeed, the biting adaptation is rarely lost even in the strongest inquilines; it is maintained in many Iphimediidae where it also is adapted for slicing (Watling, *in litteris*), although others of the family have those incisors developed into stylets. The conformity of the iphimediid and stegocephalid mouthpart bundle suggests a gross piercing function as if they normally attack some large sessile invertebrate, but this may be entirely a false assumption, as one may see in *Anamixis* where the piercing 'adaptation' is really a structure for licking food off of the gnathopods. Presumably some of the 'inquilines', like those of the greater Stenothoidea, are grazing predators, biting off coelenterate polyps or consuming sponge and tunicate tissues.

The pardaliscid and stilipedid mandibles are the most paradoxical. They are elytriform like those of some stegocephalids, lack molars but retain palps, yet the mouthpart bundle is rarely coniform and no one has demonstrated an inquilinous behaviour. Many of these species are nekters or demersal members of the deepsea fauna.

The presence or absence of medially and facially attached setae on the inner lobe of maxilla 1 often has taxonomic importance at generic level but the structure of outer plate and palp have been overlooked. Our colleagues, J.K. Lowry & H. Stoddart (*in litteris*), however, have found immense importance in these structures in the systematic arrangement of Lysianassidae and will publish that work soon. To discover the functions of the myriad of minute attributes they have found will require the most sophisticated of approaches because of the cryptic nature of those mouthparts. Some pioneering work has been accomplished (e.g., Croker, 1967a,b) on the function of setae on maxilla 2 which filter differing sized particles based on 'pore-width'. This is correlative with differing habitats of the several species studied.

Maxillipedal changes mark one of the primary subordinal grades of evolution within the Amphipoda. The loss of palps is a condition of the Hyperiidea. Only two families of Gammaridea and a few genera of two other families have a marked reduction or loss of these palps. Such loss is associated with a nektonic, often inquilinous habit, but numerous pelagic Gammaridea have fully developed palps. Reduction in maxillipedal plates or palps is not perfectly correlated with the inquilinous families or with those marked by mandibular changes, but as we should expect, all stages of the perfection of this morphology are apparent and the inquilinous trend is obvious. Plates and palps often evolve independently as if their functions were distinct; in some cases such as Liljeborgiidae and throughout the greater Stenothoidea, the plates become reduced while the palps are maintained or increased in size.

Behaviour

Very little study of behaviour in Gammaridea has occurred to this time. This discounts any possible inferences as to behaviour that might be derived from a moderate body of work on genetics (especially eye-colour), physiology (especially hormonal and humidity problems in terrestrial amphipods), reproduction and life-history, or the casual observations on mating that have been reported on or passed by word-of-mouth. The principal synoptic work on gross observations of behaviour was done by Enequist (1949). In the past few years studies on behaviour are beginning to have an impact on systematics and this burgeoning activity should have excellent consequences in future schemes of classification. Usefulness to identification will depend on the capability of linking behavioural characteristics to morphological distinctions among taxa.

Examples of four principal consequences to systematics from the study of behaviour are the discoveries of upside-down-behaviour in melphidippids (Enequist, 1949) and megaluropids (Barnard, Thomas & Sandved, 1988), the transformation of feeding differences between juveniles and adults of Anamixidae (Thomas & Barnard, 1983a; Thomas, in preparation), and the sideways amplexing behaviour in crangonyctids and other gammaridans and the use of male swimming kinds

as the basis for a superfamily classification (Bousfield, 1973, 1977, 1978, 1983).

Further consequences of functional morphology include hypotheses about the use of calceoli by amphipods (Lincoln & Hurley, 1981a; Stapleton, Williams & Barnard, 1988), and the presence and use of the callynophore (Lowry, 1986). Increased attention is now being paid to feeding, tube building, grooming, modes of amplexing, swimming, jumping, territoriality and threat displays. Mathematical and engineering studies on motions in appendages and mouthparts are commencing. Telsonic function is being discussed. One trusts that investigators will keep in mind the taxonomic and systematic consequences of their experimental models so as to optimise any contributions as swiftly as possible.

The Families of Gammaridea

A revolution of internal classification in Gammaridea has occurred since the mid 1950's when Bulycheva (1957) began the modern superfamily concept by establishing the Talitroidea. This was followed by J.L. Barnard (1972b, 1973) who filled out the Talitroidea and began using the Corophioidea to encompass several families. Then Bousfield (1973, 1977, 1978, 1983) reorganised all Gammaridea by first creating Gammaroidea and later putting all 70+ families into 19 superfamilies; Bousfield had by 1983 at least 87 families with additional unnamed groups. Since 1983 other new families have been described and out of the total mix we reject the usage temporarily of several family concepts (see Table 1 and see Table of Contents) so that our total is 91 (97 in 1991). Obviously, more new family concepts reside just in the known taxa, for example within Eusiridae.

There are many valuable elements in the superfamilial mode of classification but, as yet, it has not been rendered into a system of much value to an identifier faced with preserved specimens. The system is therefore not used in this manual. Even at family level it is almost impossible to include and thereby identify all known gammarideans to generic level in a simple key, although such a method is attempted herein. Much of the superfamily system is based on theories involved with swimming males, structure of calceoli (of limited gammaridean occurrence), amplexus during mating plus other kinds of behaviour not available to identifiers faced with specimens in preservative. Absolute and discontiguous apomorphic characters (morphological) have not been identified in such a preponderance of families, let alone superfamilies, that the superfamily concepts are useless for identification. To detect apomorphies requires a solid foundation in plesiomorphic character determination and this sort of activity is just beginning. Much dialectics remains but more urgent are extensive studies on microstructures and behaviour plus a continuing exploration of the alpha taxonomic diversity in the group.

A principal order of business in the past decade at many meetings of carcinologists around the world has been the determination of the phylogenetic origin of Amphipoda. This is not a subject to be discussed at length herein and therefore will not be documented. Suffice it to write that the pelagic versus benthic, or mysid versus syncarid origins of Amphipoda remain unclarified. Whether or not the fleshy versus laminar telson morphology is plesiomorphic is debatable. Whether or not cleft versus uncleft telsonic morphology is apomorphic is unknown. This kind of argumentation can be extended to most characters of Gammaridea.

The system of identification presented here is an elaboration of that found in J.L. Barnard (1969c) to which have been added many recently described families and many improvements from redescriptions. The Gammarida, a 'section' or 'infraorder' containing many family groupings, is excluded because it was treated by Barnard & Barnard (1983). Wherever key couplets terminate in 'Gammarida' one must turn to Barnard & Barnard (1983). The only other high-placed infraordinal names frequently found in the keys are 'Corophiida', 'Haustorioidea' and 'Talitroidea' which should direct the reader to those sections alphabetically where it has been found to be prudent to treat arrays of taxa in additional keys before reaching family level. The vast number of endemic freshwater genera is excluded from the report but any freshwater genus with contiguous marine origins is cited in the keys unless it was fully covered by Barnard & Barnard (1983) and in which case the term 'Gammarida' is used as an endpoint in the key.

Where possible the keys are constructed on gross, easy-to-see characters but the recommendation is reiterated that analysis of an amphipod should follow the very detailed procedures of preliminary observation, filling out of the analytical sheets and discovery of all characters through dissection and mounting of parts on slides (see Appendices).

An idealised member of Gammaridae (Gammarida) forms the basic model of Amphipoda. Each of the gammarid families shows some tendency in their advanced genera towards reduction in the accessory flagellum, thereby suggesting that the presence of the ramus in those families is primordial. The following valid families which are very close to this model have been discussed in Barnard & Barnard (1983) (* = marine taxa present; $^{+}$ = taxa included but not necessarily as family units): *Anisogammaridae, *Argissidae, Artesiidae^{+}, Bogidiellidae, Caspicolidae, Crangonyctidae, *Gammaridae (a loose group also termed by Barnard & Barnard [1983] to be better known as Gammarida), Gammaroporeidae, Megaluropidae^{+}, Melphidippidae, *Mesogammaridae, Neoniphargidae (called therein austrogammarids), Paraleptamphopidae^{+}, Paramelitidae (called therein austrogammarids) and Perthiidae (not at that time a family but included with austrogammarids), Phreatogammaridae, and Salentinellidae.

Bousfield (1983) placed the Crangonyctidae, Paramelitidae and Neoniphargidae in a superfamily Crangonyctoidea apart from the Gammaroidea and the recently described Perthiidae would be in that group

also. We agree that Crangonyctoidea is a real group distinct from Gammaroidea but unfortunately the only purely unique character of the group, type-9 calceolus, is lost in many members of the group and so it cannot be rigorously defined. Bousfield's Niphargidae which earlier was counted by him as a superfamily has been sunk into Crangonyctoidea by Bousfield (1983) but as yet no niphargid has been found with type-9 calceoli so that such placement is purely conjectural. The niphargids are discussed also by Barnard & Barnard (1983) who count them as a group of the Gammarida with hazy placement. The Gammarida are used as a dumping ground for a large number of taxas yet cloudy, to which we assign such ill-defined group-names as *Hadziidae, *Melitidae, *eriopisins, *eriopisellins, *cheirocratins (also placed in Melphidippoidea), *Calliopiidae (? = *Gammarellidae), weckeliins, and their many subgroups. Bousfield (1983) considered the Hadziidae and Melitidae to belong to a superfamily Hadzioidea. Such difficult-to-define groups as Pontogammaridae, Typhlogammaridae, and Acanthogammaridae are not yet resolvable.

Bousfield's Bogidiellidea (*Bogidiellidae, Artesiidae) are principally freshwater groups also treated by Barnard & Barnard (1983) who believed them to be so derived that their origins are very likely to be in the Crangonyctoidea mainly because of freshwater contiguity. They have no crangonyctoid markers nor markers of any other group.

Within Gammaroidea Bousfield placed the Macrohectopidae, discussed by Barnard & Barnard as a possible marine derivative of some unknown origin within Lake Baikal. Bousfield's Paracrangonyctidae and Salentinellidae were placed by him in his Liljeborgioidea but again Barnard & Barnard (1983) discussed these freshwater groups in the context that Paracrangonyctidae might be derived crangonyctoids and Salentinellidae have an unknown origin.

Bousfield's Melphidippoidea (including *Melphidippidae, *Megaluropidae, Phreatogammaridae) were included in Barnard & Barnard (1983) but the latter authors placed Phreatogammaridae much more basically antecedent to crangonyctoids. Melphidippidae have the structure of gammarids in which the coxae have become shortened, the gnathopods enfeebled like females of *Cheirocratus*, and uropod 3 is elongate. Cephalic ocular bulges and a strong trend towards reduction of the accessory flagellum are characteristic. The melphidippoids may be a unified group though they are rather difficult to identify with any clear apomorphies; they exhibit an upside-down behaviour which is barely visible in morphological characters that can be detected by an identifier. As noted by Bousfield and Barnard & Barnard (1983) this group, which qualifies as a superfamily, has joined with it the Megaluropidae, the cheirocratids, and *Hornellia* (see Barnard & Barnard, 1983) which have similar morphofunction, the upside-down behaviour pattern discovered by Enequist (1949) and amplified by Barnard, Thomas & Sandved (1988).

Argissidae fall into the eusirid grade of structure (see below) by reduction of the accessory flagellum to 2-articles. Such reduction by itself does not imply any direct relationship to those eusirid families because some marine and nonmarine Gammaridae also have a reduced accessory flagellum; such reduction occurs repeatedly in other completely distinct groups (e.g., corophioids). The peculiar coxal morphology of argissids (Barnard & Barnard, 1983, fig.49) is not fully unique, for an analogous condition occurs in a melphidippoid genus, *Megaluropus* (Megaluropidae) and in the Nihotungidae. Enfeeblement of gnathopods is again a feature of argissids but the quadrilocular eyes of oculate members seem significant. Except for those eyes, the diagnostic characters of argissids, though unique together, are drawn from diverse members of the Gammaridae.

The *Pontoporeiidae were included in Barnard & Barnard (1983). Bousfield (1983) joined this and *Haustoriidae into a superfamily Pontoporeioidea. We are now certain that Pontoporeiidae and Haustoriidae are not of monophyletic descent (paper in preparation) and our treatment herein is to retain Pontoporeiidae within the greater Gammarida at a hazy level and we leave their generic diagnoses to Barnard & Barnard (1983). However, we include the characters of the five pontoporeiid genera in our keys and denote them as Pontoporeiidae with reference implicated to Barnard & Barnard (1983).

This now disposes of the groups that are not further discussed in this work except to the extent that any marine components can be identified as endpoints in our keys and they are called "Gammarida, Melphidippidae, Pontoporeiidae, Megaluropidae, bogidiellids, hadziids, weckeliids", etc.

Other marine groups we consider to be within the model of the Gammarida are Bousfield's Phoxocephaloidea (Phoxocephalidae, Platyischnopidae, Urothoidae) and Haustoriidae. They have extreme fossorial adaptations found rudimentarily in several Gammaridae.

Joining the Haustoriidae as companions we now add the marine families Urohaustoriidae, Zobrachoidae, Phoxocephalopsidae, Cardenioidae, Urothoidae, Phoxocephalidae, Platyischnopidae, Cheidae, Condukiidae and Carangoliopsidae. We treat this entire complex as a unit called Haustorioidea and within various keys we include the genera of the Carangoliopsidae and Pontoporeiidae even though they may have affinities to Gammarida. The Haustorioidea are a diverse complex of fossorial amphipods characterised by attributes one associates with burrowing: heavily setose and spinose pereopods or antennae or both. The group as a whole has many aspects of similarity to Gammaroidea and is retained with them in the section Gammarida because of well-developed accessory flagellum, primitive retention of article 2 on outer ramus of uropod 3 and the tendency for the inner ramus of female uropod 3 to become shortened. We agree with Bousfield, however, that *Carangoliopsidae are simply convergent fossorial organisms with an origin possibly near the melitins within the Gammarida. Their marker-character is the presence of a basofacial spine on uropod 1.

One of the largest groups with strongest similarity to Gammarida is the Eusiridae, marked by reduction or loss

of accessory flagellum. There are many divergent morphological trends away from the basic gammaridan in this group and it probably contains several family groups to be detached when rigid phyletic tests are undertaken. For the moment, we have designed our keys toinclude these groups under the umbrella of Eusiridae. We mention this group early in our discussion because the term 'eusirid', implying severe reduction of accessory flagellum, is often used in the following discussion.

The powerful gnathopods of the Liljeborgiidae are reminiscent of those in the Eusiridae (for example, *Rhachotropis*) but most liljeborgiids have a visibly developed accessory flagellum and all have a reduced, non-triturative molar. Some eusirids also have this reduced molar. The Eusiridae seem to be so broadly polyphyletic that there is cause to investigate the inter-relationships of liljeborgiids with some of the eusirids. Several grades of structure are congruent between the Liljeborgiidae and certain members of the Pleustidae. The labia of the two groups are very similar and the mandibular molars of pleustids often resemble those of liljeborgiids. The Pleustidae are enigmatic in that only a single synapomorphy, of difficult analytical detection, the strange lower lip, is common to all members. Pleustids otherwise mix characters of Iphimediidae and general eusirids. Pleustid gnathopods are often enlarged but the family differs from liljeborgiids in their uncleft telson and vestigial accessory flagellum. The outer rami of uropods 1 to 3 are shortened in Pleustidae and the outer ramus of uropod 3 is 1-articulate but some liljeborgiids approach these conditions. The enlarged pleustid rostrum is a development that is restricted to a few members only.

While the mandibles of Liljeborgiidae show a strong tendency to a complete loss of the molars, the liljeborgiid gnathopods are very powerful and the liljeborgiid with the smallest coxae has larger coxae than any member of Pardaliscidae. The lower lip of liljeborgiids is very similar to that of pardaliscids.

The pelagic or epibenthic Vitjazianidae have the general appearance and ecology of some pelagic eusirids but they retain a 3-articulate accessory flagellum. Gnathopod 1 has become simple and the most specialised vitjazianids have extremely reduced coxae. The mouthparts maintain a basic gammarid structure. Some of our colleagues believe that the two genera of Vitjazianidae should be divided into two families.

Hyperiopsidae form another pelagic theme. The typical genus resembles hyperiid Amphipoda but retains the maxillipedal palps; the second genus, *Parargissa*, differs so remarkably in its overall appearance that it is debatably an hyperiopsid but mouthparts, antennae and pereopods seem to confirm the possibly homoplasic relationships between the two genera. Again, some resemblance to the eusirid grade of structure is seen in the elongate enfeebled gnathopods characteristic of some calliopiids, but gnathopod 1 is almost completely simple, the accessory flagellum is 3-articulate and elongate as in some vitjazianids, and furthermore, the palp on one member of the first maxillae is specially modified, bent and scaly. Article 4 of pereopods 3 to 4 is enormously elongate, thus giving to the pereopods a strong raptorial function apparently surrendered by the gnathopods.

Pardaliscidae are characterised by foliation of the mandibles and loss of molars, the frequently occurring conjoint condition (callynophore) at the base of the primary flagellum on antenna 1, feeble gnathopods, progressively reduced coxae, and one or more peculiarities of the maxillipeds: reduction in overall size of the inner plates, often a reduction in the outer plates, and, occasionally, an elongation of the article carrying the outer plates. The lower lip often has the inner lobes coalesced and forming a convex bridge between the outer lobes. A generalised view of the maxillipeds suggests similarities to the Liljeborgiidae in which the maxillipedal palps, like those of the Pardaliscidae, are relatively dominant over the basal plates.

Synopiidae are similar to the basic gammaridean in view of their elongate accessory flagellum, even though several of their members have the articles reduced to two. Gnathopods are feeble. All but a few synopiids have the head developed in galeate form and enlarged in relation to the shortened pereonites 1 to 3. Coxa 3 dominates coxa 4 in most of the genera, and in all but one genus, article 3 of the mandibular palp has become very short, almost vestigial. The mouthparts are otherwise basic except for those genera having the molars extremely enlarged and velvety smooth. This semifossorial condition has also occurred in some haustorioids even closer to the Gammaridae than the Synopiidae. Uropods have undergone the eusirid shortening of the outer rami but uropods 1 to 2 are far more specialised in the frequent sublamellar condition of the inner rami. In all but *Synopia*, the telson has become elongate. Eyes when present are dorsally coalesced or contiguous.

Oedicerotidae have reached the eusirid grade of structure in accessory flagellum, resemble the Synopiidae in head and eyes but the telson is a short, thin, ovate or truncato-ovate, uncleft lamina, unlike that of most Synopiidae. Uropod 3 has become fully elongate, a tendency seen in several synopiids but the pereopods have become strongly fossorial, the first six pairs by virtue of their long setae and the seventh pair by virtue of its immense articular elongation. On the average, gnathopods are of medium size, thus being more powerful than those of synopiids. Oedicerotidae have a strong resemblance to corophioids especially in pleonal epimera and pigmentation but lack pereopodal glands and have a thin, nonfleshy telson. Oedicerotids are presumed to descend from Exoedicerotidae which have paired eyes and spinose rami of uropods 1 to 2. Exoedicerotids then are linked to a more primitive grade of structure represented by the Paracalliopiidae in which the eyes also are paired but very enlarged; pereopod 7 is also elongate and bears the elongate setose dactyl. Strong similarity between the two groups is found in the strange gnathopods of Paracalliopiidae and Exoedicerotidae which are somewhat eusirid, enlarged mittens which twist inward on death.These are not found in Oedicerotidae though many oedicerotid gnathopods could be derived from these odd appendages. Paracalliopiidae cannot stand on a direct line ancestral to

Exoedicerotidae and Oedicerotidae because urosomites 2 to 3 are fused together and because Paracalliopiidae lack the primitive ramal spines found on uropods 1 to 2 of Exoedicerotidae. A few oedicerotids also have fused urosomites.

The paramphithoid section of the Iphimediidae, a group characterised by acuminate coxae, is very similar to the Eusiridae-Pleustidae complex. Other iphimediids have a marked change in the mouthpart field from its basic quadratiform bundle in paramphithoins to a conical or triangular field. The individual mouthparts (especially incisors) increasingly become more styliform with reduction of molars or the mandibles have become broad, flattened, and very powerful. Because of the complete loss of maxillipedal palps, the ochlesin section of the Iphimediidae is technically difficult (through keys and first impressions) to separate from hyperiids.

The Iciliidae were formerly placed in the Podoceridae but have lately been removed from that group on the probability that the telson is not fleshy and the fact that uropod 3 is well developed and thus ordinary. Although the body form of iciliids closely matches the strange, depressed form of podocerids, iciliids are believed to be at least in the same gradational level as paramphithoids (Iphimediidae). They share acuminate coxae and reduced accessory flagellum.

The Laphystiopsidae carry eusirid tendencies forward to their definitive extremes through loss of molarial grinding ridges, miniaturisation of coxae, and simplicity of gnathopods.

The Lafystiidae resemble Laphystiopsidae but are characterised by reduction of maxillipedal palps.

Bateidae have the cephalic pleustid aspect but gnathopod 1 is reduced to a single article or two.

The paramphithoid section of the Iphimediidae has similarities to more advanced families, either directly or indirectly. Resemblance between paramphithoins and Stilipedidae (= Astyridae) is readily apparent. The appendage plan of the Stilipedidae conforms remarkably to that of the Pardaliscidae. The flattened mandibles of the two families are similar. That stilipedids were not ancestral to pardaliscids is attested to by the strong accessory flagellum and weak coxae of pardaliscids. The broadened first coxa of Stilipedidae is a distinction from Pardaliscidae but shared with certain Iphimediidae. The lack of acumination on coxae differentiates synopiids and pardaliscids from iphimediids.

Many Dexaminidae (= Atylidae, = Lepechinellidae) have the acuminate coxae of Iphimediidae, but differ through coalescence of two urosomal segments.

Stegocephalidae are the only other major family of Gammaridea not yet discussed in which all members bear the strong conically arranged mouthpart field of Iphimediidae. Stegocephalidae have the broad, sublaminar mandibles of several iphimediids but lack a palp. The breadth of the lateral shield appears to have a relationship to midwater suspension but acumination may still be seen in the anterior coxae. Some benthic members may also be predatorial grazers and the only supposed raptorial predator (*Parandaniexis*) in the benthic Gammaridea is a member of the Stegocephalidae.

Another line of evolution favouring inquilinous behaviour is that commencing with the Amphilochidae and Leucothoidae. Early students of the Gammaridea noticed similarities between Liljeborgiidae and Leucothoidae in maxillipedal structures; other resemblances such as retention of enlarged gnathopods are so clear that one might say that leucothoids are liljeborgiids in which the accessory flagellum has become vestigial and gnathopod 1 has been transformed into its fully carpochelate condition while the outer plates of the maxillipeds became vestigial. The rudiments of the carpochelate gnathopod may be seen in gnathopod 2 of leucothoids, thus resembling the gnathopods of liljeborgiids. Terminal male Anamixidae carry the inquilinous state to the ultimate by the reduction of mandibles, maxillae and coxa 1, and the dominance of a ventral keel which has been found to aid in brushing off food from gnathopods.

Amphilochidae and their companion families Cyproideidae, Bolttsiidae and Pseudamphilochidae have mouthparts strongly resembling those of liljeborgiids. The gnathopods are usually miniaturised editions of the liljeborgiid form similar to those of *Listriella*. But the heads of amphilochoidids have the appearance of the pleustid-paramphithoin or bateid line. The initial distinction is the reduction of coxa 1 (except in the precursorial Bolttsiidae and Pseudamphilochidae), which is not as fully reduced as in the Bateidae. This results in a similarity to stenothoids. The peculiar *Pseudamphilochus*, because of its cleft but ovato-acuminate telson, unreduced coxa 1, large rostrum and non-elongate peduncle of uropod 3, stands among the Amphilochidae, Pleustidae and Liljeborgiidae, and is recognised as the unique Pseudamphilochidae. It is clearly more primitive than Amphilochidae in the unreduced coxa 1. The Bolttsiidae differ from Pseudamphilochidae in the uncleft telson.

All six families of the stenothoid complex have strong similarities by virtue of the mandibular form (see figures in the various families) in which at least one mandible has a box-like shape with deeply serrate incisor, a lacinia mobilis formed of a thin lamina resembling the incisor and nearly appressed to it, plus a molar bulge clearly moved distalwards toward the incisor and nearly or partially encroached upon by the spine row. One group of stenothoids (Cressidae, Stenothoidae) has the amphilochid coxa 1, whereas the second has the leucothoid (normal) coxa 1 (Pagetinidae, Sebidae, Tulearidae). The third group is represented by the aberrant Nihotungidae which has an intermediate coxa 1 with coxae 2 to 3 even more reduced, and the mandible has become palpless and 'piercing'. Sebid gnathopods even vaguely resemble gnathopod 1 of leucothoids and numerous other similarities are apparent. Stenothoidae (= Thaumatelsonidae), and Cressidae, those with amphilochid coxa 1, are very closely similar among themselves, even though some extremely pygidised species have been used as types of the Cressidae, and the old, now abandoned family Thaumatelsonidae. The six stenothoid families have a similar uropod 3. It is uniramous, presumably through loss of the inner ramus,

as the remaining ramus is basically biarticulate. Neither the Leucothoidae nor Amphilochidae show a tendency to this condition, except perhaps for the universally matching Pseudamphilochidae. If the Amphilochidae were the precursors of the Stenothoidae and the Leucothoidae were precursors to the Sebidae, then the evolution of a common uropod 3 had to occur twice.

Pagetinidae are very derived amphipods with reductions in setation and solid structure of the mouthparts, reduced amphilochid-kind of gnathopods and loss of article 2 on the single ramus of uropod 3. Tulearidae differ from pagetinids in the plesiomorphic conditions of mandibles, maxillae, maxillipeds and coxae. Tulearidae differ from sebids in the non-chelate gnathopods, short article 2 of antenna 1 and lack of mandibular palp.

The superfamily Talitroidea, comprising originally the Talitridae for nearly a century, have been considered as extremely distinctive gammarideans, often worthy of even subordinal rank. Bulycheva (1957) split the Talitridae into three families, adding the Hyalidae and the Hyalellidae. Later workers have added Ceinidae (and Chiltoniinae), Dogielinotidae, Eophliantidae, Kuriidae, Najnidae, Phliantidae, Plioplateidae and Temnophliantidae. They are often treated here in various keys as a superfamily, mainly for convenience in identification, but just as often are reported in other keys down to family level. Talitroidea, like most other gammaridean superfamilies, have no absolute synapomorphies present in every preserved specimen; several other families have a uniramous uropod 3 and lack a mandibular palp but among the genera of talitroids are many unusual morphs. Often the cephalic sclerites are clearly marked. Numerous gnathopodal, pleopodal, and antennal modifications occur in terrestrial genera; the jumping ability is extreme in those genera. The marine members appear more regularised, some even having vestigial inner rami on uropod 3. Perhaps the structure of fringing setae on the female brood lamellae will prove to be characteristic of the group. Although they may be considered as very distant from the basic gammaridean, their gradational singularity is damaged by discovery of the gammaroid *Beaudettia*. That genus is composed of a species with clear relationship to *Elasmopus*, a member of the gammaroids. Through loss of mandibular palp, reduction of the inner ramus of uropod 3, and telsonic modification, *Beaudettia* approximates the talitroidean grade of structure.

Families without clear similarities to others are the Ampeliscidae (possibly to Dexaminidae), Clarenciidae, Colomastigidae, Didymocheilidae, Lysianassidae (possibly to Stegocephalidae), and Maxillipiidae.

The Ampeliscidae are a very advanced group, apparently completely divorced from the corophioid complex, which have developed pereopodal glands and spun-silk tubes of a different form from those of corophiids. Ampeliscid morphofunction is also discrete, as far as we know. Ampeliscids have a mixture of characters represented by argissids and dexaminids but those two families otherwise bear no similarities. Barnard (1969c) found many characters in common between Ampeliscidae and Dexaminidae, generalities such as pleonal fusion, gnathopods, antennal ornamentation associated with sexual dimorphism, and diversity of pereopods 5 to 7, coxae, mouthparts and uropods.

Similarities of the Colomastigidae are difficult to trace. The body form is subcylindrical but the head is not of the spheroid kind found in the Eophliantidae, the rami of uropod 3 are present and elongate, the peduncle is elongate and in some taxa the mandible apparently lacks a true incisor, that characteristic having been replaced by an enlarged spine row. Similarities to leucothoids are seen in maxillipeds, uropods and telson.

The Lysianassidae are almost as fully diverse in morphology as all of the other Gammaridea put together and comprise about 20% of all marine genera and species of the suborder. They are united together by their clearly recognisable gnathopod 2 and furthermore share an almost unique antenna 1, with very short and often telescoped articles 2 to 3. Otherwise they have radiated into species that exhibit all forms of inquilinous specialisation such as 'piercing and sucking' mouthparts, coalesced urosomites, reduced uropod 3 and into numerous highly successful denizens of the pelagic realm. The usual nestling and burrowing members also occur in profusion. Some pelagic members are predatory and some may have developed narcotising glands. Even wood boring is a presumed habit of some deep-sea lysianassids eating waterlogged coconuts. But none has developed the tubicoly of corophiids.

The retention of well-developed accessory flagellum in the more primitive lysianassids suggests an affinity with the basic gammaridean stock. There are resemblances to Stegocephalidae, perhaps of convergence and suggesting that Lysianassidae may have developed, like Stegocephalidae, first as a pelagic group that later reinvaded the benthic realm. The obligatorily pelagic genera among the Lysianassidae are very highly specialised but many unspecialised lysianassids of other large genera (e.g., *Orchomene*) occur prominently in the nekton. Elongation of article 3 on gnathopod 2 is not fully unique to the Lysianassidae, as seen in section B of the written key to families. The functional morphology of this lysianassid appendage, with its other unique characters, should be a problem of major concern to gammaridean evolutionists, and, as this work goes to press, several of our colleagues have expressed doubts as to the integrity of gnathopod 2 and may be in the process of extracting one or more families from Lysianassidae that will prove to have closer affinities to Gammarida than to 'Lysianassoidea'. Gnathopod 2 is not grossly dimorphic in the two sexes and seems wholly inadequate, like gnathopod 2 in so many other families, of serving as a sexual grasping appendage. Male gnathopod 2 often serves this function in those few Amphipoda that have been observed in amplexus.

The Didymocheilidae have a vague resemblance to Lysianassidae but also to Sebidae and Iphimediidae. Article 3 of gnathopod 2 is scarcely elongate, both gnathopods are parachelate, the mouthparts are grouped together into a styliform bundle, and the mouthparts, especially the mandible, have some aspects of

iphimediids. Uropod 3, is however, vestigial.

The Clarenciidae have not been completely described because they are based on a single individual lacking urosomite 3 and uropods 1 to 3. The head lacks lateral lobes, antenna 1 is short and telescopic, the mouthparts are rather ordinary, gnathopod 2 is a giant propodochelate morph, coxae 3 to 4 are almost acuminate, the pereopods seem to be ordinary and the body is carinate.

The Maxillipiidae have as their most noteworthy attribute the immensely elongate pereopod 6 with flagellar dactyl. Their mouthparts are somewhat reduced, the mandibles lacking palp, the inner plate of the maxilliped being very thin and all the mouthparts being poorly armed; the coxae are very short but overlapping; the head is large and somewhat like that found in the stenothoid-amphilochid family groups, the accessory flagellum is absent and uropod 3 is like amphilochids, with long peduncle and two long rami; gnathopods are enfeebled. One could make a case that maxillipiids look like amphilochids with reduced coxae 2 to 7 and elongate pereopod 6.

The final manifold group is the greater Corophioidea complex that is accorded superfamily rank but might be elevated to sectional or subordinal level. The primitive corophioid is conceived of as a morphological analogue to the basic member of Gammaridae. Thus, *Gammaropsis* (Corophiida) is scarcely distinct from *Maera* (Gammarida). Until one examines the fleshy telson and pereopodal glands of primitive corophioids one is struck by the great similarity of generalised gammaroids and corophioids. The latter have become very diverse in many of the same ways as have the gammaridan stock but no highly advanced inquilines have appeared. Identification and relationships are clouded by the frequent loss of those glands in the Podoceridae, some Corophiidae, the Cheluridae, and even the old nomenclatorial type of Isaeidae, *Isaea*. A more basic example of the isaeid line is *Gammaropsis* and its name should ideally be the root of the stock. Corophioids comprise the Ampithoidae, Biancolinidae, Cheluridae, Corophiidae, Ischyroceridae and Podoceridae with the old Aoridae, Isaeidae, Photidae and Pseudomegamphopidae being temporarily rejoined into the Corophiidae until a better division into families can be discovered. The whole group is considered under the name Corophiida. Barnard & Barnard (1983) have suggested that Corophiida (versus Gammarida) are the more logical primitive Gammaridea because of the unspecialised telson than are gammaroid-like amphipods which have specialised laminar telsonic flaps.

The most advanced members of the corophioid group have accumulated two morphological changes, either reversal in gnathopodal domination or development of a partially to fully rigid urosome with loss of uropodal structures. The gnathopodal reversal may be related to a stronger than normal cephalic orientation required of organisms living in tubes open to the anterior end of the animal body. Rigidification of the urosome may assist the organism in maintaining a position within the tube. Some of these tube dwellers have even returned to making burrows (?internally lined) in the substrate.

Perhaps the Podoceridae have come closest to the inquilinous function; their ecology and morphology are poorly known but there has developed the impression that most of their members have lost the spinning glands and that many of them are strongly associated with hydroid or bryozoan colonies, as if they were predatorial browsers. At least one genus, *Podocerus*, has recently been shown to be a filter feeder, stealing tubes of other taxa and projecting the net-like antennae upwards into water currents.

The stability and similarity among the mouthparts of the members of the corophioid complex leads one to the view that podocerids belong with the group. They are frequently mentioned as the root stock of caprellids; indeed, the family, Caprogammaridae (Kudrjaschov & Vassilenko, 1966) has been described with further strong evidence of podocerin-caprellid relationships; that family, despite opinions of our colleagues to the contrary, is so remote from corophioids that it is not included in this work because it clearly is a recognisable caprellid.

Distinctions between isaeids and aorids are not clear except that gnathopod 1 of aorids is either larger than gnathopod 2 or is that member having sexual dimorphism. The Corophiidae seem to be a polyphyletic group of aorids and isaeids with pygidisation. They may include, by convergence, some ischyrocerids also. The Ampithoidae are fairly uniform by virtue of their third uropods and the Ischyroceridae, though analogous to ampithoids because of the development of a rudimentarily uncinate condition on the outer rami, are recognisable by the elongation of the peduncle. Ischyroceridae rarely have the reversed gnathopodal domination. One corophiid, *Ericthonius*, appears to combine features of Corophiidae and Ischyroceridae, but it is not the only 'corophiid' genus that gives trouble to the systematist.

The lignivorous Cheluridae have numerous resemblances to the isaeid-corophiid line, but the fully pygidised urosome reveals suture marks indicating that urosomite 3 has become extremely enlarged, a feature unique to this family. There is no better demonstration of the extreme genetic potential of numerous Amphipoda in replicating long lost structures than by considering the enormous, *Maera*-like gnathopod 1 of *Chelura insulae* Calman.

Geographic Distribution of Marine Gammaridea

The distribution of few species of marine Gammaridea is well known but the distribution of many genera is well known because of the cumulative data afforded by each species. The genera can therefore be organised into biogeographic groups based on thermal zones, depths and geographic regions.

We define: arctic and antarctic = water temperature always less than 4°C; temperate (boreal and austral) = temperature 4° to 10°C for nine months per year; warm-

temperate = temperature 10° to 20°C for nine months per year; tropical = temperature 20°C+ for nine months per year. Owing to results of our data analyses we hereafter combine arctic and temperate and call this 'arctic-boreal' and combine antarctic and the equivalent southern temperate zone and call this 'antarctic-austral'; warm-temperate is divisible into 'north' and 'south'. Refinements denoted by the prefix 'sub' such as 'subarctic' may be mentioned occasionally but in the ultimate data sets these have been combined with their principal zones or regions. We use 'cold-temperate' as a synonym of boreal or austral for emphatic contrast to warm-temperate and to indicate the generality of zones colder than 10°C. Definitions by depth: littoral-sublittoral, 0 to 200 m, automatically the depth limits of any geographic region named patronymically or any zone or region not otherwise specifically designated as bathyal or abyssal; 200 to 2000 m, bathyal; 2000 to 10400 m, abyssal; deep-sea = 200 to 10400 m; + and ++ are degrees of estimates based on our knowledge of new works in progress by our colleagues. Other notations will follow within lists and tables.

Genera can be sorted out relatively easily by gross thermal zones because faunistic monographers have concentrated primarily within these zones. Only Sars (1895), Chevreux & Fage (1925) and Schellenberg (1926a) have written faunistic monographs broadly overlapping two zones. Other large scale papers, seemingly monographic, are but obvious collectors' assemblages. Warm-temperate analyses in both hemispheres have suffered for the lack of discretion between that zone and either tropics or boreal (= cold-temperate) and we have not taken the time to segregate precisely the boundaries between the broad arctic-subarctic and cold-temperate zones in describing the distribution of each species; likewise in the southern hemisphere. Arctic Amphipoda of the north polar basin far from land are very poorly known and probably very sparse; most of the northern Siberian, Alaskan, Canadian, Greenlandian and Norwegian shores and the Okhotsk Sea are placed in the arctic-subarctic zone; Iceland and the outer Kamchatka Peninsula are considered as boreal (cold-temperate), and that zone extends southward to the Japan Sea, middle California, Cape Hatteras, and the Breton Capes; the warm-temperate includes the southern and Baja Californias, Mediterranean Sea, much of north-west Africa, and the northern Gulf of Mexico; south warm-temperate includes the south-western and south-eastern coasts of Australia, South Africa, and Peru to middle Chile, and actually includes many taxa in the New Zealand fauna which is partly derived from warm-temperate Australia; austral includes Tasmania and much of New Zealand, and in South America includes all of Schellenberg's (1931) Magellan and Falkland fauna. South Georgian faunas are put into the antarctic-subantarctic classification. The tropics of western South America end at approximately 4°S. Warm-temperate of eastern South America is indefinable but of no consequence because of the near absence of gammaridean studies along most of that coast except in obvious tropical or cold-temperate regions. As stated above the finer divisions of the various zones and regions mentioned above did not prove to be of value to the points we want to make herein regarding the overall contrasts between the frigid and torrid zones of the world.

Gammaridean genera have been found to fall relatively easily into these broad classes: arctic-boreal, antarctic-austral, tropics, and north and south warm-temperate. The genera are either confined to one class or are of such wide distribution as to be called cosmopolitan. The latter term, however, primarily refers to shallow water (0–200m, also known as littoral-sublittoral) genera that radiate outwards from tropical regions into boreal regions but not necessarily into arctic or antarctic regions, and there has been little point in so splitting the analyses to segregate cosmopolitan genera that extend high into polar regions. Bathyal and abyssal (including hadal) faunas are highly discrete, poorly influenced by submergent polar faunas (except in the North Atlantic), and, thus, are recognisable as distinct from latitudinal considerations; the few deep-sea genera that have been found only in polar regions have been removed from their endemic position in those regions to the deep-sea classifications.

No precise statistical methods have been used in dealing with problem genera, those with distributions partially overlapping two classes, because a bit of subjectivism has been applied in each case and because the principle of 'centralism' has been utilised. Genera are thus considered to be confined primarily to that zone in which 'most' of the species occur, to wit: a genus with two boreal and one warm-temperate species is considered to be boreal but a genus with eight boreal, two warm-temperate and one tropical species is put into the cosmopolitan class on the probability that more tropical species remain to be described.

The results of this subjective analysis are presented in Table 1. On first sight the data seem to reveal mostly a relationship to study effort, with faunas of low latitudes or southern quartospheres suffering by comparison with well-studied arctic-boreal zones. On the other hand, the data seem reasonable if one considers that austral zones are few in number, small in size, and low in habitat diversity compared with the extensive boreal zones; except for small oceanic islands the austral zone is confined to Tasmania, New Zealand, and two coasts of South America, whereas north boreal zones have four coasts on two continents and a significant disjunct subarctic embayment, the Okhotsk Sea. The rich antarctic shelves are a strong contrast to the polar-arctic impoverishment but perhaps the most striking implication in the data is the low count of tropical endemic genera. Even though numerous species of tropical amphipods remain to be described, our experience in sorting through quantities of tropical materials suggests that most of these species will be described in known genera. New genera seem to be confined primarily to inquilinous forms probably associated with the vast numbers of sessile tropical invertebrates. Thus, Gammaridea are primarily a cool-water group in terms of generic diversity; this is reflected in their strong

penetration of the deep-sea. Their body sizes are strongly associated with thermal conditions in shallow waters, the larger bodies occurring in colder water. This does not apply to deepsea benthic Amphipoda, however, for there is strong indication (J.L. Barnard, 1962d) that body size becomes smaller or remains relatively static with increase of bottom depth along a latitudinal line.

About 40 of the 74 marine families of Gammaridea can be classified as cosmopolitan in distribution but the other 34 are moderately to strongly confined to specific regions or thermal zones (see below). They are primarily cold-water oriented, for only 15 small families with 26 genera and 71 species are confined to warm shallow waters of low latitudes. This seems to confirm the orientation of Gammaridea to cool waters.

The geographic distribution of non-cosmopolitan gammaridean families, or those almost wholly confined to such classification, is as follows: # = almost wholly confined; + and ++ are estimates of species in regions and zones under study where final totals are not precisely known:

ANTARCTIC-AUSTRAL: #Iphimediidae (except paramphithoid section), Cardenioidae, Cheiidae, Clarenciidae, Didymocheliidae, Exoedicerotidae, Pagetinidae, Phoxocephalopsidae (South America), Pseudamphilochidae (South America), Urohaustoriidae, Zobrachoidae.

South WARM-TEMPERATE: Bolttsiidae (South Africa), Ceinidae (Australia-New Zealand), Condukiidae (Australia), Iciliidae (Australia to Borneo), Phreatogammaridae (New Zealand), Temnophliantidae (South Africa).

TROPICAL: Anamixidae, Bateidae (American), Kuriidae (west Indian Ocean), Maxillipiidae (Indian Ocean), Nihotungidae (south-west Pacific), Paracalliopiidae (India to New Zealand), Plioplateidae (west Indian Ocean), Tulearidae (west Indian Ocean).

BOREAL: Carangoliopsidae (deep Mediterranean), Cressidae (Atlantic), Dogielinotidae (Pacific), Gammaroporeiidae (Pacific), Haustoriidae (Atlantic), Lafystiidae, Mesogammaridae (Pacific), Najnidae (Pacific), Pontoporeiidae (Atlantic).

COLD WATER, BIPOLAR SUBMERGENTS: #Eusiridae, Lysianassidae, Oedicerotidae, Pleustidae, paramphithoid section of Iphimediidae, Pardaliscidae, Stegocephalidae, Stilipedidae, Synopiidae, thaumatelsonin section of Stenothoidae.

WARM WATER; LOW LATITUDES: Phliantidae, #prophliantin members of Dexaminidae.

DEEP-SEA: #Hyperiopsidae, Pardaliscidae, Stegocephalidae, Stilipedidae, Synopiidae, #Vitjazianidae.

There is scarcely a coastline where an exploratory taxonomist interested in species diversity cannot make some contribution, as Gurjanova (1962) has so ably shown in her study of the boreal-subarctic north Pacific; the taxonomist of western Europe, however, must move into beta-taxonomy and the north-western Atlantic taxonomist must move in that direction. The north-east Pacific taxonomist must be oriented to the groundwork laid down in Russian Pacific works. The exploratory taxonomist interested in total generic diversity will find the greatest needs for study in all warm-temperate zones, the austral, the tropics, and various islands of low latitudes.

Table 1. *Geographic classification of marine gammaridean genera by dominance* July 1986, with freshwater, terrestrial and fossil genera.

Class or Zone Dominantly	Genera	Local Species in those Genera
Cosmopolitan	58	(1639)
Antarctic-Antiboreal	105	(259)
South warm-temperate	132	(326)
Tropical*	136	(379)
North warm-temperate	53	(107)
Arctic-boreal	167	(711)
Bipolar tropical submergents	22	(403)
Bathyal	89	(538)
Abyssal	47	(94)
Freshwater (not subtr. common to sea)	-235	1197
(Freshwater exclusively)	(180)	uncounted
Terrestrial	28	187
Fossil	12	17
TOTAL	NP	NP
1986 July Marine Taxa (count update)	842	4534
* Division of Tropical into zones		
NP = not pertinent		
Pantropical	23	(159)
E. Pacific only	8	(11)
Panamic isthmian	9	(29)
Atlantic	14	(17)
Indo-Pacific	82	(163)

Endemicity

This section looks at data of generic endemicity within definable marine biotopes. These biotopes are a mixture of thermal zones and geographic regions and the term 'region' will be used to include any area we have defined regardless of its size or thermal properties. The data are redefined in the next section below much more subjectively in terms only of their dominance.

The species of all genera of Gammaridea were assembled in a computer matrix and assigned geographic code numbers as found in Barnard & Barnard (1983, volume 1: 184-203) and as based on an extensive review of literature. All of the tables concerned with biogeography herein are based on that matrix. The matrix is altered monthly as newly published papers are

received so that it evolves continuously. The matrix was 'sampled' from time to time to compose our tables herein and therefore various totals may not jibe from table to table, though the internal parts of any tabular subsection were sampled synoptically.

The matrix has been used to prepare the lists of endemic genera in List 3 in stated world regions, for example, shallow water of southern Australia or world abyssal.

List 3. Endemic genera in stated zones or regions; for geographic regions data limited to 0-200m; # = slightly less than 100%, except in sections so noted; ( ) = subgenus:

ABYSSAL: *Alicella, Aristiopsis, Astyroides, #Bathyceradocus, Bathyschaderia, Bogenfelsia, #Bruzeliopsis, Bruunosa, #Caleidoscopsis, Cebocaris, Cedrosella, Clepidecrella, Elimedon, Epereopus, Eucallisoma, Galathella, Hopiphoxus, Lepechinelloides, Lepechinellopsis, Lepiduristes, Mesocyphocaris, Metaceradocoides, Necochea, Oedicerina, Paradryope, Parahalice, #Paralicella, Parandaniexis, Pardaliscopsis, Paronesimoides, Parpano, Pleustostenus, #Princaxelia, Steleuthera, Valettia, #Valettietta, #Vemana, Ventiella, Vitjaziana, #Urothoides.*

AFRICA, SOUTH: *Basuto, Bolttsia, Calliopiella, Cunicus, Dikwa, Elasmopoides, Hoplopleon, Hystriphlias, Isaeopsis, Isipingus, Janice, Knysmetopa, Macropisthopous, Paramoerella, Phoxostoma, Plioplateia, Rostrogitanopsis, Septcarnes, Temnophlias, Unguja.*

ANTARCTIC-AUSTRAL: *Acanthonotozomella, Acanthonotozomoides, Acanthonotozomopsis, Acontiostoma, Actinacanthus, Ambasiopsis, Anchiphimedia, Anisoiphimedia, Anonychocheirus, Antatelson, Antarctogeneia, Atyloella, Atylopsis, Austroregia, Bathypanoploea, Bovallia, Cardenio, Ceradocoides, Cheirimedon, Cheus, Chosroes, Cicadosa, Clarencia, Djerboa, Echiniphimedia, Ekelofia, #Epimeriella, Eurymera, Falklandia, Fuegiphoxus, Gainella, Gnathiphimedia, Halicella* (B), *Haplocheira, Huarpe, Iphimediella, Iphinotus, Kergueleniola, Kuphocheira, Liouvillea, Lopiceros* (A), *Maxilliphimedia, Melphisubchela, Metaleptamphopus, Metoediceros, Metopoides, Nodotergum, Pagetina, Paraceradocus, Paranchiphimedia, Parapanoploea, Parapherusa, Paraperioculodes, Parapherusa, Parathaumatelson, Parepimeria, Pariphimedia, Paroediceroides, Parschisturella, Phoxocephalopsis, Phoxorgia, Podoprionides, Pontogeneoides, Probolisca, Proharpinia, Prolaphystiopsis, Prolaphystius, Prostebbingia, Prothaumatelson, Pseudambasia, Pseudamphilochus, Pseuderichthonius, Pseudiphimediella, Pseudischyrocerus, Pseudokoroga, Pseudonesimoides, Pseudorchomene, Pseudothaumatelson, Puelche, Stegopanoploea, Stegophippsiella, Stephensenia, Thaumatelson, #Torometopa, Tonocote, Tryphosoides, Tylosapis, Valettia, Zaramilla, Zhadia.*

ARCTIC-BOREAL: *Acanthonotozoma, Acanthostepheia, Accedomoera, Ambasia, Ambasiella, Amphilochopsis, #Amphiporeia, Andaniella, Andaniopsis, Anisogammarus, Arctolembos, Arctopleustes, Arrhinopsis, Arrhis, Astyroides, Barrowgammarus, Boeckosimus, Caeconynx, Calliopius, Casco, Centromedon, Cheirimedeia, Cheirocratella, Cleippides, Cressina, Dogielinoides, Dulichia, Dulichiopsis, Dyopedos, Eogammarus, Eohaustorioides, Eusyrophoxus, Gammaroporeia, Goesia, Gronella, Gulbarentsia, Hardametopa, Haustorioides, Kyska, Lepechinelloides, Leptophoxus, Locustogammarus, Machaironyx, Martensia, Melitoides, Melphidippella, Menigrates, Menigratopsis, Mesogammarus, Mesophoxus, Metaceradocoides, Metacyclocaris, Metambasia, Metopella, Paroediceroides, Paronesimus, Phippsia, Phippsiella, Pleustomesus, Pleustostenus, Pleusymtes, Priscillina, Proboscinotus, Prostenothoe, Psammonyx, Pseudoanonyx, Pseudoanonyx, Pseudunciola, Ramellogammarus, Rhynohalicella, Rifcus, Sextonia, Spasskogammarus, Spinulogammarus, Stegocephalina, Stegoplax, Stenopleustes, Tmetonyx, Uncinotarsus, Wecomedon, Weyprechtia, Xenodice.*

ATLANTIC, NORTH-WESTERN: *#Acanthohaustorius, #Amphiporeia, Casco, Lepidactylis, Neohaustorius, Parahaustorius, #Protohaustorius, #Pseudohaustorius, Pseudunciola.*

AUSTRALIA, Southern, # = eastern, this region: *Ausatelson, Australoecetes, Austropheonoides, Baracuma, Birubius, #Booranus, Brolgus, Bumeralius, Chucullba, Condukius, Conicostoma, Cunmurra, Delkarlye, #Dirimus, #Drummondia, Dryopoides, Elpeddo, Eophliantis, Exoediceroides, Exoediceros, Gabophlias, Ganba, #Gheegerus, Gitanogeiton, Goratelson, Hoho, Japara, Jerildaria, #Katocalliope, Kondoleus, Kotla, Kulgaphoxus, Kuritus, Leipsuropus, Leongathus, Limnoporeia, Matong, Meraldia, Narapheonoides, Narunius, Notoediceros, Paracyproidea, ?Parharpinia, #Paraleucothoe, Paraoroides, Parexoediceros, Platyischnopus, Prantinus, Prophlias, Prosocratus, Pseudomoera, Quasimodia, Rhinoecetes, Rikkarus, Sancho, Sheardella, Tickalerus, Tipimegus, Tittakunara, Tomituka, Tottungus, Tuldarus, Uldanamia, Unyapheonoides, #Urohaustorius, Urophoxus (= Pontharpinia), Yammacoona, Yan, Yulumara, Yurrokus, Warragaia, Zobracho.*

BATHYAL or deeper: *Adeliella, Africoecetes, Anoediceros, Arculfia, Aristiopsis, Austropleustes, Austrosyrrhoe, Bathyamaryllis, Bathyceradocus, Bathyphotis, Bathystegocephalus, Bonnierella, Bouvierella, Bruzeliopsis, Byblisoides, Caeconynx, Carangolia, Chevreuxiella, Chevreuxius, Clarencia, Cleonardo, Cleonardopsis, Coximedon, Coxophoxus, Cressina, Crybelocephalus, Crybelocyphocaris, Cyclocaris, Cyphocarioides, Cyphocaris, Danaella, Dautzenbergia, Dulichiopsis, Eurythenes, Eusirella, Eusirogenes, Eusiropsis, Eusyrophoxus, Falklandia, Finoculodes, Gainella, Halice, Halicella, Hansenella, Hirondellea, Hyperiopsis, Ileraustroe, Izinkala, Jeddo, Joubinella, Knysmetopa, Koroga, Latacunga, #Lepechinella, Lepidepecreella, Lepidepecreoides, Maeropsis, Megaceradocus, Membrilopus, Mesocyphocaris, Mesopleustes, Metacyclocaris, Metambasia, Metacyphocaris, Meteusiroides, Onesimoides, Palabriophoxus, Paracallisoma, #Paracentromedon, Paracyphocaris, Parahalice, Paralepechinella, Paralicella, Parandania, Parargissa,*

Pardaliscoides, Pareusirogenes, Pontogeneoides, Priscosyrrhoe, Procyphocaris, Prolaphystiopsis, Pseudamaryllis, Pseudharpinia, Pterunciola, Regalia, Runanga, Scopelocheiropsis, #Scopelocheirus, Stegocephalina, Stegoplax, Stephobruzelia, Stilipes, Thoriella, Tosilus, Valettiella, Valettietta, Valettiopsis.

CALIFORNIA-WEST MEXICO: *Cornudilla, Garosyrrhoe, Lignophliantis, Lupimaera, Macronassa, Meximaera, Nasageneia, Ocosingo (= Fresnillo), Posiphotis, Rildardanus, Rimakoroga, Zoedeutopus.*

CARIBBEAN-ISTHMUS: *Amphideutopus, Batea, Confodiopisa, Corocubanus, #Eudevenopus, Falcanassa, Garosyrrhoe, #Heterophlias, Hoplopheonoides, Liocuna, Netamelita, Protohadzia, Pseudoamphithoides, Rudilemboides, Skaptopus, Tabatzius, Tiburonella.*

HAWAII: *(Kamehatylus), Mokuoloe, (Wailele), Rotomelita.*

MADAGASCAR: *Aurohornellia, Ceradomoera, #Diogodias, Incratella, Madapisella, #Metaphoxoides, Ochlesodius, Tulearus, Urothopsis, Vasco, Vicitopisa.*

MAGELLAN-FALKLAND: *Austroregia, #Bathyporeiapus, Cheus, Exoediceropsis, #Fuegiphoxus, Huarpe, Metoediceros, #Phoxocephalopsis, #Phoxorgia, #Proharpinia, Prolaphystiopsis, Pseudeurystheus, Pseudiphimediella, Pseudokoroga, Pseudothaumatelson, Puelche, Stephensenia, Tryphosoides.*

MEDITERRANEAN: *Amphitholina, Aroui, Carangoliopsis, Impertiopisa, Longigammarus, Marinobogidiella, Neogammarus, Parunciola, Pseudopeltocoxa, Rhinolabia, Styloxenodice.*

NEW ZEALAND: *Acheronia, Anisoiphimedia, Cephalophoxus, Chaetocorophium, Iphinotus, Manerogeneia, Neocyproidea, Otagia, Pagurisaea, Patuki, Parajoubinella, Parathaumatelson, Peltopes, Pseudopleonexes, Rakiroa, Stegosoladidas, Synphoxus, #Tagua, Taihape, Tetradeion, Trichophoxus, Waipirophoxus, Waitangi, Waitomo, Whangarusa.*

NEW ZEALAND-AUSTRALIA: *Booranus, Syndexamine.*

OKHOTSK SEA: *Derjugiana, Mesophoxus, Pleustostenus, Pseudoanonyx, Rifcus.*

TROPICAL, # = Atlantic-Isthmus: *Abdia, Aborolobatea, Afrogitanopsis, Aloloi, Amphithoides, Anchialella, Anamixis, Aorchoides, Aorella, Aurohornellia, Azotostoma, #Batea, Beaudettia, #Bonassa, Borneoecetes, #Caribboecetes, Ceradomoera, #Cocoharpinia, #Concarnes, Concholestes, #Corocubanus, #Cyclotelson, #Dartenassa, Dexaminoculus, Diogodias, Dirimus, #Falcanassa, Flagitopisa, #Galapsiellus, Garosyrrhoe, Gheegerus, Grandidierella, Haustoriopsis, #Heterophlias, Ifalukia, Incratella, Indocalliope, #Insula, Josephosella, Kanaloa, Katocalliope, Konatopus, Kuria, Ledoyerella, Liagoceradocus, Liocuna, #Lucayrina, Madapisella, Maleriopa, Maxillipius, Metatiron, Microlysias, Microphotis, Mokuoloe, Nainaloa, Nippopisella, Ochlesodius, Orientocoetes, Paradusa, Paraniphargus, Perioculopsis, Plumithoe, #Podobothrus, #Posophotis, Pseudelasmopus, Pseudoamphithoides, #Rildardanus, Ritaumius, Ronco, Rotomelita, Scolopostoma, Sebadexius, Seborgia, Socarnella, Spelaeonicippe, Stenopleuroides, Synopia, #Tabatzius, Tegano, Tulearus, Urothopsis, #Varohios, Vasco, Vicitopisa, Vijaya, Xenocheira, #Zoedeutopus.*

The Composition of a Faunule

This section differs from 'Endemicity' in that the genera are reclassified as to their dominance but not necessarily their endemicity to a definable faunule. A faunule is the aggregate of taxa of Gammaridea in one thermal zone, geographic province, region, or habitat. Six major faunules are well known: cold-temperate of north-east Atlantic; cold-temperate of north-west Atlantic; cold-temperate of north-west Pacific (including the arctic-like Okhotsk region); circum-subarctic encompassing the Norwegian basin and the north coasts of Siberia; the warm temperate of north-east Atlantic including the western Mediterranean; and finally, the circum-antarctic-subantarctic faunule. Two faunules secondarily well known are those of the South African warm-temperate and the north-eastern Pacific warm-temperate. The faunules of individual islands or small geographic areas also have been more intensively studied than of these larger provinces, examples being Plymouth (England), Naples (Italy), South Georgia Island, Madagascar, Hawaii and Fiji.

A good model faunule is that of southern California because it is midlatitudinal and the only one relatively well explored by quantitative sampling (more than 8000 samples). The littoral-sublittoral (coastal shelf 0-100m) faunule comprises 250 reported species of which 118 species live in both littoral and shallow sublittoral depths; thus the littoral (intertidal) faunule totals 138 species, including about five species of beachhoppers and the sublittoral (coastal shelf) faunule totals 166 species (but note that the sketchy update shows a total of 250 species, Table 2).

Various other faunules are compiled in Table 2. No attempt has been made to modernise certain faunules such as Sars' Norwegian boreal in order to maintain congruency among the reports; thus each faunule presumably represents a minimal statement on diversity as a result of extensive, but not exhaustive exploration.

Generic domination within a faunule may occur through specific diversity (List 4). For example, the abyss is dominated by *Alexandrella, Amathillopsis, Ampelisca,* etc., which have more than two species each; because the abyss has many fewer species than shallower zones, the minimum qualifying number of species per genus for a dominant genus is low, whereas, for example in the shallow arctic-boreal the number is raised to five because of the higher number of species per genus in the zone. These few examples may give the reader an approximation of what to expect in commencing quantitative explorations of provinces.

List 4. Dominance of genera in stated zones or regions (= faunules); numbers after genera show number of species in zone; this differs from List 3 in listing all genera with more than a minimum relative number of

species in each zone; for example, *Ampelisca* as a genus is not dominant in the abyss in List 3 but *Ampelisca* in the context of List 4 has a significant number of species in the abyss relative to its depauperment:

ABYSSAL: *Alexandrella 3, Amathillopsis 3, Ampelisca 6, Andaniexis 5, Bathymedon 5, Bonnierella 5, Bruzelia 7, Byblis 5, Cleonardo 7, Cyphocaris 4, Epimeria 5, Eusirus 4, Haploops 3, Halice 9, Harpinia-Harpiniopsis-Pseudharpinia 16, Hippomedon 6, Hirondellea 3, Hyperiopsis 6, Ischyrocerus 3, Lepechinella 13, Leucothoe 3, Liljeborgia 3, Monoculodes 4, Oediceroides 3, Orchomene 10, Paralicella 5, Parargissa 3, Pardaliscoides 3, Pseudotiron 4, Rhachotropis 9, Schisturella 5, Scopelocheirus 3, Syrrhoites 6,*

Table 2. *Number of species and genera of Gammaridea in known faunules.* Data from July 1986 except where noted.

Region	Genera	Species
Arctic-Boreal 0-200 m, all fauna	277	1078
Arctic-Boreal 0-10,000 m, endemic species	(276)	1088
Arctic-Boreal 0-10,000 m, endemic genera	97	(184)
Norway (Sars, 1895), boreal section,		
0-80 fms	115	221
0-50 fms	110	203
Plymouth, England (Plymouth Marine Fauna), intertidal	63	92
British Isles (Lincoln, 1979) 0-50 m	124	271
0 m	52	105
1-2 m	63	128
3-50 m	109	225
Isle of Man (Bruce *et al.*, 1963) intertidal	40	66
New England 0-50 m	70	125
Warm-temperate, N, 0-200 m, all species	(248)	945
Warm-temperate California		
intertidal (compiled)	66	138
sublittoral	98	166
total, less common to both	112	186
New Count, 1986	118	250
Mediterranean France (Chevreux & Fage, 1925), intertidal	41	72
Atlantic France (Chevreux & Fage, 1925), intertidal	69	109
Tropical world 0-200 m all species	(285)	1095
Tropical endemic genera 0-200 m	91	(137)
Tropical endemic species 0-200 m	(243)	844
Indo-Pacific tropics including Red Sea	207	714
Hawaii, 0-50 m (J.L. Barnard, 1970)	51	119
Fiji (Myers, 1985c)	48	80
Madagascar 0-50 m (Ledoyer, 1982, 1986)	120	287
Caribbean Sea 0-200 m all species	(100)	210
South Africa 0-200 m (Griffiths, 1976a)	114	232
New Zealand, 0-2 m	62	113
South Georgia Island	88	159
South Georgia Island, intertidal only (Schellenberg, 1931)	45	62
Falkland Islands, intertidal (Schellenberg, 1931)	48	63
Magellan continental, intertidal (Schellenberg, 1931)	57	77
Antarctic-Austral endemic genera 0-10,000 m (incl. Australia)	160	(279)
(If Australia removed)	118	(210)
Antarctic-Austral endemic species 0-10,000 m (incl. Australia)	(306)	894
Antarctic-Austral all species 0-200 m	(315)	938
Bathyal-Abyssal species only	(236)	765
Abyssal only	(109)	199
Bathyal-Abyssal all species including those also found in shallower depths	(311)	1163

Tryphosella-Uristes 8.

AFRICA, Southern: *Abludomelita (+), Ampelisca 11, Aora 2, Ceradocus 2, Eriopisella 2, Gammaropsis 5, Grandidierella 4, Guernea 2, Hoplopleon 3, Hyale 2, Iphimedia 4, Ischyrocerus 3, Laetmatophilus 3, L emboides 3, Lembos 2, Leucothoe 2, Listriella 3, Maera 7, Ochlesis 2, Orchomene 2, Paramoera 3, Photis 3, Podocerus 3, Stenothoe 2, Unciolella 2, Uristes 2, Urothoe 7.*

ANTARCTICA-AUSTRAL: *Acanthonotozomella 3, Ambasiopsis 3, Ampelisca 8, Antatelson 4, Aora 4, Austroregia 3, Bathyporeiapus 3, Ceradocopsis 4, Echiniphimedia 3, Epimeriella 6, Eusirus 6, Fuegiphoxus 4, Gammaropsis 14, Gnathiphimedia 6, Gondogeneia 18, Hippomedon 3, Hyale 5, Iphimedia 6, Iphimediella 10, Kerguelenia 5, Lepidepecreella 4, Lepidepecreum 4, Liljeborgia 7, Mesoproboloides 5, Metopoides 9, Oediceroides 5, Oradarea 13, Orchomene 26, Pachychelium 3, Pagetina 4, Paraceradocus 6, Paradexamine 4, Paramoera 20, Paraperioculodes 6, Parawaldeckia 14, Pardalisca 3, Parepimeria 6, Pariphimedia 3, Parschisturella 3, Phoxocephalopsis 5, Polycheria 10, Probolisca 3, Prostebbingia 6, Schraderia 5, Seba 5, Stomacontion 6, Torometopa 9, Tryphosella 10, Uristes 9.*

ARCTIC-BOREAL, including some northern hemisphere endemic genera also found in warm-temperate: *Abludomelita 7, Acanthohaustorius 7, Acanthonotozoma 9, Ampelisca 9, Ampithoe 16, Anonyx 38, Aora-Aoroides 7, Apherusa 15, Aristias 6, Atylus 12, Bathymedon 10, Bathyporeia 8, Boeckosimus 13, Byblis 14, Cheirimedeia 8, Corophium 9, Cressa 8, Dulichia 6, Dulichiopsis 6 (deep), Dyopedos 6, Echinogammarus-Gammarus 7-19, Eogammarus 9, Eohaustorius 6, Ericthonius 8, Foxiphalus 7, Gammaropsis 11, Grandifoxus 7, Halirages 6, Harpinia 6, Hippomedon 13, Ischyrocerus 22, Lepidepecreum 9, Leptocheirus 12, Leucothoe 5, Melita 8, Metopa 40, Metopella 5, Microprotopus 5, Monoculodes 28, Oediceros 5, Onisimus 6, Orchomene 25, Parametopella 5, Paramoera 5, Paramphithoe 7, Parapleustes 16, Pareurystheus 7, Paroediceros 5, Photis 14, Pleustes 7, Pleusymtes 20, Pontogeneia 8, Proboloides 6, Protomedeia 10, Rhepoxynius 15, Stenopleustes 6, Stenothoe 8, Stenothoides 5, Stenula 10, Tmetonyx 8, Tryphosella 13, Unciola 5, Urothoe 6, Wecomedon 5, Westwoodilla 6.*

ATLANTIC NORTH-WEST temperate: *Acanthohaustorius 7, Ampelisca 8, Amphiporeia 3, Ampithoe 3, Anonyx 5, Atylus 3, Boeckosimus 3, Corophium 9, Dulichia 5, Ericthonius 3, Gammarus 11, Harpinia 7, Hippomedon 4, Maera 3, Melita 5, Metopa 8, Metopella 4, Orchomene 5, Parahaustorius 4, Photis 3, Rhachotropis 4, Unciola 4.*

AUSTRAL ISLANDS: *Acontiostoma 2, Antatelson 2, Aora 4, Ceradocopsis 4, Gammaropsis 2, Gondogeneia 5, Hyale 3, Paramoera 12, Parawaldeckia 5, Polycheria 3, Stenothoe 3, Stomacontion 4.*

AUSTRALIA Southern: *Amaryllis (++), Ampelisca 11, Ampithoe 4, Aora 5, Australocoetes 3, Austropheonoides 5, Birubius 37, Brolgus 5, Byblis 3, Cephalophoxoides 5, Ceradocus 5, Cerapus (++), Elasmopus (+), Gammarella 4, Gammaropsis 3+, Gondogeneia (+), Guernea 4, Hoplopleon 3, Hyale 8, Icilius 3, Iphimedia 3, Lembos (++), Liljeborgia (+), Limnoporeia 7, Leucothoe* (especially in *Pyura* colonies) *8+, Maera 3+, Mallacoota (+), Melita (+), Metaphoxus 3, Moolapheonoides 3, Paracalliope 3+, Paradexamine 20, Paramoera (+), Parawaldeckia (3+), Parelasmopus (+), Photis (+), Podocerus 3+, Quasimodia 4, Stenothoe 4+, Syndexamine 5, Tethygeneia 5, Tipimegus 5, Urohaustorius 12, Urothoides 7, Waldeckia 3, Wildus 2+.*

BATHYAL or deeper; # = pelagic: *Aceroides-Arrhis 7, Alexandrella 5, Amathillopsis 7, Ampelisca 48, Andaniexis 8, Anonyx 9, Aristias 14, Astyra 5, Bathymedon 15, Boeckosimus 7, Bonnierella 8, Bruzelia 9, Byblis 27, Byblisoides 6, Cleonardo 9, #Crybelocephalus 5, #Cyphocaris 8, Dulichiopsis 6, Epimeria 20, Euonyx 7, #Eusirella 5, #Eusirogenes 5, #Eusirus 16, Gammaropsis 17, Halice 12, Halicoides 9, Haploops 12, Harpinia 16, Harpiniopsis 18, Hippomedon 22, Hirondellea 7, #Hyperiopsis 7, Iphimediella 8, Ischyrocerus 11, Lepechinella 29, Lepidepecreella 5, Lepidepecreum 12, Leucothoe 7, Liljeborgia 9, Metopa 14, Monoculodes 19, Oediceroides 20, Orchomene 36, #Paralicella 5, #Parargissa 6, Pardalisca 5, Phippsiella 10, Photis 7, Proboloides 7, Pseudharpinia 9, Pseudotiron 5, #Rhachotropis 37, Rhepoxynius 5, Schisturella 7, Stegocephaloides 6, Stenothoe 7, Syrrhoe 8, Syrrhoites 18, Torometopa 6, #Trischizostoma 7, Tryphosella 27, Unciola 7, Uristes 12, Urothoe 7, Westwoodilla 5.*

BATHYPELAGIC, # = demersal: *#Cleonardo 9, Crybelocephalus 5, Cyphocaris 8, Eusirella 5, Eusirogenes 5, #Eusirus 22, #Halice 14, #Halicoides 10, #Hirondellea 7, Hyperiopsis 7, Joubinella 5, #Paralicella 5, #Parargissa 6, #Rhachotropis 43.*

BRITISH ISLES: *Ampelisca 10, Amphilochus 4, Ampithoe 4, Apherusa 6, Atylus 4, Bathyporeia 8, Cheirocratus 3, Corophium 12, Gammaropsis 4, Gammarus 10, Harpinia 5, Hyale 4, Jassa 4, Lembos 3, Leptocheirus 4, Leucothoe 4, Lysianassa 3, Maera 3, Melita 6, Metopa 9, Microdeutopus 6, Monoculodes 5, Stenothoe 7, Tryphosella 3, Urothoe 5.*

CALIFORNIA, GULF of: *Ampelisca 13, Ampithoe 4, Batea 4, Elasmopus 7, Gammaropsis 3, Hyale 4, Maera 3, Parhyale 3, Photis 5.*

CALIFORNIA, Southern: *Ampelisca 17, Amphilochus 3, Ampithoe-Peramphithoe 10, Batea 3, Corophium 6, Elasmopus 6, Foxiphalus 6, Gammaropsis 8, Hyale 7, Ischyrocerus 3, Listriella 5, Monoculodes 6, Orchomene 4, Photis 8, Podocerus 3, Rhepoxynius 11, Schisturella 3, Stenothoe 5, Synchelidium 3++.*

CARIBBEAN, # = estimate: *Acanthohaustorius 3#, Ampelisca 15, Amphilochus 3, Ampithoe 5, Anamixis 7#, Batea 3, Caribbocoetes 4, Ceradocus 5, Cerapus 3#, Chevalia 3#, Colomastix 10#, Confodiopisa 2, Corophium 6, Cymadusa 3#, Elasmopus 8#, Gammaropsis 3#, Gitanopsis 3, Hyale 3, Lembos 15, Leucothoe 5#, Liljeborgia 4#, Listriella 4, Maera 5#, Melita 4, Monoculodes 3#, Photis 4#, Stenothoe 3#, Synopia 3#, Tethygeneia 3#.*

GALAPAGOS: *Ampithoe 6, Elasmopus 7, Hyale 4, Maera 2.*

HARBOURS, ESTUARIES, LAGOONS – species totals not

calculated: *Corophium, Elasmopus, Grandidierella (tropics), Ischyrocerus, Jassa, Limnoporeia (Australia), Melita, Paracalliope (southern), Paracorophium (southern), Podocerus, Stenothoe.*

HAWAIIAN: *Amphilochus 3, Ampithoe 5, Colomastix 3, Elasmopus 10, Gammaropsis 8, Hyale 7, Lembos 7, Leucothoe 3, Maera 7, Melita 2, Photis 3, Podocerus 3, Stenothoe 4.*

JAPAN, Southern: *Ampelisca 6, Corophium 4, Gammaropsis 5, Gitanopsis 4, Guernea 5, Hyale 4, Liljeborgia 3, Listriella 3, Paradexamine 4, Pareurystheus 4, Peramphithoe 3, Photis 8.*

JAPAN, Sea of and Northern Japan: *Ampithoe 6, Anonyx 19, Atylus 5, Cheirimedeia 3, Eogammarus 5, Eohaustorius 3, Haustorioides 3, Hippomedon 5, Ischyrocerus 7, Lepidepecreum 3, Leucothoe 3, Melita 3, Monoculodes 7, Orchomene 12, Parapleustes 7, Pleusymtes 9, Protomedeia 5, Synchelidium 4, Westwoodilla 4.*

MADAGASCAR (from Ledoyer, 1986): *Ampelisca 11, Ampithoe 7, Aristias 3, Atylus 4, Ceradocus 8, Cheiriphotis 3, Colomastix 8, Elasmopus 11, Ericthonius 3, Gammaropsis 12, Gitanopsis 4, Grandidierella 8, Guernea 5, Hyale 4, Ichnopus 3, Ledoyerella 3, Lembos 5, Leucothoe 14, Liljeborgia 7, 'Lysianassa' 4, Maera 13, Mallacoota 4, Melita 4, Paradexamine 4, Parajassa 3, Perioculodes 6, Podocerus 7, Seba 3, Stenothoe 4.*

MAGELLAN-FALKLAND: *Austroregia 3, Colomastix 2, Epimeria 2, Fuegiphoxus 2, Gammaropsis 6, Gondogeneia 4, Iphimedia 2, Liljeborgia 3, Metopoides 5, Orchomene 2, Paramoera 5, Parepimeria 2, Phoxocephalopsis 2, Polycheria 2, Seba 2, Torometopa 4, Tryphosella 4, Uristes 3.*

MEDITERRANEAN: *Abludomelita 3, Ampelisca 26, Amphilochus 3, Ampithoe 7, Apherusa 6, Bathyporeia 5, Cheirocratus 5, Corophium 20, Dexamine 3, Elasmopus 3, Gammaropsis 12, Gammarus 5, Haploops 3, Harpinia 4, Hippomedon 5, Hyale 13, Iphimedia 11, Lembos 6, Lepidepecreum 3, Leptocheirus 7, Leucothoe 9, Liljeborgia 4, Listriella 3, Maera 8, Melita 4, Microdeutopus 12, Monoculodes 6, Orchomene 4, Parhyale 3, Stenothoe 10, Synchelidium 3.*

NEW ZEALAND intertidal: *Amphilochus 3, Ampithoe 3, Corophium 3, Elasmopus 3, Gammaropsis 5, Gitanopsis 3, Hyale 6, Liljeborgia 5, Maera 3, Melita 3, Paracalliope 3, Paradexamine 5, Paramoera 3, Parawaldeckia ++, Podocerus 4.*

NORWAY: *Ampelisca 12, Anonyx 4, Bathymedon 3, Boeckosimus 3, Byblis 7, Corophium 4, Dulichia 3, Dyopedos 5, Eusirus 5, Gammaropsis 5, Gammarus 5, Haploops 3, Harpinia 6, Hippomedon 4, Ischyrocerus 7, Melphidippa 3, Metopa 21, Monoculodes 10, Orchomene 8, Parapleustes 4, Stenothoe 4, Unciola 5.*

OKHOTSK, SEA of: *Ampelisca 5, Ampithoe 3, Anonyx 10+, Eohaustorius 2, Grandifoxus 5, Hippomedon 6, Ischyrocerus 11, Lepidepecreum 4, Metopa 6, Orchomene 5+, Pleustes 6, Protomedeia 4, Wecomedon 3.*

TROPICS, INDO-PACIFIC, # = Atlantic or American only: *Ampelisca 47, Amphilochus 7, Ampithoe 23, Anamixis 10, Atylus 10, #Batea 7, Byblis 14, Caribbocoetes 7, Ceradocus 15, Cerapus 4, Cheiriphotis 6, Colomastix 16, Corophium 8, Cymadusa 8, Dulichiella 6, Dulzura 4, Elasmopus 41, Ericthonius 4, Eriopisella 7, Eusiroides 4, Gammaropsis 43, Grandidierella 26, Guernea 5, #Heterophlias 5, Hippomedon 5, Hyale 29, Iphimedia 5, Laetmatophilus 5, Lembos 47, Leucothoe 27, Liljeborgia 6, Listriella 11, Maera 31, Mallacoota 14, #Megaluropus group 9, Melita 12, Paradexamine 9, Paranamixis 4, Parelasmopus 8, Parhyale 8, Parhyalella 4, Perioculodes 6, Photis 20, Podocerus 12, Quadrivisio 4, Stenothoe 8, Synopia 7, Tiron 5, Urothoe 12.*

Finally, the data may be assorted as in List 5 in which each major world zone or region is inspected for the largest genera which are principally endemic within the selected zone or region. In List 5 no genus is repeated twice, but every genus has been classified as to its principal place of residence depending on the situation of the majority of the species in the genus. Within each zone the minimum number of species in a genus differs according to the size of the zone. Despite this subjectivity, one may note the impoverishment of principally tropical genera, though, of course, the genera of the cosmopolitan section must be added to the tropical zone, as they would be to all other zones.

List 5. Large genera of marine Gammaridea assigned to their zones; numbers are total number of species in each genus; numbers in parentheses for BATHYAL and ABYSSAL designate number of species within zone of genus not dominantly restricted to zone; cosmopolitan genera are not replicated in any of the following shallow water zones (data constructed 1986 July, some genera in text may have different counts owing to updates).

COSMOPOLITAN: *Abludomelita 25, Ampelisca 143, Amphilochus 20, Ampithoe 68, Atylus 33, Byblis 55, Ceradocus 31, Corophium 62, Elasmopus 64, Gammaropsis 106, Hyale 90, Iphimedia 31, Ischyrocerus 38, Lembos 76, Leucothoe 55, Liljeborgia 37, Listriella 33, Maera 64, Melita 39, Orchomene 86, Photis 60, Stenothoe 49, Urothoe 35.*

TROPICS: *Anamixis 10, Batea 9, Cymadusa 13, Eriopisella 10, Grandidierella 29, Parhyale 10, Synopia 9.*

ARCTIC: *Acanthonotozoma 10, Anonyx 42, Apherusa 21, Bathyporeia 15, Boeckosimus 17, Echinogammarus 13, Gammarus 24, Harpinia 17, Leptocheirus 12, Metopelloides 10, Parapleustes 23, Pleusymtes 21, Protomedeia 14, Stenula 13, Unciola 13, Westwoodilla 10.*

ANTARCTIC: *Gondogeneia 16, Metopa 14, Parawaldeckia 15.*

North WARM-TEMPERATE: *Acanthohaustorius 8, Foxiphalus 9, Rhepoxynius 15.*

South WARM-TEMPERATE: *Birubius 38, Cephalophoxoides 8, Paradexamine 36, Urohaustorius 12, Urothoides 10.*

BIPOLAR TROPICAL SUBMERGENTS: *Allorchestes 13, Aora 15, Hippomedon 48, Lepidepecreum 27, Melphidippa 10, Metopa 51, Monoculodes 55, Oradarea 14, Paramoera 39, Polycheria 18, Proboloides 20, Tryphosella 58.*

BATHYAL (Numbers in parentheses are bathyal component of genera not otherwise dominant in bathyal): *Aceroides 8, Amathillopsis 8, Ampelisca (47), Aristias 20, Bathymedon 24, Bruzelia 10, Byblis (26), Cyphocaris 8, Epimeria 28, Eusirogenes 5, Eusirus 22, Gammaropsis (19), Halice 14, Halicoides 10, Haploops (12), Harpiniopsis 25, Hippomedon (15), Iphimediella 10, Ischyrocerus (12), Lepechinella 28, Lepidepecreella 7, Lepidepecreum (12), Metopa (14), Monoculodes (18), Oediceroides 25, Orchomene (29), Pachychelium 4, Phippsiella 10, Proboloides (8), Pseudharpinia 12, Rhachotropis 43, Schisturella 11, Stegocephaloides 6, Syrrhoe 11, Syrrhoites 20, Tmetonyx 8, Trischizostoma 8, Tryphosella (22), Unciola (7), Uristes 22, Urothoe (6).*

ABYSSAL: *Ampelisca (6), Andaniexis 8, Cleonardo 9, Monoculodes (3), Oediceroides (3), Orchomene (9).*

ABYSSAL-BATHYAL JOINT: *Alexandrella 5, Bonnierella 8, Bruzeliopsis 3, Byblisoides 6, Centromedon 5, Cleonardo 9, Crybelocyphocaris 5, Cyphocaris 8, Dulichiopsis 6, Epimeriella 6, Euonyx 9, Eusirella 5, Harpinia 17, Hirondellea 7, Hyperiopsis 7, Onesimoides 4, Parargissa 6, Pardaliscoides 4, Phippsiella 10, Princaxelia 3, Pseudharpinia 11, Pseudotiron 5, Schisturella 11, Scopelocheirus 4, Syrrhoe 11, Syrrhoites 20, Torometopa 12, Valettietta 4, Valettiopsis 3, Vemana 3, Westwoodilla 10.*

HARBOURS, ESTUARIES, LAGOONS – species numbers not calculated: *Corophium, Elasmopus, Ericthonius, Grandidierella* (tropics), *Ischyrocerus, Jassa, Limnoporeia* (Australia), *Melita, Paracalliope* (south-west Pacific, Indian), *Paracorophium* (southern), *Podocerus, Stenothoe.*

HAWAIIAN: *Amphilochus, Ampithoe, Cymadusa, Elasmopus, Gammaropsis, Hyale, Lembos, Leucothoe, Maera, Melita, Parhyale* (dominance by individuals only), *Photis, Stenothoe.*

List 6. The ecological kinds of Gammaridea within a benthic faunule are to a large extent determined by domiciliary position rather than food-type, as most Gammaridea are presumed to be opportunistic scavengers or inquilines and their feeding behaviour is poorly known. A few true herbivores apparently occur and lately a few raptorial predators have been identified. Of course there are numerous kinds of scavenger feeding. An intertidal faunule of low latitudes in lush algae might be comprised of extremely abundant nestlers such as *Hyale, Elasmopus* and *Maera*; protected rock surfaces, interstices and root systems of algae or surf-grass will contain the domicolous amphipods building tubes, such as *Ampithoe, Ericthonius, Gammaropsis, Jassa, Ischyrocerus* and *Photis*. Sessile invertebrates like sponges and tunicates will harbor nestlers and domiciliary kinds as well as a few inquilines, such as *Leucothoe* and *Anamixis.*

In most world areas the sublittoral faunule on soft bottoms will be comprised of burrowers such as *Rhepoxynius, Birubius,* and other phoxocephalids, haustoriids, and oedicerotids; domiciliary kinds building limp tubes on the sediment surface, primarily the Ampeliscidae; various domiciliary kinds building tubes on hard particles of the substrate or on projecting tubes of infaunal organisms, thus the Corophioidea; and a few nestlers or semicommensal organisms like *Listriella.*

Intertidal zones of high latitudes will have nestlers like *Pontogeneia, Paramoera* and their congeners.

The dominant genera of Gammaridea on sublittoral soft bottoms by gross region are as follows; no symbol = nestler, B = benthic burrower, I = inquiline, T = tube-dweller; numbers are species (not necessarily jibing with handbook):

COSMOPOLITAN shallow: *Ampelisca 151 T, Atylus 33, Byblis 55 T, Ensayara 5, Guernea 22, Haploops 15 T, Heterophoxus 6 B, Iphimedia 31, Kerguelenia 8, Liljeborgia 37, Lysianassa complex 20+, Megaluropus complex 9, Monoculodes 54 B, Perioculodes 9 B, Raumahara 5, Seba 13, Synchelidium 12 B, Tiron 11, Urothoe 35 B.*

BIPOLAR, COLD-WATER: *Hippomedon 48, Lepidepecreum 26, Melphidippa 10, Metaphoxus 5 B, Monoculodes 65 B, Orchomene 108, Pardalisca 9, Tryphosella 56.*

ANTARCTIC-AUSTRAL: *Ampelisca 8 T, Epimeriella 6, Gnathiphimedia 5, Iphimediella 10, Kerguelenia 5, Liljeborgia 7, Mesoproboloides 5, Metopoides 9, Oradarea 14, Orchomene 26, Paraceradocus 6, Paraperioculodes 6, Parepimeria 6, Phoxocephalopsis 5 B, Prostebbingia 6, Schraderia 7.*

TROPICAL: *Ampelisca 47 T, Atylus 10, Byblis 14 T, Caribbocoetes 7 T, Grandidierella 26 T, Guernea 5, Heterophlias 5, Hippomedon 5, Hornellia 8, Iphimedia 5,Liljeborgia 7, Pereionotus 6, Quadrivisio 5, Urothoe 12 B.*

WARM-TEMPERATE, A = mostly Australian region, M = mostly American region: *Ampelisca 57 T, Atylus 8, Birubius 37 BA, Brolgus 5 BA, Byblis 7, Cephalophoxoides 8 B, Foxiphalus 6 BM, Guernea 14, Hippomedon 11, Iphimedia 20, Lepidepecreum 5, Liljeborgia 14, Limnoporeia 7 BA, Metaphoxus 5 B, Metharpinia 5 BM, Monoculodes 13, Ochlesis 5, Orchomene 17, Paracalliope 7 A, Paradexamine 37 A, Parawaldeckia 15 A, Rhepoxynius 15 BM, Syndexamine 6 A, Tipimegus 5 BA, Urohaustorius 12 BA, Urothoe 11 B, Urothoides 10 BA, Waldeckia 6 A.*

ARCTIC-BOREAL: *Acanthohaustorius 6 B, Acanthonotozoma 10, Acidostoma 7, Ampelisca 16 T, Anonyx 42, Apherusa 20, Atylus 13, Bathyporeia 15 B, Boeckosimus 17, Byblis 14 T, Centraloecetes 5 T, Centromedon 5, Cressa 8, Dulichia 6 T, Eohaustorius 9 B, Eyakia 5 B, Foxiphalus 9 B, Grandifoxus 8 B, Haploops 7 T, Harpinia 17 B, Hippomedon 14, Lepidepecreum 8, Mesometopa 5, Metopella 5, Monoculodes 30, Oediceros 7, Onisimus 6, Orchomene 26, Paramphithoe 7, Parapleustes 23, Pardaliscella 5, Paroediceros 5, Pleustes 8, Pleusymtes 21, Stenopleustes 8, Tmetonyx 8, Urothoe 6 B, Wecomedon 5, Westwoodilla 10 B.*

List 7. The dominant genera of Gammaridea in epifaunas of intertidal and shallow sublittoral (0-200m) zones by gross region or zone are as follows; cosmopolitan genera are not repeated in the subzones; no symbol = nestler; I = inquiline; T = domicolous tube-

dweller; numbers reflect species only in area of classification:

COSMOPOLITAN: *Abludomelita 26, Ampithoe 60 T, Ceradocus 31, Cerapus 16 T, Cheirocratus 10, Corophium 62 T, Elasmopus 64, Ericthonius 13 T, Eusiroides 14, Gammarellus 9, Gammaropsis 117 T, Globoslembos 7 T, Hyale 89, Jassa 12 T, Laetmatophilus 11, Lembos 75 T, Maera 62, Melita 40, Microdeutopus 20 T, Parhyale 10, Photis 58 T, Podocerus 28, Stenothoe 48 ?I.*

BIPOLAR, COLD-WATER: *Allorchestes 5* (Pacific), *Aora-Aoroides 22 T, Ischyrocerus 39 T, Paramoera* (Pacific) *39, Peramphithoe 13 T.*

ANTARCTIC-AUSTRAL: *Ceradocopsis 5, Gammaropsis 14 T, Gondogeneia 18, Hyale 5, Paramoera 20.*

TROPICAL: *Ampithoe 23 T, Batea 9, Ceradocus 15, Cheiriphotis 10 T, Corophium 8 T, Cymadusa 14 T, Dulichiella 6, Elasmopus 41, Eriopisella 7, Gammaropsis 43, Grandidierella 29 T, Hyale 29, Lembos 47 T, Maera 31, Mallacoota 14, Melita 12, Parajassa 7 T, Parelasmopus 8, Parhyalella 7, Photis 20 T, Podocerus 12.*

WARM-TEMPERATE: *Abludomelita 12, Ampithoe 19 T, Aora-Aoroides 11 T, Austropheonoides 5 ?I, Cheiriphotis 4 T, Chevalia 3 T, Corophium 39 T, Elasmopus 20, Eusiroides 6, Gammaropsis 42 T, Gitanopsis 8, Lembos 16 T, Microdeutopus 15 T, Melita 17, Paramoera 7, Photis 18 T, Podocerus 12, Siphonoecetes 4 T, Tethygeneia 6.*

ARCTIC-BOREAL: *Abludomelita 8, Ampithoe 16 T, Anisogammarus 2+, Aora-Aoroides 7 T, Cheirimedeia 8 T, Corophium 14 T, Dulichiopsis 6, Dyopedos 9, Echinogammarus-Gammarus 3 + 13, Eogammarus 9, Ericthonius 9 T, Gammaropsis 13 T, Halirages 6, Hyale 6, Ischyrocerus 22 T, Lembos 5 T, Leptocheirus 4 T, Melita 7, Microprotopus 5 T, Photis 14 T, Pontogeneia 10, Protomedeia 14 T, Stenothoides 7, Stenula 12, Unciola 12 T.*

List 8. The dominant genera of Gammaridea in the neritic or pelagic realms, including some demersal genera, usually sand-dwelling, are as follows: Megaluropidae, Phoxocephalidae (males), *Synchelidium* 12 (pelagic phases), *Synopia* 9.

List 9. The dominant genera of bathyal-abyssal benthic and demersal zones are as follows; conservative numbers of species in depths exceeding 200 m are given following each genus; the term demersal is notated with a question mark because proof is sketchy; probably several benthic genera will be moved to the demersal category when better information comes forth:

BENTHIC: *Aceroides 8, Alexandrella 5, Amathillopsis 8, Ampelisca 45 T, Andaniexis 8, Anonyx 9 (Pacific boreal), Astyra 6, Bathyamaryllis 4, Bathymedon 24, Boeckosimus 5, Bonnierella 8 T, Byblis 25 T, Bonnierella 8 T, Bruzelia 9, Byblisoides 6 T, Dulichia 6 (Atlantic boreal), Epimeria 25, Euonyx 9, Gammaropsis 19 T, Haploops 12 T, Harpinia 4 b, Harpiniopsis 25 B, "Hippomedon" 22, Iphimediella 8, Ischyrocerus 13 T, Lepechinella 29, Lepidepecreella 7, Lepidepecreum 12, Leucothoe 4, Liljeborgia 10, Melita 5, Metopa 7, Monoculodes 19, Oediceroides 23, Onesimoides 4, Orchomene 35, Pardalisca 5, Proboloides 7, Pseudharpinia 11, Pseudotiron 5, Rhepoxynius 5, Schisturella 11, Stenothoe 4, Syrrhoe 11, Syrrhoites 20, Tryphosella 56 (or bipolar shallow), Unciola 6 (Atlantic boreal), Uristes 22, Urothoe 7, Westwoodilla 5.*

DEMERSAL?: *Andaniotes 4, Cleonardo 9, Crybelocephalus 5, Cyphocaris 8, Euonyx 7, Eusirella 5, Eusirogenes 5, Eusirus 22, Halice 14, Halicoides 10, Hirondellea 7, Hyperiopsis 7, Joubinella 5, Paracallisoma 3, Paracyphocaris 3, Paralicella 5, Parargissa 6, Pardaliscoides 4, Phippsiella 10, Rhachotropis 43, Scopelocheirus 4, Stegocephaloides 6, Stegocephalopsis 6, Valettietta 4, Valettiopsis 3, Vemana 3.*

The dominant inquilinous genera of the world are as follows; A, arctic, B, bathyabyssal, C, cosmopolitan, P, bipolar, T, tropical, W, warm-temperate: *Amphilochus 20 C, Anamixis 10 T, Aristias 20 B, Colomastix 22 C, Gitana 8 W, Gitanopsis 25 C, Leucothoe 55 C, Listriella 33 C, Metopa 51 A, Metopella 5 A, Parametopella 5 A, Paranamixis 5 T, Polycheria 18 P, Proboloides 12 C, Stomacontion 6 B, Torometopa 12 B, Trischizostoma 8 C.*

Finally, the partitioning of species in diverse bipolar genera of the major world regions is shown in Table 3.

Table 3. *Large bipolar genera; number of species reflected in each world zone; bathyal may include duplicates;* N = north, S = south:

Genus	ARCTIC	TEMPERATE	TROPICAL	ANTARCTIC	BATHYAL
Aora-Aoroides	6	11	1	4	–
Ischyrocerus	22	9	3	1	13
Hippomedon	14	11	5	3	22
Lepidepecreum	8	5	3	4	12
Monoculodes	30	13	1	26	19
Oradarea	1	–	–	12	5
Orchomene	26	17	3	26	36
Paramoera (Pacific)	8	7	4	20	–
Pardalisca	3	–	1	3	4
Peramphithoe (Pacific)	4	5 + 2	2	–	–
Tryphosella	14	6	2	13	27

Prospectus

Amphipod taxonomy is quickly becoming computerised. The following items of computerised information are in existence at the Smithsonian Institution: (1) a bibliographic file of about 4500 references to the taxonomy of Gammaridea from 1758 to 1986; (2) a file of all genera with current assignment to family; (3) a list of all species with 'master' geographic code numbers. In progress are (3n): amplification of the geographic code list to include all subsidiary code numbers besides the master numbers; (4) conversion of the Crawford-citation-file into computer memory; (5) the 2 volume work of Barnard & Barnard (1983) on hard-disc for periodic updating; (6) the present work on hard disc for periodic updating. As funds become available these files will be improved and updated so that parts can be printed and become available in small quantities as needed. In the planning stages are: (7) a master list of characters coded alphanumerically in 8-digit FORTRAN statements or one-digit PAUP statements; (8) oscilloscopic, 'mouse' memory representation of each coded character; (9) development of a program to match taxonomy with character memory; (10) development of a program to identify amphipods to species level by using program 9; (11) a mapping system to produce distribution sheets and maps for each species based on the reasonable identifications of system 4 and the codes of system 3n; (12) a protocol in which taxonomists outside of Smithsonian can access files and make emendations. Tools are being shaped for the ultimate publication method of accessing an author's latest works instantaneously by computer terminal rather than through the burdensome publication of hard-copy. The entire series of systems would become anonymous and renamed, for example 'Smithsonian Gammaridean Basis' so that it could become a worldwide working tool available to anyone with modem and reasonably inexpensive computer terminal with modest memory. The goal is to make it possible to obtain crude identifications of amphipods with printouts of idealised morphology, lists of bibliography and distribution, or research-calibre synopses of known citations and distributions. This would assist workers in narrowing down the resources they require in their own laboratories to undertake amphipod taxonomy. The one, probably impossible goal, of memorising the entire literature for screen display is at this moment not economical because of the immense labor in finding each citation and subjecting the printed words to memory.

We should attempt, however, to move in the direction of our colleagues in chemistry, who are largely able to dispense with keeping handy files of information more than ten years old. We notice that chemists, for the large part, need library resources of only the current ten years because their study field moves so rapidly and effectively that older works have little priority or value. There must come a time when amphipod taxonomists have available a fully modernised operating basis in which questions requiring backward looks of more than ten years have all but disappeared. Dispersal of hard-copy will have been replaced by instant terminal access to a modernised body of information that is upgraded daily by the taxonomists working in the group. This kind of accomplishment is much closer in Amphipoda than in many other groups because, fortunately, the taxonomic study of Amphipoda is relative recent, is not beset with massive problems of literature, and has most of its old nomenclatural problems worked out. The principal problems of historical cause are: (1) the need to modernise many poorly described species from earlier years as based on review of type materials; (2) the difficulty of finding some of those old materials from museums now defunct or in museums which have not had amphipod collections curated for many decades; (3) the need to expunge erroneous distributional records of misidentified collections; and, finally (4) the need to revivify lost curatorial positions and to establish stronger, long-lasting taxonomic centers.

Identification Procedures

The identification of a gammaridean amphipod even at familial levels so often requires a complete dissection and analysis of all appendages and mouthparts that the procedure is considered to be mandatory. This handbook cannot be utilised successfully by a non-specialist without *dissecting* appendages (Appendix I) and *observing* minute characters (checklist of Appendix II). Once the student has gained some experience, however, parts of these procedures may be skipped, because some families and many genera can often be recognised without extensive analysis. The identification of a species belonging to a genus with ten or more species may require as much as two or three weeks if the identifier is required to make a key from a survey of the literature and then analyse badly described type materials.

The procedures for identification described herein are manifold. They include the memorisation of a basic gammaridean plan, illustrated in Figure 1. Almost all other families are defined by combinations of characters expressing either minor specialisations or minor simplifications of the basic gammaridean plan.

The Diagrammatic Key to Families. This key (Figs 2-21) is composed of boxes each representing a family or superfamily containing one or more illustrated characters in solid lines that distinguish it from the basic gammaridean (Fig.1). Most of the characters would be considered to be apomorphic to the those found in the basic amphipod. For example, if mouthparts are not illustrated they either resemble those of the basic gammaridean or are so highly variable that they have no diagnostic differences from the basic gammaridean or other taxal groups and are thus not mutually exclusive. Each of these concordant families is noted in the labels of the illustrated key and character differences are figured and pointed out by arrow where necessary. The diagrammatic key is therefore, not an absolute endpoint, because the taxonomist must also check the illustrated

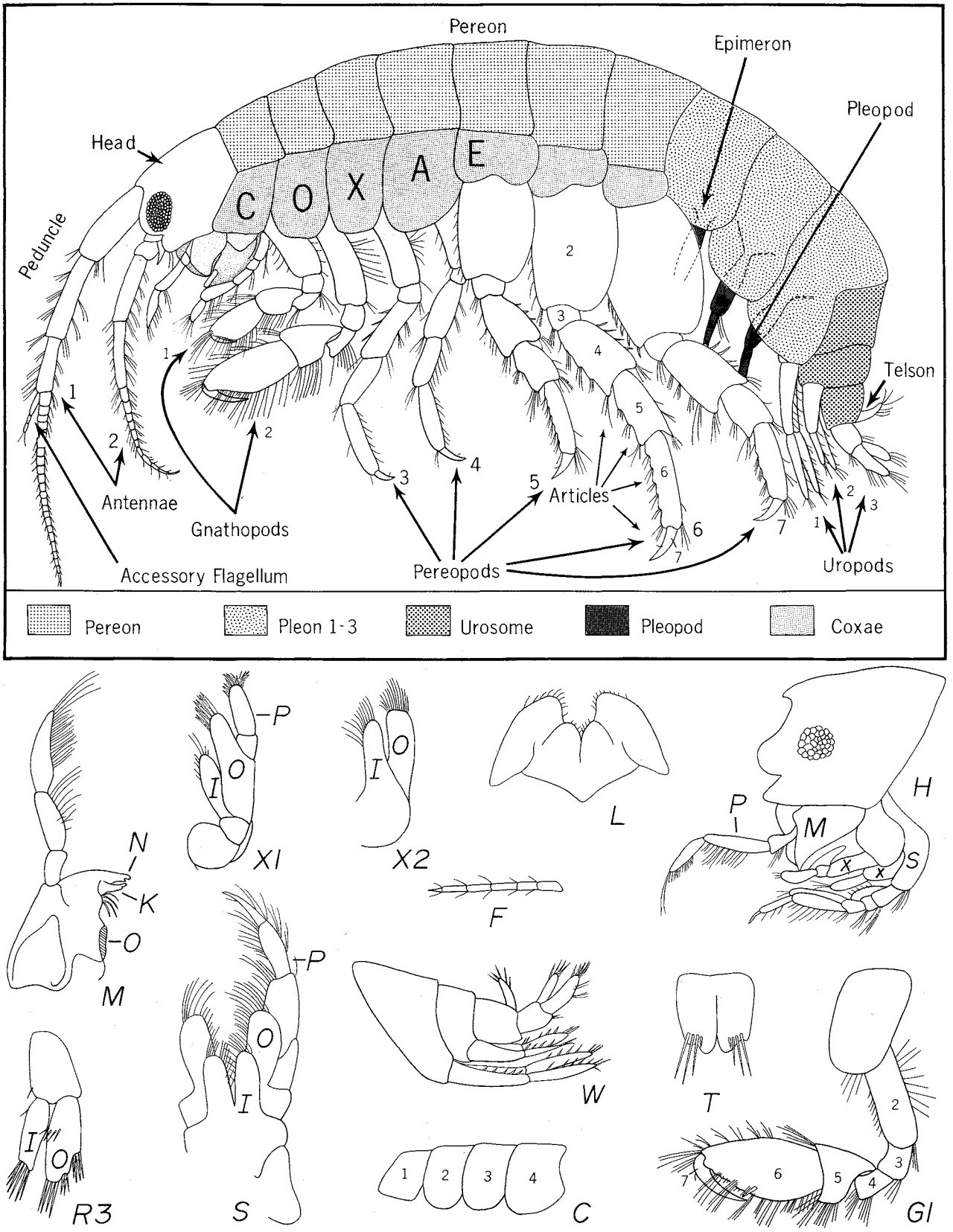


Fig.1. The basic amphipod.

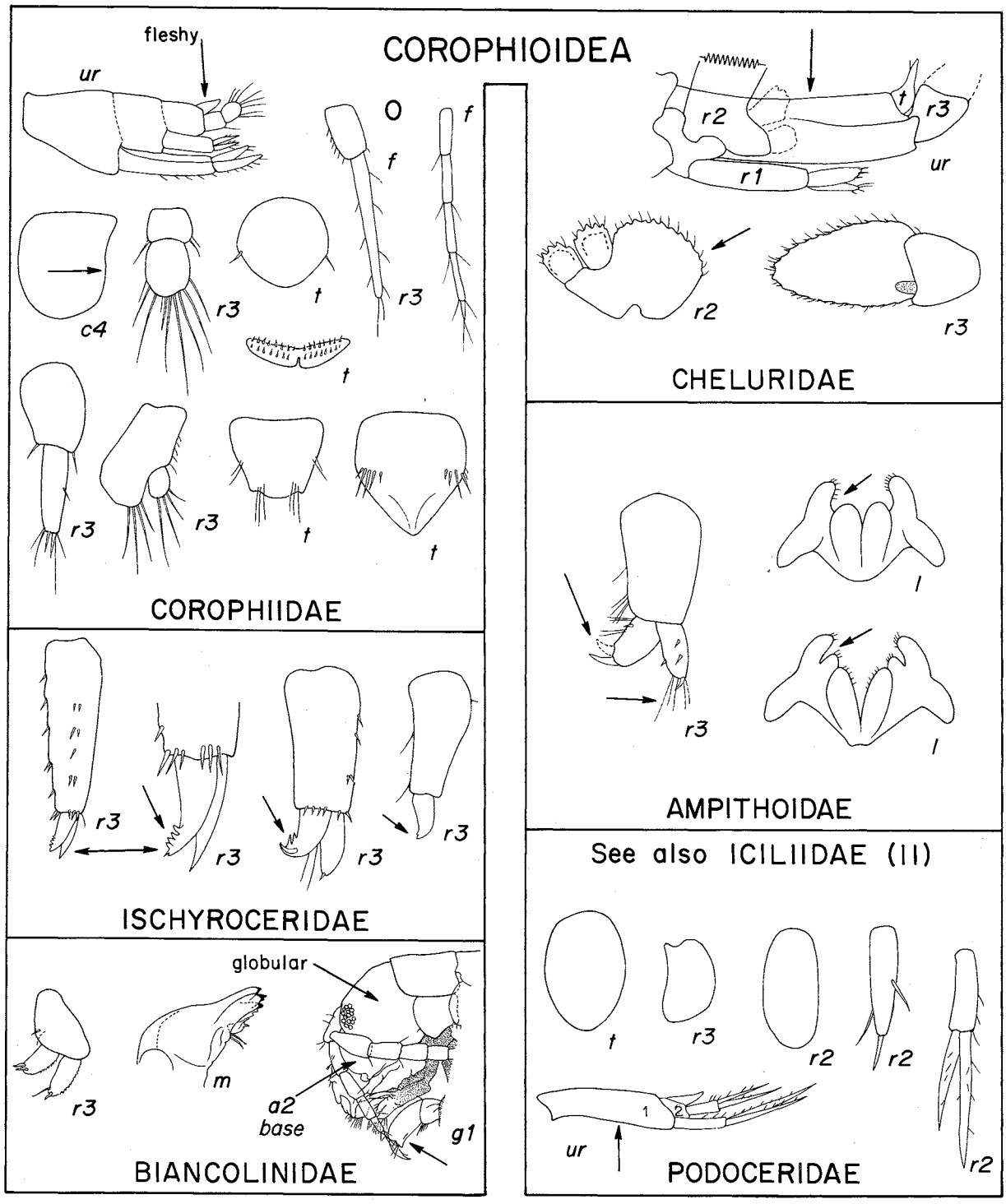


Fig.2. Pictorial key.

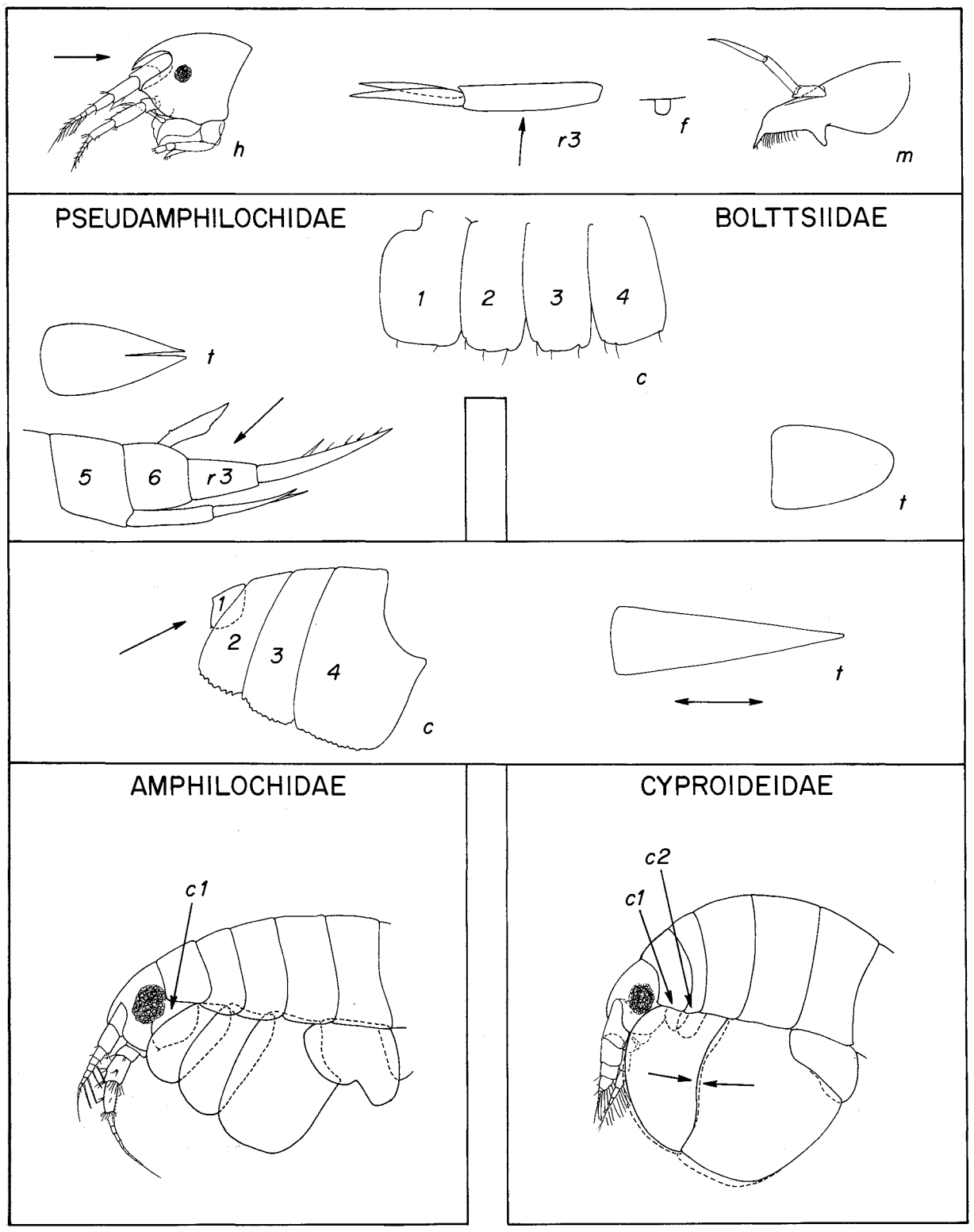
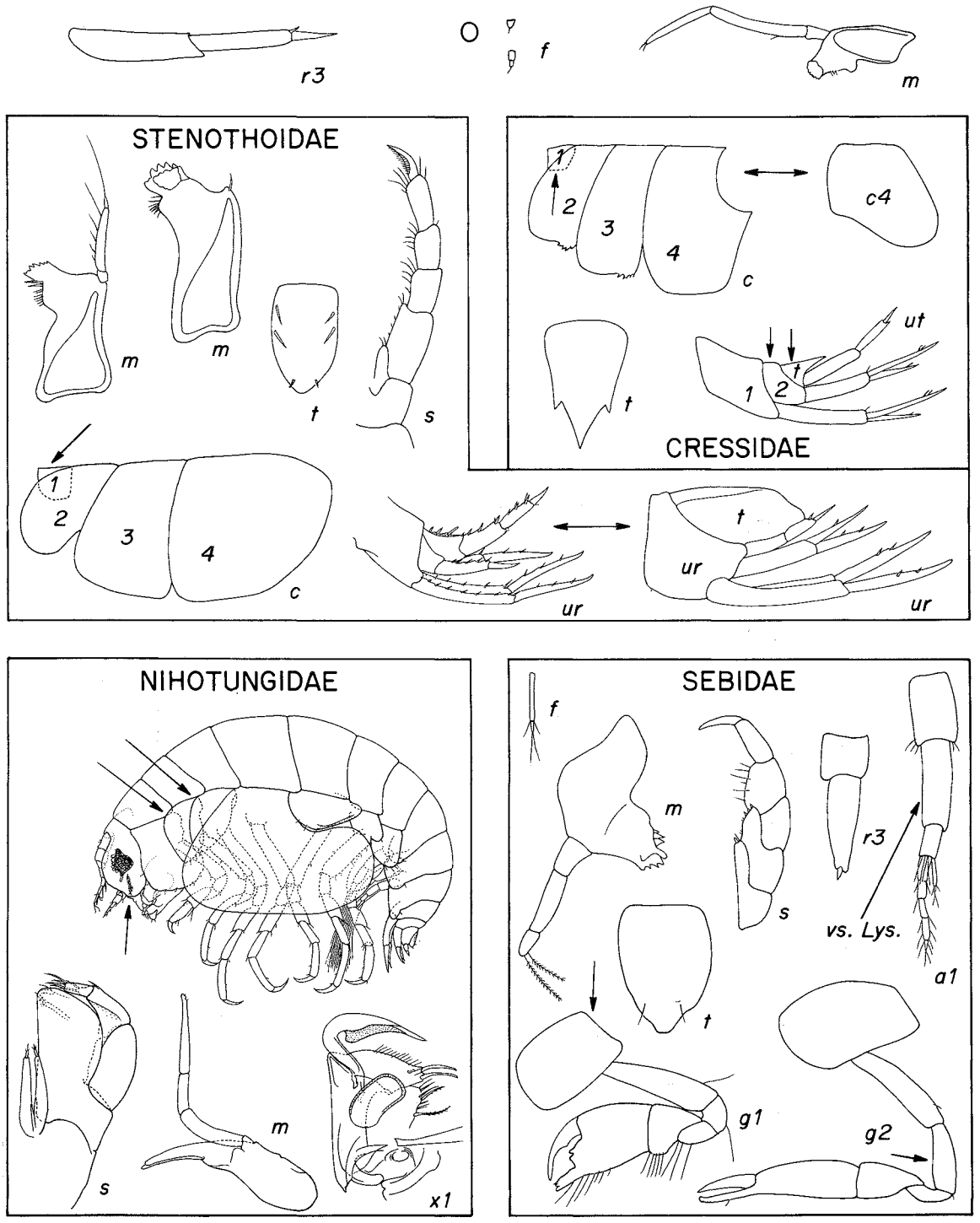


Fig.3. Pictorial key.



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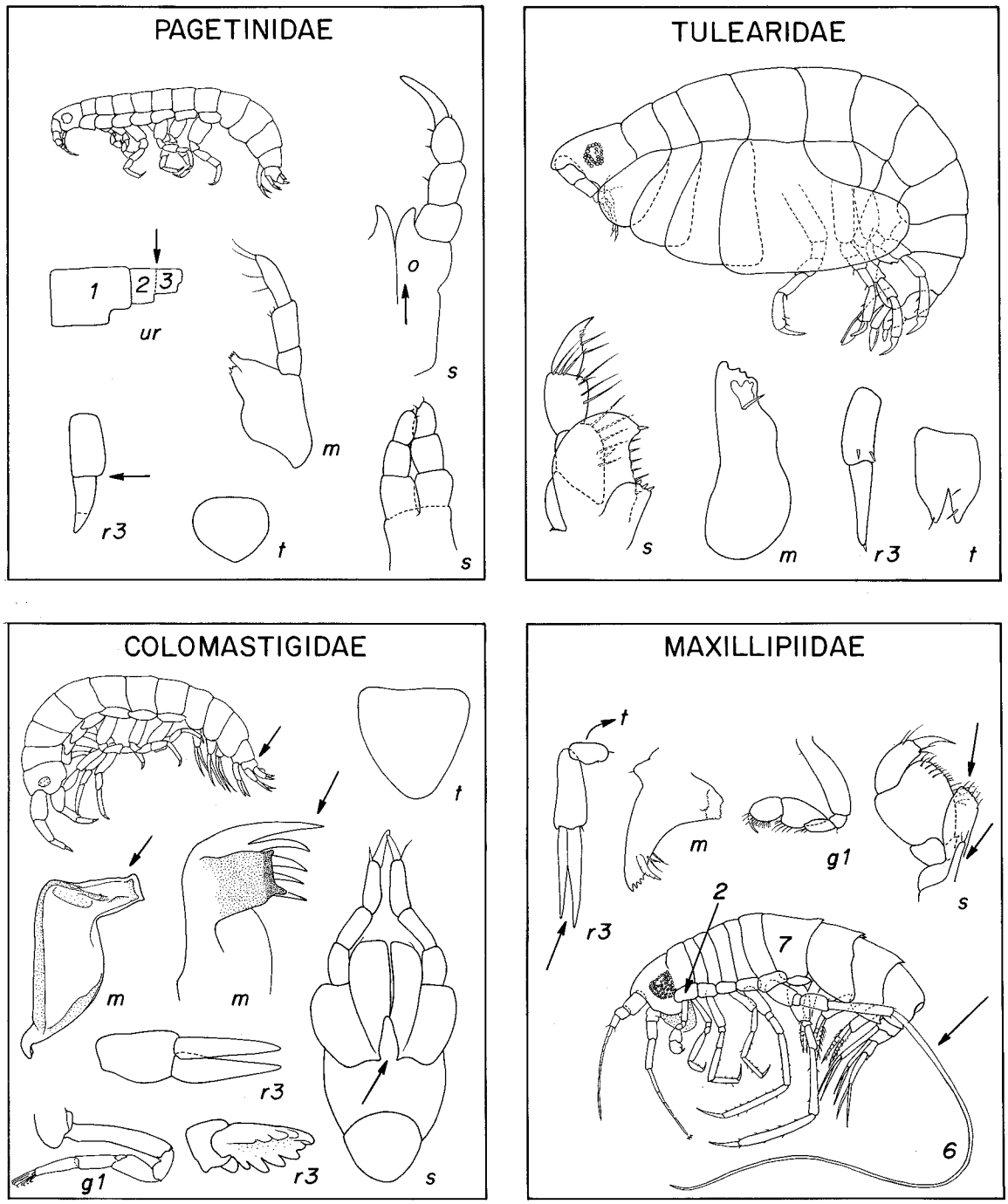

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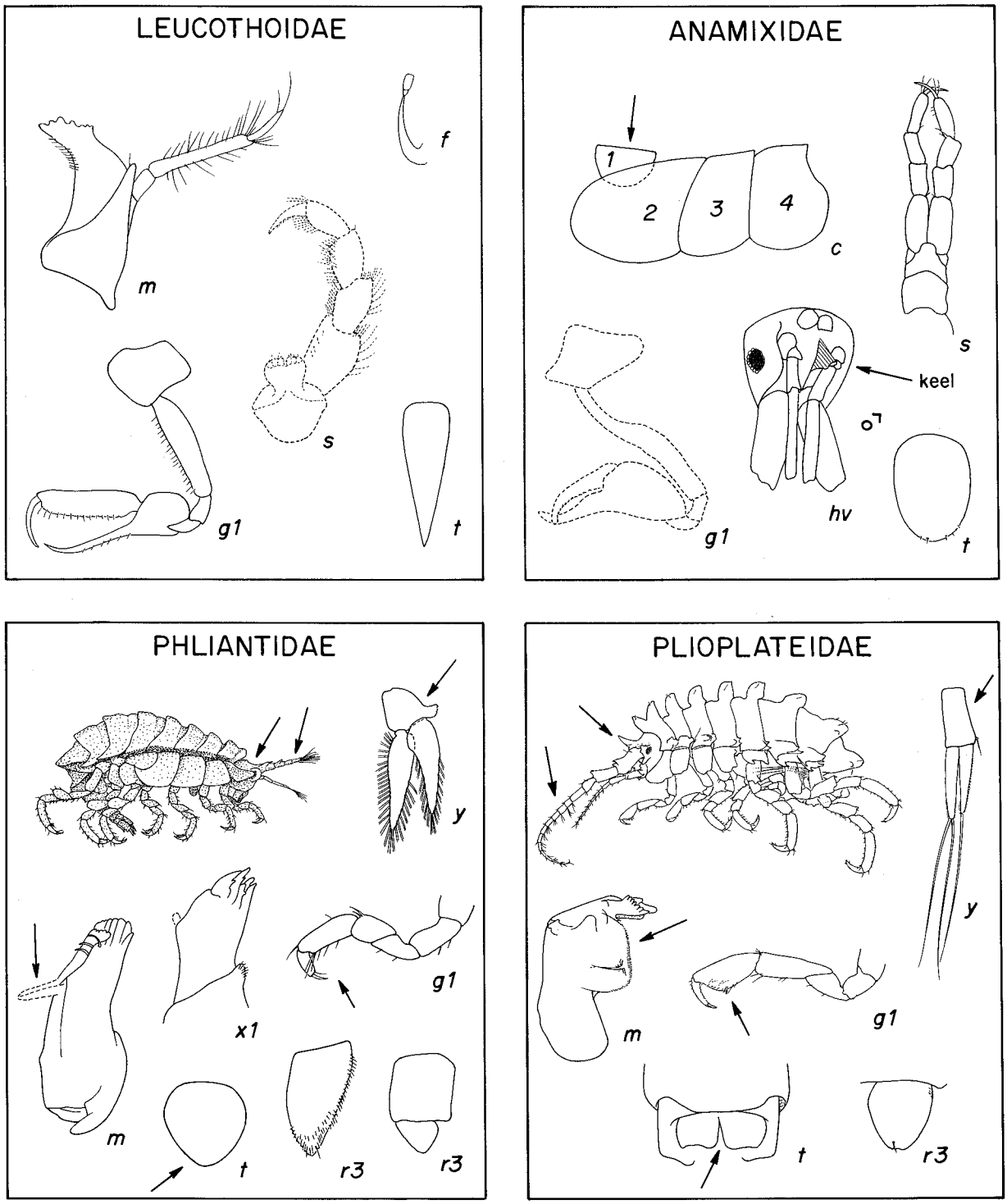

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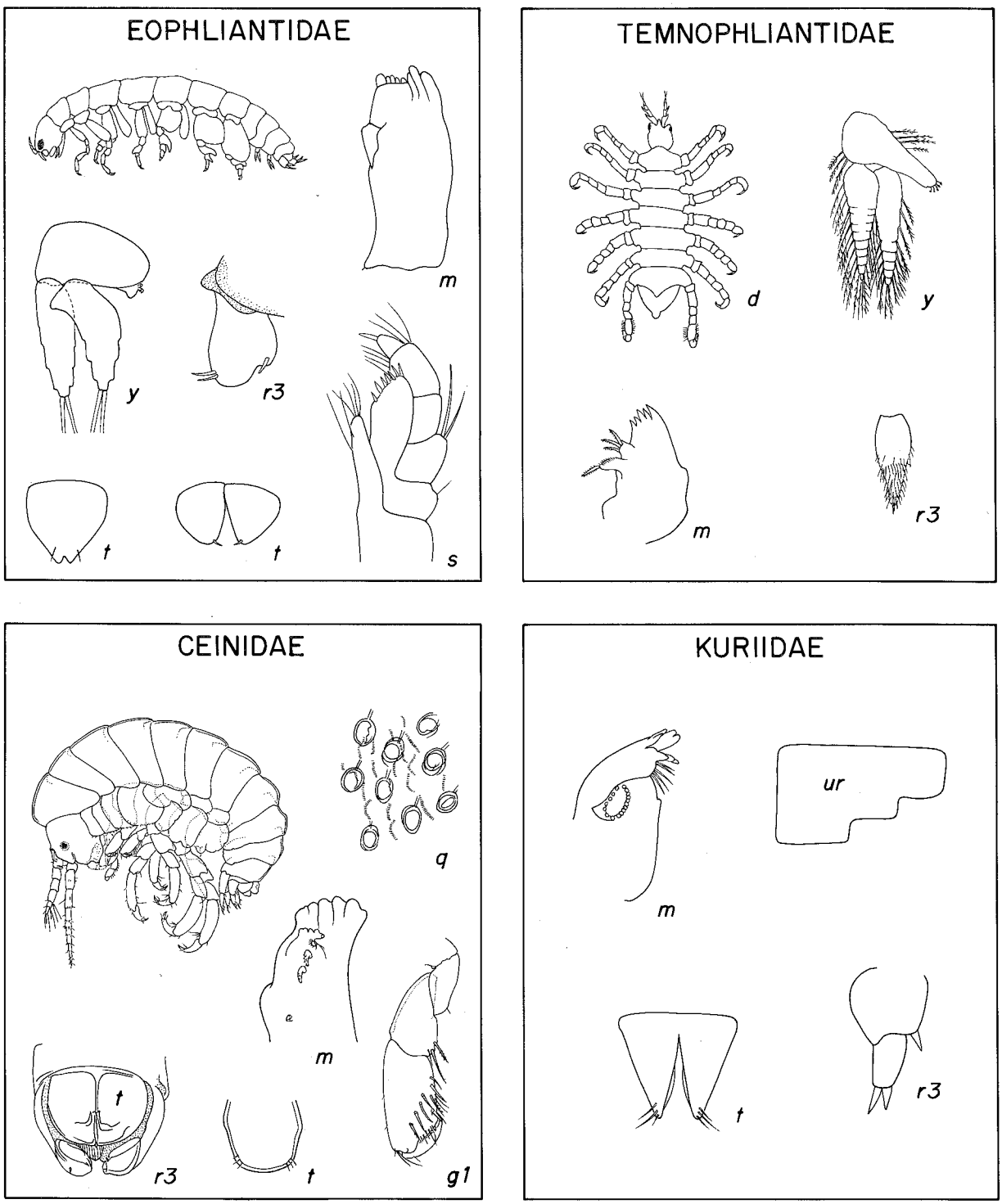

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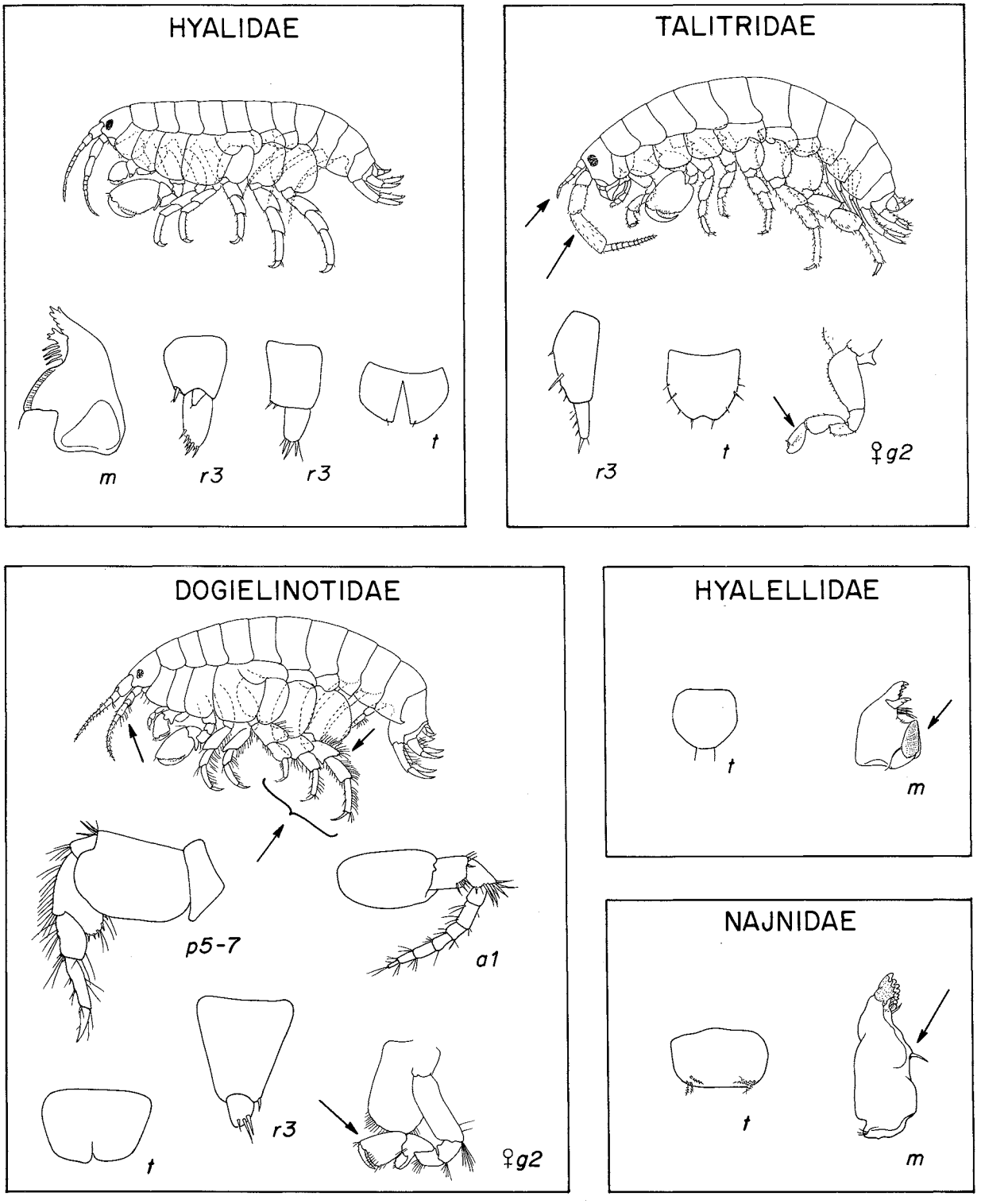

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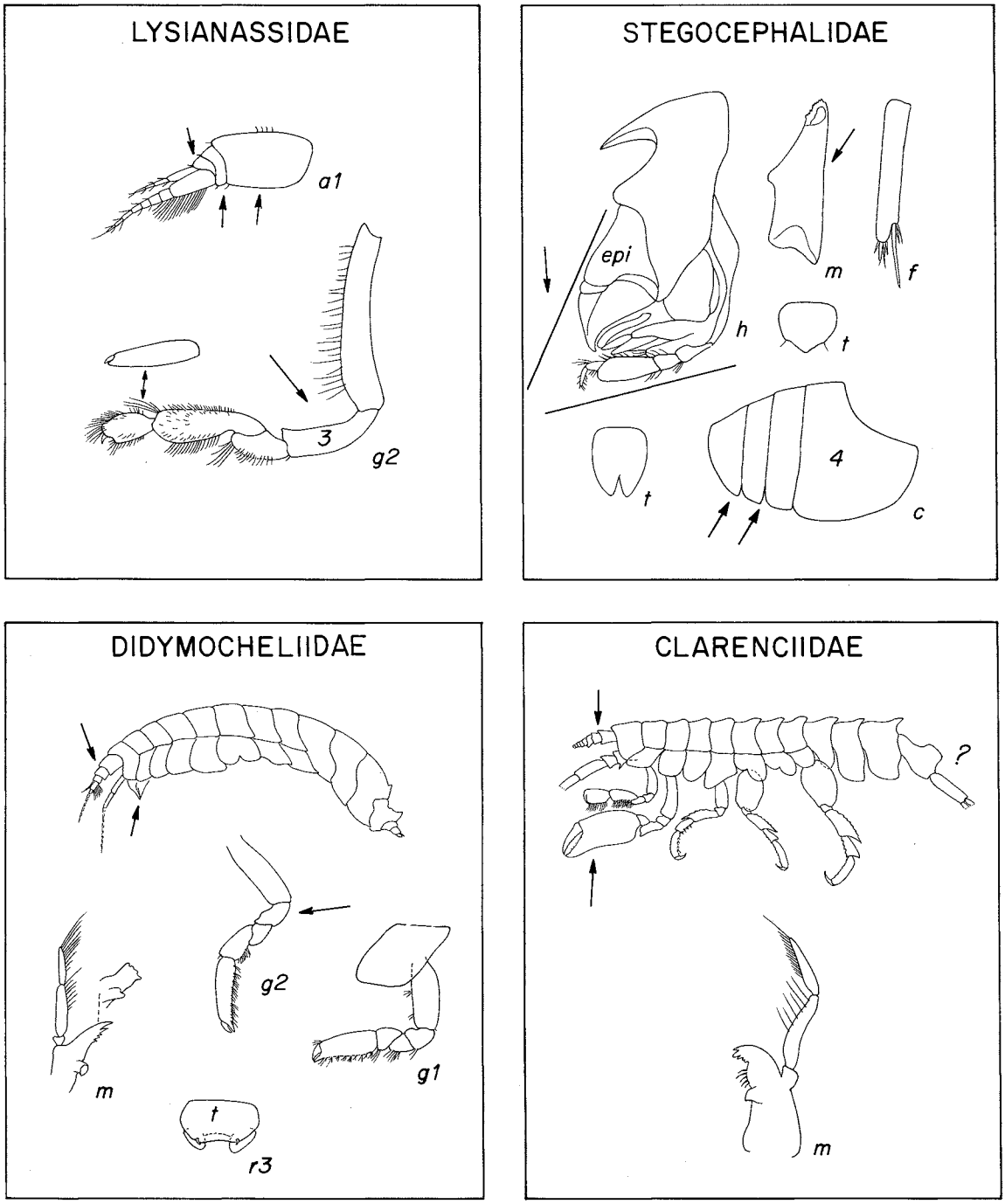

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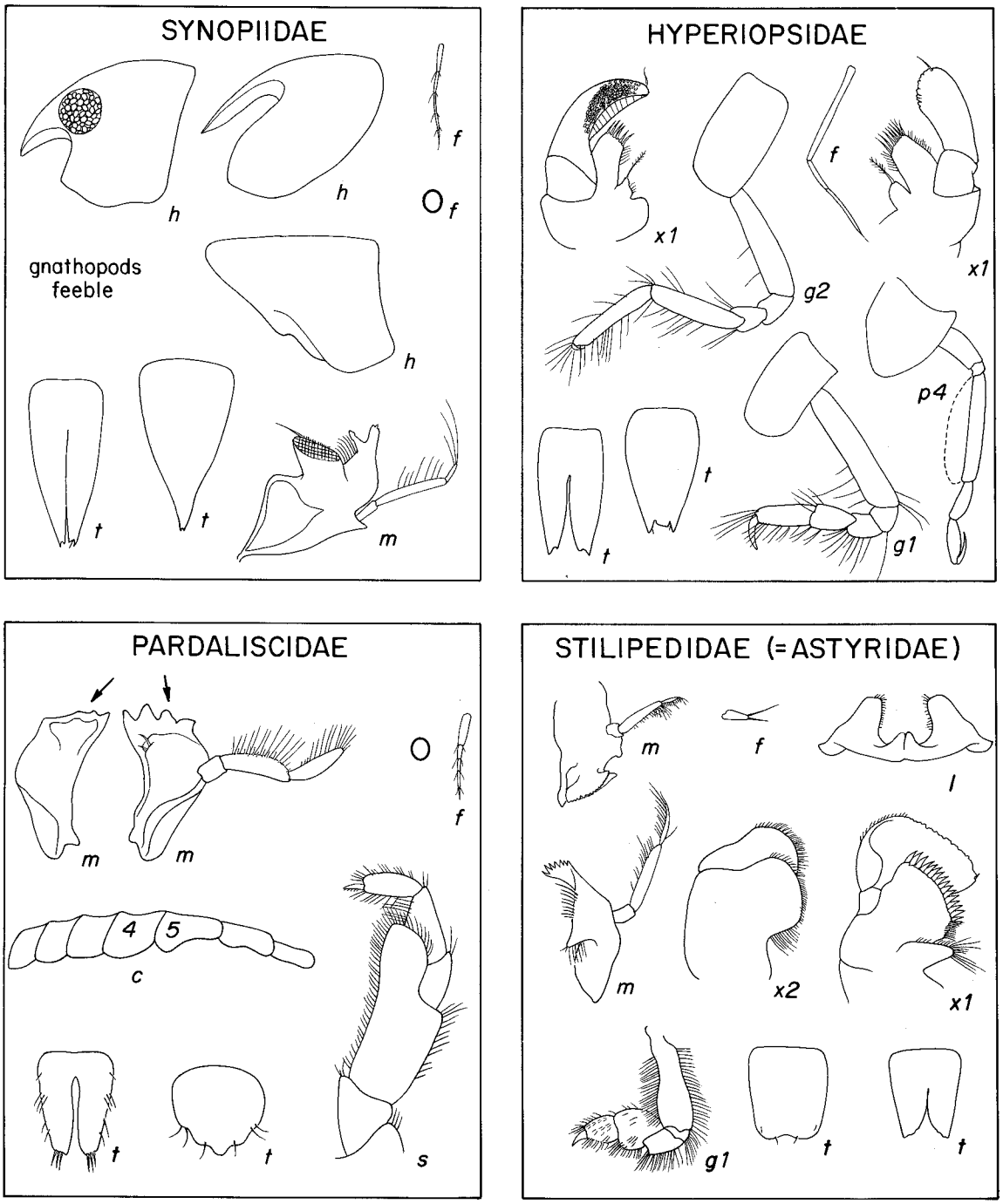

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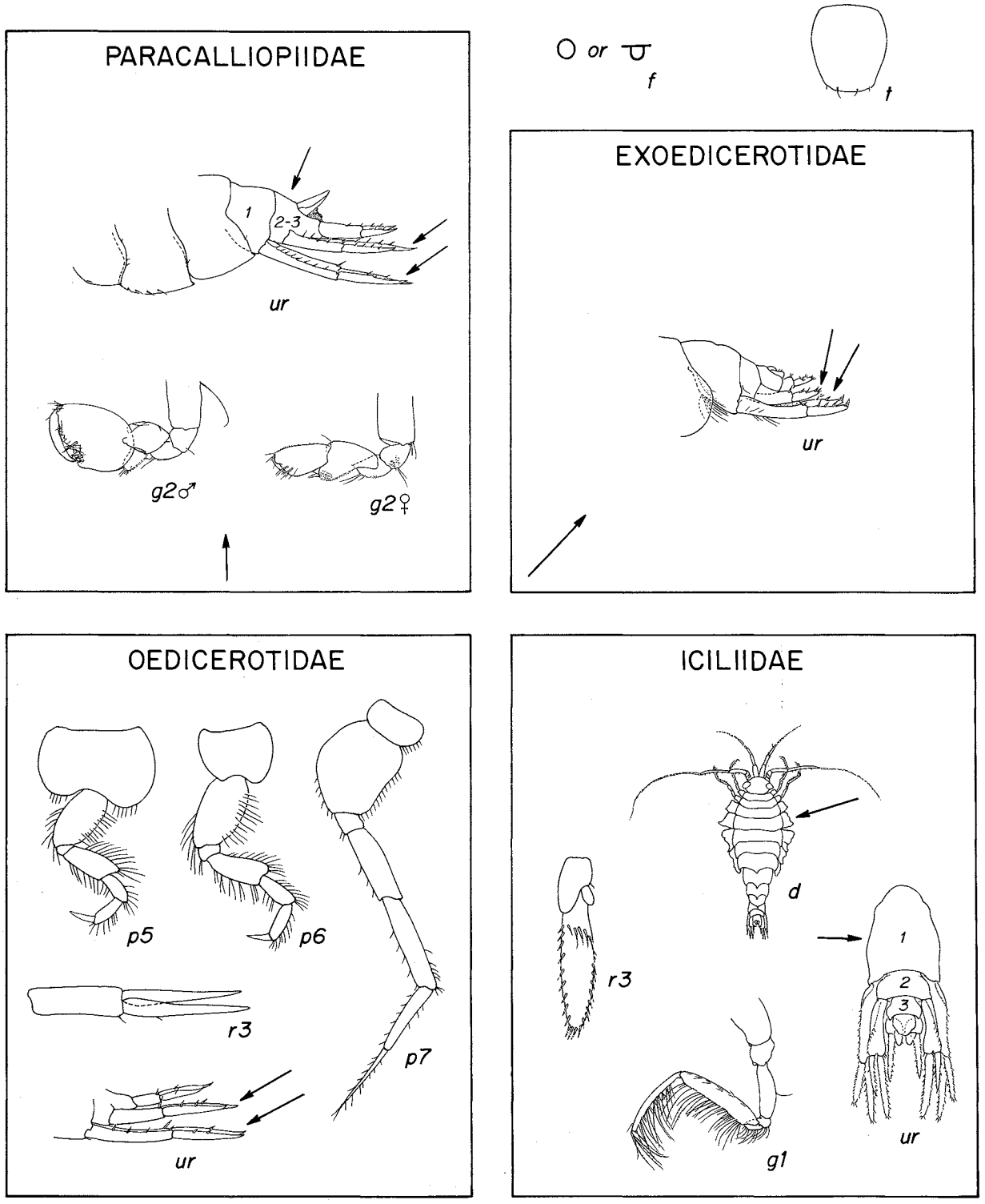

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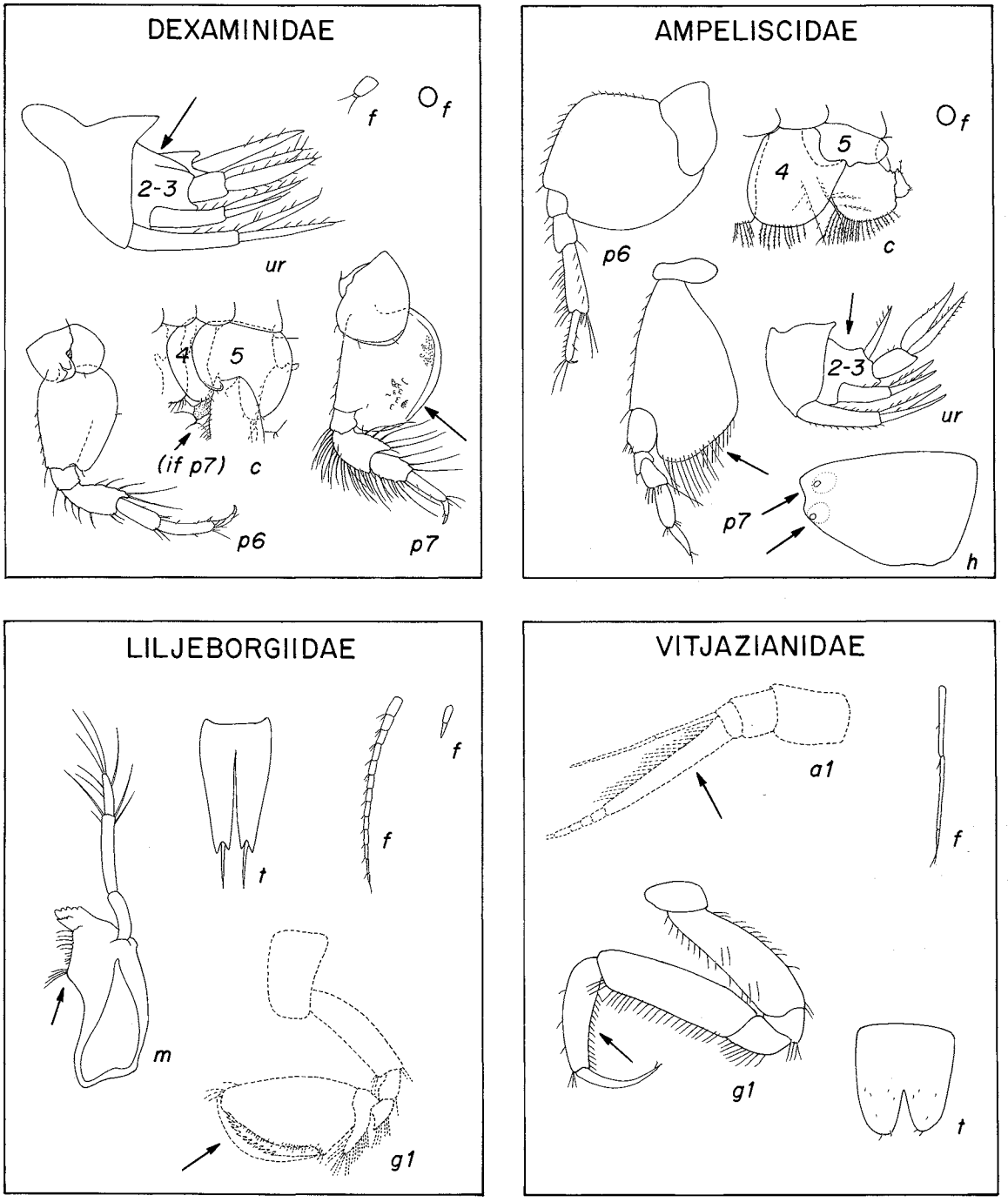

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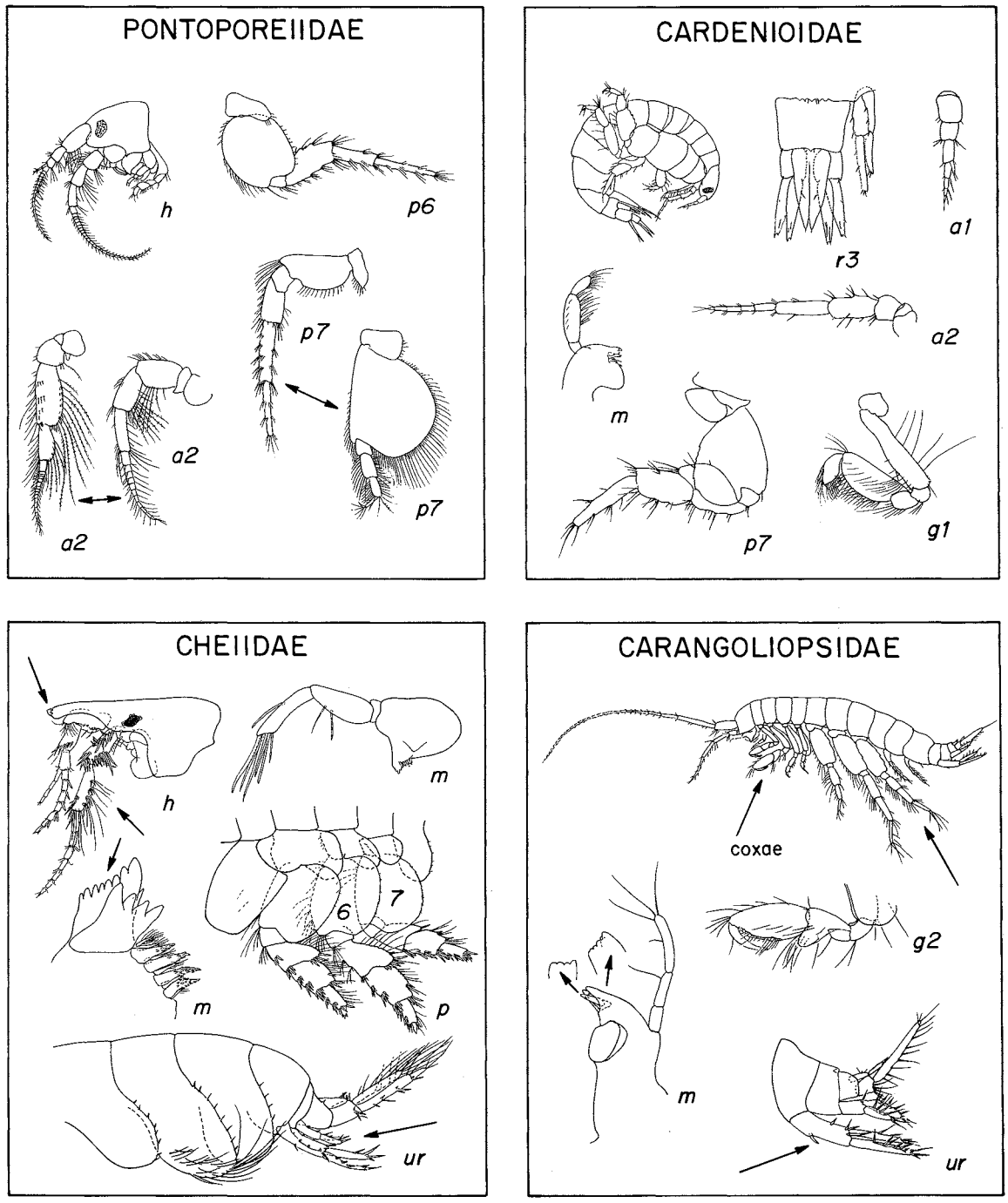

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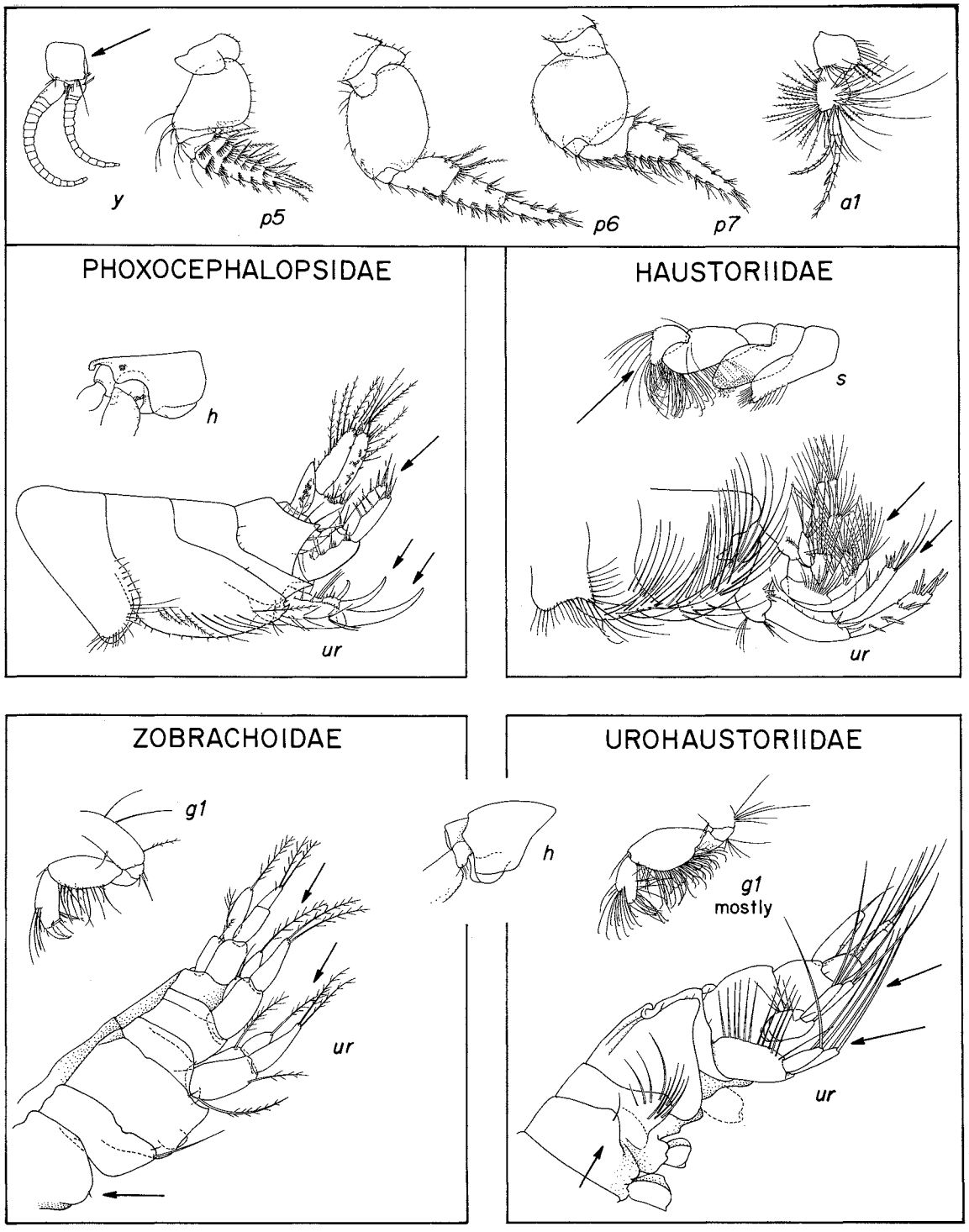

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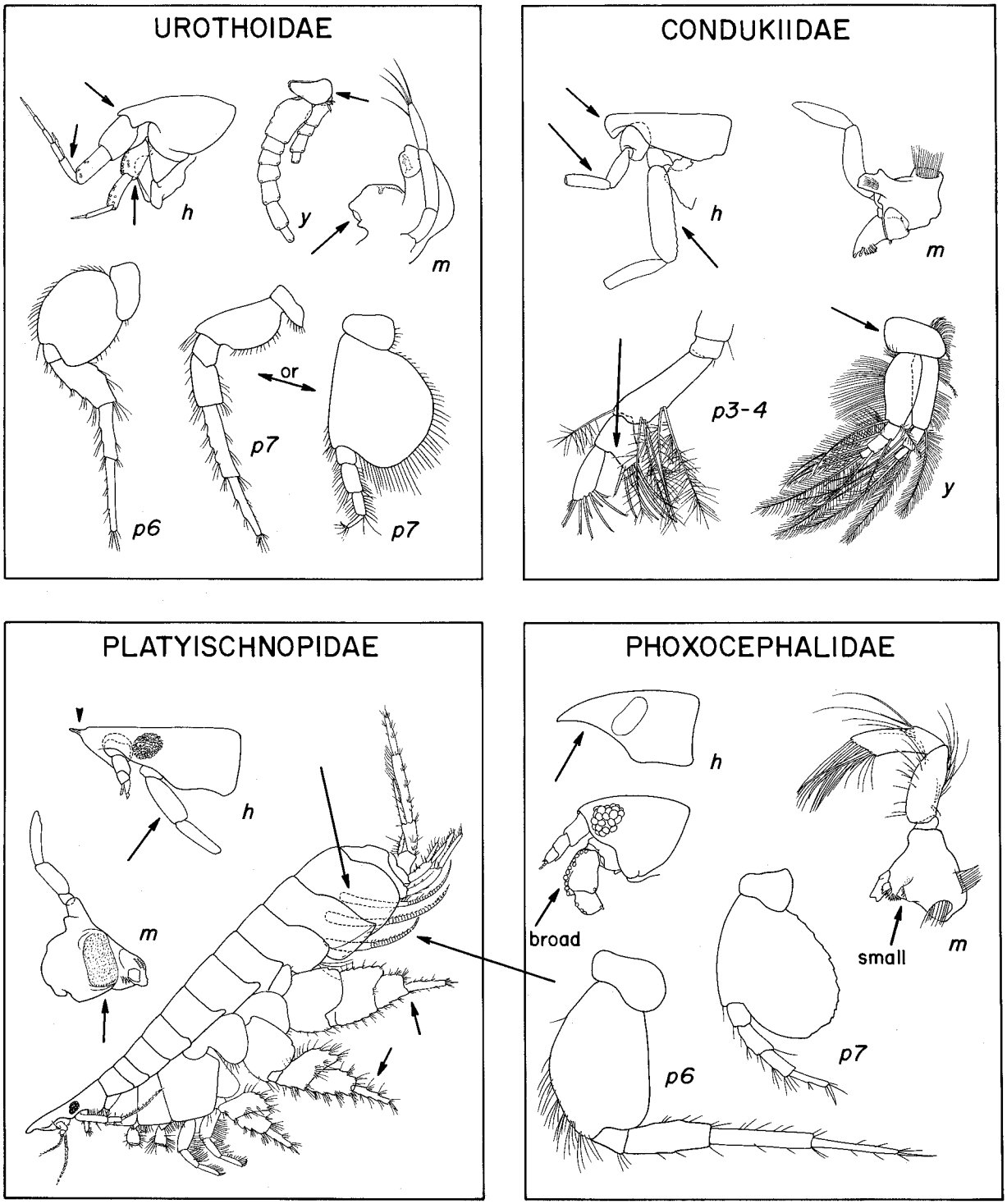

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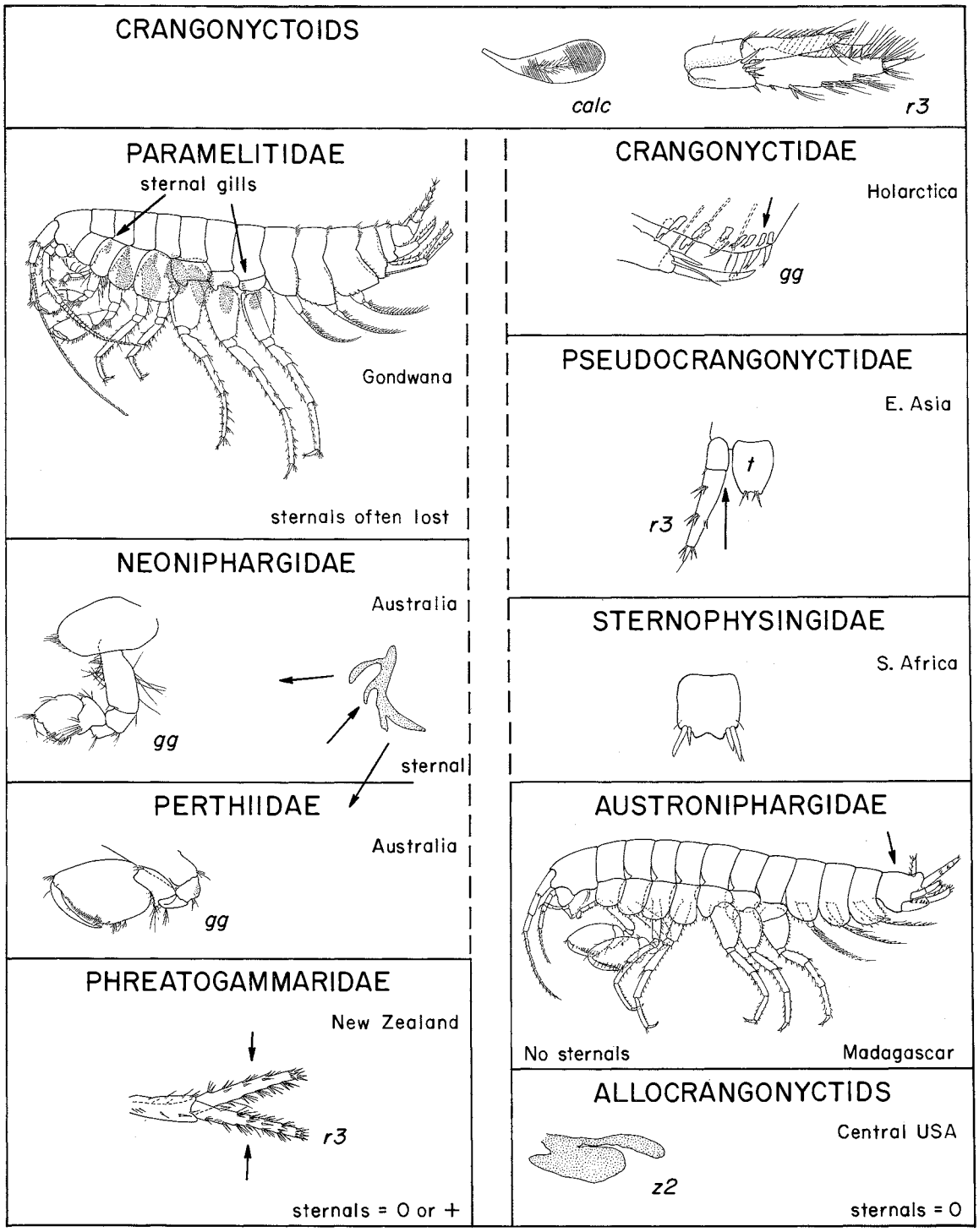

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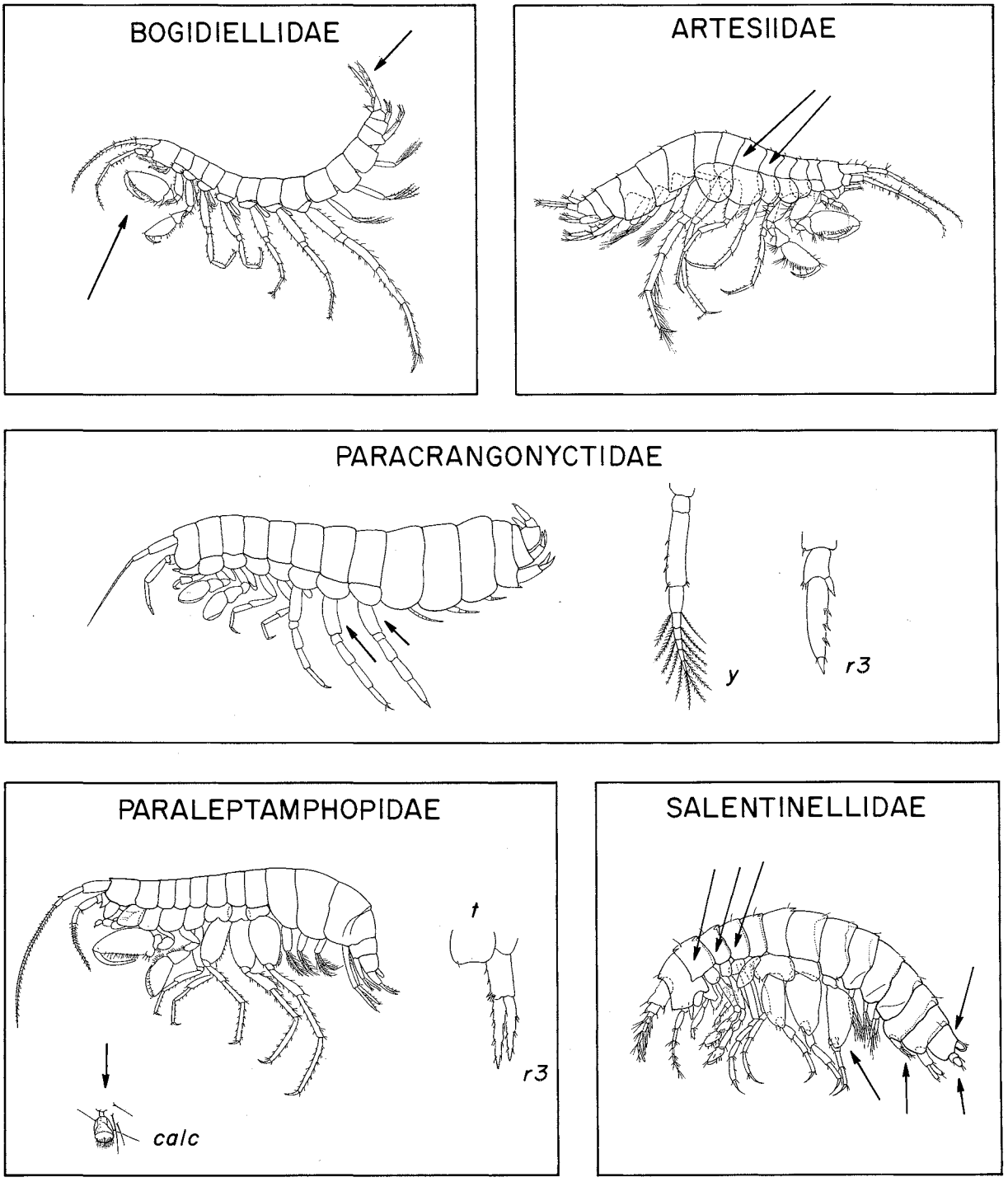

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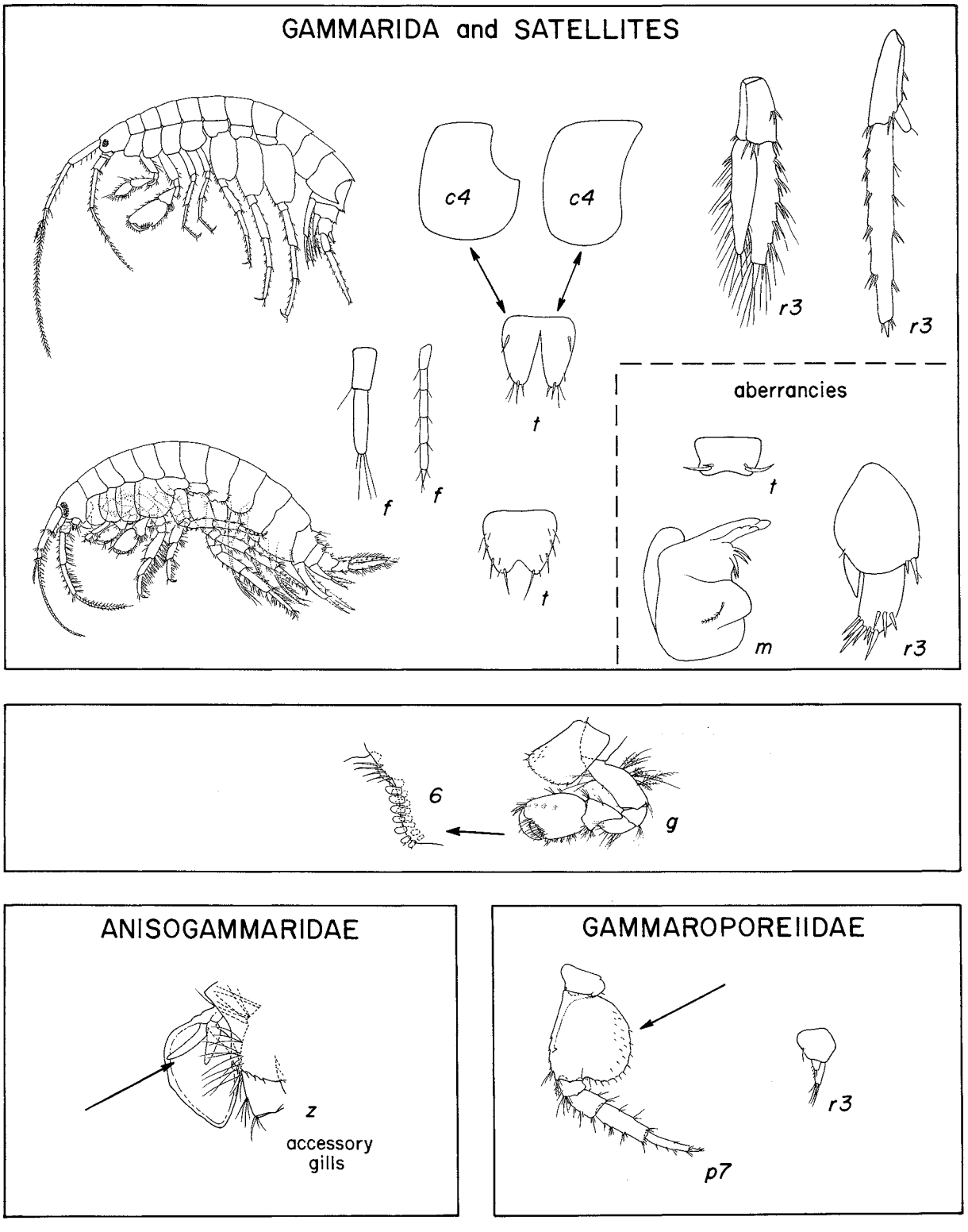

Fig.18. Pictorial key.

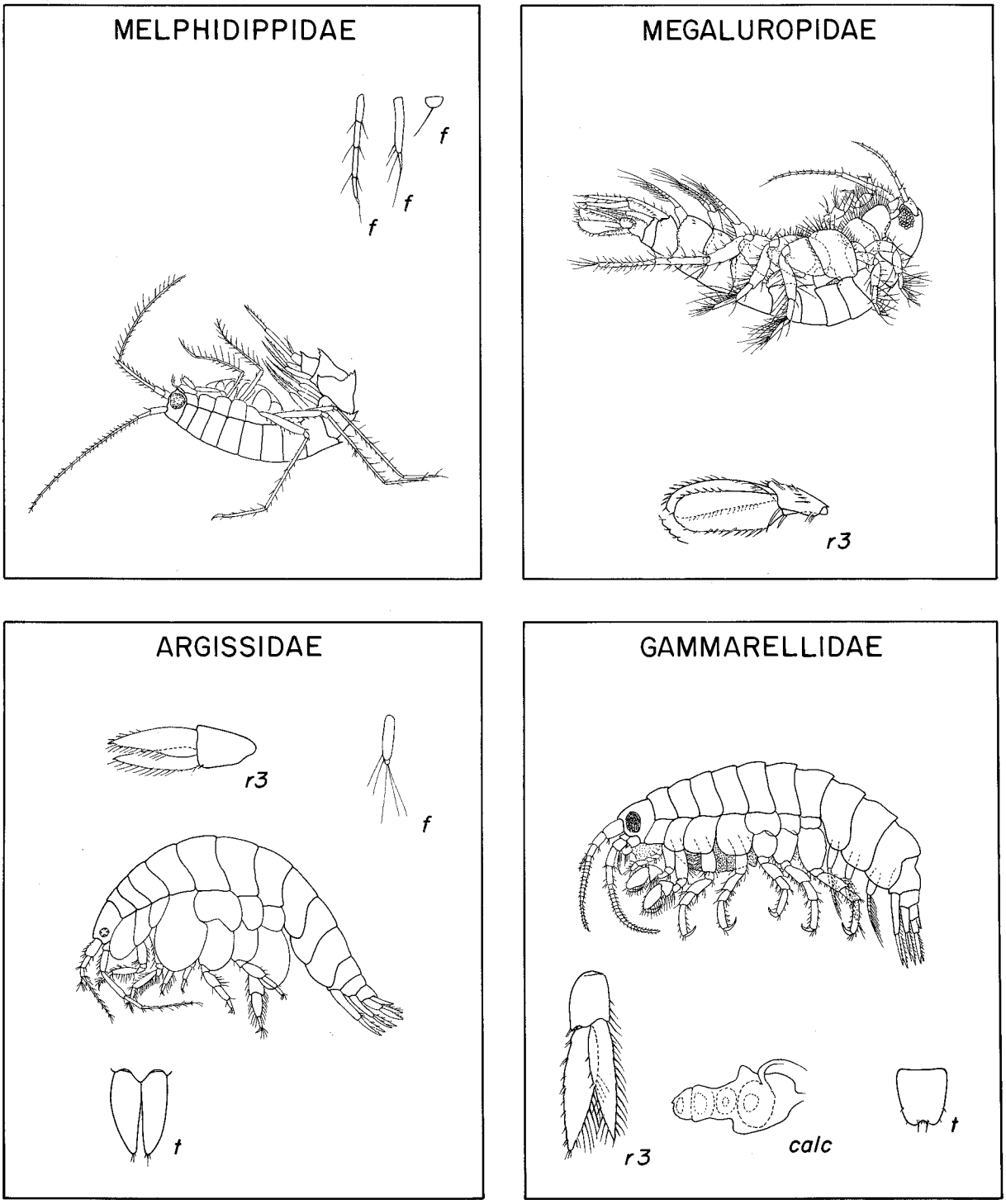

Fig.19. Pictorial key.

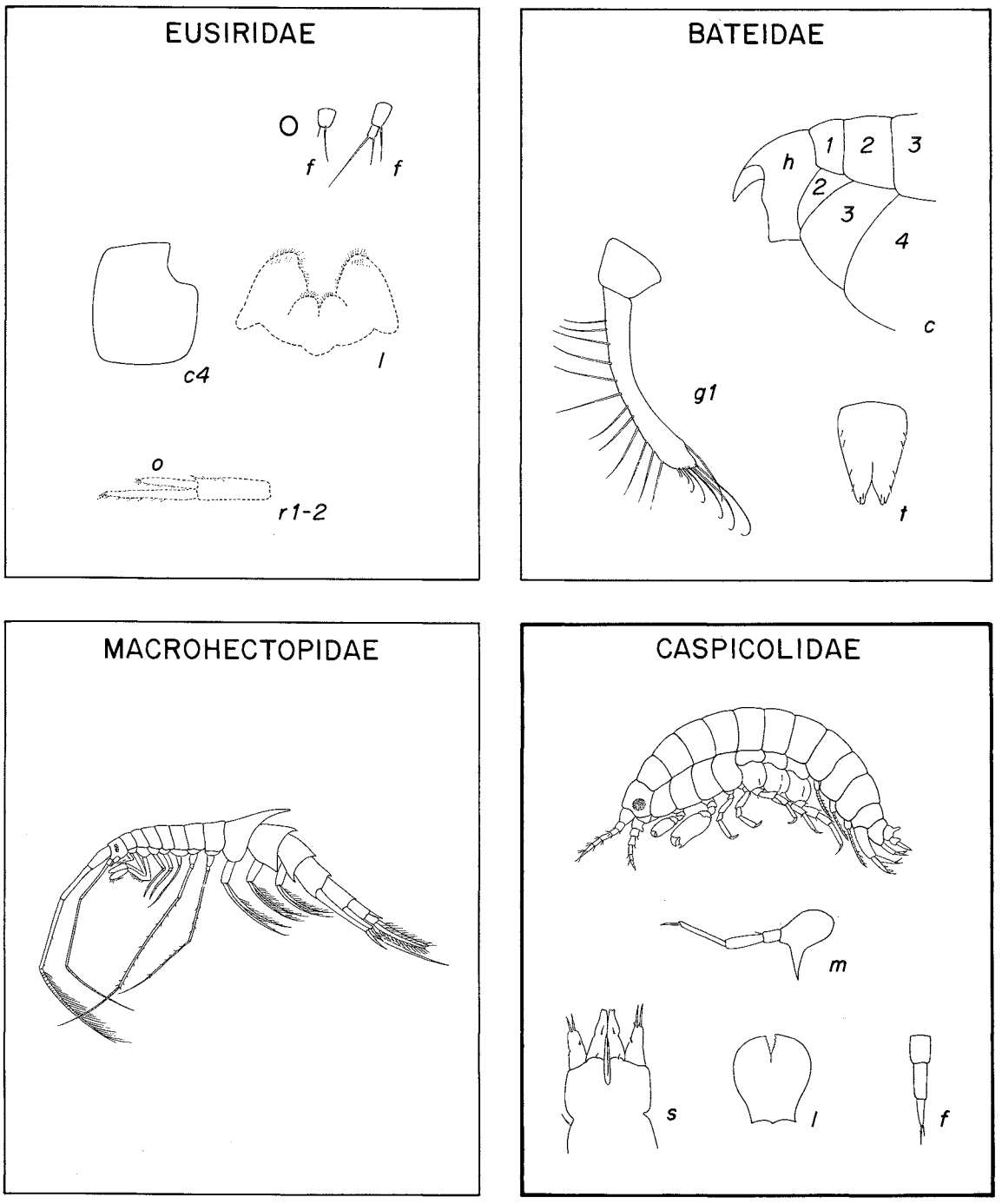

Fig.20. Pictorial key.

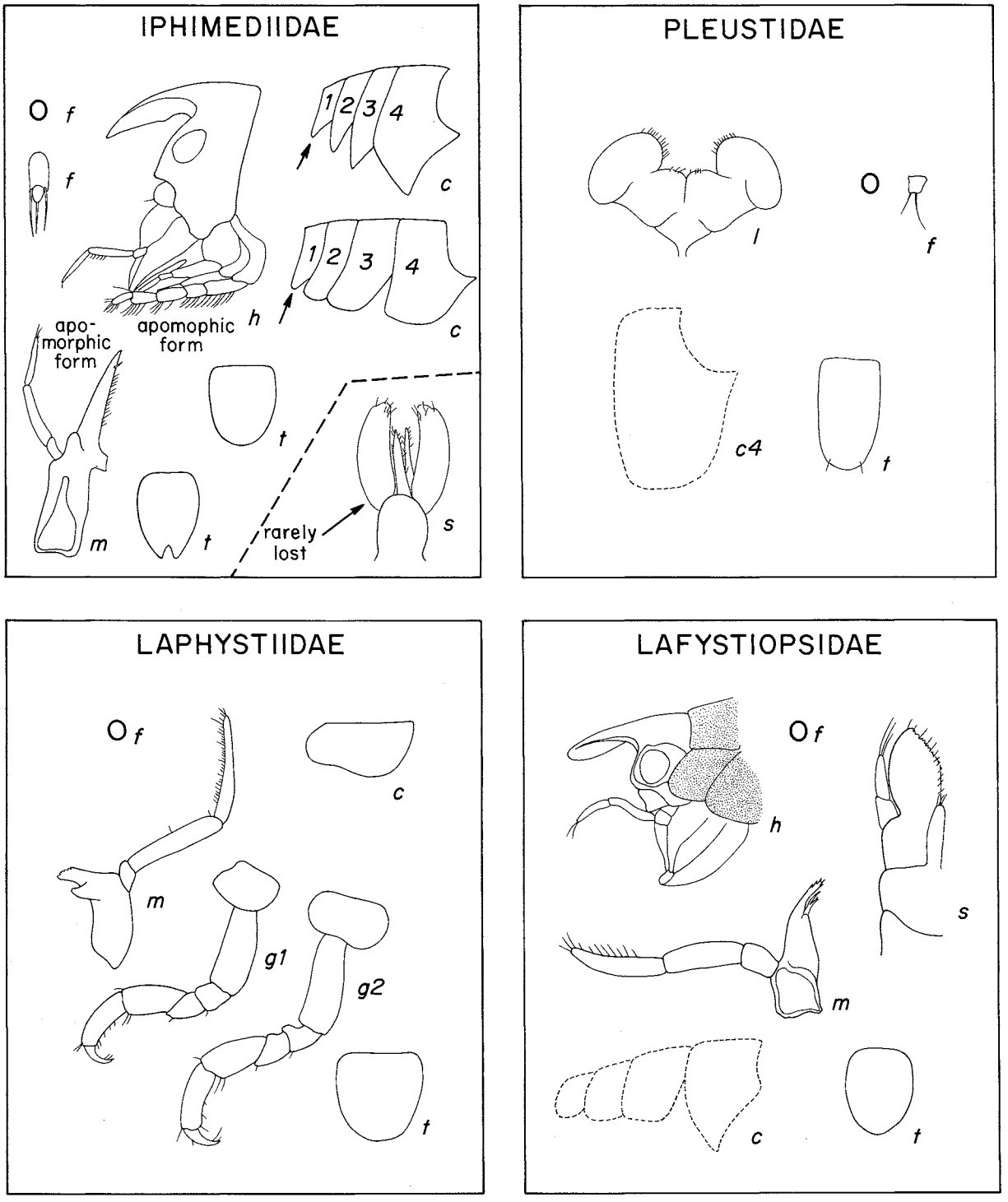

Fig.21. Pictorial key.

boxes of nearby families resembling the first provisional identification and then proceed to written diagnoses and keys.

The diagrammatic key is arranged in a way to deal first with those families which have highly characteristic and easily observed morphology and therefore the sequence generally is moving toward the basic amphipod near Figures 19 to 21.

The first group (Fig.2) is the Corophioidea, composed of families with obviously fleshy telson. The telson is thick dorsoventrally and in most of the commonly encountered species is very short, pillow-like and firmly attached to the urosome so broadly and strongly that it cannot be moved independently of the animal body. Except for a few debatable cases in figures to follow almost all other Gammaridea have the 'flappable' or easily movable, dorsoventrally depressed telson; in a few taxa where the telson has become reduced this distinction may be difficult to make.

The basic corophioid in Figure 2 is shown in the upper left. Uropod 3 may be normal or reduced as shown; coxa 4 is poorly or not excavate; the accessory flagellum varies from well developed to absent and the telson is occasionally reduced to a broad boomerang armed with denticles. In this group and in the nearby Ischyroceridae and Ampithoidae pereopods 3 to 4 contain well-developed glands which emit a spinning silk through a meatus located subapically on the dactyl.

Below the Corophiidae on Figure 2, the Ischyroceridae are characterised by the elongation of the peduncle on uropod 3, the shortened rami, the pointed and poorly armed inner ramus and the presence of a hook or denticles on the pointed and poorly setose outer ramus. In the alternate uropod 3 is depicted the loss of an inner ramus, occasionally encountered in such genera as *Ericthonius*.

To the middle right of Corophiidae are the Ampithoidae which are characterised by uropod 3 which is small, with slightly elongate peduncle, a pad-shaped inner ramus with several to many setae and a pad-like outer ramus bearing 2 strong spines usually reverted. Below Ischyroceridae is a presumed derivative of Ampithoidae, the Biancolinidae, characterised by loss of mandibular palp (occasionally also in Ampithoidae), a reduced uropod 3 with weak armaments and a subspherical head probably used for rotation while the organism burrows into the stipes of kelp.

At the top right of Figure 2, the Cheluridae are characterised by the great diversity of uropods 1 to 3, and the special form of uropod 2 with expanded peduncle; the segments of the urosome are mostly fused together to form a flat box.

Finally, at the bottom right, the Podoceridae, which are rather spider-like (Fig.118) are characterised by the elongate urosomite 1 and severely reduced uropod 3.

In Figure 3 the amphilochoids are depicted in four families. The most primitive are Pseudamphilochidae and Bolttsiidae in which coxa 1 remains primitively enlarged, whereas the ultimate amphilochoids below have coxa 1 strongly reduced. Pseudamphilochids retain the 'primitive' (in context of the model amphipod) cleft telson whereas the remaining families have the telson entire. There can be some confusion with Iphimediidae (Fig.21) and Eusiridae (Fig.20) but all amphilochoidids have characteristic gnathopods (compare Figs in main text). Cyproideids differ from amphilochids in the further reduction of coxa 1 and in coxae 3 to 4 which abut together and form a shield rather than overlap.

In Figure 4 the stenothoids and cressids continue the amphilochid form of coxa 1 reduction but uropod 3 is also apomorphic in that the inner ramus has become lost and the outer ramus is composed of 2 articles; this uropod thus appears as a simple 3-articulate undivided branch of the urosome. Maxillipedal structures are reduced as shown. Cressids have urosomite 3 fused to the telson, whereas in the thaumatelsonin form of stenothoids shown in the box extension just below, the urosome may be fused together but the telson remains distinct.

Nihotungids in Figure 4 are characterised by the reduction of coxae 1 to 3, the strange accessory eye and appearance of the main eye, the immense coxa 4, the stylet-like mandibles and the unusual maxilla 1. Sebidae also have the stenothoid uropod 3 but have normal coxae, and chelate gnathopods. Sebids resemble lysianassids (Fig.9) in the elongation of article 3 on gnathopod 2 but are distinguished from them by the elongate articles 2 to 3 of antenna 1.

In Figure 5 the Pagetinidae and Tulearidae continue the stenothoid form of uropod 3 but have non-reduced anterior coxae. Pagetinids have short equally extending coxae, very poorly developed plates on the maxilliped and partial fusion in the urosome. Tulearids have large coxae, with coxa 4 immense, well-developed plates on the maxilliped, but loss of palp on the mandible.

On the lower part of Figure 4 are found the Colomastigidae which in primitive state retain biramous uropod 3 with slightly elongate peduncle, but have fused urosomites 2 to 3, poorly developed inner plates of the maxilliped, very feeble almost styliform gnathopod 1, and loss of mandibular palp. The primitive body is cylindrical but it and uropod 3 become grotesquely modified as in Figure 23D.

The Maxillipiidae in Figure 5 somewhat resemble Colomastigidae in body form but pereopod 6 has become elongate and flagellate and the inner plates of the maxilliped remain well developed.

In Figure 6 the Leucothoidae and Anamixidae form a pair of families with carpochelate gnathopod 1, poorly developed maxillipedal plates, and uncleft telson. Anamixidae have coxa 1 reduced and occasionally gnathopod 1 is also lost.

In Figure 6 the Phliantidae and Plioplateidae commence an array of families continuing through Figure 8 which have been put into the superfamily Talitroidea. The 11 families are arranged somewhat in reverse order starting with the most derived and finishing with the most primitive. Talitroids have generally lost all but the vestiges of a mandibular palp, have curled setae on the oostegites (Fig.34A) and all but a few have lost the

inner ramus of uropod 3. The Phliantidae are strongly depressed dorsoventrally like isopods and have the coxae splayed outward laterally. In Phliantidae uropod 3 often loses both rami as shown. Note that the peduncles of the pleopods in Phliantidae are short and broadly expanded. In the companion family Plioplateidae the pleopods retain the elongate normal peduncle but the rami are reduced to one article each. The Plioplateidae are neither distinctly depressed nor the coxae splayed. The telson remains cleft, antenna 1 is elongate and the head has a dorsal tooth.

On Figure 7 the Eophliantidae are characterised by their cylindrical appearance, shortened peduncles of pleopods and poorly developed coxae. To their right, the Temnophliantidae resemble Phliantidae of Figure 6 in the dorsoventral body depression but differ in that this has become so extreme that the thoracic segments also have become partially disarticulate to form pleurae.

The Ceinidae on Figure 6 differ scarcely from the basic talitroideans except by the uncleft telson and pitted cuticle. The Kuriidae are simply basic talitroideans with coalesced urosomes.

On Figure 8 the Hyalidae represent the basic stock of talitroideans by bearing cleft telson (though often appearing fleshy as in other talitroideans and therefore in the family key also included with the corophioids as well as 'flappable' groups) and ordinary antennae, pereopods, and mandibular molar. To their right the semiterrestrial and terrestrial Talitridae are distinguished by the enlarged antenna 2, very short antenna 1 and uncleft telson; most talitrids also have very spiny pereopods though the spines are small.

On the lower part of Figure 8, the Dogielinotidae represent the fossorial mode within the talitroideans, having stout pereopods, stout antennae, both being furnished with supernumerary spines and elongate setae. To the right the Hyalellidae are distinguished from Hyalidae simply by the uncleft telson, and the Najnidae by the reduction of the triturative molar to the condition shown.

On Figure 9 the huge family Lysianassidae is characterised by elongate article 3 of gnathopod 2 coupled with a characteristic antenna 1 on which articles 2 and 3 are very short and partly telescoped basalwards. This family may be divided into groups at a later date. The Stegocephalidae have a somewhat similar body appearance of the average lysianassid but have characteristic coxae. They also have conically grouped mouthparts, reduced mandible and reduced accessory flagellum but one or more of those apomorphies may also be present in one or more lysianassids.

On the lower part of Figure 9 the poorly described Didymocheilidae resemble lysianassids but have a short article 3 on gnathopod 2 and the propodus is not the short mittenform shape of lysianassids. The Clarenciidae, also poorly described, look somewhat similar to lysianassids without the elongate article 3 of gnathopod 2 but gnathopod 2 is enlarged and the urosome may prove to have unusual anomalies; at the moment the family is known only from one broken specimen.

On Figure 10 the Synopiidae reflect the trend in the key to become less and less derived because synopiids differ from the basic gammaridean mainly in the subtlety massive head of several forms. To the right, Hyperiopsidae are more unique in their strange pereopods 3 to 4, scaled and bent palp of one member of maxilla 1 and feeble gnathopods.

On the lower part of Figure 10, the Pardaliscidae are characterised by flat mandibles one of which is heavily toothed along the margin of the incisor; the molar is lost or represented by spines and the maxillipeds have a characteristic shape, with short inner plate and elongate parent article of the outer plate. To their right the similar Stilipedidae differ from Pardaliscidae in the more flabelliform maxillae and labrum but also differ from Pardaliscidae and Iphimediidae in the broadened coxa 1 which is broader than coxa 2 (not shown, see Fig.127A).

On Figure 11, the first three families form an oedicerotid group; they all share the kind of elongate pereopod 7 with elongate dactyl shown in the box of Oedicerotidae. The most primitive is probably the Exoedicerotidae which have normal urosome and well-spinose rami of uropods 1 to 2 and which retain paired eyes. The Paracalliopiidae have lost the apical spines on uropods 1 to 2 and have fused urosomites 2 to 3; they also retain paired eyes. The Oedicerotidae have lost the apical spines on uropods 1 to 2, with few exceptions retain the normal urosome and the eyes when present are fused. Unfortunately many oedicerotids live in the deep sea and have lost their eyes but, so far, no paracalliopiid or exoedicerotid has been found to be in the deep seas or to be blind so that one may assume any organism collected in the deep sea without eyes but with the characteristic pereopod 7 can be called a member of Oedicerotidae.

To the lower right on Figure 11, the Iciliidae are depicted as an isolated group supposed to be related to Iphimediidae because of the acuminate coxae but which bear the aspects of the Podoceridae in body and appendage form. The definitely biramous uropod 3 and simple gnathopods 1 to 2 differentiate the Iciliidae from Podoceridae whereas the body form, long antennae, form of uropod 3 and elongate urosomite 1 distinguish them from iphimediids and other similar families.

On Figure 12 the Dexaminidae and Ampeliscidae are rather ordinary gammarideans but each characterised by coalesced urosomites 2 to 3. The Ampeliscidae have elongate heads bearing cuticular lenses (but again, deepsea species have lost these marks) and are best differentiated from Dexaminidae in the strongly setose margin on pereopod 7. Most dexaminids have ordinary gammarid-like pereopod 7 but a few have the ampeliscid form which lacks the setose margin; coxa 5 of those confusing dexaminids is enlarged unlike coxa 5 in ampeliscids and the diagram has the words '(if p7)' to call attention to this condition.

The Liljeborgiidae on Figure 12 scarcely differ from gammaroids except in the loss of triturative molar; from marine gammaroids they seem to be distinguished also in

the strong similarity between gnathopods 1 and 2 which in most gammaroids are diverse; size is discounted in this comparison.

The Vitjazianidae of Figure 12 differ from the basic gammaridean in the simple gnathopod 1 and the callynophore of antenna 1.

The distinctions from basic gammaroids become even more difficult on Figure 13. The Pontoporeiidae are fossorial gammaroids for all practical purposes. Because there are already anomalous fossorial gammaroids in the waters of the PontoCaspian Basin one must work with the materials in Barnard & Barnard (1983) to make the absolute distinctions; in the ocean however, marine pontoporeiids are characterised by the fossorial condition of pereopods and antennae and form a basis for comparison among the 11 other families on Figures 13 to 15. These definitely do not belong to a unified group but are placed near each other for reasons of identification.

On Figure 13 the Cardenioidae may actually be close to Synopiidae but differ from synopiids in the normal head and fossorial appendages; the Cardenioidae differ from all of the other 11 families on Figures 13 to 15 in the magniramous, almost aequiramous, uropod 3. The Cheidae are characterised by strong rostrum, uniform pereopods 5 to 7, shortened uropod 3, strongly toothed incisors and the typical haustorioid kind of pereopod 5 which has facial spines. The Carangoliopsidae appear to be a gammaroid facies, marked by basoventral spine on uropod, 1 which has invaded the deep sea and developed some fossorial adaptations; note the rather typical gammaroid uropod 1, gnathopod 2 and antennae.

On Figure 14 one strong primitive root of the haustorioid kind of fossorial amphipod is seen in the Phoxocephalopsidae; it lives in Magellanic seas and has many primitive characters such as styliform non-setose rami on uropods 1 to 2, and only a moderately developed rostrum, but it has the typical vari-parvi-dispari-ramous uropod 3 and like its relatives shares the fossorial pereopods shown in the panel above its box. The shortened peduncles of the pleopods and the haustorioid kind of antenna 1 are also characteristic. The Haustoriidae are a northern offshoot of the southern haustorioids in which the maxilliped has lost article 3 on the palp but uropods 1 to 2 remain relatively normal; haustoriids also have evanescent outer lobes on the lower lip, enlarged outer lobes on maxilla 2 and occasional baler lobes on the maxillae.

On the lower part of Figure 14 the pair of families Zobrachoidae and Urohaustoriidae are very closely related to each other and seem to be offshoots of the Phoxocephalopsidae. Both have linguiform setose rami on uropods 1 to 2 but the Urohaustoriidae have progressed further in the loss of integrity on epimeron 1 and the simple first gnathopod.

On Figure 15 is another root of haustorioids, the Urothoidae; again the pleopodal peduncles are short and the pereopods may be like those depicted on Figure 14 but pereopod 5 may also become phoxocephalid in form as in the lower right corner of the upper left box. Urothoids generally have a sharp or extended or specially marked cheek on the side of the head and antenna 1 remains somewhat more primitive than in the haustorioids because it retains some long articles and a capability to bend ('geniculation'). To the right, the Condukiidae depart radically in the development of large lobes on article 5 of pereopods 3 to 4 and in the well-developed rostrum, almost approaching the Platyischnopidae to the lower left.

On Figure 15, the Platyischnopidae, however, retain elongate peduncles on the pleopods, unlike Condukiidae and other haustorioids. The head has become very elongate and in all but the most primitive genus *Skaptopus*, has developed a circlet of armament near the apex. The very common Phoxocephalidae also retain elongate peduncles of pleopods but have developed a huge, flattened, visor-like rostrum. All phoxocephalids have a short pereopod 5 with broad shield-like article 2 similar to a few urothoids and pontoporeiids. However, a number of strange, probably inquilinous phoxocephalids in southern Australia have lost most of this characteristic rostrum and would be difficult to identify if any pontoporeiids were in the fauna and if the urothoids did not have their characteristic antenna 1.

On Figure 16 we have reached the outer limits of the gammaroid-like amphipods and the identification process becomes next to impossible. This plate contains the crangonyctoids, a group of freshwater amphipods which in primitive condition are characterised by the kind of calceolus seen in the panel above and by the presence of sternal gills as marked by arrows in the upper left box. Unfortunately many of the species lose these two markers and indeed this loss passes onward to several similar families on Figure 17 which are not empirically distinctive. The various groups of crangonyctoids have several apomorphic characters, for example, the Neoniphargidae have fimbriate sternal gills, the Crangonyctidae have thickened bifid spines on the gnathopods, the Pseudocrangonyctidae are confined to east Asia and have lost the inner ramus of uropod 3 (but American Crangonyctidae also lose this ramus), the Sternophysingidae within South Africa are distinguished from their sympatric paramelitid partners by the loss of cleft on the telson and the allocrangonyctids are characterised by a bifid gill 2. The Phreatogammaridae remain a puzzle because they are confined to New Zealand and retain a primitive uropod 3 unlike the top panel of Figure 16 but do often possess sternal gills though lacking calceoli. They may be relicts of the ancestral forms to the crangonyctoid group.

On Figure 17, the crangonyctoid 'facies' is continued although these families have lost distictive crangonyctoid characters; they live in freshwater, do not look like gammarids but have lost sternal gills, calceoli and dorsally spinose urosomes. Bogidielloids are generally just crangonyctoids without the proper characters though they retain the primitive phreatogammarid uropod 3; so also do Artesiidae which are characterised by unusual coxae. The Paracrangonyctidae are advanced New

Zealand crangonyctoids with modifications in pleopods, coxae and pereopods 5 to 7.

Paraleptamphopids, however, are quite divergent in their tympanic calceoli, shortened outer ramus of uropod 3 and are very much like Eusiridae (see Fig.20). The Salentinellidae are a strange group of freshwater Palaearctic species with their characters delineated on Figure 17.

On Figure 18 the basic amphipod, more or less represented by gammaridans, is depicted; the 'gammaroids' as here shown are immensely diverse and attempts have been made to divide them into families but for our purposes, because only a few are marine, they are amalgamated into a single group. As in many amphipod groups, the convergences and parallelisms are so rampant that great difficulty may be encountered in attempting to identify even some of the marine members of the group as shown in the dotted box in the middle right, where uropod 3, mandible and telson of *Beaudettia* show a 'false' configuration similar to a member of Hyalidae.

On the lower part of Figure 18 the Anisogammaridae and Mesogammaridae are rather easy to identify because of the peg-like spines on the palms of the gnathopods; otherwise Gammaroporeiidae carry the fossorial pereopod 7 not typical of Anisogammaridae.

The upside-down amphipods are found in the upper part of Figure 19. This function is not helpful to the dead-specimen taxonomist and these individuals are among the most difficult of marine amphipods to identify. For one thing, they usually lose their characteristic uropod 3 and quite often other appendages when preserved. Uropod 3 of Melphidippidae is immensely elongate and uropod 3 of Megaluropidae has flabellate rami. Megaluropids usually have a short coxa 3 but so do argissids below left. Both Melphidippidae and Megaluropidae have characteristic dorsal toothing or serrations on the posterior body segments which is often a clue to their position. This can be confused with the commonly encountered *Dulichiella* of the Gammaridae, which, however, has well-retainable pereopods and one huge gnathopod. Argissids have short, retainable pereopods; the strange four-eyed look of argissids is often a help but unfortunately deepsea members lose their eyes.

The Gammarellidae of the lower right on Figure 19 used to be characterised solely by the configuration of their uncleft telson superimposed on a gammarid-like body bearing gammarid-like antennae and gnathopods but now they can be recognised also by their characteristic calceoli, as illustrated.

Figure 20 contains the difficult Eusiridae which essentially are gammaridans with very reduced accessory flagellum; nearly 98% of them either have a vestigial accessory flagellum or none, but a small number have a weak 2-articulate member. This group is diverse and probably will be divisible in the future.The Bateidae are simply basic eusirids or pleustids in which gnathopod 1 has been severely reduced as shown in the upper right box.

On the lower part of Figure 20 are two aberrant groups – the Macrohectopidae of Lake Baikal and the Caspicolidae of the Caspian Sea. Their morphologies are self explanatory.

Finally, Figure 21 depicts four families which have some aspects of the eusirids in which one main feature is the reduction of the accessory flagellum. The Iphimediidae are characterised by acuminate coxae and large rostra; characters of the mandible can be normal or apomorphic as shown and the mouthpart bundle can be normal or with the derived conical grouping as shown. One small group, the Ochlesinae, has lost two or more articles of the maxillipedal palp as depicted in the dashed box.

The Pleustidae are very difficult in that they are recognisable only grossly by their strange lower lip in combination with the normalcy of most other characters. The Laphystiidae below have simple gnathopods, shortened coxae and reduced mandibular integrity. The Lafystiopsidae to the right also have reduced maxillipedal palps like Ochlesinae, and retain other iphimediid characters such as large rostrum and at least one acuminate coxa.

Examples of methodology in using the illustrated key are given below.

Example 1. Perhaps the observer determines from the completed checklist (Appendix 2), that the characters of the box Liljeborgiidae (Fig.12) fit the specimen being identified. All characters match those of the basic gammaridean except for the mandibular molar, which is nontriturative; the accessory flagellum is multiarticulate, the mandible has a 3-articulate palp, the maxillae are normal, maxillipeds have well-developed lobes and 4-articulate palps, gnathopod 1 is of normal or enlarged size and is subchelate, gnathopod 2, like gnathopod 1, is enlarged and subchelate, all pleonites are free, pereopods are generalised, uropod 3 is large and biramous, and the telson cleft. The boxes of nearby related families with which Liljeborgiidae might be confused should be examined for special combinations of characters not shared with the specimen at hand. For example, the Gammaridae and Eusiridae are congruent families, but the box of Eusiridae (Fig.20) indicates (1) by the absence of a drawing of the mandible that it is either like the basic gammaridean and therefore has a triturative molar, or is of variable character; and (2) that the accessory flagellum is 0 to 2-articulate. If the specimen being identified has an accessory flagellum of 3+ articles then it is not a eusirid; if it has a 2-articulate accessory flagellum and triturative molar then it is not a liljeborgiid; if it has a 2-articulate accessory flagellum and a nontriturative molar it may be either a eusirid or liljeborgiid and the reader would turn to the description of those families and compare them with the specimen. One would read the sections on 'Relationships' to discover that a few genera of Eusiridae also have a nontriturative molar and thus resemble Liljeborgiidae; but those genera lack an accessory flagellum entirely; furthermore their gnathopods are unlike those of Liljeborgiidae.

Example 2. Eusiridae (Fig.20) differ from the basic gammaridean only by the reduction of the accessory

flagellum to 0 to 2 articles. The assumed normalcy of the lower lip implies a distinction from the Pleustidae and the Stilipedidae; uropods 1 and 2 in broken lines show a distinction from the Liljeborgiidae.

Thus, the vestigial eusirid accessory flagellum is shared with many other families but the special combination of basic gammaridean morphology plus uropods and lower lip is distinctive.

Not mentioned are other deviations, such as the occasional reduction of mandibular molars and 1-articulate first maxillary palps. Several other families share these characters and may be partially defined by them, but those families may be distinguished from the Eusiridae by more important characteristics.

Example 3. If one has in hand a specimen with the characters of the lower left box of Figure 3, then one proceeds to the diagnosis of Amphilochidae. That diagnosis must first include the antecedent diagnosis for Amphilochoidea: "Accessory flagellum vestigial or absent. Rostrum well developed. Peduncle of uropod 3 moderately to strongly elongate. Telson usually entire but if telson cleft then propodus of gnathopods not more than 1.4 times as long as broad, these gnathopods with broad, subtransverse palms. Peduncle of uropod 3 slightly to strongly elongate". Then the family is defined as "Coxa 4 immensely broadened, coxae 2-4 with contiguous margins overlapping, not rabbeted, coxa 2 not hidden; coxa 1 very small and hidden by coxa 2. Peduncle of uropod 3 elongate. Telson entire, elongate". Next is stated "See [the family] Eusiridae (= Pontogeneiidae, Calliopiidae); Pleustidae; Leucothoidae; Anamixidae; Stenothoidae (= Thaumatelsonidae); Cressidae; Stegocephalidae".

The description of the Amphilochidae implies that the rami of uropod 3 are 'normal' in size and placement. In sequence, the description of the mentioned Stenothoidae should be examined to see that uropod 3 is uniramous and therefore distinct from uropod 3 of the Amphilochidae; *et seq.*

The Diagrammatic Key to Families is, at best, a method of narrowing the search for a familial identification to a few possibilities, each textual diagnosis and description of which must be examined for goodness of fit. A flexibility has been maintained in the diagrammatic key because of space limitations in presenting a compact visual impression of a group as well as the possibility that the observer will handle undescribed genera and families. The need to cross-check diagnoses and test keys to genera in several families is a part of the identification process. Perhaps the key to success in using the diagrammatic keys is the need to memorise the plan of the basic gammaridean and to keep an account of generalised characters, especially the generalisation of heads, feeble and strong gnathopods, anterior coxae, and elongation of telsons and pereopods. Thus, Synopiidae are extremely difficult to recognise because the subtle shapes of their heads are primary to their identification. Iphimediidae, Paramphithoidae, and Stegocephalidae are recognised mainly by their anterior coxae.

Written keys. If the Diagrammatic Key to Families does not produce results one may utilise the written key to families. The written key is not as satisfactory as the Diagrammatic Key because the observer must repeatedly make 'yes or no' decisions on individual characters and little accommodation for undescribed genera and families can be made. Simplicity of the keys requires occasional repetition of taxa in order to account for morphological diversity.

Extraordinarily long keys are occasionally divided into sections in order to improve their usefulness. The establishment of subgroups in this manner is believed to be of assistance in retaining conceptual images while the observer is proceeding through the maze of an extremely complicated key.

The textual diagnoses, descriptions and relationships of the families are presented in alphabetical sequence. A few groups, for example, the Hyalidae, Hyalellidae, and Talitridae (and several others) are initially combined into superfamily groups so as to provide family keys to small groups subsidiary to the master family keys. The master family key may therefore have a couplet terminating in 'Talitroidea' for which there is a master key in alphabetical placement and out of which the observer may then proceed to the particular family. Each family has a written key to its genera and each family is accompanied by several sets of figures illustrating: (1) the characters of the generic keys, and (2) the variation in lateral aspects and appendages of the several genera. It is largely up to the reader to find the nearby illustrations of characters.

Diagnoses. Familial diagnoses are compatible in style and brevity to the Diagrammatic Key to Families and are not mutually exclusive, for the diagnoses only differentiate the families from the basic gammaridean. Interrelated families are listed as a part of the diagnoses and are discussed under 'Relationships'. These discussions are not necessarily repeated in all possible places and the reader may have to turn from the Synopiidae to the Liljeborgiidae, for example, in order to find a discussion of the interrelationships between the two families.

Genera are diagnosed in as brief and consistent form as possible, in direct relationship to the keys. The format of the diagnoses varies with the family. Where two genera are mutually distinguished by a character of no taxonomic importance to other genera of a family, the alternatives of the character are italicised and the related genus is stated. Such character alternatives are omitted from the diagnoses of other genera. Character alternatives that are known as 'combining characters', because of their usage in keys, are occasionally listed in diagnoses and italicised; they reflect the necessity to state a general character that is diagnostic only because it occurs in unique combination with all other characters stated for the genus under question; the character is not necessarily restricted to the taxon in question.

Each diagnosis has as its framework the conditions known for the type species or type genus and any anomalous species are elaborated in 'Variables'. In

some families with few genera, the diagnoses are confined to the keys. No doubt, the range of variation permitted in the diagnoses is too narrow. Time has not been allotted to analyse the literature of each species nor to examine specimens in each genus in order to widen the generic limitations. The literature is occasionally so defective that one would waste time to ponder, analyse, and argue possible truths or to speculate on omissions. Many described species are undoubtedly misclassified. However, we have checked all species in the literature so as to place them in their proper genera.

Brief synonymies of families with synonyms are given but otherwise such information may be found in Stebbing (1906) or J.L. Barnard (1969c).

Type species of each genus and their modes of selection are listed within the generic synonymies. One or more valuable references, if available, are given for each species along with generalised distributional codes and a summary for each genus. 'Littoral' includes sublittoral, to 200 m; 'bathyal' includes depths from 200 to 2000 m (here); 'abyssal' exceeds 2000 m. Some species in depths exceeding 200 m are pelagic but have not been so designated because of uncertain data on collection methods. Reference to terms such as 'arctic, antarctic, boreal', is very imprecise because no exact definitions are followed. If a genus is centred generally in the antarctic as well as the subantarctic the terminology is simplified to 'antarctic'. The 'arctic' includes the Norwegian Basin and its fringes as well as the polar basin. 'Biboreal' denotes occurrence in northern and southern hemispheres; 'amphiboreal' denotes occurrence in both oceans of the northern hemisphere.

Occasionally depths in meters are given where they have some interest or precision. Distributional information in parentheses indicates rarity in those situations.

Diagnosis of the Basic Marine Gammaridean
(Many Marine Gammaridae)

Head subcuboidal, not 'massive', rostrum small. Antenna 1 without a callynophore. Accessory flagellum well developed, with 4 or more articles.

Mouthpart field quadratiform from lateral view. Each mandible with 3-articulate palp, article 3 longer than article 1; molar present, with grinding surface composed of ridges and teeth (= triturative). Lower lip with principal lobes undivided (un-notched) and not widely separate. Each maxilla 1 bearing inner lobe, outer spinose lobe, and strong unflexed palp of 2 articles. Each maxilla 2 with 2 well-developed, similar, setose lobes. Each side of maxillipeds with large inner (proximal) lobe and outer (distal) lobe, and 4-articulate palp, article 4 claw-shaped (unguiform).

Gnathopods well developed and subchelate ('powerful'), non-lysianassid. Gnathopod 2 larger than gnathopod 1 in male, gnathopod 1 never larger than 2 in female, article 3 of gnathopod 2 short. Article 4 of pereopods 3-4 not extensively elongate. Pereopods 5-7 of congruent structure and successively slightly longer, not fossorial.

Three pairs of large and subequal uropods present, all biramous, rami subequal in length, lanceolate. Peduncle of uropod 3 not elongate. Telson deeply cleft, of medium length.

Coxae forming elongate, rectangular plates with quadrate or rounded distal edges, coxae 1-4 of uniform shape or slightly increasing in size consecutively, coxa 4 excavate posteriorly.

All body segments free. Metasome only as long as last 5 pereonites combined.

AMPHIPODA Latreille, 1816

Diagnosis. Peracarid Malacostraca lacking carapace, thus having all but 1 or 2 of the thoracic segments freely visible; 1 thoracic segment carrying maxillipeds fused to head, occasionally next thoracic segment carrying gnathopods also fused to head (Caprellidea), followed by 7 (occasionally 6 or rarely 3 as in some Hyperiidea such as *Lestrigonus*) visibly articulated thoracic segments, each bearing paired appendages, followed by 6 abdominal segments or their macroscopic remnants (except Caprellidea), first 3 (pleon) usually bearing paired biramous pleopods, remaining 3 (urosome) bearing paired biramous uropods; telson freely articulate, though often immovable, in primitive and majority of members; head with 2 pairs of antennae, first occasionally biramous; maxillipeds lacking exopodites; heart mainly thoracic; respiration thoracic with gills attached to coxae (or their remnants) of segments 2-7 (variable); eyes sessile or rarely borne on unstalked cephalic scale; eggs carried in female brood pouch on ventral thorax formed of 2-4 (or rarely 5) pairs of lamellae attached to coxae 2-6.

Remarks. There are no radically degenerate and fully endoparasitic Gammaridae, although a number are inquilines, ectoparasites, and commensals which have sucking mouthparts and prehensile mechanisms on their appendages.

Gammaridea, especially the Gammaridae, lie closest to the logical, primitive stem of the Amphipoda and almost all evolutionary lines from Gammaridae-like ancestors are based on simplification of primitive parts. The Caprellidea have but a vestige of the abdomen (except *Cercops* and *Caprogammarus*) and the Hyperiidea have lost the maxillipedal palps. Reduction of coxae is common in both of those suborders. Ingolfiellidea have lost all pleopods but some have developed a scale on the lateral cephalic lobes.

One family of Gammaridea, the Ochlesidae, have lost the maxillipedal palps but their resemblance to Gammaridea in coxae and body shape and their presumed benthic habits have caused their assignment to the Gammaridea.

