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Siphonoecetinae (Crustacea: Amphipoda: Corophiidae) 4: *Australoecetes* Just, 1983, including *Stebbingoecetes* n. subgen.

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ABSTRACT. Based on type material and old unpublished collections as well as recently collected material *Australoecetes* Just, 1983 is fully described. *A. sellicki* (Sheard, 1936) and *A. australis* (Stebbing, 1910) are redescribed and lectotypes selected. *Australoecetes jervisi* n. sp. is described. Based on morphological and correlated biological differences two subgenera are recognized: *Australoecetes* (with *A. sellicki*, east to west southern Australia) and *Stebbingoecetes* n. subgen. (with *A. australis*, type-species, and *A. jervisi*; both from south-eastern Australia).

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KEYWORDS: Amphipoda, Corophiidae, Siphonoecetinae, *Australoecetes*, Australia, taxonomy, biology.

The first siphonoecetine described from Australia was *Siphonoecetes australis* Stebbing, 1910. Sheard (1936) described a second species, *S. sellicki*, from the Gulf of St Vincent, South Australia. Ruffo (1959) placed *S. sellicki* in synonymy of *S. australis*. Just (1983) erected a new genus, *Australoecetes*, establishing *S. sellicki* Sheard, 1936 as type-species and including *S. australis* Stebbing, 1910. The reason for selecting *S. sellicki* for type-species was the homogeneity of the syntype material; the extant syntype material of *S. australis*, on the other hand, consists of two specimens, one of which belongs in an undescribed genus and species.

During my recent field work in Australia (1984), and sorting through old and new collections primarily in the Australian Museum and the Museum of Victoria, material of the two historical species was found. In addition, an undescribed species closely related to *A. australis* was collected in Jervis Bay, New South Wales.

Biologically *A. australis* and *A. jervisi* n.sp. conform with the normal siphonoecetine way of occupying empty mollusc shells or other suitable abodes (e.g. polychaete tubes), in which they crawl around on top of the sediment. *Australoecetes sellicki*, however, is unique in that it selects for abodes very light materials (normally hollow stem nodes from *Amphibolis* sea grass, occasionally other materials). This enables the specimens to swim away from the bottom with their house by aid of the unique long natatory setae on the peduncle of antenna 2.

The present study has shown that, although the three species differ from all other siphonoecetines as outlined

in the original diagnosis of *Australoecetes*, they fall into two distinct groups (*A. sellicki*, and *A. australis* plus *A. jervisi* n. sp.). The main differences are found in the antennal armature, including the presence in *A. sellicki* of true spines on flagellar articles of antenna 1 and of natatory setae in antenna 2.

Differences between the two groups in mouthparts (e.g. mandibular palp, notched *versus* entire upper lip), in coxal plates and in details of the uropods, may be of taxonomic significance at the generic level, but more information on the intrageneric stability of such characters from other groups of siphonoecetines is needed.

The two groups are here considered as subgenera of *Australoecetes*. Distribution of the three species is shown in Fig. 1.

Scales and signatures referring to Figs 3–13 are given in Fig. 2. The term mature female refers to a female with fully developed oostegites (ovigerous, with embryos or with an empty marsupium).

A list of institutional and descriptive abbreviations follows:

AM	Australian Museum, Sydney
NMV	Museum of Victoria, Division of Natural History, Melbourne.
SAM	South Australian Museum, Adelaide
ZMUC	Zoological Museum, University of Copenhagen
a	antenna
ar	article

c	cephalon
cx	coxal plate
dv	dorsal view
f	flagellum
ll	lower lip
lv	lateral view
md	mandible
mp	maxilliped
mv	medial view
mx	maxilla
p	pereopod
pa	palp
pl	pleopod
pls	pleonal sideplate
r	right
s	seta
u	uropod
ul	upper lip
us	urosome
vp	ventral projection, article 2 of antenna 2
vv	ventral view

Unless otherwise stated left side appendages have been used for illustrations. Length of animals has been measured from tip of rostrum along dorsal curvature to apex of telson.

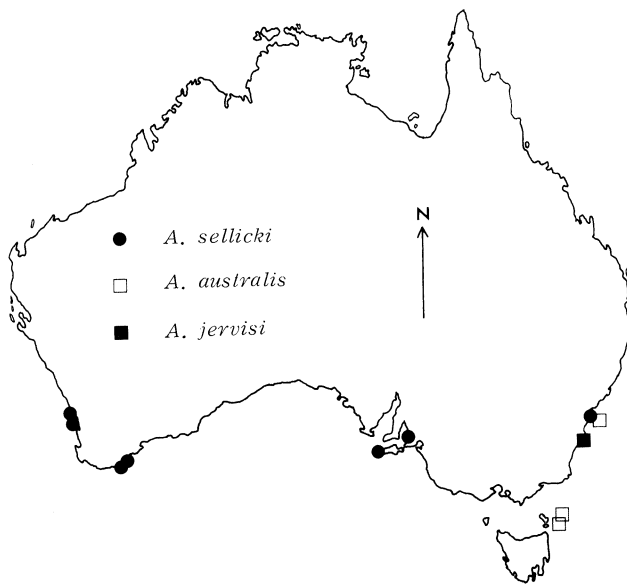


Fig. 1. Distribution of species in *Australoecetes* s.l.

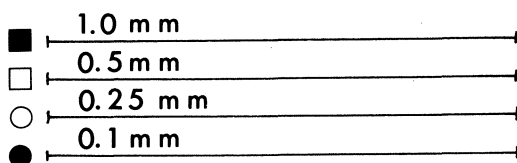


Fig. 2. Scales referring, by signature, to details in Figs 3-13.

Australoecetes Just, 1983

Remarks on diagnosis. The diagnosis of *Australoecetes* stated (Just 1983: 128) that the inner ramus of uropods 1 and 2 are at most half as long as the outer ramus. This is not correct for uropod 2, in which the inner ramus may be up to $\frac{3}{4}$ the length of the outer ramus.

Description. Cephalon and body with a few scattered monoflagellate obliquely inserted setules. Rostrum in lateral view absent or tiny, anterior cephalic margin forming a pointed angle of ca. 90° in dorsal view. Subrostral projection pointed, laterally compressed, reaching $\frac{1}{4}$ to $\frac{1}{3}$ the length of peduncular article 1 of antenna 1. Eye lobes rounded in dorsal view, bluntly produced in lateral view, ocellar area inflated.

Mouthparts normal siphonocetine (Just 1983). Upper lip broader than long, apically notched or entire. Mandibular palp with tiny article 2 inserted centrally in apex of article 1. Maxilla 1: palp slender with nearly parallel margins, reaching well beyond apical spines of outer plate, apex oblique with slender spines and a few subapical setae; inner plate without setae. Maxilla 2: plates of subequal length with rounded apex, outer plate broader than inner plate. Maxillipeds: outer plate reaching apex of article 2 of palp, with 1 apical pectinate seta followed medially by up to 14 strong spines.

Antenna 1 reaching $\frac{1}{2}$ to $\frac{2}{3}$ along peduncular article 5 of antenna 2; flagellum with 3-6 articles, about as long as peduncular article 2. Antenna 2: ventral projection of peduncular article 2 with rounded apex carrying apical and distolateral setae; articles 4 and 5 of subequal length; flagellum 50-70% the length of peduncular article 5, with 2 ventral spines apically on article 3 and 1 apical ventromedial spine on article 2.

Coxal plates 1-2 or 1-3 slightly overlapping, others discontinuous; all plates with sparse marginal setation.

Pereopod 1 simple, dactylus with posterior denticles; article 6 with posterior apical tooth and 2-3 midposterior spines, medial surface with short transverse rows of long pectinate setae, article 6 subequal to or up to 20% longer than 5; article 5 without spine on posterior lobe. Pereopod 2 simple, oval, broader than 1, dactylus with posterior denticles, article 6 with posterior apical tooth, 1 large midposterior spine and 2-4 smaller proximal spines; article 6 subequal to or up to 20% longer than 5; article 5 without spine on posterior lobe. Pereopods 3-4: article 4 with anterior and posterior lobes equally well developed, both reaching apex of or slightly overreaching article 5; article 5 without posterior spines. Pereopod 5-6: article 5 with 1 slender curved spine apically and one to several short subapical-lateral spines.

Pleopods with medially expanded peduncle of subrectangular shape, carrying two coupling hooks; rami broad with incomplete articulations, inner ramus about as long as width of peduncle, outer ramus $\frac{3}{4}$ to $\frac{4}{5}$ the length of inner ramus.

Uropods 1-2: ventral apical margin of peduncle with broadly rounded expansion covering part of rami; outer

ramus normal, slightly curved; inner ramus shortened, plate like, somewhat spoon shaped with concave surface facing outer ramus, distal margin with sharp denticles, apex with at most 1 short spine. Uropod 3; peduncle with strongly tapering mediolateral expansion carrying 2–4 mediolateral setae; ramus about as long as broad or slightly longer, apex rounded with 3–5 long pectinate setae, ventral articulation with peduncle distinct, dorsal articulations often very indistinct.

Telson broader than long, of rounded to subrectangular shape, with small oval spine fields in distolateral corners, and midlateral groups of 3–4 small setae (often 3 plumose and 1 simple).

Oostegites with setae in distal half, setae with microdenticulate apex and subapical micropectination.

Type-species. *Siphonoecetes sellicki* Sheard, 1936 (original designation).

Component species. *Australoecetes australis* (Stebbing, 1910), *A. jervisi* n.sp., *A. sellicki* (Sheard, 1936).

Subgenus *Australoecetes*

Diagnosis. *Australoecetes* with ventroapical spine on some or all flagellar articles of antenna 1. Peduncular articles 4 and 5 of antenna 2 with lateral and in particular medial transverse rows of long, plumose, curved, forward pointing setae (natatory). Inner ramus of uropods 1 and 2 without apical spine.

Description. The following characters also separate *Australoecetes* s.s. from the new subgenus described below: cephalon markedly flattened, ca. 1½ times longer than deep. Upper lip with entire, setulose apex. Mandibular palp short, slender, subcylindrical. Coxal plate 1 broader than anterior length, rectangular. Pleopods with peduncle as broad as long. Uropods 1 and 2, outer ramus with 3 and 1 short apical spines respectively, inner ramus with broadly rounded denticulate apical margin.

Type-species. *Siphonoecetes sellicki* Sheard, 1936.

