

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Griffin, D.J.G., and D. E. Brown, 1976. Deepwater decapod crustacea from eastern Australia: brachyuran crabs. *Records of the Australian Museum* 30(11): 248–271. [26 August 1976].

doi:10.3853/j.0067-1975.30.1976.394

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

Australian Museum science is freely accessible online at
www.australianmuseum.net.au/publications/
6 College Street, Sydney NSW 2010, Australia



DEEPWATER DECAPOD CRUSTACEA FROM EASTERN AUSTRALIA: BRACHYURAN CRABS

D. J. G. GRIFFIN AND DIANE E. BROWN

The Australian Museum, Sydney

SUMMARY

Fourteen species of crabs from the lower continental shelf and slope off eastern Australia are discussed. Included are two new species, one belonging to the homolid genus *Homolochunia* (which is also recorded from near New Caledonia) and one belonging to the cymonomid genus *Cymonomus*. The majids *Cyrtomaia suhmi* and *Leptomithrax richardsoni*, the geryonid *Geryon affinis* and the goneplacid *Litocheira kingsleyi* are recorded from Australia for the first time. The new species are described and illustrated.

The deepwater crab fauna of eastern Australia as it is presently known is compared with that of other nearby areas in the Indo-West Pacific.

INTRODUCTION

The deepwater crab fauna of eastern Australia is at present known only from early work by the 'Challenger' (Miers, 1886), the 'Thetis' (Whitelegge, 1900), and 'Endeavour' (Rathbun, 1918, 1923) Expeditions, and from miscellaneous deep hauls (Grant, 1905, etc.). The same is true of South Australia, the work of Baker (1904-1907) being the main contribution.

Since 1971, New South Wales State Fisheries has been carrying out trawling experiments along the coast of New South Wales in relation to the distribution of prawns off the eastern Australian coast (see *Australian Fisheries*, November 1973, pp 24-29). Approximately 60 species of shrimps, lobsters and crabs have been taken during these hauls in depths of 100 to 1,000 metres.

The present paper is a report on the brachyuran crabs collected from 1971 to June 1975. Fourteen species are recorded. The material on which this report is based is in the collection of the Australian Museum, Sydney (AM). Each species account includes principal references, a list of material, localities (all off New South Wales unless otherwise stated), remarks where necessary and a summary of the geographic and bathymetric distribution. Measurements given are carapace length (cl.) or width (cw).

SYSTEMATIC ACCOUNT

Family HOMOLIDAE

Latreillopsis petterdi Grant

Latreillopsis petterdi Grant, 1905: 317-319, pl. 10 figs. 2, 2a, 2b.—Rathbun, 1923: 140-143, pl. 36.—Dell, 1963: 244-245.—Bennett, 1964: 27, fig. 109.—Takeda & Miyake, 1969: 159-161, fig. 1, pl. 1.

Paromola petterdi.—Serene & Lohavanijaya, 1973: 26, 27.

MATERIAL: 19♂♂, 6♀♀ (2 ovig.), cl. 16-98.5 mm (AM P. 17963, 17971, 17973-4, 18372, 18997, 19107-12, 19612-16).

LOCALITIES: South east of Grafton, 29°49'S., 153°42'E. to 29°59'S., 153°38'E., 369 m, 12 May 1971, 1 spec. — Off Port Stephens, 32°46'S., 152°46'E. to 32°51'S., 152°42'E., 540 m, 29 April 1971, 5 specs. — Off Newcastle, 33°00'S., 152°31'E. to 32°55'S., 152°36'E., 360 m, July 18, 1972, 7 specs. — 25 miles east of Sydney, 33°39'S., 151°49'E. to 33°50'S., 152°55'E., 270-360 m, 6-7 April 1971, 2 specs. — South of Port Hacking, 34°19'S., 151°24'E. to 34°13'S., 151°28'E., 360 m, prawn trawl, 28 June 1971, 7 specs. — South of Jervis Bay, 35°31'S., 150°45'E. to 35°37'S., 150°42'E., 423-405 m, prawn trawl, 8 July 1971, 3 specs.

REMARKS: This species has been well described by Rathbun (1923) and by Dell (1955). The generic placing was reviewed by Griffin (1965). Following Gordon (1950), Serene & Lohavanijaya (1973) place this species in the genus *Paromola* Wood-Mason & Alcock.

DISTRIBUTION: Southeast coast of Australia, New Zealand; 180-540 m.

*Homolochunia kullar*¹ n.sp.

Figs 1-3

HOLOTYPE: Female, cl. 61 mm (AM P. 18998), off Sydney, 33°52'S., 152°50'E. to 33°48'S., 152°54'E., 765 m, 7 December 1972.

PARATYPES: Ovigerous female, cl. 58 mm (AM P. 18085), off Broken Bay, 33°34'S., 152°03'E. to 33°43'S., 151°59'E., 558 m, prawn trawl, smooth bottom, 21 April 1971. Male, cl. 60 mm (AM P. 20252), off St. Vincent's Pass, S.W. of New Caledonia, 880 m, 45 ft. pelagic trawl hit bottom, 29 April 1971, J. R. Paxton on R.V. 'Coriolis'.

DESCRIPTION: Carapace urn-shaped, convex, longer than wide, greatest width just behind middle; surfaces sparsely spiny, covered by short, dense tomentum, regions moderately well defined.

Medial rostral spine acuminate, dorsally grooved. Supraorbital spines slightly longer than carapace, arcuate, with three dorsal spines, tip bifid, dorsal branch longer than ventral.

Nine spines or tubercles on, or close to, midline of carapace — a pair of prominent submedial protogastrics behind lateral rostral spines, a prominent mesogastric close to posterior margin of region, a pair of metagastric tubercles, a pair of low cardiac tubercles and a pair of low branchial tubercles on each side of the intestinal region.

Six prominent spines laterally on carapace — two subhepatic, the anterior the longest, the posterior at a lower level (and two small tubercles posteriorly), two hepatic (one lateral and one more medial), one anterior branchial and one posterior branchial.

Antennules bulbous basally, two terminal segments short. Antennae reaching as far as middle of supraorbital spine, smooth.

A small spine at origin of antenna laterally. Pterygostomian region with three low spines posteriorly.

Eyestalks comprising slender basal segment and bulbous terminal segment; cornea large, semicircular.

¹'kullar' is the word used by the aborigines of the Wadi Wadi tribe of the Illawarra region (Wollongong, south of Sydney) for a long-handled, four-pronged fish spear.

Third maxillipeds subpediform, flattened, unarmed, widest at anterior edge of merus. Ischium subrectangular, with broad shallow, central longitudinal groove. Merus quadrate, broadening slightly to anterior edge. Palp subcylindrical, propodus twice length of carpus, dactyl two-thirds propodus, tapering.

Chelipeds subequal in both sexes, in the male slightly longer than the carapace and supraorbital spines together, slightly shorter in the female, slender, cylindrical to subcylindrical; ischium with two dorsal spines, merus with four spines dorsally in proximal third, proximal two longer and one distally on dorsal edge. Palm of chela inflated, weakly compressed, expanded distally in male, extremely slender in female; fingers 1/3 length of palm, finely toothed cutting edges gaping in male proximally, dactyl with tooth in gape; edges adjacent throughout in female.

Ambulatory legs cylindrical, extremely long and slender, third longest, almost 6 times carapace length, second only a little shorter, the first 4 times carapace length, last leg short, about 1/2 length of first. Meri of first three legs with 6-7 sharp, weakly curved, equally spaced dorsal spines and a terminal spine, remaining segments smooth, dactyls with dorsal fringe of hairs on distal third. Last leg with a distal spine on merus, otherwise smooth; chelate to subchelate, gape slight (see fig. 3b).

Abdomen of 7 segments in male, of 6 segments in female, (fifth and sixth partially fused along a prominent transverse ridge), ovate; a prominent central spine on segments 2-4 and a lateral spine or tubercle on segments 3-5, segment 5 with a central tubercle, segment 6 with a distal medial tubercle or spinule, last segment triangular, unarmed.

Male first pleopod flattened, moderately broad, distally slender and outwardly curved. Second pleopod not much shorter than first, apically truncate.

REMARKS: To the present time only one species of the genus *Homolochunia* Doflein, 1904 has been recorded. *Homolochunia valdiviae* Doflein has been collected off east Africa and Japan (Doflein, 1904; Gordon, 1950, Sakai, 1955).

The genus is distinguished by the following features:

- 1) the propodus of the fourth ambulatory leg is chelate to subchelate;
- 2) the supraorbital spine bears sub-apically a prominent spine ventrally so as to appear bifid in the vertical plane.

The new species differs from *H. valdiviae* in two main features:

- 1) the supraorbital spine is longer (just exceeding the carapace), and bears three spines dorsally in the proximal 2/3, as opposed to two spines (in *H. valdiviae*);
- 2) the spine or fixed finger on the propodus of the last leg arises distally, not proximally and the 'gape' thus appears narrow, not broad as in *H. valdiviae*.