Key to Suborders of Amphipoda

1. Gills not exceeding 3 pairs, oostegites not exceeding 2 pairs, (body otherwise skeletal, segments tubular or flattened and pleurate; abdomen vestigial and pereonite 1 fused to head except in Caprogammaridae) ..... CAPRELLIDEA (skeleton shrimps, whalelice, 300 species)

—— Gills exceeding 3 pairs, oostegites usually exceeding 2 pairs, (body compressed or flattened, rarely skeletal, segments very rarely tubular or pleurate; abdomen well developed, head free from pereonite 1) 2

2. Palps of maxillipeds absent 3

—— Palps of maxillipeds present 4

3. Urosome with only 2 segments (provenance entirely pelagic) ..... HYPERIIDEA (250 species)

—— Urosome with 3 segments (provenience benthic) ..... GAMMARIDEA (exceptional genus *Ochlesis*)

4. Movable compound claw of gnathopods formed of articles 6-7 together, pleopods vestigial or absent, when present leaf-like (head occasionally with articulate ocular scale) ..... INGOLFIELLIDEA (interstitial, 30+ species)

—— Claw of gnathopods formed of article 7 only, pleopods well developed, rarely vestigial and only in terrestrial species or 2 aquatic hypogean-anchialine genera of Bogidiellidae ..... GAMMARIDEA (marine and freshwater scuds, land and beachhoppers, 5800 species)

Key to Marine Families of Suborder Gammaridea

(Generic names in parentheses ( ) indicate an exceptional genus within the family designated)

A. Telson fleshy, thick, never cleft (Fig.2 'fleshy') ..... Section A

B. Telson flat and 'flappable' or undecided, cleft or entire ..... Section B

C. Telson absent ..... Lysianassidae

Section A

1. Urosomite 1 elongate, at least 1.5 times as long as top of pleonite 3 (Fig.2 Podoceridae ur) 2

—— Urosomite 1 not elongate 4

2. Uropod 2 with hugely expanded peduncle ..... Cheluridae

—— Uropod 2 ordinary 3

3. Uropod 3 with 0-1 ramus ..... Podoceridae

—— Uropod 3 with 2 rami ..... Iciliidae

4. Anterior coxae and posterior pereopods splayed outward radically; body form like flattened isopod, extremely broad in relation to thickness 5

—— Anterior coxae and posterior pereopods not splayed, body form not like flattened isopod 7

5. Pereonites with pleurae ..... Temnophliantidae

—— Pereonites lacking pleurae 6

6. Antenna 2 less than one fourth of body length, flagellum shorter than peduncle, uropod 3 feeble, evanescent, mouthparts reduced, mandibular palp absent, palp of maxilla 1 reduced ..... Phliantidae

—— Antenna 2 two thirds of body length, flagellum elongate, as long as peduncle, uropod 3 at least with 1 long ramus, mouthparts ordinary ..... (*Sancho, Chosroes*) Eusiridae

7. Coxae 2-4 immense, coxa 1 tiny, hidden by coxa 2 (Fig.4 Stenothoidae c), outer plate of maxilliped tiny, poorly spinose medially ..... Stenothoidae

—— Coxa 1 either large and visible or if tiny then outer plate of maxilliped well developed and well spinose medially 8

8. Coxa 4 excavate posterodorsally 9

—— Coxa 4 not excavate posterodorsally 10

9. Mandibular palp absent, inner ramus of uropod 3 vestigial or absent ..... Talitroidea

—— Mandibular palp present, inner ramus of uropod 3 conspicuous ..... Ischyroceridae

10. Pereopod 6 elongate and flagellate (Fig.5) ..... Maxillipiidae

—— Pereopod 6 not elongate nor flagellate 11

11. Palp of maxilliped with 2 articles ..... Lafystiidae

—— Palp of maxilliped with 4 articles 12

12. Gnathopods 1-2 simple 13

—— Either gnathopod 1 or 2 subchelate or carpo- or propodochelate 14

13. Rami of uropod 3 unequal, longer than inner rami, supported by peduncular process, antenna 2 shorter than 1, less than one third body length, carpus and propodus of gnathopods 1-2 slender but together less than 1.5 length of article 2 ..... Laphystiopsidae

—— Rami of uropod 3 extending equally, lacking peduncular process supporting rami, antenna 2 longer than 1, more than two thirds body length, carpus and propodus of gnathopod 1 immensely elongate, together 2.5 times length of article 2 ..... Iciliidae

14. Uropod 2 with large inner dorsal expansion ..... Cheluridae

—— Uropod 2 lacking large peduncular expansion 15

15. Either outer lobes of lower lip apically notched or inner ramus of uropod 3 broad, pad-like and apically setose ..... Ampithoidae

—— Outer lobes of lower lip not notched (one exception), inner ramus of uropod 3 not broad, pad-like, nor apically broad nor widely setose, or instead uropod 3 uniramous 16

16. Outer (or only) ramus of uropod 3 either hooked or bearing non-articulate wires or hooks or denticles at lateral apex ..... (see Corophiidae key) Ischyroceridae

—— Outer (or only) ramus of uropod 3 lacking hooks, wires or denticles (including Aoridae, Isaeidae, Photidae, Pseudomegamphopidae, Siphonoecetinae, blending to Ischyroceridae) ..... Corophiidae

Section B

1. Article 3 of gnathopod 2 elongate ..... Section C

—— Article 3 of gnathopod 2 not elongate 2

2. Urosomites 1-2 coalesced, urosomite 3 free ..... some Phliantidae; *Kamaka*; *Chevalia*

—— Urosomites 2-3 or 1-3 coalesced ..... Section D

—— Urosomites separate 3

3. Coxa 1 small or absent, much smaller than coxa 2 (less than half surface area of coxa 2) and/or mostly hidden by [a then uropod 3 not exceeding apices of uropods 1-2 or peduncle not as long as rami of uropods 1-2; if uropod 3 greatly exceeding apices of uropods1-2 then inner ramus short and scale-like or peduncle not elongate and not more than 1.2 times as long as peduncle of uropod 2, or rami much shorter than peduncle, thus uropod 3 not like that of first part of this couplet] 1

Coxa 2.

Section E

—— Coxa 1 usually subequal to coxa 2 or never hidden by following coxae (occasionally coxa 1 partly hidden but all following coxae wider than long (gnathopod 1 always fully developed) or coxa 1 totally hidden by following coxa 4

4. Uropod 3 uniramous, or lacking rami, or absent ..... Section F

—— Uropod 3 biramous, one ramus often reduced 5

5. Mandibular palp absent (see alternative if Section G unsatisfactory because of loss of palp through dissecting procedures) ..... Section G

—— Mandibular palp present (with rare exceptions) 6

6. Mandibular molar absent or if present not triturative, lacking numerous ridges and teeth (occasionally large or immense and dominating mandible) ..... Section H

—— Mandibular molar well developed, triturative (Fig.1M), bearing ridges and teeth, never extremely large or dominating mandible 7

7. Peduncle of uropod 3 elongate, as long as or longer than rami of uropods 1-2 and more than twice as long as telson, also longer than peduncle of uropod 2, uropod 3 usually greatly exceeding apices of either uropods 1 or 2 and rami usually elongate, subequal and nearly as long as rami of uropods 1-2 (Fig.19 upper left) (except *Kanaloa*), (uropod 3 usually missing on specimens of this category but melphidippids are also recognised by presence of dorsal teeth and serrations on pleon, in combination with short, subequal and evenly quadrate anterior coxae, plus strong hemispherical lateral ocular bulges on head) 8

—— Peduncle of uropod 3 not elongate or if peduncle elongate as above then uropod 3 not strongly exceeding apices of uropods 1-2; if peduncle of uropod 3 twice as long as telson then uropod 3 not exceeding apices of uropods 1-2 or peduncle not as long as rami or uropods 1-2; if uropod 3 greatly exceeding apices of uropods 1-2 then inner ramus short and scale-like or peduncle not elongate and not more than 1.2 times as long as peduncle of uropod 2, or rami much shorter then peduncle, thus uropod 3 not like that of first part of this couplet 11

8. Coxae 2-3 longer than broad, pleon dorsally smooth, pereopod 7 at least 1.5 times as long as 5 or 6, dactyl very elongate, head without lateral ocular bulges (but often strongly rostrate) 9

—— Coxae 2-3 very short and broader than long, pleon dorsally toothed and serrate, pereopods 5-7 very long but subequal in length to each other, dactyl short, head with strong hemispherical ocular bulges on sides ..... (also check Eusiridae) Melphidippidae

—— Coxae 2-3 about as long as broad, pleonite 4 with 1 dorsal tooth, pereopods 5-7 long but subequal in length, dactyls short, head without lateral ocular bulges ..... (Gammaridae) *Casco*

—— Coxae 2-3 slightly longer than broad, pleon dorsally smooth, pereopods 5-7 similar, slightly and consecutively more elongate but pereopod 7 less than 25% longer than 6, dactyl short, head without ocular bulges but often rostrate ..... (*Rotomelita*) Gammaridae, (*Metaleptamphopus*) Eusiridae

9. Uropod 3 peduncle not elongate ..... Megaluropidae

—— Uropod 3 peduncle elongate 10

10. Rami of uropods 1-2 lacking subapical spines (eyes if present coalesced or contiguous) ..... Oedicerotidae

—— Rami of uropods 1-2 with apical or subapical spines (eyes if present bilateral) ..... Exoedicerotidae

—— Rami of uropods 1-2 with apical spines, eyes coalesced or contiguous ..... (*Kanaloa*) Oedicerotidae

11. Coxae 1-3 or 2-3 progressively and strongly shortened, (and see similar megaluropids in Melphidippidae and *Casco* in Gammaridae with anteriorly acuminate coxa 1 ..... Megaluropidae, Argissidae

—— Coxae 2 or 3 almost as long as or larger than coxa 1 12

12. Telson entire or emarginate, very short, coxa 4 not or poorly excavate posteriorly (pereopods often glandular) ..... Section I

—— Telson entire or cleft, short or long, (coxa 4 usually excavate posterodorsally or acuminate when telson entire, but see *Parapherusa* in Gammaridae and Section F) (pereopods not glandular) 13

13. Head massive ('galeate' see glossary) (Figs 99,113c) or with strongly downturned rostrum, or 'shark-nose' rostral projection (gnathopods weak) 14

—— Head not massive or rostrum if present on massive head not downturned (Hyperiopsidae have massive head, no rostrum; Pleustidae and some Phoxocephalidae have downturned rostrum on small head; Platyischnopidae have shark-like anterior extension on thin head) 16

14. Pereopod 7 conspicuously longer than pereopods 5-6, at least 1.5 times as long as pereopod 6, accessory flagellum absent or 1-articulate and short if present, peduncle of uropod 3 always elongate and telson always half or less as long as that peduncle and usually entire or emarginate (see couplet 7 above) ..... Megaluropidae, Exoedicerotidae, Oedicerotidae, return to 9

—— Pereopod 7 subequal to pereopod 6 in length though both often elongate, accessory flagellum present and multiarticulate; when 1-articulate, accessory flagellum elongate; peduncle of uropod 3 rarely elongate but telson always (except *Synopia* with large accessory flagellum) longer than and generally twice as long as peduncle of uropod 3, cleft or entire 15

—— Pereopod 7 longer than 6, accessory flagellum present, multiarticulate, peduncle of uropod 3 not elongate, telson not longer than peduncle of uropod 3 (head with subapical glandular spine-pits Eudevenopus) ..... Platyischnopidae

15. Uropod 3 variramous ..... Platyischnopidae

—— Uropod 3 magniramous ..... Synopiidae

16. Pereopods 5-7 strongly spinose or setose and/or with elongate setae ('fossorial', see glossary) 17

—— Pereopods 5-7 poorly spinose or setose, not fossorial 32

17. Pereopod 7 conspicuously elongate, at least 1.5 times longer than pereopod 6 18

—— Pereopod 7 not conspicuously elongate, subequal to, shorter or slightly longer than pereopod 6 19

18. Uropod 3 grossly variramous, peduncle short ..... Platyischnopidae

—— Uropod 3 aequiramous, peduncle elongate, or uropod 3 vestigial ..... Exoedicerotidae, Oedicerotidae, Megaluropidae, return to 9

19. Telson elongate, nearly twice as long as peduncle of uropod 3 or urosomite 3 20

—— Telson not elongate or scarcely exceeding length of peduncle on uropod 3 or urosomite 3 22

20. Coxa 1 reduced, less than half area of coxa 2 ..... Cardenioidae

—— Coxa 1 ordinary, subequal to coxa 2 21

21. Head galeate, uropod 3 aequiramous ..... Synopiidae

—— Head ordinary, uropod 3 parviramous ..... (*Amphiporeia*) Pontoporeiidae

22. Base of primary flagellum on antenna 1 with callynophore (Fig.12a1), thus article 1 of flagellum longer than peduncle ..... Vitjazianidae

—— Base of primary flagellum on antenna 1 multiarticulate or with weak callynophore (Fig. 55), article 1 of flagellum less than half as long as peduncle 23

23. Pereopod 7 shorter and/or of different structure than pereopod 6 24

—— Pereopod 7 closely similar to pereopod 6 in length and morphology 28

24. Pereopod 7 as long as 6 but of grossly distinct morphology 25

—— Pereopod 7 shorter than 6 and of grossly distinct morphology 26

25. Rostrum evanescent, anterior lobe of coxae 5-6 as large as posterior lobe ..... (especially *Priscillina*) Pontoporeiidae

—— Rostrum huge, cylindrical, anterior lobe of coxae 5-6 evanescent ..... (especially *Tomituka*) Platyischnopidae

26. Mandible huge and thick, dwarfing palp, incisor thick and lacking teeth, molar huge and almost smooth ..... (especially *Urothoides*) Urothoidae

—— Mandible ordinary, incisor thin, with at least weak teeth, molar large to small, triturative to smooth 27

27. Antenna 2 without lateral facial fossorial armaments, rostrum almost absent but vertically thickened, carpus of gnathopod 2 both elongate and wider than propodus ..... (especially *Pontoporeia*) Pontoporeiidae

—— Antenna 2 with lateral facial fossorial armaments, rostrum either long and flat dorsoventrally or often reduced but remaining flat, carpus of gnathopod 2 not both elongate and wider than propodus ..... Phoxocephalidae

28. Body covered with large articulate spines ..... Ipimediidae

—— Body not covered with spines 29

29. Pereopods 5-7 not of fossorial form (except in Ponto-Caspian basin) ..... Gammaridae

—— Pereopods 5-7 of fossorial form 30

30. Outer ramus of uropod 3 shortened ..... (Eusiridae) *Sancho*

—— Outer ramus of uropod 3 never less than 95% as long as inner 31

31. Head with normal gammarid vertically thickened vestigial rostrum ..... (Haustorioidea) Pontoporeiidae, Cardenioidae

—— Head with vestigial to well-developed dorsoventrally flattened rostrum ..... other Haustorioidea

—— Head with cylindrical rostrum ..... (Haustorioidea) Condukiidae, Platyischnopidae

32. Some anterior coxae acuminate midventrally, accessory flagellum less than 3-articulate 33

—— Anterior coxae not acuminate midventrally, or if acuminate then accessory flagellum more than 2-articulate 34

33. Pereopod 7 1.5 times as long as pereopod 6 ..... Megaluropidae

—— Pereopod 7 not significantly longer than 6 ..... (= Paramphithoidae, Acanthonotozomatidae) Iphimediidae

34. Article 4 of pereopods 3-4 extremely elongate relative to other articles (Fig.10p4), palp of one member of maxilla 1 distinctly geniculate and scaled ..... Hyperiopsidae

—— Article 4 of pereopods 3-4 not elongate, palp of maxilla 1 neither strongly geniculate nor scaled 35

35. Telson entire (often with minute notch or shallow emargination) 36

—— Telson cleft 40

36. Accessory flagellum 2+articulate 37

—— Accessory flagellum 1-articulate or absent 38

37. Rami of uropod 3 cylindroconical, much shorter than elongate peduncle ..... (*Bathyphotis*) Ischyroceridae

—— Rami of uropod 3 lanceolate or flabellate, much longer than peduncle ..... Gammaridae

38. Labium with unpointed, tilted oval lobes astride partially coalesced inner lobes (Fig.21I, upper right) ..... Pleustidae

—— Labium with tilted or untilted outer lobes but with distinct mandibular extensions (Fig.1L), inner lobes when present not coalesced (also examine key to Eusiridae if telsonic condition dubious) 39

39 Telson longer than wide ..... (Calliopiidae = Gammarellidae) Eusiridae

—— Telson as wide as or wider than long ..... Gammaridae

40. Article 1 of primary flagellum on antenna 1 as long as peduncle 41

—— Article 1 of primary flagellum on antenna 1 not longer than half of peduncle 42

41. Head galeate, rostrum well developed ..... Synopiidae

—— Head not galeate, rostrum small ..... (Vemanidae) Vitjazianidae

42. Telson elongate, twice as long as peduncle of uropod 3 43

—— Telson rarely longer than peduncle of uropod 3, never twice as long as peduncle of uropod 3 46

43. Urosomite 3 twice as long as urosomite 2, head with anterodorsal margin extended as blunt plow ..... (Pseudotiron) Synopiidae

—— Urosomite 3 less than 1.5 times as long as urosomite 2, head of normal gammaridean dimensions 44

44. Accessory flagellum 3+articulate ..... (exceptional) Synopiidae

—— Accessory flagellum 0 to 2-articulate (examine key to Eusiridae if telson dubious) (rarely Gammaridae, check gammarid keys in Barnard & Barnard, 1983) 45

45. Inner ramus of uropod 3 as long as outer ..... (Calliopiidae) Eusiridae

—— Inner ramus of uropod 3 reduced ..... Gammaridae

46. Inner ramus of uropod 3 short and scale-like ..... Gammaridae

—— Inner ramus of uropod 3 elongate ..... ~~31~~ ~~47~~

47. Outer ramus of uropod 3 with 2 articles ..... Gammaridae

—— Outer ramus of uropod 3 1-articulate 48

48. Rami of uropod 3 foliaceous (Fig.19r3, upper right) ..... Megaluropidae, Gammaridae

—— Rami of uropod 3 lanceolate (Fig.19r3, lower right) 49

49. Mandibular palp article 2 shorter than article 1 or absent ..... Gammaridae

—— Mandibular palp article 2 longer than article 1 or mandibular palp 0 to 1-articulate 50

50. Gnathopod 1 simple ..... Gammaridae

—— Gnathopod 1 subchelate 51

51. Accessory flagellum 2+articulate ..... Gammaridae

—— Accessory flagellum 0 to 1-articulate ..... Eusiridae

Section C

1. Head and body strongly depressed (Fig.7 upper), coxae splayed (Fig.105A) 2

—— Head subglobular, body cylindrical, coxae short, not splayed ..... Eophliantidae

—— Head compressed or subglobular (Figs 1 Head, 2 globular), body compressed laterally, coxae not grossly splayed 3

2. Pereonites with pleurae (extensions of pereonites with gaps between them basal to coxae) ..... Temnophliantidae

—— Pereonites lacking pleurae ..... Phliantidae

3. Uropod 3 uniramous, gnathopods strongly chelate, article 2 of antenna 1 much longer than or equal to article 1 ..... Sebidae

—— Uropod 3 usually biramous but when uniramous then article 2 of antenna 1 not elongate or gnathopod 1 not chelate, article 2 of antenna 1 shorter than or equal to article 14

—— Uropod 3 biramous (vari- or parviramous), gnathopods chelate, article 2 of antenna 1 equal to or slightly longer than article 1 ..... Platyischnopidae

4. Article 4 of pereopods 3-4 enormously elongate relative to other articles and often inflated (Fig.22B3) 5

—— Article 4 of pereopods 3-4 of normal length relative to other articles 6

5. Palp of maxilla 1 claviform, slightly geniculate ..... Hyperiopsidae

—— Palp of maxilla 1 not geniculate ..... proceed to couplet 6

6. Gnathopod 2 with form of lysianassid mitten (Fig.9g2, upper left) 7

—— Gnathopod 2 not typical of lysianassids 13

7. Accessory flagellum absent, pleonites 1-3 with sharp dorsal processes (articles 5-6 of gnathopod 2 lacking scales or minute coarse setules) 8

—— If accessory flagellum absent then pleonites 1-3 dorsally smooth, accessory flagellum otherwise present (articles 5-6 of gnathopod 2 bearing or lacking scales or minute coarse setules) 9

8. Mandibular palp present, uropod 3 biramous ..... Iphimediidae

—— Mandibular palp absent, uropod 3 lacking rami ..... Ceinidae

9. Rostrum well developed, cylindrical 10

—— Rostrum vestigial 11

10. Uropod 3 with inner ramus reduced, outer with 2 articles ..... Platyischnopidae

—— Uropod 3 aequiramous, outer ramus with 1 article ..... (*Bathyamaryllis*) Lysianassidae

11. Mandibular incisor not dentate in middle (Fig.127B) 12

—— Mandibular incisor dentate in middle ..... Valettiidae, Valettiopsidae

12. Mandible flat, without palp ..... Stegocephalidae

—— Mandible otherwise, either thick or with palp ..... Lysianassidae

13. Some urosomites coalesced 14

—— Urosomites separate 16

14. Uropod 3 biramous 15

—— Uropod 3 uniramous ..... Kuriidae

15. Coxae 1-4 of dexaminid form (Figs 50-51), mandibular body 3-dimensional ..... Dexaminidae

—— Coxae 1-4 of stegocephalid form (Fig.122), mandibular body flat ..... (*Andaniotes*) Stegocephalidae

16. Uropod 3 formed only of small scale-like peduncle 17

—— Uropod 3 bearing 1-2 rami (inner often reduced) 18

—— Uropod 3 with small 2-articulate ramus ..... Nihotungidae

17. Mandible and maxilla 1 with palp, inner plates of maxillae 1-2 with medial setae ..... Didymocheilidae

—— Mandible and maxilla 1 lacking palp, inner plates of maxillae 1-2 lacking medial setae ..... Ceinidae

18. Uropod 3 with 1 ramus ..... (especially *Microprotopus*) Corophiidae

—— Uropod 3 with 2 rami 19

19. Mandibles and maxillae vestigial ..... Anamixidae

—— Mandibles and maxillae well developed 20

20. Gnathopod 1 reduced to 1 article ..... Bateidae

—— Gnathopod 1 composed of 7 articles 21

21. Accessory flagellum 0 to 2-articulate, mouthparts from lateral view usually grouped in conical bundle, pereopods not strongly spinose 22

—— Accessory flagellum 1+articulate, mouthparts from lateral view usually quadrately grouped, pereopods strongly spinose-setose (fossorial) ..... Haustorioidea

22. Mandibular palp present, pleon processiferous ..... Iphimediidae

—— Mandibular palp absent, pleon smooth ..... Stegocephalidae

Section D

1. Body plan cylindrical or depressed (like tanaids or flattened isopods (Fig.7 upper) 2

—— Body plan compressed laterally (ordinary) 8

2. Mandible lacking palp, molar degraded 3

—— Mandible with 1 to 3-articulate palp, molar triturative 6

3. Body cylindrical, like tanaids, smooth, coxae not splayed 4

—— Body strongly depressed, very broad, rugose, coxae large, splayed; or pereonites with pleurae 5

4. Inner plates of maxilliped tiny, mostly fused together ..... Colomastigidae

—— Inner plates of maxilliped large, separate ..... Eophliantidae

5. Pereonites with pleurae ..... Temnophliantidae

—— Pereonites lacking pleurae ..... Phliantidae

6. Urosomites 1-3 coalesced 7

—— Urosomites 2-3 coalesced, urosomite 1 very elongate ..... Podoceridae

7. Uropods 1-2 of diverse structure (Fig.2 upper right) ..... Cheluridae

—— Uropods 1-2 similar to each other or degraded ..... Corophioidea

8. Uropod 3 uniramous or without rami 9

—— Uropod 3 biramous 13

9. Coxa 1 visible, not covered by following coxae 10

—— Coxa 1 small, hidden by large following coxae 12

10. Body and head with sharp cusps, uropod 3 lacking ramus ..... Plioplateidae

—— Body and head smooth, uropod 3 with ramus 11

11. Mandible lacking palp, molar present, inner plates of maxillipeds fully developed, telson cleft ..... Kuriidae

—— Mandible bearing palp, molar absent, inner plates of maxilliped obsolescent, telson entire ..... Pagetinidae

12. Telson and pleonite 6 coalesced even though telson recognisable and unthickened, article 2 of pereopod 5 expanded ..... Cressidae

—— Telson thickened dorsoventrally but separate from telson, urosomites often partially coalesced, article 2 of pereopod 5 linear ..... (Thaumatelsoninae) Stenothoidae

13. Mandibular palp absent 14

—— Mandibular palp present 15

14. Pereopod 7 not significantly longer than pereopod 6, dactyl short, curved, naked, telson cleft ..... Dexaminidae

—— Pereopod 7 much longer than pereopod 6, dactyl elongate, straight, setose, telson entire ..... Paracalliopiidae

15. Pereopod 7 of different structure from pereopod 6, thus article 2 of pereopod 7 shield-like or with sharp angles (Fig.12p7, upper) 16

—— Pereopod 7 similar to but often longer than pereopod 6 (or these pereopods broken and missing) 18

16. Head elongate or with cuticular lenses (Fig.12h), marginal setae on article 2 of pereopod 7 long and dense, borne on ventral lobe (Fig.12p7, left) ..... Ampeliscidae

—— Head ordinary or galeate, lacking cuticular lenses, often with ordinary eyes, setae on article 2 of pereopod 7 either short or sparse, ventral lobe not prominent 17

17. Telson cleft, peduncle of uropod 3 shorter than telson or rami of uropod 3, dactyl of pereopod 7 short ..... Dexaminidae

—— Telson entire, peduncle of uropod 3 elongate, longer than telson, almost as long as rami of uropod 3, or uropod 3 vestigial, dactyl of pereopod 7 elongate (and setose) 22

18. Telson cleft or deeply emarginate, flat ..... Dexaminidae

—— Telson entire or slightly emarginate, fleshy 19

19. Urosomite 1 elongate ..... Podoceridae

—— Urosomite 1 not elongate or all urosomites coalesced 20

20. Uropods 1-2 extremely diverse, uropod 2 with huge peduncular expansion ..... Cheluridae

—— Uropods 1-2 similar to each other and ordinary or reduced or absent 21

21. Telson fleshy, fixed solidly, pereopod 7 not greatly longer than 6, dactyl short ..... Corophioidea

—— Telson flat, flappable, pereopod 7 greatly longer than 6, dactyl long and setose 22

22. Eyes fused dorsally or absent, head galeate, gnathopods ordinary, uropods 1-2 lacking apical ramal spines ..... (especially *Perioculodes* group) Oedicerotidae

—— Eyes close together but bilateral, head not galeate, see illustrations of unusual gnathopods in both sexes (Fig.102), uropods 1-2 lacking apical spines ..... Paracalliopiidae

—— Eyes close together but bilateral, head not galeate, see illustrations of unusual gnathopods (Fig.100g of A,F,J,N), uropods 1-2 with apical ramal spines ..... Exoedicerotidae

Section E

1. Gnathopod 1 reduced to 1 or 2 articles or absent 2

—— Gnathopod 1 with 6-7 articles 3

2. Mandibles and maxillae ordinary ..... Bateidae

—— Mandibles and maxillae vestigial, mouthpart field dominated by ventral keel ..... Anamixidae

3. Article 5 of antenna 2 strongly expanded (antennae with plumose setae longer than any antennal article, pereopods 5-7 fossorial) ..... Haustorioidea

—— Article 4 of antenna 2 not expanded (setae of antennae not elongate plumes, pereopods 5-7 usually not fossorial) 4

4. Gnathopod 1 strongly carpochelate, carpus longer than propodus (or appearing as propodochelate because of loss of dactyl) 5

—— Gnathopod 1 subchelate or simple, or carpus shorter than propodus (occasionally carpus with long lobe but not distinctly chelate) 6

—— Gnathopod 1 simple or subchelate, not carpochelate, carpus longer than propodus (pereopods often weakly to strongly fossorial) 11

5. Propodus of gnathopod 1 evenly slender, rectangular, posterior margin straight axially, carpochela extending full length of propodus (or gnathopod 1 absent) ..... Anamixidae

—— Propodus of gnathopod 1 not evenly slender, posterior margin not axially straight, carpochela not reaching full length of propodus ..... Amphilochoidae, Cyproideinidae

6. Uropod 3 biramous 7

—— Uropod 3 uniramous 17

7. Head of platyischopid form (Fig.15, lower left), thus with shark-nose projection, pereopods fossorial ..... Platyischnopidae

—— Head not of platyischnopid form, pereopods not fossorial 8

8. Pereopod 6 extremely elongate, flagellate apically, coxae 2-7 short, of equal length ..... Maxillipiidae

—— Pereopod 6 ordinary, coxae 2-7 of divergent groups 9

9. Coxa 4 not excavate posterodorsally, pereopods 3-4 glandular 10

—— Coxa 4 excavate posterodorsally, pereopods 3-4 not glandular 16

10. Rami of uropod 3 shorter than peduncle, outer ramus with distal hook or denticles or few subapical wire-like setae, no other setae ..... (Ischyroceridae) Corophioidea

—— Rami of uropod 3 as long as or longer than peduncle, outer ramus setose or spinose but lacking special hooks or denticles ..... (isaeid-photid groups) Corophioidea

11. Uropod 3 uniramous 12

—— Uropod 3 biramous 13

12. Coxa 1 reduced, pereopod 7 ordinary ..... Stenothoidae

—— Coxa 1 ordinary, pereopod 7 greatly elongate ..... Exoedicerotidae

13. Peduncle of uropod 3 not or slightly elongate, telson elongate, cleft 14

—— Peduncle of uropod 3 elongate, telson short, entire ..... Exoedicerotidae

14. Coxae 2-3 large, unhidden, body smooth 15

—— Coxae 1-3 small and mostly hidden by coxa 4, body with large dorsal processes ..... (Parargissa) Hyperiopsidae

15. Uropod 3 aequiramous, gnathopod 2 simple ..... Exoedicerotidae, Cardenioidae

—— Uropod 3 parvi- or variramous, gnathopod 2 subchelate or chelate ..... Platyischnopidae

16. Article 4 of pereopods 3-4 exceptionally elongate, base of primary flagellum on antenna 1 with callynophore, longer than peduncle, palp of maxilla 1 geniculate and scaled ..... (*Parargissa*) Hyperiopsidae

—— Article 4 of pereopods 3-4 not elongate, base of primary flagellum on antenna 1 with callynophore poorly developed or absent, palp of maxilla 1 not geniculate nor scaled grossly ..... (Cyproideidae) Amphilochoidea

17. Gnathopods simple, slender, with dense setae as long as carpus and propodus, all coxae at least as broad as long ..... (isaeids-photids) Corophioidea

—— Gnathopods usually subchelate, one pair usually stout, if not then their setae very short, sparse, some coxae much longer than broad 18

18. Article 2 of pereopod 5 slender, linear ..... Stenothoidae

—— Article 2 of pereopod 5 expanded as on pereopods 6-7 19

19. Uropod 3 very long, 3-articulate, surface area of outer plate on maxilliped much smaller than article 1 of palp ..... Cressidae

—— Uropod 3 vestigial, 1-articulate, surface of outer plate on maxilliped much larger than article 1 of palp ..... (*Ceina wannape*) Ceinidae

Section F

Uropod 3 essentially uniramous, lacking rami or occasionally absent; when present, inner ramus scale-like and outer ramus cylindrical; Cheluridae partially included herein although outer ramus flat; observer urged to verify that one ramus of uropod 3 not accidentally fallen off.

1. Mandibular molar triturative or if not then cup shaped 2

—— Mandibular molar smooth or bearing few articulate spines, or molar absent or not cup shaped 16

2. Mandibular palp absent 3

—— Mandibular palp present 9

3. All urosomites coalesced ..... Kuriidae

—— Urosomites separate 4

4. Antennae and pereopods strongly spinose or setose, spines and setae long 5

—— Antennae and pereopods poorly spinose or setose (spines if numerous small) 6

5. Carpi of gnathopods with large lobes, rami of uropods 1-2 without spines ..... Dogielinotidae

—— Carpi of gnathopods not or poorly lobate, rami of uropods 1-2 with conspicuous apical spines ..... Exoedicerotidae

6. Uropod 3 lacking ramus ..... (Hyalellinae) Ceinidae

—— Uropod 3 with ramus 7

7. Article 4 of pereopod 5 less than half as wide as article 2, article 4 of pereopods 5-6 not heavily setose 8

—— Article 4 of pereopod 5 about two thirds or more as wide as article 2, article 4 of pereopods 5-6 heavily setose ..... Dogielinotidae

8. Telson cleft ..... Hyalidae

—— Telson entire ..... Hyalellidae

9. Urosomite 1 elongate, longer than metasomite 3 and more than twice as long as urosomite 2 ..... Podoceridae

—— Urosomite 1 not elongate as above 10

10. All urosomites coalesced 11

—— Urosomites separate 12

11. Uropods 1-2 strongly diverse, peduncle of uropod 2 grossly expanded ..... Cheluridae

—— Uropods 1-2 normally styliform or otherwise reduced or absent ..... (other) Corophiopidea

12. Labium lacking inner lobes, outer lobes obsolescent, gnathopods small, chelate, slender, article 6 elongate ..... Didymocheliidae

—— Labium with inner lobes, mandibular lobes strong, gnathopods not taking form of Fig.9, lower left 13

13. Urosome depressed ..... (check Iciliidae) Corophioidea

—— Urosome not depressed (or decision difficult) 14

14. Telson fleshy, pereopod 7 though often elongate not fossorial ..... (check Iciliidae) Corophioidea

—— Telson not fleshy, pereopod 7 fossorial 15

15. Pereopod 7 very elongate, dactyl elongate ..... Exoedicerotidae

—— Pereopod 7 equals pereopod 6, dactyl short ..... Condukiidae

16. Mandibular palp present 17

—— Mandibular palp absent 19

17. Gnathopods subchelate, outer plates of maxilliped very small, inner plates obsolete ..... Pagetinidae

—— Gnathopods chelate, inner and outer plates of maxilliped well formed 18

18. Article 2 of antenna 1 equal to or longer than article 1, uropod 3 with ramus, inner plates of maxillae 1-2 lacking medial setae ..... Sebidae

—— Article 2 of antenna 1 shorter than article 1, uropod 3 lacking ramus, inner plates of maxillae 1-2 richly setose medially or facially ..... Didymocheliidae

19. Body cylindrical, coxae small ..... Eophliantidae

—— Body depressed, rugose, coxae splayed laterally, or if not rugose, pereonites laterally discontiguous 20

—— Body laterally compressed, coxae large, not splayed 21

20. Pereonites with lateral pleurae ..... Temnophliantidae

—— Pereonites without lateral pleurae ..... Phliantidae

21. Coxae 2-3 much smaller than coxa 1 (coxa 4 as wide as 4 pereonites), accessory eyes present, ramus of uropod 3 2-articulate, mandible styliform, bifid ..... Nihotungidae

—— Coxae 2-3 larger than coxa 1 (coxa 4 variable), accessory eyes absent, ramus of uropod 3 1-articulate, mandible not styliform, incisor with many teeth 22

22. Molar spine-like, antenna 1 without long aesthetascs, uropod 3 with tiny ramus ..... Najnidae

—— Molar absent, antenna 1 with long aesthetascs, uropod 3 with large ramus ..... Tulearidae

—— Molar present, antenna 1 with long aesthetascs, uropod 3 lacking ramus 23

23. Head dorsoventrally depressed, complexly and sharply cuspidate, coxae and antennae cuspidate ..... Plioplateidae

—— Head, anterior body and antennae smooth ..... Ceinidae

Section G

1. Body plan cylindrical 2

—— Body plan compressed or depressed 4

2. Palp of maxilla 1 larger than outer plate, inner lobes of maxilliped degraded ..... Colomastigidae

—— Palp of maxilla 1 degraded, inner lobes of maxilliped well developed, separate 3

3. Uropod 3 biramous ..... Biancolinidae

—— Uropod 3 less than biramous ..... Eophliantidae

4. Mandibular molar enormous, smooth ..... (*Jeddo*) Synopiidae

—— Mandibular molar of medium size, triturative 5

—— Mandibular molar evanescent or absent, not triturative 9

5. Uropod 3 with subequal rami 6

—— Uropod 3 with inner ramus reduced or absent 8

6. Uropod 3 with basofacial spine ..... Artesiidae, Gammaridae

—— Uropod 3 lacking basofacial spine 7

7. Coxae 1-5 longer than broad, gnathopod 2 large, subchelate, carpus short, lobed, rami of uropod 3 shorter than peduncle, pad-like, pereopod 6 ordinary ..... (*Sunamphitoe*) Ampithoidae

—— Coxae broader than long, gnathopod 2 feeble, linear, simple, carpus elongate, unlobed, rami of uropod 3 longer than peduncle, lanceolate, pereopod 6 immensely elongate, apically flagellate ..... Maxillipiidae

8. Accessory flagellum absent ..... (Hyalidae) Talitroidea

—— Accessory flagellum present ..... (Beaudettia) Gammaridae

9. Mouthparts from lateral view conically grouped below head, uropod 3 biramous, well developed, coxae 1-4 compressed, elongate, forming lateral shield, coxa 4 excavate, body compressed, more or less smooth ..... Stegocephalidae

—— Mouthparts grouped in conical bundle, uropod 3 biramous, coxae 1-4 short, broader than long, forming weak lateral shield, body semicylindrical, smooth, coxa 4 not excavate ..... (*Rhynohalicella*) Pardaliscidae

—— Mouthparts from lateral view not conically grouped below head, uropod 3 degraded, coxae 1-4 not forming lateral shield, splayed laterally, coxa 4 excavate, body depressed, rugose ..... Phliantidae

—— Mouthparts from lateral view not conically grouped below head, uropod 3 biramous, well developed, coxae 1-4 compressed, very short, not forming lateral shield, coxa 4 not excavate, body compressed, smooth ..... (*Parahalice*) Pardaliscidae

Section H

1. Palp of maxilliped with fewer than 4 articles 2

—— Palp of maxilliped with 4 articles 3

2. Coxae 1-3 grotesque (Fig.78), coxa 4 not larger than 3, not sharply produced ventrally ..... (Ochlesinae) Iphimediidae

—— Coxae 1-3 uniform (Fig.81), coxa 4 larger than 3 and sharply produced ventrally ..... Lafystiidae

3. Mouthparts from lateral view conically grouped below head (Fig.21h) 4

—— Mouthparts from lateral view quadrately grouped below head (Fig.1h) 5

4. Anterior coxae long, some acuminate ventrally ..... Iphimediidae

—— Anterior coxae short, not acuminate ventrally ..... (*Halicella*) Pardaliscidae

5. Gnathopod 1 carpochelate 6

—— Gnathopod 1 propodochelate, subchelate or simple 7

6. Gnathopods huge, some articles on peduncles of antennae 1-2 elongate, plates of maxilliped small ..... Leucothoidae

—— Gnathopods feeble, articles of peduncles on antennae very short, plates of maxilliped huge ..... (*Astyra*) Stilipedidae

7. Mandibular molar present though occasionally minute 8

—— Mandibular molar absent 29

8. Pereopod 7 much shorter and of different structure than pereopod 6, head with strongly depressed rostrum (except *Leptophoxus*) ..... (return to Sect. B, couplet 13) Phoxocephalidae, etc.

—— Pereopod 7 shorter than 6 but of similar structure, rostrum cylindrical or flattened even though tiny ..... (also return to Sect. A, couplet 29) Haustorioidea

—— Pereopod 7 unlike pereopod 6, longer and of different structure or with shield-shaped article 2 9

—— Pereopod 7 of structure similar to pereopod 6, rarely shorter than 6, rostrum if present not flattened 11

9. Uropod 3 aequiramous, peduncle elongate, or uropod 3 vestigial ..... Oedicerotidae, Exoedicerotidae

—— Uropod 3 grossly variramous or parviramous, peduncle short relative to outer ramus 10

10. Head with cylindrical rostrum ..... Platyischnopidae

—— Head ordinary ..... Artesiidae

11. Telson elongate, more than twice as long as urosomite 3 12

—— Telson short, subequal to or shorter than urosomite 3 (seen laterally) 14

12. Accessory flagellum 1-articulate, antennae with large calceoli, gnathopods large and strongly subchelate ..... (*Eusirella, Eusiropsis*) Eusiridae

—— Accessory flagellum multiarticulate, antennae lacking calceoli, gnathopods feeble 13

13. Mandible 3-dimensional, molar present, coxae not short ..... Synopiidae

—— Mandible very flat, molar absent, coxae short ..... Pardaliscidae

14. Pereopods 5-7 fossorial, some of their setae at least half as long as longest article 15

—— Pereopods 5-7 not fossorial, setae and spines very short, scarcely exceeding length of article 3 17

15. Accessory flagellum 0 to 1-articulate, tiny, pereopod 7 very elongate, at least 1.5 times as long as pereopods 5-6, uropod 3 elongate, peduncle elongate, rami slender, lanceolate, subequal to peduncle (often broken), outer ramus 1-articulate, telson short, linguiform, entire or emarginate ..... Oedicerotidae

—— Accessory flagellum rarely vestigial, usually 2+articulate, pereopod 7 of size approximate to 6 or much shorter than 6, peduncle of uropod 3 usually short, rami unequal in females, usually outer ramus 2-articulate, if not then accessory flagellum multiarticulate, telson cleft even minutely, usually elongate 16

16. Coxae large and overlapping, propodi of gnathopods not dominant, peduncle of uropod 1 lacking basofacial spine (occasionally setose) ..... Haustorioidea

—— Coxae minute, disjunct, propodi of gnathopods dominant, peduncle of uropod 1 with basofacial spine ..... Carangoliopsidae

17. Telson cleft 18

—— Telson entire 22

18. Gnathopods powerfully subchelate (Fig.12, lower left) 19

—— Gnathopods feeble (Fig.129) 20

19. Accessory flagellum 2+articulate, rostrum obsolescent, telson cleft 75% ..... Liljeborgiidae

—— Accessory flagellum absent, rostrum nearly as long as article 1 of antenna 1, telson cleft 40% ..... (Pseudamphilochidae) Amphilochoidea

—— Accessory flagellum 0 to 1-articulate, rostrum obsolescent, telson cleft 25% ..... (*Austropleustes*) Pleustidae

20. Mandibular molar a large setulose tuberosity ..... (*Synopia*) Synopiidae

—— Mandibular molar a conical or trapezoidal setose lamina or hump 21

21. Coxae long, coxa 1 broadened ..... Stilipedidae

—— Coxae short, coxa 1 not broadened ..... Pardaliscidae

—— Coxae long, coxa 1 not broadened ..... (*Epimeriella*) Iphimediidae

22. Coxa 3 with about 3 times surface area of coxa 4, maxillipeds foliaceous, article 3 of mandibular palp vestigial, subequal to article 1 ..... (*Synopia*) Synopiidae

—— Coxa 4 usually slightly larger than, subequal to or scarcely smaller than coxa 3, maxillipeds not foliaceous, article 3 of mandibular palp much longer than article 1 23

23. Coxae 1-4 wider (anterior-posterior) than long (dorsal-ventral) 24

—— Coxae 1-4 longer than wide 25

24. Coxae contiguous or slightly overlapping ..... (Calliopiidae) (Eusiridae)

—— Coxae not touching serially ..... (2 genera) Laphystiopsidae

25. Mandibular molar a setose conical lamella 26

—— Mandibular molar bulbous, ovate or cylindrical 27

26. Coxa 1 broader than coxa 2 ..... Stilipedidae

—— Coxa 1 not broader than coxa 2 ..... (*Epimeriella*) Iphimediidae

27. Article 4 of pereopods 3-4 enormously elongate, accessory flagellum long, 3+articulate ..... Hyperiopsidae

—— Article 4 of pereopods 3-4 ordinary, accessory flagellum 0 to 2-articulate 28

28. Inner plate of maxilla 2 with apical spine only, no medial armament, medial margin on outer plate of maxilliped irregularly acclivate, with 4-5 irregularly placed setal-spines, propodi of gnathopods expanded apicad, palm subtransverse ..... Bolttsiidae

—— Inner plate of maxilla 2 medially or apically multisetose, medial margin on outer plate of maxilliped regularly spinose or setose, propodi of gnathopods not expanded apicad, palm not transverse ..... Calliopiidae, Pleustidae

29. Maxillae not foliaceous (except rarely palp of maxilla 1), coxa 1 not expanded ..... Pardaliscidae

—— Maxillae foliaceous, coxa 1 expanded ..... Stilipedidae

Section I

1. Pereopod 7 exceeding 1.5 times length of pereopods 5-6 2

—— Pereopod 7 scarcely longer than pereopod 6 4

2. Rami of uropods 1-2 without apical or subapical spines ..... Oedicerotidae

—— Rami of uropods 1-2 with apical or subapical spines 3

3. Uropod 3 magniramous or vestigial, peduncle elongate or vestigial, anterior lobe of coxae 5-6 as large as posterior lobe ..... Exoedicerotidae

—— Uropod 3 variramous, peduncle short, anterior lobe of coxae 5-6 evanescent ..... (*Eudevenopus*) Platyischnopidae

—— Uropod 3 magniramous, peduncle short, anterior lobe of coxae 5-6 longer than posterior lobe ..... (*Melphisana*) Melphidippidae

4. Peduncle of uropod 2 greatly expanded (Fig.2r2, upper right) ..... Cheluridae

—— Peduncle of uropod 2 not greatly expanded 5

5. Outer ramus of uropod 3 bearing 1-2 giant hooked, articulate spines, rami pad-shaped ..... Ampithoidae

—— Outer ramus of uropod 3 lacking giant hooks, occasionally with tiny hooks or denticles, rami not pad-shaped 6

6. Urosomite 1 elongate 7

—— Urosomite 1 not elongate 9

7. Pleopodal peduncles medially broadened, telson not fleshy, gnathopods alike, very elongate, simple ..... Iciliidae

—— Pleopodal peduncles slender, telson fleshy, gnathopods diverse, one or both subchelate 8

8. Uropod 3 with 0-1 ramus, peduncular articles of antenna 1 very elongate ..... Podoceridae

—— Uropod 3 with 2 rami, peduncular articles of antenna 1 very elongate ..... (*Sancho*) Eusiridae

9. Telson thick and fleshy, pereopods glandular ..... Corophioidea

—— Telson thin, pereopods not glandular 10

10. Gnathopods feeble, subequal, article 3 of mandibular palp vestigial, article 1 of primary flagellum on antenna 1 elongate, plates of maxilliped foliaceous ..... Synopiidae

—— Gnathopods feeble, subequal, article 3 of mandibular palp ordinary, article 1 of primary flagellum (if present) not elongate, plates of maxilliped ordinary 11

—— Gnathopods strong, (usually dimorphic), subchelate, article 3 of mandibular palp strong, article 1 of primary flagellum on antenna 1 not elongate, plates of maxilliped not foliaceous 12

11. Coxae acuminate ..... Iciliidae

—— Coxae ordinary ..... Eusiridae

12. Gnathopod 1 slightly larger than 2 ..... Gammaridae

—— Gnathopod 1 smaller than or equal to 2 13

13. Accessory flagellum with 3+ articles ..... Gammaridae

—— Accessory flagellum 0 to 2-articulate ..... Eusiridae

AMPELISCIDAE Costa, 1957

Diagnosis. Urosomites 2-3 coalesced. Pereopods 5-6 alike but pereopod 7 of distinct structure, article 2 with distinct, usually broad posteroventral lobe, article 2 of pereopods 5-6 rhomboid or diamond shaped and poorly lobed. Eyes when present composed of internal pigment masses served by 2-4 external cuticular lenses. Accessory flagellum absent. Article 4 of pereopods 3-4 elongate, article 6 much shorter than 4 and article 5 much shorter than 6, these pereopods glandular. Head very large. Gnathopods feeble. Uropod 3 biramous. Telson laminar.

See Dexaminidae, various haustorioids, and Argissidae.

Description. Body compressed, rarely rugose (*Ampelisca furcigera*) or weakly carinate except urosomite 1 generally with dorsal process; body pliable or flaccid (contrast to Dexaminidae). Head anteriorly truncate or rarely produced (*A. cyclops*, *A. misakiensis*). Peduncle of antenna 2 elongate, antenna 1 variable. Mouthparts basic but upper lip often incised weakly, mandibular raker row strongly dominant, article 2 of mandibular palp often thickened, mandibular lobes of lower lip usually short or obsolescent, inner plate of maxilla 1 poorly setose or naked and outer plate of maxilliped very elongate or enlarged. Anterior coxae large, coxa 1 usually much broader than 2 (or 3), 2-3 occasionally tapering, coxa 4 deeply excavate and lobate posteriorly; coxa 5 very short relative to 4. Carpi of gnathopods elongate, propodi simple or weakly subchelate. Dactyls of pereopods 3-4 usually very elongate and bearing meati for exudation of web to spin tubes. Pereopods 5-7 short, 7 usually shortest; some of articles 3-6 with stout submarginal spines, dactyls variable. Ventral margin of article 2 on pereopod 7 dominantly setose but occasional species with setae obsolescent. Epimera 1-2 generally invariable, epimeron 3 highly variable. Uropods 1-2 well developed, biramous, inner rami rarely reduced, apex of uropod 1 occasionally falling short of uropod 2 apex; uropod 3 usually exceeding uropod 2, peduncle ordinary, rami elongate, lanceolate or weakly leaf-shaped, sometimes serrate. Telson laminar, variable, usually with minute incision ranging to deeply cleft, long and slender to short and broad, tapering to broadly truncate. Coxal gills on pereonites 2-6. Oostegites narrow.

Sexual dimorphism. *Male*. Antennae usually more elongate than in female, special setular-aesthete bundles or tufts anteriorly on articles 4-5 of antenna 2 and often on articles 1-2 of antenna 1 posteriorly. Antenna 1 often with callynophore. Process on urosomite 1 usually much larger than in female. Uropod 3 more setose than in female. Ventral sexual tubercle on thoracic sternite 7 usually absent in male; single hooks often present in both sexes on one or more thoracic sternites.

Relationship. Except for rare occurrences in Lysianassidae, the shiny cuticular lenses of oculate ampeliscids are unique to this family. The large head, fused urosomites 2 and 3, coxal pattern and fixed diversity of pereopods 5 and 6 vis-a-vis 7 distinguish this family. Deep sea species lose the cuticular lenses so that familiarity with the family should be built on shallow water collections.

The Dexaminidae also have fused urosomites 2 and 3 but their head is of more ordinary dimensions, and their eyes are ommatidial. Pereopod 7 in typical dexaminids is like pereopod 6 but in the Prophliantinae it is different from 6 and more like the shape described for Ampeliscidae. Prophliantins however have coxa 5 as long as 4 in contrast to ampeliscids.

Ampeliscidae can be confused with Phoxocephalidae and certain Urothoidae and Pontoporeiidae because pereopod 7 in most of those taxa is distinct from pereopods 5 and 6 but the majority of Phoxocephalidae, Pontoporeiidae and Urothoidae have a conspicuous accessory flagellum and their heads are flat, uncompressed and often rostrate and usually short or not massive; heads of Pontoporeiidae are of the ordinary gammarid kind, with large ocular lobe. Other useful clues to distinguish the taxa are the ommatidial eyes of oculate Phoxocephalidae (many are blind), and the very long peduncle of antenna 2 in Ampeliscidae (rare in Phoxocephalidae). Several Phoxocephalidae have now been found to have fusion of urosomites so that formerly useful character is unavailable. Urothoids, pontoporeiids and haustorioids, in general, have free urosomites.

Argissidae bear an accessory flagellum and have coxa 3 significantly reduced in size. Their urosomites are free. The eyes, when present, form a pinwheel of four internal ommatidia.

Occurrence. Ampeliscids spin parchment or net tubes lying on or attached to benthic mud or bottom objects, sometimes intertidally among algal rhizomes; often the tubes are single, but in other taxa they are built up into thick silty masses or web-like nests of apartment

dwellers. The bodies of shallow water and several deep sea taxa often are very mylar-like or flaccid, break easily, and have the ocular pigments rupture so that the head fills with pigment which may be bright red, brown or black; specimens of *Byblis* in shallow water are usually furnished with brown or black chromatophores and ocular pigments and some of these are more sturdy and less fragmented than *Ampelisca* when collected with grabs and trawls.

Ampeliscids dominate many finely particulate sediments 2 to 100 m in depth worldwide. See Enequist (1950) and Mills (1967b) for ecological observations.

Taxonomy. Specific identification focuses on the following characters.

Shape of head: very subtle shape of anteroventral margin often useful. Number (0-2-4) of cuticular lenses, their size, position and aiming axis; the lower pair often aim forward or downward and are difficult to see from the side.

Length of antennae relative to body: length of antenna 1 relative to peduncle of antenna 2; length of each article of peduncle on antenna 1 relative to articles 4-5 of antenna 2; relative lengths of flagella.

Pereopods 3-4: relative length of article 7 to articles 5 and 6.

Pereopod 7: shape and lower setation of article 2; lengths, widths and presence of lobes all relative to each other on articles 3,4,5,6 and 7.

Shapes of epimera 2 and 3: relative lengths of uropods 1-3, and of their rami; relative reach of each uropod; spine patterns on rami; shape and degree of armaments on uropod 3. Dorsal condition of urosomite 1: humped, carinate, peaked, hooked, keeled; subtle shape.

Telson: relative length and width, degree of cleft, dorsal armament patterns.

Females are generally the best material for basic descriptions and interspecific comparisons.

Key to Genera of Ampeliscidae

1. Flagella of antennae poorly developed, with 2-6 articles (Fig.22A) ..... *Byblisoides*

—— Flagella of antennae well developed, with more than 6 articles (Fig.22F) 2

2. Pereopod 7: anterior edge of posteroventral lobe on article 2 lacking setae near its junction with article 3 (Fig.22B) ..... *Ampelisca* (= *Triodos*)

—— Pereopod 7: anterior edge of posteroventral lobe on article 2 bearing setae near its junction with article 3 (Fig.22D) 3

3. Posteroventral lobe of article 2 on pereopod 7 expanding ventrally, posterior edge oblique (Fig.22D), article 3 of mandibular palp little more than half as long as article 2 ..... *Byblis*

—— Posteroventral lobe of article 2 on pereopod 7 either rectangular or not expanding ventrally, anterior and posterior margins almost parallel (Fig.22C), article 3 of mandibular palp scarcely longer than article 2 ..... *Haploops*

Ampelisca Krøyer

Figs 22B,E,F, 23A,C,E

Ampelisca Krøyer, 1842: 154.–J.L. Barnard, 1954e: 3.–J.L. Barnard, 1960c: 4.–Karaman, 1975d: 5.–Karaman & Barnard, 1981: 256.

Pseudopthalmus [sic] Stimpson, 1853: 57 (*Pseudopthalmus* [sic] *pelagicus* Stimpson, 1853, here selected).

Araneops Costa, 1853: 177 (*Araneops diadema* Costa, 1853, here selected).

Tetromatus Bate, 1857d: 139 (*Tetromatus typicus* Bate, 1857d, here selected).

Triodos K.H. Barnard, 1916: 140 (*Triodos insignis* K.H. Barnard, 1916, original designation).

Type species. *Ampelisca eschrichti* Krøyer, 1842, monotypy.

Diagnosis. Flagella of antennae 1-2 with 5 or more articles. Article 3 of maxilliped palp unproduced. Article 2 of pereopod 7 with posterior margin oblique and article expanding ventrally, rarely parallel to anterior margin, anterior margin of posteroventral lobe near junction with article 2 not setose. Telson much longer than broad, cleft much more than half its length.

Description. Head generally long and low. Mandibular palp stout, article 3 slender, equal to or shorter than 2. Coxae 1-4 generally elongate, coxa 1 not as prominent as in *Haploops*, coxae 2-3 usually not

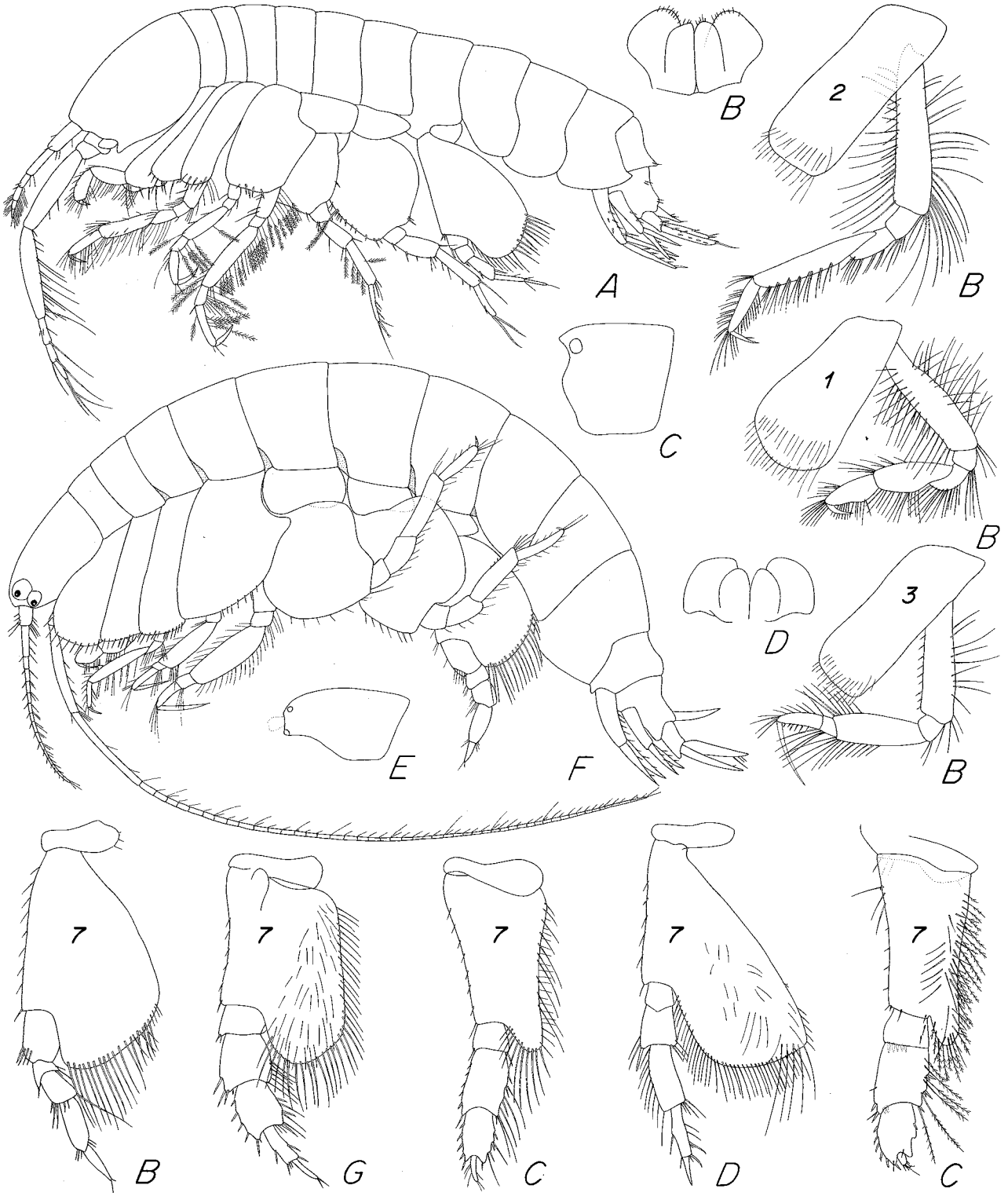

Fig.22. Ampeliscidae. A, *Byblisoides arcillis*; B, *Ampelisca typica*; C, *Haploops tubicola*; D, *Byblis gaimardi*; E, *Ampelisca brevicornis*; F, *Ampelisca tenuicornis*; G, *Haploops setosa*.

tapering; lower part of posterior margin of coxa 4 parallel to anterior margin and usually elongate.

Relationship. The basic genus; see other genera of family and key.

Species. See also J.L. Barnard (1954c, 1960c key, 1964b, 1966a,b, 1967a,b, 1969a,b, 1971a,b), K.H. Barnard (1932, 1937), Bellan-Santini, 1982c key, 1983), Bellan-Santini & Ledoyer (1973), Bousfield (1973), Chevreux & Fage (1925), Griffiths (1974, 1974b,c, 1975), Gurjanova (1951), Kaim-Malka (1969a,b,c), Karaman (1975d,h), Krapp-Schickel (1969b, 1971), Ledoyer (1977, 1982b), Margulis (1967, 1968), Mills (1967a, 1971), Nayar (1959, 1967), Pillai (1957), Pirlot (1936b), Reid (1951), Schellenberg (1925a, 1942), Shoemaker (1930c, 1931b), Stephensen (1925a, 1928, 1929, 1933b, 1935a, 1940b, 1944a); *A. abdita* Mills, 1964a (Bousfield, 1973) [364]; *A. abyssicola* Stebbing, 1888 (Shoemaker, 1935a) (Schellenberg, 1955) [400BA + ?618B]; *A. acinaces* Stebbing, 1888 (K.H. Barnard, 1931b) (Lowry & Poore, 1985a) [791 + ?776]; *A. acris* Griffiths, 1974c, 1975 [743]; *A. aequicornis* Bruzelius, 1859 (= *A. cessia* Reid, 1951) (Sars, 1895) (Mills, 1971) (Lincoln, 1979a) [250 + B]; *A. agassizi* (Judd, 1896) (= *A. compressa* Holmes, 1905) (= *A. vera* J.L. Barnard, 1954e) (Bousfield, 1973) (Dickinson, 1982) (Goeke & Heard, 1984b) [490 + B]; *A. albedo* J.L. Barnard, 1961a [715B]; *A. amblyops* Sars, 1895 (Stephensen, 1935a) [216B]; *A. amblyopsoides* J.L. Barnard, 1960c, 1966a, 1967a [370B]; *A. anisuropa* (Stebbing, 1908b, 1910b) (Griffiths, 1974b,c, 1975) [743]; *A. anomala* Sars, 1883, 1895 (Griffiths, 1974c, 1975) [240 + B + 743]; *A. anophthalma* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348B]; *A. antennata* Bellan-Santini & Kaim-Malka, 1977 (Ledoyer, 1977) (Bellan-Santini, 1982c) [348 + B]; *A. anversensis* Karaman, 1975h (= *A. macrocephala* identifications of Antarctica, via Walker, 1903, 1907, Stebbing 1914, K.H. Barnard 1932) (Bellan-Santini, 1983) [880]; *A. araucana* Gallardo, 1963 [765]; *A. armoricana* Bellan-Santini & Dauvin, 1981b [242]; *A. australis* Haswell, 1879a, 1885b (Ledoyer, 1984) (Lowry & Poore, 1985) [791 + B]; *A. ballina* Lowry & Poore, 1985 [781]; *A. barnardi* Nicholls, 1938 (Dahl, 1954) (Andres, 1979b) [870B]; *A. bicarinata* Goeke & Heard, 1983 [470]; *A. bidentata* Schellenberg, 1925a [440]; *A. bidura* Lowry & Poore, 1985 [784 + B]; *A. birulai* Brüggen, 1909 (= *A. derjugini* Bulycheva, 1936b, Gurjanova, 1951) (Shoemaker, 1955a) (Dickinson, 1982) [220]; *A. bocki* Dahl, 1944c (Nagata, 1959, 1965a) (Imbach, 1969) (Hirayama, 1983) [392]; *A. bouvieri* Chevreux, 1912a,d (Karaman, 1975e) (Bellan-Santini, 1985a) [800]; *A. brachyceras* Walker, 1904 (Nayar, 1967) (Griffiths, 1975) (Ledoyer, 1982b) [690]; *A. bransfieldi* K.H. Barnard, 1932 (?Stephensen, 1947a) [875 B]; *A. brevicornis* (Costa, 1853) (= *A. laevigata* Liljeborg, 1856 and Sars, 1895) (= *A. bellianus* Bate, 1857d) (= varieties *A. dentifer*, *A. intermedia*, *A. platypus*, *A. rectangula* of Schellenberg, 1925a; *A. canmora*, *A. cavicoxa* and *A. pectenata* of Reid, 1951) (?Rabindranath, 1975) (Karaman, 1975d) (Lincoln, 1979a) (Bellan-Santini, 1982c) [423]; *A. brevisimulata* J.L. Barnard, 1954e, 1971b (Dickinson, 1982) [490 + B]; *A. byblisoides* K.H. Barnard, 1926 (J.L. Barnard, 1962d) [701B]; [*A. calliopa* Strauss, 1909 (*nomen nudum*)]; *A. calooma* Lowry & Poore, 1985 [784 + B]; *A. calypsonis* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [340]; *A. careyi* Dickinson, 1982 [379]; *A. chiltoni* Stebbing, 1888 (Hurley, 1957) (J.L. Barnard, 1961a) [700 + B]; *A. chinensis* Imbach, 1969 [655]; *A. coeca* Holmes, 1908 (J.L. Barnard, 1960c) [310B]; *A. compacta* Norman, 1882 (Stephensen, 1925a) [240B]; *A. composita* Schellenberg, 1931 [862]; *A. cristata* Holmes, 1908 (= *A. microdentata* J.L. Barnard, 1954e) (J.L. Barnard, 1971b) (Dickinson, 1982) [490 + B]; *A. cristoides* J.L. Barnard, 1954e, 1967b [369 + B]; *A. ctenopus* Schellenberg, 1925a (Reid, 1951) [440]; *A. cucullata* J.L. Barnard, 1954e [537]; *A. cyclops* Walker, 1904 (= *A. iyoensis* Nagata, 1959)

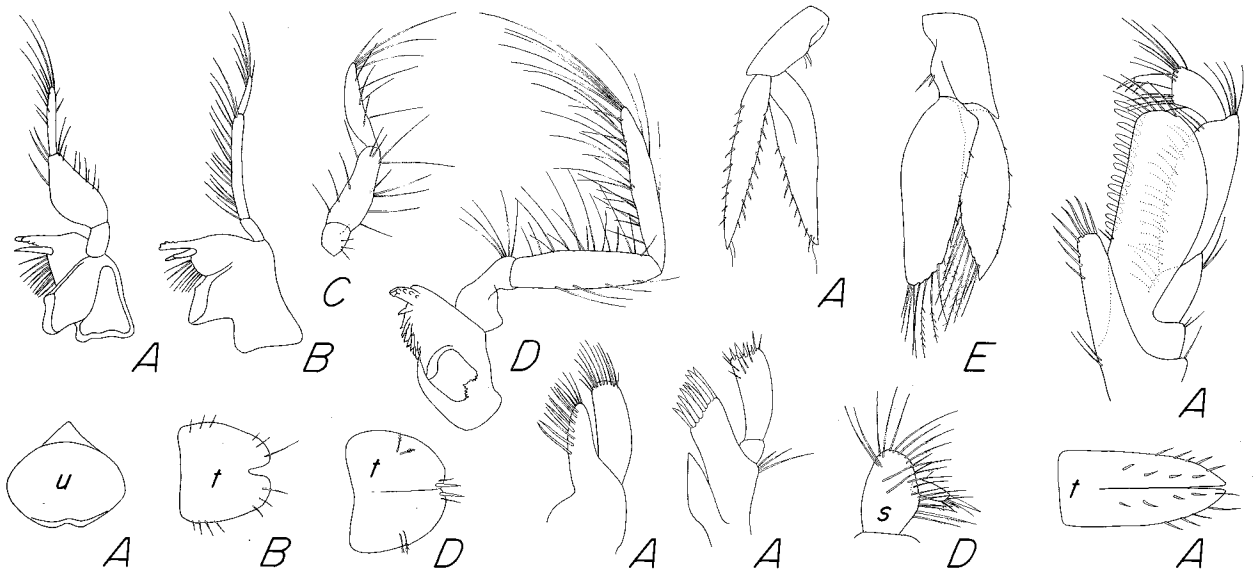

Fig.23. Ampeliscidae. A, *Ampelisca typica*; B, *Byblis gaimardi*; C, *Ampelisca gibba*; D, *Haploops tubicola*; E, *Ampelisca brevicornis*.

(Nagata, 1965a) (Imbach, 1969) (Rabindranath, 1975) (Hirayama, 1983) [600]; *A. dallenei* Bellan-Santini, 1985a [870]; *A. dalmatina* Karaman, 1975b,d (Ledoyer, 1977) (Bellan-Santini, 1982c) [340]; *A. declivitatis* Mills, 1967a, 1971 (see *A. amblyops* of Stephensen, 1925a) [260 + B]; *A. diadema* (Costa, 1853, 1857) (= *A. assimilis* Boeck, 1871 and Sars, 1895) (Lincoln, 1979a) (Bellan-Santini, 1982c) [426 + 339]; *A. dimboola* Lowry & Poore, 1985 [784]; *A. eoa* Gurjanova, 1951 (= *A. catalinensis* J.L. Barnard, 1954e) (Margulis, 1967) [510BA]; *A. eschrichti* Krøyer, 1842 (= *A. pelagicus* Stimpson, 1853) (= *A. ingens* Bate, 1862) (= *A. dubia* and *A. propinqua* Boeck, 1871b) (= *A. pacificus* Gurjanova, 1955b, homonym) (Sars, 1895) (Lincoln, 1979a) (Dickinson, 1982) [200 + B]; *A. euroa* Lowry & Poore, 1985 [784]; *A. excavata* K.H. Barnard, 1926 (J.L. Barnard, 1970b) [743]; *A. fageri* Dickinson, 1982 [379]; *A. furcigera* Bulycheva, 1936b (J.L. Barnard, 1960c, 1967a) (Hirayama, 1983) [510 + BA]; *A. fusca* Stebbing, 1888 (Griffiths, 1973-1975) [740 + B]; *A. gibba* Sars, 1883, 1895 (Lincoln, 1979a) (Bellan-Santini, 1982c) [352 + BA]; *A. gusta* J.L. Barnard, 1961a [618B]; *A. hancocki* J.L. Barnard, 1954e, 1967b, etc. (Dickinson, 1982) [535]; *A. hawaiensis* Goeke, 1985 [381]; *A. hemicryptops* K.H. Barnard, 1930, 1932 [870 + B]; *A. hermosa* J.L. Barnard, 1961a [501B]; *A. hessleri* Dickinson, 1982 [271 + B]; *A. heterodactyla* Schellenberg, 1925a (= *A. rubra* Chevreux, 1925) (Reid, 1951) [440]; *A. holmesi* Pearse, 1908 (J.L. Barnard, 1960c) (Goecke & Gathof, 1983) [362]; *A. honmungensis* Imbach, 1969 [655]; *A. hupferi* Schellenberg, 1925a (Reid, 1951) [440]; *A. incerta* Reid, 1951 [445]; *A. indentata* J.L. Barnard, 1954e, 1964b, 1967b [370]; *A. insignis* (K.H. Barnard, 1916) (Karaman & Barnard, 1981) [743]; *A. jaffaensis* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [343]; ?*A. japonica* Bate, 1862 [395]; ?*A. jarli* Reid, 1951 [444]; *A. jingera* Lowry & Poore, 1985 [784 + B]; [*A. koreni* Jarzynsky, 1870, 1885 (*nomen nudum*)]; *A. latifrons* Schellenberg, 1925a (Ledoyer, 1972, 1982b) [740]; *A. ledoyeri* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348 + B]; *A. lenaldei* Bellan-Santini, 1985a [871]; ?*A. limicola* (Stimpson, 1853) (Bate, 1862) [365]; *A. lobata* Holmes, 1908 (= *A. articulata* Stout, 1913) (J.L. Barnard, 1954e, 1979b) (Dickinson, 1982) [490]; *A. lunata* Schellenberg, 1938a [595]; *A. macrocephala* Liljeborg, 1852a (= *A. latipes* Stephensen, 1925a) (? = *A. gracilicauda* and ?*A. dentifera* Schellenberg, 1931) (Sars, 1895) (Bousfield, 1973) (Dickinson, 1982) [200 + B]; *A. maia* Imbach, 1969 [655]; *A. massiliensis* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348 + B]; *A. melanesiensis* Myers, 1985c (= *A. australis* identification of Schellenberg, 1938a) [555]; *A. melitae* Dauvin & Bellan-Santini, 1985 [344]; *A. mexicana* J.L. Barnard, 1954e, 1969b [490]; *A. miharaensis* Nagata, 1959, 1965a (Imbach, 1969) [392]; *A. milleri* J.L. Barnard, 1954e, 1969b (Dickinson, 1982) [369]; *A. mindorensis* Olerod, 1970 [641]; *A. miops* K.H. Barnard, 1916 (= *A. dentitelson* Ledoyer, 1973a) (Ledoyer, 1978a, 1982b) [740]; *A. misakiensis* Dahl, 1944c (Nagata, 1965a) (Imbach, 1969) (Hirayama, 1983) [395]; *A. monoculata* Dauvin & Bellan-Santini, 1985 [441]; *A. monodi* Ledoyer, 1979b [644]; *A. multispinosa* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [340 + B]; *A. naikaiensis* Nagata, 1959, 1965a [395]; *A. narooma* Lowry & Poore, 1985 [791B]; *A. natalensis* K.H. Barnard, 1916 (Ledoyer, 1979a) [740]; [*A. nordmanni* (Milne Edwards, 1840) (Bate, 1862) [334]]; *A. nossibeensis* Ledoyer, 1982b [698]; *A. odontoplax* Sars, 1879, 1885, 1895 (Gurjanova, 1951) [216 + B]; *A. orops* Imbach, 1969 [655]; *A. pacifica* Holmes, 1908 (J.L. Barnard, 1954e, 1966a,b) [490 + B]; *A. palmata* K.H. Barnard, 1916, 1940 (Griffiths, 1973-1975) [740]; *A. panamensis* J.L. Barnard, 1954e [541]; *A. parapacifica* Goeke & Heard, 1984a [362]; *A. parapanamensis* J.L. Barnard, 1954c [462]; *A. paria* Barnard & Agard, 1986 [462]; [*A. picta* Stuxberg, 1880 (*nomen nudum*)]; *A. planierensis* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348]; *A. plumosa* Holmes, 1908 (J.L. Barnard, 1967a) (Margulis, 1967) (Dickinson, 1982) [370BA]; *A. provincialis* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348]; *A. pseudosarsi* Bellan-Santini & Kaim-Malka, 1977 (Bellan- Santini, 1982c) [343]; *A. pseudospinimana* Bellan-Santini & Kaim-Malka, 1977 (= *A. spinimana* identifications of Kaim-Malka, 1969c and Karaman, 1975d) (Bellan-Santini, 1982c) [340 + B]; *A. pugetica* Stimpson, 1864 (= *A. californica* Holmes, 1908) (= *A. gnathia* J.L. Barnard, 1954e) (= *A. macrodentata* J.L. Barnard, 1954e) (= *A. mora* J.L. Barnard, 1967a), (J.L. Barnard, 1971b) (Dickinson, 1982), *A. p. microdonta* A. Ledoyer, 1979a, 1982b [490 + B]; *A. pusilla* Sars, 1895 (Stephensen, 1935a) (?K.H. Barnard, 1935) [240 + B]; *A. pygmaea* Schellenberg, 1938a (Ledoyer, 1978b) [600]; *A. remora* Bellan-Santini & Dauvin, 1986 [351]; *A. richardsoni* Karaman, 1975e (= *A. eschrichti* identifications of Chevreux, 1906a, 1912d and K.H. Barnard, 1932) (Bellan-Santini, 1985a) [870]; *A. romigi* J.L. Barnard, 1954e (= *A. isocornea* J.L. Barnard, 1954e) (= *A. ciego* J.L. Barnard, 1966a) [490 + B]; *A. rostrata* Spandl, 1924a [641F]; *A. rubella* Costa, 1864 (= *A. serrata* Schellenberg, 1925a) (Karaman, 1975d) (Bellan-Santini, 1982c) [330]; *A. ruffoi* Bellan- Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [340]; *A. sarsi* Chevreux, 1887a (Karaman, 1975d) (Bellan-Santini, 1982c) [330]; *A. scabripes* Walker, 1904 (Sivaprakasam, 1969a) (Rabindranath, 1975) [670]; *A. schellenbergi* Shoemaker, 1933c (J.L. Barnard, 1979b) (Dickinson, 1982) [470]; *A. senegalensis* Chevreux, 1925 [441]; *A. serraticaudata* Chevreux, 1888a (Kaim-Malka, 1969a,b) (Bellan-Santini, 1982c) [330]; *A. shoemakeri* J.L. Barnard, 1954e, 1964b, 1967b [540]; *A. soleata* Oliveira, 1955b [751]; *A. spinicaudata* Ledoyer, 1972 [698]; *A. spinifer* Reid, 1951 (Lincoln, 1969a) (Bellan-Santini, 1982c) [330]; *A. spinimana* Chevreux, 1887c (= *A. aspinosa* Schellenberg, 1925a) (Reid, 1951) [330 + B]; *A. spinipes* Boeck, 1861 (Sars, 1895) (Mills, 1963) (Lincoln, 1979a) (Bellan-Santini, 1982c) [354 + B]; *A. spooneri* Dauvin & Bellan-Santini, 1982 [353]; *A. statenensis* K.H. Barnard, 1932 [864]; *A. stenopa* Schellenberg, 1925a (Margulis, 1968) [449]; *A. subbrevicornis* Pirlot, 1936b [646]; *A. tenuicornis* Liljeborg, 1856 (Sars, 1895) (Lincoln, 1979a) (Bellan-Santini, 1982c) (Ledoyer, 1982b) [355 + B + 740]; *A. tilpa* Lowry & Poore, 1985 [784]; *A. toora* Lowry & Poore, 1985 [791]; *A. toulemonti* Dauvin & Bellan-Santini, 1982 [353]; *A. tridens* Walker, 1904 (?Pirlot, 1936b) (Nayar, 1959, 1967) [664 + ?640 + B]; *A. truncata* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [340];

A. tulearensis Ledoyer, 1967b, 1978a, 1979a [698 + B]; *A. typica* (Bate, 1857d) (= *A. carinata* Bruzelius, 1859) (Sars, 1895) (Lincoln, 1979a) (Bellan-Santini, 1982c) [352]; *A. uncinata* Chevreux, 1887c, 1900a (Mills, 1971) [250B]; *A. unidentata* Schellenberg, 1936b (Bellan-Santini & Kaim-Malka, 1977) (Bellan-Santini, 1982c) [340]; *A. unsocalae* J.L. Barnard, 1960c, 1967a, 1971b (Dickinson, 1982) [370BA]; *A. vadorum* Mills, 1963 (Bousfield, 1973) [364W]; *A. venetiensis* Shoemaker, 1916 (J.L. Barnard, 1954e, 1964b) [490]; *A. verga* Reid, 1951 (Dauvin & Bellan-Santini, 1985) [441]; *A. verrilli* Mills, 1967a (Bousfield, 1973) [361]; *A. vervecei* Bellan-Santini & Kaim-Malka, 1977 (Bellan-Santini, 1982c) [348]; *A. yuleba* Lowry & Poore, 1985 [631]; *A. zamboangae* Stebbing, 1888 (= *A. chevreuxi* Walker, 1904) (not Nayar, 1959) (Rabindranath, 1975) [600].

Habitat and distribution. Marine, cosmopolitan, 0-4930 m, 153 species.

Byblis Boeck

Figs 22D, 23B

Byblis Boeck, 1871b: 228.–J.L. Barnard, 1966a: 55 (key).

Type species. *Ampelisia* [sic] *gaimardii* Krøyer, 1846b, monotypy.

Diagnosis. Flagella of antennae 1-2 with 5 or more articles. Article 3 of maxillipedal palp unproduced. Article 2 of pereopod 7 with posterior margin oblique and article expanding ventrally and strongly extended, anterior margin of posteroventral lobe near junction with article 2 setose. Telson varying from rarely as long as to usually shorter than broad, cleft or incised less than half its length.

Description. Head generally long and low but less so than in *Ampelisca* and occasionally short and broad (*B. abyssi*). Both articles 2-3 of mandibular palp slender, article 3 shorter than 2. Coxae 1-4 generally shorter than in *Ampelisca*, coxa 1 scarcely prominent, coxae 2-3 not tapering or rarely so (*B. veleronis*). Lower part of posterior margin on coxa 4 very oblique or short compared with *Ampelisca*.

Variables. Article 2 of pereopod 7 short and truncate as in *Ampelisca*, coxae 3-4 tapering, telson slightly longer than broad and deeply cleft (*B. subantarctica*).

Relationship. Differing from *Ampelisca* in the presence of setae on the anterior edge of the posterior lobe on article 2; generally also in the long extended posterior lobe of article 2 on pereopod 7, the uniformity of articles 3-7 of pereopod 7 (see Fig.22 C7,G7), the shorter coxa 4 with sloping or short posteroventral margin. See *Haploops*.

Species. See also J.L. Barnard (1964b, 1966a,b, 1971b); K.H. Barnard (1937); Bousfield (1973); Griffiths (1974b,c); Gurjanova (1951); Just (1971); Ledoyer (1977); Margulis (1967); Nayar (1959, 1967); Schellenberg (1925b, 1942); Shoemaker (1930a, 1931b, 1955a); Stephensen (1925a, 1926, 1928, 1929, 1933b, 1935a, 1940b, 1944a); *B. abyssi* Sars, 1879, 1895 (Gurjanova, 1951) [220 + B]; *B. affinis* Sars, 1895 (Stephensen, 1935a) [238]; *B. albatrossae* J.L. Barnard, 1967b [394B]; *B. ampelisciformis* J.L. Barnard, 1967b [394]; *B. antarctica* Schellenberg, 1931 (K.H. Barnard, 1932) [871B]; *B. arcticus* Just, 1970 [251]; *B. barbarensis* J.L. Barnard, 1960c, 1971b [510B]; *B. bathyalis* J.L. Barnard, 1966a, 1971b [379B]; *B. bega* Lowry & Poore, 1985 [781]; *B. brachycephala* Mills, 1971 [307B]; *B. brachyura* Margulis, 1968 [653]; *B. brevirama* Dickinson, 1983 [230 + 267]; *B. calisto* Imbach, 1969 [655]; *B. ceylonica* J.L. Barnard, 1961a [609A]; *B. coeca* Margulis, 1967 [231B]; *B. crassicornis* Metzger, 1875 (Sars, 1895) (Gurjanova, 1951) [210B]; *B. crenulata* Pirlot, 1936b [644]; *B. cubensis* (Ortiz & Gomez, 1979) [406B]; *B. daleyi* (Giles, 1890) (?Pirlot, 1936b) [600]; *B. erythrops* Sars, 1883, 1895 (Vader, 1969a) [210 + BA]; *B. febris* Imbach, 1969 [655]; *B. gaimardi[i]* (Krøyer, 1846a) (Sars, 1895) (Mills, 1971a) (Lincoln, 1979a) (Dickinson, 1983) [210 + B]; *B. gerara* Lowry & Poore, 1985 [791B]; *B. gloriosae* Ledoyer, 1982b [618A]; *B. guernei* Chevreux, 1887c, 1900a, 1927, 1935 (Kaim-Malka, 1976b) (Bellan-Santini, 1982c) [330 + B]; *B. inaequicornis* Ledoyer, 1986 [618B]; *B. io* Imbach, 1969 [655]; *B. japonicus* Dahl, 1944c (Nagata, 1960, 1965a) [395 + B]; *B. kallarthra* Stebbing, 1886, 1887 (Margulis, 1968) [665]; *B. lepta* (Giles, 1888) (Nayar, 1967) [670]; *B. longicornis* Sars, 1895 (= *B. intermedia* Stebbing, 1894) (Gurjanova, 1951) [220]; *B. longispina* Dickinson, 1983 [272]; *B. medialis* Mills, 1971 [307B]; *B. mildura* Lowry & Poore, 1985 [784]; *B. millsi* Dickinson, 1983 [270]; *B. minuticornis* Sars, 1879, 1895 (Stephensen, 1935a) (Gurjanova, 1951) [220B]; *B. mucronata* Pirlot, 1936b (Margulis, 1968) [643]; *B. mulleni* Dickinson, 1983 [270 + B]; *B. nana* Margulis, 1967 [231A]; *B. orientalis* J.L. Barnard, 1967b [395]; *B. pearcyi* Dickinson, 1983 [290]; *B. pilosa* Imbach, 1969 [655]; *B. pirloti* Margulis, 1968 [653]; *B. plumosa* Margulis, 1968 [653]; *B. rhinoceros* Pirlot, 1936b (Schellenberg, 1938a) (Ledoyer, 1982b) [600]; *B. securiger* (K.H. Barnard, 1931a, 1932) (Stephensen, 1947a) [890 + B]; *B. serrata* Smith, 1873 (Mills, 1971) [250 + B]; *B. setosus* Kudrjaschov, 1965c [279]; *B. subantarctica* Schellenberg, 1931 (Bellan-Santini, 1985a) [890 + B]; *B. tannerensis* J.L. Barnard, 1966a (Dickinson, 1983) [310B]; *B. teres* J.L. Barnard, 1967a (Dickinson, 1983) [310B]; *B. thyabilis* J.L. Barnard, 1971b (Dickinson, 1983) [225B]; *B. tinamba* Lowry & Poore, 1985 [782]; *B. veleronis* J.L. Barnard, 1954e, 1971b (Dickinson, 1983) [379 + B]; *B. verae* Margulis, 1968 [653]; *B. vitjazi* Margulis, 1967 [231A]; species (= *B. crassicornis* ID of J.L. Barnard, 1971b) (Dickinson, 1983) [310A].

Habitat and distribution. Marine, cosmopolitan, 0-6126 m, 56 species.

Byblisoides K.H. Barnard

Fig.22A

Byblisoides K.H. Barnard, 1931a: 426.–Mills, 1971: 373.

Type species. *Byblisoides juxticornis* K.H. Barnard, 1931a, original designation.

Diagnosis. Flagella of antennae 1-2 with 4 or fewer articles. Article 3 of maxilliped palp unproduced. Article 2 of pereopod 7 with posterior margin oblique and article expanding ventrally, anterior margin of posteroventral lobe near junction with article 2 usually setose. Telson much longer than broad, cleft much more than half its length.

Description. Head generally long and low but extremely large, articles 2-3 of mandibular palp both slender, article 3 shorter than 2. Coxae 1-4 generally elongate, coxa 1 not as prominent as in *Haploops*, coxae 2-3 usually not tapering distally. Lower part of posterior margin on coxa 4 parallel to anterior margin and usually elongate.

Variables. Edge near junction of article 3 on article 2 of pereopod 7 naked (*B. esferis*).

Relationship. Like *Ampelisca* but articles in flagella of antennae very few.

Species. *B. arcillis* J.L. Barnard, 1961a (Margulis, 1967) [500A]; *B. blasensis* J.L. Barnard, 1964a [406B]; *B. esferis* J.L. Barnard, 1961a [715B]; *B. juxticornis* K.H. Barnard, 1931a, 1932 (?Dahl, 1954) [870B]; *B. plumicornis* Ledoyer, 1978a [618B]; *B. profundi* Mills, 1971 [307A]; species, Ledoyer, 1986 [618A].

Habitat and distribution. Marine, cosmopolitan, cold water submergent, 160-6500 m, 6 species.

Haploops Liljeborg

Figs 22C,G, 23D

Haploops Liljeborg, 1856: 135.–Karaman, 1975d: 57.–Lincoln, 1979a: 124.

Type species. *Haploops tubicola* Liljeborg, 1856, original designation.

Diagnosis. Flagella of antennae 1-2 with 5 or more articles. Article 3 of maxillipedal palp produced or inflated. Article 2 of pereopod 7 variable, usually narrow and with anterior and posterior margins parallel, or posterior oblique and article 2 expanding ventrally, or article 2 tapering, anterior margin of posteroventral lobe near junction with article 2 setose or face of lobe with large setae. Telson varying from scarcely longer to as long as, or shorter than broad, cleft much more than half its length.

Description. Head generally short and very tall: mandibular palp articles 2-3 both slender, article 3 usually longer than 2. Coxae 1-4 generally shorter than in *Ampelisca,* coxa 1 very prominent and often longer than coxa 4, coxae 2-3 usually tapering distally; lower part of posterior margin on coxa 4 very oblique or short compared with *Ampelisca.*

Variables. Setae on article 2 of pereopod 7 obsolescent or sparse (*H. lodo*) but shape as in typical *Haploops*; inner ramus of uropod 1 very short (*H. dellavallei*).

Relationship. Like *Byblis* but article 2 of pereopod 7 not expanding evenly towards apex; most species of *Haploops* and few of *Byblis* with coxae 2-3 tapering.

Differing from most species of *Ampelisca* in the very thin article 2 of pereopod 7, the article not expanding distally; the coxae of *Haploops* are shortened, coxa 1 is very prominent, coxae 2-3 taper and the posteroventral margin of coxa 4 is not parallel to the anterior margin.

Removal. *Haploops securiger* K.H. Barnard, 1931a, to *Byblis.*

Species. See Dickinson (1983); Gurjanova (1951); Kanneworff (1966); Karaman (1975d); Ledoyer (1968, 1977); Shoemaker (1930a, 1955a); Stephensen, (1925a, 1935a); *H. abyssorum* Chevreux, 1908a, 1935 [304B]; *H. dellavallei* Chevreux, 1900a (Kaim-Malka, 1976a) (Bellan-Santini, 1982c) [340 + B]; *H. descansa* J. L. Barnard, 1961a [715B]; *H. fundiensis* Wildish & Dickinson, 1982 [255]; *H. laevis* Hoek, 1882 (Gurjanova, 1951) (Kanneworff, 1966) (Dickinson, 1983) [200 + B]; [*H. lineata* Stuxberg, 1880 (*nomen nudum*)]; *H. lodo* J.L. Barnard, 1961a, 1964a, 1971b (Margulis, 1967) [535BA]; *H. nirae* Kaim-Malka, 1976a (Bellan-Santini, 1982c) [330 + B]; *H. oonah* Lowry & Poore, 1985 [717B]; *H. proxima* Chevreux, 1920, 1927 (Kaim-Malka, 1976a) (Bellan-Santini, 1982c) [330 + B]; *H. setosa* Boeck, 1871 (= *H. robusta* Sars, 1895) (= *H. sarsi* Schellenberg, 1925b) (? = *H. sibirica* Gurjanova, 1929b, 1932, 1951) (Sars, 1895) (Mills, 1971) (Lincoln, 1979a) (Dickinson, 1983) [200 + BA]; *H. similis* Stephensen, 1925a (Kanneworff, 1966) (Mills, 1971) [216 + BA]; *H. tenuis* Kanneworff, 1966 [240]; *H. tubicola* Liljeborg, 1856 (= *H. carinata* Liljeborg, 1856) (= *H. spinosa* Shoemaker, 1931b) (Sars, 1895) (Kanneworff, 1966) (Lincoln, 1979a) (Dickinson, 1983) [210 + BA]; *H. vallifera* Stephensen, 1925a [216B].

Habitat and distribution. Marine, cosmopolitan, cold water, submergent, 6-3570 m, 14 species.

AMPHILOCHOID group

Diagnosis. Accessory flagellum vestigial or absent. Rostrum well developed. Peduncle of uropod 3 moderately to strongly elongate. Telson usually entire but if telson cleft then propodus of gnathopods not more than 1.4 times as long as broad, these gnathopods with broad, subtransverse palm. Peduncle of uropod 3 slightly to strongly elongate.

See Eusiridae (= Pontogeneiidae, Calliopiidae), Pleustidae, Leucothoidae, Anamixidae, Stenothoidae (= Thaumatelsonidae), Cressidae and Stegocephalidae.

Description. Rostrum large. Eyes ordinary, ommatidial, round or ovate, rarely reniform (if ever). Antennae short, antenna 1 usually slightly to greatly thicker than antenna 2. Upper lip ventrally notched (except Pseudamphilochidae). Mandibular rakers numerous and dominating incisor, palp thin (when present) poorly setose, generally attached opposite molar and thus very proximally, occasionally articles 2 or 3 unusually short or elongate, molar variable. Outer lobes of lower lip thin and gaping, often notched, mandibular lobes well developed or vestigial, inner lobes absent or when present not filling gape. Inner plate of maxilla 1 medium to small, poorly armed, outer plate with apical margin usually very oblique, spines often poorly organised and intermixed with spinules or setae. Maxilla 2 poorly armed, variable, but outer plate when present usually longer and much thinner than inner plate. Inner plate of maxilliped usually large, elongate, narrow; outer plate variable but usually of area larger than inner plate, both plates poorly armed, palp thin, 4-articulate, dactyl elongate, unguiform.

Coxae 3-4 very elongate, coxa 4 large, posterodorsally excavate; coxae 1-2 variable. Gnathopods highly variable, article 3 short, carpus often carpochelate, propodus broad to narrow, chelate to simple. Pereopods 3-4 long and thin, rarely article 6 weakly prehensile; pereopods 5-7 extending subequally, 7 never significantly longer than 5, article 2 expanded or rectolinear.

Epimera generally ordinary, stable, poorly ornamented, poorly armed. Pleopodal peduncles elongate. Uropod 2 shortened; outer ramus of uropod 2, more rarely uropod 1, shortened. Uropod 3 biramous, peduncle usually elongate. Telson basically laminar and articulate but occasionally greatly enlarged and fleshy or ventrally keeled (in these cases much larger than in Corophioidea).

Relationship. Except for Pseudamphilochidae, which have a eusirid jizz, differing from the Eusiridae (including Pontogeneiidae, Calliopiidae) in the small and hidden coxa 1. The Pseudamphilochidae differ from Eusiridae and congeners in the coxal configuration, with coxa 1 generally broader than coxae 2-3 and in the overall combination of mouthparts, with obsolescent molar combined with tiny inner plate of maxilla 1 bearing only 1 seta, combined with elongate cleft telson.

Differing from Pleustidae in having coxa 1 small and hidden except for Pseudamphilochidae which have normal coxa 1; Pseudamphilochidae however, have cleft telson, not typical of Pleustidae. Many pleustids and amphilochids have similar pleustid lower lips: tilted oval outer lobes astride fused inner lobes.

The Leucothoidae and Anamixidae always have strongly carpochelate gnathopod 1 with narrow sixth article (or gnathopod 1 is absent), the Amphilochoids never having the precise situation seen in Leucothoidae where the combination of articles 5 and 6 is axially aligned. Of course, most Leucothoidae have large coxa 1 and most Amphilochoids have tiny coxa 1 but exceptions occur in both groups; in some Anamixidae a ventral keel dominates the mandibles and maxillae.

The Stenothoidae and Cressidae have uniramous uropod 3.

The Stegocephalidae always lack mandibular molar and palp, whereas no amphilochoidid lacks both simultaneously; the lateral shield of Stegocephalidae has broad coxa 4, broad coxa 1 and narrow coxae 2-3, a combination not precisely seen in Amphilochoids; few Stegocephalidae have coxa 1 so small as to be confused with the majority of Amphilochoidea all of which, except Pseudamphilochidae, have the small and hidden coxa 1; the accessory flagellum of Stegocephalidae is almost always very conspicuous.

See further in Pseudamphilochidae and Bolttsiidae.

Key to Families of the Amphilochoid Group

1. Coxae 3-4 immensely broadened, with contiguous margins abutting or rabbeted, coxa 2 hidden ..... Cyproideidae

—— Coxae 3-4 not immensely broadened, with contiguous margins overlapping, coxa 2 not hidden 2

2. Coxa 1 very small, hidden, telson entire ..... Amphilochidae

—— Coxa 1 not small, not hidden, telson cleft ..... Pseudamphilochidae

—— Coxa 1 not small, not hidden, telson entire ..... Bolttsiidae

AMPHILOCHIDAE Boeck, 1871b

Diagnosis. Coxa 4 immensely broadened, coxae 2-4 with contiguous margins overlapping, not rabbeted, coxa 2 not hidden; coxa 1 very small and hidden by coxa 2. Peduncle of uropod 3 elongate. Telson entire, elongate.

Description. Body slick. Articles 2-3 of antenna 1 not shortened. Outer lobes of lower lip usually with medial notch; inner lobes weak or absent or forming fused surficial plaque, one genus (*Amphilochoides*) with distinct inner lobes and lower lip like Pleustidae. Palp of maxilliped lacking process on article 3 or process very weak. Pereopods 5-7 elongate, article 2 expanded. In known species, outer ramus of uropod 2 shortened.

See notes with Amphilochoid group, Bolttsiidae, Cyproideidae and Pseudamphilochidae.

Key 1 to Genera of Amphilochidae

1. Mandibular molar medium to large, with strongly ridged triturative surface, often cushion shaped 2

—— Mandibular molar medium to absent, triturative surface weak or absent 7

2. Palp of maxilla 1 with 2 articles 3

—— Palp of maxilla 1 with 1 article 5

3. Rostrum very large, probosciform, gnathopods 1-2 simple ..... *Rostrogitanopsis*

—— Rostrum ordinary, at least gnathopod 2 subchelate 4

4. Pereopods 3-7 subchelate, peduncular articles 1-3 of antenna 1 progressively longer ..... *Afrogitanopsis*

—— Pereopods 3-7 simple, peduncular articles 1-3 of antenna 1 progressively shorter ..... *Gitanopsis*

5. Outer plate of maxilliped strongly excavate medially, palp article 1 elongate ..... *Gitanogeiton*

—— Outer plate of maxilliped straight or slightly excavate medially, palp article 1 subequal to article 2 6

6. Gnathopod 2 large, subchelate ..... *Amphilochopsis*

—— Gnathopod 2 feeble, often nearly simple ..... *Gitana*

7. Maxilla 2 composed only of 1 elongate plate ..... *Amphilochella*

—— Maxilla 2 with 2 plates 8

8. Dactyl of gnathopod 2 lacking nodiform process on inner margin 9

—— Dactyl of gnathopod 2 bearing nodiform process on inner margin 10

9. Plates of maxilla 2 subequally wide, inner with fewer than 4 small setae ..... *Cyclotelson*

—— Inner plate of maxilla 2 more than twice as wide as outer plate, with 10 or more large setae or setal spines ..... *Amphilochus*

10. Mandibular molar large, elongate (but poorly triturative), dactyl of gnathopod 1 lacking nodiform process on inner margin ..... *Paramphilochoides*

—— Mandibular molar obsolescent, dactyl of gnathopod 1 bearing nodiform process on inner margin ..... *Amphilochoides*

Afrogitanopsis Karaman

Afrogitanopsis Karaman, 1980a: 45.

Type species. *Gitanopsis paguri* Myers, 1974d, original designation.

Diagnosis. Mandibular molar moderately large, tapering distally, triturative; article 3 of palp not falcate. Palp of maxilla 1 2-articulate. Maxilla 2 ordinary, inner plate larger than outer one. Outer plate of maxilliped not excavate, palp article 1 much longer than article 2. Gnathopods 1-2 medium, subchelate, palm oblique, dactyl lacking large, nodiform process, carpus short but strongly produced posterodistally. Pereopods 3-7 subchelate. Uropods 1-3 with peduncle longer than rami, outer ramus longer than inner. Urosomite 3 not alate. Peduncular articles 1-3 of antenna 1 progressively longer toward article 3, accessory flagellum present, minute, 1-articulate. Labium with short mandibular lobes, outer lobes tapering distally, notched, inner lobes absent.

Relationship. Differing from *Gitanopsis* in the subchelate pereopods 3-7 and in the progressively longer peduncular articles of antenna 1. From *Rostrogitanopsis* in the normal rostrum, subchelate gnathopods 1-2 and in the ordinary shape of palp article 3 of the mandible.

Species. *A. paguri* (Myers, 1974d) [683I].

Habitat and distribution. Marine, Kenya, commensal on Decapoda *Dardanus megistos*, 1 species.

Amphilochella Schellenberg

Fig.25J

Amphilochella Schellenberg, 1926a: 307.

Type species. *Amphilochella simplicarpus* Schellenberg, 1926a, monotypy.

Diagnosis. Mandibular molar absent. Palp of maxilla 1 2-articulate. Maxilla 2 composed of 1 long thin plate. Plates of maxilliped stunted, outer not excavate, palp ordinary. Gnathopods 1-2 small, almost simple, posterior margin of propodus with setose acclivity, dactyl lacking basal processes. [Urosomite 3 unknown]. Upper lip very deeply notched. Gnathopods not carpochelate (type). [Lower lip, uropods 2-3, telson unknown in type; in *A. laticarpa* uropod 2 with short outer ramus, of uropod 3 almost as long as inner; telson elongate, triangular, sharp].

Variable. Gnathopods weakly carpochelate (*A. laticarpa*).

Relationship. More or less like *Amphilochus* but differing from it and all other amphilochids in the reduction of maxilla 2 to one plate.

Species. *A. laticarpa* Ledoyer, 1978b [697]; *A. simplicarpa* Schellenberg, 1926a [881].

Habitat and distribution. Marine, Antarctica to Mauritius, shallow water and under ice, 2 species.

Amphilochoides Sars

Fig.24H

Amphilochoides Sars, 1895: 220.–Stebbing, 1906: 152.–Lincoln, 1979a: 154.

Type species. *Amphilochus odontonyx* identification of Sars, 1895 (= *Amphilochoides boecki* Sars, 1895), original designation.

Diagnosis. Mandibular molar small to absent, not triturative. Palp of maxilla 1 2-articulate, *outer plate medially toothed* (unique). Maxilla 2 feeble, very poorly setose. Outer plate of maxilliped not excavate, palp article 2 equal to or shorter than article 1. Gnathopods 1-2 very large, subchelate, palm very oblique, both pairs of dactyls with nodiform process on inner margin.

Urosomite 3 poorly alate. Lower lip with tilted, ovate outer lobes astride distinct inner lobes widely separating outer lobes. Gnathopods carpochelate, dactyl often very elongate, flagellate.

Variables. In light of Lincoln's (1979a) new character usage of nodiform processes on gnathopodal dactyls and our use of maxilla 2, *A. pseudolongimanus* needs clarification; it may need reclassification.

Relationship. Differing from *Amphilochus* in the nodiform processes on the gnathopodal dactyls.

See *Paramphilochoides*.

Species. *A. boecki* Sars, 1895 (as *A. odontonyx* also in Sars, 1895) (Lincoln, 1979a) (? as *A. serratipes* in Krapp-Schickel, 1982c) [240]; *A. longimanus* (Chevreux, 1888b, 1900a) (Chevreux & Fage, 1925) (Ledoyer, 1977) (Krapp-Schickel, 1982c) [330]; ?*A. pseudolongimanus* Ledoyer, 1977 [348B]; *A. serratipes* (Norman, 1869a) (Lincoln, 1979a) (? not Krapp-Schickel, 1982c, ? = *A. boecki*) [330 + B].

Habitat and distribution. Marine, boreal and warm north-east Atlantic and Mediterranean, 0-370 m, 4 species.

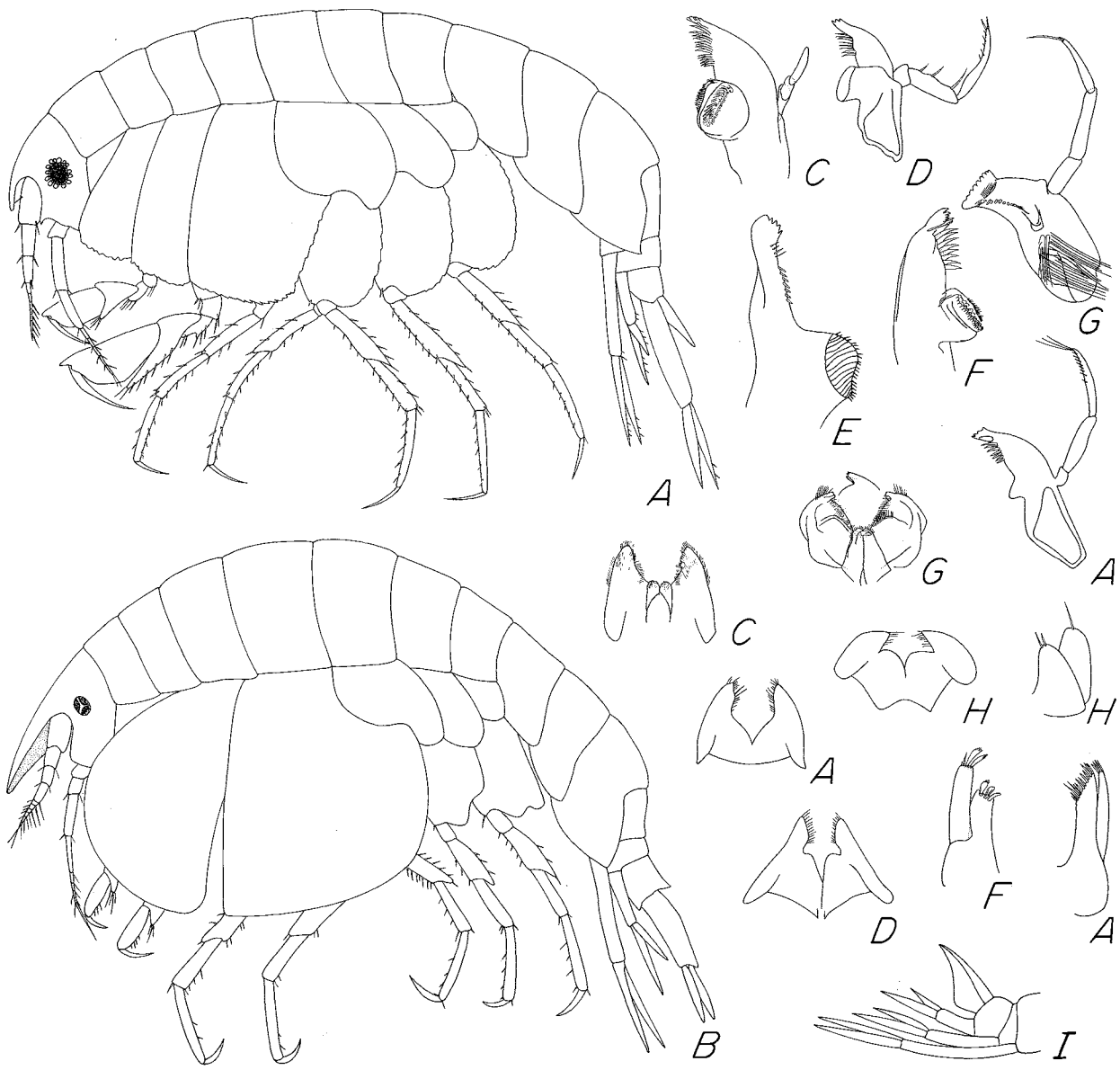

Fig.24. Amphilochidae and Cyproideidae. A, *Amphilochus manudens*; B, *Stegoplax longiorostris*; C, *Austropheonoides mundoe*; D, *Gitanopsis bisinosa*; E, *Neocyproidea otakensis*; F, *Narapheonoides mullaya*; G, *Cyproidea ornata*; I, *Peltocoxa marioni*.

Amphilochopsis Stephensen

Amphilochopsis Stephensen, 1925a: 173.

Type species. *Amphilochopsis hamatus* Stephensen, 1925a, monotypy.

Diagnosis. Mandibular molar of medium size, triturative. Palp of maxilla 1 1-articulate. Maxilla 2 ordinary though inner plate rather narrow. Outer plate of maxilliped not excavate, palp article 1 equal to article 2. Gnathopods 1-2 large, subchelate, palm very oblique, convex, dactyl without large nodiform process. Urosomite 3 weakly alate. Article 2 of antenna 1 with tooth. Lower lip ordinary. Gnathopods carpochelate, gnathopod 2 also moderately merochelate.

Relationship. Differing from *Gitanopsis* in the 1-articulate palp of maxilla 1.

Species. *A. hamatus* Stephensen, 1925a (Gurjanova,

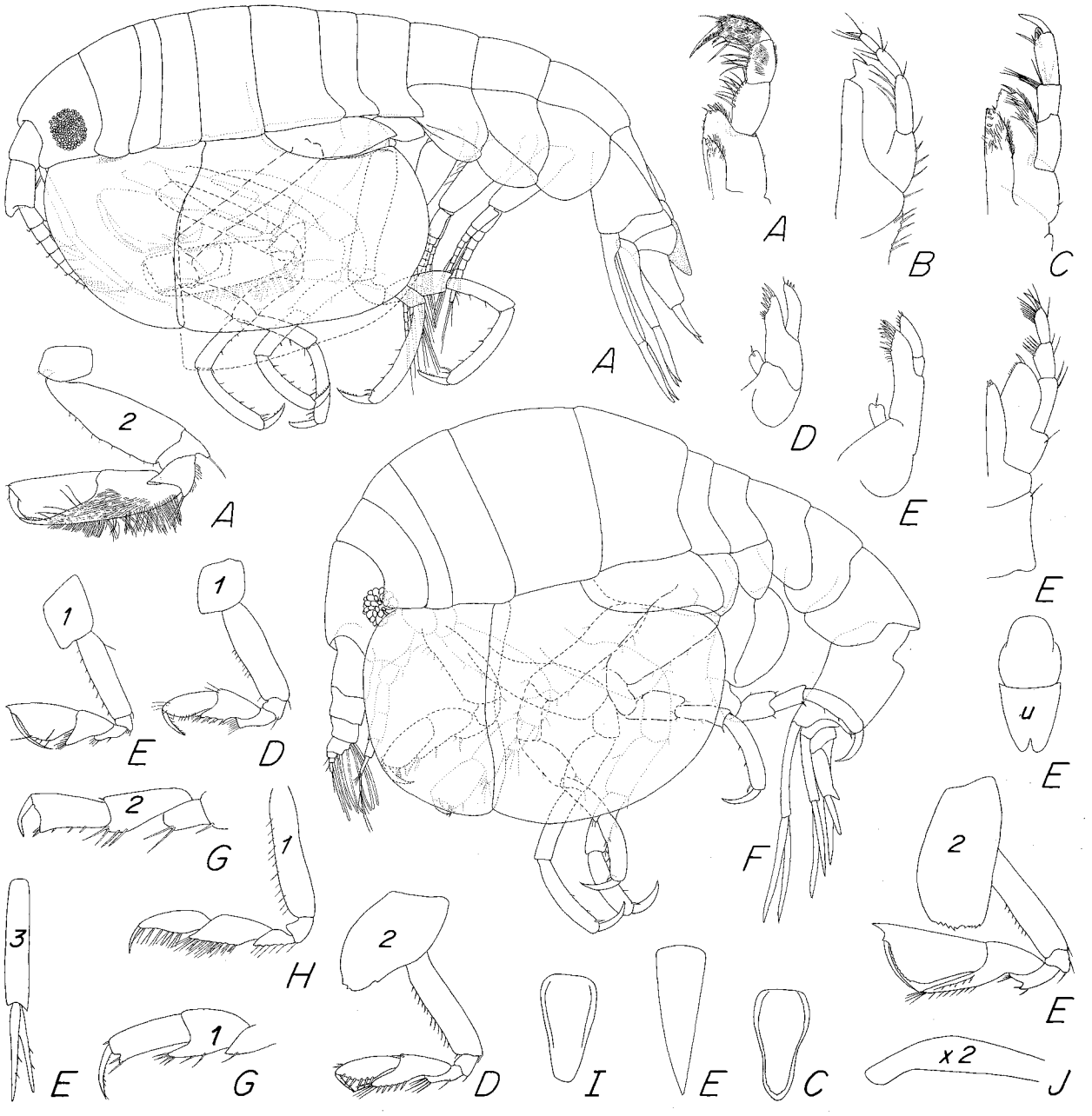

Fig.25. Amphilochidae and Cyproideidae. A, *Cyproidea ornata*; B, *Gitanogeiton sarsi*; C, *Austropheonoides mundoe*; D, *Gitana sarai*; E, *Amphilochus manudens*; F, *Narapheonoides mullaya*; G, *Hoplopheonoides obesa*; H, *Peltopes productus*; I, *Cyclotelson purpureum*; J, *Amphilochella simplicarpus*.

1951) [220B].

Habitat and distribution. Marine, Arctic, 325-2702 m, 1 species.

Amphilochus Bate

Figs 24A, 25E

Amphilochus Bate, 1862: 107.–Stebbing 1906: 149.–McKinney, 1978a: 137.
Callimerus Stebbing, 1876c: 445 (*Callimerus acudigitatata* Stebbing, 1876c, original designation).

Type species. *Amphilochus manudens* Bate, 1862, monotypy.

Diagnosis. Mandibular molar small, columnar, conical or weakly bulbous, poorly or not triturative. Palp of maxilla 1 2-articulate. Maxilla 2 ordinary, or outer plate as long as inner but inner much wider, well setose. Outer plate of maxilliped not excavate, palp article 1 subequal to or longer than (type) article 2. Gnathopods 1-2 large to small, diverse or not, subchelate, palm straight or weakly convex, subtransverse, dactyl lacking nodiform process. Urosomite 3 poorly alate. Lower lip ordinary. Gnathopods more or less carpochelate.

Variables. Palp article 2 of maxilliped almost twice as long as article 2 (*A. opunake*, see *Gitanogeiton*); certain east Pacific and west Atlantic species with molar much better developed than in east Atlantic species; palp article 3 not setose in east Pacific species; molar thus strong (*A. picadurus*, but pointed; *A. likelike*, *A. menehune*, *A. kailua*, these three large, blunt, weakly triturative); gnathopods 1-2 almost identical (*A. kailua*), gnathopods 1-2 diverse (*A. litoralis*).

Relationship. Differing from *Gitanopsis* in the feeble molar.
See *Cyclotelson*.

Species. See Chevreux & Fage (1925); Duhig & Humphries (1955); Krapp-Schickel (1982c); Ledoyer (1968, 1977); Schellenberg (1938a); Stephensen (1925a); *A. borealis* Enequist, 1950 [237]; *A. brunneus* Della Valle, 1893 (Chevreux & Fage, 1925) (= *A. melanops* Walker, 1895b) (Krapp-Schickel, 1982c) [330 + 440]; *A. casahoya* McKinney, 1978a [474]; *A. delacaya* McKinney, 1978a [471]; *A. filidactylus* Hurley, 1955 [849]; *A. kailua* J.L. Barnard, 1970a [381]; *A. likelike* J.L. Barnard, 1970a [381]; *A. litoralis* Stout, 1912 (J.L. Barnard, 1962c, 1969a) [370]; *A. manudens* Bate, 1862 (= *A. concinna* Stebbing, 1876c) (= *A. acudigitata* Stebbing, 1876c) (= *A. boecki* Meinert, 1893, = homonym) (Sars, 1895) (Lincoln, 1979a) [250 + B + I]; *A. marionis* Stebbing, 1888 (Bellan-Santini & Ledoyer, 1974) [835]; *A. menehune* J.L. Barnard, 1970a (Myers, 1985c) [550]; *A. neapolitanus* Della Valle, 1893 (Chevreux & Fage, 1925) (Lincoln, 1979a) [422I]; *A. opunake* J.L. Barnard, 1972b [775]; *A. picadurus* J.L. Barnard, 1962c, 1979b (Krapp-Schickel, 1982c) [370 + 340]; *A. pillaii* Barnard & Thomas, 1983 [478I]; *A. planierensis* Ledoyer, 1977 [348]; ?*A. schubarti* Schellenberg, 1938b (?Sivaprakasam, 1968a) (like *Cyclotelson*) [453]; *A. spencebatei* (Stebbing, 1876b) (= *A. anomalus* Chevreux, 1900a, ? = *A. brunneus* also) (Chevreux & Fage, 1925) (Lincoln, 1979a) [330]; *A. tenuimanus* Boeck, 1871b (Sars, 1895) [240 + B]; *A. tropicus* (Rabindranath, 1972a) [666].

Habitat and distribution. Cosmopolitan but antipolar, eurythermal, 0-600 m, probably slime lapper, often on scleractinian corals and the horny coral, *Pterogorgia*, 20 species.

Cyclotelson Potts

Fig.25I

Cyclotelson Potts, 1915: 87.

Type species. *Cyclotelson purpureum* Potts, 1915, monotypy.

Diagnosis. Mandibular molar [?absent]. Palp of maxilla 1 2-articulate. Maxilla 2 ordinary, though inner plate not greatly widened. Outer plate of maxilliped not excavate, palp article 1 subequal to article 2. Gnathopods 1-2 small, subchelate, palm weakly oblique, dactyl of gnathopods 1-2 lacking nodiform process. Urosomite 3 strongly alate. Lower lip ordinary. Gnathopods carpochelate. [Rami of uropods 1-3 unknown].
Genus requiring further study.

Relationship. Like *Amphilochus* but plates of maxilla 2 equally wide.

Species. *Cyclotelson purpureum* Potts, 1915 [635].

Habitat and distribution. Marine, Torres Straits, Australia, littoral, 1 species.

Gitana Boeck

Fig.25D

Gitana Boeck, 1871b: 132.–Stebbing, 1906: 155.–Lincoln, 1979a: 162.

Type species. *Gitana sarsi* Boeck, 1871b, designated by Sars, 1895: 229.

Diagnosis. Mandibular molar large, cushion shaped, triturative. Palp of maxilla 1 1-articulate. Maxilla 2

ordinary. Outer plate of maxilliped weakly excavate or not, palp article 1 equal to or subequal to article 2, or latter longer. Gnathopods 1-2 small, poorly subchelate or almost simple, palm very oblique, dactyl lacking large inner nodiform process. Urosomite 3 poorly alate. Lower lip ordinary. Gnathopods more or less carpochelate.

Variables. Inner plate of maxilla 2 rather thin (*G. longicarpa*) but broader than outer; gnathopods simple (*G. rostrata*, *G. longicarpa*, etc.), gnathopod 2 scarcely carpochelate (*G. longicarpa*, *G. rostrata*; etc.)

Relationship. Like *Gitanopsis* but palp of maxilla 1 1-articulate. Like *Amphilochopsis* but gnathopod 2 feeble.

Species. See Chevreux (1911); Chevreux & Fage (1925); Gurjanova (1951); Krapp-Schickel (1982c); Ledoyer (1973c); Schellenberg (1942); Stephensen (1938b); *G. abyssicola* Sars, 1895 (Ledoyer, 1973c) [355]; *G. bilobata* Myers, 1985c [576]; *G. calitemplado* J.L. Barnard, 1962c, 1964b [370]; *G. gracilis* Myers, 1985c [576]; *G. liliuokalaniae* J.L. Barnard, 1970a [381]; *G. longicarpa* Ledoyer, 1977 [348B]; *G. rostrata* Boeck, 1871b (Sars, 1895)[240B]; *G. sarsi* Boeck, 1871b (Sars, 1895) (= *G. sabrinae* Stebbing, 1878a) (Lincoln, 1979a) [355].

Habitat and distribution. Marine, cold and warm north-east Atlantic, warm mid to east Pacific, 0-575 m, 8 species.

Gitanogeiton Stebbing

Fig.25B

Gitanogeiton Stebbing, 1910a: 578.

Type species. *Gitanogeiton sarsi* Stebbing, 1910a, monotypy.

Diagnosis. Mandibular molar large, cushion shaped, triturative. Palp of maxilla 1 1-articulate. Maxilla 2 ordinary. Outer plate of maxilliped strongly excavate, palp article 1 nearly twice as long as article 2 (but also true of *Amphilochus opunake*). Gnathopods 1-2 small, scarcely subchelate, palm oblique. [Urosomite 3 unknown]. Upper lip very deeply notched. Gnathopods carpochelate. [Uropods unknown].

Relationship. Differing from *Gitana* in the elongate article 1 of the maxillipedal palp and the strongly excavate outer plate on the maxilliped.

Transfer. *Gitanogeiton tropica* to *Amphilochus*.

Species. *Gitanogeiton sarsi* Stebbing, 1910a [781].

Habitat and distribution. Marine, off Manning River, New South Wales, sublittoral, 1 species.

Gitanopsis Sars

Fig.24D

Gitanopsis Sars, 1895: 223.–Stebbing, 1906: 153.–McKinney, 1978a: 140.–Lincoln, 1979a: 164.–Karaman, 1980a: 44.

Type species. *Amphilochus bispinosus* Boeck, 1871b, original designation.

Diagnosis. Mandibular molar large, cushion shaped, triturative. Palp of maxilla 1 2-articulate. Maxilla 2 ordinary. Outer plate of maxilliped not excavate, palp article 1 subequal to article 2 or longer. Gnathopods 1-2 large to small and feeble, subchelate or scarcely so, palm transverse to oblique, dactyl lacking large, nodiform process. Urosomite 3 poorly alate. Lower lip ordinary (also notched). Gnathopods more or less carpochelate. Pereopods 3-7 rarely prehensile.

Variables. Accessory flagellum consisting of 0-2 articles; gnathopods feeble, poorly subchelate and scarcely carpochelate (*G. simplex*); gnathopods small, weakly carpochelate (*G. bispinosus*, type); gnathopod 2 very large, both strongly carpochelate (*G. inaequipes*, *G. magdai*); gnathopods of medium size, strongly to moderately carpochelate (*G. inermis*, *G. pele*); gnathopods of medium size but subequal to each other, propodus broad, palm transverse (*G. pusilloides*); weakly like *G. pusilloides* but propodus smaller, carpus more strongly carpochelate (*G. tortugae*); propodus even smaller (*G. squamosa*); like *G. pusilloides* but palm more oblique (*G. desmondi*); pereopods 3-7 prehensile (with swollen and spinose propodus) (*Afrogitanopsis paguri*); inner plate of maxilla 2 scarcely broadened (*G. pusilloides*, *G. tortugae*, *G. magdai*); outer ramus of uropod 3 significantly shortened (*G. pusilloides*); outer plate of maxilliped weakly excavate (*G. pele*, *G. kupe*); molar large but poorly triturative (*G. vilordes*, *G. baciroa*, etc.).

Relationship. The basic genus of Amphilochidae; thus, mandibular molar fully triturative, palp of maxilla 1 1-articulate, maxilla 2 ordinary, dactyl of gnathopods simple, etc.

Removals. *Gitanopsis mariae* Griffiths, 1973, to *Rostrogitanopsis*; *G. paguri* Myers, 1974d, to *Afrogitanopsis*.

Species. See K.H. Barnard (1932); Griffiths (1973-1975); Gurjanova (1951); Just (1980, for unidentified);

Ruffo (1969); Schellenberg (1925a, 1931); Stephensen (1925a, 1938b, 1940b, 1944a, 1947a, 1949); Thurston (1974a,b); *G. arctica* Sars, 1895 (Shoemaker, 1955a) [200]; *G. baciroa* J.L. Barnard, 1979b [540]; *G. bispinosa* (Boeck, 1871a) (Sars, 1895) (Lincoln, 1979a) [216]; *G. brevicula* Hirayama, 1983 [395]; *G. desmondi* J.L. Barnard, 1972b (= *G. pusilloides* identification of Hurley, 1955a) [776]; *G. difficilis* J.L. Barnard, 1961a [718B]; *G. inaequipes* Schellenberg, 1926a [881]; *G. inermis* (Sars, 1883) (= *G. oculatus* Hansen, 1888) (Sars, 1895) (Lincoln, 1979a) [216]; *G. japonica* Hirayama, 1983 [395]; *G. kupe* J.L. Barnard, 1972b [774]; *G. laguna* McKinney, 1978a [474]; *G. longa* Hirayama, 1983 [395]; *G. magdai* Reid, 1951 [444]; *G. pele* J.L. Barnard, 1970a (Ledoyer, 1972, 1978b, 1979a) [600]; *G. petulans* Karaman, 1980a [367]; *G. pusilla* K.H. Barnard, 1916 (Ledoyer, 1979a) [700 + 810 + I]; *G. pusilloides* Shoemaker, 1942 (J.L. Barnard, 1969b) [370]; *G. robastodentes* Hirayama, 1983 [395]; *G. simplex* Schellenberg, 1926a [881]; *G. squamosa* (Thomson, 1880) (= *G. antarctica* Chevreux, 1912a,d) (Hurley, 1955) (Bellan-Santini & Ledoyer, 1974) [800]; *G. subpusilla* Rabindranath, 1972a [666]; *G. tai* Myers, 1985c [576]; *G. tenuipes* Ledoyer, 1982b [698]; *G. tortugae* Shoemaker, 1933a (Nelson, 1979) [362]; *G. vilordes* J.L. Barnard, 1962c, 1969a (Nagata, 1965a) [393].

Habitat and distribution. Marine, cosmopolitan but rare in cold water, 0-875 m, 25 species.

Paramphilochoides Lincoln

Paramphilochoides Lincoln, 1979a: 158.

Type species. *Amphilochoides intermedius* Scott, 1896b, original designation.

Diagnosis. Mandibular molar strong, poorly triturative. Palp of maxilla 1 2-articulate. Maxilla 2 feeble, poorly setose. Outer plate of maxilliped [not ?excavate], palp article 2 [unknown]. Gnathopods 1-2 medium or large, subchelate, palm very oblique, only dactyl of gnathopod 2 with nodiform process on inner margin. Urosomite 3 not ornamented. Lower lip [?with tilted ovate outer lobes astride distinct inner lobes widely separating outer lobes]. Gnathopods carpochelate, dactyl of gnathopod 2 often very elongate, flagellate.

Relationship. Differing from *Amphilochoides* in the untoothed medial margin on the outer plate of maxilla 1, the strong (but nontriturative) molar, and the lack of a nodiform process on the dactyl of gnathopod 1 only.

Species. *Paramphilochoides intermedius* (Scott, 1896b) (Lincoln, 1979a) [?330]; *P. odontonyx* (Boeck, 1871) (= *P. pusillus* Sars, 1895) (Lincoln, 1979a) [355].

Habitat and distribution. Marine, north-east boreal and warm Atlantic, 15-200 m, 2 species.

Rostrogitanopsis Karaman

Rostrogitanopsis Karaman, 1980a: 64.

Type species. *Gitanopsis mariae* Griffiths, 1973, original designation.

Diagnosis. Mandibular molar large, triturative, third palpar article dilated medially. Palp of maxilla 1 2-articulate. Inner plate of maxilla 2 much larger than outer, both plates with distal setae. Outer plate of maxilliped slightly excavate, palp article 1 nearly subequal to article 2. Gnathopods 1-2 feeble, linear, simple, slightly carpochelate, with article 5 much wider (lobate) than article 6, but nearly as long as article 6, dactyl normal.

Pereopods 5-7 with [?unlobed article 2]. Urosomite 3 not ornamented. Telson long, tridentate distally.

Rostrum extremely developed, prosbosciform. Accessory flagellum absent. [Upper and lower lip unknown].

Relationship. Differing from *Gitanopsis* in the probosciform rostrum, simple gnathopods 1-2, slightly excavate outer plate of maxilliped, shape of telson and third palpar article of mandible, and excavate lateral cephalic lobes.

See *Afrogitanopsis*.

Species. *Rostrogitanopsis mariae* (Griffiths, 1973) (Karaman, 1980a) (Ledoyer, 1982b) [741].

Habitat and distribution. Marine, Cape Province, South Africa, 120-200 m, 1 species.

AMPITHOIDAE Stebbing, 1899a

Diagnosis. Corophioid either with outer lobes of lower lip notched (except *Amphitholina, Pleonexes* and *Pseudopleonexes* in Ampithoidae and see contrary positive occurrence in *Arctolembos* of Corophioidea) or with inner ramus of uropod 3 as short as (shortened) outer ramus and broad, pad-like and apically setose, or outer ramus of uropod 3 with 1-2 large articulate apical spines divergent from axis of ramus.

Removal. *Pleonexes* to *Ampithoe*.

Key to Genera of Ampithoidae

1. Gnathopod 1 dominant or stouter than 2 2

—— Gnathopod 1 inferior or smaller than 2 4

2. Molar triturative, well developed, rami of uropod 3 narrow ..... *Paragrubia*

—— Molar reduced, lower lip lacking notches, rami of uropod 3 broad 3

3. Mandibular palp 3-articulate, palm of gnathopod 1 transverse, gnathopod 1 small ..... *Exampithoe* type

—— Mandibular palp 2+articulate, palm of gnathopod 1 oblique, gnathopod 1 small ..... *Exampithoe gracilipes*

—— Mandibular palp absent, palm of gnathopod 1 oblique, gnathopod 1 large ..... (*Melanesius*)

4. Gnathopod 1 article 6 broad, palm oblique 5

—— Gnathopod 1 article 6 narrow, palm transverse or almost so 9

5. Outer ramus of uropod 3 tipped by 2 large upcurved hook-spines 6

—— Outer ramus of uropod 3 tipped by 1+ small or straight or weakly curved spines 8

6. Spur on peduncle of uropod 1, if present weak and blunt, accessory flagellum vestigial ..... *Ampithoe*

—— Spur on peduncle of uropod 1 long and sharp, accessory flagellum with 1+ long article(s) 7

7. Gnathopods 1-2 similar in size and form; accessory flagellum 1-articulate; mandibular palp slender, weakly setose ..... *Paradusa*

—— Gnathopod 2 large and diverse from gnathopod 1; accessory flagellum 2+articulate, mandibular palp stout, strongly setose ..... *Cymadusa*

8. Accessory flagellum and spur on uropod 1 present, palp of maxilla 1 ordinary, apically spinose; pereopods 5-7 not prehensile ..... *Amphithoides*

—— Accessory flagellum and spur on uropod 1 absent, palp of maxilla 1 reduced, bearing only 2 apical setae, pereopods 5-7 prehensile ..... *Pseudoamphithoides*

9. Telsonic cusps expanded into huge hooks 10

—— Telsonic cusps small and ordinary 11

10. Palps of mandible and maxilla 1 absent ..... *Amphitholina*

—— Palps of mandible and maxilla 1 present ..... *Pseudopleonexes*

11. Mandibular palp absent ..... *Sunamphitoe*

—— Mandibular palp present 12

12. Pereopod 7 enormously expanded, oar-like ..... *Macropisthopous*

—— Pereopod 7 ordinary, like pereopod 6 ..... *Peramphithoe*

Amphithoides Kossmann

Amphithoides Kossmann, 1880: 135.–Stebbing, 1906: 645.–J.L. Barnard, 1969c: 143.

Type species. *Amphithoides longicornis* Kossmann, 1880, monotypy.

Diagnosis. Most facts taken from *A. mahafalensis*: body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus [?weak]. Eyes ordinary. Antennae very long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum rounded, entire. Mandible normal, palp weak, very slender, article 3 rectolinear, longer than 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 short, with 1 seta, outer plate with 9 spines, palp 2-articulate. Outer plate of maxilla 2 broad, inner narrow, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate long, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail. Coxae relatively long, strongly overlapping, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 scarcely diverse, of subequal size, moderately large, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, nearly merochelate, article 5 shorter than 6, poorly lobed, palm oblique. Gnathopod 2 slightly enlarged, subchelate, with article 2 barely dilated, with article 4 enlarged, incipiently merochelate, extended along posterior margin of article 5, article 5 almost as long as 6, lobed, article 6 dilated, dactyl long.

Pereopods 3-4 normal, similar, with inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 much shorter than 7, with slightly broader article 2, pereopods 5-7 with narrow to broad unlobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods [undescribed]. Epimeron 3 bisinuate.

Uropods 1-2 biramous, normal, rami slightly unequal, longer (2) than or as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 of ordinary length, biramous, both rami short, peduncle elongate, longer than rami, rami subequal, outer ramus with 1 tiny distal hook and 1 tubercle, inner ramus narrow, tapering, with few armaments. Telson entire, as broad as long, pentagonal, without apical cusps, unarmed.

Female. Sexual dimorphism (except for oostegites), weak. Gnathopods with poorly sculptured palms. Oostegites broad, present on [?segments 2-5].

Sexual dimorphism. Weak.

Relationship. Differing from *Ampithoe* in the presence of an accessory flagellum and with hooks on outer ramus of uropod 3 reduced or inconspicuous; from almost all other ampithoids in the slender, spined but non-setose inner ramus of uropod 3.

This genus is identifiable as an ampithoid principally in the notched outer lobes of the lower lip, diverse lobes of maxilla 2, and the condition of the mandibular palp.

See *Pseudoamphithoides*.

Species. *Amphithoides longicornis* Kossmann, 1880 (Stebbing, 1906) [677]; *A. mahafalensis* Ledoyer, 1967a, 1973b, 1982b [698]; *A. patrizii* Maccagno, 1936 [677].

Habitat and distribution. Marine, western Indian Ocean and Red Sea, shallow water, 3 species.

Amphitholina Ruffo

Fig.26C

Amphitholina Ruffo, 1953a: 5.

Type species. *Amphithoe cuniculus* Stebbing, 1874b, original designation.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Head subglobular, rostrum absent, supra-antennal line absent except in defining ocular lobes, ocular lobes obsolescent, blunt, antennal sinus absent. Eyes weak. Antennae of medium length, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, flagellar articles few. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible with molar and palp absent. Labium with entire outer lobes, with well developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 leaf-like, with 1 apical seta, outer plate with 9 spines, palp absent. Outer plates of maxilla 2 broad, inner very narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate long, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with medium nail and setae. Coxae medium to long, weakly overlapping, of various sizes and shapes, progressively elongate from 1 to 4, coxa 1 tapering apically, not produced forward, coxa 2 larger than 1, weakly tapering, coxa 4 longer than coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, almost simple, palm short and transverse, article 5 longer than 6, unlobed, article 6 slender. Gnathopod 2 enlarged, subchelate, with article 2 dilated, article 5 much shorter

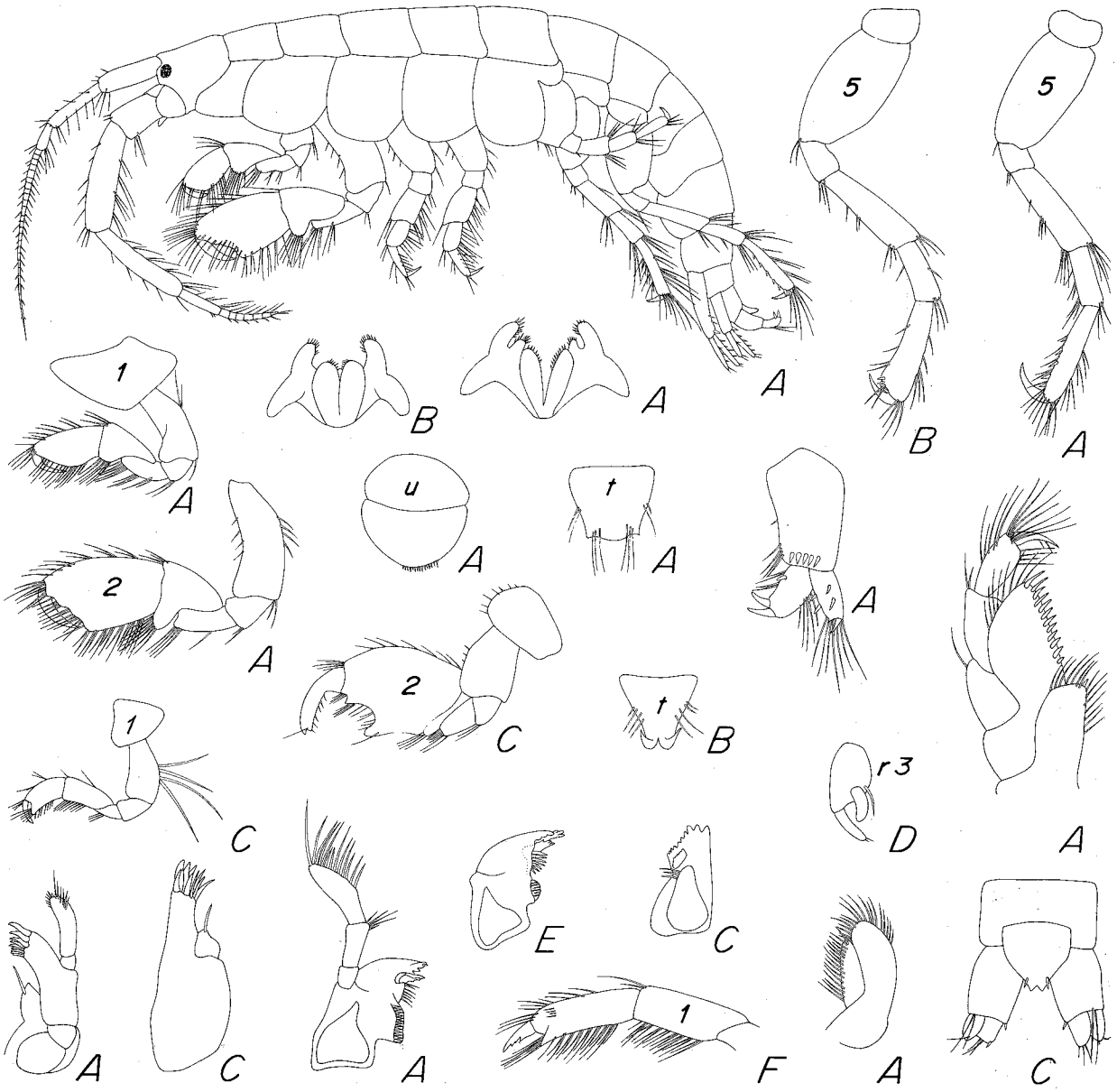

Fig.26. Ampithoidae and Biancolinidae. A, *Ampithoe rubricata*; B, *Ampithoe (= Pleonexes) gammaroides*; C, *Amphitholina cuniculus*; D, *Biancolina australis*; E, *Sunamphitoe pelagia*; F, *Macropisthopous stebbingi.*

than 6, lobed, article 6 dilated, dactyl long.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 dissimilar to each other, pereopod 5 much shorter than and different from pereopods 6-7, with broader, dorsally lobed article 2, pereopods 6-7 with narrow unlobed article 2, pereopods 6-7 with longer dactyl, dactyl of pereopod 5 almost geniculate, without accessory spine on outer margin.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami equal, shorter than peduncle, uropod 1 shortened because of elongation of urosomite 2, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 large, well projecting, biramous, both rami short, peduncle longer than rami, rami subequal, outer ramus with 2 distal hook-spines, inner ramus broad, pad-like and apically setose. Telson entire, as broad as long, pentagonal, with 2 hooked apical cusps.

Female. Oostegites moderately narrow, present on [?segments 2-5].

Sexual dimorphism. None.

Relationship. Despite loss of mandibular palp and molar, palp of maxilla 1, lack of notches on outer lobes of lower lip and subglobular head used for boring, this genus retains its ampithoid characters in uropod 3, coxae, maxilla 2 and pereopods.

Close to *Sunamphitoe* in mandibular structure but in *Sunamphitoe* palp of mandible and maxilla 1 present, notches of lower lip present, uropods 1-2 not shortened and head normal.

Species. *A. cuniculus* (Stebbing, 1874b) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Myers, 1974b) [330 + 334].

Habitat and distribution. Marine, south-western British Isles south and east to Black Sea, burrowing into kelp, *Alaria esculenta*, shallow water, 1 species.

Ampithoe Leach

Fig.26A,B

Ampithoe Leach, 1814: 403, 432.–Stebbing, 1906: 631.–J.L. Barnard, 1969c: 143.

Anisopus Templeton, 1836b: 185 (*Anisopus dubius* Templeton, 1836b, monotypy, homonym, Diptera).

Amphitoe.–Dana, 1852a: 213.

Amphithoe.–Dana, 1853: 935.–Chevreux & Fage, 1925: 332.–Conlan & Bousfield, 1982a: 45.–Conlan, 1982: 2016.

Pleonexes Bate, 1856: 59 (*nomen nudum*); 1857d: 147 (*Pleonexes gammaroides* Bate, 1857d, monotypy).–Stebbing, 1906: 642.–J.L. Barnard, 1969c: 145.–Conlan, 1982: 2020 [transitional subgenus].

Type species. *Cancer (Gammarus) rubricatus* Montagu, 1808, monotypy.

Taxonomy. *Pleonexes* is retained as a transitional polyphyletic subgenus to contain species with prehensile pereopods in the Conlan (1982) definition: parachelate pereopods 5-7 with all spines on the anterior margin of article 6 confined anterodistally to the region of the parachela; parachelate species with spines more proximally placed are situated in *Ampithoe sensu stricto*.

There may be a longer than usual nail on the dactyl of the maxilliped and the outer plate may have weaker spination.

A few of the species of *Pleonexes* have the hooked apical cusps on the telson hugely enlarged.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak to moderate. Eyes ordinary. Antennae of various lengths, often subequal or 1 longer than 2, both slender or antenna 2 stout; peduncular article 3 of antenna 1 much shorter than 1, articles 2-3 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, peduncle often stout in male. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 rarely semi-falciform, usually rectolinear or clavate, article 3 longer than 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with weakly mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with medium nail and setae. Coxae relatively long, weakly overlapping, progressively but slightly elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 larger than 1, often dilated, coxa 4 longer than coxa 1, unlobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 weakly diverse, gnathopod 2 slightly to greatly larger than 1, gnathopod 1 (weakly) subchelate, article 5 as long as or shorter than 6, poorly lobed, propodus expanded, palm oblique. Gnathopod 2 enlarged, subchelate, with article 2 only distally dilated, with article 4 often extended distally along posterior margin of article 5, article 5 shorter than 6, lobed, article 6 dilated, sometimes with false chela, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender or weakly inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, occasionally prehensile, pereopod 5 shorter than and different from pereopods 6-7, with broader article 2, pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly

unequal, much shorter than (1) or as long as (2) peduncle, peduncle of uropods 1-2 with obsolescent or without ventrodistal process, when present strongly blunted. Uropod 3 stout and conspicuous but short, biramous, both rami very short, peduncle longer than rami, outer ramus recurved apically, with 2 distal hook-spines, inner ramus often longer than outer ramus, broad and pad-like and apically setose. Telson entire, as broad as long, ovate, semi-circular or pentagonal, with hooked apical cusps, these occasionally enlarged.

Female. Gnathopods smaller, gnathopod 2 scarcely larger than 1, normally to poorly subchelate, article 5 shorter than 6, lobed, more so gnathopod 2. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Lengths, thickness and setosity of antennae, feebleness and setosity of mandibular palp, shapes, sculpture and setosity of male gnathopod 2; shape of lower lip; article 3 of mandibular palp usually equal to or slightly shorter than article 2; pereopods 5-7 strongly prehensile (e.g. *A. gammaroides*), article 2 variable in size and lobation; peduncle of uropod 1 with large spur (*A. senegalensis*); inner ramus of uropod 3 often narrowed but retaining setae, formulas of setae and spines distinctive; hooks on telson immense (e.g. *A. gammaroides*)

Relationship. See *Paradusa, Peramphithoe, Pleonexes* (immediately below), *Plumithoe, Pseudopleonexes.*

Removals. See *Macropisthopous, Peramphithoe, Plumithoe, Pseudopleonexes*; see separate lists below of prehensile and hooked-telson species; *A. brasiliensis* Dana, 1853, to *Cymadusa.*

Species. See Griffiths (1974a,c, 1975); Gurjanova (1951); Lincoln (1979a); Mordukhai-Boltovskoi (1969); Sars (1895); *A. africana* K.H. Barnard, 1926 (Griffiths, 1975) [743]; *A. akuolaka* J.L. Barnard, 1970a [381]; [*A. annulata* O. Costa & A. Costa, 1840 (Della Valle, 1893) [348]]; *A. australiensis* Bate, 1862 (Stebbing, 1906, 1910a) [785]; *A. boecki* Della Valle, 1893 (Stebbing, 1906) (= *A. gammaroides* of Della Valle, 1893) [348]; [*A. buczinskii* Kalichewsky, 1906 [334]]; [*A. chilensis* Nicolet, 1849 (Bate, 1862) (Stebbing, 1906) [765]]; *A. cinerea* Haswell, 1879a (Stebbing, 1906, 1910a) (= *A. grandimanus* Haswell, 1879a, homonym) [781]; [*A. corallina* Stout, 1912 (J.L. Barnard, 1969a) [373]]; [*A. costata* Milne Edwards, 1830 (Stebbing, 1906) [851]]; *A. dalli* Shoemaker, 1938b (Gurjanova, 1951) (Conlan & Bousfield, 1982a) (= *A. simulans* of J.L. Barnard, 1965b) [270]; *A. djakonovi* Gurjanova, 1938b, 1951 (Kudrjaschov, 1979) [280]; [*A. dubius* Templeton, 1836b (Bate, 1862) (Stebbing, 1906) [?697]]; [*A. filigera* Stimpson, 1856b (Bate, 1862) (Stebbing, 1906) [398]]; *A. flindersi* Stebbing, 1888, 1910a (Chilton, 1921d) (Hale, 1929) [793]; [*A. fucorum* Dana, 1852a (Della Valle, 1893) [?400]]; *A. grubriformis* Reid, 1951 [?443, ?445]; *A. guaspare* J.L. Barnard, 1979b [546]; *A. hinatore* J.L. Barnard, 1972b [774]; *A. kava* Myers, 1985c (= *A. ramondi* identification of J.L. Barnard, 1970a) [550]; *A. kergueleni* Stebbing, 1888 (Chevreux, 1927) [851 + 443]; *A. kuala* Myers, 1985c [576]; *A. kussakini* Gurjanova, 1955b (Kudrjaschov, 1979) (Conlan & Bousfield, 1982a) [230]; *A. lacertosa* Bate, 1858b (Conlan & Bousfield, 1982a) (Hirayama, 1983) (= *A. stimpsoni* Boeck, 1871a) (= *A. scitulus* Harford, 1877a) (= *A. japonica* Stebbing, 1888; Gurjanova, 1951; Tzvetkova,1968) (= *A. macrurus* Stephensen, 1944b) [230]; *A. longimana* Smith, 1873 (J.L. Barnard, 1959d, 1965b) (Bousfield, 1973) [260 + ?370T + 367T]; [*A. maculata* Stimpson, 1853 (Stebbing, 1906) [254]]; *A. marcuzzii* Ruffo, 1954 (Ortiz, 1978) [460]; *A. megaloprotopus* Stebbing, 1895b, 1906 [491]; [*A. mitsukurii* Della Valle, 1893 (Stebbing, 1906) [395]]; [*A. pausilipae* Milne Edwards, 1830 (? = *A. gracilis* Costa, 1851) [348]]; *A. platycera* Sivaprakasam, 1970g (?Ledoyer, 1979b) [600]; *A. plumulosa* Shoemaker, 1938b (J.L. Barnard, 1965b) (Conlan & Bousfield, 1982a), *A. p. tepahue* J.L. Barnard, 1979b [367 + ?483]; *A. pollex* Kunkel, 1910 (J.L. Barnard, 1965b, 1979b) (Hirayama, 1983) (= *A. indentata* Stout, 1913) [TL= 367 + ?379, ?395, ?546]; [*A. punctata* Say, 1818 (Bate, 1862) (Stebbing, 1906) [254]]; *A. quadrimanus* Haswell, 1879b (Stebbing, 1906, 1910a) [781]; *A. ramondi* Audouin, 1826 (Nagata, 1965c) (?J.L. Barnard, 1979b) (Sivaprakasam, 1970a) (Rabindranath, 1972c) (Krapp-Schickel, 1978, 1982a) (Hirayama, 1983) (Ledoyer, 1982b, 1984, 1985c) (Moore, 1984a) (Myers, 1985c) (Arresti *et al.*, 1986a) (= *A. vaillantii* Lucas, 1846; Chevreux & Fage, 1925; Gurjanova, 1951) (= *A. penicillata* Costa, 1857) (= *A. desmarestii* Bate, 1862) (= *A. pontica* Czerniavsky, 1868) (= *A. erythraea* Kossmann, 1880) (= *A. intermedia* Walker, 1904) (= *A. lobata* Walker, 1909b) (= *A. divisura* Shoemaker, 1933a) [423]; *A. rubricata* (Montagu, 1818) (Sars, 1895) (Chevreux & Fage, 1925) (Gurjanova, 1951) (Bousfield, 1973) (= *A. punctatus* Johnston, 1827) (= *A. picta* Rathke, 1837) (= *A. podoceroides* Rathke, 1843) (= *A. albomaculata* Krøyer, 1846a,b) (= *A. littorina* Bate, 1857d) [250 + 339]; *A. rubricatoides* Shoemaker, 1938b (Conlan & Bousfield, 1982a) [230 + 290]; *A. sectimana* Conlan & Bousfield, 1982a (= *A. pollex* of J.L. Barnard, 1954a) [270]; *A. senegalensis* Schellenberg, 1925a (Ruffo, 1947b) [441, 443]; *A. serraticauda* Rabindranath, 1972c [665]; *A. simulans* Alderman, 1936 (Conlan & Bousfield, 1982a) [270]; *A. tahue* J.L. Barnard, 1979b [546]; *A. tarasovi* Bulycheva, 1952 (Tzvetkova, 1968) [391]; [*A. tongensis* Dana, 1852a, 1853 (Stebbing, 1906) [575]]; *A. vacoregue* J.L. Barnard, 1979b [546]; [*A. valida* (Czerniavsky, 1868) (Stebbing, 1906) [334]]; *A. valida* Smith, 1873, junior homonym (Bousfield, 1973) (Conlan & Bousfield, 1982a) (Hirayama, 1983) (= *A. shimizuensis* Stephensen, 1944b [260 + ?270T, ?391T]; [*A. virescens* Stimpson, 1853 (Stebbing, 1906) [254]]; [*A. viridis* White, 1847 [346]]; *A. volki* Gurjanova, 1938b, 1951 (Conlan & Bousfield, 1982a) [230]; *A. waialua* J.L. Barnard, 1970a [381]; *A. zachsi* Gurjanova, 1938b, 1951 (Tzvetkova, 1968) [280]; "species" = *A. albomaculata* identification of Bate & Westwood, 1863 [243]; "species" Pirlot, 1938 [640];

"species" J.L. Barnard, 1965b [373]; "species" J.L. Barnard, 1970a [381]; "species" J.L. Barnard, 1972b [373]; "species" Ledoyer, 1978b [697].

Species with only pereopods prehensile, telson ordinary: *A. alluaudi* Chevreux, 1901a (Sivaprakasam, 1970g) (Ledoyer, 1982b) (= *A. inda* of Nayar, 1959) [660]; *A. ferox* (Chevreux, 1901c) (Chevreux & Fage, 1925) (Krapp-Schickel, 1982b) [330]; *A. kaneohe* J.L. Barnard, 1970a (Ledoyer, 1972c, 1979a, 1982b) (Cejas *et al.*, 1983), *A. k. navosa* A. Myers, 1985c, 1986 [600 + 442 + 576]; *A.kulafi* J.L. Barnard, 1970a (Ledoyer, 1979b, 1982b) (Myers, 1985c) (= "species" of J.L. Barnard, 1965a) [600]; *A. macrocornuta* (Kensley, 1971) [449]; *A. maxillissius* Ledoyer, 1984 [586]; *A. riedli* Krapp-Schickel, 1968, 1982a [340].

Species with pereopods prehensile and telson with giant hooks: *A. aptos* (J.L. Barnard, 1969a) [372]; *A. auriculata* Rabindranath, 1972c [665] (but telsonic hooks intermediate); *A. helleri* Karaman, 1975c (Krapp-Schickel, 1982a) (= *A. gammaroides* of Sars, 1895) (= *A. bicuspis* Heller, 1867) (= *A. neglectus* Lincoln, 1967) [352]; *A. poipu* J.L. Barnard, 1970a [381].

Pleonexes species with pereopods prehensile, with all spines concentrated near parachela, telson with giant hooks and outer lobes of lower lip unnotched (? = species with lower lip unknown or unclear but presumed): *A. gammaroides* (Bate, 1857d) (Sars, 1895) (Chevreux & Fage, 1925) (Gurjanova, 1951) (Lincoln, 1979a) (= *A. longicornis* Boeck, 1871b) (= *A. hamulus* Boeck, 1876) [355]; ?*A. neglecta* Lincoln, 1976, 1979a (Cejas *et al.*, 1983) (Arresti *et al.*, 1986a) [350]; ?*A. pomboi* Mateus & Afonso, 1974 [359].

Habitat and distribution. Marine, cosmopolitan, 0-107 m, rare below 30 m, often rolls and cements algal blades into tubes, 51 species.

Cymadusa Savigny

Cymadusa Savigny, 1816: 109.–J.L. Barnard, 1969c: 144.–Conlan & Bousfield, 1982a: 43.
Grubia Czerniavsky, 1868: 103 (*Grubia taurica* Czerniavsky, 1868, monotypy).–Stebbing, 1906: 644.–Chevreux & Fage, 1925: 338.
Acanthogrubia Stout, 1912: 143 (*Acanthogrubia uncinata* Stout, 1912, monotypy).

Type species. *Cymadusa filosa* Savigny, 1816, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes obsolescent, blunt, antennal sinus weak. Eyes ordinary. Antennae nearly subequal, 1 longer than 2, 1 slender, antenna 2 slightly stout; peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum 1 to 2-articulate or scale-like. Antenna 2 peduncular article 3 short, peduncle slightly stout in male. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 rectolinear or weakly clavate, article 3 as long as 2. Labium with weakly (type) notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 short, with a row of medial setae, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 broad or not, inner narrow, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate long, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 long, with medium nail. Coxae ordinary to long, strongly overlapping, progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 weakly diverse; densely setose, gnathopod 2 larger than 1, gnathopod 1 in male weakly subchelate, article 5 longer than 6, poorly or broadly lobed, article 6 slightly expanded, palm oblique. Gnathopod 2 enlarged, subchelate, with article 2 not dilated, very setose, with article 4 enlarged, extended along posterior margin of article 5, weakly merochelate, article 5 shorter than 6, more slender than 6, lobed, article 6 dilated, sometimes with false chela, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, scarcely prehensile, pereopod 5 shorter and different from pereopods 6-7, with broader article 2, pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal, stout, rami slightly unequal, much shorter (1) or longer (2) than peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 smaller to obsolescent. Uropod 3 of ordinary length, biramous, both rami short, peduncle longer than rami, outer ramus with 2 distal hook-spines, inner ramus longer than outer ramus, broad, pad-like and apically setose. Telson entire, short, broader than long, pentagonal with 2 hooked apical cusps.

Female. Gnathopod 2 smaller than in male. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Weak. Gnathopod 2.

Variables. Setosity of antennae, gnathopods, coxae, pereopods 3-4 and peduncle of uropod 3; shapes of articles on gnathopods 1-2; dactyl of maxilliped very short (*C. oceanica*); coxa 5 very short (*C. sardenta*); male gnathopod 1 slightly merochelate (*C. imbroglio*); male gnathopod 2 not very large (e.g. *C. compta*).

Relationship. Differing from *Ampithoe* in the well-

developed sharp spur on the peduncle of uropod 1. From *Peramphithoe* in the expanded propodus of gnathopod 1 with oblique palm.

See *Paradusa*.

Species. *Cymadusa brevidactyla* (Chevreux, 1907a, 1908c) (Myers, 1985c) (= *C. cavimana* Sivaprakasam, 1970g, Ledoyer, ?1978b, 1979a,b, 1982b) (= *C. kergueleni* of Rabindranth, 1972c) [600]; *C. compta* (Smith, 1873) (Bousfield, 1973) [361]; *C. crassicornis* (Costa, 1853, 1857) (Chevreux & Fage, 1925) (Gurjanova, 1951) (Krapp-Schickel, 1982a) (= *C. elongata* Costa, 1853, 1857) (= *C. largimanus* Heller, 1867) (= *C. longicornis* Heller, 1867) (= *C. taurica* Czerniasky, 1868) (= *C. massiliensis* Catta, 1875) [330 + 677]; *C. filosa* Savigny, 1816 (Ledoyer, 1982b) (= form A near *C. microphthalma* and form B near *C. setosa*) (Krapp-Schickel, 1982a) (Ledoyer, 1984) (= *C. imbroglio* and *C. vadosa* which see, fide Ledoyer, 1984) (= *C. inda* Milne Edwards, 1830) (= *C. indica* Milne Edwards, 1840) (= *C. rubella* Dana, 1852a) (= *C. brasiliensis* Dana, 1853) (= *C. filicornis* Dana, 1853) (= *C. setosa* Haswell, 1879a) (= *C. flindersi* Stebbing, 1888) (= *C. hirsuta* Chevreux, 1900b, Chevreux & Fage, 1925) (= *C. coei* Kunkel, 1910) (= *C. australis* K.H. Barnard, 1916) [421 + 743 + 340]; *C. grossimana* Ledoyer, 1984 [586]; *C. hawaiensis* (Schellenberg, 1938a) (J.L. Barnard, 1970a) [381]; *C. imbroglio* Rabindranath, 1972c (Myers, 1985c) [665]; *C. microphthalma* (Chevreux, 1901a) (Sivaprakasam, 1970a) [685]; *C. oceanica* J.L. Barnard, 1955a, 1971a [381]; *C. pillipes* (Ledoyer, 1984) (= *C. lunata* Myers, 1985c) [590]; ?*C. sardenta* (Oliveira, 1953) (Sivaprakasam, 1970b) [751 + 664]; *C. uncinata* (Stout, 1912) (J.L. Barnard, 1965b) (Conlan & Bousfield, 1982a) [373]; *C. vadosa* Imbach, 1967 [655]; *C. variata* (Sheard, 1936a) [785].

Habitat and distribution. Marine, throughout the tropics, 0-10 m, 14 species.

Exampithoe K.H. Barnard

Exampithoe K.H. Barnard, 1926: 363.–J.L. Barnard, 1969c: 144.

(*Melanesius*) Ledoyer, 1984: 23 (*Melanesius cooki* Ledoyer, 1984, original designation) [valid subgenus].

Type species. *Exampithoe natalensis* K.H. Barnard, 1926, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum [?short, ocular lobes obsolescent, blunt, antennal sinus weak]. Eyes present. Antennae of medium length, nearly subequal, both slender, peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum absent. Antenna 2 peduncular article 3 [?short]. Epistome [?unproduced anteriorly]. Labrum subrounded, entire. Mandible with reduced molar, somewhat conical but apically blunt, palp weak, very slender, article 3 rectolinear, shorter than 2 (but see Variables). Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 short, with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines and cusp, outer plate long, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 [?short, article 3 unlobed, article 4 short, with short nail and setae]. Coxae relatively short, [?probably weakly overlapping], progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 of subequal size, small, gnathopod 1 in male subchelate, article 6 slender, palm narrow, transverse, article 5 of both gnathopods 1-2 as long as 6, poorly lobed.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 dissimilar to each other, weakly prehensile, pereopod 5 much shorter and different from pereopods 6-7, with broader article 2, pereopods 6-7 with narrower article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami of uropod 2 unequal, shorter than peduncle on uropod 1, peduncle of uropods 1-2 [?without ventrodistal process]. Uropod 3 exceeding others, biramous, both rami short, peduncle longer than rami, rami subequal, outer ramus with 2 distal hook-spines, inner ramus as long as outer ramus, broad, pad-like and apically setose. Telson entire, short, broader than long, semicircular.

Female. Unknown. Oostegites [?moderately narrow, present on segments 2- 5].

Sexual dimorphism. Unknown.

Variables. Mandibular palp 3-articulate (*E. natalensis*), 2-articulate (*E. gracilipes*), absent (*E.* [*Melanesius*] *cooki*); outer plate of maxilla 1 with 10 spines (*E. natalensis*), with 9 spines (*E. gracilipes*), with 8 spines (*E. cooki*); inner plate of maxilliped with apical cusp large (*E. natalensis*), small (*E. gracilipes*), almost absent but replaced by enlarged spines (*E. cooki*); gnathopod 1 large (*E. cooki*), palm oblique (*E. gracilipes*); article 2 of pereopod 5 as narrow as that of pereopods 6-7 (*E. gracilipes, E. cooki*).

Relationship. Unusual in the loss of notches on the outer lobes of the lower lip and reduction of molar. Like *Paragrubia* in enlargement of gnathopod 1 but rami of uropod 3 of *Exampithoe* broadened.

Loss of notches on outer lobe of lower lip also occurring in type species of *Pleonexes* (= *Ampithoe*), *Amphitholina* and *Pseudopleonexes*.

Key to Subgenera of *Exampithoe*

Mandibular palp present.....(*Exampithoe*)

Mandibular palp absent.....(*Melanesius*)

Species. *E.* (*M.*) *cooki* Ledoyer, 1984 [586]; *E.* (*M.*) *gracilipes* Ledoyer, 1984 [586]; *E. natalensis* K.H. Barnard, 1926 (Griffiths, 1974b) [743].

Habitat and distribution. Marine, southern Africa and New Caledonia, shallow water, 3 species.

Macropisthopus K.H. Barnard

Fig.26F

Macropisthopus K.H. Barnard, 1916: 260.–J.L. Barnard, 1969c: 144.

Type species. *Macropisthopus stebbingi* K.H. Barnard, 1916, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes ordinary. Antennae of medium length, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum absent. Antenna 2 peduncular article 3 [?short]. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with notched outer lobes, with well developed inner lobes, mandibular lobes [?long, blunt]. Inner plate of maxilla 1 with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Outer plates of maxilla 2 broader, inner narrower, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 very long, short, with medium nail and setae. Coxae ordinary, weakly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 alike, of equal size, feeble, both with linear articles, article 5 of both gnathopods as long as 6, poorly lobed on 1, not lobed on 2, article 6 slender, parachelate, dactyl long.

Pereopods 3-4 normal, similar, with inflated article 2, article 4 dilated, dactyls long. Pereopods 5-7 dissimilar to each other, progressively longer, pereopod 5 ordinary, much shorter than and different from pereopod 7, latter with broad, lobed article 2, with articles 4-5 of pereopod 7 enlarged, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary length, biramous, both rami very short, peduncle longer than rami, outer ramus with 2 distal hook-spines, inner ramus almost as long as outer ramus, broad and pad-like, apically setose. Telson entire, short, broader than long, rhomboid, pointed apically, with 2 tiny hooked apical cusps.

Female. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Absent.

Relationship. Like *Peramphithoe* but pereopod 7 large and oar-like.

Species. *Macropisthopus stebbingi* (K.H. Barnard, 1916, 1940) (Griffiths, 1979) [743];

Habitat and distribution. Marine, South Africa, shallow water, 1 species.

Paradusa Ruffo

Paradusa Ruffo, 1969: 63.

Type species. *Paradusa bilobata* Ruffo, 1969, original designation.

Diagnosis. Body laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes ordinary. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum vestigial, scale-like. Antenna 2 peduncular article 3 short. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp weak, very slender, article 3 rectolinear, almost as long as 2. Labium with [?notched outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 linguiform, with 1 medial seta, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 slender but inner more narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae and cusp, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with long nail. Coxae ordinary, probably weakly overlapping, [?progressively elongate from 1 to 4], coxa 1 barely dilated, barely produced forward, coxa 2 also short, coxa 4 [?not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae].

Gnathopods 1-2 alike, of equal size, large, gnathopod

2 scarcely larger than 1, both subchelate, palms oblique, article 5 of both gnathopods very short, shorter than 6, lobed, article 6 large, dactyl ordinary.

Pereopods 3-4 normal, similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, pereopod 5 slightly prehensile, much shorter than and different from pereopods 6-7, with broader article 2, pereopods 6-7 with narrow unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (1) or as long as (2) peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 smaller. Uropod 3 of ordinary size, biramous, both rami short, peduncle longer than rami, outer ramus recurved apically, with 2 distal hook-spines, inner ramus as long as outer ramus, broad and pad-like and apically spino-setose. Telson entire, as broad as long, pentagonal, with 2 hooked apical cusps.

Female. Gnathopods much smaller than in male. Oostegites moderately narrow, present [on segments ?2-5].

Sexual dimorphism. Strong. Gnathopods.

Variables. Article 2 of mandibular palp short, male gnathopods scarcely larger than those of female, article 2 of pereopods 6-7 almost as broad as on pereopod 5 (*P. mauritiensis*).

Relationship. Differing from *Cymadusa* in the similarity in both sexes of size and form in gnathopods 1-2 (though of different size in the 2 sexes), the 1-articulate accessory flagellum and weak mandibular palp.

From *Ampithoe* in the long sharp peduncular process of uropod 1 (versus shorter and blunter or absent) and the distinctly visible though tiny 1-articulate accessory flagellum.

Removal. *Paradusa pillipes* Ledoyer, 1984, to *Cymadusa*.

Species. *Paradusa bilobata* Ruffo, 1969 (Ledoyer, 1984) [600]; *P. mauritiensis* Ledoyer, 1978b, 1982b [698, 697].

Habitat and distribution. Marine, Indo-Pacific from New Caledonia to the Red Sea, 0-5 m, 2 species.

Paragrubia Chevreux

Paragrubia Chevreux, 1901a: 426.–Stebbing, 1906: 739.–J.L. Barnard, 1969c: 144.

Type species. *Paragrubia vorax* Chevreux, 1901a, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes obsolescent, blunt, antennal sinus almost absent. Eyes ordinary. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum 5-articulate. Antenna 2 peduncular article 3 short. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp weak, article 3 rectolinear, shorter than 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, vestigial, without setae, outer plate with 7 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate long, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 slightly lobed, article 4 medium, with vestigial nail. Coxae long, strongly overlapping, progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 alike, of subequal size, small, gnathopod 1 slightly larger than 2, in male subchelate, article 5 of both gnathopods 1-2 shorter than 6, poorly lobed, article 6 expanded, palm oblique. Gnathopod 2 almost simple and almost feeble, on gnathopods 1-2, with article 4 incipiently merochelate, extended distally along posterior margin of article 5.

Pereopods 3-4 normal, similar, with scarcely inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, almost prehensile, pereopods 5-7 with broad unlobed article 2, dactyl of pereopods 5-7 curved, medium, without accessory tooth on outer margin.

Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, scarcely longer than peduncle, peduncle of uropods 1-2 [?without ventrodistal process]. Uropod 3 slightly small, biramous, both rami short, outer ramus obtuse distally, with 2 weak apicolateral spines, one reduced, peduncle slightly elongate, longer than rami, inner ramus slightly broadened, pad-like and apically setose. Telson entire, as broad as long, ovate, with 2 hooked apical cusps.

Female. Gnathopods smaller than in male. Oostegites [?moderately narrow, broad, present on segments 2-5].

Sexual dimorphism. Weak.

Relationship. Differing from most ampithoids in the enlarged gnathopod 1.

See *Amphithoides* and *Exampithoe*.

Species. *Paragrubia vorax* Chevreux, 1901a (J.L. Barnard, 1970a) (Ledoyer, 1982b) (Myers, 1985c) [423 (ex. 540)].

Habitat and distribution. Marine, Indo-Pacific, shallow water, 1 species.

Peramphithoe Conlan & Bousfield

Peramphithoe Conlan & Bousfield, 1982a: 60.–Conlan, 1982: 2019 (key).

Type species. *Ampithoe femorata* Krøyer, 1845, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes ordinary. Antennae of various lengths, rarely subequal, 1 longer than 2, 1 slender, antenna 2 often stout; peduncular article 3 of antenna 1 much shorter than 1, article 1 or 2 longest, accessory flagellum vestigial or absent. Antenna 2 peduncular article 3 short, peduncle often stout in male, flagellum moderately short to very short. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp weak, very slender, article 3 rectolinear, shorter than 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, short, with 1 apical seta, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 almost lobed, article 4 long, with medium nail. Coxae relatively long, strongly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, palm short and transverse or almost so, article 5 about as long as 6, unlobed, article 6 slender. Gnathopod 2 enlarged, weakly or strongly subchelate, with article 2 dilated only distally, article 5 very short, lobed, article 6 dilated, dactyl long.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, not prehensile, pereopod 5 shorter and different from pereopods 6-7, with broader article 2. Pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (or variable) than peduncle, peduncle of uropod 1 with well developed ventrodistal process. Uropod 3 of ordinary size, biramous, both rami very short, outer ramus recurved apically, with 2 apicolateral curved spines, peduncle longer than rami, rami subequal, inner ramus broad, pad-like and apically setose. Telson entire, broader than long, ovate, with 2 tiny hooked apical cusps or none.

Female. Gnathopod 2 small, similar to gnathopod 1 but slightly larger, article 5 shorter than 6, weakly lobed. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Strong to weak. Gnathopod 2.

Variables. Flagellum of antenna 2 becoming very short, some proximal articles becoming fused; article 5 of gnathopod 1 shorter or longer than article 6; male gnathopod 2 scarcely enlarged (e.g. *P. humeralis*).

Relationship. Differing from *Ampithoe* in the unproduced coxa 1 combined with the slender, rectangular article 6 of gnathopod 1 with transverse (or occasionally almost transverse) palm; note, however, a close approximation of this gnathopod occasionally occurs in *Ampithoe* (e.g. *P. longimana*).

See *Macropisthopous* and *Pseudopleonexes*.

Species. *Peramphithoe annenkovae* Gurjanova, 1938b, 1951 (Tzvetkova, 1968) [391]; *P. aorangi* J.L. Barnard, 1972b [775]; *P. eoa* Brüggen, 1907 (Gurjanova, 1951) (?J.L. Barnard, 1954a) (Tzvetkova, 1968) (Kudrjaschov, 1979) [510]; *P. falsa* K.H. Barnard, 1932, 1937, 1940 (Ruffo, 1969) (Sivaprakasam, 1970g) (= *P. brevipes* identification of K.H. Barnard, 1916) [743 + 685]; *P. femorata* (Krøyer, 1845) (Kreibohm-de-Paternoster & Escofet, 1976) (Alonso, 1980) (Conlan & Bousfield, 1982a) (= *P. gaudichaudii* Milne Edwards, 1840) (= *P. peregrina* Dana, 1852a, 1853) (= *P. brevipes* Dana 1852a, 1853) (= *P. falklandi* Bate, 1862) [765(TL) + ?835]; *P. humeralis* (Stimpson, 1864) (J.L. Barnard, 1965b) (Conlan & Bousfield, 1982a) [379]; *P. lessoniophila* Conlan & Bousfield, 1982a [763]; *P. lindbergi* (Gurjanova, 1938b) (J.L. Barnard, 1965b) (Conlan & Bousfield, 1982a) [230 + 379]; *P. mea* (Gurjanova, 1938b) (Conlan & Bousfield, 1982a) (Kudrjaschov, 1972b) [273 to 391]; *P. orientalis* (Dana, 1853) (J.L. Barnard, 1970a) (Hirayama, 1983) (Myers, 1985c) [TL = 641, + ?395, ?381, ?674]; *P. plea* (J.L. Barnard, 1965b) (Conlan & Bousfield, 1982a) [270]; *P. spuria* Krapp-Schickel, 1978, 1982b [352]; *P. tea* (J.L. Barnard, 1965b, 1969a, 1969b) (Conlan & Bousfield, 1982a) [379]; "species" (= *P. humeralis* of Griffiths, 1979) [743]; "species" of J.L. Barnard (1965b, 1970a) [373, 381].

Habitat and distribution. Marine, dominantly north-eastern Pacific, also north-western Pacific, rarely to Mediterranean, New Zealand, South Africa, South America, tropical Pacific, 0-60 m, 13 species.

Plumithoe n.gen.

Type species. *Amphithoe plumicornis* Ledoyer, 1979a.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short to obsolescent, blunt, antennal sinus weak. Eyes weak. Antennae of medium length, 1 longer than 2, 1 slender, antenna 2 basally stout and heavily setose, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum absent. Antenna 2 peduncular articles 3-5 short, peduncle stout in male, article 3 very setose. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp weak, very slender, article 3 rectolinear, as long as 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, short, with 1 medial seta, outer plate with 7 spines, palp 2-articulate. Outer plates of maxilla 2 broad, inner narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with long nail. Coxae long, strongly overlapping, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, [?coxa 4 longer than coxa 1, lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae].

Gnathopods 1-2 diverse, small, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, palm short and almost transverse, article 5 moderately shorter than 6, poorly lobed, with slender article 6. Gnathopod 2 slightly enlarged, subchelate, with article 2 scarcely dilated, with article 4 incipiently merochelate, extended along posterior margin of article 5, article 5 shorter than 6, lobed, article 6 slightly dilated, dactyl short.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, scarcely prehensile, pereopod 5 shorter and different from pereopods 6-7, with broader article 2; pereopods 6-7 with narrower article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments 2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, shorter than peduncle, peduncle of uropod 1 with long sharp ventrodistal process, of uropod 2 smaller to obsolescent. Uropod 3 of ordinary length, biramous, both rami short, peduncle longer than rami, outer ramus with 2 distal hook-spines, inner ramus almost as long as outer ramus, broad, pad-like and apically spinose. Telson entire, broader than long, pentagonal, with 2 tiny hooked apical cusps.

Female. Gnathopod 2 more robust, palm convex. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Almost absent.

Variables. Article 3 of mandibular palp very short; palm of male gnathopod 2 with thumb (fijian *P. hirsutus*, Myers, 1985c).

Relationship. Differing from *Peramphithoe* in the anteriorly produced coxa 1, immense setosity of articles 3-5 of antenna 2, lack of setal group on coxae 1-4, and poorly expanded article 2 on pereopods 3-4.

From *Ampithoe* in the narrow, unexpanded article 6 of gnathopod 1, and long sharp spur on the peduncle of uropod 1. From *Exampithoe* in enlarged gnathopod 2 (versus dominance of gnathopod 1). From *Paradusa* in the setosity of antenna 2, lack of accessory flagellum, lack of cusp on the inner plate of the maxilliped, and the stronger disparity in sizes and shapes of gnathopods 1-2. From *Amphithoides* in the setosity of antenna 2 and the normal uropod 3.

Species. *Plumithoe hirsutus* (Ledoyer, 1978b, 1982b) (Myers, 1985c) [600]; *P. plumicornis* (Ledoyer, 1979a, 1982b) [698].

Habitat and distribution. Marine, Indo-Pacific from Fiji to Madagascar, 0-15 m, 2 species.

Pseudoamphithoides Ortiz

Pseudoamphithoides Ortiz, 1976a: 12.–Ortiz, 1976c: 3.–Karaman & Barnard, 1979: 115.
Amphyllodomus Just, 1977b: 229 (*Amphyllodomus incurvaria* Just, 1977b, original designation).

Type species. *Pseudoamphithoides bacescui* Ortiz, 1976a, original designation.

Diagnosis. Body subcylindrical, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, extremely broad and rounded, antennal sinus absent. Eyes medium. Antennae long, nearly subequal, though 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, scarcely elongate, peduncle stout in male. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp weak, slender, article 3 rectolinear, as long as 2. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 linguiform, with 1 seta, outer plate with 7 spines, palp small, 2-articulate. Outer plates of maxilla 2 rather broad, inner narrow, inner plate without mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with medium nail. Coxae relatively short, weakly

overlapping, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 longer than 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 alike, of equal size, small, weakly subchelate, article 5 of both gnathopods 1-2 shorter than 6, unlobed, article 6 expanded, palm oblique.

Pereopods 3-4 similar, with inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, scarcely progressively longer, minutely prehensile, pereopod 5 slightly shorter than pereopod 7, with broader article 2, pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, geniculate, without accessory spine on outer margin.

Sternal processes of thorax absent. Coxal gills [undescribed, present on segments 2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami slightly unequal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary size, biramous, rami not very short, peduncle as long as rami, outer ramus with 1 distal spine-hook and 1 simple spine, inner ramus longer than outer ramus, pad-like and apically setose, narrow, tapering. Telson entire, broader than long, pentagonal, without apical cusps.

Female. Gnathopods with article 5 as long as 6. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Absent.

Relationship. Differing from *Amphithoides* in the absence of accessory flagellum, much smaller outer plate of maxilliped, presence of apical setae on inner ramus of uropod 3, presence of minute prehensility on pereopods 5-7, reduction of palp on maxilla 1, absence of spur on uropod 1, and much thinner unlobed carpi on gnathopods.

Species. *P. bacescui* Ortiz, 1976a,c, 1978 [483]; *P. incurvaria* (Just, 1977b) (Lewis & Kensley, 1982) [460].

Habitat and distribution. Marine, Caribbean Sea, 0-7 m, on turtle grass, forming 2-sided case from dissected alga, 2 species.

Pseudopleonexes Conlan

Pseudopleonexes Conlan, 1982: 2020.

Type species. *Pleonexes lessoniae* Hurley, 1954c, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes absent. Antennae long, 1 longer than 2, 1 slender, antenna 2 slightly stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, peduncle stout in male. Epistome produced anteriorly. Labrum subrounded, entire. Mandible with reduced molar, somewhat conical but apically blunt, palp weak, very slender, article 3 [?rectolinear, ?shorter than 2]. Labium with scarcely notched outer lobes, with well-developed inner lobes, mandibular lobes short, thick and pointed. Inner plate of maxilla 1 linguiform, with 1 medial seta, outer plate with 7 spines, palp weak, 2-articulate. Plates of maxilla 2 of ordinary breadth but inner narrower, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 short, with short nail and setae. Coxae of ordinary length, [probably weakly overlapping], progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae; coxae 1-5 with single long seta posteroventrally, other armaments tiny.

Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, almost simple, palm short and transverse, article 5 long, as long as 6, unlobed, article 6 slender. Gnathopod 2 enlarged, weakly subchelate, with article 2 dilated, articles 5-6 very setose, article 5 shorter than 6, lobed, article 6 dilated, ordinary.

Pereopods 3-4 similar, with inflated article 2, article 2 dilated, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, prehensile, pereopod 5 much shorter than and different from pereopods 6-7, with broader, lobed article 2, pereopods 6-7 with narrow unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments 2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, much shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary size, biramous, both rami very short, peduncle longer than rami, outer ramus with 2 distal hook-spines, inner ramus shorter than outer ramus, broad and pad-like, apically setose. Telson entire, as broad as long, pentagonal, weakly cleft, with 2 huge hooked apical cusps.

Female. Sexual dimorphism (except for oostegites), weak. Gnathopods 2 less setose than in male. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Weak.

Relationship. Differing from *Ampithoe* in the transverse palm of gnathopod 1; therefore, clearly an advancement from *Peramphithoe* but differing in the reduced palp of maxilla 1, obsolescent notching on the outer lobes of the lower lip, development of telsonic hook-knobs, and prehensile pereopods.

Species. *Pseudopleonexes lessoniae* Hurley, 1954c (?J.L. Barnard, 1972b) (Conlan, 1982) [775].

Habitat and distribution. Marine, New Zealand, North Island, shallow water, 1 species.

Sunamphitoe Bate

Fig.26E

Sunamphitoe Bate, 1857d: 147.–Stebbing, 1906: 645.–Chevreux & Fage, 1925: 340.–J.L. Barnard, 1969c: 145.–Lincoln, 1979a: 446.

Type species. *Amphithoe pelagica* Milne Edwards, 1830, designated by Chevreux & Fage, 1925.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes present, ordinary. Antennae long, 1 longer than 2, 1 slender, antenna 2 slightly stout; peduncular article 3 of antenna 1 much shorter than 1, article 1 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short. Epistome unproduced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp absent. Labium with notched outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 8+ spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 short, article 3 unlobed, article 4 medium, with medium nail and setae. Coxae relatively long, weakly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae.

Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 6 slender, palm short and transverse, article 5 very short, shorter than 6, lobed, article 6 dilated, dactyl long. Article 2 of gnathopod 2 weakly dilated distally, article 5 short, lobed.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, almost prehensile, pereopod 5 much shorter than and different from pereopods 6-7, with broader article 2, pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, curved.

Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary size, biramous, both rami very short, peduncle shorter than rami, outer ramus with 2 distal hook-spines, inner ramus as long as outer ramus, broad and pad-like, apically setose. Telson entire, short, broader than long, pentagonal, with 2 hooked apical cusps.

Female. Gnathopod 2 small, propodus slender like gnathopod 1, palm short and transverse, article 5 shorter than 6, lobed strongly. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Uropod 1 with large sharp spur (*S. plumosa*), a variable which is used as a strong difference by Conlan (1982) between *Ampithoe* and *Cymadusa* or between *Ampithoe* and *Paradusa*.

Relationship. Differing from *Peramphithoe* in loss of mandibular palp.

Species. *Sunamphitoe pelagica* Milne Edwards, 1830 (Chevreux & Fage, 1925) (Bousfield, 1973) (Ledoyer, 1979b) (Lincoln, 1979a) Krapp-Schickel, 1982b) (= *S. hamulus* Bate, 1857d) (= *S. conformata* Bate, 1857d; Sars, 1895) (= *S. grandimana* Boeck, 1861) (= *S. brusinae* Heller, 1867) [250 + 340 + 640]; *S. plumosa* Stephensen, 1944b [395].

Habitat and distribution. Marine, amphi-North Atlantic, Japan, Indonesia, shallow water, 2 species.

ANAMIXIDAE Stebbing, 1897

Diagnosis. Accessory flagellum vestigial, 1 to 2-articulate, very small. Mandible lacking molar. Outer plates of maxilliped very small or absent. Coxa 1 much smaller than coxa 2 or vestigial. Gnathopod 1 carpochelate or absent. Telson entire.

See Amphilochidae, Cressidae, Leucothoidae, Sebidae and Stenothoidae.

Description. Body laterally compressed, smooth, slick and shiny. Rostrum small to large and thick; lateral cephalic lobes weak, eyes ommatidial. Antenna 1 slender, often partially attached to rostrum, peduncle long, article 2 often as long as 1, main flagellum sparsely articulate, accessory flagellum vestigial or absent, rarely 2-articulate. Antenna 2 slender, feeble. Epistome strongly produced anteriorly, front of head with midvertical keel; labrum asymmetrically incised. Mouthparts except maxilliped in terminal males extremely reduced and vestigial, dominated by midventral keel; in young males and females mouthparts as follows: mandibles lacking molar, raker row long, incisors broad, toothed, wavy or with only one lateral notch, palp slender, feeble, 1 or 3-articulate, article 3 short, E-setae sparse. Labium with inner lobes discrete or fused to outer, gape moderate to absent, mandibular lobes well developed. Inner plate of maxilla 1 small, naked or sparsely setose, outer plate with

5-9 spines, palp 1 or 2-articulate. Maxilla 2 feeble, inner plate broad, medial setae sparse but thick and short, spine-like, outer plate much more slender and sparsely setose. Outer plates of maxillipeds moderately developed to absent, inner plates small and discrete or mostly fused together or vestigial, palp of maxilliped long, thin, 4-articulate.

Coxa 1 hidden by shield-like coxae 2-4; coxa 2 (or 3) largest, 4 scarcely larger than 3, weakly excavate or not, coxae 5-7 slightly to greatly smaller. Gnathopod 1 small or absent, carpochelate but often 6-articulate (either articles 4-5 or 6-7 thought to be amalgamated). Gnathopod 2 very large and often strongly carpochelate, propodus large in males and some females, elongate, oval, weakly to strongly sculptured, palm present or absent, dactyl long, overlapping propodus and carpal process.

Pereopods 3-4 slender. Pereopods 5-7 alike, short, bases expanded, 7 often weakly lobate. Pleopods biramous, multiarticulate. Gills simple, ovate, small. Oostegites thin or moderately broad.

Uropods 1-3 slender, apparently reaching to same extent, or outer ramus shortened, uropod 3 often breaking away, rami lanceolate, outer rami weakly to strongly shortened, weakly to moderately spinose. Uropod 3 biramous, peduncle elongate as on uropods 1-2. Telson short to long, ovate, entire.

Sexual dimorphism. Largely seen in transformed terminal males. Mouthparts except maxillipeds becoming reduced or vestigial, dominated by ventral keel; inner plates of maxilliped becoming severely reduced, outer plates becoming vestigial or absent; female gnathopod 2 with moderate carpal lobe, distinct palm, dactyl fitting palm; transformed male with enlarged gnathopod 2, carpal process and dactyl immense, usually touching across evanescent palm.

Relationship. The Amphilochidae have well-developed mandibles and gnathopod 1 is never so fully carpochelate as in anamixids.

The Cressidae and Stenothoidae have a uniramous uropod 3; many specimens of both Anamixidae and Cressidae lose uropod 3 on death so one must note the conspicuous size and form of gnathopod 2 in the anamixid section. This is also true of Stenothoidae but all genera of that family also have pereopod 5 with narrow article 2. Cressidae have the telson fused with urosomite 3.

The Sebidae have uniramous third uropods and propodochelate (not carpochelate) gnathopod 2. Their urosomites 2-3 are coalesced.

The Anamixidae superficially resemble Leucothoidae but are characterised by the severely reduced coxa 1.

The Anamixidae and some Leucothoidae have been assumed in the past to be piercing and sucking inquilines and are usually found in warm shallow waters on sessile invertebrates, particularly sponges, tunicates, corals and perhaps hydroids. However, Thomas & Taylor (1981) have found that male *Anamixis* are filter feeders despite the vestigial mandibles and maxillae and the presence of a 'piercing' stylet, which, in reality, is used to align the antennal peduncles when they are folded down for feeding. Thomas & Barnard (1983) also find that leucothoids are filter feeders, often inside ascidians and tunicates.

Taxonomy. Thomas & Barnard (1983) discovered that terminal transformed males had been placed in *Anamixis* and females had been placed in the Leucothoidae in *Leucothoides*. By redefining Anamixidae to include only leucothoid-like taxa with reduced coxa 1, *Leucothoides* became a synonym of *Anamixis*. Males of the genus are very distinctive but untransformed males and females are now impossible to differentiate until they have all been reviewed and minute characters such as shapes of coxae, setal placements and other characters to be discovered have been evaluated; many of the species may have to be reared before the proper transformations can be linked together.

Key to Genera of Anamixidae

(transformed males)

1. Gnathopod 1 absent or vestigial ..... *Paranamixis*

—— Gnathopod 1 present 2

2. Mandibles and maxillae vestigial, outer plates of maxillipeds vestigial or absent ..... *Anamixis*

—— Mandibles and maxillae ordinary, outer plates of maxillipeds almost as large as inner plates ..... Leucothoides-like females of *Anamixis* and *Paranamixis*

Anamixis Stebbing

Figs 27A,B, 85B

Anamixis Stebbing, 1897: 35.
Leucothoides Shoemaker, 1933a: 249 (*Leucothoides pottsi* Shoemaker, 1933a, monotypy).

Type species. *Anamixis hanseni* Stebbing, 1897, monotypy.

Diagnosis. In terminal males, coxa 1 very small, remainder of gnathopod 1 present.

Variables. Very minute characters such as placement of setae on coxa 1 and armament patterns of gnathopodal chelae. Outer plates of maxilliped absent (or weakly apparent in *A. grossimana*).

Relationship. Differing from *Paranamixis* in the presence of gnathopod 1 in terminal males. Females of the two genera not yet distinguished.

Species. *Anamixis barnardi* Sasidharan, 1983a [664]; *A. falarikia* J.L. Barnard, 1965a [591]; *A. grossimana* Ledoyer, 1978b [697]; *A. hanseni* Stebbing, 1897 (Pearse, 1912) [470I]; *A. pacifica* J.L. Barnard, 1955d, 1969a, 1979b (= *A. linsleyi* J.L. Barnard, 1955d, 1959d, 1969a, 1979b) [540 + 370 + I]; *A. pottsi* Shoemaker, 1933a (?Ruffo, 1959) (?Sivaprakasam, 1969a) (Ledoyer, 1967a, 1979a) (Thomas, 1979a) (J.L. Barnard, 1979b) [490I]; *A. stebbingi* Walker, 1904 (Nayar, 1967) (J.L. Barnard, 1965a, 1970a, 1971a) [600]; *A. torrida* J.L. Barnard, 1974b (= *A. pottsi* identification of Schellenberg, 1938a, J.L. Barnard, 1965a, 1970a) (?Ledoyer, 1986) [550]; *A. yarrega* J.L. Barnard, 1974b (Moore, 1987) [782]; species V (Loggerhead Key) J.L. Barnard, 1974b [478]; species Q (Albatross) J.L. Barnard, 1974b [476]; species 2 from Micronesia, J.L. Barnard, 1974b [591]; species, J.L. Barnard, 1974b [490]; species (*A. pottsi* of Hirayama, 1985c) [391];

Habitat and distribution. Marine, Indo-Pacific and Caribbean Sea, warm shallows, especially coral reefs, inquilines on corals, sponges, ascidians, etc., 0-89 m, 6 species as based on terminal males, otherwise 9 species.

Paranamixis Schellenberg

Paranamixis Schellenberg, 1938a: 29.

Type species. *Anamixis bocki* Schellenberg, 1938a, monotypy.

Diagnosis. Coxa 1 vestigial or absent, remainder of gnathopod 1 absent or vestigial.

Relationship. Differing from *Anamixis* in the loss of gnathopod 1. No females yet identified, probably represented by some species of *Anamixis* in the Leucothoides form.

Species. *Paranamixis aberro* Hirayama, 1983 [395]; *P. bocki* Schellenberg, 1938a (Ruffo, 1969) (Ledoyer, 1967a, ?1978b) [600]; *P. excavatus* Ledoyer, 1978b [697]; *P. indicus* Sivaprakasam, 1968b (?Ledoyer, 1979a) [690I]; *P.*

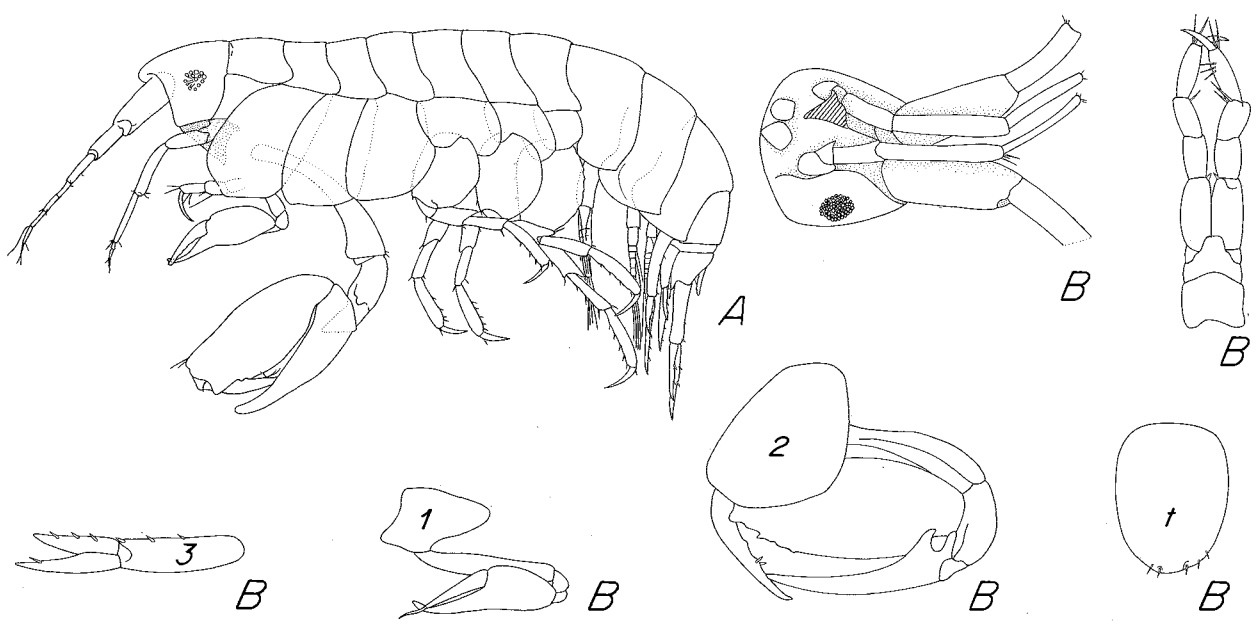

Fig.27. Anamixidae. A, *Anamixis stebbing*; B, *Anamixis linsleyi*. See also Fig.85.

madagascarensis Ledoyer, 1982b (Myers, 1986b) [698].

Habitat and distribution. Marine, Polynesia to Madagascar, coral reefs, 0-3 m, 5 species.

ANISOGAMMARIDAE Bousfield, 1977

[see Barnard & Barnard (1983)]

ARGISSIDAE Walker, 1904

[see Barnard & Barnard (1983)]

ARTESIIDAE Holsinger, 1980

[see Barnard & Barnard (1983)]

BATEIDAE Stebbing, 1906

Diagnosis. Coxa 1 vestigial or absent, not seen from lateral view, hidden behind coxa 2, part of coxa 2 hidden by coxa 3; gnathopod 2 composed of 1 article besides coxa 1; accessory flagellum vestigial or absent; plates of maxilliped well developed. Otherwise like Eusiridae.

See Eusiridae and Gammaridae.

Description. Body compressed, smooth or posterodorsally carinate, urosomites free. Rostrum large, often sharp, lateral cephalic lobes anteriorly truncate, lacking sinus for antenna 2. Eyes large. Peduncles medium to short but flagella of antennae 1-2 well developed, article 1 of antenna 1 often with ventrodistal process.

Labrum rounded distally. Incisor of mandible toothed, raker row well developed, molar strong and triturative, palp stout, article 3 subfalcate, shorter than 2. Labium well developed, gape weak, with or without strong fleshy inner lobes. Inner plate of maxilla 1 narrow to ordinary, moderately to strongly setose medially, outer plate with 11 spines, palp 2-articulate, article 1 occasionally as long as article 2. Plates of maxilla 2 narrow, outer broader than inner, latter strongly setose medially, usually with 2 especially noticeable deeply implanted enlarged setae among other medial setae, no facial row of setae. Inner plate of maxilliped very large and strongly armed, outer plate well developed, medially spinose, palp moderately strong, dactyl unguiform, nail evanescent.

Coxa 1 vestigial, coxa 2 tapering distally but partially hidden, coxa 3 expanded distally, coxa 4 large, with extremely large posteroventral lobe, coxae 5-7 short. Gnathopod 1 formed of vestigial coxa plus elongate article 2 bearing setae (resembling a weakly developed female brood lamella), gnathopod 2 feeble, carpus scarcely shorter than propodus, weakly to moderately lobate, palm oblique, (castelloserrate) dactyl strongly serrate.

Pereopods 3-4 elongate, article 6 especially long, posterior margins of articles 5-6 often strongly setose. Pereopods 5-7 consecutively larger, article 2 diverse, that of pereopod 5 narrow basally, often expanding distally, often lobate posteriorly and somewhat anteriorly, of pereopod 6 expanded but poorly lobate posteriorly, heavily setose anteriorly, of pereopod 7 expanded and strongly lobate posteriorly; these legs breaking easily after death. Gills on segments 2-?, pleated or simple, expanded, weakly pediculate. Oostegites very long, narrow to moderately expanded, tear-drop shaped.

Epimeron 3 usually densely serrate posteriorly. Pleopods strong. Uropods 1-3 long though uropod 2 much the shortest and/or smallest and/or failing to reach as far as others, outer rami of uropods 1-2 usually shortened, apical spines often fused by notches to bodies. Peduncle of uropod 3 short, rami long, broadly lanceolate, 1-articulate, aequiramous. Telson ordinary to slightly elongate, weakly to moderately cleft, incision often gaping.

Sexual dimorphism. Weak or absent, perhaps female rostrum weaker, gnathopod 1 stouter, article 2 of gnathopod 2 longer.

Variables. Body carinate and article 1 of palp on maxilla 1 almost as long as article 2 (*B. cuspidata*, *B. carinata*, *B. conductor*, the *Carinobatea* group); but article 1 of maxilla 1 palp 59% as long as article 2 (*B. catharinensis*), 65 % (*B. transversa*), 71% (*B. lobata*), 81% (*B. rectangulata*), 90% (*B. cuspidata*); article 1 of antenna 1 with process large (*B. cuspidata*), small (*B. conductor*), absent (*B. catharinensis*); article 3 of gnathopod 2 elongate (*B. cuspidata*); article 2 of pereopod 5 narrow and unlobed (*B. cuspidata*, *B. carinata*, *B. conductor*, *B. coyoa*, *B. susurrator*); inner lobes of lower lip present (type), absent (*B. lobata*).

Relationship. Bateidae can be described as a kind of Eusiridae with gnathopod 1 and coxa 1 vestigial. There is a superficial resemblance to such taxa as *Rozinante* (*Apherusa*), or *Pontogeneia*, and *Nasageneia*, which have a well-developed gnathopod 1 but a small gnathopod 2 more or less precursorial to that of Bateidae, and also have the shortened peduncles of the antennae (especially *Nasageneia*), the well-setose maxillae and other congruent mouthparts, telson, uropod 3, serrate epimeron 3, head, eyes and rostrum but Bateidae also have the unusually enlarged posteroventral lobe of coxa 4 not found in those other taxa.

Batea F. Müller, new synonymy

Figs 28A-E

Batea F. Müller, 1865: 276.–Shoemaker, 1926b: 2.
Carinobatea Shoemaker, 1926b: 21 (*Carinobatea cuspidata* Shoemaker, 1926b, original designation).

Type species. *Batea catharinensis* Müller, 1865, monotypy.

Nomenclature. Originally *Carinobatea* was distinguished from *Batea* on the presence of dorsal body teeth and lack of inner lobes on the lower lip. The latter character is now found to be variable in noncuspidate *Batea*. Other variables not correlated with body processes are the long and short article 1 of the palp on maxilla 1, the size, presence or absence of a distoventral process on article 1 of antenna 1, and the narrowness of article 2 on pereopod 5. We do not understand Shoemaker's distinction about the maxilliped so we find no particular reason to keep *Carinobatea* separated.

Diagnosis. With the characters of the family.

Species. See Dickinson *et al.* (1980); Feeley & Wass (1971, ecology); *B. carinata* (Shoemaker, 1926b, 1948) [470]; *B. catharinensis* F. Muller, 1865 (= *B. secunda* Holmes, 1903, 1905; Kunkel, 1918) (Shoemaker, 1926b, 1942) (Bousfield, 1973) [490]; *B. conductor* (J.L. Barnard, 1969b) [377]; *B. coyoa* (J.L. Barnard, 1969b) [377]; *B. cuspidata* (Shoemaker, 1926b, 1933c, 1935a, 1948) [470]; *B. lobata* Shoemaker, 1926b (J.L. Barnard, 1962b, 1969a) [370]; *B. rectangulata* Shoemaker, 1925, 1926b (J.L. Barnard, 1969b, 1979b) [377]; *B. susurrator* J.L. Barnard, 1969b, 1979b [377]; *B. transversa* Shoemaker, 1926b (Hewatt, 1946) (J.L. Barnard, 1962b, 1969a, 1979b) (Reish & Barnard, 1967) [370].

Habitat and distribution. Marine, tropical America, in shallow water especially on sandy or stony bottoms with small fleshy red algae, 0-108 m, 9 species.

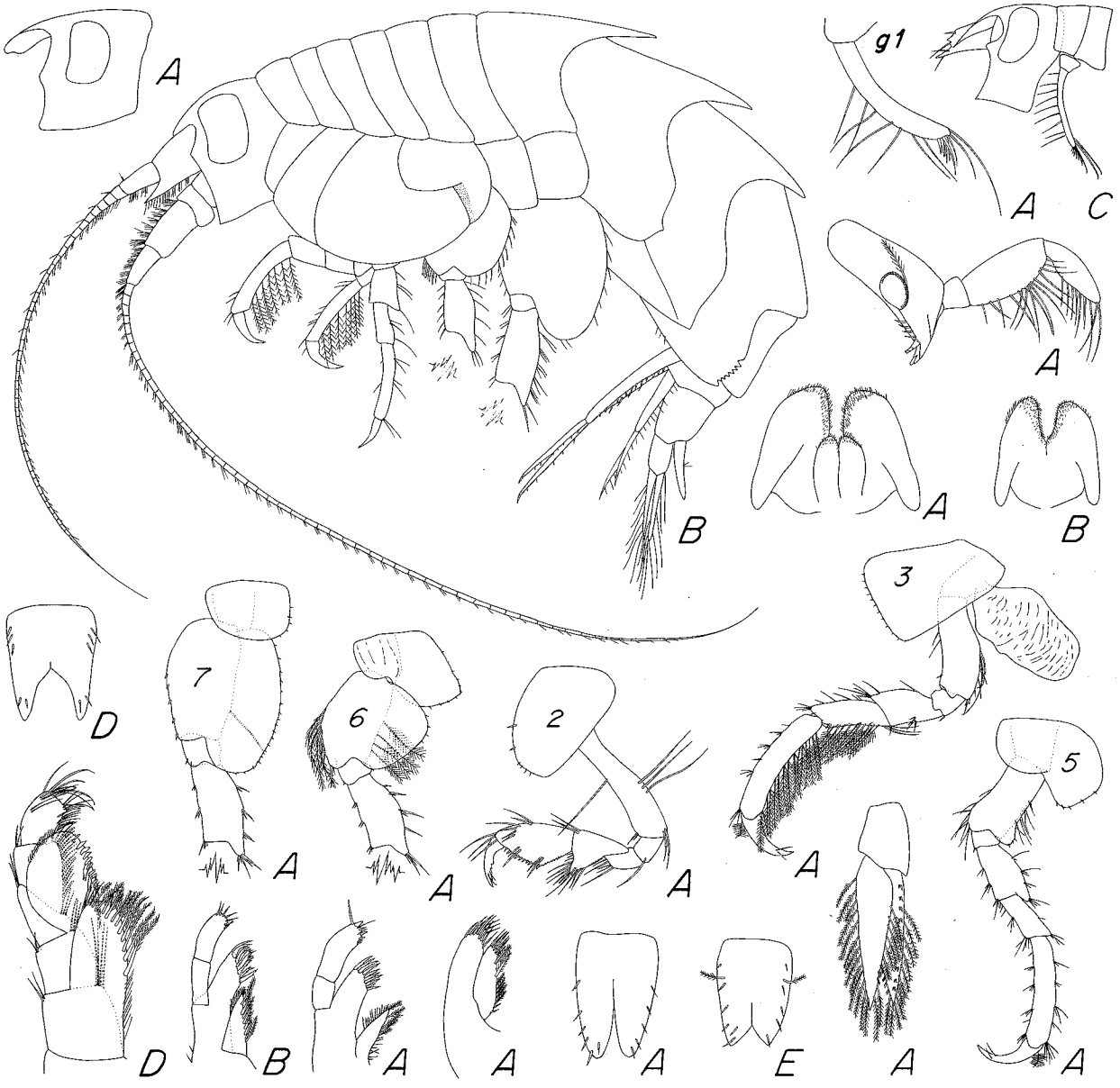

Fig.28. Bateidae. A, *Batea catharinensis*; B, *Batea cuspidata*; C, *Batea carinata*; D, *Batea rectangulata*; E, *Batea transversa*.

BIANCOLINIDAE J.L. Barnard, 1972a

Diagnosis. Body cylindrical, of medium thickness. Head depressed, cylindroid, not incised for antenna 2, with weak rostrum. Pereonite 1 lacking ventral flange. Palps of mandible and maxilla 1 absent. Inner plates of maxilliped not reaching extent of outer plates, lacking short thick spines, with 2 long setae. Coxae small to large, coxa 5 usually longer than coxa 4. Gnathopods parachelate, article 5 short. Oostegites moderately expanded, setae curl-tipped. Peduncles of uropods 1-2 with long setae. Uropod 3 large, biramous, rami slender to stout, only slightly shorter than broadened peduncle, poorly armed, usually outer ramus with 2 weakly hooked spines. Telson not strongly fleshy, entire or cleft one third, no dorsal raphus.

Additional characters. Eyes red, lacking black pigment, accessory flagellum absent; gland cone of antenna 2 vestigial or absent. Upper lip rounded or slightly emarginate. Mandibles stout, laciniae mobiles present on both sides, molar absent. Inner lobes of lower lip large. Inner plate of maxilla 1 tumid, with weak seta. Inner plate of maxilla 2 extremely thin but normally setose. Maxillipedal palp well exceeding outer plate, article 2 swollen and produced mediodistally. Article 2 of pereopods 3-4 as broad as pereopods 5-7. Rami of pleopods tumid, thus peduncles not differentially expanded. Pleonites 5-6 free.

Sexual dimorphism. Some possible males have odd uropods 1-2, uropod 1 with peduncular hyaline lobe, and outer ramus of uropod 2 short, with long hooked spine.

Variables. Rakers present or absent; lacinia mobilis absent on one side (*B. australis*); maxilliped dactyl short and tumid or long and subunguiform; pereopods simple or prehensile; setae of uropods sparse or abundant.

Relationship. Differing from Ampithoidae and apparently descended from the grade represented by *Amphitholina* in the loss of fleshiness in the telson, cylindrical head, strong basal amalgamation of antenna 2 with head and relative slenderness and poor armamentation of the rami on uropod 3.

From Eophliantidae in the retention of a weak rostrum and biramous uropod 3, in the short inner plate of the maxilliped bearing only setae (versus spines in Eophliantidae), short article 5 on parachelate gnathopods, and in the peduncle of the pleopods being not much wider than the width of both rami together.

Biancolina Della Valle

Figs 26D, 29A,B

Biancolina Della Valle, 1893: 562.–J.L. Barnard, 1972b: 195.

Type species. *Biancolina algicola* Della Valle, 1893, monotypy.

Diagnosis. With the characters of the family.

Sexual dimorphism. Male uropods 1-2 with apical armaments thickened and elongate, outer ramus often shortened more than in female (though also often short in female).

Species. See J.L. Barnard (1972b); *B. algicola* Della Valle, 1893 (Krapp-Schickel, 1969b) (Ruffo, 1982d) (= *B. mauihina* J.L. Barnard, 1970a, 1971a, Ledoyer, 1978b, 1979b, 1986) (Myers, 1985c) [423]; *B. australis* Nicholls, 1939 [788]; *B. brassicacephala* Lowry, 1974b (Steele & Collard, 1981) [470N]; *B. obtusata* Tzvetkova, 1976 [391].

Habitat and distribution. Marine, throughout tropics, north to Sea of Japan, 0 m, probably burrowers into fleshy algae, 4 species.

BOGIDIELLIDAE Hertzog, 1936

[see Barnard & Barnard (1983)]

BOLTTSIIDAE Barnard & Karaman, 1987

Diagnosis. Proceeding from Amphilochoidids, coxae 1-4 of ordinary size, coxa 1 neither reduced nor expanded ventrally and not broader than coxa 2; coxa 4 of medium size, broader than coxa 3, posterodorsal excavation small. Peduncle of uropod 3 of medium elongation. Telson entire.

Antennae short and similar to amphilochids. Accessory flagellum obsolescent. Antenna 2 slightly shorter than antenna 1, article 5 longer than 4. Upper lip scarcely incised (unusual). Molar large but simple, setulose, palp of medium stoutness. Lower lip with well-developed unnotched outer lobes bearing ordinary blunt mandibular lobes, outer lobes widely separated by well-developed unfused inner lobes. Inner plate of maxilla 1 small, naked, outer plate with 7 spines, palp thin, 2-articulate. Plates of maxilla 2 of medium width, subequal in width, latter without large medial setae. Maxilliped ordinary, inner plates thin, apical spine of dactyl very strong.

Gnathopods moderately enlarged, alike, carpus short, weakly lobate, propodus longer, well expanded, palms almost transverse. Pereopods 3-7 ordinary. Outer ramus of uropods 2-3 shortened; peduncle of uropod 3 elongate, rami naked and shorter than peduncle. Telson elongate, leaf-like, entire, apically rounded. Pleonites 1-3 with dorsal tooth.

Relationship. Relatively good ancestral kind of other amphilochoideans but probably a distinct side branch from ancestors of Pseudamphilochidae because of poorly developed excavation of coxa 4, uncleft telson and

unexpanded coxa 1.

Differing from Amphilochidae in the large coxa 1. From Pseudamphilochidae in the short antennae, uncleft telson, thin inner plate of maxilliped, presence of 7 (versus 9) spines on the outer plate of maxilla 1, and regular uropod 3 with elongate peduncle. From Eusiridae and Pleustidae in the absence of medial and apical setae on the inner plate of maxilla 2 (bearing only 1 apical spine), the medial margin of the outer plate on the maxilliped bearing 4-5 irregularly placed setal spines, and in the proportions of gnathopods 1-2 in which the propodi expand apicad and have a transverse palm.

Bolttsia Griffiths

Fig.30

Bolttsia Griffiths, 1976b: 12

Type species. *Bolttsia minuta* Griffiths, 1976b, original designation.

Diagnosis. With the characters of the family.

Species. *Bolttsia minuta* Griffiths, 1976b [743E].

Habitat and distribution. Marine, coastal disjunct lagoon (Sibaya Lake), South Africa near Mozambique border, 1 species.