Component species. Type-species, as *Australoecetes sellicki* (Sheard, 1936).

Australoecetes sellicki (Sheard, 1936)

Figs 3–7

Siphonoecetes sellicki Sheard, 1936: 450, fig.2.

Australoecetes sellicki n.comb. — Just, 1983: 128.

Notes on type-material. Sheard (1936) based his description on eight specimens "... collected in January 1936, by Mr. H.M. Hale... in a small rock pool at Sellicks Reef, ...", together with one specimen collected at a later date, "... Types in the South Australian Museum, Reg. No. C 2114, C 2117".

The South Australian Museum has a sample marked C2114 containing six specimens of *Siphonoecetes sellicki* Sheard (marked paratypes). The accompanying label reads: "South Australian Museum. Loc.: Sellicks Beach, Coll.: H.M. Hale, Date: 27/XII/1935, Depth: Reef. Tube-dwelling Amphipod. Like [?] lives in hollow fragments of *Cymodoce*

[*Amphibolis*]". A separate small label in the vial reads: "*Siphonoecetes* + *Podocerus* sp., Sellicks, rock pools, 1936".

Although there is thus a slight discrepancy between the collecting date on the main label and the date stated by Sheard (1936), all other data are consistent with these specimens being Sheard's original material. As Sheard did not designate a holotype, I have selected a lectotype from this syntype series.

LECTOTYPE. Ovigerous female of 3.5 mm; South Australia, Gulf of St Vincent, Sellicks Beach, rock pool at Sellicks Reef, H.M. Hale, 27 December 1935; SAM C 2114.

PARALECTOTYPES. Five specimens, same data as lectotype, including: 1 ovigerous female, 2 ovigerous females without head, 1 young without head, 1 specimen in *Amphibolis* house; SAM C 4032.

Additional material examined (all previously unpublished). **SOUTH AUSTRALIA.** Fourteen specimens, Marino, Gulf of St Vincent, W. Baker, 1907 (identified as *Siphonoecetes australis* Stebb.), SAM C 2292; 28 specimens, including 1 in *Amphibolis* house, Marino, Gulf of St Vincent, Baker, 1910 (identified as variety of *S. australis*), SAM C 2293; 14 specimens in *Amphibolis* houses, Aldinga Reef, Gulf of St Vincent, 35°17'S 138°27'E, J. Window & M. McPhail, AM P31568; 3 specimens, South Australia, W. Baker, 1910, AM (Sheard collection) P35087; 1 specimen, Sellicks Beach, 35°20'S 138°27'E, H.M. Hale, 1936, AM (K. Sheard collection) P35092; 3 specimens, Marino Reef, Gulf of St Vincent, W.H. Baker & H.M. Hale, AM P35093; 6 specimens (2 with chionostomatid copepod parasite), Western River Cove, Kangaroo Island, 35°40'S 136°58'E, 5 m, algae, sheltered rocky shore, I. Loch, 1 March 1978, AM P34956.

NEW SOUTH WALES. Thirteen specimens in houses of plant material and/or light polychaete tubes, Maroubra Bay, Sydney, Haswell, 8 January 1899 (identified as *Siphonoecetes* n.sp.), AM P25461.

WESTERN AUSTRALIA. Two specimens, including 1 very large male, Cottesloe, Perth, L. Glaveri, 22 September 1923 (identified as *Siphonoecetes colletti* ? by C. Chilton 1957), AM P32000; 2 specimens, 2 km south-east of South Point, Two Peoples Bay, Albany, 34°58'S 118°12'E, 14 m, *Caulerpa* bases with sand, fine sand bottom, J.K. Lowry, WA-178, 16 December 1983, AM P34957; 1 specimen in *Amphibolis* house, northern side of Point John, Rockingham, 30 km south of Perth, 1.5 m, coarse sand with some detritus, immediately outside dense belt of *Amphibolis* and algae, hand dredge, J. Just, AU-5, 8 March 1984, ZMUC; 1 specimen in *Amphibolis* house, Frenchman Bay, King George Sound, Albany, western side of Waterbay Point, 0.75 m, coarse sand with *Halodule* surrounded by dense sea grass beds, hand dredge, J. Just, AU-21, 25 March 1984, ZMUC.

Description (mature females). Rostrum absent. Anterior margin of cephalon in dorsal view forming an angle of 90° or slightly more. Apex of eye lobes downward pointing in lateral view. Ventrolateral margins of cephalon curving strongly mediad.

Mouthparts: mandibular palp article 1 with 5–6 apical, pectinate setae, microsetulose lateral surface and a few short simple setae in proximal half. Outer plate of maxilla 1 with stout, blunt denticulate spines. Outer plate of maxillipeds with up to 14 stout medial spines, distal ones coarsely bilaterally dentate.

Antenna 1 reaching to about ⅔ the length of peduncular article 5 of antenna 2; peduncular article 1 subequal in length to article 2, article 3 ca. 75% the length of 2; peduncular article 1 with low, midlateral,

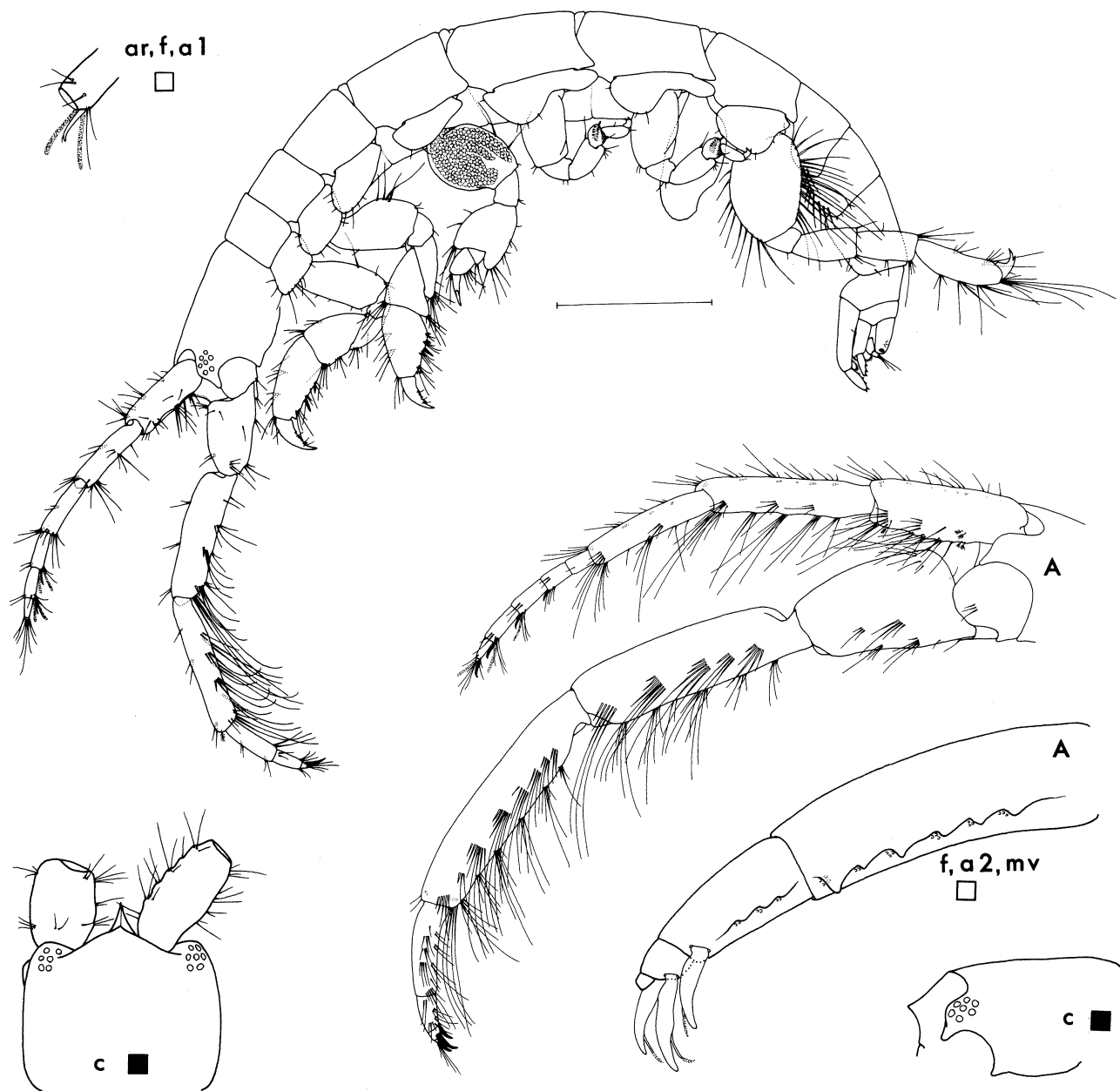


Fig. 3. *Australoecetes (Australoecetes) sellicki* (Sheard, 1936). Lectotype, except A: male of 8.0 mm, W.A. (AM P32000). Habitus scale: 0.5 mm.

longitudinal keel carrying 3–4 groups of spine-like setae (type 2, see Fig. 5), medial margin in dorsal view strongly scalloped with 5–6 groups of unequally long setae (type 2); flagellum as long as or up to 15% longer than peduncular article 2, with 4–6 articles, one or more (increasing with size of specimen) carrying ventromedial apical spine in addition to aesthetascs and setae. Antenna 2 as long as cephalon and first $4\frac{1}{2}$ – $5\frac{1}{2}$ pereonites combined; ventral projection of peduncular article 2 about as long as broad, with 1–2 apical setae; peduncular article 3 with groups of spine-like setae (type 2); articles 4 and 5 of equal length; article 4 dorsally with 2–4 groups of spine-like setae (type 1, see Fig. 5),

laterally with 4–5 transverse groups consisting of 1 spine-like seta (type 1) and 1–4 (number increasing distally) long, curved, strongly plumose setae, ventrally with 4–6 groups of unequally long spine-like setae (type 2), medially with 6–7 transverse groups, proximal ones with slender spine-like setae (type 2), distal ones with 1 spine-like seta (type 2) and increasing number of long, curved, strongly plumose setae, distal most setae as long as peduncular article 5 and half of flagellum combined; article 5 armed as article 4 but generally with fewer groups of setae on respective surfaces, medial distal most setae as long as flagellum; flagellum about 55% (large females) to 70% (small females) the length of

