

New and Little-known Melitid Amphipods from Australian Waters (Crustacea: Amphipoda: Melitidae)

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ABSTRACT. During a recent review of Australian melitid amphipods (Lowry, Berents & Springthorpe, 2001), a number of problems and undescribed species were revealed. These problems and others uncovered during the course of this study are addressed here. The Melitidae, as currently conceived, is considered to contain at least five natural groups: the *Ceradocopsis* group; the *Ceradocus* group; the *Eriopisa* group; the *Nuuana* group and the *Melita* group. In the *Ceradocus* group *Austromaera* n.gen. is established for *Maera mastersii* Haswell, 1879a, that is redescribed based on syntype material and new collections from Port Jackson. *Ceradocus circe* n.sp. is described based on specimens from Tasmania, originally reported by Chilton (1921b) as *C. rubromaculatus* (Stimpson, 1856). *Maera boecki* Haswell, 1879 and *Maera hamigera* Haswell, 1879 (*sensu stricto*), both originally described from Port Jackson, are redescribed and these species as well as *Maera octodens* Sivaprakasam, 1968 are transferred to the genus *Linguimaera* Pirlot, 1934, recently re-established by Krapp-Schickel (2003). *Linguimaera schickelae* n.sp. is described from the Sydney area. *Maera griffini* Berents, 1983, is tentatively placed in the genus *Maeropsis* Chevreux, 1919. *Mallacoota subcarinata* is redescribed based on syntypes and new collections and four new Australian species (*M. chandaniae* n.sp., *M. euroka* n.sp., *M. kameruka* n.sp. and *M. malua* n.sp.) are described, two of which have previously been mis-identified as *M. subcarinata*. *Mallacoota nananui* Myers, 1985, is reported from Australia for the first time. *Miramaera thetis* n.gen., n.sp. is established for the specimens mis-identified by Stebbing, 1910a as *Maera inaequipes*. We describe a new species of *Pareiasmopus*, *P. sowpigiensis* n.sp., from Port Jackson, New South Wales. *Quadrivisio sarina* n.sp. is described from near McKay, Queensland, the first record of *Quadrivisio* Stebbing, 1907 in Australian waters. In the *Eriopisa* group *Victoriopisa australiensis* (Chilton, 1923) is redescribed and illustrated. A second species, *Victoriopisa marina* n.sp., is described from estuarine and marine habitats in New South Wales and Victoria. In the *Melita* group *Dulichella australis* (Haswell, 1879a) is redescribed based on syntype material and *D. pacifica* n.sp. is described based on collections from the Great Barrier Reef, the southwestern Pacific Ocean and the South China Sea. *Melita ophiocola* n.sp. is described from Port Jackson, living in association with the brittlestar *Ophionereis schayeri*.

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Melitid amphipods are a diverse and abundant part of the Australian amphipod fauna. Including this work and the recent work of Krapp-Schickel (2003), there are 86 known Australian marine and freshwater species (Table 1). The majority of the marine component comes from the southeastern and southwestern parts of the country. Many species are yet to be discovered from tropical areas. Nearly 75% of the Australian melitid fauna has been described since the early 1970s and many of the earlier species were redescribed during this time. Lowry *et al.* (2001) reviewed the marine component of this fauna and provided redescriptions, pictures and an interactive key to all marine species at <http://www.crutacea.net>. The new species from that review are described here and some of the more problematical species are redescribed.

The Haswell species

The first descriptor of the Australian amphipod fauna, W.A. Haswell, described 10 species of melitids (Table 1), mainly from Port Jackson (Haswell, 1879a,b). Based on the original descriptions, these amphipods have never been easy to identify, and the status of his types, which could be used for redescriptions, has always been a problem (Springthorpe & Lowry, 1994). Sheard (1936) and J.L. Barnard (1972a) redescribed *Ceradocus ramsayi* (Haswell, 1879a) and *Maera mastersii* (Haswell, 1879a), but the material Sheard (1936) considered to be *M. mastersii* has recently been described as *Linguimaera tias* Krapp-Schickel, 2003 and the material of J.L. Barnard (1972a) has been described as *Linguimaera leo* Krapp-Schickel, 2003. J.L. Barnard (1972a) redescribed *Mallacoota diemenensis* (Haswell,

Table 1. Australian Melitidae, * freshwater species.

Ceradocopsis group

Ceradocopsis hamondi Moore, 1988

Ceradocus group

Austromaera mastersii (Haswell, 1879a)
Ceradocus circe n.sp.
Ceradocus dooliba J.L. Barnard, 1972a
Ceradocus hawaiiensis J.L. Barnard, 1955
Ceradocus oxyodus Berents, 1983
Ceradocus ramsayi (Haswell, 1879a)
Ceradocus rubromaculatus (Stimpson, 1856)
Ceradocus sellickensis Sheard, 1939
Ceradocus serratus (Bate, 1862)
Ceradocus woorree Berents, 1983
Ceradocus yandala Berents, 1983
Elasmopus alalo Myers, 1986
Elasmopus bollonsi Chilton, 1915
Elasmopus crenulatus Berents, 1983
Elasmopus hooheno J.L. Barnard, 1970
Elasmopus menurte J.L. Barnard, 1974
Elasmopus pocillimanus (Bate, 1862)
Elasmopus spinicarpus Berents, 1983
Elasmopus warra Kelaher & Lowry, 2002
Elasmopus yunde J.L. Barnard, 1974
Hoho carteta (J.L. Barnard, 1972a)
Hoho hirtipalma Lowry & Fenwick, 1983
Hoho marilla (J.L. Barnard, 1972a)
Linguimaera boeckii (Haswell, 1879b)
Linguimaera bogombogo Krapp-Schickel, 2003
Linguimaera caesaris Krapp-Schickel, 2003
Linguimaera garitima Krapp-Schickel, 2003
Linguimaera hamigera (Haswell, 1879b)
Linguimaera kellissa Krapp-Schickel, 2003
Linguimaera leo Krapp-Schickel, 2003
Linguimaera octodens (Sivaprakasam, 1968)
Linguimaera schickelae n.sp.
Linguimaera thomsoni (Miers, 1884)
Linguimaera tias Krapp-Schickel, 2003
Maeracoota sp. Krapp-Schickel & Ruffo, 2001
Maeropsis griffini (Berents, 1983)
Mallacoota balara Berents, 1983
Mallacoota chandaniae n.sp.
Mallacoota diemenensis (Haswell, 1879a)
Mallacoota euroka n.sp.
Mallacoota kameruka n.sp.
Mallacoota malua n.sp.
Mallacoota nananui Myers, 1985

Mallacoota subcarinata (Haswell, 1879b)
Miramaera thetis n.sp.
Parapherusa crassipes (Haswell, 1879b)
Pareiasmopus echo J.L. Barnard, 1972a
Pareiasmopus sowpigensis n.sp.
Pareiasmopus suensis (Haswell, 1879b)
Pareiasmopus ya J.L. Barnard, 1972a
Premaera thetis n.sp.
Quadrimaera quadrimana (Dana, 1852)
Quadrimaera reishi (J.L. Barnard, 1979)
Quadrimaera serrata (Schellenberg, 1938)
Quadrimaera viridis (Haswell, 1879b)
Quadrivisio sarina n.sp.

Eriopisa group

**Nedsia chevronia* Bradbury, 2002
 **Nedsia douglasi* Barnard & Williams, 1995
 **Nedsia fragilis* Bradbury & Williams, 1996
 **Nedsia halletti* Bradbury, 2002
 **Nedsia humphreysi* Bradbury & Williams, 1996
 **Nedsia hurlberti* Bradbury & Williams, 1996
 **Nedsia macrosculptilis* Bradbury & Williams, 1996
 **Nedsia sculptilis* Bradbury & Williams, 1996
 **Nedsia stefania* Bradbury, 2002
 **Nedsia straskraba* Bradbury & Williams, 1996
 **Nedsia urifimbriata* Bradbury & Williams, 1996
 **Norcapensis mandibulis* Bradbury & Williams, 1997
 **Nurina poulteri* Bradbury & Eberhard, 2000
Victoriopisa australiensis (Chilton, 1923)
Victoriopisa marina n.sp.

Nuana group

Gammarella berringar (J.L. Barnard, 1974)
Nuuanu merringannee (J.L. Barnard, 1974)
Nuuanu mokari J.L. Barnard, 1974
Nuuanu numbadi J.L. Barnard, 1974

Melita group

**Brachina invasa* Barnard & Williams, 1995
Dulichella australis (Haswell, 1879a)
Dulichella pacifica n.sp.
Melita festiva (Chilton, 1884)
Melita kauerti J.L. Barnard, 1972a
Melita matilda J.L. Barnard, 1972a
Melita myersi Karaman, 1987
Melita oba J.L. Barnard, 1972a
Melita ophiocola n.sp.
 **Melita plumulosa* Zeidler, 1989

1879a) and *Quadrimaera viridis* (Haswell, 1879b) and Berents (1983) redescribed *Parelasmopus suensis* (Haswell, 1879b). *Parapherusa crassipes* (Haswell, 1879b) is considered to be a well known, distinctive species. In this paper we redescribe *Austromaera mastersii* (Haswell, 1879a), *Dulichhiella australis* (Haswell, 1879a), *Linguimaera boeckii* (Haswell, 1879b), *Linguimaera hamigera* (Haswell, 1879b) and *Mallacoota subcarinata* (Haswell, 1879b).

The *Dulichhiella* complex

Once LeCroy (2000) redescribed *Dulichhiella appendiculata* (Say, 1818) from near the type locality (LeCroy, pers. comm.), it was clear that material from Australia did not belong to that species. Ledoyer (1986) gave an excellent summary of the problems associated with available names for species of *Dulichhiella*. Based on this information we were able to locate and borrow material of *D. appendiculata* (Say, 1818), St Catherines Island, Georgia, USA, *D. fresnelii* (Audouin, 1826), Great Bitter Lake, Suez Canal and *D. anisochir* (Kroyer, 1845) Rio de Janeiro, Brazil. Dana's types are lost and his species (*Dulichhiella validus* (Dana, 1852), Singapore; *Dulichhiella setipes* (Dana, 1852), Rio de Janeiro; *Dulichhiella pilosus* (Dana, 1852), Rio de Janeiro) are only identifiable at generic level. Comparison of our material with these species showed that *D. australis* is a valid species and that an undescribed species (*D. pacifica* n.sp.) occurred in northeastern Australia, the southwest Pacific and the South China Sea. A separate paper (Lowry & Springthorpe, in prep.) revises *Dulichhiella* on a world-wide basis.

The *Maera* complex

Krapp-Schickel & Ruffo (2000) recently established the genus *Quadrimaera* and transferred four of the nine Australian species, previously considered to be *Maera*, to this genus (Table 1). Krapp-Schickel (2003) recently re-established the genus *Linguimaera* Pirlot, 1936 and described seven new Australian species in the genus. But five remaining Australian species are still unassigned.

In the original description of *Maera mastersii* Haswell, 1879a, the illustrations of uropod 3 and the telson differ significantly from those presented by Sheard (1936) and J.L. Barnard (1972a). We examined syntype material and new material, both from Port Jackson, that agree with the description and illustrations of Haswell (1879a). Based on this material we redescribe the species and place it in the new genus *Austromaera*. Within Australia, the material considered by Sheard (1936) as *Maera mastersii* has been described as *Linguimaera tias* Krapp-Schickel, 2003 and that of J.L. Barnard (1972a) has been described as *Linguimaera leo* Krapp-Schickel, 2003. Krapp-Schickel (2003) has also re-established the Torres Strait species, *Maera thomsoni* (Miers, 1884) (synonymized with *M. mastersii* by Haswell, 1885), and transferred it to *Linguimaera*.

Two main characters define *Linguimaera* Pirlot, 1936 (Krapp-Schickel, 2003). The first is the second gnathopods of the male that are always asymmetrical, so that one is similar to the female second gnathopod and the other is enlarged and morphologically dissimilar, as is typical of mate-guarding amphipods. The second character is a serrate posterior margin on epimeron 3 (weakly serrate in *M. hamigera*). Among the Australian species in our study, *Maera boeckii* Haswell, 1879, *M. hamigera* Haswell, 1879

and *M. octodens* Sivaprakasam, 1968, all have these characteristics. They are here transferred to the genus *Linguimaera*. In addition, a new species, *Linguimaera schickelae* n.sp., is described from the Sydney area.

The original description of *Maera boeckii* Haswell, 1879b, was inadequate and the type material is apparently lost (Springthorpe & Lowry, 1994). As a result the species has been unidentifiable. Della Valle (1893) referred to it as *?Maera boeckii*. Stebbing (1899) transferred it to *Elasmopus* in his world monograph (Stebbing, 1906). K.H. Barnard (1916) appears to have erroneously reported *E. boeckii* from South Africa. Since Sheard (1937) placed it in his catalogue of Australian Gammaridea, there have been no further records or new material. While studying material for the Australian Amphipod Project, we discovered material from Port Jackson that we are referring to this species. The species has all the characteristics of a *Linguimaera*, except for an emarginate telson, which appears to be independently derived.