CALLIOPIIDAE Sars, 1895

[see Eusiridae, and Barnard & Barnard (1983)]

CARANGOLIOPSIDAE Bousfield, 1977

Diagnosis. Rostrum absent, head short, ventral cheek strongly developed probably as down turned lateral lobe, projecting ventrally. Antenna 1 of gammarid form, articles 1-3 elongate, primary flagellum elongate, accessory flagellum vestigial. Antenna 2 of urothoe form, articles not expanded, lacking spines, article 5 as long and as wide as article 4, flagellum of medium length (about as long as article 5 of peduncle). Prebuccal complex not massive, epistome scarcely distinct, upper lip dominant. Mandibles bearing stubby, moderately toothed incisors; laciniae mobiles present on both sides, slightly distinct from each other, rakers vestigial or absent, molar large, not triturative, lacking chopper; palp 3-articulate, slender, article 1 elongate, article 2 scarcely elongate, article 3 longer than 2, rounded apically, D- and 3E setae present. Lower lip with well-developed inner lobes, mandibular extensions of outer lobe well developed. Maxilla 1 with 2-articulate palp, inner plate with fewer than 4 setae.

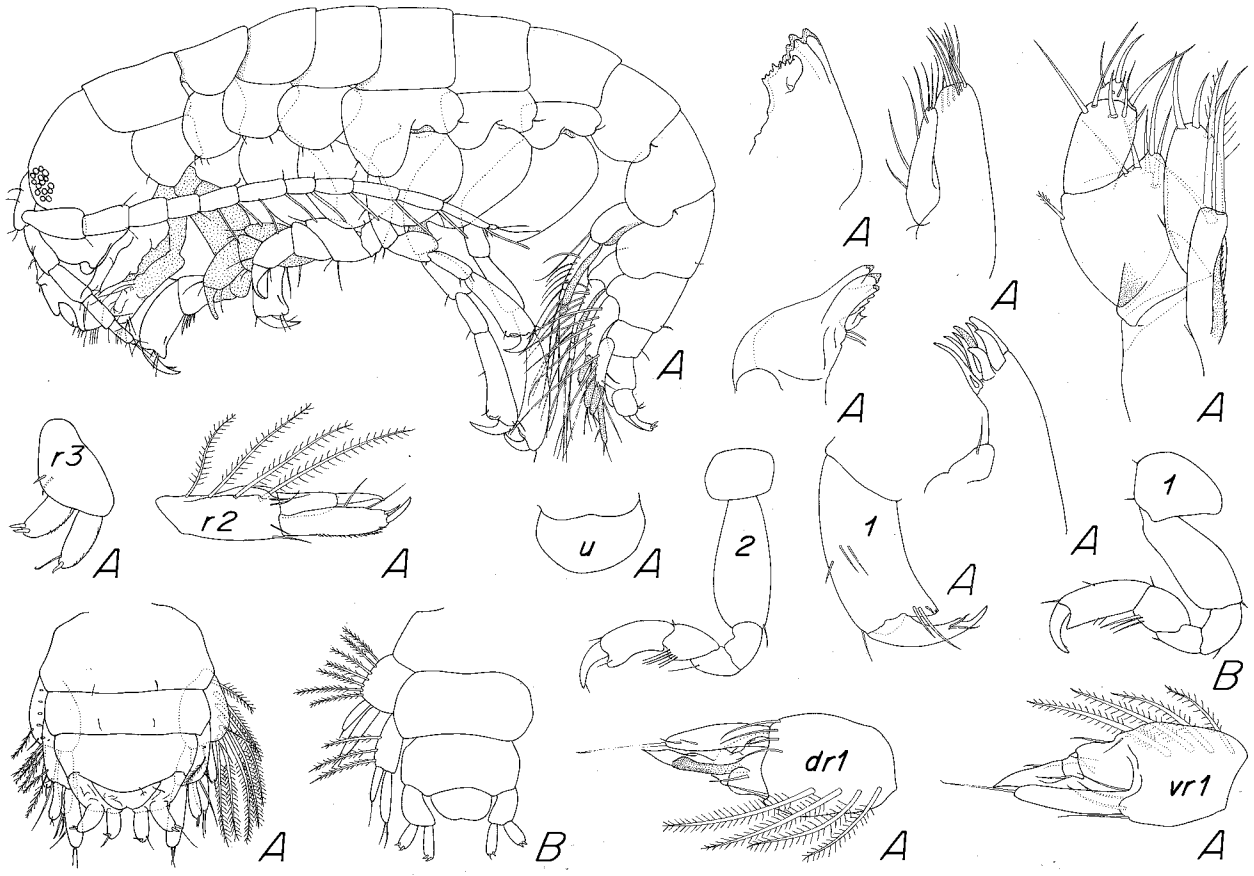

Fig.29. Biancolinidae. A, *Biancolina mauhina*; B, *Biancolina algicola*. See also Fig.26D.

Maxilla 2 well developed, lacking medial and facial setae. Maxillipeds with unexpanded bases, normally enlarged plates, outer spinose; palp 4-articulate, article 2 weakly expanded, article 4 unguiform, apical nail well developed. No baler lobes on maxillae or maxillipeds.

Coxae tiny, disjunct, coxa 4 rectangular. Coxal gills on segments 2-4; brood plates slender. Gnathopods moderate, grossly alike, carpus shorter than propodus, gnathopod 2 larger than 1 and carpus strongly lobate, propodus ovate, with long oblique palms. Article 5 of pereopods 3-4 broad, slightly expanded, not lobate, with long thin setal spines posteriorly; dactyls of pereopods 3,4,6,7 well developed, vestigial on pereopod 5; pereopod 5 only weakly of haustorioid shape and facial spination absent, pereopods 5-7 scarcely expanded, all similar, article 2 subrectangular, pereopod 6 dominant.

Pleopods similar among themselves, peduncle elongate, rami long and extending equally, [coupling hooks unknown], basal clothespin spines apparently absent. Epimeron 3 dominant, epimera lacking armaments. Rami of uropods 1-2 styliform and spinose; uropod 3 of ordinary parviramous haustorioid-phoxocephalid kind, outer ramus dominant, 2-articulate, peduncle short, flat, expanded; rami poorly setose apically. Telson short, cleft halfway. Sexual dimorphism absent.

Relationship. This family differs from the Urothoidae and all other families of the Haustorioidea in the minute and disjunct coxae and the presence of a basofacial spine on uropod 1; it differs also from Urothoidae in the toothed incisors and gammaroid like gnathopods, with dominant propodus, with slightly enlarged gnathopod 2 bearing somewhat shortened but strongly lobate carpus.

The Carangoliopsidae differ from the Phoxocephalidae in the tiny coxae, elongate article 3 of antenna 1 and sharp ventral cephalic cheek with no projecting lateral cephalic lobes and no rostrum; pereopod 7 is quite unlike that of phoxocephalids, being like pereopod 6 and having unexpanded, non-shield-like article 2.

The long peduncles of the pleopods distinguish the family from most other haustoriids.

Carangoliopsis resembles *Carangolia* (Urothoidae) superficially because *Carangolia* has small but touching coxae; otherwise *Carangolia* has dominant carpus on the gnathopods, well-developed haustorius form of pereopod 5, very short article 4 of pereopods 6-7, naked rami of uropods 1-2, broad, almost entire telson, stubby uropod 3, huge mandible typical of Urothoidae, disproportionate palp articles on the maxillipeds, much shorter antennal flagella, and elongate article 1 on the palp of maxilla 1.

The peduncle of uropod 1 is unusual in relation to various haustorioids and phoxocephalids in that it has a basofacial spine; this and the jizz of gnathopods indicates the gammaridan ancestry of this taxon.

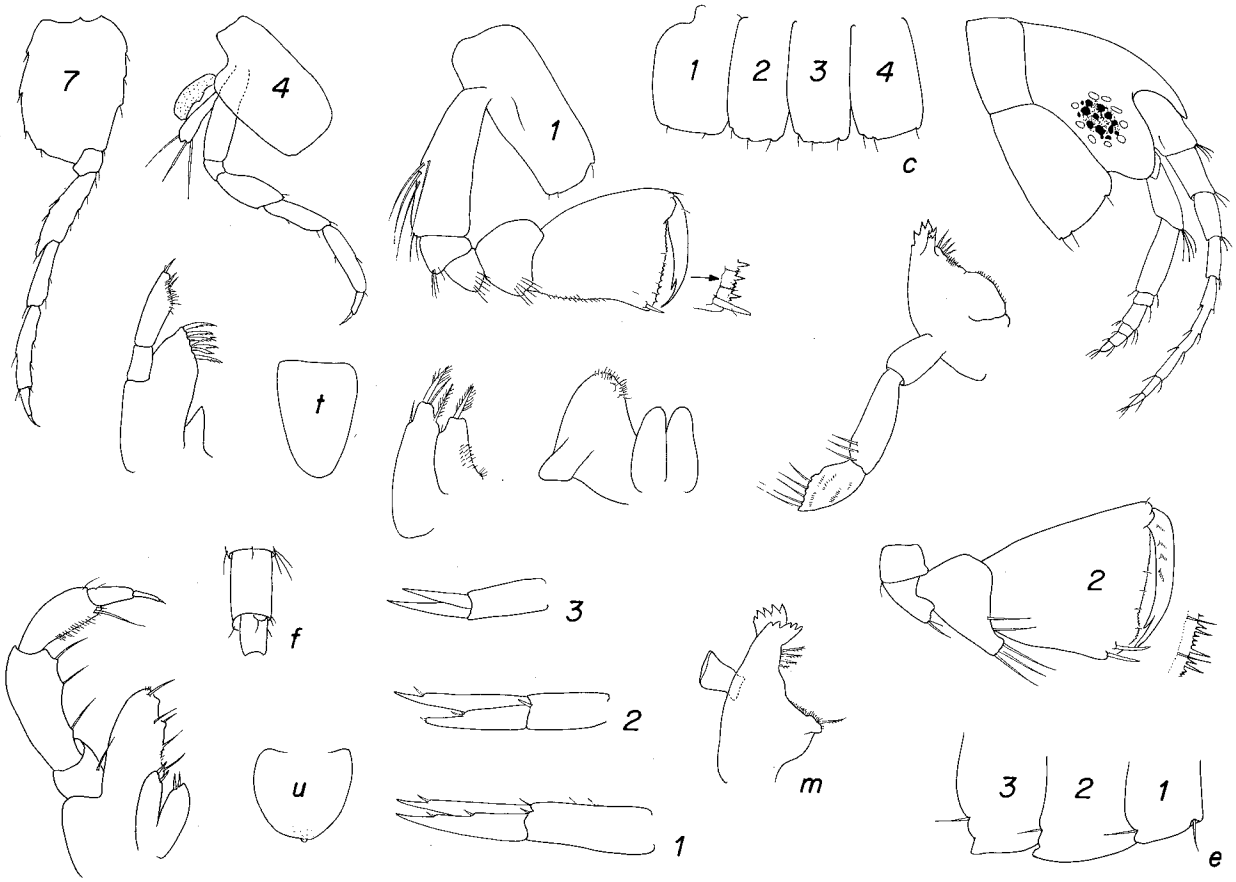

Fig.30. Bolttsiidae. *Bolttsia minuta.*

Carangoliopsis Ledoyer

Fig.31

Carangoliopsis Ledoyer, 1970: 11.

Type species. *Carangoliopsis spinulosa* Ledoyer, 1970, original designation.

Diagnosis. With the characters of the family.

Species. *Carangoliopsis spinulosa* Ledoyer, 1970 (Ruffo & Schiecke, 1971) (Bellan-Santini, 1984) [348 + B].

Habitat and distribution. Marine, Mediterranean, 52-1110 m, 1 species.

CARDENIOIDAE Barnard & Karaman, 1987

Diagnosis. Gammaridean with non-galeate head (though probably derived from such); accessory flagellum of antenna 1 1-articulate but large; antenna 2 lacking facial spines on article 4; upper lip fleshy, ventrally rounded; mandibles with 3-articulate palp, article 3 short, thick, weakly bevelled apically, all setae apical, molar medium to large, triturative, spine row present; lower lip with mandibular lobes broad but not projecting, inner lobes present and separate from each other, no extraordinary wide space between outer lobes; maxillae 1-2 well developed, strongly setose medially, palp of maxilla 1 2-articulate; plates of maxilliped well developed, palp 3-articulate; coxae poorly setose, coxa 1 tiny and hidden by large following coxae; gnathopod 1 present, essentially 6-articulate (dactyl vestigial), carpus large and lobate, propodus small and simple, gnathopod 2 very slender, elongate, carpus dominant, dactyl vestigial or

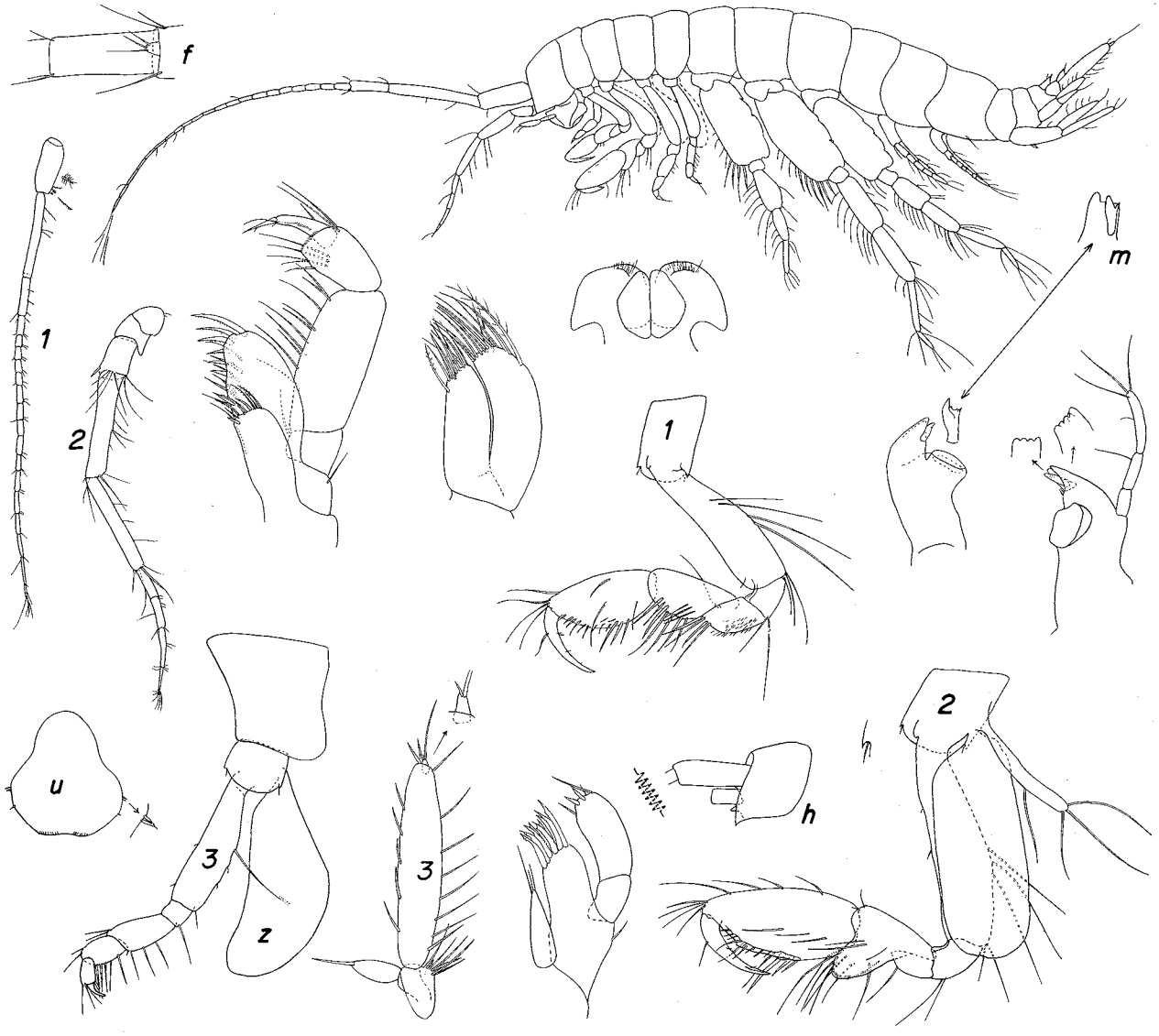

Fig.31. Carangoliopsidae. All figures are *Carangoliopsis spinulosa*.

absent; pereopods 3-4 with dactyls vestigial, of pereopods 5-6 small, of pereopod 7 absent; pereopod 6 dominant but pereopod 7 not shortened, pereopods generally fossorial; uropods 1-3 present, strongly biramous, uropod 3 magniramous; telson elongate, deeply cleft.

Relationship. Sharing many characters of Synopiidae but head not distinctly galeate and coxa 1 strongly reduced. Characters shared with Synopiidae include the short article 3 of the mandibular palp, fossorial pereopods, rather slender though reduced antenna 1 and shape of the gnathopods.

Formerly in the old Haustoriidae-Pontoporeiidae but not in those groups because of the non-fossorial antennae, non-haustorioid but otherwise well-developed lanceolate rami on uropod 3, elongate poorly setose telson and reduced coxa 1.

Specifically differing from Pontoporeiidae by the combination of aequiramous uropod 3 with 1-articulate rami, reduced coxa 1, and unshortened non-phoxocephalid pereopod 7.

The diagnosis of *Cardenio* below resembles that of Synopiidae for comparisons.

Cardenio Stebbing

Figs 32, 129G, 130E

Cardenio Stebbing, 1888: 806.–Stebbing, 1906: 125.

Type species. *Cardenio paurodactylus* Stebbing, 1888, monotypy.

Diagnosis. Forehead not protuberant, lateral cephalic lobe not sharp, eyes present; mandible with palp, molar of medium size and not dominating mandible, moderately triturative; articles 1-2 of antenna 1 basic, article 3 as long as 1 (longer than 2), no teeth; dactyl of maxilliped vestigial or absent; coxa 1 strongly reduced; coxae 3-4 not pelagont; gnathopods simple, gnathopod 1 stout, carpus thick, lobate, with serrate spines; gnathopod 2 slender, carpus long, not lobate, without serrate spines, dactyl obsolescent or absent; pereopods 5-7 elongate, dactyls elongate, pereopod 6 dominant; article 2 of pereopod 7 strongly expanded, subtruncate ventrally; pleonites 1-5 transversely denticulate; uropod 3 not grossly exceeding uropod 1, peduncle elongate, uropod 2 short; telson elongate, deeply cleft.

Species. *Cardenio paurodactylus* Stebbing, 1888, 1906 (K.H.Barnard, 1932) (Stephensen, 1947a) (Thurston, 1974b) [835, 890].

Habitat and distribution. Marine, austral and Antarctic islands, 0-70 m, 1 species.

CASPICOLIDAE Birstein, 1945

[see Barnard & Barnard (1983)]

CEINIDAE J.L. Barnard, 1972a

Diagnosis. Head of ordinary size; urosomites free; body compressed laterally and pleon unflexed; anterior coxae not splayed, much larger than posterior coxae. Antennae generally ordinary, not greatly reduced; accessory flagellum absent. Mandible lacking palp, molar triturative or degraded; maxillae feeble, moderately to poorly setose. Gnathopods subchelate or chelate. Peduncles of pleopods unexpanded. Uropod 3 with or without ramus. Telson entire or cleft, laminar or weakly fleshy. Cuticle with deep and complex sensory pits.

See other Talitroidea, especially Talitridae, and Dogielinotidae, Najnidae, Phliantidae, Eophliantidae and Plioplateidae.

Description. Rostrum weak to moderately developed, cephalic lobes well developed. Antennal flagella usually multiarticulate, occasionally antenna 1 poorly articulate. Mandibular rakers sparse. Inner lobes of lower lip absent. Inner plate of maxilla 1 small to medium, poorly setose, outer plate with 8+ spines. Maxilla 2 usually poorly armed. Plates of maxilliped ordinary, palp thin or thick, 4-articulate, dactyl with flexible nail. Coxa 4 excavate posterodistally. Gnathopods often feeble but occasionally male gnathopod 2 large, subchelate or propodochelate. Article 2 of pereopods 5-7 expanded. Body weakly humped to moderately carinate. Pleopods ordinary. Uropods 1-2 ordinary. Gills variable, formula poorly known; oostegites variable, furnished with curl-tipped setae. Cuticle bearing deep sensory pits.

Sexual dimorphism. Generally weak but in *Ceina egregia* male gnathopod 2 powerful.

Relationship. Differing from Talitridae, Hyalidae and Hyalellidae in the absence of a ramus on uropod 3 except in one species of *Africhiltonia* where this ramus remains. The Ceinidae usually have deep cuticular pits. The Hyalidae have an occasional species with weakly developed cuticular pits suggesting the Ceinidae may have descended from hyalids. Marine Ceinidae (except *Hyachelia*) differ from Hyalidae and Hyalellidae in the long aesthetascs on the flagellum of antenna 1. The freshwater Chiltoniinae differ from freshwater Hyalellidae in the presence of cuticular pits.

The Dogielinotidae have spinose peduncles of antenna 2. The Najnidae are characterised by the molar being reduced to emplaced spines. The Phliantidae have depressed bodies and splayed coxae, flexed abdomen and hidden uropod 3. The Eophliantidae have cylindrical

bodies, small coxae and hidden uropod 3. The Kuriidae have coalesced urosomites. The Plioplateidae appear to be advanced out of Ceinidae in which the head is depressed, the body furnished with anterior cuspidation, the large setae on the gnathopods are absent and the inner lobes on the lower lip are present.

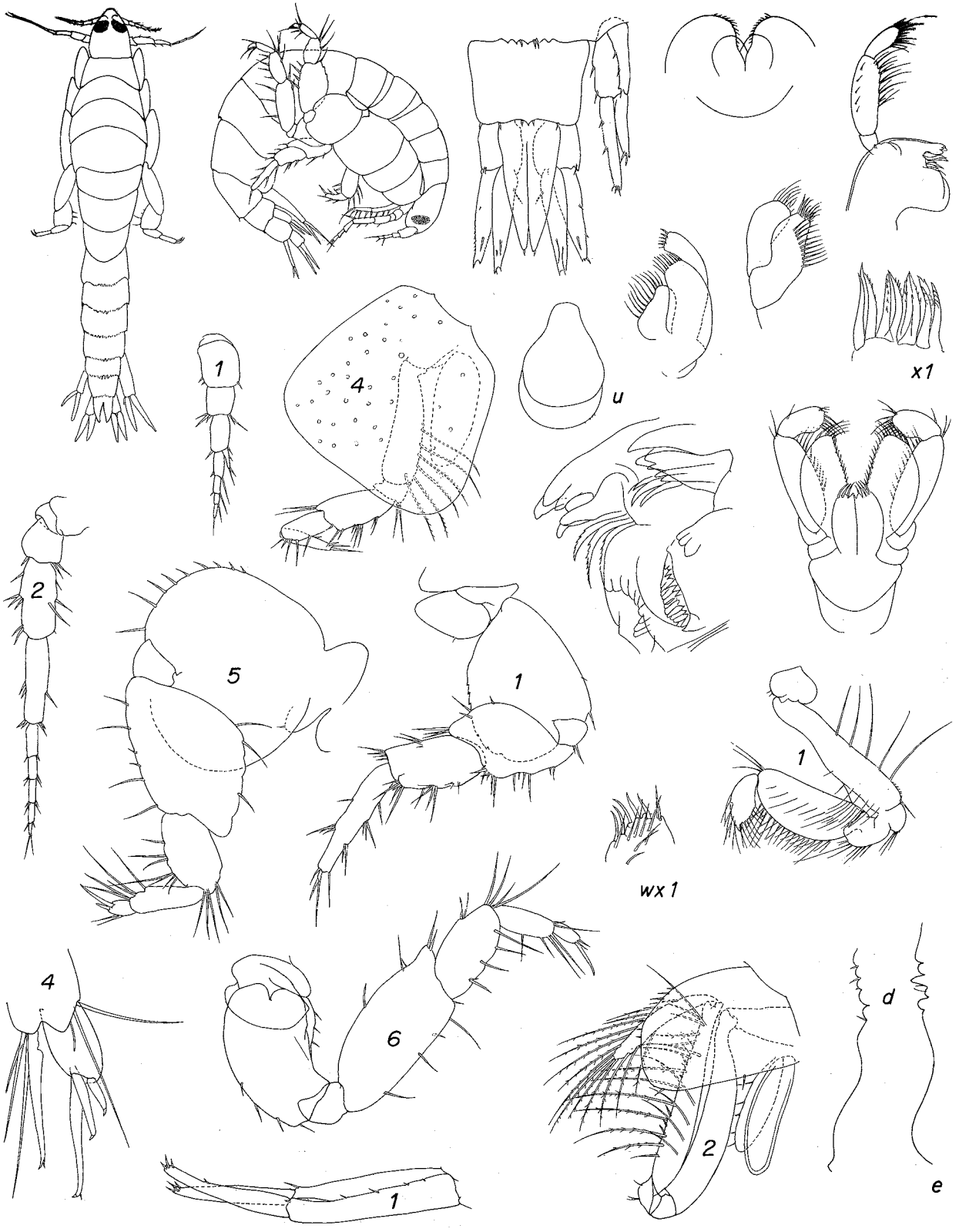

Fig.32. Cardenioidae. *Cardenio paurodactylus*. See also Figures 129, 130.

Key to Subfamilies of Ceinidae

Telson cleft ..... Ceininae

Telson entire ..... Chiltoniinae

Ceininae J.L. Barnard, 1972a

Diagnosis. Base of antenna 2 partially fused to head. Antenna 1 with long aesthetascs. Telson cleft more than halfway.

Description. Cephalic lobes flange-like. Antennae variable. Molar variable. Inner plate of maxilla 1 variable, palp variable. Inner plate of maxilliped large, outer plate much larger, dactyl unguiform or stubby. Male gnathopod 2 feeble or enlarged and chelate, article 5 not cryptic. Gills expanded, formula [?2-?]; oostegites narrow. Ramus of uropod 3 absent.

Key to Genera of Ceininae

1. Articles 2-4 of pereopod 5 densely setose anteriorly, palp of maxilliped thin (Fig.34D) ..... *Taihape*

—— Articles 2-4 of pereopod 5 not densely setose anteriorly, palp of maxilliped thick (Fig.34C) 2

2. Head underslung (Fig.33A), mandibular molar styliform, (palm of gnathopod 1 oblique) ..... *Ceina*

—— Head not underslung (Fig.34D), mandibular molar large, columnar, triturative, (palm of gnathopod 1 transverse or oblique) 3

3. Antenna 1 lacking long aesthetascs, male gnathopod 2 large and powerful, pereopods prehensile ..... *Hyachelia*

—— Antenna 1 with long aesthetascs, male gnathopod 2 feeble, like gnathopod 1, pereopods simple ..... *Waitomo*

Ceina Della Valle

Figs 33A,C, 34B,E

Ceina Della Valle, 1893: 530.–Stebbing, 1906: 554.–Pirlot, 1938: 329.–J.L. Barnard, 1972b: 170.

Periphlias Pirlot, 1936b: 295 (*Periphlias carinata* Pirlot, 1936b, original designation).

Type species. *Nicea egregia* Chilton, 1883, monotypy.

Diagnosis. Head underslung. Mandibular molar thorn-like. Palp of maxilla 1 absent. Palp of maxilliped thick, article 1 rarely alate. Female gnathopods feeble, palms oblique, short, male gnathopod 2 enlarged, chelate. Pereopod 5 lacking long anterior setae on articles 2-4.

Description. Pereonite 1 swollen anterodorsally, head hanging underneath; ocular lobes forming plate-like anterior flanges, with or without lateral notch. Flagellum of antenna 1 with 4-12 articles, elongate or short. Coxa 1 rectangular or conical, or much reduced, coxa 2 ordinary or enlarged, coxa 4 unproduced posteriorly or with sharp cusp. Article 4 of pereopods 5-7 slightly to greatly expanded. Pereon and pleon carinate. Uropod 3 plate like.

Variables. Palp of maxilliped alate, coxa 1 small, gnathopodal spines lacking prickles, male gnathopod 2 like female gnathopod 2 (*C. wannape*).

Relationship. Apparently the most advanced of the marine ceinids, differing from the primitive *Waitomo* in the reduced molar and underslung head.

Species. *Ceina carinata* (Pirlot, 1936b) [641]; *C. egregia* (Chilton, 1883) (Chilton, 1919a) (Pirlot, 1938) (J.L. Barnard, 1972b) [775]; *C. platei* Schellenberg, 1935a [769]; *C. wannape* J.L. Barnard, 1972 [787].

Habitat and distribution. Marine, Philippine Islands, Australia, New Zealand, Juan Fernandez Islands, 0-13 m, 4 species.

Hyachelia J.L. Barnard

Hyachelia J.L. Barnard, 1967c: 120.

Type species. *Hyachelia tortugae* J.L. Barnard, 1967c, original designation.

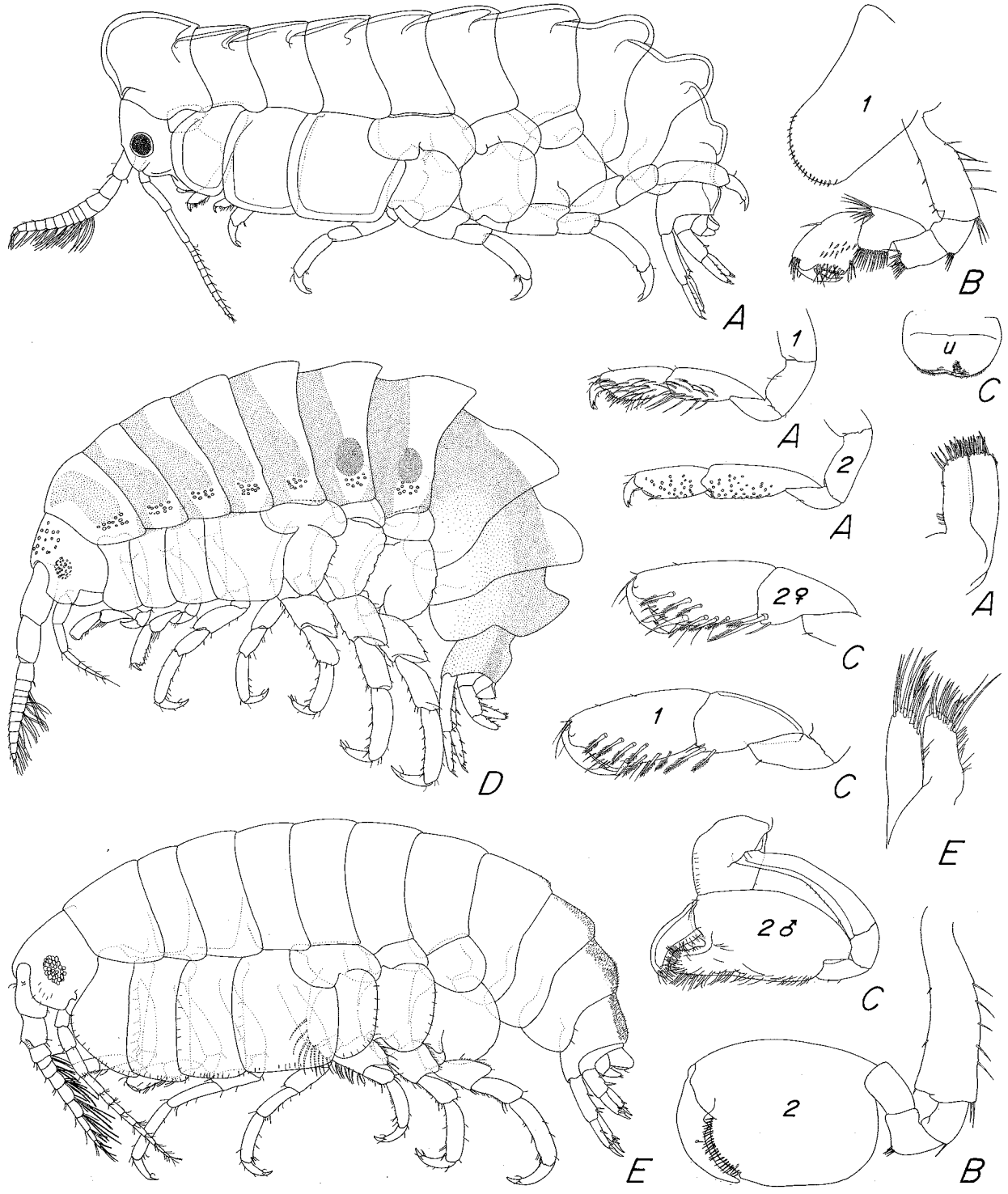

Fig.33. Ceinidae. A, *Ceina wannape*; B, *Chiltonia mihiwaka*; C, *Ceina egregia*; D, *Waitomo manene*; E, *Taihape karori*.

Diagnosis. Head not underslung. Mandibular molar triturative. Tiny palp of maxilla 1 present. Palp of maxilliped thick, article 1 not alate. Female gnathopods small but not feeble, palms oblique, short, male gnathopod 2 enlarged, subchelate. Pereopod 5 lacking long anterior setae on articles 2-4.

Description. Pereonite 1 not swollen anterodorsally, head ordinary; ocular lobes not forming plate-like anterior flanges, with lateral notch. Flagellum of antenna 1 with about 8 articles, short. Coxa 1 subconical, coxa 2 ordinary, coxa 4 bluntly lobate posteriorly. Article 4 of pereopods 5-7 not expanded. Pereon and pleon smooth. Uropod 3 leaf like.

Characters for comparison to Hyalidae. Dactyl of maxilliped short and stubby, without long whip-like seta; male gnathopod 2 article 5 not produced between articles 4 and 6; female gnathopod 1 propodus distinct from male gnathopod 1, gnathopod 2 like gnathopod 1 but slightly enlarged. Pereopods prehensile. Telson cleft, flat.

Relationship. Unique in possession of prehensile pereopods.

Differing from various hyalids (see) in the short, blunt dactyl of the maxillipedal palp, the obsolescent palp of maxilla 1 and the total loss of rami on uropod 3.

Species. *Hyachelia tortugae* J.L. Barnard, 1967c (Ruffo, 1975a) [423I].

Habitat and distribution. Marine, Galapagos and south of Dakar, probably throughout tropics, on *Chelonia* sea turtles, 1 species.

Taihape J.L. Barnard

Figs 33E, 34D

Taihape J.L. Barnard, 1972b: 172.

Type species. *Taihape karori* J.L. Barnard 1972b, original designation.

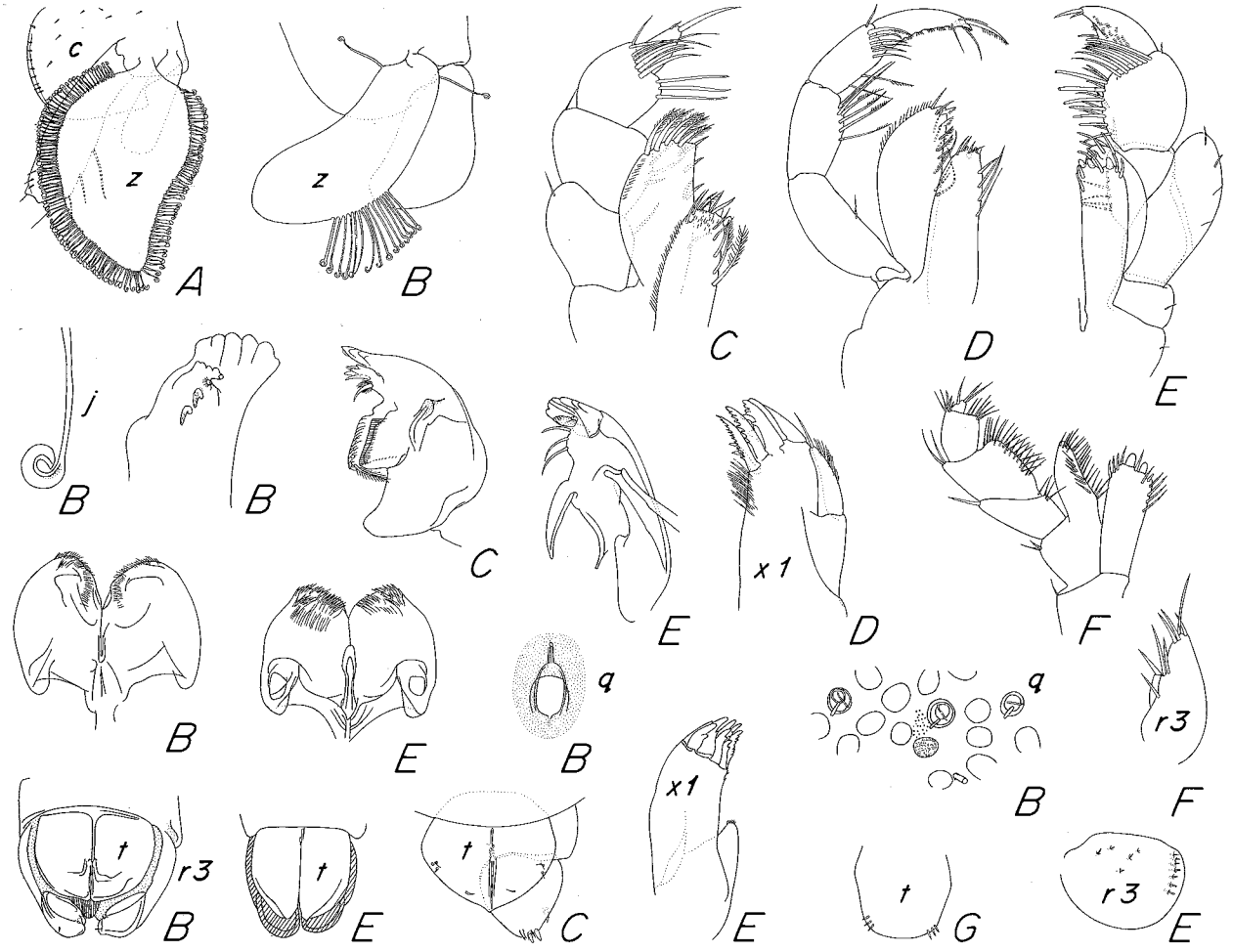

Fig.34. Ceinidae. A, *Chiltonia minuta*; B, *Ceina egregia*; C, *Waitomo manene*; D, *Taihape karori*; E, *Ceina wannape*; F, *Chiltonia mihiwaka* (see also Fig.105F); G, *Chiltonia enderbyensis*. j = brood plate seta.

Diagnosis. Head not underslung. Mandibular molar subcolumnar, weakly triturative. Palp of maxilla 1 well developed. Palp of maxilliped thin. Gnathopods feeble in both sexes, palms oblique. Pereopod 5 with long anterior setae on articles 2-4.

Description. Pereonite 1 not swollen. Ocular lobes forming weak plate-like anterior flanges without notch. Flagellum of antenna 1 long, multiarticulate. Coxa 1 weakly expanded apically, not conical, coxa 2 ordinary, coxa 4 subquadrate. Article 4 of pereopods 5-7 moderately expanded. Pleon weakly carinate.

Relationship. Notable for the setose pereopod 5 and the thin palp of the maxilliped.

Species. *Taihape karori* J.L. Barnard, 1972b [775].

Habitat and distribution. Marine, New Zealand, littoral, 1 species.

Waitomo J.L. Barnard

Figs 33D, 34C

Waitomo J.L. Barnard, 1972b: 172.

Type species. *Waitomo manene* J.L. Barnard, 1972b, original designation.

Diagnosis. Head not underslung. Mandibular molar columnar and triturative. Palp of maxilla 1 vestigial. Palp of maxilliped thick. Gnathopods of both sexes feeble, palms transverse. Pereopod 5 lacking long anterior setae on articles 2-4.

Description. Pereonite 1 not swollen. Ocular lobes forming plate-like anterior flanges without notch. Eyes weak. Flagellum of antenna 1 long, multiarticulate. Coxa 1 weakly expanded apically, not conical, coxa 2 ordinary, coxa 4 subquadrate but with sharp posterior cusp. Article 4 of pereopods 5-7 moderately expanded. Body dorsally carinate posteriorly.

Relationship. Standing closer to hyalids than *Taihape* or *Ceina* because of the well-developed molar.

Species. *Waitomo manene* J.L. Barnard, 1972b [715B].

Habitat and distribution. Marine, east of New Zealand, 860 m, 1 species.

Chiltoniinae J.L. Barnard, 1972b

Diagnosis. Base of antenna 2 free from head. Antenna 1 without long aesthetascs. Telson entire or cleft less than one fourth.

Description. Cephalic lobes ordinary. Antennae similar to each other, generally elongate, of medium thickness. Molar strongly triturative. Inner plate of maxilla 1 of medium size, with 2 apical setae, palp absent. Inner plate of maxilliped large, outer plate not larger, dactyl stubby. Male gnathopod 2 variable, feeble like female, or enlarged, article 5 cryptic, propodus large, palm subtransverse to oblique. Gills poorly expanded, 2-7; oostegites broadly expanded. Ramus of uropod 3 absent or present.

Key to Genera of Chiltoniinae

1. Inner ramus of male pleopod 1 geniculate and flagellate, male gnathopod 2 feeble like female ..... *Chiltonia*

—— Inner ramus of male pleopod 1 ordinary, male gnathopod 2 enlarged 2

2. Ramus of uropod 3 present ..... *Austrochiltonia*

—— Ramus of uropod 3 absent ..... *Afrochiltonia*

Afrochiltonia K.H. Barnard

Afrochiltonia K.H. Barnard, 1955: 93.

Type species. *Chiltonia capensis* K.H. Barnard, 1916, original designation.

Diagnosis. Gnathopods of both sexes subchelate, male gnathopod 2 not larger than gnathopod 1, male and female gnathopod 2 like gnathopod 1. Male pleopod 1 ordinary. Uropod 3 lacking both rami.

Remarks. Synonymy of *A. capensis* with *A. subtenuis*

is not accepted on geographical grounds. Males of Langebaan Lagoon (Griffiths, 1974b,c, 1975), probably belong to another species. Males of *Austrochiltonia subtenuis* from Australia have enlarged gnathopod 2 and distinct ramus on uropod 3.

Species. See Williams (1962); *A. capensis* (K.H. Barnard, 1916) (= *A. subtenuis* identification's of Ruhe, 1915, and Griffiths, 1976b) (Griffiths, 1974b,c, 1975) [917E].

Habitat and distribution. Freshwater, South Africa, rivers, some brackish river mouths, 1 species.

Austrochiltonia Hurley

Austrochiltonia Hurley, 1958a: 767.–Griffiths, 1976b: 30.

Type species. *Hyalella australis* Sayce, 1901, original designation.

Diagnosis. Gnathopods of both sexes subchelate, male gnathopod 2 larger than gnathopod 1, article 5 short and unlobed, female gnathopod 2 feeble, article 5 lobed as in gnathopod 1. Male pleopod 1 ordinary. Uropod 3 with short ramus.

Species. *Austrochiltonia australis* (Sayce, 1901, 1902a) (Chilton, 1923b) (Timms, 1978) [944]; *A. subtenuis* (Sayce, 1902a) (Hale, 1929) (Timms, 1978) [945].

Habitat and distribution. Freshwater, Australia, lakes and rivers, some brackish water river mouths, 2 species.

Chiltonia Stebbing

Figs 33B, 34A,F,G, 107F

Chiltonia Stebbing, 1899c: 408.–Stebbing, 1906: 555.–Hurley, 1954h: 565 (key).

Type species. *Hyalella mihiwaka* Chilton, 1898, original designation.

Diagnosis. Gnathopods of both sexes subchelate, male gnathopod 2 enlarged, with unlobed very short article 5, female gnathopod 2 feeble, like gnathopod 1, article 5 longer, lobed as in gnathopod 1. Inner ramus of male pleopod 1 geniculate and flagellate. Uropod 3 lacking both rami.

Species. See Chapman & Lewis (1976); *C. enderbyensis* Hurley, 1954h, 1975 [843F]; *C. mihiwaka* (Chilton, 1898) (Hurley, 1954h, 1975) [775F]; *C. minuta* Bousfield, 1964c [844K]; *C. rivertonensis* Hurley, 1954h, 1975 [775F].

Habitat and distribution. Freshwater and beach kelp, New Zealand, Auckland Island, Campbell Island, 4 species.

CHEIDAE Thurston, 1982

Diagnosis. Rostrum strong, cylindrical, with weak subapical ventral downturned process, cheek poorly developed but base of head deep. Antenna 1 of haustorius form, flagella slightly elongate. Antenna 2 of mixed haustorius-urothoe form, article 4 with facial spines near base, article 5 as long as and scarcely narrower than article 4, but latter with major basofacial armament, ventral margin dominated by thick glassy spines, setae sparse, flagellum in male not elongate and lacking calceoli. Prebuccal complex massive, [upper lip unknown], epistome scarcely evident. Mandibles with broad multitoothed incisors; laciniae mobilis present on left side only, dissimilar, rakers moderately numerous and serrate, molar small and simple; palp 3-articulate, article 3 with 1 outer seta, all other spines concentrated on apical bevel. Lower lip with discrete inner lobes, mandibular extensions of outer lobes well developed, maxilla 1 with 1-articulate palp, inner plate with fewer than 5 setae. Maxilla 2 ordinary, inner plate with 1 facial seta. Maxillipeds with unexpanded bases, poorly enlarged plates, outer spinose; palp 4-articulate, article 2 narrow, not differentially expanded, article 4 unguiform, with nail. No baler lobes on any maxillae or maxillipeds.

Coxa 1 visible, coxa 4 dominant, posterodorsally excavate, thus with posteriorly directed lobe, coxae 1-3 rectangular, alike. Coxal gills on segments 2-7; brood plates [unknown]. Gnathopods feeble, alike, carpus elongate, propodus stout, weakly chelate. Article 5 of pereopods 3-4 stout, with sparse posterior spination; dactyls of pereopods 3-7 well developed or pereopod 5 of weak haustorius form, articles 2,4,5 expanded, article 5 with weakly developed facial spination; pereopods 6-7 alike but pereopod 6 larger, article 2 ovate (thus not shield-like as in phoxocephalids), article 4 of pereopods 6-7 expanded, no pereopods with underslung articulation.

No pleopod dominant, peduncles of pleopods longer than wide; [coupling hooks and clothespin spines and relative length of inner rami unknown]. Epimeron 1 well developed, epimeron 2 slightly dominant in size, strongly dominant in setation. Urosomites ordinary. Rami of uropods 1-2 styliform, spinose, uropod 3 of phoxocephalid form, inner ramus well developed, article 2 of outer ramus well developed, apices of rami moderately setose. Telson short, almost fully cleft. Sexual dimorphism weak.

Special characters versus Platyischnopidae. Base of head broad; mandibular incisor sharply multitoothed; molar weak; outer plate of maxilla 1 with

only 6 spines (versus 7-9); outer plate of maxilliped less then twice as long as inner plate; dactyls of pereopods 3-7 short; pereopod 7 shorter than pereopod 6, article 2 subovate, not shield-shaped. Uropod 2 reduced, with rami reaching less than one third along rami of uropod 1 and strongly failing apex of peduncle on uropod 3; article 2 of uropod 3 elongate, thin, pointed, lacking major armament.

Relationship. Close to the Platyischnopidae but differing from them in (1) the deep base of the head, (2) multidentate incisors, (3) weak molar, (4) reduction of spine number in outer plate of maxilla 1 to 6, (5) small outer plate of maxilliped, (6) short pereopod 7 with (7) lack of shield on article 2, this article being more ovate and more similar to pereopod 6 than in Platyischnopidae, (8) reduced uropod 2, (9) short article 2 of outer ramus on uropod 3 bearing major armaments.

The genus *Skaptopus* in Platyischnopidae transcends formerly useful characters distinguishing Cheidae in that *Skaptopus* also lacks the apical glandular area missing in Cheidae but present in most Platyischnopidae, has a somewhat reduced uropod 2, and has spines inside the telsonic cleft.

Differing from Phoxocephalidae in the non-shield shape of article 2 on pereopod 7, multidentate incisors (except Tipimeginae in Phoxocephalidae) and reduced uropod 2.

From Urothoidae in the long head, haustoriid kind of antenna 1, presence of basofacial spines on article 4 of antenna 2, multidentate incisor, reduced molar, and 1-articulate palp of maxilla 1.

From Phoxocephalopsidae, Haustoriidae, Urothoidae and Zobrachoidae in the shape of mandibular palp article 3 with bevelled apex, armaments dominantly on bevel. In addition either uropod 1 or 2 in the haustoriid-like families has linguiform rami bearing setae.

From Condukiidae in the haustoriid-like antennae 1-2 (thus non-geniculate and with articles 2-3 of antenna 1 shortened), antenna 2 also with heavy spines, small plates of maxilliped, 1-articulate palp of maxilla 1, reduced molar, reduced pereopod 7, lack of lobes on carpus of pereopods 3-4, uniform pleopods, poorly expanded articles 4-5 of pereopods 5-7 and dominant setae present on epimeron 2 (versus epimera 1 and 3).

Cheus Thurston

Fig.35

Cheus Thurston, 1982: 413.

Type species. *Cheus annae* Thurston, 1982, original designation.

Diagnosis. With the characters of the family.

Combining long head vaguely similar to Platyischnopidae with short pereopod 7 lacking shield, chelate gnathopods, reduced uropod 2, haustoriid antennae, styliform spinose rami of uropods 1-2, and multidentate incisor.

Sexual dimorphism absent.

Species. *Cheus annae* Thurston, 1982 [831].

Habitat and distribution. Marine, Falkland Islands, intertidal sand-shell burrower, 1 species.

CHELURIDAE Allman, 1847

Diagnosis. Corophioidea with segments of urosome immovably fused together into large box marked ventrally with sutures, urosomite 3 (of complex) elongate; uropods 1-3 radically dissimilar among themselves in structure and size, uropod 2 especially unusual, with widely expanded or medially lobate peduncle; flagellum of antenna 2 clavate and essentially composed of one huge article tipped with vestigial articles; inner lobes of lower lip absent.

Type species known to be wood-scraper, invading holes of the isopods *Limnoria* spp and enlarging them into galleries; when alone, chelurids can only make furrows on soft grains of wood (J.L. Barnard, 1955c).

Format of diagnoses in this family follows that of Corophioidea.

Key to Genera of Cheluridae

1. Uropod 3 with scale-like inner ramus ..... *Chelura*

—— Uropod 3 with inner ramus 2

2. Uropod 2 with 2 rami, gnathopod 1 large, subchelate ..... *Tropichelura*

—— Uropod 2 lacking rami, gnathopod 1 small, slightly chelate ..... *Nippochelura*

Chelura Philippi

Fig.36

Chelura Philippi, 1839: 120.–Stebbing, 1906: 693.–J.L. Barnard, 1969c: 180.–Lincoln, 1979a: 544.
Nemertes White, 1847: 90 (*Nemertes nesaeoides* White, 1847, *nomen nudum*, monotypy).

Type species. *Chelura terebrans* Philippi, 1839, monotypy.

Diagnosis. Body almost cylindrical but dorsally depressed, smooth; mesosome segment 3 toothed; urosomites coalesced, marked ventrally by sutures, urosomite 3 elongate. Rostrum absent and supra-antennal line absent except in defining ocular lobes, ocular lobes short, blunt, antennal sinus weak. Eyes ordinary. Antennae very short, nearly subequal, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum 2-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, peduncle stouter in male, flagellum paddle-shaped, with several articles but bulk largely article 1.

Epistome unproduced anteriorly. Labrum subquadrate, entire. Mandible normal, palp weak, slender, article 3 semi-falciform, but almost rectolinear, scarcely shorter

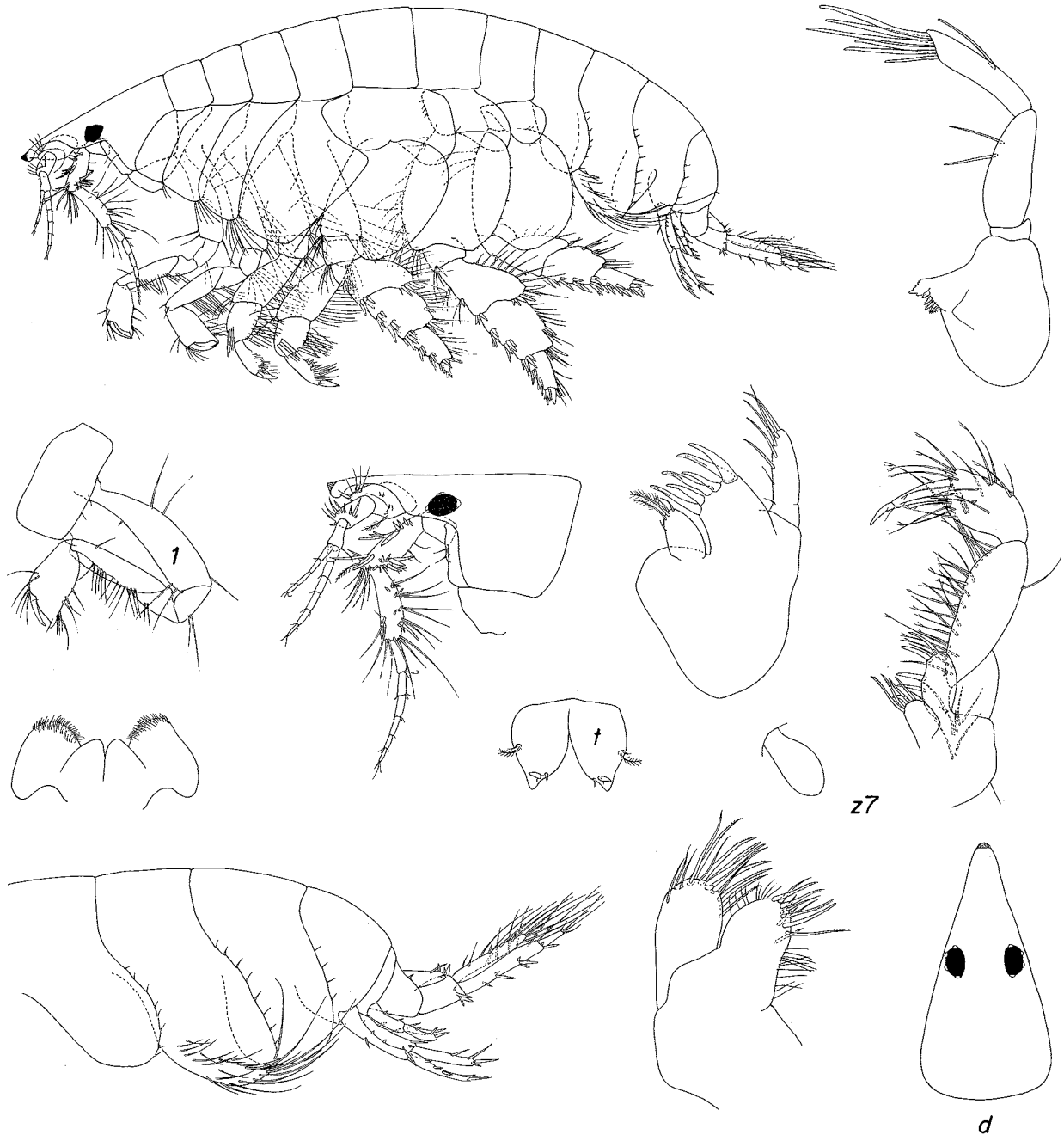

Fig.35. Cheidae. *Cheus annae*.

than 2. Labium with entire outer lobes, without inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, with 2-4 apical setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 rather narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 long, with short nail and setae.

Coxae small, relatively short, weakly contiguous, progressively shorter from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 shorter than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 barely diverse, of subequal size, feeble, both with linear articles, densely setose, gnathopod 2 slightly longer than 1, both with palm short and parachelate, article 5 shorter (1) or as long (2) as 6, unlobed, article 6 very slender.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 shorter than pereopod 7, pereopods 5-7 with broad unlobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods with dilated peduncle. Epimeron 3 not bisinuate.

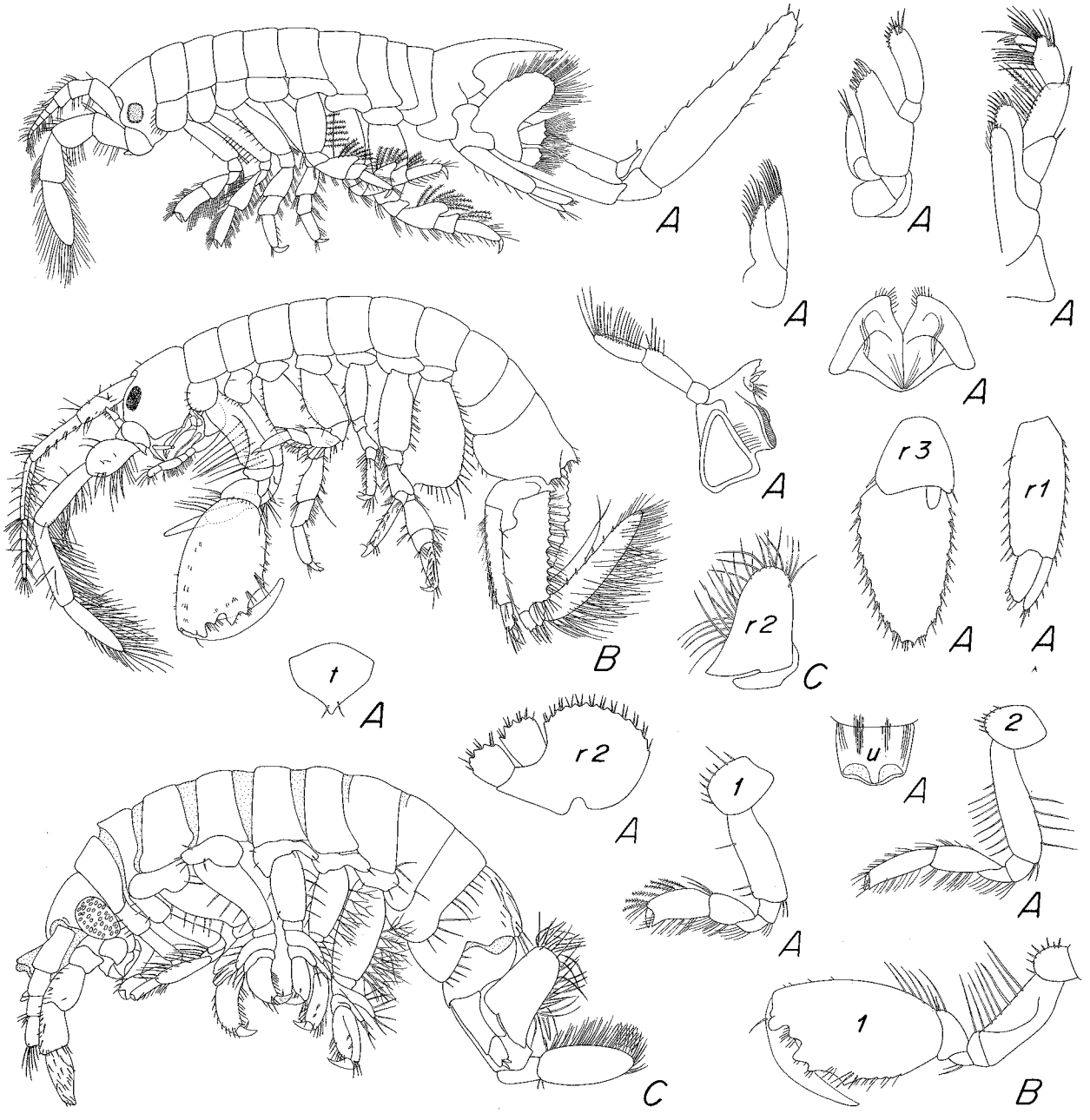

Fig.36. Cheluridae. A, *Chelura terebrans*; B, *Tropichelura insulae*; C, *Nippochelura brevicauda.*

Uropod 1 normal, stout, rami slightly unequal, much shorter than peduncle, without ventrodistal process; peduncle of uropod 2 broadly dilated, with very small square rami much shorter than peduncle. Uropod 3 very long, biramous, outer ramus long, flat, linguiform, obtuse distally, peduncle shorter than rami, very short, inner ramus scale-like, vestigial. Telson entire, broader than long, alate, pointed apically.

Female. Gnathopods like male. Antenna 2 weaker; expansion on peduncle of uropod 2 shorter, less linguiform, more quadrate. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak.

Relationship. As type of its family, an unusual corophioid in loss of inner lobes on lower lip, possibly a function of its wood-scraping habits.

See *Nippochelura* and *Tropichelura.*

Species. *Chelura terebrans* Philippi, 1839 (Sars, 1895) (Chevreux & Fage, 1925) (J.L. Barnard, 1950) (Bousfield, 1973) (Lincoln, 1979a) (Ruffo, 1982b) (= *C. nesaeoides* White, 1847) (= *C. pontica* Czerniavsky, 1868) (= *C. xylophaga* Hesse, 1868) (= *C. cambrica* McNeill, 1932) [755T].

Habitat and distribution. Marine, bipolar antitropics, especially in harbours, 1 species.

Nippochelura J.L. Barnard

Fig.36C

Nippochelura J.L. Barnard, 1959g: 6.

Type species. *Chelura brevicauda* Shiino, 1948, selected by J.L. Barnard, 1969c.

Diagnosis. Body almost cylindrical but dorsally depressed, smooth; mesosome segment 3 with 2 small bilateral teeth; urosomites coalesced, marked ventrally by sutures, urosomite 3 elongate. Rostrum short, peg-like, supra-antennal line absent except in defining ocular lobes, ocular lobes obsolescent, blunt; antennal sinus weak. Eyes large. Antennae short, 1 shorter than 2, both slightly thick, peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum 1-articulate, thick, main flagellar articles very few, most of bulk from article 1. Antenna 2 peduncular article 3 short, peduncle stout, flagellum with 2-3 articles, most of bulk from article 1.

Epistome unproduced anteriorly. Labrum subquadrate, entire. Mandible normal, palp strong, article 3 semi-falciform or rectolinear, shorter than 2. Labium with entire outer lobes, without inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 linguiform, large, with a row of medial setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 very short, with medium nail and setae.

Coxae small, relatively short, weakly overlapping, of various sizes and shapes, progressively shorter from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxae 3-4 bilobed, coxa 4 not longer than coxa 1, lobed, coxa 5 as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 scarcely diverse, of subequal size, feeble, densely setose, gnathopod 1 slightly larger than 2, both with palm short andparachelate, article 5 longer (2) or shorter (1) than 6, unlobed, article 6 very slender.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively slightly longer, short, almost geniculate, with almost linear article 2. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods with dilated peduncle. Epimeron 3 not bisinuate.

Uropod 1 biramous, normal, stout, rami slightly unequal, much shorter than peduncle, without ventrodistal process, peduncle of uropod 2 broadly dilated, lacking rami. Uropod 3 large but short, uniramous, single ramus large, obtuse distally, foliaceous, apically setose. Telson entire, longer than broad, triangular, pointed apically.

Female. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Absent.

Relationship. Differing from *Chelura* in the presence of a peg-like rostrum, loss of rami on uropod 2, loss of inner ramus on uropod 3, lack of huge mediodorsal tooth on pleonite 3, enlarged gnathopod 1, and lobed coxae 3-4.

See *Tropichelura.*

Species. *Nippochelura brevicauda* (Shiino, 1948, 1957) (J.L. Barnard, 1959g) [394, 395].

Habitat and distribution. Marine, Japan, wood-scraper, 1 species.

Tropichelura J.L. Barnard

Fig.36B

Tropichelura J.L. Barnard, 1959g: 6.

Type species. *Chelura insulae* Calman, 1910, monotypy, then designated by J.L. Barnard, 1969c.

Diagnosis (new information italicised). Body

subcylindrical, slightly depressed, dorsally provided with teeth or humps on mesosomite 3, urosomites coalesced, marked ventrally by sutures, urosomite 3 elongate. Rostrum short, supra-antennal line present, ocular lobes short, blunt, antennal sinus weak. Eyes ordinary. Antennae of medium length, 1 shorter than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 as long as 1, articles 2-3 longest, accessory flagellum absent, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, peduncle scarcely stout, flagellum clavate, mostly composed offirst article.

Epistome unproduced anteriorly. Labrum subrounded, entire. *Mandible normal, palp strong, article 3 semi-falciform, as long as or much shorter than 2. Labium with entire outer lobes, without inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 large, with row of medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather narrow, inner plate with only sparse mediomarginal setae. Inner plate of maxilliped with distal spine-setae, outer plate short, not reaching apex of palp article 2, with spine-setae only on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 with long nail and setae.*

Coxae very small, relatively short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, 3-4 weakly spiniform, coxa 1 not dilated, not produced forward, coxa 2 as large as 1, coxae 3-4 shorter than coxa 1, anteriorly lobed, coxa 5 as long as 4, coxae 6-7 not much smaller than coxae 3-4. Gnathopods 1-2 diverse, gnathopod 1 greatly larger than 2, in male subchelate, palm oblique, sculptured, article 5 very short, shorter than 6, lobed, articles 6-7 very large. Gnathopod 2 almost simple, feeble, linear, with article 2 not dilated, very setose, with article 4 enlarged, extended and fused distally along entire posterior margin of article 5, article 5 much longer than 6, unlobed, article 6 more slender than article 5, dactyl strongly reduced.

Pereopods 3-4 similar, with inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, pereopod 5 much shorter than and different from pereopod 7, with almost linear unlobed article 2, pereopod 7 with broad lobed article 2, pereopod 6 intermediate, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate.

Uropod 1 biramous, normal, rami slightly unequal, much shorter than peduncle, without ventrodistal process, peduncle of uropod 2 broadly dilated, with small square rami. Uropod 3 very long, uniramous, single ramus long, obtuse distally, foliaceous, setose. Telson entire, large, much longer than broad, leaf-shaped, almost pointed apically, with apical setae.

Female. Gnathopod 1 similar to male but scarcely smaller and less sculptured. Antennae more feeble. Uropod 3 smaller and less setose. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Weak.

Variables. Antennae 1-2 shorter, articles 2-3 of antenna 1 progressively shorter than article 1; inner plate of maxilla 1 short; outer plate of maxilla 2 narrow, inner broader; dactyl of maxilliped very short; pereopod 7 small, article 2 scarcely expanded (*T. gomezi*).

Relationship. Differing from *Chelura* and *Nippochelura* in the elongate article 3 of antenna 1, discontiguous coxae, greatly enlarged gnathopod 1, distinct supra-antennal line, and rather diverse pereopods 5-7. Also from *Chelura* in the loss of inner ramus on uropod 3. Also from *Nippochelura* in the presence of rami on uropod 2 and the non bilobed coxae 3-4.

Species. *Tropichelura gomezi* Ortiz, 1976f (Thomas, 1979b) [470]; *T. insulae* (Calman, 1910) (Atwood & Johnson, 1924) (J.L. Barnard, 1959g, 1979a) [530].

Habitat and distribution. Marine, central and West Pacific from Hawaii to Christmas Island; Caribbean, Florida Keys to Belize and Puerto Rico; wood scrapers, 2 species.

CLARENCIIDAE Barnard & Karaman, 1987

Diagnosis. Peduncle of antenna 1 short, stubby, accessory flagellum absent. Mandibular molar simple, conical. Plates of maxilliped of medium size. Gnathopod 2 enlarged and chelate, article 3 short. Uropods and telson [unknown].

See Sebidae, Lysianassidae, and Eusiridae and allies.

Description. Body compressed, dorsally carinate and toothed, urosomites 1 and 2 free, first elongate and crested, [urosomite 3 unknown]. Head subcuboidal, rostrum obsolescent, lateral lobes undeveloped; eyes absent. Antennae [broken], but peduncle of antenna 1 short and articles 1-3 progressively shorter, article 1 shorter than head, article 3 produced and almost as long as article 2, article 1 of primary flagellum ordinary [remainder broken]; antenna 2 much longer than 1 [but missing from middle of article 5].

Epistome and labrum [?separate, ?labrum dominant, ?broader than long, ?epistome unproduced], labrum apically rounded. Mandibular incisor ordinary, toothed, lacinia mobilis [?present], rakers 5, molar simple, subconical, palp attached opposite molar, article 3 shorter than 2, subfalciform, strongly setose, setae = DE. Labium with appressed outer lobes, with weak fused appressed inner lobes. Inner plate of maxilla 1 medium, with 4 marginal setae, outer plate with 9 spines, palp 2-articulate, long, article 1 short; plates of maxilla 2 moderately narrow, moderately setose, outer longer than inner; plates of maxilliped of medium size, poorly armed, palp stout, 4-articulate, dactyl long, unguiform.

Coxae 1-4 medium, coxa 4 scarcely largest, coxa 1 weakly expanded, coxa 3 weakly tapering, coxa 4 scarcely lobate and scarcely excavate, coxa 5 slightly

shorter than 4. Gnathopod 1 small, carpus not lobate, propodus of medium length, as long as carpus, palm transverse; gnathopod 2 enlarged, carpus tiny, cryptic, propodus huge, palm chelate, dactyl fitting palm.

Pereopods short to medium, 3-4 ordinary, article 2 of pereopods 5-7 expanded, weakly lobate, [scarcely setulate?]. Pleopods [?ordinary, each ramus with ? articles]. Urosome elongate, epimera ordinary, urosome elongate, [but urosome missing from 2 onward, uropods 1-3 missing, telson missing]. Gills [2-?], simple; oostegites [unknown].

Sexual dimorphism. Unknown [specimen immature].

Remarks. Apices of antennae, urosomites, and all of uropods and telson missing.

Relationship. Differing from Sebidae in the short stubby peduncle of antenna 1, and the absence of the accessory flagellum.

Differing from Lysianassidae in the short article 3 of gnathopod 2.

Differing from Eusiridae in the combination of short peduncle on antenna 1, and chelate gnathopod 2.

Vaguely resembling Iphimediidae but only coxa 4 scarcely acuminate, gnathopod 2 huge and chelate.

Clarencia K. H. Barnard

Figs 37, 65I

Clarencia K. H. Barnard, 1931a: 428.–K.H. Barnard, 1932: 155.

Type species. *Clarencia chelata* K. H. Barnard, 1931a, original designation.

Diagnosis. With the characters of the family.

Species. *Clarencia chelata* K.H. Barnard, 1931a, 1932 [871B].

Habitat and distribution. Marine, South Shetland Islands, 342 m, 1 species.

COLOMASTIGIDAE Stebbing, 1899a

Diagnosis. Body subcylindrical, thin. Accessory flagellum vestigial or absent, primary flagella of antennae 1-2 strongly reduced. Mandibular incisor cut into large sharp deeply separated teeth or forming simple adz-shaped blade, raker row 'absent' (probably in these taxa incisor absent and converted incisor composed of basally fused rakers); molar variable; palp absent. Maxillae and inner plates of maxilliped stunted, poorly developedand sparsely armed. Coxae ordinary to very short, overlapping. Gnathopod 1 simple. Urosomites 2-3 coalesced. Uropod 3 ordinary and biramous or uniramous. Telson entire.

See Corophioidea, Eophliantidae, Pagetinidae, Phliantidae and Dexaminidae (Prophliantinae).

Description. Head small to well developed, rostrum small or absent, lateral lobes weak, eyes present. First antennal peduncles thick and of medium length but flagella obsolescent. Antenna 2 variable but flagellum obsolescent. Epistome conical, labrum bilobed. Labium [poorly known]. Molar large and unridged, or short or absent. Inner plate of maxilla 1 thin, elongate, poorly armed, outer plate narrow, coniform, with reduced armament (either 9 thin or fewer than 7 elements), palp broad, larger than outer plate, 1-articulate, often

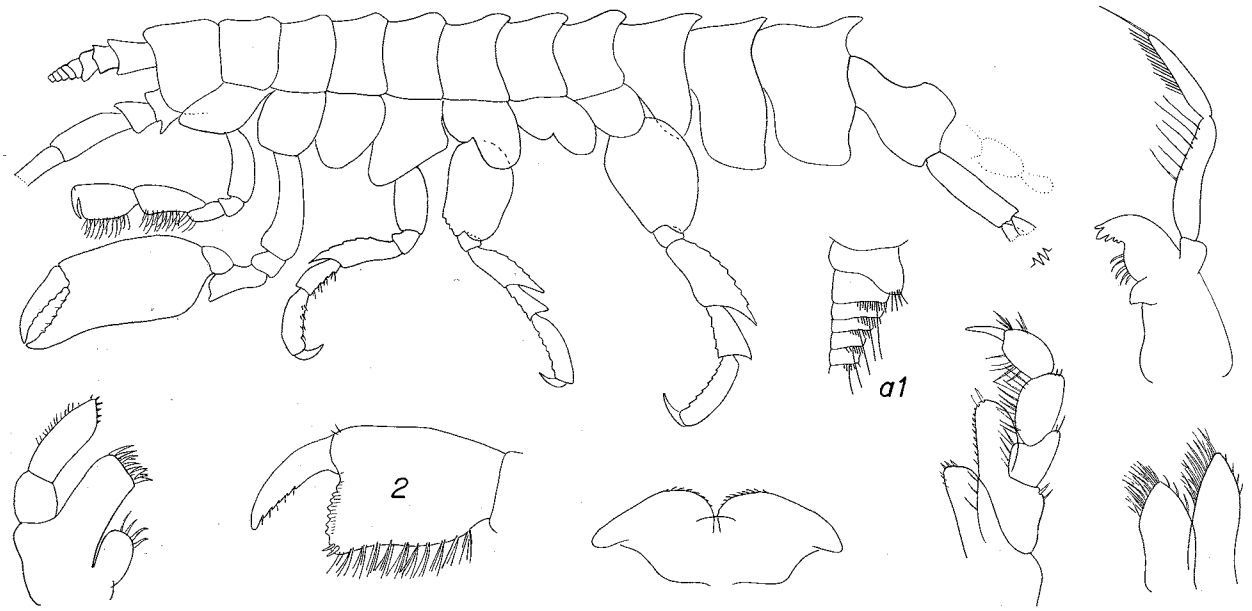

Fig.37. Clarenciidae. *Clarencia chelata*. See also Fig.63.

sculptured, armaments medium to sparse. Plates of maxilla 2 poorly defined, basally fused, often poorly armed, generally inner plate broad and truncate, separated from narrow rounded outer plate by weak notch. Maxillipeds basally flattened and alate, inner plates fused basally or fully together forming narrow bilobation, outer plate broad, often alate, both plates poorly armed, palp narrow, 4-articulate, article 3 often longest, dactyl unguiform.

Coxae variable. Gnathopod 1 feeble, simple, slender, probe-like, apex of article 6 often bearing brush of elements composed of dactyl and several spines in female or spines and dactyl vestigial in male; gnathopod 2 in female feeble and simple but stouter than gnathopod 1, articles 5-6 elongate, dactyl well developed, distinct from armaments; gnathopod 2 in male enlarged, subchelate, carpus broad, short and lobate, propodus expanded, ovate, palm oblique and poorly defined, often sculptured, dactyl strong.

Pereopods 3-7 short, slender to medium, 3-4 longer than 5-7, article 2 of 5-7 not or scarcely expanded; dactyls small to medium. Pleonites variable, either not or much larger than pereonites, epimera poorly ornamented; pleopods ordinary though rami feeble.

Uropods 1-2 generally alike, outer rami scarcely shortened or not, rami as long as peduncles on uropods 1-2 but variable on uropod 3, as long, shorter, longer, with outer ramus rarely vestigial, or absent, rami lanceolate or foliaceous, 1-articulate. Telson short to medium in length, entire, often ornamented apically.

Relationship. The two genera of this family are very distinct from each other but are united by the feeble inner plate of the maxilliped, alate outer plate of the maxilliped, vestigial flagella of antennae 1-2, probe-like gnathopod 1, 1-articulate palp of maxilla 1, and fused urosomites 2- 3.

The Eophliantidae resemble the Colomastigidae in the cylindrical bodies but differ in (1) the well-developed inner plates of the maxillipeds, (2) the cleft telson, (3) the orthodox mandibular incisor not being cut into deep, raker-like teeth, and (4) the vestigial palp of maxilla 1.

The Dexaminidae have compressed bodies with cleft telsons.

The Phliantidae and Temnophliantidae have depressed bodies with splayed coxae, vestigial uropod 3 and ordinary inner plates of the maxilliped.

Although some genera are superficially similar to Colomastigidae, all Corophioidea have a well-developed incisor with ordinary raker row, well-developed maxillae and maxillipeds and most have subchelate gnathopod 1, and most have urosomites 2-3 separate.

Key to Genera of Colomastigidae

1. Uropod 3 uniramous, foliaceous; coxae 2-4 large; peduncle of antenna 1 short and partly stout; antenna 2 much smaller than antenna 1 ..... *Yulumara*

——Uropod 3 biramous, rami lanceolate; coxae 2-4 short; peduncle of antenna 1 ordinary; antenna 2 nearly as large as antenna 1 ..... *Colomastix*

Colomastix Grube

Fig.38A,B,C

Colomastix Grube, 1861: 137.–Ledoyer, 1979a: 21.
Cratippus Bate, 1862: 275 (*Cratippus tenuipes* Bate, 1862, monotypy).
Exunguia Norman, 1869b: 359 (*Exunguia stilipes* Norman, 1869b, monotypy).

Type species. *Colomastix pusilla* Grube, 1861, monotypy.

Diagnosis. Head large and free. Antennae 1 and 2 subequal in size, peduncles thick but not immensely enlarged, not geniculate. Coxae 1-7 all very short and alike, much broader than long, strongly overlapping. Urosomite 1 without pleuron. Uropod 3 biramous though outer ramus often vestigial, main ramus not palmate.

Sexual dimorphism. Male gnathopod 1 often shrivelled on death, poorly developed.

Attributes and variables. Head with midanterior vertical keel between antennae; antennae 1-2 often with small to medium peduncular teeth; articles 3-4 of gnathopod 1 often elongate; outer ramus of uropod 1 vestigial (*C. truncatipes*) or shortened (*C. spinosa* and varieties of *C. truncatipes*); rami of uropods 1-2 shorter than peduncle (*C. japonica*); outer ramus of uropod 3 slightly shortened (*C. inaequicornis*, *C. kapiolani*), half or less as long as inner ramus (*C. japonica*, *C. lunalilo*); inner ramus of uropod 3 thickened and crenulate (but not palmate) (*C. truncatipes*); uropod 3 very flat and stunted (*C. spinosa*, *C. cornuta*); telson marginally castellate (*C. castellata*).

Species. See K.H. Barnard (1932); Stephensen (1931a); *C. armata* Ledoyer, 1979a [698]; *C. azumai*

Hirayama & Kikuchi, 1980a [395I]; *C. brazieri* Haswell, 1879b [?780]; *C. brevicornis* Ledoyer, 1982b [725w]; *C. castellata* K.H. Barnard, 1932 [831]; *C. cornuta* Ledoyer, 1979a [698]; *C. fissilingua* Schellenberg, 1926a, 1931 (Bellan-Santini & Ledoyer, 1974) (Holman & Watling, 1983b) [800 + B]; *C. halichondriae* Bousfield, 1973 [364]; *C. hamifera* Kossman, 1880 [677]; *C. inaequicornis* Ledoyer, 1979a [698]; *C. janiceae* Heard & Perlmutter,

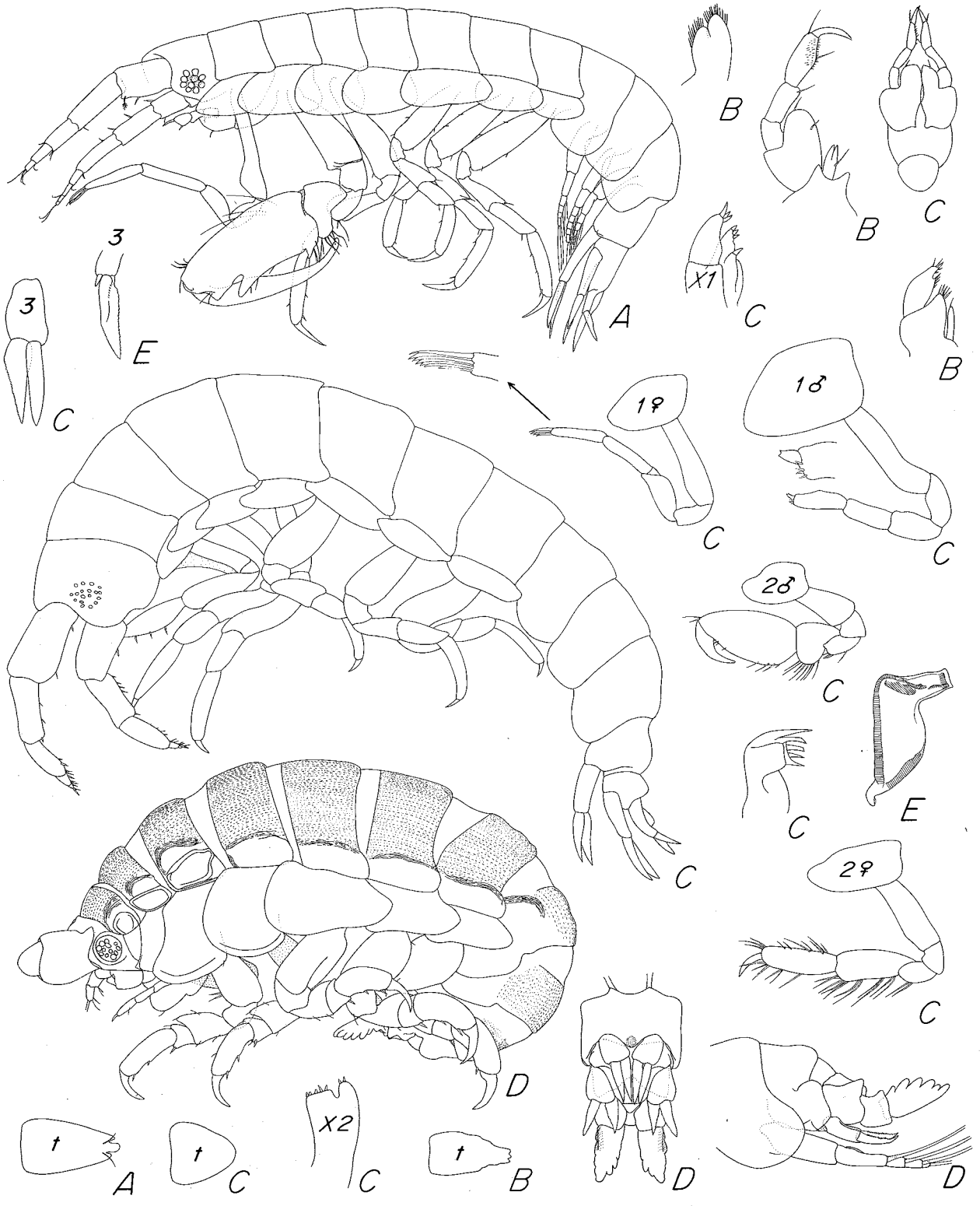

Fig.38. Colomastigidae. A, *Colomastix kapiolani*; B, *Colomastix subcastellata*; C, *Colomastix pusilla*; D, *Yulumara wallangar*.

1977 [478I]; *C. japonica* Bulycheva, 1955 [391]; *C. kapiolani* J.L. Barnard, 1970a [381]; *C. keiskana* Griffiths, 1974c [743]; *C. lunalilo* J.L. Barnard, 1970a (Ledoyer, 1979a) [600]; *C. magnirama* Hurley, 1954d [776I]; *C. plumosa* Ledoyer, 1979a [698]; *C. pusilla* Grube, 1861, 1864a (= *C. tenuipes* Bate, 1862) (= *C. crassimanus* Heller, 1867) (= *C. stilipes* Norman, 1869b) (Chevreux & Fage, 1925) (Krapp-Schickel, 1969b, 1971) (Bacescu & Mayer, 1960) (G. Karaman, 1973b) (Lincoln, 1979a) (Ruffo, 1982e) [352]; *C. simplicauda* Nicholls, 1938 (Holman & Watling, 1983b) [880]; *C. spinosa* Ledoyer, 1979a [698]; *C. subcastellata* Hurley, 1954d [776I]; *C. truncatipes* Ledoyer, 1979a,b [660]; spp. (J.L. Barnard, 1955a, 1965a, 1969a) (K.H. Barnard, 1937) (Chilton, 1912, 1921d, 1925) (Feeley & Wass, 1971) (Griffiths, 1973-1975) (Kunkel, 1910) (Nayar, 1967) (Pearse, 1912) (Shoemaker, 1942c) (Walker, 1904) (Watling & Holman, 1983b) [various localities].

Habitat and distribution. Marine, cosmopolitan but mostly warm shallow seas, in sponges and tunicates, 0-235 m, 22 species.

Yulumara J.L. Barnard

Fig.38D

Yulumara J.L. Barnard, 1972a: 32.

Type species. *Yulumara wallangar* J.L. Barnard, 1972a, original designation.

Diagnosis. Head partially telescoped into pereonite 1. Antenna 1 enlarged and part of it many times thicker than antenna 2, latter very reduced, antenna 1 geniculate between articles 1 and 2 or 2 and 3 or in middle of article 2. Coxae 1-2 crowded forward, long and thin, partially hidden by following coxae, coxae 3-4 large, as long as broad or longer, coxae 5-7 also enlarged. Urosomite 1 with lateral pleuronal plate covering part of urosomites 2-3 (fused). Uropod 3 uniramous, ramus thick, palmate.

Description. Eyes borne inside lateral cephalic bulges. Base of antenna 2 fused to head. Coxal gills 2-?, small, slender; oostegites slender, strongly setose.

Variables. Coxae 5-7 sharply decreasing in size successively, coxa 7 much smaller than 4 (*Y. wallangar*); not so, coxa 7 almost as long as 4 (*Y. improvisa*); uropod 1 attached and tucked to ventral side of urosomite 1 and hidden from lateral view by urosomite 2 and uropod 2 (*Y. wallangar*); not so, uropod 1 visible from lateral view (*Y. improvisa*); inner ramus of uropod 1 shortened (*Y. armadillicta*).

Species. *Yulumara armadillicta* Moore, 1982b [783]; *Y. improvisa* Griffiths, 1976b [743]; *Y. wallangar* J.L. Barnard, 1972a [785].

Habitat and distribution. Marine, southern Australia and southern Africa, 3-10 m, [host unknown], 3 species.

CONDUKIIDAE Barnard & Drummond, 1982c

Diagnosis. Rostrum well developed, cylindrical, with anteroventral solid keel; head otherwise elongate, cheek poorly developed. Appendages fossorial, e.g., furnished with digging spines and roiling-filtrative setae. Antenna 1 partially of *Urothoe* form, article 1 short, articles 2-3 unusually elongate, geniculate; flagella short, similar and about as long as articles 3 of peduncles. Antenna 2 slender, article 4 elongate, with no facial spines at all on article 4, article 5 shorter than article 4, these articles furnished with long and medium setae, no rows of facial armaments; flagellum short, subequal to article 5 of peduncle. Prebuccal complex massive, epistome and upper lip distinct, latter dominant. Mandibles bearing incisors, laciniae mobiles, rakers and large weakly triturative molar; palp 3-articulate, apex bevelled, all setae on bevel. Lower lip with appressed inner lobes partially fused together, mandibular lobes of outer lobes well developed. Maxilla 1 with small, moderately setose inner plate; outer plate with 6 spines; palp 2-articulate. Maxilla 2 ordinary, inner plate with oblique facial row of setae. Maxillipeds with widened and extended basal parts lacking baler lobes, outer plate enlarged (versus Cheidae), bearing only setae, otherwise with normally enlarged plates and 4-articulate palp, dactyl of latter stubby or clavate and multisetose, lacking nail.

Coxae 1-4 progressively and evenly larger; coxa 1 small but not strongly hidden by following coxae; coxa 4 broad, plate-like, with weak posterodorsal excavation; coxa 5 much shorter than coxa 4. Coxal gills on segments 2-6, [brood plates unknown]. Gnathopods feeble, grossly alike in proportions but gnathopod 1 scarcely subchelate; gnathopod 2 minutely parachelate, carpus elongate, article 3 very short. Article 5 of pereopods 3-4 with large posterior lobe and thick spines; dactyls of pereopods 3-6 vestigial, dactyl of pereopod 7 small; pereopods 5-7 of similar dominance, article 2 grossly similar in expansion, articles 4-5 broadly expanded and plate-like, bearing facial spine groups, though weak or absent in several places, article 6 much narrower and shorter and hanging as appendage to apex of article 5; article 5 of pereopod 7 underslung.

Peduncles of pleopods not longer than wide, rami of pleopods 1 and 3 extremely slender, with very few articles, those of uropod 2 weakly expanded basally, otherwise similar, with article 1 extremely elongate, only pleopod 2 with coupling hooks; essentially pleopod 2 dominant. All epimera distinctly developed, epimeron 3 dominant. Urosome flexed towards ventrum (on death), urosomite 1 greatly elongate by virtue of huge subpeduncular extension bearing pair of ventral teeth, urosomites 2-3 equally short; uropods 1-2 each biramous,

rami sublanceolate (not linguiform), spinose (not setose, or setae, if present, very short); peduncle of uropod 3 scarcely elongate, inner ramus vestigial, outer ramus grossly dominant, article 2 well developed, apically truncate, and multiarmed. Telson ordinary, slightly longer than wide, deeply cleft.

Sexual dimorphism. Unknown.

Relationship. *Condukius* carries a mixture of characteristics found in the Haustoriidae, Urothoidae, Pontoporeiidae and Platyischnopidae. For example, the rostrum resembles a primordial concept of the platyischnopid rostrum and the following appendages and parts are so similar to those of platyischnopids that a widened diagnosis could admit *Condukius*: pereopods 5-7, uropods 1-3, telson, epimera, lower lip, and maxilliped palp article 4. However, the following characteristics of *Condukius* are foreign to platyischnopids: the simple gnathopod 1, the general shape of gnathopod 2, and in most respects the parts of the mandibles, maxilla 1, maxilliped (smaller outer plates) and pereopods 3-4.

The strange apical setae on the carpus of the gnathopods are also characteristic of several platyischnopids and alien to the other groups.

Condukius differs from both Urothoidae and Haustoriidae in the shape and spination pattern of pereopod 5 and in the rostrum, but pereopods 3-4 have features of the Haustoriidae. The outer plate of the maxilliped, in its lack of thick spines, resembles that of the Haustoriidae. *Condukius* differs from the Haustoriidae in the presence of mandibular lobes on the lower lip, the presence of maxillipedal dactyl, an elongate telson, relatively normal spination on uropod 2 and distinctive antennae.

Condukius might be included within the Pontoporeiidae because of resemblances in telson, lower lip, uropods 1-2, and gnathopods, but differs in the rostral shape and antenna 1.

Provisionally, *Condukius* may be assigned to Platyischnopidae on the basis of rostrum and characteristic setae of the gnathopods but segregation in a distinct family on the basis of shapes in articles 4-5 of pereopods 6-7 (like Haustoriidae); shape of pereopods 3-4 (like Haustoriidae); the small size and the absence of thick spines on the outer plate of the maxilliped (like Haustoriidae); and the unusual mixture of pleopods, is a good alternative.

Condukius shares some of the unusual appearances found in *Cunicus*, now assigned to the Urothoidae. These similarities occur especially in antennae and mouthparts and the slight propensity in *Cunicus* to the development of a protruding rostral area; but *Cunicus* differs from *Condukius* greatly in that (1) the head, with large cheek, is readily identifiable with the *Urothoe*-like head, and the antennae are attached at the apex of the false rostrum, (2) pereopod 5 is of the haustorius form and pereopods 6-7 are of the urohaustorius form, and (3) the rami of uropods 1-2 are absent, but the remaining peduncle is lamelliform and strongly setose.

Condukius Barnard & Drummond

Figs 68J, 70F, 71A

Condukius Barnard & Drummond, 1982c: 139.

Type species. *Condukius karkan* Barnard & Drummond, 1982c, original designation.

Diagnosis. With the characters of the family, especially notable being: Platyischnopid-like rostrum, thin geniculate antennae lacking organised facial armaments, with elongate setae, articles 2-3 of antenna 1 elongate; relatively ordinary mandibles, coxae and telson; feeble gnathopods with elongate carpus, if chelate not strongly so; vestigial dactyls on pereopods 3-7; gross lobation on article 5 of pereopods 3-4; evenness of pereopods 5-7, all with expanded articles 2,4, and 5 bearing facial spines, pereopod 5 not of the haustorius form; unusual pleopods; ordinary uropods 1-2; niphargid-like uropod 3; flexed urosome with greatly attenuate urosomite 1.

Species. *Condukius karkan* Barnard & Drummond, 1982c [782].

Habitat and distribution. Marine, Victoria, 13 m, 1 species.

[Incertae sedis]

Otagia n.gen.

Type species. *Platyischnopus neozelanicus* Chilton, 1897.

Diagnosis. Head platyischnopid or condukiid. Article 1 of antenna 1 stout, short, article 2 more than 1.4 times length of article 1, article 3 short, flagella short; articles 4-5 of antenna 2 of urothoe form, slender, lacking facial spines, with long posterior setae. [Mouthparts, coxae, epimera and pleopods unknown].

Carpus of gnathopods dominant, elongate, slightly swollen, heavily setose, gnathopod 1 simple, gnathopod 2 minutely chelate. Articles 4 and 6 of pereopods 3-4 slender, but article 5 on pereopod 4 slightly swollen and bearing 7 long setae (versus pereopod 3); article 2 of pereopods 5-7 widely expanded, article 4-5 moderately expanded, article 5 longest on pereopods 5-6, article 4 longest on pereopod 7, pereopod 7 shortest, article 2 of pereopod 7 lacking notch at posteroventral corner.

Rami of uropods 1-2 naked marginally except for 0-1 subapical thin spine on each ramus, apices spinose, outer rami slightly to greatly shorter, rami of uropod 3 equal, well setose apically, article 2 of outer ramus elongate. Telson deeply cleft, each apex with 1 spine.

Systematics. Until head, mouthparts, coxae, pleopods and epimera are described this genus must remain in dubious position; however it appears to deserve a family of its own.

Relationship. Differing from Platyischnopidae in the non-chelate gnathopods, diverse article 5 on pereopods 3-4, and much weaker diversity between pereopods 5 and 7.

From Condukiidae in short article 3 of antenna 1, less produced article 5 on pereopods 3-4, presence of inner ramus on uropod 3, but otherwise similar to Condukiidae in antenna 2, telson, gnathopod 1 and gnathopod 2.

Species. *Otagia neozelanica* (Chilton, 1897) [776].

Habitat and distribution. Marine, New Zealand, Otago Harbour, surface, 1 species.

Etymology. Named for the Otago Peninsula.

COROPHIIDA Barnard & Barnard, 1983

See Corophioidea

COROPHIIDAE Dana, 1849

See Corophioidea

COROPHIOIDEA Barnard & Barnard, 1983

Diagnosis. Telson fleshy and entire, thickly attached at base so that movement at apex failing to move entire telson at base.

Description. Accessory flagellum variable; body, coxae, urosome, gnathopods, pereopods and uropods variable. Mouthparts basic though molar rarely reduced and mandibular palp occasionally reduced or absent; upper lip occasionally bilobed; inner lobes of lower lip rarely absent, outer plates occasionally notched (especially Ampithoidae); setosity of inner plates of maxillae variable; maxillipeds always with large plates and 4-articulate palp, occasionally article 2 of palp shortened; pereopod 7 occasionally with long setae as in fossorial families.

Remarks. This group is divided into five families, all found in alphabetical order but joined here temporarily to provide a key: Ampithoidae, Cheluridae, Corophiidae (including Ischyroceridae), Podoceridae and a subfamily of Corophiidae, the Siphonoecetinae. Because the practical identification of family or subfamily groups in this conglomerate is very difficult, the Corophiidae include Aoridae, Isaeidae, Neomegamphopidae and Photidae; even the Ischyroceridae have become so difficult that it has proved to be sensible to include them together with corophiids in a single key to all taxa and then to intermingle them with the genera of Corophiidae.

Confusion with other families having falsely appearing fleshy telsons is handled in the master key to families.

The following genera have been revised by Dr A.A. Myers in a paper on Aorinae he kindly allowed us to utilise prior to publication (Myers, 1988). We have appended to each of those genera a subsidiary diagnosis rewritten from his diagnoses which contains new characters or new combinations of characters distinguishing those genera from each other; we title those diagnoses 'Myers (1988) diagnosis'. The genera are *Autonoe*, *Bemlos*, *Globosolembos*, *Lemboides*, *Lembos*, *Meridiolembos*, *Microdeutopus*, *Paramicrodeutopus*, *Plesiolembos*, *Protolembos* and *Tethylembos*.

Key to Groups of Corophioidea

(Referring only to males when not specified)

1. Uropods 1-3 large and diverse and attached to box-like urosome, uropod 1 linear and almost normal, uropod 2 with inflated peduncle, uropod 3 large, paddle-shaped, inner ramus reduced or absent ..... Cheluridae

—— Uropod 1 ordinary, linear, uropod 2 if present linear, uropod 3 if present small 2

2. Urosomite 1 elongate (Fig.119A) ..... Podoceridae

—— Urosomite 1 ordinary 3

3. Outer lobes of lower lip notched or outer ramus of uropod 3 with 2 large spines ..... Ampithoidae

—— Outer lobes of lower lip entire or outer ramus of uropod 3, if present, lacking precisely 2 large spines 4

4. Article 5 of pereopods 3-6 short, reniform, covered with cuticular scales, article 4 on pereopods 3-4 greatly dilated and partially enveloping article 5, mandibular palp 1 to 2-articulate ..... Siphonoectinae

—— Article 5 of fewer than pereopods 3-6 short and reniform or no pereopod with shortened and reniform article 5 ..... Corophiidae and Ischyroceridae

There are two master keys to this group; they refer only to males unless specified. Duplicate citation of genera occurs occasionally.

Master Key 1 to Genera of Corophiidae-Ischyroceridae

1. Uropod 3 with 0-1 ramus 2

—— Uropod 3 with 2 rami ..... Key 2

2. Uropod 2 absent or with 0-1 ramus 3

—— Uropod 2 with 2 rami 11

3. Male gnathopod 2 carpochelate 4

—— Male gnathopod 2 not carpochelate 6

4. Coxa 5 of female not extremely wide ..... *Cerapus*

—— Coxa 5 of female extremely wide (Fig.44J) 5

5. Coxa 5 lacking dense setae, telson narrow, article 4 of pereopod 4 not elongate ..... *Baracuma*

—— Coxa 5 with dense setae, telson wide, article 4 of pereopod 4 elongate ..... *Runanga*

6. Male gnathopod 1 carpochelate ..... *Chevreuxius*

—— Male gnathopod 1 not carpochelate 7

7. Article 5 of pereopod 5 either small, lunate or reniform, or enveloped by article 4, telson broad and with many denticles 8

—— Article 5 of pereopod 5 not small-lunate-reniform, not enveloped by article 4, telson broad, not denticulate 9

8. Article 5 of pereopods 3-4 lunate and enveloped by article 4, mandibular palp 1 to 2-articulate, article 3 rectolinear, gnathopod 2 not carpochelate ..... Siphonoectinae

—— Article 5 of pereopods 3-4 not enveloped by article 4, mandibular palp 3-articulate, article 3 clavate, male gnathopod 2 carpochelate ..... *Cerapus*

9. Rami of uropod 2 absent, coxae 2-4 large and overlapping, gnathopod 1 thin and simple ..... *Kuphocheira*

—— Rami of uropod 2 present, coxae 2-4 small and discontiguous, gnathopod 1 stout and subchelate 10

10. Rami of uropod 3 absent, article 2 of pereopods 3-7 with spur ..... *Uncinotarsus*

—— Rami of uropod 3 present, article 2 of pereopods 3-7 lacking spur ..... *Pseudunciola*

11. Inner ramus of uropod 2 vestigial 12

—— Inner ramus of uropod 2 well developed 15

12. Peduncle of male antenna 2 sculptured, epimeron 3 with tooth, gnathopod 1 very large, gnathopod 2 feeble, ramus of uropod 3 absent or vestigial, not hooked, article 3 of antenna 1 shorter than article 1 13

—— Peduncle of male antenna 2 not sculptured, epimeron 3 lacking tooth, gnathopod 1 not larger than 2, latter not feeble, ramus of uropod 3 short, recurved, bearing thorns, article 3 of antenna 1 longer than article 1 14

—— Peduncle of male antenna 2 occasionally sculptured, epimeron 3 lacking tooth, gnathopod 2 larger than 1, not feeble, ramus of uropod 3 if present not recurved, lacking thorns, article 3 of antenna 1 shorter than article 1 [article 5 of pereopods 3-6 stunted] ..... Siphonoectinae

13. Ramus of uropod 3 vestigial, inner ramus of uropod 1 ordinary, accessory flagellum 1 to 2-articulate ..... *Pedicorophium*

—— Ramus of uropod 3 absent, inner ramus of uropod 1 vestigial, accessory flagellum a scale ..... *Rildardanus*

14. Mandibular palp article 3 rectolinear, male gnathopod 2 poorly carpochelate, form of gnathopod 1 like gnathopod 2 ..... *Pseuderichthonius*

—— Mandibular palp article 3 clavate, male gnathopod 2 strongly carpochelate, form of gnathopod 1 distinct from gnathopod 2 ..... *Ericthonius*

15. Articles 4-5 of gnathopod 2 appositional or article 4 forming long pincer lobe 16

—— Articles 4-5 of gnathopod 2 ordinary 18

16. Male gnathopod 1 carpochelate, ramus of uropod 3 very long, much longer than peduncle ..... *Grandidierella*

—— Male gnathopod 1 subchelate, ramus of uropod 3 equal to or slightly longer than peduncle 17

17. Coxae small and discontiguous, terminal article of mandibular palp rectolinear, article 4 of gnathopod 2 fused to article 5 ..... *Corophium*

—— Coxae large and overlapping, terminal article of mandibular palp clavate, article 4 of gnathopod 2 extended as lobe away from article 5 ..... *Stenocorophium*

18. Male gnathopod 2 carpochelate, ramus of uropod 3 hooked ..... *Ericthonius*

—— Male gnathopod 2 not carpochelate, ramus of uropod 3 not hooked 19

19. Ramus of uropod 3 absent 20

—— Ramus of uropod 3 present 21

20. Articles 4-6 of pereopods 3-4 ordinary, accessory flagellum 3-articulate ..... *Liocuna*

—— Article 4 of pereopods 3-4 elongate, articles 5-6 stunted, accessory flagellum vestigial ..... *Ritaumius*

21. Article 5 of pereopods 3-5 stunted, mandibular palp 1 to 2-articulate ..... Siphonoecetinae

—— Article 5 of pereopods 3-5 ordinary, mandibular palp 3-articulate 22

22. Coxae very small and disjunct 23

—— Coxae medium to large, contiguous or overlapping 27

23. Male gnathopod 1 grossly larger than gnathopod 2, latter feeble (parachelate), article 5 of gnathopod 1 short 24

—— Male gnathopod 1 not much larger than gnathopod 2, latter not feeble relative to gnathopod 1, article 5 of gnathopod 1 as long as 6 or longer 25

24. Epimeron 3 with tooth, coxae angular, article 3 of mandibular palp shorter than 2 ..... *Unciola*

—— Epimeron 3 lacking tooth, coxae not angular, article 3 of mandibular palp longer than 2 ..... *Pterunciola*

25. Coxae angular, article 3 of mandibular palp rectolinear, peduncle of uropod 3 not dilated medially ..... *Neohela*

—— Coxae not angular, article 3 of mandibular palp clavate or falciform, peduncle of uropod 3 not dilated medially 26

26. Accessory flagellum absent, urosome without teeth, article 2 of gnathopod 1 lacking plate, uropod 1 lacking spur ..... *Janice*

—— Accessory flagellum 1 to 3-articulate, urosome with teeth, article 2 of gnathopod 1 with toothed plate, uropod 1 with spur ..... *Unciolella*

27. Article 5 of male gnathopod 2 elongate, as long as article 6 28

—— Article 5 of male gnathopod 2 short 30

28. Accessory flagellum 3+articulate, inner plate of maxilla 1 with 6+ setae ..... *Parunciola*

—— Accessory flagellum absent, inner plate of maxilla 1 with 0-2 setae 29

29. Article 3 of antenna 1 shorter than article 1, article 3 of mandibular palp rectolinear, longer than article 2, ramus of uropod 3 with article 2 ..... *Paraoroides*

—— Article 3 of antenna 1 equal to or longer than article 1, article 3 of mandibular palp clavate, shorter than article 2, ramus of uropod 3 1-articulate (ocular lobes almost stalked) ..... *Ampelisciphotis*

30. Some urosomites coalesced, male gnathopod 1 propodochelate 31

—— Urosomites free, male gnathopod 1 subchelate 32

31. Urosomites 1-2 coalesced, peduncle of uropod 3 expanded medially, mandibular palp article 3 rectolinear ..... *Kamaka*

—— Urosomites 2-3 coalesced, peduncle of uropod 3 not expanded medially, mandibular palp article 3 clavate ..... *Rakiroa*

32. Article 3 of antenna 1 as long as article 1, inner plate of maxilla 1 with 0-1 seta, accessory flagellum absent, pereopod 5 with large palmar spine 33

—— Article 3 of antenna 1 shorter than article 1, inner plate of maxilla 1 with 5+ setae, accessory flagellum 2-articulate, pereopod 5 ordinary 35

33. Single ramus of uropod 3 curved ..... *Dercothoe*

—— Neither ramus of uropod 3 curved 34

34. Uropod 2 with spur, dactyl of pereopod 5 lacking tooth ..... *Microphotis*

—— Uropod 2 lacking spur, dactyl of pereopod 5 with tooth ..... *Photis*

35. Ramus of uropod 3 longer than peduncle, anterior coxae ordinary, article 3 of antenna 1 short ..... *Microprotopus*

—— Ramus of uropod 3 shorter than peduncle, anterior coxae short and diverse, article 3 of antenna 1 elongate ..... *Cheiriphotis*

Key 2 to Genera of Corophiidae-Ischyroceridae

1. Male gnathopod 2 merochelate, chela-like thumb projecting at angle to article 5 2

—— Male gnathopod 2 not merochelate 3

2. Outer plate of maxilliped with 1 set of medial armaments, both rami of uropod 3 shorter than peduncle ..... *Paracorophium*

—— Outer plate of maxilliped with 2 sets of medial armaments, one ramus of uropod 3 longer than peduncle ..... *Chaetocorophium*

3. Male gnathopod 1 grossly merochelate 4

—— Male gnathopod 1 weakly merochelate or not 7

4. Gnathopod 2 enlarged, equal to or larger than 1 5

—— Gnathopod 2 much more slender than gnathopod 1 6

5. Male coxa 1 immense, gnathopod 2 carpochelate, accessory flagellum 1.25-articulate ..... *Columbaora*

—— Male coxa 1 ordinary, gnathopod 2 ordinary, accessory flagellum 3 to 4-articulate ..... *Aorella*

6. Accessory flagellum 2+articulate, mandibular palp article 3 semifalcate ..... *Aora*

—— Accessory flagellum absent, mandibular palp article 3 rectolinear ..... *Aoroides*

7. Male gnathopod 1 carpochelate 8

—— Male gnathopod 1 not carpochelate 17

8. Male gnathopod 2 as large as gnathopod 1 9

—— Male gnathopod 2 not as large as gnathopod 1 10

9. Mandibular palp article 3 clavate, inner ramus of uropod 3 as long as outer ramus, article 3 of antenna 1 as long as article 1 ..... *Amphideutopus*

—— Mandibular palp article 3 rectolinear, inner ramus of uropod 3 shorter than outer ramus, article 3 of antenna 1 shorter than article 1 ..... *Zoedeutopus*

10. Article 3 of antenna 1 shorter than article 1 11

—— Article 3 of antenna 1 equal to or longer than article 1 15

11. Inner ramus of uropod 3 shortened ..... *Acuminodeutopus*

—— Inner ramus of uropod 3 as long as outer ramus 12

12. Mandibular palp article 3 rectolinear, carpochela of gnathopod 1 vestigial ..... *Rudilemboides*

—— Mandibular palp article 3 semifalcate, carpochela of gnathopod 1 well developed 13

13. Female gnathopod 1 like that of male gnathopod 1 ..... *Hansenella*

—— Female gnathopod 1 small 14

14. Left molar with secondary to quaternary plates present ..... *Microdeutopus, Lembos*

—— Left molar with secondary plate reduced, tertiary and quaternary plates missing ..... *Paramicrodeutopus*

15. Coxa 1 and article 2 of gnathopod 1 broadly expanded ..... *Konatopus*

—— Coxa 1 and article 2 of gnathopod 1 ordinary 16

16. Accessory flagellum 1.25-articulate, gnathopod 2 simple, inner plate of maxilla 1 with 2 setae ..... *Neomegamphopus*

—— Accessory flagellum 8+articulate, gnathopod 2 subchelate, inner plate of maxilla 1 with 6 setae ..... *Maragopsis*

17. Inner ramus of uropod 3 significantly shortened 18

—— Inner ramus of uropod 3 not shortened 30

18. Coxae tiny and disjunct ..... *Camacho*

—— Coxae large and overlapping 19

19. Article 3 of antenna 1 at least as long as or longer than article 1 20

—— Article 3 of antenna 1 shorter than article 1 24

20. Pereopods prehensile ..... *Pagurisaea*

—— Pereopods simple 21

21. Male gnathopod 2 propodochelate 22

—— Male gnathopod 2 not propodochelate 23

22. Coxae 1 or 4 or both shortened ..... *Microjassa*

—— Coxae 1 or 4 elongate ..... *Cerapopsis*

23. Accessory flagellum 3-articulate, dactyl of maxilliped stubby, pereopod 5 lacking giant spine on palm or tooth on dactyl ..... *Posophotis*

—— Accessory flagellum absent, dactyl of maxilliped unguiform, pereopod 5 with large spine on palm and tooth on dactyl ..... *Photis*

24. Article 5 of gnathopod 2 very short, less than half as long as article 6 25

—— Article 5 of gnathopod 2 longer than article 6 26

25. Uropod 3 ordinary, peduncle cylindrical, one ramus almost as long as peduncle ..... *Pareurystheus*

—— Uropod 3 tiny, peduncle flat, rami much shorter than peduncle ..... *Cheiriphotis*

26. Gnathopod 1 simple ..... *Haplocheira*

—— Gnathopod 1 subchelate 27

27. Gnathopod 1 much larger than gnathopod 2, (palm of gnathopod 1 transverse) ..... *Anonychocheirus*

—— Gnathopod 1 not larger than gnathopod 2 28

28. Article 2 of gnathopod 2 not densely setose ..... *Cheirimedeia*

—— Article 2 of gnathopod 2 densely setose (filtrative) 29

29. Uropods 1-2 lacking spur, rami with long setae ..... *Goesia*

—— Uropods 1-2 with spur, rami with short stout spines ..... *Leptocheirus*

30. Carpus (Article 5) on both gnathopods 1-2 almost equal to or longer than propodus (article 6) ..... Key 3

—— Carpus (Article 5) on one or both pairs of gnathopods very much shorter than propodus (article 6) ..... Key 4

Key 3 to Genera of Corophiidae-Ischyroceridae

1. Rami of uropod 3 tiny, much shorter than peduncle, basally disjunct ..... *Dryopoides*

—— Rami of uropod 3 not tiny nor basally disjunct 2

2. Article 3 of antenna 1 equal to or longer than article 1 3

—— Article 3 of antenna 1 shorter than article 1 (these genera usually with very setose gnathopods) 4

3. Antenna 2 weakly recessed into head, mandibular palp very thin, gnathopods not sculptured ..... *Aorcho*

—— Antenna 2 deeply recessed into head, mandibular palp thick, gnathopods slightly sculptured ..... *Ledoyerella*

4. Carpus of gnathopods 1-2 inflated and thicker than propodus, latter short, rectangular ..... *Lemboides*

—— Carpus of gnathopods 1-2 not inflated, not thicker than propodus, latter not short or rectangular 5

5. Inner plate of maxilla 1 multisetose medially 6

—— Inner plate of maxilla 1 with 0-1 seta medially 7

6. Article 5 of pereopods 3-4 slightly inserted into article 4, latter slightly enveloping article 5 by lobation (very subtle) ..... *Cheirimedeia*

—— Articles 4-5 of pereopods 3-4 ordinary ..... *Protomedeia*

7. Coxae 2-4 much longer than broad 8

—— Coxae 2-4 short and quadrangular 9

8. Rami of uropods 1-2 with setae ..... *Goesia*

—— Rami of uropods 1-2 lacking setae ..... *Leptocheirus*

9. Gnathopod 2 immensely setose (often articles 4-5 apposed and elongate or article 2 densely setose) ..... *Xenocheira*

—— Gnathopod 2 strongly setose 10

10. Left molar with oblique lamellae extending across half of molar from marginal lappet ..... *Tethylembos*

—— Left molar without lappets, with plates 11

11. Left molar with primary plate asymmetrical, rounded ..... *Meridiolembos*

—— Left molar with primary plate triangular 12

12. Anterior margin of maxilliped with wing-like flanges ..... *Lembos*

—— Anterior margin of maxilliped without wing-like flanges ..... *Autonoe*

Key 4 to Genera of Corophiidae-Ischyroceridae

1. Coxae very small and discontiguous 2

—— Coxae neither small nor discontiguous 4

2. Coxae slightly angular, gnathopod 1 enlarged, rami of uropod 3 tiny ..... *Paradryope*

—— Coxae not angular, gnathopod 1 not enlarged, rami of uropod 3 not tiny 3

3. Urosomites 1-2 coalesced, inner plate of maxilla 1 multisetose ..... *Chevalia*

—— Urosomites 1-2 free, inner plate of maxilla 1 with 1 seta ..... *Bogenfelsia*

4. Pereopods prehensile 5

—— Pereopods not prehensile 6

5. Rami of uropod 3 longer than peduncle, not hooked ..... *Isaea*

—— Rami of uropod 3 much shorter than peduncle, outer hooked and denticulate ..... *Isaeopsis*

6. Article 3 of antenna 1 shorter than article 1 7

—— Article 3 of antenna 1 equal to or longer than article 1 14

7. Gnathopods 1-2 small, alike, palms transverse ..... *Paraneohela*

—— Gnathopods 1-2 diverse, some palms oblique 8

8. Ocular lobes bilobed, outer lobes of lower lip notched, outer plate of maxilliped short, reaching less than halfway along article 2 of palp ..... *Arctolembos*

—— Ocular lobes simple, outer lobes of lower lip simple, outer plate of maxilliped not short 9

9. Male and female gnathopod 1 enlarged equally (and see *Amphithoides*) ..... *Globosolembos*

—— Male gnathopod 1 stouter than female gnathopod 1 10

10. Peduncle of uropod 3 elongate, poorly expanded ..... *Xenocheira, Lembos*

—— Peduncle of uropod 3 short, expanded 11

11. Article 3 of mandibular palp with setae of 2 lengths, terminal setae longer 12

—— Article 3 of mandibular palp with setae otherwise 13

12. Maxillipeds with wing-like flanges ..... *Protolembos*

—— Maxillipeds without wing-like flanges ..... *Bemlos*

13. Left molar with primary plate asymmetrical, rounded ..... *Meridiolembos*

—— Left molar with primary plate falcate ..... *Plesiolembos*

14. Gnathopod 1 larger than 2 15

—— Gnathopod 1 not larger than 2 16

15. Gnathopod 1 propodochelate, with only 6 articles ..... *Varohios*

—— Gnathopod 1 subchelate, with 7 articles ..... *Aloiloi*

16. Article 5 of gnathopod 1 significantly shorter than article 6 17

—— Article 5 of gnathopod 1 longer than or equal to article 6 21

17. Article 2 of pereopods 5-7 rectolinear ..... *Bonnierella*

—— Article 2 of pereopods 5-7 expanded 18

18. Palm of male gnathopod 2 with large thumb 19

—— Palm of male gnathopod 2 lacking large thumb 21

19. Coxae 1 and 5 strongly shortened ..... *Microjassa*

—— Coxae 1 and 5 not strongly shortened 20

20. Accessory flagellum 2+articulate ..... *Jassa*

—— Accessory flagellum vestigial, scale-like ..... *Parajassa*

21. Outer ramus of uropod 3 distally hooked or curved 22

—— Outer ramus of uropod 3 straight 24

22. Outer ramus of uropod 3 with long wire-like setae ..... *Ventojassa*

—— Outer ramus of uropod 3 lacking long wire-like setae 23

23. Article 3 of mandibular palp rectolinear, carpus of gnathopod 1 elongate, unlobed, accessory flagellum 1-articulate ..... *Pseudischyrocerus*

—— Article 3 of mandibular palp clavate, carpus of gnathopod 1 ordinary, lobed, accessory flagellum 2+articulate ..... *Ischyrocerus*

24. Flagellum of antenna 2 paddle-shaped, gnathopod 2 propodochelate ..... *Audulla*

—— Flagellum of antenna 2 ordinary, gnathopod 2 subchelate 25

25. Coxae 3-4 very large 26

—— Coxae 3-4 ordinary 27

26. Article 3 of mandibular palp rectolinear, dactyl of maxilliped unguiform ..... *Bathyphotis*

—— Article 3 of mandibular palp clavate, dactyl of maxilliped stubby ..... *Posophotis*

27. Article 2 of male gnathopod 1 dilated ..... *Aorchoides*

—— Article 2 of male gnathopod 1 not dilated ..... *Gammaropsis*

Master Key 2 to Genera of Corophiidae-Ischyroceridae

1. Articles 4-5 of gnathopod 2 contiguous in form seen in *Corophium* 2

—— Articles 4-5 of gnathopod 2 not contiguous in exaggerated form 7

2. Article 4 of gnathopod 2 extended erectly as chela divergent from article 5 3

—— Article 4 of gnathopod 2 not divergent 5

3. Uropod 3 with 1 ramus, gnathopod 1 with only 6 articles, last 2 articles spine-like ..... *Stenocorophium*

—— Uropod 3 with 2 rami, gnathopod 1 with 7 articles, last 2 articles ordinary 4

4. Outer ramus of uropod 3 much longer than peduncle, outer plate of maxilliped with 2 rows of setae along medial edge ..... *Chaetocorophium*

—— Outer ramus of uropod 3 much shorter than peduncle, outer plate of maxilliped with 1 row of setae along medial edge ..... *Paracorophium*

5. Uropod 3 with 2 rami, article 3 of mandibular palp semifalcate (and see Key 4 couplet 9) ..... *Xenocheira*

—— Uropod 3 with 1 ramus, article 3 of mandibular palp rectolinear 6

6. Male gnathopod 1 carpochelate, mandibular palp with 3 well-developed articles ..... *Grandidierella*

—— Male gnathopod 1 not carpochelate, mandibular palp with 1-2 weak articles ..... *Corophium*

7. Article 3 of antenna 1 longer than article 1 ..... Key 5

—— Article 3 of antenna 1 shorter than article 1 8

8. Male gnathopod 1 carpochelate 9

—— Male gnathopod 1 not carpochelate 15

9. Inner ramus of uropod 2 absent ..... *Chevreuxius*

—— Inner ramus of uropod 2 present 10

10. Uropod 3 with 1 ramus ..... *Grandidierella*

—— Uropod 3 with 2 rami 11

11. Inner ramus of uropod 3 much shorter than outer ramus 12

—— Inner ramus of uropod 3 as long as outer ramus 13

12. Gnathopod 2 as large as gnathopod 1, weakly carpochelate ..... *Zoedeutopus*

—— Gnathopod 2 feeble, not carpochelate ..... *Acuminodeutopus*

13. Propodus of gnathopod 1 'usually' larger than carpus (and see key 3 couplet 9, key 4 couplet 9) ..... *Lembos*

—— Propodus of gnathopod 1 'usually' smaller than carpus (and see key 2, couplet 14) ..... *Hansenella, Microdeutopus*

14. Article 5 of pereopod 5 short, lunate, enveloped by lobes of article 4 15

—— Articles 4-5 of pereopod 5 ordinary 16

15. Article 5 of pereopods 3-4 obsolescent, lunate, subcryptic ..... Siphonoecetinae

—— Article 5 of pereopods 3-4 ordinary ..... *Cerapus*

16. Uropod 3 with 2 rami ..... Key 6

—— Uropod 3 without rami 17

—— Uropod 3 with one ramus 20

17. Uropod 2 ordinary 18

—— Uropod 2 with inner ramus reduced or absent 19

18. Article 4 of pereopods 3-4 elongate, articles 5-6 very short, accessory flagellum vestigial ..... *Ritaumius*

—— Articles 4-6 of pereopods 3-4 ordinary, accessory flagellum 3+articulate ..... *Liocuna*

19. Inner ramus of uropod 2 absent, article 2 of pereopods 3-7 with spur ..... *Uncinotarsus*

—— Inner ramus of uropod 2 vestigial, article 2 of pereopods 3-7 lacking spur ..... *Rildardanus*

20. Gnathopod 1 very large and gnathopod 2 feeble 21

—— Gnathopod 2 dominant or not feeble or gnathopod 1 feeble 24

21. Inner ramus of uropod 2 ordinary 22

—— Inner ramus of uropod 2 reduced or absent 23

22. Epimeron 3 with tooth, article 3 of mandibular palp shorter than article 2 ..... *Unciola*

—— Epimeron 3 lacking tooth, article 3 of mandibular palp longer than article 2 ..... *Pterunciola*

23. Inner ramus of uropod 2 absent, ramus of uropod 3 moderately developed ..... *Pseudunciola*

—— Inner ramus of uropod 2 vestigial, ramus of uropod 3 vestigial ..... *Pedicorophium*

24. Some coxae disjunct and tiny 25

—— Coxae medium to large, contiguous or overlapping 26

25. Urosome smooth, uropod 1 lacking spur ..... *Janice*

—— Urosome toothed, uropod 1 with spur ..... *Unciolella*

26. Gnathopods 1-2 essentially simple, rami of uropod 2 absent ..... *Kuphocheira*

—— Gnathopods subchelate, rami of uropod 2 present 27

27. Some urosomites fused together 28

—— Urosomites free 29

28. Urosomites 1-2 fused, telson and urosome fused, mandibular palp article 3 rectolinear ..... *Kamaka*

—— Urosomites 2-3 fused, telson free, mandibular palp article 3 clavate ..... *Rakiroa*

29. Article 5 of gnathopod 2 elongate, unlobed, mandibular palp article 3 longest ..... *Paraoroides*

—— Article 5 of gnathopod 2 short, lobate, mandibular palp article 3 shorter than article 2 30

30. Coxae 1-4 diverse, rami of uropod 3 minute ..... *Cheiriphotis*

—— Coxae 1-4 uniformly incremented in size, shapes alike, rami of uropod 3 elongate ..... *Microprotopus*

Key 5 to Genera of Corophiidae-Ischyroceridae

(Article 3 of antenna 1 equal to or longer than article 1)

1. Uropod 3 with 1 ramus 2

—— Uropod 3 with 2 rami 13

2. Gnathopod 2 carpochelate, telson with many denticles 3

—— Gnathopod 2 not carpochelate, telson lacking many denticles 7

3. Inner plate of maxilla 1 multisetose 4

—— Inner plate of maxilla 1 with 1 seta 5

4. Mandibular palp article 3 clavate, uropod 1 ordinary, (inner ramus of uropod 2 often reduced or absent) ..... *Ericthonius*

—— Mandibular palp article 3 rectolinear, inner ramus of uropod 1 vestigial, (inner ramus of uropod 2 vestigial) ..... *Pseuderichthonius*

5. Coxa 5 not widened in female ..... *Cerapus*

—— Coxa 5 grossly widened especially in female 6

6. Coxa 5 lacking dense setae, telson narrow, article 4 of pereopod 4 elongate ..... *Baracuma*

—— Coxa 5 bearing dense setae, telson wide, article 4 of pereopod 4 not elongate ..... *Runanga*

7. Gnathopod 1 much larger than gnathopod 2 ..... *Unciola*

—— Gnathopod 1 not larger than gnathopod 2 8

8. Coxae tiny, spiniform or angular, almost disjunct ..... *Neohela*

—— Coxae large, smooth, overlapping 9

9. Accessory flagellum 3-articulate, inner plate of maxilla 1 multisetose 10

—— Accessory flagellum absent, inner plate of maxilla 1 with 0-2 setae 11

10. Carpus of gnathopod 2 short and lobate ..... *?Dercothoe*

—— Carpus of gnathopod 2 elongate, unlobed ..... *Parunciola*

11. Gnathopod 2 small, article 5 elongate ..... *Ampelisciphotis*

—— Gnathopod 2 enlarged, article 5 short 12

12. Uropod 1 with spur, dactyl of pereopod 5 lacking cusp ..... *Microphotis*

—— Uropod 1 lacking spur, dactyl of pereopod 5 with cusp ..... *Photis*

13. Pereopod 5 subprehensile, dactyl with cusp and palm with large spine ..... *Photis*

—— Pereopod 5 simple, dactyl simple, large spine absent 14

14. Carpus of gnathopod 1 much shorter than propodus 15

—— Carpus of gnathopod 1 not much shorter than propodus 22

15. Gnathopod 1 larger than gnathopod 2, uropod 3 not of ischyrocerid form 16

—— Gnathopod 1 not larger than gnathopod 2, uropod 3 of ischyrocerid form 18

16. Rami of uropod 3 minute ..... *Paradryope*

—— Rami of uropod 3 ordinary 17

17. Gnathopod 1 propodochelate, with 6 articles ..... *Varohios*

—— Gnathopod 1 subchelate, with 7 articles ..... *Aloiloi*

18. Gnathopod 2 with thumb 19

—— Gnathopod 2 lacking thumb 21

19. Coxa 5 very short, outer plate of maxilliped poorly armed ..... *Microjassa*

—— Coxa 5 long, outer plate of maxilliped well armed 20

20. Accessory flagellum 2+articulate ..... *Jassa*

—— Accessory flagellum vestigial ..... *Parajassa*

21. Article 2 of pereopods 5-7 rectolinear ..... *Bonnierella*

—— Article 2 of pereopods 5-7 expanded ..... *Ischyrocerus*

22. Pereopods 3-7 prehensile 23

—— Pereopods 3-7 simple 24

23. Gnathopod 2 grossly parachelate, inner plate of maxilla 1 without setae ..... *Pagurisaea*

—— Gnathopod 2 subchelate, inner plate of maxilla 1 with 3-4 setae ..... *Isaea*

24. Gnathopod 2 chelate 25

—— Gnathopod 2 not chelate 26

25. Inner ramus of uropod 3 vestigial, antenna 2 ordinary ..... *Cerapopsis*

—— Inner ramus of uropod 3 well developed, antenna 2 with paddle-shaped flagellum ..... *Audulla*

26. Coxae tiny and disjunct ..... *Bogenfelsia*

—— Coxae moderate and overlapping or contiguous 27

27. Gnathopod 1 carpochelate 28

—— Gnathopod 1 not carpochelate 31

28. Gnathopod 2 as large as gnathopod 1 ..... *Amphideutopus*

—— Gnathopod 2 feeble 29

29. Coxa 1 and article 2 of gnathopod 1 expanded ..... *Konatopus*

—— Coxa 1 and article 2 of gnathopod 1 not expanded 30

30. Accessory flagellum 2-articulate, gnathopod 2 subchelate ..... *Neomegamphopus*

—— Accessory flagellum 8 to 9-articulate, gnathopod 2 simple ..... *Maragopsis*

31. Mandibular palp article 3 rectolinear 32

—— Mandibular palp article 3 clavate 34

32. Gnathopods 1-2 small, of equal size ..... *Aorcho*

—— Gnathopod 2 much larger than 1 33

33. Outer ramus of uropod 3 distally hooked ..... *Pseudischyrocerus*

—— Outer ramus of uropod 3 straight ..... *Bathyphotis*

34. Article 2 of gnathopod 1 inflated ..... *Aorchoides*

—— Article 2 of gnathopod 1 not inflated 35

35. Outer ramus of uropod 3 distally hooked ..... *Ventojassa*

—— Outer ramus of uropod 3 straight 36

36. Gnathopods 1-2 of same medium size ..... *Ledoyerella*

—— Gnathopod 2 larger than 1, weakly or strongly 37

37. Coxae very long, dactyl of maxillipedal palp stubby ..... *Posophotis*

—— Coxae of medium length, dactyl of maxillipedal palp unguiform ..... *Gammaropsis*

Key 6 of Genera of Corophiidae-Ischyroceridae

(Article 3 of antenna 1 shorter than article 1, uropod 3 with 2 rami)

1. Gnathopod 1 grossly merochelate 2

—— Gnathopod 1 not grossly merochelate 5

2. Gnathopod 2 carpochelate ..... *Aorella*

—— Gnathopod 2 not carpochelate 3

3. Accessory flagellum absent, mandibular palp article 3 rectolinear ..... *Aoroides*

—— Accessory flagellum 2+articulate, mandibular palp article 3 semifalcate 4

4. Gnathopod 2 enlarged ..... *Columbaora*

—— Gnathopod 2 feeble ..... *Aora*

5. Gnathopod 1 carpochelate 6

—— Gnathopod 1 not carpochelate 9

6. Rami of uropod 3 subequally long 7

—— Inner ramus of uropod 3 reduced 8

7. Female gnathopod 1 as large as male gnathopod 1, carpochelate ..... *Hansenella*

—— Female gnathopod 1 much smaller than male gnathopod 1 and not carpochelate ..... *Microdeutopus*

8. Gnathopod 2 large and carpochelate ..... *Zoedeutopus*

—— Gnathopod 2 feeble, not carpochelate ..... *Acuminodeutopus*

9. Coxae discontiguous 10

—— Coxae contiguous or overlapping 11

10. Urosomites 1-2 coalesced, inner ramus of uropod 3 well developed, mandibular palp article 3 clavate ..... *Chevalia*

—— Urosomites free, inner ramus of uropod 3 shortened, mandibular palp article 3 semifalcate ..... *Camacho*

11. Pereopods prehensile ..... *Isaeopsis*

—— Pereopods simple 12

12. Both rami of uropod 3 less than half as long as peduncle 13

—— At least one ramus of uropod 3 as long as peduncle 14

13. Article 5 of gnathopod 2 very short, lobate ..... *Cheiriphotis*

—— Article 5 of gnathopod 2 long, not lobate ..... *Dryopoides*

14. Article 5 of gnathopod 1 much stouter and longer than article 6 15

—— Article 5 of gnathopod 1 not stouter than article 6 16

15. Gnathopod 2 feeble ..... *Rudilemboides*

—— Gnathopod 2 as large as gnathopod 1 ..... *Lemboides*

16. Article 5 of gnathopod 2 less than half as long as article 6 17

—— Article 5 of gnathopod 2 longer than half of article 6 18

17. Well known, see diagnosis ..... *Pareurystheus*

—— Poorly known ..... *Paraneohela*

18. Inner plate of maxilla 1 multisetose 19

—— Inner plate of maxilla 1 with 0-1 seta 22

19. Mandibular palp article 3 rectolinear 20

—— Mandibular palp article 3 clavate 21

20. Gnathopod 1 larger than 2, both with transverse palms ..... *Anonychocheirus*

—— Gnathopods 1-2 alike, slender, simple ..... *Haplocheirus*

21 Articles 4-5 of pereopods 3-4 not minutely telescoped ..... *Protomedeia*

—— Article 5 minutely telescoped into article 4 of pereopods 3-4 (subtle) ..... *Cheirimedeia*

22. Rami of uropods 1-2 setose ..... *Goesia*

—— Rami of uropods 1-2 lacking setae 23

23. Coxae 2-4 very large ..... *Leptocheirus*

—— Coxae 2-4 ordinary 24

24. Ocular lobes bilobed, outer lobes of lower lip notched, outer plate of maxilliped reaching only halfway along palp article 2 ..... *Arctolembos*

—— Ocular lobes and lower lip simple, outer plate of maxilliped reaching almost to apex of palp article 2 25

25. Female gnathopod 1 as large as male gnathopod 1 (and see key 4 couplet 9) (see *Amphithoides*) ..... *Globosolembos*

—— Female gnathopod 1 much smaller than male gnathopod 1 26

26. Articles 4-5 of gnathopod 2 either of corophiid appositional form or article 2 filtratively setose or gnathopod 1 also appositional and filtrative ..... *Xenocheira*

—— Weakly merging to *Xenocheira* ..... *Lembos*

Special Key 7 to Genera of Corophiidae-Ischyroceridae

(Restricted to taxa with any gnathopod carpochelate)

1. Only gnathopod 2 carpochelate (usually telson with denticles, coxae tiny, disjunct, uropod 3 tiny, with one vestigial hooked ramus) 2

—— Only gnathopod 1 carpochelate 7

—— Both gnathopods 1-2 carpochelate 17

2. Uropod 3 with 2 rami, telson not denticulate (uropod 2 with 2 rami) ..... *Zoedeutopus*

—— Uropod 3 with tiny hooked ramus, telson denticulate, (uropod 2 with 1-2 rami) 3

3. Inner plate of maxilla 1 multisetose, coxa 5 not elongate, (uropod 2 with 2 rami) 4

—— Inner plate of maxilla 1 with 1 seta, coxa 5 elongate, (uropod 2 with 1 ramus) 5

4. Mandibular palp article 3 rectolinear ..... *Pseuderichthonius*

——Mandibular palp article 3 clavate ..... *Ericthonius*

5. Coxa 5 not widened especially in female ..... *Cerapus*

——Coxa 5 broadly widened especially in female 6

6. Coxa 5 lacking dense setae, telson narrow, article 4 of pereopod 4 not elongate ..... *Baracuma*

——Coxa 5 with dense setae, telson wide, article 4 of pereopod 4 elongate ..... *Runanga*

7. Article 3 of antenna 1 shorter than article 1 8

——Article 3 of antenna 1 equal to or longer than article 1 13

8. Uropod 3 with 1 ramus 9

——Uropod 3 with 2 rami 10

9. Uropod 2 with 1 ramus ..... *Chevreuxius*

——Uropod 2 with 2 rami ..... *Grandidierella*

10. Rami of uropod 3 subequally long 11

——Inner ramus of uropod 3 shortened 12

11. Female gnathopod 1 as large as male gnathopod 1 ..... *Hansenella*

——Female gnathopod 1 much smaller than male gnathopod 1 ..... *Microdeutopus*

12. Gnathopod 2 feeble, not carpochelate ..... *Acuminodeutopus*

——Gnathopod 2 enlarged, carpochelate ..... *Zoedeutopus*

13. Uropod 3 with single small hooked ramus ..... *Pseuderichthonius*

——Uropod 3 with 2 unhooked rami 14

14. Gnathopod 2 enlarged, as thick as gnathopod 1 ..... *Amphideutopus*

——Gnathopod 2 feeble 15

15. Gnathopod 2 simple ..... *Neomegamphopus*

——Gnathopod 2 subchelate 16

16. Coxa 1 and article 2 of gnathopod 1 dilated ..... *Konatopus*

——Coxa 1 and article 2 of gnathopod 1 ordinary ..... *Maragopsis*

17. Article 2 of antenna 1 shorter than article 1, inner ramus of uropod 2 normal, uropod 3 with 2 rami, inner reduced ..... *Zoedeutopus*

——Article 2 of antenna 1 longer than article 1, inner ramus of uropod 2 vestigial, uropod 3 with 1 small hooked ramus ..... *Pseuderichthonius*

Special Key 8 to Genera of Corophiidae-Ischyroceridae

(Article 5 of one or more of pereopods 3-6 short, lunate, partially enveloped by article 4)

1. Lunation of article 5 present on pereopods 3-6 ..... Siphonoecetinae

—— Lunation of article 5 not present on all of pereopods 3-6 2

2. Gnathopod 2 of merusoid filtrative form, gnathopod 1 feeble ..... *Corophium*

—— Gnathopod 2 feeble, not merusoid, not filtrative, male gnathopod 1 carpochelate 3

3. Coxa 5 not especially widened ..... *Cerapus*

—— Coxa 5 especially widened in female 4

4. Coxa 5 not setose ..... *Baracuma*

—— Coxa 5 densely setose ..... *Runanga*

Special Key 9 to Genera of Corophiidae-Ischyroceridae

(Telson with numerous dorsal denticles)

1. Male gnathopod 2 not carpochelate, article 5 of pereopods 3-6 lunate, enveloped by article 4, ramus of uropod 3 if present lacking hooks (articulate or fixed) ..... Siphonoectinae

—— Male gnathopod 2 carpochelate, article 5 on pereopods 5-6 or no pereopod lunate, ramus of uropod 3 either hooked or bearing articulate hooks 2

2. Article 5 of pereopod 5 lunate, inner plate of maxilla 1 with 1 seta 3

—— Article 5 of pereopod 5 ordinary, inner plate of maxilla 1 multisetose 5

3. Coxa 5 not widened ..... *Cerapus*

—— Coxa 5 widened especially in female 4

4. Coxa 5 not setose ..... *Baracuma*

—— Coxa 5 densely setose ..... *Runanga*

5. Inner ramus of uropod 1 vestigial, mandibular palp article 3 rectolinear, gnathopod 1 weakly carpochelate ..... *Pseuderichthonius*

—— Inner ramus of uropod 1 well developed, mandibular palp article 3 clavate, gnathopod 1 subchelate ..... *Ericthonius*

Acuminodeutopus J.L. Barnard

Fig.44B

Acuminodeutopus J.L. Barnard, 1959d: 29.–J.L. Barnard, 1973b: 15.–Myers, 1981d: 58 (part).
not *Rudilemboides* J.L. Barnard, 1959d (see).

Type species. *Acuminodeutopus heteruropus* J.L. Barnard, 1959d, original designation.

Diagnosis. Body laterally compressed, slender, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed; antennal sinus deep. Eyes moderate. Antenna 1 barely longer than 2, both slender; peduncular article 3 shorter than 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 short, flagellum with 3-4 articles only. Epistome [?unproduced anteriorly]. Labrum subrounded, entire. Mandible normal, palp slender, article 3 rectolinear, scarcely shorter than 2. Labium with entire outer lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 [?triangular], small, with 2 apical setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with 3 distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long nail, armed with short setae along inner margin.

Coxae small, relatively short, contiguous or weakly overlapping, of various shapes, coxa 1 dilated, produced forward, coxa 2 scarcely larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4; coxa 6 like 5, 7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, in male simple, carpochelate, article 5 long, with large tooth. Gnathopod 2 weakly to strongly subchelate, feeble, article 2 dilated or not (type), article 5 longer than 6, not lobed, article 6 often weakly dilated, dactyl short to long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls long. Pereopods 5-7 progressively longer, with broad linear unlobed article 2, pereopod 5 much shorter than 7; pereopods 6-7 with elongate dactyl. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, peduncle of uropod 1 with large ventrodistal process, that of uropod 2 obsolescent. Uropod 3 short, biramous, peduncle shorter than rami, rami short, outer obtuse and spinose distally, with vestigial article 2; inner ramus much shorter than outer ramus, scale-like, tapering, with 1-2 apical spines. Telson entire, short, broader than long, subtriangular or semicircular, emarginate apically.

Female. Gnathopods small, gnathopod 1 barely larger than 2, normally subchelate, article 5 longer than 6, unlobed. Oostegites [?moderately narrow, broad, present on only segments 2-5].

Sexual dimorphism. Strong. Gnathopods.

Variables. Carpochela of male gnathopod 1 simple or bifid; article 2 of male gnathopod 2 dilated distally and article 3 with anterior sharp lobe (*A. periculosus*).

Relationship. Differing from *Amphideutopus* and *Zoedeutopus* in the feeble gnathopod 2 and short inner ramus of uropod 3; from *Acuminodeutopus, Maragopsis*, and *Neomegamphopus* in the short inner ramus of uropod 3; and from *Konatopus* and *Neomegamphopus* in the shorter article 3 of antenna 1.

See *Anonychocheirus*, *Rudilemboides* and *Zoedeutopus*.

Removals. *Acuminodeutopus naglei* Bousfield, 1973, and *A. stenopropodus* J.L. Barnard, 1959d, to *Rudilemboides*.

Species. *Acuminodeutopus heteruropus* J.L. Barnard, 1959, 1961b [370]; *A. periculosus* J.L. Barnard, 1969b, 1979b (= *A. heteruropus* of Myers, 1968a) [540].

Habitat and distribution. Marine, eastern Pacific, southern California to Costa Rica, 0-82 m, 2 species.

Aloiloi J.L. Barnard

Aloiloi J.L. Barnard, 1970a: 63.–J.L. Barnard, 1973b: 15.

Type species. *Aloiloi nenue* J.L. Barnard, 1970a, original designation.

Diagnosis. Body slightly depressed, otherwise laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short moderate, produced forward, blunt; antennal sinus deep. Eyes moderate. Antennae equal, both slender, peduncular article 3 of antenna 1 slightly longer than 1, article 2 longest, accessory flagellum 4-articulate, main flagellar articles few. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, large, with row of 5 medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long nail.

Coxae relatively short, strongly overlapping, of various sizes and shapes, [?progressively elongate from 1 to 4], coxa 1 broad, produced forward, coxa 2 also short, narrower than 1, coxa 4 [?not longer than coxa 1, not

lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae]. Gnathopods 1-2 diverse, large, palms oblique, gnathopod 1 greatly larger than 2, in male subchelate, article 5 of both gnathopods 1-2 short, shorter than 6, unlobed, article 6 very large. Gnathopod 2 subchelate, article 5 unlobed, article 6 weakly dilated.

Pereopods 3-4 normal, similar, with slender article 2. Pereopods 5-7 similar to each other, with weakly expanded, unlobed article 2, not progressively longer, dactyl of pereopods 5-7 curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal (outer shorter), almost as long as peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 short, biramous, peduncle longer than rami, both rami short, rami subequal, outer ramus with vestigial article 2, with 2 distal setae; inner ramus tapering and with apical few armaments. Telson entire, as broad as long, trapezoidal, with cusp apicoventrally, with 2 hooked apical cusps.

Female. Gnathopod 1 less robust than gnathopod 2, article 5 shorter than 6, scarcely lobed, propodus weakly expanded, palm oblique. Oostegites [?moderately broad, present on segments ?2-5].

Sexual dimorphism. Strong. Gnathopods.

Relationship. Like *Lembos* and allies but inner plate of maxilla 1 with medial setae, gnathopod 2 large and like *Gammaropsis* and article 3 of antenna 1 elongate. Some species of *Lembos* approach these conditions.

Differing from *Varohios* in the presence of 7 articles on gnathopod 1.

See *Pseudomegamphopus* and *Varohios*.

Species. *Aloiloi nenue* J.L. Barnard, 1970a, 1971a (Ledoyer, 1972c, 1982b) [600].

Habitat and distribution. Marine, Indo-Pacific, Hawaii to Madagascar, 0-4 m, 1 species.

Ampelisciphotis Pirlot

Figs 41B,D, 43C

Ampelisciphotis Pirlot, 1938: 341.–J.L. Barnard, 1969c: 271.–J.L. Barnard, 1973b: 15.–Ledoyer, 1982b: 174.

Gaviota J.L. Barnard, 1958d: 87 (*Gaviota podophthalma* J.L. Barnard, 1958d, original designation).–J.L. Barnard, 1969c: 192.

Type species. *Ampelisciphotis tridens* Pirlot, 1938, original designation.

Diagnosis. *Female.* Body cylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Head as long as pereonites 1-2 together. Rostrum vestigial, supra-antennal line present, ocular lobes elongate, very produced forward, blunt; antennal sinus deep. Eyes medium, on apex of ocular stalks. Antennae subequal, short, both very slender, peduncular article 3 of antenna 1 as long as or longer than 1, article 2 longest, accessory flagellum absent. Antenna 2 peduncular article 3 scarcely to moderately elongate. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp long, very slender, article 3 thinly clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short or long, pointed or blunt. Inner plate of maxilla 1 tiny, mammilliform, with 2 apical setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long setae.

Coxae relatively long, contiguous or overlapping, of various shapes, progressively shorter from 1 to 4, coxa 1 not dilated but produced forward sharply, often coxa 4 shorter than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 scarcely diverse, of subequal size, feeble, gnathopod 1 poorly subchelate, article 5 long (type), unlobed, palm oblique. Gnathopod 2 slightly enlarged, weakly subchelate, with article 2 slightly dilated, article 4 slightly enlarged, article 5 slightly shorter than 6, barely lobed, article 6 weakly dilated, dactyl ordinary.

Pereopods 3-4 similar, with weakly inflated article 2, article 4 slightly dilated, article 6 elongate and tapering, almost naked, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with broad article 2, or occasionally narrow in male pereopod 7, dactyls geniculate, very small on 5 or 6, longer on 7, with accessory spines on inner margin. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1- 2 biramous, stout, rami slightly unequal, much shorter than peduncle, not hooked, peduncles lacking ventrodistal process. Uropod 3 very short, uniramous, single ramus short, obtuse and setose distally, peduncle barely dilated medially. Telson entire, short, broader than long, pentagonal, pointed, with cusp and lateral patch of setules on each side. Oostegites narrow, present on segments [?2-5].

Male. Gnathopods small, gnathopod 2 larger than 1, subchelate; article 2 of pereopod 6 with 2-3 posteroventral cusps not present in female.

Sexual dimorphism. Pereopod 6.

Variables. Male article 2 of pereopod 7 narrow (*A. tridens*), broad (female *A. podophthalma*); male pereopod 6 article 2 with large cusps (male *A. tridens*), cusps absent

(female *A. tridens*); mandibular lobes of lower lip long and pointed (*A. tridens*) or short and blunt; anterior coxae very long (*A. podophthalma*).

Relationship. Differing from *Photis* in the greatly reduced ramus of uropod 3; no inner ramus is present on uropod 3 but a few species of *Photis* also have no inner ramus.

Also differing from *Photis* in the especially elongate and naked article 6 of pereopods 3-4, the extreme narrowness of the ramus on uropod 3, the poor grasping condition of pereopod 5, the produced coxa 1, short coxae 2- 4, small male gnathopod 2 and the immensity of the ocular stalks.

See *Cerapopsis* and *Dercothoe*.

Species. *Ampelisciphotis podophthalma* (J.L. Barnard, 1958d, 1964b) [370]; *A. tridens* Pirlot, 1938 (Ledoyer, 1982b) [600].

Habitat and distribution. Marine, eastern Pacific and Indo-Pacific, 0-64 m, 2 species.

Amphideutopus J.L. Barnard

Amphideutopus J.L. Barnard, 1959d: 34.–J.L. Barnard, 1969c: 150.–J.L. Barnard, 1973b: 15.

Type species. *Amphideutopus oculatus* J.L. Barnard, 1959d, original designation.

Diagnosis. Body laterally compressed, slender, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes long, produced forward, blunt; antennal sinus deep. Eyes large. Antenna 1 shorter than 2, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome [?unproduced anteriorly]. Labrum [?subrounded. entire. incised]. Mandible normal, palp strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 ovate, with 1 medial seta, outer plate with [?9] spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped [?with distal spines], outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long nail and setae.

Coxae small, relatively short, weakly overlapping, rectangular, not progressively elongate from 1 to 4, coxa 1 weakly to strongly produced forward, coxa 3 largest, coxa 4 not lobed, coxa 5 as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, often densely setose, large, gnathopod 1 in male poorly subchelate to simple, carpochelate, article 5 large, long, lobed, palm short, article 6 small. Gnathopod 2 weakly to strongly subchelate, occasionally almost carpochelate in male, often with article 2 dilated, article 5 almost as long 6, occasionally lobed, article 6 dilated, sometimes with false chela, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls long. Pereopods 5-7 similar to each other, progressively slightly longer, with sublinear article 2, dactyls weakly curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long as or longer than peduncle, not hooked, peduncle of uropod 1 with moderate ventrodistal process. Uropod 3 of ordinary length, biramous, both rami longer than short peduncle, obtuse distally, subequal, outer ramus with vestigial article 2, both rami apically setose, narrow, tapering. Telson entire, short, as broad as long, ovate, subrectangular or trapezoidal, pointed apicoventrally, with 2 hooked apical cusps.

Female. Gnathopods small, gnathopod 1 not larger than 2, normally subchelate, article 5 longer or almost as long as 6, unlobed. Oostegites [unknown].

Sexual dimorphism. Gnathopods.

Variables. Male gnathopod 1 with posteriorly toothed carpus (*A. dolichocephalus*), with 1 distal tooth (type); male gnathopod 2 with propodal chela, gnathopods 1-2 weakly merochelate (*A. dolichocephalus*).

Relationship. Like *Neomegamphopus* but male gnathopod 2 with well-defined palm and rami of uropod 3 more elongate.

See *Acuminodeutopus*, *Neomegamphopus*, *Pseudomegamphopus*, *Rudilemboides* and *Zoedeutopus*.

Species. *Amphideutopus dolichocephalus* Myers, 1968c [462]; *A. oculatus* J.L. Barnard, 1959d, 1961b, 1969b (Myers, 1968a) [369].

Habitat and distribution. Marine, eastern tropical Pacific and Caribbean Sea, 0-162 m, 2 species.

Anonychocheirus Moore & Myers

Anonychocheirus Moore & Myers, 1983: 217.

Type species. *Anonychocheirus richardsoni* Moore & Myers, 1983, original designation).

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus moderate. Eyes medium. Antennae ordinary, nearly subequal, 1 slender,

antenna 2 stouter; peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum 2-articulate, main flagellar articles many. Antenna 2 peduncular article 3 short, peduncle slightly stout in both sexes, flagellum with 8 articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with [?entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt]. Inner plate of maxilla 1 triangular, large, with row of medial setae, outer plate with [?9] spines, palp 2-articulate. Inner plates of maxilla 2 [?rather broad, outer narrow, inner plate with only mediomarginal setae]. Inner plate of maxilliped with [?distal spines, outer plate short, reaching halfway along palp article 2, with setae only on medial margin], palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae large, long, overlapping, of various sizes and shapes, progressively shorter from 1 to 4, coxa 1 dilated, produced forward, coxa 2 larger than 1, produced forward, coxae 3-4 smaller than coxa 2, not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, both densely setose, gnathopod 1 large, greatly larger than 2, subchelate, almost propodochelate, article 5 long but shorter than 6, unlobed, dactyl large and curved, overextending transverse palm. Gnathopod 2 simple, linear, very setose, article 5 much longer than 6, unlobed, article 6 more slender than 5, dactyl strongly reduced.

Pereopods 3-4 longer than gnathopod 2, similar, with slender article 2, article 4 slender, dactyls long. Pereopods 5-6 with weakly expanded article 2, pereopods 6-7 progressively longer, pereopod 5 much shorter than pereopods 6-7, pereopod 7 with broad unlobed article 2, pereopods 6-7 with longer dactyl. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, subequal to peduncle, peduncle of uropods 1-2 with moderate ventrodistal process. Uropod 3 short, biramous, peduncle slightly elongate, outer ramus as long as peduncle, 1-articulate, inner ramus very short, scale-like. Telson entire, short, broader than long, ovate, with 2 hookedapical cusps.

Female. Oostegites [?moderately broad, present on segments 2-5].

Sexual dimorphism. Absent.

Relationship. Differing from *Haplocheira* and *Kuphocheira* in the subchelate gnathopod 1; and from *Leptocheirus* in the non-filtrative article 2 of gnathopod 2.

From *Acuminodeutopus* in the regularly subchelate gnathopod 1 and large coxae. From *Goesia* in the enlarged gnathopod 1.

See key with *Haplocheirus*.

Species. *Anonychocheirus richardsoni* Moore & Myers, 1983 [872].

Habitat and distribution. Marine, Arthur Harbor, Anvers Island, Antarctic Peninsula, 18-50 m, 1 species.

Aora Krøyer

Figs 39I, 40D, 41G, 44C, 45H, 46A

Aora Krøyer, 1845: 328, 335.–Stebbing, 1906: 587.–J.L. Barnard, 1969c: 152.–J.L. Barnard, 1973b: 15.–Lincoln, 1979a: 472.–Myers, 1982a: 12.–Myers & Moore, 1983: 168 (key).

Lalaria Nicolet, 1849: 240 (*Lalaria longitarsis* Nicolet, 1849, monotypy).

Lonchomerus Bate, 1857d: 143 (*nomen nudum*) (*Lonchomerus gracilis* Bate, 1857d, monotypy).

Type species. *Aora typica* Krøyer, 1845, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes small. Antennae very long, 1 longer than 2, both slender, or male antenna 2 stouter; peduncular article 3 of antenna 1 usually shorter than 1, article 2 longest, accessory flagellum 4 to 5-articulate. Antenna 2 peduncular article 3 short, flagellum short, with 4-8 articles. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, very slender, article 3 semi-falciform, longer than 2, well setose. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular or conical, with 1 apical seta, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with medium nail and setae.

Coxae ordinary to short, weakly overlapping, often of various sizes and shapes, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, scarcely lobed, coxa 5 often somewhat shorter than 4, coxae 6-7 slightly to greatly smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, simple, merochelate, articles 5-6 long, linear, unlobed, dactyl very large. Gnathopod 2 subchelate, feeble, with article 2 often very setose, article 5 longer than 6, unlobed, article 6 slender, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, often with linear to increasingly expanded article 2, pereopod 5 much shorter than pereopod 7, often with narrower article 2; pereopod 7 with broad nearly lobed article 2, dactyl of pereopods 5-7 curved, short. Sternal processes of thorax absent. Coxal gills present on segments 2-6.

Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long or longer than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 of medium length, biramous, peduncle slightly elongate but shorter than rami, rami subequal, both moderately long, narrow, tapering, obtuse distally, with few armaments mostly apical, outer ramus often with small or vestigial article 2. Telson entire, short, as broad as long or longer than broad, ovate, almost pointed apically, with 2 long apical spines or setal groups and usually 2 hooked apical cusps.

Female. Coxa 1 smaller than in male, usually rectangular and poorly produced. Gnathopods small,

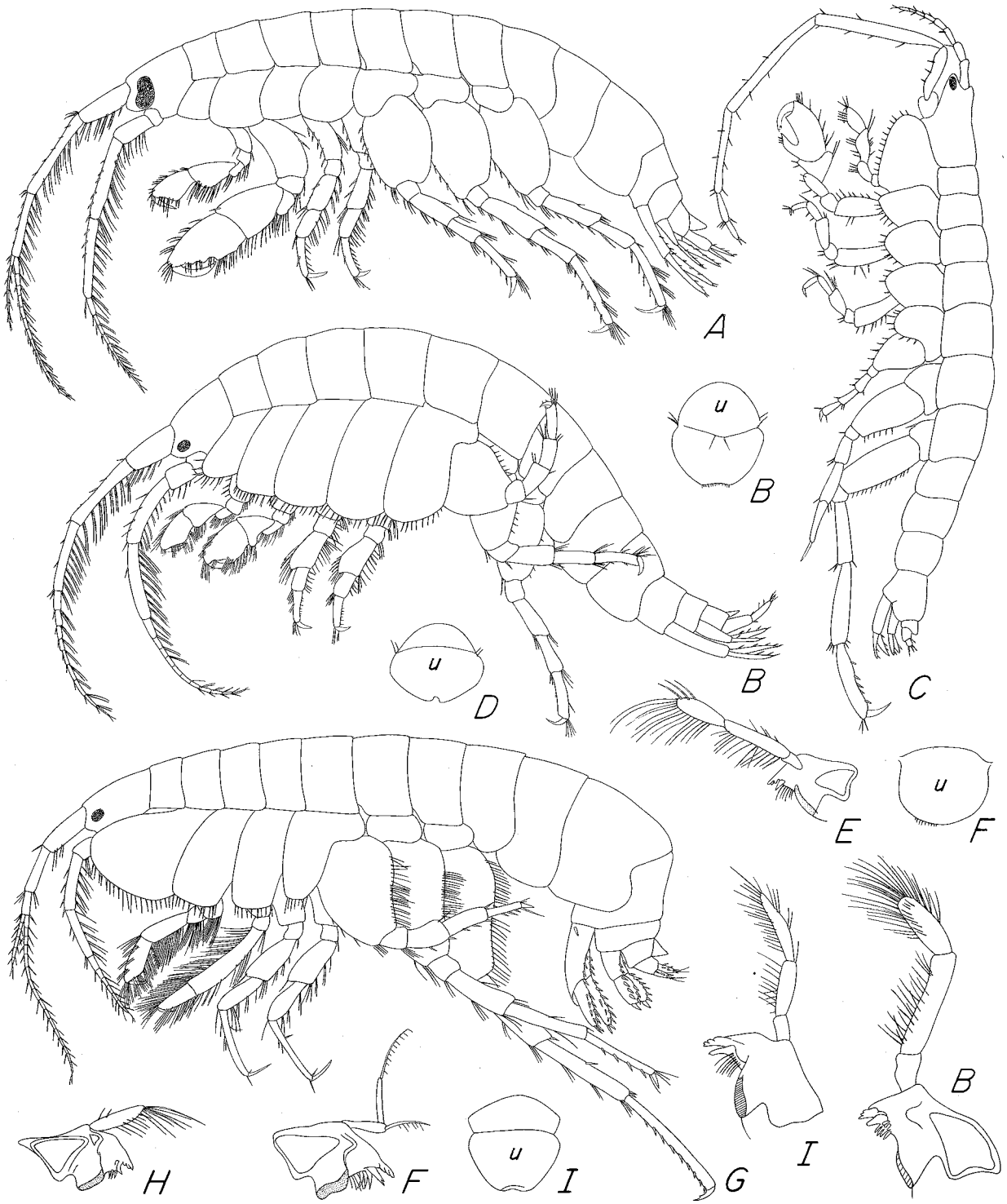

Fig.39. Corophioidea. A, *Gammaropsis maculata*; B, *Photis reinhardi*; C, *Kamaka kuthae*; D, *Neohela monstrosa*; E, *Ericthonius brasiliensis*; F, *Corophium volulator*; G, *Leptocheirus pilosus*; H, *Siphonoecetes colletti*; I, *Aora typica*.

gnathopod 1 larger than 2, normally subchelate, article 5 shorter than 6, unlobed on both gnathopods 1-2. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods, coxa 1.

Variables. Specific taxonomy based on shapes and setosity of male coxa 1, gnathopod 1, antenna 2, with various lengths and widths of articles and their projections.

Relationship. See *Aorella*, *Aoroides* and *Columbaora*.

Removals. See *Aoroides*.

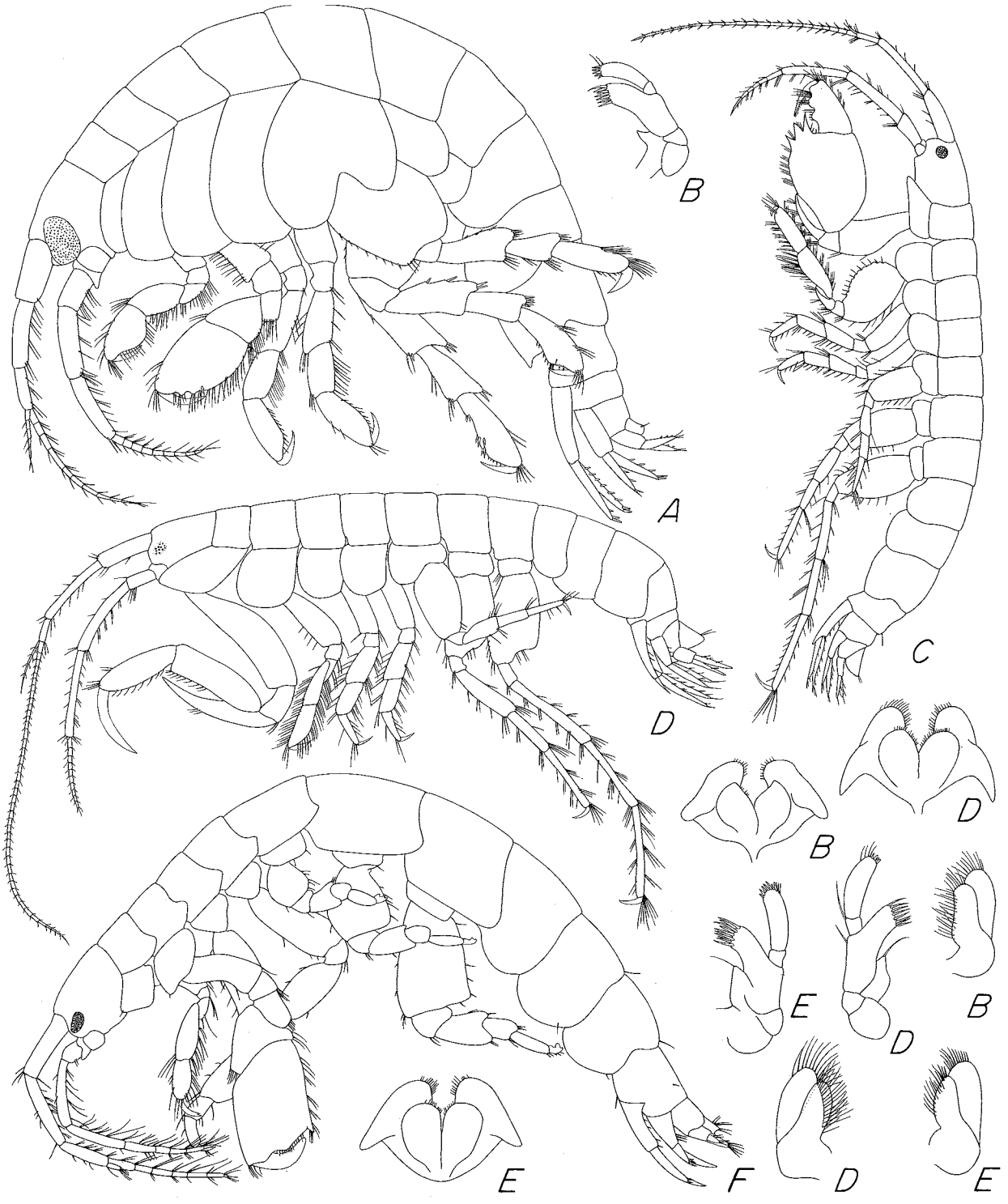

Fig.40. Corophioidea. A, *Isaea montaqui*; B, *Corophium volutator*; C, *Microdeutopus gryllotalpa*; D, *Aora typica*; E, *Photis reinhardi*; F, *Chevalia aviculae*.

Species. *Aora adpressa* Myers & Moore, 1983 [782]; *A. anomala* Schellenberg, 1926a, 1931 (Griffiths, 1975) [866 + 831]; *A. atlantidea* Reid, 1951 (Munoz-Cobo & Bengoa, 1981) [330]; *A. gibbula* K.H. Barnard, 1932 (Griffiths, 1975) [743]; *A. gracilis* (Bate, 1857d) (Sars, 1895) (Myers, 1982a) (Myers & Costello, 1984a) (= *A. punctata* Bruzelius, 1859) (= *A. typica* identifications of Chevreux & Fage, 1925; Schellenberg, 1942; Stephensen, 1944c; Nagata, 1965c; Lincoln, 1979a) [352]; *A. hebes* Myers & Moore, 1983 [781]; *A. hircosa*

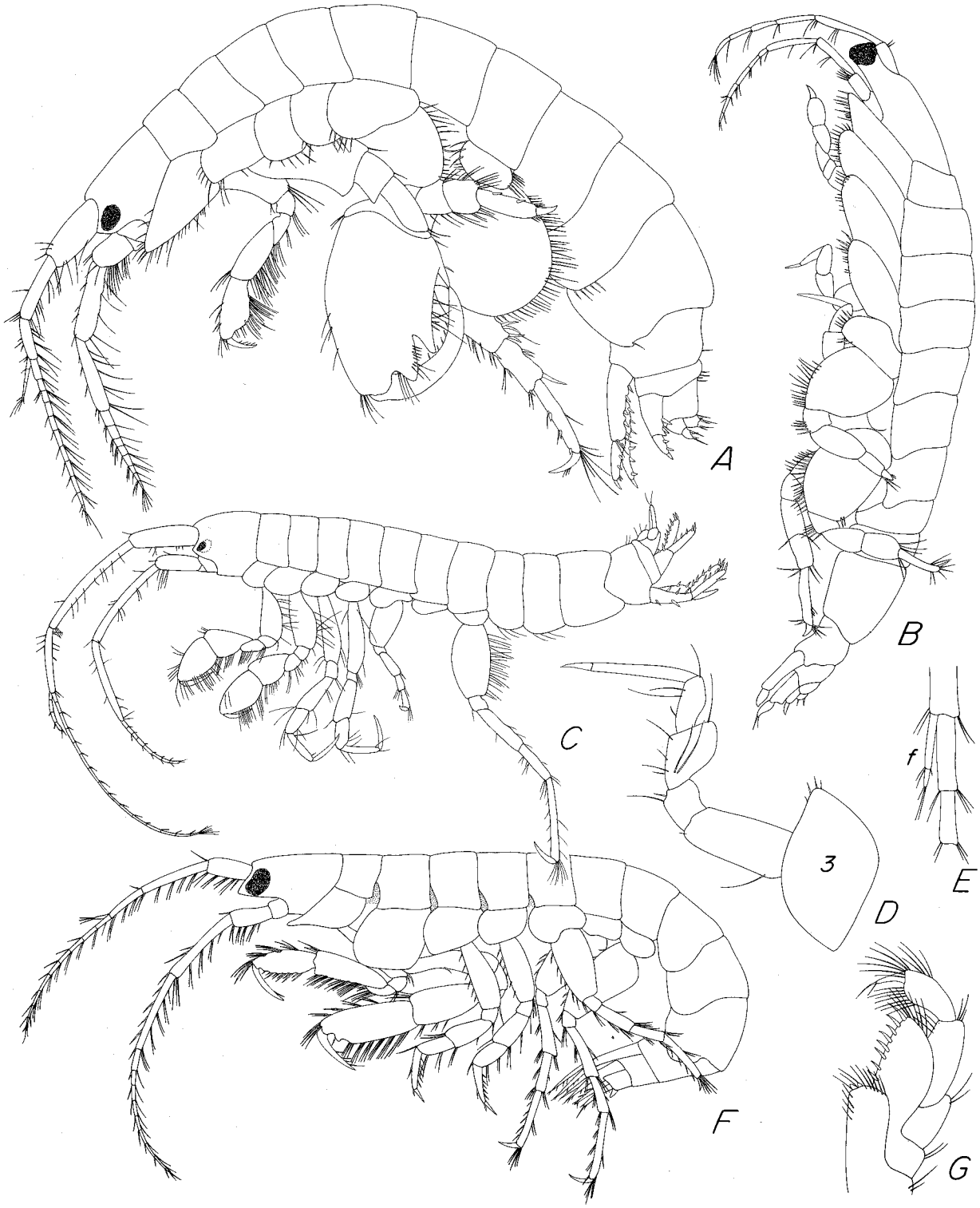

Fig.41. Corophioidea. A, *Cheiriphotis megacheles*; B, *Ampelisciphotis podophthalma*; C, *Aorcho delgadus*; D, *Ampelisciphotis tridens*; E, *Microprotopus maculatus*; F, *Gammaropsis* (= *Megaphopus*) *cornutus*; G, *Aora typica*.

Myers & McGrath, 1983a [784]; *A. inflata* Griffiths, 1976b [743]; *A. kergueleni* Stebbing, 1888 (Griffiths, 1975) [851]; *A. maculata* (Thomson, 1879a, 1881) (Chilton, 1882a) (J.L. Barnard, 1972b) (Myers & Moore, 1983) (= auct. *A. typica* of Thomson, 1879a; Chilton, 1909b; Stephensen, 1938c) [775 + 784 + 840]; *A. mortoni* (Haswell, 1879b) (Myers & Moore, 1983) (= *A. tenuipes* Haswell, 1879b) [784]; *A. pseudotypica* Hirayama, 1984a [395]; *A. spinicornis* Afonso, 1976 (Myers, 1982a) (Myers & Costello, 1984a) (= *A. gracilis* identification of Della Valle, 1893) (= *A. altantidea* of Myers, 1973b) [352]; *A. trichobostrycha* Stebbing, 1888 (?= *A. typica* of Stephensen, 1927a) [840]; *A. typica* Krøyer, 1845 (Stephensen, 1949) (Griffiths, 1974a) (Ledoyer, 1982b) (Myers & Moore, 1983) (= *A. longitarsus* Nicolet, 1849) [835].

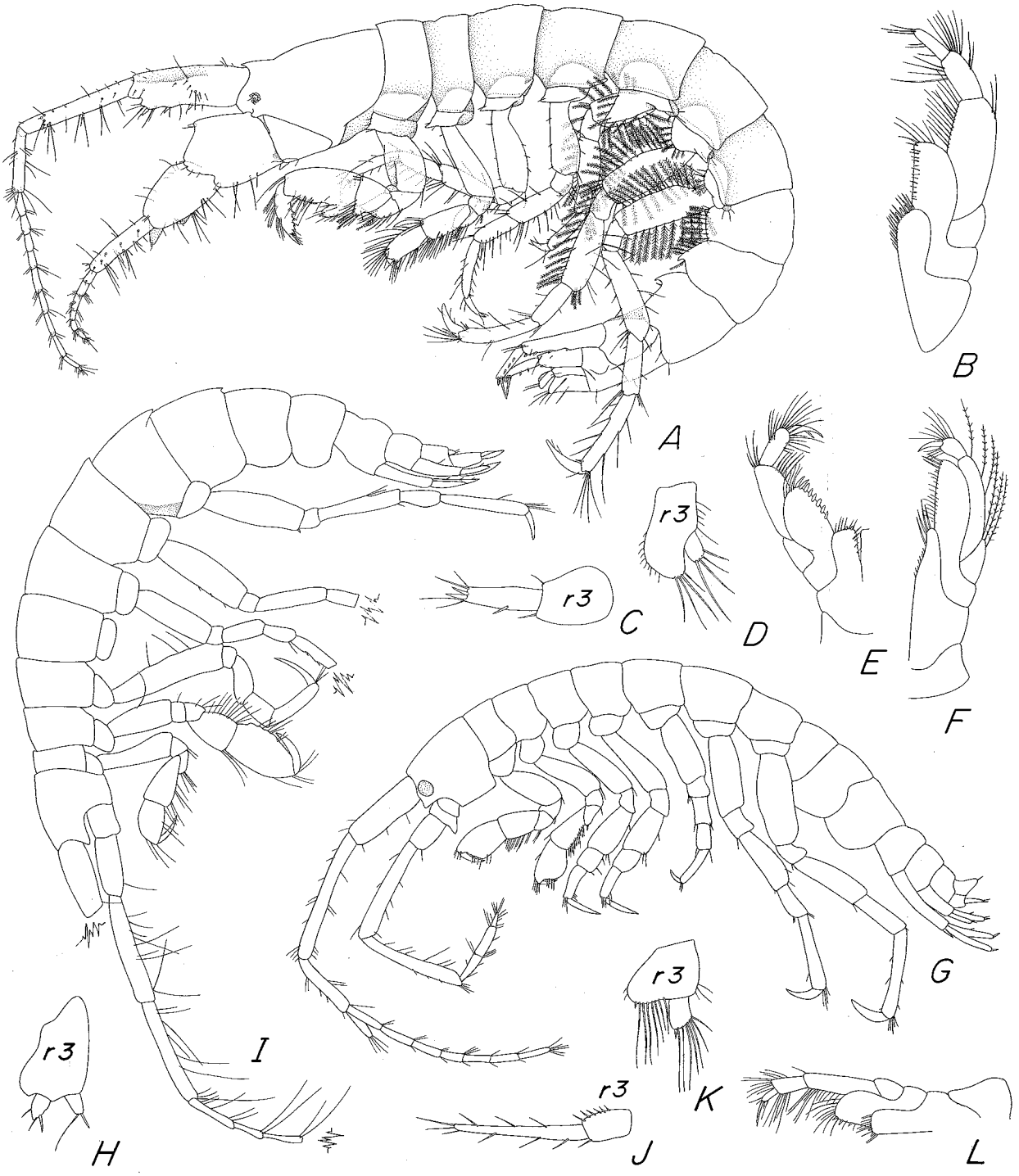

Fig.42. Corophioidea. A, *Rildardanus tros*; B, *Isaea montagui*; C, *Microprotopus maculatus*; D, *Unciola leucopis*; E, *Photis reinhardi*; F, *Corophium volutator*; G, *Unciolella lunata*; H, *Dryopoides westwoodi*; I, *Bogenfelsia incisa*; J, *Neohela monstrosa*; K, *Siphonoecetes colletti*; L, *Ericthonius brasiliensis*.

Habitat and distribution. Marine, cosmopolitan, boreal and austral, rare in tropics, 0-100 m, 15 species.

Aorcho J.L. Barnard

Fig.41C

Aorcho J.L. Barnard, 1961a: 114.–J.L. Barnard, 1969c: 152.–J.L. Barnard, 1973b: 16.

Type species. *Aorcho delgadus* J.L. Barnard, 1961a, original designation.

Diagnosis. Body laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed; antennal sinus moderate. (Head as long as pereonites 1-2 together). Eyes weak or absent. Antenna 1 longer than 2, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 elongate. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, very slender, article 3 rectolinear, shorter than 2. Labium with [?entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 triangular, moderately large, with about 4 apical and medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped narrow, with distal spines, outer plate short, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, stout, with medium nail and setae.

Coxae very small, relatively short, weakly overlapping, of various sizes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 alike, of subequal size, small, subchelate, article 5 of both gnathopods as long as 6, unlobed, dactyls ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded unlobed article 2, setose on pereopod 7, pereopod 5 much shorter than pereopod 7, article 2 almost naked, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [?undescribed]. Coxal gills [undescribed]. Pleopods slender, outer ramus much shorter than inner. Epimeron 3 not bisinuate. Uropods 1-

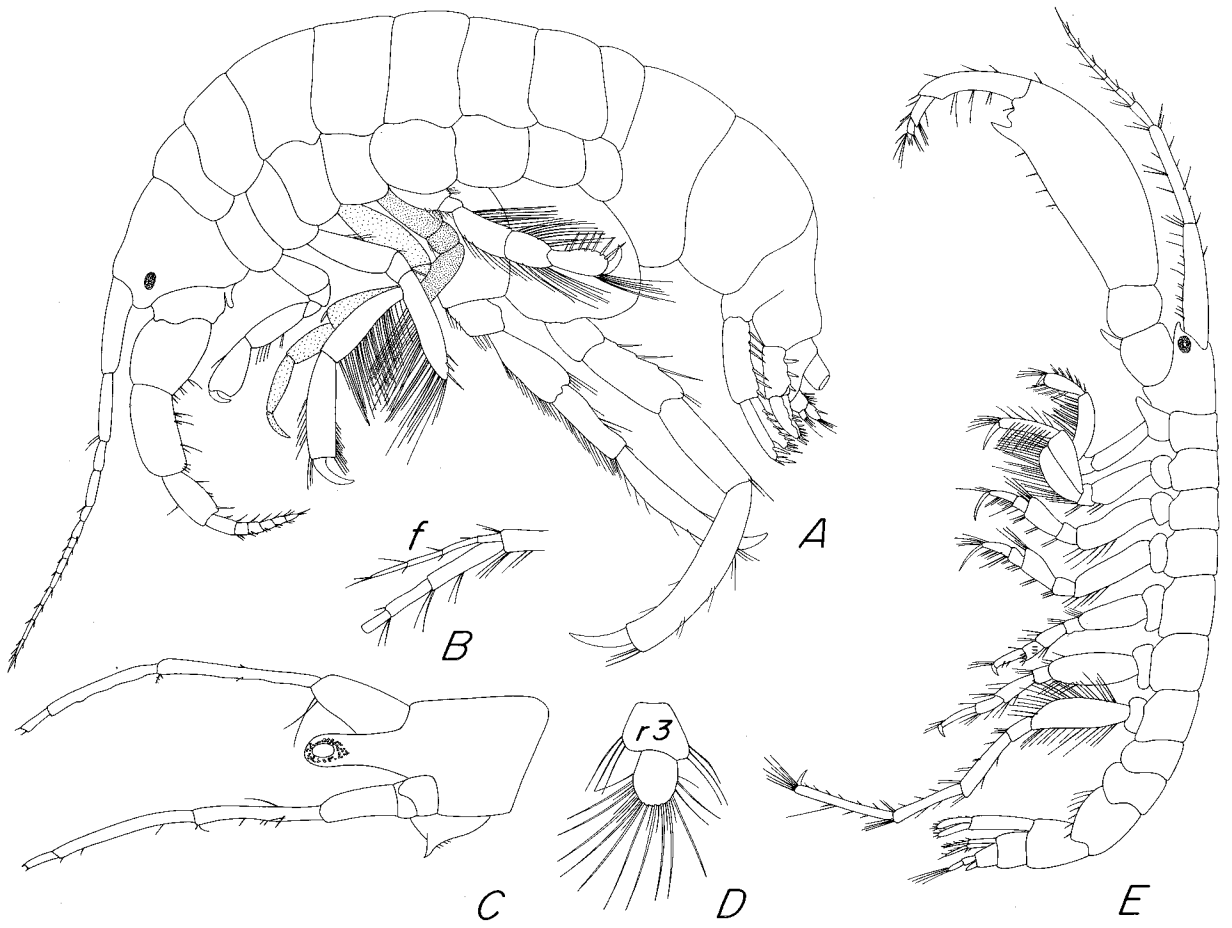

Fig.43. Corophioidea. A, *Paracorophium excavatum*; B, *Gammaropsis maculata*; C, *Ampelisciphotis tridens*; D, *Corophium crassicorne*; E, *Corophium affine*.

2 biramous, normal, rami slightly unequal, longer than peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 small to medium, biramous, both rami short, subequal, with few armaments mostly apical, peduncle short, shorter than rami, outer ramus with vestigial article 2. Telson entire, short, broader than long, ovate, with 2 weakly hooked apical cusps.

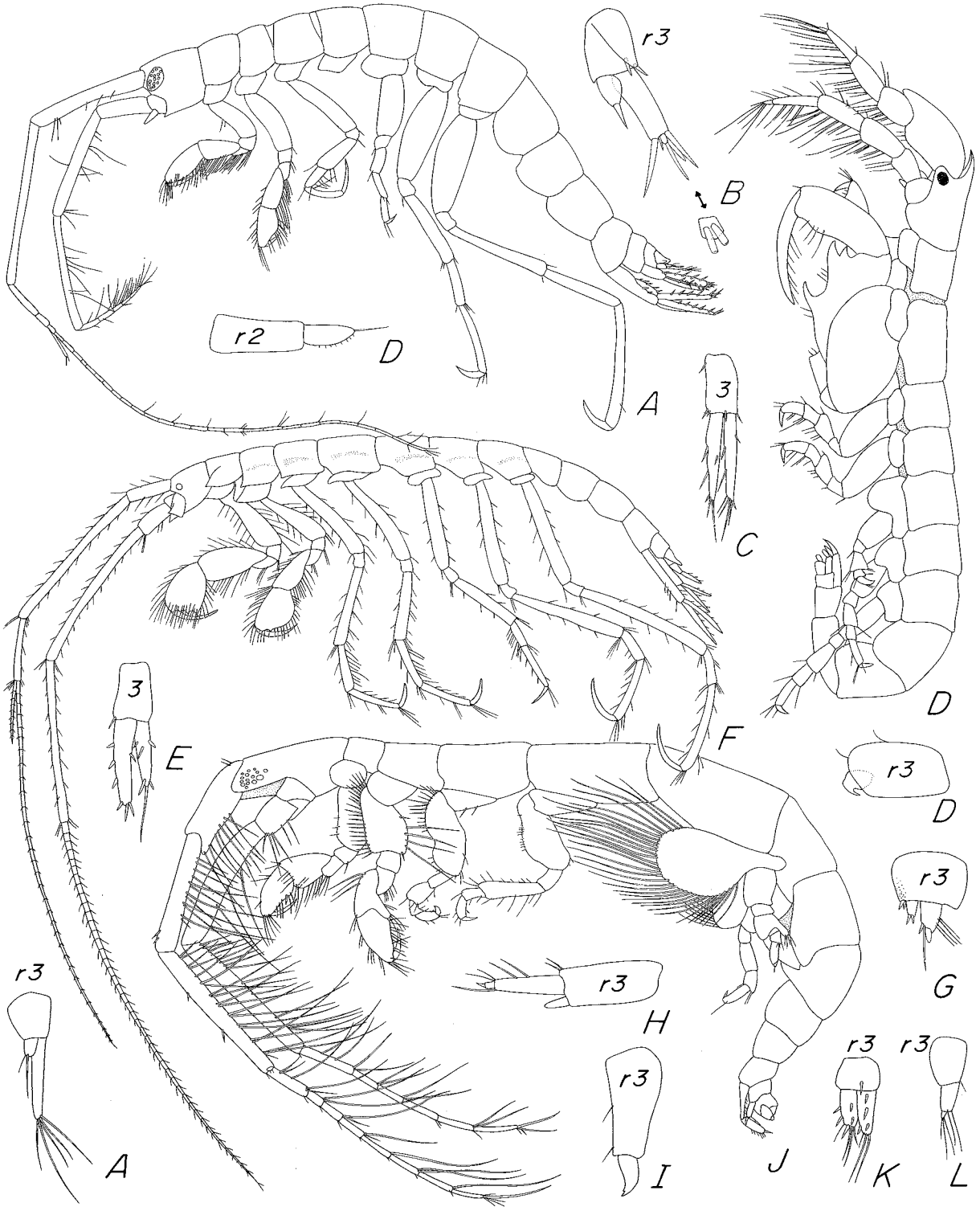

Fig.44. Corophioidea. A, *Camacho bathyplous*; B, *Acuminodeutopus heteruropus*; C, *Aora typica*; D, *Cerapus crassicornis*; E, *Gammaropsis (= Megamphopus) cornutus*; F, *Neohela monstrosa*; G, *Cheiriphotis megacheles*; H, *Photis reinhardi*; I, *Ericthonius brasiliensis*; J, *Runanga coxalis*; K, *Leptocheirus pilosus*; L, *Paraoroides unistilus*.

Female. Oostegites [?narrow, broad, present on segments 2-5].

Sexual dimorphism. None.

Variables. Eyes absent or feeble; ocular lobe pointed (*A. gracilipes*); mandibular palp article 3 longer than 2, semifalciform, palp slightly more robust than in other species (*A. curvipalma*); inner plate of maxilla 2 very broad (*A. gracilipes*), normal (*A. nanus*); article 2 of pereopods 5-7 almost linear (*A. curvipalma*); uropod 2 without ventrodistal process (*A. curvipalma, A. gracilipes*); rami of uropod 3 more elongate than in other species (*A. curvipalma*); telson longer than broad (*A. gracilipes*).

Relationship. Differing from *Ledoyerella* and *Aorchoides* in the thinness of the mandibular palp, the more feeble, unsculptured, sexually undifferentiated gnathopods, with article 5 of gnathopod 2 as long as 6 in both sexes, and the weaker recessment of antenna 2.

From *Lemboides* in the long article 3 of antenna 1. See *Aorchoides, Bogenfelsia, Camacho, Ledoyerella,*

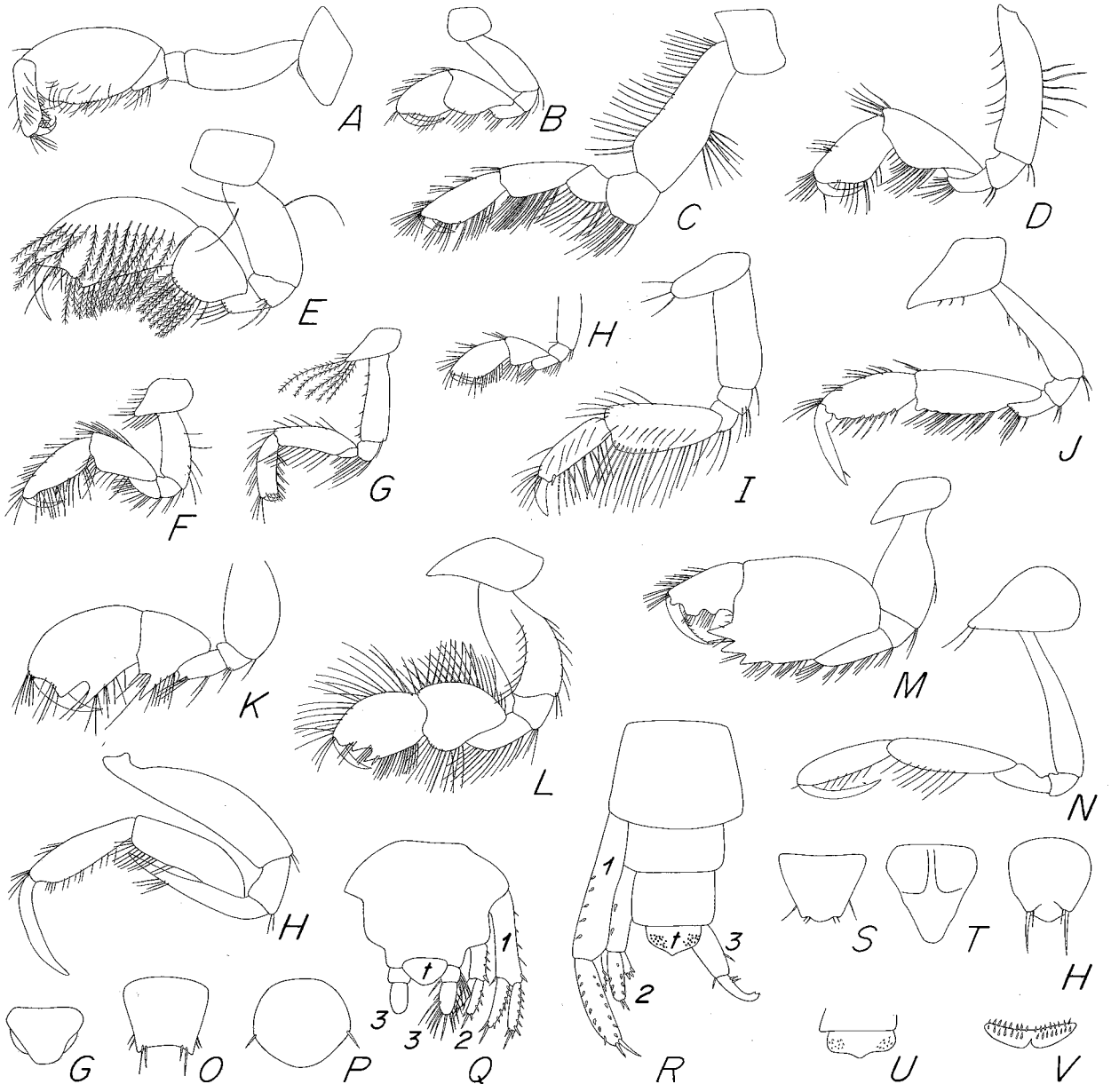

Fig.45. Corophioidea. A, *Rudilemboides stenopropodus*; B, *Ericthonius brasiliensis*; C, *Leptocheirus pilosus*; D, *Photis tenulcornis*; E, *Xenocheira fasciata*; F, *Siphonoecetes colletti*; G, *Corophium volutator*; H, *Aora typica*; I, *Kuphocheira setimanus*; J, *Gammaropsis (= Megamphopus) cornutus*; K, *Bemlos spinicarpus*; L, *Lembos websteri*; M, *Microdeutopus gryllotalpa*; N, *Cerapopsis longipes*; O, *Microprotopus maculatus*; P, *Unciola leucopsis*; Q, *Corophium crassicorne*; R, *Pseudericthonius gaussi*; S, *Photis reinhardi*; T, *Neohela monstrosa*; U, *Ericthonius difformis*; V, *Cerapus crassicornis*.

Maragopsis and *Paradryope*.

Species. *Aorcho ?curvipalma* Ledoyer, 1978b [697]; *A. delgadus* J.L. Barnard, 1961a (Griffiths, 1975) [715B + 743]; *A. gracilipes* Ledoyer, 1982b [694A]; *A. nanus* Hirayama, 1984a [395].

Habitat and distribution. Marine, Indian Ocean to Japan and Tasman Sea, 0-3716 m, 4 species.

Aorchoides Ledoyer

Aorchoides Ledoyer, 1972c: 191.

Type species. *Aorchoides dilatata* Ledoyer, 1972c, original designation.

Diagnosis. Like *Ledoyerella* but article 2 of male

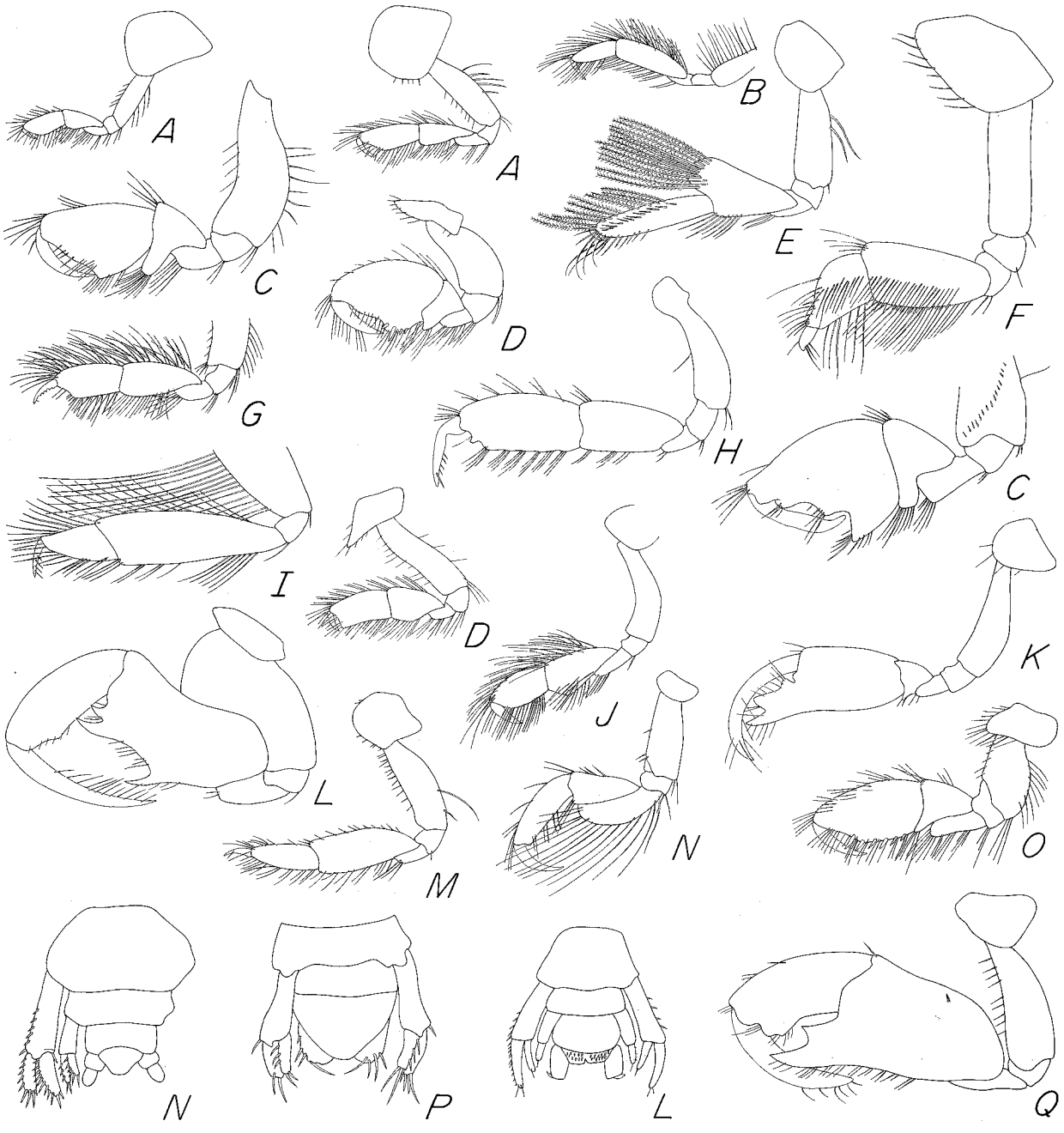

Fig.46. Corophioidea. A, *Aora typica*; B, *Neomegamphopus roosevelti*; C, *Photis tenuicornis*; D, *Unciola leucopis*; E, *Xenocheira fasciata*; F, *Kuphocheira setimanus*; G, *Lembos websteri*; H, *Gammaropsis (= Megamphopus) cornutus*; I, *Leptocheirus pilosus*; J, *Bemlos spinicarpus*; K, *Cerapopsis longipes*; L, *Cerapus crassicornis*; M, *Rudilemboides stenopropodus*; N, *Corophium volulator*; O, *Siphonoecetes colletti*; P, *Concholestes dentalii*; Q, *Ericthonius brasiliensis*.

gnathopod 1 dilated.

Description (restricted to differences from *Ledoyerella*). Head as long as pereonites 1-2 together. Outer plate of maxilla 1 with 7 spines. Article 3 on palp of maxilliped lobed. Gnathopod 2 larger than 1, gnathopod 1 in male of female form, article 5 as long as 6, unlobed. Gnathopod 2 enlarged, grossly subchelate, article 5 shorter than 6, weakly lobed, article 6 dilated, with false chela and excavate palm, dactyl long. Sternal process present on segment 2, large. Uropod 3 with peduncle elongate, almost as long as rami. Telson with 2 poorly developed apical cusps.

Female. Gnathopods small, equal in size, article 2 of gnathopod 1 not dilated, article 5 shorter than 6, unlobed on both gnathopods; gnathopod 2 with short oblique palm. Oostegites [?narrow, broad, present on segments 2-5].

Sexual dimorphism. Moderate. Gnathopods.

Relationship. Differing from *Ledoyerella* and *Gammaropsis* in the dilation of article 2 on male gnathopod 1.

From *Aorcho* in the clavate (versus rectolinear) article 3 on the mandibular palp.

Species. *Aorchoides crenatipalma* (K.H. Barnard, 1916) (Griffiths, 1974a, 1975) (Myers & Lyons, 1987) [743]; *A. dilatata* Ledoyer, 1972c, 1982b (Myers, 1985c) [698].

Habitat and distribution. Marine, southern Africa and Madagascar, 0-71 m, 2 species.

Aorella Myers

Aorella Myers, 1981a: 57.

Type species. *Aorella multiplex* Myers, 1981a, original designation.

Diagnosis. Body subcylindrical but weakly compressed laterally, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus moderate. Eyes medium. Antennae very long, 1 especially long and longer than 2, both slender, or base of male antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 3 to 4-articulate. Antenna 2 peduncular article 3 short, articles 2, 3 and part of 4 stout in male, flagellum short, with 4 articles. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp moderate, slender, article 3 semi-falciform, as long as 2, well setose. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 small, short, with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with short nail and setae.

Coxae small, short, weakly contiguous, anterior members of uniform sizes and shapes, coxa 1 not dilated, not produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, large, of subequal size, almost simple, both with linear articles, not densely setose; gnathopod 1 slightly larger than 2, poorly propodochelate, merochelate, article 5 long, linear, unlobed, fused mostly to article 4, dactyl ordinary. Gnathopod 2 simple, with article 2 poorly setose, article 5 longer than 6, strongly dilated, doubly carpochelate, article 6 slender, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded unlobed article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 curved, short. Sternal processes of thorax present on segments 1 and 3. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 obsolescent. Uropod 3 of medium length, biramous, both rami moderately long, obtuse distally, peduncle shorter than rami, rami subequal, tapering and with few armaments mostly apical, outer ramus with small article 2. Telson entire, short, [?as broad as long or longer than broad, ovate], with 2 unequal long apical setae on each side.

Female. Articles 3-5 of antenna 2 not expanded. Coxae not greatly different from male, usually longer. Gnathopods small, gnathopod 1 larger than 2, normally subchelate, article 5 almost as long as 6, unlobed on both gnathopods 1-2. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopods, antenna 2.

Relationship. Differing from *Aoroides* and *Aora* in the enlarged male gnathopod 2; from *Columbaora* in the small coxae, especially the non-enlarged coxa 1, and the carpochelate gnathopod 2.

Species. *Aorella multiplex* Myers, 1981a, 1985c [576].

Habitat and distribution. Marine, Fiji, 0 m, 1 species.

Aoroides Walker

Aoroides Walker, 1898b: 284.–Stebbing, 1906: 586.–J.L. Barnard, 1969c: 152.–J.L. Barnard, 1973b: 16.–Conlan & Bousfield, 1982b: 85.

Type species. *Aoroides columbiae* Walker, 1898b, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes small. Antennae long, 1 longer than 2, both slender, or male antenna 2 stouter; peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum vestigial, scale-like, or absent. Antenna 2 peduncular article 3 short, flagellum short, with 3-4 articles. Epistome unproduced anteriorly. Labrum subrounded, entire or barely incised. Mandible normal, palp weak, very slender, article 3 rectolinear, longer than 2, poorly setose. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed or blunt. Inner plate of maxilla 1 triangular or conical, with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with medium nail and setae.

Coxae ordinary to short, weakly overlapping, often of various sizes and shapes, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, simple, merochelate, articles 5-6 long,linear, unlobed, dactyl very large. Gnathopod 2 subchelate, feeble, with article 2 often very setose, article 5 as long as or longer than 6, unlobed, article 6 slender, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with increasingly expanded article 2, pereopod 5 much shorter than pereopod 7, often with narrower article 2. Pereopod 7 with slightly broadened unlobed article 2, dactyl of pereopods 5-7 curved, short. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods [undescribed]. Epimeron 3 not bisinuate.

Uropods 1-2 biramous, normal, rami slightly unequal, as long or longer than peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 of medium length, biramous, both rami moderately long, obtuse distally, peduncle slightly elongate but shorter than rami, rami subequal, narrow, tapering and with few armaments mostly apical, outer ramus with small or vestigial article 2. Telson entire, short, as broad as long or longer than broad, ovate, with 2 long apical spines or setal groups and usually 2 hooked apical cusps.

Female. Coxa 1 smaller than in male, usually rectangular and poorly produced. Gnathopods small, gnathopod 1 larger than 2, normally subchelate, article 5 shorter than or equal to 6, unlobed on both gnathopods 1-2. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods, coxa 1.

Variables. Specific taxonomy based on shapes and setosity of male coxa 1, gnathopod 1, antenna 2, with various lengths and widths of articles and their projections.

Relationship. Differing from *Aora* in the reduction of the accessory flagellum to a small button and the enfeeblement of the mandibular palp.
See *Aorella* and *Columbaora.*

Species. *Aoroides columbiae* Walker, 1898b (Thorsteinson, 1941) (Conlan & Bousfield, 1982b) (= *A. californica* Alderman, 1936) [270]; *A. exilis* Conlan & Bousfield, 1982b [270]; *A. inermis* Conlan & Bousfield, 1982b [270]; *A. intermedia* Conlan & Bousfield, 1982b [270]; *A. nahili* J.L. Barnard, 1970a, 1971a (Ledoyer, 1979b) [600]; *A. secunda* Gurjanova, 1938b, 1951 (Nagata, 1965c) [390]; *A. spinosa* Conlan & Bousfield, 1982b (= *A. columbiae* of J.L. Barnard, 1954a) [270].

Habitat and distribution. Marine, North Pacific south to Hawaii and Indonesia, 0-75 m, 7 species.

Arctolembos Myers, new status

Lembos (*Arctolembos*) Myers, 1979b: 269.–Conlan & Bousfield, 1982b: 80.

Type species. *Microdeutopus arcticus* Hansen, 1887, original designation.

Diagnosis. Like *Lembos* but ocular lobes bilobed; outer lobes of lower lip weakly notched; outer plate of maxilla 1 with more than 10 spines (13 generally); article 2 of maxillipedal palp elongate and outer plate shorter, therefore outer plate extending only halfway or two thirds along article 2.

Relationship. Formerly a subgenus of *Lembos*, here raised to full status; like *Lembos* except for items in diagnosis above.
See *Columbaora.*

Species. *Arctolembos arcticus* (Hansen, 1887) (Gurjanova, 1951) (Shoemaker, 1955a) (Myers, 1979b) (Conlan & Bousfield, 1982b) [220].

Habitat and distribution. Marine, Kara Sea and Bering Sea, 0-100 m, 1 species.

Audulla Chevreux

Audulla Chevreux, 1901a: 431.

Type species. *Audulla chelifera* Chevreux, 1901a, monotypy.

Diagnosis. Body weakly cylindrical, but also laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed to blunt; antennal sinus deep. Eyes medium. Antennae moderately elongate, nearly subequal, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 slightly longer than 1, article 2 longest, accessory flagellum pluriarticulate, main flagellar articles about 9. Antenna 2 peduncular article 3 scarcely elongate, peduncle stout in male, flagellum dilated, paddle-shaped. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp very strong, stout, article 3 clavate, as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, large, with a row of medial setae, outer plate with 10-11 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching two thirds to apex of palp article 2, with spines only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long setae.

Coxae small, relatively short, overlapping, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, small in contrast to enlarged coxae 2-3, coxa 2 larger than 1, coxa 4 as long as coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 subchelate, article 5 long, longer than 6, unlobed, article 6 ordinary. Gnathopod 2 enlarged, parachelate, article 5 much shorter than 6, lobed, article 6 very large, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded, unlobed article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal or partially shortened. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami strongly unequal, longer than peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 smaller. Uropod 3 of medium size, biramous, both rami short, subequal, 1-articulate, apically spinose, obtuse distally, peduncle as long as rami. Telson entire, short, as broad as long, pentagonal, pointed apically, with 2 hooked apical cusps.

Female. Coxae slightly different from male, coxa 1 longer than 2. Gnathopods slightly smaller, normally subchelate, gnathopod 2 with smaller propodus and oblique palm. Oostegites 2 and 5 moderately narrow, 3 and 4 broad.

Sexual dimorphism. Weak. Gnathopod 2.

Relationship. Differing from the *Gammaropsis* group in the paddle-shaped flagellum of antenna 2 and the large parachelate gnathopod 2. From *Cerapopsis*, additionally, in the well developed inner ramus of uropod 3.

Species. *Audulla chelifera* Chevreux, 1901a (Walker & Scott, 1903) (Sivaprakasam, 1969c, 1970a) (Griffiths, 1974b) (Ledoyer, 1982b) (Thomas & Barnard, 1987) (= *A. lina* Kunkel, 1910) (= *A. semichelatus* K.H. Barnard, 1957; Griffiths, 1973) (Thomas & Barnard, 1987) [421].

Habitat and distribution. Marine, tropical Indian Ocean, Caribbean Sea to Bermuda, 0-0.5 m, 1 species.

Autonoe Bruzelius

Autonoe Bruzelius, 1859: 23.–Sars, 1895: 546.–Myers, 1988: 188.

Type species. *Gammarus longipes* Liljeborg, 1852a, designated by Boeck, 1876.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally concave, proximally straight; left mandibular molar with complex plates, primary plate triangular, the margins approximately straight, secondary, tertiary and quaternary plates of similar shape or vestigial; anterior margin of maxilliped without wing-like flanges; male gnathopod 1 propodus subequal with carpus or longer; uropod 3 peduncle elongate, not markedly expanded, rami with marginal spines, but no marginal setae, outer ramus with small second article.

Variables. *Generalities.* Tooth at anteroventral corner of head large, small or absent. Setation patterns on antennae 1-2 and on article 3 of mandibular palp variable specifically. Shape and setation of coxa 1 variable in male, occasionally sharp and produced in female. Gnathopods 1-2 in male highly variable at specific level in shapes of articles 2, 5, 6, palmar slope and sculpture, setosity patterns of articles 2,3,5,6. Dactylar length on pereopods 3-4 diverse. Setosity of article 2 on pereopods 5-7, especially 7, highly variable; also occasionally on epimera, especially epimeron 2. Presence, size and length of interramal peduncular process on uropods 1-2 variable. Arrangement, size and form of ventral processes on sternum of thorax of specific value.

Specifics. Eyes vestigial (*A. megacheir*); article 3 of antenna 1 as long as article 1 (*A. rubromaculatus*); inner plate of maxilla 1 naked (*A. spiniventris*); gnathopods rather small as in females (*A. viduarum*); article 4 of male pereopods 3-4 heavily setose (*A. borealis* group, 5+ species).

See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. See K.H. Barnard (1937, 1940), Griffiths (1973, 1974a,b, 1975), Gurjanova (1951), Ledoyer (1967a, 1968, 1969b, 1974c), Moore (1981, 1984c), Ortiz (1983), Ruffo (1969), Schellenberg (1928, 1942), Stephensen (1942); *A. angularis* (Ledoyer, 1970, 1977) (Myers, 1974c, 1982a) [340 + B]; *(A. borealis* Myers, 1976b) (Just, 1980) [220]; *A. denticarpus* (Myers & McGrath, 1978) (Lincoln, 1979a) [239]; *A. hirsutipes* (Stebbing, 1895) [740]; *A. karamani* Myers, 1976b, 1982a (= *A. hirsutipes* identification of Karaman, 1973b) [345]; *A. longidigitans* (Bonnier, 1896) (Stephensen, 1944c) (Myers, 1979b) [250B]; *A. longipes* (Liljeborg, 1852a) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Myers, 1979b) (= *A. plumosa* Boeck, 1871b, 1876) [216 + B]; *A. megacheir* (Sars, 1879, 1885, 1886, 1895) (Gurjanova, 1951) (Myers, 1976b) [238 + B]; *A. rubromaculatus* (Ledoyer, 1973c) (Myers, 1974c, 1982a) [340]; *A. setimerus* (Myers, 1976b) [444]; *A. spiniventris* (Della Valle, 1893) (Myers, 1974c, 1982a) [340]; *A. viduarum* (Myers, 1974c, 1982a) [348].

Habitat and distribution. Marine, boreal to Mediterranean, South Africa, 0-1096 m, 12 species.

[Ischyroceridae] ***Baracuma*** Barnard & Drummond

Baracuma Barnard & Drummond, 1981: 31.

Type species. *Baracuma alquirta* Barnard & Drummond, 1981, original designation.

Diagnosis. Body cylindrical, depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus deep. Eyes medium. Antennae moderately long, nearly subequal, both slightly stout; peduncular article 3 of antenna 1 slightly longer than 1, peduncular article 3 longest, accessory flagellum absent, main flagellar articles few. Antenna 2 peduncular article 3 short, peduncle stouter in male. Epistome moderately produced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 rectolinear, article 3 as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 ovate, with 1 apical seta, outer plate with 11 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching two thirds to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae very small, short, widely discontiguous, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, very small in contrast to enlarged coxa 2, coxa 4 not longer than coxa 1, not lobed, coxa 5 much longer than 4, very elongate anteroposteriorly especially in female, thoracic segment 5 also elongate, coxae 6-7 much larger than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 unlobed, slightly longer than 6. Gnathopod 2 enlarged, simple, carpochelate in male, with article 2 dilated, with article 4 enlarged, incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 much longer and larger than 6, lobed, article 6 much more slender than article 5, short.

Pereopods 3-4 unusual, similar, but article 4 of pereopod 4 elongate, with inflated article 2, article 4 slightly dilated, articles 5-6 short, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, with expanded article 2, pereopod 5 much shorter than and different from pereopods 6-7, with broader article 2, tiny reniform article 5 enveloped by article 4, pereopods 6-7 with narrow unlobed article 2, dactyl of pereopods 5-7 geniculate, with accessory tooth on inner margin. Sternal keel of thorax present. Coxal gills diverse, narrow and broad, present on segments 3-6. Pleopods strongly reduced towards posterior, with slender peduncle; inner rami of pleopods 2-3 tiny, scale-like, outer ramus of pleopod 1 basally inflated, small and foliaceous. Epimeron 3 not bisinuate. Uropod 1 biramous, rami unequal, outer shorter than peduncle, inner two thirds of outer, peduncles of uropods 1-2 without ventrodistal process, uropod 2 with only 1 vestigial ramus. Uropod 3 forming small almost naked leaf, uniramous, ramus vestigial, with 2 tiny spines, peduncle not dilated medially. Telson entire, short, broader than long, heart-shaped, cleft almost halfway, with 2 patches of hooks.