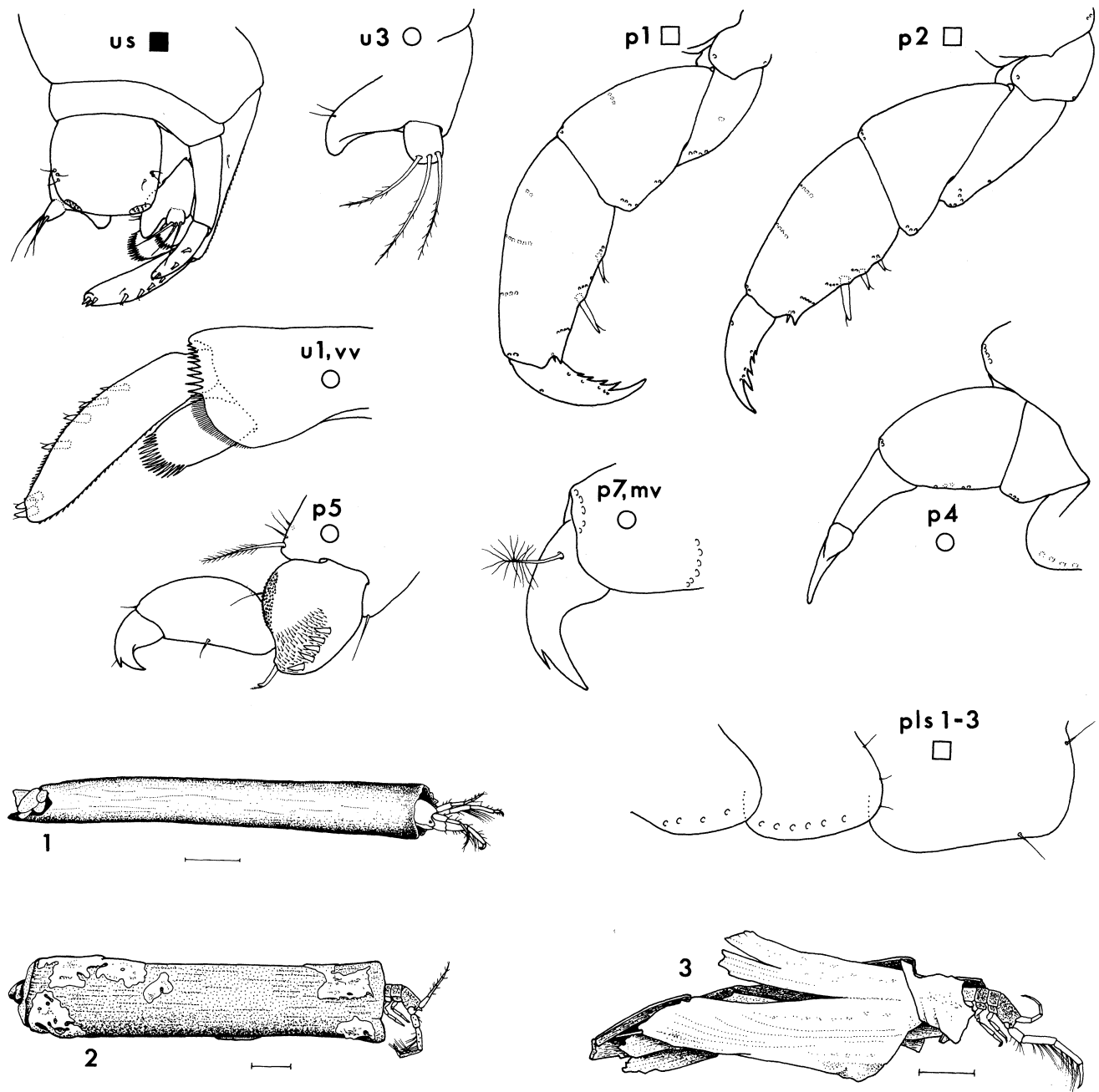


Fig. 4. *Australoecetes (Australoecetes) sellicki* (Sheard, 1936). Lectotype, except specimens in houses: 1 paralectotype; 2 specimen from W.A. (ZMUC, AU-5); 3 specimen from Maroubra Bay, N.S.W. (AM P25461); scales all 1 mm; us in oblique right view.

peduncular article 5, articles 2–4 combined ca. 65–70% the length of article 1, article 1 with lateral and medial long spine-like setae (type 1 and 2) and dorsal simple setae, article 2 laterally and medially with 2 spine-like setae (type 2) and distal simple setae, articles 3 and 4 with simple distal setae.

Coxal plates all broader than deep; plate 1 rounded rectangular; plate 2 lozenge shaped, anteriorly produced, with rounded apex; plate 3 more oval, anteriorly produced, with rounded apex, ca. 2.7 times

broader than deep; plate 4 ca. 2.5 times broader than deep, broadly produced anteriorly, more narrowly produced posteriorly; plate 5 ca. 2.7 times broader than depth of anterior lobe, anterior lobe rounded triangular, with small rounded anteroproximal projection, posterior lobe narrow, roundedly produced backwards beyond posterior point of insertion of plate to posterior corner of peronite; plate 6 ca. 2.4 times broader than depth of anterior lobe, anterior lobe evenly rounded, plate otherwise as plate 5; plate 7 evenly rounded except for

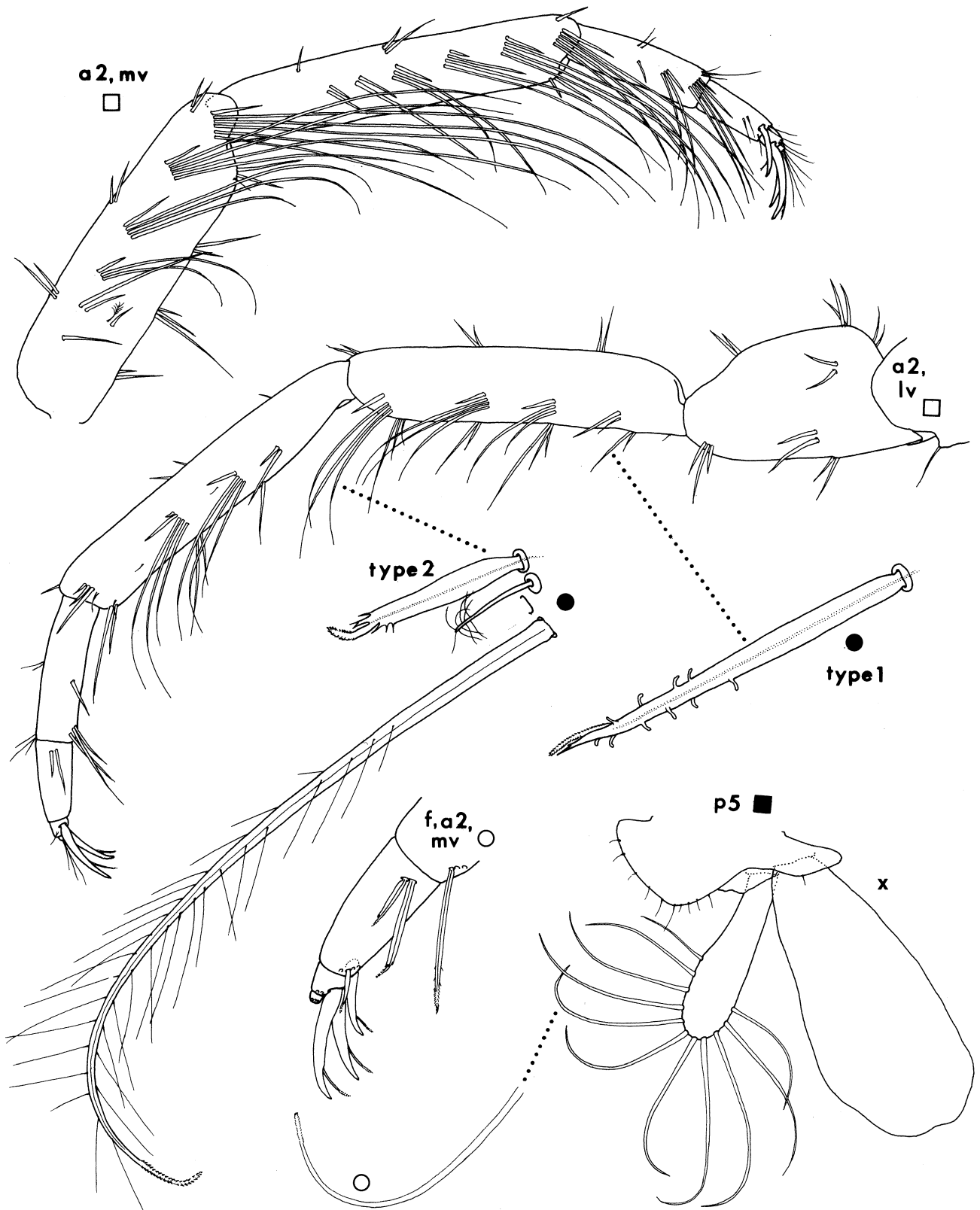


Fig. 5. *Australoecetes (Australoecetes) sellicki* (Sheard, 1936). Lectotype, except X: ovigerous female, S.A. (SAM C2293). Type 1 and 2 setae: see text.