The name *Maera hamigera* Haswell, 1879b (type locality Port Jackson), has not been used for an Australian species since Stebbing (1910a), but it has been used for species living in the Red Sea (Walker, 1909; Lyons & Myers, 1993), southern Africa (K.H. Barnard, 1916), Micronesia (J.L. Barnard, 1965), the Mediterranean Sea (Karaman & Ruffo, 1971), Madagascar (Ledoyer, 1982) and Western Samoa (Myers, 1997). A microscope slide from the syntype series shows the unusual gnathopod 2 of this species. Using this evidence we discovered many specimens of this species in collections from Twofold Bay on the south coast of New South Wales. We redescribe the species here, based on the syntypes and the newly discovered material. These results indicate that *L. hamigera* is currently confined to southeastern Australia. Material from other areas that also appears to be in the genus *Linguimaera*, and has been attributed to this species, needs to be re-examined. Krapp-Schickel (2003) recently renamed material, identified as *M. hamigera*, from the Mediterranean, the Red Sea, Madagascar and Western Samoa as *L. caesaris*, but left the material from southern Africa and Micronesia unresolved.

Stebbing (1910a) identified material from the *Thetis* Expedition as *Maera inaequipes* (Costa, 1851). Even as he did, he stated that "the specimens ... do not justify the specific name". We establish the new genus and species *Miramaera thetis* based on material in the Australian Museum collections and transfer the New Zealand species, *Maera tepuni* J.L. Barnard, 1972b, to *Miramaera*.

Based on the key in Krapp-Schickel (2000) and unpublished phylogenetic analyses (JKL) we tentatively place *Maera griffini* Berents, 1983, in the genus *Maeropsis* Chevreux, 1919. Krapp-Schickel & Ruffo (2001) deduced that *Maera tenella* of Tattersall, 1922 (Wooded Island, Abrolhos Islands) is actually a species of *Maeracoota* Myers, 1997. Unfortunately material of this species is not available for study.

The *Mallacoota* Complex

Mallacoota J.L. Barnard, 1972, was established for six species: *M. carteta* J.L. Barnard, 1972, *M. diemenensis* (Haswell, 1879), *M. insignis* (Chevreux, 1901), *M. marilla* J.L. Barnard, 1972, *M. odontoplax* (Pirlot, 1936) and *M. subcarinata* (Haswell, 1879). At the same time Barnard demonstrated several "phenotypes" for *M. subcarinata* and *M. carteta*. Lowry & Fenwick (1983) subsequently removed

M. marilla and *M. carteta* to a new genus, *Hoho*, and described a third species, *H. hirtipalma*.

Since then Ortiz has described *M. carausui* Ortiz, 1976, Ledoyer has described *M. subinsignis* Ledoyer, 1979, *M. latidactylus* Ledoyer, 1982 and *M. schellenbergi* Ledoyer, 1984 and transferred (Ledoyer, 1982) *Elasmopus latibrachium* Walker, 1905 to *Mallacoota*. Berents (1983) has described *M. balara* and Myers (1985) has described *M. nananui*. Myers (1985) summarized the status of *Mallacoota* and concluded that an in-depth study using a wide range of material was needed. Appadoo *et al.* (2002) began this process by redescribing *M. insignis*, *M. latibrachium* and *M. schellenbergi* and describing the new species *M. caerulea* from Mauritius. They also excluded *M. subcarinata* of Ledoyer (1978) from that area.

The original description of *Mallacoota subcarinata* (Haswell, 1879b) was apparently based on a series of small adult specimens from Port Jackson. These syntypes are lodged in the Australian Museum, but are in poor condition. All have the unusual gnathopod 2 palmar shape indicated by Haswell's (1879b) illustrations. Unfortunately this is not one of the species with which the name has been subsequently associated. To add to this confusion J.L. Barnard (1972) described three "phenotypes" in his redescription of *M. subcarinata*. In this paper we re-establish the original species concept of *M. subcarinata* by redescribing and illustrating the types and new material from near the type locality. We describe new Australian species (*M. chandaniae* n.sp., *M. euroka* n.sp., *M. kameruka* n.sp. and *M. malua* n.sp.) some of which have in the past been mis-identified as *M. subcarinata* and comment on records of *M. subcarinata* from geographic areas outside of Australia. We also report *M. nananui* Myers, 1985 from Australian waters for the first time.

Currently *Mallacoota* contains 16 species (Table 2) half of which occur in Australia. The genus is essentially Indo Pacific with one species, *M. carausui*, in the tropical western Atlantic.

Parelasmopus, *Quadrivisio* and *Victoriopisa*

J.L. Barnard (1972a) redefined *Parelasmopus* and established *Ifalukia* for a species that did not quite fit the *Parelasmopus* mould. In the same paper he described two Australian species and synonymized *P. suensis* (Haswell, 1879b) with *P. setiger* Chevreux, 1901. Strangely he continued to use the later name, *P. setiger*. J.L. Barnard (1974) reassessed his position and considered *P. suensis* and *P. setiger* to be separate species. Finally, Berents (1983) redescribed *P. suensis* from a lectotype male. In this paper we describe the fourth Australian species and the first species from the southeastern part of the country. This species, *Parelasmopus sowpigenis*, also does not quite fit the *Parelasmopus* or *Ifalukia* moulds, but it is placed in a slightly expanded concept of the genus *Parelasmopus*.

Quadrivisio currently contains five species: *Q. aviceps* K.H. Barnard, 1940; *Q. bengalensis* Stebbing, 1907; *Q. bousfieldi* Karaman & Barnard, 1979; *Q. lobata* Asari, 1983; and *Q. lutzi* (Shoemaker, 1933) none of which are known from Australian waters. We describe a new species, *Q. sarina*, from the Queensland coast.

Stock & Platvoet (1981) revised the genus *Victoriopisa* and described a new species from Mauritania in the eastern North Atlantic. Including the new species described here, *Victoriopisa* now contains seven species: *V. atlantica* Stock & Platvoet, 1981;

Table 2. Species of *Mallacoota*.

<i>M. balara</i> Berents, 1983
<i>M. caerulea</i> Appadoo, Myers & Fagoonee, 2002
<i>M. carausui</i> Ortiz, 1976
<i>M. chandaniae</i> n.sp.
<i>M. diemenensis</i> (Haswell, 1879)
<i>M. euroka</i> n.sp.
<i>M. insignis</i> (Chevreux, 1901)
<i>M. kameruka</i> n.sp.
<i>M. latibrachium</i> (Walker, 1905)
<i>M. latidactylus</i> Ledoyer, 1982
<i>M. malua</i> n.sp.
<i>M. nananui</i> Myers, 1985
<i>M. odontoplax</i> (Pirlot, 1936)
<i>M. schellenbergi</i> Ledoyer, 1984
<i>M. subcarinata</i> (Haswell, 1879b)
<i>M. subinsignis</i> Ledoyer, 1979

V. australiensis (Chilton, 1923); *V. chilkinsis* (Chilton, 1921a); *V. epistomata* (Griffiths, 1974a); *V. marina* n.sp.; *V. papiae* Asari, 1983 and *V. ryukyensis* Morino, 1991. In a phylogenetic analysis of the *Eriopisa* group van der Ham & Vonk (2003) affirmed the monophyly of *Victoriopisa*.

The original description and illustrations of *Victoriopisa australiensis* (Chilton, 1923) were inadequate and the type was thought to be lost (Springthorpe & Lowry, 1994). When Karaman & Barnard (1979) established the genus *Victoriopisa* they included *V. australiensis*, but did not redescribe it. This is a very distinctive species that lives in a restricted habitat. For these reasons we redescribe and illustrate this species, based on material from Boambee Creek, Sawtell, New South Wales, near the type locality, Trial Bay. After our illustration of the Boambee Creek specimens were completed the type was located, too late to be incorporated into this study. A second species (*Victoriopisa marina* n.sp.) is described, from estuarine and marine habitats in New South Wales and Victoria.

Methods

The taxonomic descriptions presented in this paper were generated from a DELTA (Dallwitz *et al.*, 1993; Dallwitz *et al.*, 1998) database of Australian melitid species. Unless indicated otherwise, the following attributes are implicit throughout the descriptions, except where the characters concerned are inapplicable.

Head. Eyes present; one pair. *Antenna 1* peduncular article 2 not geniculate. *Mandible* palp present, well developed.

Pereon. *Gnathopod 1* not sexually dimorphic; carpus about 2× as long as broad; carpus without anterodistal swelling; propodus without anterodistal projection, posterodistal margin not swollen. *Gnathopod 2* left and right gnathopods subequal in size; propodus without strong concentration of setae, distolateral margin without spines; dactylus closing along palm, reaching end of palm, inner margin smooth. *Pereopod 5* dactylus unguis anterior margin without accessory spines; carpus and propodus with few (or none) long, slender setae along anterior margin. *Pereopod 6* coxa anterior lobe ventral margin not produced ventrally; carpus and propodus with few (or none) long, slender setae along anterior margin; propodus not expanded posterodistally; dactylus unguis anterior margin without accessory spines. *Pereopod 7* basis with posterior

margin smooth or minutely castelloserrate; merus posterodistal margin narrowly rounded or subquadrate; propodus not expanded posterodistally; dactylus unguis anterior margin without accessory spines.

Pleon. *Pleonite 1* without dorsal serrations, without dorsodistal spines, not dorsally bicarinate. *Pleonite 2* without dorsal serrations, without dorsodistal spines, not dorsally bicarinate. *Pleonite 3* without dorsal serrations, without dorsodistal spines, not dorsally bicarinate. *Epimeron 1* anteroventral corner without curved spine. *Epimeron 3* posteroventral margin smooth. *Urosomite 1* without dorsal carina, without a small dorsal hump, without dorsal serrations, without spines or gape, not dorsally bicarinate, without posterodorsal spine. *Urosomite 2* posterior margin smooth, without dorsolateral robust setae. *Urosomite 3* without dorsal robust setae. *Uropod 1* peduncle with basofacial robust seta; without distoventral spur. *Telson* cleft, without robust setae on inner margins.

A separate generic level DELTA database to species in the *Maera* complex was used to generate generic diagnosis and to generate nexus files. A preliminary phylogenetic analysis was generated using PAUP 4.0 win10 in order to analyse relationships among genera and species in this complex.

Material used in this study is lodged in the Australian Museum, Sydney (AM). The following abbreviations are used on the plates: *A*, antenna; *C*, coxa; *E*, epimeron; *G*, gnathopod; *H*, head; *MD*, mandible; *MP*, maxilliped; *MX*, maxilla; *p*, palp; *P*, pereopod; *PLN*, pleonite; *T*, telson; *U*, uropod; *UR*, urosomite; *L*, left; *R*, right.

Taxonomy

Melitidae Bousfield, 1973

Lowry & Watson (2002) reviewed the discussion of informal groups within the Melitidae. They found a “*Maera-Elasmopus* group” and a “*Melita-Eriopisa*” group recognized by Bousfield (1977) and a “*Nuuanu* group” recognized by McKinney & Barnard (1977). Barnard & Barnard (1983) recognized a *Ceradocus* group (*Maera-Elasmopus* group of Bousfield, 1977), a *Ceradocopsis* group, an *Eriopisa* group, a *Nuuana* group (*Nuuanu* group of McKinney & Barnard, 1977), a *Melita* group (*Melita-Eriopisa* group of Bousfield, 1977) and a *Parapherusa* group.

The Melitidae as conceived by Bousfield (1973) is not well defined and we can find no synapomorphy to define the whole group. In fact there appears to be very few widespread synapomorphies within the group. The extremely unequal rami of uropod 3 (the inner ramus is scale-like and the outer ramus is at least 3× longer than wide) appears to be a synapomorphy that defines a *Melita* and an *Eriopisa* group. The *Eriopisa* group has an extremely well-developed second article on the outer ramus of uropod 3, another strong synapomorphy that separates this group from the *Melita* group. A third synapomorphy (two groups of small setae guarded by spines on the dorsum of urosomite 2) occurs throughout the *Melita* group and the *Nuuana* group, but not in the *Eriopisa* group.

The *Ceradocopsis*, *Ceradocus* and *Parapherusa* groups all appear to be paraphyletic assemblages at best, with no defining synapomorphies. In this paper, for practical reasons, we recognize a *Ceradocopsis* group, a *Ceradocus* group (including *Parapherusa*), an *Eriopisa* group, a *Nuuana* group and a *Melita* group.

Ceradocus group

Austromaera n.gen.

Type species. *Maera mastersii* Haswell, 1879a.

Diagnosis. *Head* with anteroventral slit; eye ovate. *Antenna 1* accessory flagellum short, significantly less than half length of primary flagellum. *Mandible palp* article 1 not produced distally; article 3 short, tapering distally; article 2 longer than article 3. *Maxilla 1* inner plate with mainly apical setae. *Gnathopod 1* coxa anteroventral corner produced, acute. *Gnathopod 2* significantly enlarged in male and female; left and right gnathopods symmetrical in male (right slightly bigger than left); palm acute in male and female, male both propodi with well defined corner (greater than 90°), female both propodi with well defined corner (greater than 90°); dactylus with 1 or 2 setae on anterior margin. *Pereopods 5–7* dactyli simple. *Epimeron 2* posteroventral corner with 1 small spine. *Epimeron 3* posterior margin smooth. *Uropod 3* rami about 2× peduncle, distally subacute, without apical robust setae; outer ramus 1-articulate. *Telson* deeply cleft, lobes apically subacute, with robust setae on inner margins, without robust setae on outer margins, without apical robust setae.

Etymology. A combination of the Latin word *auster*, meaning southern, with the Latin stem *Maera*.

Species composition. *Austromaera mastersii* (Haswell, 1879a).