Female. Antenna 2 more slender. Coxae different from male, coxa 5 and pereonite 5 hugely longer. Gnathopods small, similar, gnathopod 2 scarcely larger than 1, both poorly subchelate, article 5 slightly shorter than 6, lobed. Oostegites diverse, narrow and broad, present on segments 2-5.

Sexual dimorphism. Strong. Coxae, especially 5, gnathopods.

Relationship. The closely similar *Siphonoecetes* group differs from other corophioids in that both pereopods 5 and 6 (versus 5 only) have reduced reniform article 5 enveloped by article 4; siphonoecetins also have scales on that article, a 1 to 2-articulate mandibular palp and dominance by gnathopod 2, without any carpochelation of gnathopod 2.

Baracuma differs from *Cerapus* in the wide and enlarged coxa 5 of both sexes, the longer heart-shaped telson, male ventral keel, and elongate article 3 of pereopod 4.

Differing from *Runanga* in the wider coxa 5 lacking dense setae, narrow telson, elongate article 4 of pereopod 4, larger ramus of uropod 3, and better developed pleopod 3.

Differs from both *Chevreuxius* and *Grandidierella* in the vestigial ramus of uropods 2 and 3, unexpanded peduncle of uropod 3, reduced pleopods, large coxa 5 in both sexes, and dominance reversal of gnathopods 1 and 2.

Species. *Baracuma alquirta* Barnard & Drummond, 1981 [782].

Habitat and distribution. Marine, Australia, Victoria, 5-18 m, 1 species.

Bathyphotis Stephensen

Bathyphotis Stephensen, 1944c: 26.–J.L. Barnard, 1969c: 276.–J.L. Barnard, 1973b: 23.

Type species. *Bathyphotis tridentata* Stephensen, 1944c, monotypy.

Diagnosis. Body laterally compressed, smooth, urosomites free, urosomite 1 ordinary, toothed. Rostrum short, ocular lobes short, pointed, antennal sinus deep. Eyes large. Antennae of medium length, subequal, both slender, peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 slightly elongate. Epistome unproduced anteriorly. Labrum incised. Mandible normal, palp strong, article 3 rectolinear, as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, without setae, outer plate with 4-10 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with long setae.

Coxae small in front, long in middle, strongly overlapping, of various sizes and shapes, progressively much more elongate from 1 to 4, coxa 1 not dilated, but slightly produced forward, small in contrast to enlarged coxae 2-4, coxa 2 medium, larger than 1, coxa 4 much longer than coxa 1, lobed, coxa 5 much shorter than 4, coxae 6-7 not much smaller than coxa 5. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 long, almost linear, unlobed, palm short, article 6 shorter than 5. Gnathopod 2 enlarged, subchelate, with article 2 not dilated, article 5 much shorter than 6, lobed, article 6 dilated, palm sculptured, oblique, dactyl long, but shorter than palm.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls medium. Pereopods 5-7 similar to each other, subequally long, pereopod 5 different from pereopods 6-7, with broader, lobed article 2, pereopods 6-7 with narrower scarcely lobed article 2, article 2 of pereopod 7 shorter than that of pereopod 5, article 4 of pereopod 5 enlarged, dactyl of pereopods 5-7 curved, medium. Sternal processes of thorax [undescribed]. Coxal gills present on segments 2-3 [?4-5-6-7]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami equal, shorter than peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 of ordinary size, biramous, both rami short, peduncle elongate, longer than rami, rami equal, outer ramus with small distal spine, both tapering and with few other armaments mostly marginal. Telson entire, short, as broad as long, ovate or pentagonal, pointed apically, with 2 hooked apicolateral cusps.

Female unknown. [?Coxae different from male, usually much longer. Gnathopods small, gnathopod 1 larger than 2, normally poorly subchelate, simple, article 5 shorter longer than almost as long as 6, strongly weakly unlobed on both gnathopods 1 2. Oostegites moderately narrow, broad, present on segments 2-5].

Sexual dimorphism. Unknown.

Variables. Stephensen saw only four spines on the outer plate of maxilla 1 but Griffiths found ten.

Relationship. Possibly an ischyrocerid. A rare corophioid in that coxa 4 is large and lobate with excavate posterior margin and unusual in the very short coxa 5 like *Microjassa*. *Ischyrocerus megalops* also has a short coxa 5 and several species of *Ischyrocerus* have beginnings of posterior excavation on coxa 4.

Uropod 3 is intermediate between isaeids = photids (*Gammaropsis*) and Ischyroceridae, a family that is ill-defined, heretofore characterised by short even rami of uropod 3 with hook(s) on the apex of the outer ramus. *Bathyphotis* has slightly shortened rami but the apex of the outer ramus is slightly curved dorsally (see Griffiths, 1977a: fig.2D). The coxae and telsonic shape suggest ischyrocerid affinities.

Differing from *Pseudischyrocerus* and *Ventojassa* in the straight rami of uropod 3. From *Posophotis* in the rectolinear article 3 of the mandibular palp and unguiform dactyl of the maxilliped.

Species. *Bathyphotis tridentata* Stephensen, 1944c (Griffiths, 1977a) [426BA].

Habitat and distribution. Marine, Atlantic Ocean, 1096-2700 m, 1 species.

Bemlos Shoemaker

Figs 45K, 46J

Bemlos Shoemaker, 1925: 36.–Myers, 1988: 188.

Type species. *Bemlos macromanus* Shoemaker, 1925, monotypy.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin straight or weakly concave, marginal setae of 2 distinct lengths, but terminal setae longer; left mandibular molar with complex plates, rounded or with primary plate falcate; anterior margin of maxilliped [without wing-like flanges]; male gnathopod 1 with propodus very enlarged, carpus generally short, cup-shaped; uropod 3 peduncle short, expanded, outer ramus with small second article, long marginal setae and extremely long distal setae.

Variables. *Generalities.* Tooth at anteroventral corner of head large, small or absent. Setation patterns on antennae 1-2 and on article 3 of mandibular palp variable specifically. Shape and setation of coxa 1 variable in male, occasionally sharp and produced in female. Gnathopods 1-2 in male highly variable at specific level in shapes of articles 2, 5, 6, palmar slope and sculpture, setosity patterns of articles 2,3,5,6. Dactylar length on pereopods 3-4 diverse. Setosity of article 2 on pereopods 5-7, especially 7, highly variable; also occasionally on epimera, especially epimeron 2. Presence, size and length of inter-ramal peduncular process on uropods 1-2 variable. Arrangement, size and form of ventral processes on sternum of thorax of specific value.

Specifics. Antenna 2 stouter than normal in male (e.g. *B. foresti*); only peduncular article 4 very stout (*B. gambiense*); gnathopod 1 merochelate (e.g. *B. parahastatus*); both mero- and carpochelate (*B. pseudopunctatus*); male dactyl grotesque (*B. longicarpus*); gnathopod 2 slightly enlarged, almost propodochelate, article 5 shorter than 6 (*B. gambiense*).

See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. See K.H. Barnard (1937, 1940), Griffiths (1973, 1974a,b, 1975), Gurjanova (1951), Ledoyer (1967a, 1968, 1969b, 1974c), Moore (1981, 1984c), Ortiz (1983), Ruffo (1969), Schellenberg (1928, 1942), Stephensen (1942); *B. achire* J.L. Barnard, 1979b [540]; *B. aequimanus* Schellenberg, 1938a (J.L. Barnard, 1965a, 1970a) (Ledoyer, 1984) (Myers, 1985b) [530]; *B. audbettius* J.L. Barnard, 1962a, 1964b [370]; *B. australis* (Haswell, 1879b, 1882) (Stebbing, 1906, 1910a) [781]; *B. brunneomaculatus* (Myers, 1977c, 1978, 1981d) [478]; *B. concavus* (Stout, 1913) (J.L. Barnard, 1962a) (Conlan & Bousfield, 1982a) [379]; *B. dentischium* (Myers 1977a), *B. d. taparum* Myers, 1985b [478 + 481]; *B. edentulus* (J.L. Barnard, 1967a) [309B]; *B. foresti* (Mateus & Mateus, 1966) (Myers, 1978) [400]; *B. gambiense* (Reid, 1951) [444]; *B. griseus* (Sivaprakasam, 1970g) [664]; *B. intermedius* (Schellenberg, 1938a) (J.L. Barnard, 1970a) (Ortiz, 1978) [381]; *B. kergueleni* (Stebbing, 1888) (Walker, 1909b) [851B]; *B. kunkelae* (Myers, 1977a) (= *B. longipes* identification of Kunkel, 1910) [478 + 367]; *B. longicarpus* (Myers, 1978) [489]; *B. longicornis* (Myers, 1978) [489]; *B. mackinneyi* Myers, 1978, 1981d [474]; *B. macromanus* Shoemaker, 1925 (J.L. Barnard, 1962a, 1970a, 1979b) [540 + 530]; *B. minimus* (Myers, 1977c) [478]; *B. palmatus* (Ledoyer, 1972c, 1979a, 1982b) (Myers, 1975b) [690]; *B. parahastatus* (Myers, 1975b) [683]; (*B. kergueleni* identification of Chilton, 1909b) [840]; *B. pseudopunctatus* (Ledoyer, 1978b) [697]; *B. pualani* (J.L. Barnard, 1970a) [381]; *B. punctatus* (Myers, 1975) [683]; *B. quadrimanus* (Sivaprakasam, 1970g), *B. q. mozambicus* Myers, 1975b (Ledoyer, 1982b) [660]; *B. saloteae* (Myers, 1985b) [575]; *B. setosus* (Myers, 1978), 1981d [476]; *B. spinicarpus* (Pearse, 1912) (Myers, 1979a, 1981d,) *B. s. inermis* Myers, 1979a, 1981d [478 + 476]; *B. tehuecos* (J.L. Barnard, 1979b) [377]; *B. teleporus* (K.H. Barnard, 1955) (Ledoyer, 1982b) [745]; *B. tempus* (Myers, 1979a), 1981d [476]; *B. tigrinus* (Myers, 1979a, 1981d) [476]; *B. unicornis* (Bynum & Fox, 1977) (Myers, 1977a, 1981d) [362]; *B. waipio* (J.L. Barnard, 1970a) (Ledoyer, 1984) (Myers, 1985b) (= *B. processifer* of J.L. Barnard, 1965a) [381 + ?483].

Habitat and distribution. Marine, primarily circumtropical but extending northward to British Columbia, southward to Magellan, 0-842 m, 35 species.

Bogenfelsia J.L. Barnard

Fig.42I

Bogenfelsia J.L. Barnard, 1962d: 75.–J.L. Barnard, 1973b: 24.

Type species. *Bogenfelsia incisa* J.L. Barnard, 1962d, original designation.

Diagnosis. *Female.* Body subcylindrical, slightly depressed, smooth; pereonite 1 very short; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. Eyes absent. Antenna 1 [mostly missing]. Antenna 2 slender, elongate, peduncular article 3 slightly elongate, articles 4-5 elongate, flagellum with long articles, mostly broken. Epistome unproduced anteriorly. Labrum broad, short, incised. Mandible normal, palp strong, article 3 clavate, scarcely shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 ovate, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 rather broad, short, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate very short, reaching one third to apex of palp article 2, with 1 spine only on medial margin, palp with 4 articles, article 2 long, article 3

unlobed, article 4 very long, with medium nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, very small, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 rather similar, of subequal size, small, gnathopod 2 slightly larger than 1; gnathopod 1 weakly subchelate, article 5 ordinary, unlobed, longer than 6, article 6 almond shaped, dactyl large. Gnathopod 2 enlarged, subchelate, article 5 shorter than 6, unlobed, article 6 large, ordinary.

Pereopods 3-4 normal, longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 shorter than pereopod 7, dactyls short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (2) than or almost as long (1) as peduncle, peduncle of uropod 1 with weak ventrodistal process. Uropod 3 well developed, biramous, both rami equal, short, naked distally, peduncle longer than rami, elongate, not dilated medially. Telson entire, short, broad as long, ovate to pentagonal, pointed apically, almost unarmed.

Male. Unknown. Oostegites narrow, present [?on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Like *Camacho* but rami of uropod 3 equal, gnathopod 2 enlarged, recessment of antenna 2 stronger, and female gnathopod 2 dominant.

Like *Bonnierella* but coxae much smaller and discontiguous.

Like *Megamphopus lapisi* (in *Gammaropsis*) but coxae small and epistome unproduced.

See *Paradryope*.

Species. *Bogenfelsia incisa* J.L. Barnard, 1962d [702A].

Habitat and distribution. Marine, South Atlantic, Cape Basin, 4983 m, 1 species.

[?Ischyroceridae] ***Bonnierella*** Chevreux

Bonnierella Chevreux, 1900a: 97.–Stebbing, 1906: 737.–J.L. Barnard, 1967a: 29 (key).–J.L. Barnard, 1969c: 276.–J.L. Barnard, 1973b: 25.

Type species. *Podoceropsis abyssi* Chevreux, 1887, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum obsolescent, ocular lobes short, pointed; antennal sinus weak to deep. (Head as long as pereonites 1-2 together). Eyes absent. Antennae elongate, 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 1 to 2-articulate. Antenna 2 peduncular article 3 short. Epistome produced anteriorly. Labrum incised. Mandible normal, palp very strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 6 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate without mediomarginal setae. Inner plate of maxilliped with small distal spines, outer plate very short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, long and thin, article 2 long, article 3 unlobed, article 4 very long, with short nail.

Coxae small, relatively short, weakly overlapping, progressively even from 1 to 4, coxa 1 dilated, produced forward slightly, coxa 2 also short, coxa 4 not longer than coxa 1, barely lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 of subequal size, large, gnathopod 2 slightly larger than 1, gnathopod 1 in male strongly subchelate, palmgrossly sculptured and oblique, article 5 shorter than 6, unlobed, article 6 and dactyl very large. Gnathopod 2 enlarged, weakly subchelate, right and left diverse, article 5 shorter than 6, unlobed, article 6 dilated, palm sculptured and oblique or smooth and obsolescent (left and right), dactyl long.

Pereopods 3-4 similar, with slender article 2, article 4 dilated, dactyls long. Pereopods 5-7 short, similar to each other, progressively longer, with linear article 2, pereopod 5 slightly shorter than pereopod 7, dactyl of pereopods 5-7 curved, long, pereopods 3-7 with article 6 poorly spinose, locking spines usually reduced to 1 or reduced to setal-form or absent. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami equal, shorter (1) or equal (2) to peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 of ordinary length, biramous, both rami short, subequal, unarmed, peduncle longer than rami, elongate, outer ramus with microscopic distal wire-like setae in some species. Telson entire, as broad as long, ovate or subtriangular, pointed apically (type), with 2 hooked apical cusps.

Female. Gnathopod 2 smaller and less sculptured than in male. Oostegites moderately broad, present on segments 2-5.

Sexual dimorphism. Weak. Gnathopod 2.

Variables. Inner plate of maxilla 1 with 4 setae (*B. longirama*); ventral peduncular spurs of uropods 1-2 doubled (*B. palenquia*); outer ramus of uropod 3 with 1-2 spines (*B. longirama*).

Relationship. Differing from *Aorcho* in the clearly enlarged gnathopod 2 and vestigial accessory flagellum.

Differing from the *Gammaropsis* complex in the large gnathopod 1, non-spinose rami of uropod 3, slightly reduced inner and outer plates of the maxilliped with relatively elongate palp, poorly setose medial region on the inner plate of maxilla 2, very poorly spinose article 6 of pereopods 3-7, with locking spines either absent or represented by setae, greater dominance of mandibular body by mandibular palp, enlarged dactyl of maxilliped and relatively subequal condition of the antennae.

Very close to *Ischyrocerus* and allies but outer ramus of uropod 3 not clearly hooked and article 2 of pereopods 5-7 rectolinear.

See *Paradryope*.

Species. *Bonnierella abyssi* (Chevreux, 1887c, 1900a, 1927) (Stephensen, 1944c) [240B]; *B. abyssorum* (Bonnier, 1896) [302B]; *B. angolae* J.L. Barnard, 1962d [412A]; *B. dimorpha* Ledoyer, 1982b [694A]; *B. lapisi* (J.L. Barnard, 1962d) [702A]; *B. linearis* J.L. Barnard, 1964a, *B. l. californica* J.L. Barnard, 1966a [535BA];*B. longirama* Ledoyer, 1982b [694A]; *B. palenquia* J.L. Barnard, 1967a [309B].

Habitat and distribution. Marine, cosmopolitan deep sea, 363-6324 m, 8 species.

Camacho Stebbing

Fig.44A

Camacho Stebbing, 1888: 1178.–Stebbing, 1906: 664.–J.L. Barnard, 1973b: 16.

Type species. *Camacho bathyplous* Stebbing, 1888, monotypy.

Diagnosis. Body subcylindrical, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus weak to moderate. Eyes weak or absent. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 much shorter than 1, 2 longest, accessory flagellum 4-articulate. Antenna 2 peduncular article 3 elongate, flagellum short, about 7-articulate. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 semifalciform, shorter than 2. Labium with entire outer lobes, with well developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal but reaching only halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very long, with short nail and setae.

Coxae very small, short, mostly discontiguous, of uniform sizes and shapes, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 alike, of equal size, feeble to small, both with sublinear articles, moderately setose, weakly subchelate, article 5 slender, slightly longer than 6, unlobed, dactyls ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 not dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, with sublinear article 2, pereopod 5 much shorter than pereopod 7, article 2 of pereopods 6-7 well setose posteriorly, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 obsolescent. Uropod 3 small, very short, biramous, outer ramus much longer than short peduncle, with vestigial article 2, inner ramus much shorter than outer ramus, scale-like. Telson entire, short, as broad as long, ovate or pentagonal, with 2 tiny hooked apical cusps.

Female. Oostegites narrow, present on segments 3-5.

Sexual dimorphism. None.

Relationship. Differing from *Aorcho* in the reduced inner ramus of uropod 3. From *Unciola* in the non-enlarged gnathopod 1 and absence of large tooth on epimeron 3 (a generic character of this group). From *Siphonoecetes* and allies in the 3-articulate mandibular palp, presence of accessory flagellum, and the subequal, feeble gnathopods. From *Ledoyerella* and allies in the short inner ramus of uropod 3 and the shallow recessment of antenna 2. From *Neohela* in the biramous uropod 3, clavate article 3 of mandibular palp, unexpanded propodi of the gnathopods and the mediofacial setae on the inner plate of maxilla 2. From *Unciolella* in the large carpi on the gnathopods and the biramous uropod 3.

See *Bogenfelsia* and *Grandidierella*.

Species. *Camacho bathyplous* Stebbing, 1888, 1908b, 1910b (J.L. Barnard, 1961a) (Griffiths, 1974c) [757 + BA].

Habitat and distribution. Marine, austral cold and deep seas, 77-2640 m, 1 species.

Cerapopsis Della Valle

Figs 45N, 46K

Cerapopsis Della Valle, 1893: 388.

Type species. *Cerapopsis longipes* Della Valle, 1893, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes elongate, produced forward, blunt, antennal sinus deep. Eyes small, at apices of ocular lobes. Antennae short, subequal, both slender, peduncular article 3 of antenna 1 almost as long as 1, article 2 longest, accessory flagellum vestigial or absent, main flagellar articles about 6. Antenna 2 peduncular article 3 scarcely elongate, flagellum with about 6 articles. Epistome [?unproduced anteriorly]. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, short, with 1 apical seta, outer plate with 11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae long, weakly overlapping, of various sizes and shapes, progressively elongate from 2 to 4, coxa 1 weakly dilated, weakly produced forward, small in contrast to enlarged coxae 3-4, coxa 2 also short, coxae 3-4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse; of subequal size, large, gnathopod 2 slightly larger than 1, gnathopod 1 in male poorly subchelate, article 5 long, linear, longer than 6, unlobed, palm short. Gnathopod 2 chelate, with article 2 barely dilated, article 5 much shorter than 6, lobed, article 6 dilated, sometimes with false chela, dactyl huge, apically setose.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, not progressively longer, 5-6 barely prehensile, pereopods 5-6 scarcely shorter than and different from pereopod 7, with broader, lobed article 2, pereopod 7 with narrow, unlobed article 2, pereopods 5-6 with different dactyl, with tooth, dactyl of pereopod 7 medium, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [undescribed], present on segments [?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami unequal, much shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary length, biramous, outer ramus short, 1-articulate, recurved apically, [?with apicolateral teeth], peduncle slightly longer than rami, inner ramus vestigial. Telson entire, short, broader than long, ovate or pentagonal, pointed apically, [probably with 2 hooked apical cusps].

Female. Coxae different from male, 1-2 much longer and more normal. Gnathopods small, gnathopod 2 larger than 1, normally (2) to poorly (1) subchelate. Article 5 shorter (2) or longer (1) than 6, unlobed (1) or strongly lobed on gnathopod 2. Oostegites narrow, present on segments [?2- 5].

Sexual dimorphism. Strong. Gnathopods.

Relationship. Although Krapp-Schickel (1976b) synonymised this genus with *Photis* and the type species of this genus is an obvious advancement from species in *Photis*, the following differences of *Cerapopsis* can be utilised to preserve the genus: anteriorly produced coxa 1, small coxa 2, carpochelate gnathopod 2 on the male, and lack of tooth on dactyl of pereopod 5. Despite this lack, pereopod 5 retains the prehensility of *Photis*. The ramus of uropod 3 is almost as long as and as wide as the peduncle and, like a few species of *Photis*, the inner plate of maxilla 2 lacks facial setae and article 6 of pereopods 3-4 is long and naked.

Cerapopsis differs from *Ampelisciphotis* in the enlarged and carpochelate male gnathopod 2, small coxa 2, lack of facial setae on the inner plate of maxilla 1, and the equality in width of the base of ramus and apex of the peduncle on uropod 3.

See *Audulla*.

Species. *Cerapopsis longipes* Della Valle, 1893 (= *C. longicarpa* Chevreux, 1926b) (Krapp-Schickel, 1976b) [330 + 340].

Habitat and distribution. Marine, Mediterranean to Senegal, shallow to 80 m, 1 species.

[Ischyroceridae] ***Cerapus*** Say

Figs 44D, 45V, 46L

Cerapus Say, 1817: 49.–Stebbing, 1906: 665.–J.L. Barnard, 1969c: 188.–J.L. Barnard, 1973b: 25.–Lincoln, 1979a: 566.
Cerapodina Milne Edwards, 1840: 62 (*Cerapodina abdita* Milne Edwards, 1840 (= *Cerapus abditus* Templeton, 1836b), monotypy.

Type species. *Cerapus tubularis* Say, 1817, monotypy.

Diagnosis. Body cylindrical, occasionally dorsally corrugated, slightly depressed, urosomites free, urosomite 1 ordinary. Rostrum short to long, thorn-like, ocular lobes short, blunt; antennal sinus deep. (Head as long as pereonites 1-2 together). Eyes present, moderate to weak. Antennae large, nearly subequal, both stout; peduncular articles of antenna 1 various, in type 1 = 2 = 3, accessory flagellum absent, main flagellar articles very few. Antenna 2 peduncular article 3 short, flagellum with few articles (3-4 in type). Epistome unproduced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes

long, pointed. Inner plate of maxilla 1 subcircular, small, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only mediomarginal setae near apex. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long nail and setae.

Coxae very small, relatively short, barely contiguous, of various sizes and shapes, scarcely but slightly elongate from 1 to 4, not spiniform, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 scarcely longer than coxa 1, not posteriorly lobed, coxa 5 much longer than 4, very elongate anteroposteriorly especially in female, thoracic segment 5 also elongate, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 short, lobed, as long as 6. Gnathopod 2 enlarged, weakly subchelate, carpochelate in male, with article 2 dilated, article 5 as long as 6, much stouter than 6, lobed, article 6 slender, dactyl long.

Pereopods 3-4 similar, with inflated article 2, article 4 slightly dilated, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, pereopod 5 much shorter than and different from pereopods 6-7, with broader article 2, article 4 broad, lunate, enveloping article 5, latter tiny, lunate and cryptic; pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 almost geniculate, with accessory tooth on outer margin. Sternal processes of thorax [undescribed]. Coxal gills present on segments 3-7. Pleopods partially reduced towards posterior, with dilated base of outer ramus. Epimeron 3 bisinuate. Uropod 1 biramous, stout, rami unequal, much shorter than peduncle, without ventrodistal process, uropod 2 with only 1 vestigial ramus. Uropod 3 small, very short, uniramous, ramus very short, spinelike, recurved apically, peduncle not dilated medially. Telson entire, short, reduced, much broader than long, cleft, covered with hooks.

Female. Sexual dimorphism (except for oostegites), strong. Coxae different from male, usually much longer or broader on segment 5. Gnathopods small, subequal, alike, like gnathopod 1 of male, poorly subchelate, article 5 as long as 6, lobed. Oostegites 2-4 moderately narrow, 5 broad.

Sexual dimorphism. Strong. Gnathopods.

Variables. Tubes thick and distinctive, annulated, occasionally cones formed of uniform sand grains.

Article 1 of antenna 1 elongated and toothed, article 2 short, article 3 scarcely longer than 2 but shorter than 1 (e.g. *C. crassicornis*); antennae 1-2 especially slender (*C. erae*); medial margin of inner plate on maxilla 2 with varying degrees of setation; gnathopod 1 linear, simple (*C. harfootus*); article 5 of pereopod 5 granular (many species, perhaps of generic value); inner rami of pleopods 2-3 strongly reduced (*C. crassicornis*).

Relationship. Differing from *Siphonoecetes* and allies in the 3-articulate mandibular palp, shorter antennae, unexpanded peduncle of uropod 3, large carpochelate male gnathopod 2, simple pereopod 7 (not of the setose tanaid-like form seen in *Siphonoecetes*) and the habit of building their own structured stiff, thick tubes freely (versus collecting of shells and lining of objects with variable tube masses).

From *Chevreuxius* in the reversed dominance of male gnathopods, with gnathopod 2 being the enlarged pair. From *Ericthonius* and *Pseuderichthonius* in the loss of all but one seta on the inner plate of maxilla 1, and in the reduction of article 5 on pereopod 5 to a lunate form.

See *Baracuma* and *Runanga*.

Species. *Cerapus abditus* Templeton, 1836b (?Stebbing, 1910a; ?Pirlot, 1938; ?Pillai, 1957; ?Nayar, 1959) (? = *C. calamicola* Giles, 1885a) (? = *C. flindersi* identification of Walker & Scott, 1903) (Ledoyer, 1986) [TL= 697, ? + 743, 660, 793]; *C. benthophilus* Thomas & Heard, 1979 [476]; [*C. bidens* Czerniavsky, 1868 (Stebbing, 1906) [334]]; *C. comparativus* Kudrjaschov, 1975 [286]; *C. crassicornis* (Bate, 1857d) (Sars, 1895) (Stephensen, 1942) (Lincoln, 1979a) [240]; *C. erae* Bulycheva, 1952 [391]; *C. fallohideus* Lowry, 1981b [774]; *C. flindersi* Stebbing, 1888 (?Chilton, 1892b) [784]; *C. harfootus* Lowry, 1981b [775]; *C. longirostris* Shen, 1936 [396]; *C. oceanicus* Lowry, 1985 [573]; *C. oppositus* K.H. Barnard, 1932 (Lowry, 1981b) [835 + 872]; *C. pacificus* Lowry, 1985 (Myers, 1985c) [576]; [*C. pelagicus* Milne Edwards, 1840 (Stebbing, 1906)]; *C. polutovi* Gurjanova, 1951 [281]; [*C. ponticus* Marcusen, 1867 (Della Valle, 1893) [334]]; *C. sismithi* Stebbing, 1888 (Lowry, 1981b)]840]; *C. stoorus* Lowry, 1981b [774]; *C. tubularis* Say, 1817 (Bousfield, 1973) [362]; other principal illustrated citations to *C. tubularis*, identifications unknown: Alonso, 1980; Griffiths, 1973, 1974b,c, 1975; Hirayama, 1985b; Kunkel, 1918; Ledoyer, 1979a, 1986; Morino, 1976; Nagata, 1965c; "species" = *C. tubularis* of J.L. Barnard, 1962a, 1964b, 1969a (tube = rusty cylinder) [373]; "species" = *C. tubularis* of Nagata, 1965c [395].

Habitat and distribution. Marine, cosmopolitan, especially well developed in tropics and warm-temperate, many new species to be described; especially present in estuaries, lagoons, marshes, 0-216 m, 16 species.

Chaetocorophium Karaman

Chaetocorophium Karaman, 1979e: 98

Type species. *Paracorophium lucasi* Hurley, 1954e, original designation.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus [?moderate]. Eyes small. Antennae short to medium, nearly subequal, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum vestigial or absent, main flagellum well developed. Antenna 2 peduncular article 3 short, peduncle stout in both sexes. Epistome [?unproduced anteriorly]. Labrum [?slightly incised]. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2, apex obliquely truncate. Labium with [?entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt]. Inner plate of maxilla 1 [?linguiform], without apical setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate abnormal, long, almost reaching apex of palp article 2, with dense double row of short setae on medial margin, palp with 4 articles, article 2 long, article 3lobed, article 4 very short, with medium setae.

Coxae ordinary to long, [?probably not strongly overlapping, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae]. Gnathopods 1-2 diverse, of subequal size, small, both with linear articles, densely setose, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, article 5 long, not linear, unlobed, palm short and transverse, article 6 slender, shorter than 5. Gnathopod 2 very setose, barely enlarged, subchelate, almost parachelate, with article 2 not dilated, article 4 enlarged, merochelate, extended away from posterior margin of article 5, article 5 as long as 6, more slender than 6, unlobed, article 6 scarcely dilated, with false chela, dactyl medium, slightly overlapping transverse palm.

Pereopods 3-4 [?normal, similar, with slender article 2, article 4 dilated, dactyls long]. Pereopods 5-7 similar to each other, progressively slightly longer, not prehensile, pereopod 5 shorter than pereopod 7, pereopods 5-7 with broad unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods [?normal]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, shorter than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, very short, biramous, both rami very short, peduncle shorter than outer rami, very short, flat, dilated medially, outer ramus obtuse distally, 1-articulate, almost foliaceous, inner ramus much shorter than outer ramus, apically spinosetose, scale-like. Telson entire, short, broader than long, pentagonal, with 2 hooked apical cusps.

Female. Sexual dimorphism (except for oostegites), weak. Coxae different from male, usually much longer. Gnathopod 2 small, almost simple, article 5 slender, longer than 6, unlobed, merochela very large, propodus slender, tapering, dactyl short but overlapping palm strongly. Oostegites [?narrow, present on segments 2-5].

Sexual dimorphism. Weak. Gnathopod 2.

Relationship. Differing from *Paracorophium* in the presence of a double row of short setae along the inner margin of the outer lobe on the maxilliped. From *Stenocorophium* in the biramous uropod 3, chelate male gnathopod 2 and normal male pereopod 7 (extraordinarily enlarged in *Stenocorophium*).

Species. *Chaetocorophium lucasi* (Hurley, 1954e) (Chapman & Lewis, 1976) (Karaman, 1979e) [936F].

Habitat and distribution. Freshwater, but marine derived, New Zealand, Rotoiti Lake, Lake Waikare, 1 species.

Cheirimedeia J.L. Barnard

Cheirimedeia J.L. Barnard, 1962a: 50.–Conlan, 1983: 34.

Type species. *Protomedeia zotea* J.L. Barnard, 1962a, original designation.

Diagnosis. Like *Protomedeia* but article 4 of pereopods 3-4 more strongly overlapping article 5 (very subtle); in all but one species, inner ramus of uropod 3 half or less as long as outer ramus; antenna 1 not longer than antenna 2.

Variables. Proportions and ornaments on gnathopods; palm of gnathopod 2 deeply incised, defined by large gaping tooth (*C. palmata*); rami of uropod 3 subequal (*C. similicarpa*); spines on uropod 3 long and slender (*C. macrodactyla*).

Relationship. A very difficult genus to detect because the degree of lapping over article 5 by article 4 of pereopods 3 and 4 is a subtlety. All species but *C. similicarpa* have the inner ramus on uropod 3 half or less as long as the outer ramus, a more useful character. All species have antennae 1 and 2 subequal or antenna 1 shorter than 2, a better character.

Differing from *Protomedeia* in the weak setosity on the anterior margins of pereopods 3 and 4 (articles 4-6): all articles with fewer than 5 setal groups.

See *Leptocheirus* and *Pagurisaea*.

Species. *Cheirimedeia alaskensis* (Stebbing, 1910a, = homonym *C. dentatus* Holmes, 1908) (Gurjanova, 1951) [280]; *C. dulkeiti* (Gurjanova, 1951) [281]; *C. gurjanovae* (Bulycheva, 1951) (Gurjanova, 1951) [220]; *C. macrocarpa* (Bulycheva, 1952), *C. m. americana* Conlan, 1983 [391 + 270]; *C. macrodactyla* Conlan, 1983 [275]; *C. palmata*

(Bulycheva, 1952) [391]; *C. similicarpa* Conlan, 1983 [270]; *C. zotea* (J.L. Barnard, 1962a, 1971b) (Conlan, 1983) [270].

Habitat and distribution. Marine, boreal and Arctic North Pacific and adjacent Arctic, 0-170 m, 8 species.

Cheiriphotis Walker

Figs 41A, 55G

Cheiriphotis Walker, 1904: 283.–J.L. Barnard, 1973b: 16.

Type species. *Melita megacheles* Giles, 1885, monotypy.

Diagnosis. Body laterally compressed, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus weak to deep. Eyes small. Antennae of medium length, nearly subequal, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 short, flagellum often short. Epistome unproduced anteriorly. Labrum incised. Mandible normal, palp strong, slender, article 3 rectolinear or clavate, article 3 scarcely shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 triangular, large, with a row of medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, stubby, with long nail and setae.

Coxae small, relatively short, weakly overlapping, of various sizes and shapes, progressively elongate from 2 to 4, spiniform, coxa 1 dilated, produced forward, coxa 2 shorter than 1, broad, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 long, unlobed, longer than 6. Gnathopod 2 enlarged, subchelate, with article 2 slightly dilated, with article 4 enlarged, extended distally along posterior margin of article 5, article 5 shorter than 6, very short, often seemingly absent or fused to article 4, lobed, article 6 greatly dilated, sometimes with false chela or processes on posteroproximal margin, dactyl long.

Pereopods similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 much shorter than pereopod 7, pereopods 5-7 with broad, lobed, setose article 2, dactyl of pereopods 5-7 curved, medium. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, stout, rami subequal, much shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 small, very short, uni- or biramous, both rami very short, almost spine-like, peduncle plate-like, longer than rami but very short, often dilated medially (when inner ramus absent), outer ramus with small article 2 or spine, inner ramus scale-like, shorter than outer ramus or lost in adults. Telson entire, short, broader than long, semicircular, pointed apically, with 2 hooked apical cusps.

Female. Coxae different from male, usually much longer. Gnathopods small, gnathopod 2 larger than 1, normally subchelate, article 5 of gnathopod 2 shorter than 6, lobed. Oostegites [?moderately broad, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Recessment of antenna 2 variable, from weak to deep; male gnathopod 2 with merus and carpus fused, propodus huge, palm transverse (e.g. *C. walkeri*); inner ramus of uropod 3 present or absent.

Relationship. Differing from *Photis* and *Microphotis* in the multiarticulate accessory flagellum, plate-like peduncle of uropod 3, and short coxae, with coxa 1 produced forward (some exceptions occur in *Photis*). From *Protomedeia* and *Cheirimedeia* in the plate-like peduncle of uropod 3, short carpus of gnathopod 2, and lessened sexual dimorphism in gnathopod 2.

Very close to but differing from *Microprotopus* in the short but diverse anterior coxae, lessened sexual dimorphism in gnathopods and longer article 3 of antenna 1.

A complex genus to identify because uropod 3 may be uni- or biramous depending on age of the individuals. Unusual in the large, lobate article 2 of pereopods 5-7.

See *Dercothoe*, *Isaeopsis*, *Microjassa* and *Pagurisaea*.

Species. *Cheiriphotis australiae* Stebbing, 1910a [781]; *C. delloyei* Pirlot, 1934 [604B]; *C. durbanensis* K.H. Barnard, 1916 (Ledoyer, 1969b, 1973a, 1979a, 1982b) [745]; *C. erythraeus* Ruffo, 1969 [677]; *C. geniculata* K.H. Barnard, 1916 [666]; *C. madagascarensis* Ledoyer, 1979a, 1982b [698]; *C. mediterranea* Myers, 1983a [343]; *C. megacheles* (Giles, 1885b) (Walker, 1904) (Pillai, 1957) (Nayar, 1959, 1967) (Rabindranath, 1971b) (?= *C. hirsutus* Giles, 1887) (?= *C. monuropus* Walker, 1909b) [685]; *C. minima* Ledoyer, 1982b [698]; *C. walkeri* Stebbing, 1918 (?K.H. Barnard, 1940) (?Griffiths, 1975 and antecedents) [743]; "species" = *C. megacheles* of J.L. Barnard, 1962a, 1969a, 1979b, (possibly = *C. delloyei*) [369]; "species" = ?*C. megacheles* of Imbach, 1969 [655].

Habitat and distribution. Marine, circumtropical and warm-temperate, including eastern Mediterranean, 0-794 m, 10 species.

Chevalia Walker

Fig.40F

Chevalia Walker, 1904: 288.–J.L. Barnard, 1969c: 271.–J.L. Barnard, 1973b: 16.–Conlan, 1983: 60.
Neophotis Stout, 1913: 653 (*Neophotis inaequalis* Stout, 1913, monotypy).

Type species. *Chevalia aviculae* Walker, 1904, monotypy.

Diagnosis. Anterior body subcylindrical, slightly depressed, posterior body laterally compressed, smooth, urosomites 1-2 coalesced. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes medium. Antennae of medium length, 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 2 to 3+articulate, main flagellar articles numerous. Antenna 2 peduncular article 3 short, flagellum with 7+ articles. Epistome unproduced anteriorly. Labrum broad, short, incised. Mandible normal, palp strong, stout, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, short, with a row of medial setae, outer plate with 10-11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, stubby, with long to medium nail and setae.

Coxae small, relatively short, mostly discontiguous, progressively shorter from 2 to 4, weakly spiniform, coxa 1 barely dilated, scarcely produced forward, coxa 2 larger than 1, often produced, coxa 4 shorter than coxa 1, not lobed, coxa 5 shorter than 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male poorly subchelate, article 5 long, sublinear, unlobed, longer than 6. Gnathopod 2 enlarged, subchelate, with article 2 not dilated, article 5 much shorter than 6, lobed, article 6 dilated, sometimes with false chela, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly to strongly expanded article 2, pereopod 5 much shorter than pereopod 7, pereopods 5-7 with narrow to broad, occasionally almost lobed article 2, dactyl geniculate, with accessory tooth on outer margin. Sternal processes of thorax absent. Coxal gills thin, present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami unequal, inner longer than peduncle, peduncles without ventrodistal process. Uropod 3 small, biramous, both rami short, obtuse and setose distally, peduncle subequal to rami, short, not dilated medially, inner ramus longer than outer ramus. Telson entire, short, as broad as long, pentagonal, with 2 hooked apical cusps and many setae.

Female. Oostegites narrow, present on segments 3 or 4 to 5.

Sexual dimorphism. None.

Variables. Antennae and mandibular palp immense (*C. mexicana*); inner plate of maxilla 1 naked (Ledoyer, 1982b); anteroventral corner of coxa 1 blunt or sharp; palm of gnathopod 2 oblique or transverse, with sinus or not; article 2 of pereopods 3-4 dilated (Ledoyer, 1982b); article 2 of pereopods 5-7 ovate to subquadrate, weakly to strongly expanded, occasionally sublobate; oostegites 2-3 pairs.

Relationship. Characterised by coalesced urosomites 1-2, tooth on pereopodal dactyls, discontinguous coxae but 2 rami on uropod 3; in terms of gnathopods and antennae otherwise resembling *Protomedeia, Leptocheirus* and *Goesia.*
See *Rakiroa.*

Species. *Chevalia aviculae* Walker, 1904 (Ledoyer, 1972c, 1979a, 1982b) Barnard & Thomas, 1987 [690]; *C. carpenteri* Barnard & Thomas, 1987 [460]; *C. inaequalis* (Stout, 1913) (= *C. aviculae* of Shoemaker, 1942 and J.L. Barnard, 1962a) (Barnard & Thomas, 1987) [370]; *C. mexicana* Pearse, 1913 (Barnard & Thomas, 1987) [460]; "species" (*C. aviculae* of J.L. Barnard, 1979b [546]; "species" (*C. aviculae* of J.L. Barnard, 1970a and Myers, 1985c) [550]; "species" (*C. aviculae* of Conlan, 1983) [271].

Habitat and distribution. Marine, circumtropical north to British Columbia, Florida, shallow, 4 species.

Chevreuxius Bonnier

Chevreuxius Bonnier, 1896: 663.–J.L. Barnard 1973b: 16.

Type species. *Chevreuxius grandimanus* Bonnier, 1896, monotypy.

Diagnosis. Body cylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, scarcely pointed, antennal sinus weak. Eyes absent. Antennae long, nearly subequal, both slender, peduncular article 3 of antenna 1 slightly shorter than 1, article 2 scarcely longest, accessory flagellum 1.25-articulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum much shorter than article 5 of peduncle, 4-articulate. Epistome unproduced anteriorly. Labrum subrounded, scarcely incised. Mandible normal, palp strong, slender, article 3 clavate, longer than 2. Labium with entire outer lobes, with well-

developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, short, with 1 apical seta, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with short nail and setae.

Coxae very small, short, not contiguous, of uniform sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, coxa 2 scarcely larger than 1, coxa 4 shorter than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, gnathopod 1 in male subchelate, carpochelate, article 5 long, lobed, palm short and transverse, excavate, article 6 very large, short, thick, dactyl medium. Gnathopod 2 weakly subchelate, feeble, linear, with article 2 not dilated, article 5 longer than 6, unlobed, article 6 more slender than article 5, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with almost linear article 2, pereopod 5 much shorter than pereopod 7, pereopod 7 with setose unlobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropod 1 biramous, normal, rami slightly unequal, shorter than peduncle, peduncle without ventrodistal process, uropod 2 with only 1 ramus, ramus shorter than peduncle, latter with large apicomedial spine. Uropod 3 small, uniramous, single ramus short, obtuse distally, with few armaments mostly apical, peduncle longer than ramus, dilated medially. Telson entire, short, broader than long, ovate or semicircular, with 2 tiny hooked apical cusps.

Female unknown. Oostegites [?narrow, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Differing from *Grandidierella* in the uniramous uropod 3.

From *Siphonoecetes* and allies in the fully 3-articulate mandibular palp, enlarged carpochelate male gnathopod 1, and the non-expanded peduncle of uropod 3.

See *Baracuma* and *Cerapus*.

Species. *Chevreuxius grandimanus* Bonnier, 1896 [303B].

Habitat and distribution. Marine, Bay of Biscay, 950 m, 1 species.

Columbaora Conlan & Bousfield

Columbaora Conlan & Bousfield, 1982b: 83.

Type species. *Columbaora cyclocoxa* Conlan & Bousfield, 1982b, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes small. Antennae very long, 1 much longer than 2, both slender; peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 1.25-articulate. Antenna 2 peduncular article 3 short, flagellum short, with 6-7 articles. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, slender, article 3 semi-falciform, much longer than 2, well setose. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae.

Coxae 2-7 ordinary, overlapping, of various sizes and shapes, not progressively elongate from 2 to 4, coxa 1 hugely dilated, produced forward to cover head and base of antennae, coxa 2 short, coxa 4 barely longer than coxa 2, not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, large, both with linear articles, densely setose; gnathopod 1 slightly larger than 2, in male poorly propodochelate, also weakly carpochelate and hugely merochelate, article 5 long, linear, palm short and transverse, dactyl very large. Gnathopod 2 also enlarged, weakly subchelate, linear, with article 2 not dilated but setose, article 4 barely enlarged, extended and fused distally along posterior margin of article 5, 5 much longer than 6, unlobed, article 6 more slender, with false chela, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 weakly similar to each other, progressively longer, pereopod 5 much shorter than and different from pereopod 7, with narrower unlobed article 2 and short articles 4-6; pereopod 7 with broad almost lobed article 2, articles 4-6 long and slender, dactyl of pereopods 5-7 curved, short. Sternal processes of thorax present on segment 1 in male. Coxal gills present on [?segments 2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami equal, longer than peduncle, peduncle of uropods 1-2 with large ventrodistal process. Uropod 3 of medium length, biramous, both rami subequal, moderately long, narrow, tapering, obtuse and setose distally, peduncle shorter than rami, outer ramus with small or vestigial article 2.

Telson entire, short, broader than long, ovate or pentagonal, with 2 hooked apical cusps and setal groups.

Female. Coxa 1 smaller than in male, usually rectangular and poorly produced. Gnathopods small, gnathopod 1 barely larger than 2, almost simple, article 5 barely shorter than 6, unlobed on both gnathopods 1-2. Oostegites broad, present on [?segments 2-5].

Myers (1988) diagnosis. Head with ocular lobes strongly produced; article 3 of mandibular palp with posterior margin sinuous; left mandibular molar traversed with parallel channels; anterior margin of maxilliped [?with wing-like flanges, not described]; male gnathopod 1 merus elongate and acute, carpus larger than propodus; uropod 3 peduncle relatively elongate, poorly expanded, rami with spines, but no marginal setae, outer ramus with small second article bearing a pair of relatively short setae.

Sexual dimorphism. Strong. Gnathopods, coxa 1.

Relationship. Differing from *Aora, Aoroides*, and *Arctolembos* in the immense coxa 1 of the male. Unlike *Aora* and *Aoroides*, male gnathopod 2 is also enlarged and has a long carpus. The carpochela of male gnathopod 1 is very elongate and reaches well along the propodus; gnathopod 1 is also slightly carpochelate and propodochelate but some 'extraneous' species of *Lembos* also have this condition. Unlike *Aoroides* the accessory flagellum has 1.25 articles. Unlike most species of *Aora, Aoroides* and *Arctolembos* article 2 of male pereopod 7 is not heavily setose, in fact setae are virtually absent. *Arctolembos* has a bifid ocular lobe and unusual relationship between the outer plate and palp on the maxilliped.

See *Aorella, Lembos,* and all genera of the Myers (1988) diagnosis.

Species. *Columbaora cyclocoxa* Conlan & Bousfield, 1982b [270]; *C. longipalpa* (Kunkel, 1910) [367].

Habitat and distribution. Marine, boreal north-eastern Pacific, Bermuda, 0 m, 2 species.

Corophium Latreille

Figs 39F, 40B, 42F, 43D,E, 45G,Q, 46N

Corophium Latreille, 1806: 58.–J.L. Barnard, 1969c: 190.–J.L. Barnard, 1973b: 17.–Myers, 1982b: 185.

Audouinia Costa, 1851: 24 (*nomen nudum*) (*Audouinia acherusica* Costa, 1851, monotypy, *nomen nudum*).

Type species. "*Corophium longicorne* Fab." = *Gammarus longicornis* Fabricius, 1779 = *Oniscus volutator* Pallas, 1766, monotypy.

Diagnosis. Body cylindrical, depressed, smooth, urosomites free, or 1-3 coalesced but marked ventrally by sutures, 3 not coalesced with telson; urosomite 1 ordinary. Rostrum short to long, thorn-like, ocular lobes short to moderate, often produced forward, pointed or blunt; antennal sinus deep. Eyes small. Antennae of various lengths, 1 shorter than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest or 2 = 1, accessory flagellum vestigial or absent. Antenna 2 gland cone usually spur-like, peduncular article 3 short, peduncle stouter in male but very stout in both sexes, article 4 massive, 5 less massive, both sculptured and spinose, less strongly so in female, flagellum very short, 2+articulate. Epistome unproduced anteriorly. Labrum subrounded, entire or deeply incised. Mandible normal, palp weak, very slender, with 2-3 articles, article 1 usually missing, article 3 rectolinear, shorter than or as long as 2, attached to 2 usually in geniculate fashion, article 2 often produced apically. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, short to vestigial, without setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary to narrow, diverse or not, inner plate with mediofacial row of setae barely submarginal or with only mediomarginal setae. Inner plate of maxilliped normal or often reduced, slender, pointed, with distal setae, outer plate long, reaching apex of palp article 2, with spines or setae only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, coxa 1 dilated, produced forward, coxa 2 short, coxa 4 shorter than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 barely smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, small, both with linear articles, densely setose, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, article 5 long, linear, unlobed, palm short and transverse or oblique. Gnathopod 2 simple, linear, with article 4 enlarged, inflated, heavily setose, incipiently merochelate, grossly extended and fused distally along posterior margin of article 5, article 5 shorter than 6, unlobed, article 6 narrow, more slender than article 5,dactyl ordinary.

Pereopods 3-4 abnormal, longer than gnathopods, similar, with slightly inflated article 2, article 4 dilated, article 5 tiny, dactyls long. Pereopods 5-6 much shorter than and different from pereopod 7, with narrower article 2, tiny reniform article 5 with facial spination, pereopods 5-7 with narrow, setose, unlobed article 2, pereopods 6-7 with differently pointing dactyl; articles 4-6 of pereopod 7 elongate, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 3-6. Pleopods with dilated peduncle. Epimeron 3 bisinuate or not. Uropods 1-2 biramous,

normal, stout, rami slightly unequal or equal, on uropod 1 much shorter, on uropod 2 longer than peduncle, peduncle without ventrodistal process. Uropod 3 very short, uniramous, peduncle usually shorter than ramus, very short, peduncle not dilated medially, single ramus 1-articulate, foliaceous or narrow, obtuse distally, broad and pad-like and marginally setose. Telson entire, short, broader than long, ovate or heart-shaped or pentagonal, lacking major armaments.

Female. Antenna 2 less stout. Rostrum usually distinctive. Coxae not different from male. Gnathopods like those of male. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Weak; antenna 2, rostrum.

Variables. Specific taxonomy based on size and shape of rostrum (but also variable between sexes of one species), shape, sculpture and 3-dimensional spine patterns on article 1 of antenna 1, articles 1-5 of antenna 2, females having antenna 2 smaller, less sculptured, largely distinguished by spine patterns; tooth patterns on dactyls of gnathopods; fusion and shape of urosomites; shapes and setation of uropod 3.

Mandibular palp with article 1 present (e.g. *C. ellisi, monospinum*), article 2 (or basalmost) strongly produced (e.g. *C. baconi*), article 3 (or terminalmost) very short (e.g. *C. heteroceratum*); dactyl of maxilliped vestigial (*C. heteroceratum*); urosomites simply fused together and with uropods 1-2 attached in lateral notches (e.g. *C. crassicornis*) or urosome forming boat with lateral rim, uropods 1-2 attached under urosome (e.g. *C. baconi*); ramus of uropod 3 rodlike and or peduncle elongate and thin (e.g. *C. runcicorne*).

Relationship. A corophioid genus with the rare condition of article 1 of antenna 1 dominant. Characterised by the stout antenna 2 in both sexes combined with heavily filtrative gnathopod 2 with enlarged and setose merus, 2-articulate geniculate mandibular palp (rarely with an article 1), and unmodified pereopods 5-6. However, see *Paracorophium, Stenocorophium*, and *Pedicorophium* which have some of these characters.

Grandidierella has a much weaker antenna 2, fully 3-articulate mandibular palp and large carpochelate male gnathopod 1.

The *Siphonoecetes* group has cuticular scales on article 5 of pereopods 5-6, a 1 to 2-articulate mandibular palp with article 2 vestigial or absent, non-filtrative gnathopod 2 with small carpus and merus and a stout propodus.

The *Unciola* group also lacks the filtrative gnathopod 2 with extended merus, pereopods 5-6 are like 7 though smaller, epimeron 3 is well developed and bisinuate, gnathopod 1 is enlarged and stout, with thick and dominant propodus, and the mandibular palp is fully 3-articulate.

Species. See Birstein & Romanova (1968), Carausu (1943), Carausu *et al.* (1955), Chevreux & Fage (1925), Crawford (1937b), Gurjanova (1951), Hirayama (1984a), Hong (1983), Lincoln (1979a), Mordukhai-Boltovskoi (1969), Osadchikh (1973), Shoemaker (1934c, 1947, 1949a); *C. acherusicum* (Costa, 1851, *nomen nudum*; 1853, 1857) (Bousfield, 1973) (Lincoln, 1979a) (Myers, 1982b) [422T]; *C. aculeatum* Chevreux, 1908d, 1911d (Myers, 1982a) [340]; *C. acutum* Chevreux, 1908d (Hurley, 1954e) (Bousfield, 1973) (Myers, 1982b) [352 + 260 + 775T + 743T + 751T]; *C. affine* Bruzelius, 1859 (Sars, 1895) (Gurjanova, 1951) (Lincoln, 1979a) (= *C. tenuicorne* Norman, 1869a) [240]; *C. annulatum* Chevreux, 1908d (Myers, 1982b) [340]; *C. aquafuscum* Heard & Sikora, 1972 (Bynum & Fox, 1977) [362]; *C. arenarium* Crawford, 1937b (Ingle, 1963) (Lincoln, 1979a) [352 + E]; *C. baconi* Shoemaker, 1934a (?*C. baconi* J.L. Barnard, 1970a) (J.L. Barnard, 1979b) [535 + 290]; [*C. bidentatum* Marcusen, 1867 (senior homonym, dubious species) (Della Valle, 1893) [334]]; *C. bonellii* Milne Edwards, 1830 (Sars, 1895) (Chevreux & Fage, 1925) (Bousfield, 1973) (Lincoln, 1979a) (= *C. pseudacherusicum* Shoemaker, 1934c, Schellenberg, 1931) [420T]; *C. brevis* Shoemaker, 1949a (Coyle & Mueller, 1981) [270]; *C. californianum* Shoemaker, 1934a, 1949a (J.L. Barnard, 1969a) [370]; *C. chelicorne* Sars, 1895a (Carausu, 1943, 1955) (= *C. c. fluviatile* Martynov, 1935a) [335F]; *C. clarencense* Shoemaker, 1949a (Just, 1970) [220]; [*C. contractum* Stimpson, 1856b (Stebbing, 1906) [?395]]; *C. crassicorne* Bruzelius, 1859 (Sars, 1895) (Bousfield, 1973) (Hirayama, 1984a) (= *C. spinicorne* Bate 1862, = homonym) [200 + 339]; *C. curvispinum* Sars, 1895a (Carausu *et al.*, 1955) (Lincoln, 1979a) (Jazdzewski, 1980) (= *C. devium* Wundsch, 1912) [335EF, 235, 239]; *C. cylindricum* (Say, 1818) (Shoemaker, 1930a) [260 + ?831]; [*C. dentatum* Fr. Muller, 1864 (Stebbing, 1906) (Della Valle, 1893) [?751]]; *C. ellisi* Shoemaker, 1943, 1947 [478]; *C. heteroceratum* Yu, 1938 [396]; *C. homoceratum* Yu, 1938 [396]; *C. insidiosum* Crawford, 1937b (Shoemaker, 1947) (Bousfield, 1973) (J.L. Barnard, 1970a) (Myers, 1982b) (Hirayama, 1984a) [420T]; *C. intermedium* Ngoc, 1965 [653]; *C. kitamorii* Nagata, 1965c (Hirayama, 1984a) [395]; *C. lacustre* Vanhoffen, 1911 (Lincoln, 1979a) (Bousfield, 1973) [250]; *C. lamellate* Hirayama, 1984a [395]; *C. louisianum* Shoemaker, 1934c,1947 (Heard, 1982) [480]; *C. madrasensis* Nayar, 1950, 1959 [664]; *C. maeoticum* Sowinsky, 1898a (Carausu *et al.*, 1955) (Mordukhai-Boltovskoi, 1969) [333F]; *C. minimum* Schiecke, 1978 (Myers, 1982b) [340]; *C. minor* J.M. Thomson, 1946 [788]; *C. minutum* Ngoc, 1965 [653]; *C. monodon* Sars, 1895a (Birstein & Romanova, 1968) (Osadchikh, 1973) [332F]; *C. monospinum* Shen, 1955 [397]; *C. mucronatum* Sars, 1895a (Mordukhai-Boltovskoi, 1969) (Osadchikh, 1973) [332F]; *C. multisetosum* Stock, 1952 (Ingle, 1963) (Lincoln, 1979a) [240]; *C. nobile* Sars, 1895a (Carausu *et al.*, 1955) (Mordukhai-Boltovskoi, 1969) (Osadchikh, 1973) [335]; *C. oaklandense* Shoemaker, 1949a [371E]; *C. orientale* Schellenberg, 1928b (Carausu *et al.*, 1955) (Stock, 1960) (Myers, 1982b) [352 + E]; *C. panamense* Shoemaker, 1949a [544]; [*C. quadriceps* Dana, 1852a, 1853 (Stebbing,

1906) [751]]; *C. rioplatense* Giambiagi, 1929 (Shoemaker, 1934c, 1947) [751]; *C. robustum* Sars, 1895a (Carausu *et al.*, 1955) (Birstein & Romanova, 1968) (Osadchikh, 1973) (= *C. bidentatum* Sars, 1895a) [336F]; *C. rotundirostre* Stephensen, 1915 (Ledoyer, 1977) (Myers, 1982b) [340 + B]; *C. runcicorne* Della Valle, 1893 (Chevreux & Fage, 1925) (Mordukhai-Boltovskoi, 1969) (Myers, 1982b) [352]; *C. salmonis* Stimpson, 1857 (Bradley, 1908) (Shoemaker, 1949a) [270]; *C. setosum* Shoemaker, 1949a [537]; *C. sextoni* (lapsus for *C. sextonae*) Crawford, 1937b (Hurley, 1954e) (Lincoln, 1979a) (Myers, 1982b) [352 + 775T]; *C. shoemakeri* Monod, 1955 [641]; *C. simile* Shoemaker, 1934c (Bousfield, 1973) [361]; *C. sinensis* Zhang, 1974 [396]; *C. spinicorne* Stimpson, 1857 (Bradley, 1908) (Shoemaker, 1949a) [270F]; *C. spinulosum* Sars, 1896 (Birstein & Romanova, 1968) (Osadchikh, 1973) [332]; *C. spongicolum* Welitchkovsky, 1914 (= *C. sowinskyi* Martynov, 1924a, Mordukhai-Boltovskoi, 1969) (= var. Carausu, 1943; = *C. villosus* Carausu *et al.*, 1955) [337]; *C. steinegeri* Gurjanova, 1951 (Kudrjashov & Zvjagintsev, 1975) (Kudrjaschov, 1979) [280]; *C. stimpsoni* Shoemaker, 1941b, 1949a [371]; *C. triaenonyx* Stebbing, 1904a (Pillai, 1961) (Nayar, 1967) (Ledoyer, 1982d) [660 + 352]; *C. tuberculatum* Shoemaker, 1934c (Bousfield, 1973) [361]; *C. uenoi* Stephensen, 1932b (J.L. Barnard, 1952c, 1969b) (Hirayama, 1984a) [395 + 370T]; *C. volutator* (Pallas, 1766) (Bousfield, 1973) (Lincoln, 1979a) (? = *C. bicaudatus* Linnaeus, 1761) (= *C. grossipes* Linnaeus, 1767, see Sars, 1895) (= *C. linearis* Pennant, 1777) (= *C. longicornis* J.C. Fabricius 1779) (= *C. laevicorne* Sowinsky, 1880), *C. v. japonica* Hirayama, 1984a [352]. "species" Myers, 1985c [576].

Habitat and distribution. Marine, cosmopolitan below 60° latitudes, mostly shallow marine, often in estuaries, harbours, European and Ponto Caspian rivers, 0-360 m, usually 0-5 m, 58 species.

[Ischyroceridae] ***Dercothoe*** Dana

Dercothoe Dana, 1852b: 313.–Dana, 1853: 968.

Type species. *Dercothoe emissitius* Dana, 1853, present selection.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes elongate, produced forward, blunt, antennal sinus deep. Eyes small, at or near apex of ocular lobe. Antennae of medium length, 1 slightly longer than 2, both slender, peduncular article 3 of antenna 1 slightly longer than 1, article 2 longest, accessory flagellum 4-articulate. Antenna 2 peduncular article 3 short. [?Epistome unproduced anteriorly. ?Labrum subrounded, ?entire incised broad fleshy, bilobed. ?Mandible normal, with ?ordinary molar, palp strong weak, absent, very slender, with only 12 articles, article 3 not falciform, rectolinear, clavate, article 3 shorter longer than 2. Labium with entire notched outer lobes, with out well-developed inner lobes, mandibular lobes short long, pointed, blunt. Inner plate of maxilla 1 triangular, short, vestigial, absent, small, large with a row of medial setae, without 1 2 3 4 or 5 apical setae, outer plate with 6 7 9 or 11 spines, palp 1 2-articulate. Plates of maxilla 2 rather broad, narrow, inner plate with mediofacial row of only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, very short, long, not reaching exceeding apex of palp article 2, with spines, setae only on medial margin], palp with 4 articles, article 2 long, [?article 3 unlobed, article 4 very long, short, with long short medium lacking nail and setae, armed with row of fine spines along inner margin].

Coxae of medium size, weakly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 not smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, nearly merochelate, palm oblique, article 5 almost as long as 6, broadly but poorly lobed, article 6 inflated, dactyl ordinary. Gnathopod 2 enlarged, weakly subchelate, with scarcely dilated article 2, with article 4 incipiently merochelate, article 5 short, much shorter than 6, lobed, article 6 dilated, dactyl ordinary.

Pereopods 3-4 normal, slightly dissimilar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 much shorter than pereopod 7, with broad, unlobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than (2) or almost as long as (1) peduncle, peduncle of uropods 1-2 [?without ventrodistal process]. Uropod 3 small, very short, uniramous, single ramus short, 1-articulate, recurved apically, [?with apicolateral teeth], peduncle shorter than ramus. Telson [?entire, short, reduced, vestigial, as broad as broader than long, ovate, semicircular, pentagonal, pointed emarginate excavate apically, weakly cleft, incised fully, covered with hooks, with hooked apical cusps].

Female. Unknown. Gnathopods [?small]. Oostegites [?moderately narrow, broad, present on only segments 2-5].

Sexual dimorphism. [Assumed strong. Gnathopod 2].

Variables. Article 3 of antenna 2 slightly elongate; ramus of uropod 3 shorter than peduncle; female assumed to be represented in original figure (*D. hirsuticornis*).

Relationship. Poorly described and distinguished from other genera in negative statements as follows: close to but not *Microphotis* and *Ampelisciphotis* in

presence of well-developed accessory flagellum; not *Cheiriphotis* because of long article 3 on antenna 1, even coxae and recurved shape of ramus on uropod 3; not *Ericthonius* because of well-developed accessory flagellum, larger coxae and not fully subcylindrical body.

Not *Photis* because of curved single (?outer) ramus on uropod 3; not *Parunciola* because carpus of gnathopod 2 short and lobed.

Species. *Dercothoe emissitius* Dana, 1852a, 1853 (Stebbing, 1906) [641]; *D. hirsuticornis* (Dana, 1852a, 1853) (Stebbing, 1906) [751];

Habitat and distribution. Marine, Sulu Archipelago, Rio de Janeiro, 10 m, 2 species.

Dodophotis Karaman

Dodophotis Karaman, 1985: 16-17.

Type species. *Photis digitata* K.H. Barnard, 1935, original designation.

Diagnosis. Like *Photis* but inner plate of maxilla 2 with row of facial setae.

Other minor distinctions from description of *Photis*. Ocular lobes long, rounded. Eyes small. Labrum subrounded. Outer plate of maxilla 1 with 9-11 spines. Article 4 of maxillipedal palp short, with long nail and setae. Pereopod 5 slightly shorter than and weakly different from pereopods 6-7, with broader, article 2; dactyl of pereopods 5-7 with accessory tooth on outer margin, only pereopod 6 bearing long spine closing on palm.

Sexual dimorphism. As in *Photis*.

Species. *Dodophotis digitata* K.H. Barnard, 1935 (Nayar, 1959) (Rabindranath, 1971b) [670]; *D. distinguenda* Ruffo, 1955 (Ledoyer, 1982b) [698N].

Habitat and distribution. Marine, Indian Ocean, shallow water, 2 species.

Dryopoides Stebbing

Fig.42H

Dryopoides Stebbing, 1888: 1145.–J.L. Barnard, 1973b: 17.

Type species. *Dryopoides westwoodi* Stebbing, 1888, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, 3 covered by telson, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak. (Head as long as pereonites 1-2 together). Eyes large. Antennae very long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 short. Epistome [?unproduced anteriorly]. Labrum subrounded, weakly incised. Mandible normal, palp strong, slender, article 3 falciform, longer than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular long, pointed. Inner plate of maxilla 1 vestigial, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae.

Coxae relatively short, strongly overlapping, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, smaller than 1, dilated, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 weakly diverse, small; gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, article 5 as long as 6, poorly lobed, article 6 not enlarged. Gnathopod 2 slightly enlarged, weakly subchelate, article 5 longer than 6, unlobed, article 6 not more slender than article 5, dactyl ordinary.

Pereopods 3-4 normal, similar, with inflated article 2, article 4 dilated, dactyls long and combed (see below). Pereopods 5-7 similar to each other, progressively longer, with narrow unlobed article 2, dactyl of pereopods 5-7 medium, curved, with comb of inner marginal setae. Sternal processes of thorax [undescribed]. Coxal gills undescribed but present on segments 2-6 [?7]. Pleopods with outer rami reduced. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami equal, shorter than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, very short, biramous, both rami very short, disjunct from each other, obtuse distally, with few armaments mostly apical; peduncle short, flat. Telson entire, as broad as long, ovate or semicircular, with 2 sets of apical setules.

Female. Gnathopods small, gnathopod 1 larger than 2, poorly subchelate, article 5 shorter than 6, unlobed. Oostegites broad, present on segments 2- 5.

Sexual dimorphism. Weak. Gnathopods.

Relationship. Characterised by the small uropod 3 with two disjunctly attached tiny rami and comb of inner dactylar setae on pereopods 3-7.

Species. *Dryopoides westwoodi* Stebbing, 1888, 1910a [784].

Habitat and distribution. Marine, south-eastern Australia, 62-108 m, 1 species.

[Ischyroceridae] ***Ericthonius*** Milne Edwards

Figs 39E, 42L, 44I, 45B,U, 46Q

Ericthonius Milne Edwards, 1830: 382.–Stebbing 1906: 670.–J.L. Barnard 1969c: 192.–J.L. Barnard, 1973b: 24.–Lincoln, 1979a: 558.–Myers & McGrath, 1984a: 379 (keys).

Pyctilus Dana 1852b: 218 (*Pyctilus macrodactylus* Dana, 1852a, present selection).

Type species. *Ericthonius difformis* Milne Edwards, 1830, selected by Stebbing, 1888.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. (Head as long as pereonites 1-2 together). Eyes medium to large, weak or absent. Antennae long, subequal, both slender, peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum vestigial or absent. Antenna 2 peduncular article 3 scarcely elongate. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with a row of medial setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae very small, short, weakly contiguous or not, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 longer than 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 longer than 6, lobed. Gnathopod 2 enlarged, weakly subchelate, linear, carpochelate in male, with article 2 not dilated, article 4 extended along posterior margin of article 5, with process on posterodistal margin, dactyl long.

Pereopods 3-4 similar, with inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 shorter than pereopods 6-7, pereopods 5-7 with medium-narrow almost lobed article 2, pereopods 6-7 with longer curved dactyl, dactyl of pereopod 5 almost geniculate, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal (see Variables), rami slightly unequal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 small, uniramous, single ramus short, recurved apically, with distal hooks, peduncle elongate, longer than ramus. Telson entire, short, reduced, broader than long, rectangular, emarginate apically, covered with hooks.

Female. Gnathopod 2 small, but larger than 1, normally subchelate, article 5 shorter than 6, strongly lobed. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Male body almost tubular as in caprellids and segment 2 elongate (*E. difformis*); ocular lobes extended and blunt (female *E. difformis*); lengths and stoutness of antennae and uropods 1-2 variable; male coxa 2 with or without stridulation ridges, coxa 2 widely disjunct or not from coxae 1 and 3; shape and proportions of gnathopod 2 variable, male carpochela with 1-2 teeth; dactyl of pereopods 3-4 much longer or shorter than propodus; merus of pereopod 4 with anterior setal brush (*E. stephenseni*); article 2 of pereopod 5 with odd nasiform lobe (*E. macrodactylus*); inner ramus of uropod 2 absent and represented by process of peduncle (*E. latimanus*).

Relationship. Characterised by hooked uniramous uropod 3 with carpochelate gnathopod 2 in male, denticulate telson, long article 3 of antenna 1 with insignificant accessory flagellum and pereopod 5 almost prehensile.

Differing from *Chevreuxius* and *Grandidierella* in the reversal of the carpochelate gnathopod (in *Ericthonius* it is the second); from *Chevreuxius* also in the biramous uropod 2.

Ericthonius is an ischyrocerid because of the recurved and hooked ramus on uropod 3 but it differs from most other ischyrocerids in the loss of the inner ramus.

See *Microphotis* and *Pseudericthonius*.

Note. Identifications of species outside of Atlantic collections investigated by Myers & McGrath (1984a) now require revision; for example numerous identifications of *E. brasiliensis* in the Pacific and Indian Oceans are suspect.

Species. *Ericthonius brasiliensis* (Dana, 1853) (Bousfield, 1973) (Myers, 1982b) (Hong, 1983) (Myers & McGrath, 1984a) (Fenwick, 1985a) (Ledoyer, 1986) (= *E. bidens* Costa, 1853, 1857) (= *E. rapax* Stimpson, 1857) (= *E. difformis* identification of Bate, 1857d) (= *E. abditus* identification of Bate, 1862 and Bate & Westwood, 1863) (= *E. latimanus* Grube, 1864a,c) (= *E. minax* Smith, 1873) (= *E. disjunctus* Stout, 1913) [possibly 420 + B but at present = 751 + 340 to 470 + 260 + 698]; *E. difformis* Milne Edwards, 1830 (Sars, 1895) (Bousfield, 1973) (Myers & McGrath, 1984a) (= *E. leachii* Krøyer, 1842) (= *E. whitei*

Gosse, 1853) (= *E. ponticus* Marcusen, 1867; Czerniawsky, 1868) (= *E. longimanus* Boeck, 1871b) [240]; *E. fasciatus* (Stimpson, 1853) (Myers & McGrath, 1984a) (= *E. rubricornis* identification of Bousfield, 1973) [250]; *E. grebnitzkii* Gurjanova, 1951 [279]; *E. ledoyeri*, new name (= *E. latimanus* Ledoyer, 1978b, 1979a, 1986, = homonym) [690]; *E. macrodactylus* Dana, 1852a, 1853 (Walker, 1904) (Pirlot, 1938) (Nayar, 1967) [600]; *E. megalops* (Sars, 1879, 1885) (Stephensen, 1944c) (Myers & McGrath, 1984a) [240 + B]; [*E. peculans* and *E. speculans* (Dana, 1852a, 1853) (Stebbing, 1906) [647]]; *E. pugnax* (Dana, 1852a, 1853) (Hurley, 1954e) (Nagata, 1965c) (Hirayama, 1985b) (Ledoyer, 1986) [600w]; *E. punctatus* (Bate, 1857d) (Myers, 1982b) (Myers & McGrath, 1984a) (= *E. abditus* of Sars, 1895) (= *E. brasiliensis* of Chevreux & Fage, 1925; Gurjanova, 1951; Lincoln, 1979a) [200 + 420T]; *E. rubricornis* (Stimpson, 1853) (Myers & McGrath, 1984a) (= *E. hunteri* of Bate, 1862; Sars, 1895; Chevreux & Fage, 1925; Stephensen, 1944a; Gurjanova, 1951) (= *E. difformis* identification of Lincoln, 1979a) [250]; *E. stephenseni* Myers & McGrath, 1984a (= "species" of Stephensen, 1944b) [240B]; *E. tolli* Brüggen, 1909 (Gurjanova, 1951) (Kudrjaschov, 1972b) [200].

Habitat and distribution. Marine, cosmopolitan, 0-1134 m, 12 species.

Gammaropsis Liljeborg

Synonymy. See following (sub)genera below: *Gammaropsis*, *Megamphopus*, *Paranaenia*, *Podoceropsis* (= *Kermystheus*), *Pseudeurytheus* and *Segamphopus*.

Intergradations among all of these (sub)genera occur in the following characters: number of articles in accessory flagellum; density of setation on inner plate of maxilla 1; diversity of anterior coxae; length of carpi on gnathopods 1 and 2. The transformations in attendant species prevent any clear distinctions of generic value among the type species of the several (sub)genera.

The following key may be useful in determining the general facies of each (sub)genus; the generalities have been used to assign species loosely to each (sub)genus so that *Gammaropsis* is constructed to retain most of the ordinary members which have normal anterior coxae coupled with short carpi on gnathopod 2; most of the species with 3+articulate accessory flagellum are retained in *Gammaropsis* but many species with 1 to 2-articulate accessory flagellum in which coxae and gnathopods are ordinary are also retained there. Species with vestigial or absent accessory flagellum are put unnaturally into *Podoceropsis*. Species with extremely long carpi on gnathopod 2 are placed with *Pseudeurystheus* and *Segamphopus* and species with diverse coxae are situated in *Megamphopus*, *Kermystheus* and *Paranaenia*. The diversity of gnathopods, pereopods, uropods, setation patterns, antennae, and other characters in such groups as *Megamphopus* and *Podoceropsis* demonstrates their unnatural groupings. Undoubtedly the various members of those groups have several ancestral foci, so that the development of coxal diversity or the loss of accessory flagellum have occurred several times.

Key to Subgenera of *Gammaropsis*

1. Article 5 of male gnathopod 2 about 1.6 times as long as article 6 2

—— Article 5 of male gnathopod 2 about as long as or much shorter than article 6 3

2. Article 5 of male gnathopod 1 about 2.1 times as long as article 6 ..... *Segamphopus*

—— Article 5 of male gnathopod 1 about 1.3 times as long as article 6 ..... *Pseudeurystheus*

3. Accessory flagellum absent or scale-like 4

—— Accessory flagellum long and 1+articulate 5

4. Coxa 2 with large posterior lobe in male ..... *Podoceropsis(Kermystheus)*

—— Coxa 2 ordinary ..... *Podoceropsis*

5. Anterior coxae uniform ..... *Gammaropsis*

—— Anterior coxae diverse in male 6

6. Coxa 3 dominant in male ..... *Paranaenia*

—— Coxa 2 dominant in male ..... *Megamphopus*

(*Gammaropsis*) Liljeborg

Figs 39A, 41F, 43B, 44E, 45J, 46H

Gammarus (*Gammaropsis*) Liljeborg, 1855: 55.
Eurystheus Bate, 1856: 58 (*nomen nudum*); 1857d: 143 (*Eurystheus tridentatus* Bate, 1857d, monotypy).–Stebbing, 1906: 610.
Maeroides Walker, 1898b: 282 (*Maeroides thompsoni* Walker, 1898b, monotypy).
Fimbriella Stout, 1913: 642 (*Fimbriella robusta* Stout, 1913, monotypy).
Gammaropsis.–J. L. Barnard, 1969c: 271.–J.L. Barnard, 1973, 17.–Conlan, 1983: 4.

Type species. *Gammarus maculatus* Johnston, 1828, selected by Boeck, 1876.

Diagnosis. *Type only.* Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short to moderate, pointed; antennal sinus deep. Eyes large. Antennae long, nearly subequal, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 scarcely longest accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 short, elongate. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, moderately stout, article 3 clavate, slightly shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with a row of medial setae, also with 2 apical setae, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner narrow, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, slightly short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with long setae.

Coxae ordinary, long, strongly overlapping, almost uniform, even from 2 to 4, coxa 1 not dilated, not produced forward, somewhat small in contrast to coxae 2-4, coxa 2 larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 weakly diverse, densely setose, gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 as long as 6, unlobed. Gnathopod 2 enlarged, subchelate, with article 2 weakly dilated, with article 4 enlarged, incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 almost as long as 6, unlobed, article 6 dilated, sometimes oblong, palm oblique, dactyl long.

Pereopods 3-4 normal, almost longer than gnathopods, similar, with slender article 2, article 4 weakly dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with expanded article 2, pereopod 5 slightly shorter than pereopods 6-7, with slightly broader, almost lobed article 2, dactyl of pereopods 5-7 medium, curved. Sternal processes of thorax absent. Coxal gills moderately narrow, present on segments 2-6. Pleopods normal. Epimeron 3 scarcely bisinuate. Uropods 1-2 biramous, normal, stout, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 well developed, biramous, rami ordinary, subequal, lanceolate, pointed distally, peduncle as long as rami, elongate, not dilated medially, outer ramus with vestigial article 2, apically setose, narrow. Telson entire, short, as broad as long, ovate, with 2 hooked apical cusps.

Female. Gnathopods small, gnathopod 2 larger than 1 poorly subchelate, article 5 shorter than 6, unlobed. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Moderate. Gnathopods.

Variables. Taxonomy based on variations in male gnathopod 2 setosity, palmar slope, sculpture and spination, length of carpus and size of dactyl; coxal serrations; shapes of article 2 on pereopods 5-7 and occasional proportions of other articles; size of epistomal process; shapes of ocular lobes and eyes; degree of bisinuation on epimeron 3; setosity of antennae 1-2; tiny cuspidations on urosomites 1-2; presence or absence of terminal spine clusters on rami of uropod 3, or inner ramus lacking all but one spine (*G. atlantica*); size of apical spines on telson.

Ocular lobes elongate, with eyes at apices (*G. togoensis*); maxilla 2 poorly developed (*G. latipalma*); species besides type often with variations in coxae 1-4, coxa 1 often small; some posterior coxae slightly spiniform (*G. dentata*); coxa 7 enlarged and lobate (*G. shoemakeri*); male and female gnathopod 2 almost lacking palms but propodi thinner and remaining relatively expanded (*G. pseudostroumowi*); article 5 of male gnathopod 2 elongate, thus more like *Megamphopus* (*G. melanops*) but coxae orthodox; male gnathopods small, gnathopod 2 not much larger than 1, carpus longer

than propodus and article 2 dilated (*G. angolensis*); article 2 of pereopods 5-7 thinner and thus like *Megamphopus*) (*G. melanops, G. ulrici*) but coxae orthodox; articles 4-5 of pereopod 5 dilated, article 2 of pereopods 5-7 slightly lobate (*G. anomala*); oostegites often somewhat broadened; uropod 2 with spur (e.g. *G. togoensis*); rami of uropod 3 more slender, less armed and outer ramus lacking article 2 (thus like *Megamphopus palmata*) but coxae orthodox; same characters and inner ramus slightly shortened (*G. deseadensis*); uropod 3 very poorly armed (*G. kaumaka*).

Male gnathopod 2 immense, carpus short and lobate, propodus huge, elongate, palm and posterior margin of carpus mostly confluent, occasionally with tooth or teeth, dactyl large, sometimes as long as propodus but often shorter but greatly enlarged: these species in genera to follow marked with (*).

Relationship. The basic genus of Corophioidea, the primitive members of which are very basic in their general amphipod attributes, such as presence of well-developed accessory flagellum, ordinary mouthparts with medial setae on the inner plates of maxillae 1-2, large regular coxae, sexually dimorphic gnathopods with male gnathopod 2 enlarged and capable of amplexus, and biramous uropod 3 with rami extending subequally and longer than peduncle.

Several genera of Ischyroceridae are very difficult to distinguish from *Gammaropsis* because of the several species in *Gammaropsis* that have shortened rami on uropod 3 with elongate peduncle; ischyrocerids have definite apicolateral cusps on the outer ramus of uropod 3 but these are often minute and may not have been well studied in various species. For example, *G. l ongicornis* is very difficult to separate from *Parajassa.* The genus *Bonnierella* also has species with similar uropod 3.

See incipient subgenera below. See *Aorchoides, Audulla, Bogenfelsia, Bonnierella, Isaea, Ledoyerella, Leptocheirus, Microprotopus, Pagurisaea, Pareurystheus, Posophotis* and *Protomedeia.*

Removals. *Gammaropsis alaskensis* Stebbing (1910a) (= homonym *G. dentatus* Holmes, 1908) to *Cheirimedeia*; *G. lina* (Kunkel, 1910) to *Audulla.*

Species. See J.L. Barnard (1965a), Griffiths (1973, 1974b,c, 1975), Nayar (1967), Pillai (1957), Sivaprakasam (1969c, 1970a); *G. abbotti* (J.L. Barnard, 1965a) (Ledoyer, 1972a, 1978b, 1979a,b, 1982b) [600]; *G. abyssalis* (Stephensen, 1944c) [209b]; *G. afra* Stebbing, 1888, (Sivaprakasam, 1970a) (J.L. Barnard, 1970a) (Griffiths, 1975) (Ledoyer, 1978b, 1982b) [600 + 428 + B]; *G. alamoana* J.L. Barnard, 1970a [381]; **G. anomala* (Chevreux, 1926b) (Reid, 1951) [440]; *G. atlantica* Stebbing, 1888 (J.L. Barnard, 1965a, 1970a) (Ledoyer, 1978b, 1979a, 1982b) (Myers, 1985c) (= *G. zeylanicus* Walker, 1904) (= *G. gardineri* Walker, 1905b) (= *G. imminens* K.H. Barnard, 1916); *G. a. varius* Hirayama, 1984a [421]; *G. avera* (Reid, 1951) [444]; *G. bennetti* Thurston, 1974a [871]; *G. chiltoni* (Thomson, 1897) (Chilton, 1920b) (J.L. Barnard, 1972b) [773]; ?*G. concava* (Shoemaker, 1916) [373]; *G. crassipes* (Haswell, 1880a) (Chilton, 1920b) (J.L. Barnard, 1972b) [784 + 775]; *G. crenulata* Krapp-Schickel & Myers, 1979 [340]; *G. ctenura* (Schellenberg, 1931) [831]; *G. dentata* Chevreux, 1900a (Krapp-Schickel & Myers, 1979) [330 + 340 + B]; *G. denticulata* Ledoyer, 1979a, 1982b [698]; *G. deseadensis* Alonso, 1981 [862]; *G. digitata* (Schellenberg, 1938a) (J.L. Barnard, 1970a) (Ledoyer, 1982b) (Myers, 1985c) [600]; *G. dilatata* Ledoyer, 1979a, 1982b [698]; **G. dubia* (Shoemaker, 1942) [542]; *G. dubia* (Rabindranath, 1974: 112) (= homonym), (*G. anomalus* Rabindranath, 1971b, = homonym) [665]; *G. effrena* (J.L. Barnard, 1964b, 1969a) [370]; *G. ellisi* Conlan, 1983 [270]; *G. emancipata* Krapp-Schickel & Myers, 1979 [348]; *G. exsertipes* Stebbing, 1888, 1906 [851]; *G. georgiana* (Schellenberg, 1931) [831B]; *G. grandimana* Ledoyer, 1978b [697]; *G. gurvitzi* (Bulycheva, 1952) (Tzvetkova, 1977b) [395]; **G. haswelli* (Thomson, 1897) (Chilton, 1920b) (J.L. Barnard, 1972b) [781 + 775]; *G. hirsutimana* (Reid, 1951) [444]; *G. holmesi* (Stebbing, 1908b) (K.H. Barnard, 1955) (?Ledoyer, 1978b) (= *G. semidentatus* K.H. Barnard, 1916, Schellenberg, 1926a) [743 + ?697]; *G. inhaca* Griffiths, 1973 [741]; *G. insignis* (Chilton, 1925a) [954E]; *G. japonica* (Nagata, 1961b, 1965c) (Hirayama, 1984a) [395]; *G. kaumaka* J.L. Barnard, 1970a [381]; *G. kergueleni* (Schellenberg, 1926a,c) (Bellan-Santini & Ledoyer, 1974) [851]; *G. latipalma* Ledoyer, 1979a, 1982b [698]; **G. lobata* (Chevreux, 1920) (Chevreux & Fage, 1925) (Myers & McGrath, 1982a) [352]; *G. longicantha* (Mateus & Mateus, 1966) [446]; **G. longicarpa* Reid, 1951) (Griffiths, 1975) [444 + 743]; *G. longicornis* (Walker, 1906a, 1907) (Bellan-Santini & Ledoyer, 1974) (= *G. parvus* Schellenberg, 1926a) [881]; (= *G. trigonurus* Schellenberg, 1926a) [851]; [880 + B]; *G. longimana* (Chilton, 1884a) (Stebbing, 1906) (J.L. Barnard, 1972b) [774]; *G. longipropodi* Hirayama, 1984a [395]; *G. longitarsa* (Schellenberg, 1931) (Bellan-Santini & Ledoyer, 1986) [866 + 799]; *G. lophomeria* (K.H. Barnard, 1937) [674]; **G. maculata* (Johnston, 1828) (Krapp-Schickel, 1976) (Krapp-Schickel & Myers, 1979) (Myers & McGrath, 1982a) (= *G. erythrophthalmus* Liljeborg, 1855, 1856; Sars, 1895) (= *G. tridentatus* Bate, 1856, 1857d) (= *G. bispinimanus* Bate, 1862) [250 + 352 + B]; *G. martesia* (J.L. Barnard, 1964b, 1969a) [370]; *G. mauritiensis* Ledoyer, 1978b [697]; *G. melanops* Sars, 1883, 1895 (Gurjanova, 1951) (Shoemaker, 1955b) [200 + B]; *G. minuta* (Chevreux, 1926b) [441]; *G. monodi* (Schellenberg, 1931) (Ruffo, 1949) (= *G. eurypodii* K.H. Barnard, 1932) [866]; *G. nantis* Hirayama, 1984a [395]; *G. ostroumowi* (Sowinsky, 1897, 1898) (Chevreux & Fage, 1925) (Krapp-Schickel & Myers, 1979) [340]; *G. pacifica* (Schellenberg, 1938a) (J.L. Barnard, 1965a) (?Ledoyer, 1967a) (Myers, 1985c) [600]; *G. pali* J.L. Barnard, 1970a (Ledoyer, 1972a, 1982b) [600]; *G. palmata* (Stebbing & Robertson, 1891) (= *G. nana* Sars, 1895) (Chevreux, 1911d) (Karaman, 1973b) (Krapp-Schickel & Myers, 1979) (Lincoln, 1979a) (Myers & McGrath, 1982a) [352]; *G. palmoides* (K.H. Barnard, 1932, 1940, 1955) (Griffiths, 1975) [743]; *G. persetosa* (Chilton, 1921d) (Hale,

1929) [785]; *G. photisimilis* Ruffo, 1969 (Ledoyer, 1978b, 1982b) [685]; *G. pokipoki* J.L. Barnard, 1970a (Ledoyer, 1978b) (Myers, 1985c) [600]; *G. pseudodenticulata* Ledoyer, 1979a, 1982b [698]; *G. pseudostroumowi* Ledoyer, 1977 (Krapp-Schickel & Myers, 1979) [348 + B]; *G. purpurescens* (K.H. Barnard, 1932) [875 + B]; *G. remipes* (K.H. Barnard, 1932, 1965) [831 + 733 + ?850]; *G. scissimana* (K.H. Barnard, 1926) (Griffiths, 1975) (Ledoyer, 1982b) [745 + B]; *G. serratus* (Schellenberg, 1925a) [441]; *G. serricrus* (K.H. Barnard, 1932) [890 + B]; *G. setifera* (Schellenberg, 1938a) (Myers, 1985c) [555]; *G. shoemakeri* Conlan, 1983 (= *G. lobata* Shoemaker, 1942, junior homonym) [379]; *G. spinosa* (Shoemaker, 1942) (J.L. Barnard, 1969a) (Conlan, 1983) [379]; *G. sutherlandi* Nelson, 1981 [362 + B]; *G. tawahi* J.L. Barnard, 1972b [775]; *G. thompsoni* (Walker, 1898b) (J.L. Barnard, 1959d, 1969a,b) (Conlan, 1983) (= *G. tenuicornis* Holmes, 1904a, Shoemaker, 1931a, 1942) (= *G.robusta* Stout, 1913) (= *G. concava* Shoemaker, 1916) [379]; *G. thomsoni* Stebbing, 1888, 1910a (Chilton, 1921d) (J.L. Barnard, 1972b) (TL depth 2001 m probably erroneous) [TL = 715A, + ?774, ?784]; *G. togoensis* (Schellenberg, 1925a, 1939) (Sivaprakasam, 1968c) (Krapp-Schickel & Myers, 1979) (Myers, 1985c) [TL = 445, 343, 447, 664]; *G. tonichi* (J.L. Barnard, 1969b, 1979b) [377]; *G. triodon* (Schellenberg, 1926a, 1931) [880 + B]; *G. ulrici* Krapp-Schickel & Myers, 1979 [348]; *G. valdiviae* (Schellenberg, 1926c) [851 + I].

Habitat and distribution (including subgenera below). Marine, cosmopolitan, 0-900 m, rare below 300 m (2001 m probably erroneous), occasionally weakly inquilinous on hermit crabs and molluscs, 105 species.

(*Megamphopus*) Norman

Megamphopus Norman, 1869a: 282.–Thurston, 1974b: 91.–Lincoln, 1979a: 508.

Type species. *Megamphopus cornutus* Norman, 1869a, original designation.

Diagnosis. Like *Gammaropsis* but anterior coxae diverse, coxa 2 of male dominant, coxa 1 produced forward, coxae 3-4 much inferior to coxa 2.

Variables. Coxa 2 with large posteroventral lobe (*G. mamolus*).

Species. (*) see Variables in *Gammaropsis*; *G. brevidactyla* Myers, 1976a [348]; **G. cornuta* Norman, 1869a (Sars, 1895) (Chevreux & Fage, 1925) (Myers, 1976a) (Ledoyer, 1977) (Lincoln, 1979a) (= *G. longimana* Boeck, 1871b, 1876) (= *G. intermedia* Stebbing, 1878a) [350 + ?334]; *G. dimorpha* (K.H. Barnard, 1932) (gnathopod 1 carpus = propodus, coxae 1-3 diverse) [831 + B]; *G. elephantis* (K.H. Barnard, 1932) [871B]; *G. longicornis* Chevreux, 1911d [= homonym to *Gammaropsis longicornis* Walker, above, see] (Chevreux & Fage, 1925) (Myers, 1976a) (Arresti, *et al.*, 1986a) [352]; **G. longidactyla* Chevreux, 1926b [441]; *G. mamola* J.L. Barnard, 1962a, 1966b, 1969a [370]; ?*G. pachypa* Schellenberg, 1925a [441]; "species" Rabindranath, 1971b [666]; "species" Kangas & Geddes, 1984 [785].

Habitat and distribution. Marine, included with *Gammaropsis*.

(*Paranaenia*) Chilton

Paranaenia Chilton, 1884a: 258.

Type species. *Paranaenia typica* Chilton, 1884a, present selection.

Diagnosis. Like *Gammaropsis* but anterior coxae diverse, coxa 3 dominant and bearing strong anterior lobe and stridulation border.

Antenna 2 not longer than 1.

Variables. Gnathopods entirely distinctive from *P. dentifera* (*P. angolensis*).

Species. (*) see Variables in *Gammaropsis*; ?*P. angolensis* (Schellenberg), 1925a [449]; **P. dentifera* (Haswell, 1879a) (Schellenberg, 1931) (Bellan-Santini & Ledoyer, 1974) (probably includes *P. typica*) [835]; *[*P. typica* (Chilton, 1884a) (J.L. Barnard, 1972b) (Alonso, 1980) (= homonym *P. dentifera* Chilton, 1884a) [775 + 862]];

Habitat and distribution. Marine, Australia, New Zealand, Magellan, shallow water, 2 species, data also included with *Gammaropsis*.

(*Podoceropsis*) Boeck

Podoceropsis Boeck, 1861: 666.–Stebbing, 1906: 618.–J.L. Barnard, 1969c: 274.–J.L. Barnard, 1973b: 18.–Conlan, 1983: 17.

Naenia Bate, 1862: 471 (*Naenia tuberculosa* Bate, 1862, present selection, homonym, Lepidoptera).

Xenoclea Boeck, 1871b: 234 (*Xenoclea batei* Boeck, 1871b, monotypy).

Kermystheus J.L. Barnard, 1962a: 14 (*Kermystheus ociosa* J.L. Barnard, 1962a, original designation) [?valid subgenus].

Type species. *Podoceropsis sophia* Boeck, 1861, monotypy.

Diagnosis. Like *Gammaropsis* but accessory flagellum scale-like or absent.

Variables. Distinctive gnathopods and other character forms (*G. chionoecetophila*). Coxa 2 with large posterior lobe (*Kermystheus ociosus*).

Removals. *G. kermadeci* Stebbing, 1888, 1906 [523B] to unknown genus, but retained here provisionally until posterior end described; not in *Gammaropsis* complex because dactyl of maxilliped stubbier and lined with inner setae, head much more extended anteriorly, eyes absent, plates of maxilliped slightly reduced, shape of gnathopod 2 more like *Bonnierella*; also not in *Bonnierella* because maxillipedal dactyl short, stubby and setose marginally, inner plate of maxilla 2 with medial setae, pereopods 3-4 with long curled setae on article 6, and gnathopod 1 very small.

Species. (*) see Variables in *Gammaropsis*; see Chevreux & Fage (1925), Gurjanova (1951), Nagata (1965c); **G. amchitkensis* Conlan, 1983 [273]; *G. angulosa* Chevreux, 1919, 1927 [401aN]; *G. angustimana* Conlan, 1983 [271]; *G. barnardi* Kudrjaschov & Tzvetkova, 1975 (Conlan, 1983) [230]; *G. chionoecetophila* Conlan, 1983 [270I + B]; *G. inaequistylis* Shoemaker, 1930a (Steele *et al.*, 1986a) [256]; *G. kermadeci* (Stebbing, 1888, 1906 [523B]; *G. lindahlii* Hansen, 1888 (Gurjanova, 1951) (Shoemaker, 1955a) [220]; *G. nitida* (Stimpson, 1853) (Bousfield, 1973) (Lincoln, 1979a) (Myers & McGrath, 1982a) (Moore, 1984c) (= *G. rimapalma* Bate, 1862) (= *G. excavata* Bate, 1862; Sars, 1895) (= *G. tuberculosa* Bate, 1862) (= *G. batei* Boeck, 1871b, 1876) (= *G. caudadentata* Norman, 1867, *nomen nudum*) (= *G. megacheir* Smith, 1874) [200]; **G. ociosa* J.L. Barnard, 1962a, 1966b [370]; *G. setosa* Conlan, 1983 [273]; *G. similis* Schellenberg, 1925a [440]; *G. sophiae* Boeck, 1861, 1876 (Sars, 1895); (Karaman, 1973b) (Lincoln, 1979a) (Krapp-Schickel & Myers, 1979) (Myers & McGrath, 1982a) (Hirayama, 1984a) (= *G. undata* Bate, 1862) (= *G. pusilla* Chevreux, 1926b) [441] [352 + B].

Habitat and distribution. Marine, data included with *Gammaropsis*.

(*Pseudeurystheus*) Schellenberg

Pseudeurystheus Schellenberg, 1931: 234.

Type species. *Pseudeurystheus sublittoralis* Schellenberg, 1931, monotypy.

Diagnosis. Like *Gammaropsis* but carpus of male gnathopod 2 about 1.6 times as long as propodus; carpus of male gnathopod 1 about 1.3 times as long as propodus.

Species. *Gammaropsis sublittoralis* Schellenberg, 1931 (Thurston, 1974b) [833 + B].

Habitat and distribution. Marine, South Georgia Island region, 17-310 m, 1 species, data also included with *Gammaropsis*.

(*Segamphopus*) J.L. Barnard

(*Segamphopus*) J.L. Barnard, 1962a: 15 [valid subgenus].

Type species. *Megamphopus blaisus* K.H.Barnard, 1932, original designation.

Diagnosis. Like *Gammaropsis* but carpus of male gnathopod 2 about 1.6 times as long as propodus; carpus of male gnathopod 1 about 2.1 times as long as propodus.

Species. *Gammaropsis blaisus* K.H. Barnard, 1932 [833 + B]; *G. utinomii* (Nagata, 1961b, 1965c) (Hirayama, 1984a) [395].

Habitat and distribution. Data included with *Gammaropsis*.

Globosolembos Myers

Lembos (Globosolembos) Myers, 1985a: 341.–Myers, 1986b: 283 (key).

Type species. *Autonoe smithi* Holmes, 1905, original designation.

Diagnosis. Like *Lembos* but gnathopod 1 of both sexes equally or subequally enlarged; outer ramus of uropod 3 with only 1 article.

Sexual dimorphism. Weak. Gnathopods, coxa 1.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin sinuous; left mandibular molar with complex plates, primary plate falcate, secondary, tertiary and quaternary plates of similar shape but not markedly falcate; anterior margin of maxilliped [?without wing-like flanges, not described]; male gnathopod 1 propodus very enlarged, globose, lacking strong palmar excavation, carpus cup-shaped; female gnathopod 1 enlarged, subsimilar to that of male; pereopod 5 propodus posterior margin with setae but no spines; uropod 3 peduncle short, expanded, outer ramus lacking second article, with long marginal setae and extremely long distal setae.

Variables. *Generalities.* Same as for *Lembos*. Gnathopod 1 weakly carpochelate, carpus and propodus both stout and short, female gnathopod 1 two thirds as large as male gnathopod 1 (*G. kraemmeri*).

Relationship. As in Diagnosis.

See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. *Globosolembos excavatus* (Myers, 1975a, 1985a, 1986b) (Ledoyer, 1982b) [600]; *G. francanni* (Reid, 1951) (Myers, 1985a) [443]; *G. indicus* (Ledoyer, 1967, 1978b, 1979a, 1982b) (?Sivaprakasam, 1970g) (Myers, 1985a) [600]; ?*G. kraemmeri* (Reid, 1951) (?Mateus & Mateus, 1966) [444]; *G. leapakahi* (J.L. Barnard, 1970a) [381]; *G. ovatus* Myers, 1985a,c [555]; *G. ruffoi* (Myers, 1975a) (= species of J.L. Barnard, 1965a) [683]; *G. smithi* (Holmes, 1905) (Bousfield, 1973) (Myers, 1977, 1981d) [364]; *G. tiafaui* Myers, 1985a [573].

Habitat and distribution. Marine, circumtropical, north to Cape Cod, 0-73 m, 9 species.

Goesia Boeck

Goesia Boeck, 1871b: 231.–Stebbing, 1906: 622.–J.L. Barnard, 1969c: 272.–J.L. Barnard, 1973b: 18.

Type species. *Autonoe depressa* Goes, 1866, monotypy.

Diagnosis. Body subcylindrical but laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus moderate. Eyes small. Antenna 1 longer than 2, both slender, peduncular article 3 of antenna 1 much shorter than 1, article 2 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, peduncle stout in male, flagellum 9+articulate. Epistome [?unproduced anteriorly]. Labrum subrectangular, weakly incised. Mandible normal, palp strong, slender, article 3 falciform, as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, though outer appearing slightly geniculate, inner plate shortened, with only mediomarginal setae. Inner plate of maxilliped almost pointed, with distal setae only, outer plate long, reaching apex of palp article 2, with only setae on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, almost vestigial, with long setae.

Coxae long, strongly overlapping, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, barely produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 slightly smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, small, densely setose, filtrative, gnathopod 2 slightly larger than 1, gnathopod 1 subchelate, article 5 long, linear, unlobed, palm short, article 2 very setose anteriorly, articles 3-5 very setose posteriorly, article 3 slightly inflated. Gnathopod 2 slightly enlarged, almost simple, sublinear, with articles 2,5,6 very setose, filtrative, with article 5 slightly elongate, longer than 6, unlobed, article 6 dilated, as wide as article 5, with large spine on palm, dactyl long.

Pereopods 3-4 normal, longer than gnathopods, similar, with slender article 2, article 4 scarcely dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, with slightly expanded, unlobed, heavily setose article 2, pereopod 5 much shorter than pereopod 7, dactyls short. Sternal processes of thorax absent. Coxal gills [?slender to medium, present on segments 2-6]. Pleopods [?normal]. Epimeron 3 with tooth. Uropods 1-2 biramous, normal, stout, rami slightly unequal, as long as peduncle, peduncle of uropods 1-2 without ventrodistal process, that of uropod 2 occasionally smaller or obsolescent. Uropod 3 very short, biramous, both rami short, subequal or inner ramus strongly shortened, obtuse and weakly setose distally, peduncle shorter than rami, very short; rami of uropods 1-3 with very stout spines and setae. Telson entire, short, broader than long, ovate, sometimes almost pointed apically, with 2 hooked apical cusps.

Female. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. None.

Relationship. Very similar to *Leptocheirus* but differing in the further reduction of the maxillipedal dactyl, lack of spur on uropods 1-2, and with long setae but no short thick spines on the rami of uropods 1-2.

Haplocheira differs in the multisetose inner plate of maxilla 1, the rectolinear article 3 of the mandibular palp and the absence of an accessory flagellum.

See *Chevalia*, *Protomedeia*, and key with *Haplocheira*.

Species. *Goesia aberrans* (Ohlin, 1895b) (Gurjanova, 1951, as *Leptocheirus*) [220]; *G. depressa* (Goes, 1866) (Stappers, 1911) (Stephensen, 1942, 1944a) (Gurjanova, 1951) (Just, 1970) [220].

Habitat and distribution. Marine, Arctic Greenland to Kara Sea, 10-235 m, 2 species.

Grandidierella Coutière

Grandidierella Coutière, 1904: 166.–Myers, 1970: 136.–J.L. Barnard, 1973b: 18.–J.L. Barnard, 1977: 270.

Neomicrodeutopus Schellenberg, 1925a: 168 (*Neomicrodeutopus cabindae* Schellenberg, 1925a, monotypy).–J.L. Barnard, 1969c: 155.–J.L. Barnard, 1973b: 21.

(*Bigrandidierella*) Karaman, 1985: 37 (*Microdeutopus megnae* Giles, 1888, original designation).

Type species. *Grandidierella mahafalensis* Coutière, 1904, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak. Eyes small to medium. Antennae elongate, 1 slender, antenna 2 weakly stout; peduncular article 3 of antenna 1 much shorter than 1, article 2 slightly longest, accessory flagellum 1.25-articulate. Antenna 2 peduncular article 3 scarcely elongate, peduncle slightly stout in male, flagellum much shorter than article 5 of peduncle, with 4-13 articles. Epistome unproduced anteriorly. Labrum subrounded, entire or weakly incised. Mandible normal, palp weak, very slender, article 1 elongate (or short, thus variable), article 3 rectolinear or clavate, scarcely longer, often shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 vestigial, without setae, outer plate with 10-11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with thin spines only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with short nail and setae.

Coxae very small, relatively short, mostly contiguous in type, discontiguous in other species, of various sizes and shapes, progressively shorter from 1 or 2 to 4, coxa 1 not dilated, not produced forward, or rarely with angular cusp, coxa 2 smaller or larger than 1, coxa 4 shorter than coxa 1, not lobed, coxa 5 usually longer than 4, coxa 7 much smaller than anterior coxae. Gnathopods 1-2 diverse, both with sublinear articles, often densely setose, gnathopod 1 greatly larger than 2, in male simple or with false palmar boss, carpochelate, article 4 enlarged, inflated, incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 long, thick, lobed, article 6 short, very narrow, dactyl large. Gnathopod 2 subchelate, feeble, palm transverse (type), linear, with article 4 slightly inflated and setose, article 5 longer than 6, unlobed, article 6 more slender than 5, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with almost linear, heavily setose article 2, pereopod 5 much shorter than pereopod 7, article 2 less setose, dactyl of pereopods 5-7 medium to long, curved. Sternal processes of thorax often present. Coxal gills [undescribed]. Pleopods with short peduncle, longer than broad, outer ramus shortened. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than peduncle, peduncle with ventrodistal process, that of uropod 2 (rarely 1) smaller or obsolescent. Uropod 3 of medium length, uniramous, single ramus long, 1-articulate, obtuse distally, narrow, tapering and with few armaments mostly apical, often with vestigial article 2, peduncle shorter than rami, very short, dilated medially. Telson entire, short, broader than long, pentagonal or trapezoidal, with 2 hooked apical cusps.

Female. Antennae shorter, antenna 2 more slender. Coxae different from male, coxa 1 narrower, coxa 2 longer. Gnathopods small, very setose, gnathopod 1 larger than 2, normally subchelate, article 5 longer than 6, unlobed, thick on gnathopod 1. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Coxae, gnathopods, antenna 2.

Variables. Antenna 2 exceptionally stout in male, article 4 slightly sculptured (*G. nottoni*); flagellum reduced to 5 articles (*G. vietnamica*); inner plate of maxilla 2 lacking facial setae (subgenus *Bigrandidierella*); variability in shapes, proportions, projections, setosity, ornaments (stridulation ridges) on gnathopods 1-2 and coxae; especially, carpal tooth formulas and sizes on gnathopod 1, dilation and sculpture of article 2; coxae more angular than normal, coxa 1 with small anterior point (*G. spinicoxa*); male gnathopod 1 carpus with large posterior spines (*G. exilis*), with stridulating ridges (*G. japonica*), with distal tooth and huge posterobasal tooth (e.g. *G. chelata*), carpus extremely swollen (*G. teres*); female gnathopod 1 carpus with posterodistal tooth (*G. perlata*); male gnathopod 2 article 4 enlarged, protruding (thus technically merochelate), merus, carpus and propodus heavily armed with filtrative setae (*G. gilesi, G. exilis*), carpus shorter than propodus (*G. gilesi*), equal to propodus (*G. exilis*); pereopods 3-4 inordinately setose and article 4 expanded (*G. grossimana*); pereopods 5-7 with variable setosity on article 2; pereopod 5 significantly different from pereopod 7, articles 4-6 very short and article 6 heavily spinose (*G. gravipes*); formula, shape and size of sternal processes in male of specific value; setosity of ramus on uropod 3 such as terminal only or terminal and lateral; ramus of uropod 3 apically geniculate (*G. gravipes*).

Synonymy. Although not known in the type species of *Neomicrodeutopus*, article 1 of the mandibular palp in *N. elongata* is short and this is the only difference previously connoted for *Neomicrocdeutopus* from *Grandidierella*. If the wide diversity in gnathopods is allowable within one genus there is little justification to keep *Neomicrodeutopus* separated from *Grandidierella*. There is little reason to believe the four species formerly in *Neomicrodeutopus* have a common ancestor but there is mild geographic separation of the group, all species of *Neomicrodeutopus* occurring in west Africa.

One must note that many species of *Grandidierella* have the tanaid-like heavily setose pereopod 7 whereas *N. elongata* does not.

Relationship. Differing from *Camacho* in the carpochelate gnathopod 1 and the uniramous uropod 3.

From *Unciola* in the carpochelate male gnathopod 1, long ramus of uropod 3, non-bisinuate epimeron 3 and less angular coxae.

See *Baracuma*, *Chevreuxius*, *Corophium*, *Janice*, *Paraoroides* and *Unciolella*.

Species. See K.H. Barnard (1935, 1940, 1952, 1958), Griffiths (1974a,b,c, 1975), Imbach (1969), Myers (1970, 1972) Nagata (1960), Nayar (1959), Schellenberg (1938a), Sivaprakasam (1970b), Tattersall (1922a); *G. africana* Schellenberg, 1936a [445]; *G. bispinosa* Schellenberg, 1938a (Bousfield, 1971) (Ledoyer, 1979b, 1984) (Myers, 1981b, 1985c) [550 to 640]; *G. bonnieroides* Stephensen, 1947b (Myers, 1970) (Heard, 1982) (Asari & Myers, 1982) [421E]; *G. cabindae* Schellenberg, 1925a [449]; *G. chelata* K.H. Barnard, 1951 [743E]; *G. dentimera* Myers, 1970 [381]; *G. elongata* (Chevreux, 1926b) (Reid, 1951) [445]; *G. exilis* Myers, 1981b [673E]; *G. gilesi* Chilton, 1921a (?Imbach, 1969) (Ledoyer, 1979b, 1982b) (Myers, 1981b) (Asari & Myers, 1982) [600]; *G. gravipes* K.H. Barnard, 1935 (Asari & Myers, 1982) [650F to 670]; *G. grossimana* Ledoyer, 1967b, 1982b (Myers, 1972) [698]; *G. indentata* Ledoyer, 1979b [648]; *G. insulae* Myers, 1981b [589];*G. japonica* Stephensen, 1938a (Chapman & Dorman, 1975) (Myers, 1981b) (Hirayama, 1984a) [395 to 781T]; *G. koa* J.L. Barnard, 1977b [381Q]; *G. lignorum* K.H. Barnard, 1935, 1952 (Griffiths, 1975) [743E]: *G. longidactyla* Ledoyer, 1982b [698]; *G. lutosa* K.H. Barnard, 1952 (Ledoyer, 1982b) [745E]; *G. macronyx* K.H. Barnard, 1935 (Asari & Myers, 1982) [664Q]; *G. mahafalensis* Coutiere, 1904 (Myers, 1972) (Ledoyer, 1982b) [919Q]; *G. makena* J.L. Barnard, 1970a, 1971a [381]; *G. megnae* (Giles, 1888) (= *G. bonnieri* Stebbing, 1908a) (Tattersall, 1922a) (Asari & Myers, 1982) [600 + 400]; *G. nottoni* Shoemaker, 1935b [537E]; *G. nyala* Griffiths, 1974c [743]; *G. palama* J.L. Barnard, 1977b [381Q]; *G. perlata* Schellenberg, 1938a (Myers, 1985c) [560 to 580]; *G. propodentata* Moore, 1986 [633E]; *G. robusta* Ledoyer, 1982b [698]; *G. spinicoxa* Myers, 1972 (Ledoyer, 1982b) [698]; *G. teres* Myers, 1981b, 1985c [576]; *G. vietnamica* Dang, 1968 [954F].

Habitat and distribution. Marine and freshwater, circumtropical and warm-temperate, littoral, lagoonal, brackish, anchialine, 0-80 m, 31 species.

Hansenella Chevreux

Hansenella Chevreux, 1909: 5.–J.L. Barnard, 1969c: 153.–Myers, 1969: 138.

Type species. *Hansenella longicornis* Chevreux, 1909, original designation.

Diagnosis. *Female.* Like females of *Microdeutopus* but female gnathopod 1 much more massively developed than in any females of *Microdeutopus*.

Male. Unknown.

Sexual dimorphism. Unknown.

Relationship. See Diagnosis.

Species. *Hansenella longicornis* Chevreux, 1909, 1935 [305B].

Habitat and distribution. Marine, near Azores, 1360 m, 1 species.

Key to the *Haplocheira–Leptocheirus* Group

1. Inner plate of maxilla 1 multisetose 2

—— Inner plate of maxilla 1 with 1 seta 4

2. Inner ramus of uropod 3 absent, coxa 1 small ..... *Kuphocheirus*

—— Inner ramus of uropod 3 present, coxa 1 present 3

3. Gnathopod 1 enlarged and almost parachelate ..... *Anonychocheirus*

—— Gnathopod 1 feeble, simple ..... *Haplocheira*

4. Uropods 1-2 with spur, rami with setae ..... *Goesia*

—— Uropods 1-2 lacking spur, rami not setose ..... *Leptocheirus*

Haplocheira Haswell

Haplocheira Haswell, 1879a: 273.–Stebbing, 1906: 609.–J.L. Barnard, 1969c: 272.–Moore & Myers, 1983: 181.

Type species. *Haplocheira typica* Haswell, 1879a (= *Gammarus barbimanus* Thomson, 1879b), monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short to absent, ocular lobes moderate, produced forward, pointed or blunt, antennal sinus moderate. Eyes medium. Antennae subequal, 1 slender, antenna 2 slightly stout; peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 2-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 short to scarcely elongate, peduncle occasionally slightly stout, flagellum with 4+ articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, moderately stout, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, large, with a row of medial and apical setae, outer plate with 9 spines, palp 2-articulate. Inner plates of maxilla 2 broad, outer narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway along palp article 2, with [?setae only on medial margin], palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae ordinary, overlapping, coxa 1 not dilated, barely produced forward, coxa 2 shorter than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, small, simple, both with linear articles, densely setose, gnathopod 2 longer than 1, gnathopod 1 article 5 short, unlobed, article 6 long, linear, dactyl long. Gnathopod 2 linear, very setose, article 5 as long as 6, unlobed, article 6 more slender than article 5, dactyl short.

Pereopods 3-4 normal, as long as gnathopods, similar, with slender article 2, article 4 slightly dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with expanded article 2, pereopod 5 shorter than pereopod 7, pereopod 5 with narrow to broad unlobed or lobed article 2, article 2 of pereopod 7 lobate, of pereopod 6 variable, articles 4-5 of pereopod 7 often broad and short, dactyl of pereopods 5-7 short,almost geniculate. Sternal processes of thorax absent. Coxal gills narrow, present on [segments ?2-6]. Pleopods with dilated peduncle and distomedial accessory appendage. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, longer than peduncle, not hooked, peduncle of uropods 1-2 with strong ventrodistal process. Uropod 3 small, very short, biramous, both rami very short, peduncle slightly elongate, outer ramus as long as peduncle, with vestigial article 2, inner ramus much shorter than outer ramus, scale-like. Telson entire, short, broader than long, pentagonal, scarcely pointed apically, with 1-2 hooked apical cusps on each side.

Female. Body enlarged. Oostegites moderately broad, [present on segments ?2-5].

Sexual dimorphism. Absent.

Variables. Ocular lobes acute (*H. plumosa*), obtuse (*H. barbimana*); dactyl of gnathopod 2 straight and apically setose (*H. balssi*); posterior margins of propodi on pereopods 3-4 not setose (*H. balssi*); article 2 of pereopod 7 setose on posterodistal margin (*H. plumosa*), or not (*H. barbimanus*); posterodistal corner of epimeron 3 acute (*H. plumosa*), or obtuse (*H. barbimanus*).

Relationship. See *Anonychocheirus*, *Goesia*, *Kuphocheira* and *Leptocheirus* in key above.

Species. *Haplocheira balssi* Schellenberg, 1931 (Moore & Myers, 1983) [866]; *H. barbimana* (Thomson, 1879b) (? = *H. lendenfeldi* Chilton, 1884a) (Stebbing, 1914b) (Stephensen, 1927a) (Schellenberg, 1931) (Nicholls, 1938) (Moore & Myers, 1983, also subspecies) *H. b. typica* Haswell, 1879a, 1885b (Bellan-Santini & Ledoyer, 1974); *H. b. robusta* K.H. Barnard, 1932 [800 + B]; *H. plumosa* Stebbing, 1888 (Moore & Myers, 1983) (= *H. barbimanus* identifications of K.H. Barnard, 1930, 1932; Bellan-Santini, 1972; Thurston, 1974b) [880 +B].

Habitat and distribution. Marine, austral shores on continents and islands, Antarctic islands, 0-457 m, 3 species.

Isaea Milne Edwards

Figs 40A, 42B

Isaea Milne Edwards, 1830: 380.–Stebbing, 1906: 630.–J.L. Barnard, 1969c: 272.–J.L. Barnard, 1973b: 19.–Lincoln, 1979a: 496.

Type species. *Isaea montagui* Milne Edwards, 1830, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed; antennal sinus moderate. Eyes large. Antennae of medium length, subequal, both slender, peduncular article 3 of antenna 1 as long as 1, articles 1 or 2 or 3 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome [?unproduced anteriorly]. Labrum subrounded, entire. Mandible normal, palp strong, article 3 rectolinear or clavate, scarcely shorter than 2. Labium with entire outer lobes, with well-

developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, short, with row of 3-4 lateral setae, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium setae.

Coxae long, strongly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 longer than 6, unlobed. Gnathopod 2 enlarged, weakly subchelate, with article 2 not dilated, article 5 longer than 6, more slender than 6, unlobed, article 6 dilated, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, not glandular, prehensile, dactyls short. Pereopods 5-7 similar to each other, progressively longer, prehensile, pereopod 5 scarcely shorter than pereopod 7, with broader article 2, pereopods 5-7 with broad lobed article 2, dactyl of pereopods 5-7 short, curved, grasping. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments 2-3-4-5-6-7]. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal, rami equal, as long as peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 ordinary, biramous, peduncle slightly elongate but shorter than rami, rami 1-articulate, subequal, narrow, tapering and with few armaments. Telson entire, short, as broad as long, ovate, without hooks.

Female. Gnathopod 2 slightly smaller than in male. Oostegites moderately broad, present on segments 2-5.

Sexual dimorphism. Weak. Gnathopod 2.

Relationship. Differing from *Gammaropsis* and allies in the prehensile pereopods.
See *Isaeopsis* and *Pagurisaea.*

Removals. *Isaea longipalpus* Kunkel, 1910, to *Columbaora.*

Species. *Isaea concinna* Gurjanova, 1938b, 1951 (Kudrjaschov, 1972b) [280 + I]; *I. elmhirsti* Patience, 1909b,c (Chevreux & Fage, 1925) (Lincoln, 1979a) (Moore, 1983b) [240 + I]; *I. montagui* Milne Edwards, 1830 (Chevreux & Fage, 1925) (Lincoln, 1979a) [352 + I].

Habitat and distribution. Marine, north-east Atlantic and Mediterranean, Japan to Bering Sea, shallow water, commensals of large crustaceans such as crabs and lobsters, 3 species.

[Ischyroceridae] ***Isaeopsis*** K.H. Barnard

Fig.47F

Isaeopsis K.H. Barnard, 1916: 267.–J.L. Barnard, 1969c: 278.–J.L. Barnard, 1973b: 25.

Type species. *Isaeopsis tenax* K.H. Barnard, 1916, monotypy.

Diagnosis. Body [?laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary]. Rostrum [?short], ocular lobes short, pointed, antennal sinus [?weak]. Eyes small. Antennae of [?medium length], 1 shorter than 2, both stout; peduncular article 3 antenna 1 [?shorter than 1], article [?1 2 3] longest, accessory flagellum 1-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 [?short], peduncle stout. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, with reduced molar, somewhat conical but apically blunt, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes [?short], pointed. Inner plate of maxilla 1 [?vestigial, ?without setae], outer plate with [?9] spines, palp 2-articulate. Plates of maxilla 2 [?rather broad, inner plate with mediofacial row of setae]. Inner plate of maxilliped with distal spines, outer plate short, not reaching apex of palp article 2, [?with spines on medial margin], palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with [?medium setae].

Coxae relatively long, overlapping, of various sizes, [?progressively elongate from 2 to 4], coxa 1 not dilated, not produced forward, very small in contrast to enlarged coxae 2-4, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 shorter than 6, unlobed. Gnathopod 2 enlarged, subchelate, with article 2 not dilated, serrate, article 5 very short, unlobed, article 6 dilated, sometimes with false chela or with process on posteroproximal margin, dactyl relatively short in relation to elongate 'palm'.

Pereopods 3-4 prehensile, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, prehensile, pereopods 5-7 with broad lobed article 2, dactyl of pereopods 5-7 short, with accessory tooth on outer margin. Sternal processes of thorax [?absent]. Coxal gills [?undescribed, present on segments 2-6]. Pleopods [undescribed]. Epimeron 3 [?bisinuate]. Uropods 1-2 biramous, stout, rami slightly unequal, [?shorter than peduncle], peduncle of uropod 1 with ventrodistal process. Uropod 3 of ordinary length, biramous, both rami very short, outer ramus recurved apically, with 2 apicolateral teeth, peduncle elongate, longer than rami, inner ramus as long as outer ramus, narrow, tapering and with apical spine. Telson entire, broader than long, semicircular, with 2 apicolateral spines.

Female. Gnathopods small, gnathopod 2 like 1. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopod 2.

Relationship. Differing from other ischyrocerids, especially *Ischyrocerus* and *Jassa*, in the prehensile pereopods. In the keys, *Isaeopsis* comes closest to the aforementioned genera if pereopodal conditions are ignored. From *Isaea* in the shortened rami of uropod 3 and with the outer ramus hooked and denticulate. From *Photis, Cheiriphotis*, and allies, in the distinctly hooked outer ramus of uropod 3.

Species. *Isaeopsis tenax* K.H. Barnard, 1916 (Griffiths, 1975) [743 + I].

Habitat and distribution. Marine, South Africa, area of Capetown, shallow water, on eggs of *Palinurus lalandii*, 1 species.

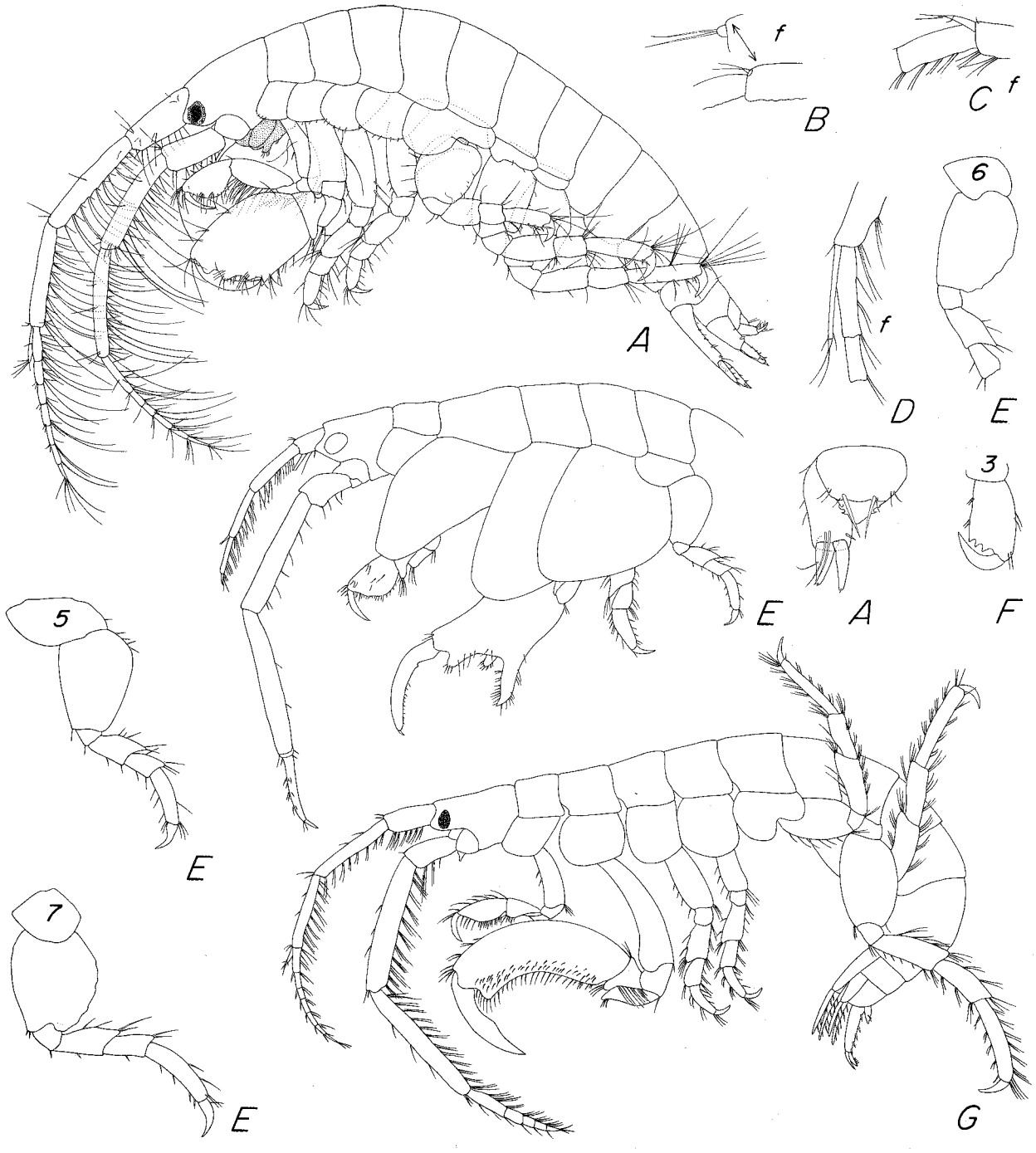

Fig.47. Corophioidea, Ischyroceridae. A, *Ventojassa ventosa*; B, *Parajassa pelagica*; C, *Jassa falcata*; D, *Ischyrocerus megacheir*; E, *Microjassa microcoxa*; F, *Isaeopsis tenax*; G, *Ischyrocerus anquipes*.

[Ischyroceridae] ***Ischyrocerus*** Krøyer

Figs 47D,G, 48A

Ischyrocerus Krøyer, 1838b: 287.–Stebbing 1906: 657.–J.L. Barnard, 1969c: 279.–J.L. Barnard, 1973b: 25.–Lincoln, 1979a: 556.

Wyvillea Haswell, 1879b: 336 (*Wyvillea longimanus* Haswell, 1879b, monotypy).

Type species. *Ischyrocerus anguipes* Krøyer, 1838b, monotypy.

Diagnosis. Body subcylindrical, occasionally dorsally corrugated, provided with elevations, teeth or humps, carinate, slightly depressed, or usually smooth; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. (Head as long as pereonites 1-2 together). Eyes ordinary. Antennae of various lengths, 1 shorter than 2, 1 slender, antenna 2 often stout in male; peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 2-articulate, main flagellar articles few (5-7). Antenna 2 peduncular article 3 scarcely elongate, peduncle often stout in male, flagellum short. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with barely mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 short, with long setae.

Coxae relatively short to long, weakly contiguous or weakly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 often larger than 1, coxa 4 not longer than coxa 1, slightly lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 short, shorter than 6, poorly lobed. Gnathopod 2 enlarged, weakly to strongly subchelate, with article 2 not dilated, with article 4 occasionally enlarged and incipiently merochelate, extended along posterior margin of article 5, article 5 much shorter than 6, lobed, article 6 hugely dilated, sometimes with weak false chela or process on distal margin near dactylar base, but lacking huge thumb; dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 shorter than pereopod 7, pereopods 5-7 with narrow to broad, lobed or unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 barely bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer (2) than or almost as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 slightly elongate, biramous, both rami very short, outer ramus recurved apically, with small apicolateral teeth, pegs or thorns, peduncle elongate, longer than rami, inner ramus narrow, tapering and with few armaments mostly apical. Telson entire, as broad as

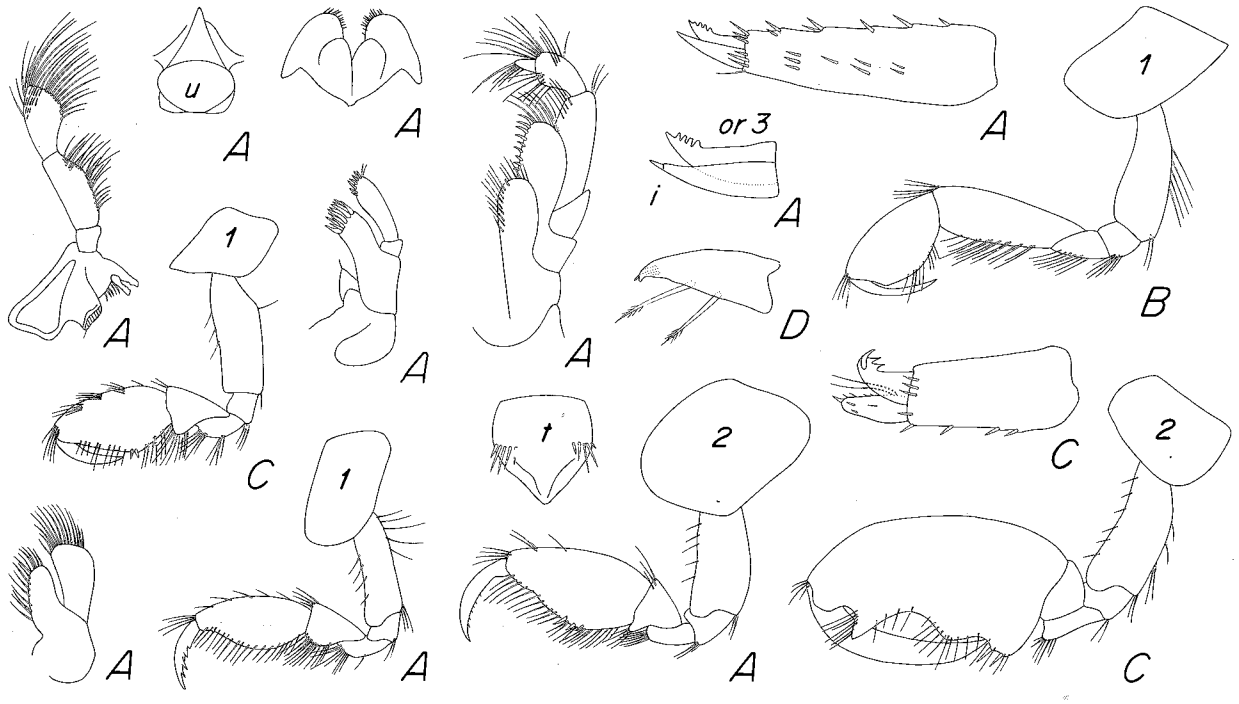

Fig.48. Corophioidea, Ischyroceridae. A, *Ischyrocerus anguipes*; B, *Pseudischyrocerus denticauda*; C, *Jassa falcata*; D, *Ventojassa ventosa*.

long, pentagonal, pointed apically, with 2 apicolateral sets of small armaments.

Female. Antennae often smaller and antenna 2 more slender. Coxae different from male, usually much longer. Gnathopods small, gnathopod 2 larger than 1, normally subchelate, article 5 shorter than 6, weakly lobed on both gnathopods 1-2. Oostegites moderately broad, present on segments 2- 5.

Sexual dimorphism. Strong. Gnathopods.

Variables. Coxa 1 shortened but coxa 5 as long as 4, coxa 4 not excavate (*I. chinipa, I. claustris*); coxa 5 much shorter than 4 (*I. megalops*); article 2 of gnathopod 1 distally dilated and article 4 incipiently merochelate, article 2 of gnathopod 2 immensely long and body keeled (*I. carinata, I. gorgoniae*); gnathopod 2 essentially simple (*I. longimanus*); male gnathopod 2 strongly merochelate (*I. kapu*, probably a distinct genus, bearing double process on palm); palm of gnathopod 2 with rudimentary proximal thumb (*I. tzvetkovae*); body with posterodorsal teeth or humps (e.g. *I. cristatus, I. serratus*).

Relationship. The basic ischyrocerid. *Jassa*, *Microjassa* and *Parajassa* have an extended posteroproximal thumb on the palm of male gnathopod 2.

See *Bonnierella*, *Isaeopsis*, *Pseudischyrocerus* and *Ventojassa*.

Species. See Shoemaker, 1930a; Stephensen, 1940b, 1942, 1944a, 1944c; *I. albanovi* Gurjanova, 1946, 1951 [220 + B]; *I. anguipes* Krøyer, 1838b (Sars, 1895) (Bousfield, 1973) (Lincoln, 1979a) (= *I. zebra* Rathke, 1843) (= *I. minutus* Liljeborg, 1851a, Sars, 1895) (= *I. fucicola* Stimpson, 1853) (= *I. isopus* Walker, 1889) [200 + B]; *I. brevicornis* (Sars, 1879, 1885, 1886) (Stephensen, 1942) (Gurjanova, 1951) [220 + B]; *I. brusilovi* Gurjanova, 1933b (Gorbunov, 1946) (Gurjanova, 1935b, 1951) (Stephensen, 1944a) [220 + B]; *I. camptonyx* Thurston, 1974b [890]; *I. carinatus* K.H. Barnard, 1916 (Griffths, 1974a, 1975) [743]; *I. chamissoi* Gurjanova, 1951 [290]; *I. chinipa* J.L. Barnard, 1979b [540]; *I. claustris* J.L. Barnard, 1969a [370]; *I. commensalis* Chevreux, 1900a (Shoemaker, 1930a) (Stephensen, 1944c) (Gurjanova, 1951) (Steele *et al.*, 1986) [200 + I]; *I. cristatus* Gurjanova, 1938b, 1951 (Kudrjaschov, 1979) [280]; *I. ctenophorus* Schellenberg, 1953 (Griffiths, 1974a, 1975) [743]; *I. dezhnevi* Gurjanova, 1951 (Kudrjaschov, 1972b) [280]; *I. elongatus* Gurjanova, 1938b, 1951 (Kudrjaschov, 1979) [280]; *I. enigmaticus* Gurjanova, 1934a, 1951 [220 + B]; *I. gorgoniae* K.H. Barnard, 1940 (Griffiths, 1975) [743I]; *I. gurjanovae* Kudrjaschov, 1975 [280]; *I. hanseni* Stephensen, 1944c (Gurjanova, 1951) [209B]; *I. hortator* (?*Bonnierella* antecedent) J.L. Barnard, 1964d [707A to 814B]; *I. inexpectatus* Ruffo, 1959, 1969 (Ruffo & Schickel, 1967) (Diviacco, 1979b) [340 + 677]; *I. kapu* J.L. Barnard, 1970a [381]; *I. krascheninnikovi* Gurjanova, 1951 (Kudrjaschov & Zvjagintsev, 1975) [280]; *I. laptevi* Gurjanova, 1946, 1951 [220]; *I. latipes* Krøyer, 1842 (Gurjanova, 1951) (Just, 1980) (= *I. assimilis* Sars, 1879, Gurjanova, 1951) (= *I. pachtusovi* Gurjanova, 1933b, 1951) [220 + B]; *I. litotes* J.L. Barnard, 1954d, 1962a, 1969a [370]; *I. longimanus* (Haswell, 1879b) (Stephensen, 1927a) (J.L. Barnard, 1972b) [775]; *I. malacus* J.L. Barnard, 1964d [372B]; *I. megacheir* (Boeck, 1871b) (Sars, 1895) (Gurjanova, 1951) (Just, 1980) (= *I. spitzbergensis* Schellenberg, 1925b) [200 + B]; *I. megalops* Sars, 1895 (Gurjanova, 1951) (Just, 1980) [220]; *I. nanoides* (Hansen, 1888) (Stephensen, 1944c) (Gurjanova, 1951) [220 + B]; *I. oahu* J.L. Barnard, 1970a, *I. o. armatus* Ledoyer, 1979a, 1986 [600]; *I. parvus* Stout, 1913 (Shoemaker, 1941) [373]; *I. pelagops* J.L.Barnard, 1962a, 1964b, 1966a [370]; *I. rhodomelae* Gurjanova, 1938b, 1951 (Kudrjaschov, 1979) [280]. *I. serratus* Gurjanova, 1938b, 1951 (Kudrjaschov, 1979) [280]; *I. stephenseni* Gurjanova, 1951 (Just, 1980) [220B]; *I. tenuicornis* (Sars, 1885) (Gurjanova, 1951) (= *I. longicornis* Sars, 1879, homonym) [218A]; *I. tuberculatus* (Hoek, 1882) (Gurjanova, 1951) (?= *I. hoeki* Stebbing 1888) [220 + B + ?715A]; *I. tzvetkovae* Kudrjaschov, 1975 (Coyle & Mueller, 1981) [230]; "species" Birula, 1937 [291]; "species" Gurjanova, 1938b [395]; "species" J.L. Barnard, 1969a [370]; "species" J.L. Barnard, 1971a [381]; "species" Ledoyer, 1979a [698]; "species" Just, 1980 [253]; "species" Just, 1980 [253]; "species" Just, 1980 [253].

Habitat and distribution. Marine, cosmopolitan, 0-2455 m, 39 species.

Janice Griffiths

Janice Griffiths, 1973: 280.

Type species. *Janice spinidactyla* Griffiths, 1973, original designation.

Diagnosis. Body cylindrical, slightly depressed, smooth, urosomites free, 1 ordinary. Rostrum short, ocular lobes obsolescent, blunt; antennal sinus moderate. Eyes medium. Antenna 1 elongate, slender, antenna 2 [?unknown, stout]; peduncular article 3 of antenna 1 much shorter than 1, article 2 slightly longest, accessory flagellum absent. Antenna 2 peduncular article 3 scarcely elongate, peduncle [?slightly stout in male, flagellum much shorter than article 5 of peduncle, with 4-13 articles]. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire or weakly incised]. Mandible normal, palp strong, stout, article 1 elongate, article 3 clavate, shorter than 2. Labium with [?entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 [?vestigial, without setae, outer plate with 10-11 spines, palp 2-articulate]. Plates of maxilla 2 [?ordinary, inner plate with mediofacial row of setae]. Inner plate of maxilliped with distal setae, outer plate normal, not

reaching apex of palp article 2, with thin spines only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with [?short nail and setae].

Coxae very small, relatively short, strongly discontiguous, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, large, gnathopod 1 subchelate, article 5 thick, unlobed, longer than 6, article 6 ordinary, dactyl small. Gnathopod 2 almost parachelate, linear, with article 2 slightly dilated, 4 inflated, strongly merochelate, extended and partly fused distally along posterior margin of article 5, article 5 longer than 6, article 6 more slender than 5, palm transverse, dactyl short.

Pereopods 3-4 longer than gnathopod 1, similar, with inflated article 2, article 4 dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, with slightly expanded article 2, pereopod 5 shorter than pereopods 6-7, article 2 broader, pereopods 6-7 with narrower, setose article 2, dactyl of pereopods 5-7 short, curved. Sternal processes [undescribed]. Coxal gills [undescribed]. Pleopods [?with short peduncle, longer than broad, outer ramus shortened]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami of uropod 2 slightly unequal, shorter (1) or as long as (2) peduncle, peduncle without ventrodistal process. Uropod 3 of medium length, uniramous, single ramus long, 1-articulate, narrow, tapering, obtuse and setose apically, peduncle shorter than ramus, very short, dilated medially. Telson entire, short, broader than long, emarginate apically, with 2 hooked apical cusps.

Female. Unknown. [?Antennae shorter, antenna 2 more slender. Coxae different from male, coxa 1 narrower, coxa 2 longer. Gnathopods small, very setose, gnathopod 1 larger than 2, normally subchelate, article 5 longer than 6, unlobed, thick on gnathopod 1, comparison to *Grandidierella*]. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Differing from *Grandidierella* in the small, non- carpochelate male gnathopod 1.

From *Unciolella* in the lack of urosomal teeth, lack of a spur on uropod 1, in the inflated article 2 of pereopods 3-4, lack of accessory flagellum, and lack of toothed plate on article 2 of gnathopod 1.

See *Neohela*.

Species. *Janice spinidactyla* Griffiths, 1973 [741E].

Habitat and distribution. Marine, southern Africa, estuarine, 1 species.

[Ischyroceridae] *Jassa* Leach

Figs 47C, 48C

Jassa Leach, 1814b: 433.–Stebbing, 1906: 652.–J.L. Barnard, 1969c: 279.–J.L. Barnard, 1973b: 25.–Thurston, 1974b: 99.–Lincoln, 1979a: 548.

Cratophium Dana, 1952b: 309 (*nomen nudum*); 1853: 840 (*Cratophium validum* Dana, 1853, present selection, ?= *Jassa falcata*).

Macleayia Haswell, 1880b: 32 (no type species).

Lusyta Nardo, 1847: 20 (*Lusyta algensis* Nardo, 1847, monotypy).

Bruzeliella Norman, 1905: 83 (*Bruzeliella falcata* (Montagu, 1808), original designation).

Hemijassa Walker, 1907: 38 (*Jassa goniamera* Walker, 1903, monotypy).

Type species. *Cancer falcatus* Montagu, 1808, selected by Chevreux & Fage, 1925.

Diagnosis. Body subcylindrical, slightly depressed, usually smooth; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed or blunt, antennal sinus deep. (Head as long as pereonites 1-2 together). Eyes ordinary. Antennae of various lengths, 1 shorter than 2, 1 slender, antenna 2 often stout in male; peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 2-articulate, main flagellar articles few (5-7). Antenna 2 peduncular article 3 scarcely elongate, peduncle often stout in male, flagellum short. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with barely mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 short, with long setae.

Coxae relatively short to long, often of various sizes and shapes, weakly contiguous or weakly overlapping, progressively elongate from 1 to 4, coxa 1 dilated, produced forward, often small in contrast to enlarged coxae 2-4, coxa 2 also short, coxa 4 not longer than coxa 1, slightly lobed, coxa 5 usually slightly shorter than 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 short, shorter than 6, poorly lobed. Gnathopod 2 enlarged, weakly to strongly subchelate, with article 2 not dilated, with article 4 occasionally enlarged and incipiently merochelate, extended along posterior margin of article 5, article 5 much shorter than 6, lobed, article 6 hugely dilated, with large thumb or process on proximal margin remote from dactylar base, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to

each other, progressively longer, pereopod 5 shorter than pereopod 7, pereopods 5-7 with narrow to broad, lobed or unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 barely bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer (2 and/or 1) than or almost as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 slightly elongate, biramous, both rami very short, outer ramus recurved apically, with large and few (usually 2) apicolateral teeth, pegs or thorns, peduncle elongate, longer than rami, inner ramus narrow, tapering and with few armaments mostly apical. Telson entire, as broad as long, pentagonal, pointed apically, with 2 apicolateral sets of small armaments.

Female. Antennae often smaller and antenna 2 more slender. Coxae occasionally different from male, 3-4 often much longer, occasionally shorter. Gnathopods small, gnathopod 2 much larger than 1, normally subchelate, article 5 shorter than 6, weakly lobed on both gnathopods 1-2. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods.

Variables. Female gnathopod 2 as small as gnathopod 1 (*J. lilpuna*).

Relationship. Differing from *Ischyrocerus* in the presence of a large thumb or tooth on the palm of male gnathopod 2; also male coxa 1 is generally sharper at the anteroventral angle and the pegs or thorns on the outer ramus of uropod 3 are generally larger and fewer than in *Ischyrocerus*. Usually female gnathopod 2 is much larger than in *Ischyrocerus* and like non-terminal stages of male gnathopod 2.

See *Isaeopsis* and *Microjassa*.

Removal. *Jassa ornata* (Miers, 1875b, 1879) to *Podocerus*.

Species. Based on Conlan (1990); *J. alonsoae* Conlan, 1990 [833, 840, 895]; *J. borowskyae* Conlan, 1990 [230]; *J. carltoni* Conlan, 1990 [372]; *J falcata* (Montagu, 1808) (Sars, 1895) (= *J. pulchella* Leach, 1814) (Lincoln, 1979) [240]; *J. fenwicki* Conlan, 1990 [776 + 833]; *J. gruneri* Conlan, 1990 [783]; *J. hartmannae* Conlan, 1990 [775]; *J. herdmani* Walker, 1893 [355]; *J. ingens* (Pfeffer, 1888) (Schellenberg, 1931) (Thurston, 1974a,b) [890]; *J. justi* Conlan, 1990 [849, 895, 780]; *J. marmorata* Holmes, 1905 (Lincoln, 1979) (= *J. falcata* of Chevreux & Fage, 1925; Bousfield, 1973) [422]; *J. morinoi* Conlan, 1990 [422]; *J. myersi* Conlan, 1990 [372]; *J. oclairi* Conlan, 1990 [230]; *J. pusilla* (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) (= *J. minutus* Sars, 1883, homonym) (= *J. odontonyx* Sars, 1895) (= *J. dentex* of Chevreux & Fage, 1925) [250]; *J. shawi* Conlan, 1990 (379); *J. slatteryi* Conlan, 1990 [422]; *J. staudei* Conlan, 1990 [369]; *J. thurstoni* Conlan, 1990 [880]. Species retained herein in *Jassa* but genus to be determined: [*J. algensis* (Nardo, 1847, 1869) [345]]; *J. australis* (Haswell, 1879b) [781]; *J. barnardi* Stephensen, 1949 [731]; *J. calcaratus* (Rathke, 1843) [237]; *J. californicus* (Boeck, 1871b, 1871a) [371]; *J. dentex* (Czerniavsky, 1868) [334]; *J. goniamera* Walker, 1903 (Stephensen, 1947a, Thurston, 1974b) [880 + B); *J. lilipuna* J.L. Barnard, 1970a [381]; *J. monodon* (Heller, 1867) [345]; *J. multidentata* Schellenberg, 1931 [833]; *J. ocia* (Bate, 1862) (Lincoln, 1979a) (Chevreux & Fage, 1925) [352T]; *J. orientalis* (Dana, 1852a, 1853) (Stebbing, 1906) [648]; *J. spinipes* (Johnston, 1829) [239]; *J. validum* (Dana, 1853) [751]; *J. variegatus* Leach, 1814 [239]; *J. wandeli* (Chevreux, 1906a) [872].

Habitat and distribution. Marine, cosmopolitan, 0-342 m, mostly very shallow water, major fouling genus, often carried by ships to exotic ports, 19 species.

Kamaka Derzhavin

Fig.39C

Kamaka Derzhavin, 1923b: 188.–J.L. Barnard, 1973b: 19.

Type species. *Kamaka kuthae* Derzhavin 1923b, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites 1-2 coalesced, 3 free from 2 but coalesced with telson, marked ventrally by sutures. Rostrum short, supra-antennal line almost absent except in defining ocular lobes, ocular lobes elongate, very produced forward, blunt, antennal sinus deep. (Head much longer than pereonites 1-2 together). Eyes medium, on apices of stalked ocular lobes. Antennae of medium length, 1 shorter than 2, both slender, peduncular article 3 of antenna 1 slightly shorter than 1, article 1 longest, accessory flagellum absent, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, flagellar articles 5-7. Epistome [?unproduced anteriorly]. Labrum subrounded, incised. Mandible normal, palp strong, very slender, article 1 elongate, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 short, without setae, outer plate with 10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only few or no mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate very long, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, stubby, with medium nail and setae.

Coxae relatively long, lobuliform, weakly overlapping, of various sizes and shapes, progressively elongate from 2 to 4, coxa 1 dilated, produced

forward, coxa 2 shorter than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxa 7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1 gnathopod 1 in male poorly subchelate, article 5 long, sublinear, unlobed, longer than 6. Gnathopod 2 enlarged, weakly subchelate, propodochelate in male, with article 2 not dilated nor setose, article 5 very short, unlobed, article 6 dilated, with false chela or large process on posteroproximal margin, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 weakly dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded article 2, prehensile, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills slender [?present on segments 2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, uniramous, single ramus short, with vestigial article 2, obtuse and setose distally, peduncle as long as ramus, short, dilated medially. Telson entire, short, broader than long, semicircular, poorly armed.

Female. Antennae weaker. Coxae not different from male. Gnathopods small, gnathopod 2 slightly larger than 1, normally subchelate, article 5 as long as 6, unlobed. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods.

Variables. Male antenna 2 exceptionally long (type); coxa 5 like coxa 4 and not lobed (*K. biwae*); peduncle of uropod 3 not dilated medially (*K. biwae*).

Relationship. Unique in the coalesced urosomites 1-2 coupled with coalesced telson and uropod 3.
See *Chevalia* and *Rakiroa*.

Species. *Kamaka biwae* Ueno, 1943 [027]; *K. dershavini* Gurjanova, 1951 [013]; *K. kuthae* Dershavin, 1923b (Ueno, 1935a, 1936) (Gurjanova, 1951) [013]; *K. palmata* Dang, 1968 [954];

Habitat and distribution. Fresh and brackish waters, east Asia from Vietnam to Kamchatka, Japan, 4 species.

Konatopus J.L. Barnard

Konatopus J.L. Barnard, 1970a: 70.

Type species. *Konatopus paao* J.L. Barnard, 1970a, original designation.

Diagnosis. Body laterally compressed, slender, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed or blunt; antennal sinus deep; head not as long as pereonites 1-2 together. Eyes moderate. Antennae subequal, short, both slender; peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum with [?about 7 articles]. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 ovate, with 3 medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with medium setae along.

Coxae small, relatively short, weakly overlapping, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 dilated, very wide but not produced forward, coxa 2 narrower, coxa 4 not longer than coxa 1, scarcely lobed, coxa 5 nearly as long as 4; coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, article 2 dilated, in male poorly subchelate, also carpochelate, also nearly merochelate, article 5 long, stout, with small tooth, article 6 very small, palm short and transverse. Gnathopod 2 weakly subchelate, feeble, article 2 weakly dilated, article 5 longer than 6, not lobed, article 6 more slender than article 5, dactyl long.

Pereopods 3-4 generally normal, similar, with dilated article 2 on pereopod 4, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded article 2, pereopod 5 much shorter than 7; pereopods 6-7 with basally broader almost or distinctly lobed article 2, pereopods 5-7 with short, curved dactyl. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami slightly unequal, much longer than (2) or equal (1) to peduncle; peduncle of uropod 1 with moderate ventrodistal process. Uropod 3 of moderate length, biramous, rami of medium length, tapering, obtuse, with few armaments mostly apical, peduncle shorter than rami but itself weakly elongate, outer ramus with vestigial article 2, shorter than inner ramus. Telson entire, short, broader than long, pentagonal, pointed apically, with apicolateral spine on each side.

Female. Coxae different from male, 1 much narrower. Gnathopods small, gnathopod 1 not larger than 2, poorly subchelate, article 5 shorter (2) or longer (1) than 6, unlobed. Article 2 ofpereopod 5 narrower basally. Oostegites [?moderately narrow, broad, present on segments 2-5].

Sexual dimorphism. Strong. Coxae, gnathopods,

pereopod 5.

Variables. Article 2 of gnathopod 1 not dilated, propodus short but rectangular and palm well developed, carpus with accessory posterior teeth (*K. latipalmus*); article 2 of pereopod 5 with strong posteroventral lobe (*K. latipalmus*); outer ramus of uropod 3 slightly more reduced than normal (*K. tulearensis*).

Relationship. Differing from male *Neomegamphopus* in the wider coxa 1, more inflated article 2, smaller carpal tooth and short propodus of gnathopod 1 bearing a palmar projection or well-developed palm.

From *Amphideutopus* in the small ordinary male gnathopod 2, the relatively shorter rami and longer peduncle of uropod 3, and the characters of gnathopod 1 cited above except for the palmar projection. *Konatopus* also has article 2 of pereopod 4 inflated unlike the 2 related genera. From *Microdeutopus* and allies by the deep insertion of antenna 2 into the head.

See *Acuminodeutopus*, *Maragopsis* and *Zoedeutopus*.

Species. *Konatopus latipalmus* Ledoyer, 1979a, 1982b [698]; *K. paao* J.L. Barnard, 1970a, 1971a [381]; *K. tulearensis* Ledoyer, 1982b [698].

Habitat and distribution. Marine, Indo-Pacific, Hawaii to Madagascar, 0-34 m, 3 species.

Kuphocheira K.H. Barnard

Figs 45I, 46F

Kuphocheira K.H. Barnard, 1931a: 429.–K.H. Barnard, 1932: 237.–J.L. Barnard, 1969c; 273.–J.L. Barnard, 1973b: 19.–Thurston, 1974b: 95.

Type species. *Kuphocheira setimana* K.H. Barnard, 1931a, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, blunt, antennal sinus moderate. Eyes medium. Antennae short, 1 longer than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum absent, main flagellar articles about 5. Antenna 2 peduncular article 3 scarcely elongate, peduncle stout in male, flagellum with 3 articles. Epistome [?unproduced anteriorly]. Labrum rounded. Mandible normal, molar large, somewhat conical but apically blunt, poorly triturative, palp strong, very slender, article 3 falciform, almost rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes broadly separating outer lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 ovate, large, with 6-7 apical setae, outer plate with 9 spines, palp 1 or 2-articulate. Inner plates of maxilla 2 narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate very short, narrow and conical, reaching apex of palp article 1, with setae only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with 1 long apical seta.

Coxae relatively short, overlapping, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, small in contrast to enlarged coxa 2, coxa 2 also short but larger than 1, dilated, coxa 4 not longer than coxa 2, not lobed, coxa 5 [?nearly as long as 4], coxae 6-7 [?much smaller than anterior coxae]. Gnathopods 1-2 diverse, small, simple, both with linear articles, densely setose, gnathopod 2 not or slightly larger than 1, gnathopod 1 with article 5 long, unlobed, article 6 shorter and thinner than 5, dactyl small. Gnathopod 2 slightly enlarged, article 5 longer than 6, unlobed, article 6 occasionally dilated but slightly more slender than article 5, dactyl strongly reduced.

Pereopods 3-4 longer than gnathopods, similar, with slightly inflated article 2, article 4 scarcely dilated in one species, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with broad, unlobed article 2, pereopod 5 much shorter than pereopods 6-7, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, shorter (1 and 2) or longer (2) than peduncles, not hooked, peduncle of uropods 1-2 (or 1 only) with ventrodistal process, that of uropod 2 smaller or absent. Uropod 3 very short, uniramous, single ramus short, 1-articulate, obtuse and setose or spinose distally, peduncle shorter or longer than ramus, slightly elongate, not dilated medially. Telson entire, short, broader than long, ovate or circular, with 2 rows of apical bosses.

Female. In type species article 2 of gnathopod 2 slender, article 6 only one third as long as 6. Oostegites moderately narrow, [?present on segments 2-5].

Sexual dimorphism. Weak or absent.

Variables. Gnathopod 2 sexually dimorphic (*K. emancipata*); possibly palp of maxilla 1 2-articulate (type), 1-articulate (*K. emancipata*); peduncle of uropod 2 elongate (type).

Relationship. Differing from *Haplocheira* in the uniramous uropod 3 and absence of accessory flagellum. From *Anonychocheirus* in the simple gnathopod 1. From *Leptocheirus* in the non filtrative article 2 of gnathopod 2.

See key with *Haplocheira*.

Species. *Kuphocheira emancipata* Moore & Myers, 1983 [872]; *K. setimana* K.H. Barnard, 1931a, 1932 (Thurston, 1974b) (Moore & Myers, 1983) [836].

Habitat and distribution. Marine, Antarctic Peninsula and South Orkney Islands, 18-75 m, 2 species.

Ledoyerella Myers

Ledoyerella Myers, 1973c: 266.

Type species. *Lembos caputphotis* Ledoyer, 1967b, original designation.

Diagnosis. Body subcylindrical, slightly depressed, laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes elongate, very produced forward, blunt; antennal sinus deep. (Probably head as long as pereonites 1-2 together). Eyes small, not on apices of ocular lobes. Antenna 1 longer than 2, both slender, peduncular article 3 of antenna 1 slightly longer than 1, article 2 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome [?unproduced anteriorly]. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 linguiform, with 1 apical seta, outer plate with 9-11 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching two thirds along palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail.

Coxae small, relatively short, [?weakly overlapping], of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, slightly dilated, coxa 4 not longer than coxa 1, not lobed, coxa 5 usually not as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 of subequal size, moderately large, subchelate, gnathopod 1 scarcely or not larger than 2, article 5 of both gnathopods as long as 6, unlobed, article 6 very large. Gnathopod 2 with article 2 dilated, not very setose, dactyl ordinary.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, article 6 and dactyls long. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded unlobed article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax present or absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami equal, longer than peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 medium, biramous, both rami medium, subequal, almost pointed distally, well spinose, peduncle short, shorter than rami, outer ramus with vestigial article 2. Telson entire, short, broader than long, semicircular or pentagonal, with 2 hooked apical cusps and few setae.

Female. Gnathopods slightly smaller, gnathopod 2 scarcely larger than 1, normally to poorly subchelate, article 5 almost as long as 6, unlobed. Oostegites [?narrow, broad, present on segments 2-5].

Sexual dimorphism. Weak.

Variables. Spination and sculpturing on palms of male gnathopod 1; dactyls of pereopods 3-4 long or short; crenulations variable on urosomite 3; sternal processes absent (type), present (*L. isochelata*).

Relationship. Differing from *Lembos* and allies in the deep recessment of antenna 2 and the non-dominant gnathopod 1, with coxa 2 dominating coxa 1. From *Gammaropsis* and *Posophotis* in the even-sized gnathopods 1-2. From *Aorcho* in the deep recessment of antenna 2, thick mandibular palp and slight sculpturing on the gnathopods.

See *Aorchoides*, *Camacho* and *Lemboides*.

Species. *Ledoyerella caputphotis* (Ledoyer, 1967b, 1982b) [698]; *L. haleiwa* (J.L. Barnard, 1970a, 1971a) (Ledoyer, 1982b) [600]; *L. isochelata* (Ledoyer, 1972c, 1979a, 1982b) [698].

Habitat and distribution. Marine, Indo-Pacific, Hawaii to Madagascar, 0-49 m, 3 species.

Lemboides Stebbing

Lemboides Stebbing, 1895d: 209.–Stebbing, 1906: 600.–J.L. Barnard, 1969c: 153.–J.L. Barnard, 1973b: 19.

Type species. *Lemboides afer* Stebbing, 1895d, monotypy.

Diagnosis. Body subcylindrical, but laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed or blunt, antennal sinus weak. Eyes small or absent. Antennae short, 1 longer than 2, both slender, peduncular article 3 of antenna 1 much shorter than 1, articles 1-2 longest, accessory flagellum 1.25-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 short, flagellum 3 to 4-articulate. Epistome [?unproduced anteriorly]. Labrum subrounded, entire. Mandible normal, palp strong, slender, article 3 semi-falciform, shorter than or as long as 2. Labium with entire outer lobes, with well-developed inner lobes,

mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, with 2 apical setae, outer plate with [?9] spines, palp 2-articulate. Plates of maxilla 2 rather broad, or ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail and setae.

Coxae small, relatively short, weakly overlapping, of various sizes and shapes, lengths alike from 1 to 4, coxa 1 dilated or not, produced forward or not, coxa 2 also short, larger or smaller than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 weakly diverse, of subequal size, densely setose, large, gnathopod 1 larger than 2, in male subchelate, article 5 long, inflated, unlobed, palm oblique, article 6 short, much thinner than article 5 especially on gnathopod 1, dactyl ordinary. Gnathopod 2 subchelate, article 2 dilated, setose, article 5 longer and larger than 6, unlobed, article 6 more slender than 5, sometimes with false chela, dactyl ordinary.

Pereopods 3-4 normal, very slender, similar, with slender article 2, article 4 not dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, with sublinear or weakly expanded article 2, pereopod 5 much shorter than pereopods 6-7, with similar unlobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [often undescribed], present or absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 of medium extension, biramous, both rami elongate, peduncle shorter than rami, outer ramus with vestigial article 2 or none, inner ramus almost as long or longer than outer ramus, narrow, tapering and with armaments mostly facial. Telson entire, short, as broad as or broader than long, ovate, with 2 pairs of apical setae or spines.

Female. Gnathopods smaller, article 5 less dominant. Oostegites [?moderately narrow, broad, present on segments 2-5].

Sexual dimorphism. Weak.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally concave, proximally straight; left mandibular molar with complex plates, primary plate triangular, the margins straight or weakly convex, secondary, tertiary and quaternary plates of similar shape or tertiary and quaternary missing; anterior margin of maxilliped without wing-like flanges; male gnathopod 1 with carpus larger than propodus but lacking teeth; uropod 3 peduncle markedly shortened, rami with spines, but no marginal setae, outer ramus with small second article.

Variables. (*Aorchoides crenatipalmata* included to show reasons for its transfer). Ocular lobe pointed (*L. caecus*); antennae very long (*L. australis*); mandibular palp article 3 very short (*L. caecus*); article 2 of gnathopod 1 very dilated (*L. crenatipalma*); male propodus of gnathopod 1 with large sharp thumb, dactyl very large and overlapping thumb (*L. crenatipalma*); propodus of male gnathopod 1 longer than carpus (*L. caecus*); article 2 of gnathopod 2 very dilated (*L. caecus, L. crenatipalma*); palm of gnathopod 2 with small sharp thumb (*L. crenatipalma*); sternal processes absent (*L. caecus*), or present on segments 3-4 (*L. acanthiger*).

Relationship. Differing from *Microdeutopus* in the subchelate but non-carpochelate male gnathopod 1, and by lacking peduncular tooth of uropod 2. From *Ledoyerella* in the poor recessment of antenna 2 and the immensely setose gnathopods. From *Lembos* in the small propodus on both gnathopods. From *Rudilemboides* in the enlarged gnathopod 2.

See *Aorcho* and all species of the Myers (1988) diagnosis.

Removal. *Lemboides crenatipalma* K.H. Barnard, 1916, to *Aorchoides*.

Species. *Lemboides acanthiger* K.H. Barnard, 1916 (Griffiths, 1974b, 1975) (Myers & Lyons, 1987) [743]; *L. afer* Stebbing, 1895d (K.H. Barnard, 1932) (Schellenberg, 1926a) (Griffiths, 1974a) (Myers & Lyons, 1987) [743]; ?*L. caecus* Ledoyer, 1982b [694B] (Myers, 1988 removes to "Neomegamphopidae"); "species" Pirlot, 1934 [604B].

Habitat and distribution. Marine, southern Africa and ?Comoro region, 35-102 (?625) m, 4 species.

Lembos Bate

Figs 45L, 46G

Lembos Bate 1856: 58 (*nomen nudum*).–Bate, 1857d: 142.–Stebbing, 1906: 594.–J.L. Barnard, 1969c: 154.–J.L. Barnard, 1973b: 20.–Myers, 1979a: 221.

Lembopsis Pearse, 1912: 372 (*Lembopsis spinicarpus* Pearse, 1912, original designation).

Type species. *Lembos websteri* Bate, 1857d, designation by Chevreux & Fage, 1925.

Diagnosis. Body slightly depressed, laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak. Eyes small. Antennae long, 1 longer than 2, both slender; peduncular article 3 of antenna 1 shorter than or equal to 1, article 2 longest, accessory flagellum pluriarticulate. Antenna 2

peduncular article 3 short, flagellum short, about 6 to 8-articulate. Epistome occasionally produced anteriorly. Labrum subrounded, entire or weakly incised. Mandible normal, palp strong, very slender, article 3 semi-falciform, longer than or equal to 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 9-10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae, armed with row of fine spines along inner margin.

Coxae small, relatively short, weakly contiguous, of various sizes and shapes, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, often densely setose, gnathopod 1 in male greatly larger than 2, subchelate, rarely merochelate, article 5 large, various, but unlobed and usually much shorter than article 6, palm transverse to oblique, often sculptured, article 6 usually very large, dactyl ordinary to very large. Gnathopod 2 subchelate, usually feeble, article 5 as long as or longer than 6, unlobed, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls long to short. Pereopods 3-7 similar to each other, progressively longer, with almost linear article 2, pereopod 5 much shorter than pereopod 7, pereopods 6-7 with scarcely expanded, unlobed, often setose article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax often present. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not or occasionally bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long as peduncle, peduncle of uropod 1 with moderate ventrodistal process, that of uropod 2 often smaller or obsolescent. Uropod 3 moderately extended, biramous, both rami short, obtuse or pointed distally, peduncle slightly elongate, as long as rami, rami subequal, outer ramus lacking or bearing vestigial article 2, inner ramus as long as outer ramus, both tapering and with few armaments mostly apical. Telson entire, short, as broad as long or longer, ovate or circular, pointed apically, with 2 hooked apical cusps or groups of setae.

Female. Coxa 1 different from male, not dilated, subrectangular. Gnathopods small, gnathopod 1 larger than 2, normally to poorly subchelate, article 5 shorter than 6, unlobed. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods, coxa 1.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally concave, proximally straight; left mandibular molar with complex plates, primary plate triangular, the margins straight or weakly convex, secondary, tertiary and quaternary plates of similar shape; anterior margin of maxilliped with wing-like flanges; male gnathopod 1 carpus and propodus subequal or propodus slightly the longer; uropod 3 peduncle elongate, not markedly expanded, rami relatively short, with marginal spines, but no marginal setae, outer ramus with small second article.

Variables. *Generalities.* Tooth at anteroventral corner of head large, small or absent. Setation patterns on antennae 1-2 and on article 3 of mandibular palp variable specifically. Shape and setation of coxa 1 variable in male, occasionally sharp and produced in female. Gnathopods 1-2 in male highly variable at specific level in shapes of articles 2, 5, 6, palmar slope and sculpture, setosity patterns of articles 2, 3, 5, 6. Dactylar length on pereopods 3-4 diverse. Setosity of article 2 on pereopods 5-7, especially 7, highly variable; also occasionally on epimera, especially epimeron 2. Presence, size and length of inter-ramal peduncular process on uropods 1-2 variable. Arrangement, size and form of ventral processes on sternum of thorax of specific value.

Specifics. Gnathopod 1 carpus cryptic, posterior lobe enclosed between merus and propodus (e.g. *L. regius*); carpus as long as propodus (e.g. *L. tetracanthus*); carpus longer than propodus (*L. conicurvae*); gnathopod 2 merochelate (*L. regius*).

Relationship. This genus and its sister genera such as *Autonoe*, *Bemlos*, *Meridiolembos*, *Pleisolembos* and *Tethylembos* are very close to *Microdeutopus* because of several transitional species in each genus but especially because several species of *Lembos* have a weak carpochela and a weak propodus on gnathopod 1. *Xenocheira* (see) is also involved in this transformation.

See *Arctolembos*, *Autonoe*, *Bemlos*, *Globoslembos*, *Ledoyerella*, *Lemboides*, *Maragopsis*, *Meridiolembos*, *Plesiolembos*, *Rudilemboides*, *Tethylembos* and *Xenocheira*.

Removals. See all genera mentioned just above; *L. chelatus* Walker, 1904, to *Varohios*; *L. leptocheirus* Walker, 1909b, to *Xenocheira*; *L. longipalpus* Kunkel, 1910, to *Columbaora*.

Species. See K.H. Barnard (1937, 1940), Griffiths (1973, 1974a,b, 1975), Gurjanova (1951), Ledoyer (1967a, 1968, 1969b, 1974c), Moore (1981, 1984c), Ortiz (1983), Ruffo (1969), Schellenberg (1928, 1942), Stephensen (1942); VALID (per Myers, 1988): *L. hypacanthus* K.H. Barnard, 1916, 1932, 1940 (Schellenberg, 1925a) (Griffiths, 1974c) (Myers & Lyons, 1987) [743]; *L. websteri* Bate, 1857d (Sars, 1895) (Chevreux & Fage, 1925) (Bousfield, 1973) (Lincoln, 1979a) (Myers, 1979b, 1982a) (= *L. bidentatus* Stebbing, 1876a) [250 + 435]. Species of *Lembos* not yet assigned to genera: ?*L. aoraformis*

Ledoyer, 1984 (Myers, *in litt.* = *Aora typica)* [586]; ?*L. barbatus* Mateus & Mateus, 1966 [446]; ?*L. bryopsis* J.L. Barnard, 1965a (Sivaprakasam, 1970g) [600]; ?*L. clavatus* Hirayama, 1984a [not *Lembos* but female only] [395]; ?*L. conicurvae* (Oliveira, 1955a) [751]; ?*L. fuegiensis* Dana, 1853 (Stebbing, 1914b) (Schellenberg, 1931) (K.H. Barnard, 1932) [866]; ?*L. hastatus* Schellenberg, 1938a [578]; ?*L. kamanu* J.L. Barnard, 1970a [381]; ?*L. lobata* J.L. Barnard, 1962d [702A]; ?*L. mayensis* Ortiz, 1984b [483]; ?*L. podoceroides* Walker, 1904 (Ruffo, 1959) (Nayar, 1967) (Sivaprakasam, 1969a) [600]; ?*L. processifer* (Pirlot, 1938) [530]; ?*L. regius* Myers, 1985b [585]; ?*L. spinimerus* Ledoyer, 1984 [586]; ?*L. tenuis* (Dana, 1852a, 1853) (?Pirlot, 1934) [649 + ?B]; ?*L. tetracanthus* Schellenberg, 1925a [446]; ?*L. tridens* (Schellenberg, 1938a) (J.L. Barnard, 1965a) (Ledoyer, 1978b, 1979a, 1982b) (as *Microdeutopus*) [600]; ?*L. tui* Myers, 1985b [573]; ?*L. unifasciatus* Myers, 1977c, 1981d, *L. u. reductus* Myers, 1979b, 1981d [460]; ?*L. viguieri* Chevreux, 1911d (Chevreux & Fage, 1925) (Myers, 1974c, 1982a) [340]; ?*L. virgus* Myers, 1985b, 1985c [576]; "species" J.L. Barnard, 1970a [381]; "species" Ledoyer, 1984 [586]; "species" Ledoyer, 1984 [586]; "species" Myers, 1985a [633]; "species" No. 1 J.L. Barnard, 1972b [850]; "species" No. 2 J.L. Barnard, 1972b [844]; "species" No. 3 J.L. Barnard, 1972b [845].

Habitat and distribution. Marine, the two confirmed species from amphi-Atlantic boreal and southern Africa, unconfirmed species = cosmopolitan but poorly represented in arctic-boreal, well developed in tropics and austral, 0-4893 m, rarely below 360 m, 2 definite and 21 unconfirmed species.

Leptocheirus Zaddach

Figs 39G, 44K, 45C, 46I

Leptocheirus Zaddach, 1844: 7.–Stebbing, 1906: 625.–J.L. Barnard, 1969c: 154.–J.L. Barnard, 1973b: 20.–Lincoln, 1979a: 482.–Myers, 1982b: 129 (key).
Boeckia Malm, 1871: 543 (*Boeckia typica* Malm, 1871, monotypy).
Ptilocheirus Stimpson, 1853: 55 (*Ptilocheirus pinguis* Stimpson, 1853, monotypy).

Type species. *Leptocheirus pilosus* Zaddach, 1844, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, occasionally toothed, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed or blunt; antennal sinus moderate. Eyes small. Antennae of nearly subequal, 1 scarcely longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 1 or 3 longest, accessory flagellum 6-articulate Antenna 2 peduncular article 3 short, flagellum 9+articulate. Epistome unproduced anteriorly. Labrum subrectangular, weakly incised. Mandible normal, palp strong, slender, article 3 semi-falciform or weakly clavate, as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 ovate, large, with 1 apical seta, outer plate with [?6]-11 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae, outer slightly geniculate in appearance. Inner plate of maxilliped with distal setae only, outer plate normal, not reaching apex of palp article 2, with setae only on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium to short, with medium nail, and/or only setae.

Coxae long, strongly overlapping, of various sizes and shapes, coxa 1 rarely reduced, coxae 2-4 similarly elongate or shorter from 1 to 4 or coxa 1 very small in contrast to enlarged coxae 2-4, in this case coxa 2 huge and covering 1, dilated, coxae 3-4 rectangular, narrow, coxa 4 lobed only dorsally, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, small, densely setose, filtrative, gnathopod 2 slightly larger than 1, gnathopod 1 subchelate, article 5 unlobed, palm short, article 2 very setose anteriorly, articles 3-5 very setose posteriorly, article 3 slightly inflated. Gnathopod 2 slightly enlarged, simple, linear, with articles 2,5,6 very setose, filtrative, with article 5 elongate, much longer than 6, unlobed, article 6 not dilated, more slender than article 5, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 scarcely dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, with broad, unlobed, heavily setose article 2, pereopod 5 much shorter than pereopod 7, dactyls short. Sternal processes of thorax absent. Coxal gills slender to medium, present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, stout, rami slightly unequal, as long as peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 occasionally smaller or obsolescent. Uropod 3 very short, biramous, both rami short, subequal or inner ramus strongly shortened, obtuse and weakly setose distally, peduncle shorter than rami, very short; rami of uropods 1-3 with very stout spines. Telson entire, short, broader than long, ovate or pentagonal, sometimes almost pointed apically, with 2 apicolateral spines or setal groups.

Female. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. None.

Variables. Accessory flagellum scale-like (*L. rhizophorae*); taxa based on setal pattern of gnathopods 1-2, shape and setation of coxae, especially coxa 1 (reduced in type species); dactyl of maxillipedal palp stubby, not unguiform (*L. rhizophorae*); coxa 1 tiny and hidden by giant coxa

2 (type), of moderate size and partly hidden by giant coxa 2 (*L. rhizophorae*), of normal amphipod form (e.g. *L. plumulosus*); anterior lobe of coxa 5 narrow or broad; gnathopod 2 lacking filtrative setae on article 2, other long setae sparse (*L. longimanus*); gnathopod 1 carpochelate and propodochelate (*L. mariae*); article 2 of pereopods 5-7 lobate and lacking major setae (*L. dufresni*); epimeron 3 with tooth (*L. aberrans*); toothing of urosomites significant (e.g. *L. guttatus*); setation pattern of urosomite 1 variable; uropod 2 very robust and spinose (*L. hirsutimanus*); spur of uropod 2 present or absent; uropods 1-2 with long setae (versus spines) on rami (*L. aberrans*); rami of uropod 3 elongate or not, with facial spines or not, inner ramus shortened (*L. guttatus*), peduncle with apicodorsal row of spines or not.

Relationship. Characterised by the usually filtrative setose condition of article 2 on gnathopods 1-2 plus the dense setae elsewhere externally; apices of inner plates on maxilliped bearing only setae.

Differing from *Cheirimedeia, Gammaropsis* and *Protomedeia* in the poorly setose inner plate of maxilla 1 and the simple gnathopod 2 with heavily setose article 2.

See *Anonychocheirus, Chevalia, Goesia* and key with *Haplocheirus*.

Removal. *Leptocheirus aberrans* Ohlin, 1895 to *Goesia*.

Species. *Leptocheirus bispinosus* Norman, 1908 (Sexton, 1911a) (Chevreux & Fage, 1925) (Myers, 1982b) [330]; *L. dufresni* Ledoyer, 1982b [725wM]; *L. guttatus* (Grube, 1864b, 1866) (Chevreux & Fage, 1925) (Myers, 1982b) [340]; *L. hirsutimanus* (Bate, 1862) (Bate & Westwood, 1863) (Chevreux & Fage, 1925) (Sexton, 1911a) (Lincoln, 1979a) (Myers, 1982b) (= *L. massiliensis* Catta, 1875) (= *L. pilosus* identification of Sars, 1895) (= *L. typica* Malm, 1871) [352]; *L. longimanus* Ledoyer, 1973c (Myers, 1982b) [340]; *L. mariae* Karaman, 1973b (?Ledoyer, 1977) (Myers, 1982b) [340]; *L. pectinatus* (Norman, 1869) (Myers, 1982b) (Lincoln, 1979a) (= *L. fasciata* Costa, 1864) (= *L. dellavallei* Stebbing, 1899c) [352]; *L. pilosus* Zaddach, 1844 (Chevreux & Fage, 1925) (Lincoln, 1979a) (Myers, 1982b) (= *L. cornuaurei* Sowinsky, 1897) (= *L. subsalsus* Norman, 1908) [352 + E]; *L. pinguis* (Stimpson, 1853) (= *L. pinguis* Bate, 1862, junior homonym) (Norman, 1908) (Kunkel, 1918) (Bousfield, 1973) (= *L. fimbriata* Bate, 1862) [361 + B]; *L. plumulosus* Shoemaker, 1932a (Bousfield, 1973) (Dickinson *et al.*, 1980) [364]; *L. rhizophorae* Ortiz & Lalana, 1980, 1981 (Rueda, Ortiz & Gomez, 1980) [483]; *L. tricristatus* (Chevreux, 1886, 1887c) (Chevreux & Fage, 1925) (Lincoln, 1979a) [240].

Habitat and distribution. Marine, mostly Atlantic Ocean, dominantly Mediterranean, Kara Sea to Senegal and western Indian Ocean, western Atlantic from Labrador to Cuba, often brackish water, 0-250 (725) m, mostly very shallow, 12 species.

Liocuna Myers

Liocuna Myers, 1981d: 54.

Type species. *Liocuna caeca* Myers, 1981d, original designation.

Diagnosis. *Female.* Body cylindrical, slightly depressed, smooth, urosomites free, 1 ordinary, 3 hidden by telson. Rostrum short, thorn-like, ocular lobes short, pointed, antennal sinus weak. Eyes absent. Antennae [mostly missing, 1 slightly longer than 2, 1 slender, antenna 2 slightly stout in male]; peduncular article 3 of antenna 1 slightly shorter than 1, with distoventral tooth, article 2 longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 elongate, [remainder missing, ?peduncle stout in male, presumably not sculptured, but articles 4-5 ?often tapering strongly distad, rarely sculptured, article 4 dominant, flagellum short. Epistome [?unproduced anteriorly]. Labrum [?subrounded, barely incised]. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, weakly obtuse. Inner plate of maxilla 1 ovate, with 2 apical setae, outer plate with ?9-10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with long nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, coxa 1 spiniform or angular, produced forward, coxa 2 short, trapezoidal, coxa 4 much shorter than coxa 1, not lobed, coxa 5 longer than 4, coxa 7 much smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, small, not densely setose, gnathopod 1 slightly larger than 2, subchelate, palm oblique, article 2 not dilated, article 5 long, thick, slightly shorter than 6, unlobed, dactyl ordinary. Gnathopod 2 simple, feeble, with article 2 not dilated, article 5 longer than 6, unlobed, article 6 more slender than article 5, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 not dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with linear unlobed article 2, pereopod 5 much shorter than pereopod 7, with broader article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [?present on segments 2-6]. Pleopods [undescribed]. Epimeron 3 bisinuate, with strong tooth. Uropods 1-2 biramous, stout, rami slightly unequal, shorter than peduncle, peduncles without ventrodistal process.

Uropod 3 forming small, poorly setose rectangle lacking rami. Telson large, entire, as broad as long, ovate, with 2 apical setae.

Oostegites [?broad, present on segments 2-5].

Male. Unknown.

Sexual dimorphism. Unknown.

Relationship. Differing from *Pterunciola* in having article 2 of the mandibular palp longest, pereopods 3-4 with the propodus longer than the carpus and a large tooth on epimeron 3. From *Pseudunciola* in the biramous uropod 2, non-*Unciola*-like peduncle of uropod 3 and the nonreduced carpus of gnathopod 1. From *Rildardanus* in the unsculptured antennae. From *Pedicorophium* in the loss of ramus on uropod 3 and the normal inner rami of uropods 1-2. From *Unciola* in the loss of ramus on uropod 3, and the unexpanded peduncle. From *Ritaumius* in the normal articles 4-6 of pereopods 3-4 and the 3+articulate accessory flagellum.

See *Uncinotarsus*.

Species. *Liocuna caeca* Myers, 1981d [476].

Habitat and distribution. Marine, west Florida, 39-73 m, 1 species.

Maragopsis Myers

Maragopsis Myers, 1973c: 266.

Type species. *Lemboides bidentata* Ledoyer, 1972, original designation.

Diagnosis. Body laterally compressed, slender, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed; antennal sinus deep; head not as long as pereonites 1-2 together. Eyes moderate. Antennae short, both slender, 1 longer than 2; peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 8 to 9-articulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum long and ordinary. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 ovate, with 6 medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching two thirds to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail.

Coxae small, relatively short, weakly overlapping, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 dilated, very wide, produced forward, coxa 2 narrower, coxa 4 not longer than coxa 1, scarcely lobed, coxa 5 nearly as long as 4; coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, article 2 dilated, in male poorly subchelate, indistinctly carpochelate, not merochelate, article 5 long, stout, scarcely lobed, article 6 very small, palm short and oblique. Gnathopod 2 weakly subchelate, feeble, article 2 not dilated, article 5 longer than 6, not lobed, article 6 not more slender than article 5, dactyl long.

Pereopods 3-4 generally normal, similar, with dilated article 2 on pereopod 4, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with weakly expanded article 2, pereopod 5 much shorter than 7, with lobed article 2; pereopods 6-7 with basally broader almost or distinctly lobed article 2, pereopods 5-7 with short, curved dactyl. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami slightly unequal (outer shorter), equal to peduncle; peduncle of uropod 1 with moderate, of uropod 2 with obsolescent ventrodistal process. Uropod 3 of moderate length, biramous, rami of medium length, tapering, obtuse, with few armaments mostly apical, peduncle shorter than rami and itself not elongate, outer ramus with vestigial article 2, shorter than inner ramus. Telson entire, short, broader than long, pentagonal, weakly pointed apically, with 2 apicolateral spines on each side.

Female. Coxae different from male, 1 much narrower. Gnathopods small, gnathopod 1 scarcely larger than 2, poorly subchelate, article 5 shorter (1) or longer (2) than 6, unlobed. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Coxae, gnathopods.

Variables. Palm of male gnathopod 1 well defined (type), lacking definition (*M. obliquimana*).

Relationship. Differing from *Konatopus* in the lack of definite carpochela and large propodus on gnathopod 1 and the well developed accessory flagellum (8-9 versus 1.25). Ledoyer's (1982b) statements that *Konatopus* lacks a peduncular tooth on uropod 1 or that article 2 of gnathopod 2 is not dilated are erroneous. From *Rudilemboides* in the long article 3 of antenna 1 and the clavate (versus rectolinear) article 3 of the mandibular palp. From *Neomegamphopus* in the subchelate gnathopod 2 and long (versus 2-articulate) accessory flagellum. From *Aorcho* in the weakly carpochelate gnathopod 1 and clavate (versus rectolinear) article 3 of the mandibular palp.

See *Acuminodeutopus*.

Species. *Maragopsis bidentata* (Ledoyer, 1972, 1982b)

[745]; ?*M. obliquimana* Ledoyer, 1982b [694].

Habitat and distribution. Marine, Madagascar, 0-32 m, 2 species.

Meridiolembos Myers

Meridiolembos Myers, 1988: 189.

Type species. *Lembos hippocrenes* Myers, 1981c, original designation.

Myers (1988) diagnosis. Article 3 of mandibular palp [?with posterior margin distally concave, proximally straight, not described]; left mandibular molar with complex plates, primary plate asymmetric, rounded, secondary, tertiary and quaternary plates of similar shape; anterior margin of maxilliped [?with wing-like flanges, not described]; male gnathopod 1 variable; uropod 3 peduncle short, rami variable, outer ramus with or without small second article, with long distal setae.

Relationship. Compare with *Lembos* and all genera of the Myers (1988) diagnosis.

Species. *Meridiolembos acherontis* Myers, 1981c [840]; *M. hippocrenes* Myers, 1981c [776]; *M. pertinax* Myers, 1981c (*M. kergueleni* identification of Chilton, 1909b) [840].

Habitat and distribution. Marine, New Zealand and satellites, 3-70 m, 3 species.

Microdeutopus Costa

Figs 40C, 45M

Microdeutopus Costa, 1853: 17.–Costa, 1857: 230.–Stebbing, 1906: 588.–J.L. Barnard, 1969c: 154.–J.L. Barnard, 1973b: 20.–Myers, 1969a: 96 (key).–Lincoln, 1979a: 474.

Stimpsonia Bate, 1862: 162.–Bate & Westwood, 1863: 284 (*Stimpsonia chelifera* Bate, 1862, monotypy).

Microdeuteropus Bate & Westwood, 1863: 287 (more properly written from *Microdeutopus*, no type species).

Stimpsonella Della Valle, 1893: 421 (new name for *Stimpsonia*) (*Microdeutopus armatus* Chevreux, 1887b, present selection).

Coremapus Norman, 1905: 78 (*Coremapus* (*Microdeutopus*) *versiculatus* Bate, 1862, monotypy, no description, selected by Chevreux & Fage, 1925).

Type species. *Microdeutopus gryllotalpa* Costa, 1853, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, laterally compressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes medium to small. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 much shorter than 1, article 2 longest, accessory flagellum 2 to 3-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum subrounded, entire or weakly incised. Mandible normal, palp strong slender, article 3 falciform, as long as or longer than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 7+ spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae.

Coxae small, relatively short, weakly contiguous, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 not dilated, produced forward, occasionally longer than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, almost simple, both with linear articles, occasionally densely setose, gnathopod 1 greatly larger than 2, in male poorly subchelate or simple, carpochelate, article 2 dilated or not, article 5 long, large, linear, lobed, palm if indicated, short and transverse, article 6 much shorter and narrower than 5, dactyl long. Gnathopod 2 feeble, linear, with article 2 dilated or not, article 4 occasionally enlarged, inflated, incipiently merochelate, extended and fused distally along posterior margin of article 5, and occasionally heavily setose, article 5 as long as or longer than 6, unlobed, article 6 more slender than 5, dactyl short.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with sublinear or weakly expanded article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short to long, curved. Sternal processes of thorax present. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than peduncle, peduncle of uropod 1 with moderate ventrodistal process. Uropod 3 of medium size, biramous, both rami of medium length, obtuse distally, peduncle elongate, often as long as rami, outer ramus often with vestigial article 2, inner ramus almost as long as outer ramus, apically setose, narrow, tapering and with few armaments mostly apical, or with many marginal and surficial spines. Telson entire, short, as broad as long or longer, ovate, with 2 hooked apical cusps or setal group.

Female. Coxae different from male, usually coxa 1 shorter and less produced. Gnathopods small, 1

larger than 2, normally subchelate, article 5 longer than or equal to 6, unlobed. Oostegites moderately broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods, coxae.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally concave, proximally straight; left mandibular molar with complex plates, primary plate triangular, the margins straight or weakly convex, secondary, tertiary and quaternary plates of similar shape; anterior margin of maxilliped with or without wing-like flanges; male gnathopod 1 carpochelate, carpus much larger than propodus; uropod 3 peduncle elongate, not markedly expanded, rami relatively short, with marginal spines, but no marginal setae, outer ramus with small second article.

Variables. Peduncle of antenna 2 stout, flagellum thick and short, about 2 to 4-articulate (*M. apopo, M. haswelli*); mandibular palp article 3 longer than 2 (*M. apopo*); basal articles of maxilliped with lateral alae (*M. anomalus*); coxa 1 especially variable in shape, forward extension and setation; coxa 1 very large, male gnathopod 1 carpus also with fully medial thumb (*M. thumbelinus*); article 2 of gnathopod 1 crenulate or not, expanded or not; gnathopod 1 with multiple carpochelae (type), most species with single carpochela or 2 weak teeth, position and size of tooth important, article 6 often sculptured on posterior margin, anterior margin of carpus with tooth (*M. myersi*), dactylar size variable; male gnathopod 2 thickened and palm almost chelate (e.g. *M. armatus, M. chelifer*), article 4 enlarged, heavily setose (*M. gryllotalpa*); setosity patterns of gnathopods; sternal tooth patterns; rami of uropod 3 not longer than peduncle (*M. armatus*).

Relationship. Characterised by the carpochelate gnathopod 1 but recessment of head weak.

Differing from *Neomegamphopus* and allies in the short article 3 of antenna 1.

See *Acuminodeutopus*, *Hansensella*, *Lemboides*, *Lembos*, *Rudilemboides*, *Xenocheira*, *Zoedeutopus* and all genera of the Myers (1988) diagnosis.

Removals. *Microdeutopus kraemmeri* Reid, 1951, to *Globoslembos*; *M. tridens* Schellenberg, 1938a, to *Lembos*.

Species. See Cecchini-Parenzan (1935), Chevreux & Fage (1925), Gurjanova (1951), Krapp-Schickel (1969b), Miloslawskawa (1931, 1939), Mordhukhai-Boltovskoi (1969), Myers (1969a, 1971, 1983b – polyphyly), Schellenberg (1942); *M. algicola* Della Valle, 1893 (Myers, 1969a, 1982b) [340 + ?334]; *M. anomalus* (Rathke, 1843) (Sars, 1895) (Bousfield, 1973) (Lincoln, 1979a) (Myers, 1982b) (= *M. cambriensis* Bate, 1856, 1857d) (= *M. titii* Heller, 1867, possibly valid, see Myers, 1969a: 139) [250 + 339]; *M. apopo* J.L. Barnard, 1972b [773]; *M. armatus* Chevreux, 1886, 1887b (Chevreux & Fage, 1925) (Myers, 1969a, 1982b) [352]; *M. bifidus* Myers, 1977b, 1982b [348]; *M. chelifer* Bate, 1862 (Chevreux & Fage, 1925) (Lincoln, 1979a) (Myers, 1982b) [352]; *M. damnoniensis* (Bate, 1856, *nomen nudum*; 1857d) (Chevreux & Fage, 1925) (Myers, 1969a) (Kamenskaya *et al.*, 1977) (Lincoln, 1979a) [352]; *M. gryllotalpa* Costa, 1853; 1857 (Sars, 1895) (Bousfield, 1973) (Lincoln, 1979a) (Myers, 1982b) (= *M. grandimana* Bruzelius, 1859) (= *M. minax* Smith, 1873) (Della Valle, 1893) (= *M. bidens* Sowinsky, 1880) (= *M. salenskii* of Carus, 1885) [352]; *M. haswelli* Stebbing, 1899 (Myers, 1969a) (= *M. chelifer* Haswell, 1879b, homonym) [781]; *M. obtusatus* Myers, 1973a, 1982b [340]; *M. propinquus* Sars, 1895 (? = *M. anomalus*) (Stebbing, 1906) (Stephensen, 1929a) (Oldevig, 1959) (= *M. danmoniensis* sic of Sars, 1895) [238 + 237]; *M. similis* Myers, 1977b, 1982b [346]; *M. sporadhi* Myers, 1969a, 1982b [340]; *M. stationis* Della Valle, 1893 (Lincoln, 1979a) (Myers, 1982b) [352]; ?*M. thumbellinus* Griffiths, 1974b (Myers, 1988 removes to "Neomegamphopidae") [743]; *M. versiculatus* Bate, 1857d, 1862 (Myers, 1969a, 1982b) (Lincoln, 1979a) [352]; "species" Myers, 1969a [478].

Habitat and distribution. Marine, cosmopolitan, mostly tropical, north to Norway, south to South Africa, 0-146 m, 16 species.

[Ischyroceridae] *Microjassa* Stebbing

Fig.47E

Microjassa Stebbing, 1899b: 240.–Stebbing, 1906: 651.–J.L. Barnard, 1969c: 278.–J.L. Barnard, 1973b: 26.–Krapp-Schickel & Schiecke, 1975: 401.–Lincoln, 1979a: 564.

Type species. *Podocerus cumbrensis* Stebbing & Robertson, 1891, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. Eyes ordinary. Antennae of medium length, subequal, both slender, peduncular article 3 of antenna 1 longer than 1, article 2 longest, accessory flagellum 2 to 3-articulate, main flagellar articles very few. Antenna 2 peduncular article 3 scarcely elongate, flagellum short, with few articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 vestigial, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate without medial setae. Inner plate of maxilliped with one distal spine, outer plate normal, not reaching apex of palp article 2, with sparse spines only on medial margin, palp with 4 articles, article 2 long, article 3

unlobed, article 4 long, with long nail and setae.

Coxae long, strongly overlapping, of various sizes and shapes, evenly extended from 2 to 4, coxa 1 not dilated, not produced forward, very small in contrast to enlarged coxae 2-4, coxa 2 larger than 1, often produced or dilated, coxa 4 longer than coxa 1, lobed and excavate, coxae 5-7 much smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 2 greatly larger than 1 gnathopod 1 in male subchelate, article 5 lobed, short, shorter than 6, article 6 moderately large. Gnathopod 2 enlarged, subchelate, occasionally weakly carpochelate in male, with article 2 not dilated, article 4 slightly enlarged, extended and often fused distally along posterior margin of article 5, article 5 absent or short, cryptic, unlobed, article 6 dilated, with large chela or thumb on posteroproximal margin, dactyl long.

Pereopods 3-4 normal, similar, with slightly inflated article 2, article 4 dilated, dactyls medium. Pereopods 5-7 similar to each other, progressively longer, pereopods 5-6 slightly shorter than pereopods 6-7, pereopods 5-7 with broad, weakly lobed article 2, dactyl of pereopods 5-7 short to long, curved. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments 2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer (2) than or as long as (1) peduncle, peduncle without ventrodistal process. Uropod 3 of ordinary length, biramous, both rami very short, outer ramus recurved apically, with apicolateral teeth or hooks, inner ramus as long as outer ramus, narrow, tapering and with few armaments mostly apical; peduncle longer than rami. Telson entire, as broad as long, pentagonal, pointed apically, with 2 apicolateral setae.

Female. Gnathopods small, alike, normally subchelate, article 5 shorter than 6, lobed. Oostegites moderately broad, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods.

Variables. Antenna 2 in male long and stout, antenna 1 short and slender, article 1 of primary flagellum elongate (*M. macrocoxa*); inner ramus of uropod 3 shortened (*M. macrocoxa*).

Relationship. Differing from *Jassa* and *Parajassa* in the very short coxa 5, being scarcely longer than coxa 6, with coxa 4 sufficiently lobed and excavate to receive the shortened coxa 5; and outer plate of maxilliped poorly armed medially. Differing also from *Jassa* and *Parajassa* in the smallness of female gnathopod 2. From *Ischyrocerus* in the presence of a thumb on male gnathopod 2. From *Parajassa* in the presence of a distinct non-scale-like accessory flagellum.

Like other ischyrocerids, with considerable resemblance to *Cheiriphotis*, *Photis*, *Posophotis* and allies, but differing in the presence of a thumb on male gnathopod 2 and the reduced coxae 1 and 5 and definitely hooked outer ramus of uropod 3.

Removals. *Microjassa chinipa* J.L. Barnard, 1979b, and *M. claustris* J.L. Barnard, 1969a, to *Ischyrocerus.*

Species. *M. cumbrensis* (Stebbing & Robertson, 1891) (Chevreux & Fage, 1925) (Krapp-Schickel & Schiecke, 1975) (Lincoln, 1979a) (Hirayama, 1985b) (= *M. falcatiformis* Sowinsky, 1897) (= *M. constantinopolitanus* Sowinsky, 1897) [352 + 395]; *M. macrocoxa* Shoemaker, 1942 (J.L. Barnard, 1964e, 1979b) [376].

Habitat and distribution. Marine, north-eastern Atlantic, north-eastern Pacific, Japan, 0-157 m, 2 species.

Microphotis Ruffo

Microphotis Ruffo, 1952: 35.–J.L. Barnard, 1969c: 273.–J.L. Barnard, 1973b: 20.

Type species. *Microphotis blachei* Ruffo, 1952, monotypy.

Diagnosis. Like *Photis* but main flagellar articles of antennae 1-2 very few; coxae short, coxa 1 dilated, produced forward; article 5 of gnathopod 2 poorly lobed; article 6 of pereopods 3-4 with only 2 locking setae on posterior margin, no other armaments; dactyl of pereopods 5-7 geniculate but dactyl of pereopod 5 lacking tooth; peduncle of uropod 1 with ventrodistal process; uropod 3 small, uniramous, single ramus shorter than peduncle, 1-articulate, peduncle also short.

Relationship. Differing from *Photis* in the short, 1-articulate ramus of uropod 3, lack of inner ramus (but some species of *Photis* also lack this ramus), lack of outer tooth on dactyl of pereopod 5, presence of a spur on the peduncle of uropod 1 and the anterior expansion of coxa 1 in the male.

See *Cheiriphotis* and *Dercothoe.*

Species. *Microphotis blachei* Ruffo, 1952 [655E].

Habitat and distribution. Freshwater, but marine derived, lower Mekong River, 1 species.

Microprotopus Norman

Figs 41E, 42C, 45O

Microprotopus Norman, 1867b: 203.–Stebbing, 1906: 604.–J.L. Barnard, 1969c: 274.–J.L. Barnard, 1973b: 20.–Lincoln, 1979a: 512.

Orthopalame Hoek, 1879: 123 (*Orthopalame terschellingi* Hoek, 1879, monotypy).

Type species. *Microprotopus maculatus* Norman, 1867b, monotypy.

Diagnosis. Body laterally compressed, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed or blunt, antennal sinus moderate. Eyes small. Antennae of medium length, subequal, 1 slender, antenna 2 slightly stout in male; peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum 2+articulate. Antenna 2 peduncular article 3 short, peduncle slightly stout in male. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, large, with a row of medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 short, with medium nail.

Coxae long, weakly contiguous, uniform, progressively but slightly elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 slightly wider than 1, coxa 4 slightly longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, palm short, oblique, gnathopod 2 subchelate, article 5 longer than 6, unlobed. Gnathopod 2 enlarged, weakly subchelate, with article 2 not dilated, articles 4 and 5 in both sexes very strongly setose medially, article 5 very short, lobed, article 6 dilated, sometimes with false chela or process on posteroproximal margin, dactyl long.

Pereopods 3-4 normal, similar, with slightly inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively but slightly longer, pereopod 5 shorter than pereopods 6-7, pereopods 5-7 with broad lobed article 2, dactyl medium, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods normal. Epimeron 3 bisinuate or notched. Uropods 1-2 biramous, normal, rami slightly unequal or equal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 small, short, uniramous, single ramus long, 1-articulate, tapering and with few armaments mostly apical, obtuse distally, peduncle shorter than ramus but not very short, not dilated medially. Telson entire, short, broader than long, pentagonal, with 2 hooked apical cusps.

Female. Coxa 2 narrower than in male. Gnathopods small, gnathopod 2 larger than 1, normally subchelate; article 5 of gnathopod 2 shorter than 6, strongly lobed. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Articles 4-5 of male antenna 2 stout (*M. shoemakeri*); spines on uropods 1-3 very stout (*M. bicuspidatus*); uropod 1 with peduncular spur (*M. bicuspidatus*); ramus of uropod 3 shorter than peduncle (*M. bicuspidatus*).

Relationship. Like *Gammaropsis* and *Photis* but inner ramus of uropod 3 absent and article 3 of antenna 1 shorter than article 1; also from *Gammaropsis* in the longer coxae.

See *Cheiriphotis*.

Species. See Chevreux & Fage (1925), Gurjanova (1951), Miloslawskawa (1931, 1939), Mordhukhai-Boltovskoi (1969); *M. bicuspidatus* Rabindranath, 1971b (Ledoyer, 1979b) [640 + 670]; *M. longimanus* Chevreux, 1886, 1887b (Myers, 1976a) (Lincoln, 1979a) (= *M. minutus* Sowinsky, 1894) [240 + ?334]; *M. maculatus* Norman, 1867b (Sars, 1895) (Nayar, 1959) (Myers, 1976a) (Lincoln, 1979a) (= *M. terschellingi* Hoek, 1879) [352]; *M. raneyi* Wigley, 1966 (Lowry, 1972) (Bousfield, 1973) [361]; *M. shoemakeri* Lowry, 1972 (Thomas, 1976) [362]; "species" Myers 1976a [348].

Habitat and distribution. Marine, North Atlantic, Mediterranean, Black Sea, Gulf of Mexico; 1 species in Indo-Pacific; 0-24 m, 5 species.

Neohela Smith

Figs 39D, 42J, 44F, 45T

Hela Boeck, 1861: 668 (homonym, Decapoda).
Neohela Smith, 1881b: 418 (new name, same type species).– J.L. Barnard, 1969c: 194; 1973b: 21.
Helella Sars, 1883: 31 (same species listed but no description).

Type species. *Hela monstrosa* Boeck, 1861, monotypy.

Diagnosis. Body cylindrical, depressed, provided with humps, urosomites 1-2 free, 1 slightly elongated, 3 coalesced with telson. Rostrum short, ocular lobes short, pointed, antennal sinus weak to moderate. Eyes absent. Antennae hugely elongate, 1 shorter than 2, both slender, peduncular article 3 of antenna as long as 1, article 2 greatly longest, accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum greatly elongate. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, very slender, article 3 rectolinear or tapering, scarcely shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 linguiform, with 1 facial seta and 3 apical setae, outer plate with 9 spines, palp 2-articulate. Inner plates of maxilla 2 shortened, with only mediomarginal setae.

Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very long, with medium nail and setae. Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 2 to 4, spiniform, coxa 1 not dilated, produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 somewhat longer than 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 alike, of subequal size, medium, densely setose, gnathopod 1 scarcely larger than 2, subchelate, article 5 unlobed, palm short and subtransverse, article 5 of both gnathopods as long as 6, article 6 large, palm sculptured in male, dactyl long.

Pereopods 3-4 longer than gnathopods, similar, very elongate,with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopod 5 short, of 6-7 elongate, curved. Sternal processes of thorax absent. Coxal gills moderately broad, present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (1) or as long (2) as peduncle, peduncle without ventrodistal process, peduncular and ramal spines very conspicuous. Uropod 3 small, uniramous, single ramus long, pointed distally, peduncle shorter than ramus, not dilated medially, 1-articulate, narrow, tapering and with few armaments. Telson entire, fused to urosomite 3, longer than broad, triangular, blunt apically, poorly armed.

Female. Gnathopod 1 slightly less developed than in male; outer ramus of male uropod 1 with swelling(s), weak or not present in female. Oostegites broad, present on only segments 3, 4, and 5.

Sexual dimorphism. Weak. Gnathopod 1; outer ramus of uropod 1.

Variables. Pereopods 3-4, but 4 especially, with saber-like dactyl (*N. pacifica*).

Relationship. Differing from *Unciola* and *Unciolella* in the ovate or trapezoidal propodus of gnathopod 2, the very slender antenna 2 with greatly elongate flagellum, and the non-expanded peduncle of uropod 3. From *Unciolella* and *Parunciola* in the angular coxae, and additionally, from *Parunciola*, in the poorly (versus greatly) setose inner plate of maxilla 1. From *Janice* in the slender gnathopod 2, rectolinear article 3 of the mandibular palp, and 3-articulate (versus absent) accessory flagellum.

See *Camacho*.

Species. *Neohela intermedia* Coyle & Mueller, 1981 [230 + 290]; *N. maxima* Stephensen, 1933b (Gurjanova, 1951) [253]; *N. monstrosa* (Boeck, 1861) (Sars, 1895) (Shoemaker, 1930a) Stephensen, 1940b, 1944a,c) (Dickinson *et al.*, 1980) (= *N. phasma* Smith, 1881b) [200 + BA]; *N. pacifica* Gurjanova, 1953 [284].

Habitat and distribution. Marine, Arctic-boreal, Pacific and Atlantic, 47-552 (?2288) m, 4 species.

Neomegamphopus Shoemaker

Fig.46B

Neomegamphopus Shoemaker, 1942: 35.–J.L. Barnard, 1969c: 91.–J.L. Barnard, 1973b: 21.

Type species. *Neomegamphopus roosevelti* Shoemaker, 1942, original designation.

Diagnosis. Body almost cylindrical, slightly depressed but laterally compressed, slender, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed; antennal sinus deep; head fully as long as pereonites 1-2. Eyes moderate. Antennae of medium extension, nearly subequal, 1 scarcely shorter than 2, both slender; peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 1.25-articulate. Antenna 2 peduncular article 3 elongate, flagellum with about 10 articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, stout, article 3 clavate, shorter than 2. Labium with entire outer lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 small, with 2 medial setae, outer plate with 10 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with 3 distal spines, outer plate short, not reaching three fourths to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long setae.

Coxae relatively short, overlapping, of various shapes, progressively shorter from 1 to 4, coxa 1 weakly dilated, slightly produced forward, coxae 2-4 smaller, coxa 4 not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, large, simple, both with linear articles, densely setose; gnathopod 1 slightly larger than 2, simple, carpochelate, article 5 long, lobed, article 6 thin but almost as long as base of article 5, dactyl normal. Gnathopod 2 simple, feeble, linear, article 2 very setose, article 5 longer than 6, not lobed, article 6 more slender than 5, dactyl moderate.

Pereopods 3-4 similar, with inflated article 2, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 much shorter than 7; pereopod 7 with slightly broader almost lobed article 2, pereopods 5-6 with moderately broad, unlobed article 2, dactyl of pereopods 5-7

short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, peduncle of uropod 1 with large ventrodistal process. Uropod 3 of medium length, biramous, rami short, narrow, tapering and pointed distally, armaments few and mostly marginal, peduncle shorter than rami, outer ramus with vestigial article 2; inner ramus longer than outer ramus. Telson entire, short, broader than long, pentagonal, with 2 tiny apical cusps, 2 spines and 2 setal groups.

Female. Coxae different from male, shorter, coxa 1 not enlarged. Gnathopods small, alike, gnathopod 2 barely larger than 1, poorly subchelate or simple, article 5 longer than or almost as long as 6, unlobed. Oostegites [?moderately narrow, broad, present on only segments 2-5].

Sexual dimorphism. Strong. Coxae, gnathopods.

Variables. Carpochela of terminal male gnathopod 1 long (type), short (*N. kunduchii*), article 2 slightly dilated (*N. kunduchii*); gnathopod 2 less extended and articles 5-6 shorter (*N. kunduchii*).

Relationship. Differing from *Microdeutopus* in the deep cephalic recessment of antenna 2, clavate article 3 of the mandibular palp, and medial (not apical) setae on the inner plate of maxilla 1. Differing from *Amphideutopus* in the simple male gnathopod 2 and short rami of uropod 3.

See *Acuminodeutopus*, *Amphideutopus*, *Konatopus*, *Maragopsis*, *Pseudomegamphopus*, *Rudilemboides*, *Varohios* and *Zoedeutopus*.

Species. *Neomegamphopus heardi* Barnard & Thomas, 1987 [541]; *N. hiatus* Barnard & Thomas, 1987 [470]; *N. kunduchii* Myers, 1973c [683]; *N. pachiatus* Barnard & Thomas, 1987 [541]; *N. roosevelti* Shoemaker, 1942 (J.L. Barnard, 1969a) (Myers, 1968a,c) [370].

Habitat and distribution. Marine, tropical Pan-America and east Africa, 0-49 m, 5 species.

Pagurisaea Moore

Pagurisaea Moore, 1983b: 47.

Type species. *Pagurisaea schembrii* Moore, 1983b, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus deep. Eyes moderate. Antennae of medium extension, nearly subequal, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 scarcely longest, accessory flagellum 4 to 5-articulate. Antenna 2 peduncular article 3 short, flagellum short, with 5 articles. Epistome produced anteriorly. Labrum subrounded, lobed. Mandible normal, palp strong, stout, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, without setae, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner narrow, with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching two thirds to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae.

Coxae long, probably strongly overlapping, of similar sizes and shapes, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 slightly larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 long, unlobed, as long as 6, dactyl ordinary. Gnathopod 2 enlarged, transversely subchelate, with article 2 not dilated, not setose, article 5 very short, scarcely lobed, article 6 dilated, dactyl thick, fitting palm.

Pereopods 3-4 similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with expanded article 2, 3-7 prehensile, pereopod 5 not shorter than 7, with broader, well lobed article 2; pereopods 6-7 with narrower, weakly lobed article 2, article 2 of pereopod 7 long and pointed, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills slightly expanded, present on segments [?2-6]. Pleopods [?normal]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropods 1-2 with ventrodistal process, that of uropod 2 smaller. Uropod 3 small, biramous, both rami slightly elongated, obtuse distally, peduncle almost as long as rami, slightly elongated, not dilated medially, outer ramus with wirelike dorsolateral setae; inner ramus much shorter than outer ramus, narrow, tapering, and with few armaments mostly apical. Telson entire, short, as broad as long, semicircular or pentagonal, with 2 rows of hooked apical spinules.

Female. Gnathopods small, gnathopod 2 larger than 1, normally subchelate, article 5 shorter than 6, unlobed on 1, weakly lobed on 2. Uropod 3 rami subequal. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopods.

Relationship. Differing from *Cheiriphotis* in the cylindrical uropod 3, prehensile pereopods, longer

article 3 of antenna 1 and lack of setae on the inner plate of maxilla 1. From *Protomedeia* and *Cheirimedeia* in the elongate article 3 of antenna 1, deep recessment of antenna 2, and the dominant propodus of male gnathopod 2. From *Isaea* in the slight to great enfeeblement of the inner ramus on uropod 3, the presence of silk glands on pereopods 3-4, and the presence of tiny hooks on the telson. From *Gammaropsis* and allies in the prehensile pereopods.

Species. *Pagurisaea schembrii* Moore, 1983b [776I].

Habitat and distribution. Marine, New Zealand, off Otago Peninsula, 38 m, 1 species.

Paracorophium Stebbing

Fig.43A

Paracorophium Stebbing, 1899b: 241.–Stebbing, 1899d: 350.–J.L. Barnard, 1969c: 194.–J.L. Barnard, 1973b: 21.–Karaman, 1979d: 88.