There also appear to be differences in the number of dorsal spines on the ambulatory meri (6-7 as opposed to 4-6), and the spines of the carapace appear longer and sharper. (The spines on the carapace are usually longer and sharper in juvenile crabs but this is not the case in *H. valdiviae* — the juvenile male figured by Doflein (1904: pl. 1 fig. 2) has short, blunt spines like the adult.) The spines on the lateral part of segment 4 of the abdomen of the female of our specimen are slightly longer than those of *H. valdiviae*.

This genus has not previously been recorded from Australia.

DISTRIBUTION: Off eastern Australia, and New Caledonia; 558-880 m.

Family CYMONOMIDAE

*Cyonomus delli*² n. sp.

Figs 4, 5

HOLOTYPE: Female, cl. 8.9 mm (AM P. 19379), off Sydney, 33°51'S., 151°51'E. to 33°45'S., 151°55'E., 675 m, 19 October 1972.

DESCRIPTION: Body and appendages with granules, spinules and short hairs. Carapace subquadrate, one or two spinules at anterolateral angle enlarged. Regions poorly marked, only intestinal region obvious, a faint line marking border of mesogastric region, a low ridge extending obliquely forward from intestinal region to lateral surface of carapace.

Rostrum short, sharply triangular, unarmed, about half length of eyestalks.

Eyestalks weakly flattened, reaching to end of first segment of antenna, hardly tapering, distally rounded, dorsal surface densely covered by granules and laterally by spinules, ventrally smooth; no vestige of cornea.

Antennules as long as carapace, second segment of peduncle bulbous, other three segments slender. Antennal peduncle reaching middle of third segment of antennular peduncle; antennal scale obsolete.

Third maxillipeds granular, merus of endopod spinulose, exopod reaching almost as far forward as anterior edge of merus of endopod. Merus of endopod about 2/3 length of ischium.

Chelipeds with a few spinules dorsally on carpus and chela, palm of chela with enlarged granules on outer surface; fingers slightly longer than palm, cutting edges only weakly gaping.

First two ambulatory legs long, second three times length of carapace including rostrum, first 2/3 length of second, last two legs subequal, 1.3 times total length of carapace. Dactyls of first two legs at least 1.5 times length of propodus, weakly curved, distally weakly depressed, dactyls of last two legs less than 1/4 length of propodi, curved, weakly compressed.

Sternum granular.

Abdomen of female of seven free segments, segment 7 short and broadly rounded; surface granular, second and third segments with spinules laterally.

REMARKS: We follow I. Gordon (pers. comm. to J. S. Garth) in placing the genus *Cyonomus* A. Milne Edwards, 1880 in a separate family on the basis of the external genitalia.

C. delli, like *C. cubensis* Chace 1940, differs from most other species of the genus in having seven abdominal segments instead of six. In some groups, e.g., spider crabs (family Majidae), differences such as this are considered important enough to warrant subfamilial separation. Further investigation of the genus *Cyonomus* may result in separation of the species into two or more genera on this basis.

Differences from the New Zealand species *C. aequilonius* Dell, 1971 include the number of segments in the abdomen, the shorter rostrum relative to the eyestalk, the less

²Named for Dr. R. K. Dell, presently Director of the National Museum (of New Zealand), who has contributed much to the knowledge of New Zealand and Australian crabs including the genus *Cyonomus*.

advanced front (extraorbital border). From the New Zealand *C. bathamae* Dell, 1971, it differs in the number of abdominal segments, the weakly advanced front, the presence of spines at the anterolateral corner and the smoother appearance of the carapace.

From *C. andamanicus* Alcock, 1905, *C. delli* differs in having two spinules on the anterolateral angle of the carapace, the smoother appearance of the carapace and legs (number of abdominal segments of *C. andamanicus* unknown).

C. granulatus japonicus Balss, 1922a, has a very long rostrum and medially advanced front (number of abdominal segments unknown).

The new species agrees with *C. granulatus curvirostris* Sakai, 1965 in the rostrum being shorter than the eyestalks, but Sakai's species is very strongly granulate, and the granules along the lateral margins are knobby or leaflike; the number of abdominal segments in this species are unknown.

This genus has not previously been recorded from Australia.

DISTRIBUTION: Eastern Australia; 675 m.

Family MAJIDAE

Chlorinoides goldsboroughi Rathbun

Chlorinoides goldsboroughi Rathbun, 1906: 881-882, pl. 14, fig. 7. — Griffin, 1970: 67-70, figs. 1a, 2, 4b, c, f.

MATERIAL: 1♂, cl. 19 mm (AM P. 19643).

LOCALITY: Southeast of Gabo Island, Victoria, 37°39'S., 150°17'E. to 37°45'S., 150°13'E., 401-396 m, 30 July 1971, 1 spec.

REMARKS: Differences between this species and the Japanese *C. brevispinosa* Yokoya have already been discussed recently (Griffin, 1966a, 1970).

DISTRIBUTION: Hawaii; southeastern Australia; 126-401 m.

Cyrtomaia suhmi Miers

Fig 6

Cyrtomaia suhmi Miers, 1886: 16-17, pl. 3, fig. 2. — Griffin 1974: 9-10.

MATERIAL: 1♂, post. rost. 1. 60.0 mm, 4♀♀ (3 ovig.), cl. 69-76 mm (P. 19153, 20585, 20586, 20631), smallest ovig. ♀ 71 mm.

LOCALITIES: Off Port Stephens, 32°46'S., 152°46'E. to 32°51'S., 152°42'E., 540 m, 29 April 1971, 2 specs. — East of Broken Bay, 33°39'S., 151°56'E., to 33°33'S., 152°00'E., 450 m, 8 April 1975, 2 specs; 33°40'S., 151°53'E. to 33°35'S., 151°58'E., 450-810 m, 23 May 1975, 1 spec.

REMARKS: These extremely large specimens are smooth with long protogastric spines. They clearly are not *C. maccullochi* Rathbun, 1918, the only known large Australian *Cyrtomaia*. That species differs in having no spine above the eye (probably not specifically important in this genus), there is a line of close-set tubercles laterally on each branchial region, the surface of the carapace is coarsely granular and there are fewer dorsal branchial spines.

C. suhmi is at present considered to contain three subspecies (see Griffin, 1974; and Serene & Lohavanijaya, 1973). One of these, the Japanese *C. suhmi curviceros* Bouvier, 1916, resembles our five specimens in its large size, the arrangement of spines on the carapace, the generally smooth appearance, the relative length and shape of the rostrum and the

ornamentation of the basal antennal article. The Japanese species, however, lacks a spine above the eye (present in all of our specimens) and possesses two subdorsal branchial spines, instead of one. It seems almost certain that *C. suhmi curviceros* is not subspecifically distinct from *C. suhmi suhmi*.

There are four other large species of *Cyrtomaia*. *C. echinata* Rathbun, 1916, from the Philippines is extremely spiny. *C. horrida* Rathbun, 1916, from the Philippines has a spine on the orbital border but the anterolateral branchial spines are much larger than on our specimens, there is an intestinal spine (absent in our specimens) and two mesogastric spines (only one in our specimens).

C. goodridgei McArdle, 1900, from the Indian Ocean differs in having spinules along the anterior border of the branchial region dorsally, there is a strong ridge extending back from each orbit to each large protogastric spine, there is no spine above the eye, there is only one spine on the lateral edge of the basal antennal article and the erect protogastric spines are longer than the branchial spines.

The New Zealand *C. hispida* (Borradaile, 1916) is a small species (Bennett, 1964).

Cyrtomaia suhmi has not previously been recorded from Australia.

DISTRIBUTION: Indo-West Pacific, northern Indian Ocean, Indonesia, Philippine Islands and Japan; southeastern Australia; 450-900 m.

Leptomithrax richardsoni Dell

Leptomithrax richardsoni Dell, 1960: 2-4, fig. 3, pl. 2. — Dell, 1963: 252 (in list). — Griffin, 1966b: 79-81, figs. 16, 23, pls. 3, 4. — Takeda & Miyake, 1969: 184-5.

MATERIAL: 1♂, cl. 70 mm, 1♀, (post. rost.) cl. 53.5 mm (AM P. 18367, 20668).

LOCALITIES: Southeast of Broken Bay, 33°40'S., 151°55'E. to 33°35'S., 151°58'E., 540 m, 14 July 1971, 1 spec. — East of Brush Island, 35°28'S., 150°48'E. to 35°34'S., 150°45'E., 540-558 m, 10 June 1975, 1 spec.

REMARKS: These two specimens clearly agree with specimens from New Zealand in the characteristic features of the orbit, chelipeds and first pleopod.

This species has not been previously recorded from Australia.

DISTRIBUTION: New Zealand; southeastern Australia; 382-558 m.

Leptomithrax waitei (Whitelegge)

Chlorinoides waitei Whitelegge, 1900: 143-146, pl. 33.

Leptomithrax waitei. — Rathbun, 1918: 23. — Griffin, 1966c, p. 285 (in key).

MATERIAL: 2 ovig. ♀♀, cl. 120.5 mm, 113.5 mm (AM P. 18598).

LOCALITY: Southeast of Broken Bay, 33°40'S., 151°55'E. to 33°35'S., 151°58'E., 540 m, 14 July 1971, 2 specs.

REMARKS: This species is well described and figured by Whitelegge.

DISTRIBUTION: Southeastern Australia, lower shelf and slope to 540 m.