Remarks. *Austromaera* is part of the large *Maera* group, in which gnathopod 2 is symmetrical and significantly enlarged in males and females, the palms are acute with well defined corners and the rami of uropod 3 are distally acute or subacute. The main defining characters of the genus are: the weakly produced first article of the mandibular palp and the distally acute margins of the rami of the third uropods. *Austromaera* is the only member of the *Maera* complex with such strongly setose inner margins on the telson. It is excluded from *Maera* and *Miramaera* because of its ovate eyes, its short accessory flagellum and its weakly produced first mandibular palp article. It is excluded from *Maera* and *Lupimaera* because of its sparsely setose gnathopod 2 dactylus. *Austromaera* occurs in the *Maera* group, but appears to be most similar to the Indian Ocean species of *Zygomaera* that apparently have symmetrical second gnathopods. The main difference between these taxa is the telson that is emarginate in the Indian Ocean species. Currently *Austromaera* is confined to Australian waters.

Distribution. Australia.

Austromaera mastersii (Haswell, 1879a)

Figs. 1–4

Megamaera mastersii Haswell, 1879a: 265, pl. 11, fig. 1.–Haswell, 1882: 258.–Haswell, 1885: 105.

Maera mastersii.–Stebbing, 1899: 426.–Stebbing, 1906: 439.–Stebbing, 1910a: 642.–?Chilton, 1921b: 72 (southern Australia).

Not *Moera mastersii*.–Chilton, 1911: 564 (Kermadec Islands) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).

Not *Maera mastersii*.–Thomson, 1882: 235 (in part, part = *M. quadrimana*) (New Zealand).–Sheard, 1936: 177, fig. 3 (South Australia) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–Sheard, 1937: 24 (South Australia) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–

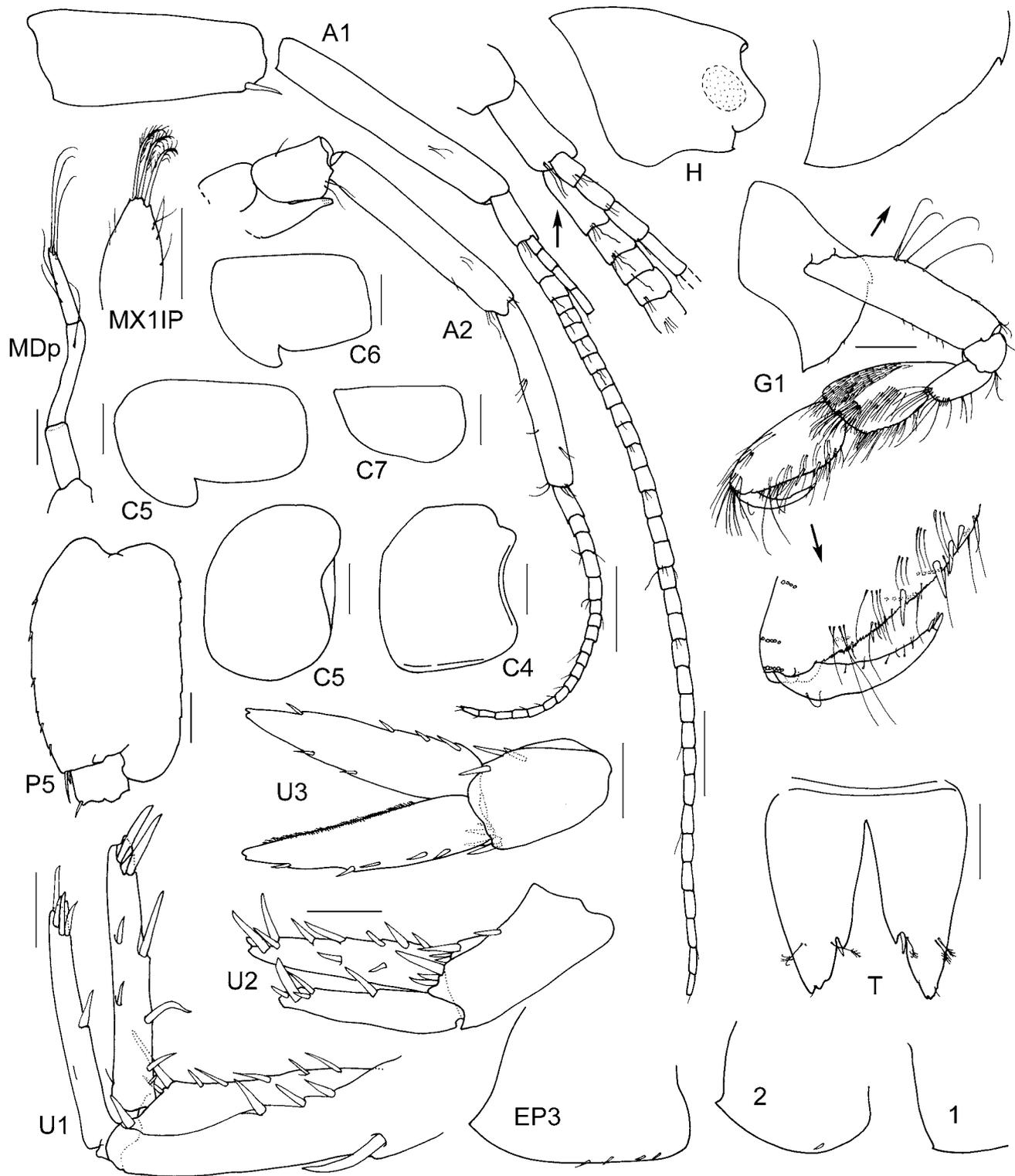


Fig. 1. *Austromaera mastersii* (Haswell, 1879a), syntype, ♀, AM P3487. Port Jackson, New South Wales, Australia. Scales for MDp and MX1IP represent 0.1 mm, remainder represent 0.2 mm.

Sivaprakasam, 1969: 36, fig. 1 a–g [= *L. mannarensis* (Sivaprakasam, 1970), according to Krapp-Schickel, 2003].–J.L. Barnard, 1972a: 226, fig. 132 (southern Australia) (= *L. leo* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–J.L. Barnard, 1972b: 109, figs 55–56 (New Zealand) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–Ledoyer, 1979: 77, fig. 44 [= *Zygomaera pseudemarginata* (Ledoyer, 1982) (Madagascar)].–Lowry & Fenwick, 1983: 236 (New Zealand subantarctic) (= ? *L. tias* Krapp-Schickel, 2003,

according to Krapp-Schickel, 2003).
 Not *Maera mastersii*.–Chevreux, 1908: 481 (French Polynesia).–Stebbing, 1910b: 457 (South Africa).–Chilton, 1916: 367 (New Zealand).–Chilton, 1925: 317 (Chatham Islands, New Zealand).–Hale, 1929: 215, fig. 213 (figure = *L. thomsoni* of Miers, 1884) (South Australia) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–Hurley, 1954: 603 (New Zealand) (= *L. tias* Krapp-Schickel, 2003, according to Krapp-Schickel, 2003).–Griffiths, 1974b: 291 (South Africa).–J.L. Barnard, 1962: 99 (key).

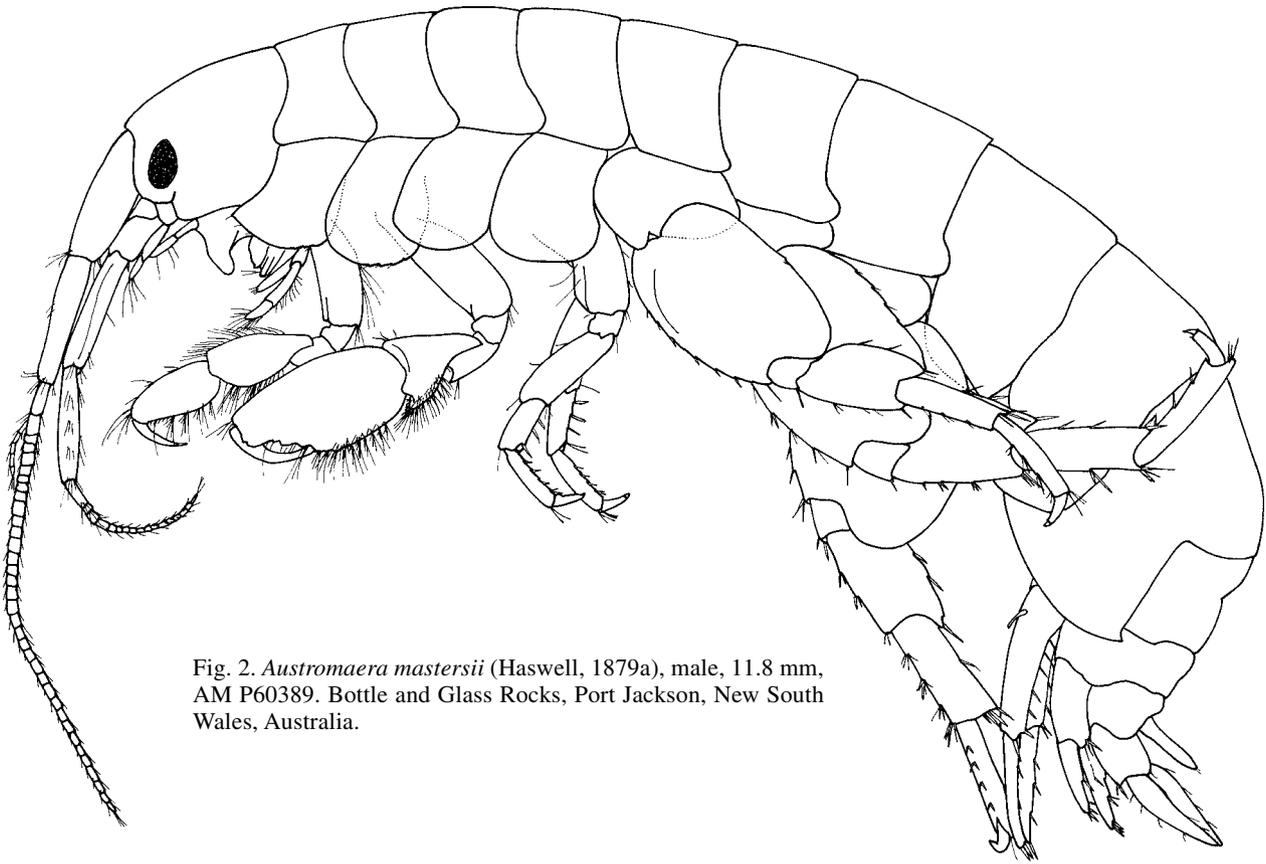


Fig. 2. *Austromaera mastersii* (Haswell, 1879a), male, 11.8 mm, AM P60389. Bottle and Glass Rocks, Port Jackson, New South Wales, Australia.

Type material. Syntype, female, ovigerous, AM P3487, Port Jackson, New South Wales, Australia, [approx. 33°50.9'S 151°16.2'E], [from AM Old Collection].

Additional material examined. New South Wales: male, 11.8 mm, AM P60389; female, 12.5 mm, AM P27286, Bottle and Glass Rocks, Port Jackson, 33°50.9'S 151°16.2'E, in and among dense tubes on sediment covered rocks, G.D. Fenwick, 29 Aug 1977. 1♂, AM P60390; 5 specimens, AM P60391, off Wy-ar-gine Point, Port Jackson, [approx. 33°49'S 151°15.1'E], sand and shell, dredge, Malacological Society, 8 May 1971. 1 specimen, AM P60392, northeast of Marys Rock, Cook Island, 28°11.42'S 153°34.79'E, orange bryozoan, 19 m, R.T. Springthorpe, 8 June 1993, stn NSW-816.

Type locality. Port Jackson, New South Wales, Australia, [approx. 33°50.9'S 151°16.2'E].

Description. Based on syntype female, AM P3487, male, AM P60389 and female AM P27286.

Head. Lateral cephalic lobes broad, rounded, with anteroventral slit, anteroventral corner subquadrate, with acute/subacute spine. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 1 distal robust seta on posterior margin; flagellum with 34 articles; accessory flagellum with 6 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 longer or subequal to article 5; flagellum with 20 articles. *Mandible* palp article 3 rectilinear, setose along straight medial margin, longer than article 1; article 2 longer than article 3; article 1 not produced, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with about 3 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch absent; merus without posterodistal spine; palm extremely acute, slightly convex,

without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* not sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, palm acute, straight, sculptured, with sparse robust setae, defined by posteroventral corner; apically acute/subacute. *Pereopod 5* basis posterior margin straight, posteroventral corner broadly rounded. *Pereopod 6–7* basis posterior margin convex, posteroventral corner broadly rounded.

Pleon. *Epimeron 1* posteroventral corner broadly rounded, or with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with small acute spine. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* with robust setae on inner margins (1 or 2 per lobe), without apical robust setae, apical conical extension absent.

Habitat. Marine; littoral; in and among dense tubes on sediment covered rocks, bryozoans, sand and shell, 7 to 19 m depth.