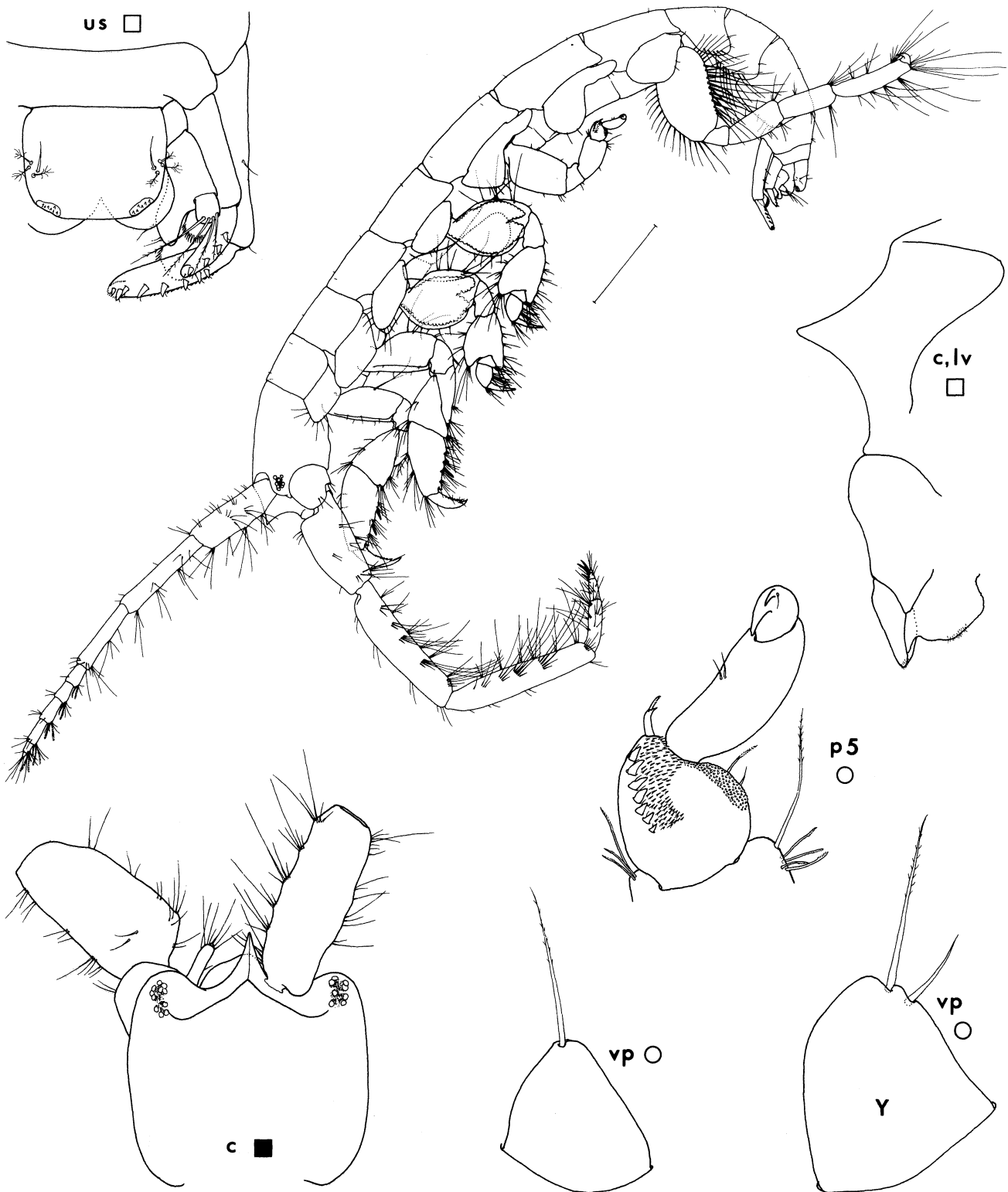


Fig. 6. *Australoecetes (Australoecetes) sellicki* (Sheard, 1936). Male of 4.4 mm, S.A. (AM P31568), except **Y**: male, S.A. (SAM C2293). Habitus scale: 0.5 mm.

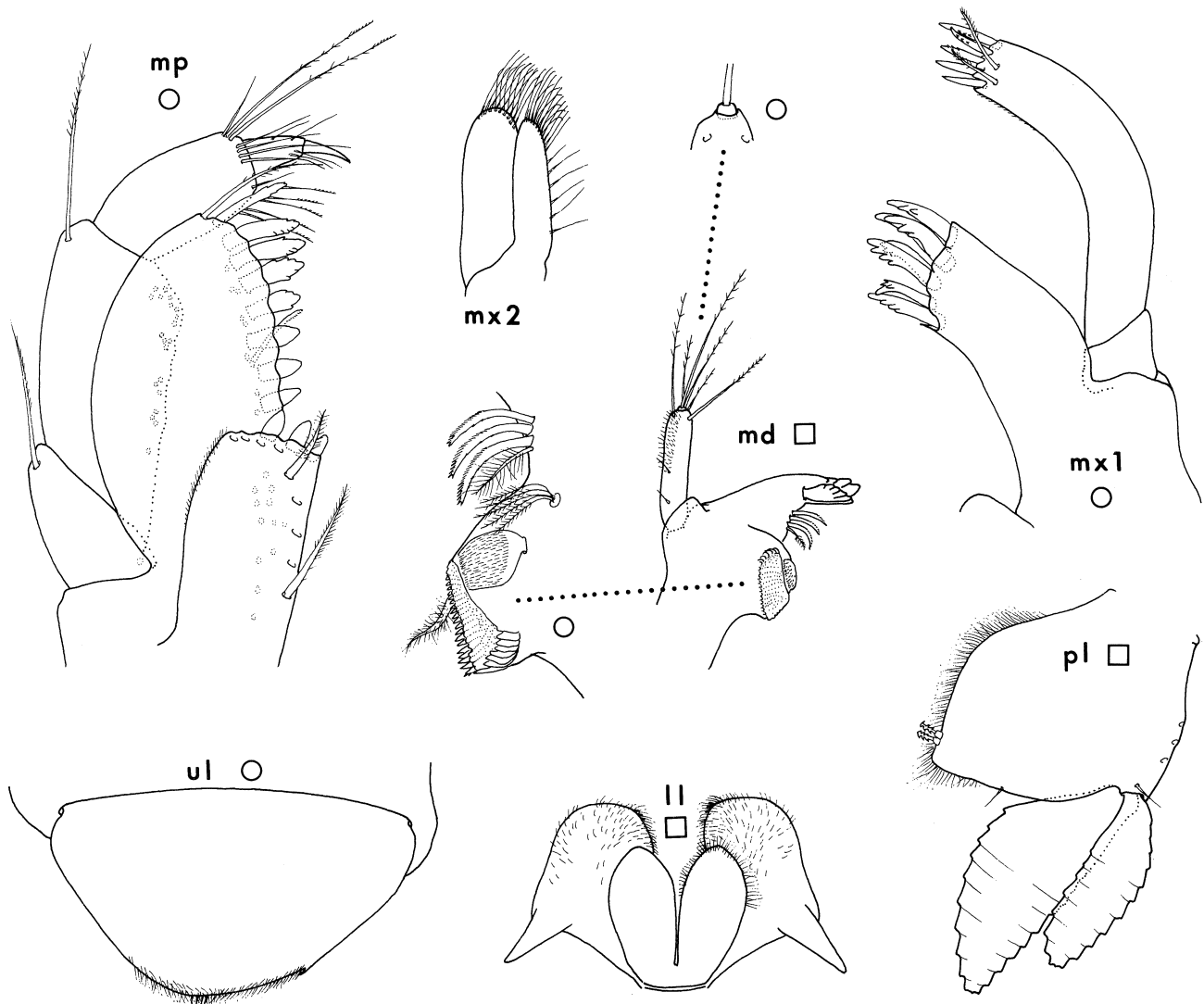


Fig. 7. *Australoecetes (Australoecetes) sellicki* (Sheard, 1936). Male of 4.4 mm, same specimen as in Fig. 6 (P31568).

posterior emargination and a small blunt proximal projection.

Pleonal sideplate 1 with up to 5, and plate 2 with up to 8, long plumose submarginal setae and a few short simple posterior setae, plate 3 with 1–2 short simple distoventral and 1 posterior setae.

Pereopod 1, article 6 oval, distally tapering, ca. twice as long as greatest width, with 2 midposterior spines. Pereopod 2, article 6 of similar shape but slightly broader than in pereopod 1, with 1 long midposterior and 2–3 short, more proximal spines. Pereopods 3–4, article 2 oval, 25–30% longer than broad, with 2–3 posterior groups of long setae. Pereopods 5–6, article 5 with lateral crescent of 5–7 short spines in addition to apical spine. Pereopod 7, dactylus with short (ca. $\frac{1}{3}$ the length of dactylus: straight line between anterior point of insertion and tip of dactylus) plumose seta proximally on medial surface.

Uropod 1, peduncle reaching just beyond telson, lateral margin with 2–3 small setae, margin of

ventroapical expansion with coarse acute denticles in lateral half, medial half with fine, closely set microsetules; outer ramus ca. $\frac{2}{3}$ the length of peduncle (lateral margin), with 4–7 lateral spines in addition to apical group; inner ramus (excluding denticles) ca. 40% the length of outer ramus. Uropod 2 similar to 1, peduncle reaching apex of telson; outer ramus ca. 70% the length of peduncle, with 2–4 lateral spines in addition to apical spine. Uropod 3, peduncle strongly expanded mediocaudad, rounded apex produced beyond tip of ramus, (the suction-like tip of the peduncular projection mentioned by Sheard 1936 does not exist; Sheard's interpretation must be due to an artificial folding in the specimen illustrated), mediolateral margin of peduncle with 3–4 short setae; ramus with 3–5 setae.

Telson rectangular with rounded corners, ca. 80% as long as broad.

Colour. Sheard (1936:451) writes: "... antennae ... orange, spotted with black; the body is slatey-grey to the fifth pereon segment, the remainder pallid". It is

not stated whether the colour was observed in live specimens or after a period of preservation.

Live animals observed by me in Western Australia had the base of article 1 of the peduncle of antenna 1 brown, antenna otherwise colourless transparent; antenna 2 in one specimen (AU-5) was colourless semitransparent, in another specimen (AU-21) with scattered brown blotches on peduncular articles 3–5.

Dark spots on antenna 2 can still be seen in many of the preserved specimens listed.

Cephalon, frontal cephalic surface (frons), mouthparts, and first 2 pereonites including coxae in the two W.A. specimens observed were dark brown, often in a reticulate pattern, the rest of the body increasingly light beige; appendages other than those mentioned were colourless transparent.

Size. Largest male: 8.0 mm; largest female: 5.5 mm; size range of mature females: 3.6–5.5 mm.

Sexual dimorphism. Males have longer and stouter, more densely setose antennae. Articles 1 and 2 of flagellum of antenna 2 in large males with strongly scalloped longitudinal ridge on medial surface (Fig. 3)

Biology. The species lives in and around sea grass beds and algae. Over most of the range houses appear to consist exclusively of hollow stem nodes from *Amphibolis* sea grass (Fig. 4, 1–2). No entrance tube is added to the house, but the posterior opening is covered with bits and pieces of algae and sea grass.