Type species. *Paracorophium excavatum* Thomson, 1884, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus moderate. Eyes small. Antennae of medium length, 1 longer than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum absent. Antenna 2 peduncular article 3 short but enlarged, peduncle stout in male, flagellum short. Epistome [?unproduced anteriorly]. Labrum slightly incised. Mandible normal, palp strong, slender, article 1 elongate, article 3 rectolinear or clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 linguiform, pubescent, without setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, not reaching apex of palp article 2, with thin spines or setae on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long spines and setae.

Coxae ordinary to long, strongly overlapping, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, of subequal size, feeble or small, both with linear articles, densely setose, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 long, sublinear, unlobed, palm short and subtransverse, article 6 slender, shorter than 5. Gnathopod 2 very setose, enlarged, weakly parachelate, with article 2 not dilated, article 4 enlarged, merochelate, extended away from posterior margin of article 5, article 5 shorter than 6, more slender than 6, lobed, article 6 dilated, with double chela, dactyl medium, not overlapping transverse palm.

Pereopods 3-4 normal, similar, with slender article 2, article 4 scarcely dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 often prehensile, pereopods 5-6 much shorter than and slightly different from pereopod 7, pereopods 5-7 with broad unlobed article 2, pereopods 6-7 with different dactyl, short, curved, dactyl of pereopod 5 almost geniculate, without accessory spine on outer margin, slight palm developed. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal to stout, rami slightly unequal on 2, much shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodistal process, spines of uropods 1-2 strong. Uropod 3 small, very short, biramous, both rami very short, peduncle longer than rami but very short and flat, occasionally dilated medially, outer ramus obtuse distally, 1-articulate almost foliaceous, inner ramus much shorter than outer ramus, apically setose, almost scale-like. Telson entire, short, broader than long, pentagonal, pointed apically. with 2 hooked apical cusps.

Female. Gnathopod 2 small, poorly subchelate, almost simple, article 5 slender, longer than 6, unlobed, merochela very large, propodus slender, tapering, dactyl short but overlapping palm strongly. Oostegites narrow, present on [?segments 2-5].

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Article 4 of antenna 2 with distal lobe (type); inner plate of maxilla 1 with 1 seta (*P. chelatum*); outer plate of maxilla 1 with 7 spines (*P. hartmannorum*); inner plate of maxilliped with stout spines (*P. hartmannorum*); male gnathopod 2 fully chelate (*P. chelatum*), doubly parachelate (type); pereopod 6 as long as 5 (*P. chelatum*), longer than 5 (*P. hartmannorum*); urosomites 1-2 coalesced (*P. chelatum*).

Relationship. Differing from *Corophium* in the longer overlapping coxae, presence of 3 (versus 2) normal articles on the mandibular palp, the normal nonlunate, nonspined article 5 of pereopod 5, the biramous uropod 3, shorter antenna 2, broader article 2 of pereopod 7, and the freely projecting merochela of gnathopod 2.

See *Chaetocorophium* and *Stenocorophium*.

Species. *Paracorophium chelatum* Karaman, 1979g [594R]; *P. chilensis* Varela, 1983 [767]; *P. excavatum* Thomson, 1884 (part of Chilton, 1920a) (Hurley, 1954e) (Chapman & Lewis, 1976) (Karaman, 1979d) [770E]; *P. hartmannorum* Andres, 1975b, 1979a (Karaman, 1979d) (Gonzalez, 1986) [765E]; "species" Kangas & Geddes,

1984a [785].

Habitat and distribution. Marine, brackish and freshwater, New Zealand, Chile, Palau, 4 species.

Paradryope Stebbing

Paradryope Stebbing, 1888: 1151.–Stebbing, 1906: 602.–J.L. Barnard, 1969c: 155.–J.L. Barnard, 1973b: 26.

Type species. *Paradryope orguion* Stebbing, 1888, monotypy.

Diagnosis. Body cylindrical, laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. Eyes small. Antennae long, nearly subequal, both slender, peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 elongate. Epistome [?unproduced anteriorly. Labrum ?slightly incised. ?broad ?fleshy, ?bilobed]. Mandible normal, palp strong, article 3 almost rectolinear, shorter than 2. Labium [?with entire outer lobes, with well-developed inner lobes, mandibular lobes short long, pointed. blunt. Inner plate of maxilla 1 triangular, short, vestigial, absent, small large, with a row of medial setae, without 1 2 3 4 5 apical setae, outer plate with 6 7 9 11 spines, palp 1 to 2-articulate. Plates of maxilla 2 rather broad, narrow, inner plate with mediofacial row of setae, with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, very short, long, not reaching exceeding apex of palp article 2, with spines, setae only on medial margin, palp with 2 3 4 articles, article 2 long short, article 3 unlobed, article 4 very long, short, with long short medium lacking nail, and setae, armed with row of fine spines along inner margin].

Coxae very small, relatively short, weakly contiguous, not progressively elongate from 1 to 4, slightly angular, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 slightly larger than 2, gnathopod 1 subchelate, article 5 shorter than 6, unlobed, article 6 very large. Gnathopod 2 subchelate, feeble, with article 2 not dilated, article 5 as long as 6, unlobed, article 6 dilated, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls long. Pereopods 5-7 similar to each other, scarcely progressively longer, with sublinear article 2, dactyl of pereopods 5-7 curved, medium. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, rami strongly unequal, outer much shorter than inner, latter shorter than peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 small, short, biramous, both rami very short, spinelike, with no armaments, outer recurved apically, peduncle elongate, longer than rami. Telson entire, longer than broad, pyriform, pointed apically, with 2 midlateral spines.

Female. Unknown. Gnathopods [?small, gnathopod 1 larger smaller than 2, normally poorly subchelate, simple, article 5 shorter longer than almost as long as 6, strongly weakly unlobed on both gnathopods 1 2. Oostegites moderately narrow, broad, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Differing from *Aorcho* in the much shorter rami of uropod 3. From *Bogenfelsia* in the very short rami of uropod 3 and the enlarged gnathopod 1.

Species. *Paradryope orguion* Stebbing, 1888, 1906 [320A].

Habitat and distribution. Marine, North Pacific, east of Yokohama, 36°N 158°E, 4200 m, 1 species.

[Ischyroceridae] *Parajassa* Stebbing

Fig.47B

Janassa Boeck, 1871b: 249 (homonym, Pisces).
Parajassa Stebbing, 1899b: 240 (new name, same type species).–Stebbing, 1906: 649.–J.L. Barnard, 1969c: 279.–J.L. Barnard, 1973: 26.–Lincoln, 1979a: 562.–Ledoyer, 1979a: 96 (key).–Moore, 1985a: 234 (key).

Type species. *Podocerus variegatus* Leach, 1814b, misidentified by Boeck, species in his hand (= *Jassa pelagica* Leach, 1814b).

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, blunt, antennal sinus deep. Eyes ordinary. Antennae of medium length, 1 shorter than 2, both stout; peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum vestigial, scale-like; main flagellar articles very few. Antenna 2 peduncular article 3 short, peduncle especially stout in male, flagellum short. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, almost pointed. Inner plate of maxilla 1 triangular, short, without setae, outer plate with 7-8 spines, palp 2-articulate. Outer plates of maxilliped with distal spines, outer plate short, not reaching apex of palp article 2, with spines on medial margin, palp with 4

articles, article 2 long, article 3 almost lobed, article 4 medium, with long setae.

Coxae relatively short, weakly overlapping, of various sizes and shapes, progressively elongate from 1 to 4, coxa 1 scarcely dilated, scarcely produced forward, small in contrast to slightly enlarged coxae 3-4, coxa 2 also short, often produced or dilated, coxa 4 longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 short, shorter than 6, lobed. Gnathopod 2 enlarged, subchelate, with article 2 dilated only apically, with article 4 extended distally along posterior margin of article 5, article 5 very short, lobed, article 6 dilated, with false chela and process on posteroproximal margin, dactyl long.

Pereopods 3-4 normal, similar, with slightly inflated article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, almost prehensile, pereopod 5shorter than pereopods 6-7, pereopod 7 with lobed article 2, pereopods 5-6 with broad unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 of ordinary length, biramous, both rami very short, recurved apically, each with apical spine, peduncle elongate, longer than rami. Telson entire, as broad as long, pyriform, pointed apically, with 2 hooked apical cusps.

Female. Gnathopod 2 slightly and poorly sculptured. Oostegites moderately narrow, present on segments 2-5.

Sexual dimorphism. Weak. Gnathopod 2.

Variables. Antennae 1-2 immensely setose in form of bottle-brush (type only); antennae 1-2 slender (all but type and *P. georgiana*); article 5 of gnathopod 1 often elongate (e.g. *P. chikoa*); palm of gnathopod 2 transverse and entire (female *P. chikoa*), otherwise sculptured or not; anterior margin of article 2 on pereopod 5 heavily setose or not; article 2 of pereopod 7 narrow (*P. andromedae*); peduncle of uropods 1-2 densely setose (*P. angularis, P. spinipalma*); outer ramus of uropod 2 modified in male (*P. angularis*); outer ramus of uropod 3 with normal apical hooks (e.g. *P. bidentata*); outer ramus of uropod 3 shortened and lacking armament (*P. tristanensis*); oostegites broad (*P. andromedae*).

Relationship. Differing from *Ischyrocerus* and *Jassa* in the reduction of the accessory flagellum to a small scale; from *Ischyrocerus* additionally in the enlarged female gnathopod 2.

See *Microjassa* and *Gammaropsis longicornis*, very close to *Parajassa*.

Species. *Parajassa andromedae* Moore, 1985 [776I]; *P. angularis* Shoemaker, 1942 (J.L. Barnard, 1962a, 1970a) [376 + 381]; *P. bidentata* Ledoyer, 1979a, 1986 [698]; *P. chikoa* Griffiths, 1974c (Ledoyer, 1978b, 1979a, 1986) [690]; *P. pelagica* (Leach, 1814b) (Chevreux & Fage, 1925) (Lincoln, 1979a) (= *P. capillatus* Rathke, 1843, Sars, 1895) [355]; *P. spinipalma* Ledoyer, 1979a, 1986; *P. s. longicephalus* Ledoyer, 1978b [690]; *P. tristanensis* Stebbing, 1888 (K.H. Barnard, 1932) (Stephensen, 1949) [731].

Habitat and distribution. Marine, Arctic-North Atlantic, Indo-Pacific tropics, Austral-Antarctic, 0-130 m, 7 species.

Paramicrodeutopus Myers

Paramicrodeutopus Myers, 1988: 190.

Type species. *Microdeutopus schmitti* Shoemaker, 1942, original designation.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally concave, proximally straight; left mandibular molar with complex plates, primary plate triangular or subtriangular, secondary plate reduced or absent, tertiary and quaternary plates missing; anterior margin of maxilliped without wing-like flanges; male gnathopod 1 carpochelate, carpus larger than propodus; uropod 3 peduncle shortened, weakly expanded, rami with spines, but no marginal setae, outer ramus with small second article.

Relationship. See *Microdeutopus* and all genera of the Myers (1988) diagnosis.

Species. *Paramicrodeutopus hancocki* Myers, 1968a, 1969a (J.L. Barnard, 1979b) [540]; *P. myersi* Bynum & Fox, 1977 (Myers, 1981d) [362]; *P. schmitti* Shoemaker, 1942 (J.L. Barnard, 1959d, 1969a,b, 1979b) (Reish & Barnard, 1967) (Myers, 1968a, 1969a) [369]; *P. trichopus* Myers, 1968a, 1969a [546].

Habitat and distribution. Marine, tropical America north to California and Chesapeake region, 0-221 m, 4 species.

Paraneohela Oldevig

Paraneohela Oldevig, 1959: 115.

Type species. *Paraneohela anomala* Oldevig, 1959,

original designation.

Diagnosis. *Badly described* (known items italicised). Like *Neohela*. Body cylindrical, [dorsally corrugated, provided with elevations, teeth or humps, carinate, slightly depressed, laterally compressed, smooth, normal, last 2 3 mesosome segments fused together; urosomites free, 1 elongated, or 1-2-3 coalesced, 3 coalesced with telson, marked ventrally by sutures, urosomite 1 ordinary, elongate, toothed]. Rostrum [short, long, thorn-like, supra-antennal line absent present except in defining ocular lobes], *ocular lobes short, blunt*, [antennal sinus absent. weak. moderate. deep. (Head as long as pereonites 1-2 together)]. *Eyes ordinary. Antennae long, 1 much longer than 2*, [1 both slender, antenna 2 stout]; *peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 6-articulate, main flagellar articles many. Antenna 2* [peduncular segment 3 short. scarcely elongate. peduncle stout in male], *flagellum with 7 articles*. Epistome [unproduced anteriorly]. *Labrum entire*. Mandible [normal, with reduced molar, somewhat conical but apically blunt, palp strong weak, absent, very slender, with only 1 2 articles, article 3 not semi falciform, rectolinear, clavate, article 3 shorter longer than 2. Labium with entire notched outer lobes, ?probably without weakly well-developed inner lobes, mandibular lobes short long, pointed. blunt]. *Inner plate of maxilla 1 short, without setae*, [outer plate with 6 9 11 spines, palp 1 2-articulate. Plates of maxilla 2 rather broad, narrow, inner plate with mediofacial row of setae. with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, very short, long, not reaching exceeding apex of palp article 2, with spines, setae only on medial margin, palp with 2 3 4 articles, article 2 long, article 3 un lobed, article 4 very long, short, with long short medium lacking nail. and setae. armed with row of fine spines along inner margin].

Coxae long, strongly overlapping, [of various sizes and shapes, progressively elongate from 1 to 4, spiniform], *coxa 1 dilated, produced forward*, [very small in contrast to enlarged coxae 2-4, coxa 2 also short, larger than 1, often produced or dilated, other coxae ?, coxa 4 not longer than coxa 1, lobed, coxa 5 usually nearly as long as much shorter somewhat longer than 4. very elongate anteroposteriorly especially in female, thoracic segment 5 also elongate, very small, coxae 6-7 much smaller than anterior coxae]. *Gnathopods 1-2 of subequal size, small*, [simple, both with linear articles, densely setose, large, gnathopod 1 2 slightly greatly larger than 1 2, gnathopod 1 in male weakly poorly subchelate, simple, with only 6 articles, carpochelate, nearly merochelate, article 5 long, linear, unlobed, palm short and transverse, gnathopod 2 subchelate simple], *article 5 of both gnathopods 1-2 shorter than 6*, [poorly unlobed, carpochelate in males, with large article 5, article 6 very large], *palms transverse*. [Gnathopod 2 enlarged, weakly subchelate, parachelate, simple, feeble, linear, carpochelate in male, with article 2 dilated, very setose, with article 4 enlarged, inflated, incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 as long as longer shorter than 6, larger more slender than 6, unlobed, article 6 dilated, more slender than article 5, sometimes with false chela. with process on posteroproximal margin, dactyl short. long. strongly reduced].

Pereopods [3-4 normal, longer than gnathopods, dissimilar (article 3 of pereopod 4 elongate), with slender inflated article 2, article 4 dilated, dactyls long. short]. *Pereopods 5-7 similar to each other, with linear article 2*, [pereopods 5-7 progressively longer, pereopods 5-6 much shorter than different from pereopods 6-7, with broader, often lobed article 2; pereopods 5-6-7 with narrow broad linear unlobed article 2, article 2 of pereopod 7 long and pointed, pereopods 6-7 with different dactyl. articles 4-5 of pereopod 7 enlarged]; *dactyl of pereopods 5-7 long, curved*, [without accessory spine on outer margin. with several inner marginal setae]. Sternal processes [of thorax undescribed. present. absent. Coxal gills undescribed. present on segments 2-3-4-5-6-7. Pleopods undescribed. normal. partially reduced towards posterior. with dilated peduncle]. Epimeron 3 not bisinuate. Uropods 1-2 [biramous, normal, stout, rami slightly unequal, much shorter longer than almost as long as peduncle, not hooked, peduncle of uropods 1 2 with moderate ventrodistal process, that of uropods 1 2 smaller obsolescent, of uropod 1 linear, of uropod 2 broadly dilated, uropod 2 absent, lacking rami, with very unequal small rami. with only 1 ramus, ramus shorter than peduncle]. *Uropod 3 small, short, biramous, both rami short, peduncle shorter than rami, rami subequal, with few armaments mostly apical. Telson entire, longer than broad, pointed apically, with 2 hooked apical cusps.*

Female. Unknown. [?Coxae different from male, usually much longer. Gnathopods small, gnathopod 1 larger than 2, normally poorly subchelate, simple, article 5 shorter longer than almost as long as 6, strongly weakly unlobed on both gnathopods 1 2. Oostegites moderately narrow, broad, present on only segments 2 3 4 5].

Sexual dimorphism. Unknown.

Relationship. Unknown.

Species. *Paraneohela anomala* Oldevig, 1959 [278].

Habitat and distribution. Marine, Bering Sea, 32 m, 1 species.

Paraoroides Stebbing

Fig.44L

Paraoroides Stebbing, 1910a: 606.–J.L. Barnard, 1969c: 155.–J.L. Barnard, 1973b: 21.

Type species. *Paraoroides unistilus* Stebbing, 1910a, monotypy.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus moderate to deep. Eyes medium. Antennae of medium length, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum vestigial. Antenna 2 peduncular article 3 short, flagellum articles very few. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, slender, article 3 rectolinear, longer than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 vestigial, without setae, outer plate with 7-9 spines, palp 2-articulate. Plates of maxilla 2 rather narrow, inner with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate long, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail and setae.

Coxae of medium length, weakly contiguous, of various shapes, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, weakly lobed, coxa 5 much shorter than 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 weakly diverse, of subequal size, small, gnathopod 1 slightly larger than 2, in male weakly subchelate, article 5 short but almost as long as 6, unlobed, article 6 slightly larger. Gnathopod 2 weakly subchelate, article 5 longer than 6, unlobed, article 6 slightly more slender than 5, palm short and transverse, dactyl short, curved.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively but slightly longer, scarcely prehensile, pereopod 5 slightly shorter than pereopod 7, pereopods 5-7 with broad unlobed article 2, dactyl of pereopods 5-7 geniculate, without accessory spine on outer margin, palms with stout spine. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami equal, much shorter than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, short, uniramous, single ramus short, obtuse distally, with vestigial article 2, with few armaments mostly apical, peduncle longer than ramus but short, not dilated medially. Telson entire, short, as broad as long, ovate, with 2 apicolateral sets of setules.

Female. Coxae shorter than in male. Gnathopods small, gnathopod 1 scarcely larger than 2, poorly subchelate, article 5 longer than 6, unlobed. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopods.

Relationship. Differing from *Grandidierella* in the non-carpochelate male gnathopod 1 and short ramus of uropod 3.

Species. *Paraoroides unistilus* Stebbing, 1910a [781].

Habitat and distribution. Marine, Australia, New South Wales, off Manning River, depth unknown, 1 species.

Pareurystheus Tzvetkova

Pareurystheus Tzvetkova, 1977: 88.–Conlan, 1983: 13.

Type species. *Eurystheus anamae* Gurjanova, 1952b, original designation.

Diagnosis. Body subcylindrical, urosomites free, urosomite 1 of ordinary length, toothed or carinate. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes small to medium. Antennae of various lengths, nearly subequal, or usually 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum multiarticulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than or equal to 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, large, with a row of medial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae relatively short, [probably not weakly overlapping], not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 similar, of subequal size, small, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, article 5 as long as 6, poorly lobed. Gnathopod 2 subchelate, with article 2 not dilated, article 5 shorter than 6, weakly lobed, article 6 scarcely dilated or not.

Pereopods 3-4 normal but longer than gnathopods, similar, with scarcely inflated article 2, article 4 scarcely dilated, dactyls short. Pereopods 5-7 similar to each other (or not), progressively longer, almost prehensile, pereopod 5 much shorter and slightly different from pereopods 6-7, with slightly broader (relative to size) article 2. Pereopods 6-7 with narrow, almost lobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-7]. Pleopods

normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer (2) than or as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, biramous, both rami short, peduncle slightly elongate, as short as outer ramus, ramus 1-articulate, inner ramus shorter than outer ramus, both narrow, tapering, with few armaments mostly apical. Telson entire, short, broader than long, subquadrate, with 2 tiny hooked apical cusps.

Female. Oostegites [?moderately broad, present on segments 2-5].

Sexual dimorphism. Absent.

Variables. Outer plate of maxilla 2 enlarged (*P. latipes*); male gnathopod 2 almost as feeble as gnathopod 1 (*P. dentatus*); male gnathopod 2 significantly larger than gnathopod 1 (*P.amakusaensis*); pereopods 6-7 enlarged (type and *P. tzvetkovae*); length of inner ramus on uropod 3 variable, often half of outer ramus (e.g. *P. dentatus*) or almost as long as outer ramus (type).

Relationship. Differing from *Gammaropsis* and allies in the shorter article 3 of antenna 1.

From *Protomedeia* in the weak (Conlan, 1983, says "not setose") posterior setation of article 2 on pereopods 5-7.

See *Parunciola.*

Species. *Pareurystheus amakusaensis* Hirayama, 1984a [395]; *P. anamae* (Gurjanova, 1952b) (Tzvetkova, 1977) [280]; *P. dentatus* (Holmes, 1908) (Conlan, 1983) [273]; *P. gurjanovae* Tzvetkova, 1977 (= *P. dentatus* of Gurjanova, 1938b, 1951) [395]; *P. latipes* Tzvetkova, 1977 [395]; *P. sexdentatus* (Stephensen, 1944b) (Tzvetkova, 1977) [396]; *P. tzvetkovae* Conlan, 1983 [273].

Habitat and distribution. Marine, Aleutians southwestward through Japan into the Yellow Sea, 0-90 m, 7 species.

Parunciola Chevreux

Parunciola Chevreux, 1911d: 266.–J.L. Barnard, 1973b: 21.

Type species. *Parunciola seurati* Chevreux, 1911d, monotypy.

Diagnosis. *Female.* Body subcylindrical, posteriorly carinate, slightly depressed, urosomites free, 1 elongated, toothed. Rostrum absent, ocular lobes short, blunt; antennal sinus moderate. (Head as long as pereonites 1-2 together). Eyes ordinary. Antennae long subequal, both slender, peduncular article 3 of antenna 1 longer than 1, article 2 longest, accessory flagellum pluriarticulate, flagellum short. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, with a row of medial setae, outer plate with 10 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with short setae.

Coxae small, relatively short, anterior members weakly overlapping, progressively but scarcely elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 scarcely longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 of subequal size, small, densely setose, gnathopod 2 scarcely larger than 1; gnathopod 1 in female weakly subchelate, article 5 of both gnathopods slightly longer than 6, poorly lobed, dactyl ordinary.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, [presumably pereopod 5 much shorter than 7], dactyl of pereopods 5-7 geniculate, short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, very long and slender, rami slightly unequal, shorter (except uropod 2) than peduncle, peduncles of uropods 1-2 without ventrodistal process. Uropod 3 long, uniramous, single ramus long, peduncle shorter than ramus, not dilated medially, single ramus 1-articulate, apically and marginally setose, narrow. Telson entire, as broad as long, pentagonal, incised, with 2 apical spine-setae. Oostegites moderately narrow, present on [?segments 2-5].

Male. Unknown.

Sexual dimorphism. Unknown.

Relationship. Differing from *Unciolella* in the well setose inner plate of maxilla 1, longer ramus of uropod 3 and large coxae. From *Unciola* in the non-angular coxae, obsolescent rostrum, clavate apical article of the mandibular palp, non-toothed epimera, much smaller gnathopod 1 in supposed males, non-dilated peduncle of uropod 3 and unthickened male antenna 2. From *Dercothoe* in the elongate and unlobed carpus of gnathopod 2. From *Pareurystheus* in the 1-articulate uropod 3.

See *Neohela.*

Species. *Parunciola seurati* Chevreux, 1911d (Ledoyer, 1968, 1977) [348].

Habitat and distribution. Marine, Mediterranean,

105-130 m, 1 species.

Pedicorophium Karaman

Pedicorophium Karaman, 1981a: 17.

Type species. *Unciola laminosa* Pearse, 1912, original designation.

Diagnosis. Body cylindrical, smooth, slightly depressed, urosomites free, 1 ordinary. Rostrum long, thorn-like, with larger downturned thorn on each side of rostrum; ocular lobes short blunt; antennal sinus deep. Eyes small or absent. Antennae of various lengths, sometimes nearly subequal, or 1 longer than 2, 1 slender, antenna 2 stout in male; peduncular article 3 of antenna 1 slightly shorter than 1, article 2 longest, accessory flagellum 1 to 2-articulate. Antenna 2 peduncular article 3 scarcely elongate but huge, dominant from side view, article 4 dominant from dorsal view, peduncle stout in both sexes, with articles 3-4 heavily sculpted and spined, flagellum short. Epistome produced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular or ovate, with 2 apical setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with medium nail and setae.

Coxae very small, short, discontiguous, of almost uniform sizes and shapes, progressively shorter from 1 to 4, weakly spiniform or angular, coxa 1 poorly dilated and produced forward, coxa 2 longer than 1, often produced or dilated, coxa 4 [?shorter than coxa 1, not lobed], coxa 5 as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, not densely setose, gnathopod 1 greatly larger than 2, subchelate, article 2 dilated, article 5 short, shorter than 6, lobed, article 6 very large, dactyl large. Gnathopod 2 parachelate, feeble, with article 2 not dilated, not very setose, article 5 almost as long as 6, unlobed, article 6 scarcely more slender than article 5, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with sublinear article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin, with one inner marginal seta. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, stout, inner rami vestigial, peduncle of uropods 1-1 without ventrodistal process. Uropod 3 very short, cylindrical, uniramous, single ramus vestigial, with 2-3 wire-like setae, peduncle longer than ramus, slender, not dilated medially. Telson entire, short, as broad as long, ovate, poorly armed.

Female. Antenna 2 more slender, slightly sculptured. Coxae different from male, usually shorter and less modified. Gnathopods like those of male but palm of gnathopod 1 less sculptured. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. Weak. Antenna 2, coxae.

Relationship. Differing from *Pseudunciola* in the presence of a tooth on epimeron 3, sculpture on antenna 2, presence of tiny inner ramus on uropod 2 but smaller inner ramus of uropod 1, and thinner article 2 of pereopods 5-7. From *Unciola* in the reduced inner rami of uropods 1-2, even more reduced uropod 3, and, except for one species in *Unciola*, the heavily sculpted antenna 2. From *Rildardanus* in the presence of a vestigial ramus on uropod 3, well-developed inner ramus of uropod 1 and the 1 to 2-(versus scale) articulate accessory flagellum. From *Pterunciola* in the reduced inner rami of uropods 1-2, the reduced ramus of uropod 3 and the presence of a tooth on epimeron 3.

See *Liocuna*.

Species. *Pedicorophium laminosum* (Pearse, 1912) (Shoemaker, 1945c) (Dickinson *et al.*, 1980) [362].

Habitat and distribution. Marine, Gulf of Mexico, Caribbean Sea, north to Virginia, 40-80 m, 1 species.

Photis Krøyer

Figs 39B, 40E, 42E, 44H, 45D,S, 46C

Photis Krøyer, 1842: 155.–Stebbing, 1906: 605.–J.L. Barnard, 1962a: 26 (Key).–J.L. Barnard, 1969c: 274.–J.L. Barnard, 1973b: 22.–Conlan, 1983: 42 (key North Pacific).

Eiscladus Bate & Westwood, 1863: 411 (*Eiscladus longicaudatus* Bate & Westwood, 1863).

Heiscladus (lapsus) Norman, 1869a: 255.

Photis (*Cedrophotis*) J.L. Barnard, 1967a: 26 (*Photis* [*Cedrophotis*] *malinalco* J.L. Barnard, 1967a) [valid subgenus].

Pseudophotis Hirayama, 1984a: 35 (*Pseudophotis ariakensis* Hirayama, 1984a, original designation) [possible valid subgenus].

not *Cerapopsis* Della Valle, 1893: 388 (*Cerapopsis longipes* Della Valle, 1893, monotypy) [see as valid genus].

Type species. *Photis reinhardi* Krøyer, 1842, monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum

short, ocular lobes short, pointed; antennal sinus deep. Eyes small, weak or absent. Antennae of medium lengths, subequal, both slender, peduncular article 3 of antenna 1 as long as 1, peduncular articles 2-3 longest, accessory flagellum vestigial or absent, Antenna 2 peduncular article 3 short, flagellum occasionally very short. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, blunt. Inner plate of maxilla 1 triangular, with 0-1 apical seta, outer plate with 9-11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate [? without] mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with medium nail and setae.

Coxae long, weakly contiguous, uniform, progressively but slightly elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 slightly larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 slightly to strongly diverse; gnathopod 2 slightly to greatly larger than 1, gnathopod 1 in male poorly to strongly subchelate, palm short, article 5 very short or as long as 6, lobed. Gnathopod 2 enlarged, subchelate, with article 2 barely dilated, article 4 extended distally along posterior margin of article 5, article 5 shorter than 6, lobed, article 6 dilated, sometimes with false chela or process on posteroproximal margin, dactyl short or long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls medium. Pereopods 5-7 dissimilar to each other, progressively longer, 5 prehensile, much shorter than and different from pereopods 6-7, with broader, often lobed article 2; pereopods 6-7 with narrower unlobed article 2; pereopods 6-7 with normal dactyl, dactyl of pereopod 5 geniculate, with accessory tooth on outer margin, bearing long spine, closing on palm. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 bisinuate or not. Uropods 1-2 biramous, normal, rami slightly unequal, shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 of ordinary length, biramous, peduncle elongate, as long as outer ramus, latter with small article 2, inner ramus much shorter than outer ramus. Telson entire, short, as broad as long, ovate, semicircular or pentagonal, often pointed apically, with 2 hooked apical cusps.

Female. Gnathopod 2 small, like male but less sculptured. Oostegites moderately narrow to broad, present on segments 2-5.

Sexual dimorphism. Moderate. Gnathopod 2.

Variables. Size of eyes; ocular lobes blunt or pointed, occasionally elongate and forming stalks (e.g. *P. dolichommata*); setation of antennae 1-2; antenna 2 much longer than 1 (*P. antennata*); inner plate of maxilla 2 with facial setae often reduced or absent, medial setae often sparse; setation of coxae; coxa 1 produced forward (*P. longimanus*); coxae 1-2 shortened (e.g. *P. longipes*), or only coxa 1 shortened (e.g. *P. obesa*), coxae 1 and 3 excavate and lobulate (*P. nataliae*); shapes, setation, sculpture and palmar excavations of gnathopods 1-2; palms of gnathopods 1-2 becoming obsolescent (*Cedrophotis, Pseudophotis*); presence and shape of stridulation ridges on male gnathopod 2 and coxae; male gnathopod 2 with carpus elongate, unlobed, anteroproximally spinose (*P. spinicarpa*); setation and proportions of articles on pereopods 3-7; inner ramus of uropod 3 absent (*P. antennata*); outer ramus of uropod 3 1-articulate (*Cedrophotis*).

Key to Subgenera of *Photis*

1.Inner ramus of uropod 3 half length of outer ramus ..... (*Cedrophotis*)

Inner ramus of uropod 3 one third or less length of outer ramus 2

2.Palms of gnathopods obsolescent ..... (*Pseudophotis*)

Palms of gnathopods present ..... (*Photis*)

Subgenera. *Pseudophotis.* Like *Photis* but palms of gnathopods obsolete; includes *P. ariakiensis* and *P. nana*; originally described as full genus but transformations (for example, *P. californica, P. coecus, P. elephantis, P. phaeocula*) sufficiently frequent to deny full status; however, other characters may be present on *P. ariakiensis* and differentially on *P. nana* to warrant full generic status when determined.

Cedrophotis. Inner ramus of uropod 3 half as long as outer ramus; a more plesiomorphic state than *Photis sensu stricto*; at present confined to the species *P. malinalco* (type) and *P. aina*; also palms of gnathopods obsolescent as in *Pseudophotis.*

Relationship. Differing from *Gammaropsis* in the reduction of the inner ramus to half or less of the outer ramus and in the longer anterior coxae. Unlike *Gammaropsis* the apex of pereopod 5 is prehensile because of the grasping mechanism between a toothed dactyl and the large spine on the weak propodal palm.

See *Cerapopsis, Cheiriphotis, Dercothoe, Dodophotis, Isaeopsis, Microjassa, Microphotis, Microprotopus* and *Posophotis.*

Removals. *Photis digitata* K.H. Barnard, 1935, to *Dodophotis*; *P. distinguenda* Ruffo, 1955, to

Dodophotis; *P. geniculata* K.H. Barnard, 1935, to *Cheiriphotis*; *P. longipes* Della Valle, 1893 (= *P. longicarpa* Chevreux, 1926b), to revived *Cerapopsis*.

Species. See J.L. Barnard (1962a, 1964b, 1966a,b, 1969a,b, 1971b, 1972b), Chevreux & Fage (1925), Griffiths (1974b,c, 1975), Ledoyer (1973a,d, 1977, 1978a), Nagata (1965c), Reish & Barnard (1967), Schellenberg (1942), Shoemaker (1945b), Stephensen (1940b, 1944a,c); *P. aequimanus* Schellenberg, 1925a [441]; *P. africana* Schellenberg, 1925a [440]; *P. aina* J.L. Barnard, 1970a [381]; *P. albus* Budnikova, 1985 [391]; *P. antennata* Chevreux, 1926b [441]; *P. ariakensis* Hirayama, 1984a, aberrant, see text [395]; *P. baeckmannae* Gurjanova, 1951 [290]; *P. beringiensis* Tzvetkova, 1980 [281]; *P. bifurcata* J.L. Barnard, 1962a (Conlan, 1983) [379]; *P. brevicaudatus* (Norman, 1867b) (Stebbing, 1888, 1910a) (Chilton, 1912b) [782 + 773]; *P. brevipes* Shoemaker, 1942 (Conlan, 1983) (= *P. californica* identification of J.L. Barnard, 1954a) [379 + B]; *P. californica* Stout, 1913 (J.L. Barnard, 1962a) (Stretch, 1985a) [370]; *P. cavimana* Ledoyer, 1979a, 1982b [698]; *P. chiconola* J.L. Barnard, 1964d, 1971b [372B]; *P. coeca* J.L. Barnard, 1962d [801A]; *P. conchicola* Alderman, 1936 (J.L. Barnard, 1962a) (Carter, 1982) (?Conlan, 1983) [379]; *P. dentata* Shoemaker, 1945b (Dickinson *et al.*, 1980) [364 + B]; *P. dolichommata* Stebbing, 1910a (Ledoyer, 1984) [781 + 660 + 743 + B]; *P. elephantis* J.L. Barnard, 1962a, 1969a, 1979b [369]; *P. fischmanni* Gurjanova, 1951 (Conlan, 1983) [280 + 290]; *P. goreensis* Schellenberg, 1925a [441]; *P. hawaiensis* J.L. Barnard, 1955a, 1970a [381]; *P. japonica* Hirayama, 1984a [395]; *P. kapapa* J.L. Barnard, 1970a (Griffiths, 1973) (Ledoyer, 1979a, 1982b) (Myers, 1985c) [600 + 743]; *P. kurilica* Gurjanova, 1955b [232B]; *P. lacia* J.L. Barnard, 1962a (Conlan, 1983) [379]; *P. lamellifera* Schellenberg, 1928b (Ruffo, 1959, 1969) [685 + 340]; *P. lamina* Hirayama, 1984a [395]; *P. longicaudata* (Bate & Westwood, 1863) (Sars, 1895) (Lincoln, 1979a) (Ledoyer, 1979a,b, 1982b) (Hirayama, 1984a) (= *P. lutkeni* Boeck, 1871b, 1876) [420 except 535]; *P. longidactyla* Griffiths, 1974a, 1975 [743]; *P. longimana* Walker, 1904 (Nayar, 1967) (Sivaprakasam, 1970a) (Rabindranath, 1971b) [660]; *P. macinerneyi* Conlan, 1983 [270]; *P. macrocarpa* Stebbing, 1888, 1906 [851]; *P. macromana* McKinney, *et al.*, 1978 (McKinney, 1980b) [474]; *P. macrotica* J.L. Barnard, 1962a, 1966b [370]; *P. malinalco* J.L. Barnard, 1967a [309A]; *P. melanica* McKinney, 1980b [474]; *P. nana* (Walker, 1904) (Nayar, 1967), aberrant, see text [665]; *P. nataliae* Bulycheva, 1952 [391]; *P. nigricola* Lowry, 1979 [776]; *P. obesa* Chevreux, 1926b [441]; *P. oligochaeta* Conlan, 1983 [270]; *P. pachydactyla* Conlan, 1983 [270]; *P. parvidons* Conlan, 1983 [270]; *P. phaeocula* Lowry, 1979 [776]; *P. pirloti* Myers, 1985c [555]; *P. pollex* Walker, 1895b (Myers & McGrath, 1981) (Moore, 1984c) (= *P. macrocoxa* Shoemaker, 1945b, Bousfield, 1973) (= *P. reinhardi* identification of Lincoln, 1979a) [250]; *P. producta* (Stimpson, 1856b) (Bate, 1862) (Stebbing, 1906) [395]; *P. pugnator* Shoemaker, 1945b (McKinney, 1980b) [364]; *P. reinhardi* Krøyer, 1842 (Sars, 1895) (Bousfield, 1973) (Myers & McGrath, 1981) (Hirayama, 1984a) (= *P. pygmaea* Liljeborg, 1852a) [200 + B]; *P. spasskii* Gurjanova, 1951 (?Conlan, 1983) [230]; *P. spinicarpa* Shoemaker, 1942 [376]; *P. strelkovi* Gurjanova, 1953 [280]; *P. tenuicornis* Sars, 1883, 1895 (Myers & McGrath, 1981) [220]; *P. uncinata* K.H. Barnard, 1932, 1940 (Griffiths, 1975) [743]; *P. vinogradovi* Gurjanova, 1951 [290]; *P. viuda* J.L. Barnard, 1962a, 1964b [370 + B]; "species" of Pirlot, 1938 [643]; "species" of J.L. Barnard, 1969a [373]; "species" of J.L. Barnard, 1972b [775 + 771 + ?733]; "species" A, Camp *et al.*, 1977 [478]; "species" B, Camp *et al.*, 1977 [478].

Habitat and distribution. Marine, cosmopolitan, 0-3725 m, rarely below 200 m, 56 species.

Plesiolembos Myers

Plesiolembos Myers, 1988: 190.

Type species. *Plesiolembos rectangulatus* Myers, 1977a, original designation.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin straight or sinuous; left mandibular molar with complex plates, primary plate falcate, secondary, tertiary and quaternary plates of similar shape but not markedly falcate; anterior margin of maxilliped [?with wing-like flanges, not described]; male gnathopod 1 with propodus enlarged, subovoid, carpus short cup-shaped; female gnathopod 1 not like that of male; pereopod 5 propodus posterior margin with setae but no spines; uropod 3 peduncle short, expanded, outer ramus with long marginal setae and extremely long distal setae, without small second article.

Relationship. See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. *Plesiolembos ovalipes* Myers, 1979b, 1981d [476]; *P. rectangulatus* Myers, 1977a, 1981d (= *P. habanensis* Ortiz, 1980 [483] (Ortiz, 1983a,b) [460].

Habitat and distribution. Marine, Caribbean Sea, 0-37 m, 2 species.

Posophotis J.L. Barnard

Posophotis J.L. Barnard, 1979b: 30.

Type species. *Posophotis seri* J.L. Barnard, 1979b, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, moderate, produced

forward, blunt; antennal sinus deep. Eyes ordinary. Antennae of medium length, subequal, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 3-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, without setae, outer plate with 11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 very short, with long setae.

Coxae long, weakly contiguous or overlapping, of various sizes and shapes, progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, small in contrast to enlarged coxae 2-4, coxa 2 larger than 1, coxae 3-4 anteriorly expanded, coxa 4 longer than coxa 1, not lobed, not excavate, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 scarcely diverse, of subequal size, small, gnathopod 2 slightly larger than 1, gnathopod 1 in male poorly subchelate, article 5 long, sublinear, unlobed, longer than 6. Gnathopod 2 slightly enlarged, subchelate, article 2 not dilated, with article 4 slightly enlarged, extended along posterior margin of article 5, article 5 shorter than 6, weakly lobed, article 6 dilated, with sculptured palm, dactyl ordinary.

Pereopods 3-4 normal, similar, with slightly inflated article 2, article 4 dilated, dactyls medium. Pereopods 5-7 similar to each other, not progressively longer, not prehensile, pereopod 5 different from pereopods 6-7, with broader, lobed article 2 and widely expanded article 4; pereopods 6-7 with narrower unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory tooth on outer margin. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments 2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, inner much shorter (2) or as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 of ordinary length, biramous, both rami short, peduncle elongate, longer than rami, inner ramus as long as (female) or shorter (male) than outer ramus, rami narrow, tapering and with few armaments mostly marginal, outer with tiny apical immersed spinules. Telson entire, short, broader than long, trapezoidal, with 2 hooked apical cusps.

Female. Coxae different from male, 3-4 not expanded. Gnathopod 2 smaller, palm shorter, less sculptured; article 4 of pereopod 5 not expanded. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopods, coxae 3-4, pereopod 5.

Relationship. Differing from *Photis* and (*Cedrophotis*) in the following combination of characters: lack of article 2 on outer ramus of uropod 3, presence of well-developed accessory flagellum and stubbiness of dactyl on maxilliped. *Photis antennata* also lacks article 2 on the outer ramus of uropod 3 but lacks an accessory flagellum. From *Gammaropsis* complex in the long coxae, stubby dactyl of maxilliped and additionally from *Gammaropsis (Pseudeurystheus)* in the short carpus of male gnathopod 2.

See *Bathyphotis* and *Ledoyerella*.

Species. *Posophotis seri* J.L. Barnard, 1979b [540].

Habitat and distribution. Marine, eastern tropical Pacific, 0-6 m, 1 species.

Protolembos Myers

Protolembos Myers, 1988: 190.

Type species. *Lembos chiltoni* Myers, 1981c, original designation.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin distally straight or sinuous, marginal setae of 2 different lengths but terminal setae longer; left mandibular molar with complex rounded subsimilar plates; anterior margin of maxilliped with strong wing-like flanges; male gnathopod 1 with propodus enlarged, longer than carpus; female gnathopod 1 not like that of male; uropod 3 peduncle short, expanded, outer ramus with long marginal setae and extremely long distal setae, with small second article.

Relationship. See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. *Protolembos chiltoni* Myers, 1981c (= "species" No. 4 J.L. Barnard, 1972b) [783 + 772]; *P. kidoli* Myers, 1975a [683]; *P. philacanthus* (Stebbing, 1888) (Chilton, 1921b) (?Pirlot, 1934) [783 + ?772 + ?602B].

Habitat and distribution. Marine, Australia, New Zealand, east Africa, ?Indonesia bathyal, 0-71 (?411) m, 3 species.

Protomedeia Krøyer

Protomedeia Krøyer, 1842: 154.–J.L. Barnard, 1969c: 274.–J.L. Barnard, 1973b: 22.–Lincoln, 1979a: 510.

Type species. *Protomedeia fasciata* Krøyer, 1842,

monotypy.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt; antennal sinus weak to moderate. Eyes small. Antennae of medium length, 1 longer than 2, both slender or antenna 2 in male scarcely stout; peduncular article 3 of antenna 1 shorter than 1, articles 1 or 2 longest; accessory flagellum pluriarticulate. Antenna 2 peduncular article 3 short, peduncle slightly stout in male. Epistome unproduced anteriorly. Labrum subrounded, weakly incised. Mandible normal, palp strong, slender, article 3 clavate, as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short, pointed. Inner plate of maxilla 1 triangular, short, with sparse medial and apical setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate without mediofacial and mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, almost reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with short nail and setae.

Coxae small, relatively short, weakly contiguous, of slightly varying sizes and shapes in male, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, often rounded, coxa 4 not longer than coxa 1, not lobed, coxa 5 usually longer than 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 diverse, small to medium, densely setose, gnathopod 2 slightly to greatly larger than 1, gnathopod 1 in male weakly subchelate, article 2 often partly dilated, article 5 long, unlobed, palm short and oblique. Gnathopod 2 enlarged, weakly subchelate, with article 2 very setose, article 5 longer than 6, larger than 6, unlobed, article 6 slightly more slender than article 5, often with false chela or process on posteroproximal margin, dactyl ordinary but overlapping palm.

Pereopods 3-4 normal, similar, with slender article 2, article 4 weakly dilated, poorly overlapping article 5, dactyls long. Pereopods 5-7 similar to each other, progressively longer or 6-7 equal, with expanded article 2, pereopod 5 much shorter than pereopod 7, with almost lobed article 2; dactyls of pereopods 5-7 short, curved. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long as peduncle, peduncle of uropods 1-2 with ventrodistal process. Uropod 3 ordinary, biramous, both rami short, peduncle as long as rami, outer ramus with vestigial article 2, inner ramus almost as long as outer ramus, both with heavy spines. Telson entire, short, as broad as long, ovate or semicircular, with 2 apical groups of setule-spinules.

Female. Coxae slightly different from male, usually shorter or even. Gnathopods small, very setose, gnathopod 2 scarcely larger than 1, normally to poorly subchelate, article 5 shorter or as long as 6, unlobed. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Mandibular palp poorly setose, article 1 elongate (*P. crudiolops*); coxal sizes variable; palm of male gnathopod 2 transverse or oblique; ornaments and proportions of articles on gnathopods 1-2; inner ramus of uropod 3 as little as two thirds as long as outer.

Relationship. Like *Gammaropsis* one of the more primitive members of the Corophioidea and differing from *Gammaropsis* in the poorly recessed antenna 2.

Differing from *Goesia* in the well-developed accessory flagellum, the poor to absent basomedial setation on the inner plate of maxilla 2 and the well-developed dactyl on the maxillipeds.

See *Aorchoides*, *Cheirimedeia*, *Chevalia*, *Ledoyerella*, *Leptocheirus*, *Pagurisaea*, *Pareurystheus* and *Posophotis*.

Removals. See *Cheirimedeia*.

Species. See J.L. Barnard (1964b, 1966b, 1971b), Gurjanova (1951), Shoemaker (1955a), Stephensen (1940b, 1942, 1944a, 1944c); *P. articulata* J.L. Barnard, 1962a (Conlan, 1983) [379 + B]; ?*P. chelata* Kudrjaschov, 1965c [279]; *P. coeca* Bulycheva, 1952 [391 + B]; *P. crudoliops* Hirayama, 1984a [395]; *P. epimerata* Bulycheva, 1952 [391]; *P. fasciata* Krøyer, 1842 (Sars, 1895) (Lincoln, 1979a) (Conlan, 1983) (= *P. macronyx* Liljeborg, 1855, 1856, Bruzelius, 1859) [200]; *P. fasciatoides* Bulycheva, 1952 [280]; *P. grandimana* Brüggen, 1906 (Conlan, 1983) [200]; *P. microdactyla* Bulycheva, 1952 [391 + B]; *P. penates* J.L. Barnard, 1966b [371]; *P. popovi* Gurjanova, 1951 [279]; *P. prudens* J.L. Barnard, 1966a, 1971b (Conlan, 1983) [379 + B]; *P. spinigera* Oldevig, 1959 [279]; *P. stephenseni* Shoemaker, 1955a (Conlan, 1983); *P. s. ochotensa* Kudrajaschov, 1965b [220]; "species" of Takamaru & Ochaia, 1982 [394].

Habitat and distribution. Marine, Arctic-boreal, cold water, tropical submergent south to 32°N, 0-906 m, 14 species.

[Ischyroceridae] ***Pseudericthonius*** Schellenberg

Fig.45R

Pseudericthonius Schellenberg, 1926a: 385.-J.L. Barnard, 1969c: 196.-J.L. Barnard, 1973b: 26.

Type species. *Pseudericthonius gaussi* Schellenberg, 1926a, monotypy.

Diagnosis. *Female only*. Like *Ericthonius* but mandibular palp article 3 rectolinear. Inner plate of maxilla 1 with 5-7 medial setae, outer plate with 10 spines.

Article 5 of both gnathopods longer than 6, lobed, almost carpochelate. Uropods 1-2 biramous, rami strongly unequal, inner much shorter than outer, very small. Uropod 3 outer ramus with 4 distal hooks.

Sexual dimorphism. Weak. Gnathopods.

Relationship. Differing from *Ericthonius* in the narrow article 3 of the mandibular palp, the presence of 10 (versus 7) spines on the outer plate of maxilla 1, the identity (versus diversity) between female gnathopods 1 and 2 and the reduced inner rami of uropods 1-2.
See *Cerapus*.

Species. *Pseudericthonius gaussi* Schellenberg, 1926a (K.H. Barnard, 1932) [880B].

Habitat and distribution. Marine, Antarctica and South Shetland Islands, 200-385 m, 1 species.

[Ischyroceridae] ***Pseudischyrocerus*** Schellenberg

Fig.48B

Pseudischyrocerus Schellenberg, 1931: 254.–J.L. Barnard, 1969c: 280.–J.L. Barnard, 1973b: 26.

Type species. *Pseudischyrocerus denticauda* Schellenberg, 1931, selected by J.L. Barnard, 1969c.

Diagnosis. Body subcylindrical, slightly depressed, smooth; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, pointed, antennal sinus deep. (Head as long as pereonites 1-2 together). Eyes ordinary. Antennae of various lengths, 1 shorter than 2, 1 slender, antenna 2 often stout in male; peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 1-articulate, main flagellar articles few (5-7). Antenna 2 peduncular article 3 scarcely elongate, peduncle often stout in male, flagellum short. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 7 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only sparse mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 short, with long setae.

Coxae relatively short to long, weakly contiguous or weakly overlapping, progressively elongate from 1 to 4, coxa 1 not dilated, barely produced forward, coxa 2 often larger than 1, coxa 4 longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male weakly subchelate, article 5 long, almost linear, longer than 6, poorly lobed. Gnathopod 2 enlarged, weakly to strongly subchelate, with article 2 not dilated, with article 4 occasionally enlarged and incipiently merochelate, extended along posterior margin of article 5, article 5 much shorter than 6, lobed, article 6 dilated, sometimes with weak false chela or process on distal margin near dactylar base, articles 5-6 strongly setose anteriorly, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 shorter than pereopod 7, pereopods 5-7 with narrow to broad, lobed or unlobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 barely bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, longer than (2) or almost as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 slightly elongate, biramous, both rami very short, outer ramus recurved apically, with few distal hooks, peduncle elongate, longer than rami, inner ramus narrow, as long as outer ramus, tapering and with few armaments mostly apical. Telson entire, longer than broad, linguiform, poorly armed.

Female. Coxae different from male, usually much longer. Gnathopod 2 smaller than in male, larger than 1, normally subchelate, palm not sculptured, article 5 shorter than 6, weakly lobed on both gnathopods 1-2, anterior setae reduced on articles 5-6. Oostegites [?moderately broad, present on segments 2-5].

Sexual dimorphism. Weak. Gnathopods.

Relationship. Differing from *Ischyrocerus* in the reduction of the accessory flagellum to one article, the unexpanded rectolinear article 3 of the mandibular palp, and the elongate unlobed carpus of gnathopod 1.
See *Bathyphotis*.

Species. *Pseudischyrocerus crenatipes* Bellan-Santini & Ledoyer [799]; *P. denticauda* Schellenberg, 1931 [866]; *P. distichon* (K.H. Barnard, 1930, 1932) (Schellenberg, 1931) (Nicholls, 1938) (Stephensen, 1947a) [880 + B].

Habitat and distribution. Marine, Antarctica and adjacent islands, 6-570 m, 3 species.

Pseudomegamphopus Myers

Pseudomegamphopus Myers, 1968b: 527.–J.L. Barnard, 1973b: 22.

Type species. *Pseudomegamphopus barnardi* Myers, 1968b, original designation.

Diagnosis. Body cylindrical, depressed, smooth, urosomites 1-2 free, 3 coalesced with telson. Rostrum short, thorn-like, pointed, lacking subrostral projection, ocular lobes elongate, produced forward and downward, blunt. Antennal sinus deep. Eyes present, small. Antenna 1 much shorter than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 slightly shorter than 1, article 2 longest, accessory flagellum vestigial or absent. Antenna 2 peduncular article 3 slightly elongate, peduncle stout in male, flagellum with 1 long, 1 short and 2 tiny articles. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, with only 1 article. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, short, without setae, outer plate with 6 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with 3 distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, with long nail and setae.

Coxae small, relatively elongate, 3-5 not contiguous, 1-2 and 6-7 weakly overlapping, of various sizes and shapes, progressively but scarcely elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 larger than 1, coxa 4 not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae; coxae 3-4 with dentate margin and stout pectinate setae. Gnathopods 1-2 of subequal size, small, almost simple, first with linear articles, gnathopod 1 slightly longer than 2, gnathopod 1 in male simple, article 5 long, linear, unlobed. Gnathopod 2 weakly subchelate, with articles 2-3 dilated, very spinose, with article 4 incipiently merochelate, extended and fused distally along posterior margin of article 5, article 5 shorter than 6, unlobed, dactyl long.

Pereopods 3-4 alike, unusual, with inflated article 2, article 4 dilated, dactyls long. Pereopods 5-7 dissimilar to each other, pereopods 5-6 shorter than and different from pereopod 7, with broader, anteriorly lobed article 2, with short and reniform article 5 like pereopods 3-4, pereopod 7 with broad unlobed heavily setose article 2, articles 4-6 slender, dactyls of pereopods 5-7 short, geniculate, without accessory tooth. Sternal processes of thorax [undescribed]. Coxal gills present on segments 4-6. Pleopods with dilated peduncle. Epimeron 3 not bisinuate. Uropod 1 biramous, stout, peduncle without strong ventrodistal process, rami strongly unequal, outer as long as peduncle, inner ramus much shorter than outer. Uropod 2 absent. Uropod 3 small, single ramus shorter than peduncle, obtuse and setose distally, peduncle dilated medially, armed with several simple setae. Telson entire, short, broader than long, softly triangular, with 2 apical patches of hooks.

Female. Antenna 2 more slender. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak.

Relationship. See *Varohios.*

Removal. *Pseudomegamphopus chelatus* (Walker, 1904), to *Varohios.*

Species. *Pseudomegamphopus barnardi* Myers, 1968b [539]; *P. excavatus* Myers, 1968b [462]; *P. jassopsis* (K.H. Barnard, 1951) (Myers, 1974a) (Griffiths, 1975) [743E].

Habitat and distribution. Marine, tropical Pan-America and South Africa, 3- 60 m, 3 species.

Pseudunciola Bousfield

Pseudunciola Bousfield, 1973: 177.
Dactylocorophium Karaman, 1981a: 15 (same type species).

Type species. *Unciola obliquua* Shoemaker, 1949b, original designation.

Diagnosis. Body cylindrical, smooth, slightly depressed, urosomites free, 1 ordinary, 3 hidden dorsally by telson. Rostrum long, thorn-like, ocular lobes short, pointed or blunt; antennal sinus deep. Eyes weak or absent. Antennae nearly subequal, 1 longer than 2, 1 slender, antenna 2 stout in male; peduncular article 3 of antenna 1 shorter than 1, article 1 longest, accessory flagellum 1-articulate. Antenna 2 peduncular article 3 slightly elongate, peduncle scarcely stout in male, but articles 4-5 tapering distad, not sculptured, article 3 dominant, flagellum short. Epistome unproduced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular or ovate,with 2-3 apicomedial setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with medium nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, often spiniform or angular, coxa 1 dilated, produced forward, coxa 2 not longer than 1, produced or dilated, coxa 4 not longer than coxa 1, not lobed, coxa 5 longer than 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, moderately setose, gnathopod 1 greatly larger than 2, subchelate, article 2 dilated, article 5 short, shorter than 6, lobed, article 6 large, dactyl large. Gnathopod 2 parachelate or subchelate, feeble, with article 2 not dilated, poorly setose, article 5 as long as or longer than 6, unlobed, article 6 more slender than article 5, dactyl short or reduced.

Pereopods 3-4 longer than gnathopods, similar, with inflated article 2, article 4 slightly dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with expanded article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin, with several inner marginal setae. Sternal processes of thorax [undescribed]. Coxal gills present on segments 2-6. Pleopods normal. Epimeron 3 not bisinuate but epimera 1-2 with large tooth. Uropod 1 biramous, stout, rami grossly unequal, inner much shorter than outer, both shorter than peduncle, peduncle without ventrodistal process, single ramus of uropod 2 shorter than peduncle. Uropod 3 very short, cylindrical, uniramous, single ramus short, 1-articulate, obtuse and setose distally, peduncle longer than ramus but very short, not dilated medially. Telson entire, short, as broad as long, ovate, poorly armed.

Female. Antenna 2 and gnathopod 1 weaker. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Weak. Antenna 2, gnathopod 1.

Relationship. Differing from *Unciola* in the reduced inner ramus of uropod 1, loss of one ramus on uropod 2, loss of sculpture on epimeron 3, further reduction in tiny cylindrical uropod 3, and better expansion of article 2 on pereopods 3-7. From *Pedicorophium* in the loss of sculpture on epimeron 3. See that genus for more details. From *Uncinotarsus* in the presence of a ramus on uropod 3 and the lack of a spur on pereopods 3-7. From *Pterunciola* in the loss of the inner ramus on uropod 3 and the reduction of the inner ramus on uropod 1.

See *Liocuna* and *Rildardanus*.

Species. *Pseudunciola obliquua* (Shoemaker, 1949b) (Bousfield, 1973) (Karaman, 1981a) (Morgan & Woodhead, 1984, life history) [260].

Habitat and distribution. Marine, western Atlantic, Bay of Fundy to Virginia, 13-91 m, 1 species.

Pterunciola Just

Pterunciola Just, 1977a: 131.

Type species. *Pterunciola spinipes* Just, 1977a, original designation.

Diagnosis. Body cylindrical, smooth, slightly depressed, urosomites free, 1 ordinary. Rostrum short, not thorn-like, ocular lobes obsolescent; antennal sinus weak to moderate. Eyes absent. Antennae subequal, both slender; peduncular article 3 of antenna 1 much shorter than 1, articles 1-2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 scarcely elongate, peduncle slender in male, flagellum with 6-7 long articles. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, moderately stout, article 3 rectolinear, longer than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 linguiform, with 2 apical setae, outer plate with 6 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate ordinary but only reaching two thirds to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with medium nail and setae.

Coxae very small, short, weakly discontiguous (except 1 and 2), of various sizes and shapes, progressively shorter from 2 to 4, not spiniform or angular, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, weakly produced, coxa 4 shorter than coxa 1, not lobed, coxa 5 as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, densely setose, gnathopod 1 greatly larger than 2, subchelate, article 2 not dilated, article 5 short, shorter than 6, not lobed, article 6 large, dactyl large. Gnathopod 2 parachelate, feeble, with article 2 not dilated, very setose, article 5 as long as 6, unlobed, article 6 not more slender than article 5, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, article 6 longer than 5, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 slightly shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills moderately expanded, present on segments 2-6. Pleopods [undescribed]. Epimera 1-3 not bisinuate nor toothed. Uropods 1-2 biramous, stout, rami slightly unequal, shorter than peduncle, peduncles without ventrodistal process. Uropod 3 very short, uniramous, single ramus short, 1-articulate, obtuse and setose distally, peduncle longer than ramus but very short, dilated medially. Telson entire, short, longer than broad, ovate, poorly armed.

Female. Antenna 2 more slender. Gnathopod 1 slightly smaller, palm less differentiated than in male. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak. Gnathopod 1.

Relationship. Differing from *Unciola* in the much poorer recessment of antenna 2, non-angular coxae, lack of teeth on the epimera, longer article 3 of the mandibular palp, presence of only 6 spines on the outer plate of maxilla 1, shorter article 6 of pereopods 3-4 and slender oostegites.

See *Liocuna*, *Pedicorophium* and *Pseudunciola*.

Species. *Pterunciola spinipes* Just, 1977a [307B].

Habitat and distribution. Marine, off North Carolina, 840-1540 m, in empty shells of pteropod, *Cuvierina columnelle*, 1 species.

Rakiroa Lowry & Fenwick

Rakiroa Lowry & Fenwick, 1982: 119.

Type species. *Rakiroa rima* Lowry & Fenwick, 1982, original designation.

Diagnosis. Body laterally compressed, setae tufted dorsally, urosomites 2-3 coalesced, urosomite 1 not of elongate form in its complex. Rostrum short, ocular lobes obsolescent, blunt, antennal sinus moderate. Eyes large. Antennae of medium length, nearly subequal but 1 longer than 2, both stout; peduncular article 3 of antenna 1 slightly shorter than 1, article 1 longest, accessory flagellum vestigial, scale-like, main flagellar articles only 3, article 1 long and thick. Antenna 2 peduncular article 3 short, peduncle stout, flagellum also short and stout and like antenna 1, with 4 articles, only first large. Epistome [?unproduced anteriorly]. Labrum [?subrounded. entire]. Mandible normal, palp strong, stout, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes short blunt. Inner plate of maxilla 1 linguiform, large, with a row of medial setae and 2 apical setae, outer plate with 9 spines, palp 2-articulate. Outer plates of maxilla 2 rather broad, inner plate with only mediomarginal setae. Inner plate of maxilliped with only distal setae, outer plate short, reaching halfway to apex of palp article 2, with spines only apicomedially and apically, palp with 4 articles, article 2 long, article 3 unlobed, article 4 long, and very stubby, with long nail and setae.

Coxae relatively short, strongly overlapping, of various sizes and shapes, progressively elongate from 2 to 4, coxa 1 dilated, produced forward, coxa 2 slightly larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 slightly smaller than anterior coxae. Gnathopods 1-2 diverse, large, gnathopod 2 greatly larger than 1, gnathopod 1 subchelate, weakly merochelate, article 5 long, thick, unlobed, longer than 6, palm short and weakly oblique, dactyl overlapping palm. Gnathopod 2 huge, subchelate, almost parachelate, with article 2 slightly dilated, article 5 very short, weakly lobed, article 6 dilated, rectangular, dactyl large, fitting long sculptured transverse palm.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls short. Pereopods 3-7 similar to each other, progressively longer, with weakly expanded article 2, pereopod 5 shorter than pereopod 7, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, stout, rami slightly unequal, shorter (1) or longer (2) than peduncle, peduncle without ventrodistal process. Uropod 3 small, uniramous, single ramus long, obtuse and spinosetose distally, peduncle as long as ramus, not dilated medially, single ramus 1-articulate. Telson entire, longer than broad, ovate, truncate apically, with 2 lateral and 1 apical patch of setae.

Female. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. None.

Relationship. Differing from *Chevalia* in the uniramous uropod 3, loss of accessory flagellum, thick, poorly articulate flagella of antennae 1-2, normal dactyls of pereopods 5-7 and more normal uropods 1-2.

Otherwise characterised in the group by fused urosomites 2-3 and therefore to be differentiated from *Kamaka*; in the latter genus urosomites 1-2 are fused together but 3 is separate and fused to the telson, the ocular lobes are stalk-like and the flagellum of antenna 2 is multiarticulate.

Species. *Rakiroa rima* Lowry & Fenwick, 1982 [776s].

Habitat and distribution. Marine, Snares Islands, depth unknown, 1 species.

Rildardanus J.L. Barnard

Fig.42A

Rildardanus J.L. Barnard, 1969b: 197.–J.L. Barnard, 1973b: 22.

Type species. *Rildardanus tros* J.L. Barnard, 1969b, original designation.

Diagnosis. Body cylindrical, often dorsally corrugated, or smooth, slightly depressed, urosomites free, 1 ordinary, 3 hidden by telson. Rostrum long, thorn-like, ocular lobes short, blunt; antennal sinus deep; head longer than pereonites 1-2 together. Eyes weak. Antenna 1 longer than 2, 1 slender, antenna 2 stout in male; peduncular article 3 of antenna 1 shorter than 1, article 2 scarcely longest, accessory flagellum vestigial, scale-like. Antenna 2 peduncular article 3 scarcely elongate, huge, with huge dominant article 4, articles 3-4 heavily sculptured and spined, flagellum short. Epistome produced anteriorly. Labrum subrounded, incised. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 linguiform, with 2 apical setae, outer plate with 9 spines, palp 2-articulate. Inner plates of maxilla 2 shortened, with

only mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with long nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, often spiniform or angular, coxa 1 not dilated, not produced forward, coxa 2 smaller than 1, produced or dilated, coxa 4 as long as coxa 1, not lobed, coxa 5 much longer than 4, elongate anteroposteriorly, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, not densely setose, gnathopod 1 greatly larger than 2, subchelate, article 2 dilated, article 5 short, shorter than 6, lobed, article 6 large, dactyl large. Gnathopod 2 parachelate, feeble, with article 2 not dilated, very setose, article 5 longer than 6, unlobed, article 6 not more slender than article 5, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin, with several inner marginal setae. Sternal processes of thorax [undescribed]. Coxal gills [?present on segments 2-6]. Pleopods partially reduced towards posterior, with scarcely dilated peduncle. Epimeron 3 bisinuate. Uropods 1-2 biramous, stout, inner rami vestigial, outer shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 forming small setose leaf lacking rami. Telson entire, short, as broad as long, semicircular, with 2 major apical setae.

Female. Unknown. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Differing from *Unciola* in the reduction of the inner rami on uropods 1-2, loss of ramus on uropod 3, and the formation of heavy sculpture on antenna 2. From *Pedicorophium* and *Pseudunciola* in the loss of ramus on uropod 3; from *Pseudunciola* also in the development of sculpture on antenna 2 and the retention of a tooth on epimeron 3. From *Uncinotarsus* in the presence of a vestigial inner ramus on uropod 2 and lack of a spur on pereopods 3-7. From *Ritaumius* and *Liocuna* in the abnormal uropod 2.

Species. *Rildardanus tros* J.L. Barnard, 1969b [377].

Habitat and distribution. Marine, Gulf of California, Bahia de Los Angeles, 9-16 m, 1 species.

Ritaumius Ledoyer

Ritaumius Ledoyer 1978b: 256.

Type species. *Ritaumius longicornis* Ledoyer, 1978b, original designation.

Diagnosis. Body cylindrical, smooth, urosomites free, 1 ordinary. Rostrum short, almost absent, ocular lobes short; antennal sinus weak to moderate. Eyes small. Antenna 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum vestigial, 1-articulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum with only 4-5 articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, barely incised]. Mandible normal, palp strong, slightly stout, article 1 elongate, 2 short, article 3 rectolinear, longer than 2. Labium with [?entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 small, with a row of 9 medial setae, outer plate with [?9] spines, palp 2-articulate. Inner plates of maxilla 2 rather broad, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 slightly lobed, article 4 long, armed with row of fine spines along inner margin.

Coxae very small, short, weakly contiguous, of similar sizes and shapes, not progressively shorter from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 [?nearly as long as 4, coxa 7 smaller than anterior coxae]. Gnathopods 1-2 similar, of subequal size, feeble, both with sublinear articles, not densely setose, gnathopod 1 scarcely larger than 2, both gnathopods in male subchelate, article 5 of both gnathopods longer than 6, unlobed, dactyls ordinary.

Pereopods 3-4 abnormal, similar, with scarcely inflated article 2, article 4 slender, elongate, articles 5-6 very short, dactyls very short. Pereopods 5-7 [?similar to each other, progressively longer, with linear article 2, pereopod 5 slightly shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin]. Sternal processes of thorax [undescribed]. Coxal gills [?present on segments 2-6]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, as long as or longer than peduncle, peduncles without ventrodistal process. Uropod 3 forming small, naked leaf lacking rami. Telson entire, short, broader than long, pentagonal, with 2 tiny apicolateral setae.

Female. Unknown. Oostegites [?broad, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Characterised by aramous uropod 3, feeble gnathopods in male, strange pereopods 3-4, the latter almost linear, with articles 5-6 very short, latter slightly stubby, dactyl reduced. Mandibular palp article 1 is elongate.

Analogous to *Uncinotarsus* but uropod 2 subequally biramous (versus uniramous), article 2 of antenna 1 longer than article 1, coxae contiguous and inner plate of maxilla 1 very setose medially.

See *Liocuna* and *Rildardanus*.

Species. *Ritaumius longicornis* Ledoyer, 1978b [697].

Habitat and distribution. Marine, Mauritius Island, shallow water, 1 species.

Rudilemboides J.L. Barnard

Figs 45A, 46M

Rudilemboides J.L. Barnard, 1959d: 30.–J.L. Barnard, 1969c: 156.–J.L. Barnard, 1973b: 22.

Type species. *Rudilemboides stenopropodus* J.L. Barnard, 1959d, original designation.

Diagnosis. Body laterally compressed, smooth, normal; urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes moderate, produced forward, pointed; antennal sinus moderate. Eyes moderate. Antenna 1 longer than 2, both slender; peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 3-articulate. Antenna 2 peduncular article 3 scarcely elongate, flagellum with about 4-5 articles. Epistome unproduced anteriorly. Labrum subrounded, incised. Mandible normal, palp slender, article 3 rectolinear, as long as 2. Labium with entire outer lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 conical, small, with 1 medial seta, 1 apical seta, outer plate with 13 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with 3 distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with short setae.

Coxae small, relatively short, contiguous or weakly overlapping, of various shapes, coxa 1 dilated, produced forward, coxa 2 slightly larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 nearly as long as 4; coxa 6 like 5, 7 smaller than anterior coxae. Gnathopods 1-2 diverse; gnathopod 1 greatly larger than 2, in male simple, incipiently carpochelate, article 5 enlarged, long, unlobed or weakly so, article 6 small. Gnathopod 2 weakly subchelate, feeble, linear, often very setose, article 5 longer than 6, not lobed, article 6 rectangular, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls long. Pereopods 5-7 progressively longer, pereopod 5 much shorter than 7, former with broad, latter with narrow unlobed article 2, pereopods 6-7 with elongate dactyl. Sternal processes of thorax absent. Coxal gills [undescribed]. Pleopods [undescribed]. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal on uropod 2, peduncle of uropod 1 with moderate ventrodistal process. Uropod 3 short, biramous, rami long, subequal, narrow, rod-like, obtuse and spinose distally, peduncle much shorter than rami, outer ramus with vestigial article 2. Telson entire, short, broader than long, ovate to semicircular, with 2 weak, apicolateral cusps.

Female. Gnathopods small, gnathopod 1 barely broader than 2, normally subchelate, article 5 slightly longer than 6, unlobed. Oostegites [?moderately narrow, broad, present on only segments ?2-5].

Sexual dimorphism. Strong. Gnathopods.

Variables. Article 2 of pereopod 5 narrowed (*R. naglei*).

Relationship. Differing from *Acuminodeutopus* and *Zoedeutopus* in the fully developed inner ramus of uropod 3 and the weak to absent carpochela on male gnathopod 1. Myers (1981d) believes that the two genera are synonymous because of the weak carpochela on *R. naglei* which transcends the extremes between the genera. From *Neomegamphopus* and *Amphideutopus* and their allies in the short article 3 of antenna 1. From *Microdeutopus* and *Lembos* in the rectolinear article 3 of the mandibular palp.

See *Lemboides* and *Maragopsis*.

Species. *Rudilemboides naglei* Bousfield, 1973 (Myers, 1981d, as *Acuminodeutopus*) [364]; *R. stenopropodus* J.L. Barnard, 1959, 1964e, 1979b (Stretch, 1985a) [369].

Habitat and distribution. Marine, tropical and warm-temperate Pan-America, 0-68 m, 2 species.

[Ishyroceridae] ***Runanga*** J.L. Barnard

Fig.44J

Runanga J.L. Barnard 1961a: 117.–J.L. Barnard, 1969c: 196.–J.L. Barnard, 1973b: 26.

Type species. *Runanga coxalis* J.L. Barnard, 1961a, original designation.

Diagnosis. *Female.* Body cylindrical, depressed, smooth, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, subpointed; antennal sinus deep. Eyes medium. Antennae very long, nearly subequal, both slender; peduncular article 1 of antenna 1 with distal tooth, article 3 greatly longer than 1, peduncular article 3 longest, accessory flagellum scale-like, main flagellum with 6-7 articles. Antenna 2 peduncular article 3 short, peduncle not stouter in male. Epistome [?moderately

produced anteriorly]. Labrum [?subrounded, incised]. Mandible normal, palp strong, slender, article 3 rectolinear, article 3 as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 ovate, with 1 apical seta, outer plate with 11 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with only apicad mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching two thirds to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with medium nail and setae.

Coxae very small, short, widely discontiguous, of various sizes and shapes, progressively shorter from 2 to 4, coxa 1 not dilated, not produced forward, coxa 2 larger than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 heavily setose, much longer than 4, very elongate anteroposteriorly especially in female, thoracic segment 5 also elongate, coxae 6-7 not larger than anterior coxae. Gnathopods 1-2 scarcely diverse, of equal size, small, both weakly subchelate, in gnathopod 1 article 5 unlobed, longer than 6, propodi almond-shaped, dactyls ordinary. Gnathopod 2 with article 2 dilated, article 5 as long as 6, strongly lobed.

Pereopods 3-4 unusual, similar but article 4 of pereopod 4 elongate, with inflated article 2, article 4 slightly dilated, articles 5-6 short, dactyls short. Pereopods 5-7 dissimilar to each other, progressively longer, with weakly expanded article 2, pereopod 5 much shorter than and different from pereopods 6-7, with broader article 2 and tiny reniform article 5 enveloped by article 4, pereopods 6-7 with narrow unlobed article 2, dactyl of pereopods 5-7 geniculate, with accessory tooth on inner margin. Sternal keel [?of thorax present]. Coxal gills narrow, present on segments 3-6. Pleopods strongly reduced towards posterior, with slender peduncle; outer ramus of pleopod 1 basally inflated, small and foliaceous; inner ramus of pleopod 2 tiny, scale-like; pleopod 3 tiny, with 1 tiny ramus. Epimeron 3 not bisinuate. Uropod 1 biramous, rami unequal, outer shorter than peduncle, inner two thirds of outer, peduncles of uropods 1-2 without ventrodistal process, uropod 2 with only 1 small ramus. Uropod 3 forming small almost naked leaf, uniramous, ramus vestigial, with 2 tiny hooks; peduncle not dilated medially. Telson entire, very short, much broader than long, emarginate apically, with 2 apical patches of hooks. Oostegites narrow, present on segments 3-5.

Male. Possible correct identification. Gnathopod 2 carpochelate, carpus large, propodus thin, shorter than carpus, with weak apical thumb, dactyl moderate.

Sexual dimorphism. Strong. Gnathopod 2.

Variables. Flagella of antennae 1-2 with 9 and 7 articles (type), with 15 and 15 articles (*R. wairoa*); coxa 2 enlarged and overlapping coxa 1 in female (*R. wairoa*); pleonites 1-2 with posterodorsal sculpture (*R. wairoa*); pleopod 3 with 2 rami (*R. wairoa*), thus pleopod 3 of type possibly lost in dissection.

Relationship. Differing from *Cerapus* in the more elongate pereonite 5 and coxa 5, with the latter heavily setose. From Siphonoecetinae in the carpochelate gnathopod 2, and the well-developed 3-articulate mandibular palp.

This genus and *Baracuma* form a pair united by the elongate article 4 of pereopod 4 and reduction of posterior pleopods.

Species. *Runanga coxalis* J.L. Barnard, 1961a [715B]; *R. wairoa* McCain, 1969 [715B].

Habitat and distribution. Marine, Tasman Sea, 610-705 m, 2 species.

Stenocorophium Karaman

Stenocorophium Karaman, 1979b: 580.

Type species. *Stenocorophium bowmani* Karaman, 1979b, original designation.

Diagnosis. Body subcylindrical, slightly depressed, smooth, urosomites 1-2 coalesced. Rostrum short, ocular lobes short, pointed, antennal sinus moderate. Eyes medium. Antennae of medium length, 1 scarcely longer than 2, both slender, peduncular article 3 of antenna 1 slightly shorter than 1, article 2 scarcely longest, accessory flagellum absent. Antenna 2 peduncular article 3 short, flagellum short, with few articles. Epistome [?unproduced anteriorly]. Labrum [?subrounded, ?incised]. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes obsolescent, blunt. Inner plate of maxilla 1 small, without setae, outer plate with 7 spines, palp 2-articulate. Inner plates of maxilla 2 rather broad, outer narrow, inner plate with only mediomarginal setae. Inner plate of maxilliped with distal setae, outer plate normal, reaching only halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with setae.

Coxae of ordinary length, strongly overlapping, not progressively elongate from 1 to 4, coxa 1 strongly dilated and produced forward, coxa 2 shorter than 1, coxa 4 not longer than coxa 1, scarcely lobed, coxa 5 as long as 4, coxa 7 much smaller than anterior coxae. Gnathopods 1-2 slightly diverse, of subequal size, small, both with linear articles, densely setose, gnathopod 2 slightly larger than 1, gnathopod 1 in male subchelate, palm almost transverse, article 5 longer than 6, unlobed, article 6 slender. Gnathopod 2 with only 6 articles, simple, linear, very setose, with article 4 enlarged, merochelate, lobe extended away from

posterior margin of article 5, article 5 now representing propodus, elongate, tapering, as long as and more slender than 4, unlobed, article 6 representing dactyl, spine-like, apically setose.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls long. Pereopods 5-7 dissimilar to each other, progressively longer, pereopod 7 almost prehensile, pereopods 5-6 much shorter than and different from pereopod 7, pereopod 5 with unlobed article 2, pereopods 6-7 with broad lobed article 2, pereopods 5-6 with shorter dactyl, articles 4-6 of pereopod 7 greatly enlarged, dactyl of pereopods 5-7 curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2-7]. Pleopods [undescribed]. Epimeron 3 weakly bisinuate. Uropods 1-2 biramous, stout, spines large, rami unequal, much shorter than (1) or as long as (2) peduncle, peduncle of uropod1 with ventrodistal process. Uropod 3 small, short, uniramous, single ramus short, obtuse distally, peduncle as long as ramus, very short, dilated medially. Telson entire, short, broader than long, pentagonal, with 2 hooked apical cusps.

Female. Unknown. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Unknown.

Relationship. Differing from *Paracorophium* and *Chaetocorophium* in the loss of the inner ramus on uropod 3, loss of mandibular lobes on the lower lip, and the strange condition of gnathopod 2 in which one article is lost and propodus and dactyl are now represented by articles 5-6, which are styliform. From *Corophium* in the large coxae, apically clavate mandibular palp and the divergent article 4 of gnathopod 2.

Species. *Stenocorophium bowmani* Karaman, 1979b [594F].

Habitat and distribution. Freshwater (?brackish water), river bottom, Palau Islands, 1 species.

Tethylembos Myers

Tethylembos Myers, 1988: 191.

Type species. *Lembos viguieri* Chevreux, 1911d, original designation.

Myers (1988) diagnosis. Article 3 of mandibular palp with posterior margin straight, marginal setae of 2 different lengths, but terminal setae longer; left mandibular molar with oblique lamellae extending across half of molar surface from marginal lappets; anterior margin of maxilliped [?with wing-like flanges, not described]; male gnathopod 1 with propodus enlarged, slightly longer than carpus; female gnathopod 1 not like that of male; uropod 3 peduncle short, expanded, outer ramus with long marginal setae, extremely long distal setae, with small second article.

Relationship. See *Lembos* and all genera of the Myers (1988) diagnosis.

Species. *Tethylembos viguieri* (Chevreux, 1911d) (Chevreux & Fage, 1925) (Myers, 1974c, 1982a) [340].

Habitat and distribution. Marine, Mediterranean Sea, 3-40 m, 1 species.

Uncinotarsus L'Hardy & Truchot

Uncinotarsus L'Hardy & Truchot, 1964: 126.–J.L. Barnard, 1969c: 156.–J.L. Barnard, 1973b: 23.

Type species. *Uncinotarsus pellucidus* L'Hardy & Truchot, 1964, original designation.

Diagnosis. Body cylindrical, smooth, slightly depressed, urosomites free, 1 ordinary, 3 mostly hidden by telson. Rostrum short, thorn-like, ocular lobes short, blunt; antennal sinus weak. Eyes weak. Antenna 1 longer than 2, both slender; peduncular article 3 of antenna 1 much shorter than 1, articles 1-2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 short, peduncle slender in female, flagellum long but with only 4-5 articles. Epistome unproduced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with notched outer lobes, with weakly developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular, with 1 apical seta, outer plate with 5 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate naked medially. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with few spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long setae.

Coxae very small, short, discontiguous, of almost uniform sizes and shapes, not progressively shorter from 1 to 4, spiniform or angular, coxa 1 not dilated, produced forward, coxa 2 larger than 1, produced, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 slightly diverse, gnathopod 1 greatly larger than 2, subchelate, article 2 not dilated, article 5 short, shorter than 6, weakly lobed, article 6 large, dactyl large. Gnathopod 2 subchelate, not feeble, with article 2 not dilated, poorly setose, article 5 much shorter than 6, unlobed, article 6 stouter than article 5, dactyl ordinary.

Pereopods 3-4 longer than gnathopods, similar, with

slender article 2 armed with rear tooth, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2 bearing rear tooth, pereopod 5 slightly shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin, with several inner marginal setae. Sternal processes of thorax [undescribed]. Coxal gills slender, present on segments 2-5. Pleopods normal. Epimeron 3 not bisinuate. Uropod 1 biramous, normal, inner rami slightly reduced, outer shorter than peduncle, peduncle of uropods 1-2 without ventrodistal process; uropod 2 with only 1 ramus, ramus shorter than peduncle. Uropod 3 forming small, poorly setose leaf lacking rami. Telson entire, short, as broad as long, ovate, with 2 apicolateral setae.

Female. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Absent.

Relationship. Differing from all members of the *Unciola* group in the large, thorn-like posterior tooth on article 2 of pereopods 3-7. From *Rildardanus* in the thin, unsculptured antenna 2. From *Liocuna* in the loss of the inner ramus on uropod 2, larger gnathopod 1 with short, lobed carpus, and thicker, shorter simple gnathopod 2 with carpus elongate and dactyl reduced.

See *Pseudunciola* and *Ritaumius*.

Species. *Uncinotarsus pellucidus* L'Hardy & Truchot, 1964 (Toulmand & Truchot, 1964) [242].

Habitat and distribution. Marine, France, Finisterre, near Île de Batz, 50 m, 1 species.

Unciola Say

Figs 42D, 45P, 46D

Unciola Say, 1818: 388.–Stebbing, 1906: 676.–J.L. Barnard, 1969c: 197.–J.L. Barnard, 1973b: 23.–Karaman, 1981a: 14.

Glauconome Krøyer, 1845: 501 (homonym) (*Glauconome leucopis* Krøyer, 1845, monotypy).

Dryope Bate, 1862: 276 (homonym) (*Unciola irrorata* identification of Gosse, 1855 (= *Dryope crenatipalma* Bate, 1862, fide Stebbing, 1906), here selected).

Type species. *Unciola irrorata* Say, 1818, monotypy.

Diagnosis. Body cylindrical, often dorsally corrugated, or smooth, slightly depressed, urosomites free, 1 ordinary. Rostrum long, thorn-like, ocular lobes short, pointed or blunt; antennal sinus weak to moderate. Eyes small or absent. Antennae of various lengths, sometimes nearly subequal, or 1 longer than 2, 1 slender, antenna 2 stout in male; peduncular article 3 of antenna 1 various, usually 1 = 3, or 3 shorter than 1, article 2 longest, accessory flagellum 2 to 4-articulate. Antenna 2 peduncular article 3 short or scarcely elongate, peduncle stout in male but articles 4-5 often tapering strongly distad, rarely sculptured, article 4 dominant, flagellum short. Epistome unproduced anteriorly. Labrum subrounded, barely incised. Mandible normal, palp strong, slender, article 3 rectolinear, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, blunt. Inner plate of maxilla 1 triangular or ovate, with 4 apical setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 moderate, with medium nail and setae.

Coxae very small, short, discontiguous, of various sizes and shapes, progressively shorter from 1 to 4, often spiniform or angular, coxa 1 dilated, produced forward, coxa 2 longer than 1, often produced or dilated, coxa 4 shorter than coxa 1, not lobed, coxa 5 as long as 4, coxa 7 smaller than anterior coxae. Gnathopods 1-2 diverse, densely setose, gnathopod 1 greatly larger than 2, subchelate, article 2 dilated, article 5 short, shorter than 6, lobed, article 6 large to very large, dactyl large. Gnathopod 2 feeble, parachelate, subchelate or almost simple, with article 2 not dilated, very setose, article 5 as long as or longer than 6, unlobed, article 6 more slender than article 5, dactyl short or strongly reduced.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 not dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 slightly shorter than pereopod 7, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin, with several inner marginal setae. Sternal processes of thorax [undescribed]. Coxal gills present on segments 2-6. Pleopods [undescribed]. Epimeron 3 bisinuate, with tooth. Uropods 1-2 biramous, stout, rami slightly unequal, shorter than peduncle, peduncle of uropod 1 with or without ventrodistal process. Uropod 3 very short, uniramous, single ramus short, 1-articulate, obtuse and setose distally, peduncle longer than ramus but very short, dilated medially. Telson entire, short, as broad as long, ovate, poorly armed.

Female. Antenna 2 more slender. Coxae different from male, usually shorter and less modified. Gnathopods like those of male but occasionally smaller. Oostegites broad, present on segments 2-5.

Sexual dimorphism. Weak. Antenna 2, coxae.

Variables. Slight sculpture of male antenna 2; mediofacial row of setae on inner plate of maxilla 2

often absent, mediomarginal setae also occasionally absent; small differences in shapes of coxae 1-4; shape and length of propodus on male gnathopod 1; gnathopod 2, article 6 short or long, palm well developed, parachelate or obsolescent; article 2 of pereopods 5-7 heavily setose or not; epimeron 3 lacking tooth (*U. integripleura*); uropod 3, medial dilation of peduncle often resembling ramus, spine and setal patterns variable, this dilation formed into ramus, therefore uropod 3 biramous (*U. crassipes*).

Relationship. Differing from the *Siphonoecetes* group in the normal pereopods 5-6 which are like 7 and have a more or less regular free article 5, free article 5 of pereopods 3-4 not being enveloped by article 4, in the non-inflated article 2 of pereopods 3-4, the bisinuate epimeron 3, weaker recessment of antenna 2, normal mandibular palp, and the dominance of gnathopod 1. From *Pterunciola* in the presence of a tooth on epimeron 3, the angular coxae and in article 3 of the mandibular palp being shorter than article 2.

See *Camacho*, *Corophium*, *Grandidierella*, *Liocuna*, *Neohela*, *Parunciola*, *Pedicorophium*, *Pseudunciola*, *Uncinotarsus* and *Unciolella*.

Removals. See *Pedicorophium*, *Pseudunciola*, *Pterunciola* and *Rildardanus*.

Species. *Unciola crassipes* Hansen, 1888 (Stephensen, 1944c) (Gurjanova, 1951) [220B]; *U. crenatipalma* (Bate, 1862) (= *U. crenatipalmata, lapsus* of Bate & Westwood, 1863) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Arresti *et al.*, 1986a) [240]; *U. dissimilis* Shoemaker, 1945c (Bousfield, 1973) [363 + B]; *U. incerta* Bonnier, 1896 (Chevreux & Fage, 1925) [353]; *U. inermis* Shoemaker, 1945c (Bousfield, 1973) (Dickinson *et al.*, 1980) [361]; ?*U. integripleura* Ledoyer, 1986 [618B]; *U. irrorata* Say, 1818 (Stebbing, 1888) (Shoemaker, 1945c) [361 + B]; *U. laticornis* Hansen, 1888 (Stephensen, 1944c) (Shoemaker, 1945c) (Gurjanova, 1951) [350 + BA]; *U. leucopis* (Krøyer, 1845, 1846a) (Sars, 1895) (Stephensen, 1944a) (Shoemaker, 1945c) (Gurjanova, 1951) [250 + B]; *U. petalocera* (Sars, 1879, 1885, 1886) (Stephensen, 1942, 1944c) (Gurjanova, 1951) [220 + B]; *U. planipes* Norman, 1867a (Sars, 1895) (Chevreux & Fage, 1925) (Stephensen, 1942) (Lincoln, 1979a) (= *U. leucopes* Bate & Westwood, 1868) (= *U. kroyeri* Boeck, 1871b) (= *U. steenstrupi* Boeck, 1871b) [216]; *U. serrata* Shoemaker, 1945c (Bousfield, 1973) (Myers, 1981d) [363]; *U. spicata* Shoemaker, 1945c (Dickinson *et al*, 1980) [362 + B]; *U. tenuipes* Chevreux, 1919-20, 1927 [441]; "species" A, "species" B, Dickinson *et al.* 1980 [363].

Habitat and distribution. Marine, cold North Atlantic and Arctic outliers, Arctic Ocean, well developed in bathyal and abyssal, but in shallow water south to Florida and France, 0-3235 m, 14 species.

Unciolella Chevreux

Fig.42G

Unciolella Chevreux, 1911d: 264.–J.L. Barnard, 1969c: 197.–J.L. Barnard, 1973b: 23.

Type species. *Unciolella lunata* Chevreux, 1911d, monotypy.

Diagnosis. Body cylindrical, slightly depressed, provided with urosomal teeth, urosomites free, 1 ordinary. Rostrum absent; ocular lobes obsolescent, pointed or blunt (type); antennal sinus moderate. (Head as long as pereonites 1-2 together in type). Eyes weak. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 slightly shorter than 1, article 2 longest, accessory flagellum 1 to 2-articulate. Antenna 2 peduncular article 3 short, flagellar articles few. Epistome unproduced anteriorly. Labrum rounded, entire. Mandible normal, palp strong, stout, article 3 falciform or clavate (type), as long as 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, large, with 1 apical seta, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 scarcely elongate, article 3 unlobed, article 4 short, with short setae.

Coxae very small, short, discontiguous, coxa 1 not dilated, not produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, unlobed, coxa 5 as long as 4, coxae 6-7 smaller than anterior coxae. Gnathopods 1-2 almost alike, of subequal size, small, gnathopod 1 slightly larger than 2, gnathopod 1 in male subchelate, article 2 with toothed plate, palm short and oblique, article 5 of both gnathopods as long as 6, unlobed, dactyl short.

Pereopods 3-4 longer than gnathopods, similar, with slender article 2, article 4 dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, with linear article 2, pereopod 5 much shorter than pereopod 7, dactyl of pereopods 5-7 curved, short to medium in length. Sternal processes of thorax present [but not known in type]. Coxal gills [undescribed]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami of uropod 2 slightly unequal, shorter than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, short, uniramous, peduncle shorter than ramus, slightly dilated medially, single ramus 1-articulate, narrow, with few apical armaments. Telson entire, short, vestigial, broader than long, pentagonal, emarginate apically, with 2 hooked apical cusps.

Female. Gnathopods small, like male, article 2 of gnathopod 2 slender. Oostegites [?narrow, present on

segments ?2-5].

Sexual dimorphism. Probably none except article 2 of male gnathopod 2 with ornaments (type).

Variables. Accessory flagellum 3-articulate (*U. spinosa*); ocular lobe pointed, mandibular palp article 3 falcate, outer plate of maxilla 1 with 11 spines, peduncular process on uropod 1 obsolete, ramus of uropod 3 with second article (*U. spinosa*); article 2 of male gnathopod 2 with huge toothed plate (type); carpi of gnathopods 1-2 longer than propodi (*U. spinosa*).

Relationship. Differing from *Unciola* in the non-angular coxae and in the same ways as in *Parunciola.* From *Grandidierella* in the unmodified male gnathopod 1.

See *Camacho, Janice, Neohela* and *Parunciola.*

Species. *Unciolella articulata* Ledoyer, 1978a, 1982b [698]; *U. foveolata* K.H. Barnard, 1955 (Griffiths, 1975) [743]; *U. lunata* Chevreux, 1911d, 1927 (Nagata, 1965c) (Myers, 1982a) [340]; *U. spinosa* Griffiths, 1974b, 1975 (Ledoyer, 1979a, 1982b) [745].

Habitat and distribution. Marine, western Indian Ocean to South Africa, Mediterranean, 12-205 m, 4 species.

Varohios J.L. Barnard

Varohios J.L. Barnard, 1979b: 34.

Type species. *Varohios topianus* J.L. Barnard, 1979b, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes long, produced forward, blunt; antennal sinus deep. Eyes medium. Antennae of medium length, subequal, both slender, peduncular article 3 of antenna 1 as long as 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 slightly elongate. Epistome unproduced anteriorly. Labrum subrounded. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 short, with 1 apical seta, outer plate with 9 spines, palp 2-articulate. Plates of maxilla ordinary, narrow, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate short, reaching halfway to apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 short, with long nail and setae.

Coxae ordinary, weakly overlapping, not progressively elongate from 1 to 4, coxa 1 scarcely dilated, not produced forward, coxa 2 also short, coxa 4 not longer than coxa 1, not lobed, coxa 5 as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse; densely setose, gnathopod 1 greatly larger than 2, gnathopod 1 in male strongly propodochelate, with only 6 articles, articles 4-5 fused, short, unlobed, article 6 very large, dactyl huge, forming pincers, with large inner boss. Gnathopod 2 weakly subchelate, almost simple, feeble, article 5 slightly shorter than 6, unlobed, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 barely dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 shorter than and different from pereopods 6-7, with broader, almost lobed article 2, dactyl of pereopods 5-7 short, curved, without tooth on outer margin. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 weakly bisinuate. Uropods 1-2 biramous, normal, uropod 2 stout, rami slightly unequal, inner longer than peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, biramous, both rami short, subequal, obtuse distally, peduncle as long as rami, outer ramus with small article 2. Telson entire, short, as broad as long, ovate or semicircular, with 2 hooked apical cusps.

Female. Gnathopods small, gnathopod 2 slightly larger than 1, weakly subchelate, article 5 shorter than 6, unlobed. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopods.

Relationship. Differing from *Pseudomegamphopus* in the chelate gnathopod 1 with pincer-like claws; *P. chelatus* is a partial intergrade because gnathopod 1 is only slightly chelate. From *Aloiloi* in the chelate male gnathopod 1 and small gnathopod 2.

Neomegamphopus has a carpochelate gnathopod 1 with large boss on the propodus; if the dactyl of that taxon disappeared, gnathopod 1 would resemble that of *Varohios.*

Species. *Varohios chelatus* (Walker, 1904) (Nayar, 1967) [665]; *V. pseudochelatus* (Ledoyer, 1982b) (= *V. chelatus* Ledoyer, 1979a, homonym) [698]; *V. topianus* J.L. Barnard, 1979b [540].

Habitat and distribution. Marine, eastern tropical Pacific to Madagascar, 0 m, 3 species.

[Ischyroceridae] *Ventojassa* J.L. Barnard

Figs 47A, 48D

Ventojassa J.L. Barnard, 1970a: 204.–J.L. Barnard, 1972b: 135.–J.L. Barnard, 1973b: 26.

Type species. *Eurystheus ventosa* J.L. Barnard, 1962a, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, almost pointed, antennal sinus deep. Eyes ordinary. Antennae equal, both slender, peduncular article 3 of antenna 1 longer than 1, articles 2-3 longest, accessory flagellum 2 to 3-articulate. Antenna 2 peduncular article 3 scarcely elongate. Epistome produced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 clavate, shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, short, with 1 seta, outer plate with [?9] spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate [?with mediofacial row of setae]. Inner plate of maxilliped [?with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with long nail and setae].

Coxae relatively short, strongly overlapping, not progressively elongate from 1 to 4, coxa 1 not dilated, not produced forward, coxa 2 also short but wider than 1, coxa 4 not longer than coxa 1, not lobed, coxa 5 longer than 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, gnathopod 2 greatly larger than 1, gnathopod 1 in male subchelate, article 5 long, almost linear, unlobed, longer than 6. Gnathopod 2 enlarged, subchelate, with article 2 dilated distally, article 5 very short, lobed, article 6 dilated, dactyl long.

Pereopods 3-4 normal, similar, with slender article 2, article 4 slightly dilated, dactyls short. Pereopods 5-7 similar to each other, progressively longer, almost prehensile, pereopod 5 shorter than pereopods 6-7, pereopods 5-7 with broad lobed article 2, dactyl of pereopods 5-7 short, curved, without accessory spine on outer margin. Sternal processes of thorax [undescribed]. Coxal gills [undescribed, present on segments ?2- 6]. Pleopods [undescribed]. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal to stout, rami unequal, shorter (1) or as long as (2) peduncle, spines stout, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, biramous, peduncle elongate, scarcely longer than rami, both rami short, outer recurved apically, with apicolateral hooks, and 1-3 wirelike dorsolateral setae; inner ramus longer than outer ramus, narrow, tapering and with few armaments mostly apical. Telson entire, as broad as long, triangular, pointed apically, with 2 or more hooked apical cusps.

Female. Oostegites [?moderately broad, present on segments 2-5].

Sexual dimorphism. None.

Variables. Gnathopodal shapes, proportions and palmar sculpture; female gnathopod 2 weakly different from male (*V. crenulata*); article 2 of pereopods 6-7 crenulate (*V. crenulata*); pereopod 6 stout (*V. frequens*); peduncle of uropod 2 with well developed spur (*V. frequens*); urosomal appendages and their parts neotenic (shorter and stouter, thus stunted) (*V. crenulata*).

Relationship. Differing from other ischyrocerids in the presence of long wire-like setae on the outer ramus of uropod 3 in adults. Otherwise like *Parajassa* but bearing an easily visible accessory flagellum.

See *Bathyphotis*.

Species. *Ventojassa crenulata* Ledoyer, 1979a, 1986 [698]; *V. frequens* (Chilton, 1883) (J.L. Barnard, 1972b) (Griffiths, 1975) (= *V. latipes* Chilton, 1884a) [775 + ?760]; *V. georgiana* Schellenberg, 1931 (K.H. Barnard, 1932) (Thurston, 1974b) [880];*V. ventosa* (J.L. Barnard, 1962a, 1970a) (Ledoyer, 1978b, 1979a, 1986) (Myers, 1985c) [600].

Habitat and distribution. Marine, eastern Pacific, tropical Indo-Pacific, New Zealand, Antarctica, 0-34 m, 4 species.

Xenocheira Haswell

Figs 45E, 46E

Xenocheira Haswell, 1879a: 272.–Stebbing, 1906: 624.–J.L. Barnard, 1969c: 156.–J.L. Barnard, 1973b: 23.

Type species. *Xenocheira fasciata* Haswell, 1879a, monotypy.

Diagnosis. *Female.* Most of the details are taken from *X. seurati*. Body slightly depressed, laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus weak. Eyes medium. Antennae long, 1 longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 short, flagellum short, 3 to 4-articulate. Epistome [?un produced anteriorly]. Labrum [?subrounded, entire]. Mandible normal, palp strong, article 3 semi-falciform, longer than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 triangular, small, with 1 apical seta, outer plate with 10 spines, palp 2-articulate. Plates of maxilla 2 ordinary, [?with only mediomarginal setae]. Inner plate of maxilliped with distal spines, outer plate normal, not reaching apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 unlobed, article 4 medium, with short setae.

Coxae relatively short, strongly overlapping, slightly progressively elongate from 1 to 4, coxa 1 not dilated,

barely produced forward, coxa 2 also short, coxa 4 barely longer than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 much smaller than anterior coxae. Gnathopods 1-2 diverse, in female of subequal size, feeble, both with linear articles, densely setose, gnathopod 1 slightly larger than 2, weakly subchelate, articles 4 and 5 short and appositional, unlobed, palm short and almost transverse, article 6 much longer than 5, slender. Gnathopod 2 weakly subchelate or simple, feeble, linear, with articles 2,4,5 very setose, with article 4 enlarged, extended and fused distally along posterior margin of article 5, article 5 almost as long as 6, larger than 6, anteriorly lobed, article 6 long and more slender than article 5, dactyl reduced.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, pereopod 5 much shorter than 7, pereopods 5-7 with broad almost lobed article 2, dactyl of pereopods 5-7 short, curved. Sternal processes of thorax [undescribed]. Coxal gills [?present on segments ?2-6]. Pleopods normal. Epimeron 3 not bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, much longer (2) than or almost as long (1) as peduncle, peduncle of uropods 1-2 without ventrodistal process. Uropod 3 small, biramous, peduncle shorter than rami, outer ramus 1-articulate, rami long, subequal, narrow, tapering and with few armaments. Telson entire, short, broader than long, pentagonal, with 2 hooked apical cusps.

Oostegites moderately broad [?present on segments 2-5].

Type male unknown. Coxae [possibly different in male]. Otherwise gnathopod 1 larger than 2, normally subchelate, article 5 shorter than 6, unlobed.

Sexual dimorphism. Poorly known.

Variables. Accessory flagellum 4-articulate (*X. leptocheira*); peduncle of antenna 2 slightly stout (*X. leptocheira*); female gnathopod 1 with normal articles 4-6, article 4 not greatly enlarged, article 5 as long as 6, article 6 short, broad, with normal oblique palm and dactyl (*X. seurati*); male and female gnathopod 1 normal as above but article 6 more slender and palm weak (*X. angusticarpa*); male and female gnathopod 2 with article 4 only partly apposed along article 5 and not lobate (*X. angusticarpa, X. leptocheira*); male gnathopod 1 and coxa 1 enlarged like *Lembos* (*X. leptocheira* and possibly male of *X. fasciata* in Pirlot, 1938); article 2 of gnathopods 1-2 not setose (*X. leptocheira*); article 2 of pereopods 5-7 narrow (*X. leptocheira*); epimeron 3 bisinuate (*X. leptocheira*); peduncle of uropods 1-2 with well-developed spur (*X. leptocheira*) or weak (*X. angusticarpa*); outer ramus of uropod 3 with article 2 (*X. leptocheira*).

Relationship. Close to *Lembos* and differing only by the immense setosity of gnathopod 2; *X. leptocheira*, formerly in *Lembos*, forms almost the perfect intergrade between the two genera.

Species. *Xenocheira ?angusticarpa* Ledoyer, 1979a; 1982b [690]; *X. fasciata* Haswell, 1879a, 1885b (K.H. Barnard, 1931b) (?Pirlot, 1938) [645]; *X. leptocheira* (Walker, 1909b) (Ruffo, 1959a) (?Sivaprakasam, 1968a) (Myers, 1975a) [660]; *X. seurati* Chevreux, 1907a, 1908c (Schellenberg, 1938) (Ledoyer, 1984) [555].

Habitat and distribution. Marine, Indo-Pacific, from Gambier Archipelago to Madagascar and the Great Barrier Reef, 6-38 m, 4 species.

Zoedeutopus J.L. Barnard

Zoedeutopus J.L. Barnard, 1979b: 37.

Type species. *Zoedeutopus cinaloanus* J.L. Barnard, 1979b, original designation.

Diagnosis. Body laterally compressed, smooth, normal, urosomites free, urosomite 1 ordinary. Rostrum short, ocular lobes short, blunt, antennal sinus moderate to deep. Eyes medium. Antennae medium-short, 1 scarcely longer than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, articles 1-2 longest, accessory flagellum 2-articulate. Antenna 2 peduncular article 3 short, main flagellar articles very few. Epistome unproduced anteriorly. Labrum subrounded, entire. Mandible normal, palp strong, article 3 rectolinear, scarcely shorter than 2. Labium with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed. Inner plate of maxilla 1 ovate, short, with 2 lateral setae, outer plate with 9 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with mediofacial row of setae. Inner plate of maxilliped with distal spines, outer plate normal, exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3 lobed, article 4 short, with medium nail and setae.

Coxae small, relatively short, strongly overlapping, progressively shorter from 1 to 4, coxa 1 dilated, produced forward, coxa 2 also short, coxa 4 shorter than coxa 1, not lobed, coxa 5 nearly as long as 4, coxae 6-7 not much smaller than anterior coxae. Gnathopods 1-2 alike, of subequal size, large, gnathopod 1 in male weakly subchelate, palm short, gnathopod 2 subchelate or chelate, article 5 of both gnathopods 1-2 very much longer than 6, carpochelate in males, article 6 more slender than article 5, dactyls overlapping palms. Gnathopod 2 with article 2 dilated.

Pereopods 3-4 normal, similar, with slender article 2, article 4 dilated, dactyls long. Pereopods 5-7 similar to each other, progressively longer, pereopods 5-7 with broad unlobed article 2, pereopods 6-7 with longer dactyl, dactyl of pereopods 5-7 curved, without accessory spine on outer margin. Sternal processes of thorax absent. Coxal gills [undescribed, present on segments ?2-6]. Pleopods normal. Epimeron 3 bisinuate. Uropods 1-2 biramous, normal, rami slightly unequal, much longer (2) than or as long as (1) peduncle, peduncle of uropod 1 with ventrodistal process. Uropod 3 small, biramous, peduncle shorter than rami, very short, outer ramus with small article 2 and apical spines, inner ramus shorter than outer ramus, narrow, tapering and with few armaments mostly apical. Telson entire, short, broader than long, ovate, with 2 hooked apical cusps.

Female. Gnathopods feeble, gnathopod 2 scarcely larger than 1, poorly subchelate, article 5 longer than 6, unlobed. Oostegites [?moderately narrow, present on segments 2-5].

Sexual dimorphism. Strong. Gnathopods.

Relationship. Differing from *Microdeutopus* in the deeply recessed antenna 2, short linear article 3 of the mandibular palp bearing only terminal setae, presence of facial but no apical setae on the inner plate of maxilla 1, and in the presence of article 2 on the outer ramus of uropod 3. From *Acuminodeutopus* and allies in the simple article 3 of the mandibular palp. The allies are *Amphideutopus, Konatopus* and *Neomegamphopus*. *Zoedeutopus* differs from these by the shorter inner ramus of uropod 3 (in those allies the outer ramus is shorter than the inner ramus).

See *Rudilemboides*.

Species. *Zoedeutopus cinaloanus* J.L. Barnard, 1979b [377].

Habitat and distribution. Marine, Gulf of California, 0 m, 1 species.

[Ishyroceridae] **Siphonoecetinae** Just, 1983b

Diagnosis. Article 5 of pereopods 5-6 short, reniform, covered with cuticular scales, article 4 of pereopods 3-4 greatly dilated and partly enveloping tiny reniform article 5. Mandibular palp 1 to 2-articulate, article 1 always large and elongate, article 2 if present, tiny. Single ramus of uropod 3, if present, much shorter than peduncle. Antenna 2 pediform. Gnathopod 1 small, simple or poorly subchelate, gnathopod 2 also small, weakly subchelate or simple. Body cylindrical, coxae small and partly or fully discontiguous.

See *Camacho* in Corophioidea above.

All members occupying portable abodes made by cementing amphipod silk to environmental objects such as shells, tubes, and hard or soft debris.

Common characters (eliminated from descriptions below). Body cylindrical, weakly depressed, smooth. Eyes small. Antenna 1 slender, antenna 2 stout or stouter; article 3 of antenna 1 shorter than article 1; accessory flagellum vestigial or absent. Antenna 2 peduncle stout in male, more slender in female. Epistome unproduced anteriorly. Mandible normal, palp strong. Labium with entire outer lobes, inner lobes well developed, mandibular lobes long, pointed. Inner plate of maxilla 1 small or vestigial, lacking setae, palp 1 or 2-articulate. Plates of maxilla 2 ordinary. Inner plate of maxilliped with apical spines, outer plate with medial spines.

Gnathopods diverse, subequal, small, article 5 of gnathopod 1 elongate, linear, unlobed. Gnathopod 2 slightly stouter than gnathopod 2, with article 4 enlarged, incipiently merochelate, extended and fused along posterior margin of article 5; article 5 shorter than 6, lobed; dactyl long.

Pereopods 3-4 alike, article 2 dilated, article 4 enveloping article 5, dactyls long. Pereopods 5-6 similar to each other, short, article 2 poorly expanded; pereopod 7 elongate, with slightly expanded strongly setose, unlobed article 2, articles 4-6 elongate or much more so than in pereopods 5-6. Sternal processes absent. Pleopods with dilated peduncle. Epimeron 3 not bisinuate. Telson with 2 apical patches of hooks. Oostegites narrow.

Relationship. Siphonoecetines are very close to *Cerapus*, *Baracuma* and *Runanga* because article 5 of pereopod 5 is short, lunate and enveloped by lobesfrom article 4 and the telson has patches of dorsal hook-denticles. The mentioned genera differ from siphonoecetines in the carpochelate male gnathopod 2 and the normal article 5 of pereopods 3,4,6.

Corophium differs from siphonecetines in the lack of hooks on the telson, the lesser envelopment of article 5 on pereopods 3 to 4, linear gnathopod 1, filtrative and merus-extended gnathopod 2 and the lack of scales on article 5 of pereopods 5 to 6.

Unciola differs from siphonoecetines in the lack of hooks on the telson, the dominant gnathopod 1, the well-developed 3-articulate mandibular palp, a large tooth on epimeron 3, less dominant male antenna 2, presence of well-developed accessory flagellum, unexpanded peduncles of the pleopods, and normal article 5 of pereopods 3-6.

Key to Genera of Siphonoecetinae

(Emended from Just, 1983b)

1. Coxae 3-4 with smooth margins and normal setae; dactyl of pereopods 5-7 with strong accessory tooth; uropod 2 present 2

——Coxae 3-4 with dentate margins bearing stout pectinate setae; dactyl of pereopods 5-7 without accessory tooth; uropod 2 absent 6

2. Uropod 2 biramous 3

——Uropod 2 uniramous 4

3. Strong subrostral projection present ..... *Australoecetes*

——Subrostral projection absent ..... *Siphonoecetes*

4. Urosomites 1-2 dorsally fused ..... *Bubocorophium*

——Urosomites 1-2 dorsally free 5

5. Depression above rostrum absent; article 1 of flagellum on antenna 2 with 1 spine ..... *Borneoecetes*

——Rostrum present, offset from dorsum by depression; article 1 of flagellum on antenna 2 with many spines ..... *Rhinoecetes*

6. Uropod 3 with articulated ramus ..... *Africoecetes*

——Uropod 3 lacking ramus 7

7. Telson free (but proximal margin hidden by urosomite 2); gnathopod 2 strongly subchelate ..... *Concholestes*

——Telson fused dorsally to urosomite 3; gnathopod 2 simple8

8. Dactyl of pereopod 7 well developed ..... *Caribboecetes*

——Dactyl of pereopod 7 vestigial ..... *Corocubanus*

Africoecetes Just

Africoecetes Just, 1983b: 17.

Type species. Concholestes armatus Griffiths, 1974c, original designation.

Diagnosis. Urosomites 1-2 free, 3 coalesced with telson. Rostrum short, thorn-like, pointed, lacking subrostral projection, ocular lobes elongate, produced forward and downward, blunt. Antennal sinus deep. Antenna 1 much shorter than 2, article 2 longest. Antenna 2 peduncular segment 3 slightly elongate. Epistome [?un produced anteriorly]. Labrum [subrounded]. Mandibular palp with only 1 article. Labium [?with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 triangular, short, without setae, outer plate with 6 spines, palp 2-articulate. Maxilla 2 inner plate with mediofacial row of setae. Maxilliped palp article 4 long, with long nail and setae.

Coxae small, relatively elongate, 3-5 not contiguous, 1-2 and 6-7 weakly overlapping, of various sizes and shapes, progressively but scarcely elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 larger than 1, weakly, coxa 4 not lobed, coxa 5 nearly as long as 4, coxae 6-7 smaller than anterior coxae; coxae 3-4 with dentate margin and stout pectinate setae. Gnathopod 1 slightly longer than 2, 1 in male simple. Gnathopod 2 weakly subchelate, with articles 2-3 dilated, very spinose,

dactyl long. Dactyls of pereopods 5-7 short, geniculate, without accessory tooth. Coxal gills on segments 4-6. Pleopods [undescribed].

Uropod 1 biramous, stout, rami strongly unequal, outer as long as peduncle, inner ramus much shorter than outer. Uropod 2 absent. Uropod 3 small, single ramus short, obtuse and setose distally, peduncle dilated medially, with few short simple setae. Telson entire, short, broader than long, softly triangular.

Female. Oostegites narrow, reduced.

Sexual dimorphism. Weak.

Relationship. Differing from *Concholestes* in the presence of a ramus on uropod 3.

See *Caribboecetes*.

Species. *Africoecetes armatus* (Griffiths, 1974c) (Just, 1983b, 1984a) [700B].

Habitat and distribution. Marine, South Africa, 200 m, 1 species.

Australoecetes Just

Australoecetes Just, 1983b: 128.
(*Stebbingoecetes*) Just, 1985: 333 (*Siphonoecetes australis* Stebbing, 1910a, original designation) [valid subgenus].

Type species. *Siphonoecetes sellicki* Sheard, 1936c, original designation.

Diagnosis. Urosomites 1-2 free, 3 not coalesced with telson. Rostrum vestigial, sharp, anterior keel below this with long, thorn-like false rostrum, ocular lobes elongate, produced forward, blunt. Antennal sinus moderate. Antenna 1 shorter than 2, peduncular articles 1-2 longest. Antenna 2 peduncular article 3 slightly elongate, flagellum with 1 long, 1 short and 2 tiny articles. Labrum subrounded, entire. Mandibular palp with 2 articles, article 2 tiny. Inner plate of maxilla 1 vestigial, outer plate with 6 spines, palp 2-articulate. Maxilla 2 inner plate with only mediomarginal setae. Maxilliped outer plate reaching apex of palp article 2, palp article 4 long, with medium nail and setae.

Coxae very small, relatively short, anteriorly weakly overlapping, of various sizes and shapes, progressively shorter from 1 to 4, coxa 1 not dilated, barely produced forward, coxa 4 not lobed, coxa 5 as long as 4, coxa 7 smaller than anterior coxae; coxae 3-4 with smooth margin and normal setae. Gnathopod 1 in male simple, article 5 medium. Gnathopod 2 slightly larger than 1, weakly subchelate, with article 2 barely dilated, article 5 barely shorter than 6, dactyl short. Dactyls of pereopods 5-7 short, geniculate, with accessory tooth. Coxal gills present on segments 3-6.

Uropods 1-2 biramous, stout, inner rami much shorter than outer, not hooked, peduncle of uropods 1-2 with moderate ventrodistal process, that of uropod 2 smaller. Uropod 3 small, single ramus shorter than peduncle, obtuse and setose distally, peduncle dilated medially, armed with several weak simple setae. Telson entire, short, broader than long, subrectangular.

Female. Antenna 2 more slender. Oostegites narrow, reduced, present on segments 2-5.

Sexual dimorphism. Weak.

Variables. See Key to Subgenera. Species of (*Stebbingoecetes*) with incised upper lip, mandibular palp flattened (versus subcylindrical), pleopodal peduncles even more broadened, inner rami of uropods 1-2 tapering more strongly.

Relationship. Differing from *Siphonoecetes* in the rostral area, the true rostrum vestigial with a large false rostrum situated below the vestigial rostrum.

Key to Subgenera of *Australoecetes*

Most flagellar articles of antenna 1 with ventral spines, peduncular articles 4-5 of antenna 2 with lateral and medial transverse rows of long setae, inner rami of uropods 1-2 lacking apical spine ..... ("A")(*Australoecetes*)

Flagellar articles of antenna 1 lacking ventral spines, lateral and medial setae on articles 4-5 of antenna 2 weak, inner rami of uropods 1-2 with apical spine(s)... ..... ("S")(*Stebbingoecetes*)

Species. Species marked with symbols in key above ("X"); "S" *A. australis* (Stebbing, 1910a) (Just, 1983b, 1985) [784]; "S" *A. jervisi* Just, 1985 [781]; "A" *A. sellicki* (Sheard, 1936c) (Just, 1983b, 1985) [780].

Habitat and distribution. Marine, southern Australia, 0-124 m, 3 species.

Borneoecetes Barnard & Thomas

Borneoecetes Barnard & Thomas, 1984: 873.

Type species. *Borneoecetes wongi* Barnard & Thomas, 1984, original designation.

Diagnosis. Urosomites 1-3 free, 3 not coalesced with telson. Rostrum absent, lacking subrostral projection and dorsal depression, ocular lobes short,

blunt. Peduncular article 2 of antenna 1 scarcely longest. Antenna 2 peduncular article 3 elongate, flagellum with 1 long, 1 short long and 2 tiny articles, article 1 with 1 spine. Labrum subrounded, weakly incised. Mandible palp with only 2 articles, article 2 tiny. Inner plate of maxilla 1 vestigial, outer plate with 7 spines, palp 1-articulate. Inner plate of maxilla with only mediomarginal setae. Maxilliped outer plate not exceeding apex of palp article 2, palp article 4 very short, with medium nail and setae.

Coxae small, relatively short, weakly discontiguous, of uniform sizes and shapes, progressively shorter from 1 to 4, coxa 1 not dilated, produced forward, coxa 4 not lobed, coxa 5 usually as long as 4, coxa 7 smaller than anterior coxae; coxae 3-4 with smooth margin and normal setae. Gnathopods 1-2 small, gnathopod 2 slightly larger than 1. Gnathopod 2 weakly subchelate, with article 2 slightly dilated, dactyl long. Dactyls of pereopods 5-7 short, geniculate, with accessory tooth on outer margin. Coxal gills present on segments 3-6.

Uropod 1 biramous, stout, rami slightly unequal, not hooked, peduncle of uropods 1-2 with moderate pectinate ventrodistal process, that of uropod 2 smaller. Uropod 2 with only 1 ramus, shorter than peduncle. Uropod 3 very short, single ramus short, obtuse and with 1 seta distally, peduncle weakly dilated medially, with 1 seta. Telson entire, short, broader than long,semicircular, with 2 apical patches of hooks.

Female. Antenna 2 more slender. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak.

Relationship. Like *Rhinoecetes* but rostrum and dorsal depression of head absent. Like *Bubocorophium* but differing in the freely articulate urosomites 1 to 2, the 1-articulate palp of maxilla 1 and the lack of pointed rostrum.

Species. *Borneoecetes wongi* Barnard & Thomas, 1984 [647].

Habitat and distribution. Marine, North Borneo, 2-3 m, 1 species.

Bubocorophium Karaman

Bubocorophium Karaman, 1981a: 19.

Type species. *Siphonoecetes tanabensis* Harada, 1971, original designation.

Diagnosis. Urosomites 1-2 coalesced dorsally, 3 not coalesced with telson. Rostrum short, thorn-like, lacking subrostral projection, ocular lobes moderate, produced forward, blunt. Antennal sinus deep. Peduncular article 3 of antenna 1 slightly shorter than 1, article 1 longest. Antenna 2 peduncular article 3 elongate, flagellum with 1 long, 1 medium and 2 tiny articles, articles 1-3 spinose. Labrum subrounded, incised. Mandible palp with only 1 article. Inner plate of maxilla 1 vestigial, outer plate with 6 spines, palp 2-articulate. Inner plate of maxilla 2 with only mediomarginal setae. Maxilliped palp article 4 long, with medium nail and setae.

Coxae small, relatively short, only 1-2 weakly contiguous, of various shapes, coxa 1 dilated, produced forward, coxa 4 not longer than coxa 1, not lobed, coxa 5 shorter than 4, coxa 7 much smaller than anterior coxae; coxae 3-4 with simple margin and ordinary setae. Gnathopod 1 simple. Gnathopod 2 slightly stouter than 1, subchelate, with article 2 slightly dilated, very setose, dactyl long. Dactyls of pereopods 5-7 geniculate, with accessory tooth. Coxal gills present on segments 3-6.

Uropod 1 biramous, stout, peduncle with moderate serrate ventrodistal process, rami slightly unequal, much shorter than peduncle. Uropod 2 with only 1 ramus, shorter than peduncle, peduncle also with ventrodistal serrate margin. Uropod 3 small, single ramus shorter than peduncle, obtuse and setose distally, peduncle dilated medially, armed with several simple setae. Telson entire, short, broader than long, semicircular.

Female. Antenna 2 more slender. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak.

Relationship. Differing from *Siphonoecetes* in the loss of the inner ramus on uropod 2.

Species. *Bubocorophium* ? *conchicola* (Gurjanova, 1938b, 1951) (Just, 1983b) [280]; *B. tanabensis* (Harada, 1971) (Karaman, 1981a) (Takamaru & Ochiai, 1982) (Hirayama, 1984a) [395].

Habitat and distribution. Marine, Japan and Japan Sea, 0-12 m, 2 species.

Caribboecetes Just

Caribboecetes Just, 1983b: 130.–Just, 1984b: 38.

Type species. *Caribboecetes barbadensis* Just, 1983b, original designation.

Diagnosis. Urosomites 1-2 free or occasionally 1-2 or 2-3 partly fused, 3 coalesced with telson. Rostrum short to long to absent, thorn-like, pointed, lacking subrostral projection, ocular lobes elongate, produced forward, blunt. Antennae nearly subequal or 1 shorter than 2, peduncular article 3 of

antenna 1 slightly shorter than 1, article 2 longest. Antenna 2 peduncular article 3 scarcely elongate, flagellum with 1 long, 1 shorter, and 2 tiny articles. Mandibular palp with 2 articles, article 2 tiny. Inner plate of maxilla 1 triangular, vestigial, outer plate with 6 spines, palp 2-articulate. Inner plate of maxilla 2 with mediofacial row of setae. Maxilliped palp article 4 very short, with medium nail and setae.

Coxae very small, relatively short, discontiguous, of various sizes but shapes similar, progressively shortened from 1 to 4, coxa 1 not dilated, often produced forward, coxa 2 often larger than 1, often produced, coxa 4 often shorter or longer than coxa 1, not lobed, coxa 5 usually much shorter than 4, coxa 6 much smaller than anterior coxae; coxae 3-4 with dentate margin and stout pectinate setae. Gnathopod 1 simple. Gnathopod 2 usually enlarged, weakly subchelate or simple, with article 2 partly dilated, setose, article 6 often dilated, often with process on posterodistal margin, dactyl long. Dactyls of pereopods 5-7 geniculate, without accessory tooth. Coxal gills present on segments 4-6.

Uropod 1 biramous, stout, peduncle without strong ventrodistal process, inner ramus one third as long as outer. Uropod 2 absent. Uropod 3 forming small, setose leaf lacking rami. Telson entire, short, broader than long, ovate or semicircular.

Female. Antenna 2 more slender. Oostegites narrow, present on segments 2-5.

Sexual dimorphism. Weak.

Variables. Body with or without anterodorsal setular rows; article 1 of antenna 1 with setose lateral wing (*C. pterycornis*); inner plate of maxilla 2 often lacking mediofacial row of setae (per *C. crassicornis*); coxa 1 occasionally with small midposterior serrations or teeth, coxae 3-4 often much shorter than coxae 1-2 (per *C. pterycornis*); gnathopods 1-2 simple but often with sharp tooth at palmar area.

Relationship. Differing from *Concholestes* in the free telson and subchelate gnathopod 2. From *Africoecetes* in the loss of ramus on uropod 3. From other siphonoecetines in the loss of uropod 2.

Species. *Caribboecetes barbadensis* Just, 1983b, 1984b [491]; *C. crassicornis* Just, 1984b [460]; *C. intermedia* Just, 1984b [491]; *C. jenikarpae* Just, 1984b [537]; *C. magellani* Just, 1984b [641]; *C. pterycornis* Just, 1984b [491]; *C. squamiferus* Just, 1984b [641]; "species" of Just, 1984b [544].

Habitat and distribution. Marine, Caribbean Sea, east tropical Pacific, Philippines, 0-54 m, 7 species.

Concholestes Giles

Fig.46B

Concholestes Giles 1888: 238.–Stebbing, 1906: 663.–J.L. Barnard, 1969c: 190.–J.L. Barnard, 1973b: 16.–Just, 1983b: 131.

Type species. *Concholestes dentalii* Giles, 1888, monotypy.

Diagnosis. *Female.* Body provided with dorsal setose saddle on pleonite 1, urosomites 1-2 free, 3 not coalesced with telson. Rostrum short, bifid laterally, ocular lobes short to obsolescent, pointed; antennal sinus weak. Peduncular articles 1-2 of antenna 1 longest. Antenna 2 peduncular article 3 scarcely elongate, flagellum with 1 long, 1 short article only. Epistome [?unproduced anteriorly]. Labrum [?subrounded, entire]. Mandible palp with 1-2 articles, article 2 tiny. Labium [?with entire outer lobes, with well-developed inner lobes, mandibular lobes long, pointed]. Inner plate of maxilla 1 ovate, short, outer plate with ?5 spines, palp 2-articulate. Inner plate of maxilla 2 with only mediomarginal row of setae. Maxilliped article 4 long, with long nail, armed with row of fine spines along inner margin.

Coxae very small, 1-2 relatively short, 3-4 longer, all discontiguous, of various sizes and shapes, progressively scarcely elongate from 1-2 to 3-4, coxa 1 dilated, slightly produced forward, coxa 4 not lobed, coxa 5 much shorter than 4, coxae 6-7 smaller than anterior coxae; coxae 3-4 with dentate margin and stout pectinate setae. Gnathopod 1 simple. Gnathopod 2 enlarged, subchelate, with article 2 not dilated, dactyl long. Dactyls of pereopods 5-7 short, geniculate, without accessory tooth. Coxal gills present on segments 3-6.

Uropod 1 biramous, stout, peduncle without ventrodistal process, rami slightly unequal, outer almost as long as peduncle. Uropod 2 absent. Uropod 3 forming small setose leaf lacking rami. Telson entire, short, broader than long, ovate to semicircular. Oostegites narrow, present on segments 3-5.

Male. Unknown. Antenna 2 [?thicker].

Sexual dimorphism. Unknown.

Relationship. See *Caribboecetes*.

Remarks. Just (1984a) is not certain the Madagascan specimens he and Ledoyer (1979a, 1982b) report are the same species as the missing Giles types.

Species. *Concholestes dentalii* Giles, 1888 (?Ledoyer, 1979a, 1982b) (?Just, 1984a) [660].

Habitat and distribution. Marine, Bay of Bengal to Madagascar, 7-13 m, 1 species.

Corocubanus Ortiz & Nazabal

Corocubanus Ortiz & Nazabal, 1984a: 5.

Type species. *Corocubanus guitarti* Ortiz & Nazabal, 1984a, original designation.

Diagnosis. Like *Caribboecetes* but dactyl of pereopod 7 vestigial.

Relationship. Possibly synonymous with *Caribboecetes*.

Species. *Corocubanus guitarti* Ortiz & Nazabal, 1984a [483c].

Habitat and distribution. Freshwater, Cuba, cave, 1 species.

Rhinoecetes Just

Rhinoecetes Just, 1983b: 125.

Type species. *Rhinoecetes robustus* Just, 1983b, original designation.

Diagnosis. *Female.* Urosomites 1-2 free, 3 not coalesced with telson. Rostrum long, thorn-like, displaced ventrad by dorsal depression, ocular lobes moderate, produced forward, blunt. Antennal sinus deep. Antenna 1 much shorter than 2, both slender, peduncular article 3 of antenna 1 shorter than 1, article 2 scarcely longest. Antenna 2 peduncular article 3 elongate, flagellum with 1 long, 1 short long and 2 tiny articles, article 1 well spinose. Labrum subrounded, incised, almost bilobed. Mandibular palp with 2 articles, article 2 tiny. Inner plate of maxilla 1 triangular, short, outer plate with 6 spines, palp 2-articulate. Inner plate of maxilla 2 with only mediomarginal setae. Maxilliped palp article 4 long, with long nail and setae.

Coxae very small, relatively short, discontiguous, of various sizes and shapes, not progressively elongate from 1 to 4, coxa 1 dilated, produced forward, coxa 2 larger than 1, dilated, coxa 4 not lobed, coxa 5 nearly as long as 4, coxa 7 not much smaller than anterior coxae; coxae 3-4 with smooth margin and normal setae. Gnathopod 1 simple, slightly longer than 2. Gnathopod 2 slightly enlarged, weakly subchelate, with article 2 not dilated, article 6 more slender than 5, dactyl long. Dactyls of pereopods 5-7 short, geniculate, with accessory tooth on outer margin. Coxal gills present on segments 3-6. Oostegites narrow, present on segments 2-5.

Uropod 1 biramous, stout, peduncle without ventrodistal process, rami strongly unequal. Uropod 2 with 1 ramus, ramus shorter than peduncle. Uropod 3 small, single ramus shorter than peduncle, obtuse and setose distally, peduncle dilated medially, armed with several simple setae. Telson entire, short, broader than long, semicircular.

Male. Unknown. Antenna 2 [?thicker].

Sexual dimorphism. Unknown.

Relationship. Characterised by the odd, depressed margin above the rostrum, otherwise like *Bubocorophium*.

Species. *Rhinoecetes robustus* Just, 1983b [781].

Habitat and distribution. Marine, Australia, NSW, 12-20 m, 1 species.

Siphonoecetes Krøyer

Figs 39H, 42K, 45E, 46O

Siphonoecetes Krøyer, 1845: 491.–Stebbing, 1906: 681.–J.L. Barnard, 1969c: 197.–J.L. Barnard, 1973b: 23.–Karaman, 1981a: 18.–Just, 1983b: 122.
(*Centraloecetes*) Just, 1983b: 124 (*Siphonoecetes kroyeranus* Bate, 1857d, original designation) [valid subgenus].
(*Orientoecetes*) Just, 1983b: 124 (*Siphonoecetes orientalis* Walker, 1904, original designation) [valid subgenus].

Type species. *Siphonoecetes typicus* Krøyer, 1845, monotypy.

Diagnosis (full diagnosis given for only this genus in Siphonoecetinae; replicative items eliminated in diagnoses of similar genera). Body cylindrical, depressed, smooth, urosomites 1-2 free, 3 not coalesced with telson. Rostrum short, thorn-like, pointed or blunt, lacking subrostral projection, ocular lobes elongate, produced forward, blunt. Antennal sinus deep. Eyes weak. Antenna 1 much shorter than 2, 1 slender, antenna 2 stout; peduncular article 3 of antenna 1 slightly shorter than 1, article 2 longest, accessory flagellum absent. Antenna 2 peduncular segment 3 elongate, peduncle stout in male, flagellum with 1 long, 1 short long and 2 tiny articles. Epistome unproduced anteriorly. Labrum subrounded, entire or weakly incised. Mandible normal, palp strong but very slender, with only 2 articles, article 2 tiny. Labrum with entire outer lobes, with well-developed inner lobes, mandibular lobes long, weakly pointed. Inner plate of maxilla 1 vestigial, lacking setae, outer plate with 6 spines, palp 2-articulate. Plates of maxilla 2 ordinary, inner plate with or without mediofacial row of setae, otherwise with mediomarginal setae. Inner plate of maxilliped with distal spines, outer plate normal, not exceeding apex of palp article 2, with spines on medial margin, palp with 4 articles, article 2 long, article 3

unlobed, article 4 very short, with long nail and setae.

Coxae small, relatively short, discontiguous, of various sizes and shapes, progressively shortened from 1 to 4, coxa 1 not dilated, occasionally produced forward, coxa 2 larger than 1, weakly produced or not, coxa 4 not lobed, coxa 5 nearly as long as 4, coxa 7 smaller than anterior coxae; coxae 3-4 with dentate margin and stout pectinate setae. Gnathopods 1-2 diverse, small, first occasionally with linear articles, gnathopod 1 slightly longer than 2, gnathopod 1 in male poorly subchelate, article 5 longer than 6, unlobed. Gnathopod 2 slightly enlarged, weakly subchelate or simple, with article 2 dilated, very spinose, article 5 shorter than 6, lobed, more slender than article 5, dactyl long.

Pereopods 3-4 alike, unusual, with inflated article 2, article 4 dilated, dactyls long. Pereopods 5-7 dissimilar to each other, with weakly expanded article 2. Pereopods 5-6 then 7 progressively longer; pereopods 5-6 shorter than and different from pereopod 7, with broader, anteriorly lobed article 2, with short and reniform article 5 like pereopods 3-4, pereopod 7 with broad unlobed heavily setose article 2, articles 4-6 slender, dactyls of pereopods 5-7 short, geniculate, with accessory tooth. Sternal processes of thorax [undescribed]. Coxal gills present on segments 3-6. Pleopods with dilated peduncle. Epimeron 3 not bisinuate.

Uropods 1-2 biramous, stout, rami slightly unequal, much shorter than peduncle, inner ramus much shorter than outer; peduncle of uropod 1 without ventrodistal process. Uropod 3 small, single ramus shorter than peduncle, obtuse and setose distally, peduncle dilated medially, armed with several long apical pectinate setae or not. Telson entire, short, broader than long, ovate or softly triangular, with 2 apical patches of hooks.

Female. Antenna 2 more slender. Oostegites narrow, often reduced, on segments 2-5.

Sexual dimorphism. Weak.

Variables. See key to subgenera. Inner plate of maxilla 2 with (*S. kroyeranus*) or without (*S. arabicus*) facial row of setae, medial margin otherwise setose. Inner rami of uropods 1-2 with 1 spine in apical hollow (*Siphonoecetes* s.s.), lacking hollowed apex (*Centraloecetes*, *Orientoecetes*).

Relationship. The model genus and coincidentally the most primitive in terms of normality in rostrum (thorn-like), uropods 1-2 (biramous), uropod 3 (with 1 ramus), gnathopod 2 (weakly subchelate, without bizarre adaptations), and coxae 3-4 (normal setae not set in notches). See keys and other genera.

Australoecetes appears closest to *Siphonoecetes* but differs in the displaced false rostrum; *Bubocorophium*, *Rhinoecetes* and *Bubocorophium* lack the inner ramus of uropod 2; and *Africoecetes*, *Concholestes*, *Corocubanus* and *Caribboecetes* lack all of uropod 2.

Removals. Many species, see each genus in this subfamily.

Key to Subgenera of *Siphonoecetes*

1.Distal margin of peduncle on uropod 3 with row of long pectinate setae; males with bulbous apicoventral process on peduncle of uropod 1 .....(*Centraloecetes*)

Distal margin of peduncle on uropod 3 with few scattered short simple setae; male with unproduced but often ragged apicoventral margin on peduncle of uropod 1 2

2.Flagellum of antenna 2 with spines on articles 2-3 ....(*Siphonoecetes*)

Flagellum of antenna 2 with spines on articles 1-3 ....(*Orientoecetes*)

Species. See Griffiths (1973, 1974b), Miloslawskawa (1931, 1939) (Mordhukhai-Boltovskoi, 1969) (Schellenberg, 1942) (Stephensen, 1942). Listed by subgenus: (SIPHONOECETES) *S. arabicus* Barnard & Thomas, 1984 [673]; [*S. dubius* Bate, 1856, *nomen nudum*]; *S. exolitus* Hirayama, 1984a [395]; *S. sabatieri* de Rouville, 1894 (Chevreux & Fage, 1925) (Myers, 1982b) [340]; *S. smithianus* Rathbun, 1905 (Bousfield, 1973) (= *S. cuspidatus* Smith, 1873)[260]; *S. typicus* Krøyer, 1845, 1846a (Stephensen, 1944a) (Gurjanova, 1951) [220 + ?W]; "species" = *S. sabatieri* of Reid, 1951 [444]. (CENTRALOECETES) *S. dellavallei* Stebbing, 1899b (Chevreux & Fage, 1925) (Gurjanova, 1951) (Myers, 1982b) [339 + 743]; *S. kroyeranus* Bate, 1857d (Myers & McGrath, 1979) (Lincoln, 1979a) (= *S. cuspidatus* Metzger, 1871) (= *S. whitei* Bate, 1862, homonym) (= *S. colletti* Boeck, 1871, Sars, 1895, Chevreux & Fage, 1925) [240]; *S. neapolitanus* Schiecke, 1978 (Myers, 1982b) [340]; *S. pallidus* Sars, 1883, 1895 (Gurjanova, 1951) [238 + B]; *S. striatus* Myers & McGrath, 1979 (Lincoln, 1979a) [240]. (ORIENTOECETES) *S. erythraeus* Ruffo, 1959, 1969 (Ledoyer, 1967a,b, 1982b) [690]; *S. orientalis* Walker, 1904 (K.H. Barnard, 1937) (Nayar, 1967) (Griffiths, 1974c) [660].

Habitat and distribution. Marine, cosmopolitan, mostly shallow and tropical, 0-282 m, 12 species.

CRANGONYCTIDAE Bousfield, 1973

[see Barnard & Barnard (1983)]

CRESSIDAE Stebbing, 1899a

Diagnosis. Accessory flagellum vestigial or absent. Mandibular molar evanescent. Outer plates of maxilliped small (Fig.49B). Coxa 1 small and mostly covered by large following coxae; gnathopod 1 simple. Article 2 of pereopod 5 weakly expanded (not rectolinear). Uropod 3 uniramous. Telson entire and fused to urosomite 3, thus urosome appearing to have only 2 urosomites, with urosomites 2-3 fused (in a technical sense).

See Stenothoidae, Amphilochidae, Leucothoidae, Pagetinidae and Phliantidae.

Description. Body compressed laterally, often strongly or weakly carinate, slick. Head large, free, rostrate, with sharp ocular lobe, eyes present. Antennal peduncles elongate, antenna 1 especially long, article 2 of peduncle almost as long as 1, article 3 short, primary flagellum elongate. Antenna 2 more slender and shorter than antenna 1. Labrum bilobed (incised). Incisor of medium width, minutely toothed, molar simple or absent, right lacinia mobilis apparently present, rakers short but numerous; palp long, thin, article 3 elongate but slightly shorter than article 2. Lower lip composed of widely separated tilted oval lobes without distinct mandibular extensions astride fused inner lobes. Maxillae weak, poorly armed, inner plate of maxilla 1 rounded, outer plate with 7+ spines, palp 1-articulate; outer plate of maxilla 2 extending much farther than inner plate. Inner plate of maxilliped small, outer scarcely larger (small by amphipodan measures), palp slender, dactyl well developed, unguiform. Gills 2-?, small, ovate; oostegites moderately expanded, well setose.

Coxae 2-4 large but variable in shape from subquadrate to shoe-shaped, coxa 4 strongly excavate or rounded posteriorly, never hugely shield-forming. Gnathopod 1 feeble, with linear articles, carpus elongate, underslung by merus, dactyl prominent. Gnathopod 2 small to medium, strongly subchelate, carpus short, lobate, propodus weakly to strongly expanded, palm oblique. Pereopods 3-7 slender, article 2 of pereopods 5-7 alike, weakly expanded, lobate or not.

Pleonites 1-3 slightly larger than any pereonites, epimera ordinary. Pleopods ordinary. Uropods 1-3 extending subequally, elongate, outer rami of uropods 1-2 shortened, often poorly armed. Uropod 3 with elongate peduncle bearing single long ramus of 2 articles. Telson scarcely longer than broad, usually ornamented with teeth or cusps.

Sexual dimorphism. Weak; gnathopod 2 of male scarcely stronger, armaments of flagellum on antenna 1 stronger.

Relationship. The Stenothoidae (= Thaumtelsonidae) often have urosomal fusion but apparently the telson is always distinct from urosomite 3 and article 2 of pereopod 5 is always rectolinear.

The Leucothoidae and Anamixidae, especially *Anamixis*, resemble Cressidae, but uropod 3 is biramous and gnathopod 1 is either totally absent or fully carpochelate (if the chelate article is always counted as the carpus; otherwise the terminology is fully carpo-, propodo- or merochelate). The telson of Leucothoidae also is distinct from urosomite 3.

The Amphilochidae have biramous third uropods and well-developed outer plates on the maxillipeds.

The Phliantidae have depressed bodies with splayed coxae, coxa 1 is always large, the mandibular palp is absent and the outer plates of the maxillipeds are large.

The Pagetinidae have short antennae, large coxa 2, and subchelate gnathopod 1.

Key to Genera of Cressidae

1. Coxa 4 rectangular, excavate posterodorsally, ventral margin horizontal (Fig.49B) ..... *Cressa*

——Coxa 4 shoe-shaped, without posterodorsal concavity, ventral margin tilted obliquely (Fig.49A) ..... *Cressina*

Cressa Boeck

Fig.49B,C

Danaia Bate, 1857d: 137 (*Danaia dubia* Bate, 1857d, monotypy) [homonym, Anthozoa].
Cressa Boeck, 1871b: 145.

Type species. *Cressa schiodtei* Boeck, 1871b, selected by Boeck, 1876.

Diagnosis. Coxae 2-4 rectangular or subrectangular or coxa 2 weakly shoe-shaped (with rounded and protruding anterior margin and weakly excavate ventral margin); coxa 4 strongly excavate posterodorsally, thus bearing broad, sharply angular posterior lobe, ventral margin horizontal (though often short). Oostegites moderately expanded.

Species. See Gurjanova (1951); Schellenberg, 1942); Stephensen (1931a, 1938b); *C. abyssicola* Sars, 1879, 1885 (Stephensen, 1931a) [220B]; *C. bereskini* Gurjanova, 1936c, 1951 [216 + B]; *C. carinata* Stephensen, 1931a [216B]; *C. cristata* Myers, 1969c (Ruffo, 1979, 1982f) [340]; *C. dubia* (Bate, 1857d) (= *C. schiodtei* Boeck, 1871) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln,1979a) [355]; *C. mediterranea* Ruffo, 1979, 1982f [340]; *C. minuta* Boeck, 1871b (Sars, 1895) (Stephensen, 1928, 1929, ?1931a) [240]; *C. quinquedentata* Stephensen, 1931a [209B].

Habitat and distribution. Marine, Arctic, northeastern Atlantic, shallow Mediterranean, 5-1505 m, 8 species.

Cressina Stephensen

Fig.49A

Cressina Stephensen, 1931a: 204.

Type species. *Cressina monocuspis* Stephensen, 1931a, monotypy.

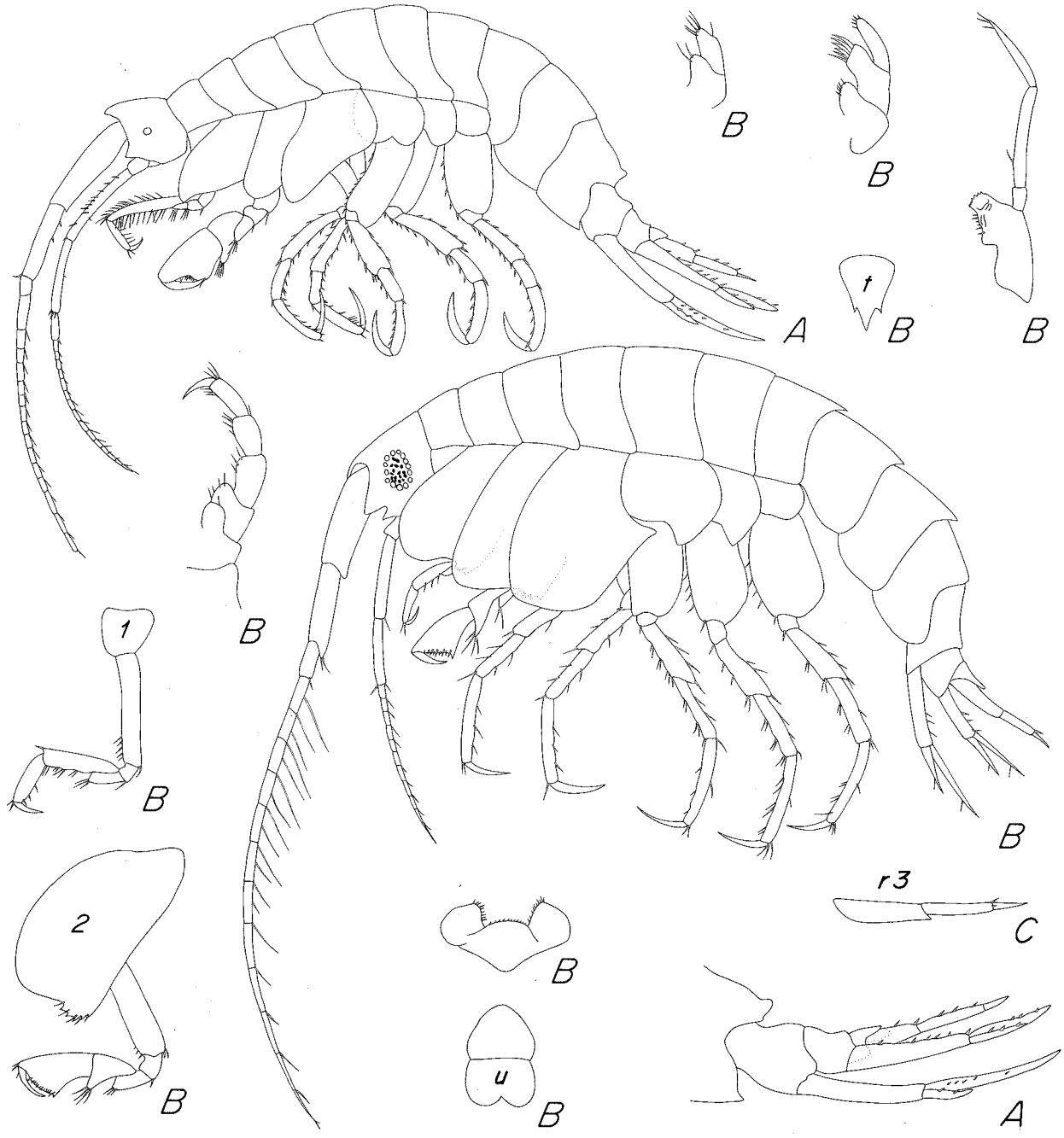

Fig.49. Cressidae. A, *Cressina monocupis*; B, *Cressa dubia*; C, *Cressa minuta*.

Diagnosis. Coxae 2-4 shoe-shaped, thus anterior margins sinuous or protruding, or anteroventral corners attenuate, or ventral margins excavate, or various combinations of these shapes, coxa 4 rounded posteriorly, without lobe or excavation, ventral margin tilted obliquely. Oostegites very large (larger than in *Cressa*).

Species. *Cressina monocuspis* Stephensen, 1931a [216B].

Habitat and distribution. Marine, cold North Atlantic and Norwegian Basin, 682-1906 m, 1 species.

CYPROIDEIDAE J.L. Barnard, 1974b

Diagnosis. Coxae 3-4 immensely broadened, with contiguous margins abutting or when weakly overlapping fitting together along rabbeted acclivities; coxae 1-2 very small, coxa 2 mostly hidden by coxa 3. Peduncle of uropod 3 elongate. Telson entire.

Description. Body usually subglobular in lateral view but strongly flattened from side to side, with pereonites 3-4 enlarged, pleon often with grotesque armour. Antenna 1 usually much stouter than antenna 2, flagellum sparsely articulate, articles 2-3 occasionally very short. Outer lobes of lower lip usually un-notched. Palp article 3 of maxilliped with small apicodistal process or tooth, palp generally very poorly armed, usually with few thick pectinate spines. Propodi of gnathopods often with sparse giant pectinate spines on acclivities, dactyls often with large spearing thorns or pectinations. Pereopods 3-4 usually elongate, 5-7 variable, often shortened, 6-7 often appearing shorter (because of folding) than pereopod 5. Article 2 of pereopod 5 rectolinear; article 2 of pereopods 6-7 variable, rectolinear or expanded in varying combinations, often lobate posteroventrally.

Relationship. Like Stegocephalidae in the globular body and lateral shield but differing from Stegocephalidae in the reduction and cryptic form of coxae 1-2.

Ecological position suspected to be commensalistic.

Key 1 to Genera of Cyproideidae

1. Article 2 of pereopod 7 linear, slender 2

—— Article 2 of pereopod 7 expanded 3

2. Palm of gnathopod 2 transverse, urosomite 3 vaulting over small telson ..... *Cyproidea*

—— Palm of gnathopod 2 oblique, urosomite 3 not vaulting over huge telson ..... *Paracyproidea*

3. Urosomite 1 unkeeled (in middle), long or short 4

—— Urosomite 1 dorsally keeled, elongate 7

4. Article 2 of pereopod 6 linear, slender ..... *Mokuoloe*

—— Article 2 of pereopod 6 expanded 5

5. Gnathopod 2 almost simple, uropod 2 shortened, not reaching end of uropod 3 ..... *Stegoplax*

—— Gnathopod 2 subchelate, with oblique or transverse palm, uropod 2 reaching apex of uropod 3 6

6. Mandibular palp present ..... *Peltocoxa*

—— Mandibular palp absent ..... *Pseudopeltocoxa*

7. Article 2 of pereopod 5 slender, linear 8

—— Article 2 of pereopod 5 expanded 13

8. Mandible with palp 9

—— Mandibular palp absent 11

9. Article 2 of pereopod 6 rectangular ..... *Terepeltopes*

—— Article 2 of pereopod 6 expanded 10

10. Gnathopod 1 slightly subchelate, propodus neither attenuate nor tapering ..... *Moolapheonoides*

—— Gnathopod 1 simple, propodus tapering, attenuate ..... *Austropheonoides*

11. Gnathopod 1 simple, palp of maxilla 1 2-articulate ..... *Hoplopleon*

—— Gnathopod 1 subchelate, palp of maxilla 1 1-articulate 12

12. Article 2 of pereopod 6 basally expanded, pleonite 3 with process ..... *Narapheonoides*

—— Article 2 of pereopod 6 fully rectolinear, pleonite 3 lacking process ..... *Hoplopheonoides*

13. Mandibular palp absent 14

—— Mandibular palp present 15

14. Dactyls of gnathopods multitoothed, telson reaching apex of rami on uropod 3, gnathopod 2 with palm ..... *Unguja*

—— Dactyls of gnathopods with 1 tooth, telson failing apex of peduncle on uropod 3, gnathopod 2 lacking palm ..... *Neocyproidea*

15. Gnathopod 2 simple, telson scarcely reaching apex of peduncle on uropod 3 ..... *Peltopes*

—— Gnathopod 2 subchelate, telson extending beyond apex of outer ramus on uropod 3 ..... *Unyapheonoides*

Key 2 to Genera of Cyproideidae

1. Article 2 of at least pereopod 5 expanded 2

—— Article 2 of pereopod 5 rectolinear, others variable 4

2. Mandibular palp absent ..... (see Key 1, couplet 14) *Unguja, Neocyproidea*

—— Mandibular palp present 3

3. Gnathopods subchelate, palp of maxilla 1 1-articulate, telson over-reaching peduncle of uropod 3 ..... *Unyapheonoides*

—— Gnathopods simple, palp of maxilla 1 2-articulate, telson not exceeding apex of peduncle on uropod 3 ..... *Peltopes*

4. Article 2 of pereopods 6-7 expanded 5

—— Article 2 of pereopod 6 rectolinear, of 7 variable 11

5. Urosomite 1 short 6

—— Urosomite 1 elongate 8

6. Mandibular palp absent ..... *Pseudopeltocoxa*

—— Mandibular palp present 7

7. Telson huge, boat-shaped ..... *Peltocoxa*

—— Telson thin but elongate ..... *Stegoplax*

8. Mandibular palp present 9

—— Mandibular palp absent 10

9. Gnathopod 1 weakly subchelate, propodus subrectangular ..... *Moolapheonoides*

—— Gnathopod 1 simple, propodus tapering and attenuate ..... *Austropheonoides*

10. Article 2 of pereopod 6 triangular, telson short, palp of maxilla 1 1-articulate ..... *Narapheonoides*

—— Article 2 of pereopod 6 ovate, telson elongate, palp of maxilla 1 2-articulate ..... *Hoplopleon*

11. Article 2 of pereopod 7 expanded 12

—— Article 2 of pereopod 7 rectolinear 14

12. Urosomite 1 short, telson very elongate ..... *Mokuoloe*

—— Urosomite 1 elongate, telson short 13

13. Mandibular palp present, article 2 of pereopod 7 expanded ..... *Terepeltopes*

—— Mandibular palp absent, article 2 of pereopod 7 triangular ..... *Hoplopheonoides*

14. Telson huge, boat-shaped, dominating uropod 3 ..... *Paracyproidea*

—— Telson small, not reaching apex of peduncle on uropod 3 ..... *Cyproidea*

Key 3 to Genera of Cyproideidae

1. Urosomite 1 short, ordinary 2

—— Urosomite 1 elongate 7

2. Telson failing to reach apex of peduncle on uropod 3 ..... *Cyproidea*

—— Telson reaching or exceeding apex of peduncle on uropod 3 3

3. Telson not vertically inflated 4

—— Telson vertically inflated or with large ventral keel 5

4. Article 2 of pereopods 5-6 rectolinear ..... *Mokuoloe*

—— Article 2 of only pereopod 5 rectolinear ..... *Stegoplax*

5. Article 2 of pereopods 5-7 rectolinear ..... *Paracyproidea*

—— Article 2 of pereopods 6-7 expanded, ovate 6

6. Mandibular palp present ..... *Peltocoxa*

—— Mandibular palp absent ..... *Pseudopeltocoxa*

7. Article 2 of pereopods 5-7 expanded, ovate 8

—— Article 2 of pereopod 5 rectolinear 10

8. Palp of maxilla 1 2-articulate, gnathopods 1-2 simple ..... *Peltopes*

—— Palp of maxilla 1 1-articulate, 1 or both pairs of gnathopods subchelate 9

9. Mandibular palp present, gnathopod 1 subchelate, telson exceeding peduncle of uropod 3 ..... *Unyapheonoides*

—— Mandibular palp absent, gnathopod 1 nearly simple, telson not over-reaching peduncle of uropod 3 ..... (see Key 1 couplet 14) *Unguja, Neocyproidea*

10. Article 2 of pereopod 6 rectolinear ..... (see Key 2 couplet 13) *Terepeltopes, Hoplopheonoides*

—— Article 2 of pereopods 6-7 fully expanded 11

11. Telson short, failing to reach apex of peduncle on uropod 3, article 2 of pereopod 6 tapering distally ..... *Narapheonoides*

—— Telson elongate, reaching apex of peduncle on uropod 3, article 2 of pereopod 6 fully expanded 12

12. Gnathopod 1 barely subchelate ..... *Moolapheonoides*

—— Gnathopod 1 simple 13

13. Mandibular palp absent, palp of maxilla 1 2-articulate ..... *Hoplopleon*

—— Mandibular palp present, palp of maxilla 1 1-articulate ..... *Austropheonoides*

Austropheonoides J.L. Barnard

Figs 24C, 25C

Austropheonoides J.L. Barnard, 1972b: 18.

Type species. *Austropheonoides mundoe* J.L. Barnard, 1972b, original designation.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 small, simple, weakly carpochelate, propodus elongate, thin, attenuate, tapering, dactyl medium to elongate and curved. Gnathopod 2 small, subchelate, partly to fully carpochelate, propodus rectangular, palm transverse, weakly excavate to weakly chelate. Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded.

Urosomite 1 elongate, dorsally keeled; urosomite 3 unvaulted. Telson elongate, reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 elongate, lanceolate, outer plate with about 8 main spines. Maxillipeds ordinary. Pleonite 3 unproduced posterodorsally. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Hoplopleon* in the presence of the mandibular palp.

See *Moolapheonoides*, *Peltocoxa* and *Stegoplax*.

Species. *Austropheonoides mallee* J.L. Barnard, 1974b [785]; *A. mundoe* J.L. Barnard, 1972b [787]; *A. splendens* Moore, 1981b [783]; *A. takkure* J.L. Barnard, 1974b [785]; *A. truganini* Moore, 1981b [783].

Habitat and distribution. Marine, cool temperate Australia, littoral, 5 species.

Cyproidea Haswell

Figs 24G, 25A

Cyproidea Haswell, 1880b: 31.–Stebbing, 1906: 157.
Cyproidia [sic] Haswell, 1879b: 320 (published earlier than 1880b, but no type species described).
Gallea Walker, 1904: 256 (*Gallea tecticauda* Walker, 1904, monotypy).

Type species. *Cyproidia* [sic] *ornata* Haswell, 1879b, selected by J.L. Barnard, 1969a.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 large, subchelate, weakly carpochelate, propodus large, palm very oblique; gnathopod 2 large, subchelate, fully carpochelate, propodus small, palm almost transverse. Article 2 of pereopods 5-7 rectolinear. Urosomite 1 not elongate, not dorsally keeled; uropod 3 vaulting over telson. Telson short, reaching middle of peduncle on uropod 3.

Article 2 of antenna 1 dorsally crested and apically toothed. Mandibular molar medium to small, poorly or not triturative. Mandibular lobes of lower lip obsolescent (type) or not. Inner plate of maxilla 1 of medium size (type) to very small, outer plate with 6-8 main spines. Outer plate of maxilliped feeble. Pleonite 3 unproduced posterodorsally. Inner and outer rami of uropods 1-3 extending subequally.

Variables. Molar obsolescent (*C. ornata*); molar medium and poorly triturative (*C. liodactyla*, *C. serratipalma*).

Relationship. Differing from the *Stegoplax-Peltocoxa* group in the small telson; from the many genera in the *Hoplopheonoides-Peltopes* group by the short urosomite 1.

See *Paracyproidea*.

Species. *Cyproidea liodactyla* Hirayama, 1978 [395]; *C. marmorata* Moore, 1981b [783]; *C. ornata* Haswell, 1879b (= *C. tecticauda* Walker, 1904) (= *C. crinita* Spandl, 1924b) (Hale, 1929) (Schellenberg, 1938a, 1953) (K.H. Barnard, 1926, 1940) (Ruffo, 1938b, 1959, 1969) (Ledoyer, 1967a, 1973a, 1978b, 1979a,b) (Nayar, 1959, 1967) (Sivaprakasam, 1968a) (Rabindranath, 1972a) (J.L. Barnard, 1972b) (Griffiths, 1974-1975) [600]; *C. serratipalma* Schellenberg, 1938a (Ledoyer, 1984) [578 + 586].

Habitat and distribution. Marine, warm and cool Indo-Pacific, including Australia, 0-27 m, 4 species.

Hoplopheonoides Shoemaker

Fig.25G

Hoplopheonoides Shoemaker, 1956: 61.

Type species. *Hoplopheonoides obesa* Shoemaker, 1956, monotypy.

Diagnosis. Mandibular palp absent. Palp of maxilla 1 1-articulate. Gnathopod 1 small, scarcely subchelate, weakly carpochelate, propodus small, palm transverse or parachelate; gnathopod 2 small, parachelate, not carpochelate, propodus small, palm transverse, excavate. Article 2 of pereopods 5-6 rectolinear, of pereopod 7 weakly expanded basally, subtriangular, tapering distally. Pleonite 3 unproduced posterodorsally. Urosomite 1 elongate, dorsally keeled; urosomite 3 unvaulted. Telson short, not reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. [Lower lip unknown]. Inner plate of maxilla 1 elongate, narrow; outer plate with 9-11 main spines. Outer plate of maxilliped small. Outer ramus of uropod 3 shortened.

Relationship. Differing from *Narapheonoides* in the poor expansion of article 2 on pereopod 7 and the chelate gnathopod 2.

See *Cyproidea*.

Species. *Hoplopheonoides obesa* Shoemaker, 1956 [478].

Habitat and distribution. Marine, Dry Tortugas, Florida, sublittoral, 1 species.

Hoplopleon K.H. Barnard

Hoplopleon K.H. Barnard, 1932: 105.

Type species. *Peltocoxa australis* K.H. Barnard, 1916, original designation.

Diagnosis. Mandibular palp absent. Palp of maxilla 1 2-articulate. Gnathopod 1 small, simple (type) or slightly subchelate, carpochelate, propodus slender, palm obsolescent, long and oblique, dactyl not elongate; gnathopod 2 small, subchelate, carpochelate, palm subtransverse, dactyl elongate. Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded. Pleonite 3 scarcely extended posterodorsally. Urosomite 1 elongate, with dorsal keel; urosomite 3 unvaulted. Telson elongate, reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative [unknown on type]. Lower lip ordinary [unknown on type]. [Size of inner plate on maxilla 1 unknown], outer plate of maxilla 1 with 10 main spines. Maxilliped ordinary [unknown on type]. Outer rami of uropods 2-3 shortened [unknown on type].

Relationship. Differing from *Moolapheonoides* in the 2-articulate palp of maxilla 1.

See *Austropheonoides*, *Neocyproidea*, *Peltocoxa* and *Stegoplax*.

Species. *Hoplopleon australis* (K.H. Barnard, 1916) [743I]; *H. medusarum* K.H. Barnard, 1932 (Griffiths, 1975) [743I]; *H. similis* Schellenberg, 1953 [743].

Habitat and distribution. Marine, South Africa, littoral, often on medusae or hydroids, 3 species.

Mokuoloe J.L. Barnard

Mokuoloe J.L. Barnard, 1970a: 40.

Type species. *Mokuoloe ninole* J.L. Barnard, 1970a, original designation.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 of medium size, subchelate, not carpochelate, propodus large, palm very oblique, (ill?) defined, dactyl flagellate; gnathopod 2 large, subchelate, carpochelate, propodus large, palm oblique. Article 2 of pereopods 5-6 rectolinear, of pereopod 7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 not elongate, unkeeled dorsally; urosomite 3 unvaulted. Telson elongate, almost reaching apex of inner ramus on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Mandibular lobes of lower lip small. Inner plate of maxilla 1 short, broad, rectangular; outer plate with 7 main spines; setae on palp strap-shaped. Maxillipeds ordinary. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Stegoplax* in the rectolinear article 2 of pereopod 6; from most other genera in the extremely long telson reaching the apex of the rami on uropod 3.

See *Paracyproidea*, *Peltocoxa* and *Unyapheonoides*.

Species. *Mokuoloe ninole* J.L. Barnard, 1970 [381].

Habitat and distribution. Marine, Hawaiian Islands, littoral, 1 species.

Moolapheonoides J.L. Barnard

Moolapheonoides J.L. Barnard, 1974b: 5.

Type species. *Moolapheonoides kadee* J.L. Barnard, 1974b, original designation.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 small, scarcely subchelate, weakly carpochelate, propodus rectangular, not tapering. Gnathopod 2 small, subchelate, weakly carpochelate, palm moderately developed, oblique. Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded. Urosomite 1 elongate, dorsally keeled; urosomite 3 unvaulted. Telson elongate, almost reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 thickly rectangular, outer plate with 9-10 main spines. Maxillipeds ordinary. Pleonite 3 unproduced posterodorsally. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Austropheonoides* in the slightly subchelate gnathopod 1.

See *Hoplopleon*, *Narapheonoides*, *Peltocoxa* and *Stegoplax*.

Species. *Moolapheonoides angustipes* Ledoyer, 1982b [698]; *M.coocoo* J.L. Barnard, 1974b [782]; *M. kadee* J.L. Barnard, 1974b [785]; *M. poontee* J.L. Barnard, 1974b [782].

Habitat and distribution. Marine, southern Australia, Madagascar, littoral, 4 species.

Narapheonoides J.L. Barnard

Figs 24F, 25F

Narapheonoides J.L. Barnard, 1972b: 21.

Type species. *Narapheonoides mullaya* J.L. Barnard, 1972b, original designation.

Diagnosis. Mandibular palp absent. Palp of maxilla 1 1-articulate. Gnathopod 1 small, scarcely subchelate, carpochelate, palm slightly oblique. Gnathopod 2 small, subchelate, weakly carpochelate, palm almost transverse. Article 2 of pereopod 5 rectolinear, of pereopod 6 subtriangular, with expanded base but tapering distally, of pereopod 7 expanded. Urosomite 1 elongate, dorsally keeled; urosomite 3 unvaulted. Telson short, not reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 medium, rectangular, outer plate with 7 main spines. Maxilliped ordinary. Pleonite 3 produced posterodorsally. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Hoplopheonoides* and *Moolapheonoides* in the poor expansion of article 2 on pereopod 6, the short telson and the lack of a mandibular palp.

Species. *Narapheonoides mullaya* J.L. Barnard, 1972b [780].

Habitat and distribution. Marine, southern Australia, littoral, 1 species.

Neocyproidea Hurley

Fig.24E

Neocyproidea Hurley, 1955a: 199.

Type species. *Cyproidea otakensis* Chilton, 1900, original designation.

Diagnosis. Mandibular palp absent. Palp of maxilla 1 1-articulate. Gnathopod 1 small, simple, carpochelate, propodus small, slender, tapering, dactyl elongate; gnathopod 2 small, almost simple, carpochelate, palm obsolescent, oblique. Article 2 of pereopods 5-7 expanded but weakly so on pereopod 5. Pleonite3 unproduced posterodorsally. Urosomite 1 elongate, with boat-shaped keel vaulted almost to telsonic base, dorsal surface concave; urosomite 3 unvaulted. Telson elongate, almost reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 short; outer plate with 8 main spines. Maxillipeds ordinary. Dactyl of gnathopod 1 strongly toothed. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Hoplopleon* in the 1-articulate palp of maxilla 1 and the slight expansion of article 2 on pereopod 5.

See *Unyapheonoides* and *Peltopes*.

Species. *Neocyproidea otakensis* (Chilton, 1900) (Hurley, 1955a) [775]; *N. pilgrimi* Hurley, 1955a [775].

Habitat and distribution. Marine, New Zealand, littoral and sublittoral, 2 species.

Paracyproidea Stebbing

Paracyproidea Stebbing, 1899a: 207.–Stebbing, 1906: 160.

Type species. *Cyproidia* [sic] *lineata* Haswell, 1879b, original designation.

Diagnosis. Mandible with 3-articulate palp. [Palp of maxilla 1 unknown]. Gnathopod 1 slender, weakly subchelate, scarcely carpochelate but falsely merochelate, propodus slender, palm short, oblique, obsolescent; gnathopod 2 slender, weakly subchelate, carpochelate, propodus stouter than on gnathopod 1, palm elongate, very oblique. Article 2 of pereopods 5-7 rectolinear. Pleonite 3 unproduced posterodorsally. Urosomite 1 not elongate, unkeeled; urosomite 3 unvaulted. Telson large, fleshy, laterally compressed, blade-like, almost reaching apex of rami on uropod 3.

Antenna 1 thick, article 2 dorsodistally cuspidate. Mandibular molar large, triturative. [Lower lip, maxilla 1, maxillipeds unknown]. Both rami of uropods 1-3 very short, extending equally, peduncles elongate.

Relationship. Differing from *Cyproidea* by the immense telson. From *Peltocoxa* and *Pseudopeltocoxa* in the rectolinear article 2 of pereopods 6-7 and the subchelate gnathopod 1. From *Stegoplax* in the linear article 2 of pereopod 7.

Species. *Paracyproidea lineata* (Haswell, 1879b) [781].

Habitat and distribution. Marine, Australia, New South Wales, littoral, 1 species.

Peltocoxa Catta

Fig.24I

Peltocoxa Catta, 1875: 162.–Lincoln, 1979a: 168.–Krapp-Schickel, 1982c: 88.

Type species. *Peltocoxa marioni* Catta, 1875, original designation.

Diagnosis. Mandibular palp 3-articulate. Palp of

maxilla 1 1-articulate. Gnathopod 1 small, simple, weakly carpochelate, propodus small, tapering; gnathopod 2 small, subchelate, scarcely carpochelate, palm almost transverse or oblique. Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 not elongate, unkeeled; urosomite 3 unvaulted. Telson huge, boat-shaped, with deep ventral keel.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 slender; outer plate with [?3-6 main spines]. Maxillipeds ordinary. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Stegocephalus* and *Mokuoloe* in the vertically inflated telson and fully simple gnathopod 1; from *Hoplopleon*, *Austropheonoides* and *Moolapheonoides* in the vertically inflated telson.

Species. *Peltocoxa brevirostris* (T. Scott & A. Scott, 1893) (Lincoln, 1979a) [240]; *P. damnoniensis* (Stebbing, 1885) (Lincoln, 1979a) [239]; *P. marioni* Catta, 1875 (Chevreux & Fage, 1925) (Krapp-Schickel, 1969b, 1982c) [330]; *P. mediterranea* Schiecke, 1977 (Ledoyer, 1977) (Krapp-Schickel, 1982c) [340].

Habitat and distribution. Marine, eastern Atlantic and Mediterranean, 0-80 m, 4 species.

Peltopes K.H. Barnard

Fig.25H

Peltopes K.H. Barnard, 1930: 337.

Type species. *Peltopes productus* K.H. Barnard, 1930, monotypy.

Diagnosis. Mandibular palp 3-articulate. Palp of maxilla 1 2-articulate. Gnathopod 1 small, simple, scarcely carpochelate (type) to moderately carpochelate, propodus slender, tapering, dactyl elongate; gnathopod 2 small, simple, scarcely (type) to moderately carpochelate, propodus slender, tapering. Article 2 of pereopods 5-7 expanded. Pleonite 3 weakly extended posterodorsally (in second species). Urosomite 1 elongate, with boat-shaped process reaching to base of telson; urosomite 3 unvaulted. Telson elongate but slightly failing apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. [Inner plate of maxilla 1 size unknown; outer plate spination unknown. Maxillipeds presumed ordinary]. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Neocyproidea* in the simple gnathopod 2 and 2-articulate palp of maxilla 1.

Species. *Peltopes peninsulae* (Hurley, 1955a) (J.L. Barnard, 1972a) [776]; *P. productus* K.H. Barnard, 1930 [779N].

Habitat and distribution. Marine, New Zealand, 0-20 m, also night neritic, 2 species.

Pseudopeltocoxa Schiecke

Pseudopeltocoxa Schiecke, 1977: 525.

Type species. *Pseudopeltocoxa gibbosa* Schiecke, 1977, monotypy.

Diagnosis. Mandibular palp *absent*. Palp of maxilla 1 1-articulate (but weak joint apparent). Gnathopod 1 small, simple, not carpochelate, propodus small, tapering; gnathopod 2 small, subchelate, scarcely carpochelate, palm oblique. Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 not elongate, with weak bilateral keels; urosomite 3 unvaulted. Telson huge, boat-shaped, with deep ventral keel.

Pereonite 4 with massive lateral bulge.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary, with faint inner lobes. Inner plate of maxilla 1 slender; outer plate with at least 10 main spines. Maxillipeds ordinary. Outer rami of uropods 1-2 weakly to strongly shortened respectively.

Relationship. Differing from *Peltocoxa* in the absence of mandibular palp and the large size of the lateral bulge on pereonite 4. Krapp-Schickel (1982c) fuses this genus with *Peltocoxa*.

See *Paracyproidea*.

Species. *Pseudopeltocoxa gibbosa* Schiecke, 1977 (Krapp-Schickel, 1982c) [348].

Habitat and distribution. Marine, north-central Mediterranean, 30-50 m, 1 species.

Stegoplax Sars

Fig.24B

Stegoplax Sars, 1883: 88.–Stebbing, 1906: 158.

Type species. *Stegoplax longirostris* Sars, 1883, original designation.

Diagnosis. Mandibular palp 3-articulate. Palp of maxilla 1 1-articulate. Gnathopods 1-2 similar, almost simple, weakly carpochelate, propodus small, tapering.

Article 2 of pereopod 5 rectolinear, of pereopods 6-7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 not elongate, unkeeled; urosomite 3 unvaulted. Telson elongate, thin, reaching apex of peduncle on uropod 3, not vertically inflated.

Antenna 1 slightly thickened, uncuspidate. Mandibular molar large, triturative. Lower lip ordinary. Inner plate of maxilla 1 short and broad; outer plate with 6-7 main spines. Maxillipeds ordinary. Outer ramus of uropod 2 shortened, not reaching end of uropod 3.

Relationship. Differing from *Moolapheonoides*, *Hoplopleon* and *Austropheonoides* in the short urosomite 1.

See *Cyproidea*, *Mokuoloe*, *Paracyproidea* and *Peltocoxa*.

Species. *Stegoplax longirostris* Sars, 1883, 1895 (Stephensen, 1925a, 1938b) [240B].

Habitat and distribution. Marine, bathyal of boreal North and East Atlantic, 300-1505 m, 1 species.

Terepeltopes Hirayama

Terepeltopes Hirayama, 1983: 117.

Type species. *Terepeltopes dolichorhunia* Hirayama, 1983, original designation.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 small, scarcely subchelate, scarcely carpochelate, palm transverse; gnathopod 2 small, subchelate, slightly carpochelate, propodus small, palm oblique, excavate. Article 2 of pereopods 5-6 rectilinear, of pereopod 7 fully expanded. Pleonite 3 slightly produced posterodorsally. Urosomite 1 elongate, dorsally keeled and vaulted over urosome; urosomite 3 unvaulted. Telson ordinary, short, not reaching apex of peduncle on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative, lower lip ordinary. Inner plate of maxilla 1 slender, elongate, lanceolate; outer plate with 6 main spines. Outer plate of maxillipeds shortened. Outer rami of uropod 3 shortened.

Relationship. Differing from *Mokuoloe* in the short telson and long urosomite 1. From *Peltopes* in the thin article 2 of pereopods 5-6. From *Hoplopheonoides* in the ovate article 2 of pereopod 7, slightly carpochelate gnathopod 2 with oblique palm, ordinary (not serialised) maxilla 2, and presence of mandibular palp. From *Narapheonoides* in presence of mandibular palp, large vault of urosomite 1, and oblique palm of gnathopod 2. From *Moolapheonoides* in the stronger vault of urosomite 1 and the rectolinear article 2 of pereopod 6.

Species. *Terepeltopes dolichorhunia* Hirayama, 1983 [395].

Habitat and distribution. Marine, Japan, western Kyushu, deeper than 40 m, 1 species.

Unguja Griffiths

Unguja Griffiths, 1976b: 15.

Type species. *Unguja yaya* Griffiths, 1976b, original designation.

Diagnosis. Mandible lacking palp. Palp of maxilla 1 1-articulate. Gnathopod 1 small, simple, scarcely carpochelate; gnathopod 2 small, subchelate, scarcely carpochelate, palm transverse, excavate. Article 2 of pereopods 5-7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 elongate, with pair of weak dorsal keels; urosomite 3 unvaulted. Telson elongate, exceeding apex of outer ramus on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative, lower lip ordinary. Inner plate of maxilla 1 slender, elongate, lanceolate; outer plate with 7 main spines. Maxillipeds ordinary. Outer rami of uropods 2-3 shortened.

Relationship. Almost identical to *Unyapheonoides* but mandibular palp absent. Differing from *Neocyproidea* in the poorly toothed dactyls of the gnathopods, definite palm of gnathopod 2 and very elongate telson.

Species. *Unguja yaya* Griffiths, 1976b [743].

Habitat and distribution. Marine, South Africa, 10 m, 1 species.

Unyapheonoides J.L. Barnard

Unyapheonoides J.L. Barnard, 1972b: 26.

Type species. *Unyapheonoides dabber*, J.L. Barnard, 1972b, original designation.

Diagnosis. Mandible with 3-articulate palp. Palp of maxilla 1 1-articulate. Gnathopod 1 small, scarcely subchelate, scarcely carpochelate, palm oblique; gnathopod 2 small, subchelate, scarcely carpochelate, palm transverse, excavate. Article 2 of pereopods 5-7 expanded. Pleonite 3 unproduced posterodorsally. Urosomite 1 elongate, with pair of weak dorsal keels; urosomite 3 unvaulted. Telson elongate, exceeding

apex of outer ramus on uropod 3.

Antenna 1 thick, uncuspidate. Mandibular molar large, triturative, lower lip ordinary. Inner plate of maxilla 1 slender, elongate, lanceolate; outer plate with 7 main spines. Maxillipeds ordinary. Outer rami of uropods 2-3 shortened.

Relationship. Differing from *Peltopes* and *Neocyproidea* in the subchelate gnathopod 1 and by the telson overextending the peduncle of uropod 3. From *Mokuoloe* in the elongate urosomite 1 and the expansion of article 2 on pereopods 5-6.

Species. *Unyapheonoides dabber* J.L. Barnard, 1972b [780].

Habitat and distribution. Marine, southern Australia, littoral, 1 species.

DEXAMINIDAE Leach, 1814b

Dexameridae [sic] Leach, 1814b: 432 [sic].
Dexaminidae Stebbing, 1888: 573, 900.–Stebbing, 1906: 514.–J.L. Barnard, 1970c: 163.
Atylina [subfamily] Liljeborg, 1865a: 18.
Atylinae Boeck, 1876: 320.
Atylidae Sars, 1882: 26.–Stebbing, 1888: 899.–Stebbing, 1906: 327.
Dorbanellidae Schellenberg, 1925b: 205.
Lepechinellidae Schellenberg, 1926a: 344.
Prophliantidae Nicholls, 1939: 312 (now valid subfamily).
Anatylidae Bulycheva, 1955: 204.

Diagnosis. Head basic; body laterally compressed, at least 2 urosomites coalesced together; coxae ordinary to acuminate. Eyes, if present, ommatidial. Accessory flagellum 1-2 usually vestigial. Gnathopods 1-2 subchelate, of medium enfeeblement. Pereopods 3-4 not glandular. Pereopod 7 less than 1.2 times as long as pereopod 6, occasionally of different form than 5-6 but article 2 not of shape and setation found in Ampeliscidae. Uropod 3 biramous. Telson laminar, more or less cleft.

See Ampeliscidae, Phliantidae, Talitroidea (Kuriidae, Eophliantidae), Colomastigidae and Argissidae. General work: Vader (1969b).

Description. Body usually heavily calcified, rarely smooth, usually with processes. Head basic, usually with well-developed rostrum. Antennae variable, often very short (female *Guernea*) or highly elongate (*Lepechinella*). Mouthparts variable, ranging from basic to loss of mandibular palp (typical), loss of trituration on molar, reduction of rakers, loss of inner lobes or mandibular lobes on lower lip, reduction in maxillary setae, fusion of palp articles on maxilla 1, reduction in apex of maxillipedal palp (but 3+articulate) and plates or enlargement of outer plate, progressing from nestlers to inquilines. Coxa 1 never severely reduced. Article 4 of pereopods 3-4 not as fully elongate as in Ampeliscidae. Coxa 5 variable. Article 2 of pereopods 5-7 dilated, poorly setose posteriorly and ventrally, pereopods 5-7 uniform (Dexamininae) or highly diverse (Prophliantinae). Pleopods and uropods 1-3 well developed, biramous, uropod 3 aequiramous, rami lanceolate, weakly foliaceous or elongate and rod-like. Telson longer than broad, cleft. Gills and oostegites poorly known but gills known in some species on coxae 2-7, occasionally plaited, oostegites 4 pairs, slightly expanded.

Sexual dimorphism. Occasionally absent; in other species with male neritic swarmers bearing elongate flagellum of antenna 2, occasionally more elongate antenna 1, often with denser armament bundles on anterior margins of articles 4-5 of peduncle on antenna 2, enlarged pleopods, more strongly setose natatory uropod 3, generally body smaller, pereonites relatively shorter, more strongly packed, pleon relatively larger, body generally more streamlined, eyes enlarged.

Relationship. Dexaminidae differ from Ampeliscidae in the ordinary head, poorly setose article 2 of pereopod 7, and lack of glands in and smaller article 4 on pereopods 3-4. Most Ampeliscidae have elongate heads, though *Haploops* has shortened head; in any event the shape in Ampeliscidae is usually characteristic. Most Dexaminidae have calcified bodies and brittle appendages whereas most Ampeliscidae are pliable or parchment-like (especially in low latitudes). Ampeliscidae have basic mouthparts whereas most Dexaminidae have one or more small abnormalities in mouthparts. Most Dexaminidae have at least a vestigial accessory flagellum whereas Ampeliscidae lack this appendage. Coxa 1 of many Ampeliscidae is broader than coxa 2, and the other coxae adhere closely to a common form, whereas coxae of Dexaminidae are highly variable or depart from the form found in Ampeliscidae.

Colomastigidae have cylindrical or vermiform bodies, simple first gnathopods and lack mandibular incisors.

Kuriidae belong to the Talitroidea and therefore have uniramous third uropods.

Eophliantidae belong to the Talitroidea and have cylindrical-vermiform bodies, and vestigial uropod 3.

Argissidae have discrete urosomites, at least 1 pair of simple gnathopods and a much reduced coxa 3.

The Phliantidae and Temnophliantidae have strongly splayed coxae and evanescent uropod 3.

Key to Subfamilies of Dexaminidae

Pereopods 5-7 of uniform morphology, coxa 5 not enlarged ..... Dexamininae

Pereopods 5-7 of diverse morphology, coxa 5 enlarged ..... Prophliantinae

Dexamininae Leach,1814b

Diagnosis. Pereopods 5-7 of uniform morphology. Coxa 5 not enlarged.

Key to Genera of Dexamininae

1. Palp of maxilliped 3-articulate 2

—— Palp of maxilliped 4-articulate 5

2. Inner lobes of labium well developed 3

—— Inner lobes of labium obsolescent or absent 4

3. Palm of gnathopod 1 transverse; palm of gnathopod 2 bulbous, dactyl deeply curved and flagellate; antennae 1-2 diverse, antenna 1 very thick ..... *Delkarlye*

—— Palms of gnathopods oblique and straight, dactyls ordinary; antennae 1-2 alike, elongate and thin ..... *Dexaminella*

4. Article 4 of pereopods 3-7 shorter than articles 5-6 combined ..... *Dexamine*

—— Article 4 of pereopods 3-7 longer than articles 5-6 combined ..... *Tritaeta*

5. Pereopods 3-7 fully prehensile ..... *Polycheria*

—— Pereopods 3-7 simple or scarcely prehensile 6

6. Head lacking rostrum, cephalic teeth or distinct lateral cephalic lobes [otherwise with *Lepechinella* facies as in couplet 11 part 1] ..... *Lepechinelloides*

—— Head with rostrum or cephalic teeth or distinct lateral cephalic lobes 7

7. Cephalic lobes rounded, not distinctly verticalised 8

—— Cephalic lobes verticalised, strongly truncate or with 2+ anterior points 9

8. Pleon bearing dorsolateral teeth besides those on midline ..... *Paradexamine*

—— Pleon lacking dorsolateral teeth, pleon mostly smooth ..... *Syndexamine*

9. Inner lobes of lower lip absent or obsolescent, body parts (antennae, pereopods, uropods) rarely elongate ..... *Atylus*

—— Inner lobes of lower lip present, body parts greatly elongate 10

10. Gnathopods apically thin or linear, chelate, propodus rectangular, mandibular palp absent ..... *Sebadexius*

—— Gnathopods with propodus not rectangular, mandibular palp present 11

11. Outer rami of uropods 1-3 strongly reduced ..... *Lepechinellopsis*

—— Outer rami of uropods 1-3 elongate 12

12. Mandibular palp 1-articulate ..... *Lepechinelloides*

—— Mandibular palp 3-articulate 13

13. Article 3 of mandibular palp shorter than article 2 ..... *Lepechinella*

—— Article 3 of mandibular palp immensely longer than article 2 ..... *Paralepechinella*

Atylus Leach

Figs 50A,B,I, 51D, 52B,F, 53E,H, 54F,H

Atylus Leach, 1815b: 21.–Mills, 1961: 17 (key).–J.L. Barnard, 1970c: 164.
Nototropis Costa, 1853: 170 (*Nototropis spinulicauda* Costa, 1853, monotypy).
Epidesura Boeck, 1861: 659 (*Amphithoe compressa* Liljeborg, 1852a, original designation).
Paratylus Sars, 1895: 462 (*Amphithoe swammerdamei* Milne Edwards, 1830, here selected).
Anatylus Bulycheva, 1955: 205 (*Anatylus pavlovskii* Bulycheva, 1955, original designation).
(*Kamehatylus*) J.L. Barnard, 1970a: 93 (*Atylus nani* J.L. Barnard, 1970a, original designation) (valid subgenus).

Type species. *Gammarus carinatus* J.C. Fabricius, 1793, monotypy.

Diagnosis. Cephalic lobes with verticalisation in form of truncation or bearing 2 points with imaginary vertical tangent. Mandibular palp 0 to 3-articulate. Inner lobes of lower lip absent or obsolescent. Palp of maxilla 1 2-articulate. Palp of 4-articulate.

Description. Eyes present. Antennae well developed, of medium size, thin. Molar triturative (typical) or not (*Anatylus*). Apart from lower lip and mandible, other mouthparts basic. Coxae 1-4 ordinary or tending to slight shortness of nonrectangular shapes. Gnathopods ordinary. Pereopods simple or rarely pereopod 3 weakly prehensile; article 2 of pereopods 5-7 expanded, often with posteroventral tooth. Rami of uropod 3 broadly lanceolate. Telson deeply cleft. Urosomites 2-3 (*Atylus*) or 1-3 (*Kamehatylus*) coalesced. Body variously carinate dorsally, all teeth on midline. Urosomite 1 with (*Nototropis*) or without dorsal notch. Gill formula 2-7, often several gills plaited; oostegites weakly to moderately expanded.

Sexual dimorphism. As in family description.

Variables. Pereonites carinate (type), smooth (*A. swammerdamei*); urosomite 1 with dorsal notch and tooth (*A. swammerdammei*, *A. falcatus*, *A. vedlomensis*, *A. guttatus*, etc.), with only dorsal tooth (type), notch weak (some demes of *A. brevitarsus*); rostrum especially large (*A. smitti*, *A. carinatus*), moderately sized (*A. nordlandicus*), small (*A. falcatus*); molar weak (*A. pavlovskii*); mandibular palp 3-articulate (normal), 2-articulate (*A. reductus*), absent (*Anatylus pavlovskii*, *A. japonicus*, *A. processicer*); inner lobes of lower lip moderate (*A. pavlovskii*), weak (*A. swammerdamei*), absent (*A. carinatus*); coxa 1 curved forward (*A. smitti*), tapering (*A. falcatus*, *A. vedlomensis*, *A. pavlovskii*); article 6 of pereopods 3-4 with basal grasping spines, thus prehensile, dactyl enlarged and falcate (*A. falcatus*); article 2 of pereopods 5-7 with posteroventral process (*A. falcatus*, *A. swammerdamei*, *A. vedlomensis*), only pereopod 7 with process (*A. carinatus*), only pereopod 5 with process but only pereopod 7 strongly setose (*A. smitti*), process vestigial (*A. japonica*, *A. pavlovskii*), process absent (*A. nani*); outer ramus of uropod 2 shortened (ordinary), unshortened (*A. brevitarsus*); uropod 2 shorter than uropods 1 or 3 (ordinary).

Relationship. The basic genus of the group and adequately ancestral to all others to be near a model ancestor.

Key to Subgenera of *Atylus*

Urosomites 2-3 coalesced ..... (*Atylus*)

Urosomites 1-3 coalesced ..... (*Kamehatylus*)

Species. See K.H. Barnard (1932); Chevreux & Fage (1925); Griffiths (1974b,c); (Gurjanova, 1951); Schellenberg (1927, 1942); Stephensen (1933b, 1938b, 1944c); *A. atlassovi* (Gurjanova, 1951) [290]; *A. brevitarsus* Ledoyer, 1979a [698]; *A. bruggeni* (Gurjanova, 1938b) (Shoemaker, 1955a) [200]; *A. carinatus* (J.C. Fabricius, 1793) (Sars, 1895) (Stephensen, 1944a) [220]; *A. collingi* (Gurjanova, 1938b) (Mills, 1961) (Tzvetkova, 1968) [230];

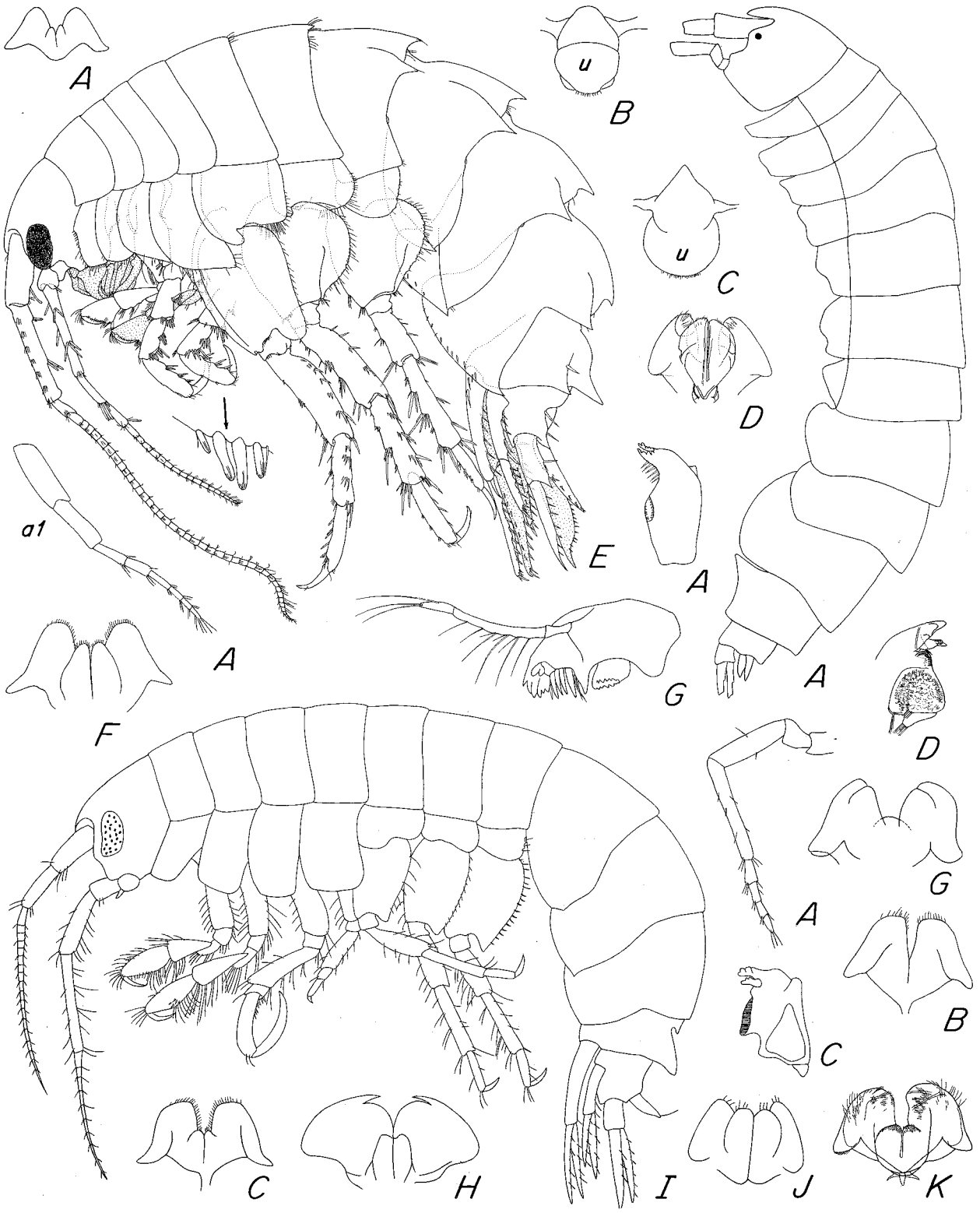

Fig.50. Dexaminidae. A, *Atylus (= Anatylus) pavlovskii*; B, *Atylus carinatus*; C, *Dexamine spinosa*; D, *Guernea reduncans*; E, *Paradexamine frinsdorf*; F, *Dexaminella aegyptica*; G, *Lepechinella chrysotheras*; *Syndexamine carinata*; I, *Atylus falcatus*; J, *Prophlias anomalus*; K, *Lepechinella occlo.*

A. comes Giles, 1888 [664]; *A. dentatus* Schellenberg, 1931 (as *A. homochir*) [866]; *A. ekmani* (Gurjanova, 1938b) (Tzvetkova, 1968) [280]; *A. falcatus* Metzger, 1871 (= *A. uncinatus* Sars, 1883) (Sars, 1895 as *Paratylus*) (Lincoln, 1979a) [240]; *A. granulosus* (Walker, 1904) (Ledoyer, 1967a, 1979a) [680]; *A. guttatus* (Costa *in* Hope 1851, Costa, 1851, 1857) (= *A. spinulicauda* Costa, 1853, 1857) (= *A. costae* Heller, 1867) (?= *A. andrusowi* Sowinsky, 1895 [334]) (= *A. odessanus* Kalichevsky, 1906) (Lincoln, 1979a) (Bellan-Santini, 1982a) [330]; *A. homochir* Haswell, 1885b (Stebbing, 1888) (J.L. Barnard, 1974b) [784+]; *A. japonicus* Nagata, 1961a, 1965b (Ledoyer, 1979b, 1984) [390 + ?586]; *A. levidensus* J.L. Barnard, 1956, 1969a (Mills, 1961) [368]; *A. massiliensis* Bellan-Santini, 1975, 1982a [348N]; *A. megalops* Moore, 1984a [613N]; *A. melanops* (Oldevig, 1959) [220]; *A. minikoi* (Walker, 1905b) (Chilton, 1922b) (Shoemaker, 1932b) (Schellenberg, 1938b) (Ruffo, 1950) (Oliveira, 1953) (Pillai, 1957) (Sivaprakasam, 1968a) (Bynum & Fox, 1977) [660 + N]; *A. nani* J.L. Barnard, 1970a (*Kamehatylus*) [381]; *A. nordlandicus* Boeck, 1871b (Sars, 1895) (Stephensen, 1944c) [216]; *A. pavlovskii* (Bulycheva,

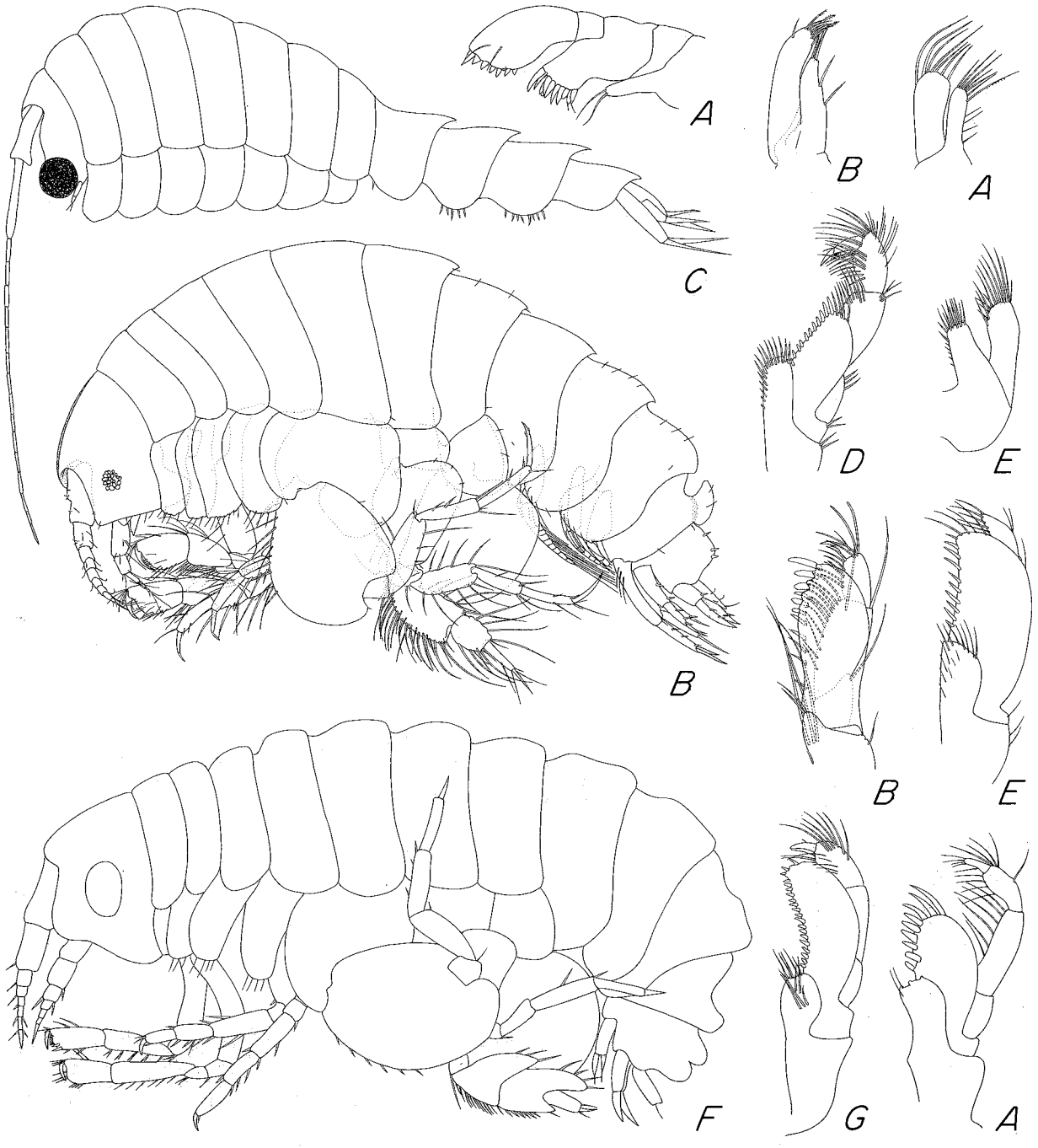

Fig.51. Dexaminidae. A, *Lepechinella chyrsotheras*; B, *Guernea reduncans*; C, *Dexaminoculus grobbeni*; D, *Atylus carinatus*; E, *Dexamine spinosa*; F, *Haustoriopsis reticulatus*; G, *Polycheria antarctica*.

1955) (Tzvetkova, 1968) [391]; *A. processicer* [sic] Sivaprakasam, 1970c (*Kamehatylus*) [664]; *A. reductus* (K.H. Barnard, 1930) [779]; *A. rylovi* (Bulycheva, 1952) [391]; *A. serratus* (Schellenberg, 1925a, 1939) (Pirlot, 1939) (Ruffo, 1953c) [435]; *A. smitti* (Goes, 1866) (Sars, 1895 as *Paratylus smithi*) (?Stephensen, 1944c) [220 + B]; *A. swammerdamei* (Milne Edwards, 1830) (= *A. compressa* Liljeborg, 1852a) (= *A. gordoniana* Bate, 1857d) (= *A. loughrini* Bate, 1862) (Sars, 1895 (Lincoln, 1979a) (Bellan-Santini, 1982a) [355]; *A. taupo* J.L. Barnard, 1972b [774N]; *A. tridens* (Alderman, 1936) (Mills, 1961) (J.L. Barnard, 1966a) [368]; *A. tulearensis* Ledoyer, 1984 [690]; *A. urocarinatus* McKinney, 1980a [480]; *A. vedlomensis* (Bate & Westwood, 1863) (Sars, 1895) (Lincoln, 1979a) (Bellan-Santini, 1982a) [240]; *A. villosus* Bate, 1862 (Bellan-Santini & Ledoyer, 1974) [835]; species (*A. homochir* identification of Chilton, 1912) [743].

Habitat and distribution. Marine, cosmopolitan, 0-900 m, 33 species.

Delkarlye J.L. Barnard

Delkarlye J.L. Barnard, 1972a: 41.

Type species. *Delkarlye enamalla* J.L. Barnard, 1972a,

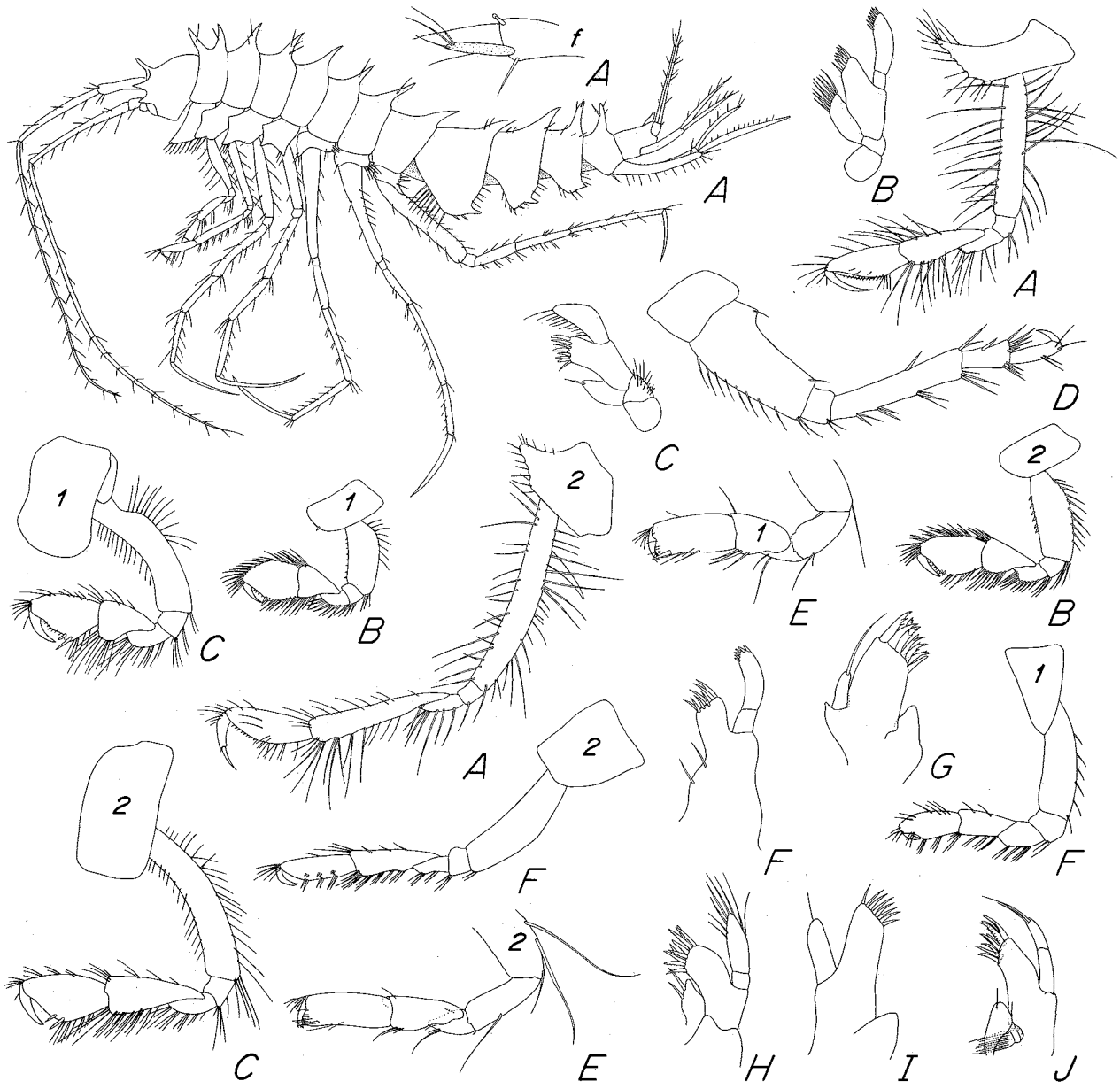

Fig.52. Dexaminidae. A, *Lepechinella bierii*; B, *Atylus carinatus*; C, *Dexamine spinosa*; D, *Tritaeta gibbosa*; E, *Prophlias anomalus*; F, *Atylus (= Anatylus) pavlovskii*; G, *Paradexamine maunaloa*; H, *Polycheria antarctica*; I, *Haustoriopsis reticulatus*; J, *Guernea reduncans*.

original designation.

Diagnosis. Cephalic lobes broadly rounded anteriorly. Mandibular palp absent. Inner lobes of lower lip well developed. Palp of maxilla 1 1-articulate. Palp of maxilliped 3-articulate.

Description. Eyes present. Antenna 1 well

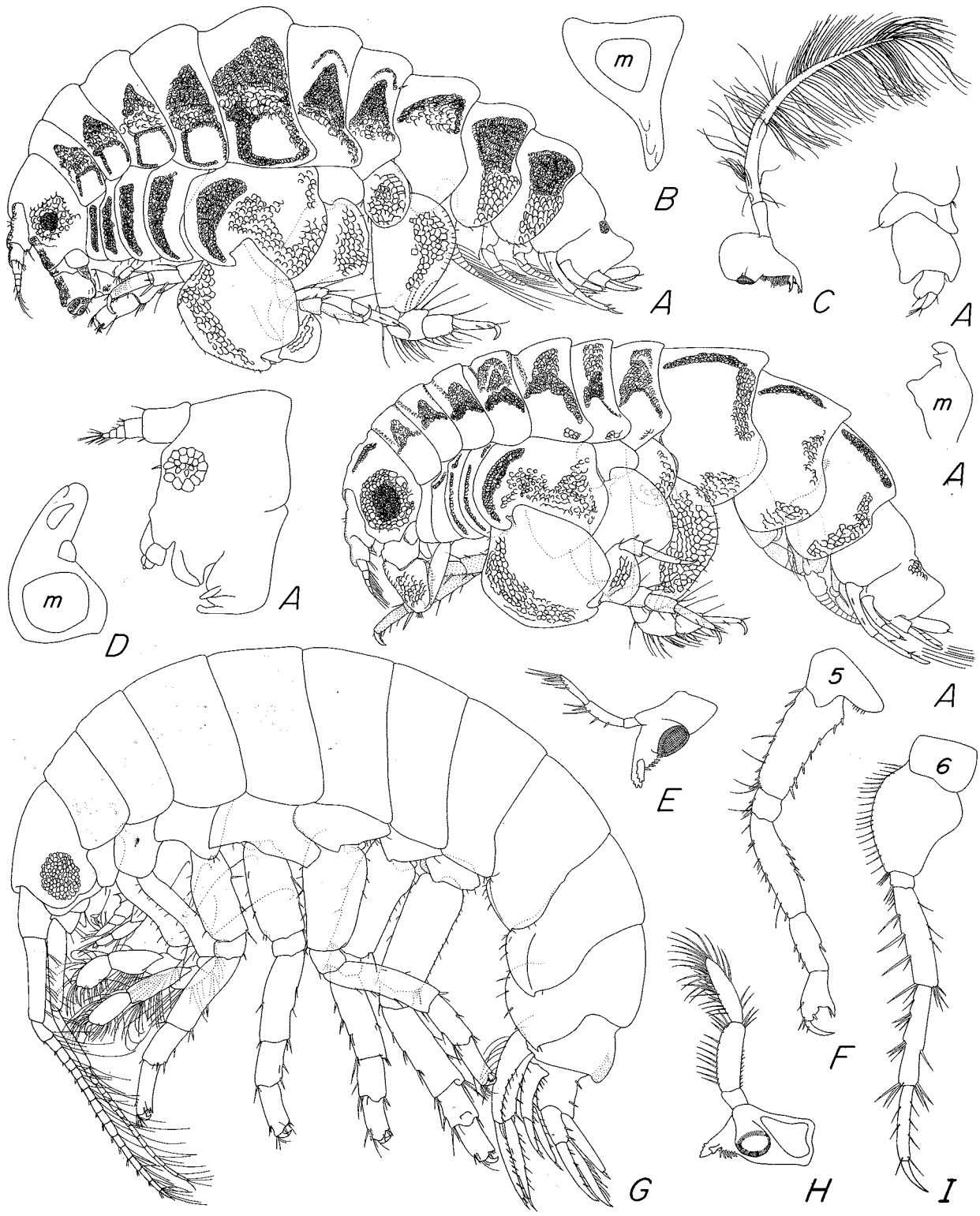

Fig.53. Dexaminidae. A, *Prophlias anomalus*; B, *Haustoriopsis reticulatus*; C, *Paralepechinella longipalpa*; D, *Guernea coalita*; E, *Atylus swammerdami*; F, *Polycheria antarctica*; G, *Polycheria obtusa*; H, *Atylus carinatus*; I, *Dexamine spinosa*.

developed, very stout, antenna 2 feeble, thin, short. Molar obsolescent, not triturative. Maxillae poorly setose; inner plate of maxilliped very small, outer plate immense. Coxae 1-4 tending towards non-rectangular shapes, coxa 1 weakly expanded apically, coxae 2-4 more or less tapered; coxa 5 as long as coxa 4, not greatly enlarged. Palm of gnathopod 1 transverse; gnathopod 2 extraordinary, palm bulbous, dactyl deeply curved and flagellate. Pereopods 5-6 strongly prehensile, other pereopods weakly prehensile; for example, pereopod 6 with broad concavity bounded by spined hump on article 6, dactyl immense; article 2 of pereopods 5-7 rectolinear; pereopod 5 very short. Inner rami of uropods 1-2 shortened. One ramus of uropod 3 flabellate. Telson deeply cleft. Urosomites 2-3 coalesced. Body scarcely carinate. Gills and oostegites [unknown].