Remarks. Although there are many records of *A. mastersii* in the literature from inside and outside Australia, only Haswell (1879a: 265, pl. 11, fig. 1), Sheard (1936: 177, fig. 3), J.L. Barnard (1972a: 226, fig. 132), J.L. Barnard, 1972b: 109, figs 55–56 and Ledoyer (1979: 77, fig. 44) illustrated their material. Neither Sheard (1936), nor J.L. Barnard (1972a,b) showed the distinctive third uropods and telson illustrated by Haswell (1879a). Their misidentified species have recently been studied by Krapp-Schickel (2003). The

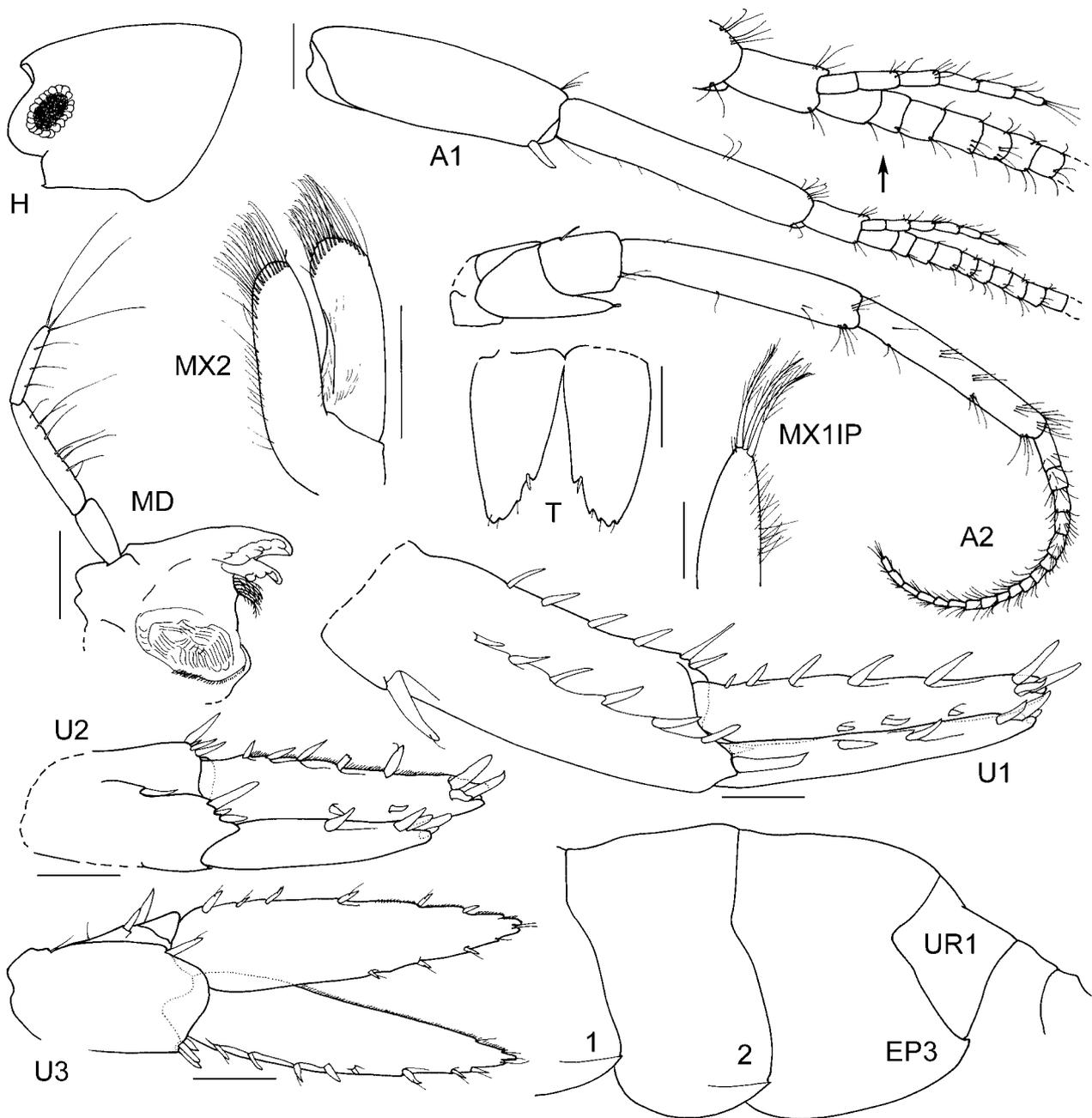


Fig. 3. *Austromaera mastersii* (Haswell, 1879a), male, 11.8 mm, AM P60389. Bottle and Glass Rocks, Port Jackson, New South Wales, Australia. Scale for MX1IP represents 0.1 mm, remainder represent 0.2 mm.

material of Ledoyer (1979) was later shown to be a different species, now known as *Zygomaera pseudemarginata* (Ledoyer, 1982). Based on currently available information, *A. mastersii* appears to be confined to southeastern and possibly southern Australia. Other records attributed to this species (at least since Haswell [1885] synonymized *L. thomsoni* with *A. mastersii* and certainly since the illustrations of Sheard [1936]) represent *Linguimaera leo* and *L. tias* of Krapp-Schickel (2003) plus several unknown species.

Distribution. *New South Wales:* Bottle and Glass Rocks and Wy-ar-gine Point, Port Jackson; Marys Rock, Cook Island (all AM).

Australian geographic areas. Southeastern Australia.

***Ceradocus* Costa, 1853**

***Ceradocus circe* n.sp.**

Figs. 5–7

Ceradocus rubromaculatus.—Chilton, 1921b: 71, fig. 9a–c.

Type material. HOLOTYPE ♂ “a”, 24.3 mm, AM P60564; 1 PARATYPE, ♀ “a”, 18.6 mm, AM P60565; 1 PARATYPE, ♂ “b”, 22.9 mm, AM P5915; 8 Paratypes, AM E6543, 16 kms north of Circular Head, Tasmania, Australia, [approx. 40°46’S 145°18’E], FIS *Endeavour*, 1909–1914. 1 PARATYPE, female, AM E6542, Tasmanian Coast, Australia, FIS *Endeavour*, 1909–1914

Type locality. 16 kms north of Circular Head, Tasmania, Australia, [approx. 40°46’S 145°18’E].

Description. Based on holotype ♂ “a”, AM P60564, paratype ♀ “a”, AM P60565, and paratype ♂ “b”, AM P5915.

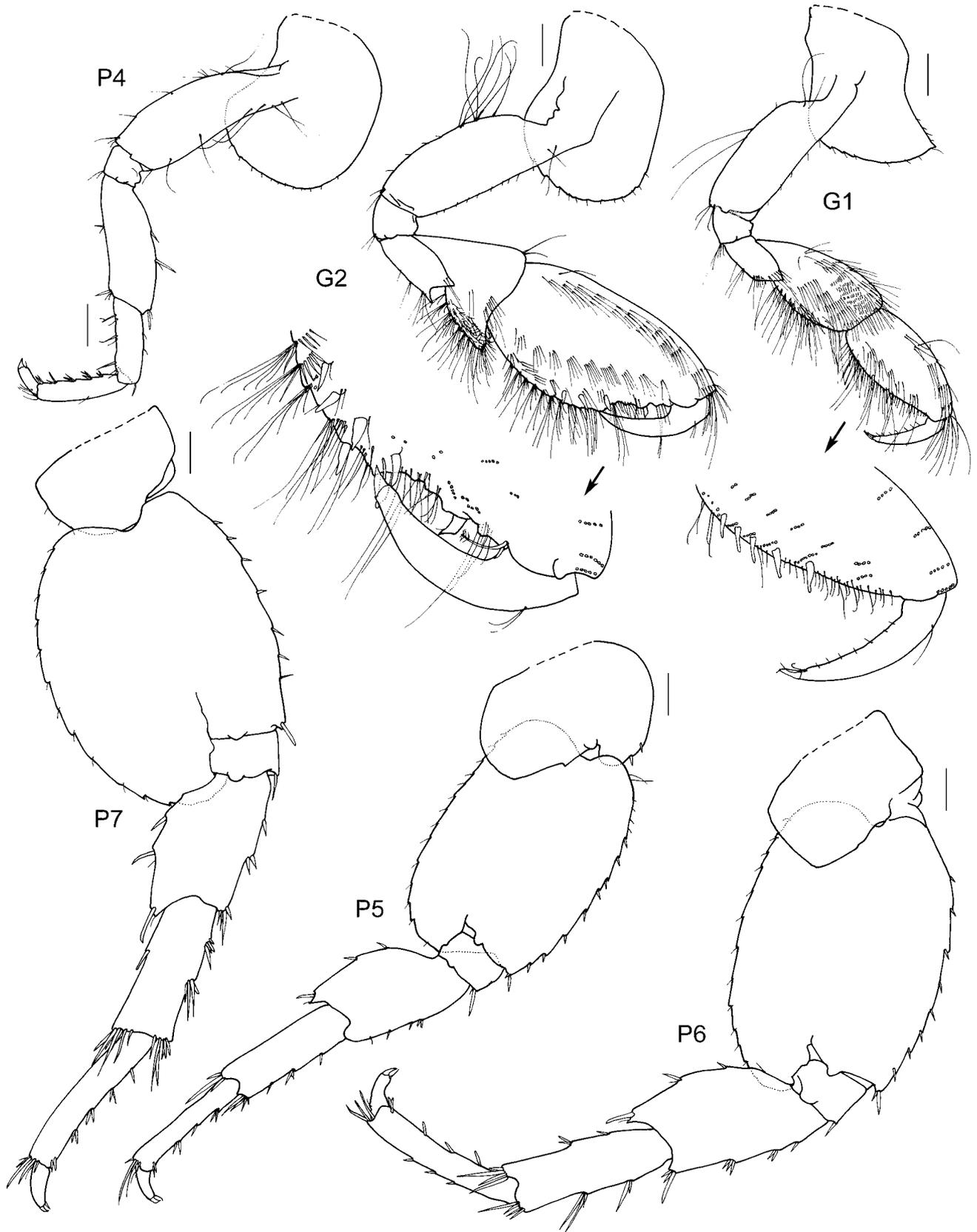


Fig. 4. *Austromaera mastersii* (Haswell, 1879a), male, 11.8 mm, AM P60389. Bottle and Glass Rocks, Port Jackson, New South Wales, Australia. Scales represent 0.2 mm.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner with acute/subacute spine. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 4 or more robust

setae along posterior margin; flagellum with at least 30 articles; accessory flagellum with 11 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 subequal to article 5; flagellum

with about 20 articles. *Mandible* palp article 3 cone-like, setose on distomedial margin, subequal to article 1; article 2 longer than article 3; article 1 produced distally, shorter than article 2, about as long as broad. *Maxilla 1* inner plate setose along entire inner margin.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch absent; merus with sharp posterodistal spine; propodus palm acute, straight, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, without strong concentration of setae, palm acute, straight, sculptured, with group of anterodistal robust setae, without posterodistal robust setae, defined by posteroventral spine; apically acute/subacute. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin straight, posteroventral corner with acute or subacute process. *Pereopod 7* basis posterior margin straight, posteroventral corner with acute or subacute process.

Pleon. *Pleonites 1–3* with dorsal serrations. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin with 3 large or small spines above spine defining posteroventral corner, or without spines above posteroventral corner. *Epimeron 3* posterior margin serrate, posteroventral corner with strongly produced acute spine, posteroventral margin serrate. *Urosomite 1* with dorsal serrations, with spines at midline, no conspicuous medial gape. *Urosomite 2* posterior margin serrate. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus much longer (more than 2× length) than peduncle; 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust

setae, apical conical extension reaching at least halfway along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* convex, smooth, without robust setae, defined by posterodistal robust setae, defined by posterodistal spine.

Habitat. Marine; continental shelf.

Etymology. Named for the wooden schooner *Circe*, which went ashore in 1892, between Entrance Island and the North Spit, while attempting to pass through Hells Gates and enter Macquarie Harbour, Tasmania.

Remarks. Among Australian species of *Ceradocus*, *C. circe* occurs in the group with sparse serrations along the posterior margins of epimera 1 and 2. Within this group *C. circe* appears to be the only species with the rami of uropod 3 more than twice as long as the peduncle (not known for *C. yandala* Berents, 1983 from tropical northeastern Australia).

Ceradocus orchestiiipes A. Costa, 1853 from the Mediterranean Sea, has sparse serrations along the posterior margins of epimera 1 and 2, long rami on uropod 3 and the second gnathopods in the male and the female are very similar to those of *C. circe*. But *C. orchestiiipes* does not have dorsal serrations on urosomites 1–3, nor does it have a strongly serrate posterodistal corner on epimeron 3.

Distribution. *Tasmania*: north of Circular Head; eastern slope of Bass Strait (Chilton, 1921b).

Australian geographic areas. Southeastern Australia.