Rochinia fultoni (Grant)

Hyastenus fultoni Grant, 1905: 313-315, pl. 11, fig. 1.

Scyramathia fultoni. — Rathbun, 1918: 14, pl. 5.

Rochinia fultoni. — Griffin, 1972: 71-72. — Serene & Lohavanijaya, 1973: 55 (in key).

MATERIAL: 2♂♂, 1 ovig. ♀, cl. 21-26.5 mm (AM P. 17965, 18990-1).

LOCALITIES: Off Port Stevens, 32°46'S., 152°46'E. to 32°51'S., 152°42'E., 585-576 m, 7 May 1971, 1 spec. — Off Sydney, 33°44'S., 151°48'E. to 33°38'S., 151°45'E., dredged, 270 m, 10 August 1972, 1 spec. — South of Sydney, 34°00'S., 151°43'E. to 33°54'S., 151°47'E., 720 m, 6 November 1972, 1 spec.

REMARKS: This species is most similar to the Japanese *R. debilis* Rathbun from which it differs in possessing a conical mesogastric spine; it also possesses a much longer intestinal spine and a small tubercle on each side of the cardiac spine.

DISTRIBUTION: Southeastern Australia; 108-720 m.

Family PORTUNIDAE

Ovalipes molleri (Ward)

Aeneacancer molleri Ward, 1933: 381-3, pl. 23, fig. 11.

Ovalipes molleri. — Stephenson and Rees, 1968: 237-239, pls 37A, 40B, 41B, 42H; figs. 1H, 29, 39, 4G. — Dawson & Yaldwyn, 1974: 46-47.

MATERIAL: 4♂♂, 11♀♀ (2 ovig.), cw. 31-87.5 mm (AM P. 17912-3, 17969, 17972, 19100-1, 19611).

LOCALITIES: Off Port Stephens, 32°46'S., 152°46'E. to 32°51'S., 152°42'E., 585-576 m, 7 May 1971, 5 specs; 32°54'S., 152°37'E., to 32°50'S., 152°42'E., 369-360 m, prawn trawl, mud bottom, 28 April 1971, 2 specs. — Between Port Stephens and Lake Macquarie, 32°46'S., 152°17'E. to 33°15'S., 152°46'E., 360-540 m, 28-29 April 1971, 2 specs. — Transect between Port Stephens and Sydney, 32°51'S., 151°48'E. to 33°47'S., 152°45'E., 360 m, July 1972, 3 specs. — 25 miles east of Sydney, 33°39'S., 151°49'E. to 33°50'S., 152°55'E., 80 ft. otter trawl, 270-360 m, 6-7 April 1971, 2 specs. — South of Port Hacking, 34°15'S., 151°25'E. to 34°20'S., 151°21'E., 261-279 m, 28 June 1971, 1 spec.

REMARKS: This species differs from *Ovalipes iridescens* (Miers, 1886) in having four frontal lobes (medial two fused basally) instead of three (see Stephenson & Rees, 1968). There are additional differences in the form of the ridge on the pterygostomial region, the number of spines on the palm of the chela, and the stoutness and hairyness of the first pleopod of the male.

DISTRIBUTION: New Zealand; southeast Australia — off New South Wales and Victoria; 198-585 m.

Family GONEPLACIDAE

Carcinoplax victoriensis Rathbun

Carcinoplax victoriensis Rathbun 1923: 101-103, pl. 19. — Dell, 1960: 4, pl. 1; 1963: 251-252. — Takeda & Miyake, 1969: 172-173. — Serene & Lohavanijaya, 1973: 64 (in key).

MATERIAL: 15♂♂, 5♀♀, cw. 15-23 mm (AM P. 19143-6, 17915, 17994)

LOCALITIES: Off Broken Bay, 33°41'S., 151°55'E. to 33°44'S., 151°53'E., 540 m, prawn trawl, 20 April 1971, 1 spec. — North of Sydney, 33°44'S., 151°55'E. to 33°40'S., 151°58'E., 720 m, 9 November 1972, 12 specs. — Off Sydney, 33°51'S., 151°51'E. to 33°45'S., 151°55'E.,

675 m, 19 October 1972, 1 spec.; 33°52'S., 152°50'E. to 33°48'S., 152°54'E., 765 m, 7 December 1972, 1 spec. — South of Sydney, 34°00'S., 151°43'E. to 33°54'S., 151°47'E., 720 m, 6 November 1972, 4 specs. — Off Ulladulla, 35°25'S., 150°50'E. to 35°29'S., 150°48'E., 540 m, 2 August 1971, 1 spec.

REMARKS: This species is most easily distinguished from the other Australian species of the genus, *C. meridionalis* Rathbun, 1923, by the dark brown (fading in alcohol) fingers (black in *C. meridionalis*) and the blunt first anterolateral tooth of the carapace.

DISTRIBUTION: Southeastern Australia; New Zealand; 125-765 m.

Carcinoplax meridionalis Rathbun

Carcinoplax meridionalis Rathbun, 1923: 99-101, pl. 19. — Serene & Lohavanijaya, 1973: 67, pl. 15D.

MATERIAL: 1 ♀ (ovig.), cw. 14.5 mm (AM P. 20634).

LOCALITY: East of Wollongong, 34°18'S., 151°26'E. to 34°24'S., 151°23'E., 450-468 m, 29 May 1975, 1 spec.

DISTRIBUTION: Off southeastern Australia, from Eucla, Great Australian Bight to off Wollongong, New South Wales; 126-540 m.

Neopilumnoplax heterochir (Studer)

Pilumnus heterochir Studer, 1882: 11, pl. 1, figs. 3a-d (not seen).

Pilumnoplax heterochir. — Rathbun, 1923: 99, pl. 17, figs. 1, 2.

Neopilumnoplax heterochir. — Serene & Lohavanijaya, 1973: 69-70, pl. 16D.

MATERIAL: 1 ♂, cw. 9.5 mm (AM P. 20635).

LOCALITY: East of Wollongong, 34°18'S., 151°26'E. to 34°24'S., 151°23'E., 450-468 m, 29 May 1975, 1 spec.

REMARKS: This species possesses the uneven carapace, notched front, two anterolateral spines behind the low external orbital spine and bifid or double spine on the medial border of the carpus of the cheliped characteristic of this species. The genus *Neopilumnoplax* Serene (in Guinot, 1969) was set up following the transfer of several species of *Pilumnoplax* to other genera.

DISTRIBUTION: South Africa; South China Sea; southeastern Australia; 108-520 m.

Litocheira kingsleyi (Miers)³

Litocheira kingsleyi Miers, 1886: 232-3, pl. 21, fig. 1. — Doflein, 1904: 121. — Tesch, 1918: 164 (in key). — Barnard, 1950: 294-5, fig. 55.

MATERIAL: 1 ♂, 1 ♀ (ovig.), cw. 9.5 mm (AM P. 20671).

LOCALITY: East of Brush Island, 35°28'S., 150°48'E. to 35°34'S., 150°45'E., 459-441 m, 10 June 1975, 2 specs.

REMARKS: This species has been well described and figured by Miers (1886) and Barnard (1950). It is easily distinguished from *L. bispinosa* Kinahan, 1858, the only other

³Since this paper was submitted for publication, Turkey, 1975 (*Senckenbergiana biol.* 56(1/3): 103-122) has revised the genus *Litocheira*. *L. kingsleyi* is now placed in the genus *Euchirograpsus*, family Grapsidae.

Australian species of the genus, by the prominent spiniform tooth at the outer angle of the orbit, the shape of the male first pleopod, and the form of the front of the carapace (see McCulloch, 1913).

This species has not previously been recorded from Australia.

DISTRIBUTION: South Africa; southeastern Australia; 171-459 m.

Family GERYONIDAE⁴

Geryon affinis A. Milne Edwards & Bouvier

Figs 7-9

Geryon affinis A. Milne Edwards & Bouvier, 1894: 41-45, figs. A, C, pl. 1, fig. 1. — Alcock, 1899: 85. — Doflein, 1904: 106-111, pls 3, 4, 33, 34, 38, figs. 1-6, pl. 41, figs. 3-7, pl. 43, figs. 2, 8. — Chace, 1940: 39-40. — Kjennerud, 1967: 193-197.

Geryon trispinosus. — Ortmann, 1894: 685-687. — Sakai, 1939: 561; 1965: 168, pl. 82. — Balss, 1922b: 121. (Not *Cancer trispinosus* Herbst, 1803.)

MATERIAL: 10♂♂, 3♀♀ (1 ovig.), cw. 125-175.5 mm (AM P. 19104-6, 19335, 19584-5, 20487-89, 20490-1, 20632-3.)

LOCALITIES: South east of Grafton, 29°49'S., 153°42'E. to 29°59'S., 153°38'E., 369 m, 12 May 1971, 2 specs. — East of Broken Bay, 33°40'S., 151°53'E. to 33°22'S., 152°09'E., 450 m, 19-20 September 1972, 1 spec.; 33°38'S., 151°57'E. to 33°34'S., 152°01'E., 774-792 m, 2 April 1975, 5 specs; 33°40'S., 151°53'E. to 33°35'S., 151°58'E., 450-810 m., 23 May 1975, 2 specs. — North of Sydney, 33°43'S., 151°55'E. to 33°37'S., 152°02'E., 675 m, 19 October 1972, 1 spec. — Off Sydney, 33°52'S., 152°50'E. to 33°48'S., 152°54'E., 765 m, 7 December 1972, 2 specs.