The material from Maroubra Bay (N.S.W.) was found in a different kind of houses (Fig. 4, 3): empty, semitransparent polychaete tubes more or less covered with bits and pieces of algae and sea grass, or houses constructed from those materials without an inner polychaete tube; the posterior opening is covered in the above mentioned manner.

The implications of this difference in house building biology remain unclear until further material from the coast of south-eastern Australia can be studied.

The Western Australian specimens (AU-5, AU-21) were observed swimming rapidly with their house by strong downward beating with antenna 2, the long plumose setae of which can thus be ascribed a natatory function. Specimens also crawl slowly around on the sand or among the vegetation by aid of antenna 2.

Distribution. Southern parts of Australia from around Perth in the west to Sydney in the east; rock pools to 14 m depth.

Subgenus *Stebbingoecetes* n. subgen.

Diagnosis. *Australoecetes* without spines on flagellum of antenna 1. Peduncular articles 4 and 5 antenna 2 without transverse rows of long natatory setae. Inner ramus of uropods 1 and 2 with apical spine.

Description. Species assigned to this subgenus differ from *Australoecetes* s.s. in the following points: Cephalon not markedly flattened, at most 10% longer than deep. Upper lip with notched apex and apical cuticular scales only. Mandibular palp relatively long,

flattened (oval in cross section). Coxal plate 1 narrowly triangular, forward pointing. Pleopods with peduncle nearly twice as broad as long. Uropod 1, outer ramus with apical group of 1 long and 3 shorter spines; uropod 2, outer ramus with apical group of 2 short spines; inner ramus of uropods 1 and 2 with medial margin nearly straight, lateral margin convex, tapering distally towards blunt apex, margins in distal half denticulate.

Type-species. *Siphonoecetes australis* Stebbing, 1910.

Component species. *Australoecetes australis* (Stebbing, 1910), *Australoecetes jervisi* n.sp.

Australoecetes australis (Stebbing, 1910)

Figs 8–10

Siphonoecetes australis Stebbing, 1910: 619, pl. 54, all figs except C.

Australoecetes australis n. comb. — Just, 1983: 128.

Notes on type-material. Stebbing (1910) did not explicitly state how many specimens he had at hand, but he mentions a male (dissected: habitus and details illustrated) and an ovigerous female. The collecting localities given by Stebbing are: “Off Cape Three Points, 41 to 50 fathoms; and Botany Bay, from a depth of 50 to 52 fathoms”.

The Australian Museum, Sydney, has two samples (AM P2529 and P2530) labeled *Siphonoecetes australis* Stebbing (original label), and marked syntypes at a later day. The label data are exactly as stated by Stebbing, and they represent ‘Thetis’ Expedition Stns 13 and 37 respectively.

P2529 (Cape Three Points) contains one fully developed female in a calcareous polychaete tube. P2530 (Botany Bay) contains two empty polychaete tubes and one fully developed female in a polychaete tube. Neither specimen has been dissected by Stebbing.

As mentioned by Just (1983: 128) these two specimens, which are undoubtedly part of Stebbing’s original material, represent two different species in different siphonoecetine genera. P2530 belongs in *Australoecetes*, and the single specimen has accordingly been selected here as lectotype for *Siphonoecetes australis* Stebbing, 1910, (males belonging to this species agree with Stebbing 1910, pl. 54: all figs except C, which is from an undescribed species and genus). P2529 belongs in an as yet undescribed genus and represents an undescribed species (fig. C in Stebbing’s above mentioned pl. 54).

A third sample in the collections of the Australian Museum, P31867 (re-registered from P2528), has exactly the same data as P2529. The single male present is most likely part of Stebbing’s original material, but due to the lack of an original label it is not here treated as a syntype. The specimen belongs in the same undescribed species as P2529.

LECTOTYPE. Fully developed female of 3.3 mm, in polychaete tube. Botany Bay, New South Wales, 50–52 fathoms (91.5–95 m), ‘Thetis’ Expedition Stn 37; AM P2530 (old collection).

PARALECTOTYPES. None.

Additional material examined (all previously unpublished). Twenty-three specimens, including 1 in scaphopod and 5 in polychaete tubes, 33°52’S 151°23’E, 88 m, 2.5 m sledge-dredge, F.R.V. ‘Kapala’, K-80-20-11, R.T. Springthorpe & P. Colman, 11 December 1980, AM P32002 and P35730 (male A), except 1 male and 1 female: ZMUC; 1 specimen, 40°13.8’S 148°39.6’E, Bass Strait east of Flinders Island, 60 m, fine sand,

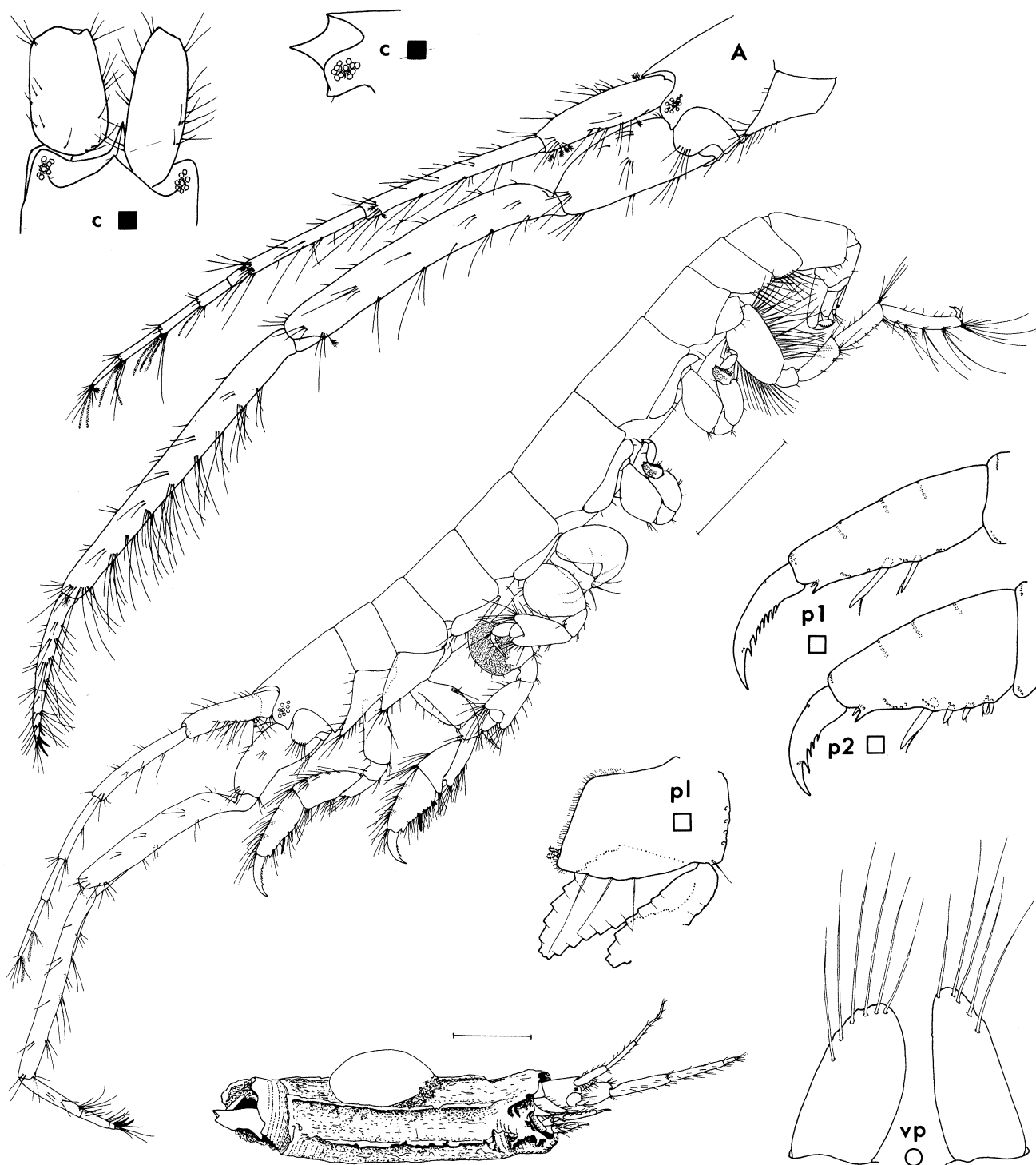


Fig. 8. *Australoecetes (Stebbingoecetes) australis* (Stebbing, 1910). Lectotype, except A: male of 4.3 mm (AM P35730). Habitus scale (including A): 0.5 mm. Scale for animal in house: 1 mm.

epibenthic sled, NMV Bass Strait Survey Stn BSS 165, cruise 81-HK-1, 14 November 1981, NMV J2636; 25 specimens, 39°44.8'S 148°40.6'E, Bass Strait east of Flinders Island, 124 m, muddy sand, epibenthic sled, NMV Bass Strait Survey Stn BSS 167, cruise 81-HK-1, 14 November 1981, NMV J9525.

Description (mature females). Rostrum in lateral view a short point. Apex of eye lobes forward pointing

in lateral view. Ventrolateral margins of cephalon only faintly inward curving.