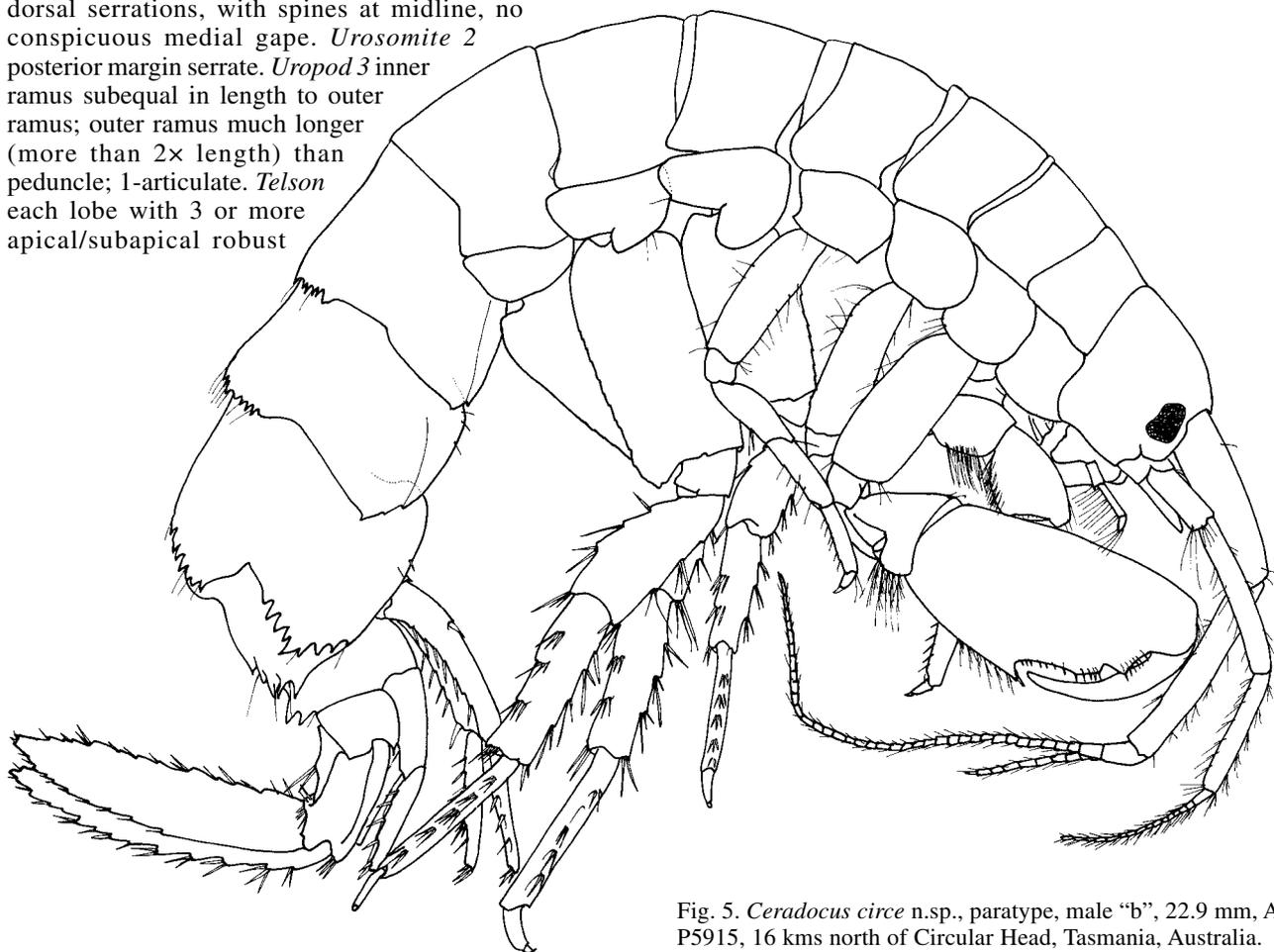


Fig. 5. *Ceradocus circe* n.sp., paratype, male "b", 22.9 mm, AM P5915, 16 kms north of Circular Head, Tasmania, Australia.

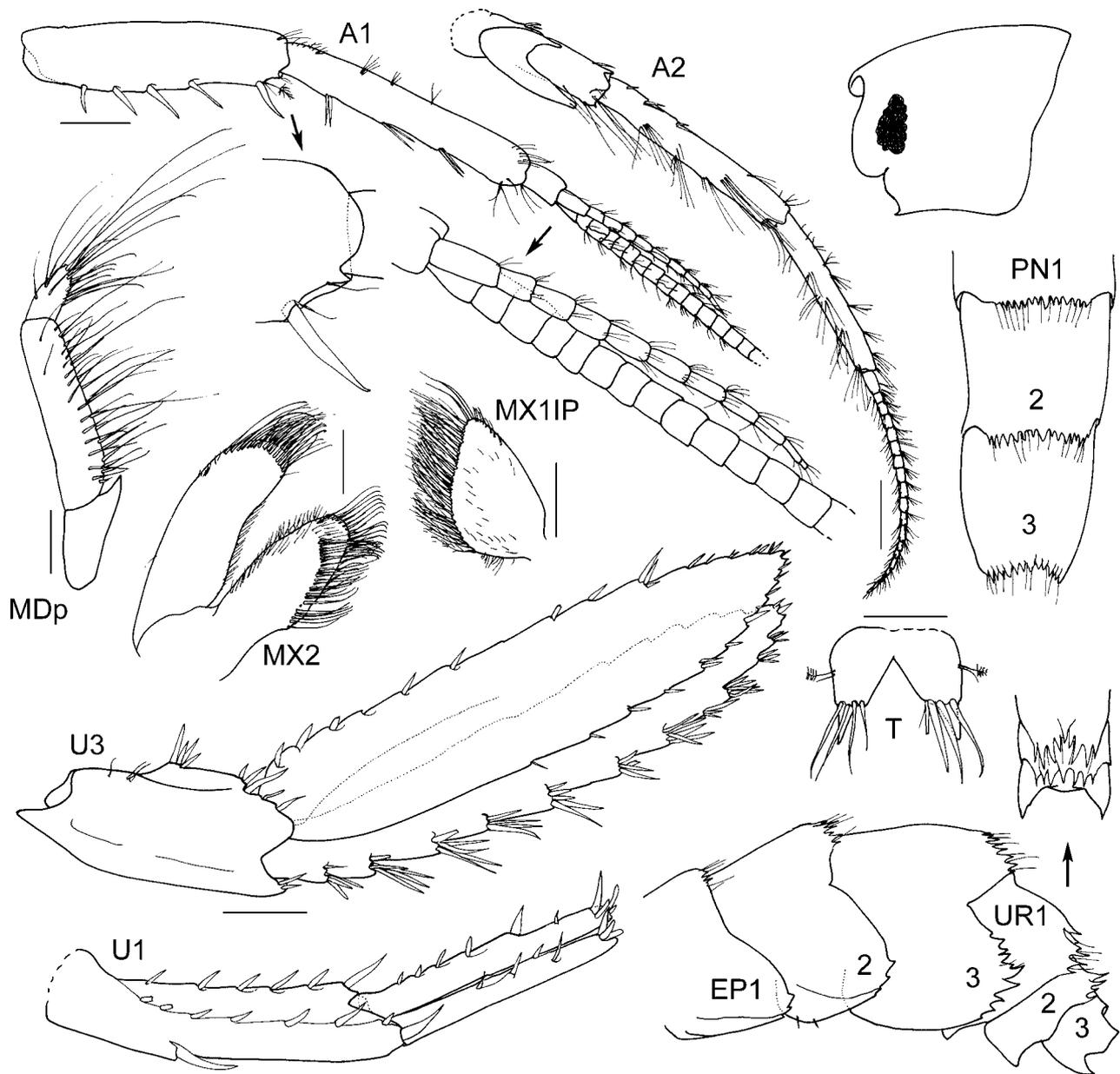


Fig. 6. *Ceradocus circe* n.sp., holotype, male "a", 24.3 mm, AM P60564, 16 kms north of Circular Head, Tasmania, Australia. Scales for A1, A2, U1, U3, T represent 0.5 mm, remainder represent 0.2 mm.

Linguimaera Pirlot

Linguimaera Pirlot, 1936: 309.—Krapp-Schickel, 2003: 258.

Type species. *Linguimaera pirloti* Krapp-Schickel, 2003, replacement name for misidentified type species.

Diagnosis. Head with anteroventral slit; eye ovate to reniform. Antenna 1 accessory flagellum short, significantly less than half length of primary flagellum. Mandible palp article 1 not produced distally; article 2 longer than article 3; article 3 long, rectilinear. Maxilla 1 inner plate with mainly apical setae. Gnathopod 1 coxa anteroventral corner produced, acute or subacute. Gnathopod 2 significantly enlarged in male, not in female; left and right gnathopods asymmetrical in male; palm acute in male and female, male one propodus with well defined corner, the other propodus with poorly defined or no corner, female with poorly defined corner or no corner in either propodus; dactylus with 1 or 2

setae on anterior margin. Pereopods 5–7 dactyli simple. Epimeron 3 posterior margin serrate. Uropod 3 rami about 2× peduncle, distally truncated, apical robust setae short; outer ramus 1-articulate. Telson emarginate, without robust setae on outer margins, with apical robust setae, apical robust setae long.

Species composition. *Linguimaera boeckii* (Haswell, 1879b); *L. bogombogo* Krapp-Schickel, 2003; *L. caesaris* Krapp-Schickel, 2003; *L. eugeniae* Schellenberg, 1931; *L. garitima* Krapp-Schickel, 2003; *L. hamigera* (Haswell, 1879b); *L. kellissa* Krapp-Schickel, 2003; *L. leo* Krapp-Schickel, 2003; *L. mannarensis* Sivaprakasam, 1970; *L. octodens* (Sivaprakasam, 1968); *L. pirloti* Krapp-Schickel, 2003; *L. schickelae* n.sp.; *L. thomsoni* (Miers, 1884); *L. tias* Krapp-Schickel, 2003.

Distribution. Indo-Pacific and Mediterranean.

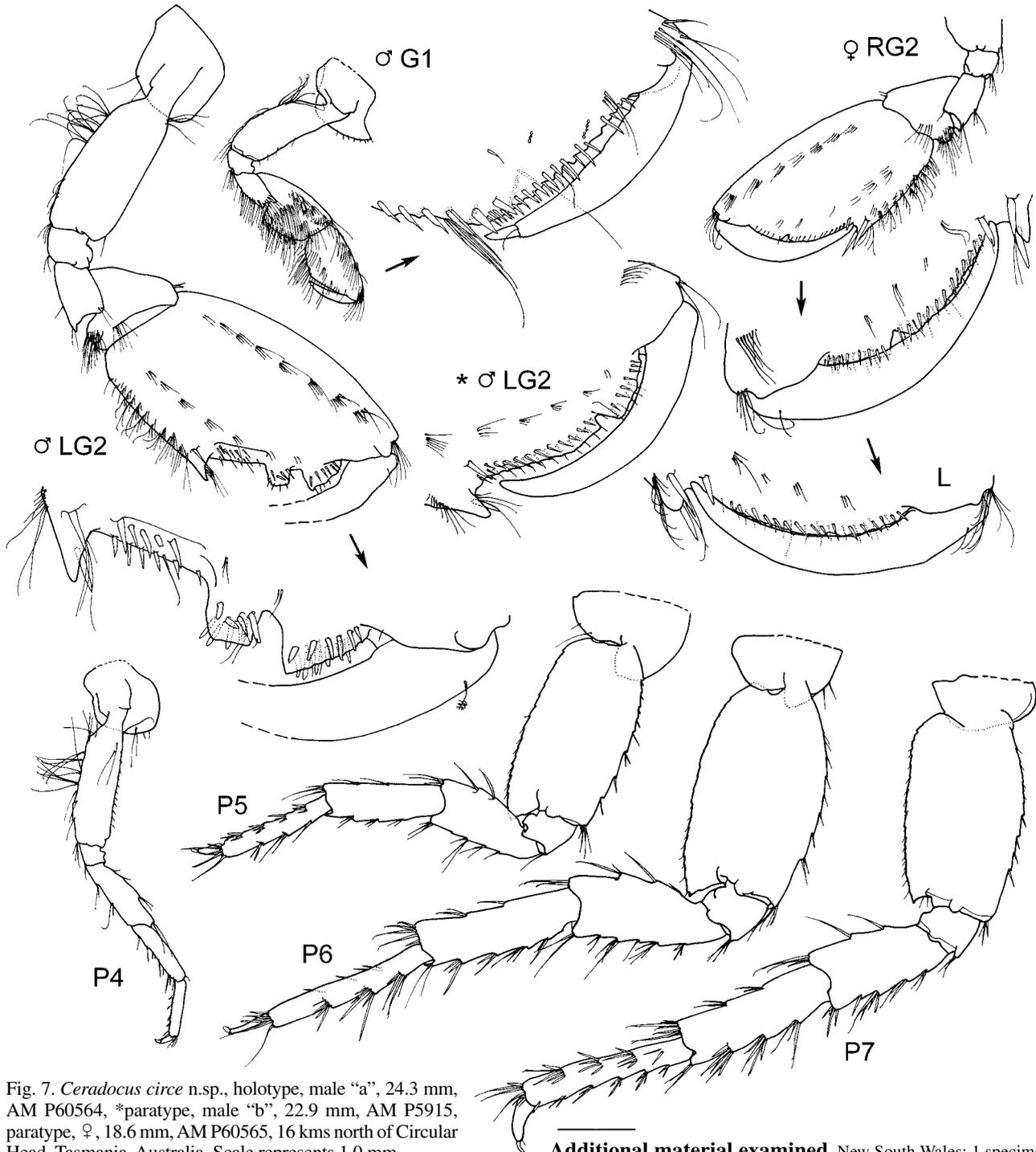


Fig. 7. *Ceradocus circe* n.sp., holotype, male "a", 24.3 mm, AM P60564, *paratype, male "b", 22.9 mm, AM P5915, paratype, ♀, 18.6 mm, AM P60565, 16 kms north of Circular Head, Tasmania, Australia. Scale represents 1.0 mm.

Additional material examined. New South Wales: 1 specimen, AM P60763; 1 ♀, 7.9 mm, AM P60947, type locality.

Type locality. Sow and Pigs Reef, Port Jackson, New South Wales (33°50.3'S 151°16.2'E), shelly sand, 5 m depth.

Description. Based on neotype male, AM P60619 and female, AM P60947.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner subquadrate. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 2 robust setae along posterior margin; flagellum with 20 articles; accessory flagellum with 4 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 longer than article 5; flagellum with 10 articles.

***Linguimaera boeckii* (Haswell)**

Figs. 8–10

- Megamoera boeckii* Haswell, 1879b: 336, pl. 21, fig. 6.
- ?*Maera boeckii*.—Della Valle, 1893: 732.
- Elasmopus boeckii*.—Stebbing, 1899: 426.—Stebbing, 1906: 445.—Stebbing, 1910a: 643.
- Maera boeckii*.—Barnard & Barnard, 1983: 623.
- Not *Elasmopus boeckii*.—K.H. Barnard, 1916: 199: pl. 27, figs 13–14.