REMARKS: These thirteen specimens all possess four frontal spines, of which the external pair form the internal angle of the orbits and the median two are close together but separated by a broad sinus and project slightly more forward than the external ones. All have five spines on the anterolateral margin of the carapace, the first, third and fifth being the most prominent. The second spine, slightly smaller than the first, is situated less than half way between the first (external orbital border) and third spine. The fourth spine is located approximately equidistant between the third and fifth spines. (In several specimens the fourth spine is not very pronounced.) The ambulatory dactyls are long, slender, compressed and prominently ridged (see A. Milne Edwards and Bouvier).

All the specimens are light yellowish-tan in colour with red markings on the carapace and pereopods as figured by Doflein (1904, pl. 4) except for one juvenile male (cw. 125.0 mm.) in which the carapace is reddish tan in colour.

The specimens figured by Sakai (1965) as *Geryon trispinosus* also have four frontal spines and five anterolateral spines on the carapace. But *Cancer trispinosus*, as originally described and figured by Herbst (1803: 43-44, pl. 57, fig. 4), has only three anterolateral spines. De Man (1890), in giving a description of the Herbst specimen, states "... in the original specimen of Herbst the lateral margin is quite straight between the first and second spines and slightly convex between the second and third spines." Dr. H. E. Gruner

⁴We follow Guinot, 1969 (*Bull. Mus. Nat. Paris* 41 (3): 690-696) and Balss, 1957 (Decapoda. In: Bronns, H. G., Klassen und Ordnungen des Tierreichs, vol. 5 sect. 1 book 7 pt.12, p. 1654, fig. 1196), in placing *Geryon* in a separate family — Geryonidae. Eschscholtz, 1829 (*System der Acalephen*, p. 86-87, Ferdinand Dümmler, Berlin) however, has used the family name Geryonidae for a group of coelenterates. But the coelenterate family name, Geryonidae, was derived from the genus *Geryonia*, and thus is incorrectly formed; it should be spelt Geryoniidae.

(Zoologisches Museum, Berlin) has kindly forwarded photographs (see fig. 10) of Herbst's type material (from "Ostindien", i.e. Indonesia according to Gruner) which confirms that *Cancer trispinosus* possesses only three anterolateral spines and lacks ridges on the short ambulatory dactyls.

Barnard (1950), Capart (1951) and Monod (1956) considered *G. affinis* to be a synonym of *G. quinquedens* Smith (1880) on the basis that the ridges on the dactyls, an important diagnostic character used to separate the two species, was not consistent.

G. quinquedens is considered to differ from *G. affinis* in having broad compressed ambulatory dactyls (see Chace, 1940, p. 40) and in being blood red in colour. However, as Sankarankutty (1968) has pointed out, the male first pleopod of *G. quinquedens* figured by Barnard (1950: fig. 54, i) does not possess the prominent pubescence along the lateral margin which is very evident in the pleopod of *G. affinis* (as figured by Doflein, 1904: pl. 41, fig. 6). The New South Wales specimens are also pubescent on the outer margin of the first pleopod of the male (see figs. 9 a-c). A closer examination of all *G. quinquedens/affinis* material is necessary to determine the validity of the difference in the pubescence of the first pleopod of the male.

Of the remaining species, *Geryon tridens* Kroyer, 1836 has three anterolateral spines on the carapace and the male first pleopod, as figured by Sankarankutty (1968), has very thick pubescence on its medial and lateral margins. Barnard (1950) suggests that *Geryon ishurodous* Stebbing, 1923 is probably a synonym of Herbst's *G. trispinosus*. As *G. trispinosus* appears similar to *G. tridens* in the rather straight front and three anterolateral teeth, a closer examination of the male first pleopods of these species is also needed.

This genus has not been recorded previously from Australia.

DISTRIBUTION: Atlantic: Azores, off South Africa, Northern Europe, off eastern North America. Indo-West Pacific: off east Africa, India, Japan and eastern Australia; 80-2000 m.

DISCUSSION

Approximately thirty species of crabs (5% of the total known from Australia — see Griffin & Yaldwyn, 1968) have been recorded from the continental slope (or archibenthal region) of Australia. The families and genera represented in the Australian archibenthal fauna are much the same as those represented in the equivalent faunas of other parts of the Indo-West Pacific. Thus the typical groups are homolids (e.g. *Homola*), dromiids and majids (e.g. *Platymaia*, *Cyrtomaia* and *Leptomithrax*) and goneplacids (e.g. *Carcinoplax*). But the Australian fauna, as currently known, presents some peculiarities. Deepwater faunas are generally considered to comprise widely distributed species and genera and to contain fewer species with a relatively restricted distribution. Thus the fact that species like *Homola orientalis* Henderson, 1888, *Lyreidus tridentatus* De Haan, 1841, *Platymaia wyvillethomsoni* Miers, 1886, *Cyrtomaia suhmi*, *Pilumnus tomentosus* Latreille, 1825 and *Geryon affinis* occur in Australia and Japan and, in some cases, in other parts of the Indo-West Pacific, conforms with this general view. But the fact that species of *Cymonomus* and of *Trichopeltarion* (see Dell, 1968), quite distinct from the New Zealand species, should occur in Australia and that other species known from the New Zealand archibenthal, such as *Paromola spinimana* Griffin, 1965, do not occur in Australia suggests an absence of faunal interchange over a much longer period than is sometimes thought. It may further support the suggestion that Australia and New Zealand have been separate and distinct outliers of the tropical Indo-Pacific for a considerable length of time. Further evidence of this may be provided by the study of other deepwater decapod Crustacea.

ACKNOWLEDGEMENTS

We wish to thank the Director of the New South Wales State Fisheries, Dr. D. D. Francois, and his staff, particularly the crew of the F.R.V. 'Kapala', for kindly making this material available for study, Dr. H. E. Gruner (Berlin) for providing information about type material in collections under his care, and Mr. Greg Millen (Australian Museum) for taking the photographs (except fig. 10) accompanying this paper.

Special thanks are due to Drs. J. S. Garth (Allan Hancock Foundation, Los Angeles) and J. C. Yaldwyn (National Museum, Wellington) for their care in reviewing this manuscript and for making so many valuable comments on it.

REFERENCES

- Alcock, A. W., 1899. An account of the deep-sea Brachyura collected by the Royal Indian Marine Survey Ship 'Investigator'. Calcutta, 88 pp, 4 pls.
- 1905. Natural history notes from the R.I.M.S. Ship 'Investigator' — Series III, No. 9. On a New Species of the Dorippoid genus *Cymonomus* from the Andaman Sea, considered with Reference to the distribution of the Dorippidae; with some remarks on the Allied Genus, *Cymonomops*. *Ann. Mag. nat. Hist.* (7) 15: 565-577.
- Baker, W. H., 1904-1907. Notes on South Australian decapod Crustacea. Parts 1-5. *Trans. R. Soc. S. Aust.* 28: 146-161 (1904); 29: 116-131 (1905); 252-269 (1905); 30: 104-117 (1906); 31: 173-191 (1907).
- Balss, H., 1922a. Ostasiatische Decapoden. III. Die Dromiaceen, Oxystomen und Parthenopiden. *Arch. Naturgesch.* 88A (3): 104-140, 9 text-figs.
- 1922b. Ostasiatische Decapoden. IV. Die Brachynhynchen (Cancridea). *Arch. Naturgesch.* 88A(11): 94-166, 2 figs., 2 pls.
- Barnard, K. H., 1950. Descriptive catalogue of South African decapod Crustacea (crabs and shrimps). *Ann. S. Afr. Mus.* 38: 1-837, 154 figs.
- Bennett, E. W., 1964. The marine fauna of New Zealand: Crustacea Brachyura. *N.Z. Dept. scient. ind. Res. Bull.* 153: 1-120, 141 figs.
- Bouvier, E. L., 1916. Étude sur un *Cyrtomaia suhmi* due Musée de Marseille. *Annls. Mus. Hist. Nat. Marseille* 15: 9-15, 1 pl.
- Carpent, A., 1951. Crustacés décapodes, Brachyure. In *Rés. sci. expéd. océanogr. Belge eaux Côtières Afr. Atl Sud.* (1948-1949) 3 (1): 11-205, 80 figs., 3 pls.
- Chace, F. A., 1940. Reports on the scientific results of the 'Atlantis' Expedition to the West Indies, under the joint auspices of the University of Havana and Harvard University. Brachyuran crabs. *Torreia* 4: 3-67, 22 figs.
- Dawson, E. W. & Yaldwyn, J. C., 1974. *Ovalipes mollerii* (Ward), a portunid swimming crab new to New Zealand: Occurrence and distinguishing features. *N.Z.O.I. Rec.* 2: 45-48.
- Dell, R. K., 1955. A record of *Latreillopsis petterdi* Grant (Crustacea, Brachyura) from New Zealand, with notes on some other species of Crustacea. *Rec. Dom. Mus., Wellington* 2: 147-149, 1 fig.
- 1960. Biological Results of the Chatham Islands 1954 Expedition. Part 1 — The Crabs (Decapoda, Brachyura) of the Chatham Islands 1954 Expedition. *N.Z. Dept. scient. ind. Res. Bull.* 139 (1): 1-7, 6 figs., 2 pls.
- 1963. Some deepwater crabs (Crustacea, Decapoda) from New Zealand. *Rec. Dom. Mus., Wellington* 4: 243-253, 13 figs.
- 1968. A new crab of the genus *Trichopeltarion* from Australia. *Aust. Zool.* 14: 275-276, 1 pl., 5 text-figs.
- 1971. Two new species of crabs of the genus *Cymonomus* from New Zealand (Crustacea: Brachyura). *Rec. Dom. Mus. Wellington* 7 (8): 55-64, 11 figs.
- Doflein, F., 1904. Brachyura. Wissenschaftliche Ergebnisse der Deutschen Tiefsee — Expedition auf dem Dampfer 'Valdivia' 1898-1899. Vol. 6, XII + 31 pages, 1 map, 68 figs.; Atlas: 58 plates.
- Grant, F. E., 1905. Crustacea dredged off Port Jackson in deep water. *Proc. Linn. Soc. N.S.W.* 30: 312-324, pls. 10, 11.
- Gordon, I. 1950. Crustacea Dromiacea. I. Systematic account of the Dromiacea collected by the 'John Murray' Expedition, II. The morphology of the spermatheca in certain Brachyura. *Scient. Rep. 'John Murray' Exped.* 1933-34 9: 201-253, 26 text-figs., pl. 1.
- Griffin, D. J. G., 1965. A new species of *Paromola* (Crustacea, Decapoda, Thelxiopidae) from New Zealand. *Trans. R. Soc. N.Z., Zool.* 7: 85-91, 8 figs., 2 pls.