Mouthparts: mandibular palp article 1 ca. 3 times longer than broad in the middle, somewhat tapering in distal half, ventral margin with 4-5 transverse groups of long pectinate setae, medial surface with 3-4 short stiff setae single or in pairs and 2 unequally long

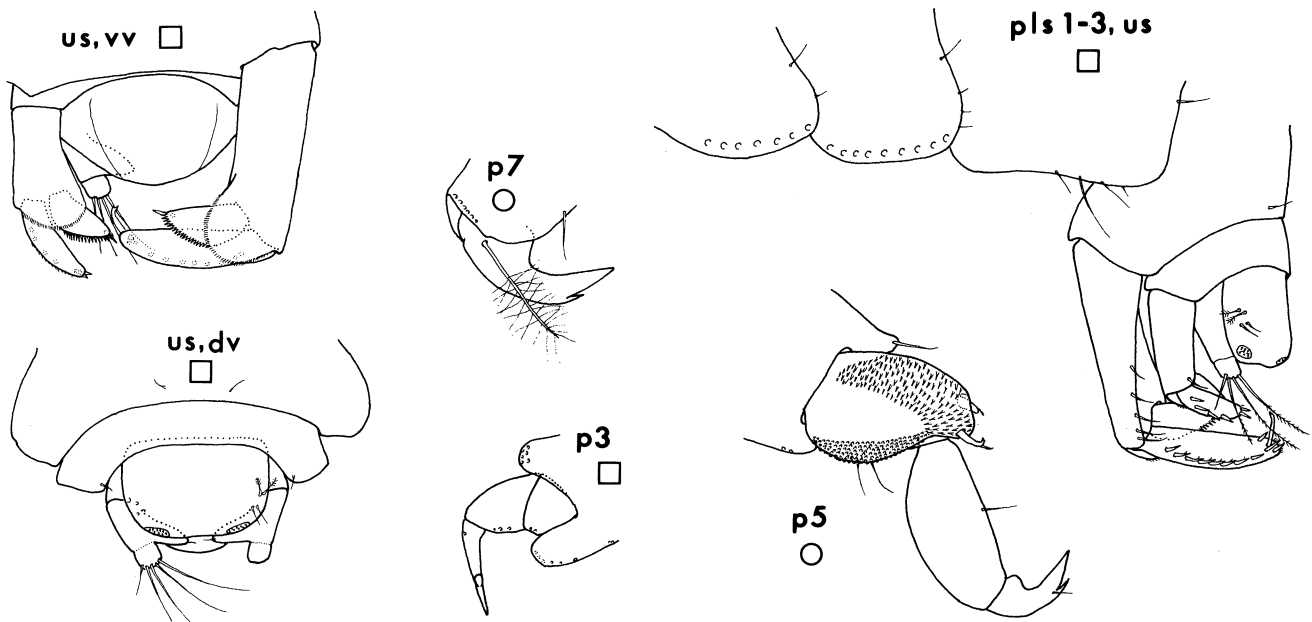


Fig. 9. *Australoecetes (Stebbingoecetes) australis* (Stebbing, 1910). Lectotype.

subapical setae. Outer plate of maxilla 1 with slender, acute, bi- or trifid spines. Outer plate of maxillipeds with up to 9 medial spines, distal ones long, slender, acute, unilaterally denticulate.

Antenna 1 as long as cephalon and first 4-4½ pereonites combined, reaching to about the middle of peduncular article 5 of antenna 2; peduncular article 2 ca. 8 times longer than broad, 18-20% longer than article 1 and 58-60% longer than 3, article 1 with low lateral keel carrying row of long setae, medial margin in dorsal view smooth with 5-6 groups of setae; flagellum with 3-4 slender articles, article 3 ca. 6.5 times longer than broad. Antenna 2 ca. as long as cephalon and entire pereon combined, slender, sparsely setose; lateral surface of peduncular article 1 with transverse row of setae; ventral projection of peduncular article 2 nearly twice as long as broad at base, with 5-6 long setae apically and distolaterally; article 3 distally tapering, proximal half of dorsolateral surface with a few setae only; articles 4 and 5 of equal length; article 5, 11-12 times longer than broad; flagellum ca. half the length of peduncular article 5, articles 2-4 combined ca. 65% the length of article 1.

Antennal setae all short, slender, distally micropectinate (Fig. 10,s), occasionally with coarser pectination more proximally.

Coxal plate 1 narrowly triangular, acute, forward pointing, anterior margin 80-100% longer than plate width at base; plate 2 of similar shape but less narrowly triangular, apex blunt, anterior margin ca. 25% longer than width at base; plates 3 and 4 ca. 3 and 4.5 times broader than deep respectively, anteriorly rounded, posteriorly strongly tapering, plate 3 more anteriorly produced than 4; plates 5 and 6 ca. 3 times broader than depth of anterior lobe, anterior lobe broader and slightly deeper than posterior lobe, posterior lobe in plate 5

rounded, in plate 6 posteroventrally produced into a blunt point.

Pleonal sideplate 1 with 6-7 long plumose submarginal setae and 2 short posterior setae; plate 2 with 8-9 plumose setae and 3-4 short posterior setae; plate 3 with 4-5 unequally long simple setae along posterior ⅓ of ventral margin and 1-2 posterior setae.

Pereopod 1, article 6 slender, ca. 3 times longer than greatest width, with 2 slender midposterior spines; articles 5 and 6 of equal length. Pereopod 2, article 6 oval, distally tapering, ca. twice as long as greatest width, with 1 long midposterior spine and 3-4 smaller proximal spines; article 5 ca. 80% the length of article 6. Pereopods 3-4, article 2 oval, ca. 20% longer than broad; article 2 in pereopod 3 with 1-2 long posterior setae, such setae absent in pereopod 4. Pereopods 5-6, article 5 with 1 short subapical spine in addition to apical spine. Pereopod 7, dactylus with long (ca. 80% the length of dactylus, see *Australoecetes sellicki*), densely plumose seta proximally on medial surface.

Uropod 1, peduncle reaching beyond telson with ca. ⅓ of its length, distal half of lateral margin with 4-6 stout setae, ventral apical expansion covering ½ of inner, ⅓ of outer ramus, margin of expansion fringed with microsetules; outer ramus ca. 70% the length of peduncle (lateral margin), with 7-9 lateral spines in addition to apical group; inner ramus ca. half as long as outer ramus. Uropod 2 similar to 1; peduncle reaching ca. ⅓ along peduncle of uropod 1, distolateral margin with 2-3 stout setae; outer ramus ca. as long as peduncle, with 3-4 lateral spines in addition to apical group; inner ramus ca. ⅔ the length of outer ramus. Uropod 3, peduncular expansion directed mediad, with 2-3 short apical-subapical medial setae; ramus with 4-5 pectinate setae.

Telson ca. 50% broader than long, of rectangular

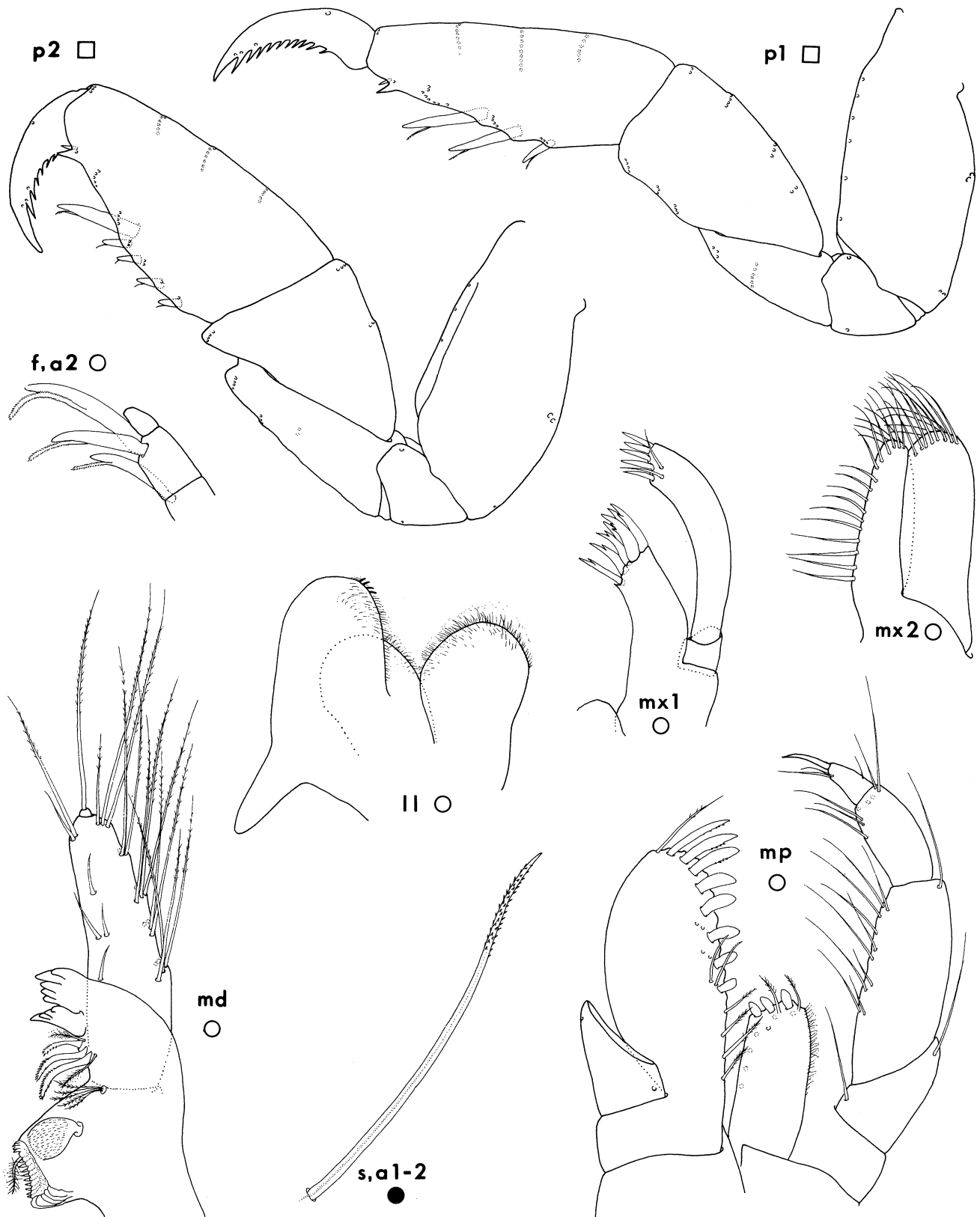


Fig. 10. *Australoecetes* (*Stebbingoecetes*) *australis* (Stebbing, 1910). Male of 4.3 mm, same specimen as **A** in Fig. 8.

shape, distal corners evenly rounded, apical margin nearly straight.

Colour. Not known. Several specimens in the AM P32002 sample have a dark, longitudinal core in the antennae (cf. the following species).

Size. Largest male: 4.3 mm; largest female: 3.6 mm; size range of mature females: 2.8–3.6 mm.

Sexual dimorphism. Antennae longer in males. Antenna 1 with up to 6 flagellar articles; peduncular article 2 ca. 33% longer than 1 and ca. 45% longer than 3. Antenna 2 in large males as long as cephalon and entire pereon and pleon combined; peduncular article 5 with about twice as many groups of ventral setae; flagellum ca. 40% the length of peduncular article 5, articles 2–4 combined ca. 55% the length of 1.

Pereopod 1 in large males with article 5 ca. 80% the length of article 6, in pereopod 2 ca. 65% the length of article 6.