Type material. Neotype: male, 7.5 mm, AM P60619, off Sow and Pigs Reef, Port Jackson, New South Wales, 33°50.3'S 151°16.2'E, shelly sand, 5 m, benthic grab, J.K. Lowry & A.R. Jones, 30 Sep. 1976, stn NSW-184.

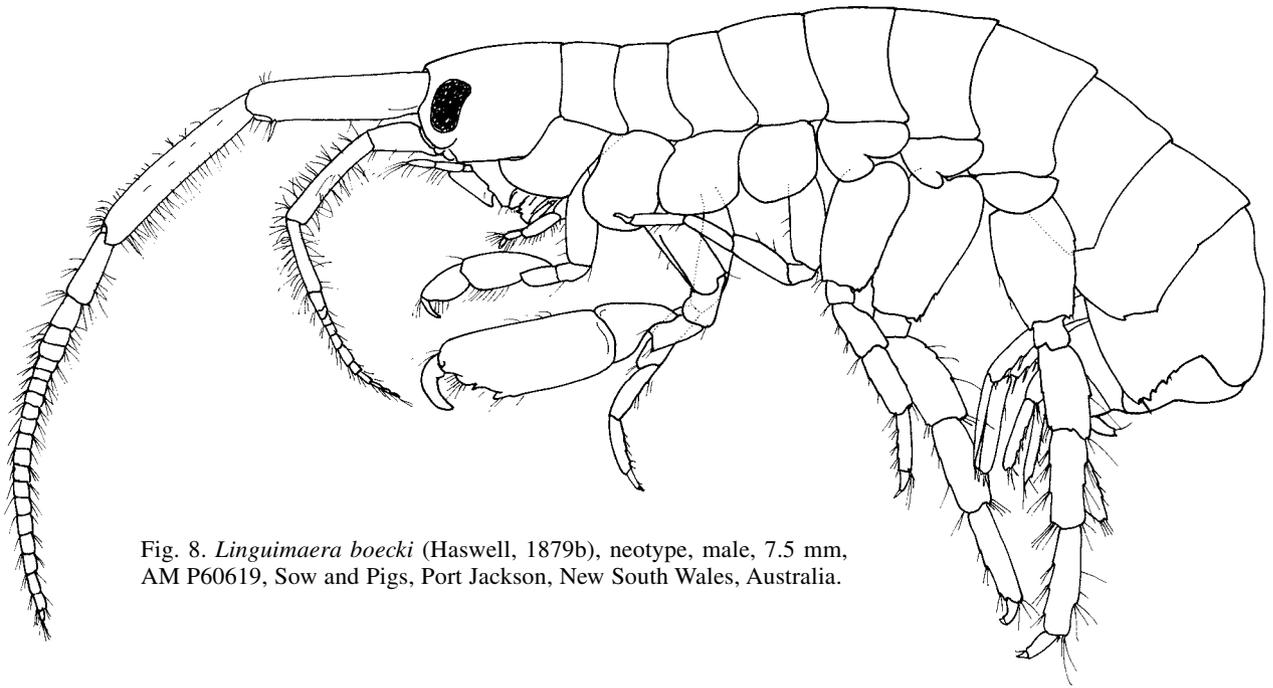


Fig. 8. *Linguimaera boeckii* (Haswell, 1879b), neotype, male, 7.5 mm, AM P60619, Sow and Pigs, Port Jackson, New South Wales, Australia.

Mandible palp article 3 rectilinear, setose on distomedial margin, longer than article 1; article 2 longer than article 3; article 1 not produced, shorter than article 2, about twice as long as broad. **Maxilla 1** inner plate with 3 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, straight, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; left and right gnathopods unequal in size, subchelate; coxa posteroventral corner notch absent; (larger) merus with sharp posteroventral spine; carpus compressed; propodus palm angle acute, straight, defined by posterodistal spine, with robust setae; dactylus apically blunt; (smaller) merus with sharp posteroventral spine; carpus long; propodus palm straight, without posteroventral spine. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin straight, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin with 1 to 2 large or small spines above spine defining posteroventral corner. *Epimeron 3* posterior margin minutely serrate, posteroventral corner with small acute spine. *Urosomites 1–3* dorsally smooth. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. **Telson** deeply emarginate, each lobe with 1 apical/subapical robust seta, apical conical extension reaching scarcely one third along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* carpus long; propodus without medial depression, setose, palm acute, straight or slightly concave, smooth, lined with

robust setae, defined by posterodistal robust setae, defined by posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral, shelley sand, 5 m depth.

Remarks. *Linguimaera boeckii* appears to be most similar to *L. hamigera*. They differ from other members of the genus in having rather short rami on uropod 3 and *L. boeckii* is the only species of *Linguimaera* with an emarginate telson.

Distribution. *New South Wales*: Port Jackson (Haswell, 1879b; AM).

Australian geographic areas. Southeastern Australia.

Linguimaera hamigera (Haswell)

Figs. 11–13

Moera hamigera Haswell, 1879b: 333, pl. 21, fig. 1.

Maera hamigera.—Stebbing, 1888: 1790.—Della Valle, 1893: 723.—Stebbing 1906: 437.—Barnard & Barnard, 1983: 623.

Not *Maera hamigera*.—Walker 1909: 335, pl. 43, fig. 5, pl. 3.—Stebbing 1910a: 600.—K.H. Barnard, 1916: 196, pl. 27, figs 11–12.—Chilton, 1921b: 73.—J.L. Barnard, 1965: 507, fig. 16 (in part).—Karaman & Ruffo, 1971: 152, figs 21–23.—Ledoyer, 1982: 523, figs 196–197.—Karaman, 1982: 312, fig. 211.—Lyons & Myers, 1993: 587, fig. 10.—Myers, 1997: 109.

Type material. Syntype, ♂, AM P3477, Port Jackson, New South Wales, Australia, [approx. 33°51'S 151°16'E], [AM Old Collection].

Type locality. Port Jackson, New South Wales, Australia, (33°51'S 151°16'E).

Additional material examined. *New South Wales*: 1 specimen, AM P57328, 100 m north west of Split Solitary Island, 30°14.0'S 153°10.8'E, sponge, 15–17 m, R.T. Springthorpe, 7 March 1992, stn NSW-683. 1 specimen, AM P57329, 50 m west of Split Solitary Island, 30°14.0'S 153°10.8'E, rocks with brown & red algae (coralline & *Halimeda* sp.), 15–17 m, P. Hutchings & C. Rose, 7 March 1992, stn NSW-692. 1 specimen, AM P56712, Coffs Harbour Jetty, Coffs Harbour, 30°18.4'S 153°08.5'E, arborescent sponge on jetty pilings, 7 m, S.J. Keable, 9 March 1992, stn NSW-735. 1 specimen, AM P25467, 5.5–6.5

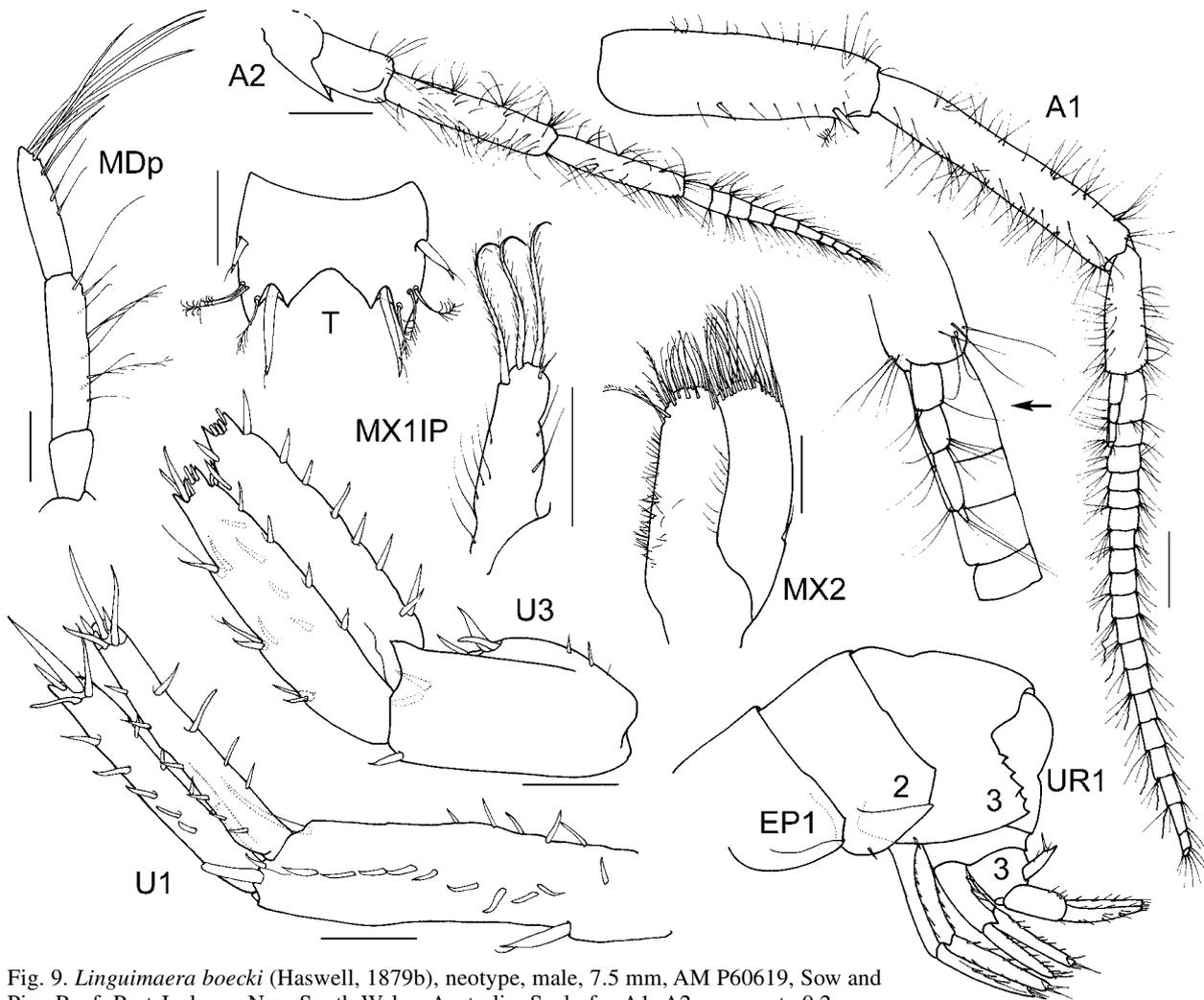


Fig. 9. *Linguimaera boeckii* (Haswell, 1879b), neotype, male, 7.5 mm, AM P60619, Sow and Pigs Reef, Port Jackson, New South Wales, Australia. Scale for A1, A2 represents 0.2 mm, remainder represent 0.1 mm

km off Wattamolla, 34°10'S 151°11'E, mud, 99–108 m, E.R. Waite on HMCS *Thetis*, 22 March 1898, stn 57. 1♂, AM P60608, Munganno Point, Twofold Bay, 37°06.2'S 149°55.7'E, subtidal rock platform, wharf pile, S.J. Keable & E.A. Bamber, 12 December 1984, stn M2.3. 1♀, AM P60609, same locality. Tasmania: 1 specimen, E6546, eastern slope of Bass Strait, [approx. 39°00'S 148°40'E], FIS *Endeavour*, 1909–1914. 1 specimen, AM P25468, same locality.

Description. Based on syntype, ♂, AM P3477, ♂, AM P60608, and female, AM P60609.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner subquadrate. *Antenna 1* longer than antenna 2; peduncular article 1 slightly longer than or subequal in length to article 2, with 1 robust seta on posterior distal margin; flagellum with 26 articles; accessory flagellum with 4 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 slightly longer than article 5; flagellum with 9 articles. *Mandible* palp article 3 rectilinear, setose along straight medial margin, longer than article 1; article 2 longer than article 3; article 1 not produced, shorter than article 2, about as long as broad. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, slightly convex,

defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; left and right gnathopods unequal in size; coxa posteroventral corner notch absent; (larger) merus with subquadrate posteroventral corner; carpus compressed; propodus palm angle nearly transverse, concave, defined by posterodistal spine, with robust setae; dactylus apically blunt; (smaller) merus with sharp posteroventral spine; carpus short, or long; propodus palm straight, without posteroventral spine. *Pereopod 5* basis posterior margin slightly convex, posteroventral corner broadly rounded. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded, or not produced ventrally; basis posterior margin straight, posteroventral corner broadly rounded. *Pereopod 7* basis posterior margin slightly convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded.

Pleon. *Epimeron 1* posteroventral corner broadly rounded. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth or minutely serrate, posteroventral corner with strongly produced acute spine. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta.