- 1966a. The genus *Chlorinoides* (Crustacea, Brachyura, Majidae) I. A redescription of *C. tenuirostris* Haswell and the status of the genus *Acanthophrys* A. Milne Edwards. *Rec. Aust. Mus.* 27: 1-16, 11 figs.
- 1966b. The marine fauna of New Zealand: spider crabs of the family Majidae (Crustacea, Brachyura). *N.Z. Dept. scient. ind. Res. Bull.* 172: 9-111, 23 figs, 4 pls.
- 1966c. A review of the Australian majid spider crabs (Crustacea, Brachyura). *Aust. Zool.* 13: 259-298, 3 figs., pls. 15-17.
- 1970. The genus *Chlorinoides* (Crustacea, Brachyura, Majidae). 2. *Chlorinoides goldsboroughi* Rathbun from eastern Australia, *C. tenuirostris* and a new species from Western Australia. *Rec. Aust. Mus.* 28: 65-76, 4 figs.
- 1972. Brachyura collected by Danish expeditions in South-Eastern Australia (Crustacea; Decapoda). *Steenstrupia* 2: 49-90, 3 figs.
- 1974. Spider Crabs (Crustacea, Brachyura, Majidae) from the International Indian Ocean Expedition, 1963-1964, *Smithson. Contr. Zool.* (182): 1-35, 6 tables, 8 figs.
- Griffin, D. J. G. & Yaldwyn, J. C., 1968. The constitution, distribution and relationships of the Australian Decapod Crustacea. *Proc. Linn. Soc. N.S.W.* 93: 164-183, 7 tables, 5 figs.
- Herbst, J. F. W., 1782-1804. Versuch einer naturgeschichte der Krabben und Krebse, nebst einer Systematischen Beschreibung ihrer verschiedenen Arten. 3 volumes, atlas: 62 plates. G. A. Lange, Berlin & Stralsund.
- Kjennerud, J., 1967. A find of *Geryon affinis* Milne-Edwards & Bouvier, 1894 (Crustacea Decapoda) off the coast of Norway. *Sarsia* 29: 193-198, 1 fig.
- Kroyer, H., 1836. *Geryon tridens*, en ny Krabbe. *Naturhist. Tidsskr.* 1: 10-21, 1 pl. (quoted from S. I. Smith, 1880).
- Man, J. G. De, 1890. Carcinological studies in the Leyden Museum. No. 4. *Notes Leyden Mus.* 12: 49-126, pls. 3-6.
- McArdle, A. F., 1900. Natural history notes from the Royal Indian Marine Survey Ship 'Investigator'. Series III. No. 4. Some results of the dredging season 1899-1900. *Ann. Mag. nat. Hist.* (7), 6: 471-478.
- McCulloch, A. R., 1913. Studies in Australian Crustacea. No. 3. *Rec. Aust. Mus.* 9: 323-5, fig. 42.
- Miers, E. J., 1886. Report on the Brachyura collected by H.M.S. 'Challenger' during the years 1873-76. *Rep. Voy. 'Challenger', Zool.*, Vol. 17 (No. 2, pt. 49): I-L, 1-362, 29 pls.
- Milne Edwards, A. & Bouvier, E. L., 1894. Crustacés Décapodes provenant des campagnes du yacht 'l'Hirondelle' 1886, 1887 et 1888. Brachyures et Anomoures. *Résult. Camp. Scient. Prince Albert I. Monaco* 7: 1-112, 11 pls.
- Monod, Th., 1956. Hippidea et Brachyura ouest Africains. *Mem. Inst. Fr. Afr. Noire cent. Cameroun* (45): 1-674, 2 tables, 884 figs.
- Ortmann, A. E., 1894. Die Decapoden Krebse des Strassburger Museums. VIII. Abteilung Brachyura III. Unterabteilung Cancroidea, 2. Section: Cancrinea, 2. Gruppe: Catometopa. *Zool. Jb. Syst.* 7: 683-772, pl. 23.
- Rathbun, J., 1906. The Brachyura and Macrura of the Hawaiian Islands. *Bull. U.S. Fish. Comm.* 23: 829-930, 79 figs., 124 pls.
- 1916. New species of crabs of the families Inachidae and Parthenopidae. (Scientific results of the Philippine cruise of the fisheries steamer 'Albatross'. 1907-1910. No. 34). *Proc. U.S. Natn. Mus.* 50: 527-559.
- 1918. Report on the spider crabs obtained by the F.I.S. 'Endeavour' on the coasts of Queensland, New South Wales, Victoria, South Australia and Tasmania. *Biol. Results Fish. Exp. 'Endeavour' 1909-14* 5: 1-29, 3 figs., 15 pls.

- 1923. Report on the crabs obtained by the F.I.S. 'Endeavour' on the coasts of Queensland, New South Wales, Victoria, South Australia and Tasmania. *Biol. Results Fish Exp. 'Endeavour' 1909-14* 5: 95-156, 3 figs., pls. 16-42.
- Sakai, T., 1939. Studies on the Crabs of Japan. IV. Brachygnatha Brachyrhyncha. Pp. 365-741, 129 text figures, pls. 42-111. Yokendo Co., Tokyo.
- 1955. On some rare species of crabs from Japan. *Bull. biogeogr. Soc. Japan*. 15-16: 106-113, 6 figs.
- 1965. The crabs of Sagami Bay collected by His Majesty The Emperor of Japan. Pp XVI, 206, 92, 32, 27 figs., 100 pls., 1 map, Maruzen, Tokyo.
- Sankarankutty, C., 1968. The first male pleopod in Norwegian Decapoda Brachyura. *Sarsia* 31: 43-56, 6 figs.
- Serene, R. & Lohavanijaya, P., 1973. The Brachyura (Crustacea: Decapoda) collected by the Naga Expedition, including a review of the Homolidae. *Naga Rep.* 4 (4): 1-187, 186 figs., 21 pls.
- Smith, S. I., 1880. The stalk-eyed Crustaceans of the Atlantic Coast of North America north of Cape Cod. *Trans. Connecticut Acad.* 5 (1): 27-138, pls. 8-12.
- Stebbing, T. R. R., 1923. Crustacea of Natal. Special Report No. III. *Fish. Mar. Biol. Survey Rep.* (3): 1-15, pls. 10-16.
- Stephenson, W. & Rees, M., 1968. A revision of the genus *Ovalipes* Rathbun, 1898 (Crustacea, Decapoda, Portunidae). *Rec. Aust. Mus.* 27: 213-261, 4 figs., pls. 35-42.
- Studer, T., 1883. Verzeichniss der Crustaceen, welche wahrend der Reise S.M.S. 'Gazelle' an der Westkuste von Africa, Ascension und dem Cap der Guten Hoffnung gesammelt wurden. *Abh. K. Acad. Wiss. Berlin* 1883 (2): 1-32, 2 pls. (Quoted from Serene & Lohavanijaya, 1973).
- Takeda, M. & Miyake, S., 1969. A small collection of crabs from New Zealand. *Ohmu* 2: 157-193, 7 figs, 3 pls.
- Tesch, J. J., 1918. The Decapoda Brachyura of the 'Siboga' Expedition. V. Goneplacidae and Pinnotheridae. *Siboga Exped. Monogr.* 39C (84): 149-295, pls. 7-17.
- Ward, M. 1933. New genera and species of Marine Decapoda Brachyura from the coasts of New South Wales and Queensland. *Aust. Zool.* 7: 337-394, pls. 21-23.
- Whitelegge, T., 1900. Crustacea, Part 1 — Decapoda and Stomatopoda. In: Scientific Results of the Trawling Expedition of H.M.C.S. 'Thetis', off the Coast of New South Wales, in February and March, 1898. *Mem. Aust. Mus.* 4: 135-199, pls. 32-35.