Coxal plates 1 and 2 of similar shape but shorter in relation to width than in females; plate 3 more pointedly produced anteriorly.

Biology. The species has been found on fine sand, and on muddy sand (64% sand, 34% silt and mud, pers. comm. Dr Gary Poore, BSS St. 167).

Of the 50 specimens treated seven were still in their house (1 in small scaphopod, 6 in more or less straight pieces of calcareous polychaete tubes, Fig. 8). There is no sediment-grain entrance tube attached to the houses, but a small tube (cf. the following species) may have been torn off during dredging operations. The posterior opening is loosely covered with small shell fragments.

Distribution. South-eastern Australia, Bass Strait to Sydney; between 60 and 124 m depth.

Australoecetes jervisi n. sp.

Figs 11–13

Type-material. HOLOTYPE. Male of 3.8 mm in calcareous polychaete tube, Jervis Bay, New South Wales, south-east of Huskisson off Moona Moona Creek, 35°03'S 150°52'E, 8 m, along inner edge of low rock reef, fine sand with detritus, hand dredge, SCUBA, J. Just, P.B. Berents, R.T. Springthorpe, AU-68, 16 November 1984, AM P35731.

PARATYPES. Ten specimens in calcareous polychaete tubes and scaphopods, same data as holotype, AM P35732 (5 specimens) and P35733 (paratype A, ovigerous female), 4 specimens in ZMUC; 5 specimens in similar houses, same data as holotype except: AU-65, 15 November 1984, ZMUC.

Description (adult males). Rostrum in lateral view a short point. Apex of eye lobes forward pointing in lateral view. Ventrolateral margin of cephalon only faintly inward curving.

Mouthparts closely similar to *A. australis*. Mandibular palp with three transverse rows of setae on ventral margin (the two posterior rows in right mandible of holotype forming continuous oblique transverse crescent, Fig. 12). Outer plate of maxillipeds with up to 10 medial spines.

Antenna 1 as long as cephalon and first 4–4½

pereonites combined, reaching $\frac{2}{3}$ along peduncular article 5 of antenna 2; peduncular article 2, 5–5½ times longer than broad, ca. 10% longer than article 1 and ca. 45% longer than 3; article 1 with low lateral keel carrying 3–4 groups of long setae, medial margin in dorsal view smooth with 5–6 groups of setae; flagellum 10–12% longer than peduncular article 2, with 4–5 articles, article 3 ca. 3.5 times longer than broad. Antenna 2 as long as cephalon and first 6–6½ pereonites combined; lateral surface of peduncular article 1 with transverse row of setae; ventral projection of article 2 about as long as broad or slightly longer, triangular with broadly rounded apex and 2–4 apical and distolateral setae; article 3 barely tapering distally, proximal half of dorsolateral surface with 4–5 irregular transverse rows of setae (2–4 setae in each row); article 4 with 4–5 groups of ventral setae; article 5, 6½–7 times longer than midwidth, with 7–8 irregular groups of ventral setae; article 5 ca. 17% longer than 4; flagellum 50–55% the length of peduncular article 5, articles 2–4 combined ca. 58% the length of article 1.

Antennal setae similar to those in *Australoecetes australis* (Fig. 10,s).

Coxal plate 1 narrowly triangular, acute, forward pointing, anterior margin as long as plate width at base; plate 2 of similar shape but less narrowly tapering, anterior margin slightly convex, ca. 85% the length of plate width, apex rounded; plate 3 triangular, forward pointing with broadly rounded apex, anterior margin ca. 80% the length of plate width; plate 4 broadly rounded anteriorly, posteriorly tapering towards rounded corner, ca. 2.5 times broader than deep; plate 5 ca. 3.5 times broader than depth of anterior lobe, anterior lobe rounded triangular, posterior lobe posteroventrally produced with rounded apex, lobes of subequal depth; plate 6 ca. 4 times broader than depth of anterior lobe, anterior lobe evenly convex, posterior lobe posteroventrally produced, tapering towards bluntly pointed apex, slightly deeper than anterior lobe.

Pleonal sideplate 1 with 4–5 long plumose submarginal setae and 1 small posterior seta; plate 2 with 5–6 plumose setae and 2–3 small posterior setae; plate 3 with 2–3 unequally long simple setae along posterior $\frac{1}{3}$ of ventral margin and 1–2 posterior setae.

Pereopod 1, article 6 tapering in distal half, ca. 2.2 times longer than greatest width, with two long, midposterior spines; article 6 ca. 15% longer than 5. Pereopod 2, article 6 broadly oval, ca. 1.8 times longer than greatest width, with 1 long midposterior spine and 3 smaller spines more proximally; article 6 ca. 40% longer than 5. Pereopods 3–4, article 2 nearly circular (7–8% longer than broad); article 2 in pereopod 3 with 1–2 long posterior setae, such setae absent in pereopod 4. Pereopods 5–6, article 5 with 1 short subapical spine in addition to apical spine. Pereopod 7, dactylus with long (ca. 80% the length of dactylus) densely plumose seta proximally on medial surface.

Uropod 1, peduncle reaching beyond telson with ca. $\frac{1}{3}$ its length, distal half of lateral margin with 4–5 stout setae, ventral apical expansion covering about half of

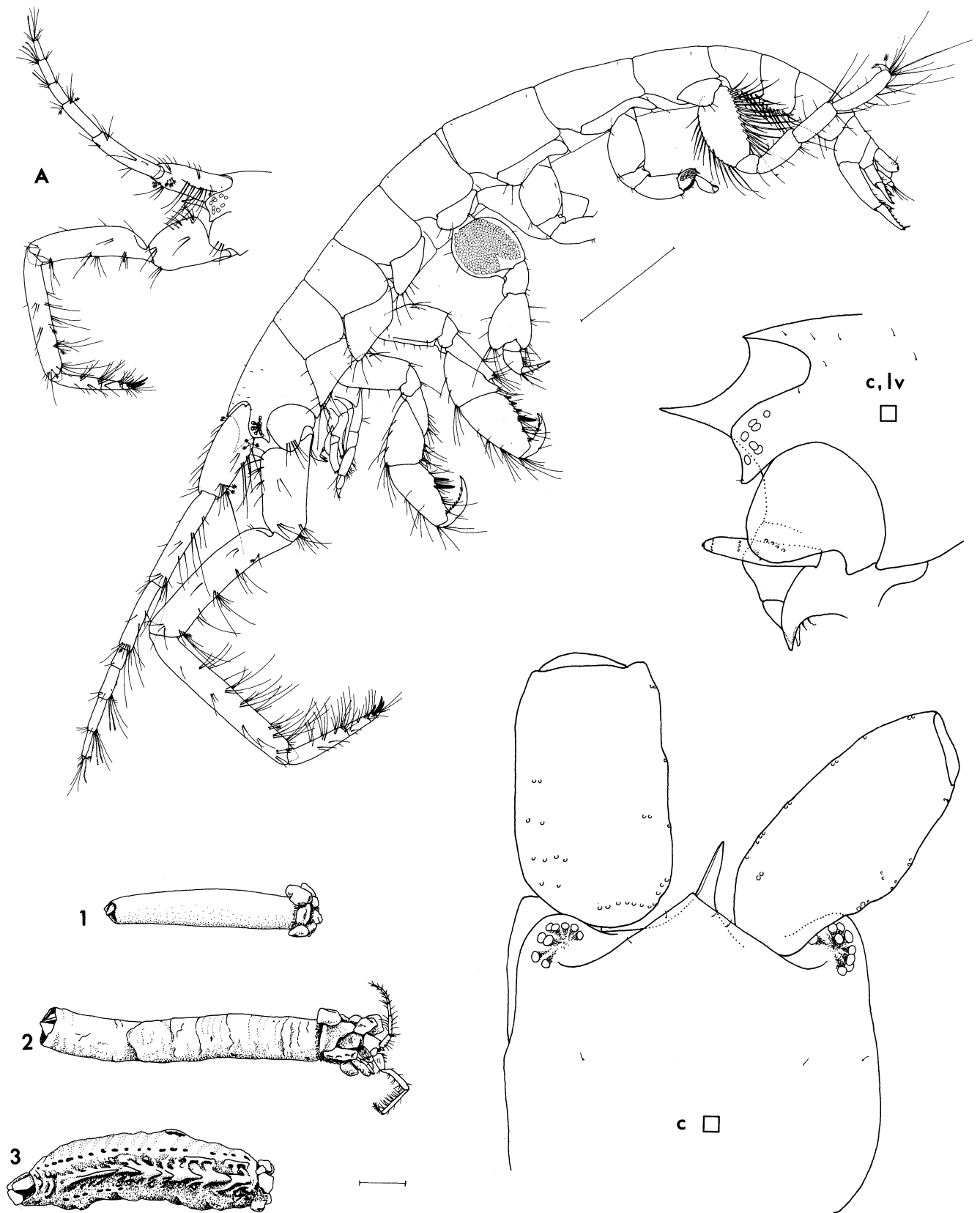


Fig. 11. *Australoecetes (Stebbingoecetes) jervisi* n. sp. Holotype, except A: female paratype A, 3.8 mm (AM P35733), and 1 and 3: both from type locality. Habitus scale (including A): 0.5 mm. Scale for houses: 1 mm.