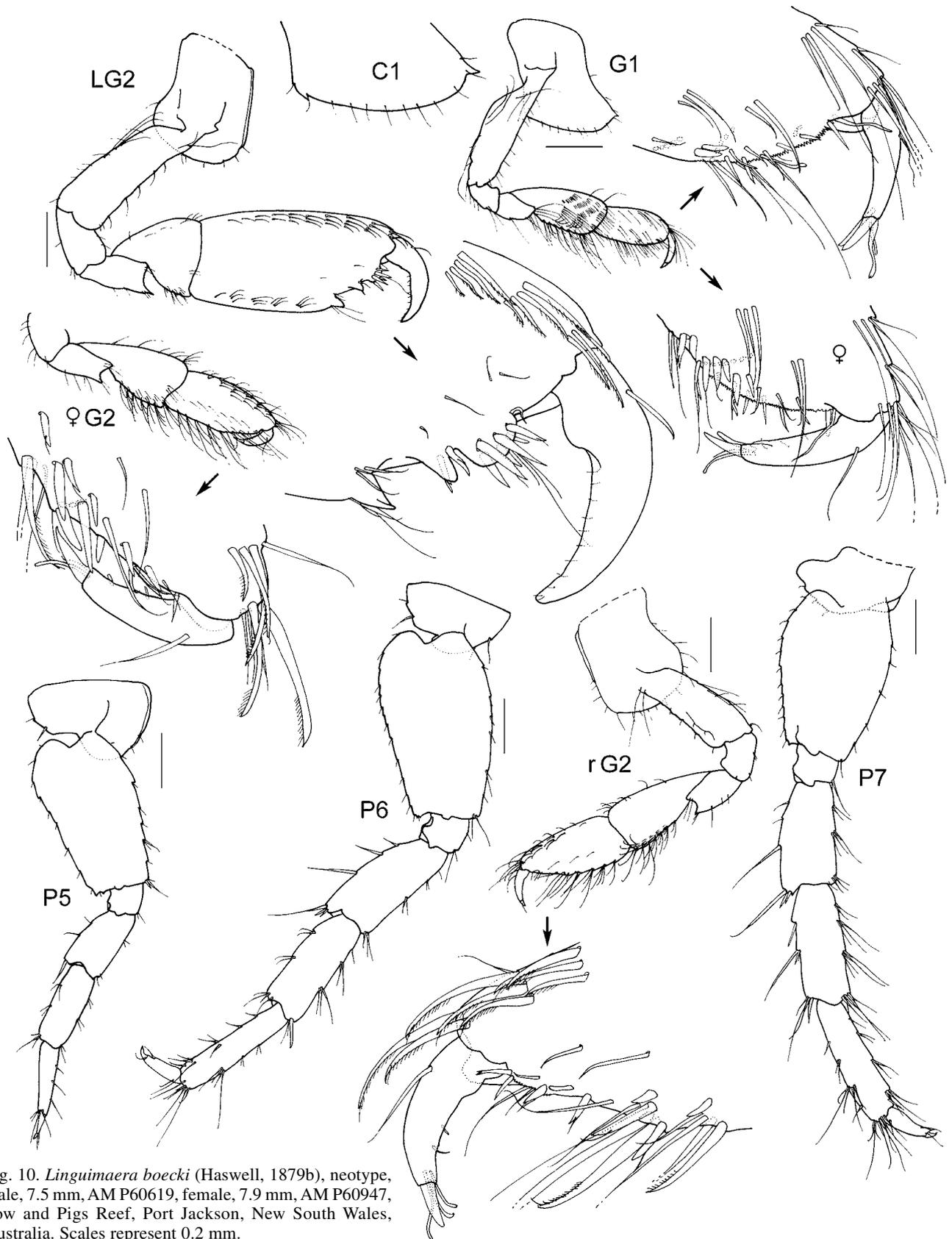


Fig. 10. *Linguimaera boeckii* (Haswell, 1879b), neotype, male, 7.5 mm, AM P60619, female, 7.9 mm, AM P60947, Sow and Pigs Reef, Port Jackson, New South Wales, Australia. Scales represent 0.2 mm.

Female (sexually dimorphic characters). *Gnathopod 2* merus with sharp posteroventral spine; carpus short, or long; propodus without medial depression, palm acute, straight, sculptured, with sparse robust setae, defined by posterodistal

robust setae, defined by posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; subtidal rock platforms, 0 to 7 m depth.

Remarks. Since Haswell (1879b) described *Linguimaera hamigera* (as *Maera hamigera*) from Port Jackson, only Stebbing (1910a) has reported it from Australian waters—several specimens of about 5 mm length from off Wattamolla, which he unfortunately did not illustrate. However, it has been reported by Walker (1909) from the Red Sea, K.H. Barnard (1916) from Southern Africa, J.L. Barnard (1965) from Micronesia, Karaman & Ruffo (1971) from the Mediterranean Sea, Myers (1997) from Western Samoa and Ledoyer (1982) from Madagascar. Ledoyer (1982) completely illustrated and described his material. Based on this species concept he suggested that the *Maera* sp. A of J.L. Barnard, 1970, is also *L. hamigera*, extending its distribution to Hawaii and that *L. mannaensis* (Sivaprakasam, 1970) is a synonym of *L. hamigera*, thus extending its distribution into India, a proposition not accepted by Krapp-Schickel (2003).

All reports subsequent to Stebbing (1910a) must be considered as erroneous. As currently known, *A. hamigera* is confined to southeastern Australia. Illustrated species in the literature (Walker, 1909; K.H. Barnard, 1916; J.L. Barnard, 1965; Karaman & Ruffo, 1971; Ledoyer, 1982) refer to one or more unnamed species. For instance Karaman & Ruffo (1971) illustrated a cleft telson without setae on the inner margins, whereas Ledoyer's (1982) specimens have well-developed robust setae along the inner margins.

Linguimaera hamigera is most similar to *L. boeckii*, but easily distinguished from that species by its cleft telson.

Distribution. *New South Wales:* Coffs Harbour (AM); Port

Jackson (Haswell, 1879b); Munganno Point, Twofold Bay (AM). *Tasmania:* eastern slope of Bass Strait.

Australian geographic areas. Southeastern Australia.

Linguimaera schickelae n.sp.

Figs. 14–16

Type material. HOLOTYPE, ♂, 15.4 mm, AM P60620, Little Bay, New South Wales, Australia, [approx. 33°59'S 151°15'E], under stones between tide marks, G.P. Whitley, 18 April 1924. 2 PARATYPES, AM P60618; 1 PARATYPE ♀, 14.1 mm, AM P60948; Clovelly Pool, Clovelly, New South Wales, Australia, [approx. 33°55'S 151°16'E], from under stones, 7 m, P.C. Terrill, 12 June 1979.

Type locality. Little Bay, New South Wales, Australia, [approx. 33°59'S 151°15'E].

Additional material examined. New South Wales: 1 specimen, AM P62902, northern cove of Boondelbah Island, Port Stephens, 32°42.28'S 152°13.47'E, airlift under small boulders, 19.6 m, R.T. Springthorpe, P.B. Berents & A. Murray, 28 May 1998, stn NSW-1401.

Description. Based on holotype male, AM P60620 and paratype female, AM P60948.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner subquadrate, with acute/subacute spine. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2 or shorter than article 2, with 1 robust seta on posterior margin (distal); flagellum with about 26 articles; accessory flagellum with 7 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 longer than article 5; flagellum with about 14 articles. *Mandible* palp article 3 rectilinear, setose

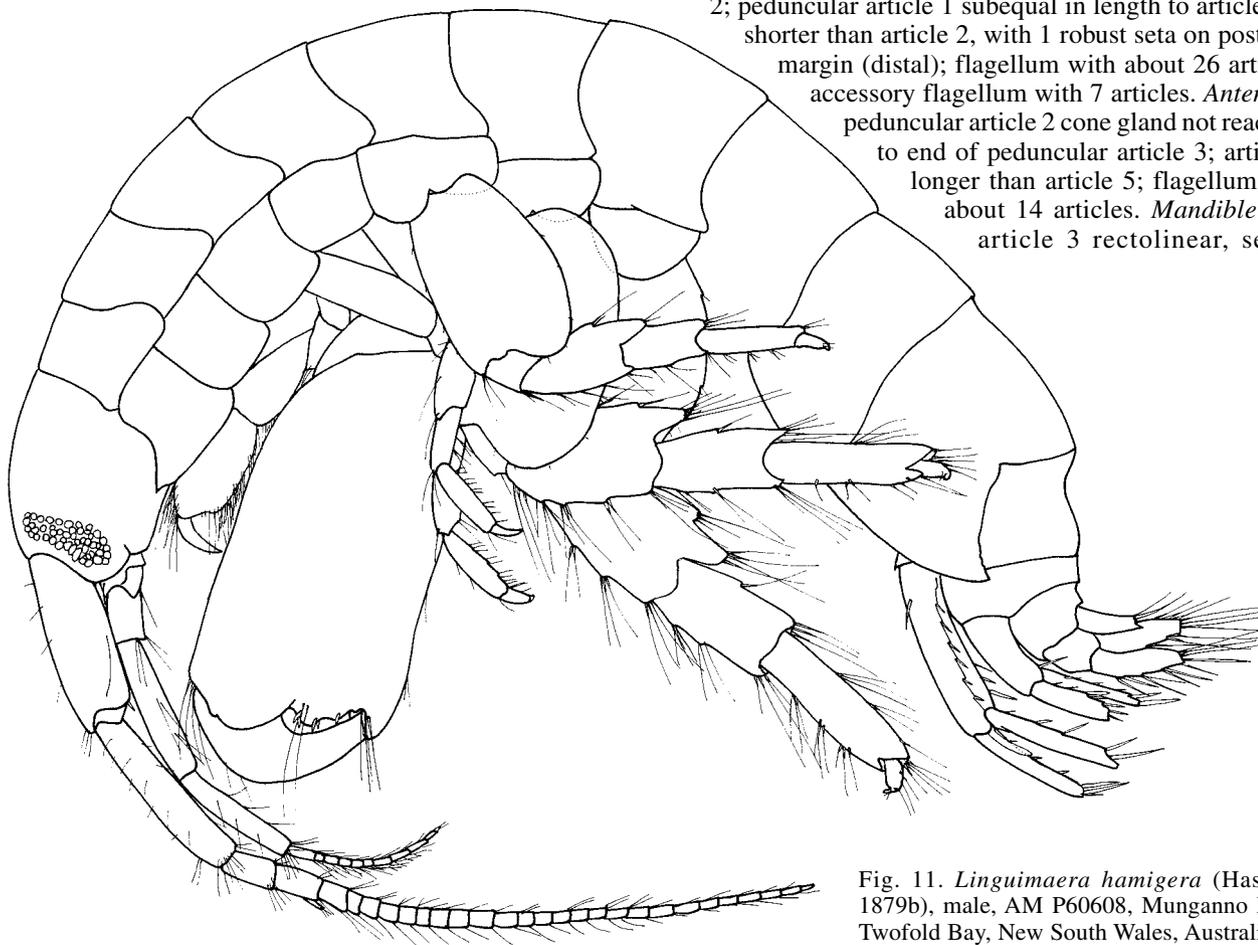


Fig. 11. *Linguimaera hamigera* (Haswell, 1879b), male, AM P60608, Munganno Point, Twofold Bay, New South Wales, Australia.

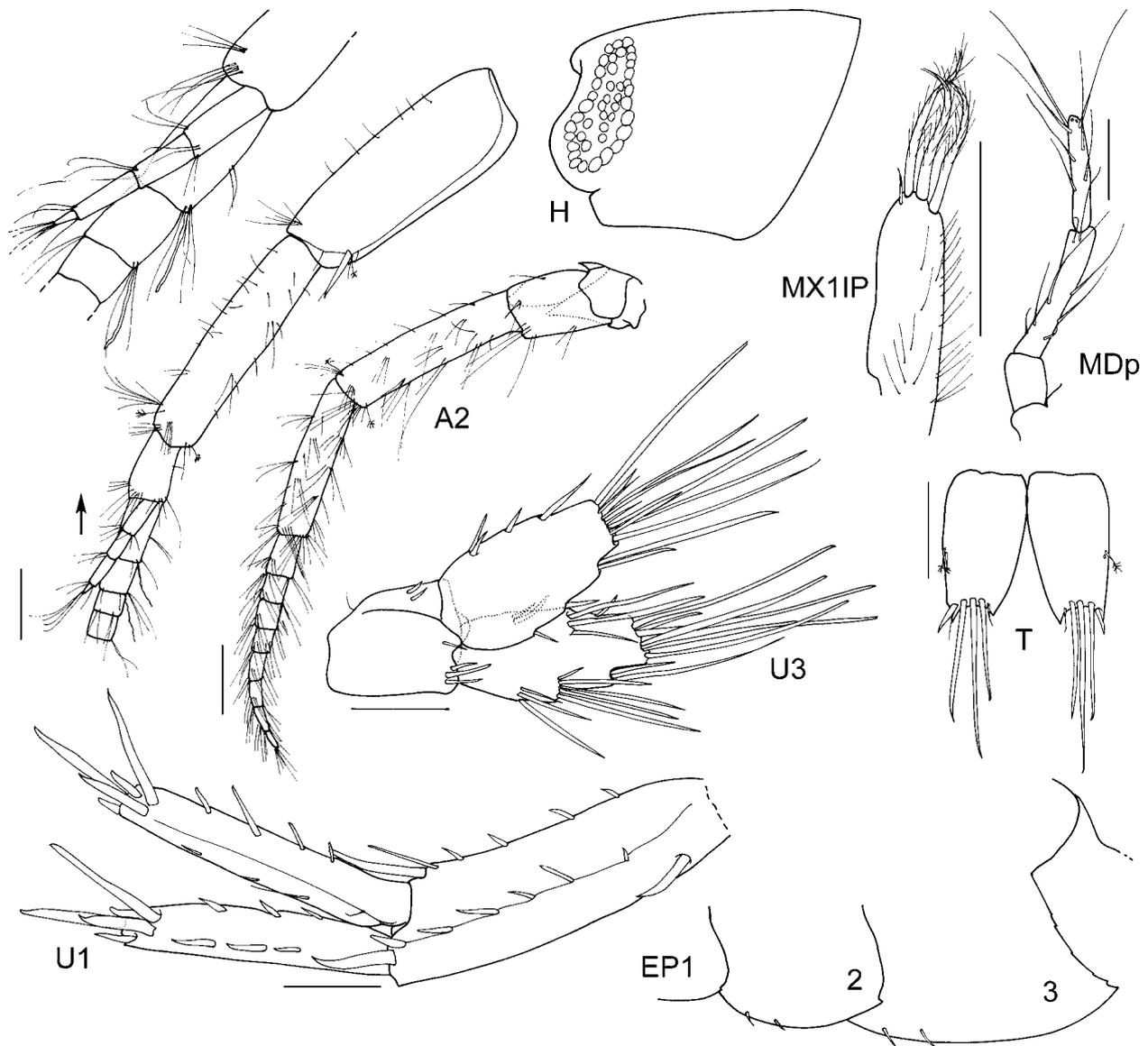


Fig. 12. *Linguimaera hamigera* (Haswell, 1879b), male, AM P60608, Munganno Point, Twofold Bay, New South Wales, Australia. Scales for MDp, MX1IP represent 0.1 mm, remainder represent 0.2 mm.