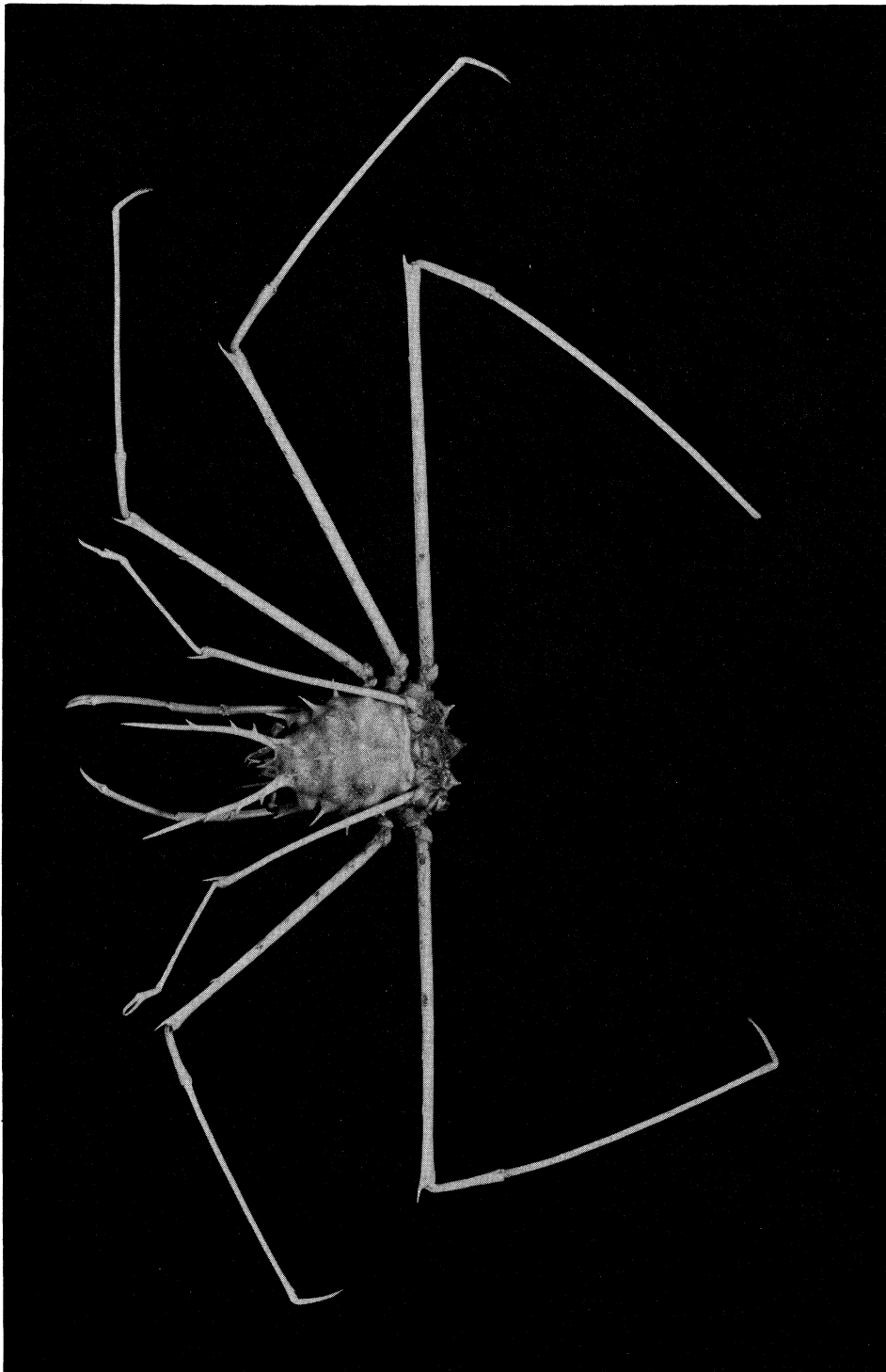


Fig. 1. *Homolochunia kullar* n. sp., female (Holotype, AM P. 18998), cl. 61 mm: dorsal aspect.



Fig. 2. *Homolochunia kullar* n. sp., female (Holotype, AM P. 18998), cl. 61 mm: lateral aspect.

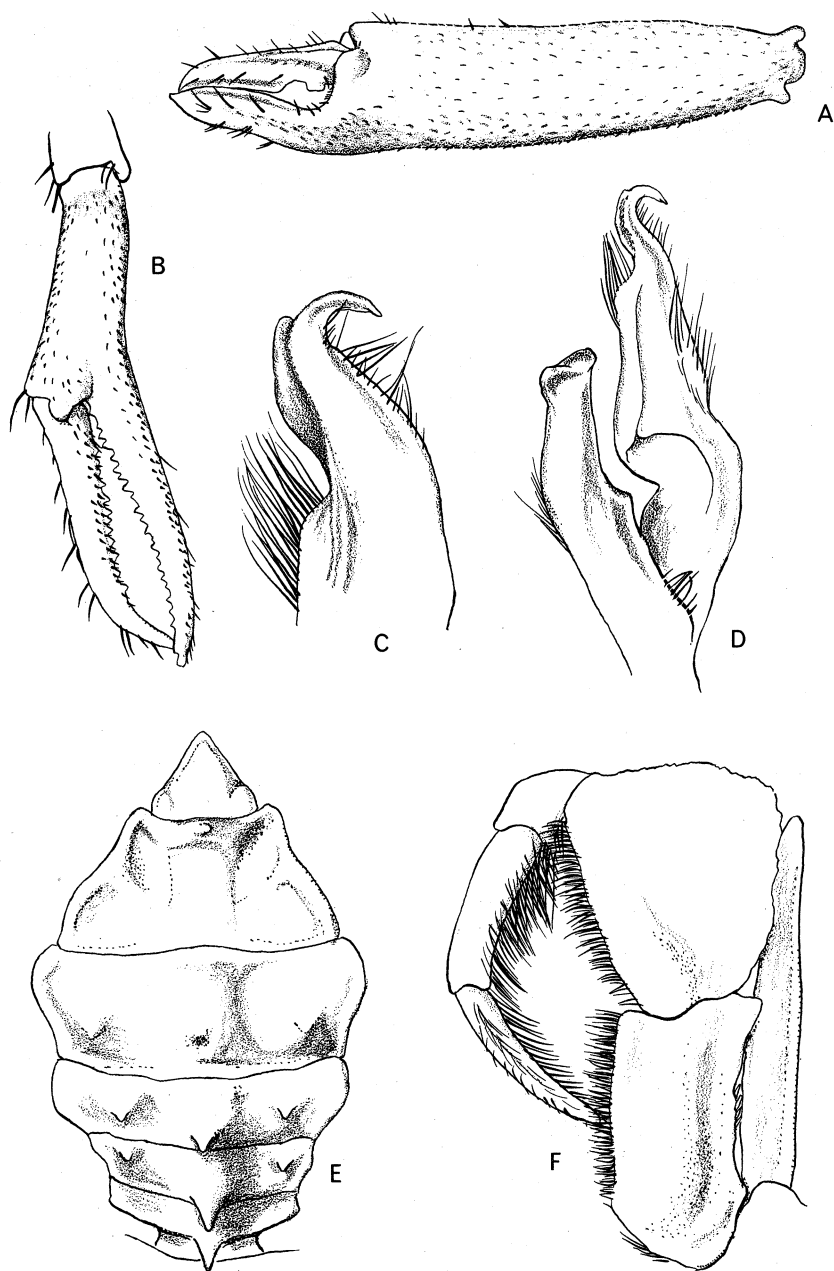


Fig. 3. *Homolochunia kullar* n. sp., male (Paratype, AM P. 20252), cl. 60 mm: a, left chela, outer aspect; b, left fourth ambulatory dactyl, posterior aspect; c, left first pleopod, abdominal aspect; d, left first and second pleopods, abdominal aspect; e, abdomen; f, left third maxilliped.