Relationship. *Delkarlye* weakly bridges the gap between Dexaminidae and Prophliantinae because coxa 5 is as long as coxa 4 but not as enlarged as in Prophliantinae; like *Prophliantis* the gnathopodal palms are transverse; the diversity of pereopods 5-7 is not like that in Prophliantinae.

Like *Syndexamine* but palp of maxilliped 3-articulate, spines absent on pleonites 5-6 and head with midantennal keel. Differing from *Dexaminella* in the blunt cephalic lobes, diverse thickness of antennae 1-2, the parabolic telson, the transverse palm of gnathopod 1, reduced gland cone and unornamented article 2 of pereopods 5-7; also see key.

Species. *Delkarlye enamalla* J.L. Barnard, 1972a [785].

Habitat and distribution. Marine, southern Australia, sublittoral, 4 m, 1 species.

Dexamine Leach

Figs 50C, 51E, 52C, 53I, 54B

Dexamine Leach, 1814b: 432.
Amphithonotus Costa, 1851: 45 (*Amphithonotus acanthophthalmus* Costa, 1851, selected by Stebbing, 1888: 250).

Type species. *Cancer spinosus* Montagu, 1813, monotypy.

Diagnosis. Cephalic lobes pointed. Mandibular palp absent. Inner lobes of lower lip obsolescent. Palp of

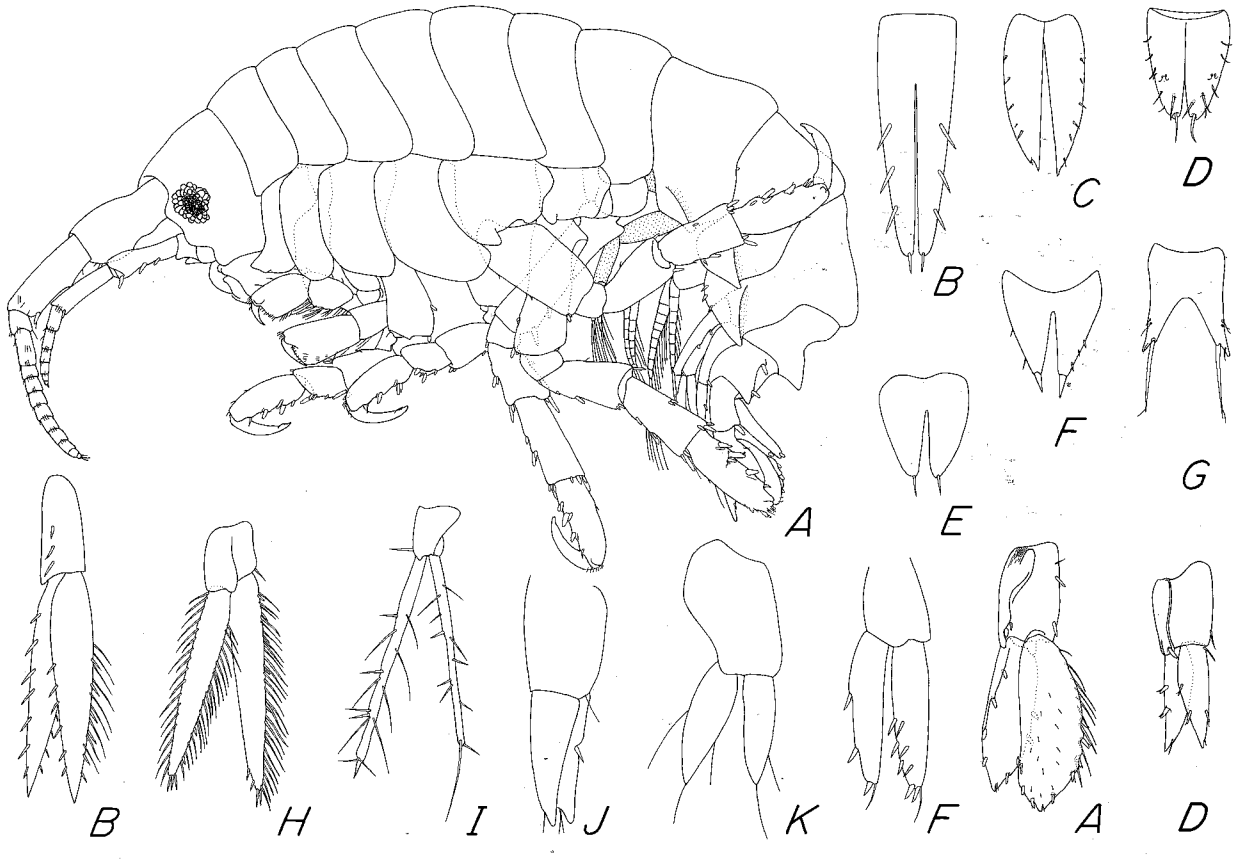

Fig.54. Dexaminidae. A, *Syndexamine wane*; B, *Dexamine spinosa*; C, *Polycheria obtusa*; D, *Guernea nordenskioldi*; E, *Guernea coalita*; F, *Atylus (= Anatylus) pavlovskii*; G, *Lepechinella occlo*; H, *Atylus carinatus*; I, *Lepechinella bierii*; J, *Prophlias anomalus*; K, *Haustoriopsis reticulatus*.

maxilla 1 1-articulate. Palp of maxilliped 3-articulate. Coxae 3-4 ordinary. Article 4 of pereopods 3-7 shorter than articles 5-6 combined (versus *Tritaeta*).

Description. Eyes present. Antennae elongate, thin. Molar triturative; maxillae poorly setose; palp of maxilliped small, outer plate especially large. Coxae 1-4 ordinary. Gnathopods ordinary. Pereopods simple; article 2 of pereopods 5-7 expanded. Rami of uropod 3 lanceolate. Telson elongate and deeply cleft. Urosomites 2-3 coalesced. Pleon dorsally carinate and toothed in midline, with or without accessory lateral teeth. Gill formula 2-7, often several gills plaited; oostegites expanded.

Sexual dimorphism. As described for family, male body smaller, pereonites more closely packed, pleon relatively larger, eyes enlarged, flagella of antennae longer, armament bundles denser anteriorly on articles 4-5 of antenna 2.

Variables. Article 2 of pereopod 6 broad proximally (*D. spinosa*), of pereopod 6 broad distally (*D. thea*), of pereopod 7 scarcely expanded (*D. thea*), moderately expanded (*D. spinosa*).

Relationship. Differing from *Delkarlye* and *Dexaminella* in the weak inner lobes of the lower lip. From *Atylus* in the pointed cephalic lobes, 1-articulate palp of maxilla 1 and 3-articulate palp of the maxilliped.

See *Tritaeta*.

Species. See Carausu (1956); Fage (1933); Gurjanova (1951); Kaim-Malka (1970); Karaman (1973b); Krapp-Schickel (1969b, 1971); Kunkel (1918); Miloslavskaja (1931, 1939); Schellenberg (1942); Sowinsky (1897, 1898); Stephensen (1928, 1929, 1940a); [?*D. anisopus* Grube, 1864a (Stebbing, 1906) [345]]; [?*D. blossevilliana* Bate, 1862 [dubious] (Stebbing, 1906) [unknown]]; [?*D. bobretzkii* (Catta, 1876) (Della Valle, 1893, as *Amphithonotus*) (not in Stebbing, 1906) [dubious] [348]]; [?*D. leptonyx* (Grube, 1861) (Stebbing, 1906) [dubious] [345]]; [?*D. pelagica* Costa, 1851 [*nomen nudum*]]; [?*D. septemdentatus* (Stimpson, 1864) (Della Valle, 1893) (not in Stebbing, 1906) [dubious (probably *Pleustes panopla*)] [269]]; *D. spiniventris* (Costa, 1853) (Chevreux & Fage, 1925) (Krapp-Schickel, 1969b, 1971) (Griffiths, 1975) (Bellan-Santini, 1982a) [352]; *D. spinosa* (Montagu, 1813) (= *D. corallinus* Risso, 1826) (= *D. marionis* Milne Edwards, 1830) (= *D. tenuicornis* Rathke, 1843) (= *D. acanthophthalmus* Costa, 1851) (= *D. speciosus* Bruzelius, 1859, *lapsus* for *D. spinosus*) (= *D. pontica* Czerniavsky, 1868) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Bellan-Santini, 1982a) [352]; *D. thea* Boeck, 1861 (= *D. heibergi* Boeck, 1871b) (= *D. tenuicornis* Rathke identification's of Bate, 1862, Bate & Westwood, 1863) (Sars, 1895) (Bousfield, 1973) (Lincoln, 1979a) (Bellan-Santini, 1982a) [354].

Habitat and distribution. Marine, mostly amphi-North Atlantic from the Arctic to Chesapeake Bay, Mediterranean, Senegal (to Puget Sound and Ceylon probably erroneous, these species not *Dexamine*), 0-113 [?1550] m, 3 species.

Dexaminella Schellenberg

Fig.50F

Dexaminella Schellenberg, 1928b: 654.

Type species. *Dexaminella aegyptiaca* Schellenberg, 1928b, monotypy.

Diagnosis. Cephalic lobes pointed. Mandibular palp absent. Inner lobes of lower lip well developed and fleshy. Palp of maxilla 1 1-articulate. Palp of maxilliped 3-articulate. Pereopods 3-7 lacking aspect of prehensility (versus *Tritaeta*).

Description. Eyes present. Antennae elongate, thin. Molar triturative, incisor very broad, rakers not apparent; maxillae poorly setose; inner plate of maxilliped vestigial or absent, outer plates large, palp small or thin. Coxae 1-4 ordinary. Gnathopods ordinary. Pereopods simple; article 2 of pereopods 5-7 partly to fully expanded, partially cuspidate. Rami of uropod 3 lanceolate. Telson elongate and moderately cleft. Urosomites 2-3 [?coalesced]. Pleon dorsally carinate and toothed in midline. Gills and oostegites [unknown].

Sexual dimorphism. Male antenna 2 article 4 swollen and densely and minutely setulose anteriorly; male eyes enlarged.

Variables. Article 2 of pereopod 5 lobate, rounded; of pereopod 6 lobate and either sharp or rounded; of pereopod 7 poorly expanded, not lobate, tapering from base to apex.

Relationship. See *Dexamine* and *Delkarlye*.

Species. *Dexaminella aegyptiaca* Schellenberg, 1928b [343s]; *D. ovata* Ledoyer, 1979a [698]; *D. rotundicoxa* Ledoyer, 1972c, 1978b, 1979a [698 + 697].

Habitat and distribution. Marine, Red Sea to Madagascar, 7-25 m, 3 species.

Lepechinella Stebbing

Figs 50G,K, 51A, 52A, 54G,I

Lepechinella Stebbing, 1908c: 191.–J.L. Barnard, 1973a: 5 (key).

Dorbanella Chevreux, 1914: 1 (*Dorbanella echinata* Chevreux, 1914, original designation).

Type species. *Lepechinella chrysotheras* Stebbing, 1908c, monotypy.

Diagnosis. Cephalic lobes verticalised in form of truncation bearing 2 points or long spikes. Mandibular palp present, article 3 much shorter than article 2 (versus *Paralepechinella*). Inner lobes of lower lip well developed. Palp of maxilla 1 2-articulate. Palp of maxilliped 4-articulate.

Description. Eyes absent. Antennae elongate, thin. Molar weakly triturative; maxillae poorly setose; maxillipeds ordinary. Coxae 1-4 acuminate or biacuminate, coxa 1 usually larger than coxa 4. Gnathopods ordinary, often elongate. Pereopods simple; usually elongate; article 2 of pereopods 5-7 rectolinear. Rami of uropod 3 elongate and rod-like. Telson partly cleft, lobes usually gaping. Urosomites 2-3 coalesced. Body dorsally carinate and toothed on midline, usually throughout; body often heavily setose or spinose. Gills often pleated, formula [unknown]; oostegites [unknown].

Sexual dimorphism. Unknown.

Variables. Long dorsal processes on anterior body obsolete (*L. cetrata*, *L. pangola*); posterior body bearing numerous surface spines (*L. cachi*), total body bearing spines (*L. cura*, *L. echinata*, *L. manco*, *L. occlo*, *L. raua*); coxae poorly acuminate (*L. aberrantis*, *L. curvispinosa*, *L. ultraabyssalis*); pereopods not elongate (*L. aberrantis*); urosomite 1 with 1 dorsal notch like *Nototropis* = *Atylus* (*L. aberrantis*); inner rami of uropod 2 very short (*L. uchu*).

Relationship. Connected through *L. aberrantis* to *Atylus*, differing from *Atylus* only in the fleshiness of the well developed inner lobes on the lower lip.

Differing from *Paradexamine* and *Syndexamine* in the verticalised (double pointed or truncate) lateral cephalic lobes; from *Atylus* in the well-developed inner lobes of the lower lip and elongate body parts.

See *Lepechinelloides* and *Paralepechinella*.

Species. See J.L. Barnard (1973a); *L. aberrantis* (J.L. Barnard, 1962d, 1964a, 1973a) (Kamenskaya, 1981a) [420AB]; *L. arctica* Schellenberg, 1926a (= *L. schellenbergi* Stephensen, 1944c) (J.L. Barnard, 1973a) [220B]; *L. auca* J.L. Barnard, 1973a [707B]; *L. bierii* J.L. Barnard, 1957, 1973a [310B]; *L. cachi* J.L. Barnard, 1973a [802A]; *L. cetrata* K.H. Barnard, 1932 [871B]; *L. chrysotheras* Stebbing, 1908c (K.H. Barnard, 1926) (Stephensen, 1944c) [426B]; *L. cura* J.L. Barnard, 1973a [501A]; *L. curvispinosa* Pirlot, 1933c [602B]; *L. drygalskii* Schellenberg, 1926a (Ruffo, 1949) [870 + B]; *L. echinata* (Chevreux, 1914, 1935) (J.L. Barnard, 1962d) [426A]; *L. eupraxiella* J.L. Barnard, 1973a (= *L. arctica* identification of Gurjanova, 1951) [202B]; *L. grimmi* Thurston, 1980b [209B]; *L. helgii* Thurston, 1980b [209B]; *L. huaco* J.L. Barnard, 1973a (Holman & Watling, 1983b) [801-802A]; *L. madagascarensis* Ledoyer, 1982b [618A]; *L. manco* J.L. Barnard, 1973a (Ledoyer, 1977) (Bellan-Santini, 1984) [340B]; *L. monocuspidata* J.L. Barnard, 1961a [618B]; *L. occlo* J.L. Barnard, 1973a (Griffiths, 1977b) [600B]; *L. pangola* J.L. Barnard, 1962d [702A]; *L. raua* J.L. Barnard, 1973a [406B]; *L. sagamiensis* Gamo, 1981a [395B]; *L. skarphedini* Thurston, 1980b [209B]; *L. sucia* J.L. Barnard, 1961a (?Griffiths, 1977a) [600BA]; *L. turpis* J.L. Barnard, 1967a [309BA]; *L. uchu* J.L. Barnard, 1973a [501A]; *L. ultraabyssalis* Birstein & Vinogradov, 1960 [322A]; *L. vitrea* Kamenskaja, 1977b [531A]; *L. wolffi* Dahl, 1959 [714A].

Habitat and distribution. Marine, cosmopolitan, cold water submergent (shallowest tropical record 566 m), 260-7190 m, 29 species.

Lepechinelloides Thurston

Lepechinelloides Thurston, 1980b: 81.

Type species. *Lepechinelloides karii* Thurston, 1980b, original designation.

Diagnosis. Cephalic lobes absent, antenna 2 received into quadrate invagination of head but no clear lobes present; head also lacking rostrum or long spike teeth, bearing only pegs armed with spines. Mandibular palp 1-articulate. Inner lobes of lower lip distinct and fleshy. Palp of maxilla 1 2-articulate. Palp of maxilliped 4-articulate.

Description. Eyes absent. Antennae elongate, thin. Molar well developed but only setulose; maxillae poorly setose; maxillipeds ordinary. Coxae 1-4 acuminate, coxa 1 slipper or sabre-shaped, longer than coxa 4. Gnathopods ordinary but elongate. Pereopods simple, elongate; article 2 of pereopods 5-7 rectolinear. Uropod 1 especially elongate. Rami of uropod 3 elongate and rod-like. Telson cleft halfway, lobes weakly gaping. Urosomites 2-3 coalesced. Body dorsally carinate and toothed on midline, strongly spinose-setose. Gills and oostegites [not described].

Sexual dimorphism. Unknown.

Relationship. Differing from *Lepechinella* and *Paralepechinella* in the lack of cephalic projections and the 1-articulate mandibular palp.

Species. *Lepechinelloides karii* Thurston, 1980b [222A].

Habitat and distribution. Marine, boreal North

Atlantic, abyssal hauls to 2174 m, 1 species.

Lepechinellopsis Ledoyer

Lepechinellopsis Ledoyer, 1982b: 365.

Type species. *Lepechinellopsis brevicaudata* Ledoyer, 1982b, original designation.

Diagnosis. Cephalic lobes very weak, antenna 2 received into shallow, broad invagination of head; rostrum tiny, head with few pegs. Mandibular palp 3-articulate. Inner lobes of lower lip reduced. Palp of maxilla 1 2-articulate. Palp of maxilliped 4-articulate.

Outer rami of uropods 1-3 reduced, one third to one tenth as long as inner rami. Rami of uropod 3 both strongly reduced. Telson emarginate.

Description. Eyes absent. Antennae elongate, thin. Molar well developed but only setulose; maxillae poorly setose; maxillipeds ordinary. Coxae 1-4 acuminate, coxa 1 slipper or sabre-shaped, longer than coxa 4. Gnathopods ordinary but elongate. Pereopods simple, elongate; article 2 of pereopods 5-7 rectolinear. Uropod 1 especially elongate. Rami of uropod 3 strongly reduced. Telson emarginate. Urosomites 2-3 coalesced. Body dorsally carinate and toothed on midline, strongly spinose-setose. Gills and oostegites [not described].

Sexual dimorphism. Unknown.

Removal. *Lepechinellopsis inaequicaudata* Ledoyer, 1982, to *Melita* in Gammarida.

Relationship. Differing from the other lepechinella-like genera in the reduced outer rami of uropods 1-3.

Species. *Lepechinellopsis brevicaudata* Ledoyer, 1982b [618A].

Habitat and distribution. Marine, south-east of the Glorieuses Islands (11°44'S 47°35'E), 3710 m, 1 species.

Paradexamine Stebbing

Figs 50E, 52G

Paradexamine Stebbing, 1899d: 210.–Stebbing, 1906: 518.–J.L. Barnard, 1972a: 46 (key).–J.L. Barnard, 1972b: 51.

Dexaminoides Spandl, 1923b: 87 (*Dexaminoides orientalis* Spandl, 1923b, monotypy).

(*Wailele*) J.L. Barnard, 1970a: 102 (*Paradexamine (Wailele) maunaloa* J.L. Barnard, 1970a, original designation) [valid subgenus].

Type species. *Dexamine pacifica* Thomson, 1879b, original designation.

Diagnosis. Cephalic lobes rounded or pointed. Mandibular palp absent. Inner lobes of lower lip well developed and fleshy. Palp of maxilla 1 1-articulate. Palp of maxilliped 4-articulate, 1 or more posterior body segments with lateral teeth.

Description. Eyes present. Antennae elongate, thin. Molar triturative; maxillae poorly setose; inner plate of maxilliped absent to well developed, outer plate large, palp medium sized to small. Coxae 1-4 ordinary. Gnathopods ordinary. Pereopods simple; article 2 of pereopods 5-7 weakly to strongly expanded. Rami of uropod 3 lanceolate. Telson elongate and deeply cleft. Urosomites 2-3 coalesced. Posterior body segments with midline carina and teeth, also with lateral teeth. Gills often heavily plaited, on coxae 2-7; oostegites slender.

Sexual dimorphism. Male eyes enlarged, article 2 of antenna 1 elongate, article 5 of antenna 2 shortened, male setular tufts developing on antennae 1-2; flagellum of antenna 2 elongate; mouthparts often losing structure in minor degree; thoracic appendages often becoming elongate or thinned; body teeth reduced; urosomal spines shortened.

Variables. Incisors cornified and untoothed (*P. moorhousei*); rakers vestigial or absent (*P. marlie*); inner plate of maxilla 1 naked (*P. maunaloa, P. otichi*); palp of maxilla 1 reduced (*Wailele maunaloa, P. indentata*, etc.); inner plate of maxilla 2 strongly reduced (*P. maunaloa, P. windara*); inner plate of maxilliped very small (*P. lanacoura, P. narluke*, etc.); dactyl of maxilliped slightly reduced (*P. maunaloa*); palms of gnathopods transverse (*P. maunaloa, P. otichi, P. rongii*, etc.); pereopods 3-4 subprehensile (*P. maunaloa*); article 2 of pereopod 5 not lobate (*P. otichi*), lobate (*P. maunaloa, P. pacifica*); pereopod 7 generally dominated by pereopods 5-6; article 2 of pereopod 7 broadly expanded (*P. maunaloa, P. rongii*), lobate (*P. alkoomie, P. quarallia*, etc.), scarcely expanded and tapering distally (type, *P. thadalee*), almost rectolinear (*P. fissicauda*); outer ramus of uropod 2 often shortened (*P. fissicauda*, etc.); rami of uropod 3 foliaceous (*P. frinsdorfi*).

Relationship. Differing from *Syndexamine* in the presence on body segments of dorsolateral teeth besides mid-dorsal teeth; from *Atylus* in the protruding, not verticalised, lateral lobes of the head.

Key to Subgenera of *Paradexamine*

Palp of maxilla 1 strongly reduced ..... (*Wailele*)

Palp of maxilla 1 ordinary ..... (*Paradexamine*)

Species. See J.L. Barnard (1972b); K.H. Barnard (1932); Pirlot (1938); Schellenberg (1931); Sheard (1938); Stephensen (1927a, 1938c, 1947a); Thurston (1974a,b); *P. alkoomie* J.L. Barnard, 1972a [785]; *P. barnardi* Sheard, 1938 [779]; *P. bisetigera* Hirayama, 1984b [395]; *P. churinga* J.L. Barnard, 1972a [780]; *P. dandaloo* J.L. Barnard, 1972a [784]; *P. echuca* J.L. Barnard, 1972a [785]; *P. excavata* Ledoyer, 1984 [586]; *P. fissicauda* Chevreux, 1906a,b (Thurston, 1974a,b) [870]; *P. flindersi* (Stebbing, 1888, 1910a) [791]; *P. fraudatrix* Tzvetkova, 1976 [391]; *P. frinsdorfi* Sheard, 1938 (?Ledoyer, 1984) [780 + ?586]; *P. gigas* Hirayama, 1984b [395]; *P. goomai* J.L. Barnard, 1972a [788]; *P. houtete* J.L. Barnard, 1972b [775]; *P. indentata* Ledoyer, 1978b [697]; *P. lanacoura* J.L. Barnard, 1972a [782]; *P. linga* J.L. Barnard, 1972a [788]; *P. marlie* J.L. Barnard 1972a (?Ledoyer, 1979a) (Hirayama, 1984b) (?Ledoyer, 1984) [788 + 395 + ?698 + ?586]; *P. maunaloa* (J.L. Barnard, 1970a) [381I]; *P. micronesica* Ledoyer, 1979a, 1978b (= *P. orientalis* identification of J.L. Barnard, 1965a) (Hirayama, 1984b) (Ledoyer, 1984) [600]; *P. miersi* (Haswell, 1885b) [633]; *P. moorehousei* Sheard, 1938 [784]; *P. mozambica* Ledoyer, 1979a [698]; *P. muriwai* J.L. Barnard, 1972b [774]; *P. nana* Stebbing, 1914b (Schellenberg, 1931) [831]; *P. narluke* J.L. Barnard, 1972a [788]; *P. orientalis* (Spandl, 1923b, 1924a) (Schellenberg, 1928b) (Ledoyer, 1967a,b, 1973b, 1979a,b) [600]; *P. otichi* J.L. Barnard, 1972a [780]; *P. pacifica* (Thomson, 1879b) (J.L. Barnard, 1972a,b) [850]; *P. quarallia* J.L. Barnard, 1972a [780]; *P. rewa* Myers, 1985c [576]; *P. ronggi* J.L. Barnard, 1972a[788]; *P. serraticra* (Walker, 1904) (Nayar, 1967) [665]; *P. setigera* Hirayama, 1984b [395]; *P. sexdentata* Schellenberg, 1931 [833 + B]; *P. thadalee* J.L. Barnard, 1972a [780]; *P. windarra* J.L. Barnard, 1972a (?Ledoyer, 1984) [787 + ?586]; species, Sivaprakasam, 1969a (as *Dexaminoides*) [664]; species, *P. pacifica* identification of Nagata, 1960 and *P. barnardi* identification of Nagata, 1965c [390]; species, *P. flindersi* identification of Nagata, 1965c [395]; species, *P. flindersi* identification of Pirlot, 1938 [640]; species, *P. pacifica* identification of Griffiths, 1975 [743]; species, *P. pacifica* forma *P. kergueleni* identification of Bellan-Santini & Ledoyer, 1974 [851]; species, *P. pacifica* identification of Schellenberg, 1931 [765].

Habitat and distribution. Marine, dominantly Australian but with outliers in Mediterranean, South Africa, South America, Japan, Fiji, 0-310 m, males often neritic, 37+ species.

Paralepechinella Pirlot

Fig.53C

Paralepechinella Pirlot, 1933: 161.

Type species. *Paralepechinella longipalpa* Pirlot, 1933, by original designation.

Diagnosis. Cephalic lobes verticalised in form of truncation bearing 2 tilted points. Mandibular palp present, article 3 immensely longer than article 2 (versus *Lepechinella*). Inner lobes of lower lip distinct and fleshy. Palp of maxilla 1 2-articulate. Palp of maxilliped 4-articulate.

Description. Eyes absent. Antennae elongate, thin. Molar triturative; maxillae poorly setose; maxillipeds ordinary. Coxae 2-4 short, coxa 1 slipper-shaped, longer than coxa 4. Gnathopods ordinary but elongate. Pereopods simple, elongate; article 2 of pereopods 5-7 almost rectolinear. Rami of uropod 3 elongate and rod-like. Telson poorly cleft, lobes not gaping. Urosomites 2-3 coalesced. Body dorsally carinate and toothed on midline, poorly setose. Gill formula 2-6; oostegites thin.

Sexual dimorphism. Unknown.

Relationship. Differing from *Lepechinella* in the elongate article 3 of the mandibular palp.
See *Lepechinelloides*.

Species. *Paralepechinella longicornis* Ledoyer, 1982b [618A]; *P. longipalpa* Pirlot, 1933 [603B].

Habitat and distribution. Marine, Indonesia and west Indian Ocean, 1301 m, 2 species.

Polycheria Haswell

Figs 51G, 52H, 53F,G, 54C

Polycheria Haswell, 1879b: 345.–Thurston, 1974a: 18 (key).

Type species. *Polycheria tenuipes* Haswell, 1879b, selected by J.L. Barnard, 1969a.

Diagnosis. Cephalic lobes pointed or rounded, occasionally with weak flange. Mandibular palp absent. Inner lobes of lower lip well developed and fleshy. Palp of maxilla 1 1-articulate. Palp of maxilliped 4-articulate.

Description. Eyes present. Antennae elongate, thin. Molar weakly triturative; maxillae moderately setose; palp of maxilliped ordinary. Gnathopods ordinary. Pereopods prehensile; article 2 of pereopods 5-7 rectolinear. Rami of uropod 3 lanceolate. Telson elongate and deeply cleft. Urosomites 2-3 coalesced; urosomite 1 dorsally toothed or carinate. Gill formula [unknown]; oostegites scarcely expanded.

Sexual dimorphism. Male antenna 2 with anterior pubescence on article 4. Eyes enlarged.

Variables. Ocular lobes pointed (*P. acanthocephala*), rounded (*P. macrophthalma*, *P. tenuipes*); coxa 1 with point (*P. similis*), without point (*P. gracilipes*); coxa 4 bilobed (*P. similis*), rounded posteroventrally (*P. gracilipes*), pointed posteroventrally (*P. macrophthalma*), with large anterior tooth (*P. dentata*), moderate tooth (*P. gracilipes*), no tooth (*P. tenuipes*); merus longer than propodus on pereopods 3-4 (*P. similis*, etc.), as long as propodus (*P. gracilis*); and many more variables of similar kind.

Relationship. This genus is distinguished from all others in its family by the prehensile pereopods 3-7, each propodus bearing a tiny apical palm and fixed finger.

Taxonomy confused; often assumed as single polymorphic species but possibly composed of several polymorphic species; see list of forms below.

Species. See Holman & Watling (1983b); *P. acanthocephala* Schellenberg, 1931 [753]; *P. acanthopoda* Thurston, 1974a [870I]; *P. amakusaensis* Hirayama, 1984b [395]; *P. antarctica* (Stebbing, 1875b) (Bellan-Santini & Ledoyer, 1974) [870 + B + I]; *P. atolli* Walker, 1905b (Pillai, 1957) (Ledoyer, 1972c, 1979a) [660]; *P. a. orientalis* Hirayama, 1984b [395]; *P. bidens* Schellenberg, 1931 [751]; *P. brevicornis* Haswell, 1879b (Stebbing, 1910a) [781]; *P. cristata* Schellenberg, 1931 [851]; *P. dentata* Schellenberg, 1931 [833 + B]; *P. gracilipes* Schellenberg, 1931 (Thurston, 1974b)[810]; *P. intermedia* Stephensen, 1947a [851]; *P. japonica* Bulycheva, 1952 [391]; *P. kergueleni* (Stebbing, 1888) (Schellenberg, 1931) [851]; *P. macrophthalma* Schellenberg, 1931 [864]; *P. nuda* Holman & Watling, 1983b [872B]; *P. obtusa* Thomson, 1882 (J.L. Barnard, 1972b) [775 + I]; *P. osborni* Calman, 1898 (Skogsberg & Vansell, 1928) (J.L. Barnard, 1969a,b, 1979b) [379 + I]; *P. similis* Schellenberg, 1931 [830 + I]; *P. tenuipes* Haswell, 1879b (?Schellenberg, 1931) [781]; species, (*P. atolli* identifications of K.H. Barnard, 1916, 1940) (Schellenberg, 1925a) (Griffiths, 1973-75) [440]; species (plural) (*P. antarctica* identification of Walker, 1904) (Chilton, 1921d, 1923b) (Hale, 1929) (Shoemaker, 1935c) (Pirlot, 1938) [various localities].

Habitat and distribution. Marine, mostly deep southern hemisphere but extending to Ceylon, Japan and Puget Sound, usually burrowing in tests of tunicates such as *Amaroucium* species or *Distaplia* species, 0-548 m, speciation debatable, perhaps 19+ species.

Sebadexius Ledoyer

Sebadexius Ledoyer, 1984:56.

Type species. *Sebadexius neocaledoniensis* Ledoyer, 1984, original designation.

Diagnosis. Cephalic lobes pointed. Mandibular palp absent. Inner lobes of lower lip well developed and fleshy. Palp of maxilla 1 1-articulate. Palp of maxilliped 4-articulate. One or more posterior body segments feebly tridentate.

Description. Eyes present. Antennae elongate, thin. Molar weakly triturative; maxillae poorly setose; palp of maxilliped vestigial, outer plate large, palp thick but not exceeding outer plate. Coxae 1-4 ordinary. Gnathopods slender, strongly chelate. Pereopods simple; article 2 of pereopods 5-7 strongly expanded. Rami of uropod 3 lanceolate. Telson short, deeply cleft. Urosomites 2-3 coalesced; urosomite 1 dorsally toothed. Metasomites 2-3 (1 badly observed) weakly tridentate. Gill formula [unknown]; oostegites [unknown].

Sexual dimorphism. Male unknown.

Relationship. Similar to *Paradexamine* in most characters but differing from all other dexaminids in the strongly chelate gnathopods.

Species. *Sebadexius neocaledoniensis* Ledoyer, 1984 [586].

Habitat and distribution. Marine, New Caledonia, shallow water, in algae, 1 species.

Syndexamine Chilton

Figs 50, 54A

Syndexamine Chilton, 1914: 332.–J.L. Barnard, 1972a: 142 (key).

Type species. *Syndexamine carinata* Chilton, 1914, monotypy.

Diagnosis. Cephalic lobes rounded or subtruncate (weakly verticalised). Mandibular palp absent. Inner lobes of lower lip of medium size. Palp of maxilla 1 1-articulate. Palp of maxilliped 4-articulate.

Description. Eyes present. Antennae variable, elongate and thin or shortened and antenna 1 thickened. Molar moderately triturative to smooth. Maxillae moderately to poorly setose; inner plate of maxilliped small to large, palp small to large (type). Coxa 1-4 ordinary or coxa 1 slightly acuminate. Gnathopods ordinary. Pereopods simple to weakly prehensile; article 2 of pereopods 5-7 expanded or rectolinear. Rami of uropod 3 lanceolate or foliaceous. Telson deeply cleft. Urosomites 2-3 coalesced. Pleon weakly carinate on midline. Gills and oostegites [unknown].

Variables. Incisor untoothed and cornified (type, *S.*

wane), ordinary and toothed (*S. runde*, etc.); molar smooth (type), triturative (*S. runde*, etc.); inner plate of maxilliped well developed and setose (type), poorly developed and almost naked (*S. nuttoo*), palp large (*S. mullauna*); palms of gnathopods oblique (type), almost transverse (*S. wane*); article 2 of pereopod 7 narrow (type, *S. wane*) broad (*S. nuttoo*, *S. wunda*, *S. runde*) (many others intermediate); pereopods 5-6 weakly prehensile (*S. mullauna*); rami of uropod 3 foliaceous (*S. mullauna*, *S. wane*).

Relationship. See *Paradexamine*.

Species. *Syndexamine carinata* Chilton, 1914 (Sheard, 1938) [776]; *S. mullauna* J.L. Barnard, 1974a [785]; *S. nuttoo* J.L. Barnard, 1972a [782]; *S. runde* J.L. Barnard, 1972a [780]; *S. wane* J.L. Barnard, 1972a [785]; *S. wunda* J.L. Barnard, 1972a [787]; species of J.L. Barnard, 1972a [785].

Habitat and distribution. Marine, New Zealand and southern Australia, 0-50 m, 6 species.

Tritaeta Boeck

Fig.52D

Lampra Boeck, 1871b: 188 [homonym, Lepidoptera].
Tritaeta Boeck, 1876: 317 [new name].–Lincoln, 1979a: 452.

Type species. *Atylus gibbosus* Bate, 1862, monotypy.

Diagnosis. Cephalic lobes weakly pointed, truncate or rounded. Mandibular palp absent. Inner lobes of lower lip obsolescent. Palp of maxilla 1 1-articulate. Palp of maxilliped 3-articulate. Coxae 3-4 bilobed or biacuminate; article 4 of pereopods 3-7 slightly longer than article 2, articles 5 and 6 together about three fourths as long as article 4 (versus *Dexamine*). Pereopods 3-7 with false prehensility (versus *Dexaminella*).

Description. Eyes present. Antennae elongate, thin. Molar triturative; maxillae poorly setose; palp of maxilliped small. Coxae 1-2 ordinary, 3-4 bilobed or biacuminate, 4 not excavate posteriorly (sinuate instead). Gnathopods ordinary. Pereopods simple but with weak look of prehensility owing to conjunction of dactyl with article 5; article 2 of pereopods 5-7 almost rectolinear. Outer ramus of uropod 2 shortened. Rami of uropod 3 lanceolate. Telson elongate and deeply cleft. Urosomite 1 toothed in midline. Gill formula 2-7, some gills in male plaited; oostegites slightly expanded.

Variable. Article 5 on pereopods 3-7 with chela, thus carpochelate (*T. chelata*).

Relationship. Differing from *Dexamine* in the elongate article 4 of pereopods 3-7 and the prehensile look of those pereopods owing to the shortness of article 6 compared to the lengths of dactyl and adjacent proximal spines.

Species. See Chevreux & Fage (1925); Gurjanova (1951); Karaman (1969); Ledoyer (1977); Miloslawskaya (1931, 1939); Mordhukhai-Boltovskoi (1969); Stephensen (1928, 1929, 1940a); Vader (1969a); *T. chelata* Chevreux, 1925 [441]; *T. gibbosa* (Bate, 1862) (?= *T. brevitarsus* Grube, 1861) (= *T. dolichonyx* Nebeski, 1881) (Sars, 1895) (Chevreux & Fage, 1925) (Reid, 1951) (Karaman, 1973b) (Lincoln, 1979a) [352].

Habitat and distribution. Marine, Norway to Senegal and Black Sea, 0-150 m, on sponges and ascidians, 2 species.

Prophliantinae Nicholls

Diagnosis. Pereopods 5-7 diverse; pereopod 5 much shorter than pereopod 4, article 2 much broader than in pereopod 4 and articles 4 and 5 much broader and more heavily setose than on pereopods 5-6; article 2 of pereopod 5 grossly pyriform, highly convex on anterior margin and article 2 asymmetrical. Coxa 5 enlarged.

Key to Genera of Prophliantinae

1. Article 4 of pereopod 5 broadly and asymmetrically expanded, article 3 of gnathopod 2 elongate ..... *Prophlias*

—— Article 4 of pereopod 5 and article 3 of gnathopod 2 ordinary 2

2. Article 5 of pereopod 7 broadened and often enveloping article 6 ..... *Haustoriopsis*

—— Article 5 of pereopod 7 ordinary 3

3. Antenna 2 of female vestigial, 3-articulate, lateral cephalic lobes fully enveloping eye ..... *Dexaminoculus*

——Antenna 2 of female 7+articulate, eyes disjunct from margins of cephalic lobes ..... *Guernea*

Dexaminoculus Lowry

Fig.51C

Sphaerophthalmus Spandl, 1923b: 111 [homonym, Trilobita].
Dexaminoculus Lowry, 1981a: 191 (new name, same type species).

Type species. *Sphaerophthalmus grobbeni* Spandl, 1923f, 1924a, monotypy.

Diagnosis. Only urosomites 2-3 coalesced. Antenna 2 of female vestigial, 3-articulate and thin. Article 5 of pereopod 7 thin. Maxilla 1 with large 1-articulate palp (*D. acutipes*). Article 4 of pereopod 5 thin.

Description. Cephalic lobes rounded, fully enveloping eye. Eyes present. Molar large but weakly triturative, right rakers 3 (type), left 1, (*D. acutipes*), mandibular palp absent; maxillae poorly setose; inner plates of maxilliped of medium size, outer plates large, palp 3-articulate. Coxae 1-4 ordinary. Palms of gnathopods transverse; gnathopod 1 short, carpus broad and lobate, article 4 short, underslinging carpus; gnathopod 2 elongate, carpus thin, not lobate, article 4 very elongate. Pereopods simple, pereopods 5-7 weakly typical of subfamily. Uropod 2 strongly shortened (or not), outer ramus shortened; uropod 3 small, rami broadly lanceolate. Telson elongate and deeply cleft. Pleon carinate dorsally and laterally (very weak). Gills and oostegites [unknown].

Sexual dimorphism. [unknown].

Variables. Merus of gnathopod 2 longer than carpus (*D. acutipes*); lobe on article 2 of pereopod 6 sharp (*D. acutipes*); coxae 2 and 3 odd (see Lowry, 1981a: fig.1).

Relationship. Differing from *Guernea* and *Dexaminella* in the vestigial female antenna 2 and the envelopment of the eyes by the lateral cephalic lobes. From *Dexaminella* also in the presence of inner plates of the maxillipeds.

Species. *Dexaminoculus acutipes* (Ledoyer, 1979a) [698]; *D. cavimanus* Ledoyer, 1982b [698]; *D. grobbeni* Spandl, 1923b, 1924a (Lowry, 1981f) (Ledoyer, 1984) [600N].

Habitat and distribution. Marine, Red Sea to Madagascar and Australia, 0-24 m, 3 species.

Guernea Chevreux

Figs 50D, 51B, 52J, 53D, 54D,E

Helleria Norman, 1868: 418 [homonym, Isopoda] (*Helleria coalita* Norman, 1868, monotypy).
Guernea Chevreux, 1887b: 302 (new name, same type species).-Stebbing, 1906: 521 [in part].
Prinassus Hansen, 1888: 82 (*Prinassus nordenskioldi* Hansen, 1888, original designation) [valid subgenus].
Dexamonica J.L. Barnard, 1958c: 130 (*Dexamonica reduncans* J.L. Barnard, 1958c, monotypy) [subgeneric synonym of *Prinassus*].

Type species. *Helleria coalita* Norman, 1868, monotypy.

Diagnosis. Only urosomites 2-3 coalesced. Antenna 2 of female more than 7-articulate and thin. Article 5 of pereopod 7 normally rectangular. Palp of maxilla 1 usually 2-articulate, rarely 1-articulate, not greatly exceeding outer plate. Article 4 of pereopod 5 not asymmetrically expanded.

Description. Cephalic lobes rounded. Eyes present. Molar weakly to scarcely triturative; rakers weak, sparse or absent; mandibular palp absent; maxillae poorly setose, though inner plate often with medial setae; inner plate of maxilliped small to ordinary, palp slightly reduced, 4-articulate. Gnathopods ordinary though palms occasionally subtransverse. Pereopods simple, pereopods 5-7 typical of subfamily. Uropod 2 short; uropod 3 small, rami lanceolate. Telson deeply cleft. Gills narrow, ovate or elliptical [formula unknown]; oostegites slender.

Sexual dimorphism. Body of male thinner and more streamlined than in female, pleon enlarged, anterior coxae compacted; eyes enlarged; flagellum of antenna 2 elongate, multiarticulate; article 1 of antenna 1, article 4 of antenna 2 often swollen and brushy; uropod 3 setose (only spinose in female).

Variables. Palp of maxilla 1 1-articulate (*G. endota*, etc.); inner plate of maxilla 2 very short (*G. timaru*); inner plate of maxilliped short (*G. gelane*), long (*G. endota*); inner rami of uropods 1-2 reduced (*G. gelane*, *G. tumulosa*); spines on uropods 1-2 shortened (*G. rhomba*, *G. tumulosa*).

Key to Subgenera of *Guernea*

Urosomite 1 with weak dorsal hump in both sexes..... .....(*Guernea*)

Urosomite 1 with retrorse dorsal process in female, high keel in male .....(*Prinassus*)

Species. See J.L. Barnard (1966a,b, 1970c); Bulycheva (1957); Fage (1933); Gurjanova (1951); Karaman (1973b); Shoemaker (1930a, 1955a); G = *(Guernea)*, P = *(Prinassus)*; G. *G. brevispinis* Ledoyer, 1982b [698]; G. *G. coalita* (Norman, 1968) (= *G. laevis* Chevreux 1887b) (Chevreux & Fage, 1925) (Lincoln, 1979a) (Bellan-Santini, 1982a) [352]; G. *G. endota* J.L. Barnard, 1972a [787]; G. *G. gelane* J.L. Barnard, 1972a [781]; G. *G. longicornis* Ledoyer, 1982b [698]; G. *G. magnaphilostoma* Hirayama, 1985b [395]; G. *G. melape* J.L. Barnard, 1972a [780]; P. *G. nordenskioldi* (Hansen, 1888) (J.L. Barnard, 1970c) (Just, 1980) [354+]; P. *G. nullispina* Hirayama, 1985b [395]; G. *G. petalocera* Ruffo, 1959 [677]; G. *G. quadrispinosa* Stephensen, 1944b (Bulycheva, 1957) [391]; P. *G. rectocephala* Hirayama, 1985b [395]; P. *G. reduncans* (J.L. Barnard, 1958c, 1970c) [373]; G. *G. rhomba* Griffiths, 1974a, 1975 [743]; G. *G. spinicornis* Ledoyer, 1982b [698]; G. *G. tenuipes* Ledoyer, 1979a [698]; P. *G. terelamina* Hirayama, 1985b [395]; G. *G. timaru* J.L. Barnard, 1972b [773]; P. *G. tomiokaensis* Hirayama, 1985b [395]; G. *G. tumulosa* Griffiths, 1976b [743I]; G. *G. unchalka* J. L. Barnard, 1972a [787]; species, *G. laevis* identification of Walker, 1904 [665].

Habitat and distribution. Marine, cosmopolitan except for Antarctica, 0-255 m, 31 species.

Haustoriopsis Schellenberg

Figs 51F, 52I, 53B, 54K

Haustoriopsis Schellenberg, 1938a: 12.

Type species. *Haustoriopsis reticulatus* Schellenberg, 1938a, monotypy.

Diagnosis. Only urosomites 2-3 coalesced. Antenna 2 of female about 8-articulate and thin. Article 5 of pereopod 7 broadly expanded, often forming anterior and posterior lobes partially enveloping article 6. Palp of maxilla 1 1-articulate, not reaching apex of outer plate. Article 4 of pereopod 5 normally thin.

Description. Cephalic lobes rounded. Eyes present. Molar non triturative, rakers absent, mandibular palp absent; maxillae poorly setose; inner plates of maxilliped very small, outer plate large, palp ordinary, 4-articulate. Gnathopods ordinary. Pereopods simple, pereopods 5-7 typical of subfamily. Uropod 2 short; uropod 3 small, rami lanceolate. Telson deeply cleft. Gills simple, formula [unknown]; oostegites slender.

Variables. Article 5 of pereopod 7 strongly (*H. reticulatus*) or scarcely (*H. latipes*) enveloping article 6; article 4 of pereopod 5 dilated (*H. latipes*) or not (*H. reticulatus*).

Relationship. Differing from *Guernea* in the broadened article 5 of pereopod 7. Placed by Ledoyer (1982b) as subgenus of *Guernea* owing to intergradation by pereopod 7 of *H. latipes* to *G. tumulosa.*

Species. *Haustoriopsis latipes* Ledoyer, 1979a (= *H. petalocera* identification of Ledoyer, 1973d) [698]; *H. reticulatus* Schellenberg, 1938a [595].

Habitat and distribution. Marine, Indo-Pacific, 12-42 m, 2 species.

Prophlias Nicholls

Figs 50J, 52E, 53A, 54J

Prophlias Nicholls, 1939: 312.–J.L. Barnard, 1972a: 161.

Type species. *Prophlias anomalus* Nicholls, 1939, monotypy.

Diagnosis. All urosomites rigidly coalesced but weak suture of segment 1 partially visible. Antenna 2 of female about 6-articulate, articles lamellar or palmate. Article 5 of pereopod 7 normally rectangular. Palp of maxilla 1 1-articulate, greatly exceeding outer plate. Article 4 of pereopod 5 asymmetrically expanded.

Description. Cephalic lobes truncate (female) or rounded (male). Eyes present. Molar poorly triturative, mandibular palp absent; maxillae poorly setose; inner plates of maxilliped small, palp small, 4-articulate. Coxae 1-4 ordinary or coxa 4 weakly acuminate. Palms of gnathopods transverse, article 3 of gnathopod 2 elongate. Pereopods simple, pereopods 5-7 typical of subfamily. Uropod 2 short; uropod 3 small, rami lanceolate. Telson deeply cleft. Gills and oostegites [unknown].

Sexual dimorphism. Body of male thinner and more streamlined than in female, pleon enlarged, anterior coxae compacted; eyes enlarged; flagellum of antenna 2 elongate, multiarticulate.

Attribute. Inner ramus of uropod 1 shortened.

Relationship. Differing from *Guernea* in the oddly expanded article 4 of pereopod 5 and the elongate article 3 of gnathopod 2.

Species. *Prophlias anomalus* Nicholls, 1939 (J.L. Barnard, 1972a)[788].

Habitat and distribution. Marine, western Australia, littoral, 1 species.

DIDYMOCHELIIDAE Bellan-Santini & Ledoyer, 1986

Diagnosis. Peduncle of antenna 1 short, article 2 shorter than article 1, accessory flagellum 4-articulate. Mouthparts forming conical bundle. Labrum elongate, subpointed, entire. Mandible with palp, simple columnar molar, left lacinia mobilis (right unknown), few to many rakers, 3-articulate palp. Lower lip substyliform and elongate, inner lobes absent, mandibular lobes weak to strong and basal. Inner plates of maxillae strongly setose medially. Maxilliped ordinary but outer plate setose, palp dactyl stubby. Gnathopods slender and chelate. Coxae 1-4 ordinary, coxa 5 almost as long as coxa 4. Pleonites 3-4 with dorsal tooth-carina. Uropod 3 vestigial, composed only of scale-like peduncle. Telson short, very broad, barely excavate apically.

Description. Head of lysianassid form, rostrum thick and of medium extension, lateral cephalic lobe covering base of antenna 2, lacking antennal sinus. Basal article of flagellum on antenna 1 longer than article 3 of peduncle and heavily armed with aesthetascs (callynophore). Outer plate of maxilla 1 apparently with 9 spines, palp 2-articulate, apically setose. Pereopods ordinary, short. Coxae 6-7 pointed posteroventrally. Epimera 1-3 with sinuous posterior margins and medium posteroventral tooth. Uropods 1-2 very short and stout. Female and gills [unknown].

Relationship. Differing from the Lysianassidae in the short article 3 of gnathopod 2 and from most of the lysianassids except the cyphocarid and valettiopsid 'groups' in the strongly setose medial margins of the maxillae.

Differing from the Sebidae in the completely reduced uropod 3 lacking a ramus, the short peduncular articles of antenna 1, the triturative molar, and the conically grouped mouthparts with substyliform labrum and labium.

Didymochelia K.H. Barnard

Fig.55

Didymochelia K.H. Barnard, 1931a: 429.-K.H. Barnard, 1932: 247

Type species. *Didymochelia spongicola* K.H. Barnard, 1931a, original designation.

Diagnosis. With the familial characters.

Species. *Didymochelia edwardi* Bellan-Santini & Ledoyer, 1986 [797B]; *D. spongicola* K.H. Barnard, 1931a, 1932 [833].

Habitat and distribution. Marine, South Georgia, in sponge, 88-570 m, 2 species.

DOGIELINOTIDAE Gurjanova, 1953

Diagnosis. Body laterally compressed, rostrum short, urosomites 1-3 free. Accessory flagellum absent. Palp of maxilla 1 vestigial, mandible lacking palp. Coxae 1-4 large. Gnathopods 1-2 subchelate, pereopods 5-7 nearly alike. Uropod 3 very short, with 1 ramus or without rami. Telson broader than long, notched or emarginate.

Fig.55. Didymocheliidae. *Didymocheila spongicola.*

See Haustoriidae, Kuriidae, Phliantidae and Talitridae.

Description. Antennae 1-2 stout, with short peduncle. Labrum with rounded distal margin. Epistome variable, proboscoid or not; labium without inner lobes. Mandible: molar triturative, strong; incisor toothed, palp absent. Maxilla 1: inner plate conical, outer lobe with several spines, palp vestigial, 1-articulate. Maxilla 2: plates moderately long, setose. Maxilliped: inner plate normal, outer plate smaller than inner, palp 4-articulate, articles 1-2 dilated at medial margin.

Coxa 5 remarkably shorter than coxa 4. Gnathopod 2 larger than gnathopod 1 in males. Pereopods 5-7 with expanded article 2; articles 3-5 progressively narrower towards pereopod 7. Pleopods well developed, with short stout peduncle and 2 multiarticulate rami. Uropods 1-2 biramous. Uropod 3 very short, with or without single ramus. Gills ovoid, flat, simple, occurring on coxae 2-6. Oostegites large, occurring on coxae 2-5.

Sexual dimorphism. Female gnathopod 2 small and similar to gnathopod 1; male gnathopod 2 enlarged, propodus expanded.

Relationship. Haustoriidae have well-developed mandibular palps and biramous third uropods.

Kuriidae have coalesced urosomites 1-3 and deeply cleft telson.

Phliantidae have evanescent molars and a dorsoventrally compressed body.

Differing from Hyalidae and other talitroids in spinose antennae, heavily setose and fossorial pereopods (at least pereopods 3-5, not necessarily pereopods 6-7), pereopods 5-6 especially with article 4 expanded; and uropods 1-2 with peduncular setae.

Key to Genera of Dogielinotidae

1. Uropod 3 with ramus 2

—— Uropod 3 without ramus 4

2. Epistome proboscoid ..... *Proboscinotus*

—— Epistome not proboscoid 3

3. Article 5 of pereopod 6 slender, poorly setose posteriorly, article 4 of pereopods 3-4 without anterodorsal lobe ..... *Dogielinotus*

—— Article 5 of pereopod 6 stout, multi-setose posteriorly, article 4 of pereopods 3-4 with sharp anterodorsal lobe ..... *Dogielinoides*

4. Epimeron 3 with large tooth, epimera 1-2 with small tooth, telson with weak cleft-notch ..... *Haustorioides*

—— Epimera 1-3 with large tooth, telson emarginate ..... *Eohaustorioides*

Dogielinoides Bousfield

Dogielinoides Bousfield *in* Bousfield & Tzvetkova, 1982: 82.

Type species. *Dogielinotus golikovi* Kudrjaschov, 1979, original designation.

Diagnosis. Epistome not proboscoid; dactyl of maxilliped with 1 nail; articles 4-5 of pereopods 3-4 well setose, article 4 with sharp anterodistal lobe; article 5 of pereopod 6 expanded; articles 4-5 of pereopod 6-7 multisetose; epimera 1-2 with weak tooth; epimeron 3 with medium tooth. Uropod 3 with ramus.

Species. *Dogielinotus golikovi* (Kudrjaschov, 1979) (Bousfield & Tzvetkova, 1982) [280].

Habitat and distribution. Marine, Japan Sea to Kuril Islands, shallow sands, 1 species.

Dogielinotus Gurjanova

Fig.56A

Dogielinotus Gurjanova, 1953: 235.-Bousfield & Tzvetkova, 1982: 79.

Type species. *Allorchestes moskvitini* Derzhavin, 1930a, original designation.

Diagnosis. Epistome not proboscoid; dactyl of maxilliped with 1 nail; articles 4-5 of pereopods 3-4 multisetose, article 4 not lobate; article 5 of pereopod 6 not expanded; articles 4-5 of pereopods 6-7 barely setose; epimera 1-3 with weak tooth; uropod 3 with ramus.

Species. *Dogielinotus moskvitini* (Derzhavin, 1930a, 1937) (= *D. cimbaluki* Kudrjaschov, 1972c; Kudrjaschov & Zejagintsev, 1975) (Gurjanova, 1951, 1953, 1962) (Bousfield & Tzvetkova, 1982) [280].

Habitat and distribution. Marine, Japan Sea to Kuril Islands and Okhotsk Sea, shallow sands, 1 species.

Eohaustorioides Bousfield & Tzvetkova

Eohaustorioides Bousfield & Tzvetkova, 1982: 92.

Type species. *Haustorioides japonicus* Kamihira, 1977b, original designation.

Diagnosis. Epistome not proboscoid; dactyl of maxilliped multisetose; articles 4-5 of pereopod 3-4 multisetose, article 4 without anterodistal lobe; article 5 of pereopod 6 expanded; articles 4-5 of pereopods 6-7 multisetose; epimera 1-3 with large tooth; uropod 3 lacking ramus.

Species. *Eohaustorioides japonicus* (Kamihira, 1977b, 1981) (Bousfield & Tzvetkova, 1982) [394].

Habitat and distribution. Marine, Hakodate, Hokkaido, Japan, shallow water, 1 species.

Haustorioides Oldevig

Fig.56B

Haustorioides Oldevig, 1958: 343.–Bousfield & Tzvetkova, 1982: 87.

Type species. *Haustorioides munsterhjelmi* Oldevig, 1958, monotypy.

Diagnosis. Epistome not proboscoid; dactyl of maxilliped multisetose; articles 4-5 of pereopods 3-4

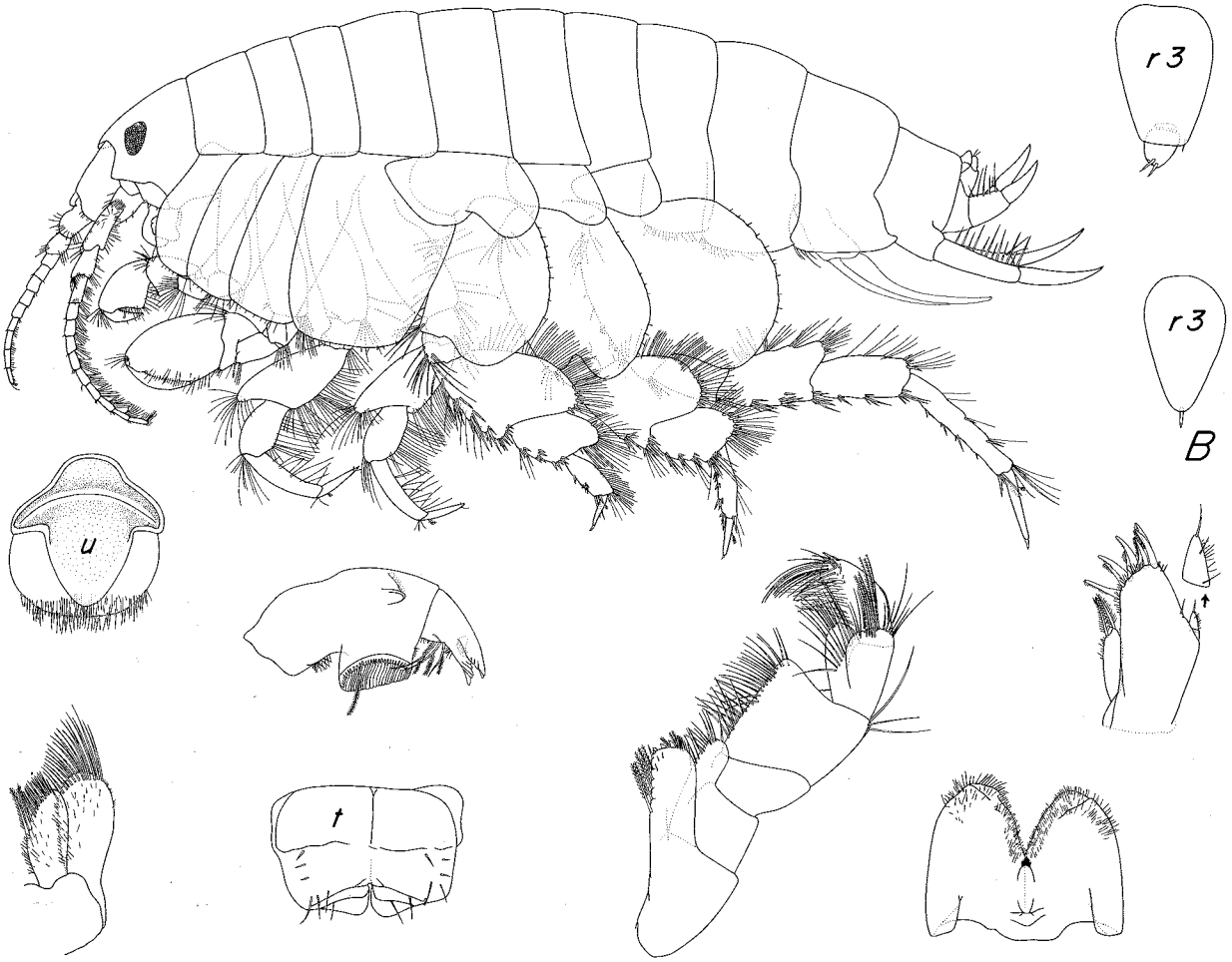

Fig.56. Dogielinotidae. A, *Dogielinotus sp.*; B, *Haustorioides munsterhjelmi.*

multisetose, article 4 with sharp anterodistal lobe; article 5 of pereopod 6 expanded; articles 4-5 of pereopods 6-7 multisetose; epimera 1-2 with weak tooth, epimeron 3 with large tooth; uropod 3 lacking ramus.

Species. See Bousfield & Tzvetkova, 1982; *H. gurjanovae* Bousfield & Tzvetkova, 1982 [280]; *H. magnus* Bousfield & Tzvetkova, 1982 [280]; *H. munsterhjelmi* Oldevig, 1958 (J.L. Barnard, 1967d) [280]; species, Kamihira, 1977a [394].

Habitat and distribution. Marine, Japan Sea to Kuril Islands and Okhotsk Sea, 3 species.

Proboscinotus Bousfield

Proboscinotus Bousfield *in* Bousfield & Tzvetkova, 1982: 84.

Type species. *Dogielinotus loquax* J.L. Barnard, 1967d, original designation.

Diagnosis. Epistome proboscoid; dactyl of maxilliped multisetose; articles 4-5 of pereopods 3-4 multisetose, article 4 with weak blunt anterodistal lobe; article 5 of pereopod 6 expanded; articles 4-5 of pereopods 6-7 multisetose; epimera 1-2 with weak tooth, epimeron 3 with medium tooth; uropod 3 with ramus.

Species. *Proboscinotus loquax* (J.L. Barnard, 1967d, 1972b) (Bousfield & Tzvetkova, 1982) [268, 269].

Habitat and distribution. Marine, Eureka, California to Vancouver, Canada, shallow sands, 1 species.

EOPHLIANTIDAE Sheard, 1936b

Diagnosis. Body cylindroid (vermiform), coxae small, often discontiguous. Head spheroid. Cuticle smooth. Eyes bilateral. Antennae short, sparsely articulate, accessory flagellum absent. Mandibular palp vestigial or absent; molar nontriturative, often absent, or spinose, rakers sparse to absent. Palp of maxilla 1 vestigial or absent. Gnathopods thin, feeble, parachelate, or minutely subchelate. Pereopods short, article 2 of pereopods 5-7 expanded. Uropod 3 vestigial, ramus absent. Telson entire (unusual) or deeply cleft or fully bilobate, lobes usually forming tent and slightly fleshy. Urosomites 2-3 occasionally coalesced.

See Prophliantinae (= Dexaminidae), Phliantidae, Kuriidae, Colomastigidae, Ceinidae, Temnophliantidae, Plioplateidae, and other Talitroidea.

Description. Antennae nonspinose. Inner lobes of lower lip weak or absent. Antenna 2 rarely fused basally with head. Mandibles slightly flattened and twisted distally. Inner lobes of lower lip weak or absent. Inner plate of maxilla 1 elongate and thin or weak to vestigial; spines of outer plate usually fewer than 9. Maxilla 2 poorly setose. Both plates of maxilliped large, outer not larger than inner; palp stout, articles short, article 2 usually not longer than article 1, dactyl short, stubby, usually with elongate nail. Gnathopods with small sharp chela, dactyl strongly overlapping palm. Pleopods feeble, otherwise variable. Urosome weak, uropods 1-2 usually small, poorly spinose, outer rami often shortened. Uropod 3 plate-like, occasionally with tiny spine or armament resembling vestigial ramus. As far as known, gills small, weakly expanded, 2-6 or 2-5; oostegites expanded and furnished with curl-tipped setae.

Variables. Pereonite 1 occasionally with ventral cradle for support of head.

Eophliantids are probably all algal-burrowers.

Remarks. Type genus, *Eophliantis*, poorly known (see J.L. Barnard, 1972b) and distinctions from *Ceinina* unclear; key herein showing a probable generic distinction.

Relationship. The Phliantidae have compressed or depressed bodies and large splayed coxae.

Differing from the Colomastigidae in the well-developed inner plates of the maxillipeds and the presence of a distinct mandibular incisor; in some Colomastigidae the incisor is presumed to be absent and is replaced by a series of fused teeth representing raker spines. Colomastigids usually have very stout antennae and well-developed biramous uropod 3.

Prophliantinae (Dexaminidae) have large coxae, diverse pereopods 5-7, bulky (not flattened) mandibles, maxillipeds with very diverse plates, the inner being small, and the outer very large, well-developed biramous uropod 3 and long cleft telson.

The Temnophliantidae have depressed crab-louse bodies (like cyamids).

The Kuriidae, Ceinidae, Plioplateidae and all other Talitroidea have compressed bodies with large anterior coxae, and except for *Najna* have triturative molars, and except for Chiltoniinae (Ceinidae) have a well-developed ramus on uropod 3.

Certain Corophioidea have cylindrical bodies but they have mandibular palps, triturative molars, ordinary maxillae and maxillipeds.

Nomenclature. Article 11 (f) of the International Code of Zoological Nomenclature requires that a name of the genus group "...must be a noun in the nominative singular or treated as such". The name *Eophliantis* Sheard (1936b; Crustacea) is the type genus of the subfamily Eophliantinae Sheard (1936b), which was

compared with the Phliantinae as sister subfamilies of the family Phliantidae, but the name of the genus from which those family group names were formed was not mentioned. That basonym is *Phlias*, the genitive of which is *Phliantis*, and the family group names are therefore correctly formed. The genus name *Eophliantis* is also therefore obviously not in the nominative singular, but in the genitive singular and does not satisfy the requirements of Article 11 (f). For that reason the name *Eophliantis* could be considered as unavailable. It could also be considered an "...incorrect original spelling", as dealt with in Article 32, but the provisions in that Article do not cover names that do not meet the requirements of Article 11, but only those of Articles 26 to 31, inadvertent errors, and multiple original spellings.

Drs Curtis W. Sabrosky and George C. Steyskal believe that *Eophliantis* could well be considered an inadvertent error (Article 32.a.ii), in that the author failed to note that *Phlias* is the basonym of Phliantidae and Phliantinae and that therefore *Eophlias* is the proper basonym of Eophliantinae.

Temnophlias Barnard (1916) is also the basonym of a family group name, one that has been known as Temnophliidae, but for the above reasons should be corrected to Temnophliantidae.

This procedure will at least give consistency.

[The authors thank these experts for their view].

Key to Genera of Eophliantidae

1. Telson uncleft and fused to urosomites 2-3, flagella of antennae 1-2 with only 1 article ..... *Lignophliantis*

—— Telson cleft, distinct from urosome, flagella of antennae 1-2 with more than 2 articles 2

2. Pleopods with 1 ramus ..... *Cylindryllioides*

—— Pleopods with 2 rami 3

3. All coxae contiguous ..... *Wandelia*

—— Some or all coxae discontiguous 4

4. Pereonite 1 with ventral cradle ..... *Bircenna*

—— Pereonite 1 lacking ventral cradle 5

5. Posterior lobe on articles 4-5 of pereopods 5-7 with 0-1 vestigial seta ..... *Ceinina*

—— Posterior lobe on articles 4-5 of pereopods 5-7 densely setose, setae elongate ..... *Eophliantis*

Bircenna Chilton

Figs 57D, 58B,H,I

Bircenna Chilton, 1884a: 264.–Stebbing, 1906: 205.–Sheard, 1936b: 460.–Nicholls, 1939: 328 (key).–J.L. Barnard, 1972b: 180.

Type species. *Bircenna fulvus* Chilton, 1884a, monotypy.

Diagnosis. Flagella of antennae 1-2 with 4+ articles. Pereonite 1 with ventral cradle for support of head. Coxae 2-4 or 4-5 discontiguous. Posterior lobe on articles 4-5 of pereopods 5-7 with 2-3 medium sized setae. Pleopods biramous, peduncles expanded. Telson almost fully cleft.

Description. Antenna 1 larger than antenna 2. Right lacinia mobilis absent or like left, rakers 3-4, left lacinia mobilis tiny, bifid, rakers 1-2; molars tiny and simple or absent. Inner plate of maxilla 1 thin, elongate, with 1 thick apical seta; outer plate with 5-6 thick and 2 thin spines. Dactyl of maxilliped with short apical setae. Coxae extremely short. Chela of gnathopods large or small. Pereopod 7 much larger than pereopod 5; article 2 of pereopods 5-7 moderately to strongly expanded, weakly to strongly lobate on pereopod 7. Outer ramus of uropod 1 usually long, but when short, especially so on male; of uropod 2 slightly shortened or not. Uropod 3 weakly bilobate (depending on view), or broad, with 2-4 short setae in row, with 1

jewel spine and occasional other setule (based on type); or uropod 3 subcircular and bearing pointed cusp or spine. Lobes of telson tightly appressed in tent form, triangular, with several thick setules (type). Urosomites 2-3 coalesced.

Relationship. Differing from all other eophliantids in the ventral cradle of pereonite 1.

Species. *Bircenna dronga* Myers, 1985c [576]; *B. fulva* Chilton, 1884a, 1909a (J.L. Barnard, 1972b) (Kreibohm-de-Paternoster, 1976) [775 + 862]; *B. ignea* Nicholls, 1939 (J.L. Barnard, 1972a) [794]; *B. nicholsi* Sheard, 1936b (Nicholls, 1939) [785]; species, (*B. crassipes* identification of Stephensen, 1949) [731].

Habitat and distribution. Marine, cool water New Zealand, Australia, Fiji, Argentina, and ?Tristan da Cunha, shallow water, 4+ species.

Ceinina Stephensen

Fig.57F

Ceinina Stephensen, 1933e: 63.–J.L. Barnard, 1972b: 183.

Type species. *Ceinina japonica* Stephensen, 1933e, monotypy.

Diagnosis. Flagellum of antenna 1 with 3 articles, of antenna 2 with 2 articles. Pereonite 1 lacking ventral cradle. All coxae discontiguous. Posterior lobe on articles 4-5 of pereopods 5-7 with only small seta. Pleopods with 2 rami, peduncles weakly expanded. Telson fully cleft.

Description. Antennae subequal, very short. Right and left laciniae mobiles plate-like, deeply 4-toothed, teeth sharp; rakers and molars absent. Inner plate of

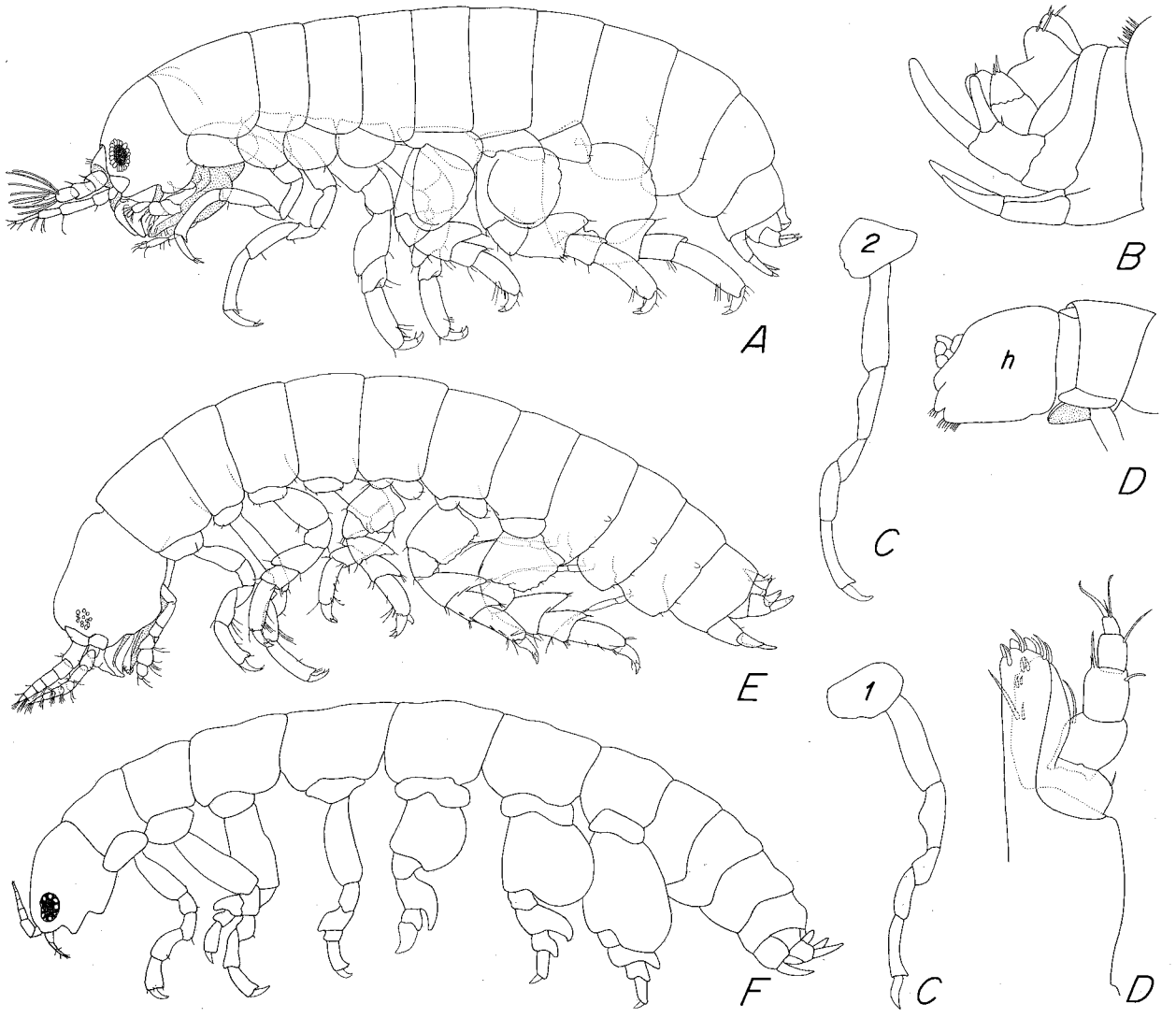

Fig.57. Eophliantidae. A, *Wandelia wairarapa*; B, *Eophliantis tindalei*; C, *Wandelia crassipes*; D, *Bircenna fulva*; E, *Cylindryllioides kaikoura*; F, *Ceinina japonica*.

maxilla 1 thin, elongate, with 1 medium apical seta; outer plate with 8 more or less similar spines. Dactyl of maxilliped with short apical setae. Coxae extremely short. Pereopod 7 larger than pereopod 5; article 2 of pereopods 5-7 expanded, moderately lobate on pereopod 6, deeply lobate and elongate on pereopod 7. Outer rami of uropods 1-2 slightly shortened. Uropod 3 unlobate, with 1 small apical seta. Lobes of telson partly appressed, not strongly tent shaped, each subovate, thus with gape in cleft. Urosomites 2-3 coalesced.

Relationship. Differing from *Eophliantis* in having only 0-1 seta on the posterior margin of each lobe on articles 4-5 of pereopods 5-7.

Species. *Ceinina japonica* Stephensen, 1933e (= *Wandelia japonensis* Nicholls, 1939) (Gurjanova, 1951) [391]; *C. latipes* Ledoyer, 1978b [697].

Habitat and distribution. Marine, Japan, Hokkaido, and Mauritius, 0 m, 2 species.

Cylindryllioides Nicholls

Figs 57E, 58D,E

Cylindryllioides Nicholls, 1938: 58.–J.L. Barnard, 1972b: 183.

Type species. *Cylindryllioides mawsoni* Nicholls, 1938, original designation.

Diagnosis. Flagella of antenna 1-2 with 4 + articles. Pereonite 1 without ventral cradle. All coxae discontiguous. Posterior lobe on articles 4-5 of pereopods 5-7 with only 1-2 small setae. Pleopods uniramous, poorly articulate, peduncles unexpanded. Telson almost fully cleft.

Description. Antennae subequal. Right lacinia mobilis either absent or formed like raker, simple, left lacinia mobilis bifid, rakers 2-3; molars small to medium, weakly humped or ridge-like, spinose or setose. Inner plate of maxilla 1 thin, elongate, with 1 thick apical seta; outer plate with 5-6 thick and 1-2 thin spines. 1 seta on dactyl of maxilliped very elongate and whip-like. Coxae extremely short. Pereopod 7 only slightly larger than pereopod 5; article 2 of pereopods 5-7 moderately expanded, subquadrate or trapezoidal, unlobate. Outer rami of uropods 1-2 shortened or not. Uropod 3 with 1 jewel spine and 2-3 setae in row. Lobes of telson tightly appressed in tent form, with several thick setules (?or none). Urosomites 2-3 coalesced.

Relationship. Differing from other genera in the Eophliantidae by the uniramous pleopods.

Species. *Cylindryllioides kaikoura* J.L. Barnard, 1972b

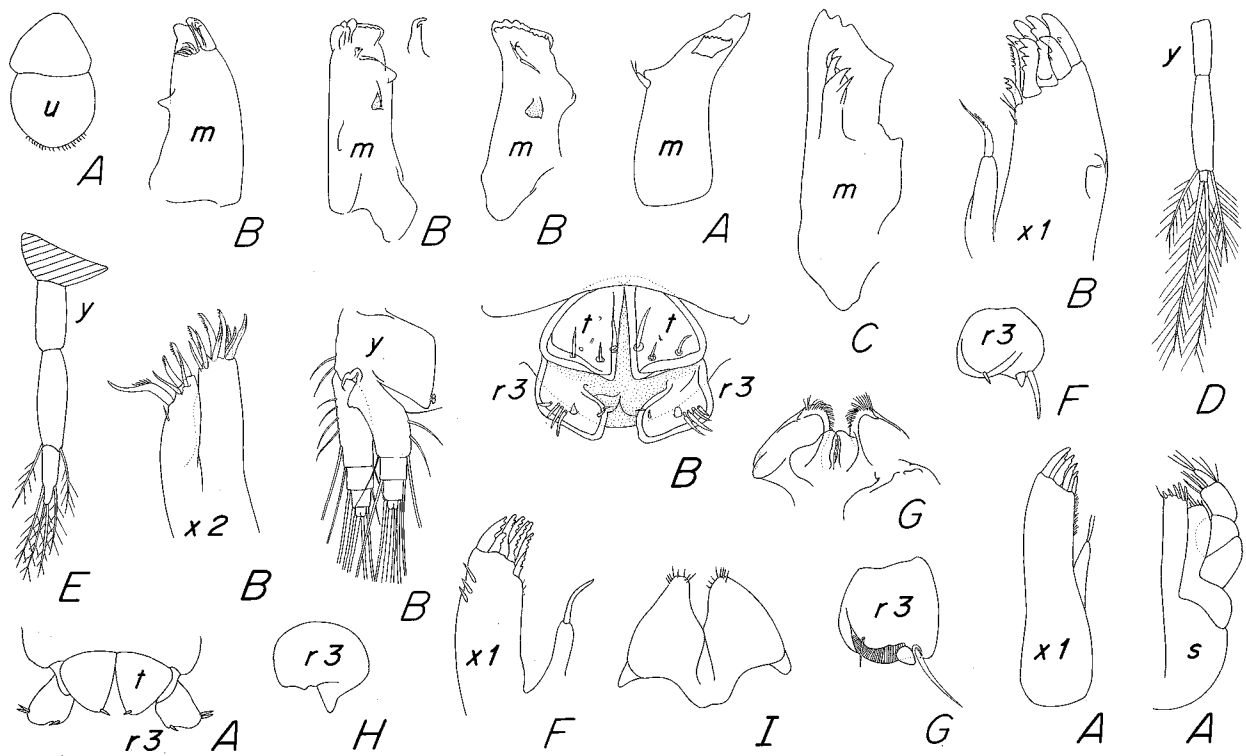

Fig.58. Eophliantidae. A, *Wandelia crassipes*; B, *Bircenna fulva*;C, *Wandelia japonensis*; D, *Cylindryllioides kaikoura*; E, *Cylindryllioides mawaoni*; F, *Eophliantis tindalei*; G, *Wandelia wairarapa*; H, *Bircenna nicholls*i; I, *Bircenna ignea*.

[774]; *C. mawsoni* Nicholls, 1938, 1939 (Bellan-Santini & Ledoyer, 1974) [880].

Habitat and distribution. Marine, New Zealand, Macquarie, Kerguelen, Crozet, 0-2 m, 2 species.

Eophliantis Sheard

Figs 57B, 58F

Eophliantis Sheard, 1936b: 457.–J.L. Barnard, 1972b: 184.

Type species. *Eophliantis tindalei* Sheard, 1936b, original designation..

Diagnosis. Flagella of antennae 1-2 with 3-4 articles. Pereonite 1 without ventral cradle (as far as known). Most coxae (apparently) discontiguous. Posterior lobe on articles 4-5 of pereopods 5-7 densely setose, setae elongate. Pleopods with 2 well-developed rami, peduncles expanded. Telson cleft.

Description. Antennae similar. Right and left laciniae mobilesand rakers apparently absent; molars small, blunt. Inner plate of maxilla 1 thin, elongate, with 1 thick short apical seta; outer plate with 5 larger and 1 smaller spines. Dactyl of maxilliped with short apical setae (implied from description). Coxae apparently extremely small. Pereopod 7 much larger than pereopod 5; article 2 of pereopod 5 apparently unexpanded, very slender, of pereopods 6-7 broadly expanded, deeply lobate on pereopod 7. Outer rami of uropods 1-2 slightly shortened. Uropod 3 weakly bilobate, with 2-3 short setae and possibly 1 jewel spine. Lobes of telson apparently closely appressed in tent form, shape possibly ovate, with several thick setules. Urosomites 2-3 said to be discrete.

Morphology confounded by mixture of interpretations and possible mixture of different species and genera in material of type species; see Nicholls (1939) and J.L. Barnard (1972b) for exposition.

Relationship. See *Bircenna*, *Ceinina* and *Wandelia*.

Species. *Eophliantis tindalei* Sheard, 1936b (in part) (Nicholls, 1939, in part) (J.L. Barnard, 1972b) [783].

Habitat and distribution. Marine, Tasmania, littoral, 1 species.

Lignophliantis J.L. Barnard

Lignophliantis J.L. Barnard, 1969a: 103.

Type species. *Lignophliantis pyrifera* J.L. Barnard, 1969a, original designation.

Diagnosis. Flagella of antennae 1-2 with only 1 article. Pereonite 1 without ventral cradle. Coxae 3-7 discontiguous. Articles 4-5 of pereopods 5-7 neither lobate nor setose, nor bearing basal setae on article 4. Pleopods with 2 rami, inner ramus short, peduncles not expanded. Telson uncleft, fused to urosomites 2-3.

Description. Antenna 1 larger than antenna 2. Right lacinia mobilis, if present, weakly bifid apically, 1 vestigial raker possibly present; left mandible unknown; molar styliform, flagellate. Inner plate of maxilla 1 short, pointed sharply, setulate; outer plate with 3-4 large and 1 smaller spines. Dactyl of maxilliped attenuate and not setose apically. Anterior coxae not extremely shortened. Gnathopods not parachelate, palms vestigial. Pereopod 7 not larger than pereopod 3; article 2 of pereopods 5-7 small and scarcely expanded. Pleopodal rami apparently not multiarticulate. Inner rami of uropods 1-2 moderately and slightly shortened. Uropod 3 leaf-like, simple. Urosomites 2-3 and uncleft telson coalesced.

Relationship. Differing from all other eophliantids in the uncleft telson fused to the urosome.

Species. *Lignophliantis pyrifera* J.L. Barnard, 1969a [373].

Habitat and distribution. Marine, southern California, littoral, 1 species.

Wandelia Chevreux

Figs 57A,C, 58A,C,G

Wandelia Chevreux, 1906b: 87.J.L. Barnard, 1972b: 187.

Type species. *Wandelia crassipes* Chevreux, 1906b, original designation.

Diagnosis. Flagella of antenna 1-2 with 5+ articles. Pereonite 1 lacking ventral cradle. All coxae contiguous. Posterior lobe on articles 4-5 of pereopods 5-7 with only 1-2 small setae. Pleopods with 2 rami, peduncles weakly expanded. Telson fully cleft.

Description. Antennae subequal (or antenna 1 slightly shorter, thicker and poorly articulate). Right lacinia mobilis spiniform, left broad and multidentate, rakers absent (type) or 2; molar absent, palp absent or ?tiny palp present (type). Inner plate of maxilla 1 thin, elongate, with 1-2 small setae; outer plate with 7 large and 1 small spines. Dactyl of maxilliped with short apical setae. Coxae not extremely small. Pereopod 7 much larger than pereopod 5; article 2 of pereopods 5-7 strongly expanded, weakly lobate on all. Rami of uropods 1-2 extending equally. Uropod 3 weakly

bilobate, with or without (type) jewel spine and 2-3 other small setae. Lobes of telson tightly appressed in tent form, triangular, with 1-2 apical setae. Urosomites 2-3 coalesced.

Mandibular palp in type possibly misinterpreted as piece of attachment tendon; *W. wairarapa* with atypical antenna 1 and pleopods (inner ramus with lateral hook).

Relationship. Differing from *Bircenna*, *Ceinina* and *Eophliantis* in the contiguous coxae.

Species. *Wandelia crassipes* Chevreux, 1906a,b (Nicholls, 1939) (Thurston, 1974a,b) [870]; *W. wairarapa* J.L. Barnard, 1972b [774].

Habitat and distribution. Marine, Antarctica and New Zealand, 0-40 m, 2 species.

EUSIRIDAE Stebbing, 1888

Calliopiidae Sars, 1895: 431.
Pontogeneiidae Stebbing, 1906: 356.
Gammarellidae Bousefield, 1977: 309 [most of these taxa are in Barnard & Barnard, 1983].

Diagnosis. Accessory flagellum 0 to 2-articulate. A polyphyletic assemblage marked by reduction of accessory flagellum but lacking other synapomorphic specialisations.

See Gammarida, Pleustidae, Liljeborgiidae, Dexaminidae, Vitjazianidae, Iphimediidae (= Acanthonotozomatidae, Paramphithoidae), Paracalliopiidae, Laphystiopsidae, Exoedicerotidae, Bolttsiidae and Stilipedidae.

Description. Accessory flagellum absent or represented by bulge or quadrate projection on article 3 of antenna 1, or formed of articulate scale or articulate barrel, occasionally elongate, rarely formed by long article tipped with short article 2. Ordinary article 1 of primary flagellum longer than article 2 of flagellum but shorter than article 3 of peduncle. Rostrum variable, large to absent. Labrum usually entire, rarely incised or deeply bilobed. Mandibles with 3-articulate palp, molar triturative, rarely reduced and simple. Labium with or without inner lobes but not of form in Pleustidae. Other mouthparts basic though many genera with reduced medial and facial setation on inner plates of maxillae, several genera with reduced palp of maxilla 1, one genus (*Laothoes*) with enlarged outer plate of maxilliped.

Coxae medium to very short, coxa 4 occasionally without excavation or posterior lobe. Gnathopods variable, powerful and subchelate, usually small and moderately subchelate, occasionally feeble and/or simple (*Harpinioides*); some genera with so-called 'eusirid' gnathopods, those having propodus attached to carpus by narrow neck allowing great flexibility, these gnathopods appearing hammer-shaped. Pereopods 3-7 variable but 5-7 without internal diversity or subgrouping. Outer ramus of uropods 1-2 usually shortened. Rami of uropod 3 broadly lanceolate, flat, 1-articulate, outer often shortened, inner rarely shortened; peduncle short or elongate, uropod 3 often overextending uropod 1. Telson ordinary or elongate, entire or cleft, emarginate or trifid, linguiform or triangular, usually very poorly armed but occasional genera with several elongate apical setae or weak spines, apex of entire or lobate telson often with cusps.

Body occasionally carinate or toothed but never very strongly (*Rhachotropis* and *Austroregia* strongest).

Calceoli. Two kinds of calceoli occur in taxa of this group (Lincoln & Hurley, 1981). In the pontogeneiid-calliopiid-paracalliopiid kind the proximal element and the distal element are closely contiguous, the proximal element not forming a separate cup. That form is found in *Apherusa*, *Bovallia*, *Calliopius*, *Eusiroides*, *Halirages*, *Paramoera* and *Pontogeneia*.

In the Eusirid-*Amathillopsis* form the distal element is fully discontiguous from the proximal element and forms a cup or tympanum. This is found in *Eusirus*, *Rhachotropis* and *Schraderia*.

Unfortunately calceoli are not found in all genera nor some species of the partly calceoliferous genera so that they can only be used in this group to visualise certain subgroupings. They suggest that Paracalliopiidae have their roots in the Pontogeneiid-Calliopiid genera whereas *Gammarellus*, *Chosroes* as a group, and the Oedicerotidae have their roots in the eusirid genera. In other places evidence is presented that Oedicerotidae might have funnelled out of pontogeneiids near paracalliopiids directly without going through eusirids.

Relationship. Eusirids represent a diverse group of taxa of gammaroid form, mostly living in the sea, that have lost or had the accessory flagellum severely reduced. Eusirids therefore intergrade Gammaroidea because several gammaroids have reduced accessory flagella. Eusirids can be described simply as derived grades of gammaroids. Decision on familial assignment can often be difficult but generally is assisted by studying the 'facies' or 'jizz'. This means that one must try to match the taxon in question with some generalised member of the Gammaroidea. The lack of matching is especially notable in many Eusiridae because gammaroids generally have more strongly spinose telsons, and more often have dispariramous uropod 3 with 2-articulate outer ramus and strongly shortened inner rami whereas in Eusiridae quite the opposite is true. A few taxonomists have suggested that eusirids are more primitive than gammaridans but they have not yet justified the loss of accessory flagellum nor constructed an ancestor for this

deployment. Most eusirids have the outer rami of uropods 1 and 2 (often 3) shortened, and many have weak or feeble gnathopods. The suspected eusirid can be keyed through the Gammaroidea keys in Barnard & Barnard (1983) until some absurd position is reached. Many small hints can be found to aid in taxonomic assignments. For example, almost no gammaroid has strong alternation in size of flagellar articles on antenna 1, a characteristic of dozens of species of eusirids. No eusirid has a basofacial spine on the peduncle of uropod 1, a character present in many gammaroids. Few gammaroids have both outer rami of uropods 1 and 2 shortened and almost never have shortened outer rami of uropod 3. Few marine gammaroids have calceoli as strongly developed as in many eusirids. Pereopods 5 to 7 in eusirids usually are rigidly like each other (except *Rhachotropis*), whereas fewer gammaroids have rigidly similar pereopods 5 to 7. The linguiform uncleft telson of so many eusirids (the old calliopiids) is almost never found in gammaroids, especially marine taxa. Most marine gammaroids with cleft telsons also have strong telsonic armament.

In the time of Stebbing (1906) the eusirid concept focussed on the enlarged pleosome, the calliopiid on the uncleft telson, and the pontogeneiid on the cleft telson. These divisions have not worked well and in the last two decades all have been synonymised. However, there is a possibility that Calliopius and Gammarellus are confamilial and this is why the names calliopiid and gammarellid are still honoured. The Melphidippidae connect by analogy to eusirids through *Metaleptamphopus* which has the similar elongate uropod 3 with elongate peduncle; the latter taxon resembles *Melphisana* of Melphidippidae in the uncleft telson, obsolete accessory flagellum, slightly enlarged coxae and well-developed rostrum. Eusirids never have the melphidippid combination of almost simple gnathopod 1 with carpus longer than propodus and broadly lobate.

Pleustidae differ from Eusiridae mainly in their lower lips described as tilted oval outer lobes astride almost fused inner lobes. The lower lips of *Mesopleustes* (Pleustidae) and *Harpinioides* (Eusiridae) bridge the small difference between the families.

Iphimediidae (= Acanthonotozomatidae, Paramphithoidae) always have one of the first four pairs of coxae pointed. But iphimediids and eusirids are bridged by *Austroregia* and *Cleippides* which have the subacuminate anterior coxae. On the basis of calceoli, *Austroregia* belongs with the Gammarellidae, a family apparently synonymous with the Calliopiidae; the generic content of this so-called family is very restricted so that most taxa formerly considered as the 'pontogeneiid' fraction no longer belong in Calliopiidae, but the Pontogeneiidae have not yet been sufficiently well defined to be usable as a concept and we place those genera in our Eusiridae. In any event this kind of handbook is not the place to try to present a phylogenetic classification nor to solve major nomenclatural questions.

The Laphystiopsidae appear to be derivative from Eusiridae in which the gnathopods are completely simple as in the iphimediid *Cleippides*, and the maxillipedal palp is poorly setose.

The Vitjazianidae are somewhat more distinct in that at least gnathopod 1 is simple (like *Cleippides*) and also bears an elongate dactyl reminiscent of ordinary pereopod 3 in many families. The peduncle of antenna 1 on Vitjazianidae is very short and formed in fashion similar to Lysianassidae.

Oedicerotidae have disproportionately long pereopod 7 and densely setose coxae and pereopods.

Most Synopiidae have multiarticulate accessory flagellum, but those which do not, have a massive, usually galeate head, a frequently strong deflexion of rostrum (but like certain eusirids such as *Rhachotropis*), and a nondominant coxa 4. The feeble gnathopods, but especially the feeble mandibular palp on which article 3 is extremely short, also characterise synopiids.

The total absence of molar and the laminar, broadly toothed incisor of one mandible distinguish Pardaliscidae. The strange laminar mandible similar to Pardaliscidae helps to distinguish stilipedids (= astyrids).

Stilipedidae have a very strong gap between the outer lobes of the lower lip, the gnathopods are simple but not so strongly different from *Pseudomoera* or *Cleippides* (in combination), and like *Cleippides* (but no other incipient eusirid, except *Laothoes*) the outer plate of the maxillipeds is greatly enlarged.

All Liljeborgiidae have a nontriturative molar but most also have a large multiarticulate accessory flagellum. Most of them have a feeble mandibular palp with short article 3, weak plates on the maxilliped, and large apical spines on the telson.

Dexaminidae have pleonites 5-6 coalesced.

Pseudamphilochidae could be confused with Eusiridae but have a subtle combination of head-antennal shape, mandibles, gnathopods and uropod 3 that is distinctive.

Hyperiopsidae have very elongate fourth articles on pereopods 3 and 4 and the palp of maxilla 1 is weakly geniculate or curved medially.

Removals. *Clarencia* has been removed to its own family which is characterised by chelate gnathopods and uniramous uropod 3.

Cleippides has been transfered to Iphimediidae. *Chosroes* has been transfered to the vicinity of *Gammarellus* in Gammaroidea.

Paraleptamphopus has been transfered to Gammaroidea.

Harpinioidella is a synonym of *Harpinioides*.

Some of these genera are nevertheless retained in the generic keys to Eusiridae.

Key 1 to Genera of Eusiridae

(See also Bulycheva, 1986, for key to 'Calliopiidae')

1. Pleonites 1-2 tricarinate ..... *Regalia*

—— Pleonites 1-2 not tricarinate 2

2. Mandibular molar nontriturative, usually conical 3

—— Mandibular molar triturative, columnar, rather conical (*Atylopsis*) 6

3. Gnathopods 1-2 of eusirid form ..... *Eusiropsis*

—— Gnathopods 1-2 not eusirid-like 4

4. Inner plate of maxilla 2 broader than outer; palp of maxilla 1 short, article 1 longer than article 2 [vaguely Stilipedidae] ..... [vaguely also *Pseudamphilochus*]*Eusirella*

—— Inner plate of maxilla 2 not broader than outer; palp of maxilla 1 ordinary article 2 longer than article 1 5

5. Carpi of gnathopods 1-2 shorter than propodi, weakly lobed, antenna 2 elongate ..... [see also *Prolaphystiopsis*] *Harpinioides*

—— Carpi of gnathopods 1-2 as long as propodi, unlobed, antenna 1 elongate ..... *Calliopiurus*

6. Eusirid and noneusirid gnathopods combined together in one species 7

—— Both pairs of gnathopods in both sexes alike, eusirid together or non eusirid together 8

7. Body depressed, male gnathopod 2 of eusirid form ..... *Sancho*

—— Body compressed, male gnathopod 1 of eusirid form (gammarid) ..... *Paraleptamphopus*

8. Gnathopods of strong eusirid form 9

—— Gnathopods not strongly eusirid-like 11

9. Gnathopod 1 larger than gnathopod 2 ..... *Eusirogenes*

—— Gnathopod 1 not larger than gnathopod 2 10

10. Article 5 of gnathopods 1-2 bearing numerous short posterior setae; accessory flagellum absent; maxillipedal palp article 4 spinose along inferior margin ..... *Pareusirogenes*

—— Article 5 of gnathopods 1-2 poorly setose posteriorly; accessory flagellum present; maxillipedal palp article 4 not spinose along inferior margin ..... *Eusirus*

11. Inner plate of maxilla 2 much broader than outer plate 12

—— Inner plate of maxilla 2 not much broader than outer plate 21

12. Pereopods 3-7 prehensile ..... *Bouvierella*

——Pereopods 3-7 not prehensile 13

13. Dactyl of pereopods 3-7 strongly pectinate on superior margin, uropod 3 huge ..... *Metaleptamphopus*

——Dactyl of pereopods 3-7 not strongly pectinate on superior margin, uropod 3 ordinary to small 14

14. Coxa 4 twice as long as coxa 1 15

——Coxa 4 not twice as long as coxa 1 16

15. Body carinate or toothed, telson short, coxae 3-4 long ..... *Cleonardopsis*

——Body smooth, telson elongate, coxae 3-4 short ..... *Meteusiroides*

16. Gnathopods 1-2 greatly dissimilar, article 5 of gnathopod 1 reaching two thirds length of article 6; gnathopod 2 much enlarged, article 5 much shorter than article 6 (1:6), with strong lobe ..... *Pontogeneoides*

——Gnathopods 1-2 similar to each other, article 5 much shorter than article 6, lobe (?well) developed, gnathopod 2 not greatly enlarged 17

17. Pereopods 3-7 not elongate 18

——Pereopods 3-7 elongate 19

18. Labrum weakly incised or emarginate ..... *Eusiroides*

——Labrum deeply incised ..... *Ronco*

19. Coxa 1 strongly produced anteriorly, body carinate or toothed ..... *Rhachotropis*

——Coxa 1 not or scarcely produced anteriorly, body smooth 20

20. Accessory flagellum absent ..... *Harcledo*

——Accessory flagellum present ..... *Cleonardo*

21. Article 2 of pereopods 3-4 with large midanterior lobe; [body very depressed] ..... [near *Gammarellus*] *Chosroes*

——Article 2 of pereopods 3-4 without large midanterior lobe; [body more or less compressed laterally] 22

22. Coxae very short and progressively longer towards coxa 7 23

——Coxae not as greatly shortened and not progressively lengthened towards coxa 7 24

23. Articles 5-6 of pereopods 6-7 extremely elongate (planktonic); body carinate; coxa 1 not or scarcely produced anteriorly; article 3 of peduncle on antenna 1 weakly produced distoventrally ..... [*Regalia*] *Stenopleuroides*

—— Articles 5-6 of pereopods 6-7 not extremely elongate; body smooth; coxa 1 produced anteriorly; article 3 of peduncle on antenna 1 weakly produced distoventrally ..... [*Haliragoides*]*Stenopleura*

24. Palp of maxilla 1 reduced, not exceeding apex of outer plate, article 1 longer than article 2 or outer plate of maxilliped enlarged, reaching apex of palp article 3 25

—— Palp of maxilla 1 ordinary, article 1 shorter than article 2, outer plate of maxilliped ordinary, not reaching apex of palp article 3 26

25. Telson almost entire, accessory flagellum absent, outer plate of maxilliped immense ..... *Laothoes*

—— Telson deeply cleft, accessory flagellum present, outer plate of maxilliped ordinary ..... *Awacaris*

26. Article 5 of either of gnathopods 1-2 much wider (or longer?) than article 6, with large lobe produced distalwards 27

—— Article 5 of gnathopods 1-2 scarcely larger (or longer) or usually smaller than article 6, lobe if present not produced in distalwards direction 33

27. Gnathopod 2 much larger than gnathopod 1 ..... *Dautzenbergia*

—— Gnathopod 2 subequal to gnathopod 1 28

28. Telson entire ..... *Paracalliopiella*

—— Telson cleft 29

29. Epistome sharply produced, palms of gnathopods with large spines ..... *Meteusiroides*

—— Epistome unproduced, palms of gnathopods with weak armament 30

30. Carpus of both pairs of gnathopods lobate ..... *Pseudomoera*

—— Only carpus of gnathopods 2 lobate (if any lobes present) 31

31. Epimeron 3 strongly serrate ..... *Nasageneia*

—— Epimeron 3 weakly serratosetulate or smooth 32

32. Calceoli anthurial ..... *Tethygeneia*

—— Calceoli seriate (about 4 tympana in row) ..... *Abdia*

33. Article 4 of pereopods 5-7 strongly dilated and produced distoposteriorly (dactyl of pereopods 3-7 minutely pectinate on inferior margin) ..... (Pontoporeiidae) *Zaramilla*

—— Article 4 of pereopods 5-7 not dilated, usually poorly produced distoposteriorly 34

34. Rami of uropods 1-2 without lateral and dorsal spines (bearing only distal spine(s), (rami usually only half as long as peduncle) ..... (see also *Paramoera incognita*) *Calliopiella*

—— Rami of uropods 1-2 with lateral and dorsal spines 35

35. Body stout, umbonate ..... *Eurymera*

—— Body stout or slender, not umbonate 36

36. Gnathopod 2 very slender, linear, article 5 very slender and elongate, unlobed, article 6 generally elongate and linear (except in *Amphithopsis*) ..... (also see Key 3) 37

—— Gnathopod 2 not very slender nor linear nor greatly elongate (propodus not especially elongate) 53

37. Gnathopod 1 ordinary, neither linear nor elongate 38

—— Gnathopod 1 linear, elongate 44

38. Article 6 of gnathopod 2 not linear; dactyl of pereopods 3-7 with 2 inferior teeth; outer ramus of uropod 3 less than half as long as inner ramus ..... *Amphithopsis*

—— Article 6 of gnathopod 2 linear; dactyl of pereopods 3-7 without inferior teeth; outer ramus of uropod 3 more than half as long as inner ramus 39

39. Telson entire or emarginate 40

—— Telson cleft 42

40. Pereopods 3-7 prehensile ..... *Bouvierella*

—— Pereopods 3-7 not prehensile 41

41. Outer plate of maxilliped enlarged ..... *Laothoes*

—— Outer plate of maxilliped ordinary ..... *Oradarea*

42. Epistome sharply produced, rostrum large, peduncle of uropod 3 with large process ..... *Liouvillea*

—— Epistome unproduced, rostrum small, uropod 3 peduncle lacking large process 43

43. Article 3 of antenna 1 elongate, rami of uropod 3 lanceolate, palp of maxilla 1 ordinary ..... *Relictomaera*

—— Article 3 of antenna 1 short, rami of uropod 3 rod-shaped, palp of maxilla 1 reduced ..... *Awacaris*

44. Dactyl of pereopods 5-7 with one or more superior spines 45

—— Dactyl of pereopods 5-7 without superior spines 47

45. Dactyl of pereopods 5-7 with 1 superior spine; inner ramus of uropod 3 much shorter than outer ramus (3:5); peduncular article 1 of antenna 1 longer than article 2 ..... *Djerboa*

—— Dactyl of pereopods 5-7 with several superior spines; rami of uropod 3 subequally extended; peduncular article 1 of antenna 1 shorter than article 2 46

46. Telson cleft, palms of gnathopods well developed ..... *Bathyschraderia*

—— Telson entire, palms of gnathopod obsolescent ..... *Cleippides*

47. Article 5 of gnathopods 1-2 much longer than article 6 48

—— Article 5 of gnathopods 1-2 scarcely longer and usually shorter than article 6 52

48. Body carinate, antenna 1 longer than 2, uropod 3 not extended 49

—— Body smooth, antenna 2 longer than 1, uropod 3 extended beyond uropod 1 51

49. Gnathopods simple, dactyls of pereopods 3-7 with armaments ..... *Cleippides*

—— Gnathopods subchelate, dactyls of pereopods 3-7 simple 50

50. Calceoli present ..... *Halirages*

—— Calceoli absent ..... *Apherusa*

51. Propodus of gnathopods slender, rectangular ..... *Apherusa*

—— Propodus of gnathopods broadened, almond shaped ..... *Haliragoides*

52. Inner ramus of uropod 3 twice as long as outer ramus; accessory flagellum absent ..... *Leptamphopus*

—— Inner ramus of uropod 3 as long as or longer than outer ramus; accessory flagellum present ..... *Schraderia* (and *Awacaris*)

53. Article 3 of peduncle on antenna 1 produced apicoventrally 54

—— Article 3 of peduncle on antenna 1 not or weakly produced apicoventrally 65

54. Body stout; article 1 of peduncle on antenna 1 large, much longer than head ..... *Bovallia*

—— Body slender; article 1 of peduncle on antenna 1 scarcely longer but usually shorter than head 55

55. Article 5 on either of gnathopods 1-2 much shorter than article 6 56

—— Article 5 on gnathopods 1-2 scarcely shorter than or longer than article 6 62

56. Carpus of gnathopods not or scarcely lobate 57

—— Carpus of gnathopods strongly lobate ..... *Calliopius*

57. Outer ramus of uropod 3 much shortened ..... *Tylosapis*

—— Rami of uropod 3 nearly subequal 58

58. Telson distinctly cleft ..... *Gondogeneia*

—— Telson emarginate or entire 59

59. Telson ordinary 60

—— Telson elongate 61

60. Telson deeply emarginate ..... *Atylopsis*

—— Telson entire ..... *Halirages bungei*

61. Gnathopods subequal ..... (Gammarellidae) *Austroregia*

—— Gnathopod 1 of male greatly enlarged ..... *Whangarusa*

62. Accessory flagellum present; [body carinate, inner ramus of uropod 3 longer than outer; inner plate of maxilla 2 with one facial seta] 63

—— Accessory flagellum absent [inner plate of maxilla 2 with more than one facial seta, other characters variable] 64

63. Body smooth, inner plate of maxilla 2 with many facial setae ..... *Lopyastis*

—— Body carinate, or smooth or toothed, inner plate of maxilla 2 with 1 facial seta ..... *Accedomoera*

64. Telson distinctly cleft ..... *Pontogeneia*

—— Telson entire but apically concave, not distinctly cleft ..... *Halirages*

65. Pereopods 3-7 elongate; [gnathopods 1-2 with greatly elongate trapezoidal article 5, article 6 much shorter than article 5] ..... *Haliragoides*

—— Pereopods 3-7 not elongate; [gnathopods 1-2, except *Halirages*, usually with ordinary article 5, article 6 not greatly shorter than article 5] 66

66. Article 5 of gnathopods 1-2 dissimilar in lobation, gnathopod 2 with strong narrow lobe, gnathopod 1 poorly lobed [rostrum extending more than halfway along article 1 of antenna 1] 67

—— Article 5 of gnathopods 1-2 similar to each other, weakly lobed or unlobed, lobes if present broad and short 69

67. Epimeron 3 unserrate, propodus of male gnathopods lacking posterior spines outside of palm 68

—— Epimeron 3 serrate, propodus of male gnathopods bearing posterior spines outside of palm ..... [including Bateidae] *Nasageneia*

68. Propodus of gnathopod 2 huge, rostrum small, article 3 of mandibular palp longer than article 2 ..... *Dautzenbergia*

—— Propodus of gnathopod 2 ordinary, rostrum large, article 3 of mandibular palp shorter than article 2 ..... *Tethygeneia*

69. Telson entire, notched, truncate, weakly incised but not distinctly cleft 70

—— Telson distinctly cleft 81

70. Epimeron 3 serrate 71

—— Epimeron 3 not serrate 72

71. Article 5 of gnathopods 1-2 longer than 6, accessory flagellum absent ..... group of *Apherusa bispinosa* + *Halirages*

—— Article 5 of gnathopods 1-2 not longer than article 6, accessory flagellum present ..... *Oligochinus*

72. Rostrum small 73

—— Rostrum large 79

73. Gnathopodal palms obsolescent ..... *Cleippides*

—— Gnathopodal palms well developed 74

74. Accessory flagellum absen t75

—— Accessory flagellum present 78

75. Gnathopod 1 strongly dominant in male ..... *Whangarusa*

—— Gnathopod 1 not dominant 76

76. Outer plate of maxilliped enlarged ..... *Laothoes polylovi*

—— Outer plates of maxilliped ordinary 77

77. Calceoli absent, telson ordinary ..... *Apherusa*

—— Calceoli present, telson elongate ..... *Austroregia, Meteusiroides*

78. Telson deeply emarginate, articles of flagellum on antenna 1 even ..... *Atylopsis*

—— Telson entire, articles of flagellum on antenna 1 diverse ..... *Paracalliopiella*

79. Dactyls of pereopods 3-7 bifid ..... *Manerogeneia*

—— Dactyls of pereopods 3-7 pectinate 80

80. Accessory flagellum present, pectinations of pereopodal dactyls on outer sides, uropod 3 ordinary ..... *Membrilopus*

—— Accessory flagellum absent, pectinations of dactyls on pereopods 3-7 on inner side, uropod 3 huge and extended ..... *Metaleptamphopus*

81. Article 5 of both gnathopods 1-2 much longer than article 6 82

—— Article 5 of only gnathopod 1 or 2 or neither much longer than article 6 84

82. Article 3 of antenna 1 not produced ..... [including Stilipedidae] *Apherusa*

—— Article 3 of antenna 1 produced 83

83. Article 2 of antenna 1 as long as article 1 ..... *Antarctogeneia*

—— Article 2 of antenna 1 shorter than article 1 ..... *Pontogeneia*

84. Sternal gills present ..... *Sternomoera*

—— Sternal gills absent 85

85. Epistome acutely produced 86

—— Epistome not produced 88

86. Peduncle of uropod 3 ordinary ..... *Meteusiroides*

—— Peduncle of uropod 3 with large apical process 87

87. Rostrum large, anteroventral corner of head not produced ..... *Liouvillea*

—— Rostrum small, anteroventral corner of head produced ..... *Atyloella*

88. Lateral cephalic lobes sinusoid ..... *Relictomoera*

—— Lateral cephalic lobes not sinusoid 89

89. Gnathopod 2 greatly enlarged, dactyl of pereopods 5-7 with 2 teeth ..... (?theoretical position) *Dautzenbergia*

—— Gnathopod 2 not greatly enlarged, dactyl of pereopods 5-7 with less than 2 teeth 90

90. Inner plate of maxilla 2 with 3 or more facial setae in oblique row 91

—— Inner plate of maxilla 2 with 1 or no facial setae 93

91. Accessory flagellum absent ..... *Prostebbingia*

—— Accessory flagellum present 92

92. Coxa 4 excavate, rostrum ordinary to large ..... *Paramoera*

—— Coxa 4 not or scarcely, excavate, rostrum obsolescent ..... *Paramoerella*

93. Telson with long apical setae or spines ..... group of North Pacific *Paramoera*

—— Telson lacking long apical setae or spines 94

94. Epimeron 3 serrate, anteroventral angle of head strongly produced ..... [including Stilipedidae] *Apherusa* (*Rozinante*)

—— Epimeron 3 not serrate, anteroventral angle of head not strongly produced 95

95. Eyes round; rostrum very small; gnathopod 1 slightly larger than gnathopod 2 ..... *Gondogeneia*

—— Eyes reniform; rostrum of medium size; gnathopod 1 not larger than gnathopod 2 ..... group of North Pacific like *Pontogeneia rostrata*

Key 2 to Genera of Eusiridae

(except *Paraleptamphopus* and *Zaramilla*)

1. Inner plate of maxilla 2 broader than outer plate 2

—— Inner plate of maxilla 2 not broader than outer plate 15

2. One or both pairs of gnathopods eusirid 3

—— Neither pair of gnathopods distinctly eusirid 7

3. Only gnathopod 2 eusirid, gnathopod 1 mittenform ..... *Sancho*

—— Both pairs of gnathopods eusirid 4

4. Accessory flagellum absent ..... *Pareusirogenes*

—— Accessory flagellum present 5

5. Gnathopod 1 larger than gnathopod 2 ..... *Eusirogenes*

—— Gnathopod 1 as large as gnathopod 2 6

6. Accessory flagellum elongate, molar triturative, dactyls of pereopods 3-7 not setose, telson without long apical spines ..... *Eusirus*

—— Accessory flagellum short, molar simple, dactyls of pereopods 3-7 setose, telson with long apical spines ..... *Eusiropsis*

7. Telson ordinary ..... [including Stilipedidae] *Cleonardopsis*

—— Telson elongate 8

8. Gnathopod 2 much larger than gnathopod 1 ..... *Pontogeneoides*

—— Gnathopod 2 not much larger than gnathopod 1 9

9. Epistome sharply produced ..... *Meteusiroides*

—— Epistome not produced 10

10. Palp of maxilla 1 shortened, molar simple or poorly triturative ..... *Eusirella*

—— Palp of maxilla 1 ordinary, molar distinctly triturative 11

11. Coxa 1 not expanded or produced 12

—— Coxa 1 expanded and produced 13

12. Accessory flagellum present ..... *Cleonardo*

—— Accessory flagellum absent ..... *Harcledo*

13. Spines on palms of gnathopods thin or inconspicuous, body carinate, graceful, pereopods elongate, collected in demersal samples ..... *Rhachotropis*

—— Spines on palms of gnathopods thick, body uncarinate, or weakly carinate and toothed, thick or stout, generally benthic 14

14. Labrum deeply incised ..... *Ronco*

—— Labrum weakly incised or entire ..... *Eusiroides*

15. Either pair of gnathopods with large posterior lobe on carpus 16

—— Neither pair of gnathopods with large posterior lobe on carpus 26

16. Gnathopod 2 much larger than gnathopod 1 ..... *Dautzenbergia*

—— Gnathopods of nearly subequal size 17

17. Coxae very short 18

—— Coxae ordinary 19

18. Body smooth ..... *Stenopleura*

—— Body carinate ..... (see also *Regalia*) *Stenopleuroides*

19. Telson entire 20

—— Telson cleft 22

20. Accessory flagellum present ..... *Paracalliopiella*

—— Accessory flagellum absent 21

21. Dactyls of pereopods 3-7 ordinary, rami of uropod 3 subequal ..... *Calliopius*

—— Dactyls of pereopods 3-7 bifid, outer ramus of uropod 3 shortened ..... *Manerogeneia*

22. Gnathopods 1-2 alike, both with lobate carpus 23

—— Gnathopods 1-2 divergent, only gnathopod 2 with lobate carpus 24

23. Back carinate, accessory flagellum absent, inner lobes of lower lip absent ..... *Bovallia*

—— Back smooth, accessory flagellum present, inner lobes of lower lip present ..... *Pseudomoera*

24. Calceoli seriate ..... *Abdia*

—— Calceoli anthurial 25

25. Epimeron 3 serrate ..... *Nasageneia*

—— Epimeron 3 unserrate ..... *Tethygeneia*

26. Gnathopods simple (palm absent, dactyl short and/or not folding back on propodus) 27

—— Gnathopods subchelate 29

27. Coxae ordinary, coxa 1 either expanded apically or elongate and coxa 4 weakly excavate posteriorly 28

—— Coxae small, coxa 1 not expanded, coxa 4 not excavate ..... *Regalia*

28. Antenna 1 much longer than shortened antenna 2, coxae 1-3 not longer than broad ..... [see also *Prolaphystiopsis*] *Cleippides*

—— Elongate antenna 2 longer than medium antenna 1, coxae 1-3 twice as long as wide ..... *Calliopiurus*

29. Length of one ramus on uropod 3 about 75% or less of other ramus 30

—— Rami of uropod 3 subequal 38

30. Telson deeply cleft 31

—— Telson entire or emarginate or distally incised 32

31. Body not umbonate, gnathopod 2 linear, accessory flagellum present, dactyls of pereopods 3-7 with tooth ..... *Djerboa*

—— Body umbonate, gnathopod 2 ordinary, accessory flagellum absent, dactyls of pereopods 3-7 simple ..... *Eurymera*

—— Body not umbonate, gnathopod 2 ordinary, accessory flagellum present, dactyls of pereopods simple ..... *Accedomoera*

32. One or both gnathopods linear 33

—— Neither pair of gnathopods linear 35

33. Accessory flagellum absent, article 3 of mandibular palp long and thin ..... *Oradarea*

—— Accessory flagellum present, article 3 of mandibular palp short and stout 34

34. Maxilla 2 with facial setae, accessory flagellum tiny, articles 5-6 of gnathopod 2 together 1.5 times as long as article 2 ..... *Leptamphopus*

—— Facial setae on maxilla 2 absent, accessory flagellum elongate, articles 5-6 of gnathopod 2 together 1.1 times as long as article 2 ..... *Amphithopsis*

35. Body with dorsal teeth ..... *Austroregia*

—— Body smooth 36

36. Dactyls of pereopods 3-7 bifid ..... *Manerogeneia*

—— Dactyls of pereopods 3-7 not bifid 37

37. Inner plate of maxilla 1 setose only apically, accessory flagellum absent but article 3 of antenna 1 produced, dactyls of pereopods 3-7 simple ..... *Tylosapis*

—— Inner plate of maxilla 1 strongly setose medially, accessory flagellum present, dactyls of pereopods 3-7 pectinate ..... *Membrilopus*

38. Epistome sharply produced anteriorly 39

—— Epistome unproduced 41

39. Anteroventral angle of head produced ..... *Atyloella*

—— Anteroventral angle of head unproduced 40

40. Rostrum large, article 2 of antenna 1 short ..... *Liouvillea*

—— Rostrum small, article 2 of antenna 1 elongate ..... *Antarctogeneia*

41. Propodus of gnathopods elongate and bent ..... *Harpinioides* (= *Harpinioidella*)

—— Propodus of gnathopods not bent 42

42. Uropod 3 greatly extended beyond uropod 1 43

—— Uropod 3 not or hardly extended beyond uropod 1 46

43. Dactyls of pereopods 3-7 pectinate on superior margins ..... *Metaleptamphopus*

—— Dactyls of pereopods 3-7 not pectinate 44

44. Propodus of gnathopods rectangular ..... *Apherusa*

—— Propodus of gnathopods ovatotrapezoidal or inflated 45

45. Rami of uropods 1-2 with marginal spines ..... *Haliragoides*

—— Rami of uropods 1-2 marginally naked *Calliopiella*

46. Body greatly depressed and article 2 of pereopods 3-4 with large anterior process ..... (near *Gammarellus*) *Chosroes*

—— Body not greatly depressed, article 2 of pereopods 3-4 simple 47

47. Sternal gills present ..... (Gammarida) *Sternomoera*

—— Sternal gills absent 48

48. Gnathopod 1 much larger than gnathopod 2 49

—— Gnathopods subequal or gnathopod 2 larger than 1 50

49. Telson cleft, facial setae on maxilla 2 weak or absent ..... *Gondogeneia*

—— Telson entire, maxilla 2 with row of facial setae ..... *Whangarusa*

50. Telson entire or emarginate 51

—— Telson cleft 58

51. Outer plate of maxilliped enlarged ..... *Laothoes*

—— Outer plate of maxilliped ordinary 52

52. Inner plate of maxilla 2 without facial setae 53

—— Inner plate of maxilla 2 with row of facial setae 55

53. Epimeron 3 serrate ..... *Bouvierella*

—— Epimeron 3 not serrate 54

54. Main flagellum of antenna 1 with diverse articles ..... *Paracalliopiella*

—— Main flagellum of antenna 1 with regular articles ..... (?and *Regalia*) *Atylopsis*

55. Article 3 of antenna 1 with process ..... *Halirages*

—— Article 3 of antenna 1 without process 56

56. Accessory flagellum absent ..... *Apherusa*

—— Accessory flagellum present 57

57. Inner plate of maxilla 2 with row of facial setae, head slightly produced anteroventrally ..... (see also *Paramoera incognita*) *Lopyastis*

—— Inner plate of maxilla 2 with only 1 facial seta, head not produced anteroventrally ..... *Oligochinus*

58. Accessory flagellum absent or not articulate 59

—— Accessory flagellum present, articulate 63

59. Inner plate of maxilla 1 widely setose medially ..... *Prostebbingia*

—— Inner plate of maxilla 1 setose mostly near apex 60

60. Peduncle of antenna 1 elongate ..... *Antarctogeneia*

—— Peduncle of antenna 1 not elongate 61

61. Article 3 of antenna 1 unproduced ..... *Apherusa*

—— Article 3 of antenna 1 produced 62

62. Calceoli of pontogeneiid form (see Lincoln & Hurley, 1981), coxae 1-4 protruding anteroventrally ..... *Pontogeneia*

—— Calceoli of gammarellid form, coxae 1-3 bevelled anteroventrally ..... *Austroregia*

63. Inner plate of maxilla 1 poorly setose (5 or fewer setae), facial (= medial) setae on inner plate of maxilla 2 = 0-2 64

—— Inner plate of maxilla 1 strongly setose (6 or greater), facial setae on inner plate of maxilla 2 = 3+ 66

64. Telson emarginate or scarcely cleft ..... *Oligochinus*

—— Telson deeply cleft 65

65. Article 3 of antenna 1 not strongly produced, eyes round or ovate ..... *Gondogeneia*

—— Article 3 of antenna 1 strongly produced, eyes reniform ..... *Accedomoera*

66. Article 3 of antenna 1 elongate ..... *Relictomoera*

—— Article 3 of antenna 1 not elongate 67

67. Article 2 of antenna 1 longer than article 1 ..... *Bathyschraderia*

—— Article 2 of antenna 1 almost subequal o r shorter than article 1 68

68. Palp of maxilla 1 reduced ..... *Awacaris*

—— Palp of maxilla 1 ordinary 69

69. Gnathopods linear ..... *Schraderia*

—— Gnathopods inflated 70

70. Rostrum moderately large, coxa 4 excavate ..... *Paramoera*

—— Rostrum obsolescent, coxa 4 scarcely excavate posteriorly ..... *Paramoerella*

Key 3 to Genera of Eusiridae (restricted)

(either of gnathopods 1 or 2 linear)

1. Telson entire or emarginate 2

—— Telson cleft 9

2. Mandibular molar evanescent, not triturative ..... *Calliopiurus*

—— Mandibular molar triturative 3

3. Outer plate of maxilliped enlarged ..... *Laothoes*

—— Outer plate of maxilliped ordinary 4

4. Outer ramus of uropod 3 half to three fourths length of inner ramus 5

—— Rami of uropod 3 subequal 7

5. Maxilla 2 lacking facial setae, dactyls of pereopods 3-7 serrate, toothed or pectinate, propodus of gnathopods short ..... *Amphithopsis*

—— Maxilla 2 with facial setae, dactyls of pereopods 3-7 simple, propodus of gnathopods elongate 6

6. Mandibular palp article 3 much shorter than article 2, accessory flagellum present ..... *Oradarea*

—— Mandibular palp article 3 as long as article 2, accessory flagellum absent ..... *Leptamphopus*

7. Carpu s of gnathopod 1 sublobate, maxilla 2 lacking facial setae ..... *Bouvierella*

—— Carpus of cgnathopod 1 unlobate, cmaxilla 2 with facial setae 8

8. Calceoli present, article 3 of antenna 1 produced ..... *Halirages*

—— Calceoli absent, article 3 of antenna 1 unproduced ..... *Apherusa*

9. Rami of uropod 3 rod-like, palp of maxilla 1 reduced ..... *Awacaris*

—— Rami of uropod 3 lanceolate, palp of maxilla 1 ordinary 10

10. One ramus of uropod 3 very short ..... *Djerboa*

—— Rami of uropod 3 subequal 11

11. Article 3 of antenna 1 subequal to article 2 ..... *Relictomoera*

—— Article 3 of antenna 1 much shorter than article 2 12

12. Article 3 of antenna 1 produced 13

—— Article 3 of antenna 1 not produced 14

13. Article 2 of antenna 1 shorter than article 1, peduncle of antenna 2 not elongate ..... *Pontogeneia*

—— Article 2 of antenna 1 as long as article 1, peduncle of antenna 2 elongate ..... *Antarctogeneia*

14. Epistome sharply produced, peduncle of uropod 3 with large process ..... *Liouvillea*

—— Epistome unproduced, peduncle of uropod 3 lacking large process 15

15. Accessory flagellum absent ..... *Apherusa*

—— Accessory flagellum present 16

16. Article 2 of antenna 1 much shorter than article 1 ..... *Schraderia*

—— Article 2 of antenna 1 longer than article 1 ..... *Bathyschraderia*

Abdia Barnard & Karaman

Abdia Barnard & Karaman, 1987: 860.

Type species. *Atylopsis latipalpus* Walker & Scott, 1903, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum [?large], lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes ovate. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 2 shorter than head, article 3 not produced; article 1 of primary flagellum short, accessory flagellum absent. Calceoli seriate. Labrum [?entire, subrounded, broader than long, epistome unproduced]. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: [?inner lobes absent]. Maxilla 1: inner plate with 3 medial setae, palp long, article 1 slightly elongate. Maxilla 2: [?inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae and other medial setae]. Maxilliped: inner plate relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed (?), 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods diverse, small (female), of similar size, subchelate, not eusirid, carpus of both scarcely shorter than propodus, of second only with strong posterodistal lobe extending distad, carpus of both without numerous long posterior setae. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 not serrate. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, nearly subequal. Telson ordinary, cleft, apices without long apical armaments.

Additional characters. Coxal gills heavily pleated as in Atylidae; urosomites however, distinct.

Assumption. If *Pontogeneia barnardi* Rabindranath (1972a) is a synonym of *Atylopsis latipalpus* then the rostrum of *Abdia* is large like that of *Tethygeneia* and *Nasageneia.*

Relationship. Differing from the freshwater Australia *Pseudomoera* in the presence of carpal lobes only on gnathopod 2.

Differing from *Tethygeneia* in the seriate, not anthurial, calceoli.

Not Atylidae because urosomites separate.

See *Nasageneia.*

Species. *Abdia latipalpus* (Walker & Scott, 1903) (Sivaprakasam, 1968a) (?= *A. barnardi* Rabindranath, 1972a) [690].

Habitat and distribution. Marine, India to Abd-el-Kuri, sublittoral, 1 species.

Accedomoera J.L. Barnard

Accedomoera J.L. Barnard, 1964c: 59.

Type species. *Pontogeneia tricuspidata* Gurjanova, 1938b, original designation.

Diagnosis. Body ordinary, compressed, smooth, or carinate or toothed. Rostrum large to medium; lateral cephalic lobes ordinary. Anteroventral margin of head not or weakly produced. Eyes ovate or reniform. Antennae subequal or 1 longer than 2, peduncular articles of antenna 1 progressively shorter, article 1 as long as head, article 3 produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like or medium. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: [?inner lobes small]. Maxilla 1: inner plate with 2 medial setae, palp long. Maxilla 2: inner plate narrow, outer broad, inner plate with facial 'row' of 1 seta and several other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly or expanded ventrally, coxa 4 [?with posterior lobe, excavate]. Gnathopods alike, medium, subchelate, not eusirid, carpus of both scarcely shorter than propodus, with weak posterior lobe not extending distad, with long posterior setae. Pereopods 3-7 ordinary, simple, dactyls simple. Epimeron 3 smooth. Outer rami of uropods 1-3 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary, cleft, apices without long apical armaments.

Relationship. Differing from *Pontogeneia* in the articulated accessory flagellum. From *Eusiroides* in the shorter accessory flagellum, smaller gnathopods with distinct palms and obsolescent inner lobes on the lower lip.

See *Antarctogeneia, Calliopius, Lopyastis, Paracalliopiella* and *Paramoera.*

Species. *Accedomoera tricuspidata* (Gurjanova, 1938b, 1951) [280]; *A. vagor* J.L. Barnard, 1969a (Coyle & Mueller, 1981) [270].

Habitat and distribution. Marine, north-western Pacific, California, cold water, 0-90 m, 2 species.

Amphithopsis Boeck

Amphithopsis Boeck, 1861: 661.

Type species. *Amphithopsis longicaudata* Boeck, 1861, selected by Boeck, 1876.

Diagnosis. Body ordinary, compressed. Rostrum small, lateral cephalic lobes ordinary. Anteroventral margin of head not produced. Eyes round. Antennae subequal, peduncular article 1 almost as long as head, article 2 as long as article 1; article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, elongate. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes faint.

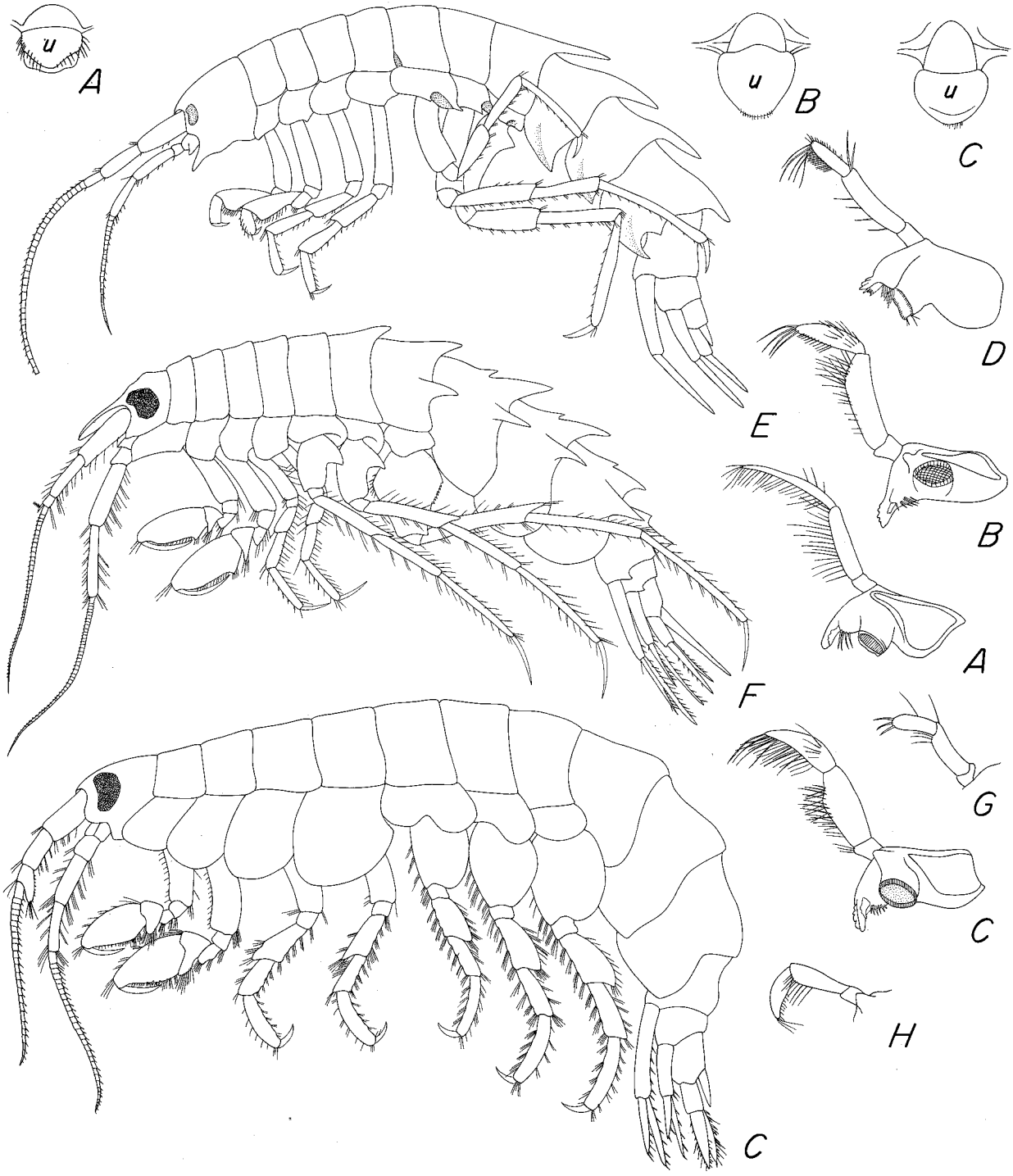

Fig.59. Eusiridae. A, *Eusirus propinquus*; B, *Pontogeneia inermis*; C, *Calliopius laeviusculus*; D, *Liouvillea oculata*; E, *Cleippides quadricuspis*; F, *Rhachotropis aculeata*; G, *Oradarea walkeri*; H, *Leptamphopus sarsi*.

Maxilla 1: inner plate with 7 medial and apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, narrow, without facial row of setae but with other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 1-2 broad, 3-4 narrow together, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly but expanded ventrally, coxa 4 with posterior lobe and excavate. Gnathopods diverse, small, of similar size, subchelate, palms transverse, not eusirid, carpus as long as propodus on gnathopod 1 but longer than propodus on gnathopod 2, with weak posterior lobe not extending distad, on 1 only, carpus with numerous short posterior setae, gnathopod 2 almost linear. Pereopods 3-7 elongate, simple, dactyls minutely toothed on inferior margins, article 2 not anteriorly lobate. Epimeron 3

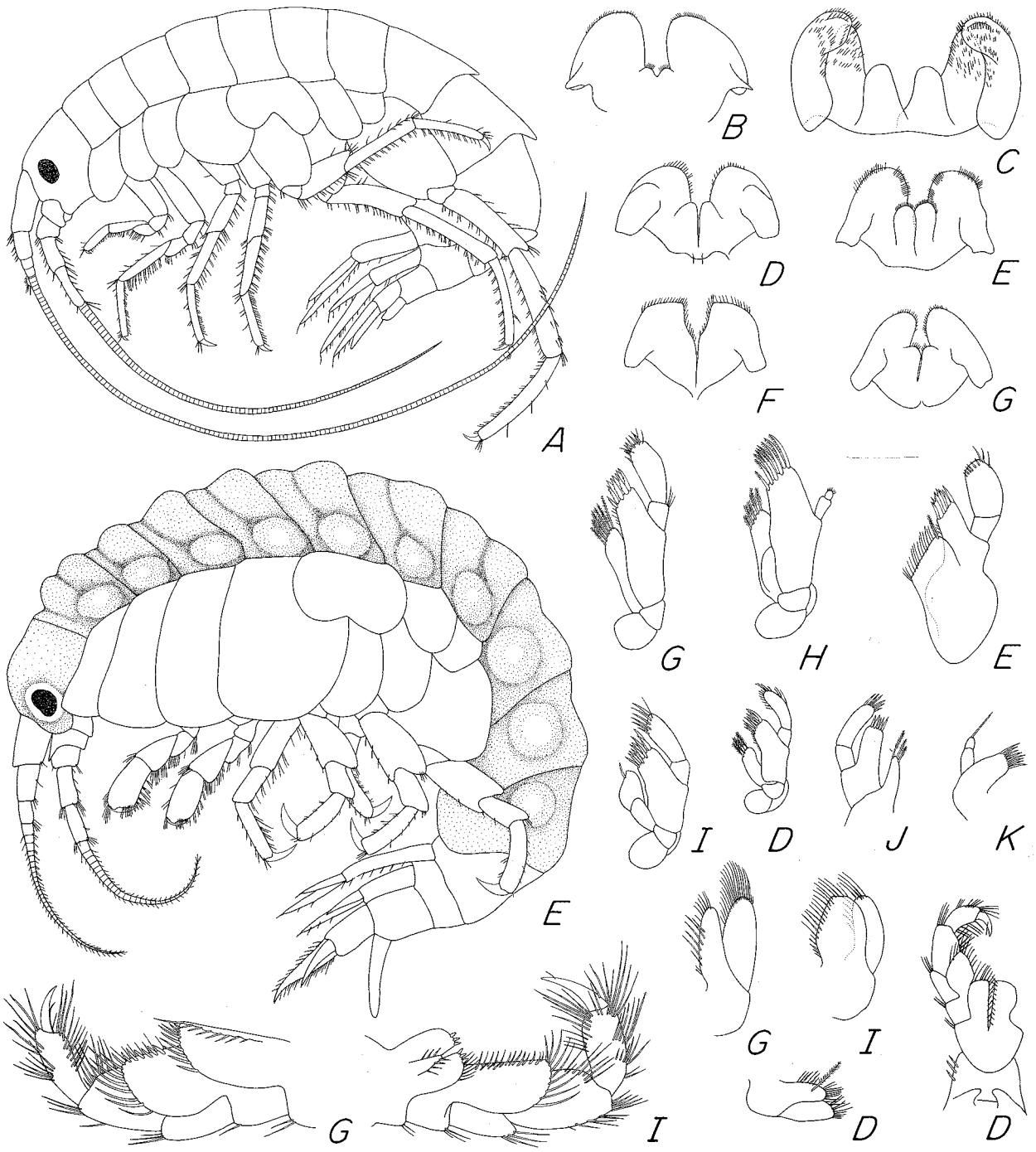

Fig.60. Eusiridae. A, *Djerboa furcipes*; B, *Pontogeneoides abyssi*; C, *Meteusiroides keyensis*; D, *Calliopius laeriusculus*; E, *Eurymera monticulosa*; F, *Halirages fulvocinctus*; G, *Pontogeneia inermis*; H, *Laothoes meinerti*; I, *Eusirus propinquus*; J, *Pseudomoera gabrieli*; K, *Eusirella elegans*.

smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, long, very unequal, outer ramus much shorter. Telson ordinary, entire, linguiform, apices without long armaments.

Relationship. Differing from *Leptamphopus* in the lack of facial setae on maxilla 2 and the presence of teeth on the pereopodal dactyls.

See *Bouvierella*, *Halirages* and *Oradarea*.

Species. *Amphithopsis depressa* Schiecke, 1976a (Krapp-Schickel, 1982b) [348]; *A. longicaudata* Boeck, 1861 (Sars, 1895) (Stephensen, 1931a, 1938b) (Gurjanova, 1951) (Dunbar, 1954) [216 + B].

Habitat and distribution. Marine, Arctic, North Atlantic and Mediterranean, 20-1505 m, often in sponges, 2 species.

Antarctogeneia Thurston

Antarctogeneia Thurston, 1974a: 21.

Type species. *Antarctogeneia macrodactyla* Thurston, 1974a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 1 longer than 2, peduncular articles of antenna 1 not progressively shorter, article 1 shorter than head, article 2 as long as article 1, produced, article 3 weakly produced; article 1 of primary flagellum ordinary, about as long as article 3 of peduncle; accessory flagellum absent. Labrum [?entire, subrounded, broader than long]; epistome [?bluntly] produced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes small. Maxilla 1: inner plate with 3 medial and 1 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of 2 setae and several other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, 2 longer than 1, subchelate, not eusirid, carpus of both much longer than propodus, without posterior lobe, carpus with few short posterior setae, gnathopods 1-2 almost slender or linear, propodus rectangular. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate. Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 huge, peduncle elongate, [?extended beyond uropod 1], peduncle without large process, rami lanceolate, almost subequal. Telson elongate, cleft, lobes notched, apices without long armaments.

Relationship. Differing from *Gondogeneia*, *Tethygeneia*, *Pontogeneia* and *Accedomoera* in the serrate epimeron 3. From *Accedomoera*, *Gondogeneia* and *Nasageneia* in the unlobed carpus of gnathopods 1-2. From *Paramoera* in the lack of an accessory flagellum, short apical telsonic armaments and the weak setation on the inner plate of maxilla 1.

In lacking a process on article 3 of antenna 1 *Pontogeneia ivanovi* keys to *Antarctogeneia*.

See *Apherusa*.

Species. *Antarctogeneia macrodactyla* Thurston, 1974a [870].

Habitat and distribution. Marine, Antarctica, 2-64 m, 1 species.

Apherusa Walker

Figs 61F,J, 62O, 63N

Phaedra Bate, 1859a: 138, 140 [homonym, Lepidoptera] (*Phaedra antiqua* Bate, 1859a, monotypy).

Gossea Bate, 1862: 159 [homonym, Coelenterata] (*Gossea microdentopa* Bate, 1862, = *Amphithoe jurinei* Milne Edwards, 1830), monotypy.–Bate & Westwood, 1863: 276.

Apherusa Walker, 1891b: 83.–Lincoln, 1979a: 408.

?*Rozinante* Stebbing, 1894: 38 (*Paramphithoe fragilis* Goes, 1866, original designation).

Type species. *Amphithoe jurinei* Milne Edwards, 1830, selected by Sars, 1895.

Diagnosis. Body ordinary, compressed, smooth (type) or weakly carinate or toothed. Rostrum small, lateral cephalic lobes ordinary, or weakly sinusoid; anteroventral margin of head produced or not. Eyes round or reniform. Antennae subequal or 2 longer than 1 (type), peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 occasionally as long as 1, article 3 produced or not; article 1 of primary flagellum ordinary to short, accessory flagellum absent. Labrum entire, subrounded, as broad as long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as or shorter (type) than 2. Labium: inner lobes small. Maxilla 1: inner plate with 3-14 medial setae, palp long, article 1 short. Maxilla 2: inner plate narrower than outer, plates narrow, inner plate with weakly facial row of many setae and other medial setae. Maxilliped: inner plate relatively long, outer plate as long as inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin but often multisetose and not

unguiform (*A. glacialis*).

Coxae ordinary to short, coxa 1 not or scarcely produced anteriorly nor expanded ventrally, coxa 4 scarcely with posterior lobe excavate or scarcely so. Gnathopods alike, small, subchelate, not eusirid, carpus of both longer or scarcely shorter than propodus, with weak or no posterior lobe, carpus with numerous long posterior setae, gnathopods 1-2 often very slender but not linear or weakly so, propodus slender, palm well developed. Pereopods 3-7 ordinary, simple, dactyls

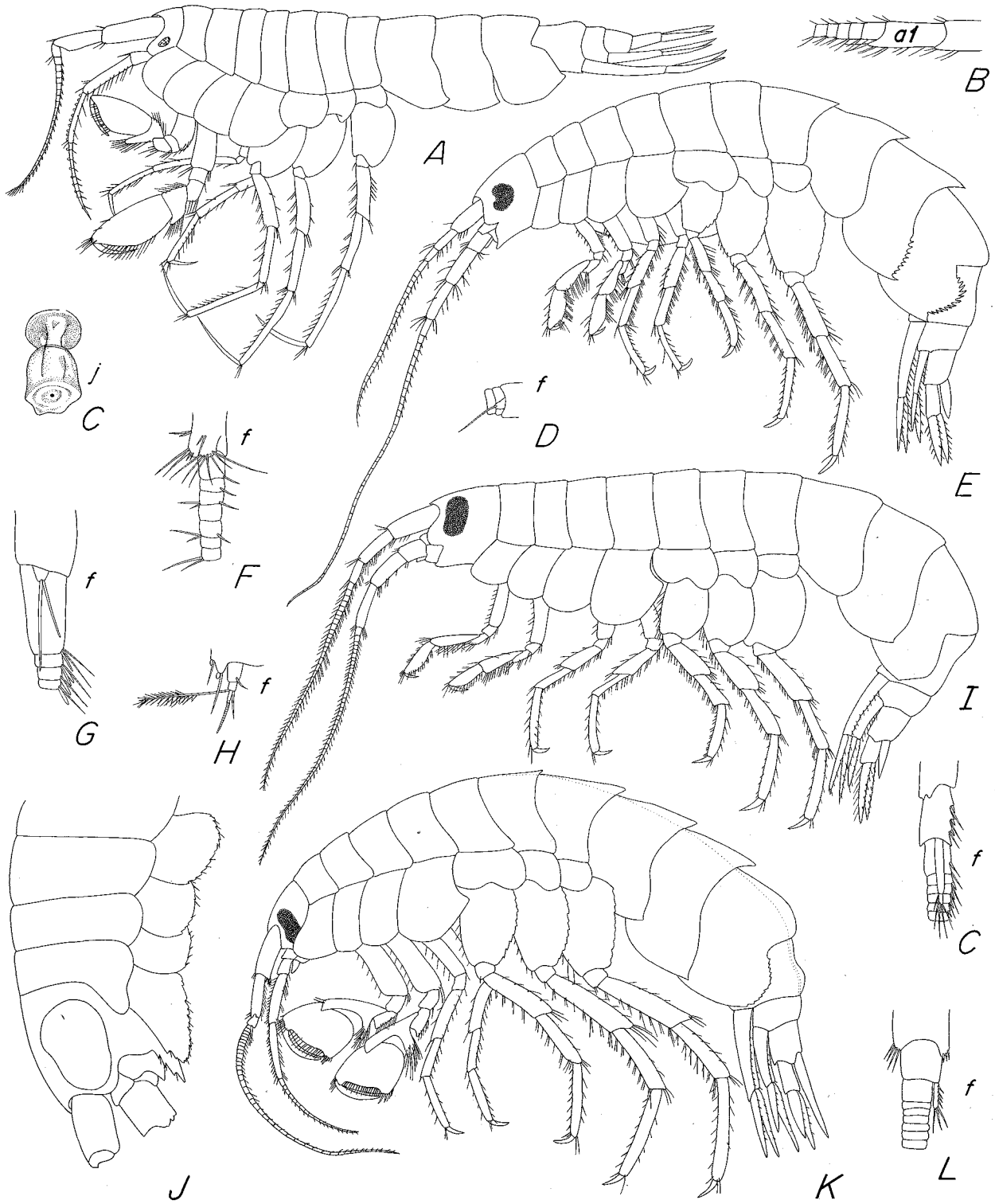

Fig.61. Eusiridae. A, *Cleonardo appendiculatus*; B, *Pontogeneia inermis*; C, *Eusirus propinquus*; D, *Liouvillea oculata*; E, *Apherusa tridentata*; F, *Prostebbingia gracilis*; G, *Pontogeneoides abyssi*; H, *Rhachotropis aculeata*; I, *Pontogeneia imermis*; J, *Apherusa (= Rozinante) fragilis*; K, *Eusirus cuspidatus*; L, *Djerboa furcipes*. j, calceolus.

simple, article 2 not anteriorly lobate. Epimeron 3 smooth (type) or serrate. Outer rami of uropods 1-2 shortened (type) or not; rami with lateral and dorsal spines. Uropod 3 ordinary (type) not extended or huge and extended beyond uropod 1, peduncle without large process, rami lanceolate, nearly subequal. Telson weakly elongate, weakly cleft, incised or entire (type), pointed, triangular, often notched, apices without long armaments.

Variables. Carpus of gnathopod 1 longer than, of gnathopod 2 as long as propodus (*A. bispinosa*); of gnathopod 2 longer (*A. sarsi*); epimeron 3 serrate (type) or not (*A. cirrus* = *A. borealis*); telson entire (type) or incised (*A. sarsi*), or cleft one fourth (*A. fragilis*); serrate (*A. tridentata*); head produced (*A. fragilis*, *A. tridentata*); uropod 3 not (type) weakly (*A. tridentata*, *A. sarsi*) or strongly extended (*A. cirrhus*, *A. bispinosa*); coxa 1 strongly produced and expanded (*A. fragilis*).

Relationship. Differing from *Haliragoides* in the shorter pereopods and narrower, more rectangular propodus of the gnathopods. From *Leptamphopus* in the equal rami of uropod 3. From *Oradarea* in the absence of accessory flagellum, unshortened outer ramus of uropod 3 and nonelongate propodus of gnathopod 2. From *Cleippides* in the absence of accessory flagellum, better palms of the gnathopods and simple dactyls of pereopods 3-7. From *Manerogeneia* in the simple dactyls of pereopods 3-7, slightly poorer setosity of maxillae 1-2 and the

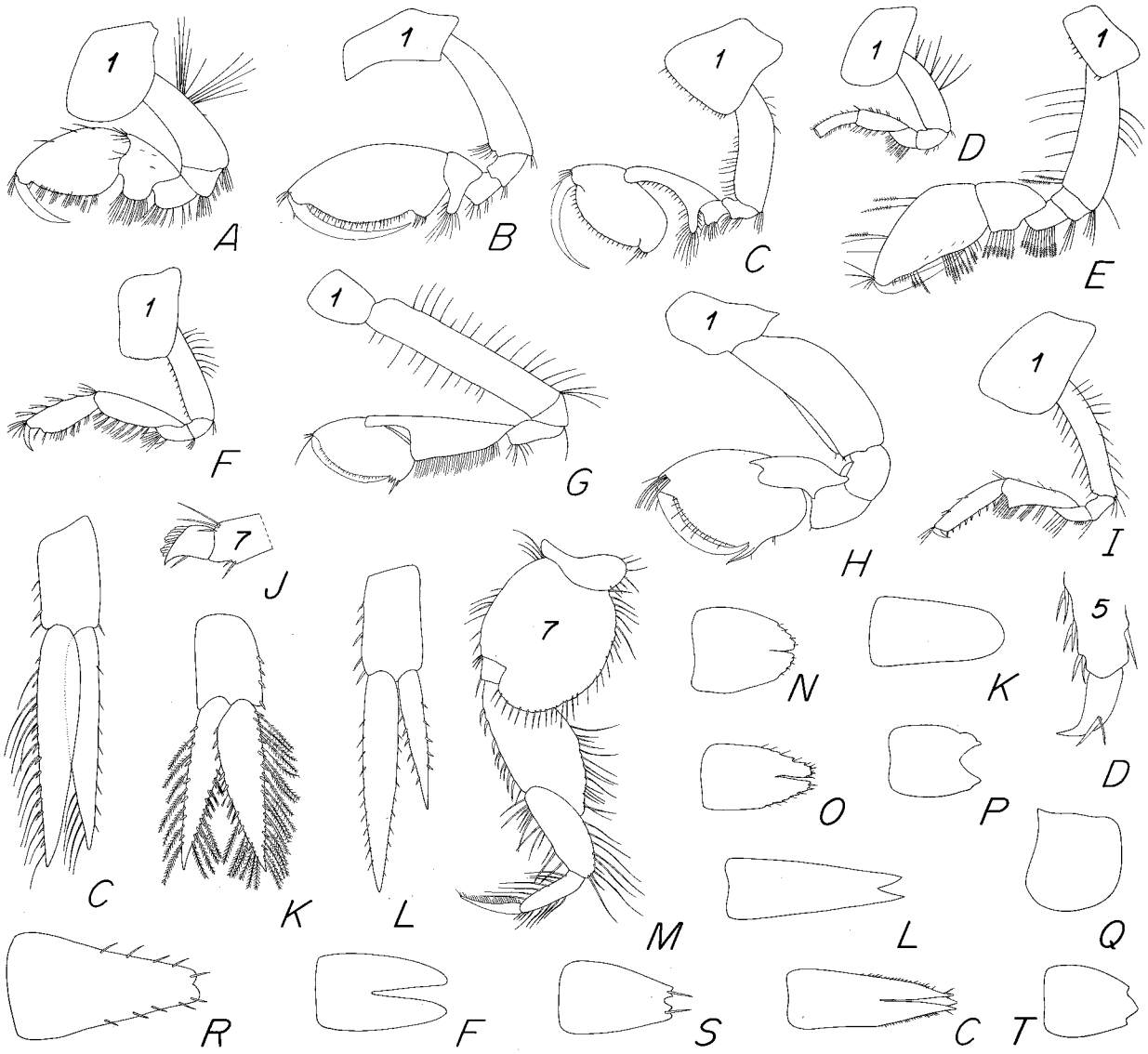

Fig.62. Eusiridae. A, *Bovallia gigantea*; B, *Rhachotropis aculeata*; C, *Eusirus propinquus*; D, *Djerboa furcipes*; E, *Harcledo plumipes*; F, *Pontogeneia inermis*; G, *Pareusirogenes carinatus*; H, *Eusiropsis riisei*; I, *Leptamphopus sarsi*; J, *Metaleptamphopus pectinatus*; K, *Calliopius laeviusculus*; L, *Eusirus minutus*; M, *Zaramilla kergueleni*; N, *Liouvillea oculata*; O, *Apherusa* (= *Rozinate*) *fragilis*; P, *Atylopsis emarginata*; Q, *Prostebbingia gracilis*; R, *Pontogeneoides abyssi*; S, *Harpinioides drepanocheir*; T, *Stenopleura atlantica*.

unshortened outer ramus of uropod 3. From *Schraderia* and *Paracalliopiella* in the absence of an accessory flagellum. From *Antarctogeneia*, normal *Prostebbingia* and *Schraderia* in the uncleft telson.

See *Austroregia*, *Awacaris*, *Calliopiella*, *Gondogeneia*, *Halirages*, *Haliragoides*, *Laothoes*, *Lopyastis*, *Oligochinus*, *Relictomaera* and *Whangarusa*.

Removal. *Apherusa translucens* Chilton, 1884a, to *Whangarusa*.

Species. See Chevreux & Fage (1925); Dunbar (1954); Gurjanova (1951); Krapp-Schickel (1982b, key); Lincoln (1979a); Stephensen (1931a, 1933b, 1938b, 1940b, 1944a); *A. alacris* Krapp-Schickel, 1969a, 1969b, 1982b [345]; *A. antiqua* (Bate, 1859a, 1862) (Bate & Westwood, 1863) [239]; *A. barretti* (Bate, 1862) ["240"]; *A. bispinosa* (Bate, 1857) (= *A. macrocephala* M. Sars, 1858) (= *A. elegans* Bruzelius, 1859) (= *A. pontica* Czerniawsky, 1868) (Sars, 1895) (Lincoln, 1979a) (Krapp-Schickel, 1979, 1982b) [240 + 339]; *A. chiereghinii* Soika, 1949 (Krapp-Schickel, 1969a, 1979, 1982b) [345]; *A. cirrhus* (Bate, 1862) (= *A. bicuspis* Krøyer of Bate, 1862) (= *A. borealis* Boeck, 1871b, and Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) [220, 240]; *A. clevei* Sars, 1904 (Chevreux & Fage, 1925) (Lincoln, 1979a) [240N]; *A. corbeli* Lagardere, 1968 [295]; *A. fragilis* (Goes, 1866) (Shoemaker, 1930a, 1955a) (Stephensen, 1933b, 1940a) [200 + B]; *A. glacialis* (Hansen, 1888) (= *A. dubia* Vosseler, 1889) (Stephensen, 1931a, 1933b, 1938b, 1944a) (J.L. Barnard, 1959) [220N]; *A. henneguyi* Chevreux & Fage, 1925 (Lincoln, 1979a) [240]; *A. jurinei* Milne-Edwards, 1830 (= *A. norvegica* Rathke, 1843) (= *A. microdentopa* Bate, 1862) (Sars, 1895) (Lincoln, 1979a) [240]; *A. mediterranea* Chevreux, 1911d (Ruffo & Wiesner, 1952) (Krapp-Schickel, 1982b) [340 + 442]; *A. megalops* (Buchholz, 1874) (Shoemaker, 1930a) (Just, 1970) [200]; *A. ovalipes* Norman & Scott, 1906 (Chevreux & Fage,

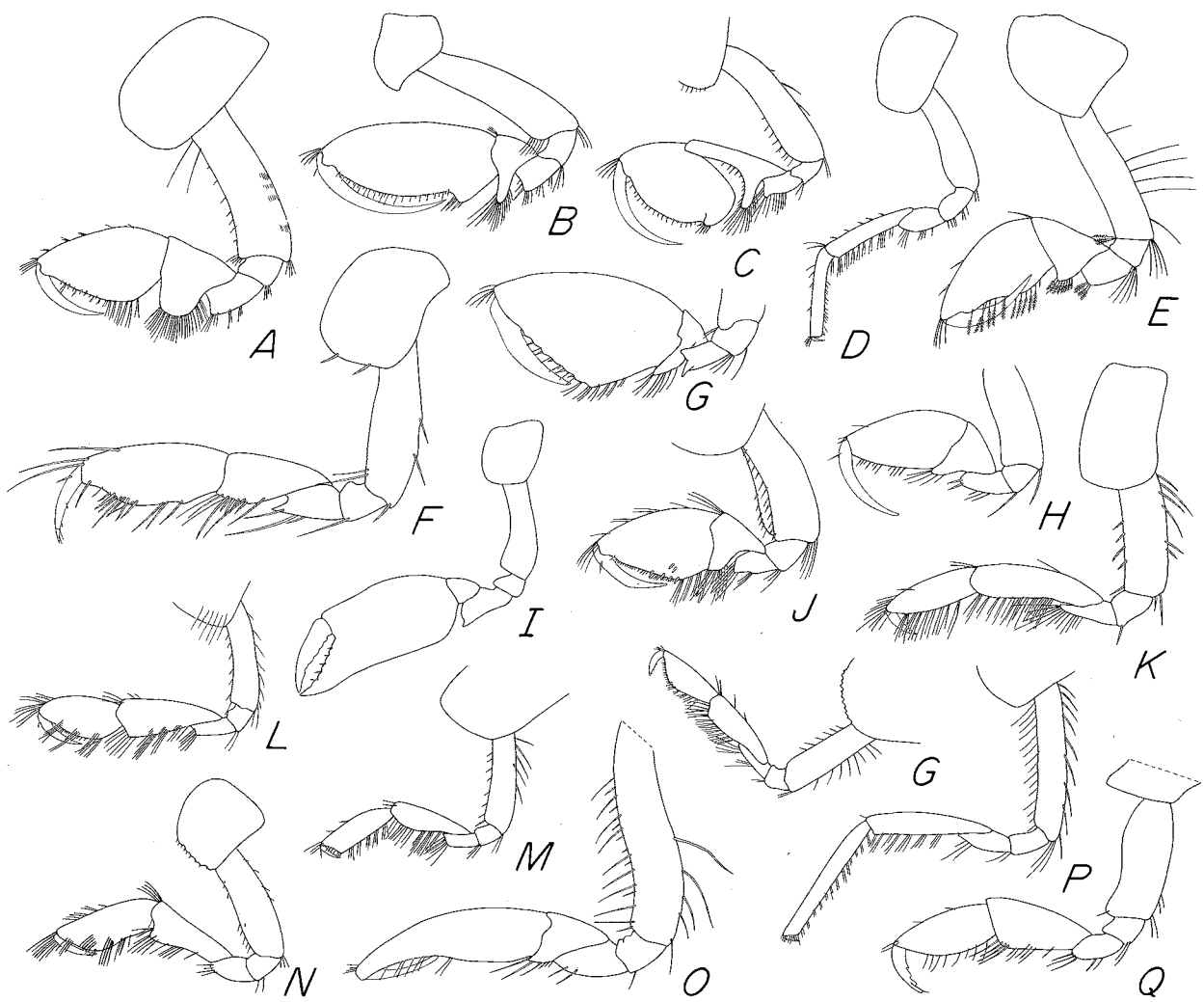

Fig.63. Eusiridae and Clarenciidae. A, *Bovallia gigantea*; B, *Rhachotropis aculeata*; C, *Eusirus propinquus*; D, *Djerboa furcipes*; E, *Harcledo plumipes*; F, *Atylopsis dentatus*; G, *Pontogeneoides abyssi*; H, *Stenopleura atlantica*; I, *Clarencia chelata*; J, *Calliopius laeviusculus*; K, *Cleippides bicuspus*; L, *Haliragoides inermis*; M, *Laothoes meinerti*; N, *Apherusa (= Rozinante) fragilis*; O, *Harpinioides drepanocheir*; P, *Leptamphopus sarsi*; Q, *Regalia fascicularis*.

1925) (Lincoln, 1979a) [240]; *A. retovskii* Gurjanova, 1934a, 1935a, 1936b, 1951 [220]; *A. ruffoi* Krapp-Schickel, 1969a, 1982b [345]; *A. sarsi* Shoemaker, 1930a (= *A. megalops* identification of Sars, 1883, 1895) (Gurjanova, 1951) [220]; *A. stuxbergi* Oldevig, 1959 [281]; *A. tridentata* (Bruzelius, 1859) (Sars, 1895) (Gurjanova, 1951) [220]; *A. vexatrix* Krapp-Schickel, 1979, 1982b [340].

Habitat and distribution. Marine, Arctic, boreal, rarely warm-temperate, 0-372 m, often neritic, 21 species.

Atyloella Schellenberg

Atyloella Schellenberg, 1929c: 279.

Type species. *Atylopsis magellanicus* Stebbing, 1888, monotypy.

Diagnosis. Body ordinary, compressed, not (type) or carinate or toothed. Rostrum very small or obsolescent; lateral cephalic lobes ordinary, anteroventral margin of head produced. Eyes round. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum twice as long as article 3 of peduncle, but proliferating internally; accessory flagellum 1-articulate, short. Labrum incised, broader than long; epistome acutely produced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with 5 medial and apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of 6 setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 1-2 narrow, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin, unguiform.

Coxae ordinary, coxa 1 strongly expanded ventrally, coxa 4 with posterior lobe. Gnathopods alike, medium, 2 larger than 1, subchelate, not eusirid, carpus of both shorter than propodus, without posterior lobe, carpus with sparse long posterior setae, propodus weakly expanded, palms weakly oblique. Pereopods 3-7 ordinary to elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 with small posteroventral tooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle with large process, rami lanceolate, subequal(?). Telson ordinary, cleft, lobes often notched, apices without long armaments.

Variables. Telson cleft one fourth (*A. dentata*); body with dorsal teeth on pleon (*A. dentata*, *A. quadridens*, *A. moke*); inner plate of maxilla 1 with only 2 setae (*A. moke*); accessory flagellum elongate (*A. moke*); palp article 3 of mandible shorter than article 2 (*A. moke*); facial row of setae on maxilla 2 reduced to 1 seta.

Relationship. Differing from *Liouvillea* in the small rostrum and produced anteroventral angle of the head. From *Pseudomoera* in the presence of facial setae on the inner plate of maxilla 2, the large process on the peduncle of uropod 3 and more importantly, the nonlobate carpus of the gnathopods.

See *Atylopsis*, *Calliopiella* and *Meteusiroides*.

Species. See K.H. Barnard (1932); Nicholls (1938); Schellenberg (1926a, 1931); Stephensen (1947a); Thurston (1974a,b); *A. dentata* K.H. Barnard, 1932 [831]; *A. magellanica* (Stebbing, 1888) (Bellan-Santini & Ledoyer, 1974) [800 + B]; *A. quadridens* (K.H. Barnard, 1930) (Schellenberg, 1931) [870B]; *A. moke* J.L. Barnard, 1972b [776].

Habitat and distribution. Marine, Antarctic and austral 0-549 m; *A. moke*, New Zealand, 0 m; 4 species.

Atylopsis Stebbing

Figs 62P, 63F

Atylopsis Stebbing, 1888: 924.–Thurston, 1974b: 53.

Type species. *Atylopsis emarginatus* Stebbing, 1888, selected by J.L. Barnard, 1969c.

Diagnosis. Body ordinary, compressed, smooth, carinate or toothed. Rostrum small; lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 not as long as head, article 3 produced (type); article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, flappet-like; flagellar articles simple (see *Paracalliopiella*). Labrum weakly incised, as long as broad; epistome unproduced. Molar triturative, conical, article 2 of mandibular palp unlobed, article 3 almost as long as 2. Labium: inner lobes small. Maxilla 1: inner lobe with 3-4 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner lobe without facial row of setae but with 4+ other medial setae. Maxilliped: inner plates not relatively long, outer plate slightly longer than inner, ordinary; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin, unguiform.

Coxae ordinary, often short, coxa 1 not produced anteriorly, weakly expanded ventrally, coxa 4 with posterior lobe or not excavate. Oostegites expanded. Gnathopods alike, medium to large, 2 larger than 1,

subchelate, not eusirid, carpus of both slightly to much shorter than propodus, with weak or indistinct posterodistal lobe not extending distad, carpus with numerous long posterior setae, propodus ovatorectangular, palm slightly oblique. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, almost subequal. Telson ordinary, incised to deeply emarginate, lobes scarcely notched, apices without long armaments.

Variables. Coxa 4 unlobed, not excavate (*A. orthodactyla*); article 3 of antenna 1 not produced (*A. orthodactyla*); gnathopod 2 slightly elongate (see Relationship) (*A. procerus*).

Relationship. Differing from *Atyloella* in the unproduced epistome and from *Dautzenbergia* by the presence of inner lobes on the lower lip and the absence of major armaments on the inferior margins of the dactyls of pereopods 3-7. From *Gondogeneia* in the uncleft telson. From *Halirages bungei* in the emarginate telson. From the type of *Halirages* in the short carpus of the gnathopods; intergrading to *Halirages*.

Differing from *Oradarea* in the short gnathopod 2 but intermediated by *A. procerus*; *Atylopsis* and *Oradarea* need re-evaluation in search of better generic differences.

See *Calliopiella*, *Harpinioides*, *Lopyastis*, *Manerogeneia*, *Membrilopus*, *Paracalliopiella*, *Pontogeneia*, *Regalia*, *Stenopleura*, *Tylosapis* and *Whangarusa*.

Species. *Atylopsis emarginatus* Stebbing, 1888 [799B]; *A. orthodactylus* Thurston, 1974a [872]; ?*A. procerus* Andres, 1986 [885P].

Habitat and distribution. Marine, Antarctica to Marion Island, 18-567 m, 3 species.

[Gammarellidae] ***Austroregia*** J.L. Barnard

[see also Iphimediidae]

Austroregia J.L. Barnard, 1989: 703.

Type species. *Atylus huxleyanus* Bate, 1862, original designation.

Diagnosis. Body ordinary, compressed, carinate or toothed. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes round. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 indistinctly produced; article 1 of primary flagellum ordinary, accessory flagellum absent; calceoli present and of form found in Gammarellidae. Labrum entire, subrounded, longer than broad; epistome unproduced. Molar triturative, broad but scarcely columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2, weakly sickle-shaped. Labium: inner lobes absent. Maxilla 1: inner plate with about 6 apicomedial setae, palp long, article 1 shorter than 2. Maxilla 2: inner plate narrower and not longer than outer, plates narrow, inner plate with inner marginal row of 6+ setae and other medial setules. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 1-2 broad, 3-4 narrow together, 4 shorter than 3, 3 unlobed, 4 setulose along inferior margin.

Coxae ordinary but strongly rounded and foreshortened anteroventrally, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not twice as long as 1, with posterior lobe, excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus much shorter than propodus, without posterior lobe, without numerous long posterior setae, propodus weakly swollen, elongate, palms very oblique, one spine slightly outside of palmar extent. Pereopods 3-7 scarcely elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, weakly extended beyond uropod 1, peduncle without large process, rami lanceolate, alike. Telson elongate, incised or weakly cleft, linguiform, without long apical armaments.

Relationship. This genus is situated twice in this handbook, here and in the Iphimediidae.

Very close to *Pontogeneia* but with gammarellid and not pontogeneiid calceoli (see Lincoln & Hurley, 1981 for these forms). Also differing from *Pontogeneia* in the poor cleft of the telson, lack of minute inner lobes on the lower lip, the rounded and anteroventrally blunt coxae 1-4 and the fully marginal medial setae on the inner plate of maxilla 2.

Differing from *Halirages* in the unserrate epimeron 3 and weakness of the process on article 3 of antenna 1. From *Paracalliopiella* in lack of accessory flagellum and elongate telson. From *Apherusa* in the elongate telson and swollen propodus of the gnathopods. Like *Whangarusa* but gnathopod 1 in male not grossly enlarged and article 3 of antenna 1 not distinctly produced.

Because of acuminate anterior coxae, *Halirages regis* is diagnostically referable to and keys out to *Parepimeria* in the Iphimediidae, but otherwise has no relationship to that genus; the gnathopods are entirely different; *A. regis* is therefore a confounding taxon. The analyses in the literature suggest that *A. huxleyana* and *A. regis* are also very close despite the acuminate coxae of *A. regis* that make it referable to Iphimediidae.

See *Chosroes* and *Harpinioides*.

Species. *Austroregia batei* Cunningham, 1871 [864];

A. huxleyana (Bate, 1862) (Schellenberg, 1931) (K.H. Barnard, 1932) (was *Halirages*) [866]; *A. regis* (Stebbing, 1914b) (= *A. huxleyanus* identification of Stebbing, 1888) (= *A. stebbingi* Schellenberg, 1931) (K.H. Barnard, 1932) [866].

Habitat and distribution. Marine, austral Magellan region and nearby islands, 0-91 m, 3 species.

Awacaris Ueno

Awacaris Ueno, 1971d: 241.

Type species. *Awacaris kawasawai* Ueno, 1971d, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum obsolescent; lateral cephalic lobes weakly sinusoid, anteroventral margin of head weakly produced. Eyes absent. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 2 almost as long as article 1; article 3 short, not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, conical. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp short, article 1 longer than 2. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of many setae and other medial setae. Maxilliped: inner plate relatively long, enlarged, outer plate slightly shorter than inner, ordinary; palp of 4 articles, narrow, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary to slightly short, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not twice as long as 1, with weak posterior lobe weakly excavate. Gnathopods diverse, feeble, 2 longer than 1, subchelate, not eusirid, carpus of both longer and broader than propodus, without posterior lobe, carpus with sparse long posterior setae, gnathopod 1 ordinary, gnathopod 2 very slender or linear, carpus and propodus elongate, unlobed, palms very short. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami somewhat rod-shaped, nearly subequal. Telson elongate, cleft, lobes notched, without long apical armaments.

Relationship. This genus is characterised by the rod-shaped rami of uropod 3 which resemble those in gammaridean amphipod groups such as crangonyctoids; the small palp of maxilla 1 is also characteristic but this resemblance to *Laothoes* is lessened by the otherwise strong differences in the deeply cleft telson and nonenlarged outer plate of the maxilliped.

The linear gnathopods suggest affinities with *Oradarea* and *Schraderia* but *Awacaris* differs in uropod 3 and maxilla 1.

Differing from *Apherusa* in the deeply cleft and slightly elongate telson. From *Relictomoera* in the thinner gnathopods, longer carpus of gnathopod 2, well-setose inner plate of maxilla 1 and short article 3 of antenna 1.

One may wonder if *Schraderia udehe* belongs with *Awacaris*.

Species. *Awacaris kawasawai* Ueno, 1971d [028c].

Habitat and distribution. Freshwater, Japan, Shikoku, Himise-do Cave, near Kaminaka-cho, Tokushima.

[?Gammarida] ***Bathyschraderia*** Dahl

Bathyschraderia Dahl, 1959: 224.

Type species. *Bathyschraderia magnifica* Dahl, 1959, monotypy.

Diagnosis. Body ordinary, compressed, not toothed. Rostrum small; lateral cephalic lobes separated from cheek by slit; anteroventral margin of head not produced. Eyes absent. [?Antenna 2 longer than 1], peduncular article 1 of antenna 1 [?longer than head], article 2 longer than article 1; article 3 short, not produced; article 1 of primary flagellum [?ordinary]; accessory flagellum 1-articulate, scale-like. Labrum emarginate, epistome with keel, unproduced(?). Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of many setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, narrow, article 2 elongate, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin, unguiform.

Coxae 1-4 long, 1-3 serrate below, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not twice as long as 1, with posterior lobe. Gnathopods alike, both very slender, linear, (non-eusirid), 2 longer than 1, subchelate, carpus and propodus elongate, unlobed, carpus with numerous long posterior setae, palms well developed. Pereopods 3-7 [?ordinary ?elongate], simple, dactyls simple, spined on superior margins, article 2 not anteriorly lobate. Epimeron 3 with small posteroventral tooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal. Telson elongate, cleft, apices serrate.

Relationship. This genus is probably a gammaridan without accessory flagellum and should be transfered to a position near the *Bathyceradocus* group (see Barnard & Barnard, 1983).

Differing from *Schraderia* in the longer dactyl of the maxillipedal palp, the presence of superiorly spinose dactyls on pereopods 3-7, and the elongate article 2 of antenna 1, longer than article 1. From *Djerboa* in the elongate peduncle of antenna 1 bearing elongate article 2 and the unarmed dactyls of the posterior pereopods.

See *Bouvierella.*

Species. *Bathyschraderia fragilis* Kamenskaya, 1981a [601A]; *B. magnifica* Dahl, 1959 [523A].

Habitat and distribution. Marine, Kermadec and Philippine Trenches, 6960-7000 m, 2 species.

Bouvierella Chevreux

Bouvierella Chevreux, 1900a: 70.–J.L. Barnard, 1969a: 95.

Type species. *Paramphithoe carcinophilus* Chevreux, 1889a, monotypy.

Diagnosis. Body ordinary, compressed, not toothed. Rostrum moderate; lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes absent. Antenna 1 longer than 2, peduncular articles short and progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum absent. Labrum incised, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 falciform, shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate scarcely broader but not longer than outer, outer plate narrow, inner plate without facial row of setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 1-2 broad, 4 shorter than 3, 3 unlobed, 4 sparsely spinose along inferior margin, unguiform.

Coxae ordinary, coxa 1 not produced anteriorly but expanded ventrally, coxa 4 with weak posterior lobe. Gnathopods diverse, medium, 2 longer than 1, weakly subchelate, not eusirid, carpus of first barely longer, of second much longer than propodus, first weakly swollen, of second unlobed, carpus of both with several long posterior setae, gnathopod 2 very slender or linear, carpus and propodus elongate, unlobed. Pereopods 3-7 ordinary to elongate, weakly prehensile, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate. Outer rami of uropods 1-3 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson weakly elongate, emarginate, apices without long armaments.

Relationship. Differing from *Schraderia, Halirages, Apherusa, Leptamphopus, Oradarea, Bathyschraderia* and *Djerboa* in the prehensile pereopods.

Differing also from *Schraderia, Djerboa* and *Bathyschraderia* in the absence of accessory flagellum, and poorly cleft telson. From *Oradarea* in the falcate article 3 of the mandibular palp, the absence of accessory flagellum and absence of inner lobes on the lower lip. From *Bathyschraderia* in the short peduncle of antennae 1-2. From *Amphithopsis* in the serrate epimeron 3. From *Leptamphopus* in the scarcely shortened outer ramus of uropod 3 being three fourths or more as long as inner, whereas in *Leptamphopus* the outer ramus is two thirds or less as long as the inner ramus.

See *Calliopiella.*

Species. *Bouvierella carcinophila* (Chevreux, 1889a, 1900a, 1935) [359B + I].

Habitat and distribution. Marine, Azores, 620-1386 m, 1 species.

Bovallia Pfeffer

Figs 62A, 63A

Bovallia Pfeffer, 1888: 95.–Schellenberg, 1929c: 277.

Type species. *Bovallia gigantea* Pfeffer, 1888, monotypy.

Diagnosis. Body ordinary but stout, compressed, weakly carinate or toothed posterodorsally. Rostrum small; lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes crescentic or reniform. Antenna 1 slightly longer than 2, peduncular articles progressively shorter, article 1 longer than head, article 3 weakly produced (as vestige of accessory flagellum); article 1 of primary flagellum ordinary; accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with 12 medial setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of setae and other medial setae. Maxilliped: inner plates not relatively long, outer plate as long as inner; palp of 4 articles, 1-2 broad, 3-4 narrow, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, progressively longer toward coxa 4; coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 twice as long as 1, with posterior

lobe excavate. Gnathopods alike, subchelate, not eusirid, large carpus of both shorter than propodus, with strong posterodistal lobe not extending distad, carpus with numerous long posterior setae, propodus ovate, palm long, oblique. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth (with 1 tiny tooth). Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft halfway, apices without long armaments. Oostegites broad.

Relationship. Characterised by the first article of antenna 1 being longer than the head.

Differing from *Eurymera* in the subequal rami of uropod 3; from *Calliopius* in the weaker lobe on the gnathopodal carpus and the cleft of the telson; from *Gondogeneia* in the toothed body and fully developed setae on maxilla 2.

See *Calliopius*, *Eurymera*, *Manerogeneia*, *Pontogeneia* and *Regalia*.

Species. *Bovallia gigantea* Pfeffer, 1888 (Chevreux, 1906a) (Schellenberg, 1931) (K.H. Barnard, 1932) (Stephensen, 1938c, 1947a) (Thurston, 1974a,b) [870].

Habitat and distribution. Marine, Antarctica, 0-91 m, 1 species.

Calliopiella Schellenberg

Calliopiella Schellenberg, 1925a: 147.–J.L. Barnard, 1978b: 33.

Type species. *Calliopiella michaelseni* Schellenberg, 1925a, monotypy.

Diagnosis. Body slender, compressed, smooth. Rostrum obsolescent; lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes ovate. Antennae subequal, short, peduncular articles of antenna 1 progressively shorter, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial and apical setae, palp long, article 1 short. Maxilla 2: plates narrow, inner plate with facial row of many setae and few other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 1-2 broad, elongate together, 3-4 narrow together, 4 slightly shorter than 3, 3 unlobed, 4 spinose along inferior margin.

Coxae short, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 without posterior lobe, scarcely excavate. Gnathopods alike, medium, weakly subchelate, not eusirid, carpus of both much shorter than propodus, with weak posterior lobe not extending distad, carpus with short posterior setae, propodus elongate, palm short, excavate. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 weakly scalloped. Both rami of uropods 1-2 short; rami without lateral and dorsal spines. Uropod 3 small but extended distinctly beyond uropod 1, peduncle without large process, rami lanceolate, subequal. Telson ordinary, entire, linguiform, apex without long armaments.

Relationship. Characterised by the short uropod 3 and nonspinose rami of uropods 1-2. Further, differing from *Atylopsis* in the lack of inner lobes on the lower lip. From *Bouvierella* in the larger gnathopods almost identical to each other and the presence of an accessory flagellum. From *Calliopius* in presence of an accessory flagellum and poorly lobate carpus of the gnathopods. From *Liouvillea*, *Cleippides*, *Apherusa* and *Halirages* in the short gnathopodal carpus. From *Atyloella* and *Eusiroides* in the more densely setose maxilla 1. From *Bovallia* in the elongate propodus of the gnathopods.

Species. *Calliopiella michaelseni* Schellenberg, 1925a (J.L. Barnard, 1978b) [743I].

Habitat and distribution. Marine, South Africa, with limpets, intertidal, 1 species.

Calliopiurus Bushueva

Calliopiurus Bushueva, 1986: 1296.

Type species. *Calliopiurus excellens* Bushueva, 1986, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes absent. Antenna 1 slightly shorter than elongate 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate. Labrum entire, rounded, broader than long; epistome unproduced. *Incisor pectinate*, molar simple, humped or conical, article 2 of mandibular palp unlobed, article 3 as shorter than 2. Labium: [?inner lobes present]. Maxilla 1: inner plate with 6-7 apical and subapical setae, palp long, article 1 short. Maxilla 2: inner plate as wide but shorter than outer, inner plate without facial row of setae and with sparse medial setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 very short, 3 unlobed, [?4 not spinose along inferior margin].

Coxae 1-3 elongate, twice as long as broad, coxa 1

not expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, slender, linear, almost simple, not eusirid, carpus of both as long as propodus, without lobes, carpus with few short posterior setae, propodi long, thin, not bent apically, dactyl not folding into posterior margin. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of only uropod 2 shortened; rami without lateral and dorsal spines. Uropod 3 with very elongate rami, strongly extended beyond uropod 1, peduncle without large process, rami lanceolate, [?nearly subequal; 1 ramus broken]. Telson very short, weakly incised, apices without long armaments.

Relationship. Differing from *Harpinioides* in the elongate antenna 2, elongate unlobed carpus of the gnathopods, unbent propodi and unshortened outer ramus of uropod 1. From *Cleippides* in the elongate coxae 1-3 and elongate antenna 2.

Species. *Calliopiurus excellens* Bushueva, 1986 [391].

Habitat and distribution. Marine, Davis Sea, 0-50 m, 1 species.

[Calliopiidae] ***Calliopius*** Liljeborg

Figs 59C, 60D, 62K, 63J

Calliope Bate, 1857d: 142 [homonym, Aves] (*Calliope Leachii* Bate, 1857d (= *Amphithoe laeviuscula* Krøyer, 1838), monotypy).
Calliopius Liljeborg, 1865a: 11 [new name for *Calliope*].–Stebbing, 1906: 295.–Lincoln, 1979a: 406.

Type species. *Calliope Leachii* Bate, 1857d (= *Amphithoe laeviuscula* Krøyer, 1838), monotypy

Diagnosis. Body ordinary, slender, compressed, weakly carinate. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 almost as long as head, article 3 produced; article 1 of primary flagellum almost as long as article 3 of peduncle; accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with 4 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner with facial row of 1 seta and many other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, 2 scarcely larger than 1, subchelate, not eusirid, carpus of both distinctly shorter than propodus, with strong posterior lobe not extending distad, with numerous long posterior setae. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal. Telson elongate, entire, linguiform, without long apical armaments.

Additional characters. Calceoli tympanic, on both antennae in both sexes; coxal gills 2-6; oostegites broad.

Relationship. Like *Gammarellus* but accessory flagellum absent, medial setae on maxillae sparser, inner lobes of lower lip present.

Differing from *Accedomoera* in the uncleft telson and stronger lobes on the carpus of the gnathopods. From *Halirages* in the short lobed carpus of the gnathopods, slight inner lobes on lower lip, short peduncle of uropod 3 and presence of only one facial seta on maxilla 2. From *Pontogeneia* in the uncleft telson, lobed carpus of the gnathopods and the presence of only one facial seta on maxilla 2. From *Bovallia* in the uncleft telson.

See *Calliopiella*, *Paracalliopiella* and *Pontogeneia*.

Species. *Calliopius behringi* Gurjanova, 1951 [281]; *C. laeviusculus* (Krøyer, 1838b) (= *C. rathkii* Zaddach, 1844) (= *C. gibba* Frey & Leuckart, 1847) (= *C. macropthalmus* [sic] Stimpson, 1853) (= *C. leachi* Bate, 1857d) (= *C. serraticornis* Sars, 1858) (= *C. grandoculis* Bate, 1862) (= *C. crenulatus* Chevreux & Fage, 1925) (Sars, 1895) (Bousfield, 1973) (Lincoln, 1979a) [200].

Habitat and distribution. Marine, circumarctic-boreal, 0-20 m, 2 species.

[Gammarellidae] ***Chosroes*** Stebbing

Chosroes Stebbing, 1888: 1208.

Type species. *Chosroes incisus* Stebbing, 1888, monotypy.

Diagnosis. Body depressed, weakly (type) to strongly carinate. Rostrum small; lateral cephalic lobes ordinary. Eyes round. Anteroventral margin of head not produced. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1

of primary flagellum short, accessory flagellum absent. Labrum emarginate, or not broader than long; epistome unproduced (type) or keeled. Molar triturative, columnar, article 2 of palp unlobed, article 3 as long as 2. Labium: inner lobes present. Maxilla 1: inner lobe with apical setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate slightly broader but not longer than outer. Maxilliped: inner lobes not relatively long, outer lobe longer than inner; palp of 4 articles, 1-2 narrow, 3-4 narrow, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, progressively longer toward coxa 4; coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 twice as long as 1, weakly to strongly excavate posteriorly. Gnathopods alike, subchelate, not eusirid, medium, carpus of both as long as but not wider than propodus, without posterodistal lobe, carpus with numerous long posterior setae. Pereopods 3-7 ordinary, elongate, simple, dactyls simple, article 2 anteriorly or posteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not (type) or strongly extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary to elongate, cleft or incised (type); linguiform, apices with long apical armaments.

Additional character. Calceoli of Type-6 (Lincoln & Hurley, 1981) thus of gammarellid affinity.

Variables. Body strongly carinate and toothed (*C. decoratus*); labrum incised (type) or rounded (*C. decoratus*); coxa 4 strongly excavate (*C. decoratus*); uropod 3 strongly extended beyond uropod 1 (*C. decoratus*); telson cleft one third (*C. decoratus*).

Relationship. Characterised by the depressed body.

Calceolar structure relates this genus to *Gammarellus* and *Austroregia.*

Chosroes differs from *Austroregia,* its apparent closest sibling; in the non-enlarged gnathopod 1, narrower outer plate of maxilliped and presence of anterior hump on article 2 of pereopods 3-4.

Scarcely distinct from Pleustidae but lower lip not definitely of that form.

Species. *Chosroes decoratus* K.H. Barnard, 1932 (Andres, 1982) [870 + B]; *C. incisus* Stebbing, 1888 (K.H. Barnard, 1930, 1932) (Schellenberg, 1931) [835].

Habitat and distribution. Marine, circumaustral and subantarctic, 95-342 m, 2 species.

[also Iphimediidae] ***Cleippides*** Boeck

Figs 59E, 63K

Cleippides Boeck, 1871b: 201.

Type species. *Acanthonotus tricuspis* Krøyer, 1846, monotypy.

Type. Poorly described, generic diagnosis based on other species. Krøyer (1846a) not seen. Quotes from Stebbing (1906).

Diagnosis. Body ordinary to slender, compressed, carinate or toothed. Rostrum small to large; lateral cephalic lobes ordinary to sinusoid. Eyes reniform. Anteroventral margin of head produced. Antenna 1 much longer than 2, peduncular article 1 shorter than head, article 2 as long as article 1; article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate or absent. Labrum entire, or emarginate, [?longer broader than long broad]; epistome unproduced. Molar [?triturative, columnar], article 2 of palp unlobed, article 3[?as long as longer shorter than 2], 'articles 2-3 distally widened'. Labium: inner lobes small. Maxilla 1: inner lobe with 'several setae' palp long, article 1 not longer than 2. Maxilla 2: inner plate shorter than outer, inner lobe 'fringed with medial setae'. Maxilliped: inner lobes 'moderate', outer lobe longer than inner; palp of 4 articles, 1-3 'subequal in length', 4 'small', 3 [?unlobed, 4 not spinose along inferior margin].

Coxae ordinary and not progressively longer toward coxa 4, coxa 5 slightly enlarged; coxa 1 not (type) or strongly produced anteriorly or expanded ventrally, coxa 4 not longer than 1, weakly excavate. Gnathopods alike, subchelate, simple, not eusirid, medium, carpus of both much longer but not wider or much wider than propodus, without posterior lobe, with numerous posterior setae, gnathopods 1-2 and very slender or linear, not elongate. Pereopods 3-7 elongate, simple, dactyls strongly pectinate or spined on inferior and superior margins, article 2 simple. Epimeron 3 strongly and sparsely toothed. Outer rami of uropods 1-2 scarcely shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary, entire, subpointed.

Variables. See Diagnosis.

Relationship. Differing from *Amphithopsis* in the long outer ramus of uropod 3 and shape of gnathopods. From *Laothoes* (also see) in the ordinary outer plate of the maxilliped. From *Oradarea* in lack of medial setae on maxilla 1 and pectinate dactyls. From *Metaleptamphopus* in reversal of pectinations on dactyl of pereopods 3-7 and shorter uropod 3. From *Stenopleura, Stenopleuroides, Haliragoides* and *Regalia* in the unproduced article 3 of antenna 1. From *Djerboa* in the poorly setose inner plate of maxilla 1, and simple gnathopods. From *Leptamphopus* and *Schraderia* in the weakness of elongation on carpus of gnathopods, carinate body and pectinate dactyls. From *Accedomoera* in the shape of the gnathopods and uncleft telson. From *Lopyastis* in the carinate body

and long carpus of the gnathopods. From *Haliragoides* in the carinate body, simple gnathopods and pectinate dactyls. From *Paracalliopiella* in the even articles on the flagellum of antenna 1 and simple gnathopods. From *Leptamphopus* in the carinate body and simple dactyls.

See *Apherusa.*

Species. See Gurjanova, 1951; Stephensen, 1931a, 1933b, 1940b, 1944a; *C. bicuspis* Stephensen, 1931a (Gurjanova, 1951) [209BA]; *C. quadricuspis* Heller, 1875 (Sars, 1885) (Chevreux, 1935) (Stephensen, 1938b) [220 + B]; *C. tricuspis* (Krøyer, 1846a,b) (Stephensen, 1931a) [251 + B].

Habitat and distribution. Marine, circumarctic to high North Atlantic, largely deep water, 28-1900 m, 3 species.

Cleonardo Stebbing

Fig.61A

Cleonardo Stebbing, 1888: 959.

Type species. *Cleonardo longipes* Stebbing, 1888, monotypy.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small or large, lateral cephalic lobes ordinary or sinusoid, anteroventral margin of head not produced. Eyes absent. Antennae subequal or 1 longer than 2, calceoli present, peduncular article 1 as long as head, article 2 as long as or longer than article 1; article 3 not produced; article 1 of primary flagellum in male twice or more as long as article 3 of peduncle; strongly armed with aesthetascs; accessory flagellum 1-articulate, elongate. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 longer or shorter than 2. Labium: inner lobes small, forcing gape between outer lobes. Maxilla 1: inner plate with 2 apical setae, palp long, article 1 scarcely shorter than 2. Maxilla 2: inner plate much to slightly broader but not longer than outer, outer plate narrow, inner plate without facial row of setae but with other medial setae. Maxilliped: inner plate not relatively long, outer plate longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 spinose or setulose along inferior margin.

Coxae ordinary, coxa 1 not strongly produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, large, subchelate, not or scarcely eusirid, carpus of both much shorter than propodus, with strong posterior lobe extending distad, with numerous long posterior setae, propodus large, expanded, ovate, palms very oblique. Pereopods 3-7 elongate, simple, dactyls simple, but often setose, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft, apices without long armaments.

Variables. Accessory flagellum absent (*C. maxima*); article 1 of antenna 1 with long tooth (*C. spinicornis*); article 2 produced (*C. biscayensis*).

Relationship. Differing from *Rhachotropis* in the noncarinate body and anteriorly unproduced coxa 1. From *Cleonardopsis* in the generally similar lengths of coxae 1 and 4, the elongate pereopods 5-7. From *Eusiroides* in the elongate pereopods and unproduced coxa 1.

See *Harcledo, Meteusiroides* and *Eusirella.*

Species. See Birstein & Vinogradov (1955, 1960, 1962b); Gurjanova (1951); Pirlot (1929); Schellenberg (1926c, 1955); Stephensen (1933, 1940a, 1944c); *C. appendiculatus* (Sars, 1879, 1885) (Gurjanova, 1951) [220BA]; *C. biscayensis* Chevreux, 1908e, 1935 (Birstein & Vinogradov, 1964) [423A]; *C. brevipes* Ledoyer, 1982b [618A]; *C. longipes* Stebbing, 1888 (= *C. longirostris* Chevreux, 1908e) (Birstein & Vinogradov, 1962b, 1964) [422B]; *C. macrocephala* Birstein & Vinogradov, 1955, 1962b [420BA]; *C. maxima* Birstein & Vinogradov, 1964 [609B]; *C. microdactyla* Stephensen, 1912b (Shoemaker, 1945a) (Gurjanova, 1951) [216BA]; *C. neuvillei* Chevreux, 1908e, 1935 [304A]; *C. spinicornis* Chevreux, 1908e, 1927, 1935 [304A].

Habitat and distribution. Marine, cosmopolitan, cold or deep waters, caught in vertical hauls 1000-5000 m deep, confirmed depths however only 1000-1500 m, 9 species.

Cleonardopsis K.H. Barnard

Cleonardopsis K.H. Barnard, 1916: 175.
Amathillopleustes Pirlot, 1934: 205 (*Amathillopleustes alticoxa* Pirlot, 1934, original designation).

Type species. *Cleonardopsis carinata* K.H. Barnard, 1916, monotypy.

Diagnosis. Body ordinary, compressed, weakly carinate or toothed posterodorsally. Rostrum small, lateral cephalic lobes ordinary, strong, quadrate; anteroventral margin of head not produced. Eyes absent. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 longer than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative,

columnar, article 2 of mandibular palp unlobed, article 3 scarcely longer than 2. Labium: inner lobes small, short, mostly coalesced (almost pleustid). Maxilla 1: inner plate very broad and truncate, with 4 apical setae, palp long, article 1 short. Maxilla 2: inner plate broader but not longer than outer, outer plate narrow, inner plate without facial row of setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 1-2 narrow, 2 elongate, 3-4 narrow, 4 scarcely shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, progressively longer toward coxa 4; coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 twice as long as 1, with posterior lobe, excavate. Gnathopods alike, medium, scarcely subchelate, both scarcely eusirid, carpus of both wider but scarcely shorter than propodus, with broad, truncate posterior lobe not extending distad, carpus thus larger than propodus, with numerous posterior setae, palm long but poorly developed, very oblique. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 with 1 tooth. Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson slightly elongate, cleft one fourth its length, apices without long armaments.

Relationship. Differing from *Eusiroides* in the larger or longer carpus of gnathopods 1-2, the elongation of palp article 2 on the maxilliped, by coxa 4 being twice as long as coxa 1 and the more slender elongate mandibular palp. From *Rhachotropis* in the disparity between the lengths of coxae 1 and 4.

See *Cleonardo*, *Harcledo*, *Metaleptamphopus*, *Meteusiroides* and *Stenopleuroides*.

Species. *Cleonardopsis carinata* K.H. Barnard, 1916 (= *C. alticoxa* Pirlot, 1934) (Schellenberg, 1926c) (Stephensen, 1944c) (Griffiths, 1975) [420B].

Habitat and distribution. Marine, cosmopolitan, mesopelagic to bathypelagic, 564-1189 m, 1 species.

Dautzenbergia Chevreux

Dautzenbergia Chevreux, 1900a: 73.–J.L. Barnard, 1961a: 106.

Type species. *Amphithopsis grandimana* Chevreux, 1887c, monotypy.

Diagnosis. Body ordinary, smooth. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes ovate. Antenna 1 much longer than 2, peduncular articles progressively shorter, article 1 scarcely shorter than head, article 3 not produced; article 1 of primary flagellum as long as article 3 of peduncle; accessory flagellum absent. Labrum incised, but otherwise subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 longer than 2. Labium: inner lobes small or obsolescent (type), outer lobes gaping or not (type). Maxilla 1: inner plate with 3 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae and few (1 generally) other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 strongly produced anteriorly or expanded ventrally, coxa 4 with weak posterior lobe, scarcely excavate. Gnathopods diverse, first medium, second large, 2 much larger than 1, subchelate, not eusirid, carpus of first as long as, of second much shorter than propodus, only second with strong posterior lobe extending distad, carpus of first with numerous long posterior setae, propodus expanded, ovate, second palm only with row of stout spines. Pereopods 3-7 ordinary, simple, dactyls double toothed on inferior margins, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 scarcely shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, unequal. Telson elongate, weakly cleft or incised, linguiform, lobes notched, apices without long armaments.

Relationship. Differing from *Eusiroides* and *Pontogeneoides* in the normal, unexpanded inner plate of maxilla 2. From *Tethygeneia* in the strong propodus of gnathopod 2, in adults with row of very stout spines, the lack of accessory flagellum or process on article 3 of antenna 1, the elongate article 3 of the mandibular palp and the small rostrum.

See *Atylopsis*, *Pontogeneoides* and *Stenopleura*.

Species. *Dautzenbergia dentata* (Chevreux, 1920, 1927) (Stephensen, 1944c) [401B]; *D. grandimana* (Chevreux, 1887c, 1900a, 1927) (Griffiths, 1977b) [350B, 690B, 740B]; *D. megacheir* (Walker, 1897) (Chevreux, 1927, 1935) (Stephensen, 1944c) (Diviacco, 1983a) [350B].

Habitat and distribution. Marine, North Atlantic to western Indian Ocean, 363-1400 m, 3 species.

Djerboa Chevreux

Figs 61L, 62D, 63D

Djerboa Chevreux, 1906a: 74.–Chevreux, 1912d: 179.

Type species. *Djerboa furcipes* Chevreux, 1906a,

monotypy.

Diagnosis. Body slender, compressed, weakly carinate or toothed on pleonites 1-2. Rostrum very small, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes ovate. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 as long as head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, elongate. Labrum entire, rounded, as long as broad; epistome unproduced. Molar triturative, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial and apical setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of setae. Maxilliped: inner plate ordinary, outer plate slightly shorter than inner; palp of 4 articles, 1-4 narrow, 4 shorter than 3, 3 unlobed, 4 weakly spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 as long as 1, with posterior lobe. Gnathopods alike, 2 longer than 1, subchelate, noneusirid, both very slender or linear, elongate, unlobed, carpus as long as or scarcely longer than propodus. Pereopods 3-7 elongate, simple, dactyl of pereopod 7 with 1 tooth on inferior margin, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, inner shortened. Telson ordinary, cleft, apices without long armaments.

Relationship. Differing from *Schraderia* in the short inner ramus on uropod 3 and the superior cusp on the dactyls of pereopods 3-7. From *Leptamphopus* and *Oradarea* in the deeply cleft telson and the spinose pereopodal dactyls.

See *Bathyschraderia*, *Bouvierella* and *Oradarea*.

Species. *Djerboa furcipes* Chevreux 1906a, 1912d (Thurston, 1974a,b) (Bellan-Santini & Ledoyer, 1974) (Andres, 1982) [870].

Habitat and distribution. Marine, circumantarctic and Antarctic islands, 0-110 m, 1 species.

Eurymera Pfeffer

Fig.60E

Eurymera Pfeffer, 1888: 102.

Type species. *Eurymera monticulosa* Pfeffer, 1888, monotypy.

Diagnosis. Body stout, compressed, weakly carinate or toothed, umbonate. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum absent. Labrum entire, subrounded, broader than long epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes small. Maxilla 1: inner lobe with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of many setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, feeble, subchelate, not eusirid, carpus of both not much shorter than propodus, without posterior lobe, with numerous long posterior setae, propodus rectangular, palms scarcely oblique. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 minutely serrate. Outer rami of uropods 1-3 shortened, with lateral and dorsal spines. Uropod 3 ordinary, extended beyond uropod 1, peduncle elongate, without large process, rami lanceolate, unequal, inner ramus longer. Telson elongate, cleft, lobes notched, without long apical armaments.

Relationship. This genus is characterised by the umbonate body. It differs by that character and the unproduced article 3 of antenna 1 from *Bovallia*, *Pontogeneia*, *Tylosapis* and *Prostebbingia*.

In addition, it differs in the shortened outer ramus of uropod 3 from *Pontogeneia* and *Prostebbingia*.

The unlobate carpus of the gnathopods distinguish *Eurymera* from *Bovallia* and the strongly setose maxillae distinguish it from *Tylosapis*.

See *Chosroes* and *Bovallia*.

Species. *Eurymera monticulosa* Pfeffer, 1888 (Chevreux, 1906a, 1912d) (Thurston, 1974a,b) [870].

Habitat and distribution. Marine, Antarctica and outliers, 0-40 m, 1 species.

Eusirella Chevreux

Fig.60K

Eusirella Chevreux, 1908e: 12.

Type species. *Eusirella elegans* Chevreux, 1908e, original designation.

Diagnosis. Body slender, compressed, smooth.

Rostrum small, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes absent. Antenna 1 longer than 2, peduncular article 1 as long as head, article 2 longer than article 1; article 3 very short, not produced; article 1 of primary flagellum ordinary to longer than article 3 of peduncle; accessory flagellum 1-articulate, scale-like, or absent. Labrum entire, subrounded, [?broader than long]; epistome unproduced. Molar poorly triturative or simple, terete to conical, article 2 of mandibular palp unlobed, article 3 shorter than 2, linear, poorly setose. Labium: inner lobes present. Maxilla 1: inner plate without setae, palp short, article 1 longer than 2. Maxilla 2: inner plate weakly broader but not longer than outer, inner plate without facial row of setae and no other medial setae. Maxilliped: inner plate not relatively long, outer plate longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae very short, coxa 1 strongly produced anteriorly or expanded ventrally, coxa 4 without posterior lobe, not excavate. Gnathopods diverse, large, 2 larger than 1, subchelate, not eusirid, carpus of both usually much shorter than propodus, with weak or no posterior lobe not extending distad, carpus with numerous long posterior setae, propodus ovate, elongate, palms very long and oblique, occupying most of posterior margin. Pereopods 3-7 elongate, simple, dactyls simple, they and propodi with long plumose setae, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle elongate but without large process, rami lanceolate. Telson elongate, cleft or incised, apices without long armaments.

Additional characters. Antennal peduncles often with dense masses of calceoli; flagellum of antenna 2 often short.

Variables. Carpus of gnathopod 1 as long as propodus (*E. heterochela*); carpus of gnathopods better lobate (*E. longisetosa*); article 3 of antenna 1 produced (*E. longisetosa*); each lobe of telson with giant apical plume (*E. longisetosa*).

Relationship. Characterised by the simple molar, long article 2 of antenna 1, elongate pereopods and short palp of maxilla 1 in combination.

Differing from *Cleonardo*, *Rhachotropis* and *Harcledo* in combination of simple molar and short palp of maxilla 1.

Species. See Birstein & Vinogradov (1955, 1960); K.H. Barnard (1932); Chevreux (1935); *E. elegans* Chevreux, 1908e (= *E. valdiviae* Schellenberg, 1926c) (Stephensen, 1944c) [426B]; *E. flagella* Andres, 1982 [801A]; *E. heterochela* Birstein & Vinogradov, 1964 [615B]; *E. longisetosa* Birstein & Vinogradov, 1960 [528B]; *E. multicalceola* (Thorsteinson, 1941) (= *E. elegans* of Shoemaker, 1945a) (J.L. Barnard 1964d) (Kamenskaya, 1981a) [422B + 601A].

Habitat and distribution. Marine cosmopolitan, bathypelagic or possibly deeper, probably vertical migrators, shallowest confirmed depths 820 m, deepest unknown, 5 species.

Eusirogenes Stebbing

Eusirogenes Stebbing, 1904b: 15.

Type species. *Eusirogenes dolichocarpus* Stebbing, 1904b, monotypy.

Diagnosis. Body ordinary, compressed, weakly carinate. Rostrum small or large (type), lateral, cephalic lobes sinusoid; anteroventral margin of head not produced. Eyes absent. Antennae [?subequal] or 1 longer than 2, peduncular articles progressively shorter, article 1 as long as head, article 2 almost as long as article 1; article 3 not produced; article 1 of primary flagellum twice as long as article 3 of peduncle; accessory flagellum 1-articulate, elongate. Labrum emarginate, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes [unknown in type] small, occasionally forcing gape between outer lobes. Maxilla 1: inner plate with 0-1 apical seta, palp long, article 1 short. Maxilla 2: inner plate much broader but not longer than outer, outer plate narrow, inner plate without facial row of setae and few other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with weak posterior lobe, scarcely excavate. Gnathopods diverse, large, 1 larger than 2, subchelate, both eusirid, carpus of both, much longer than propodus, with weak posterior lobe not extending distad, first without, second with numerous long posterior setae, carpus of first, occasionally second, gnathopod very slender or linear, otherwise of second not strongly lobed, but broadly so; propodus stout, short, trapezoidal. Pereopods 3-7 elongate, simple, [unknown in type], dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth or serrate. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 [unknown in type] ordinary, but peduncle elongate, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson [unknown in type] elongate, weakly cleft or incised, triangular, without long apical armaments.

Additional characters. Article 1 of antenna 1 produced; gill 7 present.

Variables. Uropod 3 known only in *E. adad*; telson known only in *E. propinquus* and *E. adad*; article 2 = 3 on mandibular palp (*E. adad*); carpus of gnathopod 2 short lobe more extended (*E. adad*); carpus almost identical (*E. propinquus*); outer ramus of uropod 1 not shortened (*E. deflexifrons*); epimeron 3 serrate (*E. propinquus*).

Relationship. Differing from *Eusirus* in the enlarged gnathopod 1. This is the only eusirid genus with eusirid gnathopods characterised by gnathopod 1 being the larger.

Differing from *Pareusirogenes* also in the presence of an accessory flagellum.

See *Eusiropsis*.

Species. *Eusirogenes adad* J.L. Barnard, 1964a [406B]; *E. deflexifrons* Shoemaker, 1930a [255B]; *E. dolichocarpus* Stebbing, 1904b [221B]; *E. homocarpus* Birstein & Vinogradov, 1955, 1958 [280B]; *E. propinquus* Scott, 1909 [221*B]. [* author's original position probably erroneous, corrected here to 07°W, not 70°W.]

Habitat and distribution. Marine, northern hemisphere, 387-1829 m, 5 species.

Eusiroides Stebbing

Eusiroides Stebbing, 1888: 969.

Type species. *Atylus monoculoides* Haswell, 1879b, selected by Chevreux & Fage, 1925.

Diagnosis. Body ordinary compressed, smooth or weakly carinate and toothed. Rostrum small to medium, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes reniform. Antenna 1 longer than 2, article 1 almost as long as head, article 2 almost as long as article 1; article 3 short, not produced; article 1 of primary flagellum, short, accessory flagellum 1-articulate, elongate. Labrum weakly incised, emarginate, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as or longer than 2. Labium: inner lobes small, forcing gape between outer lobes. Maxilla 1: inner plate with 1 medial and 1 apical setae or fewer, palp long, article 1 short. Maxilla 2: inner plate much broader but not longer than outer, outer plate narrow, inner plate without facial row of setae and no other basomedial setae. Maxilliped: inner plates not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 weakly lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 produced anteriorly, expanded ventrally, coxa 4 with posterior lobe, excavate, not twice as long as coxa 1. Gnathopods alike, medium to large, subchelate, not eusirid, carpus of both, much shorter than propodus, with strong posterior lobe extending distad, carpus with numerous long posterior setae, propodus broadly ovate, swollen, palms very oblique and usually bearing thick spines. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth or serrate (type). Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft, lobes notched, without long apical armaments.

Variables. Labrum scarcely incised, not adequately to overlap *Ronco* (*E. crassi*); epimeron 3 not serrate (*E. stenopleura*), with one sinus (*E. georgianus*), otherwise serrate; uropod 3 with 2-articulate outer ramus (*E. orchomenipes*, possibly distinct genus); *E. pictus* probably senior synonym to some other species like *E. diplonyx*.

Relationship. Adults generally easy to recognise because of the large similar gnathopods with short lobate carpus, large ovate propodus with long palms bearing row of giant spines in tandem; juveniles and neotenic species however, bearing less pronounced gnathopods. Differing from *Rhachotropis* in the short stout pereopods and larger palmar spines and generally in habitat; *Eusiroides* is a benthic genus generally in shallow water and the body is quite robust; primarily demersal, *Rhachotropis* comes up in benthic hauls but generally has a more slender more fragile body with more brittle chitin, the gnathopods are generally more extended or longer, often twisted, and less robust.

See *Accedomoera*, *Cleonardo*, *Cleonardopsis*, *Dautzenbergia*, *Harcledo*, *Pontogeneoides* and *Ronco*.

Species. *Eusiroides caberrantis* Bellan-Santini & Ledoyer, 1986 [799B]; *E. aesaris* Stebbing (1888) [782]; *E. crassi* Stebbing, 1888 [706B]; *E. dellavallei* Chevreux, 1899c (Ledoyer, 1968, 1982a) (Krapp-Schickel, 1969b) [330]; *E. dentimera* Ledoyer, 1982a [725wM]; *E. diplonyx* Walker, 1909b (Pirlot, 1936b) (J.L. Barnard, 1970a) (Ledoyer, 1972c) [600]; *E. georgiana* K.H. Barnard, 1932 (= ?*E. crassi* of Schellenberg, 1931, Stephensen, 1947a) [890 + B]; *E. japonica* Hirayama, 1985b [395]; *E. lippus* (Haswell, 1879b) [781]; *E. monoculoides* (Haswell, 1879b) (= *E. pompeii* Stebbing, 1888) (= *E. verrilli* Kunkel, 1910) (?= *E. dellavallei* Chevreux above) (J.L. Barnard, 1972b) [?422]; ?*E. orchomenipes* Walker, 1904 (Nayar, 1967) [665]; *E. picta* (Giles, 1890) [662]; *E. sarsi* Chevreux, 1900a, 1925a, 1927 (Afonso, 1976) [358]; *E. stenopleura* K.H. Barnard, 1932 (Birstein & Vinogradov, 1962b) (Andres, 1982) [835B]; *E. yucatanensis* McKinney *et al.*, 1980a [471]; species (= *E. crassi* identification of Kunkel, 1910) [367].

Habitat and distribution. Marine, subcosmopolitan but especially tropical, 0-1310 (confirmed) m, 15 species.

Eusiropsis Stebbing

Fig.62I

Eusiropsis Stebbing, 1897: 39.

Type species. *Eusiropsis riisei* Stebbing, 1897, monotypy.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes absent. Antennae subequal, calceolate, peduncular article 1 as long as head, article 2 as long as article 1; article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome unproduced. Molar simple, boss-like, article 2 of mandibular palp unlobed, article 3 longer than 2. Labium: inner lobes present. Maxilla 1: inner plate naked, palp long, article 1 almost as long as 2. Maxilla 2: inner plate broader but not longer than outer, without facial row of setae and few other medial setae. Maxilliped: inner plates very short and mostly fused together, outer plate much longer than inner; palp of 4 articles, 4 slightly longer than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae very short and progressively longer toward coxa 7; coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not twice as long as 1, with posterior lobe, excavate; coxa 1-3 posteroventral points. Gnathopods alike, medium, subchelate, both eusirid, carpus of both cryptic, much shorter than propodus, without posterior lobe, carpus without numerous long posterior setae, propodus very broad. Pereopods 3-7 elongate, simple, dactyls simple, but multisetulate or setose on inferior margins, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 huge, well extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, weakly cleft, linguiform, lobes notched, with long apical armaments.