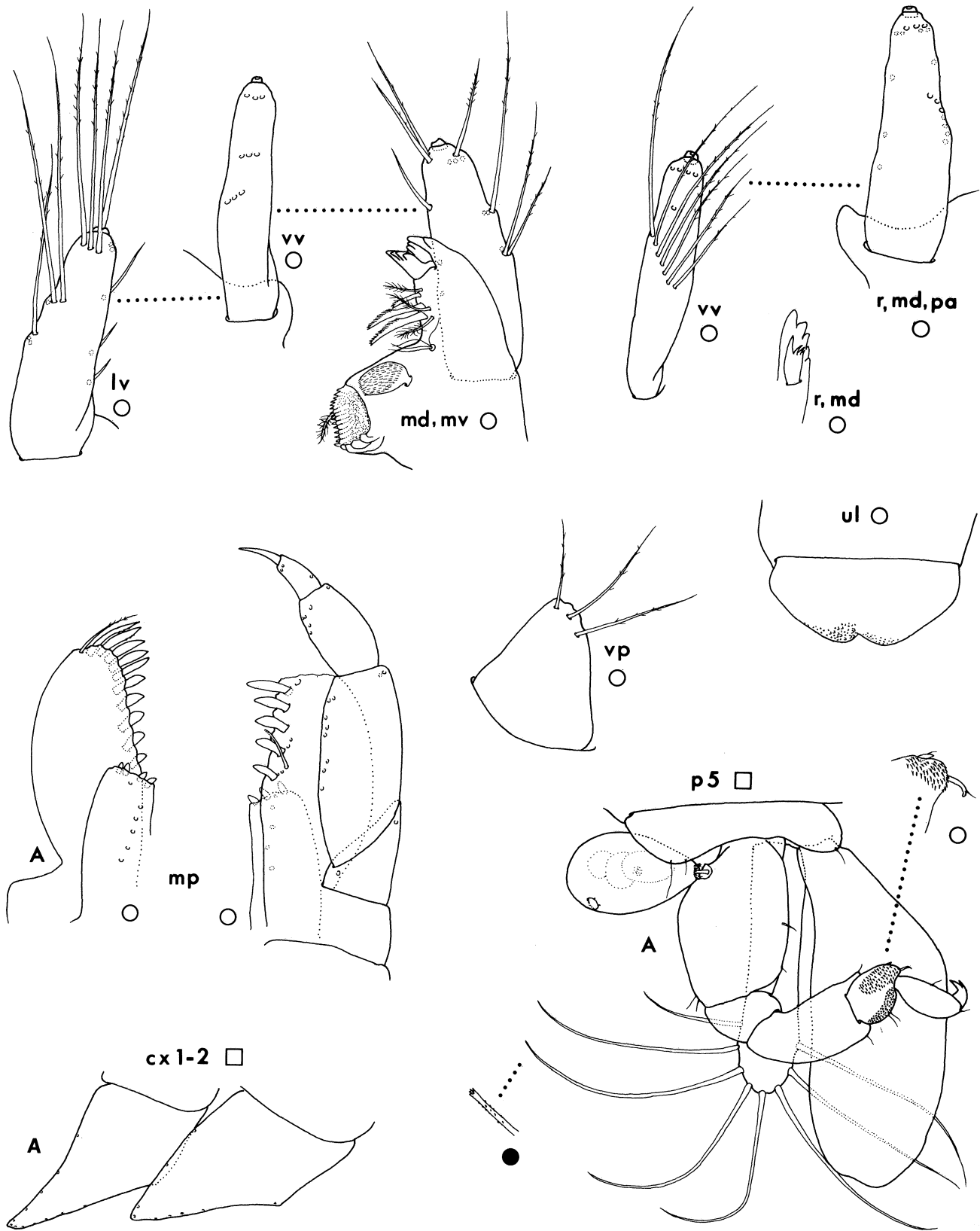


Fig. 12. *Australoecetes (Stebbingoecetes) jervisi* n. sp. Holotype, except **A**: female paratype **A** (see Fig. 11). Apex of outer plate in holotype maxilliped damaged. Note ectoparasite in female **A** pereopod 5.

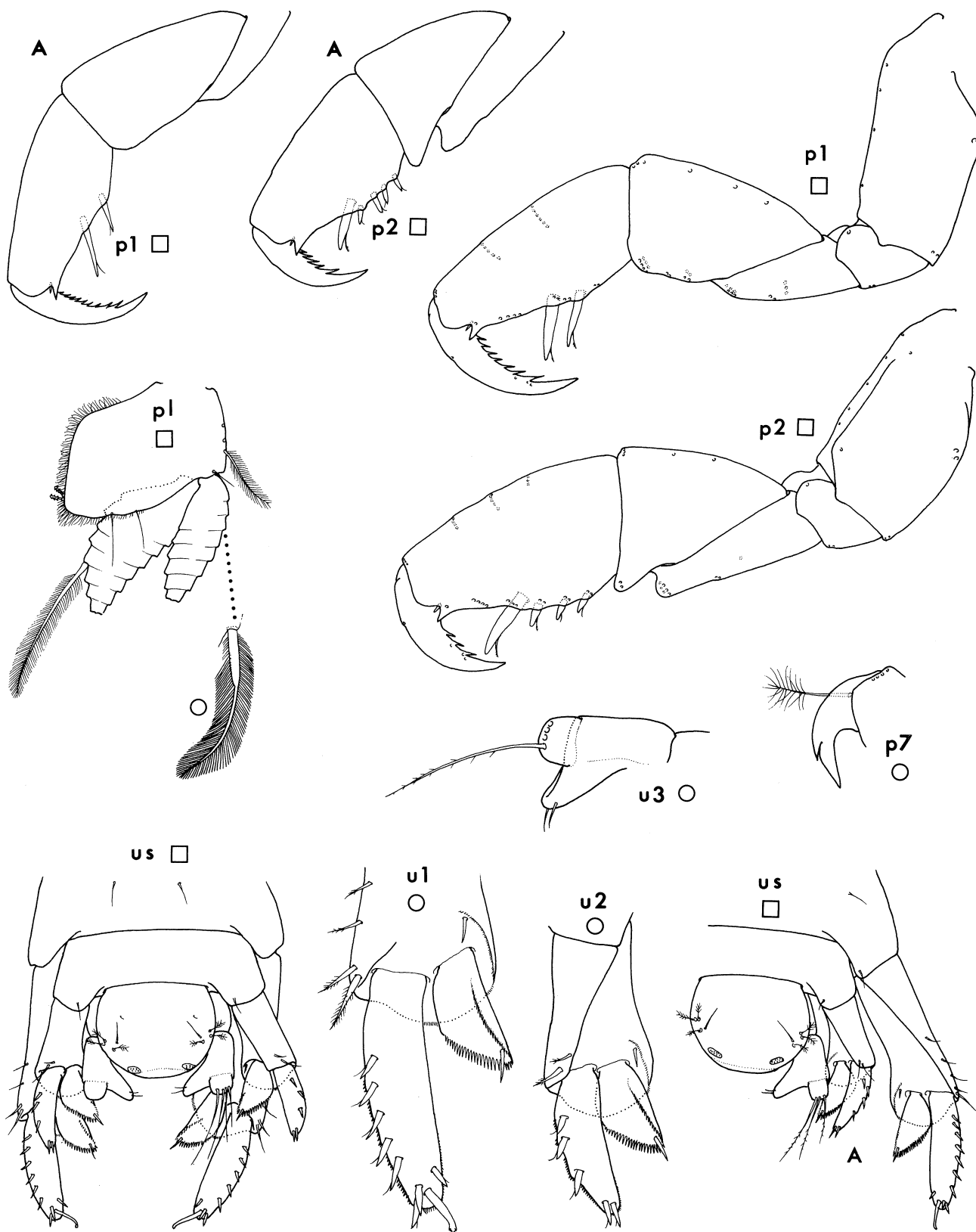


Fig. 13. *Australoecetes (Stebbingoecetes) jervisi* n. sp. Holotype, except A: female paratype A (see Fig. 11).

inner and $\frac{1}{5}$ to $\frac{1}{6}$ of outer ramus, margin fringed with microsetules; outer ramus ca. 60% the length of peduncle (lateral margin), with 5–7 lateral spines; inner ramus half as long as outer ramus. Uropod 2 similar to 1; peduncle reaching ca. $\frac{3}{4}$ along peduncle of uropod 1, distolateral margin with 2 stout setae, ventral expansion covering $\frac{1}{2}$ of inner, ca. $\frac{1}{3}$ of outer ramus; outer ramus ca. as long as peduncle, with 2–3 lateral spines; inner ramus ca. $\frac{2}{3}$ the length of outer ramus. Uropod 3, peduncular expansion directed medially, with 2–3 short subapical setae; ramus with 3–4 setae.

Telson ca. 25% broader than long, with convex lateral margins curving evenly into slightly less convex apical margin.

Colour (live animals). Cephalon and first two pereonites mottled brown, pereonites 3–7 mottled with white pigment, brown entrails shining through, pleon and urosome semitransparent. Eyes white with black ocellus. Frons pale brown. Antenna 1 colourless transparent, but peduncular articles 1 and 2 with central, longitudinal, cylindrical, red-brown core. Antenna 2, peduncular articles 3–4 (female) or 3–5 (male) with similar but weaker central core, peduncular articles 3–5 with pale yellow-white apical ring, antenna otherwise colourless transparent. Mouthparts with brownish tinge, all other body appendages colourless transparent.

Size. Largest male: 3.8 mm; largest female: 3.8 mm; size range of mature females: 3.0–3.8 mm.

Sexual dimorphism. Females have shorter and somewhat less setose antennae: antenna 1 as long as cephalon and first 2½–3 pereonites combined, antenna 2 as long as cephalon and first ca. 4½ pereonites combined; peduncular article 2 of antenna 1 subequal to 1, 50–55% longer than 3, flagellum as long as peduncular article 2, with 3–4 articles; antenna 2, peduncular article 3 distinctly shorter in relation to width than in male, article 5 ca. 10% longer than 4, flagellum ca. 60% the length of peduncular article 5, articles 2–4 combined ca. 60% the length of 1.

Coxal plates 1 and 2 longer and more pointed than in male, anterior margin of 1 ca. 80% longer than plate width at base, of 2 ca. 35% longer; plate 3 less produced with anterior corner more angular.

Pereopod 1, articles 5 and 6 of equal length; pereopod 2, article 6 ca. 12% longer than 5, with up to 4 short posterior spines proximal to large midposterior one.

Uropod 2 with inner ramus up to $\frac{3}{4}$ the length of outer ramus.

Biology. The species was taken on fine sand with detritus in relative shelter along the landwards foot of low stone reefs, within 1 metre of the reef. Further landwards, at similar depths, in more exposed

conditions with slightly coarser sediments where large numbers of other siphonoecetines occurred, *A. jervisi* was not observed.

The 14 specimens were all found to inhabit rather straight houses (scaphopods, calcareous polychaete tubes, Fig. 11), to which is added a very short entrance tube of sand grains or shell fragments, often a single tier only; the posterior opening is loosely covered with shell fragments.

The specimens crawled slowly around primarily by aid of antenna 2. The backward jumping movement typical of many siphonoecetines was never observed.

Distribution. Jervis Bay, New South Wales; eight metres.

Remarks. Although closely similar to *A. australis*, *A. jervisi* can be readily distinguished from that species by its shorter and more compact antennae in which the length/width ratio of articles is distinctly less than in *A. australis*.

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