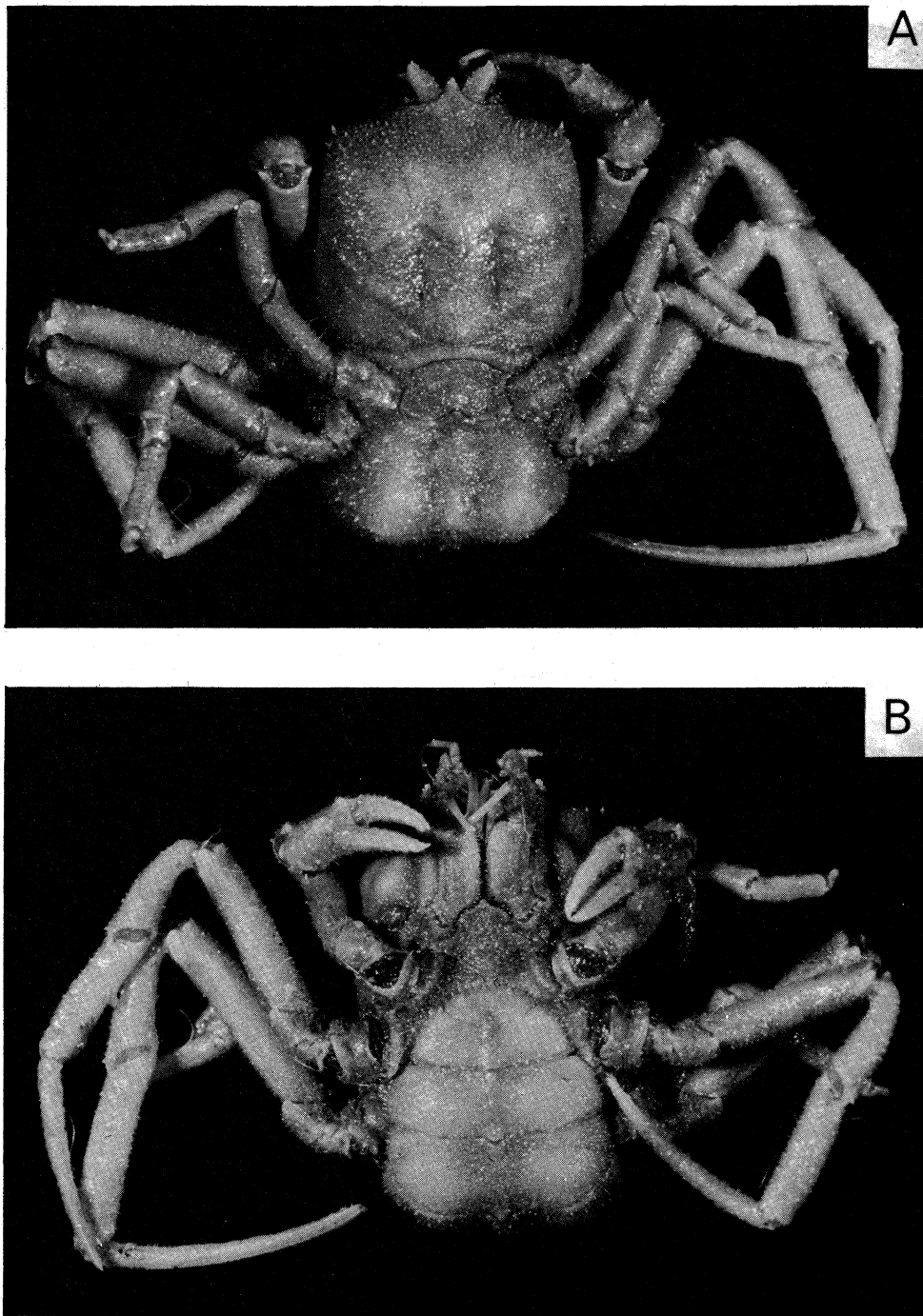


Fig. 4. *Cyonomus delli* n. sp., female (Holotype AM P. 19379), cl. 8.9 mm: a, dorsal aspect; b, ventral aspect.

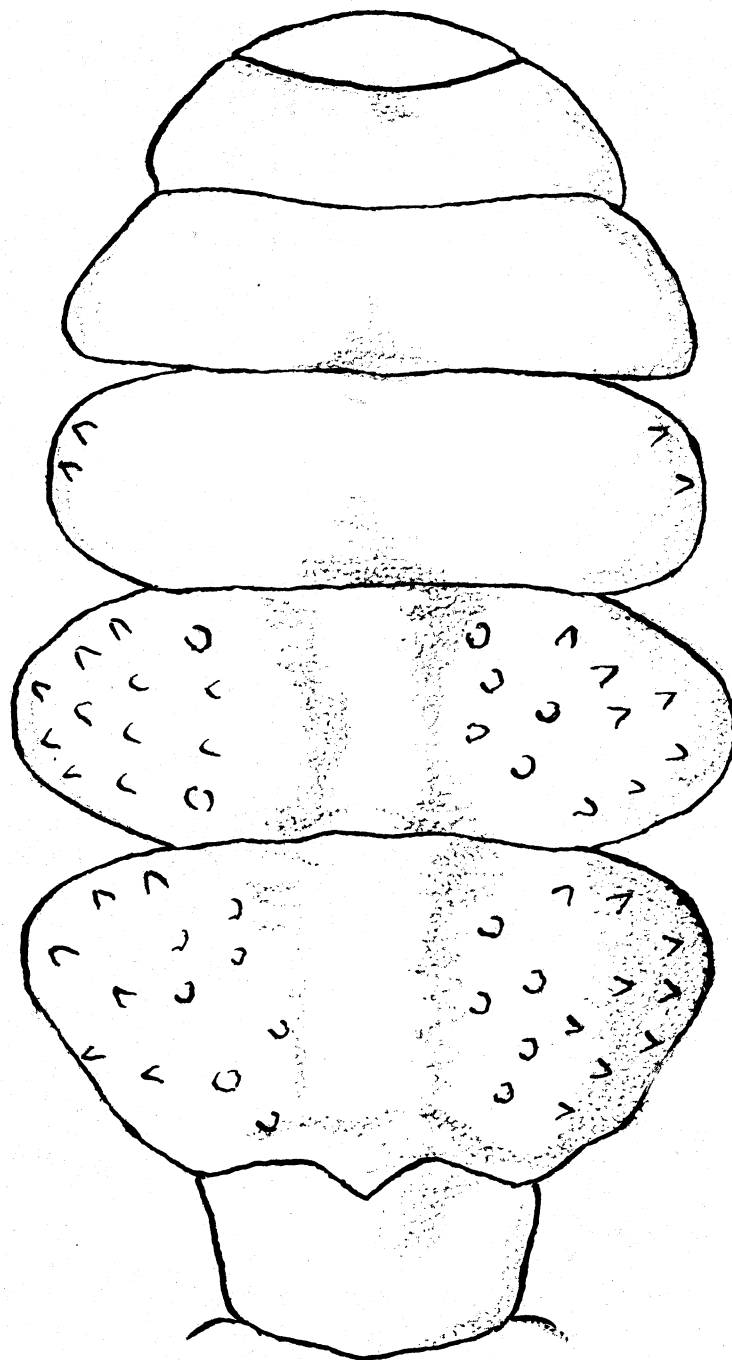


Fig. 5. *Cymonomus delli* n. sp., female (Holotype AM P. 19379), cl. 8.9 mm: abdomen.

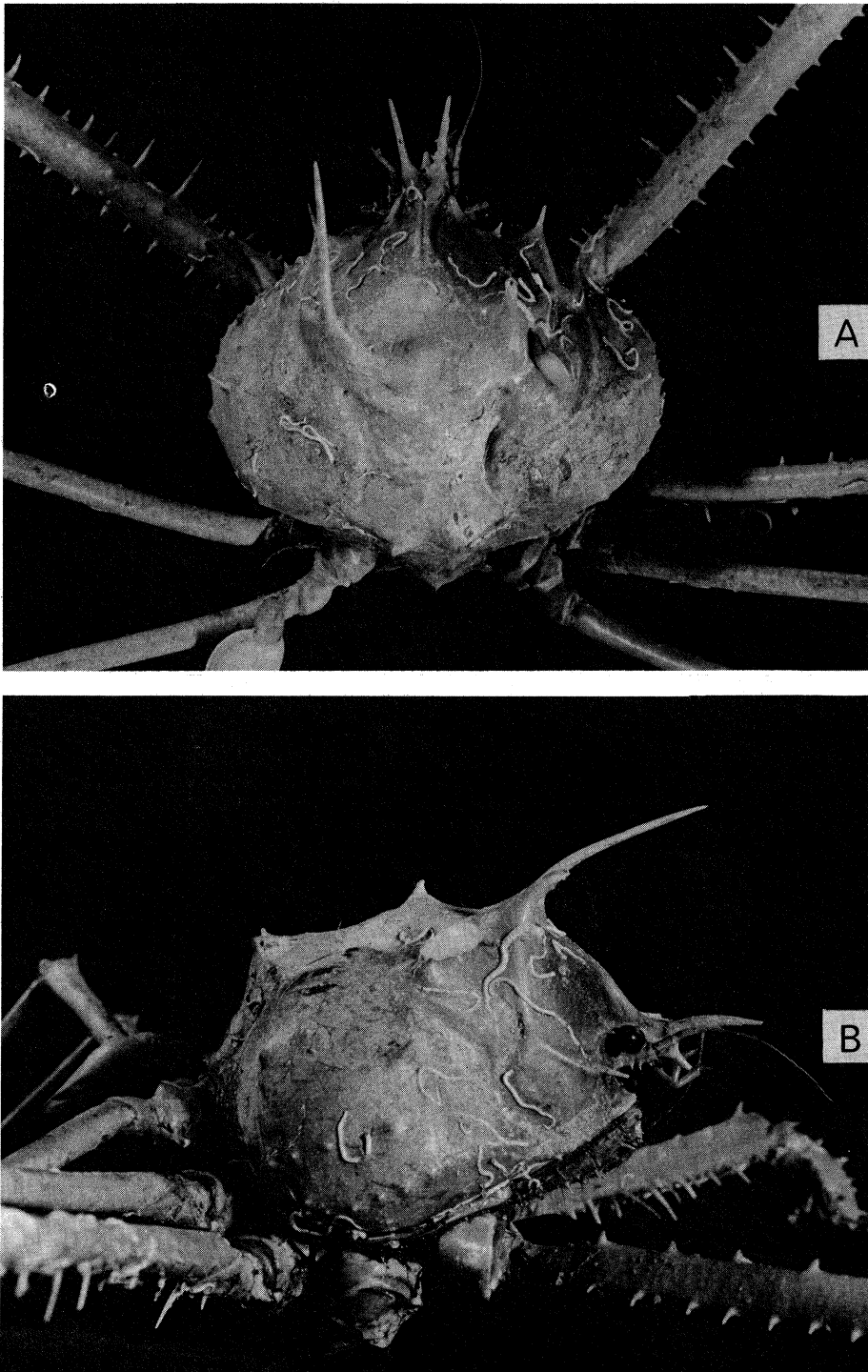


Fig. 6. *Cyrtomaia suhmi* Miers, female (AM P. 20585), cl. 76 mm: a, dorsal aspect; b, lateral aspect.