Variables. Molar with very weak triturative plaque; articles 2-3 of mandibular palp of equal length; dactyl of maxilliped slightly spinose on inferior margin; coxa 4 more than twice as long as coxa 1; coxa 7 smaller than 6 (all *E. spinidorsalis*).

Relationship. Differing from *Eusirus*, *Pareusirogenes* and *Eusirogenes* in the short cryptic carpus of the gnathopods; also from *Eusirogenes* in the equal size of the gnathopods.

Species. *Eusiropsis riisei* Stebbing, 1897 (K.H. Barnard, 1930) (Birstein T & Vinogradov, 1960, 1964) (Thurston, 1976a) [423NB]; *E. spinidorsalis* Gamo, 1981b [323A].

Habitat and distribution. Marine, cosmopolitan in low latitudes, epi- or mesopelagic, 2 species.

Eusirus Krøyer

Figs 59A, 60I, 61C,K, 62C,L, 63C

Eusirus Krøyer, 1845: 511.

Type species. *Eusirus cuspidatus* Krøyer, 1845, 1846a, monotypy.

Diagnosis. Body ordinary, compressed, often weakly carinate or toothed. Rostrum small to large, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform or absent. Antennae subequal or 1 longer than 2 (type), peduncular article 1 as long as head, articles progressively shorter, or article 2 as long as article 1 (type), often longer, article 3 short, not produced; article 1 of primary flagellum ordinary, or often more than twice as long as article 3 of peduncle; accessory flagellum 1-articulate, elongate. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter, as long as or longer than 2. Labium: inner lobes small. Maxilla 1: inner plate with 1-2 apical setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate broad, broader but not longer than outer, inner plate broad, often with strong medial setae. Maxilliped: inner plates not long, outer plate longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary to short, coxa 1 not produced anteriorly but expanded ventrally, coxa 4 with posterior lobe and excavate or very poorly so. Gnathopods alike, subchelate, both eusirid. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth or serrate (type). Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate or short, variable, cleft, incised or emarginate, apices without long armaments.

Variables. Dactyl of maxillipedal palp as long as article 3 (*E. parvus*); molar weak (*E. parvus*); article 1 of flagellum on antennae 1-2 elongate (*E. antarcticus*); uropod 1 often with peduncular tooth (*E. crosnieri*).

Relationship. See *Eusirogenes*, *Eusiropsis* and *Pareusirogenes*.

Species. See Andres (1979b); K.H. Barnard (1930, 1932); Birstein & Vinogradov (1962b); Chilton (1912d); Chevreux & Fage (1925); Gurjanova (1951); Nicholls

(1938); Schellenberg (1926a, 1927, 1931); Stephensen (1933b, 1940a, 1944a,c); *E. abyssi* Stephensen, 1944c [209B]; *E. antarcticus* Thomson, 1880 (= *E. laticarpus* Chevreux, 1906a, 1912d) (= *E. longipes* identification of Stebbing, 1888) (Bellan-Santini & Ledoyer, 1974) (Thurston, 1974a) (Andres, 1982) [880 + B]; *E. bathybius* Schellenberg, 1955 (Birstein & Vinogradov, 1960) (Kamenskaya, 1981a) [528A + 404A + 601A]; *E. biscayensis* Bonnier, 1896 (Sexton, 1909, 1911c) (Stephensen, 1944c) [240B]; *E. bouvieri* Chevreux, 1911b (Thurston, 1974a) [870 + B]; *E. crosnieri* Ledoyer, 1978a [698]; *E. cuspidatus* Krøyer, 1845, 1846a (Sars, 1895) (Schellenberg, 1925b, 1927) (Stephensen, 1940a, 1944a) [220]; *E. fragilis* Birstein & Vinogradov, 1960 [523A]; *E. holmi* Hansen, 1887 (Stephensen, 1933b, 1935a) (J.L. Barnard, 1959) [220 + B]; *E. laevis* Walker, 1903 (Monod, 1926) [802N]; *E. latirostris* Ledoyer, 1982b [618A]; *E. leptocarpus* Sars, 1895 (Gurjanova, 1951) [283B]; *E. longipes* Boeck, 1861 (= *E. helvetiae* Bate, 1862) (= *E. bidens* Heller, 1867) (Sars, 1895) (Lincoln, 1979a) (Ledoyer, 1982a) (Hirayama, 1985b) [352 + BA + 395]; *E. microps* Walker, 1906a, 1907 (Ruffo, 1949) (Bellan-Santini, 1972b) (Andres, 1982) [870 + B]; *E. minutus* Sars, 1895 (Gurjanova, 1951) [426 + B]; *E. nevandis* J.L. Barnard, 1961a [618B]; *E. parvus* Pirlot, 1934 (Birstein & Vinogradov, 1964) [506N + 604B]; *E. perdentatus* Chevreux, 1912a,d (= *E. splendidus* Chilton, 1912d) (Ruffo, 1949) (Bellan-Santini, 1972b) (Andres, 1982) [870 + B]; *E. propeperdentatus* Andres, 1979b, 1982 [871]; *E. propinquus* Sars, 1895 (Stephensen, 1940a) (Gurjanova, 1951) [238]; *E. tjalfiensis* Stephensen, 1912b, 1913, 1944c [212B]; *E. tridentatus* Bellan-Santini & Ledoyer, 1974 (= *E. antarcticus* per Bellan-Santini, 1972a) [878]; species, Pirlot, 1934 [602B].

Habitat and distribution. Marine, cosmopolitan, 0-7625 m (deeper citations unconfirmed), 22 species.

Gondogeneia J.L. Barnard

Gondogeneia J.L. Barnard, 1972a: 191.–Thurston, 1974a: 30.

Type species. *Atylus microdeuteropus* Haswell, 1880a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes round or ovate. Antennae subequal, or 1 shorter than 2, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum short, accessory flagellum 1-articulate or absent, when present scale-like; calceoli seriate, not anthurial or tympanic. Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with 3 medial and 1 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate without or with weak facial row of setae but with other medial setae rarely enlarged. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not or scarcely produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, 1 subequal or often larger than 2, subchelate, not eusirid, medium, carpus of both much shorter than propodus, without strong posterior lobe, carpus without numerous long posterior setae, propodus rectangular, or in male inflated and often with 1-2 posterior spines outside of palmar limits. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Sternal gills absent. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary to weakly elongate, cleft, apices without long armaments.

Variables. Telson cleft only one third (*G. antarctica*, *G. spinicoxa*); article 3 of antenna 1 as long as article 2 (*G. antarctica*); article 3 of mandibular palp shortened (*G. antarctica*); coxa 4 lobe and sinus weak (*G. redfearni* and others); pleon weakly carinate (*G. simplex* = *G. calliopioides*).

Relationship. Differing from *Pontogeneia*, *Tethygeneia* and *Nasageneia* in the seriate calceoli. Differing from *Tethygeneia* and *Nasageneia* in the unlobate carpus of gnathopod 2; from *Nasageneia* in the unserrate epimeron 3 and usually well distinguished from genera other than *Nasageneia* in the large or at least rounded eyes. Also differing from *Pontogeneia*, especially some of the difficult and close species, by the lack of facial setae on maxilla 2.

Differing from *Apherusa* in the deeper cleft of the telson and the absence of facial setae on maxilla 2.

Gondogeneia gracilicauda has an anterodistal lobe on article 2 of pereopod 3 (less so on pereopod 4) but otherwise is not related to *Chosroes*, a genus with midanterior lobe on article 2 of pereopods 3-4.

See *Antarctogeneia*, *Bovallia*, *Manerogeneia* and *Paracalliopiella*, *Paramoera* and *Whangarusa*.

Species. See K.H. Barnard (1932); Ruffo (1949); Schellenberg (1931, 1935a); Stephensen (1927a, 1947a); *G. antarctica* (Chevreux, 1906a,b, 1912d) (Thurston, 1974a,b) [800]; *G. bidentata* (Stephensen, 1927a) [844]; *G. chosroides* (Nicholls, 1938) (= *G. denticulata* Nicholls, 1938) [845]; *G. dania* (= *G. danai* auct.) (Thomson, 1879b) (J.L. Barnard, 1972b) [775]; *G. dentata* Alonso, 1986 [862]; *G. georgiana* (Pfeffer, 1888) (Schellenberg, 1931) (K.H. Barnard, 1932) (Andres, 1982) [833]; *G. gracilicauda* (Schellenberg, 1931) [866]; *G. macrodon*

(Schellenberg, 1931) [866]; *G. microdeuteropa* (Haswell, 1880a) (J.L. Barnard, 1972) [780]; *G. patagonica* Alonso, 1986 [862]; *G. redfearni* (Thurston, 1974a,b) [890]; *G. rotorua* J.L. Barnard, 1972b [775]; *G. simplex* (Dana, 1852a, 1853) (= *G. calliopioides* Schellenberg, 1926a) (Schellenberg, 1931) (K.H. Barnard, 1932) [835]; *G. spinicoxa* Bellan-Santini & Ledoyer, 1974 [797]; *G. subantarctica* (Stephensen, 1938c) (= *G. antarctica* of Stephensen, 1927a) [840]; *G. tasmaniae* (Thomson, 1893) [783]; *G. tristanensis* (K.H. Barnard, 1932, 1965) (?Stephensen, 1949) [731 + 733]; *G. ushuaiae* (Schellenberg, 1931) [866]; species (= *G. antarctica* of Chilton, 1909b) [840].

Habitat and distribution. Marine, circum-antarctic and austral, 0-183 m, 18 species.

Halirages Boeck

Fig.60F

Halirages Boeck, 1871b: 194.

Type species. *Amphithoe fulvocincta* M. Sars, 1858, selected by Boeck, 1876.

Diagnosis. Body ordinary, compressed, weakly carinate or toothed. Rostrum small, lateral cephalic lobes ordinary; anteroventral margin of head weakly produced. Eyes ovate to reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 slightly shorter than head, article 3 produced; article 1 of primary flagellum ordinary, accessory flagellum absent; calceoli present (contra *Apherusa*). Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with 7 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of 2 setae and with other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 lobed (type), 4 not spinose along inferior margin.

Coxae ordinary to short, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with weak posterior lobe, poorly excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus of both longer (rarely equal) than propodus, without posterior lobe, carpus with numerous long posterior setae, propodus narrow, rectangular, sometimes gnathopods 1-2 very slender, linear. Pereopods 3-7 ordinary to weakly elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate. Outer rami of uropods 1-2 slightly to strongly shortened; rami with lateral and dorsal spines. Uropod 3 large, not or weakly extended beyond uropod 1, peduncle elongate, without large process, rami lanceolate, subequal or inner ramus slightly longer than outer one. Telson elongate, emarginate, or almost entire, sometimes notched, linguiform, without long apical armaments.

Variables. Article 3 of maxillipedal palp unlobed (not type); article 3 of antenna 1 unproduced (*H. elegans*, etc.). Labium with inner lobes (*H. elegans*); carpus of gnathopods as short as propodus (*H. mixtus*); body teeth absent (*H. mixtus*).

Relationship. Differing from *Apherusa* in the poorly or unextended uropod 3 and often in the produced article 3 on the peduncle of antenna 1 and presence of calceoli. From *Leptamphopus*, *Oradarea* and *Amphithopsis* in the unshortened outer ramus of uropod 3. From *Amphithopsis* and *Cleippides* in the simple dactyls of pereopods 3-7. From *Pontogeneia* in the uncleft telson. From *Paracalliopiella* in the lack of accessory flagellum. From *Haliragoides* in the slightly shorter pereopods 3-7 and unextended uropod 3. Intergrading to *Atylopsis* (which see).

See *Austroregia*, *Calliopiella*, *Calliopius*, *Cleippides*, *Laothoes*, *Lopyastis*, *Manerogeneia* and *Whangarusa*.

Removals. *Halirages bungei* Gurjanova, 1951, to *Paracalliopiella*; *H. huxleyanus*, Bate, 1862, *H. batei* Cunningham, 1871, and *H. regis* Stebbing, 1914b, to *Austroregia*.

Species. See Gurjanova (1951); Stephensen (1933b, 1940b, 1944c); *H. caecum* Kamenskaya, 1979a [206A]; *H. elegans* Norman, 1882 (Stappers, 1911) (Stephensen, 1931a, 1938b, 1944c) [220 + B]; *H. fulvocincta* (M. Sars, 1858) (= *H. tricuspis* Stimpson, 1863) (= *H. bispinosus* Stephensen, 1917) (Sars, 1895) (Stephensen, 1931a, 1938b, 1944a) [200 + B]; *H. gorbunovi* Gurjanova, 1946, 1951 [?220A]; [*H. maculatus* Stuxberg, 1880 [*nomen nudum*]]; *H. mixta* Stephensen, 1931a, 1944a (Dunbar, 1954) [260]; *H. nilssoni* Ohlin, 1895b (Gurjanova, 1951) [220]; *H. quadridentata* Sars, 1876, 1885 (Stephensen, 1931a, 1944a) [220B].

Habitat and distribution. Marine, Arctic, boreal, 0-3530 m, 7 species.

Haliragoides Sars

Fig.63

Haliragoides Sars, 1895: 432.

Type species. *Halirages inermis* Sars, 1883, monotypy.

Diagnosis. Body ordinary to slender, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head produced. Eyes reniform. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of

primary flagellum ordinary, accessory flagellum absent. Labrum emarginate, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 much shorter than 2. Labium: inner lobes small. Maxilla 1: inner plate with 7 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with weakly facial row of many setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae short, coxa 1 strongly produced anteriorly, expanded ventrally, coxa 4 with weak posterior lobe, weakly excavate. Gnathopods alike, medium, subchelate, weakly eusirid, carpus of both much longer than propodus, without posterior lobe, without numerous long posterior setae, propodus expanded, almond shaped. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 with 1 tooth. Outer rami of uropods 1-2 scarcely shortened; rami with lateral and dorsal spines. Uropod 3 huge, extended beyond uropod 1, peduncle without large process, rami lanceolate, almost subequal. Telson ordinary, entire, notched, without long apical armaments.

Variables. Inner plate of maxilla 2 without facial setae (*H. abyssi*); palp article 3 of mandible not very short (*H. abyssi*); eyes absent (*H. abyssi*); article 3 of antenna 1 weakly cuspidate (*H. abyssi*); telson un-notched (*H. abyssi*).

Relationship. Differing from *Apherusa* in the expanded propodus of the gnathopods and the elongate pereopods 5-7. From *Prostebbingia* in the uncleft telson, short article 3 of the mandibular palp and elongate pereopods 5-7. From *Manerogeneia* in the simple dactyls of pereopods 3-7, produced corner of head and elongate carpus of the gnathopods.

See *Cleippides*, *Halirages*, *Membrilopus* and *Paracalliopiella*.

Haliragoides australis not well described, bearing dorsal pleonal teeth, long downcurved rostrum.

Species. *Haliragoides abyssi* Gurjanova, 1951 [208BA]; ?*H. australis* Chilton, 1912d [836]; *H. inermis* (Sars, 1883, 1895) (Stephensen, 1931a, 1933b, 1938b, 1944a) [216 + B].

Habitat and distribution. Marine, Arctic and North Atlantic, 10-2450 m; also possibly South Orkneys, 16-18 m, 3 species.

Harcledo J.L. Barnard

Figs 62E, 63E

Harcledo J.L. Barnard, 1964c: 60.

Type species. *Meteusiroides plumipes* Birstein & Vinogradov, 1955 (= *Meteusiroides curvidactyla* Pirlot, 1934), original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum medium, lateral cephalic lobes ordinary, anteroventral margin of head not. Eyes ovate or reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum twice as long as article 3 of peduncle; accessory flagellum absent. Labrum [?entire, subrounded, broader than long; epistome ?unproduced]. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes present, causing broad gape on outer lobes. Maxilla 1: inner plate with 1 apical seta, palp long, article 1 short. Maxilla 2: inner plate broader but not longer than outer, inner plate without facial row of setae but with other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not setulose along inferior margin.

Coxae very short and progressively longer toward coxa 7; coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 [?not twice as long as 1], with weak posterior lobe, poorly excavate. Gnathopods alike, medium, almost simple, not eusirid, carpus of both much shorter than propodus, with weak posterior lobe not extending distad, with numerous posterior setae, propodus elongate, slightly expanded, palms forming posterior margins. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft, pointed, without long apical armaments.

Additional character. Article 1 of mandibular palp with tooth.

Relationship. Differing from *Cleonardo* in the lack of accessory flagellum. From *Rhachotropis* in the poorly produced coxa 1, smooth body and lack of accessory flagellum, and lack of thick spines on the gnathopodal palms. From *Eusiroides* in the same way as *Rhachotropis* plus the elongate pereopods and short coxae. From *Meteusiroides* in the elongate pereopods 5-7, shorter article 3 of mandibular palp, and absence of tooth on article 1 of the mandibular palp. From *Harpinioides* in the short coxae and broad inner plate of maxilla 2. From *Cleonardopsis* in the smooth body, lack of accessory flagellum, long article 1 on the flagellum of antenna 1, and elongate telson. From *Stenopleura* and*Stenopleuroides* in the long deeply cleft telson.

See *Eusirella*.

Species. *Harcledo curvidactyla* (Pirlot, 1929, 1934)

(= *H. plumipes* Birstein & Vinogradov, 1955) (Stephensen, 1933b, 1944c) (Birstein & Vinogradov, 1964) [422 N + B].

Habitat and distribution. Marine, cosmopolitan, pelagic and bathypelagic, 1 species.

Harpinioides Stebbing, new synonymy

Figs 62S, 63O

Harpinioides Stebbing, 1888: 936.
Harpinioidella Schellenberg, 1926a: 356 (*Harpinioidella fissicauda* Schellenberg, 1926a, monotypy).

Type species. *Harpinioides drepanocheir* Stebbing, 1888, monotypy.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes round or absent. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, elongate. Labrum entire, truncate, broader than long; epistome unproduced. Molar simple, humped or conical, article 2 of mandibular palp unlobed, article 3 as long as or longer than 2. Labium: inner lobes present, forcing broad gape between outer lobes. Maxilla 1: inner plate with 1-2 apical setae, palp long, article 1 short. Maxilla 2: inner plate much narrower and shorter than outer, inner plate without facial row of setae and with few other medial setae. Maxilliped: inner plate not relatively long, outer plate much longer than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, almost simple, not eusirid, carpus of both much shorter than propodus, with weak posterior lobe extending distad, carpus with few long posterior setae, propodus long, thin, bent apically, dactyl folding into posterior margin. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, nearly subequal. Telson slightly elongate, cleft or incised, apices without long armaments.

Variables. Telson incised (type) or cleft; article 3 of mandibular palp equal to (type) or longer than article 2.

Remarks. Though we have been citing uncleft and cleft telsons as good generic distinctions the type species of these two synonymous genera are otherwise so close as to suggest they are not worth distinguishing.

They differ mainly by the characters of *Harpinioidella* in having a cleft telson and slightly longer article 3 on the mandibular palp.

Relationship. Differing from other pelagic genera in the bent propodus of the gnathopods, the reversal in width of plates on maxilla 2, with the inner being narrow and the outer wide.

Differing also from *Membrilopus*, *Harcledo* and *Austroregia* in the simple molar as well as gnathopods and maxilla 2. From *Atylopsis* in the gnathopods and maxilla 2 plus the lack of accessory flagellum and unproduced article 3 of antenna 1.

See *Stenopleuroides*.

Species. *Harpinioides drepanocheir* Stebbing, 1888 (Pirlot, 1934) (Bellan-Santini & Ledoyer, 1974) [851 + 602B]; *H. fissicauda* (Schellenberg, 1926a) (J.L. Barnard, 1962d) [881 + 702B].

Habitat and distribution. Marine, Antarctica to equator, bathypelagic, 2 species.

Laothoes Boeck

Figs 60H, 63M

Laothoes Boeck, 1871b: 202.
Thoelaos Della Valle, 1893: 592 [*lapsus* for *Laothoes*] (same type species).

Type species. *Laothoes meinerti* Boeck, 1871b, monotypy.

Diagnosis. Body ordinary to slender, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 very short (ratio of 1,2,3 = 23:9:6), article 3 not produced; article 1 of primary flagellum short, accessory flagellum absent. Labrum entire, emarginate, subrounded, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with 5 medial setae, palp short, article 1 longer than 2. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae, with other medial setae. Maxilliped: inner plate not relatively long, outer plate longer than inner, enlarged, immense; palp of 4 articles, narrow, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with small posterior lobe, poorly excavate. Gnathopods diverse, medium, 2

longer than 1, subchelate, not eusirid, carpus of both longer (type) or shorter than propodus, without posterior lobe, carpus with numerous long posterior setae, gnathopods 1-2, especially gnathopod 2, very slender or linear (type) or not. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 slightly to greatly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal. Telson ordinary, emarginate, almost entire, linguiform, without long apical armaments.

Variables. Telson crenellated distally (*L. pacificus*); palp of maxilla 1 ordinary (*L. polylovi*); carpus of gnathopods shorter than propodus, gnathopods not elongate (*L. pacificus*).

Relationship. *Laothoes* is characterised by the enlarged outer plate of the maxilliped, and except for *L. polylovi*, by the short palp of maxilla 1; in addition it differs from *Halirages* in the unproduced article 3 of antenna 1, lack of facial setae on maxilla 2 and the smooth epimeron 3.

Differing from *Cleippides* in the enlarged outer plate of the maxilliped, very short article 2 on antenna 1, simple dactyls of pereopods 3-7 and the more strongly subchelate gnathopods. From *Paracalliopiella* and *Apherusa* in the enlarged outer plate of the maxilliped; also from *Paracalliopiella* in the lack of accessory flagellum. From *Amphithopsis* in the maxilliped, equal rami of uropod 3, short article 2 of antenna 1 and lack of accessory flagellum.

See *Awacaris*, *Oradarea* and *Whangarusa*.

Species. *Laothoes macrocheir* Oldevig, 1959 (? = *L. pacificus*, see below) [278]; *L. meinerti* Boeck, 1871b, 1876 (Sars, 1895) (Stephensen, 1931a, 1938b) (Gurjanova, 1951) [240 + B]; *L. pacificus* Gurjanova, 1938b, 1951 (see *L. macrocheir* above) [391]; *L. polylovi* Gurjanova, 1946, 1951 [207B].

Habitat and distribution. Marine, Arctic, high boreal, 25-1384 m, 4 species.

Leptamphopus Sars

Figs 59H, 63P

Leptamphopus Sars, 1895: 458.

Type species. *Leptamphopus sarsi* Vanhoffen, 1897, new name for Sars' (1895) misidentification of *Amphithopsis longimana* Boeck.

Diagnosis. Body slender, compressed, smooth. Rostrum small, lateral cephalic lobes ordinary; anteroventral margin of head weakly produced. Eyes ovate to reniform. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with 11 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of many setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate, or very poorly so (*L. massiliensis*). Gnathopods diverse, medium, 2 longer than 1, subchelate, not eusirid, with numerous short posterior setae, gnathopods very slender, linear, carpus and propodus elongate, unlobed on gnathopod 2, weakly lobed on gnathopod 1 (type). Pereopods 3-7 slightly elongate, simple, or weakly prehensile, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 slightly to strongly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, outer about half as long as inner. Telson ordinary, incised or emarginate, almost entire, linguiform, without long apical armaments.

Variables. Palp article 3 of maxilliped lobed (*L. massiliensis*); carpus of gnathopod 1 unlobed (*L. massiliensis*); pereopods 3-7 weakly prehensile (*L. paripes*); antennae reaching equally (*L. paripes*).

Relationship. Differing from *Schraderia* in the absence of an accessory flagellum and the short outer ramus of uropod 3.

See *Amphithopsis*, *Apherusa*, *Bouvierella*, *Cleippides*, *Djerboa*, *Halirages* and *Oradarea*.

Species. *Leptamphopus massiliensis* Ledoyer, 1977 (Krapp-Schickel, 1982b) [348M + B]; *L. paripes* Stephensen, 1931a (Gurjanova, 1951) [211B]; *L. sarsi* Vanhoffen, 1897, 1907 (= *L. longimanus* Boeck of Sars, 1895) (Stephensen, 1931a, 1938b) [240B].

Habitat and distribution. Marine, north-eastern boreal Atlantic and Mediterranean, 63-1505 m, 3 species.

Liouvillea Chevreux

Figs 59D, 61D, 62N

Liouvillea Chevreux, 1911c: 1168.–Chevreux, 1912a: 7.-

Chevreux, 1912d: 139.

Type species. *Liouvillea oculata* Chevreux, 1912a, designated by Chevreux, 1912a.

Diagnosis. Body slender, compressed, weakly carinate or toothed. Rostrum large; lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes round. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 short, article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome acutely produced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes present, small. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, with facial row of many setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not strongly produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods diverse, small, 2 longer than 1, subchelate, not eusirid, small carpus of first shorter than, of second as long as propodus, without posterior lobe, carpus with numerous long posterior setae, propodus rectangular or weakly trapezoidal; gnathopod 2 slender, gnathopod 1 ordinary. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 with single tooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle with large process, rami lanceolate, slightly unequal (inner ramus longer than outer). Telson ordinary, cleft, distally, apices without long armaments.

Relationship. See *Atyloella*, *Calliopiella*, *Lopyastis*, *Meteusiroides* and *Pseudomoera*.

Species. *Liouvillea oculata* Chevreux, 1911c, 1912a,d (Thurston, 1974a,b) [875].

Habitat and distribution. Marine, Palmer Region of Antarctica and outliers, 0-200 m, 1 species.

Lopyastis Thurston

Lopyastis Thurston, 1974a: 32.

Type species. *Atylopsis signiensis* Thurston, 1972, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary; anteroventral margin of head weakly produced. Eyes trapezoidal or reniform. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum [?ordinary], accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 scarcely shorter than 2. Labium: inner lobes small. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of many setae and several other medial setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 shorter than 3, 3 lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, 2 scarcely larger than 1, subchelate, not eusirid, carpus of both scarcely shorter than propodus, without posterior lobe, carpus with numerous posterior setae, propodus rectangular. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 not shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, slightly unequal. Telson elongate, incised or emarginate, without long apical armaments.

Relationship. Differing from *Accedomoera*, *Apherusa*, *Atylopsis* and *Tylosapis* in the presence of facial setae on maxilla 2. From *Liouvillea* in the absence of an epistomal cusp. From *Haliragoides* in the nondominant coxa 1. From *Halirages* and *Pontogeneia* in the presence of an accessory flagellum. From *Cleippides* in the short carpus of the gnathopods. From *Regalia* in the normally extended coxae and small rostrum. From *Tylosapis* and *Atylopsis* in the longer carpus of the gnathopods.

See *Paracalliopiella*, *Membrilopus* and a note with *Paramoera* on *P. incognita*.

Species. *Lopyastis multisetosa* (Schellenberg, 1926) [881 + B]; *L. signiensis* (Thurston, 1972, 1974a) [836].

Habitat and distribution. Marine, Antarctica, 5-350 m, 2 species.

Manerogeneia Barnard & Karaman

Manerogeneia Barnard & Karaman, 1987: 860.

Type species. *Pontogeneiella maneroo* J.L. Barnard, 1972b, original designation.

Diagnosis. Body ordinary, compressed, smooth.

Rostrum, large, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes round. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum as long as article 3 of peduncle; accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes present. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of many setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 weakly setulate along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not quite twice as long as 1, with posterior lobe, excavate. Gnathopods alike, medium, but 1 scarcely larger than 2, subchelate, not eusirid, carpus of both shorter than propodus, with weak or no posterior lobe not extending distad, carpus without numerous long posterior setae, propodus rectangular. Pereopods 3-7 ordinary, simple, dactyls strongly toothed or bifid on inferior margins, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, unequal. Telson slightly elongate, entire, linguiform, without long apical armaments.

Relationship. Noted among its relatives for the bifid dactyls of pereopods 5-7. Closest to *Tylosapis* but back smooth, telson not emarginate, medial margin of inner plate on maxilla 1 strongly setose, and gnathopod 1 slightly enlarged; also like *Atylopsis* but outer ramus of uropod 3 shortened.

Differing from *Prostebbingia* and *Gondogeneia* in the uncleft telson. From *Bovallia* in the short article 1 of antenna 1. From *Halirages* in the unserrate epimeron 3, short outer ramus of uropod 3 and nonemarginate telson.

See *Apherusa*, *Haliragoides* and *Membrilopus*.

Species. *Manerogeneia maneroo* (J.L. Barnard, 1972b) [780].

Habitat and distribution. Marine, ~~New Zealand~~ Australia, intertidal, 1 species.

Membrilopus Barnard & Karaman

Membrilopus Barnard & Karaman, 1987: 861.

Type species. *Metaleptamphopus membrisetata* J.L. Barnard, 1961a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum medium, large, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced. Eyes reniform. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, barrel-shaped. Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner without facial row of setae but with 2 other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 almost twice as long as 1, with posterior lobe, excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus of both nearly as long as propodus, with weak posterior lobe not extending distad, with numerous long posterior setae, propodus weakly inflated, trapezoidal. Pereopods 3-7 scarcely elongate, simple, dactyls strongly pectinate on inferior margins, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 not or slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, outer shortened. Telson ordinary, entire, linguiform, without long apical armaments.

Relationship. Like *Metaleptamphopus* but lobes of maxilla 2 narrow, inferior side of pereopodal dactyls 3-7 ornamented (not superior side), accessory flagellum present, enlarged gnathopods with short lobed carpus, articles 2-3 of the maxillipedal palp normally shorter and uropod 3 neither extended well beyond uropod 1 nor bearing elongate peduncle.

Differing from *Prostebbingia* in the uncleft telson. From *Haliragoides* in the short carpus of the gnathopods and the absence of truly facial setae on maxilla 2. From *Manerogeneia* in the absence of inner lobes on the lower lip, absence of facial setae on maxilla 2, and the pectinate dactyls of the pereopods (bifid only in *Manerogeneia*).

Very close to *Atylopsis* but lacking a process on article 3 of antenna 1, lacking inner lobes on the lower lip and bearing pectinate dactyls on the pereopods. Also very close to *Paracalliopiella* but differing in the pectinate dactyls and lack of inner lobes on the lower lip. Close to *Tylosapis* but inner plate of maxilla 1 strongly setose medially.

Differing from *Lopyastis* in the short outer ramus of uropod 3 and the pectinate dactyls of the pereopods.

See *Harpinioides*.

Species. *Membrilopus membrisetata* (J.L. Barnard, 1961a) (Griffiths, 1974a) [416B].

Habitat and distribution. Marine, south-western Africa, 537 m, 1 species.

Metaleptamphopus Chevreux

Fig.62J

Metaleptamphopus Chevreux, 1911c: 1168.–Chevreux, 1912a: 7.

Type species. *Metaleptamphopus pectinatus* Chevreux, 1912a, original designation of 1912a.

Diagnosis. Body ordinary, compressed, smooth. Rostrum large, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes round. Antenna 1 longer than 2, peduncle very short, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum short; accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 longer than 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates broad, inner plate without facial row of setae and few other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp very thin, of 4 articles, 4 much shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae short and progressively longer toward coxa 4; coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 twice as long as 1, with weak posterior lobe, poorly excavate. Gnathopods alike, feeble, 1 slightly stouter than 2, scarcely subchelate, not eusirid, carpus of both as long as propodus, without posterior lobe, with numerous short posterior setae, propodus slender, subrectangular. Pereopods 3-7 ordinary, simple, dactyls strongly pectinate on superior margins, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 slightly to scarcely shortened; rami with lateral and dorsal spines. Uropod 3 huge, extended well beyond uropod 1, peduncle elongate, without large process, rami lanceolate, poorly unequal. Telson ordinary, short, entire, linguiform, without long apical armaments.

Relationship. Differing from *Rhachotropis* in the pectinate dactyls of pereopods 3-7 and the huge, extended uropod 3. From *Stenopleura* and *Stenopleuroides* in the feeble gnathopods with unlobed carpus and the longer middle coxae. From *Cleonardopsis* in the equal sized lobes of maxilla 2, uncleft telson, and the greatly extended uropod 3 with elongate peduncle.

See *Chosroes*, *Cleippides* and *Membrilopus*.

Removal. *Metaleptamphopus membrisetata* J.L. Barnard, 1961a, to *Membrilopus*.

Species. *Metaleptamphopus pectinatus* Chevreux, 1912a,d (Schellenberg, 1931) (Thurston, 1974a,b) [875].

Habitat and distribution. Marine, Antarctica, 1-6 m, 1 species.

Meteusiroides Pirlot

Fig.60C

Meteusiroides Pirlot, 1934: 218.

Type species. *Meteusiroides keyensis* Pirlot, 1934, original designation.

Diagnosis. Body ordinary, compressed, partially toothed. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced. Eyes reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum twice as long as article 3 of peduncle; accessory flagellum absent. Labrum incised, [?broader than long], epistome produced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 longer than 2. Labium: inner lobes large, forcing gape between outer lobes (possibly unnaturally postured, see J.L. Barnard, 1969c: 227). Maxilla 1: inner lobe with 2 apical setae, palp long, article 1 short. Maxilla 2: inner plate scarcely (or remarkably?) broader but not longer than outer, inner plate without facial row of setae but with other medial setae. Maxilliped: inner plate not relatively long, outer plate ordinary, slightly longer than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae relatively short, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 twice as long as 1, with posterior lobe, excavate. Gnathopods alike, medium, scarcely subchelate,not eusirid, carpus of both much shorter than propodus, with weak posterior lobe slightly extending distad, with numerous short posterior setae, propodus slightly expanded, palms occupying most of posterior margin, with large spines, some outside palm. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, slightly unequal. Telson elongate, cleft, triangular, apices without long armaments.

Relationship. Differing from *Stenopleura* and *Stenopleuroides* in the long coxae and long cleft telson; from *Stenopleura* also in the long article 4 of antenna 2 and the long article 3 of the mandibular palp. From *Harcledo* in the long coxae, short pereopods and large palmar spines of the gnathopods. From *Cleonardopsis* in the smooth body, long coxae, elongate telson, smaller carpus on the gnathopods and the lack of accessory flagellum. From *Cleonardo* in the short pereopods 5-7, large gnathopodal spines, lack of accessory flagellum and better developed coxa 1. From *Atyloella* in the lack of accessory flagellum and lack of facial setae on the inner plate of maxilla 1. From *Liouvillea* also in the poorly setose maxilla 2, stouter gnathopods and elongate telson.

Species. *Meteusiroides keyensis* Pirlot, 1934 [602B].

Habitat and distribution. Marine, Indonesia, 304 m, probably meso- or epipelagic, 1 species.

Nasageneia Barnard & Karaman

Nasageneia Barnard & Karaman, 1987: 862.

Type species. *Pontogeneia nasa* J.L. Barnard, 1969b, original designation.

Diagnosis. Body slender, compressed, smooth. Rostrum large, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced. Eyes reniform. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum ordinary to short, accessory flagellum absent. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with 1 medial and 2 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader but slightly longer than outer, inner plate without facial row of setae but with other medial setae, few, large, at least one slightly submarginal. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary to short, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 without posterior lobe, excavate. Gnathopods diverse, medium, of similar size, subchelate, not eusirid, medium, carpus of both shorter than propodus, only gnathopod 2 with strong posterior lobe extending distad, carpus without numerous long posterior setae, propodus rectangular in female, inflated in male, in latter with posterior spines outside limits of oblique palm. Pereopods 3-7 ordinary, simple, dactyls simple; article 2 not anteriorly lobate. Epimeron 3 serrate. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle with small process, rami lanceolate, subequal. Telson ordinary, weakly cleft, apices without long armaments.

Relationship. Like *Tethygeneia* but epimeron 3 serrate and propodus of male gnathopods with posterior spines well outside palmar limits as in *Gondogeneia*. Calceoli tending to be much more strongly anthurial than in *Tethygeneia*, with one lobe quite linguiform.

Differing from *Abdia* in the serrate epimeron 3 and presence of many spines on the propodus of the gnathopods outside of the palmar area.

See *Antarctogeneia* and *Pseudomoera*.

Species. *Nasageneia nasa* (J.L. Barnard, 1969b, 1979b) [377]; *N. quinsana* (J.L. Barnard, 1964c, 1969a, 1979b) [370].

Habitat and distribution. Marine, warm temperate California and Mexico, 0-1 m, 2 species.

Oligochinus J.L. Barnard

Oligochinus J.L. Barnard, 1969a: 98.

Type species. *Oligochinus lighti* J.L. Barnard, 1969a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes ovate. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with 4 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of 1 seta and several other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with weak posterior lobe, weakly excavate. Gnathopods alike, small, subchelate, not eusirid, carpus of both much shorter than propodus, with weak posterior lobe not extending distad, carpus with numerous short posterior setae, propodus rectangular, thin. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate. Outer ramus of only uropod 2 shortened;

rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate nearly subequal. Telson ordinary, incised, not cleft, deeply emarginate, without long apical armaments.

Relationship. Differing from *Apherusa* in the presence of an accessory flagellum, the absence of inner lobes on the lower lip, the poorly extended uropod 3, the unshortened outer ramus of uropod 1 and the presence of only 1 facial seta on the inner plate of maxilla 2.

Species. *Oligochinus lighti* J.L. Barnard, 1969a [372].

Habitat and distribution. Marine, northern California, intertidal, 1 species.

Oradarea Walker

Fig.59G

Oradarea Walker, 1903: 56.–Thurston, 1974b: 34.

Type species. *Oradarea walkeri* Shoemaker, 1930a, new name for Walker's *Oradarea longimana*, homonym to Boeck's species.

Diagnosis. Body slender, compressed, carinate or toothed. Rostrum large, lateral cephalic lobes ordinary, anteroventral margin of head produced or weakly so. Eyes reniform. Antenna 2 longer than 1, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 often as long as 1, article 3 not produced; article 1 of primary flagellum ordinary, about as long as article 3 of peduncle; accessory flagellum 1-articulate, barrel-like. Labrum [?entire, broader than long]; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes obsolescent [lobes showing not inner ones]. Maxilla 1: inner plate with many medial setae, palp long, article 1 shorter than 2. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of many setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 shorter than 3, 3 lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods diverse, medium, 2 longer than 1, subchelate, not eusirid, medium, carpus of both shorter than (type) or as long as propodus, without posterior lobe, carpus with numerous small posterior setae, gnathopod 1 short, gnathopod 2 very slender or linear, carpus and propodus elongate. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate, strongly unequal. Telson ordinary, incised, emarginate, almost entire, linguiform, without long apical armaments.

Variables. Labrum entire in species other than type [= unknown in type].

Note on *O. scissicaudata*: not *Oradarea* because of cleft telson and long article 1 of palp on maxilla 1, but not firmly identified to genus; close to *Bouvierella* on basis of maxilla 2, mandible and maxilla 1 but epimeron 3 not serrate, palp of maxilla 1 incorrect and inner lobes of lower lip present.

Relationship. Differing from *Leptamphopus* in the presence of an accessory flagellum, dominant antenna 2 and short broad article 3 of the mandibular palp. From *Amphithopsis* in the short article 3 of the mandibular palp, facial setae on maxilla 2, and sharply produced head. From *Djerboa* in the uncleft telson and simple pereopodal dactyls.

See *Apherusa*, *Atylopsis*, *Awacaris*, *Bouvierella*, *Cleippides*, *Halirages* and *Schraderia*.

Species. See Bellan-Santini & Ledoyer (1974); Thurston, 1974a,b); *O. acuminata* Thurston, 1974b [870 + B]; *O. bidentata* K.H. Barnard, 1932 (Stephensen, 1938c) [870]; *O. edentata* K.H. Barnard, 1932 [870]; *O. impressicauda* K.H. Barnard, 1932 [871B]; *O. longimana* (Boeck, 1871b) (Vanhoffen, 1907) (Shoemaker, 1930a) (Stephensen, 1931a) [216 + B]; *O. megalops* (Nicholls, 1938) [878]; *O. novaezealandiae* (Thomson, 1879b) (= *O. debilis* Thomson, 1880) (J.L. Barnard, 1972b) [850]; *O. ocellata* Thurston, 1974a,b [870]; *O. rossi* Thurston, 1974b (Andres, 1982) [870]; [?*O. scissicaudata* Ledoyer, 1986 (see note above) [618A, 3716 m]]; *O. shoemakeri* Pirlot, 1934 [635B]; *O. tricarinata* K.H. Barnard, 1932 (Andres, 1982) [870 + B]; *O. tridentata* K.H. Barnard, 1932 (Stephensen, 1938c) [875]; *O. unidentata* Thurston, 1974a,b [875]; *O. walkeri* Shoemaker, 1930a (= *O. longimana* Walker, 1903, homonym) (Bellan-Santini 1972, 1972a) (Thurston, 1974a,b) [870 + B].

Habitat and distribution. Marine, cold water, mostly Antarctica, sparsely to deep sea tropics and to boreal north Atlantic, 0-1264m, 14 species.

Paracalliopiella Tzvetkova & Kudrjaschov

Paracalliopiella Tzvetkova & Kudrjaschov, 1975: 14.–Karaman & Barnard, 1979: 114.

Callaska J.L. Barnard, 1978: 38 (*Calliopiella pratti* J.L. Barnard, 1954a, original designation).

Type species. *Leptamphopus litoralis* Gurjanova, 1938b, original designation.

Diagnosis. Body ordinary, compressed, smooth or carinate. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 1 shorter than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like, main flagellar articles diverse. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with 4-5 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae but with many other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 setulose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, but sexually diverse, male stouter than female, subchelate, not eusirid, carpus of both in male much shorter, in female scarcely shorter than propodus, in male with weak posterior lobe not extending distad, in female unlobed, carpus with numerous long posterior setae, propodus rectangular and thin in female, broader in male. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 (often 3 also) shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, nearly subequal. Telson ordinary, entire, pointed or linguiform, without long apical armaments.

Variables. Gnathopods sexually diverse, carpus of gnathopods long (female type), shorter (male type), short (female *P. pratti*, *P. pacifica*), very short (male *P. pratti*), very lobate (*P. pacifica*); body carinate (*P. bungei*).

Relationship. Differing from *Paramoera*, *Accedomoera*, *Tylosapis* and *Lopyastis* in the lack of facial setae on maxilla 2. From *Accedomoera*, *Paramoera*, *Tethygeneia* and *Gondogeneia* in the uncleft telson. From *Tylosapis* and *Lopyastis* in the aequiramous uropod 3. From *Haliragoides* and *Calliopius* in the presence of an accessory flagellum. From *Atylopsis* in the alternation of flagellar articles on antenna 1 in size and/or armaments and in the non-emarginate, fully entire telson.

See *Apherusa*, *Atylopsis*, *Austroregia*, *Halirages*, *Laothoes*, *Lopyastis*, *Membrilopus* and note in *Paramoera* on *P. incognita*.

Species. See Tzvetkova & Kudrjaschov (1975); *P. bungei* (Gurjanova, 1951, as *Halirages*) (Shoemaker, 1964) [290]; *P. litoralis* (Gurjanova, 1938b, 1951) (Tzvetkova, 1968) [280]; *P. pacifica* Tzvetkova & Kudrjaschov, 1975 (= variety of *P. pratti* by Coyle & Mueller, 1981) [281 (locality = "Beringa"; there are 2 "Beringas" in Siberia; we assume the one in the Commander Islands is the correct one)]; *P. pratti* (J.L. Barnard, 1954a, 1969a) (Coyle & Mueller, 1981) [270].

Habitat and distribution. Marine, amphiboreal North Pacific, 0 m, 4 species.

Paraleptamphopus Stebbing, 1899

[see Barnard & Barnard (1983)]

Paramoera Miers

Paramoera Miers, 1875: 75.–Thurston, 1974b: 72.
Stebbingia Pfeffer, 1888: 110 (*Stebbingia gregaria* Pfeffer, 1888, monotypy).
Aucklandia Walker, 1908: 35 (*Aucklandia enderbyi* Walker, 1908, monotypy).
Amphoediceros Fearn-Wannan, 1968a: 44 (*Amphoediceros willisi* Fearn-Wannan, 1968a, original designation).

Type species. *Paramoera australis* Miers, 1875, present selection.

Diagnosis. Body ordinary, compressed, smooth, or carinate. Rostrum small to large, lateral cephalic lobes ordinary, anteroventral margin of head not significantly produced. Eyes reniform. Antennae subequal, or variably extending, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 often almost as long as article 1; article 3 not produced, not elongate; article 1 of primary flagellum ordinary to short, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 about as long as 2. Labium: inner lobes small to absent. Maxilla 1: inner plate with 4 to many medial (facial) setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of various number of setae and many other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 usually unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate or poorly so. Gnathopods alike but sexually diverse, medium, 2 larger than 1, subchelate, not eusirid, carpus of both usually shorter than propodus, with weak or no posterior lobe not extending distad, carpus with numerous short posterior setae, propodus rectangular or in male weakly expanded or ovate. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth or minutely

serrate (type). Outer rami of uropods 1-2 shortened or not; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, almost subequal. Telson ordinary to elongate, cleft, lobes often notched, apices with long armaments.

Variables. Outer ramus of uropod 1 not shortened (*P. chevreuxi*, etc.), of uropod 2 not shortened (*P. assimilis*, etc.); pleonites 1-2 each with dorsal tooth (*P. bidentata*) or 1-3 (*P. tridentata*) or pereon and pleon generally carinate (*P. walkeri*); epimeron 3 grossly serrate (*P. tridentata*); article 3 of mandibular palp short (*P. hurleyi*); carpus of gnathopods 1-2 diverse, that of gnathopod 2 longer and less lobate (*P. mokyevskii*), as long as or longer than propodus (*P. rua*, etc.); apex of telson scarcely notched, not cleft (*O. incognita*, see note below).

Note on *P. incognita*. Probably the type of a new genus; the telson is almost uncleft but retains the long setae of *Paramoera* while the rami of uropods 1-2 have lost all but one apical spine; close to *Paracalliopiella* but with facial setae on maxilla 2; keys out near *Calliopiella* but otherwise distinctive.

Relationship. Characterised among its many sibling genera by the dominant apical armament on the distinctly cleft telson; this armament is either thick, numerous or elongate in comparison to the weak or undeveloped armament in such taxa as *Pontogeneia*, *Gondogeneia*, *Prostebbingia* and *Accedomoera*. Differing also from *Pontogeneia* in the slightly to greatly better setosity on the inner plates of maxillae 1-2. Differing also from *Accedomoera* and *Pontogeneia* in the unproduced article 3 of antenna 1.

See *Antarctogeneia*, *Paracalliopiella*, *Paramoerella*, *Relictomoera* and *Sternomoera*.

Removals. *Paraleptamphopus hayamenensis* Stephensen, 1944b, and *P. yezoensis* Ueno, 1933a, to *Sternomoera*.

Species. See K.H. Barnard (1930, 1932); Macnae (1953); Nicholls (1938); Schellenberg (1926, 1931); Stephensen (1938c, 1947a); *P. assimilis* (Stebbing, 1888) [743T]; *P. aucklandica* (Walker, 1908) (J.L. Barnard, 1972b) [843F]; *P. australis* P. Miers, 1875b, 1879 (Stebbing, 1888) [851]; *P. austrina* (Bate, 1862) (?Chilton, 1923, ?1925c) [781]; *P. bidentata* K.H. Barnard, 1932 (Griffiths, 1974a,c, 1975) [743]; *P. brachyura* Schellenberg, 1931 [867]; *P. brevirostrata* (Bulycheva, 1952) [391]; *P. capensis* (Dana, 1853)(= *P. assimilis* Stebbing, 1888) (= *P. schizurus* Stebbing, 1918) (K.H. Barnard, 1932) (Griffiths, 1974a,c, 1975) [743]; *P. carlottensis* Bousfield, 1958 (Bousfield & Hubbard, 1968) [270E]; *P. chevreuxi* (Stephensen, 1927a) (J.L. Barnard, 1972b) [850]; *P. columbiana* Bousfield, 1958 (Bousfield & Hubbard, 1968) [270E]; *P. edouardi* Schellenberg, 1929c, 1931 (= only *P. magellanica* Stebbing of Chevreux, 1906a, 1912d, Chilton, 1909b, 1912) (Thurston, 1974a,b) [870 + B]; *P. fasciculata* (Thomson, 1880, 1881, 1889, 1891, 1893, 1913 as *P. austrina*) (= *P. enderbyi* Walker, 1908) (Stephensen, 1927a, 1938c) [850]; *P. fissicauda* (Dana, 1852a, 1853) (Schellenberg, 1931 part, 1935a) [765]; *P. gregaria* (Pfeffer, 1888) (Stephensen, 1949) [866]; *P. hamiltoni* Nicholls, 1938 [845]; *P. hermitensis* K.H. Barnard, 1932 [864]; *P. hurleyi* Thurston, 1974b [836]; *P. husvikensis* Thurston, 1974a [833]; [?*P. incognita* Bushueva, 1966 (see note above) [881]]; *P. kergueleni* Bellan-Santini & Ledoyer, 1974 [851]; *P. koreana* Stephensen, 1944b [395]; *P. litoralis* (Oldevig, 1959) [279]; *P. lokowai* J.L. Barnard, 1977b [381Q]; *P. macquariae* Nicholls, 1938 [845]; *P. mohri* J.L. Barnard, 1952, 1969a [372]; *P. mokyevskii* (Gurjanova, 1952b) [283]; *P. obliquimana* K.H. Barnard, 1932 [831]; *P. paakai* J.L. Barnard, 1977b [381Q]; *P. parva* Ruffo, 1949 [864]; ?*P. pfefferi* Schellenberg, 1931, 1935a (Thurston, 1974a) [867 + B]; *P. rangatira* J.L. Barnard, 1972b [776]; *P. rua* J.L. Barnard, 1977b [381Q]; *P. schellenbergi* Nicholls, 1938 [845]; *P. stephenseni* Barnard & Karaman, 1982 (= *P. brachyura* Stephensen, 1949, homonym) [731]; ?*P. tridentata* Bulycheva, 1952 [024F] [possibly Gammaridae]; *P. tristanensis* K.H. Barnard, 1932 (Stephensen, 1949) [731, 733]; *P. udehe* (Derzhavin, 1930a) (Birstein, 1939) (Uschakov, 1948) [024F]; *P. walkeri* (Stebbing, 1906) (= *P. antarcticus* Walker, 1903, homonym) (Chevreux, 1912d as *Bovallia*) (Bellan-Santini, 1972a,b) (Thurston, 1974a) [870 + B]; *P. willisi* (Fearn-Wannan, 1968a) [782]; species [Campbellian], (*P. austrina* identifications of Walker, 1908; Chilton, 1909b; Stephensen, 1927a; *P. fissicauda* identifications of Bellan-Santini & Ledoyer, 1974; J.L. Barnard, 1972b) [840]; species [Magellanian], (*P. austrina* identifications of Shoemaker, 1914; Stebbing, 1914b; Monod, 1926; *P. fissicauda* identifications of Stephensen, 1938c, 1947a; Ruffo, 1947h) [830]; species (plural), (*P. austrina* identifications of Chilton, 1912; Stebbing, 1920; Bellan-Santini & Ledoyer, 1974; *P. aucklandicus* identification of Chilton, 1909b: 628) [various localities]; species of Nicholls, 1938; Shoemaker, 1945e; J.L. Barnard, 1972b (twice); Bellan-Santini & Ledoyer, 1974; Hurley, 1975 [various localities].

Habitat and distribution. Marine, some freshwater, cosmopolitan but dominantly austral, 0-91 m, penetrating freshwater in Manchuria, Hawaii, West America, austral islands, about 39 species.

Paramoerella Ruffo

Paramoerella Ruffo, 1974b: 412.

Type species. *Paramoerella interstitialis* Ruffo, 1974b, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced. Eyes round, weak. Antennae subequal, peduncular articles

Diagnosis. Body ordinary, compressed, smooth or carinate. Rostrum small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 1 shorter than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, scale-like, main flagellar articles diverse. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with 4-5 medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae but with many other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 as long as 3, 3 unlobed, 4 setulose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, but sexually diverse, male stouter than female, subchelate, not eusirid, carpus of both in male much shorter, in female scarcely shorter than propodus, in male with weak posterior lobe not extending distad, in female unlobed, carpus with numerous long posterior setae, propodus rectangular and thin in female, broader in male. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 (often 3 also) shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, nearly subequal. Telson ordinary, entire, pointed or linguiform, without long apical armaments.

Variables. Gnathopods sexually diverse, carpus of gnathopods long (female type), shorter (male type), short (female *P. pratti*, *P. pacifica*), very short (male *P. pratti*), very lobate (*P. pacifica*); body carinate (*P. bungei*).

Relationship. Differing from *Paramoera*, *Accedomoera*, *Tylosapis* and *Lopyastis* in the lack of facial setae on maxilla 2. From *Accedomoera*, *Paramoera*, *Tethygeneia* and *Gondogeneia* in the uncleft telson. From *Tylosapis* and *Lopyastis* in the aequiramous uropod 3. From *Haliragoides* and *Calliopius* in the presence of an accessory flagellum. From *Atylopsis* in the alternation of flagellar articles on antenna 1 in size and/or armaments and in the non-emarginate, fully entire telson.

See *Apherusa*, *Atylopsis*, *Austroregia*, *Halirages*, *Laothoes*, *Lopyastis*, *Membrilopus* and note in *Paramoera* on *P. incognita*.

Species. See Tzvetkova & Kudrjaschov (1975); *P. bungei* (Gurjanova, 1951, as *Halirages*) (Shoemaker, 1964) [290]; *P. litoralis* (Gurjanova, 1938b, 1951) (Tzvetkova, 1968) [280]; *P. pacifica* Tzvetkova & Kudrjaschov, 1975 (= variety of *P. pratti* by Coyle & Mueller, 1981) [281 (locality = "Beringa"; there are 2 "Beringas" in Siberia; we assume the one in the Commander Islands is the correct one)]; *P. pratti* (J.L. Barnard, 1954a, 1969a) (Coyle & Mueller, 1981) [270].

Habitat and distribution. Marine, amphiboreal North Pacific, 0 m, 4 species.

Paraleptamphopus Stebbing, 1899

[see Barnard & Barnard (1983)]

Paramoera Miers

Paramoera Miers, 1875: 75.–Thurston, 1974b: 72.
Stebbingia Pfeffer, 1888: 110 (*Stebbingia gregaria* Pfeffer, 1888, monotypy).
Aucklandia Walker, 1908: 35 (*Aucklandia enderbyi* Walker, 1908, monotypy).
Amphoediceros Fearn-Wannan, 1968a: 44 (*Amphoediceros willisi* Fearn-Wannan, 1968a, original designation).

Type species. *Paramoera australis* Miers, 1875, present selection.

Diagnosis. Body ordinary, compressed, smooth, or carinate. Rostrum small to large, lateral cephalic lobes ordinary, anteroventral margin of head not significantly produced. Eyes reniform. Antennae subequal, or variably extending, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 2 often almost as long as article 1; article 3 not produced, not elongate; article 1 of primary flagellum ordinary to short, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 about as long as 2. Labium: inner lobes small to absent. Maxilla 1: inner plate with 4 to many medial (facial) setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of various number of setae and many other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 usually unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate or poorly so. Gnathopods alike but sexually diverse, medium, 2 larger than 1, subchelate, not eusirid, carpus of both usually shorter than propodus, with weak or no posterior lobe not extending distad, carpus with numerous short posterior setae, propodus rectangular or in male weakly expanded or ovate. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth or minutely

Thurston, 1974b: 76 (key).–J.L. Barnard, 1979b: 38.

Type species. *Amphithoe inermis* Krøyer, 1838b, monotypy.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small to large; lateral cephalic lobes ordinary; anteroventral margin of head often weakly produced. Eyes reniform. Antennae subequal, peduncular article 1 of antenna 1 shorter than head, article 2 shorter than article 1; article 3 not or weakly produced; article 1 of primary flagellum ordinary, accessory flagellum absent; calceoli tympanic. Labrum entire, subrounded, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 scarcely shorter than 2. Labium: inner lobes small. Maxilla 1: inner plate with medial and distal setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of 3 setae and several other medial setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 shorter than 3, 3 weakly lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, small, subchelate, not eusirid, small carpus of both longer than propodus, without posterior lobe, with numerous posterior setae, gnathopods 1-2 slender and slightly elongate in type. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal or unequal. Telson slightly elongate, cleft, apices without long armaments.

Variables. So-called facial setae on maxilla 2 barely submarginal in type, not so in many other species (*P. rostrata*); inner lobes of lower lip obsolescent or absent (*P. rostrata*); carpus of gnathopods equal to or shorter than propodus (*P. intermedia*); propodus of gnathopods weakly inflated (*P. melanophthalma*, *P. bartschi*); carpus of gnathopod 2 long, with broad lobe (*P. kondakovi*) (*P. ivanovi*) (*P. andrijaschevi*) (*P. arenaria*); inner plate of maxilla 2 with 1 facial seta (*P. melanophthalma*, *P. bartschi*); process on article 3 of antenna 1 obsolescent (*P. ivanovi*) (this species therefore keying to *Antarctogeneia*).

Relationship. Differing from genera also bearing a process on article 3 of antenna 1: from *Bovallia* in the shorter article 1 of antenna 1; from *Halirages* and *Calliopius* in the cleft telson; and from *Accedomoera* and *Atylopsis* in the lack of an accessory flagellum.

Differing from genera that, unlike *Pontogeneia*, lack a process on article 3 of antenna 1: from *Paramoera* in the lack of long apical armaments on the telson; from *Tethygeneia* in the unlobate article 5 of either gnathopods 1 and 2; from *Antarctogeneia* in the short peduncle of antenna 2, the long article 3 of the mandibular palp, the unexpanded coxa 1 and the filiform flagella of the antennae; from *Gondogeneia* in the facial setae of maxilla 2, the presence of inner lobes on the lower lip and the non-enlarged gnathopod 1; and from *Prostebbingia* (= *Pontogeneiella*) in the poorly setose inner plate of maxilla 1.

See *Austroregia*, *Eurymera* and *Lopyastis*.

Removals. *Pontogeneia nasa* J.L. Barnard, 1969b, and *P. quinsana* J.L. Barnard, 1964c, to *Nasageneia*; *P. macrodon* Schellenberg, 1931, and *P. redfearni* Thurston, 1974a,b, to *Gondogeneia*; *P. makarovi* Gurjanova, 1951, and *P. opata* J.L. Barnard, 1979b, to *Tethygeneia*; *P. barnardi* Rabindranath (1972a) to *Abdia*.

Species. See K.H. Barnard (1932); Gurjanova (1951); Kudrjaschov & Zejagintsev (1975); Schellenberg (1931); Stephensen (1938c); Shoemaker (1945d); *P. andrijaschevi* Gurjanova, 1951 [290]; *P. arenaria* Bulycheva, 1952 [391]; *P. bartschi* Shoemaker, 1948 [483]; ?*P. cavitelson* (Ledoyer, 1984) [586]; *P. inermis* (Krøyer, 1838b) (? = *P. abyssinus* O. Fabricius, 1780) (= *P. crenulata* Krøyer, 1838b) (Sars, 1895) (Stephensen, 1933b, 1944a) (Bousfield, 1973) [200]; *P. intermedia* Gurjanova, 1938b (J.L. Barnard, 1969a, 1979b) [393]; *P. ivanovi* Gurjanova, 1951 [290]; *P. kondakovi* Gurjanova, 1951 [290]; *P. melanophthalma* Gurjanova, 1938b [280]; *P. rostrata* Gurjanova, 1938b (J.L. Barnard, 1969a, 1979b) [393].

Habitat and distribution. Marine, Arctic-boreal-warm temperate, to Cuba and Cocos Island (Costa Rica), 0-220 m, 10 species.

Pontogeneoides Nicholls

Figs 60B, 61G, 62R

Pontogeneoides Nicholls, 1938: 106.

Type species. *Pontogeneoides abyssi* Nicholls, 1938, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes [?ordinary]; anteroventral margin of head [?not produced]. Eyes [?absent]. Antenna 1 much longer than 2, peduncular articles progressively shorter, article 1 [?shorter] than head, article 2 slightly shorter than article 1; article 3 not produced; article 1 of primary flagellum as long as article 3 of peduncle; accessory flagellum 1-articulate, scale-like. Labrum entire or incised, subrounded, broader than long; epistome unproduced. Molar [?triturative, columnar], article 2 of mandibular palp unlobed,

article 3 longer than 2. Labium: inner lobes small, forcing gape to outer lobes. Maxilla 1: inner plate with 4 apical setae, palp long, article 2 short. Maxilla 2: inner plate broader but not longer than outer, outer plate narrow, inner plate with facial setae apically, few other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 scarcely lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 strongly produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods diverse, first medium, second large, 2 much larger than 1, subchelate, not eusirid, carpus of both shorter than propodus, only second with strong posterior lobe extending distad, carpus of first longer than second, with numerous long posterior setae, propodus expanded, ovate, only second palm with row of stout spines. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 scarcely shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, incised, almost entire, linguiform, without long apical armaments.

Variables. Labrum incised (*P. dubia*).

Relationship. Differing from *Rhachotropis* and *Eusiroides* in the diversity of size in gnathopods 1 and 2; almost identical to *Dautzenbergia* but inner plate of maxilla 1 broadened as in *Eusiroides* and accessory flagellum present; *P. dubia*, with incised upper lip, nevertheless is closer to *Pontogeneoides* than to *Dautzenbergia*.

Species. *Pontogeneoides abyssi* Nicholls, 1938 [806B]; *P. dubia* (Ruffo, 1949) [802B].

Habitat and distribution. Marine, Antarctica, 480-1591 m, 2 species.

Prostebbingia Schellenberg, new synonymy

Figs 61F, 62Q

Prostebbingia Schellenberg, 1926a: 357.
Pontogeneiella Schellenberg, 1929c: 278 (*Atyloides brevicornis* Chevreux, 1906b, 1906a, selected by J.L. Barnard, 1969).–J.L. Barnard, 1972b: 187.

Type species. *Stebbingia gracilis* Chevreux, 1912a,d, selected by J.L. Barnard, 1969.

Diagnosis. Body slender, compressed, not carinate. Rostrum obsolescent; lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes reniform. Antenna 1 much longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not or weakly produced; article 1 of primary flagellum ordinary, accessory flagellum absent or fused broadly to article 3 of peduncle. Labrum entire, rounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with many medial and apical setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate not broader nor longer than outer, inner plate with facial row of setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 narrow, 4 shorter than 3, 3 unlobed, 4 weakly setulose along inferior margin.

Coxae short and progressively longer toward coxa 4; coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 not twice as long as 1, without posterior lobe, scarcely excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus smaller and shorter than propodus, without posterodistal lobe, carpus with numerous long posterior setae. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, almost subequal, outer often shortened. Telson ordinary, cleft halfway, apices without long apical armaments.

Variables. Antenna 1 not longer than antenna 2 (*P. brevicornis*); coxae elongate (*P. brevicornis*); accessory flagellum lappet absent (*P. longicornis*, *P. brevicornis*); coxa 4 deeply excavate (*P. brevicornis*) or nonexcavate (*P. serrata*); head with anteroventral tooth (*P. serrata*); article 1 of primary flagellum on antenna 1 elongate (*P. serrata*); apices of telson weakly serrate (*P. brevicornis*, *P. longicornis*); rostrum large (*P. levis*).

Relationship. Differing from *Apherusa* in the more setose inner lobe of maxilla 1 and the presence of a weak process on article 3 of antenna 1. From *Paramoera* in the absence of an accessory flagellum and the absence of long apical armaments on the telson. From *Pontogeneia* in the strong setation of maxillae 1-2.

See *Eurymera*, *Haliragoides*, *Manerogeneia* and *Membrilopus*.

Removal. *Prostebbingia maneroo* J.L. Barnard, 1972b, to *Manerogeneia*.

Species. See Schellenberg (1926a, 1931); K.H. Barnard (1932); Nicholls (1938); Stephensen (1938c, 1947a); *P. brevicornis* (Chevreux, 1906b, 1906a) (Thurston, 1974a,b) (Bellan-Santini & Ledoyer, 1974) [880]; *P. gracilis* (Chevreux, 1912a,d) (Bellan-Santini, 1972a,b) (Thurston, 1974a,b) [870]; ?*P. laevis* (Haswell, 1879a) (J.L. Barnard, 1974b) [781]; ?*P. laevis* (Thomson, 1879a) (Chilton, 1921b) (J.L. Barnard, 1972b) [775]; *P.*

longicornis (Chevreux, 1906a, 1912d) (Thurston, 1974a,b) (Andres, 1982) [870]; *P. serrata* Schellenberg, 1926a (Bellan-Santini, 1972a,b) (Thurston, 1974a) [870].

Habitat and distribution. Marine, core species from Antarctica, 0-400 m; questionable species from south-eastern Australia, New Zealand, 0-9 m; 6 species.

Pseudomoera Schellenberg, new composition

Fig.60J

Pseudomoera Schellenberg, 1929c: 281.

Type species. *Atyloides gabrieli* Sayce, 1901, monotypy.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes round. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, weakly elongate. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp lobed, article 3 as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with 3 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate without facial row of setae but with many medial setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 1-2 broad, elongate together, 3-4 narrow, short together, 4 slightly shorter than 3, 3 lobed, 4 spinose along inferior margin.

Coxae ordinary, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus of both as long as and wider than propodus, with strong posterodistal lobe extending distad, with numerous long posterior setae, propodus rectangular. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer ramus of uropod 1 not, of uropod 2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary, cleft, margins with long armaments.

Additional character. Article 1 of antenna 2 greatly tumid.

Variables. Outer ramus of uropod 1 shortened (*P. fontana*); inner plate of maxilla 1 fully setose medially and of maxilla 2 facially setose (*P. fontana*); palp article 2 of mandible not lobed (*P. fontana*).

Relationship. Differing from *Liouvillea* in the lobate carpus of the gnathopods and from *Nasageneia* and *Tethygeneia* in the lobate gnathopod 1 as well as gnathopod 2.

See *Atyloella*, *Abdia* and *Liouvillea*.

Species. *Pseudomoera fontana* (Sayce, 1902a) [943G]; *P. gabrieli* (Sayce, 1901) [943G].

Habitat and distribution. Freshwater, Australia, Victoria, streams, 457-915 m altitude, 2 species.

Pseudopontogeneia Oldevig, dubious

Pseudopontogeneia Oldevig, 1959: 69.

Type species. *Pseudopontogeneia intermedia* Oldevig, 1959, original designation.

Comments. Not enough is known about this genus to find its place. By virtue of its maxilla 2, gnathopods, epimeron 3, telson and guesses about other things it comes closest to the *rostrata* group of *Pontogeneia* which would be typical for its area.

Species. *Pseudopontogeneia intermedia* Oldevig, 1959 [281].

Habitat and distribution. Marine, Bering Island, ?littoral, 1 species.

Regalia K.H. Barnard

Fig.63Q

Regalia K.H. Barnard, 1930: 370.

Type species. *Regalia fascicularis* K.H. Barnard, 1930, monotypy.

Diagnosis. Body slender, compressed, carinate or toothed on pleonites 1-3. Rostrum large, lateral cephalic lobes sinusoid, almost absent, anteroventral margin of head weakly produced. Eyes ovate. Antenna 1 [?broken]. Antenna 2 of male elongate, article 5 of peduncle shorter than 4, both covered with setal combs. Labrum incised, emarginate, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes present. Maxilla 1: inner plate with 1-2 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader but shorter than outer, lobes narrow, inner plate without facial row of setae and no other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly

longer than inner; palp of 4 articles, 1-2 broad, elongate together, 3-4 narrow, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae very short and progressively even toward coxa 7; coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 not twice as long as 1, almost without posterior lobe and not excavate. Gnathopods alike, simple, or scarcely subchelate, not eusirid, carpus of both almost as long as and wider than propodus, with weak broad posterior lobe scarcely extending distad, carpus with posterior setae, gnathopods slender, slightly elongate. Pereopods 3-7 ordinary to elongate, simple, dactyls simple, article 2 not anteriorly lobate. Pleonites 1-2 not tricarinate. Epimeron 3 bicuspidate (as in Iphimediidae). Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal(?). Telson ordinary, short, emarginate, without long apical armaments.

Remarks. Mouthparts based on *R. gracilimana* as description of *R. fascicularis* vague (= like *Calliopius*).

Relationship. Like *Atylopsis* but epimeron 3 bidentate as in Iphimediidae and rostrum large.

Differing from *Stenopleuroides* in the triple carina of pleonites 1-2; from *Bovallia* in the unlobate carpus of the gnathopods.

See this genus in Iphimediidae.

See *Lopyastis*.

Species. *Regalia fascicularis* K.H. Barnard (1930) [779N]; *R. gracilimana* Pirlot, 1934 [602B].

Habitat and distribution. Marine, New Zealand to Banda Sea, 130-304 m, 2 species.

Relictomoera n.gen.

Type species. *Paramoera relicta* Ueno, 1971a.

Diagnosis. Body slender, compressed. Rostrum obsolescent; lateral cephalic lobes sinusoid, with notch in middle, anteroventral margin of head weakly produced. Eyes round, tiny or vestigial or absent. Antenna 1 longer than 2, peduncular articles of antenna 1 progressively shorter, article 1 as long as head, articles 2-3 scarcely shorter than article 1; article 3 elongate, not produced; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, barrel shaped. Labrum [?entire, ?subrounded, ?broader than long]; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp poorly lobed, article 3 shorter than 2. Labium: inner lobes [?absent]. Maxilla 1: inner plate with 5 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, plates narrow, inner plate with facial row of 4 setae but no other medial setae. Maxilliped: inner plate relatively long, outer plate slightly shorter than inner; not spinose medially; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin, unguiform, with nail.

Coxae short, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with weak posterior lobe, excavate. Gnathopods diverse, medium, 2 larger than 1, subchelate, not eusirid, carpus of both as long as propodus, without posterior lobe, carpus with few short posterior setae, propodi rectangular or weakly expanding, gnathopod 2 especially slender or linear. Coxal gills 2-6, ovate; sternal gills absent. Oostegites broad. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Pleopods with peduncle dominating rami. Epimeron 3 smooth. Outer rami of uropods 1-2 slightly shortened or not; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate, aequiramous, 1-articulate. Telson ordinary, cleft two thirds, apices with short or thin armaments.

Variables. Telson elongate (*R. tsushimana*).

Relationship. Like *Paramoera* but head with unusually sinusoid anterolateral margin.

Differing from *Awacaris* by the normal palp of maxilla 1, the normal head and the stronger propodus and palm of gnathopod 1. From *Apherusa* in the stronger sinusoid cephalic lobes, the deeply cleft telson, and the presence of an accessory flagellum.

See *Sternomoera*.

Species. *Relictomoera relicta* (Ueno, 1971a) [029g]; *R. tsushimana* (Ueno, 1971b) [029t].

Habitat and distribution. Freshwater, Goto and Tsushimana Islands south and west of Kyushu, Japan, hypogean, 2 species.

Etymology. Named for the type species.

Rhachotropis S.I. Smith

Figs 59F, 61H, 62B, 63B

Tritropis Boeck, 1871b: 158 (*Oniscus aculeatus* Lepechin, 1780, monotypy) [homonym, Reptilia].
Rhachotropis S.I. Smith, 1883b: 222 (new name).
Gracilipes Holmes, 1908: 526 (*Gracilipes natator* Holmes, 1908, original designation).

Type species. *Oniscus aculeatus* Lepechin, 1780, monotypy.

Diagnosis. Body ordinary to slender, compressed

or depressed, carinate or toothed. Rostrum small to large, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes round, reniform, or absent. Antennae subequal, article 1 of antenna 1 as long as or longer than head, article 2 usually as long as article 1; article 3 shorter, not produced; article 1 of primary flagellum in female short, often twice as long as article 3 of peduncle in male; accessory flagellum 1 to 2-articulate but short. Labrum entire, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as or longer than 2. Labium: inner lobes short. Maxilla 1: inner plate with 1-4 medial setae, palp long, article 1 short. Maxilla 2: inner plate broader but not longer than outer, outer plate narrow, inner plate without facial row of setae and few other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly or greatly longer than inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae very short, coxa 1 strongly produced anteriorly or expanded ventrally, coxa 4 without or with weak posterior lobe, excavate or not. Gnathopods alike, large, subchelate, weakly eusirid, carpus of both much shorter than large ovate propodus, with strong posterior lobe extending distad, numerous posterior setae, spines on palms of gnathopods thin or inconspicuous. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate, or rarely smooth. Outer rami of uropods 1-2 shortened or not; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft, incised, emarginate, or entire, triangular or linguiform, without long apical armaments.

Additional character. Calceoli tympanic, on both antennae in both sexes.

Variables. Mandibular palp feeble (*R. gubilata*); width or shape of article 2 on pereopods 5-7 alike or diverse.

Relationship. See *Cleonardo*, *Eusiroides*, *Pontogenoides*, *Harcledo*, *Metaleptamphopus*, *Cleonardopsis* and *Eusirella*.

Species. See Shoemaker (1930a); Stephensen (1940a, 1944a,c); *R. aculeata* (Lepechin, 1780) [not seen] (= *R. edvardsii* Sabine, 1821) (= *R. avirostris* Sars, 1883) (Sars, 1895) (Stephensen, 1940a, 1944a,c) (Gurjanova, 1951) [200 + B]; *R. anoculata* J.L. Barnard, 1962d [801A]; *R. anomala* K.H. Barnard, 1916 [701B]; *R. antarctica* K.H. Barnard, 1932 (Andres, 1982) [870 + B]; *R. arii* Thurston, 1980a [209B]; *R. caeca* Ledoyer, 1977, 1982a [340BA]; *R. cervus* J.L. Barnard, 1957c, 1967a [368B]; *R. clemens* J.L. Barnard, 1967a, 1971a [309B]; *R. distincta* (Holmes, 1908) (Shoemaker, 1930a) (J.L. Barnard, 1971a) [399BA]; *R. faeroensis* Stephensen, 1944c [209B]; *R. flemmingi* Dahl, 1959 [604A]; *R. gislii* Thurston, 1980a [209B]; *R. glabra* Ledoyer, 1977, 1982b (Bellan-Santini, 1984) [348]; *R. gloriosae* Ledoyer, 1982a [618B]; *R. gracilis* Bonnier, 1896 (Chevreux, 1927) [221B]; *R. grimaldii* (Chevreux, 1887c) (= *R. elegans* Bonnier, 1896) (Chevreux, 1900a, 1927) (Ledoyer, 1977, 1982a) [426B]; *R. gubilata* J.L. Barnard, 1964a [501B]; *R. helleri* (Boeck, 1871b) (Sars, 1895) (Sexton, 1909) (Gurjanova, 1951) [200B]; *R. hunteri* Nicholls, 1938 [878B]; *R. inermis* Ledoyer, 1977, 1982a [348 + B]; *R. inflata* (Sars, 1883) (= *R. tumida* Sars, 1895) (Gurjanova, 1951) [200M]; *R. integricauda* Carausu, 1948, 1949 (Ledoyer, 1977, 1982a) [348B] [= ?*R. inflata*]; *R. kergueleni* Stebbing, 1888 (?Stephensen, 1944c) (Griffiths, 1975) [835B]; *R. leucophthalma* Sars, 1895 (Gurjanova, 1951) [218B]; *R. levantis* J.L. Barnard, 1961a [715B]; *R. lobata* Shoemaker, 1934b [404B]; *R. lomonsovi* Gurjanova, 1934a, 1951 [210B]; *R. luculenta* J.L. Barnard, 1969b [377]; *R. ludificor* J.L. Barnard, 1967a [309B]; *R. macropus* Sars, 1895 (Stephensen, 1940a, 1944a,c) (Just, 1970) [210 + B]; *R. multesimus* J.L. Barnard, 1967a [309B]; *R. natator* (Holmes, 1908) (J.L. Barnard, 1954b, 1964d) [510B]; *R. oculata* (Hansen, 1888) (J.L. Barnard, 1966b) (Bousfield, 1973) [210M]; *R. paeneglaber* K.H. Barnard, 1916 (Griffiths, 1975) [701B]; *R. palporum* Stebbing, 1908c (= *R. pacifica* Schellenberg, 1929b, 1955) (Griffiths, 1975) [422BA]; *R. platycera* K.H. Barnard, 1931b [633]; *R. portoricana* J.L. Barnard, 1964a [404A]; *R. proxima* Chevreux, 1911a, 1935 (Thurston, 1980a) [240B]; *R. rostrata* Bonnier, 1896 (Sexton, 1909) (Stephensen, 1944c) (Ledoyer, 1982a) [352B]; *R. schellenbergi* Andres, 1982 [871]; *R. sibogae* Pirlot, 1934 [604B]; *R. thordisae* Thurston, 1980a [209B]; *R. thorkelli* Thurston, 1980a [209A].

Habitat and distribution. Marine cosmopolitan, mostly cold or deep water, usually demersal or pelagic, 0-9460 m [warmest occurrences = *R. luculenta*, *R. glabra*, *R. inermis*, *R. platycera*], 43 species.

Ronco J.L. Barnard

Ronco J.L. Barnard, 1965a: 493.

Type species. *Ronco sosa* J.L. Barnard, 1965a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum small, lateral cephalic lobes unproduced; anteroventral margin of head not produced. Eyes reniform. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, elongate. Labrum deeply incised, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes well developed. Maxilla 1: inner plate with 2 apical setae, palp long, article 1 short. Maxilla 2: inner plate

broader and longer than outer, outer plate narrow, inner plate without facial row of setae and few other setae. Maxilliped: inner plate not relatively long, outer plate as long as inner; palp of 4 articles, 4 as long as 3, 3 weakly lobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 strongly produced anteriorly and expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, medium, subchelate, not eusirid, carpus of both shorter than propodus, with strong posterior lobe weakly extending distad, carpus with numerous long posterior setae, propodus ovate. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson elongate, cleft, apices with short armaments.

Relationship. Differing from *Eusiroides* in the deeply bilobed labrum and the poorly developed palmar spines on the gnathopods.

Species. *Ronco sosa* J.L. Barnard, 1965a [591].

Habitat and distribution. Marine, Caroline Islands, Ifaluk, sublittoral, 1 species.

[Calliopiidae = Gammarellidae] ***Sancho*** Stebbing

Fig.64

Sancho Stebbing, 1897: 42.

Type species. *Sancho platynotus* Stebbing, 1897, monotypy.

Diagnosis. Body strongly depressed. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes ovate. Antennae subequal, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, elongate. Calceoli of gammarelloid form (see this form in Lincoln & Hurley, 1981). Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with 2 apical setae, palp long, article 1 short. Maxilla 2: inner plate broader but not longer than outer, inner plate without facial row of setae, with few other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 setospinose along inferior margin.

Coxae ordinary, but splayed, coxa 1 scarcely expanded ventrally, coxa 4 twice as long as 1, with posterior lobe, excavate. Gnathopods diverse, 2 larger than 1, second subchelate, first not but second eusirid, carpus of first longer but of second much shorter than propodus, without posterior lobe, carpus of second without numerous long posterior setae, gnathopod 1 slender, parachelate, (mittenform), propodus of gnathopod 2 inflated, palm transverse, female gnathopods both slender, feeble, like male gnathopod 1. Pereopods 3-4 ordinary, 5-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3

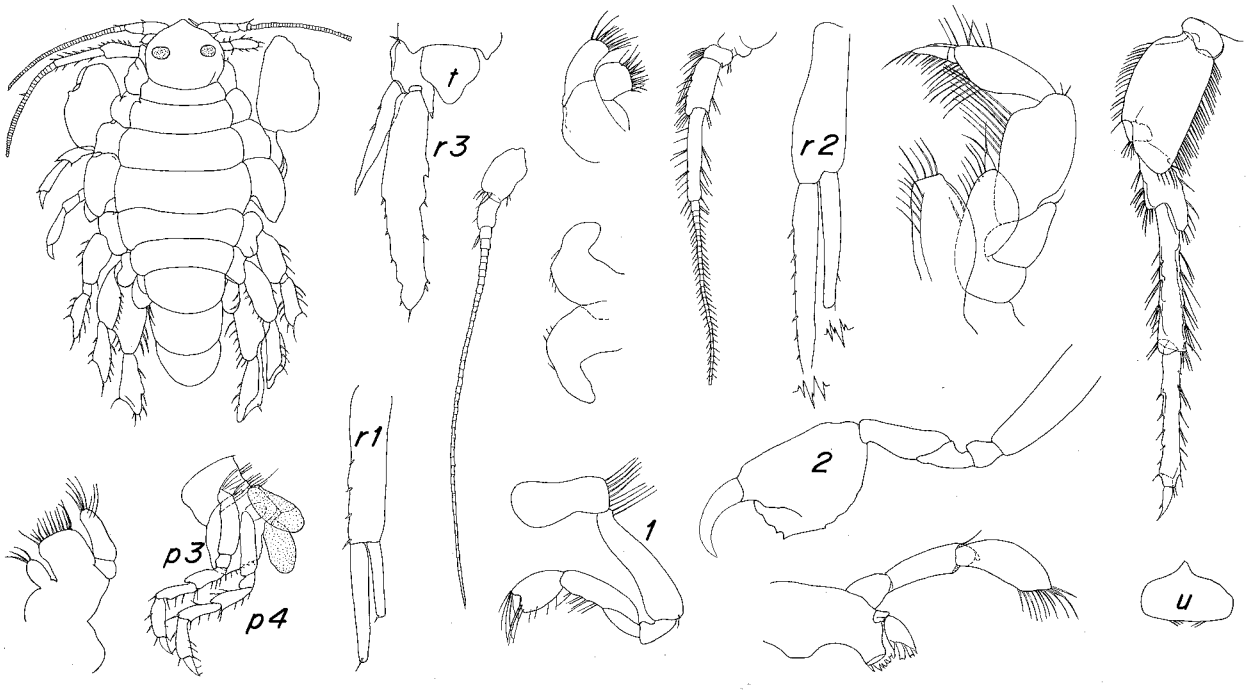

Fig.64. Eusiridae. *Sancho platynotus*.

shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle with large process, rami lanceolate, inner very elongate. Telson short, entire, linguiform, without long apical armaments.

Additional character. Pereopod 7 with nasiform lobe on article 4.

Relationship. *Sancho* is unique in the combination of depressed body, and mixture of eusirid and noneusirid gnathopods.

Sancho might be misidentified as a phoxocephalid but differs from that group in the uncleft telson, shortened outer rami of uropods 1-3, and the outer ramus of uropod 3 being 1-articulate.

See *Chosroes* in Eusiridae (gammarellid group).

Species. *Sancho platynotus* Stebbing, 1897, 1906, 1910a [781].

Habitat and distribution. Marine, Australia, Port Jackson, [?depth], 1 species.

Schraderia Pfeffer

Schraderia Pfeffer, 1888: 141.–K.H. Barnard, 1932: 203.–Thurston, 1974b: 58.

Atyloides Stebbing, 1888: 913 (*Atyloides serraticauda* Stebbing, 1888, here designated).–Schellenberg, 1929c: 280.

Dolobrotus Bowman, 1974: 130 (*Dolobrotus mardeni* Bowman, 1974, original designation).

Type species. *Schraderia gracilis* Pfeffer, 1888, monotypy.

Diagnosis. Body ordinary, compressed. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head weakly produced or quadrate, serrate. Eyes reniform, or ovate. Antennae subequal or 1 longer than 2, peduncular articles progressively shorter, article 1 shorter or as long as (type) head, article 2 shorter than article 1; article 3 not produced, not elongate; article 1 of primary flagellum ordinary, accessory flagellum 1-articulate, elongate or scale-like. Labrum entire, subrounded, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with medial pubescence and apical setae, palp long, article 1 not longer than 2. Maxilla 2: inner plate as broad but shorter than outer, with facial row of many setae and few other medial setae. Maxilliped: inner plates relatively long, outer plate slightly longer than inner; palp of 4 articles, 1-2 narrow, 2 elongate, 4 slightly shorter than 3, 3 weakly lobed, 4 spinose or setulose along inferior margin.

Coxae ordinary, and progressively longer toward coxa 4, coxa 1 scarcely expanded ventrally, coxa 4 not twice as long as 1, with posterior lobe, excavate. Gnathopods weakly diverse, very slender or linear, of similar size, subchelate, not eusirid, carpus and propodus elongate, scarcely lobed and slightly the shorter on gnathopod 1. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate. Outer rami of uropods 1-2 slightly shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, scarcely extended beyond uropod 1, peduncle without large process, rami lanceolate, inner ramus as long as or longer than outer. Telson slightly elongate, cleft, lobes notched, without long apical armaments. Oostegites large.

Variables. Propodus of gnathopods not linear (*S. acuticauda* = *Oradarea*?); inner plate of maxilla 1 with only 4 setae (*S. acuticauda*): or fully setose medially (*S. mardeni*); antenna 2 longer than 1 (*S. mardeni*); epimeron 3 with tooth and sinus only (*S. mardeni*); head not serrate (*S. mardeni*); gnathopods not fully linear (*S. acuticauda*); accessory flagellum articulate and elongate (*S. gracilis*).

Relationship. Differing from *Oradarea* in the cleft telson and the equal rami of uropod 3.

See *Apherusa*, *Awacaris*, *Bathyschraderia*, *Bouvierella*, *Cleippides*, *Djerboa* and *Leptamphopus*.

Species. *Schraderia acuticauda* Bellan-Santini & Ledoyer, 1974 [851]; *S. barnardi* Thurston, 1974a,b [875]; *S. dubia* Thurston, 1974a,b [875]; *S. gracilis* Pfeffer, 1888 (= *S. calceolata* Chilton, 1912) (Shoemaker, 1945d) (Bellan-Santini & Ledoyer, 1974) (Thurston, 1974a,b) [870]; *S. mardeni* (Bowman, 1974) [363]; *S. serraticauda* (Stebbing, 1888) (Thurston, 1974b) [782 + ?840]; ?*S. udehe* (Derzhavin, 1930) [024].

Habitat and distribution. Marine, Antarctica, 0-310 m; *S. udehe* = streams of DeKastri Bay, in Lower Amur Basin; *S. mardeni* = north-western Atlantic, 75- 165 m; 7 species.

Stenopleura Stebbing

Figs 62T, 63H

Stenopleura Stebbing, 1888: 949.

Type species. *Stenopleura atlantica* Stebbing, 1888, monotypy.

Diagnosis. Body slender, compressed, smooth. Rostrum medium, thin, lateral cephalic lobes ordinary; anteroventral margin of head not produced. Eyes reniform. Antennae subequal, peduncular articles progressively shorter, article 1 shorter than head,

article 2 shorter than article 1; article 3 not produced; article 1 of primary flagellum twice as long as article 3 of peduncle; accessory flagellum absent. Labrum incised, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 almost as long as article 2. Labium: inner lobes small, outer lobes extended. Maxilla 1: inner plate with 1 apical seta, palp long, article 1 not longer than 2. Maxilla 2: lobes narrow, inner plate with 0-1 facial and no other medial setae. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 1-2 broad, not elongate together, 3-4 narrow together, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin, unguiform.

Coxae very short and generally even toward coxa 7; coxa 1 sharply produced anteriorly, coxa 4 as long as 1, shorter than 5, with weak posterior lobe, not distinctly excavate. Gnathopods alike, medium, scarcely subchelate, not eusirid, carpus of both much shorter than propodus, with strong posterodistal lobe extending distad, carpus with posterior setae, propodus narrowly ovate, palm long and poorly defined. Pereopods 3-7 elongate, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle with large process, rami lanceolate. Telson ordinary, entire, trifid, without long apical armaments.

Relationship. Differing from *Dautzenbergia* in the absence of dactylar spines on pereopods 3-7 and the nondiverse gnathopods. From *Atylopsis* in the absence of an accessory flagellum and the shorter coxae. From *Meteusiroides* in the short coxae, absence of facial setae on maxilla 2 and the extension of coxa 5 over coxa 4.

See *Harcledo*, *Metaleptamphopus* and *Stenopleuroides*.

Species. *Stenopleura atlantica* Stebbing, 1888 (Stephensen, 1915) (Birstein & Vinogradov, 1958, 1964) (J.L. Barnard, 1962d) [422].

Habitat and distribution. Marine, cosmopolitan, tropical and subtropical seas, epipelagic and bathypelagic to about 400 m, 1 species.

Stenopleuroides Birstein & Vinogradov

Stenopleuroides Birstein & Vinogradov, 1964: 177.

Type species. *Stenopleuroides macrops* Birstein & Vinogradov, 1964, monotypy.

Diagnosis. Body slender, compressed, carinate or toothed posterodorsally. Rostrum very small, lateral cephalic lobes sinusoid, anteroventral margin of head not produced. Eyes reniform. Antenna 1 much longer than 2, peduncular articles progressively shorter, article 1 as long as head, article 3 not or weakly produced; article 1 of primary flagellum twice as long as article 3 of peduncle; accessory flagellum absent. Labrum incised, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 longer than 2. Labium: inner lobes [?small]. Maxilla 1: inner plate with 1 apical seta, palp long, article 1 not longer than 2. Maxilla 2: plates narrow, inner plate [?without facial row of setae and other medial setae]. Maxilliped: inner plate not relatively long, outer plate not longer than inner; palp of 4 articles, 1-4 narrow, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae very short and progressively longer toward coxa 7; coxa 1 scarcely produced anteriorly, not expanded ventrally, coxa 4 longer than 1, without posterior lobe, not excavate, coxa 5 as long as 4, 7 longer than 4. Gnathopods alike, medium, subchelate, not eusirid, carpus of both much shorter than propodus, with strong posterodistal lobe extending distad, with posterior setae, propodus narrowly ovate, palm long and poorly defined. Pereopods 3-7 simple, dactyls simple, article 2 not anteriorly lobate, article 5 of pereopod 7 as long as articles 2,3,4 and 6 together (contra *Stenopleura*), articles 5-6 of pereopods 6-7 extremely elongate. Epimeron 3 smooth. Outer rami of uropods 1-2 scarcely shortened, rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, weakly unequal. Telson ordinary, entire, linguiform, without long apical armaments.

Relationship. Differing from *Stenopleura* in the immensely elongate article 5 of pereopod 7 and the dorsal body teeth. From *Harpinioides* in the unbent propodus of the gnathopods. From *Meteusiroides* by the short coxae, short uncleft telson and elongate pereopods 5-7. From *Cleonardopsis* by the short coxae, uncleft telson and elongate article 1 on the primary flagellum of antenna 1.

See *Bovallia*, *Harcledo* and *Metaleptamphopus*.

Species. *Stenopleuroides macrops* Birstein & Vinogradov, 1964 [600].

Habitat and distribution. Marine, tropical Indian Ocean, epipelagic, 1 species.

Sternomoera n.gen.

Type species. *Paramoera yezoensis* Ueno, 1933a, present selection.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced.

Eyes reniform. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 not produced; article 1 of primary flagellum short, accessory flagellum 1-articulate, scale-like. Labrum entire, subrounded, as long as broad; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes absent. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with scarcely submarginal facial row of many setae and several other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, small, in female subchelate, not eusirid, carpus of both scarcely shorter than propodus, without posterior lobe, with numerous posterior setae, propodus rectangular; male gnathopods larger, 2 larger than 1, carpus broadly lobate, propodus ovate, posterior margins swollen, palms oblique, with few large clavate or peg spines. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 serrate sparsely and minutely. Outer rami of uropods 1-2 not or scarcely shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, almost subequal. Telson ordinary, cleft, apices with small armaments.

Additional characters. Thorax with sternal gills; coxal gills [?2-7], ovate. Oostegites broad.

Variables. Apices of telson poorly (*S. yezoensis*) to densely setose (*S. japonica*) apically.

Relationship. Like *Paramoera* but sterno-branchiate. Not of modern crangonyctid affinity because of precisely aequiramous uropod 3, short peduncle of antenna 1, basally proliferate flagellum of antenna 1. Not bogidiellid because of the general gnathopodal facies and presence of sternal gills.

Differing from *Eoniphargus* in the magniramous, aequiramous uropod 3 and vestigial accessory flagellum. From *Relictomoera* in the presence of sternal gills and the normal head.

Species. *Sternomoera hayamenensis* (Stephensen, 1944b) [027]; *S. japonica* (Tattersall, 1922a) [017]; *S. yezoensis* (Ueno, 1933a) [026].

Habitat and distribution. Freshwater, Japan, streams, 3 species.

Etymology. Named for the sternal gills and the root of *Paramoera*.

Tethygeneia J.L. Barnard

Tethygeneia J.L. Barnard, 1972a: 197.

Type species. *Tethygeneia waminda* J.L. Barnard, 1972a, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum large, lateral cephalic lobes ordinary, anteroventral margin of head scarcely produced. Eyes reniform. Antennae subequal or 1 shorter than 2, peduncular articles of antenna 1 progressively shorter, article 1 shorter than head, article 3 weakly or not produced; article 1 of primary flagellum ordinary or short, accessory flagellum 1-articulate, scale-like or absent; calceoli anthurial. Labrum entire, subrounded, broader than long, epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 shorter than 2. Labium: inner lobes absent. Maxilla 1: inner plate with 5 (4-7) medial-apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate without facial row of setae but with other medial setae, often few, enlarged and weakly submarginal. Maxilliped: inner plate not relatively long, outer plate slightly shorter than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin, coxae ordinary, coxa 1 not or scarcely produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate.

Gnathopods diverse, medium, of same size, subchelate, not eusirid, carpus of both much shorter than propodus, only gnathopod 2 with strong posterior lobe extending distad, carpus without numerous long posterior setae, propodus rectangular. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, slightly extended beyond uropod 1, peduncle without large process, rami lanceolate. Telson ordinary, cleft, without long apical armaments.

Variables. Accessory flagellum and process of article 3 on antenna 1 present or absent; dactyls of pereopods occasionally pectinate or castellate (*T. nalgo*, *T. elanora*).

Relationship. Like *Pontogeneia* and *Gondogeneia* but gnathopod 2 with lobate carpus; differing also from *Gondogeneia* in the anthurial (not seriate) calceoli and long rostrum.

See *Abdia*, *Antarctogeneia*, *Dautzenbergia*, *Nasageneia*, *Paracalliopiella* and *Pseudomoera*.

Species. *Tethygeneia elanora* J.L. Barnard, 1972a [788]; *T. longleyi* (Shoemaker, 1933a) (Ruffo, 1950) (Camp *et al.*, 1977) [460]; ?*T. makarovi* (Gurjanova, 1951) [290]; *T. megaloptthalma* (Haswell, 1880a) (J.L. Barnard, 1972a) [781]; *T. minuta* (Chevreux, 1908k, 1935) [443];

T. nalgo J.L. Barnard, 1972a [788]; *T. opata* J.L. Barnard, 1979b [369]; *T. pacifica* (Schellenberg, 1938a) (Ledoyer 1967a, 1979b) (Ruffo, 1969) (J.L. Barnard, 1970a) [600]; *T. tulkara* J.L. Barnard, 1972a [788]; *T. waminda* J.L. Barnard, 1972a [788]; species, (*T. austrina* var. *T. megalophthalma* identification of Chilton, 1921d) [783].

Habitat and distribution. Marine, mostly southern warm temperate, tropical, northern warm temperate, littoral-sublittoral, 0-20 m, 10+ species.

Tylosapis Thurston

Tylosapis Thurston, 1974a: 40.

Type species. *Atylopsis dentata* Stebbing, 1888, original designation.

Diagnosis. Body ordinary, compressed, weakly carinate and toothed. Rostrum medium, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes round or ovate. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 produced; article 1 of primary flagellum [?ordinary, short, twice as long as article 3 of peduncle]; accessory flagellum considered as process on article 3 of peduncle. Labrum emarginate, subrounded, broader than long; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 as long as 2. Labium: inner lobes present. Maxilla 1: inner plate with 2 apical setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, outer plate broad, inner plate with facial row of 2 setae and no other medial setae. Maxilliped: inner plate short, outer plate longer than inner; palp of 4 articles, 4 shorter than 3, 3 lobed, 4 not spinose along inferior margin.

Coxae ordinary to short, coxa 1 scarcely produced anteriorly or expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, small, 2 scarcely larger than 1, subchelate, not eusirid, carpus of gnathopod 2 shorter than propodus, without posterior lobe, with long posterior setae, propodus rectangular, narrow, carpus of gnathopod 1 as long as propodus. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-3 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary, not extended beyond uropod 1, peduncle without large process, rami lanceolate, outer ramus much shorter than inner one. Telson ordinary, distally incised, without long apical armaments.

Relationship. Differing from *Atylopsis* and *Lopyastis* in the reduced facial row of setae on maxilla 2 and possibly from *Atylopsis* only in the shortened outer rami of uropods 1 and 3; from *Lopyastis* additionally in the poor development of setae on the inner plate of maxilla 1.

See *Eurymera*, *Manerogeneia*, *Membrilopus* and *Paracalliopiella*.

Species. *Tylosapis dentatus* (Stebbing, 1888) (Schellenberg, 1931) [866 + B].

Habitat and distribution. Marine, Magellan South America and Falkland Islands, 5-275 m, 1 species.

Whangarusa Barnard & Karaman

Whangarusa Barnard & Karaman, 1987: 863.

Type species. *Panoploea translucens* Chilton, 1884, original designation.

Diagnosis. Body ordinary, compressed, smooth. Rostrum very small, lateral cephalic lobes ordinary, anteroventral margin of head not produced. Eyes ovate. Antenna 1 longer than 2, peduncular articles progressively shorter, article 1 shorter than head, article 3 weakly produced; article 1 of primary flagellum ordinary, accessory flagellum absent. Labrum [?entire, subrounded, broader than long]; epistome unproduced. Molar triturative, columnar, article 2 of mandibular palp unlobed, article 3 almost as long as 2. Labium: inner lobes small. Maxilla 1: inner plate with many medial setae, palp long, article 1 short. Maxilla 2: inner plate not broader nor longer than outer, inner plate with full facial row of setae and other medial setae. Maxilliped: inner plate not relatively long, outer plate slightly longer than inner; palp of 4 articles, 4 slightly shorter than 3, 3 unlobed, 4 not spinose along inferior margin.

Coxae ordinary, coxa 1 not produced anteriorly nor expanded ventrally, coxa 4 with posterior lobe, excavate. Gnathopods alike, large, 1 larger than 2, subchelate, not eusirid, carpus of both, in male much shorter than propodus, with weak posterior lobe not extending distad, carpus without numerous long posterior setae, gnathopods 1-2 of female much more slender, carpus as long as propodus. Pereopods 3-7 ordinary, simple, dactyls simple, article 2 not anteriorly lobate. Epimeron 3 smooth. Outer rami of uropods 1-2 shortened; rami with lateral and dorsal spines. Uropod 3 ordinary to small, not extended beyond uropod 1, peduncle without large process, rami lanceolate, subequal(?). Telson ordinary, entire, almost pointed, without long apical armaments.

Relationship. Differing from *Gondogeneia* in the uncleft telson. From *Atylopsis*, *Laothoes*, *Apherusa*, *Austroregia* and *Halirages* in the grossly enlarged gnathopod 1 in the male, and both gnathopods with very short carpus and large propodus.

Species. *Whangarusa translucens* (Chilton, 1884a,

1921b) (J.L. Barnard, 1972b) [775].

Habitat and distribution. Marine, New Zealand, intertidal, 1 species.

[Pontoporeiidae] ***Zaramilla*** Stebbing

Fig.62M

Zaramilla Stebbing, 1888:866.–Barnard & Barnard, 1983: 563.

Type species. *Zaramilla kergueleni* Stebbing, 1888, monotypy.

Remarks. Not otherwise treated herein.

EXOEDICEROTIDAE Barnard & Drummond, 1982a

Diagnosis. Amphipoda like Oedicerotidae but apices of rami on uropods 1-2 spinose.

Description. Body laterally compressed, scarcely or not processiferous, urosomites 1-3 free. Head not strongly galeate, rostrum medium, thin or weak; eyes usually paired and widely separated but occasionally appressed or absent. Peduncle of antennae medium to short, flagella usually calceoliferous, calceoli probably of oedicerotid kind 7 (Lincoln & Hurley, 1981), accessory flagellum 0 to 1-articulate. Labrum weakly excavate or entire, epistome occasionally produced. Mandible strong, incisor toothed, raker row well developed, molar triturative to obsolescent, palp 0 to 1-articulate. Inner lobes of lower lip fleshy and separate. Maxillae well developed, inner plates poorly to strongly setose. Maxillipeds well developed, outer plate small to large, palp 4-articulate.

Coxae 1-4 well developed, coxa 4 lobate and excavate or not, coxa 5 generally only slightly smaller than 4. Gnathopods diverse, ranging from medium, alike and subchelate with spine fields on propodus, to feeble, simple and elongate and without spine fields. Pereopods 3-7 fossorial, with powerful and spinose articles, dactyls often vestigial or absent on pereopods 3-6, pereopod 7 very large as in Oedicerotidae, article 2 broadly expanded, appendage much longer than pereopods 5-6, dactyl elongate and well armed. Gills on coxae 2-7; oostegites narrow to moderately broad.

Pleon powerful, pleopods well developed, epimera ordinary, poorly ornamented. Uropods 1-2 with long rami bearing apical spines. Uropod 3 variable, moderately to strongly developed or vestigial. Telson short, entire, laminar.

Key 1 to Genera of Exoedicerotidae

1. Uropod 3 composed of peduncle only ..... *Metoediceros*

—— Uropod 3 with 1-2 rami 2

2. Uropod 3 with 1 ramus ..... *Notoediceros*

—— Uropod 3 with 2 rami 3

3. Gnathopods well developed 4

—— Gnathopods mittenform or inferior 7

4. Epimera 1-3 with many marginal setae ..... *Patuki*

—— All setae, if present, on epimera 1-3 facial, not marginal 5

5. Pereopods 3-4 with large dactyl, setae sparse ..... male *Metoediceropsis*

—— Pereopods 3-4 with dactyl vestigial, setae dense 6

6. Gill of coxa 5 small or vestigial, primary flagellum of antenna 1 with diverse armament, male and female gnathopods diverse ..... *Exoediceros*

—— Gill 5 ordinary, armament of primary flagellum on antenna 1 homogeneous, gnathopods of both sexes alike ..... *Exoediceroides*

7. Molar feeble ..... *Exoediceropsis*

—— Molar strong 8

8. Inner plate of maxilla 2 widely setose, maxilla 2 with submarginal facial inner setal row, dactyls of pereopods 3-6 ordinary 9

—— Inner plate of maxilla 1 naked, maxilla 2 lacking facial or submarginal inner row of setae, dactyls of pereopods 3-6 vestigial 11

9. Uropod 3 dominant, much larger than uropod 1, strongly spinose ..... *Parhalimedon*

—— Uropod 3 ordinary, lacking major spines 10

10. Article 3 of antenna 1 as long as 2, article 3 of mandibular palp falcate ..... *Kanaloa*

—— Article 3 of antenna 1 much shorter than 2, article 3 of mandibular palp linear ..... *Methalimedon*

11. Epimeron 2 with tooth, article 3 of mandibular palp not bevelled, with A-B or D setae besides E-setae ..... *Bathyporeiapus*

—— Epimeron 2 lacking tooth, article 3 of mandibular palp bevelled, lacking A-B setae, all setae (E) on bevel ..... *Vadosiapus*

Key 2 to Genera of Exoedicerotidae

1. Male gnathopods with spine fields on propodus near apices of closed dactyls 2

—— Male gnathopods lacking propodal spine fields 3

2. Uropod 3 with 2 rami ..... *Exoediceros*

—— Uropod 3 with 1 ramus ..... *Notoediceros*

—— Uropod 3 lacking rami ..... *Metoediceros*

3. Gnathopods ordinary, large 4

—— Gnathopods mittenform or gnathopod 2 almost simple ..... couplet 7 of Key 1

4. Epimera 1-3 with many marginal setae ..... *Patuki*

—— All setae of epimera 1-3, if present, facial ..... *Exoediceroides*

Bathyporeiapus Schellenberg

Fig.100F

Bathyporeiapus Schellenberg, 1931: 154.

Type species. *Bathyporeiapus magellanicus* Schellenberg, 1931, monotypy.

Diagnosis. Rostrum of moderate length, acute or downturned. Eyes bilateral, small. Article 3 of antenna 1 elongate, flagellar articles and armaments not diverse in type, weakly so in one species. Accessory flagellum

'absent'. Cutting edge of mandible projecting and weakly toothed; molar large, weakly ridged; palp article 3 short, clavate or sublinear. Inner plate of maxilla 1 lacking setae. Plates of maxilla 2 strongly distinct in size, inner plate setose medially but without facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 large, coxa 5 scarcely shorter than coxa 4. Gnathopods diverse, [?not sexually dimorphic], feeble, gnathopod 1 barely subchelate, carpus not lobate, much longer than propodus, latter expanded, palm oblique, gnathopod 2 much longer than gnathopod 1, simple, slender, carpus not lobate, very elongate, propodus also elongate; dactyl of gnathopod 2 vestigial to moderately developed; palms without spine fields. Dactyls of pereopods 3-4 vestigial or absent. Dactyl of pereopods 5-6 vestigial, of pereopod 7 multiarticulate; article 2 of pereopod 7 broad but scarcely lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-2 with setae on margins, epimeron 3 naked. Extension of uropods 1-3 diverse; uropod 2 shortest; uropod 2 not exceeding end of peduncle on uropod 3. Uropod 3 well developed, with 2 well-developed rami, peduncle longer than rami of uropod 2.

Additional characters. Outer plate of maxilla 1 with 7-9 spines.

Relationship. Differing from *Exoediceros* and *Exoediceroides* in the feeble diverse gnathopods, with vestigial to moderate dactyl on gnathopod 2, lack of setae on the inner plate of maxilla 1, lack of facial row on the inner plate of maxilla 2, and the elongate article 3 of antenna 1.

Species. *Bathyporeiapus bisetosus* Escofet, 1970, 1971 [753]; *B. copacabana* J.L. Barnard & Thomas, 1988 [751]; *B. magellanicus* Schellenberg, 1931 (Varela, 1983) [864]; *B. ruffoi* Escofet, 1971 (= species, Ruffo, 1956b) [751-753].

Habitat and distribution. Marine, Rio de Janeiro, Brazil to Magellan region, shallow water sands, 3 species.

Exoediceroides Bousfield

Exoediceroides Bousfield, 1983: 273.
Warreyus Barnard & Drummond, 1983: 65 (*Exoediceros maculosus* Sheard, 1936, original designation).

Type species. *Exoediceroides maximus* Bousfield, 1983, original designation.

Diagnosis. Rostrum long, acute. Eyes absent, bilateral. Article 3 of antenna 1 short, flagellar articles and armaments diverse. Accessory flagellum present. Cutting edge of mandible projecting and well toothed; molar medium, ridged; palp article 3 long, weakly falcate. Inner plate of maxilla 1 bearing medial setae. Plates of maxilla 2 not strongly distinct in size, inner plate with facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 large, coxa 5 not much shorter than coxa 4. Gnathopods alike, not sexually dimorphic, well developed, subequal, subchelate, stout, carpus lobate, propodus expanded, palms oblique, palms without spine fields, but with several groups of long spines. Dactyls of pereopods 3-6 absent. Article 2 of pereopod 7 broadly lobate posteroventrally. Gill of pereopod 5 ordinary.

Epimera 1-3 with many setae, setae facial and on ventral margins. Extension of uropods 1-3 diverse; uropod 2 shortest. Uropod 2 barely exceeding end of peduncle on uropod 3. Uropod 3 well developed, with 2 well-developed rami, peduncle as long as rami of uropod 2.

Additional characters. Calceoli and aesthetascs present in both sexes; peduncle of uropod 3 with dorsal spines, rami flat and both spinose and setose.

Relationship. Differing from *Exoediceros* in the long acute rostrum, diversity in size and armaments on the primary flagellum of antenna 1, the long subfalcate article 3 of the mandibular palp, lack of sexual dimorphism in gnathopods, large gill of coxa 5, and thin (versus stubby) spines on palms of gnathopods.

Species. *Exoediceroides latrans* (Haswell, 1879b) (= *E. maximus* Bousfield, 1983) [784]; *E. maculosus* (Sheard, 1936) (Barnard & Drummond, 1983) [784]; species, Barnard & Drummond, 1983 [782].

Habitat and distribution. Marine, south-eastern Australia and Tasmania, sand beaches, 0 m, 2 species.

Exoediceropsis Schellenberg

Fig.100A

Exoediceropsis Schellenberg, 1931: 152.

Type species. *Exoediceropsis chiltoni* Schellenberg, 1931, monotypy.

Diagnosis. Rostrum long, blunt. Eyes bilateral. Article 3 of antenna 1 short, flagellar articles and armaments diverse. absent. Accessory flagellum 'absent'. Cutting edge of mandible projecting and well toothed; molar feeble, simple, conical, with apical spine; palp article 3 short, falcate. Inner plate of maxilla 1 lacking setae. Plates of maxilla 2 not strongly distinct in size, inner plate without facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 very large, [?coxa 5 not much shorter than coxa 4]. Gnathopods alike, [?not sexually dimorphic, male unknown], feeble, subchelate, slender, carpus elongate, not lobate, propodus barely expanded, palms scarcely oblique, short, dactyls short, palms without spine fields. Dactyls of pereopods 3-4 absent. Dactyls of pereopods 5-7 vestigial. Article 2 of pereopod 7 broadly lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 with many setae on margins. Extension of uropods 1-3 diverse; uropod 2 shortest. Uropod 2 exceeding end of peduncle on uropod 3. Uropod 3 slightly reduced, with 2 well developed rami, peduncle shorter than rami of uropod 2.

Additional characters. Coxa 4 with sharp posteroventral tooth; article 4 of gnathopods with tooth.

Relationship. Characterised by the feeble, unridged molar and large sharp lobe of coxa 4.

Species. *Exoediceropsis chiltoni* Schellenberg, 1931 [860].

Habitat and distribution. Marine, middle Argentina, 95-113 m, 1 species.

Exoediceros Stebbing

Exoediceros Stebbing, 1899a: 208.–Stebbing, 1906: 239.–Barnard & Drummond, 1982a: 611.

Type species. *Oedicerus fossor* Stimpson, 1855, original designation.

Diagnosis. Rostrum short, blunt. Eyes bilateral. Article 3 of antenna 1 short, flagellar articles and armaments uniform. Accessory flagellum present. Cutting edge of mandible projecting and well toothed; molar large, ridged, setulose; palp article 3 short, stout, clavate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 strongly distinct in size, outer broad, inner plate with facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 large, coxa 5 not shorter than coxa 4. Gnathopods alike, sexually dimorphic, well developed in male, feeble in female, subequal, subchelate, propodus moderately stout in male, slightly expanded, palms oblique, with spine fields, carpus with sharp small posterior lobe projecting weakly distalwards, mostly at right angles, not especially guarding propodus; female propodus smaller than in male, carpus relatively longer, lobes weaker, broader and blunter, palms without spine fields. Dactyls of pereopods 3-4 vestigial. Dactyls of pereopods 5-6 very small. Article 2 of pereopod 7 narrowly rectangular, scarcely lobate posteroventrally. Gill of pereopod 5 vestigial.

Epimeron 3 without setae, on epimera 2-3 setae both facial and ventral. Extension of uropods 1-3 diverse; uropod 2 shortest. Uropod 2 exceeding end of peduncle on uropod 3. Uropod 3 slightly reduced, with 2 ovatolinguiform, well-setose rami, peduncle as long as rami of uropod 2.

Additional characters. Calceoli and aesthetascs present in both sexes; peduncle of uropod 3 with dorsal subapical spines; rami flat and expanded, setose in both sexes.

Species. *Exoediceros fossor* (Stimpson, 1856a) (Bate, 1862) (= *E. arenicola* Haswell, 1879b) (Haswell, 1882) (Stebbing, 1910a) (Barnard & Drummond, 1982a, 1983) [784].

Habitat and distribution. Marine, south-eastern Australia and Tasmania, shallow sands, 1 species.

Kanaloa J.L. Barnard

Fig.100J

Kanaloa J.L. Barnard, 1970a: 224.

Type species. *Kanaloa manoa* J.L. Barnard, 1970a, original designation.

Diagnosis. Rostrum short, blunt. Eyes appressed dorsally. Article 3 of antenna 1 elongate, flagellar articles and armaments uniform. Accessory flagellum [?absent]. Cutting edge of mandible scarcely projecting and poorly toothed; molar large, ridged; palp article 3 long, falcate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 distinct in size, inner plate with facial row of setae. Dactyl of maxilliped short and stubby.

Coxae 1-4 large, coxa 5 much shorter than coxa 4. Gnathopods alike, [?not sexually dimorphic, male unknown], feeble, subequal, subchelate, slender, carpus not lobate, propodus not expanded, palms transverse, gnathopod 2 not much longer than gnathopod 1, palm of gnathopod 2 densely spinose. Dactyls of pereopods 3-6 well developed. Article 2 of pereopod 7 broadly lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 without many setae, all setae on margins. Extension of uropods 1-3 equal; uropod 2 shortest. Uropod 2 fully exceeding end of peduncle on uropod 3. Uropod 3 well developed, with 2 well-developed rami, peduncle as long as rami of uropod 2.

Additional characters. Coxa 1 slightly expanded apically; coxa 4 strongly excavate posteriorly; outer ramus of uropods 1-2 shortened; epimera 1-3 with small posteroventral tooth.

Relationship. Differing from *Parhalimedon* and *Methalimedon* in the transverse palms of the gnathopods, the strongly excavate coxa 4 and the equally extending uropods 1-3.

Species. *Kanaloa manoa* J.L. Barnard, 1970a, 1971a (Ledoyer, 1978b, 1979a, 1986) [600].

Habitat and distribution. Marine, Hawaii to Madagascar and Mauritius, 5-30 m, 1 species.

Methalimedon Schellenberg

Methalimedon Schellenberg, 1931: 150.

Type species. *Methalimedon nordenskjoldi* Schellenberg, 1931, monotypy.

Diagnosis. Rostrum short, acute. Eyes coalesced dorsally. Article 3 of antenna 1 short, flagellar articles and armaments uniform. Accessory flagellum [?absent]. Cutting edge of mandible projecting and well toothed; molar large, ridged; palp article 3 short, thin, poorly setose, not falcate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 not strongly distinct in size, inner plate with facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 large, coxa 5 [?shorter than coxa 4]. Gnathopods alike, [?not sexually dimorphic, male unknown], feeble, subequal, subchelate, slender, carpus not lobate, propodus not expanded, palms oblique, dactyls well developed; palms without spine fields. Dactyls of pereopods 3-6 well developed. Article 2 of pereopod 7 broadly lobate posteroventrally. Gill of pereopod 5[?ordinary].

Epimera 1-3 with several setae on margins. Extension of uropods 1-3 diverse; uropod 2 shortest. Uropod 2 not [?barely exceeding end of peduncle on uropod 3]. Uropod 3 well developed, exceeding uropod 2, with 2 well-developed rami, peduncle longer than rami of uropod 2.

Additional characters. Palp of maxilliped barely exceeding outer plate; coxa 1 apically expanded.

Relationship. Differing from *Bathyporeiapus* in the well setose inner plates of maxillae 1-2, large dactyls of pereopods 3-6, feeble article 3 of the mandibular palp, huge eyes, and expanded coxa 1.

Species. *Methalimedon nordenskjoldi* Schellenberg, 1931 (K.H. Barnard, 1932) (Nicholls, 1938) (Bellan-Santini, 1972) (Thurston, 1974a,b) [875].

Habitat and distribution. Marine, Antarctica and South Georgia, 5-310 m, 1 species.

Metoediceropsis Dang

Metoediceropsis Dang, 1968: 212.

Type species. *Metoediceropsis dadoensis* Dang, 1968, original designation.

Diagnosis. Rostrum short, acute. Eyes bilateral. Article 3 of antenna 1 slightly elongate, flagellar articles and armaments uniform. Accessory flagellum [?absent]. Cutting edge of mandible projecting and toothed; molar large, ridged, palp article 3 long, weakly falcate. Inner plate of maxilla 1 bearing few apical and medial setae. Plates of maxilla 2 not strongly distinct in size, inner plate without facial row of setae. Dactyl of maxilliped unguiform and short.

Coxae 1-4 medium, coxa 5 not much shorter than coxa 4. Gnathopods alike, strongly diverse, sexually dimorphic, well developed in male, feeble in female and weakly diverse, subequal, subchelate, slender in female, stout in male, carpus of gnathopod 1 scarcely lobate, propodus expanded, palm oblique, gnathopod 2 much larger than gnathopod 1, carpus with subsharp strong posterior lobe projecting distalwards at right angles, dactyls well developed; female gnathopods feeble, carpus as long as propodus, with moderate lobes, palms weakly oblique; palms without spine fields. Dactyls of pereopods 3-6 well developed. Article 2 of pereopod 7 scarcely lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 with few setae. Extension of uropods 1-3 diverse; uropod 3 shortest. Uropod 2 [?exceeding end of peduncle on uropod 3]. Uropod 3 slightly reduced, with 2 slightly reduced rami, peduncle as long as rami of uropod 2.

Additional characters. Coxa 1 expanded apically; pereopods 3-4 slender, poorly setose; epimera 1-3 with small posteroventral tooth.

Relationship. Differing from *Exoediceros* and *Exoediceroides* in the poorly setose epimera 1-3 bearing posteroventral tooth, lanceolate rami on uropod 3, slender and poorly setose pereopods 3-4, and expanded coxa 1. From *Methalimedon* in the bilateral eyes, lobate carpus of female gnathopods, and subfalcate article 3 of mandibular palp. From *Bathyporeiapus* in slightly lobate carpus of female gnathopods, and well-developed dactyls of pereopods 3-6. From *Parhalimedon* in the much shorter coxae and short uropod 3.

Species. *Metoediceropsis dadoensis* Dang, 1968 [653].

Habitat and distribution. Marine, North Vietnam, Da Do, Chai Fonga, ?brackish, 1 species.

Metoediceros Schellenberg

Figs 99C, 100N

Metoediceros Schellenberg, 1931: 157.

Type species. *Metoediceros fuegiensis* Schellenberg, 1931, monotypy.

Diagnosis. Rostrum short, blunt. Eyes bilateral. Article 3 of antenna 1 elongate, flagellar articles and armaments uniform. Accessory flagellum 'absent'. Cutting edge of mandible projecting and well toothed; molar large, ridged, palp absent. Inner plate of maxilla 1 bearing few apical setae. Plates of maxilla 2 not strongly distinct in size, inner plate without facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 very large, coxa 5 shorter than coxa 4. Gnathopods alike, sexually dimorphic, well developed in male, feeble in female, subequal, gnathopods in male subchelate, moderately stout, carpus not lobate, propodus expanded, palms oblique, in female slender, usually gnathopod 2 much more slender, carpus only of gnathopod 2 with blunt small posterior lobe, dactyls well developed; male palms with spine fields. Dactyls of pereopods 3-6 vestigial. Article 2 of pereopod 7 broadly lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 with setae, on margins. Extension of uropods 1-3 diverse; uropod 3 shortest. Uropod 2 fully exceeding end of peduncle on uropod 3. Uropod 3 vestigial, without rami.

Additional characters. Calceoli present in male; inner lobes of lower lip poorly developed.

Relationship. Characterised by the vestigial uropod 3.

Species. *Metoediceros fuegiensis* Schellenberg, 1931 [864E].

Habitat and distribution. Marine, Magellan area, Punta Arenas, "gray green brackish water", 1 species.

Notoediceros Bousfield

Notoediceros Bousfield, 1983: 273.–Barnard & Drummond, 1984: 26.

Type species. *Notoediceros tasmaniensis* Bousfield, 1983, original designation.

Diagnosis. Rostrum short, blunt. Eyes bilateral. Article 3 of antenna 1 short, flagellar articles and armaments uniform. Accessory flagellum present. Cutting edge of mandible scarcely projecting and well toothed; molar large, ridged, setulose; palp article 3 short, weakly falcate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 not strongly distinct in size, inner plate with facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-3 medium, coxa 4 large, coxa 5 not much shorter than coxa 4. Gnathopods alike, sexually dimorphic, feeble, subequal, subchelate, moderately stout in male, carpus not lobate, propodus slightly expanded, palms oblique, with spine fields in male, gnathopod 2 not much longer than gnathopod 1, female propodus smaller than in male, carpus relatively longer, palms without spine fields. Dactyls of pereopods 3-4 absent. Dactyls of pereopods 5-6 vestigial. Article 2 of pereopod 7 broadly trapezoidal, not lobate posteroventrally. Gill of pereopod 5 ordinary.

Epimera 1-3 with few setae, most setae facial. Extension of uropods 1-3 diverse; uropod 3 shortest. Uropod 2 fully exceeding end of peduncle on uropod 3. Uropod 3 poorly developed, with 1 reduced ramus, peduncle shorter than rami of uropod 2.

Additional characters. Calceoli and aesthetascs absent; many spines on outer plate of maxilla 1 basally bent, 3 of the 11 spines very small (versus *Exoediceros*); gills bilobate.

Relationship. Differing from *Exoediceros* and *Exoediceroides* in the absence of calceoli and aesthetascs, odd spines of outer plate on maxilla 1, non-lobate carpus of the gnathopods, large gill of coxa 5, and loss of inner ramus on uropod 3.

See *Metoediceros*.

Species. *Notoediceros tasmaniensis* Bousfield, 1983 (Barnard & Drummond, 1984) [783EFK].

Habitat and distribution. Marine and ?freshwater, Tasmania, brackish pools and streams of intertidal zone, 1 species.

Parhalimedon Chevreux

Parhalimedon Chevreux, 1906b: 76.

Type species. *Parhalimedon turqueti* Chevreux, 1906b, original designation.

Diagnosis. Rostrum short, blunt. Eyes [? absent]. Article 3 of antenna 1 elongate, flagellar articles and armaments uniform. Accessory flagellum [?absent]. Cutting edge of mandible projecting and well toothed; molar large, ridged, palp article 3 short, falcate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 not strongly distinct in size, inner plate with

facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 very large, coxa 5 much shorter than coxa 4. Gnathopods diverse, [?not sexually dimorphic, male unknown]; feeble, slender, carpus scarcely lobate, propodus not expanded, palms oblique, gnathopod 2 longer than gnathopod 1, dactyls well developed; palms without spine fields. Dactyls of pereopods 3-6 well developed. Article 2 of pereopod 7 constricted posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 with few setae, Extension of uropods 1-3 diverse; uropod 2 shortest. Uropod 2 barely reaching end of peduncle on uropod 3. Uropod 3 hugely developed, with 2 large rami, peduncle longer than rami of uropod 2.

Additional character. Outer rami of uropods 1-2 shortened.

Relationship. Characterised by the huge uropod 3; this may however go missing in preserved specimens.

Differing from *Bathyporeiapus* in the well-developed dactyls of pereopods 3-6, and well setose inner plate of maxilla 1. From *Methalimedon* in the falcate article 3 of the mandibular palp, and constricted article 2 of pereopod 7. From *Exoediceropsis* in the constricted article 2 of pereopod 7, poorly setose toothed epimera, and lack of tooth on article 4 of the gnathopods. From *Patuki* in the large uropod 3, constricted article 2 of pereopod 7 and well-developed dactyls of pereopods 3-4. From *Exoediceros*, *Exoediceroides* and *Notoediceros* in the elongate article 3 of antenna 1 and points on the epimera. From females of *Metoediceropsis* in the constricted article 2 of pereopod 7, well-setose pereopods 3-4, and huge coxae. From *Kanaloa* in the oblique palms of the gnathopods, non-excavate coxa 4 and diversely extending uropods.

Like *Halicreion*, in the Oedicerotidae in the huge uropod 3. Differing from *Halicreion* in the feeble gnathopods with elongate and unlobate carpus, in the lack of a significant rostrum, and the strong setosity on the inner plates of maxillae 1-2.

Species. *Parhalimedon tropicalis* J.L. Barnard, 1961a [631]; *P. turqueti* Chevreux, 1906b (Schellenberg, 1931) (Thurston, 1974b) [880].

Habitat and distribution. Marine, Antarctica 5-50 m and Coral Sea, 230 m, 2 species.

Patuki Cooper & Fincham

Fig.69B

Patuki Cooper & Fincham, 1974: 173.

Type species. *Patuki breviuropodus* Cooper & Fincham, 1974, original designation.

Diagnosis. Rostrum short, subacute. Eyes appressed dorsally. Article 3 of antenna 1 elongate, flagellar articles and armaments uniform. Accessory flagellum present. Cutting edge of mandible projecting and well toothed; molar large, ridged, palp article 3 short, stout, clavate. Inner plate of maxilla 1 fully setose medially. Plates of maxilla 2 not strongly distinct in size, inner plate with facial row of setae. Dactyl of maxilliped unguiform and long.

Coxae 1-4 very large, coxa 5 not much shorter than coxa 4. Gnathopods alike, slightly dimorphic sexually, feeble, subequal, subchelate, carpus weakly lobate, propodus weakly expanded, palms oblique or transverse, palms without spine fields but with several elongate spines at defining corners. Dactyls of pereopods 3-4 absent. Dactyls of pereopods 5-6 small. Article 2 of pereopod 7 broad but not lobate posteroventrally. Gill of pereopod 5 [?ordinary].

Epimera 1-3 with many setae, mostly on margins. Extension of uropods 1-3 diverse; uropod 3 shortest. Uropod 2 fully exceeding end of peduncle on uropod 3. Uropod 3 reduced, with 2 slightly reduced rami, peduncle shorter than rami of uropod 2.

Additional characters. [?Calceoli] and aesthetascs present [? in both sexes]; peduncle of uropod 3 lacking subapical spines; rami slender, lanceolate, sharp, with spines but no setae.

Sexual dimorphism. Males with lesser armament and more oblique palms on the gnathopods (*P. roperi*).

Variables. Palms of gnathopods oblique (type), transverse (female of *P. roperi*).

Relationship. Characterised by the many marginal setae on the epimera. Differing also from *Exoediceros* and *Exoediceroides* in the short uropod 3, lack of subapical dorsal spines on the peduncle of uropod 3, and the lack of long setae on the rami.

Species. *Patuki breviuropodus* Cooper & Fincham, 1974 [776]; *P. roperi* Fenwick, 1983 [774].

Habitat and distribution. Marine, New Zealand, 0-6 m, 2 species.

GAMMARELLIDAE Bousfield, 1977

[see Barnard & Barnard (1983)]

GAMMARIDA and GAMMARIDAE Leach, 1814b

[see Barnard & Barnard (1983)]

GAMMAROIDEA Leach, 1814

[see Barnard & Barnard (1983)]

GAMMAROPOREIIDAE Bousfield, 1979

[see Barnard & Barnard (1983)]

HADZIIDAE S. Karaman, 1943

[see Barnard & Barnard (1983)]

HAUSTORIOIDEA Stebbing, 1906

Diagnosis. Antennae and pereopods fossorial, thus antennae and pereopod 5 with facial spines or pereopod 5 occasionally narrowed and heavy spines mostly marginal.

Relationship. The Oedicerotidae also have fossorial pereopods but pereopod 5 is poorly spinose facially, pereopod 7 is very elongate and bears a long, setose dactyl; except for one genus with vestigial uropod 3, oedicerotids have an elongate peduncle on uropod 3, and the rami are elongate and 1-articulate; haustorioids with 1-articulate outer ramus of uropod 3 have short rami and short peduncle.

Some platyischnopids within the Haustorioidea have elongate pereopod 7 but the outer ramus of uropod 3 has 2 articles and the distinctly cylindroid head in all but one genus has special apical denticular armaments formed in an equatorial circle.

For the sake of convenience the Carangoliopsidae are discussed here but they are in reality a member of Gammarida as evidenced by the basofacial spine on the peduncle of uropod 1. The Pontoporeiidae are also placed within the keys to follow but are considered to be part of the Gammarida and are to be found in Barnard & Barnard (1983).

Keys to Families of Haustorioidea

Key 1 to Families of Haustorioidea

1. Rostrum cylindrical 2

—— Rostrum not cylindrical or absent 5

2. Article 5 of pereopods 3-4 strongly produced posteriorly, peduncles of pleopods wider than long or as wide as long ..... Condukiidae

—— Article 5 of pereopods 3-4 unproduced posteriorly, peduncles of pleopods longer than wide 3

3. Article 2 of pereopod 7 subcircular, like pereopod 6, teeth of incisor well developed and subsharp, molar evanescent ..... Cheidae

—— Article 2 of pereopod 7 shield-shaped, teeth of incisor evanescent, molar simple but moderately large 4

4. Molar large, pereopod 7 not typical of phoxocephalids, pereopod 5 elongate ..... Platyischnopidae

—— Molar evanescent, pereopod 7 typical of phoxocephalids, pereopod 5 short ..... (*Leptophoxus*) Phoxocephalidae

5. Head with sharp or plaque-like ventral cheek projecting downward 6

—— Head lacking sharp or defined ventral cheek pointing downward, often with sharp projection on small cheek pointing forward 8

6. Mandibular molars large and pubescent, incisors broad and almost toothed, peduncles of pleopods less than 1.6 length *x* width ..... Ipanemidae, Urothoidae (part)

—— Mandibular molars triturative or not, but not large nor pubescent, incisors broad but 3+ toothed, (except *Leptophoxus*), peduncles of pleopods longer than wide 7

7. Flat rostrum present though often tiny, coxae large and overlapping, article 2 of pereopod 7 shield-shaped, article 3 of antenna 1 less than one third as long as article 1 ..... Phoxocephalidae

—— Rostrum absent, coxae tiny and disjunct, article 2 of pereopod 7 subrectangular, article 3 of antenna 1 more than two thirds as long as article 1 (uropod 1 with basofacial spine) ..... (in Gammarida) Carangoliopsidae

8. Pereopod 7 of characteristic phoxocephalid form ..... Couplet 4

—— Pereopod 7 not of phoxocephalid form 9

9. Rami of uropod 1 styliform and either naked, spinose, or rami absent; palp of maxilla 1 2-articulate 10

—— Rami of uropod 1 linguiform and setose, palp of maxilla 1 1-articulate (except *Huarpe*) 16

10. Rami of uropod 2 linguiform and setose, palp of maxilliped 3-articulate ..... Haustoriidae

—— Rami of uropod 2 rod-like and spinose or rami absent, palp of maxilliped 4-articulate 11

11. Antennae of haustoriid form, thus article 1 of antenna 1 short, article 4 of antenna 2 broadly expanded ..... Phoxocephalopsidae

—— Antennae of urothoid form, (article 1 of antenna 1 usually elongate, except *Cardenio, Zaramilla*), article 4 of antenna 2 poorly expanded 12

12. Cephalic cheek strong (Fig.67D) ..... Ipanemidae, Urothoidae

—— Cephalic cheek weak or absent 13

13. Rostrum about one third of head length, molar evanescent ..... Cheidae

—— Rostrum vestigial, molar well developed 14

14. Uropod 3 vari- or parviramous, outer ramus 2-articulate ..... Pontoporeiidae

—— Uropod 3 magniramous, outer ramus 1-articulate 15

15. Pereopod 7 of phoxocephalid form, shorter than pereopod 6, with broad, shield-shaped article 2 and short thin articles 3-7, telson short ..... Pontoporeiidae

—— Pereopod 7 as long as pereopod 6, article 2 shield-shaped but articles 4-6 long, articles 4-5 broad, telson elongate ..... Cardenioidae

16. Gnathopod 1 simple ..... Urohaustoriidae

—— Gnathopod 1 subchelate 17

17. Palp of maxilliped with 4 articles ..... Zobrachoidae

—— Palp of maxilliped with 3 articles ..... Haustoriidae

Key 2 to Families of Haustorioidea

1. Uropod 1 lacking rami ..... *Cunicus* in Urothoidae

—— Uropod 1 bearing 1-2 rami 2

2. Uropod 2 with linguiform rami bearing long setae 3

—— Rami of uropod 2 styliform or rod-like and spinose or naked, rarely with 1 seta on each ramus 7

3. Antenna 1 of urothoe form, thus geniculate and articles 1-2 slender or article 3 as long as 2, antenna 2 of urothoe form, thus article 4 lacking disjunct basofacial spine group, head with cheek in place of antennal incision ..... Urothoidae (part)

—— Antenna 1 of haustorius form, not geniculate, either article 2 shorter than 1 or 3 shorter than 2, also either articles 1 or 2 stout, antenna 2 of haustorius form, thus article 4 with disjunct group(s) of basofacial spines or setae, head lacking cheek or with antennal incision 4

4. Spines absent on rami of uropod 1, only setae present 5

—— Spines (and often setae) present on rami of uropod 1 6

5. Gnathopod 1 subchelate, epimeron 1 well developed ..... (see Key 1, last couplet) (and *Eohaustorius*) Zobrachoidae

—— Gnathopod 1 simple, epimeron 1 vestigial ..... Urohaustoriidae

6. Dactyl of maxilliped well developed, setae on second uropod 5 or fewer, dactyl of pereopod 5 (and pereopods 3-7 generally) larger than adjacent spines ..... Phoxocephalopsidae

—— Dactyl of maxilliped vestigial or absent, setae on second uropod 2 5 or more, dactyl of pereopod 5 (and pereopods 3-7 generally) smaller than adjacent spines (seemingly absent) ..... Haustoriidae

7. Rostrum cylindrical 8

—— Rostrum flat, thorn-like or absent 10

8. Inner ramus of uropod 3 absent, article 5 of pereopods 3-4 grossly lobate ..... Condukiidae

—— Inner ramus of uropod 3 present, article 5 of pereopods 3-4 ordinary 9

9. Molar evanescent, pereopod 5 very short, pereopod 7 of phoxocephalid form ..... (*Leptophoxus*) Phoxocephalidae

—— Molar large, pereopod 5 long, pereopod 7 not of phoxocephalid form ..... Platyischnopidae

10. Pereopod 7 shorter than pereopod 6, or of typical phoxocephalid form 11

—— Pereopod 7 as long as pereopod 6 15

11. Article 4 of antenna 2 not spinose facially 12

—— Article 4 of antenna 2 spinose on outer or anterior face, spines sometimes like opals 13

12. Rostrum vestigial, molar large ..... Pontoporeiidae

—— Rostrum huge, molar vestigial ..... Phoxocephalidae

13. Molar triturative or simple, article 4 of antenna 2 with disjunct group(s) of basofacial spines 14

—— Molar very large, smooth and pubescent, antenna 2 with all spines in single apical or anterior group ..... (*Urothoides*) Urothoidae

14. Article 2 of pereopod 7 shield-shaped ..... Phoxocephalidae

—— Article 2 of pereopod 7 subcircular, like pereopod 6 ..... Cheidae

15. Molar very large, smooth and pubescent ..... Ipanemidae, Urothoidae

—— Molar otherwise 16

16. Coxae tiny and disjunct ..... Carangoliopsidae

—— Some coxae large and overlapping 17

17. Inner ramus of uropod 3 absent, basal setation on pleopod 2 dense, absent on pleopods 1 and 3, article 5 on pereopods 3-4 grossly lobate ..... Condukiidae

—— Inner ramus of uropod 3 present, basal setation on pleopod 2 not grossly distinctive, article 5 of pereopods 3-4 not lobate 18

18. Uropod 2 reduced, rostrum huge, incisors sharply multidentate, gnathopods 1-2 chelate, (palp article 3 of mandible with bevelled apex, setal dominance on bevel) ..... Cheidae

—— Uropod 2 ordinary, rostrum small, incisors scarcely dentate, gnathopods 1-2 subchelate or simple, palp article 3 of mandible variable 19

19. Coxae 1-2 tiny and hidden by large coxae 3-4 ..... Ipanemidae

—— Coxae 1-2, though small, visible and only partly hidden 20

20. Article 4 of antenna 2 strongly expanded, small rostrum flat, palp of maxilla 1 stunted, peduncles of pleopods as short as broad ..... Phoxocephalopsidae

—— Article 4 of antenna 2 evenly narrow, vestigial rostrum thick dorsoventrally, palp of maxilla 1 ordinary, peduncles of pleopods much longer than broad ..... (see Key 1 couplet 15) Cardenioidae, Pontoporeiidae

Key 3 to Families of Haustorioidea

1. Coxae tiny and disjunct ..... Carangoliopsidae

—— Coxae large and overlapping 2

2. Apex of mandibular palp article 3 pointed, setal dominance concentrated on inner edge (normal D-E dominance) ..... Pontoporeiidae

—— Apex of mandibular palp article 3 bevelled or truncate, setal dominance concentrated on bevel or on outer margin as A-B groups 3

—— Apex of mandibular palp article 3 not bevelled, setae forming fan around apex and sides of article 3 10

3. Pereopod 7 unlike pereopod 6, article 2 shield-like 4

—— Pereopod 7 like pereopod 6, article 2 ovate or circular 8

4. Rostrum cylindrical ..... (also see *Leptophoxus*) Platyischnopidae

—— Rostrum flat or absent 5

5. Mandibular molar huge, unridged, pubescent, head with cheek ..... (*Urothoides*) Urothoidae

—— Mandibular molar triturative or small and simple, spinose, head with antennal incision 6

6. Pereopod 7 subequal to pereopod 6 in length, (and see Key 1, couplet 14 for Cheidae, and Key 1 couplet 15 for Cardenioidae) ..... Pontoporeiidae

—— Pereopod 7 much shorter than pereopod 6 or of typical phoxocephalid form 7

7. Mandibular palp article 3 linear, apically bevelled, all apical setae concentrated on bevel, otherwise with few strongly basolateral A-B setae ..... Phoxocephalidae

—— Mandibular palp article 3 otherwise ..... Pontoporeiidae

8. Article 4 of pereopods 3-4 grossly lobate, urosomite 1 with huge ventral tooth, pleopod 2 heavily setose basally, pleopods 1 and 3 not, antenna 2 lacking spines ..... Condukiidae

—— Article 4 of pereopods 3-4 nonlobate, urosomite 1 with small or no tooth ventrally, pleopods 1-3 with basal setosity uniform or minor, antenna 2 with spines 9

9. Mandibular incisor well toothed, molar vestigial, article 4 of antenna 2 with basofacial disjunct spine group(s) ..... Cheidae

—— Mandibular incisor poorly toothed, molar huge and pubescent, article 4 of antenna 2 with all spines in one apical group ..... Urothoidae

—— Mandibular incisor poorly toothed, molar ordinary and triturative, article 4 of antenna 2 bearing only setae, no spines ..... Pontoporeiidae

10. Rami of uropod 1 absent ..... (*Cunicus*) Urothoidae

—— Rami of uropod 1 present 11

11. Rami of uropod 1 lacking spines, only setose, always linguiform 12

—— Rami of uropod 1 bearing spines (and occasional setae) or naked and styliform 14

12. Gnathopod 1 simple ..... Urohaustoriidae

—— Gnathopod 1 subchelate 13

13. Palp of maxilliped with 4 articles ..... Zobrachoidae

—— Palp of maxilliped with 3 articles ..... (*Eohaustorius*) Haustoriidae

14. Article 4 of antenna 2 lacking basal disjunct spine group, molar huge and pubescent ..... Ipanemidae, Urothoidae (part)

—— Article 4 of antenna 2 with basofacial disjunct spine group(s), molar medium to absent, triturative, simple or spinose 15

—— Article 4 of antenna 2 lacking basal disjunct spine group, molar ordinary, triturative ..... Ipanemidae, Pontoporeiidae

15. Rami of uropod 2 with 20+ setae, lacking spines, dactyl of maxilliped vestigial or absent, inner plate of maxilla 1 densely setose medially ..... Haustoriidae

—— Rami of uropod 2 with 0-5 setae, also spinose or naked, dactyl of maxilliped well developed, inner plate of maxilla 1 sparsely setose apically only 16

16. Article 2 of antenna 1 setose, articles 4-5 of antenna 2 broad, spines small, in ranks, coxae 1-2 not hidden ..... Phoxocephalopsidae

—— Article 2 of antenna 1 spinose, articles 4-5 of antenna 2 slender, in lines, coxae 1-2 tiny, hidden ..... Ipanemidae

HAUSTORIIDAE Stebbing, 1906

Diagnosis. Rostrum moderate to weak, head short, cheek poorly developed. Antenna 1 of haustorius form, article 1 short, articles 2-3 progressively shorter, weakly geniculate or not; primary flagellum elongate, accessory flagellum short. Antenna 2 of haustorius form, article 4 expanded, article 5 shorter and narrower than article 4, these articles furnished with 1 or more rows of longitudinal facial ornaments, ventral margin of article 4 with at least 3 kinds of setae: (1) elongate plumes, (2) shorter and stiffer glassy spines set in tandem, and (3) bulbar based penicillate setules; flagellum scarcely longer than article 4 of peduncle. Prebuccal complex massive, upper lip dominant, epistome scarcely distinct. Mandibles bearing stubby, poorly toothed incisors; laciniae mobiles present on both sides and weakly unlike each other; rakers poorly serrate, numerous to few; molar large and very weakly triturative, usually fuzzy, often furnished with accessory chopper in form of articulate multifid spine; palp 3-articulate, article 3 not bevelled, with numerous outer setae, no setae of palp article 3 awned, apical group with mostly simple setae but proximal members bilaterally serrate, distinctive and disjunct set of inner basal, short and bilaterally serrate spines also present. Lower lip with discrete inner lobes, mandibular extensions of outer lobes absent; mandibular palp article 3 with apical and subapical setal fan, apex not bevelled. Maxilla 1 with 2-articulate palp, inner plate usually triangular but always evenly and densely setose medially, lacking any lateral setae; baler lobes often present. Maxilla 2 usually with outer plate significantly enlarged, inner plate with fully developed medial row of setae. Maxilliped with expanded bases bearing baler lobes (usually), otherwise maxilliped with normally enlarged plates, outer spinose; palp 3-articulate, article 3 usually geniculate, article 2 expanded.

Coxae 1-4 evenly integrated by stepped enlargement from coxa 1 onwards, coxa 4 dominant, coxa 1 not extremely small, coxae 3-4 more or less weakly produced posteroventrally. Coxal gills on segments 2-6, brood plates slightly to moderately broadened. Gnathopods feeble, grossly alike in proportions, carpus elongate, but gnathopod 1 simple (dactyl with nail = unusual); gnathopod 2 minutely parachelate; article 3 short. Article 5 of pereopods 3-4 broad and deeply lobate, with thick posterior or facial spines; dactyls of pereopods 3-7 vestigial, represented by tiny bulb bearing plusetule; pereopod 5 of haustorius form, articles 2,4, and 5 expanded, articles 4-5 with extensive facial rows of spines; pereopods 6-7 not alike but not of phoxocephalid form; article 4 on pereopod 6 immensely dominant, article 2 subrectangular; article 2 on pereopod 7 immensely dominant, subcircular, articles 4-5 expanded, but together not as large as article 4 of pereopod 6; pereopods 6-7 occasionally with weakly developed underslung articulation. Peduncles of pleopods not longer than wide, inner rami not or scarcely inferior, pleopod 2 not inferior; coupling hooks paired on each pleopod, inner rami lacking clothespin hooks. Epimeron 1 well developed; epimeron 3 dominant in size, cuspidation or setation. Urosome flexing ventrad, urosomite 1 often becoming elongate, extending ventrally, and apicoventrally toothed. Rami of uropod 1 clavate or rod-like or weakly styliform, spinose; rami of uropod 2 linguiform or grossly rod-like, setose; uropod 3 with rod-like rami, outer ramus weakly dominant, 2-articulate, article 2 elongate, inner and outer rami and article 1 of outer ramus apically multi-armed. Telson very short, broad, cleft gaping, base often constricted.

Relationship. Haustoriids can be developed evolutionarily from a position antecedent both to the Zobrachoidae-Urohaustoriidae cluster and to the Phoxocephalopsidae. Haustoriids retain the primitive epimeral condition of most amphipods in that epimeron 3 is dominant, whereas the other groups mentioned have epimeron 2 dominant. Haustoriids also maintain, like Phoxocephalopsidae, the plesiomorphic uropod 1 bearing rod-styliform rami with spines, quite unlike the linguiform-setose rami of Zobrachoidae-Urohaustoriidae, which are very unusual and presumably apomorphic. The rami of uropod 2, however, are linguiform but the setae are far more numerous and not as regularly positioned as in the austral groups. Uropod 3 is distinctive and somewhat reminiscent of certain Eurasian freshwater gammarids.

The presence of baler lobes is a specialisation superimposed on what otherwise are primitive maxillae in terms of medial setation; but the maxillipeds have progressed greatly through loss of the dactyl and geniculate substitution by article 3 of dactylar functions. Haustoriids retain many rakers in primitive forms, though several apomorphic genera show decline in numbers, as in Urohaustoriidae. The presence of a special inner proximal row of spines on palp article 3 may be a carryover from the primitive gammarid condition; these do not occur in other haustorioids as far as known.

Gnathopods are very similar to those of Urohaustoriidae but lack surficial button combs on the faces of article 5 (observation new). The dactyl of gnathopod 1 bears a nail, a unique feature. All pereopodal dactyls are truly vestigial (e.g., as small as can be imagined and be observable). Article 5 of pereopods 3-4 is grossly lobate. Pereopods 6-7 are of quite distinctive morphology in comparison with zobrachoids and urohaustoriids. The pleopods differ in several ways from those in austral taxa.

The key to genera develops the generic relationships within the family.

Key to Genera of Haustoriidae

1. Pereopod 4 smaller and unlike pereopod 3, reversed in orientation, inner plate of maxilla 1 with 1 seta ..... *Eohaustorius*

—— Pereopods 3-4 similar and alike in orientation, inner plate of maxilla 1 with many setae 2

2. Epimeron 3 rounded 3

—— Epimeron 3 with tooth 7

3. Inner ramus of uropod 1 with setae and spines 4

—— Inner ramus of uropod 1 only with spines 5

4. Pleonite 3 forming lobe overhanging urosome ..... *Haustorius*

—— Pleonite 3 not protruding ..... *Lepidactylus*

5. Maxillipedal palp 3 clavate, outer plate of maxilla 2 scarcely enlarged, posterolateral lobes of pereonites weak, rostrum weak ..... *Protohaustorius*

—— Maxillipedal palp 3 geniculate, outer plate of maxilla 2 greatly enlarged, posterolateral lobes of pereonites strong, rostrum strong 6

6. Uropod 2 large, biramous, mandible with incisor, article 5 of antenna 2 not lobate posteriorly ..... *Parahaustorius*

—— Uropod 2 small, uniramous, mandible without incisor, article 5 of antenna 2 lobate posteriorly ..... *Neohaustorius*

7. Rami of uropod 1 expanding distally, outer plate of maxilla 2 scarcely enlarged, rostrum small, head broadest posteriorly, article 2 on outer ramus of uropod 3 short or absent ..... *Pseudohaustorius*

—— Rami of uropod 1 scarcely expanding apically, outer plate of maxilla 2 greatly enlarged, rostrum large, head broadest in middle, article 2 of outer ramus on uropod 3 ordinary ..... *Acanthohaustorius*

Acanthohaustorius Bousfield

Figs 66C, 69H

Acanthohaustorius Bousfield, 1965: 198.

Type species. *Acanthohaustorius millsi* Bousfield, 1965, original designation.

Diagnosis. Head broad, broadest in middle, lateral margins convex, rostrum large. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna 2 not lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 enlarged, slightly lunate. Palp article 3 of maxilliped geniculate. Pereonites with pronounced lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 decurved, strongly reflexed, forming lobe overhanging urosome. Epimeron 3 with posterior process. Urosome long, lappet weak; dorsal margin of urosomite 2 about equal to urosomite 3. Uropod 1 slender, only inner ramus armed with both spines and setae; outer ramus longest, rami distally untapering. Uropod 2 strong and stout, biramous. Outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson broad, large, setose sharply or broadly cleft.

Variables. Pleosome 3 dorsal process variable; inner ramus of uropod 1 long or short; telson cleft to base or U-cleft halfway to base.

Species. Ecology, see Croker (1967), Dexter (1967); *A. bousfieldi* Frame, 1980 (= species A, Dickinson *et al.*, 1980) [361]; *A. intermedius* Bousfield, 1965, 1973

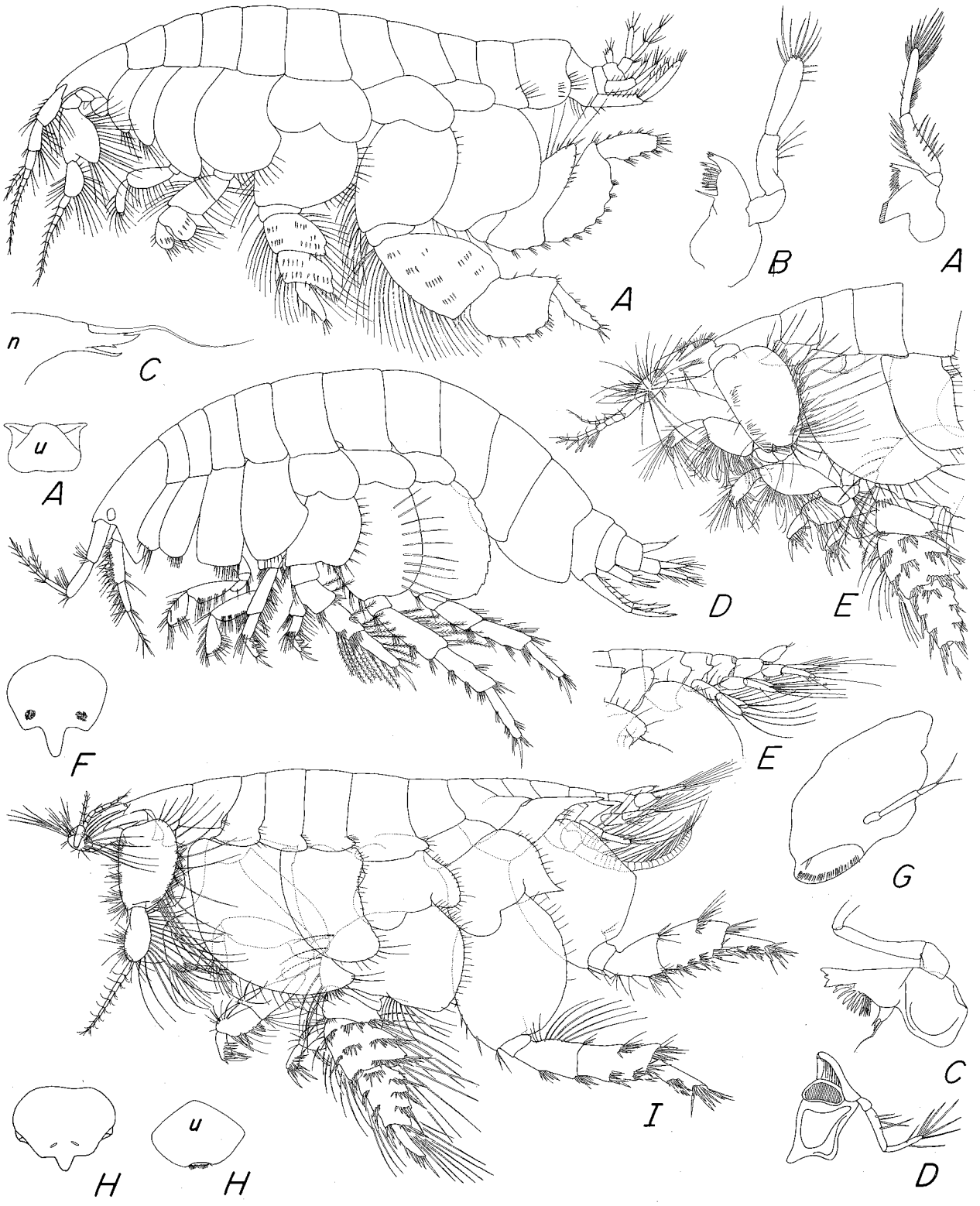

Fig.65. Haustorioidea. A, *Haustorius arenarius*; B, *Cunicus profundus*; C, *Prantinus talanggi*; D, *Urothoe elegans*; E, *Urohaustorius halei*; F, *Zobracho canguro*; G, *Carangolia mandibularis*; H, *Bumeralius buchalius*; I, *Urohaustorius gunni*.

(Dickinson *et al.*, 1980) [364]; *A. millsi* Bousfield, 1965, 1973 (Feeley & Wass, 1971) (Fox & Bynum, 1975) [361]; *A. pansus* Thomas & Barnard, 1984 [470]; *A. shoemakeri* Bousfield, 1965, 1973 [361]; *A. similis* Frame, 1980 (species B, Dickinson *et al.*, 1980) [361]; *A. spinosus* (Bousfield, 1962, 1965, 1973) (Dickinson *et al.*, 1980) [254]; species, Camp, Whiting & Martin, 1977 [363]; species C, Dickinson *et al.*, 1980 [363].

Habitat and distribution. Marine, north-western Atlantic Ocean, Bay of Fundy and Georges Bank to north Florida, 0-183 m, 7+ species.

Fig.66. Haustorioidea. A, *Zobracho canguro*; B, *Neohaustorius biarticulatus*; C, *Acanthohaustorius intermedius*; D, *Pseudohaustorius borealis*; E, *Parahaustorius attentuatus*; F, *Haustorius canadensis*; G, *Haustorius arenarius*; H, *Carangolia pulicifornis*; I, *Bumeralius buchalius*; J, *Condukius karkan*; K,*Tuldarus barinius*; L, *Urohaustorius pulcus*; M, *Urohaustorius gunni*; N, *Protohaustorius wigleyi*; O, *Parahaustorius longimerus*.

Eohaustorius J.L. Barnard

Eohaustorius J.L. Barnard, 1957b: 81.

Type species. *Haustorius washingtonianus* Thorsteinson, 1941, original designation.

Diagnosis. Head broad, broadest in middle, lateral margins subparallel, rostrum strong. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna

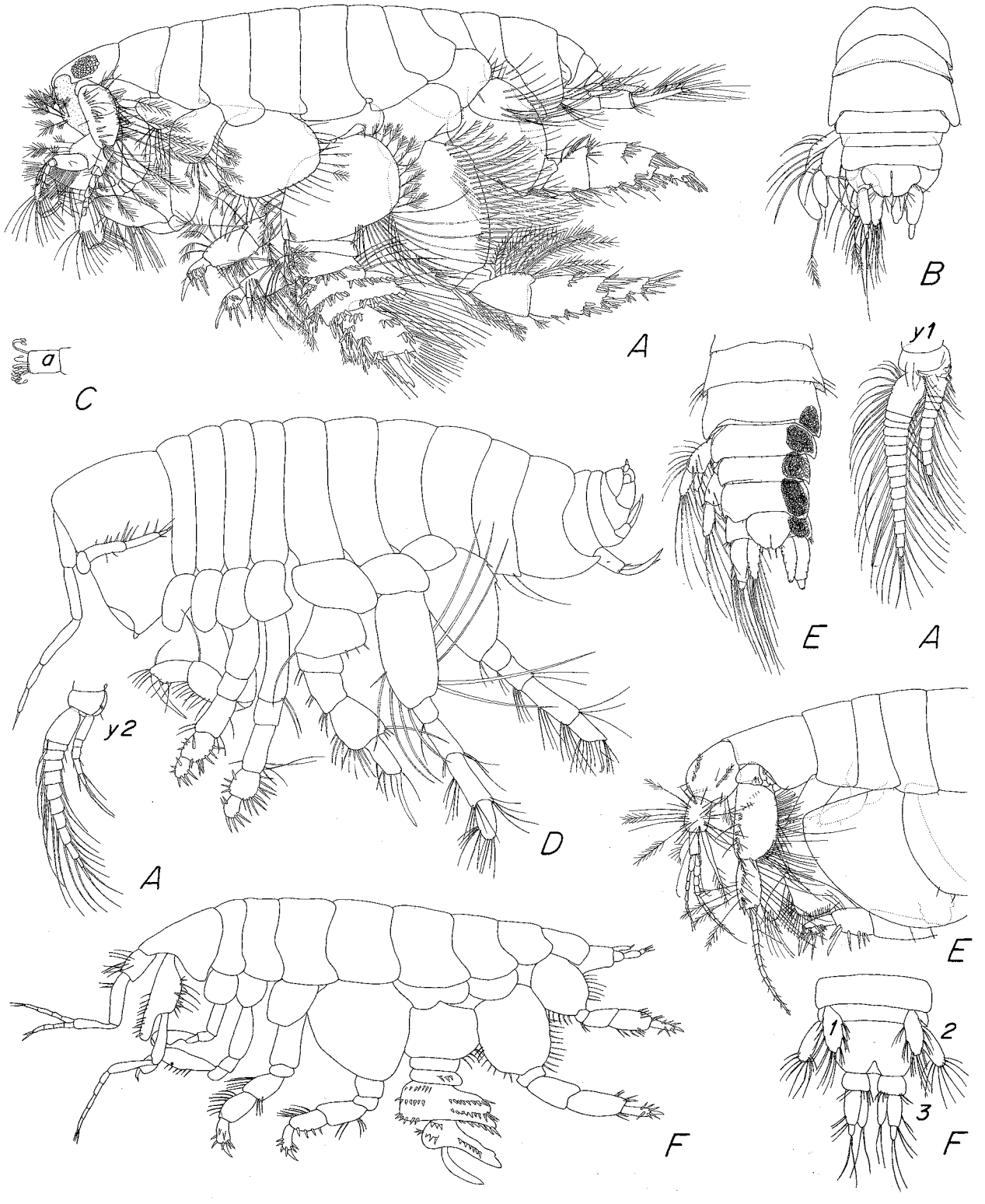

Fig.67. Haustorioidea. A, *Prantinus talanggi*; B, *Bumeralius buchalius*; C, *Narunius tallerkus*; D, *Cranagolia pulicifornis*; E, *Urohaustorius pulcus*; F, *Cunicus profundus*.

2 broad but scarcely lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 little larger than inner, not lunate. Palp article 3 of maxilliped clavate. Anterior pereonites without pronounced lobes just above coxae. Coxae 1-2 much smaller than 3-4, disjunct in size from 3-4. Pereopod 4 distinctly smaller than and unlike pereopod 3. Posterodorsal border of pleonite 3 slightly decurved, strongly reflexed, forming lobe overhanging urosome. Epimeron 3 with posterior process. Urosome short, lappet absent; dorsal margin of urosomite 2 short, not occluded, about equal to urosomite 3. Uropod 1 slender, both rami armed with both spines and setae (mostly); rami subequal, distally expanding. Uropod 2 strong biramous. Article 2 on outer ramus of uropod 3 medium. Telsonic lobes widely separated at base; lobes slender-setose.

Variables. Gnathopod 2 chelate (*E. cheliferus*); one

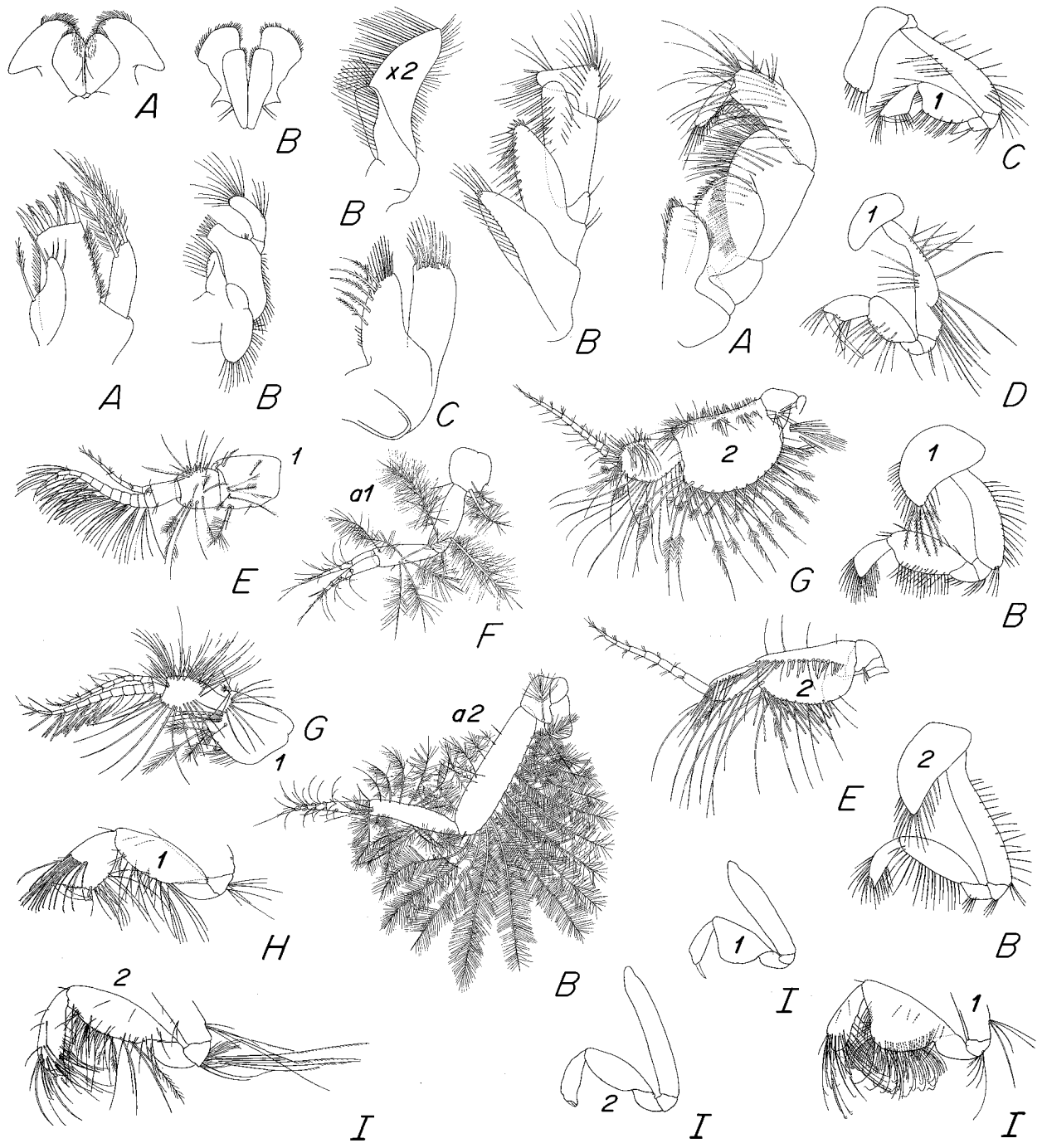

Fig.68. Haustorioidea. A, *Bumeralius buchalius*; B, *Haustorius arenarius*; C, *Urothoe elegans*; D, *Carangolia pulciformis*; E, *Tuldarus cangellus*; F, *Condukius karkan*; G, *Zobracho kamaroo*; H, *Prantinus talanggi*; I, *Urohaustorius pulcus*.

ramus of uropod 2 lacking sub-basal setae (Japan form of *E. washingtonianus* Gurjanova, 1962: fig.135B); dactyl of gnathopod 1 as long as or half as long as article 4.

Relationship. Uniquely characterised by reversal of pereopod 4 to resemble pereopod 5. Also, only known genus of family in east Pacific, thus easily recognisable.

Species. *Eohaustorius brevicuspis* Bosworth, 1973 [268]; *E. cheliferus* (Bulycheva, 1952) (Gurjanova, 1962) [280]; *E. eous*(Gurjanova, 1951, 1962) (Takamaru & Ochiai, 1982), *E. e. eous* Gurjanova, 1962, *E. e. robustus* Gurjanova, 1953, 1962 [280]; *E. estuarius* Bosworth, 1973 [268E]; *E. sawyeri* Bosworth, 1973 [268]; *E. sencillus* J.L. Barnard, 1962f, 1966b, 1971b [379]; *E. subulicolus* Hirayama, 1985b [395]; *E. tandeensis* Dang, 1968 [653]; *E. washingtonianus* (Thorsteinson, 1941) (?J.L. Barnard, 1957b) (?Gurjanova, 1962) (Bosworth, 1973) (?Kudrjaschov, 1972) [269].

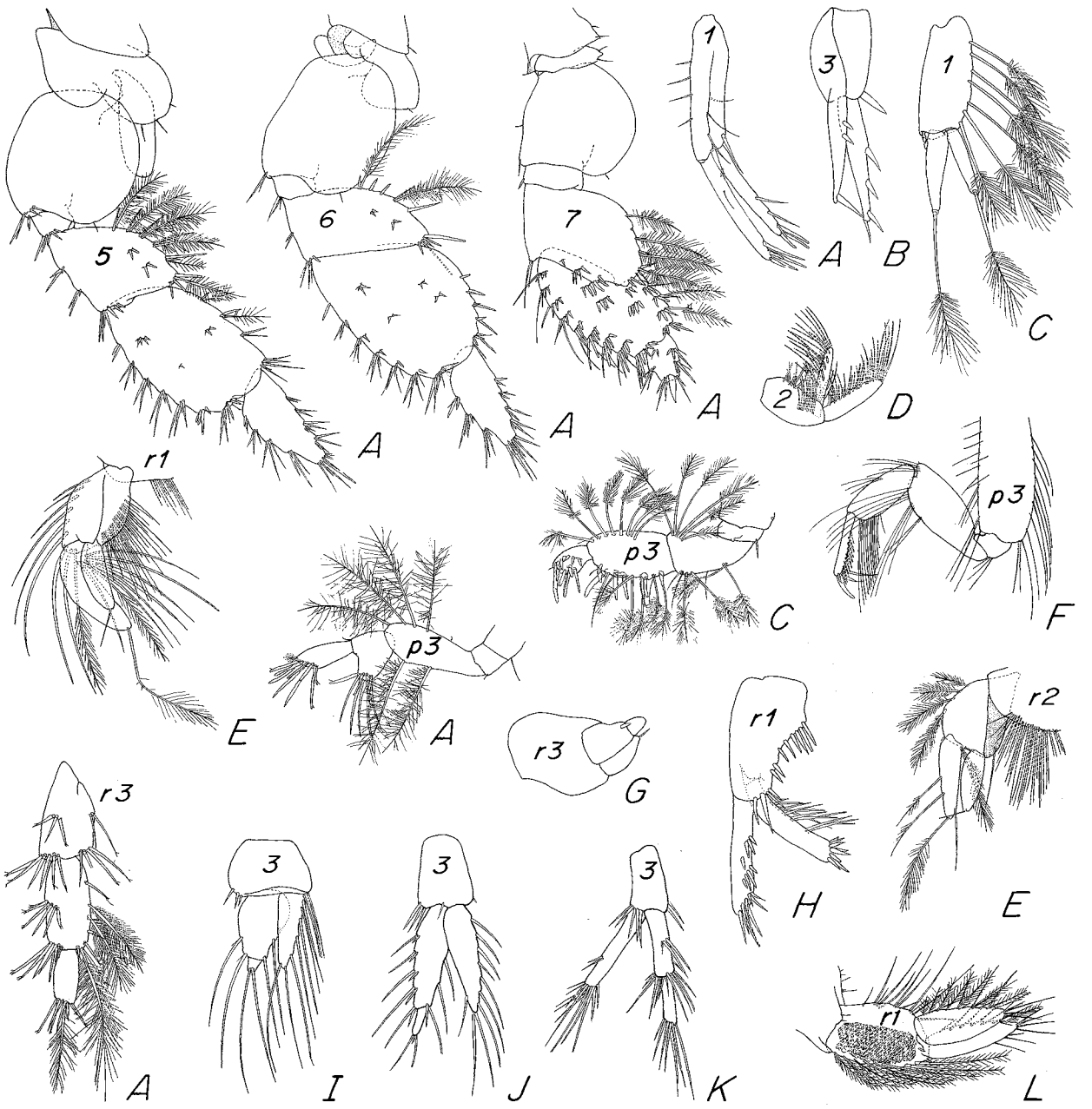

Fig.69. Haustorioidea and Exoedeceroidae. A, *Condukius karkan*; B, *Patuki breviuropodus*; C, *Prantinus talanggi*; D, *Parahaustorius attenuatus*; E, *Bumeralius buchalius*; F, *Waitangi rakirus*; G, *Carangolia pulciformis*; H, *Acanthohaustorius spinosus*; I, *Urohaustorius perkeus*; J, *Urothoe elegans*; K, *Haustorius arenarius*; L, *Zobracho canguro*.

Habitat and distribution. Marine, North Pacific, North Vietnam northward around basin to southern California, 0-40 m, 8 species.

Haustorius Müller

Figs 65A, 66F,G, 68B, 69K

Haustorius Müller, 1775: 53.
Pterygocerus Latreille, 1825: 236 (same type species).
Bellia Bate, 1851: 318 (homonym, Decapoda) (same type species).
Sulcator Bate, 1854: 58.-Bate, 1856: 58 (same type species).

Type species. *Oniscus arenatius* [sic] Slabber, 1769, monotypy.

Diagnosis. Head very broad, broadest in middle, lateral margins convex, rostrum strong. Accessory flagellum 4-articulate. Article 5 of peduncle on antenna 2 broad but not lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 enlarged, lunate. Palp article 3 of maxilliped geniculate. Pereonites with pronounced lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 decurved, strongly reflexed, forming lobe overhanging urosome. Epimeron 3 without posterior process. Urosome short, lappet long; dorsal margin of urosomite 2 short, occluded. Uropod 1 slender, inner ramus armed with both spines and setae; rami subequal, distally untapering. Uropod 2 strong, biramous. Outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson broad, short-spinose, sharply cleft.

Variables. Proximal margin of article 4 on pereopod 7 rounding, continuous with posterior margin (European), sharply set off from posterior margin (American); peduncle of uropod 1 with continuous spination (European), with 2 disjunct groups of spines (American).

Species. *Haustorius algeriensis* Mulot, 1967 [344]; *H. arenarius* (Bate, 1856, 1858a, 1862) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) [240]; *H. canadensis* Bousfield, 1962, 1973 [260]; species, Croker 1967a (Feeley & Wass, 1971) (Fox & Bynum, 1975) [365].

Habitat and distribution. Marine, amphiboreal Atlantic, 0 m, 3 species.

Lepidactylis Say

Lepidactylis Say, 1818: 379.

Type species. *Lepidactylis dytiscus* Say, 1818, monotypy.

Comments. Based on *L. triarticulatus*.

Diagnosis. Head broad, broadest posteriorly, lateral margins convex, rostrum weak. Accessory flagellum 2 to 3-articulate. Article 5 of peduncle on antenna 2 broad, lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 enlarged, outer plate lunate. Palp article 3 of maxilliped geniculate. Pereonites without pronounced lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 free or slightly decurved, not strongly reflexed. Epimeron 3 without posterior process. Urosome short, lappet absent; dorsal margin of urosomite 2 short, occluded. Uropod 1 slender, only inner ramus armed with both spines and setae; rami subequal, distally expanding. Uropod 2 strong and stout, biramous. Article 2 on outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson broad, short-spinose-setose, almost fully cleft.

Species. *Lepidactylis dytiscus* Say 1818 (Feeley & Wass, 1971) (Boesch & Diaz, 1974) (Robertson & Shelton, 1980a) (Grant & Lazo-Wasem, 1986) [362]; *L. triarticulatus* Robertson & Shelton, 1980 [474]; species (plural), Robertson & Shelton (1980a) [476, 474].

Habitat and distribution. Marine, north-western Atlantic, Chesapeake Bay to north Florida, then in Gulf of Mexico from Padre Island, Texas to Grand Isle, Louisiana, 0 m, 2 species.

Neohaustorius Bousfield

Fig.66B

Neohaustorius Bousfield, 1965: 185.

Type species. *Neohaustorius schmitzi* Bousfield, 1965, original designation.

Diagnosis. Head very broad, broadest in middle, lateral margins subparallel, rostrum weak. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna 2 lobate ventrally. Mandible without incisor. Outer plate of maxilla 2 enlarged, outer plate semilunate or not. Palp article 3 of maxilliped geniculate. Pereonites with pronounced lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 free or slightly decurved, not strongly reflexed. Epimeron 3 without posterior process. Urosome long; lappet long; dorsal margin of urosomite 2 about equal to urosomite 3. Uropod 1 stout or slender, inner ramus present and short, or absent, outer ramus setation variable; rami distally tapering.

Uropod 2 small, uniramous. Article 2 on outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson narrow, small, short-spinose, almost entire.

Variables. Article 1 of flagellum on antenna 2 not elongate (*N. biarticulatus*), elongate (type); inner ramus of uropod 1 present or absent, outer ramus of uropod 1 spinose, with or without few setae.

Species. Ecology, see Croker (1967a, 1968a), Dexter (1971); *N. biarticulatus* Bousfield, 1965, 1973 [254]; *N. schmitzi* Bousfield, 1965, 1973 (Fox & Bynum 1975) [361].

Habitat and distribution. Marine, north-western Atlantic, New England to North Carolina, 0-1 m, 2 species.

Parahaustorius Bousfield

Figs 66E,O, 69D

Parahaustorius Bousfield, 1965: 177.

Type species. *Parahaustorius longimerus* Bousfield, 1965, original designation.

Diagnosis. Head broad, broadest posteriorly, lateral margins convex, rostrum strong. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna 2 broad but not lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 enlarged, outer plate not lunate. Palp article 3 of maxilliped geniculate. Pereonites with pronounced lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 free or slightly decurved, not strongly reflexed. Epimeron 3 without posterior process. Urosome moderately long, lappet medium to long; dorsal margin of urosomite 2 short, not occluded. Uropod 1 moderately stout, both rami armed with spines; outer ramus longest, rami distally tapering. Uropod 2 strong and stout, biramous. Article 2 on outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson broad, large, short-spinose, sharply cleft.

Variables. Telson variable in breadth and cleft.

Species. *Parahaustorius attenuatus* Bousfield, 1965, 1973 (Dickinson *et al.*, 1980) [361]; *P. holmesi* Bousfield, 1965, 1973 (= *Haustorius arenarius* identifications of Holmes 1905, M.J. Rathbun, 1905) (Dickinson *et al.*, 1980) [361]; *P. longimerus* Bousfield, 1965, 1973 (Fox & Bynum, 1975) [364]; *P. obliquus* Robertson & Shelton, 1978 [474].

Habitat and distribution. Marine, north-western Atlantic, Georges Bank to Texas, 0-50 m, 4 species.

Protohaustorius Bousfield

Fig.66N

Protohaustorius Bousfield, 1965: 172.

Type species. *Protohaustorius deichmannae* Bousfield, 1965, original designation.

Diagnosis. Head normally very broad, broadest posteriorly, lateral margins convex, rostrum weak. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna 2 broad but not lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 little larger than inner, outer plate not lunate. Palp article 3 of maxilliped clavate. Pereonites with short lobes just above coxae. Coxae 1-2 long and deep, not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 free or slightly decurved, not strongly reflexed. Epimeron 3 without posterior process. Urosome long, lappet long; dorsal margin of urosomite 2 short, but not occluded. Uropod 1 stout, both rami armed with spines; rami subequal, distally tapering. Uropod 2 small, biramous. Article 2 on outer ramus of uropod 3 ordinary. Telsonic lobes contiguous at base; telson narrow, large, short-spinose, shallow-cleft.

Variables. Telson variable in shape and cleft.

Species. *Protohaustorius bousfieldi* Robertson & Shelton, 1973 [474]; *P. deichmannae* Bousfield, 1965, 1973 (?Bynum & Fox, 1977) (Dickinson *et al.*, 1980) [361]; *P. wigleyi* Bousfield, 1965, 1973 (Dickinson *et al.*, 1980) [361]; species, Camp, Whiting & Martin, 1977 [478].

Habitat and distribution. Marine, north-west Atlantic, New England to Texas, 0-150 m, 3+ species.

Pseudohaustorius Bousfield

Fig.66D

Pseudohaustorius Bousfield, 1965: 190.

Type species. *Pseudohaustorius caroliniensis* Bousfield, 1965, original designation.

Diagnosis. Head broad, broadest posteriorly, but lateral margins subparallel, rostrum weak. Accessory flagellum 2-articulate. Article 5 of peduncle on antenna 2 broad but not lobate ventrally. Mandible with incisor. Outer plate of maxilla 2 little larger than inner, not lunate. Palp article 3 of maxilliped clavate.

Pereonites with pronounced lobes just above coxae. Coxae 1-2 not disjunct in size from 3-4. Pereopods 3-4 subequal and similar to each other. Posterodorsal border of pleonite 3 not strongly reflexed and forming lobe overhanging urosome. Epimeron 3 with posterior process. Urosome short, lappet short to long; dorsal margin of urosomite 2 short, occluded. Uropod 1 slender, both rami armed with both spines and setae; inner ramus longest, rami distally expanding. Uropod 2 strong and stout, biramous. Article 2 on outer ramus of uropod 3 small or absent. Telsonic lobes contiguous at base; telson broad, large, short-setose, almost entire.

Variables. Article 3 of antenna 1 elongate or not; article 2 on outer ramus of uropod 3 absent (*P. americanus*).

Species. *Pseudohaustorius americanus* (Pearse, 1908) (Gurjanova, 1962, key) [474]; *P. borealis* Bousfield, 1965, 1973 (Dickinson *et al.*, 1980) [361]; *P. caroliniensis* Bousfield, 1965, 1973 [361].

Habitat and distribution. Marine, north-west Atlantic, New England to Louisiana, 0-62 m, 3 species.

HYALELLIDAE Bulycheva, 1957

See Ceinidae

HYALIDAE Bulycheva, 1957

Diagnosis. Accessory flagellum absent; mandible lacking palp, molar triturative; uropod 3 essentially uniramous though tiny scale-like inner ramus rarely present.

See Dogielinotidae, Eophliantidae and Phliantidae.

Description. Lower lip lacking inner lobes; coxae of medium size, coxa 4 with large excavation; telson variable, cleft or uncleft.

Relationship. Differing from Dexaminidae and Kuriidae in the distinct urosomites; from Dogielinotidae in the lack of fossorial appendages.

The Ceinidae lack a ramus on uropod 3.

The Eophliantidae have cylindrical bodies and the Phliantidae have greatly depressed bodies; both families plus Najnidae generally have degraded molars.

Key to Genera of Hyalidae
(except *Neobule*)

1. Dactyl of maxilliped short and blunt or uropod 3 lacking ramus ..... Ceinidae, especially *Hyachelia*

—— Dactyl of maxilliped unguiform 2

2. Uropod 3 with minute inner ramus 3

—— Uropod 3 lacking inner ramus 4

3. Palp of maxilla 1 1-articulate ..... *Parhyale*

—— Palp of maxilla 1 2-articulate ..... *Parallorchestes*

4. Telson entire 5

—— Telson cleft 6

5. Male gnathopod 2 enlarged and different than gnathopod 1 ..... *Parhyalella*

—— Male gnathopods 1-2 of medium size and similar ..... *Insula*

6. Article 5 of male gnathopod 2 lobate and projecting between articles 4 and 6 ..... *Allorchestes*

—— Article 5 of male gnathopod 2 not lobate, not projecting between articles 4 and 6 7

7. Dactyl of maxilliped lacking long, whip-like seta ..... *Hyale*

—— Dactyl of maxilliped bearing long whip-like seta 8

8. Male and female gnathopods diverse, male gnathopod 2 enlarged ..... *Lelehua*

—— Gnathopods of both sexes small and female-like ..... *Micropythia*

Allorchestes Dana

Fig.70G

Allorchestes Dana, 1849: 136.–Dana, 1853: 883.–J.L. Barnard, 1974b: 41 (key).
Aspidophoreia Haswell, 1880a: 101 (*Aspidophoreia diemenensis* Haswell, 1880a, monotypy).

Type species. *Allorchestes compressa* Dana, 1852a, selected by Chevreux & Fage, 1925.

Diagnosis. Maxilla 1 bearing tiny 1-articulate palp not reaching base of spines on outer plate. Dactyl of maxilliped unguiform, article 4 without long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 produced between articles 4 and 6; female gnathopod 2 like gnathopod 1, scarcely enlarged. Uropod 3 lacking inner ramus. Telson cleft, either flat or lobes erected to form tent.

Variables. Shape and setation of male gnathopod 1; presence or absence of pleonal carination.

Relationships. Differing from *Parhyale* and *Parallorchestes* in the loss of the inner ramus on uropod 3.

See *Hyale*.

Species. See Bulycheva (1957); *A. angusta* Dana, 1856 (J.L. Barnard, 1979b) (= *A. malleolus* Stebbing, 1899c, Iwasa, 1939, Bulycheva, 1957) (= *A. oculatus* Stout, 1913) (= *A. vladimiri* Derzhavin, 1937, Gurjanova, 1951) [510]; *A. bellabella* J.L. Barnard, 1974b, 1979b (= *A. angustus* J.L. Barnard, 1954a) [270]; [*A. brevicornis* Dana, 1852a, 1853 (Stebbing, 1906) [773]]; *A. carinata* Iwasa, 1939 (J.L. Barnard, 1979b) (Hirayama, 1985b) [280]; *A. compressa* Dana, 1852a (Stebbing, 1899c) (Bousfield, 1964c) (J.L. Barnard, 1974b), *A. c.* V, and *A. c.* W of J.L. Barnard, 1974b (= *A. australis* Dana, 1852a, 1853) (= *A. gaimardii* Dana, 1853) (= *A. diemenensis* Haswell, 1880a) [780 + ?840]; [*A. istrica* (Grube, 1861) (Stebbing, 1906) [345 + 334]]; [*A. japonica* Stimpson, 1856b (Stebbing, 1906) [391]]; *A. novizealandiae* Dana, 1852a, 1853 (Hurley, 1957b) (= *A. intrepida* Dana, 1852a) (= *A.didactyla* Thomson, 1879b) (= *A. neozelanicus* Thomson & Chilton, 1886) (= *A. chiltoni* Thomson, 1899) [850]; [*A. paulensis* Heller, 1868a (Stebbing, 1906) [795]]; [*A. penicillata* Stimpson, 1856b (Stebbing, 1906) [391]]; [*A. rubricornis* Stimpson, 1856b (Stebbing, 1906) [391]]; [*A. sayi* Bate, 1862 (Stebbing, 1906) [?254]]; [*A. stylifer* Grube, 1864b [345]];

Habitat and distribution. Marine, North and South Pacific Ocean, to western Australia, cool to cold water only [other obscure species outside Pacific not considered], 0 m, 5 species.

Hyale Rathke

Figs 70A,B, 71E

Hyale Rathke, 1837: 377.–Stebbing, 1906: 559.–J.L. Barnard, 1965a (key).–J.L. Barnard, 1974b: 49.–Lincoln, 1979a: 230.
Nicea Nicolet, 1849: 237 (*Nicea lucasii* Nicolet, 1849, monotypy).
(*Allorchestina*) Brandt, 1850: 141 (*Orchestia nidrosiensis* Krøyer, 1845 (= *Amphithoe prevostii* Milne Edwards, 1830), present selection).
Galanthis Bate, 1857d: 136 (homonym, Mollusca) (*Galanthis lubbockiana* Bate, 1857d (= *Hyale pontica* Rathke, 1837), monotypy).

Type species. *Hyale pontica* Rathke, 1837, monotypy.

Diagnosis. Maxilla 1 bearing large 1-articulate palp reaching base of spines on outer plate. Dactyl of maxilliped unguiform, article 4 without long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 not produced between articles 4 and 6; female gnathopod 2 like gnathopod 1 but slightly enlarged. Uropod 3 lacking inner ramus. Telson cleft, lobes erected to form tent.

Variables. Dactyl of maxillipedal palp often small, setal density variable, nail present or absent, variable in length. Acclivities on coxae. Morphology and setation of male and female gnathopods. Dactylar setae and locking-spine morphology on pereopods 3-7. Posteroventral tooth of epimera 1-3. Presence or absence of enlarged apical spine on peduncle of uropod 1; spination on rami of uropods 1-2. Proportions and armaments of uropod 3.

Relationship. Differing from *Allorchestes* in the

cryptic article 5 of male gnathopod 2 lacking posterior lobe, with articles 4-6 abutting.

Removals. See *Lelehua* and *Micropythia*.

Species. See Arresti *et al.* (1986a), J.L. Barnard (1965a) Bulycheva (1957), Cecchini & Parenzan (1935), Chevreux & Fage (1925), Giovannini (1965), Griffiths 1974a,c, 1975), Gurjanova (1951), Mateus & Afonso (1974), Miloslavskaya (1931, 1939), Mordukha-Boltovskoi (1969), Nayar (1967), Reid (1947a), Ruffo(1969), Schellenberg (1931, 1938a), Shoemaker (1935a),

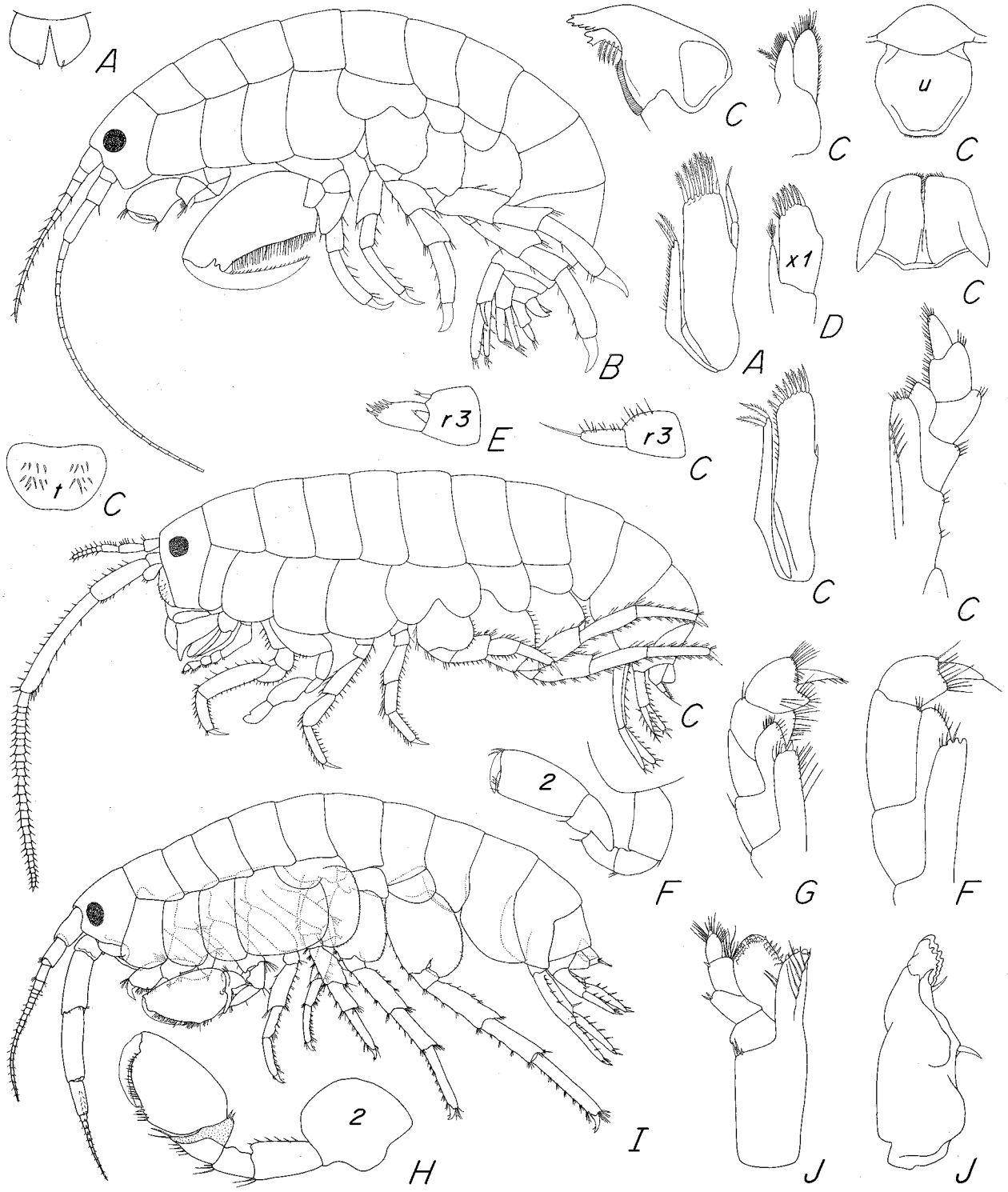

Fig.70. Talitroidea, Hyalidae, Hyalellidae, and Najnidae. A, *Hyale nilssoni*; B, *Hyale chevreuxi*; C, *Talitrus saltator*; D, *Parhyalella batesoni*; E, *Parhyale hawaiensis*; F, *Insula antennuella*; *Allorchestes plumicornis*; H, *Parhyalella pietschmanni*; I, *Najna sp.*

Sivaprakasam (1969d); *H. affinis* Chevreux, 1907a, 1908c (Sivaprakasam, 1969d) (J.L. Barnard, 1970a) (Myers, 1985a) [550]; *H. anceps* (J.L. Barnard, 1969a, 1979b) [372]; *H. antares* Oliveira, 1953 [751]; *H. ayeli* J.L. Barnard, 1955a, 1970a (Sivaprakasam, 1969d) [600]; [*H. babirussa* (Costa, 1853, 1857) (Stebbing, 1906)] [348]; *H. barbicornis* Hiwatari & Kajihara, 1981a, 1984 (= *H. plumicornis* identification of Iwasa, 1939) [392]; *H. bassargini* Derzhavin, 1937 (Tzvetkova, 1968) (Kudrjaschov, 1979) [280]; *H. bidentata* Ledoyer, 1984 [586]; *H. bishopae* J.L. Barnard, 1955a, 1970a [381]; *H. californica* J.L. Barnard, 1969a, 1979b [370]; *H. campbellica* (Filhol, 1885b) (Hurley, 1957b) [844]; *H. camptonyx* (Heller, 1867) (Chevreux & Fage, 1925) (Krapp-Schickel, 1974) [330 + 677]; *H. canalina* J.L. Barnard, 1979b (= *H. rubra rubra* identification of J.L. Barnard, 1969a) [370]; *H. changi* Chen, 1939 [031F]; *H. chelonitis* (Oliveira, 1953) [751]; *H. chevreuxi* K.H. Barnard, 1916 (Ledoyer, 1972c) (Myers, 1985c) (J.L. Barnard, 1965a) (= *H. macrodactylus* identification of Chevreux, 1901a) [600]; *H. corallinacola* Hirayama, 1980 [398]; *H. crassicornis* (Haswell, 1879a) (Chilton, 1885) (J.L. Barnard, 1974b) (= *H. coogensis* Chilton, 1885) [780]; *H. crassipes* (Heller, 1867) (Krapp-Schickel, 1974) (= *H. bucchichi* Heller, 1867) (= *H. gulbenkiani* Mateus & Mateus, 1962) [330]; *H. darwini* J.L. Barnard, 1979b [540]; *H. dentifera* Chevreux, 1907a, 1908c (J.L. Barnard, 1965a) [550]; *H. diastoma* K.H. Barnard, 1916 (Griffiths, 1975) [743]; *H. didendactyla* Hirayama, 1980 [398]; *H. diplodactyla* Stebbing, 1899c (Sivaprakasam, 1969d) (Ledoyer, 1979b) [400 + 660]; *H. dollfusi* Chevreux, 1911d (Chevreux & Fage, 1925) (Stephensen, 1944b) (Arresti *et al.*, 1986) [339 + ?390]; *H. frequens* (Stout, 1913) (J.L. Barnard, 1969b, 1979b) [379]; *H. furcata* (Reid, 1951) [359]; *H. galateae* Stebbing, 1899c (Shoemaker, 1945a) [400N + 530N]; *H. g. distorta* Myers, 1985c [576]; [*H. gazella* (Costa, 1853, 1857) (Stebbing, 1906) [348]]; *H. goetschi* Schellenberg, 1935a [465]; [*H. gracilis* (Dana, 1852a, 1853) (Stebbing, 1906) [575]]; [*H. graminea* (Dana, 1852a, 1853) (Stebbing, 1906) [751]; *H. grandicornis* (Krøyer, 1845) (Stephensen, 1949) (Griffiths, 1975) (Branch, 1975) (= *H. longicornis* Krøyer, 1845, homonym) (= *H. lucasii* Nicolet, 1849) (= *H. verticillata* Dana, 1852a) (= *H. peruviana* Dana, 1852a) (= *H. inquirendus* K.H. Barnard, 1940) [TL = 765 + ?422]; *H. grenfelli* Chilton, 1917b (Hurley, 1957b) [775]; *H. grimaldii* Chevreux, 1891a (Chevreux & Fage, 1925) (Giovannini, 1965) (Mateus & Afonso, 1974) [330]; *H. guasave* J.L. Barnard, 1979b [540]; [*H. helleri* (Grube, 1866) (= *H. imbricatus* Grube, 1864) [345]]; *H. hirtipalma* (Dana, 1852a, 1853) (Stephensen, 1949) (Hurley, 1957b) (Alonso, 1980) (= *H. inca* Bate, 1862) (= *H. villosa* Smith, 1876) (= *H. fimbriata* Thomson, 1879b) (= *H. georgianus* Pfeffer, 1888) (= *H. trigonochir* Walker, 1908) [835]; *H. honoluluensis* Schellenberg, 1938a (Nayar, 1959) (J.L. Barnard, 1970a) (?Ledoyer, 1972c, 1986) [600]; *H. humboldti* J.L. Barnard, 1979b [546]; *H. humilis* (Dana, 1852a, 1853) (?Stebbing, 1899c) (J.L. Barnard, 1974b) [781 + 284]; *H. incerta* Chevreux, 1913a [683]; *H. inermis* Ledoyer, 1978b, 1979a, 1986 [697 + 698]; *H. iole* J.L. Barnard, 1970a [381]; *H. ishigakiensis* Hirayama, 1980 [398]; *H. jeanneli* Chevreux, 1913a (Spandl, 1924) [683 + ?677]; *H. kuriensis* Walker & Scott, 1903 (Walker, 1904) [690]; *H. laie* J.L. Barnard, 1970a [381]; *H. littoralis* (Stimpson, 1853) (Kunkel, 1918) [254]; [*H. longicornis* (Haswell, 1879a, homonym) (J.L. Barnard, 1974b) [781]]; *H. loorea* J.L. Barnard, 1974b [780]; *H. macrodactyla* Stebbing,

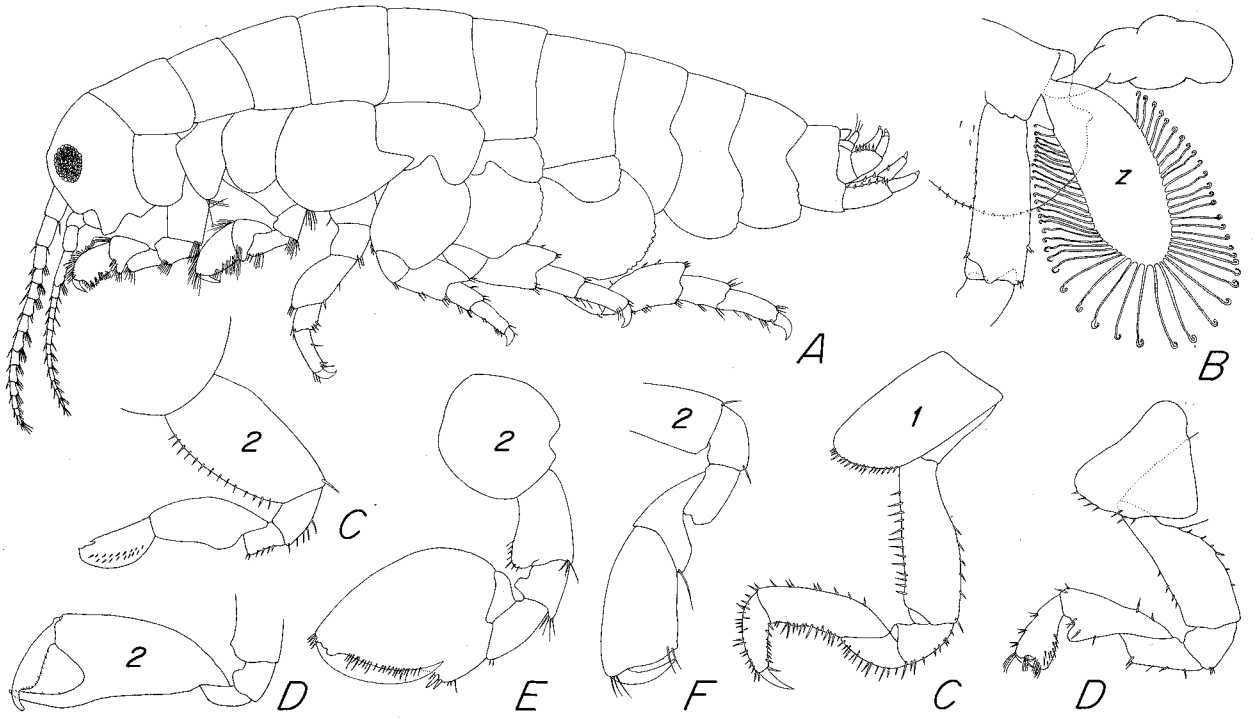

Fig.71. Talitroidea, Hyalidae, Hyalellidae and Najnidae. A, *Najna sp.*; B, *Parorchestia campbelliana*; C, *Talitrus saltator*; D, *Orchestia costaricana*; E, *Hyale bassargini*; F, *Insula antennuella.*

1899c (Schellenberg, 1939) (Ledoyer, 1972c, 1986) [400 + 660]; *H. maroubrae* Stebbing, 1899c (Hurley, 1957b) (Myers, 1985c) [600]; *H. media* (Dana, 1853) (Stephensen, 1949) (Ruffo, 1950) (Hurley, 1957b) (Kensley, 1971) (J.L. Barnard, 1974b) [751 + ?423]; *H. milloti* Ruffo, 1958 [694F]; *H. minor* Chevreux & Fage, 1925 (Krapp-Schickel, 1974) [330]; *H. niger* (Haswell, 1879b) (Schellenberg, 1928) (?Sivaprakasam, 1969d) (Ledoyer, 1967a, 1971, 1979a, 1986) [781 + ?685]; *H. novaezealandiae* (Thomson, 1879b) (Bulycheva, 1957) (Hurley, 1957b) [850 + ??280]; [*H. orientalis* (Dana, 1852a, 1853) (Stebbing, 1906) [647]]; *H. ornata* Reid, 1951 [359]; *H. perieri* (Lucas, 1846) (Krapp-Schickel, 1974) (Lincoln, 1979a) (= *H. macronyx* Heller, 1867) (= *H. brevicornis* Czerniavsky, 1868) (= *H. pontica* Czerniavsky, 1868) (= *H. bonelliana* identification of White, see Bate, 1862: 42; Della Valle, 1893) [352]; [*H. piedmontensis* (Bate, 1862) (Stebbing, 1906) [?348]]; *H. plumulosa* (Stimpson, 1857) (Thorsteinson, 1941) (Bousfield, 1973) [260 + 270]; *H. pontica* Rathke, 1837 (Chevreux & Fage, 1925) (Lincoln, 1979a) (Mateus & Afonso, 1974) (= *H. imbricatus* Bate, 1857d) (= *H. lubbockiana* Bate, 1857d, Sars, 1895) [355 + 339]; *H. prevostii* (Milne Edwards, 1830) (Chevreux, 1900a) (= *H. nilssonii* Rathke, 1843, Sars, 1895, Bousfield, 1973, Lincoln, 1979a) (= *H. nidrosiensis* Krøyer, 1845) (= *H. danai* Bate, 1857d) (= *H. major* Chevreux, 1888c) (= *H. barnardi* Chevreux, 1926b) [250]; [*H. pugettensis* (Dana, 1853) (Stebbing, 1906) [269]]; *H. pumila* Hiwatari & Kajihara, 1981b (= *H. dollfusi* identification of Iwasa, 1939) [390]; *H. punctata* Hiwatari & Kajihara, 1981a (= *H. novaezealandiae* identification of Iwasa, 1939) [390]; *H. pusilla* Chevreux, 1907a, 1908c [556]; *H. pygmaea* Ruffo, 1950 [462]; *H. ramalhoi* Reid, 1939 [357]; *H. rubra* (Thomson, 1879b) (Hurley, 1957b) (J.L. Barnard, 1974b, 1979b) [775 + ?500]; *H. rupicola* (Haswell, 1879a, 1885b) (J.L. Barnard, 1974b) [781]; *H. saldanha* Chilton, 1912 (K.H. Barnard, 1940) (Griffiths, 1975) [743]; *H. schmidti* (Heller, 1867) (Krapp-Schickel, 1974) (Iwasa, 1939) (= *H. microphthalmus* Bate, 1862) [330]; [*H. seminuda* (Stimpson, 1956c) (Stebbing, 1906) [371]]; *H. spinidactyla* Chevreux, 1926b (Pirlot, 1939) (Ruffo, 1948) (Reid, 1951) [440]; *H. spinidactyloides* Schellenberg, 1939 [447]; *H. stebbingi* Chevreux, 1888c, 1900a (Krapp-Schickel, 1974) (Lincoln, 1979a) (= *H. nilssoni* identification of Chevreux & Fage, 1925) [352]; [*H. stewarti* (Filhol, 1885a,b) (Stebbing, 1906) [776]]; [*H. stolzmani* Wrzesniavsky, 1879 (Stebbing, 1906) [548]]; [*H. tenella* (Costa, 1853, 1857) (Stebbing, 1906) [348]]; *H. thomsoni* Hurley, 1957b [775]; *H. tristanensis* Macnae, 1953 (K.H. Barnard, 1965) [731]; *H. uragensis* Hiwatari & Kajihara, 1981a [395]; *H. wilari* J.L. Barnard, 1974b [785]; *H. wolffi* Reid, 1951 [359]; *H. yake* J.L. Barnard, 1974b [780]; *H. yaqui* J.L. Barnard, 1979b [369]; *H. zuaque* J.L. Barnard, 1979b [369]; "species" = *H. nilssoni* var. identification of Walker & Scott, 1903 [676]; "species" = *H. rubra* identification of J.L. Barnard, 1970a [381]; "species" Ledoyer, 1972c [698]; "species" J.L. Barnard, 1974b [787]; "species 1" Hirayama, 1980 [398]; "species 2" Hirayama, 1980 [398]; "species 3" Hirayama, 1980 [398].

Habitat and distribution. Marine, cosmopolitan, mostly warmer water, 0-2 m, 77 species.

Insula Kunkel

Figs 70F, 71F

Insula Kunkel, 1910: 61.

Type species. *Insula antennullela* Kunkel, 1910, monotypy.

Diagnosis. Maxilla 1 bearing small, 1-articulate palp not reaching base of spines on outer plate. Dactyl of maxilliped uniform, representing article 3 of palp. Gnathopods of [?both sexes subchelate, subequal in size, female unknown], male gnathopod 2 not larger than 1, article 5 produced between articles 4 and 6; female gnathopod 2 [?like gnathopod 1 but slightly enlarged]. Uropod 3 lacking inner ramus. Telson entire, flat.

Relationship. Like *Parhyalella* but male gnathopods 1-2 of medium size and similar.

Species. *Insula antennullela* Kunkel, 1910 [367].

Habitat and distribution. Marine, Bermuda, shallow water, 1 species.

Lelehua J.L. Barnard

(*Lelehua*) J.L. Barnard, 1970a: 264.

Type species. *Hyale (Lelehua) waimea* J.L. Barnard, 1970a, original designation.

Diagnosis. Maxilla 1 bearing large 1-articulate palp reaching base of spines on outer plate. Dactyl of maxilliped unguiform, with long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 not produced between articles 4 and 6; female gnathopod 2 like gnathopod 1 but slightly enlarged. Uropod 3 lacking inner ramus. Telson cleft, lobes erected to form tent.

Relationship. *Hyale* but dactyl of maxillipedal palp with long whip-like seta.

Species. *Lelehua kandari* (J.L. Barnard, 1974b) [782]; *L. malevua* Myers, 1985c [576]; *L. waimea* J.L. Barnard, 1970a [381].

Habitat and distribution. Marine, Hawaii to Fiji

to Victoria, Australia, intertidal, 3 species.

Micropythia Krapp-Schickel

Pythia Krapp-Schickel, 1972: 182 (homonym, Gastropoda) (*Allorchestes carinatus* Bate, 1862, original designation).
Micropythia Krapp-Schickel, 1976b: 33 (new name).

Type species. *Allorchestes carinatus* Bate, 1862, original designation.

Diagnosis. Maxilla 1 bearing large 1-articulate palp not reaching base of spines on outer plate. Dactyl of maxilliped short and stubby, with long whip-like seta. Gnathopods of both sexes small, subchelate, subequal in size. Uropod 3 lacking inner ramus. Telson cleft, lobes erected to form tent.

Relationship. Like *Lelehua* but gnathopods of both sexes small and female-like.

Species. *Micropthyia carinata* (Bate, 1862) (Chevreux & Fage, 1925) (Krapp- Schickel, 1972) (= *M. longicornis* Grube, 1866) [340 + 442].

Habitat and distribution. Marine, Mediterranean outward to Canary Islands, shallow to 42 m, 1 species.

Neobule Haswell

Neobule Haswell, 1879a: 255.–Stebbing, 1906: 556.

Type species. *Neobule algicola* Haswell, 1879a (= *Amphitoe gaimardii* Milne Edwards, 1840, fide Stebbing, 1906), monotypy.

Diagnosis. Maxilla 1 [?bearing lacking palp, small, large, tiny, 1 to 2-articulate, not reaching base of spines on outer plate. Dactyl of maxilliped unguiform, short and stubby, article 4 without long whip-like seta.] Gnathopods subchelate, (?male) gnathopod 2 larger than 1, article 5 produced between articles 4 and 6; [?female gnathopod 2 like gnathopod 1 but slightly enlarged]. Uropod 3 [?lacking scale-like inner ramus.] Telson entire, flat.

Variables. Outer plate of maxilliped said to be absent; telson said to be entire. Description: antennae 1-2 equal and short. Maxilliped with squamiform process on basos only; article 5 of gnathopod 1 shorter than article 6, triangularly lobate, propodus rectangular, palm almost transverse; article 4 of gnathopod 2 large, weakly produced, article 5 shorter than 6, strongly lobate, 6 rectangular, palm transverse; pereopods 5-7 short, subequal, perhaps 6 longest, article 2 of pereopods 5-6 weakly expanded, lobate, of pereopod 7 broadly expanded and lobate; posterior pleopoda biramous (Haswell) [probably referring to uropod 3 and erroneous]; (Milne-Edwards) last appendages terminated by 2 rudimentary conical articles.

Relationship. Differing from *Allorchestes* in the female-like gnathopods of both sexes and the presumed absence of outer plate on maxilliped and entire telson. A quite obscure group of species not seen in a century.

Species. See Stebbing (1906); *N. armorica* (Milne Edwards, 1830) [242]; *N. gaimardii* (Milne Edwards, 1840) (= *N. algicola* Haswell, 1879a, 1885b) [586]; *N. reynaudii* (Milne Edwards, 1830) [743].

Habitat and distribution. Marine; Brittany; New South Wales; Cape of Good Hope; depths shallow; 3 species.

Parallorchestes Shoemaker

Parallorchestes Shoemaker, 1941b: 183.–J.L. Barnard, 1979b: 119 (Key).

Type species. *Allorchestes ochotensis* Brandt, 1851, original designation.

Diagnosis. Maxilla 1 bearing large 2-articulate palp reaching base of spines on outer plate. Dactyl of maxilliped unguiform, without long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 produced between articles 4 and 6; female gnathopod 2 like gnathopod 1 but slightly enlarged. Uropod 3 bearing scale-like inner ramus. Telson cleft, flat.

Relationship. Differing from *Parhyale* in the 2-articulate palp of maxilla 1; probably the basic genus of the group.

Species. *Parallorchestes ochotensis* (Brandt, 1851) (Bate, 1862) (Gurjanova, 1951) (J.L. Barnard, 1952c, 1962c) (Bulycheva, 1957) (= *P. kurilensis* Iwasa, 1934) [230]; *P. zibellina* Derzhavin, 1937 (Gurjanova, 1937) (Bulycheva, 1957) [280].

Habitat and distribution. Marine, cold North Pacific, 0-5 m, 2 species.

Parhyale Stebbing

Fig.70E

Parhyale Stebbing, 1897: 26.–J.L. Barnard, 1979b: 120

(key).

Hyaloides Schellenberg, 1939: 126 (*Hyaloides dartevillei* Schellenberg, 1939, monotypy).

Type species. *Parhyale fasciger* 1897, monotypy.

Diagnosis. Maxilla 1 bearing large 1-articulate palp not reaching base of spines on outer plate. Dactyl of maxilliped unguiform, without long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 produced between articles 4 and 6; female gnathopod 2 like gnathopod 1 but slightly enlarged. Uropod 3 bearing scale-like inner ramus or vestigial fused replica. Telson cleft, flat.

Variables. Setosity of antennae 1-2; shape and spination of gnathopods 1-2; pereopod 7 (occasionally also 6) with or without posterior spines on article 6; spination patterns on rami of uropods 1-2; spination pattern on peduncle and outer ramus of uropod 3.

Relationship. Differing from *Parallorchestes* in the 1-articulate (versus 2-) palp of maxilla 1. Also close to the basic genus of this group in the retention of an inner ramus on uropod 3.

Species. See Bulycheva (1957); Chevreux & Fage, 1925; J.L. Barnard, 1979b; *P. aquilina* (Costa, 1853, 1857) (Krapp-Schickel, 1974) (= *P. fasciculata* Heller, 1867) (= *P. nudicornis* Heller, 1867) (= *P. rudis* Heller, 1867) [330]; *P. basrensis* Salman, 1986 [673]; *P. eburnea* Krapp-Schickel, 1974 [345]; *P. fascigera* Stebbing, 1897 (Shoemaker, 1956a) (= *P. brevipes* identification of Shoemaker, 1933c) [435 + 470 + 540 + ?]; *P. hawaiensis* (Dana, 1853) (Shoemaker, 1956a) (J.L. Barnard, 1965a) (Tararam, 1978) (Myers, 1985c) (= *P. brevipes* Chevreux, 1901a) (= *P. trifoliadens* Kunkel, 1910) (= *P. dartevellei* Schellenberg, 1939) (Ledoyer, 1986) [421]; *P. inyacka* K.H. Barnard, 1916 (Griffiths, 1973) (J.L. Barnard, 1979b) [469]; *P. iwasai* (Shoemaker, 1956a) (= *P. gracilis* Iwasa, 1939) (= *P. iwasa* Bulycheva, 1957) [392]; *P. penicillata* Shoemaker, 1956a (J.L. Barnard, 1979b) [377]; *P. plumicornis* (Heller, 1867) (Stebbing, 1899c) (Chevreux & Fage, 1925) (Stephensen, 1944b) (Krapp-Schickel, 1974) [340 + ?395]; *P. ptilocerus* (Derzhavin, 1937) (Gurjanova, 1951) [391]; "species" (*P. hawaiensis* identification of Sivaprakasam, 1970a) [381]; "species" (*P. zibellina* identification of Bulycheva, 1957) [280].

Habitat and distribution. Marine, Mediterranean and circumtropical, north to Bermuda and Japan, shallow water, 10 species.

Parhyalella Kunkel

Figs 70D,H

Parhyalella Kunkel, 1910: 74.

Exhyalella Stebbing, 1917b: 435 (*Exhyalella natalensis* Stebbing, 1917b, monotypy).

Type species. *Parhyalella batesoni* Kunkel, 1910, monotypy.

Diagnosis. Maxilla 1 lacking palp. Dactyl of maxilliped unguiform, without long whip-like seta. Gnathopods of both sexes subchelate, male gnathopod 2 larger than 1, article 5 produced between articles 4 and 6; female gnathopod 2 like gnathopod 1 but greatly enlarged. Uropod 3 lacking inner ramus. Telson entire.

Relationship. Differing from *Allorchestes* and *Parhyale* in the uncleft telson.

Species. *Parhyalella batesoni* Kunkel, 1910 [367]; *P. congoensis* Ruffo, 1953b [447]; *P. indica* K.H. Barnard, 1935 (Sivaprakasam, 1969d) [664]; *P. natalensis* (Stebbing, 1917b, 1918) (Griffiths, 1974b) [743]; *P. pietschmanni* Schellenberg, 1938a (Ruffo, 1969) (J.L. Barnard, 1970a) (Steele, 1973) [600]; *P. richardi* (Chevreux, 1902a, 1935) (Brian, 1940) (Legrand, 1951) [340]; *P. whelpleyi* (Shoemaker, 1933c, 1948) [460].

Habitat and distribution. Marine, throughout the tropics, south to South Africa, intertidal, often as sand-hoppers, 7 species.

HYPERIOPSIDAE Bovallius, 1886

Diagnosis. Accessory flagellum well developed. Article 1 of primary flagellum on antenna 1 formed of fused basal articles, elongate. Article 5 of peduncle on antenna 2 very short. At least one palp of maxilla 1 bent or claviform. Gnathopods feeble. Article 4 of pereopods 3-4 greatly elongate relative to article 5.

See Vitjazianidae, Stilipedidae (= Astyridae) and Synopiidae.

Description. Body laterally compressed, smooth or carinate. Head huge to small, lobate or globular, rostrum weak or absent. Except for any processes present, articles of peduncle on antenna 1 short, article 2 often produced; articles of accessory flagellum slender, basalmost usually elongate; elongate article 1 of primary flagellum strongly armed with setules or aesthetascs. Antenna 2 very thin, basal article of flagellum usually elongate.

Labrum with small distal incision. Body of mandible small, incisor simple or scarcely toothed, right lacinia mobilis present, rakers sparse and weak; molar triturative or simple and feeble; palp ordinary to greatly elongate, article 3 very short relative to article 2, setae = DE. Inner lobes of lower lip when present fused, mandibular lobes ordinary to greatly alate. Inner plate of maxilla 1 triangular or ovate, well

setose or almost naked, spines of outer plate mostly thin, simple, discontiguous or scattered, palp 2-articulate, often scaly, usually poorly setose and bent apically, but also asymmetric, with opposite member more regular. Maxilla 2 ordinary, plates of medium width, similar, apically setose. Plates of maxilliped broad, outer plate short, medially armed, palp very long and thin, dominating plates, 4-articulate, dactyl unguiform.

Coxae variable. Gnathopods feeble but long and thin, simple or weakly subchelate, gnathopod 2 longer than 1, carpus usually longer than propodus. Dactyls of pereopods 3-4 elongate, curving back on propodus, thus almost prehensile. All other pereopodal features variable.

Epimera regular. Pleopods ordinary. Urosome and uropods large, uropods extending subequally, uropod 1 very elongate, outer rami of uropods 1-2 usually shortened, inner ramus of uropod 3 shortened, peduncle of uropod 3 slightly elongate. Telson elongate, emarginate or cleft, poorly armed though often cuspidate.

Relationship. The elongate article 4 of pereopods 3-4 in relation to the very short article 5 differentiates Hyperiopsidae from Stilipedidae (= Astyridae), Vitjazianidae, Synopiidae and Pardaliscidae. The Vitjazianidae are otherwise very closely similar and may have to be joined to Hyperiopsidae because of congruence in antennae, gnathopods, maxilliped (broad outer plate with very thin dominant palp), but article 5 of antenna 2 is not shortened in Vitjazianidae. Article 4 of pereopods 3-4 in *Vitjaziana* is elongate but so is article 5. The mandibles of the two families look similar but the maxillary palps of Vitjazianidae are not as modified as those in Hyperiopsidae.

Some of the Stilipedidae such as *Alexandrella* with bent maxillary palps, are not very remote from Hyperiopsidae but Stilipedidae have coxa 1 broadened relative both to coxae 2 and 4, article 2 of pereopods 5-7 is diversely shaped and article 1 of the primary flagellum on antenna 1 is not elongate, whereas article 5 of antenna 2 is not shortened. The maxilliped of *Stilipes* in Stilipedidae and of Hyperiopsidae is strikingly similar.

A member of Hyperiopsidae could almost be built from a mixture of parts drawn from various taxa of the Synopiidae but the short article 5 of antenna 2, bent maxillary palps, elongate article 4 of pereopods 3-4 and small rostrum of Hyperiopsidae combined together are characteristic.

The Pardaliscidae are characterised by the strange maxilliped with poorly developed inner plates, and the flat mandibles with broad incisors.

The two genera associated in this family appear as day and night, *Hyperiopsis* looking like a member of Hyperiidea with globular head and thin pereopods, whereas *Parargissa* looks like an ornamented, specialised member of the benthos. But they do share the familial characteristics as cited in the diagnosis and have many amazingly coincident attributes.

Key to Genera of Hyperiopsidae

1. Coxae 1-4 small, similar in size and shape, article 4 of pereopods 3-4 elongate and broadly expanded ..... *Hyperiopsis*

—— Coxae 1-3 small and mostly hidden by large coxa 4, article 4 of pereopods 3-4 elongate but slender ..... *Parargissa*

Hyperiopsis Sars

Figs 72B,D,E

Hyperiopsis Sars, 1885: 231.

Type species. *Hyperiopsis voringii* Sars, 1885, monotypy.

Diagnosis. Peduncular article 2 of antenna 1 unproduced. Labium with alate mandibular lobes greatly extended. Coxae 1-4 subequal in size, generally similar, weakly rounded below, none hidden. Article 4 of pereopods 3-4 broadly expanded; article 2 of pereopods 5-7 rectolinear.

Description. Body smooth or weakly carinate. Head larger than pereonites 1-2 together, globular, lateral lobes absent or obsolescent. Flagellum of antenna 2 short and articles mostly fused together. Mandibular molar small but distinct or well developed, triturative; palp elongate. Inner plate of maxilla 1 with 1 apical seta. Dactyl(s) of pereopods 5-7 elongate (one at least). Telson barely emarginate or minutely cleft. Gills 2-7, large, simple; oostegites slender.

Variables. Head with interantennal spike (rostrum) (*H. tridentata*); gnathopods diverse, thus gnathopod 1 simple but gnathopod 2 with very linear articles 5-6 but oblique apical palm well developed (*H. laticarpa*); pereonite 7 posterodistally produced (*H. gibbosa*); telson trifid apically (*H. tridentata*) or bifid with medial gape (*H. gibbosa*).

Species. See Gurjanova (1962); *H. anomala* Birstein & Vinogradov, 1960 [523A]; *H. australis* Walker, 1906b, 1907 [876N]; *H. gibbosa* Pirlot, 1934 [602B]; *H. laticarpa* Birstein & Vinogradov, 1955, 1958, 1960, 1964 [600A]; *H. tridentata* K.H. Barnard, 1937 [420BA]; *H. vitjazi* Birstein & Vinogradov, 1958, 1960 [325A]; *H. voringii* Sars, 1885 (Schellenberg, 1927) (Stephensen, 1934, 1942) (Gurjanova, 1951) (Birstein & Vinogradov, 1970) [200BA].

Habitat and distribution. Marine, cold water cosmopolitan, mostly neritic (Ross Sea) or pelagic, 27-6400 m, 7 species.

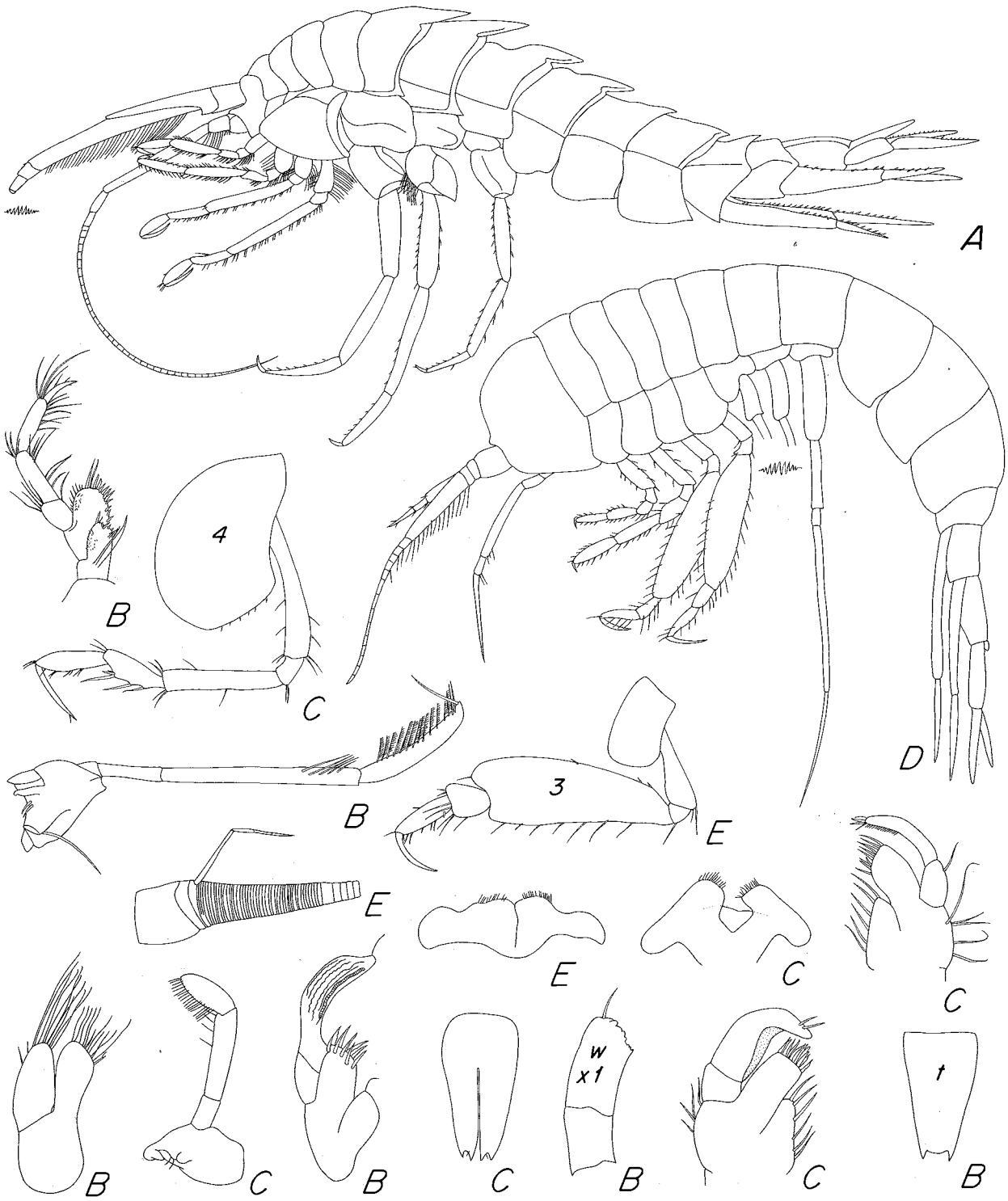

Fig.72. Hyperiopsidae. A, *Parargissa galatheae*; B, *Hyperiopsis gibbosa*; C, *Parargissa arquata*; D, *Hyperiopsis voringii*; E, *Hyperiopsis laticarpa*.

Parargissa Chevreux

Figs 72A,C

Parargissa Chevreux, 1908g: 9.
Protohyperiopsis Birstein & Vinogradov, 1955: 236 (*Protohyperiopsis arquata* Birstein & Vinogradov, 1955, original designation).

Type species. *Parargissa nasuta* Chevreux, 1908g, original designation.

Diagnosis. Peduncular article 2 of antenna 1 with apical process. Labium ordinary, mandibular lobes not greatly extended. Coxae 1-3 small and mostly hidden by large coxa 4. Article 4 of pereopods 3-4 narrow; article 2 of pereopods 5-7 expanded, shape on 7 distinct from 5-6.

Description. Body carinate dorsally, laterally and sometimes on coxae 4-6. Head smaller than pereonites 1-2 together, lateral cephalic lobes well developed. Flagellum of antenna 2 long and multiarticulate. Mandibular molar feeble, not triturative; palp not elongate. Inner plate of maxilla 1 with 5+ medial setae. Inner plate of maxilla 2 with facial row of setae. Coxa 2 usually larger than coxae 1 or 3. Dactyls of pereopods 5-7 short or elongate. Telson deeply cleft, each apex notched (type) or not. Gills ovoid; oostegites narrow.

Variables. Article 1 of antenna 1 also with apical process(es) (*P. arquata*, *P. affinis*, *P. galatheae*); inner plate of maxillae 2 with medial setae and facial row of setae (*P. arquata*, *P. affinis*, *P. longipes*, *P. galatheae*); gnathopod 2 simple (*P. galatheae*) or weakly subchelate (*P. curticornis*); article 2 of pereopods 5-7 of similar size and width but on pereopod 7 not sharply lobate posteroventrally (*P. galatheae*), broad and short on pereopods 5-6, narrow and long on pereopod 7 (*P. nasuta*); dactyls of pereopods 5-7 short (*P. galatheae*) or long (*P. nasuta*); rami or uropods 1-2 subequal (type, *P. longipes*), outer ramus shortened (*P. affinis*); inner ramus of uropod 3 significantly shortened and thin (*P. affinis*, *P. nasuta*) or subequal to outer ramus (*P. galatheae*); outer ramus of uropod 3 2-articulate (*P. affinis*, *P. curticornis*, *P. nasuta*) or 1-articulate (*P. galatheae*); telsonic lobes unnotched (*P. longipes*).

Remarks. The wide variability of attributes is notable but not worthy of generic division as one can hardly mistake a species of *Parargissa*; no purpose is served to divide the species until the world oceans reveal more taxa.

Species. *Parargissa affinis* Birstein & Vinogradov, 1960 [528B]; *P. arquata* (Birstein & Vinogradov, 1955, 1958, 1960, 1964) (= *P. intermedia* Birstein & Vinogradov, 1963) (Gurjanova, 1962) [600BA]; *P. curticornis* Birstein & Vinogradov, 1960, 1964 [600BA]; *P. galatheae* J.L. Barnard, 1961a (Andres, 1977), *P. g. americana* J.L. Barnard, 1961a [420A]; *P. longipes* Birstein & Vinogradov, 1960 [528B]; *P. nasuta* Chevreux, 1908g, 1935 [304B].

Habitat and distribution. Marine, cold water cosmopolitan, 1300-5315 m, pelagic or demersal, 6 species.

ICILIIDAE Dana, 1849

Diagnosis. Body depressed; head depressed, eyes bulging. Antenna 2 longer than 1, articles 1-2 of antenna 1 elongate, accessory flagellum 1-articulate, cylindrical. Mandibular incisor present, molar large, strongly triturative, rakers present, palp well developed. Maxillae ordinary, palp of maxilla 1 2-articulate. Inner plates of maxillipeds ordinary, well armed, outer plates large, palp huge. Coxae 1-2 much smaller than 3-4 but free, other coxae short, contiguous, mostly sharply squared or acuminate, coxa 4 not distinctly excavate posteriorly. Gnathopods feeble, equal, simple, long and thin, strongly setose posteriorly. Article 2 of pereopods 5-7 unexpanded, bases with processiferous posterodistal lobes. Peduncle of uropod 3 short, with medial process supporting long inner ramus, inner rami variable, almost as long as peduncle or more than twice as long as peduncle, lanceolate or paddle-shaped, outer rami (usually much) shorter than outer, usually not longer than peduncle. Telson short, 'not fleshy', as broad as long, uncleft.

See Dulichiidae, Maxillipiidae, Melphidippidae, Amphilochidae, Colomastigidae, Dexaminidae and Pardaliscidae.

Description. Body weakly carinate on pleon. Head with tiny rostrum, eyes bulging, bilateral, ommatidial, medium to large. Articles 1-2 of antenna 1 elongate. Incisors extended, toothed, laciniae mobiles present, 6-7 rakers present; molar large, columnar, strongly triturative, palp well developed, 3-articulate, article 3 weakly curved but shorter than 2. Outer lobes of lower lip not appressed, inner lobes large and fleshy, mandibular lobes blunt and broad. Inner plate of maxilla 1 medium, apically and subapically setose, outer plate with 11 spines, palp long and 2-articulate. Plates of maxilla 2 slender, apically setose, inner plate well setose medially. Inner plates of maxillipeds ordinary, with many apical setae and 3 spines, outer plates well setose medially, palp article 2 weakly expanded, setose medially, article 3 curved, dactyl unguiform.

Article 2 of gnathopods 1-2 slender, articles 3-4 short; carpus and propodus subequally elongate, strongly setose posteriorly, carpus broadest, not lobate, propodus very thin, palm absent, dactyl well developed, curved, sharp. Pereopods 3-7 slender,

article 4 very short. Gills 2-7, short and fleshy, oostegites 2-5, large and expanded. Pleopods short, peduncles often expanded, rami as long as peduncles. Epimeron 2 larger than 3. Urosomites separate, 1 largest, but not elongate. Rami of uropods 1-3 rectangular or lanceolate or those of uropod 3 paddle-shaped, outer rami of uropods 1-3 shortened.

Sexual dimorphism. Male unknown.

Relationship. Said by Laubitz (1983a) to be close to Paramphithoidae (= Iphimediidae) on the basis of

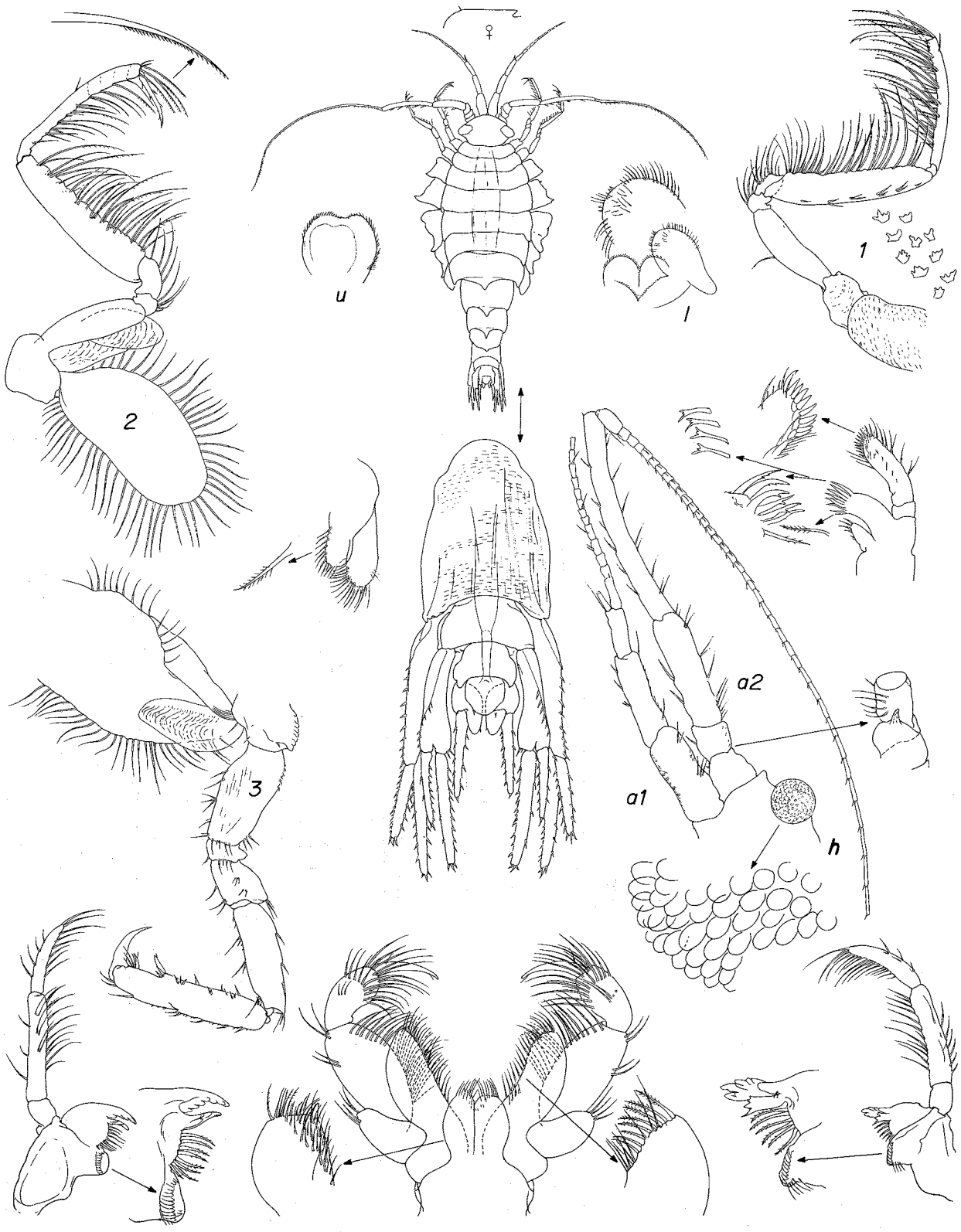

Fig.73. Iciliidae. *Icilius australis*; see also Fig.119 C,H.

acuminate coxae, vestigial accessory flagellum, ordinary mouthparts, and simple gnathopods.

Differing from Dulichiidae in the non-fleshy telson, shorter urosomite 1, much better developed uropod 3, lack of any fusion in body segments, (?possible lack of flexion of urosome), and feeble gnathopod 2.

Differing from Corophioidea in general in the combination of very elongate antenna 2, very elongate, identical and simple gnathopods 1-2, short peduncle on uropod 3 with outer ramus twice as long as peduncle, with inner ramus supported by peduncular process and longer than outer ramus (if not broken off), weakly acuminate coxae and non-fleshy telson.

See Maxillipiidae for its distinctions.

Icilius Dana

Figs 73,106

Icilius Dana, 1849: 140 (no species).–Dana, 1852a: 220.–Dana, 1853: 144.–Laubitz, 1983a: 78.

Type species. *Icilius ovalis* Dana, 1852a, monotypy.

Diagnosis. With the familial characters.

Species. See Stebbing (1906), who followed Della Valle (1893) in fusing all species but later Stebbing (1910a) redistinguished them; *I. australis* Haswell, 1879a, 1882 (Stebbing, 1910a) (Chilton, 1921d) (Hale, 1929) [784]; *I. danae* Stebbing, 1888, 1910a [784]; *I. ovalis* Dana, 1852a, 1853 (= *I. ellipticus* Dana, 1853) [647]; *I. punctatus* Haswell, 1879b (Stebbing, 1910a) [781I].

Habitat and distribution. Marine, north Borneo and southern Australia, 31-108 m, 4 species.

IPANEMIDAE Barnard & Thomas, 1988

Diagnosis. Rostrum weak, broad; cheek strong. Antenna 1 of neither haustoriid nor urothoid form, peduncle short, no articles elongate, each thick, article 1 with weak setation, article 2 furnished with dense row of spines, article 3 about 0.67 as long as article 1, poorly armed; no geniculations present; flagellum longer than peduncle and heavily armed with aesthetascs; accessory flagellum 2-articulate. Antenna 2 of urothoid form, articles 4 and 5 slender, with long lines of spines not organised into ranks, posterior margins lacking glass-spines (typical of Urohaustoriidae), ordinary setae and bulbar setae extremely sparse, flagellum very short, 2-articulate. Epistome and upper lip fused together, lower margin rounded. Right and left mandibles alike, with narrow but stubby and simple incisors lacking teeth, laciniae mobiles alike, rakers absent, molar of medium size (compared to Urothoidae), weakly triturative, choppers weak to absent; palp 3-articulate, article 3 with urohaustoriid setal-spine distribution (versus urothoid setal distribution), spines hooked but unawned. Lower lip with mandibular lobes well developed. Maxilla 1 with 2-articulate palp, inner plate small and spout-like, naked. Inner plate of maxilla 2 without oblique facial seta row, with one medial seta. Maxillipeds with unexpanded bases and no baler lobes, with rather small inner plate but normally enlarged and spinose outer plate; palp 4-articulate, article 2 expanded, article 4 rectangular, with 2 thin nail-setae.

Coxae 1-2 minute and hidden by coxa 3, coxa 4 dominant, weakly excavate behind, coxa 3 adze-shaped; coxae 5-6 with comma-shaped posterior lobe. Gnathopods feeble, subsimilar, simple (gnathopod 2 with minute palm), article 3 short. Article 5 of pereopods 3-4 slender, not lobate; dactyls of pereopods 3-7 well developed; pereopod 5 of weakly haustorius form, article 2 expanded, articles 4-5 weakly expanded and with few facial spines; article 2 of pereopods 5 and 7 diverse, with that of pereopod 6 intermediate in form; no pereopod with underslung articulation. Gills on coxae 2-5 only, 6-7 apparently without gills because of long forward reach of beating pleopods, gill 2 (on coxa 2) spear-shaped, others decreasing in size, subrectangular sacs.

Pleopods like urohaustoriids, pleopod 3 inferior; peduncles as long as wide. Epimeron 1 fully developed, small, with 1 seta, epimera 2-3 equally dominant, all epimera with posterodorsal 'hip'. Urosomites ordinary. Rami of uropod 1 styliform, naked; of uropod 2 rod-like and spinose; uropod 3 of ordinary haustorioid-phoxocephalid kind, neither ramus dominant, article 2 on outer ramus small and poorly setose. Telson very short, much wider than long, essentially entire, each side with alate lobe projecting upward.

Relationship. Differing from the Phoxocephalopsidae in the completely distinctive antennae 1-2, of which antenna 1 has a heavily spinose (versus setose) article 2 and the accessory flagellum is poorly developed; of which antenna 2 has slender articles 4-5 bearing large facial spines in lines rather than small spines in ranks and on which the posterior margins have almost no long setae, almost no bulbar setae and no glass spines. Also differing from Phoxocephalopsidae in the thin article 5 of pereopods 3-4; the diversity of article 2 on pereopods 5-7, with article 2 on pereopod 5 constricted apically; thin apical articles of pereopods 5-7; the presence of a long comma-shaped posterior lobe on coxae 5-6; the equal size of epimera 2-3 and the hips on epimera 1-3; the strange telson (versus ordinary and cleft); and the reduced inner plate of maxilla 1 lacking a seta.

Differing from Urothoidae in the short articles of the peduncle on antenna 1, with article 2 heavily spinose; the long primary flagellum of antenna 1; the kind and distribution of setal-spines on article 3 of the

mandibular palp (versus regular setae and presence of an A-seta in Urothoidae); the tiny coxae 1-2; the hipped shapes of epimera 1-3; and the more delicate mandible.

Phoxocephalopsidae and Urothoidae appear to be more closely related than previously perceived: both have a well-developed lateral cephalic cheek, styliform rami on uropods 1-2 and many similarities in mandibles, maxillae, and maxillipeds. Phoxocephalopsids differ from urothoids principally in the antennae, in which articles 1-3 of antenna 1 are short, not geniculate, and bear a huge setal patch on article 2; article 4 of antenna 2 is widely expanded and bears 3 kinds of posterior armaments, including glass spines; article 5 also is expanded and bears 2 kinds of armaments posteriorly; the mandibular palp bears hooked setal-spines and the dactyl of the maxilliped is less elongate and less unguiform.

Differing from the Cheidae in the large molar and lack of significant rostrum, normal uropod 2, untoothed incisors and simple gnathopods.

Differing from the complex Pontoporeiidae in the shortened peduncles of the pleopods, the short article 1 of antenna 1 and the lack of long setae (distinct from spines) on pereopods 5-7; also differing from all pontoporeiids except *Priscillina* in the spinose antenna 2.

Differing from the Haustoriidae in the 4-articulate (versus 3-) palp of the maxilliped, the presence of only spines (no flexible setae) on pereopods 5-7, the hidden coxae 1-2, large mandibular lobes of the lower lip, the presence of only a few stiff spines (no long flexible setae) on mandibular palp article 3, the unexpanded article 4 of antenna 2, the poor setation on the inner plates of maxillae 1-2 and the ordinary, non-enlarged outer plate of maxilla 2.

Ipanema Barnard & Thomas

Ipanema Barnard & Thomas, 1988: 617.

Type species. *Ipanema talpa* Barnard & Thomas 1988, original designation.

Diagnosis. With the characters of the family.

Species. *Ipanema talpa* Barnard & Thomas, 1988 [751].

Habitat and distribution. Marine, Brazil, sandy beaches, 4 m, 1 species.

IPHIMEDIIDAE Boeck, 1871b

Iphimedinae [sic] Boeck, 1871b: 178.
Epimerinae Boeck, 1871b: 183.
Acanthonotozomatidae Stebbing, 1906: 210.
Paramphithoidae Stebbing, 1906: 320.
Ochlesidae Stebbing, 1910a: 581 (but see as separate subfamily).
Amathillopsidae Pirlot, 1934: 201.

Diagnosis. Body compressed. Rostrum well developed. Accessory flagellum 0 to 2-articulate. At least 1 member of coxae 1-4 acuminate downward (not just sharp anteroventral point on coxa 1).

See Dexaminidae, Eusiridae, Haustoriidae, Lafystiidae, Pardaliscidae, Stegocephalidae and Stilipedidae (= Astyridae).

Description. Body usually with dorsal teeth (except *Iphimedia gibba*), rostrum usually large, epimeron 3 often with 2 large cusps, occasionally body or coxae with surficial cusps or rarely articulate spines. Antennae well developed, long or short: accessory flagellum 0 to 2-articulate, short. Mouthparts forming conical (piercing-sucking) or quadrate bundle. Epistome and labrum highly variable, broad or narrow, long or short, incised or entire. Mandibular palp always present, 3-articulate; incisor variable, ordinary, toothed to needle shaped or blunt, untoothed, callused or hollowed out; raker row strong, short or long, feeble or absent; molar large and triturative, small and simple, laminar or absent, occasionally with raker row running onto surface. Labium with or without separate or fused inner lobes, outer lobes notched or not. Inner plate of maxilla 1 minute or ordinary, usually medially setose; outer plate oblique, with or without distal spines; palp large or small, 1 to 2-articulate. Inner plate of maxilla 2 rarely with facial setae. Palp of maxilliped 3 to 4-articulate, article 2 often produced medially.

Coxae 1-4 more or less acuminate, coxae 3-4 occasionally forming together ventral crescentic curve. Coxa 5 much shorter than 4. Gnathopods feeble, rarely gnathopod 2 weakly enlarged and with lobate carpus, gnathopods usually feeble and with elongate thin articles 5-6, simple, subchelate or parachelate, article 3 rarely elongate. Article 2 of pereopods 5-7 usually with posterior cusps or teeth. Urosomites free. Uropods 1-3 biramous. Rami of uropod 3 longer than peduncle, flattened, lanceolate, usually 1-articulate. Telson entire or weakly incised, generally not longer than peduncle of uropod 3.

Relationship. The acumination of at least one of coxae 1-4 differentiates Iphimediidae from Eusiridae (such as *Cleonardopsis*). *Oradarea* and *Cleippides* are simply iphimediids with untapering coxae.

The Lafystiidae have a 2-articulate palp on the maxilliped but otherwise scarcely differ from Iphimediidae.

The Ochlesinae, treated here as a subfamily, lack any maxillipedal palp or bear a vestige and have reduced antennal flagella.

The Pardaliscidae have poorly developed inner plates on the maxillipeds and one of the mandibles is heavily flattened; usually pardaliscids have an

elongate accessory flagellum. Most Pardaliscidae have evenly extending coxae 1-7, there being little difference in the ventral extension of these plates.

The Stilipedidae (= Astyridae) have an expanded, non-acuminate coxa 1, and foliaceous mandibles and maxillae 1 and 2, though *Maxilliphimedia* in the Iphimediidae has a foliaceous palp on maxilla 1 thereby narrowing the distinctiveness of the 2 groups.

Astyra scarcely differs from Iphimediidae; its lower lip has widely separated outer lobes and the gnathopods have a characteristic pattern, the carpus being weakly lobate but much wider than the thin, simple propodus. *Stilipes* has an exaggerated version of this kind of gnathopod but the carpus is not so strongly lobate as it is strongly enlarged.

Stegocephalidae lack a mandibular palp.

Dexaminidae have fusion of certain urosomites and normal maxillipeds.

Pleustidae have characteristic lower lips. *Mesopleustes* is a link.

Gammaridans with acuminate coxae have a large accessory flagellum and normal maxillipeds.

Within Pontoporeiidae *Priscillina* also bears acuminate coxae but differs otherwise from Iphimediidae in the multiarticulate accessory flagellum and short inner ramus of uropod 3 (gammaroid).

Cleonardopsis is a link bridging the gap between Iphimediidae and Eusiridae; *Cleonardopsis* has a cleft telson and non-acuminate coxae.

Rhachotropis intergrades Eusiridae and Iphimediidae but is distinguished from Iphimediidae in the large gnathopods with expanded propodus and short deeply lobate carpus; the telson is elongate.

Oradarea in the Eusiridae has an occasional species with incipiently acuminate coxae.

Regalia in the Eusiridae is like iphimediids in the doubled tooth of epimeron 3 but the coxae are very small and unpointed.

Parepimeriella irregularis has rounded untapering coxae and is placed in this family on the basis of derivation from typical Iphimediidae.

Cleippides quadricuspis has points on some anterior coxae but no coxa tapers to a single point downward.

Iphimediids such as *Amathillopsis* are links to eusirid-calliopiid groups.

Removal. *Bathypanoploea* and its synonyms are removed to Stilipedidae, but these contents remain cited in the key to the genera of Iphimediidae. *Eclysis* and *Epimeriella* are removed to the Stilipedidae by Andres (1986a) and we do not necessarily disagree but *Epimeriella* does not fit our system of identification because coxa 1 is not expanded and therefore we must leave it in Iphimediidae for identification reasons.

Key 1 to Subfamilies of Iphimediidae

1. Palp of maxilliped with 0-2 articles ..... (see at terminus of Iphimediinae) Ochlesinae

—— Palp of maxilliped with 3-4 articles ..... (Iphimediinae) Key A

Key A to Genera of Iphimediidae

1. Gnathopod 1 simple or subchelate 2

—— Gnathopod 1 chelate 18

2. Molar moderately well developed and triturative or forming smooth ring 3

—— Molar simple or absent 12

3. Carpus of gnathopods 1-2 lobate 4

—— Carpus of gnathopods 1-2 not lobate 6

4. Molar forming smooth ring ..... (Eusiridae) *Cleippides* (part)

—— Molar broadly triturative 5

5. Peduncles of antennae 1-2 less than twice as long as head ..... (Gammarellidae) *Austroregia* and (Pleustidae) *Mesopleustes*

—— Peduncles of antennae more than 3 times as long as head ..... *Amathillopsis*

6. Coxa 4 with 2 ventral points 7

—— Coxa 4 with 0-1 ventral point 10

7. Epimeron 3 with 1 tooth, coxae 5-6 with 1 point ..... *Austroregia* and *Actinacanthus*

—— Epimeron 3 with 2 teeth, coxae 5-6 with 2 points 8

8. Gnathopods simple, mandibular raker row absent, incisor and molar each contiguous and formed of smooth rings ..... (Eusiridae) *Cleippides*

—— Gnathopods subchelate, mandibular raker row present, incisor toothed and normal, molar of normal triturative column 9

9. Propodus of gnathopods ovate, coxa 4 and epimeron 3 each with only 1 tooth ..... (Gammarellidae) *Austroregia* (part)

—— Propodus of gnathopods rectilinear, coxa 4 and epimeron 3 each with 2 teeth ..... *Paramphithoe*

10. Coxae 3-4 not forming ventral crescentic curve, weak inner lobe of labium present ..... (and *Austroregia* and *Cleippides*) *Parepimeria*

—— Coxae 3-4 forming ventral crescentic curve, inner lobes of lower lip absent 11

11. Maxillipedal palp 3-articulate ..... *Metepimeria*

—— Maxillipedal palp 4-articulate ..... *Epimeria*

12. Rakers well developed 13

—— Rakers vestigial or absent 16

13. Coxa 2 shortened ..... *Acanthonotozomella*

—— Coxa 2 ordinary 14

14. Coxae 3-4 forming ventral crescentic curve ..... *Epimeriella*

—— Coxae 3-4 not forming ventral crescentic curve 15

15. Telson incised, dorsal teeth sharp ..... (Stilipedidae) *Bathypanoploea*

—— Telson entire, dorsal teeth rounded ..... *Acanthonotozomopsis*

16. Palp article 2 of maxilliped produced ..... *Acanthonotozomoides*

—— Palp article 2 of maxilliped not produced 17

17. Gnathopod 2 simple ..... *Nodotergum*

—— Gnathopod 2 subchelate ..... *Acanthonotozoma*

18. Rakers and triturative molar present 19

—— Rakers and triturative molar not present 23

19. Body covered with articulate spines ..... *Uschakoviella*

—— Body with cusps or no processes, no articulate spines 20

20. Gnathopod 2 simple; outer lobes of labium short, subrounded distally ..... *Dikwa*

—— Gnathopod 2 subchelate; outer lobe of labium long, subpointed distally 21

21. Carpus of gnathopod 2 narrow, long, propodus long, narrow ..... *Stegopanoploea*

—— Carpus of gnathopod 2 stout, short, propodus dilated 22

22. Palp article 4 of maxilliped absent ..... *Postodius*

—— Palp article 4 of maxilliped obsolescent ..... *Odius*

23. Palp of maxilla 1 flabellate ..... *Maxilliphimedia*

—— Palp of maxilla 1 not flabellate 24

24. Mandible extraordinary 25

—— Mandible ordinary 27

25. Incisor needle-like ..... *Parapanoploea*

—— Incisor thick 26

26. Incisor hollowed ..... *Labriphimedia*

—— Incisor calloused ..... *Gnathiphimedia*

27. Body or coxae with fixed cusps on surfaces ..... *Echiniphimedia*

—— Body or coxae lacking surficial cusps, teeth always marginal 28

28. Palp of maxilla 1 1-articulate (always reduced) 29

—— Palp of maxilla 1 2-articulate (occasionally reduced) 31

29. Palp article 2 of maxilliped unproduced ..... *Paranchiphimedia*

—— Palp article 2 of maxilliped produced 30

30. Incisor toothed ..... *Pariphimedia*

—— Incisor smooth ..... *Coboldus*

31. Palp article 2 of maxilliped produced 32

—— Palp article 2 of maxilliped weakly produced or not produced 33

32. Accessory flagellum absent, inner lobe of labium absent ..... *Iphimedia*

—— Accessory flagellum present, inner lobe of labium present ..... *Anisoiphimedia*

33. Palp of maxilla 1 reduced ..... *Anchiphimedia*

—— Palp of maxilla 1 not reduced 34

34. Mandible not cutting in frontal plane ..... *Iphimediella*

—— Mandible cutting in frontal plane ..... *Pseudiphimediella*

Key 2 to Subfamilies of Iphimediidae

1. Palp of maxilliped 0 to 2-articulate ..... (see at terminus of Iphimediinae) Ochlesinae

—— Palp of maxilliped 3 to 4-articulate ..... Iphimediinae Key B

Key B to Genera of Iphimediidae

1. Mandibular rakers large 2

—— Mandibular rakers tiny or absent 16

2. Carpus of either gnathopods 1 or 2 lobate 3

—— Carpus of gnathopods 1-2 not lobate 6

3. Gnathopod 1 chelate ..... *Odius*

—— Gnathopod 1 subchelate or simple 4

4. Antennae 1-2 greatly elongate ..... *Amathillopsis*

—— Antennae 1-2 short 5

5. Coxae 5-6 together forming crescentic curve below ..... *Epimeria*

—— Coxae 5-6 not closely interacting ..... (Gammarellidae) *Austroregia* (Pleustidae) *Mesopleustes*

6. Gnathopod 1 chelate ..... *Dikwa*

—— Gnathopod 1 not chelate 7

7. Coxae 3-4 forming ventral excavation in form of crescent 8

—— Coxae 3-4 not forming ventral crescentic excavation 11

8. Gnathopods subchelate 9

—— Gnathopods simple 10

9. Mandibular molar simple, small ..... *Epimeriella*

—— Mandibular molar triturative, large ..... *Epimeria*

10. Palp of maxilliped 4-articulate ..... See couplet 5

—— Palp of maxilliped 3-articulate ..... *Metepimeria*

11. Coxae 2-4 very sharp apically, coxa 4 with 2+ sharp ventral teeth 12

—— Coxae 2-4 blunt apically, coxa 4 with 0-1 sharp ventral teeth 13

12. Coxa 1 pointing forward, coxae 5-6 bifid epimeron 3 bicuspidate ..... *Paramphithoe*

—— Coxa 1 pointing downward, coxae 5-6 simple, epimeron 3 monocuspidate ..... *Actinacanthus*

13. Molar triturative, gnathopod 1 flagellate ..... *Parepimeria*

—— Molar absent or vestigial, gnathopod 1 not flagellate 14

14. Telson incised ..... *Bathypanoploea*

—— Telson entire 15

15. Coxa 2 shortened ..... *Acanthonotozomella*

—— Coxa 2 ordinary ..... *Acanthonotozomopsis*

16. Gnathopod 1 simple 17

—— Gnathopod 1 chelate 20

17. Gnathopod 2 chelate ..... *Nodotergum*

—— Gnathopod 2 simple 18

18. Palp article 2 of maxilliped produced ..... *Acanthonotozomoides*

—— Palp article 2 of maxilliped not produced 19

19. Incisor forming large half ring adjacent to large molarial ring, gnathopods alike, not flagellar ..... *Cleippides*

—— Incisor forming jagged point, molar simple and remote from incisor, gnathopods diverse, gnathopod 1 flagellar ..... *Acanthonotozoma*

20. Palp article 4 of maxilliped well developed, body covered with articulate spines ..... *Uschakoviella*

—— Palp article 4 of maxilliped weak or absent, body often with fixed teeth and cusps but few or no articulate spines 21

21. Palp article 2 of maxilliped unproduced 22

—— Palp article 2 of maxilliped produced 29

22. Mandibular incisor with callus or hollow 23

—— Mandibular incisor lacking hollow or callus 24

23. Incisor smooth, calloused ..... *Gnathiphimedia*

—— Incisor hollowed, scoop-shaped ..... *Labriphimedia*

24. Mandibular incisor extended, needle-shaped, coxa 2 shortened ..... *Parapanoploea*

—— Mandibular incisor not extended in needle-like form, coxa 2 not shortened 25

25. Palp article 2 of maxilla 1 lamelliform ..... *Maxilliphimedia*

—— Palp article 2 of maxilla 1 ordinary 26

26. Palp of maxilla 1 shortened, body lacking surficial cusps 27

—— Palp of maxilla 1 ordinary, body with few too many surficial cusps 28

27. Palp of maxilla 1 with 2 articles ..... *Anchiphimedia*

—— Palp of maxilla 1 with 1 article ..... *Paranchiphimedia*

28. Surface of body segments or coxae with cusps ..... *Echiniphimedia*

—— Cusps only at edges of body segments or coxae ..... *Pseudiphimediella*

29. Palp of maxilla 1 shortened 30

—— Palp of maxilla 1 ordinary 32

30. Mandibular incisor smooth ..... *Coboldus*

—— Mandibular incisor serrate 31

31. Palp of maxilla 1 2-articulate ..... *Stegopanoploea*

—— Palp of maxilla 1 1-articulate ..... *Pariphimedia*

32. Body with extra surficial cusps ..... *Echiniphimedia*

—— Body without extra surficial cusps, only with dorsal elements 33

33. Lobes of labium un-notched, article 2 of maxillipedal palp unproduced ..... subgenus (*Iphimediella*)

—— Lobes of labium notched, article 2 of maxillipedal palp produced 34

34. Accessory flagellum present; inner lobes of labium present ..... *Anisoiphimedia*

—— Accessory flagellum absent; inner lobes of labium absent ..... *Iphimedia*

Iphimediinae Boeck, 1871b

Diagnosis. Palp of maxilliped with 3-4 articles.

Acanthonotozoma Boeck

Figs 74M, 75C,E, 76E, 77A

Acanthonotus Ross, 1835: 90 (*Acanthonotus cristatus* Ross, 1835, original designation) [homonym, Pisces].
Acanthonotozoma Boeck, 1876: 237 [new name, same type species].–Just, 1978: 12.–Karaman & Barnard, 1979: 107.
Panoploeopsis Kunkel, 1910: 23 (*Panoploeopsis porta* Kunkel, 1910, monotypy).

Type species. *Acanthonotus cristatus* Ross, 1835, original designation.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum scarcely incised, epistome not very broad. Mandibular incisor broad, not toothed or simple; rakers absent; molar obsolescent. Labium: inner lobes absent, outer variable. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate; palp article 2 unproduced; palp article 4 small or absent (= *Panoploeopsis*). Coxae 1-4 progressively longer, acuminate; 4-5 forming ventral arc; coxa 4 polycuspidate. Gnathopods diverse, of different sizes, articles 5-6 elongate, gnathopod 2 stout, setose, both gnathopods simple. Telson incised, or cleft, short.

Relationship. Differing from *Epimeria* and allies in the loss of raker spines and gnathopod 1 much thinner than gnathopod 2.
See *Acanthonotozomoides*, *Cleippides* and *Nodotergum*.

Species. See Just (1978) for all species; *A. cristatum* (Ross, 1835) (Sars, 1895) (Gurjanova, 1951) [220 + B]; *A. dunbari* Just, 1978 [220]; *A. gurjanovae* Just, 1978 [220]; *A. inflatum* (Krøyer, 1842) (Stephensen, 1938b) [200]; *A. magnum* Just, 1978 [220 + B]; *A. monodentatum* Kudrjaschov, 1965b [220]; *A. portum* (Kunkel, 1910) [367]; *A. rusanovae* Bryazgin, 1974b [200 + B]; *A. serratum* (O. Fabricius, 1780) (= *A. serra* Krøyer, 1838) (Sars, 1895) (Stephensen, 1931a) (Gurjanova, 1951) (Moore, 1984d) [216]; *A. sinuatum* Just, 1978 [216 + B].

Habitat and distribution. Marine, circumarctic south to 40°N; Bermuda; 0-700 m, 10 species.

Acanthonotozomella Schellenberg

Fig.76G

Acanthonotozomella Schellenberg, 1926a: 332.–Watling & Holman, 1980: 609.
Paracanthonotozoma Bellan-Santini, 1972b: 177 (*Paracanthonotozoma trispinosum* Bellan-Santini, 1972b, original designation).

Type species. *Acanthonotozomella alata* Schellenberg, 1926a, monotypy.

Diagnosis. Body covered with teeth. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised, not very broad. Mandibular incisor ordinary, toothed; raker row long; molar broad and blunt, simple. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long but not as broad as outer plate, latter short; palp article 2 narrow and unproduced; palp article 4 well developed. Coxa 2 short; coxa 4 long, weakly bicuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods simple. Telson broad, entire or incised.

Additional characters. Coxa 4 with posterior protuberance (*Acanthonotozomopsis*).

Relationship. Characterised by the short coxa 2. Like *Acanthonotozoma*, *Acanthonotozomoides* and *Acanthonotozomopsis* but differing from *Acanthonotozoma* in the long raker row, similar gnathopods, poorly cleft telson; from *Acanthonotozomoides* in normal inner plate of maxilla 1, unproduced palp of maxilliped, short coxa 2 with shape different from coxae 1-2; from *Acanthonotozomopsis* in the sharp teeth of the body, ordinary or narrow incisor, ordinary inner plate of maxilla 1 and posterior protuberance of coxa 4. Differing from *Bathypanoploea* in the short coxa 2.
See *Parapanoploea*.

Species. *Acanthonotozomella alata* Schellenberg, 1926a [881]; *A. barnardi* Watling & Holman, 1980 [802B]; *A. trispinosa* (Bellan-Santini, 1972b) [878].

Habitat and distribution. Marine, Antarctica, 120-384 m, 3 species.

Acanthonotozomoides Schellenberg

Acanthonotozomoides Schellenberg, 1931: 124.–Watling & Holman, 1980: 611.

Type species. *Acanthonotozomoides sublitoralis* Schellenberg, 1931, monotypy.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting conically. Labrum incised; epistome not very broad. Mandibular incisor elongate, narrow, toothed; raker row present; molar absent. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long but much narrower than outer plate, latter elongate; palp article 2 narrow but apicomedially produced; palp article 4 small. Coxae ordinary; 1-4 progressively longer; coxa 4 polycuspidate. Gnathopods alike, articles

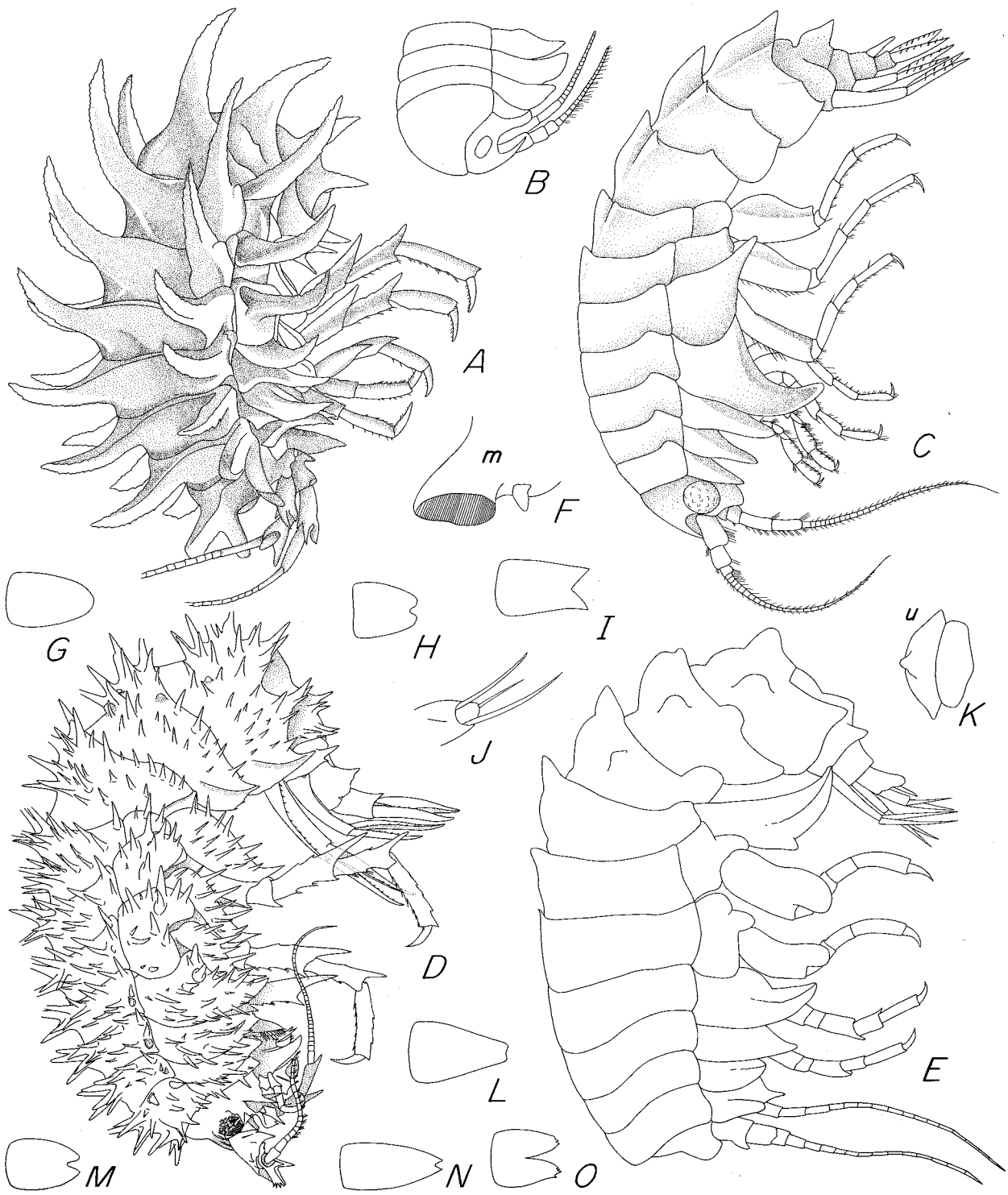

Fig.74. Iphimediidae. A, *Actinacanthus tricarinatus*; B, *Iphimedia (= Cypisiphimedia) gibba*; C, *Epimeria cornigera*; D, *Echiniphimedia hodgsoni*; E, *Dikwa acranio*; F, *Gnathiphimedia mandibularis*; G, *Pariphimedia integricauda*; H, *Epimeria loricata*; I, *Iphimedia obesa*; J, *Iphimedia haurakiensis*; K, *Labriphimedia vespuccii*; L, *Paramphithoe hystrix*; M, *Acanthonotozoma serratum*; N, *Odius carinatus*; O, *Eclysis similis*.

5-6 elongate, narrow; both gnathopods simple. Telson entire.

Special character. Inner plate of maxilla 1 minute.

Relationship. Differing from *Acanthonotozoma* and *Acanthonotozomella* in the minute inner plate of maxilla 1; and from the latter genus plus *Acanthonotozomopsis* in normal unshortened coxa 2 and from all 3 in the produced article 2 of the maxillipedal palp.

Differing from *Bathypanoploea* in the weak rakers

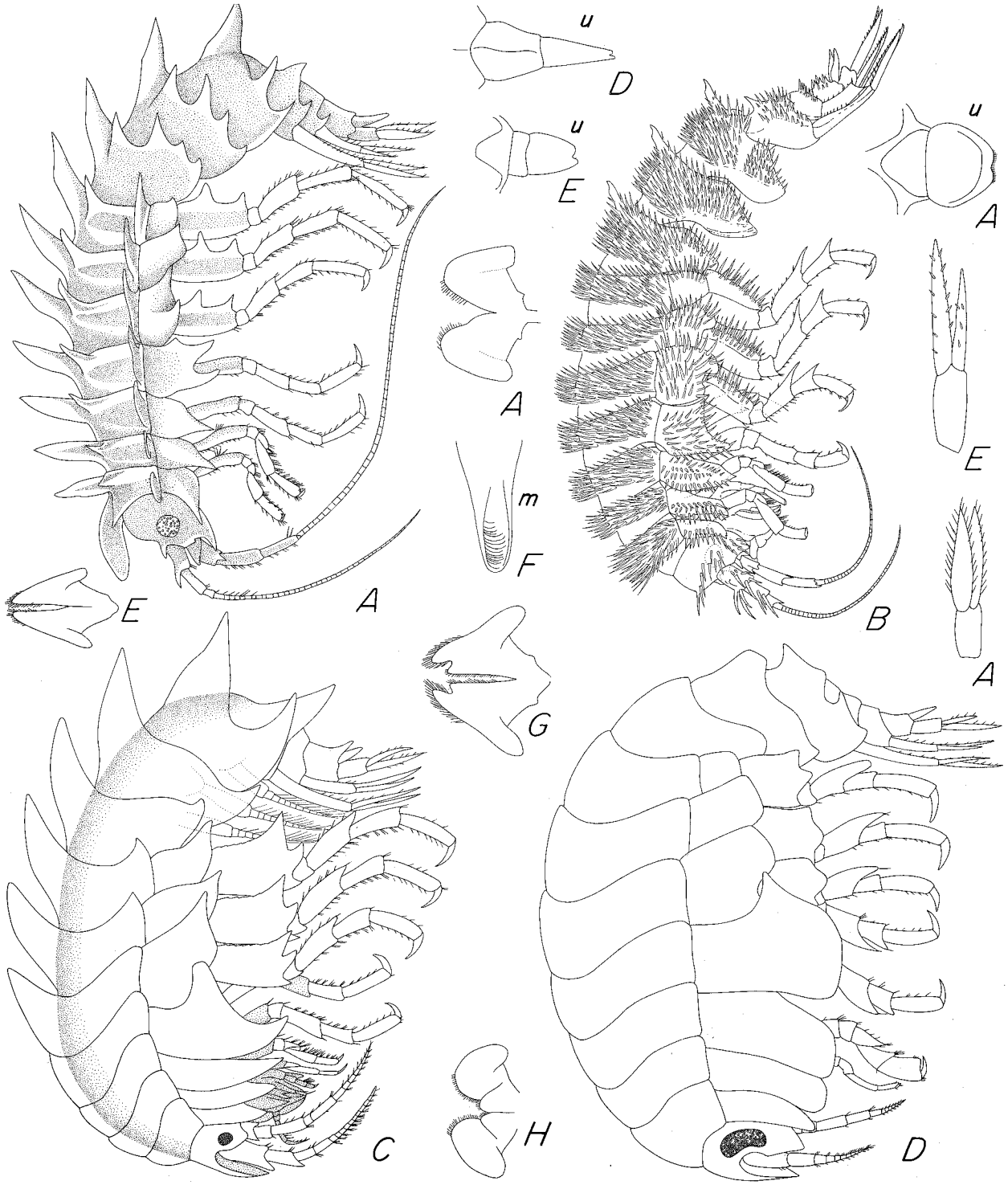

Fig.75. Iphimediidae. A, *Paramphithoe hystrix*; B, *Uschakoviella echinophora*; C, *Acanthonotozoma cristatum*; D, *Odius carinatus*; E, *Acanthonotozoma serratum*; F, *Labriphimedia vespuccii*; G, *Iphimedia crenulata*; H, *Parepimeria crenulata* (see also Fig.116 D).

and pointed coxae 1-3.

Species. *Acanthonotozomoides oatesi* K.H. Barnard, 1930, 1932 (Bellan-Santini, 1972b) (Watling & Holman, 1981) [870]; *A. sublitoralis* Schellenberg, 1931 [864].

Habitat and distribution. Marine, Antarctica, 82-236 m, 2 species.

Acanthonotozomopsis Watling & Holman

Acanthonotozomopsis Watling & Holman, 1980: 614.

Type species. *Acanthonotozomella pushkini* Bushueva, 1978, original designation.

Diagnosis. Body with weak posterior transverse segmental rugae, no sharp teeth. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised, not very broad. Mandibular incisor broad, serrate; raker row long; molar [?absent]. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 enlarged. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate shorter and much narrower than outer plate, latter elongate; palp article 2 broad but unproduced; palp article 4 obsolescent. Coxa 2 short; 3-4 progressively longer; coxa 4 monocuspidate. Gnathopods scarcely diverse, of different sizes, articles 5-6 elongate, both gnathopods simple. Telson entire.

Relationship. Differing from *Acanthonotozoma*, *Acanthonotozomoides* and *Acanthonotozomella* in the lack of large sharp body processes, lack of posterior tooth on coxa 4, the broader incisor and the expanded article 2 of the palp on maxilla 1.

Differing from *Bathypanoploea* in the rounded telson and rounded dorsal teeth.

Species. *Acanthonotozomopsis pushkini* (Bushueva,

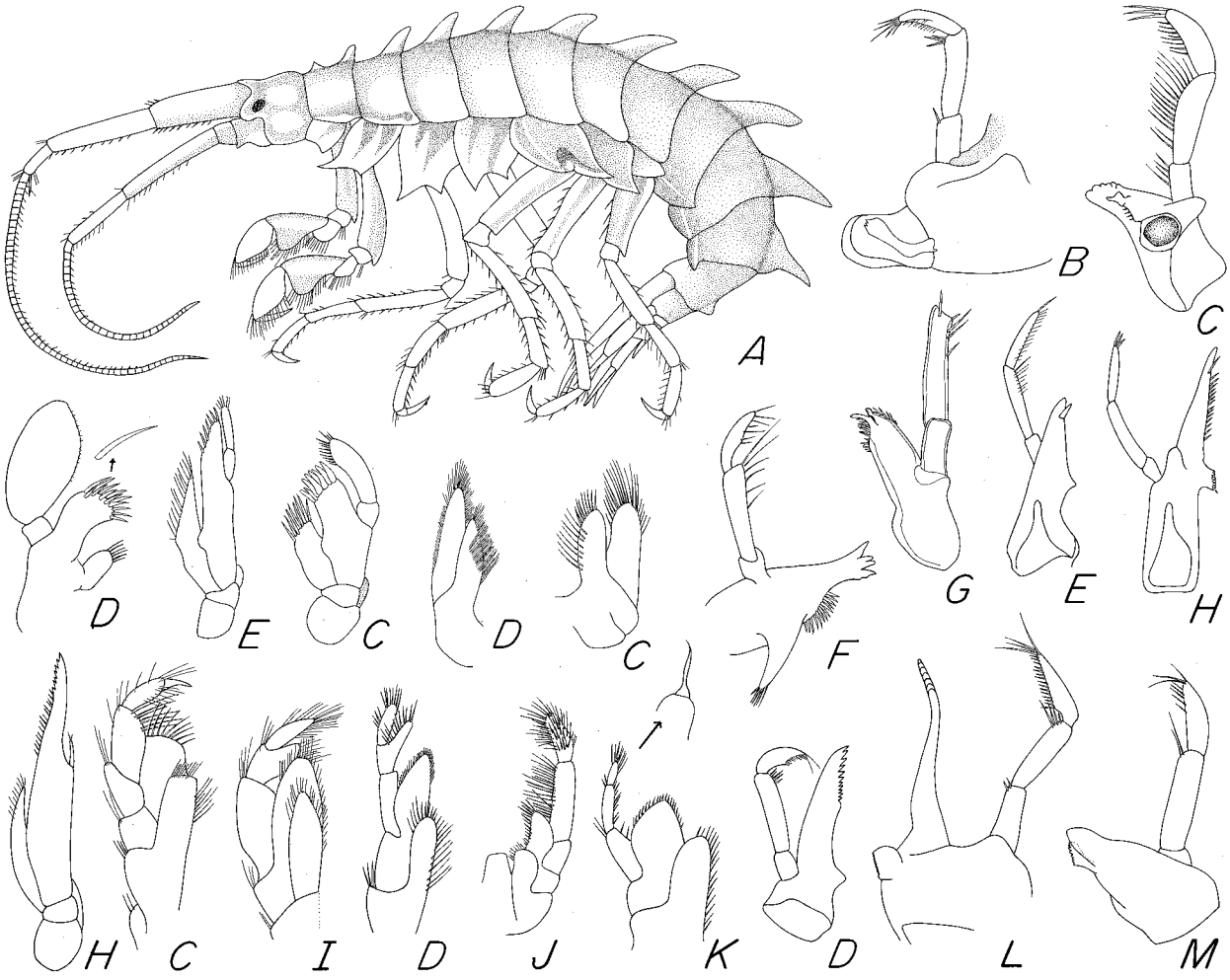

Fig.76. Iphimediidae. A, *Amathillopsis spinigera*; B, *Labriphimedia hinemoa*; C, *Paramphithoe hystrix*; D, *Maxilliphimedia longipes*; E, *Acanthonotozoma serratum*; F, *Eclysis similis*; G, *Acanthonotozomella trispinosum*; H, *Odius carinatus*; I, *Iphimedia obesa*; J, *Parepimeria crenulata*; K, *Labriphimedia vespuccii*; L, *Parapanoploea oxygnathia*; M, *Paranchiphimedia monodi*.

1978) [881].

Habitat and distribution. Marine, Antarctica, Davis Sea, 45 m, 1 species.

Actinacanthus Stebbing

Figs 74A, 77L

Acanthechinus Stebbing, 1888: 883 (*Acanthozone tricarinata* Stebbing, 1883, monotypy) [homonym, Echinodermata].
Actinacanthus Stebbing, 1906: 326 [new name].

Type species. *Acanthozone tricarinata* Stebbing, 1883, monotypy.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting quadrately. Labrum incised; it and epistome not very broad. Mandibular incisor ordinary; raker row present, toothed; molar broad and blunt, triturative. Labium: inner lobes absent, outer lobes broad. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate shorter and narrower than outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 well developed, unguiform. Coxae 1-4 progressively longer; coxa 4 long, polycuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods scarcely subchelate. Telson entire.

Additional characters. Rostrum short; article 5 of gnathopods longer than article 6 (versus *Paramphithoe*); articles 5-6 of gnathopods extremely elongate (versus *Epimeria*, *Amathillopsis*).

Relationship. Differing from *Paramphithoe*, *Epimeria* and *Amathillopsis* in the extra elongation of article 5 on gnathopods 1-2; from *Epimeria* additionally in the

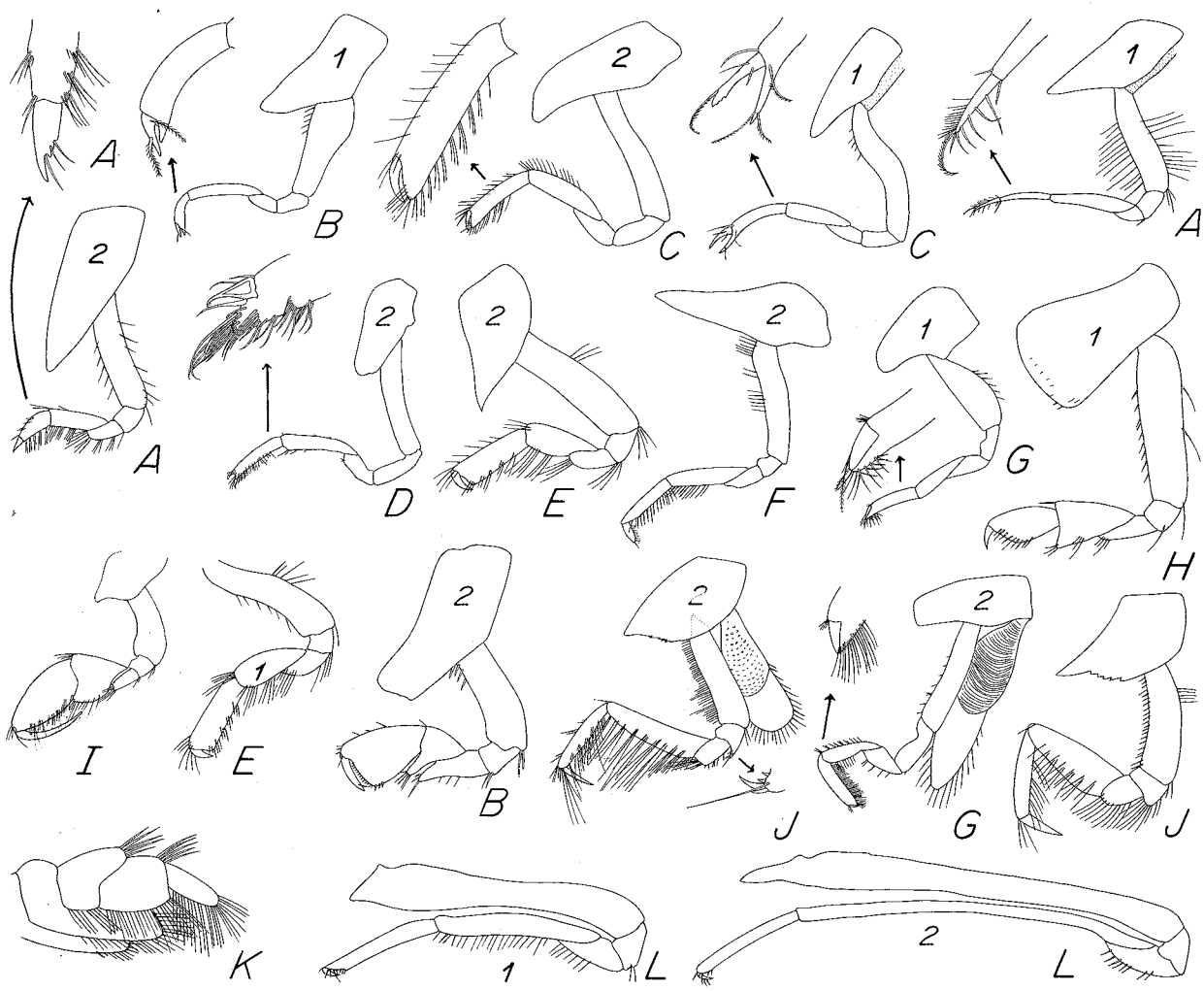

Fig.77. Iphimediidae. A, *Acanthonotozoma serratum*; B, *Odius carinatus*; C, *Iphimedia odesa*; D, *Nodotergum bicarinatum*; E, *Paramphithoe hystrix*; F, *Epimeria grandirostris*; G, *Pariphimedia integricauda*; H, *Eclysis similis*; I, *Amathillopsis annectens*; J, *Parepimeria crenulata*; K, *Pseudiphimediella nodosa*; L, *Actinacanthus tricarinetus*.

lack of ventral crescentation on coxae 4-5 and the single tooth of epimeron 3; from *Amathillopsis* additionally in the absence of lobes on article 5 of gnathopods and the much wider development of teeth on the antennae.

See *Paramphithoe*.

Species. *Actinacanthus tricarinata* (Stebbing, 1883, 1888, 1906) [852B].

Habitat and distribution. Marine, Antarctica, Heard Island, 282 m, 1 species.

Amathillopsis Heller

Figs 76A, 77I

Amathillopsis Heller, 1875: 35.–Gurjanova, 1955b: 209 (key).
Acanthopleustes Holmes, 1908: 533 (*Acanthopleustes annectens* Holmes, 1908, original designation).

Type species. *Amathillopsis spinigera* Heller, 1875, original designation.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 long, subequal; or 1 shorter than 2. Mouthparts projecting quadrately. Labrum incised or entire, very broad, thin, elongate. Mandibular incisor ordinary, toothed; raker row present; molar broad and blunt, triturative. Labium: inner lobes present, weak, or coalesced. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate shorter but scarcely narrower than outer plate, latter short; palp article 2 narrow and apicomedially unproduced; palp article 4 well developed. Coxae ordinary; 1- 4 progressively longer; coxa 4 mono- or polycuspidate. Gnathopods slightly enlarged, alike, articles 5-6 ordinary, stout, article 5 lobate, both gnathopods weakly subchelate. Telson entire or incised.

Additional character. Peduncle of uropod 3 elongate.

Variables. Accessory flagellum often spine-like; coxae scarcely acuminate (*A. grevei*), therefore transitional to taxa such as *Cleonardopsis*; telson often elongate.

Relationship. Differing from *Epimeria* and *Paramphithoe* in the long subequal articles 1-2 of the peduncle on antenna 1. In addition, *Epimeria* has the ventral crescentic formation of coxae 3-4.

See *Actinacanthus*, *Austroregia* and *Odius*.

Species. *Amathillopsis affinis* Miers, 1881 (Stephensen, 1940a) [294]; *A. annectens* (Holmes, 1908) [310B]; *A. atlantica* Chevreux, 1908h, 1935 (Stephensen, 1944c) [240B]; *A. australis* Stebbing, 1883, 1888 (Pirlot, 1934) [532A]; *A. comoroensis* Ledoyer, 1986 [618A]; *A. grevei* J.L. Barnard (1961a) [715A]; *A. pacifica* Gurjanova, 1955b, *A. p. margo* J.L. Barnard, 1967a [232A + 309A]; *A. septemdentata* Ledoyer, 1978a, 1986 [619B]; *A. spinigera* Heller, 1875 (Sars, 1895) (Stephensen, 1944a,c) (Gurjanova, 1951) [220B].

Habitat and distribution. Marine, cosmopolitan, cold waters and deep seas, 66-3580 m, 9 species.

Anchiphimedia K.H. Barnard

Anchiphimedia K.H. Barnard, 1930: 357.–Watling & Holman, 1981: 182.

Type species. *Anchiphimedia dorsalis* K.H. Barnard, 1930, monotypy.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 long, subequal. Mouthparts projecting conically. Labrum incised; only upper part of epistome very broad. Mandibular incisor ordinary, with 2 teeth, molar absent; palp long and strong. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, very small. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 broad but apicomedially unproduced; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 polycuspidate. Gnathopods alike, of similar size, articles 5-6 elongate, narrow, article 5 unlobed, propodus sharply parachelate. Telson incised.

Relationship. Close to *Iphimediella* but differing in the long article 2 of antenna 1, short palp of maxilla 1 and poorly toothed incisor. Differing from *Iphimedia* in the unproduced palp article 2 on the maxilliped.

See *Paranchiphimedia*, *Coboldus* and *Pariphimedia*.

Species. *Anchiphimedia dorsalis* K.H. Barnard, 1930, 1932 (Watling & Holman, 1981) [870B].

Habitat and distribution. Marine, Antarctica, 259-732 m, 1 species.

Anisoiphimedia Karaman

Anisoiphimedia Karaman, 1980b: 50.

Type species. *Iphimedia haurakiensis* Hurley, 1954f, original designation.

Diagnosis. Body covered with teeth posteriorly.

Antenna 1: peduncular article 2 shorter than 1, *accessory flagellum 2-articulate* (versus *Iphimedia*). Mouthparts projecting conically. Labrum scarcely incised distally, epistome not very broad. Mandibular incisor ordinary, poorly toothed; raker row absent; molar a small condyle on inner margin near base, nontriturative. Labium: inner lobes well developed; outer lobes long and pointed distally, inner margins somewhat incised. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2 [unknown]. Maxillipeds: inner plate as long as but narrower than outer plate; palp article 2 apicomedially produced; palp article 4 absent. Coxae 1-3 progressively longer, coxa 4 weakly polycuspidate. Gnathopods diverse, of similar size, articles 5-6 elongate, narrow; gnathopod 1 filiform, chelate; gnathopod 2 narrow, subchelate, article 5 unlobed. Telson short, incised.

Relationship. Differing from *Iphimedia* in the presence of an accessory flagellum and the presence of inner lobes on the labium.

Species. *Anisoiphimedia haurakiensis* (Hurley, 1954f) [773].

Habitat and distribution. Marine, New Zealand, Hauraki Gulf, depth unknown, 1 species.

[Gammarellidae] ***Austroregia*** Barnard

[see also Eusiridae]

Austroregia J.L. Barnard, 1988: 703.

Type species. *Atylus huxleyanus* Bate, 1862, original designation.

Diagnosis. Body covered with teeth or processes. Rostrum very short. Antenna 1: peduncular articles 1-2 short; 2 shorter than 1. Accessory flagellum absent. Mouthparts projecting quadrately. Labrum entire, broad. Mandibular incisor ordinary, toothed, narrow; molar broad and blunt, strong, triturative; palp long and strong. Labium: inner lobes weak; outer lobes broad, short. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long and as broad as outer plate, short; palp article 2 broad and apicomedially unproduced; palp article 4 well developed. Coxae short; 1-4 not progressively longer, often smooth; 4-5 not forming ventral arc; coxa 4 monocuspidate or smooth. Gnathopods weakly enlarged, alike, article 5 slightly shorter than 6, both gnathopods subchelate, propodus ovate. Telson elongate, incised.

Additional character. Calceoli of *Amathillopsis* form, bearing cup between extreme elements.

Relationship. This genus is situated twice in this handbook, here and in the Eusiridae.

Differing from *Amathillopsis* in the shortened peduncles of the antennae and from *Paramphithoe* in the rectilinear propodus of the gnathopods and the presence of only 1 tooth each on coxa 4 and epimeron 3.

Species. *Austroregia batei* (Cunningham, 1871) [864]; *A. huxleyana* (Bate, 1862) (J.L. Barnard, 1988) [866]; *A. regis* Stebbing, 1914b (= *A. huxleyanus* identification of Stebbing, 1888) (= *A. stebbingi* Schellenberg, 1931) (K.H. Barnard, 1932) (J.L. Barnard, 1988) [866].

Habitat and distribution. Marine, austral Magellan region and nearby islands, 0-91 m, 3 species.

[Stilipedidae] ***Bathypanoploea*** Holman & Watling

Epimeriopsis K.H. Barnard, 1931a: 428 [*void ab initio*].
Iphimediopsis Schellenberg, 1931: 126 (*Acanthonotozoma australis* Chilton, 1912, monotypy) [homonym, not Della Valle, 1893].
not *Bathypanoploea* Schellenberg, 1939: 137 (new name for *Iphimediopsis* Schellenberg, same type species).
not *Pseudiphimediopsis* Ruffo, 1949: 18 (new name for *Iphimediopsis* Schellenberg, same type species).
Bathypanoploea Holman & Watling, 1983a: 47.

Type species. Holman & Watling (1983a) are requesting the type be changed to *Bathypanoploea schellenbergi* Holman & Watling, 1983 to overcome erroneous original identification by Schellenberg, 1931.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting quadrately. Labrum incised, not very broad. Mandibular incisor broad, toothed; rakers present; molar absent. Labium: inner lobes coalesced, outer lobes moderately broad. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate shorter and narrower than outer plate, latter elongate; [?palp article 2 narrow and apicomedially unproduced]; palp article 4 well developed. Coxae ordinary; 1-4 progressively longer; coxa 4 scarcely polycuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods simple. Telson incised.

Relationship. Differing from *Acanthonotozoma* in the similarity of gnathopods 1-2 to each other, the non-conical mouthpart field and the short strong incisor.

Differing from *Epimeria* and allies in the absence of the molar; and from *Epimeriella* in the blunt coxae 1-3 and non-crescentic form of coxae 3-4.

See *Acanthonotozomopsis*, *Acanthonotozomoides*, *Acanthonotozomella* and *Nodotergum*.

Species. *Bathypanoploea schellenbergi* Holman &

Watling, 1983a [880BA].

Habitat and distribution. Circumantarctic, 482-2675 m, 1 species.

[Eusiridae] ***Cleippides*** Boeck

Figs 59E, 63K

Cleippides Boeck, 1871b: 201.

Type species. *Acanthonotus tricuspis* Krøyer, 1846b, monotypy.

Diagnosis. Body with posterodorsal teeth or processes. Antenna 1: peduncular articles 1-2 long, subequal. Accessory flagellum 1-articulate. Mouthparts projecting quadrately. Labrum entire, broad. Mandibular incisor hollowed out in form of spoon, forming half ring; molar strong, forming unridged hollow ring; palp long and strong. Labium: inner lobes obsolescent, fleshy, outer lobes broad. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate with facial row of 9 setae. Maxillipeds: both plates short and broad; palp article 2 broad, apicomedially unproduced; palp article 4 well developed. Coxae 1-4 short, not progressively longer, 4-5 not forming ventral arc; coxa 4 bicuspidate, or not. Gnathopods alike, feeble, article 5 elongate, 6 short, both narrow; both gnathopods simple. Telson entire.

Relationship. Differing from *Acanthonotozoma* and *Paramphithoe* in the mandibular structure, an incisor and molar each formed of half ring or full ring occupying entire mandibular body; differing also from both genera in the simple non-diverse gnathopods with elongate carpus.

Species. See Gurjanova (1951); *C. bicuspis* Stephensen, 1931a [209AB]; *C. quadricuspis* Heller, 1875 (Sars, 1885) (Stephensen, 1933b, 1938b, 1940b, 1944a) [216 + B]; *C. tricuspis* (Krøyer, 1846b) (Stephensen, 1931a, 1944a) [251 + B].

Habitat and distribution. Marine, Arctic and North Atlantic, 28-2150 m, 3 species.

Coboldus Krapp-Schickel

Coboldus Krapp-Schickel, 1974: 340.

Type species. *Coboldus nitior* Krapp-Schickel, 1974, original designation.

Diagnosis. Body with weak posterior teeth or processes, poorly armed. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised, not very broad. Mandibular incisor ordinary, blunt and smooth; raker row absent; molar absent. Labium: inner lobes present, [outer strongly notched]. Maxilla 1: palp articulate, very short. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 apicomedially produced; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 long, weakly polycuspidate. Gnathopods 1-2 alike, but of different setosities, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised.

Variables. Inner lobes of lower lip each coalesced to outer (*C. hedgpethi*); gnathopod 2 subchelate (*C. hedgpethi*).

Relationship. Like *Odius* but palp article 2 of maxillipedal palp produced, article 4 absent and gnathopod 2 feeble (stout in *Odius*).

Differing from *Iphimedia* and *Anchiphimedia* in the 1-articulate palp of maxilla 1. Probably *C. nitior* and *C. hedgpethi* arose from distinctive ancestors in *Iphimedia*, therefore *C. hedgpethi* would better be relegated to a new genus.

Differing from *Pariphimedia* in the smooth incisor.

Species. *Coboldus hedgpethi* (J.L. Barnard, 1969a) [373]; *C. nitior* Krapp-Schickel, 1974 (Ruffo & Schiecke, 1979, 1982) [340].

Habitat and distribution. Marine, Mediterranean Sea (type) and California, 0-82 m, 2 species.

Dikwa Griffiths

Fig.74E

Dikwa Griffiths, 1974c: 266.

Type species. *Dikwa acrania* Griffiths, 1974c, original designation.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting conically. Labrum incised, very broad. Mandibular incisor narrow, almost needle-like; raker row long; molar broad and blunt, strong, triturative. Labium: inner lobes absent, outer lobes short and broad. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: [unknown]. Maxillipeds: inner plate narrowerbut as long as outer plate, latter ordinary; palp article 2 narrow and apicomedially unproduced; palp article 4 well developed but short. Coxae 2 short; 1, 3, 4 progressively longer; coxa 4 long, monocuspidate. Gnathopods diverse, of different elongations, articles 5-6 elongate, narrow; gnathopod

1 chelate, gnathopod 2 simple. Telson emarginate.

Additional character. Head greatly reduced.

Relationship. Differing from *Iphimedia* and *Acanthonotozomella* in the simple gnathopod 2 and strongly reduced head. From *Epimeria* in the strong contrast of form between gnathopods 1 and 2. From *Odius* in the simple, unlobate gnathopod 2.

Species. *Dikwa acrania* Griffiths, 1974c [743].

Habitat and distribution. Marine, South Africa, 200 m, 1 species.

Echiniphimedia K.H. Barnard

Fig.74D

Echiniphimedia K.H. Barnard, 1930: 358.–J.L. Barnard, 1967a: 2.

Type species. *Iphimedia hodgsoni* Walker, 1906c, 1907, selected by J.L. Barnard, 1969c.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 long, subequal (but only including processes). Mouthparts projecting conically. Labrum weakly incised, or entire, not very broad. Mandibular incisor broad, stout, smooth or weakly toothed; raker row absent; molar absent or obsolescent. Labium: inner lobes absent, outer lobes moderately broad, entire or minutely incised. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long and almost as broad as outer plate, latter elongate; palp article 2 apicomedially produced or not; palp article 4 obsolescent. Coxae 1-4 progressively longer; 4-5 forming ventral arc; coxa 4 scarcely polycuspidate. Gnathopods weakly diverse, of different setosities, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised.

Additional character. Article 1 of mandibular palp with tooth.

Relationship. Close to *Iphimedia* and *Iphimediella* but differing in the presence of small teeth emerging from surface of pleon and usually from coxae and article 2 of pereopods 5-7. Unlike *Uschakoviella* in having fixed teeth, not articulate spines covering body.

Species. See J.L. Barnard (1967e); Bellan-Santini (1972b); Thurston (1974a); Watling & Holman (1981); *E. echinata* (Walker, 1906a, 1907) (? = *E. nodosa* Dana, 1853, Bate, 1862, Chevreux, 1912d, K.H. Barnard, 1930, not Stebbing, 1906) (K.H. Barnard, 1932) (Nicholls, 1938) [880 + B]; *E. hodgsoni* (Walker, 1906a, 1907) (K.H. Barnard, 1930, 1932) (Schellenberg, 1931) (Nicholls, 1938) [880 + B]; *E. scotti* K.H. Barnard, 1930 (Andres, 1985) [870 + B].

Habitat and distribution. Marine, Antarctica, 10-1120 m, 3 species.

Eclysis K.H. Barnard

Remarks. Removed to Stilipedidae.

Epimeria Costa

Figs 74C,H, 77F

?*Vertumnus* White, 1847: 89 [*nomen nudum*].
Epimeria Costa, 1851: 24 [*nomen nudum*].–Costa **in** Hope, 1851: 46.–Karaman & Barnard, 1979: 108.–Watling & Holman, 1980: 642.
Pseudepimeria Chevreux, 1912a: 9 (*Pseudepimeria grandirostris* Chevreux, 1912a, original designation).
Subepimeria Bellan-Santini, 1972b: 225 (*Subepimeria geodesiae* Bellan-Santini, 1972b, original designation).

Type species. *Epimeria tricristata* Costa *in* Hope, 1851 (= *Gammarus corniger* J.C. Fabricius, 1779), monotypy.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Accessory flagellum present or absent. Mouthparts projecting quadrately. Labrum almost entire, epistome not very broad. Mandibular incisor ordinary, toothed, rakers present; molar blunt, strong, triturative. Labium: inner lobes absent, outer lobes relatively broad. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 well developed, unguiform. Coxae 1-4 progressively longer; 4-5 forming ventral arc; coxa 4 long, polycuspidate. Gnathopods alike, article 5-6 elongate, both gnathopods simple or subchelate (typical). Telson incised or cleft.

Additional character. Mandibular palp long and strong (but weak relative to *Metepimeria*).

Variables. Molar indistinctly triturative (*E. yaquinae*); gnathopods chelate (*E. yaquinae*); gnathopods simple (*E. grandirostris*, formerly *Pseudepimeria*); dactyls pectinate (*E. grandirostris*).

Relationship. Differing from *Odius* in the pointed coxae 1-3 and strong dactyl of the maxilliped.

See *Actinacanthus*, *Epimeriella*, *Metepimeria*, *Paramphithoe* and *Parepimeria*.

Species. See Gurjanova, 1955b (key); *E. bispinosa* Ledoyer, 1986 [618A]; *E. bruuni* J.L. Barnard, 1961a [715kA]; *E. cora* J.L. Barnard, 1971b [310A]; *E. concordia* Griffiths, 1977a [701A]; *E. cornigera* (J.C. Fabricius, 1779) (= *E. cranchii* White, 1847, *nomen nudum*) (= *E. tricristata* Costa *in* Hope, 1851) (= *E. oweni* Bate, 1857d) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) [354B]; *E. extensa* Andres, 1985 [801B]; *E. georgiana* Schellenberg, 1931 (= *E. excisipes* K.H. Barnard, 1932; Watling & Holman, 1981) (Andres, 1985) [870 + B]; [*E. glacialis* Stuxberg, 1880, *nomen nudum*]; *E. glaucosa* J.L. Barnard, 1961a [716A]; *E. grandirostris* (Chevreux, 1912a,d) (Bellan-Santini, 1972b) [870B]; *E. inermis* Walker, 1903 (not 1907, = *E. robusta*) (Bellan-Santini, 1972b) [830 + B]; *E. intermedia* Schellenberg, 1931 (K.H. Barnard, 1932) [833]; *E. longispinosa* K.H. Barnard, 1916 (Griffiths, 1975) [701B]; *E. loricata* Sars, 1879, 1885, 1895 (= *E. conspicua* Stebbing, 1883) (Gurjanova, 1951) [216B]; *E. macrodonta* Walker, 1906c, 1907 (Bellan-Santini, 1972b) (Watling & Holman, 1981) [870 + B]; *E. monodon* Stephensen, 1947a (Thurston, 1974a,b) [875]; *E. obtusa* Watling, 1981 [364 + B]; *E. pacifica* Gurjanova, 1955b [322B]; *E. parasitica* (M. Sars, 1858) (Sars, 1895) (Stephensen, 1944c) [240B]; *E. pelagica* Birstein & Vinogradov, 1958 [231A]; *E. puncticulata* K.H. Barnard, 1930, 1932 (Watling & Holman, 1981) (= *E. geodesiae* Bellan-Santini, 1972b, as *Subepimeria*) [878]; [830 + B]; *E. rimicarinata* Watling & Holman, 1980 [876B]; *E. robusta* K.H. Barnard, 1930 (see *E. inermis*) [876B]; [*E. sayi* (Bate, 1862), new name for *Amphitoe serrata* of Say, 1818] [dubious] [254]]; *E. semiarmata* K.H. Barnard, 1916 (Griffiths, 1975) [701B]; *E. similis* Chevreux, 1912a,d (Andres, 1985) [870e + B]; *E. subcarinata* Nagata, 1963 [322B]; *E. tuberculata* Sars, 1895 (Enequist, 1950) (Lincoln, 1979a) [238]; *E. yaquinae* McCain, 1971 [310B].

Habitat and distribution. Marine, cosmopolitan cold waters, 2-3710 m (confirmed), 27 species.

Epimeriella Walker

Epimeriella Walker, 1906c: 17.–Walker, 1907: 26.–Karaman & Barnard, 1979: 107.

Type species. *Epimeriella macronyx* Walker, 1906c, 1907, monotypy.

Diagnosis. Body poorly armed, almost smooth. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting quadrately, *but tending to be foliaceous as in Stilipedidae*. Labrum incised; epistome not very broad, gibbous. Mandibular incisor ordinary, or broad, toothed; raker row long, molar absent or simple, conical or laminar. Labium: inner lobes absent, outer moderately gaping. Maxilla 1: inner plate slightly broadened, palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxilla 2: inner plate short and stout, outer extended, both separated at base. Maxillipeds: inner plate shorter and narrower than outer plate, latter elongate; palp article 2 narrow and medially unproduced; palp article 4 well developed, serrate. Coxae 1-4 progressively longer; coxa 1 either weakly acuminate or blunt and in some species becoming weakly expanded basally, 4-5 forming ventral arc; coxa 4 polycuspidate. Gnathopods alike, articles 5-6 ordinary, both gnathopods weakly subchelate. Telson incised or cleft.

Additional character. Pereopod 7 shorter than pereopods 5-6.

Relationship. Differing from *Epimeria* in the simple laminar or conical molar.

Put by Andres (1985) into Stilipedidae but here retained in Iphimediidae as a transitional genus.

See *Bathypanoploea* in Iphimediidae.

Species. *Epimeriella macronyx* Walker, 1906c, 1907 (K.H. Barnard, 1932) (Ruffo, 1949) (Andres, 1985) [870 + B]; *E. scabrosa* K.H. Barnard, 1930 [878B]; *E. truncata* Andres, 1985 [871B]; *E. victoria* (Hurley, 1957a) (Moore, 1985a) [775]; *E. walkeri* K.H. Barnard, 1930, 1932 (McCain, 1971) (Andres, 1985) [870B];

Habitat and distribution. Marine, Antarctica, New Zealand, 120-385 m, 5 species.

Gnathiphimedia K.H. Barnard

Fig.74F

Gnathiphimedia K.H. Barnard, 1930: 352.–Watling & Holman, 1981: 185 (key).

Type species. *Gnathiphimedia mandibularis* K.H. Barnard, 1930, selected by J.L. Barnard, 1969c.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically but not strongly. Labrum entire, epistome very broad. Mandibular incisor broad, hollowed out in form of spoon; raker row absent but right lacinia mobilis present; molar conical, simple or obsolescent. Labium: inner lobes absent or weak. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 obsolescent or absent. Coxae ordinary; 1-4 progressively longer, 4-5 forming weak ventral arc; coxa 4 long, weakly

polycuspidate. Gnathopods alike, but of different setations, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised.

Additional characters. Juveniles with 2 cornified incisorial teeth instead of spoon-hollow; mandibular palp weak.

Relationship. Differing from *Labriphimedia* in the smooth unhollowed incisor.

Species. See Nicholls (1938); Watling & Holman (1981); *G. barnardi* Thurston, 1974a (= *G. mandibularis* identification of K.H. Barnard, 1932) [833]; *G. fuchsi* Thurston, 1974b [836]; *G. incerta* Bellan-Santini, 1972b [878 + B]; *G. macrops* K.H. Barnard, 1932 (= *G. discoveryi* Watling & Holman, 1980) (Thurston, 1974a) [870 + B]; *G. mandibularis* K.H. Barnard, 1930 (not 1932, see above) [876 + B]; *G. sexdentata* (Schellenberg, 1926a) (= *G. pacifica* ID of K.H. Barnard, 1930) (Stephensen, 1947a) (Thurston, 1974a) [870 + B]; *G. urodentata* Bellan-Santini & Ledoyer, 1986 [799].

Habitat and distribution. Marine, Antarctica, 5-732 m, 6 species.

Iphimedia Rathke

Figs 74B,I,J, 75G, 76I, 77C

Iphimedia Rathke, 1843: 85.–Karaman & Barnard, 1979: 110.–Watling & Holman, 1980: 615.–Karaman, 1980b: 52.

Microcheles Krøyer, 1846b: 58, 66 (*Microcheles armata* Krøyer, 1846b, monotypy).

Panoploea Thomson, 1880: 2 (*Panoploea spinosa* Thomson, 1880, selected by J.L. Barnard, 1969c).

Iphimediopsis Della Valle, 1893: 585 (*Iphimedia eblanae* Bate, 1857d, monotypy).

Cypsiphimedia K.H. Barnard, 1955: 87 (*Iphimedia gibba* K.H. Barnard, 1940, original designation).

Type species. *Iphimedia obesa* Rathke, 1843, monotypy.

Diagnosis. Body covered with teeth or processes posteriorly or smooth. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum scarcely incised or entire, epistome not very broad. Mandibular incisor ordinary, toothed or not; raker row absent; molar conical or obsolescent, simple. Labium: inner lobes absent, outer notched or not. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long as but narrower than outer plate, latter elongate; palp article 2 apicomedially produced; palp article 4 obsolescent or absent. Coxae 1-4 progressively longer; coxa 4 sometimes weakly polycuspidate. Gnathopods diverse, of similar size, articles 5-6 elongate, narrow; gnathopod 1 filiformly chelate, gnathopod 2 narrowly subchelate. Telson entire to incised.

Variables. Occasional species with greatly elongate pereonite 1 (*I. gibba* formerly *Cypsiphimedia*); palp of maxilla 1 highly variable in length (short phase formerly called *Panoploea*); body smooth (*I. gibba*).

Relationship. A central comparative genus.
For example see *Anchiphimedia*, *Anisoiphimedia*, *Coboldus*, *Echiniphimedia*, *Iphimediella*, *Maxilliphimedia*, *Nodotergum*, *Paranchiphimedia*, *Pariphimedia*, *Pseudiphimediella* and *Stegopanoploea*.

Removal. *Iphimedia joubini* Chevreux, 1912d, to *Stegopanoploea*.

Species. See Karaman (1980b); Watling & Holman (1981); *I. ambigua* Haswell, 1879b (Stebbing, 1910a) [781]; *I. brachygnatha* Ruffo & Schiecke, 1979, 1982 [340]; *I. capicola* K.H. Barnard, 1932 (Griffiths, 1975) [743]; *I. carinata* Heller, 1867 (= *I. geniculata* Della Valle, 1893) (= *I. eblanae* identifications of Della Valle, 1893, Cecchini & Parenzan, 1935, Ledoyer, 1977) (Ruffo & Schiecke, 1979, 1982) [340]; *I. compacta* Ledoyer, 1978b [697]; [*I. corallina* Catta, 1875 (Karaman 1980b) [dubious] [348]]; *I. discreta* Stebbing, 1910a (?Schellenberg, ?1928b, ?1938a) [681]; *I. eblanae* Bate, 1857d (formerly *Panoploea*) (= *I. multispinis* Grube, 1864a,b) (Chevreux & Fage, 1925) (Ruffo & Schiecke, 1979, 1982) (Myers *et al.*, 1987a) [352]; *I. edgari* Moore, 1981b [783]; *I. excisa* (K.H. Barnard, 1932) (Pirlot, 1939) (Griffiths, 1975) [743]; *I. gibba* (K.H. Barnard, 1955) (Griffiths, 1974c) (Watling & Holman, 1980) [743]; *I. gibbula* Ruffo & Schiecke, 1979, 1982 [340]; *I. gladiola* K.H. Barnard, 1937 [674]; *I. grossimana* Ledoyer, 1972c, 1979a, 1982b [698]; *I. imparilabia* Watling & Holman, 1980 [831B]; *I. jugoslavica* Karaman, 1975a (Ruffo & Schiecke, 1979, 1982) [340]; *I. macrocystidis* (K.H. Barnard, 1932) [831]; *I. magellanica* Watling & Holman, 1980 [864B]; *I. mala* (Hirayama, 1983) [395]; *I. minuta* Sars, 1883, 1895 (Ruffo & Schiecke, 1979, 1982) (Lincoln, 1979a) (Myers *et al.*, 1987a) [352]; *I. multidentata* (Schellenberg, 1931) [864]; *I. nexa* Myers *et al.*, 1987 [240]; *I. obesa* Rathke, 1843 (= *Microcheles armata* Krøyer, 1846b) (Sars, 1895) (Lincoln, 1979a) (Ruffo & Schiecke, 1982) (Myers *et al.*, 1987a) [352]; *I. orchestimana* Ruffo, 1959 [677]; *I. pacifica* Stebbing, 1883, 1888 (Chevreux, 1912d) [880]; *I. perplexa* Myers *et al.*, 1987 [239]; *I. quasimoda* Ruffo & Schiecke, 1979, 1982 (Karaman, 1980b) [340]; *I. rickettsi* (Shoemaker, 1931a) (J.L. Barnard, 1962b, 1964b, 1966b) [372]; *I. serratipes* Ruffo & Schiecke, 1979, 1982 [340]; *I. spatula* Myers *et al.*, 1987 (= *I. eblanae* identification of Lincoln, 1979a) [240]; *I. spinosa* (Thomson, 1880) (Stephensen, 1927a) (Hurley, 1954f) [850]; *I. stegosaura* (Griffiths, 1975) [743]; *I. stimpsoni* Bate, 1862 (Stebbing, 1910a) [781]; *I. vicina* Ruffo & Schiecke, 1979, 1982 [340]; [*I. vulgaris* Stimpson, 1853 (Stebbing, 1906, *incertae sedis*) [254]].

Habitat and distribution. Marine, cosmopolitan, sublittoral and weakly bathyal, 33 species.

Iphimediella Chevreux

Iphimediella Chevreux, 1911c: 1167.–Chevreux, 1912d: 119.–Watling & Holman, 1980: 624.–Watling & Holman, 1981: 186 (key).
Pariphimediella Schellenberg, 1931: 121 (*Iphimedia serrata* Schellenberg, 1926a, original designation).

Type species. *Iphimediella margueritei* Chevreux, 1912a, designated by Chevreux, 1912b.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular article 1 long, 2 shorter than 1. Mouthparts projecting conically. Labrum incised or entire; epistome not very broad. Mandibular incisor elongate, cutting transversely, toothed or not, narrow; raker row absent; molar obsolescent. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, palp article 2 scarcely or not produced; palp article 4 well developed or obsolescent and absent. Coxae ordinary; coxa 4 polycuspidate. Gnathopods weakly diverse, alike, of different sizes and setations, articles 5-6 elongate, narrow; both gnathopods chelate. Telson slightly cleft or emarginate.

Additional character. Gnathopod 2 more strongly setose than gnathopod 1 (generally common in family).

Relationship. Differing from *Iphimedia* in the weakly or unproduced palp article 2 of the maxillipeds.
See *Anchiphimedia*, *Maxilliphimedia* and *Nodotergum*.

Removal. *Iphimediella discoveryi* Watling & Holman, 1980, to *Gnathiphimedia macrops*.

Species. See Schellenberg (1926a, 1931); K.H. Barnard (1930, 1932); Nicholls (1938); Stephensen (1947a); Bellan-Santini (1972b); *I. acuticoxa* Watling & Holman, 1980 [871]; *I. bransfieldi* K.H. Barnard, 1932 (Nicholls, 1938) [870B]; *I. cyclogena* K.H. Barnard, 1930 (= *I. intermedia* Nicholls, 1938) [870B]; *I. georgiei* Watling & Holman, 1980 [870B]; *I. imparidentata* Bellan-Santini, 1972b [878]; *I. margueritei* Chevreux, 1912a,d (= *I. acuta* Nicholls, 1938) (Stephensen, 1947a) (Watling & Holman, 1981) (Andres, 1985) [870 + B]; *I. microdentata* (Schellenberg, 1926a) (= *I. brevispinosa* K.H. Barnard, 1930) (Nicholls, 1938) [870 + B]; *I. octodentata* (Nicholls, 1938) [878B]; *I. rigida* K.H. Barnard, 1930 (Watling & Holman, 1981) [876B]; *I. serrata* (Schellenberg, 1926a) (Watling & Holman, 1981) [881 + B].

Habitat and distribution. Marine, Antarctica, 10-732 m, 10 species.

Labriphimedia K.H. Barnard

Figs 74K, 75F, 76B,K

Labriphimedia K.H. Barnard, 1931a: 427.–K.H. Barnard, 1932: 123.–Karaman & Barnard, 1979: 111.
Maoriphimedia Hurley, 1954f: 771 (*Maoriphimedia hinemoa* Hurley, 1954f, original designation).

Type species. *Labriphimedia vespuccii* K.H. Barnard, 1931a, original designation.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting conically. Labrum incised or entire, it and epistome very broad. Mandibular incisor broad, hollowed out in form of spoon; raker row absent; molar obsolescent, simple. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 obsolescent or absent. Coxae ordinary; 1-4 progressively longer; coxa 4 long, polycuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised or cleft.

Relationship. See *Gnathiphimedia*.

Species. *Labriphimedia hinemoa* Hurley, 1954f [773]; *L. pulchridentata* (Stebbing, 1883, 1888, 1906) [852]; *L. vespuccii* K.H. Barnard, 1931a, 1932 [831].

Habitat and distribution. Marine, New Zealand-Falklands-Heard, sublittoral, 3 species.

Maxilliphimedia K.H. Barnard

Fig.76D

Maxilliphimedia K.H. Barnard, 1930: 355.–Watling & Holman, 1981: 202.

Type species. *Iphimedia longipes* Walker, 1906a, 1907, monotypy.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised; it and epistome very broad. Mandibular incisor broad, minutely serrate; raker row absent; molar absent. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 enlarged. Maxilla 2: inner plate without facial

row of setae. Maxillipeds: inner plate shorter and narrower than outer plate, latter elongate; palp article 2 apicomedially produced weakly; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 polycuspidate. Gnathopods [poorly known], gnathopod 1 chelate. Telson incised.

Relationship. Characterised by the large article 2 of the palp on maxilla 1, and thereby differing from *Iphimedia* and *Iphimediella*.

Species. *Maxilliphimedia longipes* (Walker, 1906a, 1907) (K.H. Barnard, 1930) (Watling & Holman, 1981) [876 + B].

Habitat and distribution. Marine, Ross Sea region, 100-769 m, 1 species.

Metepimeria Schellenberg

Metepimeria Schellenberg, 1931: 162.

Type species. *Metepimeria acanthurus* Schellenberg, 1931, monotypy.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting quadrately. Labrum almost entire, not very broad. Mandibular incisor toothed; raker row present; molar broad and blunt, triturative. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate [?without facial row of setae]. Maxillipeds: [?inner plate shorter and narrower than outer plate, latter elongate; ?palp article 2 narrow and apicomedially unproduced]; palp article 4 absent. Coxae 1-4 progressively longer; 4-5 forming ventral arc; coxa 4 long, polycuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods simple. Telson incised or cleft.

Relationship. Like *Epimeria* but palp of maxilliped 3-articulate and gnathopods simple.
See *Parepimeria*.

Species. *M. acanthurus* Schellenberg, 1931 (K.H. Barnard, 1932) (Watling & Holman, 1981) [866 + N + B].

Habitat and distribution. Marine, Magellan-Falkland region, often neritic to 494 m, 1 species.

Nodotergum Bellan-Santini

Fig.77

Nodotergum Bellan-Santini, 1972b: 173.

Type species. *Nodotergum bicarinatum* Bellan-Santini, 1972b, original designation.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Accessory flagellum 1-articulate, obsolescent. Mouthparts projecting [?conically]. Labrum incised, not very broad. Mandibular incisor ordinary, toothed; raker row absent; molar obsolescent. Labium: inner lobes absent, outer lobes relatively broad, entire. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 long, polycuspidate. Gnathopods diverse, of similar size, articles 5-6 elongate, narrow; gnathopod 1 simple, gnathopod 2 chelate. Telson entire, but apically trifid.

Relationship. Differing from *Epimeria* and *Parepimeria* in the chelate gnathopod 2; from *Parepimeria* additionally in the short article 2 of antenna 1 and the absence of palp article 4 on the maxilliped. From *Acanthonotozomella* in the ordinary coxa 2. From *Iphimedia* and *Iphimediella* in the simple gnathopod 1. From *Acanthonotozoma* and *Bathypanoploea* in the chelate gnathopod 2.

Species. *Nodotergum bicarinatum* Bellan-Santini, 1972b [878].

Habitat and distribution. Marine, Cape Geodesie, Antarctica, 115-135 m, 1 species.

Odius Liljeborg

Figs 74N, 75D, 76H, 77B

Otus Bate, 1862: 125 (*Otus carinatus* Bate, 1862) [homonym, Lepidoptera].
Odius Liljeborg, 1865a: 11 (new name for *Otus*).–Lincoln, 1979a: 136.

Type species. *Otus carinatus* Bate, 1862, monotypy.

Diagnosis. Body with few posterior with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised, very thin, elongate. Mandibular incisor elongate, narrow, almost needle-like; toothed; raker row present; molar broad and blunt, triturative. Labium: inner lobes absent. Maxilla 1: styliform, palp 1-articulate, minute. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower and slightly shorter than outer plate (if each plate measured from its base), latter elongate; palp article 2 narrow and apicomedially unproduced (in Sars, 1895: pl.133 but P.G. Moore, *in*

litt., remarks that it is produced in his material of the type species); palp article 4 obsolescent. Coxae ordinary; 1-4 progressively longer; coxa 1 (or 2) pointed, (2) 3-4 truncate, coxa 4 long, monocuspidate. Gnathopods diverse, of different sizes, gnathopod 1 chelate, articles 5-6 elongate, narrow; gnathopod 2 enlarged, subchelate, palm transverse, articles 4-5 lobate. Telson incised or entire, elongate.

Additional characters. Mouthparts generally styliform; outer plate of maxilla 1 styliform, active margin medial, crenellated and pectinate but aspinose; mandibular palp weak.

Relationship. Differing from *Amathillopsis* in the chelate gnathopods.

See *Coboldus*, *Dikwa*, *Epimeria*, *Paranchiphimedia* and *Pariphimedia*.

Species. *Odius antarcticus* Watling & Holman, 1981 [836B]; *O. carinatus* (Bate, 1862) (Sars, 1895) (Lincoln, 1979a) [210]; *O. cassigerus* Gurjanova, 1972 [286 + B]; *O. kelleri* Brüggen, 1907 (Gurjanova, 1951) (Tzvetkova, 1968) [280].

Habitat and distribution. Marine, bipolar, 0-263 m, 4 species.

Paramphithoe Bruzelius

Figs 74L, 75A, 76C, 77E

Acanthosoma Ross, 1835: 91 (*Acanthosoma hystrix* Ross, 1835, selected by Bate, 1862) [homonym, Hemiptera].
Paramphithoe Bruzelius, 1859: 68.–Gurjanova, 1972: 178.
Acanthozone Boeck, 1871: 184 (*Oniscus cuspidatus* Lepechin, 1778-1780, monotypy). [Boeck was confused about identification of type species.]

Type species. *Acanthosoma hystrix* Ross, 1835, here selected.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting quadrately. Labrum scarcely incised; epistome not very broad. Mandibular incisor ordinary, toothed; raker row present; molar broad and blunt, triturative. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower and as long as outer plate, latter short; palp article 2 narrow and unproduced; palp article 4 well developed. Coxae 1-4 progressively longer; coxa 4 scarcely to strongly polycuspidate. Gnathopods alike, articles 5-6 elongate, narrow; both gnathopods subchelate, palms transverse. Telson entire or weakly cleft.

Additional character. Articles 5-6 of gnathopods subequally long (*Actinacanthus*).

Relationship. Differing from *Epimeria* in the noncrescentic coxae 3-4. From *Actinacanthus* in the presence of 2 teeth on epimeron 3 and the gnathopodal differences described above. See *Austroregia*.

Species. *Paramphithoe buchholzi* Stebbing, 1888, *P. b. pacifica* Gurjanova, 1951, *P. b. vafer* Gurjanova, 1972 [200]; *P. concinna* Gurjanova, 1972 [282]; *P. cuspidata* (Lepechin, 1780) (not Sars, 1895 = *P. hystrix*) (= *P. minuta* Bulycheva, 1934), *P. c. eugenovi* Gurjanova, 1972 [216 + B]; *P. hystrix* (Ross, 1835) (= *P. cuspidata* of Sars, 1895) (Gurjanova, 1972) [216 + B]; *P. monocera* Gurjanova, 1972 [260]; *P. paraparadoxa* Gurjanova, 1972 [260 + B]; *P. polyacantha* (Murdoch, 1885b), *P. p. bruggeni* Gurjanova, 1951 [220].

Habitat and distribution. Marine, pan Arctic-boreal, 2-800 m, 7 species.

Paranchiphimedia Ruffo

Fig.76M

Paranchiphimedia Ruffo, 1949: 18.

Type species. *Paranchiphimedia monodi* Ruffo, 1949, original designation.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Accessory flagellum obsolete. Mouthparts [?projecting conically]. Labrum incised, not very broad. Mandibular incisor ordinary, broad, smooth; rakers present; molar absent; palp long and strong. Labium: inner lobes absent. Maxilla 1: palp 1-articulate, very short. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 broad and apicomedially unproduced; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 monocuspidate. Gnathopods alike but of different setations and sizes, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised.

Relationship. The short palp of maxilla 1 places this genus near *Coboldus*, *Pariphimedia* and *Odius*; otherwise, it has no resemblance to *Odius* and differs from *Coboldus* and *Pariphimedia* in the unproduced maxillipedal palp and further from *Coboldus* in the chelate gnathopod 2; further from *Pariphimedia* in the facially naked maxilla 2. Close to the smoother species of *Echiniphimedia* but palp of maxilla 1 small.

Differing from *Iphimedia* in the unproduced maxillipedal palp; from *Anchiphimedia* in the

1-articulate palp of maxilla 1.

Species. *Paranchiphimedia monodi* Ruffo, 1949 [872];

Habitat and distribution. Marine, Antarctica, near Bellingshausen Sea, depth unknown, 1 species.

Parapanoploea Nicholls

Fig.76L

Parapanoploea Nicholls, 1938: 65.–Watling & Holman, 1981: 208.

Type species. *Parapanoploea oxygnathia* Nicholls, 1938, original designation.

Diagnosis. Body covered posteriorly with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum scarcely incised, not very broad. Mandibular incisor elongate, narrow, needle-like, toothed; raker row absent; molar conical, simple or obsolescent. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 absent. Coxae ordinary; 1-4 progressively longer; coxa 4 long, polycuspidate. Gnathopods alike, but of different setations, articles 5-6 elongate, narrow; both gnathopods chelate. Telson incised.

Relationship. Differing from *Acanthonotozomella* in the chelate gnathopods and absence of a raker row. From *Gnathiphimedia* and *Labriphimedia* in the needle-like incisor.

Species. *Parapanoploea longirostris* Bellan-Santini, 1972b [878]; *P. oxygnathia* Nicholls, 1938 (Watling & Holman, 1981) [875B].

Habitat and distribution. Marine, eastern Antarctica, 110-357 m, 2 species.

Parepimeria Chevreux

Figs 75H, 76J, 77J, 116D

Parepimeria Chevreux, 1911c: 1168.–Watling & Holman, 1980: 646 (+ key).
Parepimeriella Schellenberg, 1931: 165 (*Parepimeriella irregularis* Schellenberg, 1931, monotypy).–Gurjanova, 1972: 134.

Type species. *Parepimeria crenulata* Chevreux, 1911c, 1912a,d, designated by Chevreux, 1912a.

Diagnosis. Body covered with teeth or processes, or weakly so (*P. irregularis*). Antenna 1: peduncular articles 1-2 long, subequal. Mouthparts projecting quadrately. Labrum incised; epistome not very broad. Mandibular incisor narrow, toothed; raker row long; molar broad and blunt, triturative. Labium: inner lobes weak. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: plates alike, outer plate short; palp elongate, article 2 narrow and unproduced; palp article 4 well developed, unguiform. Coxae ordinary; 1-4 progressively longer; coxa 4 monocuspidate. Gnathopods alike, of different sizes, articles 5-6 elongate, narrow; both gnathopods simple. Telson entire.

Variable. Rostrum long (type) or short (*P. irregularis*).

Relationship. Differing from *Metepimeria* in the presence of inner lobes on the lower lip and the noncrescentic coxae 3-4; from *Epimeria* in the 3-articulate palp of the maxilliped.

Somewhat resembling a pleustid; obviously more study is needed on relationships between iphimediids and pleustids.

Species. See Watling & Holman (1980); *P. bidentata* Schellenberg, 1931 [865 + B]; *P. crenulata* Chevreux, 1912a,d (Stephensen, 1947a) [870 + B]; *P. irregularis* (Schellenberg, 1931) [831]; *P. major* K.H. Barnard, 1932 [871B]; *P. minor* Watling & Holman, 1980 [871B]; *P. miothele* K.H. Barnard, 1932 [871B].

Habitat and distribution. Marine, Antarctic islands near South America, 23-1080 m, 6 species.

Pariphimedia Chevreux

Figs 74G, 77G

Pariphimedia Chevreux, 1906a: 39.

Type species. *Pariphimedia integricauda* Chevreux, 1906a,c, original designation.

Diagnosis. Body with few posterior teeth or processes. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting conically. Labrum almost entire, not very broad. Mandibular incisor cutting surface elongate, oblique, toothed; raker row absent; molar obsolescent. Labium: inner lobes absent, outer lobes subrounded or pointed. Maxilla 1: palp 1-articulate, very short. Maxilla 2: inner plate with facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow but apicomedially produced; palp article 4 obsolescent or absent. Coxae ordinary; 1-4 progressively longer; 4-5 forming weak ventral arc; coxa 4 scarcely

polycuspidate. Gnathopods alike, but of different setosities; articles 5-6 elongate, narrow; both gnathopods chelate. Telson entire.

Variables. Outer plate of maxilliped very elongate (*P. normani*); telson weakly incised (*P. normani*).

Relationship. Like *Odius*, *Coboldus* and *Paranchiphimedia* in the 1-articulate palp of maxilla 1; further differing from *Coboldus* in the entire telson, chelate gnathopod 2 and facially armed inner plate of maxilla 2; from *Odius* and *Paranchiphimedia* in the produced article 2 of the maxillipedal palp. From *Iphimedia* in the entire telson, 1-articulate palp of maxilla 1 and the facial armament of maxilla 2, and the serrate incisor. From *Anchiphimedia* in the 1-articulate palp of maxilla 1 and the produced palp of the maxilliped.

Species. *Pariphimedia incisa* Andres, 1985 [875]; *P. integricauda* Chevreux, 1906a,c (not K.H. Barnard, 1932) (Stephensen, (1947a) (Thurston, 1974a,b) [870]; *P. normani* (Cunningham, 1871) (Stebbing, 1914b) (Schellenberg, 1931) (K.H. Barnard, 1932) [880].

Habitat and distribution. Marine, Magellan-Palmer and outliers, 0-91 m, 2 species.

Postodius Hirayama

Postodius Hirayama, 1983: 97.

Type species. *Postodius imperfectus* Hirayama, 1983, original designation.

Diagnosis. Body weakly carinate dorsally. Antenna 1: peduncle of article 2 shorter than 1. Mouthparts projecting conically. Labrum not incised, epistome not very broad. Mandibular incisor narrow, barely toothed; rakers present; molar well developed, poorly triturative. Labium: inner lobes absent, outer notched. Maxilla 1: palp 1-articulate, short. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower and shorter than outer plate; palp article 2 unproduced; palp article 3 large, stubby, setose, article 4 absent. Coxae 1-4 progressively larger, equally long, coxa 1 acuminate, no ventral arc formed; coxa 4 with 1 cusp. Gnathopods diverse, of differing sizes, gnathopod 1 feeble, slender, parachelate, gnathopod 2 with lobate wrist, expanded hand, palm subtransverse. Telson elongate, entire.

Relationship. Scarcely distinct but differing from *Odius* in the 3-articulate palp of the maxilliped, slightly weaker chelation of gnathopod 1 and non-emarginate telson.

Species. *Postodius imperfectus* Hirayama, 1983 [395].

Habitat and distribution. Marine, west Kyushu, 20 m, 1 species.

Pseudiphimediella Schellenberg

Fig.77K

Pseudiphimediella Schellenberg, 1931: 119.–Watling & Holman, 1980: 639.

Type species. *Amphitoe nodosa* Dana, 1853, original designation.

Diagnosis. Body covered with teeth or processes. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting quadrately. Labrum incised, not very broad. Mandibular incisor broad, cutting frontally, weakly toothed; raker row absent; molar absent. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate as long but not as broad as outer plate, palp article 2 broad and apicomedially unproduced; palp article 4 obsolescent. Coxae ordinary. Gnathopods scarcely diverse, of slightly different sizes, articles 5-6 elongate, narrow; both gnathopods chelate. Telson scarcely incised.

Additional character. Gnathopod 2 more strongly setose than 1.

Relationship. Like *Iphimediella* but mandible cutting in frontal plane; thus mouthparts projecting quadrately.

Differing from *Echiniphimedia* in the absence of surficial cusps, all teeth emerging from margins of segments and coxae.

Species. *Pseudiphimediella glabra* (Schellenberg, 1931) (Watling & Holman, 1980) [866 + B]; *P. nodosa* (Dana, 1852a, 1853) (K.H. Barnard, 1932) [866].

Habitat and distribution. Marine, Magellan-Falkland, 2-494 m, 2 species.

Stegopanoploea Karaman

Stegopanoploea Karaman, 1980b: 51.

Type species. *Panoploea joubini* Chevreux, 1912a,d original designation.

Diagnosis. Body with strong posterior teeth and processes, (rostrum very long). Antenna 1: peduncular article 1 nearly twice as long as 2, (accessory flagellum absent). Mouthparts projecting conically. Labrum entire,

rather narrow, epistome not very broad. Mandibular incisor narrow and long, toothed, raker row absent; molar well developed, triturative. Labium: inner lobes absent, outer lobes narrow, long, pointed distally, with nearly smooth inner margin. Maxilla 1: (outer plate with spines), palp short, 2-articulate, ratio of articles normal. Maxilla 2: inner plate with facial row of setae (fide Bellan-Santini, 1972b). Maxillipeds: inner plate narrower and shorter than outer plate; palp 3-articulate, article 2 apicomedially produced. Coxae 1-4 progressively longer, 4-5 forming ventral arc; coxa 4 strongly polycuspidate. Gnathopods narrow, diverse, with elongate articles 5-6; gnathopod 1 chelate, gnathopod 2 poorly subchelate. Telson incised.

Relationship. Differing from *Iphimedia* by the well-developed triturative mandibular molar, in the presence of facial setae on the inner plate of maxilla 2, and by the untoothed inner margin of the outer lobes of the labium.

Species. *Stegopanoploea joubini* (Chevreux, 1912a,d) (? = var. *S. bidentata* Nicholls, 1938) (Bellan-Santini, 1972b) (Karaman, 1980b) [870 + B].

Habitat and distribution. Marine, Antarctica, 45-426 m, 1 species.

Uschakoviella Gurjanova

Fig.75B

Uschakoviella Gurjanova, 1955b: 199.–Shoemaker, 1964: 417.

Type species. *Uschakoviella echinophora* Gurjanova, 1955b, original designation.

Diagnosis. Body covered with articulated spines. Antenna 1: peduncular articles 1-2 subequal. Mouthparts projecting conically. Labrum incised, not very broad. Mandibular incisor ordinary, toothed; raker row weak; molar broad and blunt, triturative. Labium: inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxillipeds: inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomedially unproduced; palp article 4 well developed. Coxae 1-4 progressively longer; 4-5 forming ventral arc; coxa 4 scarcely polycuspidate. Gnathopods alike, article 5 elongate, 6 shorter, both narrow; both gnathopods scarcely chelate. Telson incised or cleft.

Relationship. Differing from *Echiniphimedia* in the well-developed molar and the articulate condition of the spines covering the body surface; in *Echiniphimedia* the processes are fixed.

Differing from *Acanthonotozoma* in the slightly chelate gnathopods and from most other taxa lacking rakers but bearing chelate gnathopods by the well-developed dactyl of the maxillipedal palp.

Species. *Uschakoviella echinophora* Gurjanova, 1955b, *U. e. abyssalis* Gurjanova, 1955b (Shoemaker, 1964) (Watling & Holman, 1981) [230 + AB].

Habitat and distribution. Marine, Okhotsk-Bering region, 54-2550 m, 1 species.

Ochlesinae Stebbing, 1910a

Diagnosis. Palp of maxilliped with 0-2 articles.

Description. Body massive, compressed; anterior coxae acuminate or oddly shaped. Head short, tall, partially enveloped by pereon. Accessory flagellum absent. Mouthparts grouped conically. Mandibular rakers absent, molar very small poorly triturative or simple. Palp of maxilliped absent or 1-articulate or 2-articulate. Gnathopods feeble, gnathopod 1 simple, hand of gnathopod 2 simple, otherwise gnathopod 2 carpo- or merochelate. Urosomites separate. Uropod 3 ordinary. Telson entire or weakly slit.

See Iphimediinae and Lysianassidae.

Additional description. Rostrum large. Eyes ordinary. Lateral cephalic lobes well developed. Antennae cuspidate or not; antennal flagella sparsely articulate. Labrum elongate. Left mandible with spiniform lacinia mobilis, right absent, palp article 1 elongate. Mandibular lobes of labium acuminate, inner lobes weak or absent. Inner plate of maxilla 1 small, outer plate subconical, spines mostly fused to base, palp vestigial or absent. Maxilla 2 elongate. Inner plate of maxilliped acuminate, outer operculiform. Coxae variable. Articles 3-6 of gnathopod 1 elongate, apical setae strap-shaped or grossly feathered; articles 4-6 of gnathopod 2 elongate. Article 2 of pereopods 5-7 well or weakly expanded, with even or deeply sinuate posteroventral lobe. Pereopodal dactyls variable in length. Pleopods ordinary. Epimera toothed or not. Outer ramus of uropod 3 shortened. Body narrowing dorsally to thin continuous keel, 1 or more segments usually with large dorsal tooth.

Gills 2-?, narrow, strap shaped and clavate or apically geniculate; oostegites narrow and broad together in same species, thus narrow on coxae 2 and 5 but broad on coxae 3-4 or also broad on coxa 2 in another species.

Variables. Peduncle of antenna 1 with large teeth (type) or not (*O. eridunda*); dactyls of pereopods 3-7 elongate (*O. innocens*), short (*O. lenticulosus*).

Relationship. Of the suborder Gammaridea, only

certain members of the Ochlesinae and the genus *Danaella* (see also *Thoriella* and *Chevreuxiella* in the Lysianassidae) lack a palp on the maxilliped. This lack is characteristic of all members of the Hyperiidea but Ochlesinae appear in other respects to be related closely to Gammaridea; and *Ochlesodius* has a 2-articulate palp and thus shows a close connection to the Iphimediidae. The large coxae are especially characteristic of gammarideans but the general body shape resembles that of Iphimediiae and Stilipedidae (= Astyridae).

Assumed to derivatives of the Iphimediinae.

Key to Genera of Ochlesinae

1. Palp of maxilliped 2-articulate ..... *Ochlesodius*

—— Palp of maxilliped 0 to 1-articulate 2

2. Body keel dorsally flattened, with plaques, pereonites with lateral plaques (Fig.80C), telson linguiform, lateral margins curled upward ..... *Meraldia*

—— Body keel dorsally knife-like, pereonites smooth laterally, telson flat 3

3. Palp of maxilliped absent ..... *Ochlesis*

—— Palp of maxilliped 1-articulate ..... *Curidia*

Curidia Thomas

Curidia Thomas, 1983: 127.

Type species. *Curidia debrogania* Thomas, 1983, original designation.

Diagnosis. Like *Ochlesis* but maxilliped with 1-articulate palp.

Species. *Curidia debrogania* Thomas, 1983 [471].

Habitat and distribution. Marine, Caribbean Sea, Belize, 6 m, 1 species.

Meraldia Barnard & Karaman

Figs 78C, 79B

Meraldia Barnard & Karaman, 1987: 857.

Type species. *Ochlesis meraldi* J.L. Barnard, 1972b, original designation.

Diagnosis. As in key.

Species. *Meraldia meraldi* (J.L. Barnard, 1972b) [785].

Habitat and distribution. Marine, Pearson Islands, South Australia, 35 m, 1 species.

Ochlesis Stebbing

Figs 78A,B,D, 79A,C

Ochlesis Stebbing, 1910a: 581.

Type species. *Ochlesis innocens* Stebbing, 1910a, monotypy.

Diagnosis. As in key.

Removal. *Ochlesis meraldia* J.L. Barnard, 1972b, to *Meraldia.*

Species. *Ochlesis alii* J.L. Barnard, 1970a (?*O. innocens* identification of Pirlot, 1936b and ?Schellenberg, 1938a) [381 + ?640]; *O. carinatus* Ledoyer, 1986 [725wB]; *O. eridunda* J.L. Barnard, 1972b [785]; *O. innocens* Stebbing, 1910a [781]; *O. lenticulosus* K.H. Barnard, 1940 (Griffiths, 1974b,c, 1975) [743]; *O. levetzowi* Schellenberg, 1953 (Griffiths, 1974a,c) [743].

Habitat and distribution. Marine, Indo-Pacific from Hawaii to southern Australia and southern Africa, 0-200 m, 6 species.

Ochlesodius Ledoyer

Ochlesodius Ledoyer, 1982b: 48.

Type species. *Ochlesodius spinicornis* Ledoyer,

1982b, original designation.

Diagnosis. As in key.

Species. *Ochlesodius spinicornis* Ledoyer, 1982b [693].

Habitat and distribution. Marine, Glorieuseus, 26 m, 1 species.

ISCHYROCERIDAE Stebbing, 1899a

See Corophioidea

KURIIDAE J.L. Barnard, 1964c

Diagnosis. Head ordinary; body laterally compressed, barely rugose, urosomites 1-3 or 2-3 fused. Anterior coxae ordinary, much larger than posterior coxae. Antennae ordinary. Mandible lacking palp, molar triturative. Gnathopods feeble, poorly prehensile, carpus and propodus linear, palms very short, almost parachelate. Pleopods [?ordinary]. Uropod 3 with 1 ramus. Telson about as long as broad, deeply cleft, formed into tent.

See other Talitroidea such as Hyalidae, Hyalellidae, Ceinidae, Phliantidae, Plioplateidae, Dexaminidae,

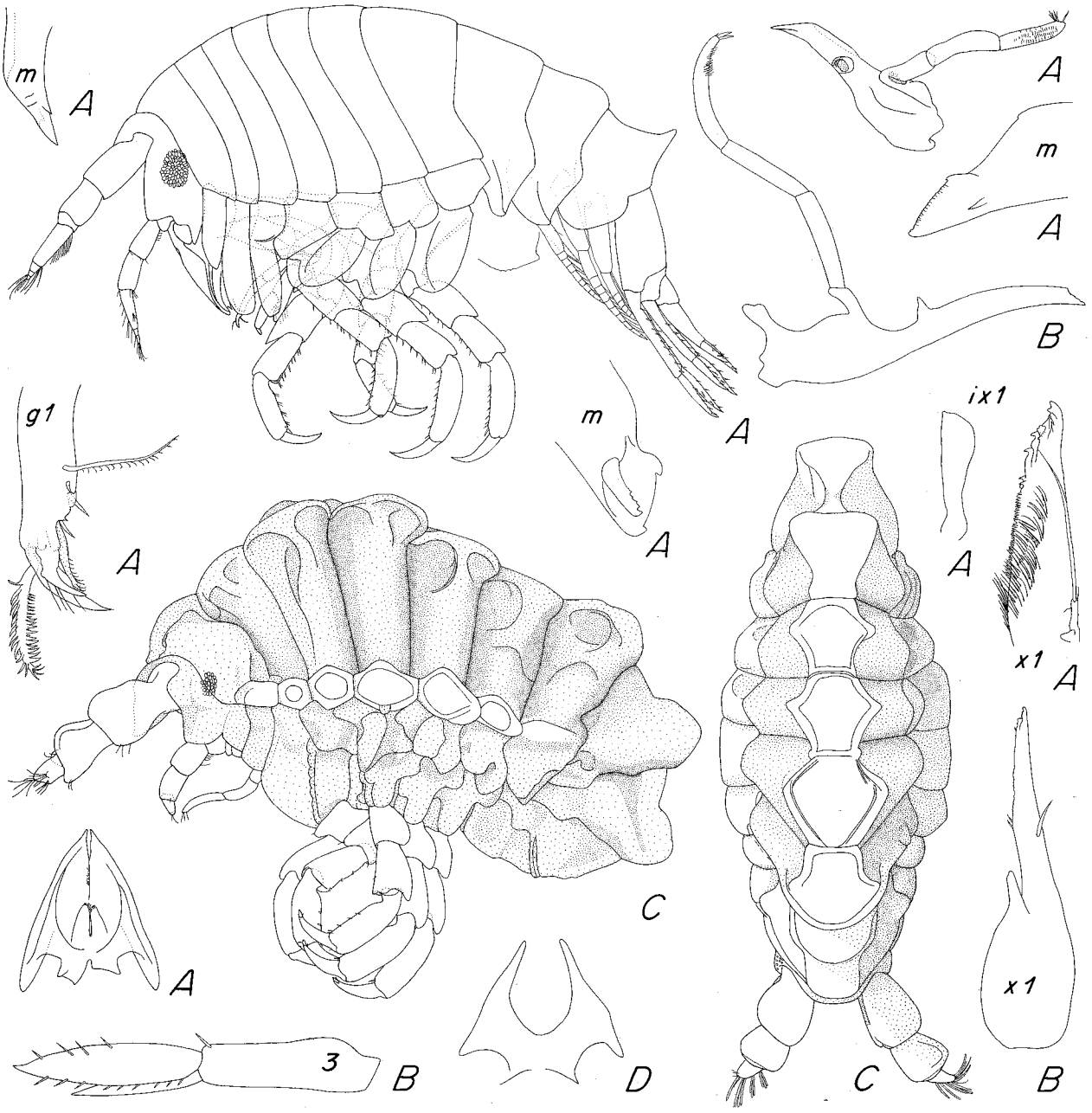

Fig.78. Iphimediidae, Ochlesinae. A, *Ochlesis eridunda*; B, *Ochlesis innocens*; C, *Meraldia meraldi*; D, *Ochlesis lenticulosus*.

Pagetinidae and Sebidae.

Description. Rostrum absent. Eyes ommatidial, small. Accessory flagellum absent; antennae of medium size, flagella poorly developed, antenna 1 slightly larger than 2. Mandibular incisors toothed, laciniae mobiles present, rakers present, palp absent. Labrum, labium, maxillae [unknown]. Inner plates of maxillipeds ordinary, outer much smaller, palp robust, dactyl stubby, with long nail and accessory setae. Article 3 of gnathopods 1-2 elongate, article 6 longer than 5. Pereopods 3-4 stouter than gnathopods, simple; article 2 of pereopods 5-7 broadly expanded, article 4 expanded and lobate, pereopods otherwise short and alike. Pleopods [unknown]. Uropods 1-2 ordinary, rami with apical and marginal spines; uropod 3 very small. Body and appendages studded with setules. Gills [unknown]; oostegites [unknown].

Relationship. Characterised by the fused urosomites on a laterally compressed body with ordinary coxae and 1-articulate uropod 3. The Dexaminidae have biramous uropod 3.

Hyalidae, Dogielinotidae, Hyalellidae and Ceinidae have separate urosomites; Phliantidae and Plioplateidae have flexed urosomes, cuspidate bodies, heads or antennae and have unusual pleopods, either the rami being 1-articulate, or reduced on one or more pleopods, or the peduncles are expanded. One assumes the unknown pleopods of Kuriidae are ordinary, with slender and long multiarticulate subequal rami.

The Pagetinidae have a mandibular palp but the molar is weak or absent, and the plates of the maxillipeds are reduced.

The Sebidae have chelate gnathopods, mandibular palps, elongate peduncles of the antennae, and subequally large coxae 4 and 5.

Kuria Walker & Scott

Fig.80

Kuria Walker & Scott, 1903: 228.

Type species. *Kuria longimanus* Walker & Scott, 1903, monotypy.

Diagnosis. With the characters of the family.

Species. *Kuria longimanus* Walker & Scott, 1903 [676].

Habitat and distribution. Marine, Abd-el-Kuri, [?littoral], 1 species.

LAFYSTIIDAE Sars, 1895

Diagnosis. Accessory flagellum absent. Field of mouthparts conical. Mandibular molar absent. Palp of maxilla 1 vestigial, 1-articulate. Palp of maxilliped 2-articulate. Coxae 1-3 quadrate, coxa 4 acuminate. Gnathopod 1 simple. Telson short, entire.

See Iphimediidae and Laphystiopsidae.

Description. Body broad, depressed, not carinate. Urosome flattened, urosomite 1 elongate. Rostrum large, eyes bulging laterally. Antenna 1 dominant, peduncle short. Upper lip entire, with narrow, almost attenuate apex. Mandible modified for piercing, palp well developed, 3-articulate. Inner lobes of lower lip absent. Inner plate of maxilla 1 medium, apically setose, outer plate with 7 spines. Plates of maxilla 2 narrow, inner plate medially setose. Inner plate of maxilliped narrow,

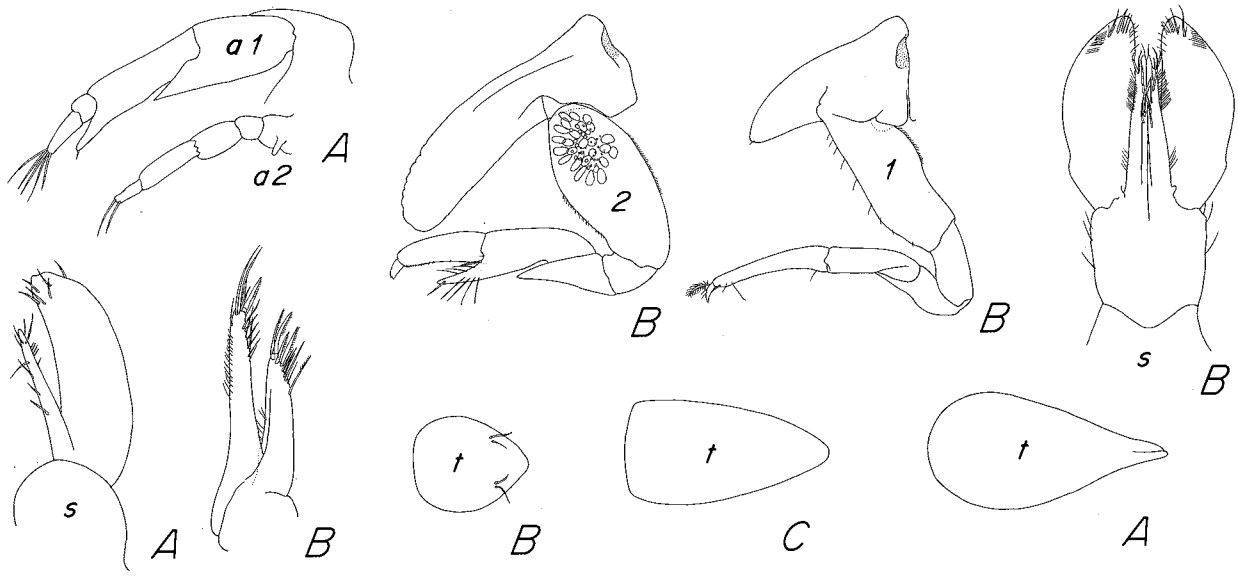

Fig.79. Iphimediidae, Ochlesinae. A, *Ochlesis innocens*; B, *Meraldia eridunda*; C, *Ochlesis lenticulosus*.

apically armed, outer plate large, sparsely armed, palp short. Coxa 4 longer than coxa 3, coxae 5-6 with sharp and elongate posterior lobe. Gnathopod 1 slender, propodus and dactyl elongate; gnathopod 2 feeble, propodus not elongate, weakly parachelate, dactyl elongate. Pereopods 3-4 much larger than gnathopods, dactyls deeply curved; pereopods 5-7 extending equally, article 2 increasingly expanded, dactyls deeply curved. Epimeron 2 dominant. Uropods 1-3 extending equally, outer rami shortened, peduncle of uropod 3 scarcely elongate. Telson ovate.

Relationship. Differing from the Iphimediidae in the quadrate coxae 1-3 and 2-articulate palp of the maxilliped; from Laphystiopsidae in the reduction of the palps on maxilla 1 and maxilliped, the loss of molars and raker rows, the retention of prehensility on gnathopod 2, and the apically narrowed, entire upper lip.

Other affinities are discussed through the Laphystiopsidae.

Lafystius Krøyer

Fig.81

Lafystius Krøyer, 1842: 156.–Stebbing, 1906: 208.
Darwinia Bate, 1857d: 141 (*Darwinia compressa* Bate, 1857d, monotypy).
?*Dermophilus* Beneden & Bessels, 1870: 26 (*Dermophilus lophii* Beneden & Bessels, 1870, monotypy, *nomen nudum*).
?*Ichthyomyzocus* Hesse, 1873: 5 (*Ichthyomyzocus ornatus* Hesse, 1873, here selected).

Type species. *Laphystius sturionis* Krøyer, 1842, monotypy.

Diagnosis. With the characters of the family.

Species. *Lafystius sturionis* Krøyer, 1842 (= *L. compressa* Bate, 1857d) (= *L. lophii* Beneden & Bessels, 1870) (= *L. ornatus*, *L. morrhuae*, *L. squatinae* Hesse, 1873) (Sars, 1895) (Chevreux & Fage, 1925) (Stephensen, 1931a, 1938b) (Lincoln, 1979a) [354].

Habitat and distribution. Marine, boreal to warm-temperate, amphi-Atlantic, littoral, occurring on fishes, 1 species.

LAPHYSTIOPSIDAE Stebbing, 1899a

Diagnosis. Accessory flagellum absent. Field of mouthparts not conical. Mandibular molar scarcely triturative or not. Palp of maxilla 1 large, 1-2 articulate. Palp of maxilliped 4-articulate. Coxae 1-4 small, quadrate or anteroposteriorly rectangular. Gnathopods 1-2 feeble simple. Telson short, entire.

See Iphimediidae, Lafystiidae, Eusiridae (Calliopiidae, Pleustidae), Oedicerotidae and Stilipedidae (= Astyridae).

Description. Body broad, depressed, weakly to strongly carinate on pleonites 3-4 or 1-3 only. Urosome slightly flattened, urosomite 1 elongate or not. Head flat, rostrum large and spatulate or absent; eyes present or absent; sides of head bulging or not. Antenna 1 dominant, peduncle short, flagellum elongate, article 1 of flagellum pubescent or not.

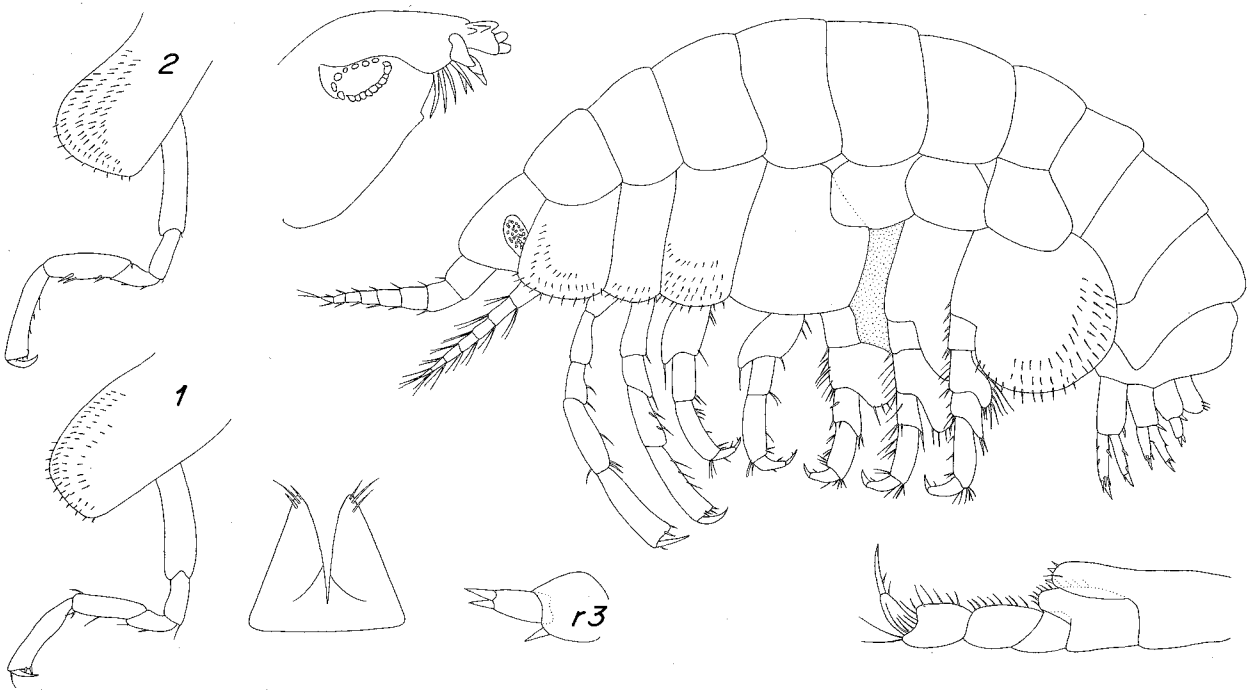

Fig.80. Kuriidae. A, *Kuria longimanus*.

Upper lip broad, incised. Mandibular incisors ordinary, not attenuate or piercing, palp well developed, 3-articulate. Inner lobes of lower lip weak or absent. Inner plate of maxilla 1 small, ovate, with 1 small seta, outer plate with 5-7 spines, palp variable. Plates of maxilla 2 narrow, inner setose medially or not. Plates of maxilliped ordinary, palp large or small. Coxae variable, short and evenly extending or middle coxae longer. Gnathopods simple, like pereopod 3, carpus elongate. Pereopods 5-7 increasingly elongate or not, article 2 increasingly expanded. Epimeron 2 dominant. Uropods 1 and 3 exceeding uropod 2 (as far as known), outer rami slightly shortened or not; peduncle of uropod 3 scarcely elongate. Telson ovate.

Variables. *Prolaphystius* departs most from the typical characterisation in the absence of rostrum, larger middle coxae, excavate coxa 4, lysianassid-like pereopods 5-7, and elongate urosomite 1.

Relationship. The Laphystiopsidae are simply taxa like Eusiridae (= Calliopiidae) and Pleustidae with feeble, simple gnathopods; feeble, poorly setose maxillipedal palps; and poorly developed mandibular molars. The lower lip of the type genus is like the characteristic labium of Pleustidae, although *Prolaphystius* carries the situation further in having lost the inner lobes.

Like the Lafystiidae one supposes Laphystiopsidae might have some roots in Iphimediidae. Lafystiidae have an acuminate coxa 4 and otherwise fit the Iphimediidae except for the reduced palp on the maxilliped. The Laphystiopsidae are so diverse that they must be discussed one at a time. *Laphystiopsis* differs from Iphimediidae in the very short non-acuminate coxae and flattened (though strongly rostrate) head; *Prolaphystiopsis* differs in the flat rostrum and possibly the coxae [not described]; *Prolaphystius* differs in the non-rostrate head and thin geniculate urosome.

The Stilipedidae (= Astyridae) bear a small accessory flagellum, large outer lobes on the maxillipeds and strongly dominant carpus on the gnathopods.

All but one genus of Oedicerotidae have elongate peduncles on uropod 3, and that genus, *Metoediceros*, like other oedicerotids, has slightly or strongly subchelate gnathopods, disproportionately elongate pereopod 7, strongly setose pereopods, and un-notched labra.

Corophioids have triturative molars and usually subchelate or strongly setose and specialised gnathopods.

The Laphystiopsidae might be confused with Phoxocephalidae which also have a flat, spatulate

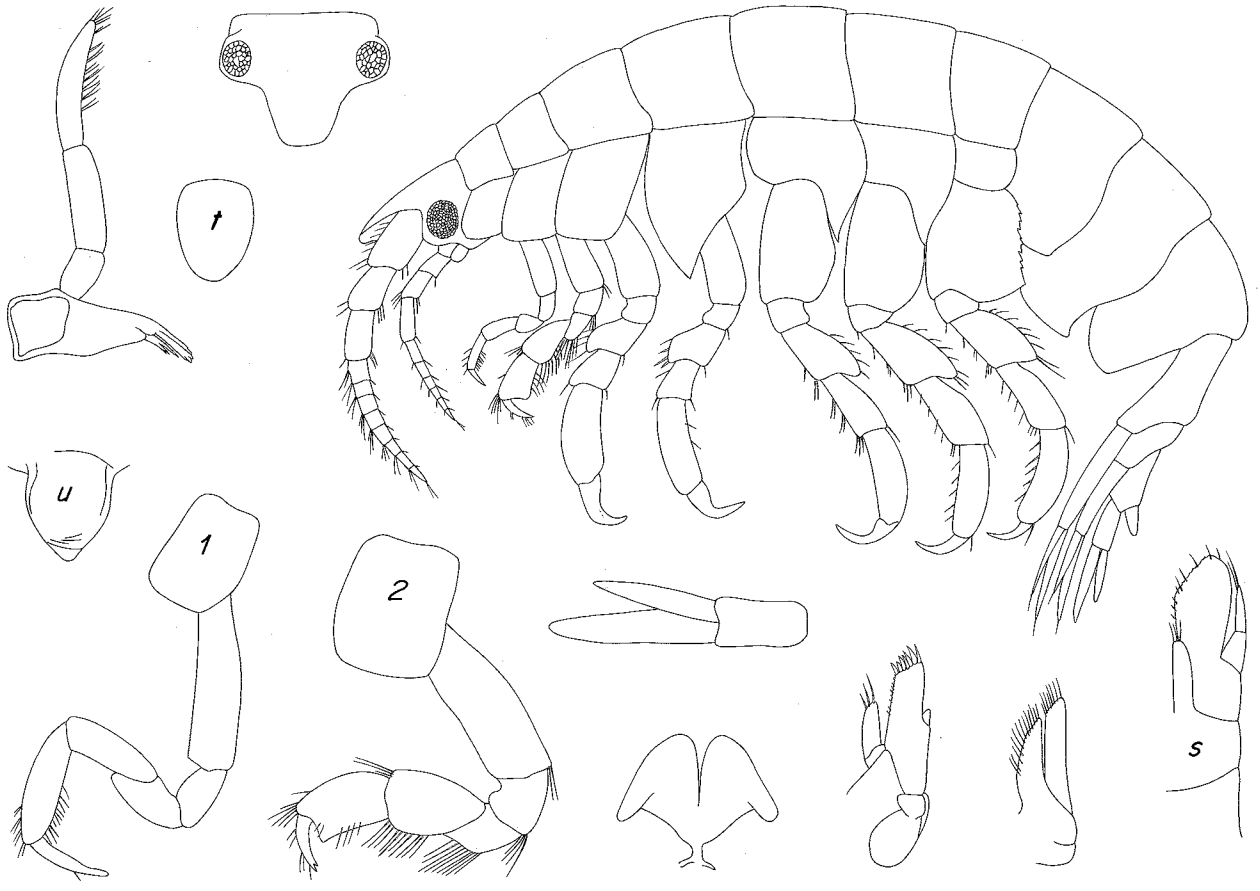

Fig.81. Lafystiidae. A, *Lafystius sturionis*.

rostrum, but Laphystiopsidae differ in the non-fossorial pereopods and antennae and the large magniramous uropod 3 lacking article 2 on the outer ramus (occasionally true in Phoxocephalidae but only with short uropod 3), the small coxae, the weak antenna 2 and the uncleft telson.

The uniformity of Laphystiopsidae is spoiled by the loss of the rostrum in *Prolaphystius*. That genus has a long urosomite 1 as in Podoceridae but otherwise has no further relationship to that family. *Prolaphystius* is added to the Key to the Genera of Eusiridae where it seems to have some affinity.

Key to Genera of Laphystiopsidae

1. Large rostrum absent, coxa 4 almost as long as broad and deeply excavate posteriorly ..... *Prolaphystius*

—— Large rostrum present, coxa 4 small, much wider than long, unexcavate posteriorly 2

2. Palp of maxilla 1 2-articulate ..... *Prolaphystiopsis*

—— Palp of maxilla 1 1-articulate ..... *Laphystiopsis*

Laphystiopsis Sars

Fig.82B

Laphystiopsis Sars, 1895: 386.

Type species. *Laphystiopsis planifrons* Sars, 1895, monotypy.

Diagnosis. Rostrum well developed. Mandibular molar conical, unridged. Palp of maxilla 1 1-articulate. Coxae short, broad, not touching serially, coxa 4 much wider than long, not excavate posteriorly. Pleonite 3 dorsally carinate but not forming horizontal shelf, urosomite 1 carinate and saddled. Telson short, oval.

Description. Article 1 of antenna 1 weakly carinate to strongly produced apically and massive. Coxae produced forward or not. Articles 2-7 of pereopod 2 either like pereopod 1 or pereopod 3. Pleonites 3-4

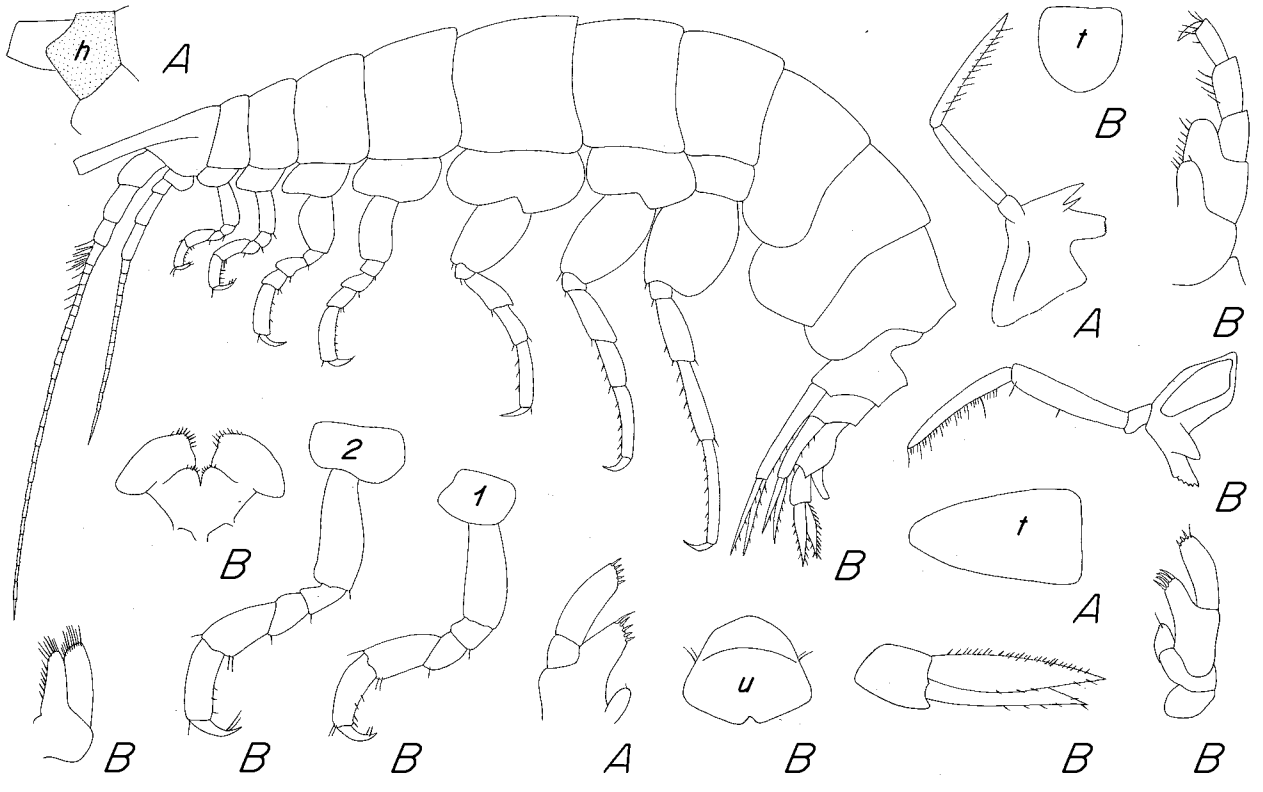

Fig.82. Laphystiopsidae. A, *Prolaphystius isopodops*; B, *Laphystiopsis planifrons*.

carinate and pleonite 4 saddled or only pleonites 1-3 carinate.

New records. Shoemaker (1919) did not publish data on *L. iridometrae*; these are *Albatross* 5310, South China Sea near Hong Kong, 21°33'N 116°13'E, 183 m and *Albatross* 5311, same, 21°33'N 116°15'E, 161 m.

Species. *Laphystiopsis iridometrae* Shoemaker, 1919 (Vader, 1978) [652I]; *L. ornitorhynchus* Bulycheva, 1952 [391 + B]; *L. planifrons* Sars, 1895 (Stephensen, 1926, 1931a, 1938b) (Gurjanova, 1951) [240 + B].

Habitat and distribution. Marine, boreal to South China Sea, 167-900 m, occasionally on crinoids, 3 species.

Prolaphystiopsis Schellenberg

Fig.82A

Prolaphystiopsis Schellenberg, 1931: 115.

Type species. *Prolaphystiopsis platyceras* Schellenberg, 1931, monotypy.

Diagnosis. Rostrum well developed. Mandibular molar conical, scarcely triturative. Palp of maxilla 1 2-articulate. [?Coxae short, broad, not touching serially, coxa 4 much wider than long, not excavate posteriorly. ?Pleonite 3 dorsally carinate and not forming horizontal shelf; ?urosomite 1 carinate and saddled]. Telson short, oval.

Description. Article 1 of antenna 1 strongly carinate, massive. [Coxae, pereopod 4 and pleon unknown].

Second species. Characters in brackets of diagnosis true.

Species. *Prolaphystiopsis latirostris* Ledoyer, 1986 [618A]; *P. platyceras* Schellenberg, 1931 [831].

Habitat and distribution. Marine, north-west of Falkland Islands, 197 m, and north-east of Geyser Bank near Madagascar, 2300-2500 m, 2 species.

Prolaphystius K.H. Barnard

Prolaphystius K.H. Barnard, 1930: 342.

Type species. *Prolaphystius isopodops* K.H. Barnard, 1930, monotypy.

Diagnosis. Rostrum absent. Mandibular molar columnar, scarcely triturative. Palp of maxilla 1 2-articulate. Coxae of ordinary size, touching serially, coxa 4 about as long as wide, excavate posteriorly. Pleonite 3 dorsally flattened and forming horizontal shelf projecting posteriorly; urosomite 1 unmodified (young) or in adult weakly saddled. Telson elongate, linguiform.

Description. Article 1 of antenna 1 thick, not carinate. Coxae not produced forward. Pereopod 4 like pereopod 3. Pleonites 1-2 not carinate.

Species. *Prolaphystius isopodops* K.H. Barnard, 1930 [876B].

Habitat and distribution. Marine, McMurdo Sound, 406-441 m, 1 species.

LEUCOTHOIDAE Dana, 1852b

Diagnosis. Accessory flagellum vestigial, 1 to 2-articulate, very small. Mandible lacking molar. Outer plates of maxilliped very small, probably never larger than inner plates. Coxa 1 ordinary. Gnathopod 1 carpochelate. Telson entire.

See Amphilochidae, Anamixidae, Cressidae, Sebidae and Stenothoidae.

Description. Body laterally compressed, smooth, slick and shiny. Rostrum small to large and thick; lateral cephalic lobes weak, eyes ommatidial. Antenna 1 slender, often partially attached to rostrum, peduncle long, article 2 often as long as 1, main flagellum sparsely articulate, accessory flagellum vestigial or absent, rarely 2-articulate. Antenna 2 slender, feeble. Epistome strongly produced anteriorly, front of head with midvertical keel; labrum asymmetrically incised. Mandibles lacking molar, raker row long, incisors broad, toothed, wavy or with only one lateral notch, palp slender, feeble, 1 or 3-articulate, article3 short, E-setae sparse. Labium with inner lobes discrete or fused to outer, gape moderate to absent, mandibular lobes well developed. Inner plate of maxilla 1 small, naked or sparsely setose, outer plate with 5-9 spines, palp 1 or 2-articulate. Maxilla 2 feeble, inner plate broad, medial setae sparse but thick and short, spine-like, outer plate much more slender and sparsely setose. Outer plates of maxillipeds moderately developed, inner plates small and discrete or mostly fused together, palp of maxilliped long, thin, 4-articulate.

Coxa 1 large, sometimes hidden by shield-like coxae 2-4; coxa 2 largest, 4 scarcely larger than 3, weakly excavate or not, coxae 5-7 slightly to greatly smaller. Gnathopod 1 small or large, carpochelate but often 6-articulate (either articles 4-5 or 6-7 thought to be amalgamated). Gnathopod 2 very large and often strongly carpochelate, propodus large in males and some females, elongate, oval, weakly to strongly

sculptured, palm present or absent, dactyl long, overlapping propodus and carpal process.

Pereopods 3-4 slender. Pereopods 5-7 alike, short, bases expanded, 7 often weakly lobate. Pleopods biramous, multiarticulate. Uropods 1-3 slender, apparently reaching to same extent, uropod 3 often breaking away, rami lanceolate, outer rami weakly to strongly shortened, weakly to moderately spinose. Uropod 3 biramous, peduncle elongate as on uropods 1-2. Telson short to long, ovate, entire. Gills simple, ovate, small. Oostegites thin or moderately broad. Sexual dimorphism not apparent in many taxa.

Relationship. The Amphilochidae have well-developed mandibles and gnathopod 1 is never so fully carpochelate as in leucothoids, nor does the second gnathopod quite reach the condition in which the appendage is huge, the long carpal process overlapped by the dactyl and the huge propodus have such a poor palm.

The Cressidae and Stenothoidae have a uniramous uropod 3; many specimens of both Leucothoidae and Cressidae lose uropod 3 on death so again one must note the conspicuous size and form of gnathopod 2 in the Leucothoidae. This is also mostly true of Stenothoidae but all genera of that family also have pereopod 5 with narrow article 2. Cressidae have the telson fused with urosomite 3.

The Sebidae have uniramous third uropods and propodochelate (not carpochelate) gnathopod 1. Their urosomites 2-3 are coalesced.

The Anamixidae superficially resemble Leucothoidae but are characterised by the reduced coxa 1 and strong sexual dimorphism.

Ecology. The Anamixidae and some Leucothoidae have been assumed in the past to be piercing and sucking inquilines and are usually found in warm shallow waters on sessile invertebrates, particularly sponges, tunicates, corals and perhaps hydroids. However, Thomas & Taylor (1981) have found that male *Anamixis* are filter feeders despite the vestigial mandibles and maxillae and the presence of a 'piercing' stylet. Thomas & Barnard (new observations) also find that leucothoids are filter feeders, often inside ascidians and tunicates.

Key to Genera of Leucothoidae and Anamixidae

1. Coxa 1 large and visible, palp of mandible 3-articulate 2

—— Coxa 1 small or absent and largely hidden by coxa 2, palp of mandible 0 to 1-articulate 4

2. Coxa 2 very short, broader than long, acute anteriorly ..... *Leucothoe (Leucothoella)*

—— Coxa 2 at least as long as broad, rounded below and anteriorly 3

3. Outer plate of maxilliped reaching less than halfway along palp article 1 (Fig.84A), palp of maxilla 1 2-articulate ..... *Leucothoe (Leucothoe)*

—— Outer plate of maxilliped reaching almost to end of palp article 1, palp of maxilla 1 1-articulate ..... *Paraleucothoe*

4. Gnathopod 1 absent or vestigial ..... *Paranamixis*

—— Gnathopod 1 well developed 5

5. Mandibles and maxillae vestigial, outer plates of maxillipeds vestigial or absent ..... male *Anamixis*

—— Mandibles and maxillae ordinary, outer plates of maxillipeds conspicuous ..... female *Anamixis*

Leucothoe Leach

Figs 83A,C,D, 84A,B

Leucothoe Leach, 1814b: 432.–Leach, 1814a: 403.–J.L. Barnard, 1974b: 79.–Ledoyer, 1978b: 291.–Lincoln 1971: 172.
Cuviera Leach, 1814b: 435 [*nomen nudum*].
Lycesta Savigny, 1816: 109 (*Lycesta furina* Savigny, 1816, monotypy).
Leucothoella Schellenberg, 1928b: 638 (*Leucothoella bannwarthi* Schellenberg, 1928b, monotypy).
Leucothopsis Ledoyer, 1972c: 250 (*Leucothopsis angustiucoxa* Ledoyer, 1972c, original designation).

Type species. *Cancer articulosus* Montagu, 1804 (= *Gammarus spinicarpus* Abildgaard, 1789), monotypy.

Diagnosis. Palp of maxilla 1 2-articulate. Maxilla 2 moderately setose. Outer plates of maxilliped reaching less than halfway to apex of palp article 1. Coxa 2 variable, broad or long, acute or rounded below and anteriorly long or very short.

Sexual dimorphism. In males base of antenna 1 rarely swollen (*L. oboa*, *L. pachycera*); male gnathopod 2 occasionally distinctive, propodus longer, sculpture of palm either less or more accentuated.

Variables. Head usually with midanterior vertical

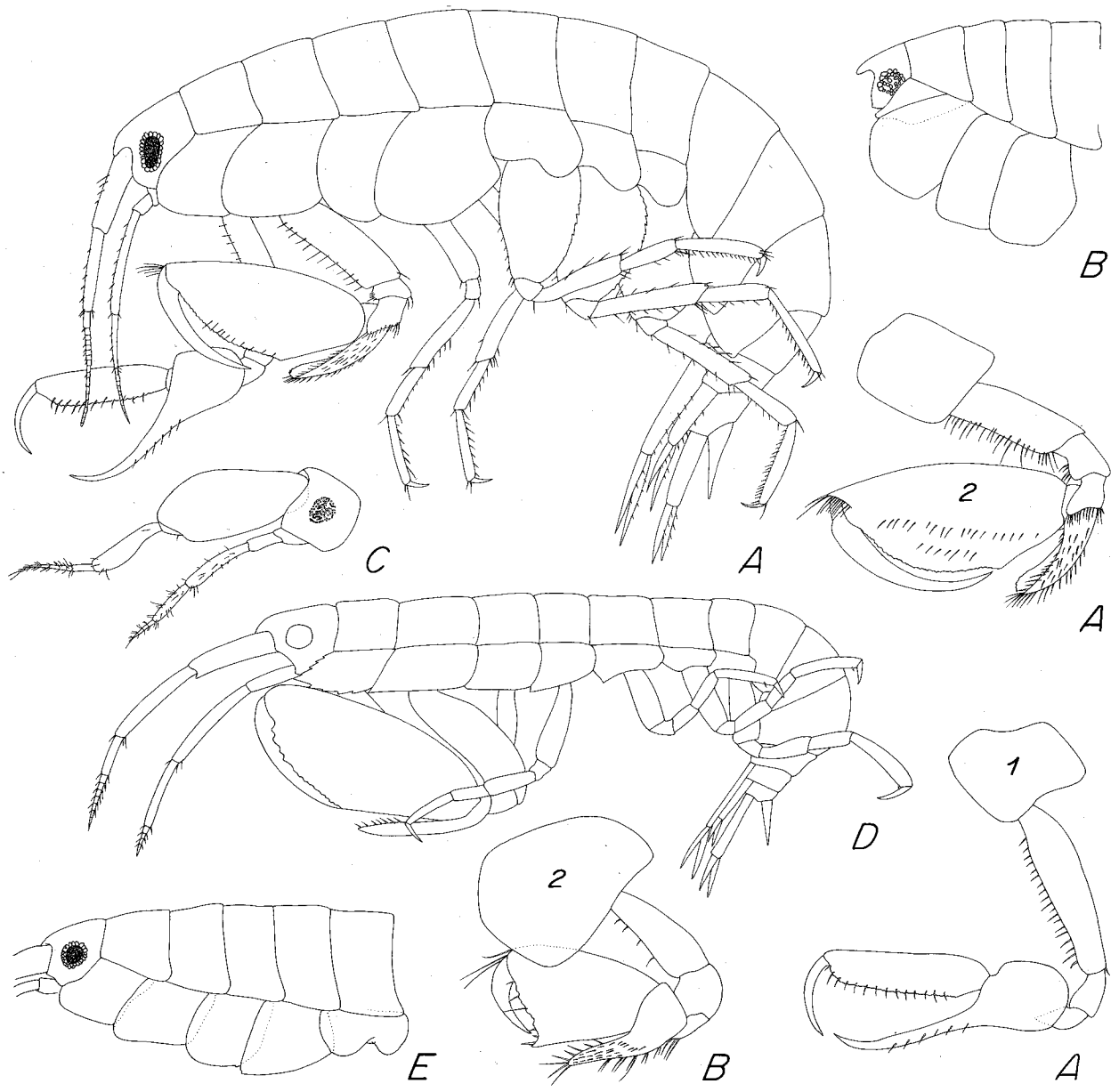

Fig.83. Leucothoidae and Anamixidae. A, *Leucothoe spinicarpa*; B, *Anamixis (= Leucothoides) pottsi*; C, *Leucothoe pachycera*; D, *Leucothoe (= Leucothoella) bannwarthi*.

keel distinctly sculptured in various species; epistome also with large process; rostrum large (*L. rostrata*); coxa 2 shortened, broader than long but corners rounded (*L. occulta, L. goowera*); coxa 2 shortened and with anteroventral corner sharp (character of *Leucothoella* and *Leucothopsis*, especially *L. gracilis, L. angusticoxa*), this condition intermediated by *L. ctenochir*; coxa 3 subacuminate (*L. crenatipalma*); posteroventral lobe of coxa 4 present or absent; coxa 5 slightly or greatly shorter than coxa 4; dactyl of gnathopod 1 short (*L. lilljeborgi*, etc.); article 2 of pereopods 5-7 very slender, almost rectilinear (*L. gracilis*); outer ramus of uropod 2 frequently shortened, of uropod 3 shortened (*L. gracilis*); uropod 3 greatly exceeding uropods 1-2 (*L. gracilis*); telson usually elongate; see also Ledoyer (1978b) for long list of variables and list of species.

Relationship. Differing from *Paraleucothoe* in the smaller outer plates of the maxillipeds.

Ecology. Commensal with ascidians, sponges and pelecypods.

Key to Subgenera of *Leucothoe*

(Subgenera poorly distinct)

Coxa 2 short, broader than long, with sharp corner(s) ..... (*Leucothoella*)

Coxa 2 ordinary, as long as broad, with rounded corners ..... (*Leucothoe*)

Species. See Chevreux & Fage (1925); Karaman (1971a); Krapp-Schickel (1971, 1975b); Ledoyer (1972c, 1978b); species marked "(E)" are in *Leucothoella*; *L. acanthopus* Schellenberg, 1928b (Ruffo, 1969) [677]; *L. acutilobata* Ledoyer, 1978b [697]; *L. affinis* Stimpson, 1856a [743]; *L. alata* J.L. Barnard, 1959d, 1962c, 1979b [370]; *L. alcyone* Imbach, 1969 [655]; *L. angusticoxa* (Ledoyer, 1972c, 1979a, 1986) (as *Leucothopsis*) [698]; *L. assimilis* J.L. Barnard, 1974b (Ledoyer, 1984) [784 + 586]; (E) *L. bannwarthi* (Schellenberg, 1928b) (J.L. Barnard, 1965a) (Ledoyer, 1979a, 1986) (as *Leucothoella*) [600]; *L. bidens* Hirayama, 1985c [391]; *L. boolpooli* J.L. Barnard, 1974b (Chilton, 1923 as *L. spinicarpa*) (Moore, 1987) [782]; *L. commensalis* Haswell, 1879a (J.L. Barnard, 1974b) (Ledoyer, 1984) (Moore,1987) [780 + 586]; *L. crassimana* Kossmann, 1880 (?Sowinsky, 1897, 1898) [677 + 341]; *L. crenatipalma* Ledoyer, 1972c, 1979a, 1986 [690]; *L. ctenochasma* Moore, 1987 [783]; *L. ctenochir* K.H. Barnard, 1925 (Ledoyer, 1979a, 1986) [690]; *L. dentata* Ledoyer, 1973a, 1986 [698]; *L. diemenensis* Haswell, 1879a (J.L. Barnard, 1974b) [783]; *L. dolichoceras* K.H. Barnard, 1916 (Griffiths, 1974b,c, 1975) [743]; *L. euryonyx* Walker, 1901 (= *L. dentitelson* Chevreux, 1925, Reid, 1951) (= *L. quadrimana* Ruffo, 1946, Krapp-Schickel, 1967) (Krapp-Schickel, 1975b) (Ledoyer, 1986) [352 + 698]; *L. furina* (Savigny, 1816) (= *L. procera* Bate, 1857d) (= *L. hornelli* Walker, 1904, 1905b, 1909b; Chevreux, 1908c) (Sivaprakasam, 1969b) (Imbach, 1969) (Ledoyer, 1979b) [600]; *L. gavialis* Myers, 1985c [576]; *L. goowera* J.L. Barnard, 1974b [788]; *L. gracilis* Haswell, 1879a (J.L. Barnard, 1974b) (auct. *Leucothoella*) [780]; *L. grandimana* Stimpson, 1853 [254]; *L. hyhelia* J.L Barnard, 1965a, 1970a (Ledoyer, 1979a, 1986) (Myers, 1986b) [600]; *L. incisa* Robertson, 1892 (Chevreux & Fage, 1925) (Nagata, 1965a) (Krapp-Schickel, 1975b) (Lincoln, 1979a) (Myers & Costello, 1986) [330 + 395]; *L. laticoxa* Ledoyer, 1978a, 1986 [698B]; *L. lihue* J.L. Barnard, 1070a (Ledoyer,

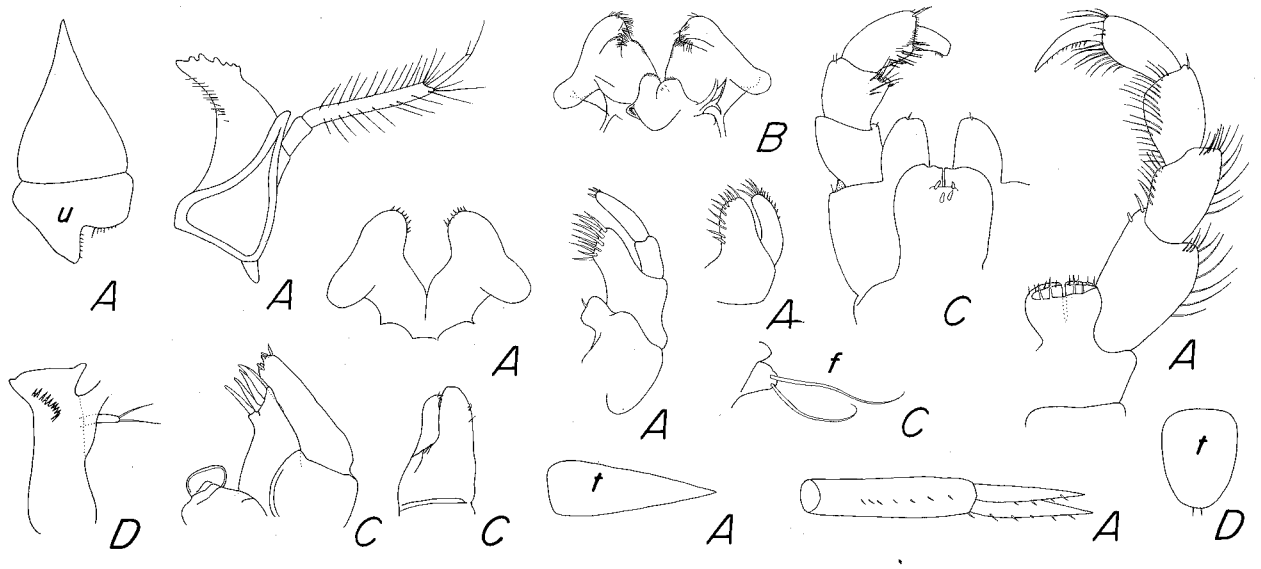

Fig.84. Leucothoidae and Anamixidae. A, *Leucothoe spinicarpa*; B, *Leucothoe boolpooli*; C, *Paraleucothoe novaehollandia*; D, *Anamixis (= Leucothoides) pottsi*.

1979a, 1986) [600]; *L. lilljeborgi* Boeck, 1861 (= *L. impariconnis* Norman, 1889, Sars, 1895) (Krapp-Schickel, 1975b) (Myers & Costello, 1986) (Lincoln, 1979a) [352 + BA]; *L. macrodonta* Ledoyer, 1986 [698]; *L. madrasana* Sivaprakasam, 1969b (Ledoyer, 1979a, 1986) [660]; *L. mateusae* n.sp. (= *L. denticulata* Mateus & Mateus, 1966 [homonym]) [446]; *L. micronesiae* J.L. Barnard, 1965a (Ledoyer, 1979a, 1986) [600]; *L. minima* Schellenberg, 1925a (?Reid, 1951) [445]; *L. minuscula* Schellenberg, 1938a [578]; *L. nagatai* Ishimaru, 1985b (*L. alata* of Nagata, 1965a) [394I]; *L. neptunea* Moore, 1987 [783]; *L. oboa* Karaman, 1971a (Krapp-Schickel, 1975b) (Ledoyer, 1977) [340]; *L. occulta* Krapp-Schickel, 1975b [352]; *L. orkneyi* Watling & Holman, 1983 [836B]; *L. pachycera* Della Valle, 1893 (Chevreux & Fage, 1925) (Krapp-Schickel, 1975b) [340]; *L. pacifica* Nagata, 1963 [394B]; *L. panpulco* J.L. Barnard, 1961a [501A]; [*L. parthenopaea* Costa, 1851] [*nomen nudum*]; *L. predenticulata* Ledoyer, 1978b, 1986 [697]; *L. procera* Bate, 1857d (= identification of *L. richiardi*, Lincoln, 1979a) (Myers & McGrath, 1982b) [239]; *L. richiardi* Lessona, 1865 (?Sivaprakasam, 1969b) (not Lincoln, 1979a) (Ledoyer, 1986) [352 + 660]; *L. rostrata* Chevreux, 1908g, 1935 [304B]; *L. serraticarpa* Della Valle, 1893 (Krapp-Schickel, 1975b) [348]; *L. spinicarpa* (Abildgaard, 1789) (= *L. articulosus* Montagu, 1804, Sars, 1895) (= *L. denticulata* Costa, 1853) (= *L. miersi* Stebbing, 1888) (= *L. antarctica* Pfeffer, 1888) (= *L. occidentalis* Reid, 1951) (Krapp-Schickel, 1975b) (Lincoln, 1979a) (Watling & Holman, 1983) (Ledoyer, 1986) [420 + B + I]; *L. spinulosa* Chevreux, 1919-20, 1927 [441B]; *L. squalidens* Ledoyer, 1984, 1986 [586]; *L. stegoceras* Walker, 1904, 1909b [675I]; *L. stylifera* Stimpson, 1856b [395]; *L. tarte* J.L. Barnard, 1974b [782]; *L. trailli* Thomson, 1882 (J.L. Barnard, 1972b) [775]; *L. tridens* Stebbing, 1888 (? = *L. recifensis* Schellenberg, 1938a) (?Schellenberg, 1938a) (J.L. Barnard, 1970a) [?775A + 555]; *L. uschakovi* Gurjanova, 1951 [220A]; *L. venetiarum* Soika, 1949(Krapp-Schickel, 1975b) [330].

Habitat and distribution. Marine, cosmopolitan, 0-3570 m, in ascidians, sponges and clams, 58 species.

Paraleucothoe Stebbing

Fig.84C

Paraleucothoe Stebbing, 1899a: 208.

Type species. *Leucothoe novaehollandiae* Haswell, 1879b, original designation.

Diagnosis. Palp of maxilla 1 1-articulate. Maxilla 2 nearly naked. Outer plates of maxilliped reaching to apex of palp article 1. Coxa 2 as long as broad, corners rounded below.

Variables. Epistome and cephalic keel growing more discontiguous with maturity; dactyl of gnathopod 1 relatively larger in juveniles than in adults; gnathopod 1 becoming more like Dutch wooden shoe in adults, with articles 5-6 becoming broader and article 6 developing parrot head anteriorly.

Relationship. Except for the 1-articulate palp of maxilla 1 this is the basic leucothoid at least in its subadult stages, thereby having all the positive characters such as large outer plates of the maxillipeds, large gnathopod 1 and large coxa 1. See *Leucothoe*.

Species. *Paraleucothoe novaehollandiae* (Haswell, 1879b) (= *P. brevidigitata* Miers, 1884) (= *P. flindersi* Stebbing, 1888) (Chilton, 1922b, 1923b) (J.L. Barnard, 1972b) [793].

Habitat and distribution. Marine, circum-Australia, 0-9 m, 1 species.

LILJEBORGIIDAE Stebbing, 1899a

Diagnosis. Accessory flagellum 2+articulate. Molar of mandible feeble, not triturative. Gnathopods powerful, carpus of at least 1 pair well produced. Plates of maxilliped only moderately developed. Telson cleft, each apex with spine(s) in notch.

See Gammaridae, Eusiridae, Pleustidae, Haustoriidae, Stilipedidae, Vitjazianidae and Pseudamphilochidae.

Description. Body laterally compressed, weakly carinate especially on urosome. Rostrum small, lateral lobes well developed, incision for antenna 2 weak or absent. Peduncle of antenna 1 medium to short, article 2 medium to short relative to article 1, primary flagellum elongate, usually thick, proliferate (articles short and broad), accessory flagellum usually very well developed, 6 to 12-articulate, rarely 2-articulate (*Listriella*). Antenna 2 of ordinary amphipodan size, usually longer than antenna 1. Labrum broad, very short, truncate or weakly incised. Incisor weakly toothed, laciniae mobiles symmetrical, flabellate on both sides, raker row well developed, molar feeble or absent, often weakly spinose, palp feeble, slender, linear, article 1 usually elongate, thereafter geniculate, article 3 short, DE or E-setae sparse. Inner lobes of lower lip scarcely developed, outer lobes ovate, tilted. Inner plate of maxilla 1 small, poorly setose, outer plate with 7+ spines, palp 2-articulate. Inner plate of maxilla 2 broader than outer, medially setose, lacking facial setae. Plates of maxilliped medium to feeble, outer plate spinose medially; palp very long, slender, dactyl unguiform.

Coxae 1-4 well developed, quadrate or rectangular, poorly setose, coxa 1 trapezoidal, larger than coxa 2, 2-3 usually weakly tapering, coxa 4 largest, excavate posterodorsally, coxae 5-7 much shortened. Gnathopods medium to large, usually alike but often diverse, either

gnathopod 1 or 2 occasionally enlarged greatly; propodus large, ovate or trapezoidal, carpus very short, lobate or not, merus usually underslung and often weakly produced ('merochelate'). Pereopods 3-7 successively more elongate, article 2 of pereopods 5-7 alike, expanded, ovate, weakly lobate.

Epimera ordinary. Pleopods ordinary, peduncles elongate. Uropods 1-2 ordinary. Uropod 3 not very elongate but usually over-reaching uropods 1-2 because of slightly enlarged urosomite 3 (relative to most other Gammaridea) peduncle rarely elongate, rami lanceolate or leaf-like, usually outer ramus narrower than inner, 1 to 2-articulate. Telson slightly elongate, deeply cleft, lobes narrow, tapering, each apex with spine in notch. Gills 2-?, tear-drop shaped; oostegites slender.

Relationship. Close to the Gammaridae in overall similarity, distinguishable from all but a few genera of Gammaroidea in the feeble molar, from Gammaroidea with feeble molar by the form of the maxilliped (Fig.85A), coxae 1-4, and often in the elongate article 1 of the mandibular palp or the shape of uropod 3 and the telson. For example, *Parelasmopus* of Gammaroidea has the elongate article 1 of the mandibular palp but the mandibular molar is fully triturative.

The Stilipedidae and Vitjazianidae have feeble gnathopods and very large plates on the maxillipeds.

Eusiridae and Pleustidae usually have 0 to 1-articulate accessory flagella whereas only a few Liljeborgiidae have 2-articulate accessory flagella, thereby conflicting with a few 2-articulate Eusiridae and Pleustidae. The various Eusiridae-Pleustidae with uncleft telsons can be easily recognised, so can others with fully triturative molars. *Listriella* can usually be separated from *Austropleustes* and similar eusirids in the elongate article1 of the mandibular palp and 2-articulate outer ramus of uropod 3. Eusiridae have the outer rami of uropods 1-2 shortened; this is rarely evident only on uropod 2 in a few liljeborgiids. Two confusing eusirids with obsolescent molars, *Eusirella* and *Eusiropsis*, have calceoli, not found in Liljeborgiidae. Again the maxillipedal configuration in Liljeborgiidae is helpful along with the coxal shapes, coxae 1-4 being broad–narrow–narrow–broad.

The Pseudamphilochidae lack an accessory flagellum, have a large rostrum and un-notched telsonic apices; otherwise the Liljeborgiidae share the similar coxa 1, weak molar, cleft telson and moderately powerful gnathopods.

Most haustorioids have diverse pereopods 5-7, or fossorial pereopods 5-7, few if any have the broadened coxa 1 and narrow coxae 2-3 of Liljeborgiidae; they mostly have large plates of the maxillipeds or fossorial antennae or otherwise have feeble gnathopods in other troublesome genera.

Key to Genera of Liljeborgiidae

1. Article 1 of mandibular palp short ..... *Idunella*

—— Article 1 of mandibular palp elongate 2

2. Carpus of gnathopods 1-2 strongly produced, slender and elongate [Fig.85A], one or both dactyls of gnathopods 1-2 deeply serrate or toothed 3

—— Carpus of gnathopods 1-2 weakly produced, slender or thick or short [Fig.85B], neither gnathopodal dactyl deeply serrate nor toothed 4

3. Coxa 1 enlarged, posteroventrally lobate and enveloping reduced coxae 2-3, each lobe of telson with 4+ spines ..... *Isipingus*

—— Coxa 1 ordinary, not lobate, not enveloping coxae 2-3 of ordinary length and not enveloped by coxa 1, each lobe of telson with 1 spine ..... *Liljeborgia*

4. Mandibular molar triturative, gnathopod 2 propodus and carpus setose anteriorly ..... *Sextonia*

—— Mandibular molar simple, gnathopod 2 propodus and carpus naked anteriorly ..... *Listriella*

Idunella Sars

Fig.85C

Idunella Sars, 1895: 536.–J.L. Barnard, 1959a: 16 (part).–Karaman & Barnard, 1979: 114 (part).

Type species. *Lilljeborgia* [sic] *aequicornis* Sars, 1876, monotypy.

Diagnosis. Accessory flagellum 4+articulate. Epistome poorly produced. Article 1 of mandibular palp not elongate; molar simple. Coxae 1-4 ordinary. Gnathopod 2 smaller than gnathopod 1, propodus and carpus of gnathopods not setose anteriorly; carpus of male gnathopods 1-2 poorly produced. Outer ramus of uropod 3 2-articulate. Each lobe of telson with 2 apical spines.

Description. Article 2 of peduncle on antenna 1 longer than half of article 1. Outer plate of maxilla 1 with 5 spines. Dactyls of gnathopods not deeply toothed nor serrate.

Sexual dimorphism. In type species male antenna 2 enlarged, male gnathopod 1 much larger than female gnathopod 1, lobe of carpus stronger, propodus large, palm more oblique and deeply

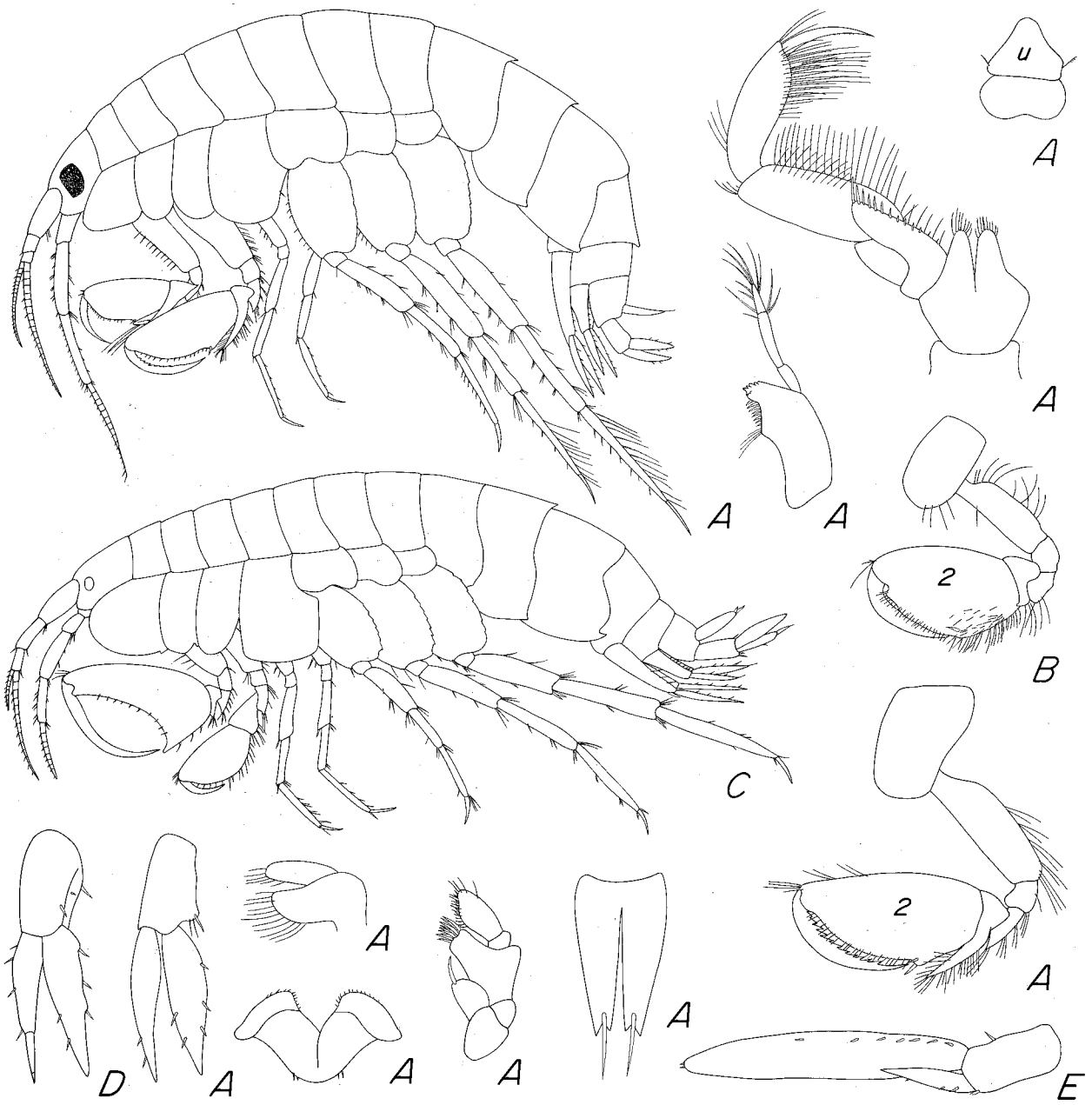

Fig.85. Liljeborgiidae. A, *Liljeborgia brevicornis*; B, *Listriella goleta*; C, *Idunella aequicornis*; D, *Listriella diffusa*; E, *Listriella eriopisa*.

excavate; uropod 3 enlarged and inner ramus thickened.

Variables. Inner plate of maxilla 1 with 1 seta (type), 2 setae (*I. pirata*); inner and outer plates of maxilla 2 each with 1 + facial seta (*I. pirata*).

Relationship. Differing from all other liljeborgiids in the short article 1 of the mandibular palp.

Species. *Idunella aequicornis* (Sars, 1876, 1885, 1895) (Stephensen, 1944a) (Gurjanova, 1951) [220 + B]; *I. pirata* Krapp-Schickel, 1975a (Karaman, 1975a) (Ledoyer, 1977) [340 + B].

Habitat and distribution. Marine, high Arctic and North Atlantic into Mediterranean Sea, 67-763 m, 2 species.

Isipingus Barnard & Karaman

Isipingus Barnard & Karaman, 1987: 864.

Type species. *Liljeborgia epistomata* K.H. Barnard, 1932, original designation.

Diagnosis. Accessory flagellum 4+articulate. *Epistome hugely produced.* Article 1 of mandibular palp elongate. In male, coxa 1 greatly enlarged, posteroventrally lobate, this lobe encompassing much reduced coxae 2-3; coxa 4 much smaller than coxa 1, abnormally narrowed and anteriorly bevelled. Carpus of gnathopods 1-2 strongly produced. Outer ramus of uropod 3 [?1-articulate]. Each lobe of telson with 4-5 apical spines.

Description. Article 2 of peduncle on antenna 1 [?short]. Dactyls of gnathopods deeply toothed.

Relationship. Differing from *Liljeborgia* in the large epistomal process, enlarged coxa 1 enveloping reduced coxae 2-3 and the multispinose lobes of the telson.

Species. *Isipingus epistomata* (K.H. Barnard, 1932, 1940, 1955) [743].

Habitat and distribution. Marine, South Africa, 44-124 m, 1 species.

Liljeborgia Bate

Fig.85A

Iduna Boeck, 1861: 656 [homonym, Aves].
Liljeborgia Bate, 1862: 118 (*Gammarus pallidus* Bate, 1857d, monotypy).–Lincoln, 1979a: 388.
Microplax Liljeborg, 1865a: 11.–Liljeborg, 1865b: 18 [new name for *Iduna*] [homonym, Hemiptera].
Lilljeborgiella Schellenberg, 1931: 136 (*Lilljeborgiella longicornis* Schellenberg, 1931, monotypy).

Type species. *Gammarus brevicornis* Bruzelius, 1859, here selected.

Diagnosis. Accessory flagellum 4+articulate. Epistome poorly produced. Article 1 of mandibular palp elongate, molar simple. Coxae 1-4 ordinary. Gnathopod 2 not smaller than gnathopod 1, propodus and carpus of gnathopods not setose anteriorly; carpus of gnathopods 1-2 strongly produced. Outer ramus of uropod 3 1-articulate. Each lobe of telson with 1 apical spine.

Description. Article 2 of peduncle on antenna 1 usually very short, longer than half of article 1. Dactyls of gnathopods usually deeply toothed or serrate (sometimes not on male gnathopod 2).

Sexual dimorphism. Usually weak; occasional males with large propodus on gnathopod 2, longer palm, straighter palm, smooth dactyl or rami of uropod 3 slightly broader.

Variables. Rostrum larger than ordinary (*L. laniloa*); article 2 of antenna 1 very short (*L. pallida*); accessory flagellum only 5-articulate (*L. psaltrica*), most species with much larger accessory flagellum, up to 12 articles; antenna 2 very elongate (*L. mojada*); mandibular palp article 2 shorter than article 3 (*L. marcinabrio*); article 6 of pereopods 3-4 with grasping hooks (*L. bousfieldi*, *L. heeia*); dactyl of pereopod 7 short and claw-shaped *Lilljeborgiella longicornis*); outer ramus of uropod 2 slightly shortened (*L. eurycrada*, *L. georgiana*, etc.); uropod 3 extraordinarily elongate, rami foliaceous (*L. eurycrada*); peduncle of uropod 3 almost as long as rami (*L. mojada*); outer ramus of uropod 3 slightly shortened (*L. japonica*).

Relationship. *Liljeborgia* and *Isipingus* differ from *Idunella*, *Sextonia* and *Listriella* in the elongate carpus of the gnathopods and usually in the deep serrations or teeth on the dactyls of the gnathopods (occasionally gnathopod 2 of male lacking serrations).
See *Isipingus*.

Removal. *Liljeborgia epistomata* K.H. Barnard, 1932, to *Isipingus*.

Species. See J.L. Barnard (1962b, table); K.H. Barnard (1930); Chevreux & Fage (1925); Griffiths (1974b,c, 1975); Gurjanova (1951); Ledoyer (1968); Schellenberg (1925a); Stephensen (1928, 1931a, 1938b, 1940b, 1944a); *L. aequabilis* Stebbing, 1888 (?Pirlot, 1936b) (?Hurley, 1954f) (see Nagata 1965a for discussion)

[783 + ?645 + ?775]; *L. akaroica* Hurley, 1954f (= *L. maria* Hurley, 1954f) (?Ledoyer, 1973a, 1986) [775 + ?698]; *L. barhami* Hurley, 1954f [777]; *L. bispinosa* (Costa, 1853, 1857) [348]; *L. bousfieldi* McKinney, 1979 (not Ledoyer, 1986) [471]; *L. caeca* Birstein & Vinogradova, 1960 [322A]; *L. consanguinea* Stebbing, 1888 (Chevreux, 1912d) (Nicholls, 1938) [880 + B]; *L. cota* J.L. Barnard, 1962b, 1966a, 1967a, 1971b [379B]; *L. dellavallei* Stebbing, 1906 (= *L. mixta* Schellenberg, 1925a, Ruffo, 1959) (Chevreux & Fage, 1925) (Gelidiay *et al.*, 1971) (Krapp-Schickel, 1975a) [352 + B]; *L. dubia* (Haswell, 1879b, 1885b) (= *L. affinis* Haswell, 1885b) (= *L. haswelli* Stebbing, 1888) (K.H. Barnard, 1930) (Pirlot, 1936b) [783 + ?775 + ?645]; *L. enigmatica* Ledoyer, 1986 [698]; *L. eurycrada* Thurston, 1974a [890]; *L. fissicornis* (M. Sars, 1858) (Sars, 1895) (Chevreux & Fage, 1925) (Gurjanova, 1951) [220 + B]; *L. geminata* J.L. Barnard, 1969a [370]; *L. georgiana* Schellenberg, 1931 (Nicholls, 1938) (?Bellan-Santini, 1972a,b) (Holman & Watling, 1983) [870]; *L. gloriosae* Ledoyer, 1986 [618A]; *L. hansoni* Hurley, 1954f [776]; *L. heeia* J.L. Barnard, 1970a (Ledoyer, 1972c, 1978b, 1979a, 1986) [600]; *L. inermis* Chevreux, 1919-20, 1927 [443 + B]; *L. japonica* Nagata, 1965a [395]; *L. kerguelensis* Bellan-Santini & Ledoyer, 1974 [851]; *L. kinahani* (Bate, 1862) (? = varieties *L. capensis*, *L. falklandica*, *L. georgensis* K.H. Barnard, 1932) (Sars, 1895) (Chevreux & Fage, 1925) (Lincoln, 1979a) [426]; *L. laniloa* J.L. Barnard, 1970a [381]; *L. longicornis* (Schellenberg, 1931) (K.H. Barnard, 1932) [890]; *L. macrodon* Schellenberg, 1931 (Holman & Watling, 1983) [864]; *L. macronyx* Sars, 1895 (Stephensen, 1938b) [238 + B]; *L. marcinabrio* J.L. Barnard, 1969b [377]; *L. mojada* J.L. Barnard, 1961a (Ledoyer, 1986) [621A]; *L. mozambica* Ledoyer, 1986 [618A]; *L. octodentata* Schellenberg, 1931 (Holman & Watling, 1983) [866]; *L. pallida* (Bate, 1857d) (Sars, 1895) (Nayar, 1967) (Lincoln, 1979a) (= *L. brevicornis* Bruzelius, 1859 (Sars, 1895) (Chevreux & Fage, 1925) (Ledoyer, 1968) [210] [355 + B]; *L. palmata* Griffiths, 1974c, 1975 [743]; *L. polosi*, new name (= *L. dubia* Kamenskaya, 1979a) [206A]; *L. proxima* Chevreux, 1907a, 1908c (Schellenberg, 1938a) (Ledoyer, 1978b) [600]; *L. psaltrica* Krapp-Schickel, 1975a [345]; *L. pseudomacronyx* Bellan-Santini & Ledoyer, 1986 [799]; *L. quadridentata* Schellenberg, 1931 (Holman & Watling, 1983) [833 + B]; *L.quinquedentata* Schellenberg, 1931 [831]; *L. serrata* Nagata, 1965a [395]; *L. serratoides* Tzvetkova, 1968 [391]; *L. zarica* J.L. Barnard, 1962d [702A].

Habitat and distribution. Marine, cosmopolitan, 0-6156 m, 41 species.

Listriella J.L. Barnard

Figs 85B,D,E

Listriella J.L. Barnard, 1959a: 16.
Ronconoides Ledoyer, 1973a: 59 (*Ronconoides brevicornis* Ledoyer, 1973a, original designation).

Type species. *Listriella goleta* J.L. Barnard, 1959a, original designation.

Diagnosis. Accessory flagellum usually 2- (rarely 4) articulate. Epistome poorly produced. Article 1 of mandibular palp elongate, molar simple. Coxae 1-4 ordinary. Gnathopods variable, either dominant; propodus and carpus not setose anteriorly; carpus of gnathopods 1-2 moderately to poorly produced. Outer ramus of uropod 3 1- or 2-articulate. Each lobe of telson with 2 apical spines.

Description. Article 2 of peduncle on antenna 1 variable in length. Inner plate of maxilla 1 usually with 2 setae. Dactyls of gnathopods not deeply toothed nor serrate. Gills sac-like; oostegites slender.

Sexual dimorphism. Usually not strong; occasionally male gnathopod 2 larger or more sculptured (*L. eriopisa*, *L. excavata*, *L. clymenella*); or male antenna 2 much enlarged (*L. chilkensis*); or male uropod 3 short and stout (*L. barnardi*), or larger with much enlarged inner ramus and shorter outer ramus; or male telson poorly cleft (less than halfway in *L. barnardi* male, deeper in female).

Variables. Article 2 of antenna 1 longer than article 1 (*L. chilkensis*); antennae 1-2 very short (*L. clymenellae*); accessory flagellum 3-articulate (*L. saldanha*), 4-articulate (*L. sinuosa*); peduncle of antenna 2 with large spines (*L. pauli*); mandibular palp article 1 ?short (*L. spinifera*); gnathopods axially reversed, with gnathopod 1 larger than 2 and generally also with the thinner carpus lobe (for example, *L. bowenae*, *L. curvidactyla*, *L. demersalis*, *L. janisae*, *L. nagatai*, *L. pauli*, *L. serra*, *L. similis*), only slightly larger (*L. bahia*); carpus of both gnathopods 1-2 alike, lobes slender (*L. dahli*); dactyl of pereopod 7 of medium length (*L. diffusa*), short (*L. saldanha*); outer ramus of uropod 1 shortened (*L. saldanha*), of uropod 2 (*L. carinata*, *L. eriopisa*, *L. saldanha*), of uropod 3 (*L. albina*, *L. demersalis*, *L. eriopisa*, *L. orientalis*, etc.); outer ramus of uropod 3 1-articulate (male *L. diffusa*, *L. eriopisa*, *L. excavata*, *L. clymenellae*, etc.); telson cleft only one third (*L. barnardi*).

Relationship. Differing from *Sextonia* in the simple molar and the non-setose anterior margins of the carpus and propodus of the gnathopods. From *Liljeborgia* and *Isipingus* in the poorly produced carpus of the gnathopods (see Fig.87B), in the poorly serrate or toothed dactyls of the gnathopods. From *Idunella* in the elongate article 1 of the mandibular palp.

Species. See J.L. Barnard (1964b,e 1964b, 1966a,b, 1971b); Batcheller & Mills (1965); Dickinson *et al.* (1980); Feeley & Wass (1971, ecology); Ledoyer (1968);

McKinney (1979); Stephensen (1931a, 1938b, 1940b, 1944a); Toulmond & Truchot (1964); Vader (1978); *L. albina* J.L. Barnard, 1959a, 1971b [379 + B]; *L. bahia* McKinney, 1979 [474]; *L. barnardi* Wigley, 1966 (Bousfield, 1973) [361 + I]; *L. bowenae* (Karaman, 1979a) (Lazo-Wasem, 1985a) [363]; *L. brevicornis* (Ledoyer, 1973a, 1986) [698]; *L. carinata* McKinney, 1979 [474]; *L. chilkensis* Chilton, 1921a [664E]; *L. clymenellae* Mills, 1962a, 1964b (Bousfield, 1973) [364I]; *L. curvidactyla* (Nagata, 1965a) [395]; *L. dahli* (Schellenberg, 1938a) (Ledoyer, 1979a) [595 + ?]; *L. demersalis* Sivaprakasam, 1972a [666]; *L. dentipalma* Dauvin & Gentil, 1983 [242]; *L. diffusa* J.L. Barnard, 1959a [370I]; *L. eriopisa* J.L. Barnard, 1959a, 1966a [370I + B]; *L. excavata* Krapp-Schickel, 1975a (?Ledoyer, 1986) [348 + ?698]; *L. goleta* J.L. Barnard, 1959a, 1971b [379I + B]; *L. janisae* Imbach, 1967 [655]; *L. lindae* Griffiths, 1974a, 1975 [743]; *L. melanica* J.L. Barnard, 1959a, *L. m. lazaris* J.L. Barnard, 1969b [369I]; *L. mollis* Myers & McGrath, 1983 [239]; *L. nagatai* Karaman, 1979a [395]; *L. nana* Krapp-Schickel, 1975a [348]; *L. orientalis* Hirayama, 1985c [391]; *L. pauli* Imbach, 1967 [655]; *L. picta* (Norman, 1889a) (Chevreux & Fage, 1925) (Reid, 1951) (Lincoln, 1979a) (Myers & McGrath, 1983) [330]; *L. quintana* McKinney, 1979 [471]; *L. saldanha* Griffiths, 1975 [743]; *L. serra* Imbach, 1967 [655]; *L. similis* Rabindranath, 1971a [666E]; *L. sinuosa* Griffiths, 1974c [743]; *L. sketi* (Karaman, 1980d) [367Z]; *L. smithi* (Lazo-Wasem, 1985a) [363]; *?L. spinifera* Dauvin & Gentil, 1983 [242]; species (plural), (Dickinson *et al.* 1980) (Feeley & Wass, 1971) [various localities].

Habitat and distribution. Marine, cosmopolitan but largely circumtropical, mostly commensal with maldanid polychaetes in their mud tubes on soft benthos, 0-721 m, 33 species.

Sextonia Chevreux

Sextonia Chevreux, 1920: 76.–Karaman, 1980d: 431.

Type species. *Sextonia longirostris* Chevreux, 1920, monotypy.

Diagnosis. Accessory flagellum 4+articulate. Epistome poorly produced. Article 1 of mandibular palp elongate, molar triturative. Coxae 1-4 ordinary. Gnathopod 2 smaller than gnathopod 1, propodus and carpus setose anteriorly; carpus of male gnathopods 1-2 moderately to poorly produced. Outer ramus of uropod 3 2-articulate. Each lobe of telson with apical spines.

Description. Article 2 of peduncle on antenna 1 longer than half of article 1. Dactyls of gnathopods not deeply toothed nor serrate.

Sexual dimorphism. Male antenna 2, including peduncle, elongate; male gnathopod 1 much larger than in female; male uropod 3 much larger, with enlarged blunt inner ramus, outer ramus by contrast small.

Relationship. Differing from other liljeborgiids in the triturative molar, a presumably plesiomorphic condition, plus the unusual anterior setosity of the carpus and propodus on gnathopod 2.

Species. *Sextonia longirostris* Chevreux, 1920 (Chevreux & Fage, 1925) (Toulmond & Truchot, 1964) (Karaman, 1980d) [240].

Habitat and distribution. Marine, Brittany, France, intertidal, rare, 1 species.

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Barnard and Karaman, 1991, *Rec. Aust. Mus., Suppl.* 13(1): 1–417
http://dx.doi.org/10.3853/j.0812-7387.13.1991.91

Barnard and Karaman, 1991, *Rec. Aust. Mus., Suppl.* 13(2): 419–866
http://dx.doi.org/10.3853/j.0812-7387.13.1991.367