Fig. 7. *Geryon affinis* A. M. Edwards and Bouvier, male (AM P. 19584), cw. 146 mm: dorsal aspect.



Fig. 8. *Geryon affinis* A. M. Edwards and Bouvier, male (AM P. 19584), cw. 146 mm: ventral aspect.

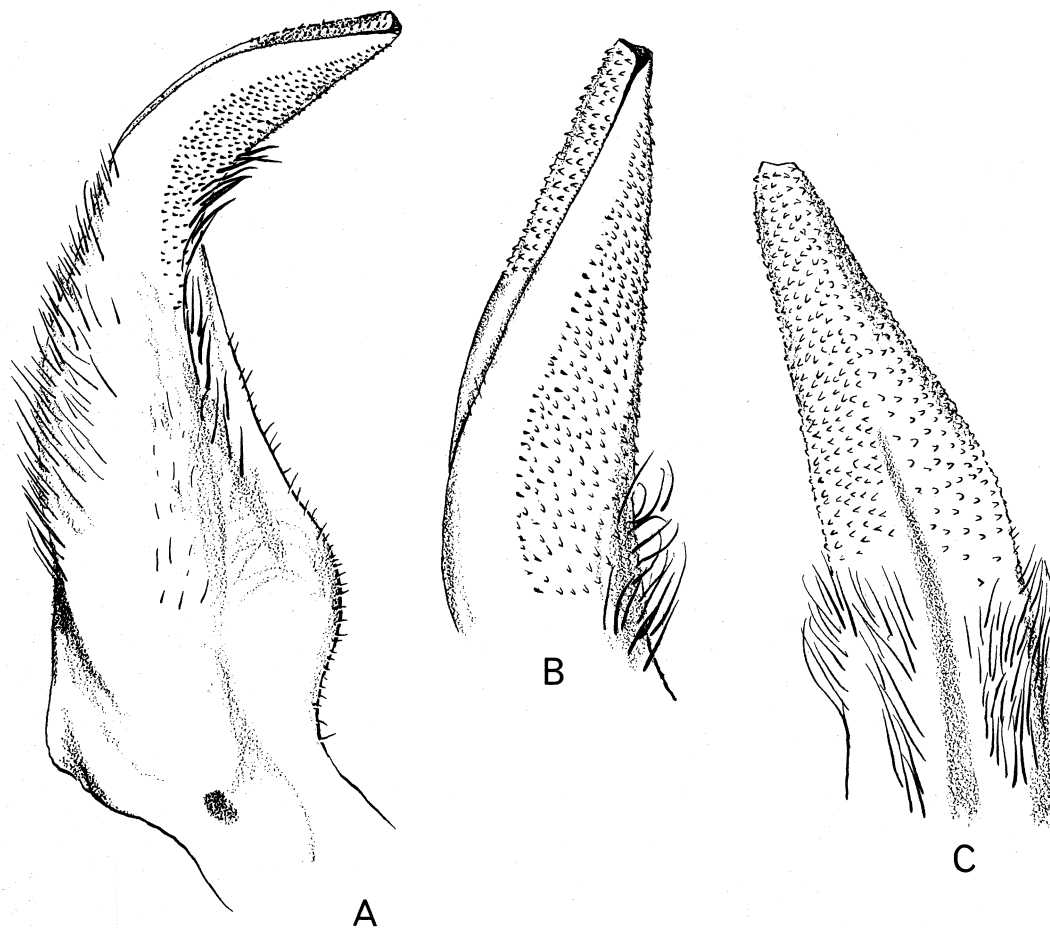
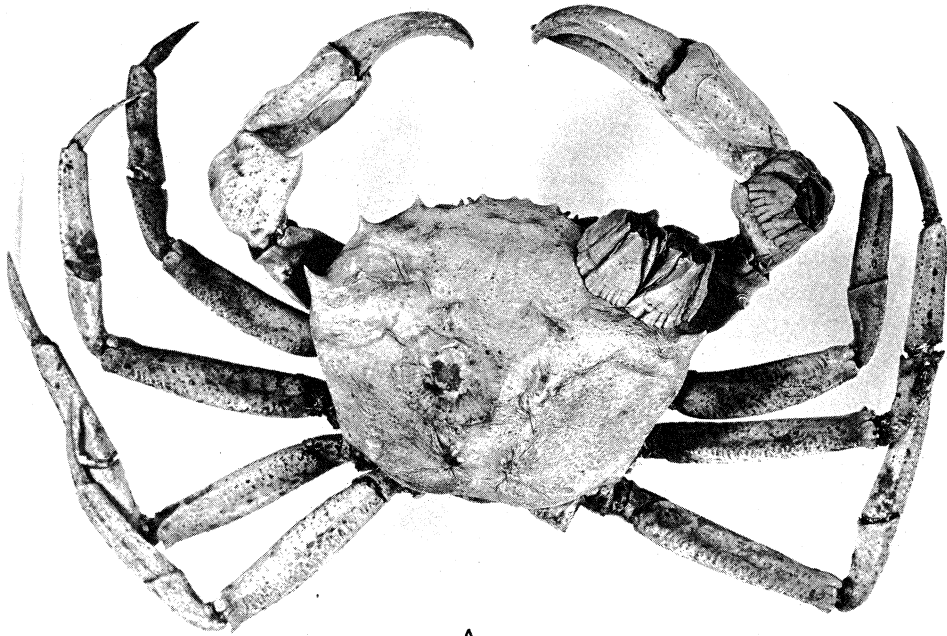
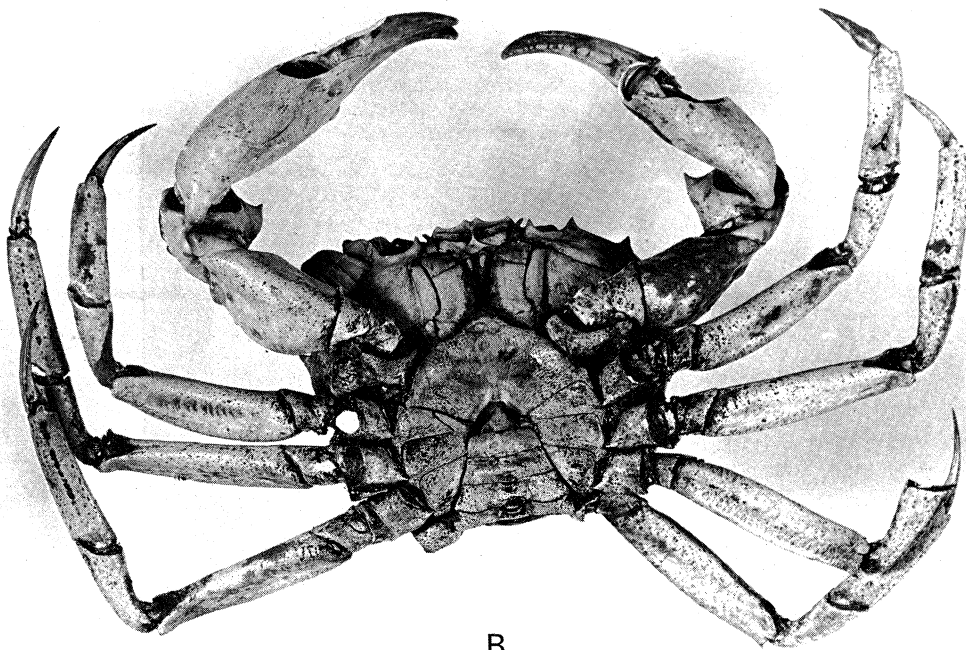


Fig. 9. *Geryon affinis* A. M. Edwards and Bouvier, male (AM P. 19584), cw. 146 mm: a, left first pleopod, abdominal aspect; b, left first pleopod, tip, abdominal aspect; c, left first pleopod, tip, sternal aspect.



A



B

Fig. 10. *Cancer trispinosus* Herbst, male (Holotype, "Ostindien", Zoologisches Museum, Berlin): a, dorsal aspect; b, ventral aspect. (Photo — Miss V. Kopke, Zool. Mus. Berlin.)