along straight medial margin, longer than article 1; article 2 longer than article 3; article 1 not produced, shorter than article 2, about as long as broad. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch present; merus with sharp posterodistal spine; carpus about 3× as long as broad; palm acute, straight, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; left and right gnathopods unequal in size; coxa posteroventral corner notch absent; (larger) subchelate; merus with sharp posteroventral spine; carpus short; palm angle acute, concave, defined by posterodistal spine, with robust setae; dactylus apically acute; (smaller) subchelate; merus with sharp posteroventral spine; carpus short; palm slightly concave, defined by posteroventral spine. *Pereopod 5* basis posterior margin slightly concave or straight, posteroventral corner with acute or subacute process. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded;

basis posterior margin slightly concave, basis posteroventral corner narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin with 1 to 2 large or small spines above spine defining posteroventral corner. *Epimeron 3* posterior margin serrate, posteroventral corner with small acute spine. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle; 1-articulate. *Telson* with robust setae on inner margins (about 4 per lobe), each lobe with 2 apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* propodus palm straight, sculptured, lined with robust setae.

Etymology. Named for Traudl Krapp-Schickel, who has contributed greatly to the revision of the *Maera* complex.

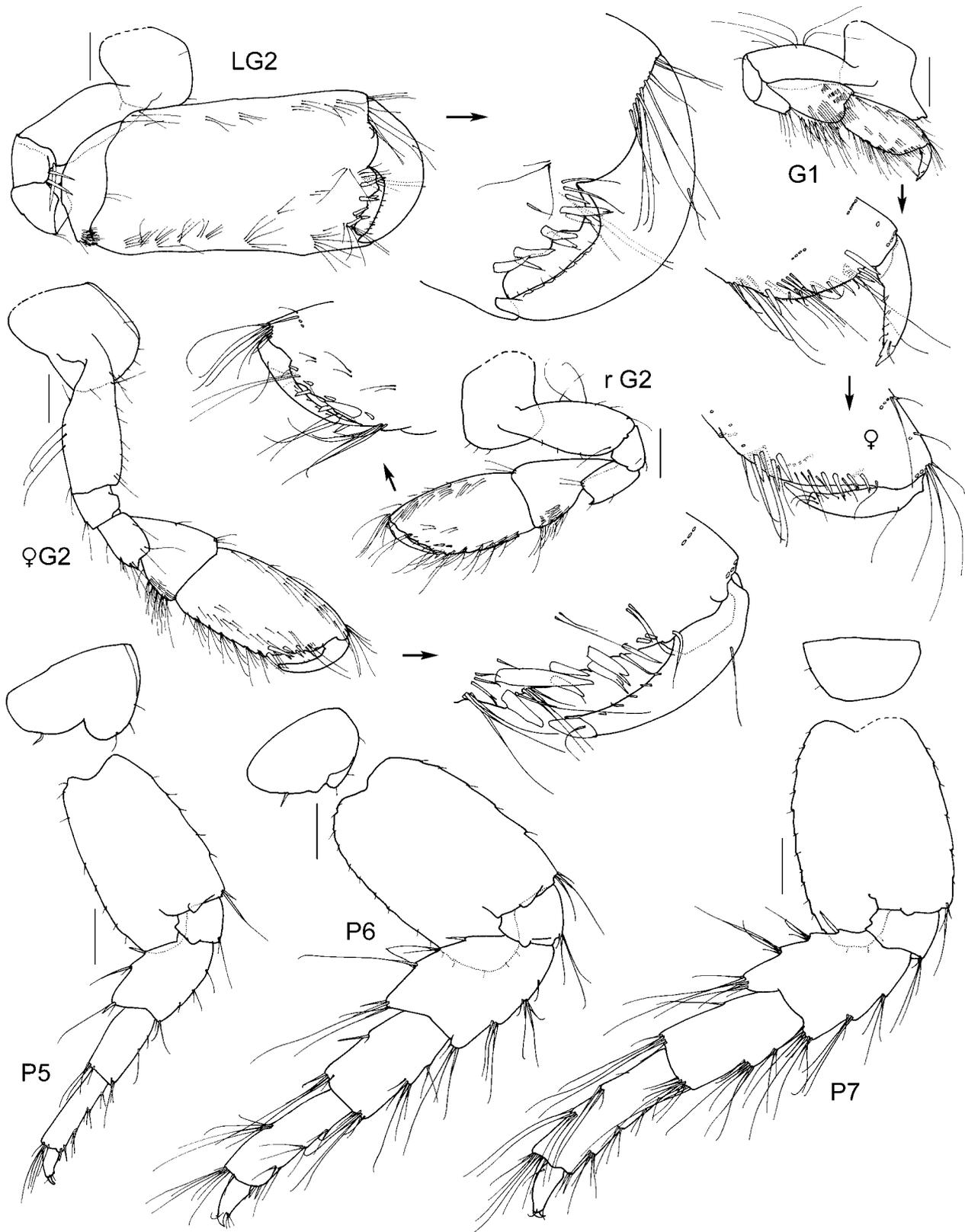


Fig. 13. *Linguimaera hamigera* (Haswell, 1879b), male, AM P60608, female, AM P60609 Munganno Point, Twofold Bay, New South Wales, Australia. Scales represent 0.2 mm.

Fig. 14. *Linguimaera schickelae* n.sp., holotype, male, 15.4 mm, AM P60620, Little Bay, New South Wales, Australia.

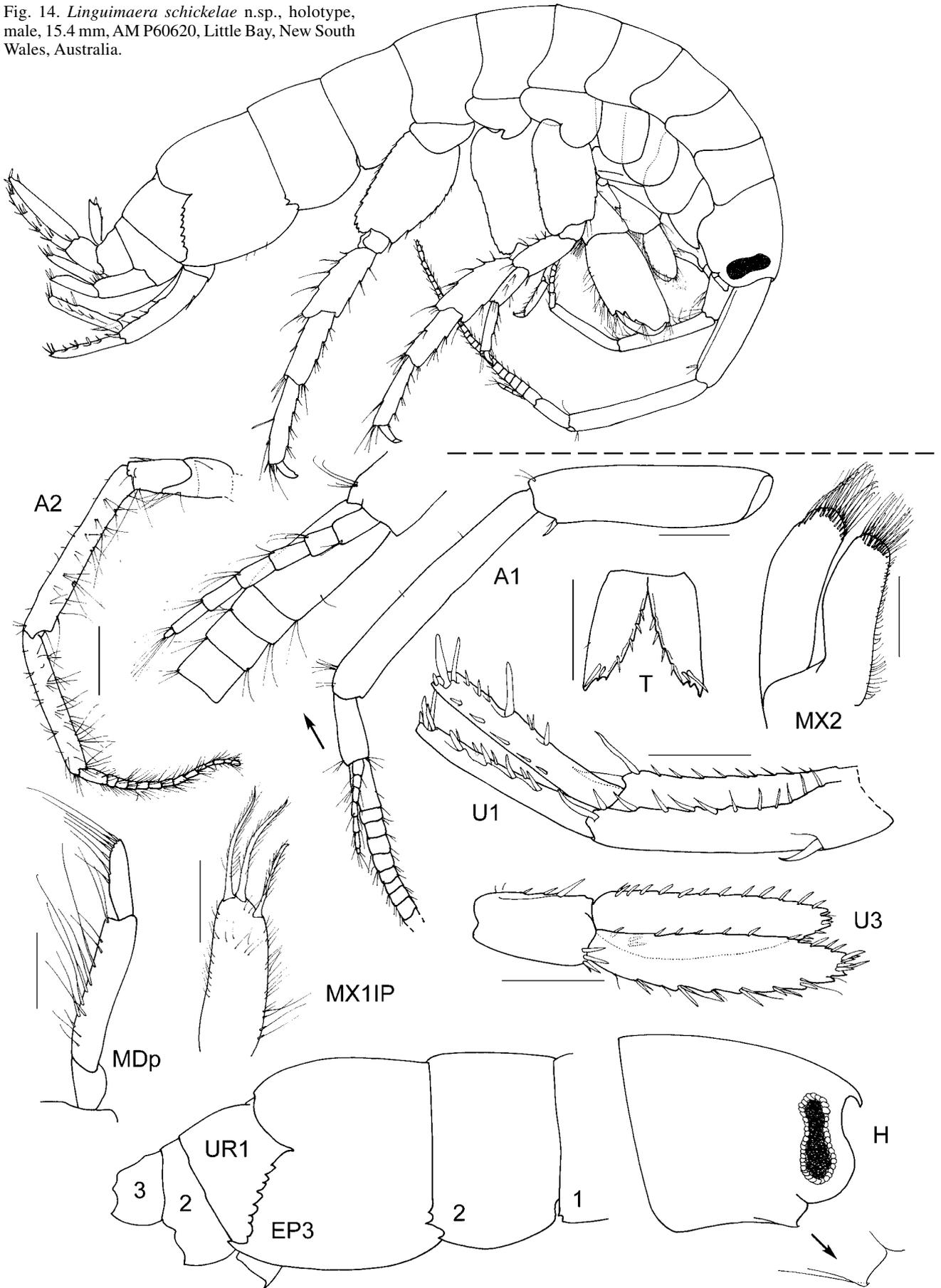


Fig. 15. *Linguimaera schickelae* n.sp., holotype, male, 15.4 mm, AM P60620, Little Bay, New South Wales, Australia; scales for MDp, MX1IP, MX2 represent 0.2 mm, remainder represent 0.5 mm.

Linguimaera thomsoni (Miers, 1884)

Megamaera thomsoni Miers, 1884: 318, pl. 34, fig. B.
Maera mastersii Haswell, 1885: 105 (in part).

Type material. Apparently lost.

Type locality. Torres Strait.

Description. Based on Miers, 1884: 318, pl. 34, fig. B.

Head. Lateral cephalic lobes broad, rounded. *Antenna 1* longer than antenna 2; peduncular article 1 shorter than article 2, with 1 robust seta on posterior margin; flagellum with 30+ articles. Article 4 subequal to article 5; *antenna 2* flagellum with 10+ articles.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded; merus with sharp posterodistal spine; carpus about 3× as long as broad; palm extremely acute, concave, without posterodistal corner. *Gnathopod 2* subchelate; merus with sharp posteroventral spine; carpus long; propodus without medial depression, setose, palm acute, convex, sculptured, with sparse robust setae, defined by posteroventral spine; apically acute/subacute. *Pereopod 5–7* basis posterior margin concave or straight, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin with 1 to 2 large or small spines above spine defining posteroventral corner. *Epimeron 3* posterior margin serrate, posteroventral corner with small acute spine. *Uropod 3* rami distally acute/subacute; inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* with robust setae on inner margins, each lobe with 1 apical/subapical robust seta, apical conical extension absent.

Habitat. Marine; 7 to 16 m depth.

Remarks. *Linguimaera thomsoni* is a poorly described species. Krapp-Schickel (2003) was able to separate *L. thomsoni* from *L. pirloti* by the first coxa that is anteroventrally rounded (acute in *L. pirloti*) and the palm of gnathopod 2 that has a large excavation in *L. thomsoni* (two smaller excavations in *L. pirloti*).

Distribution. *Queensland:* Albany Island, Prince of Wales Channel, Thursday Island, Torres Strait (Miers, 1884).

Australian geographic areas. Northeastern Australia.

Mallacoota J.L. Barnard, 1972*Mallacoota chandaniae* n.sp.

Figs. 17–19

Type material. HOLOTYPE, ♂ “a”, 11 mm, AM P59021; 1 PARATYPE, ♂ “b”, 9.1 mm, AM P62996, at end of sugar loading jetty 5 km long, Lucinda, Queensland, Australia, [approx. 18°31'S 146°19'E], pylon scrapings, 7 m, Frank Hoedt, CRIMP survey, August 1999, stn A138. 5 PARATYPES, ♂ “c”, 9.5 mm, ♀ “a” 10.8 mm, 3 ♀♀, AM P59020, Evans Landing, Weipa, Queensland, Australia, [approx. 12°35'S 141°36'E], pylon scrapings, 0.5 m, Frank Hoedt, CRIMP survey, October 1999, stn A220.

Type locality. At end of sugar loading jetty 5 km long, Lucinda, Queensland, Australia, [approx. 18°31'S 146°19'E], pylon scrapings.

Description. Based on holotype male, AM P59021, paratype male, AM P62996 and paratype female, AM P59020.

Head. Lateral cephalic lobes broad, truncated, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 4 or more robust setae along posterior margin; flagellum

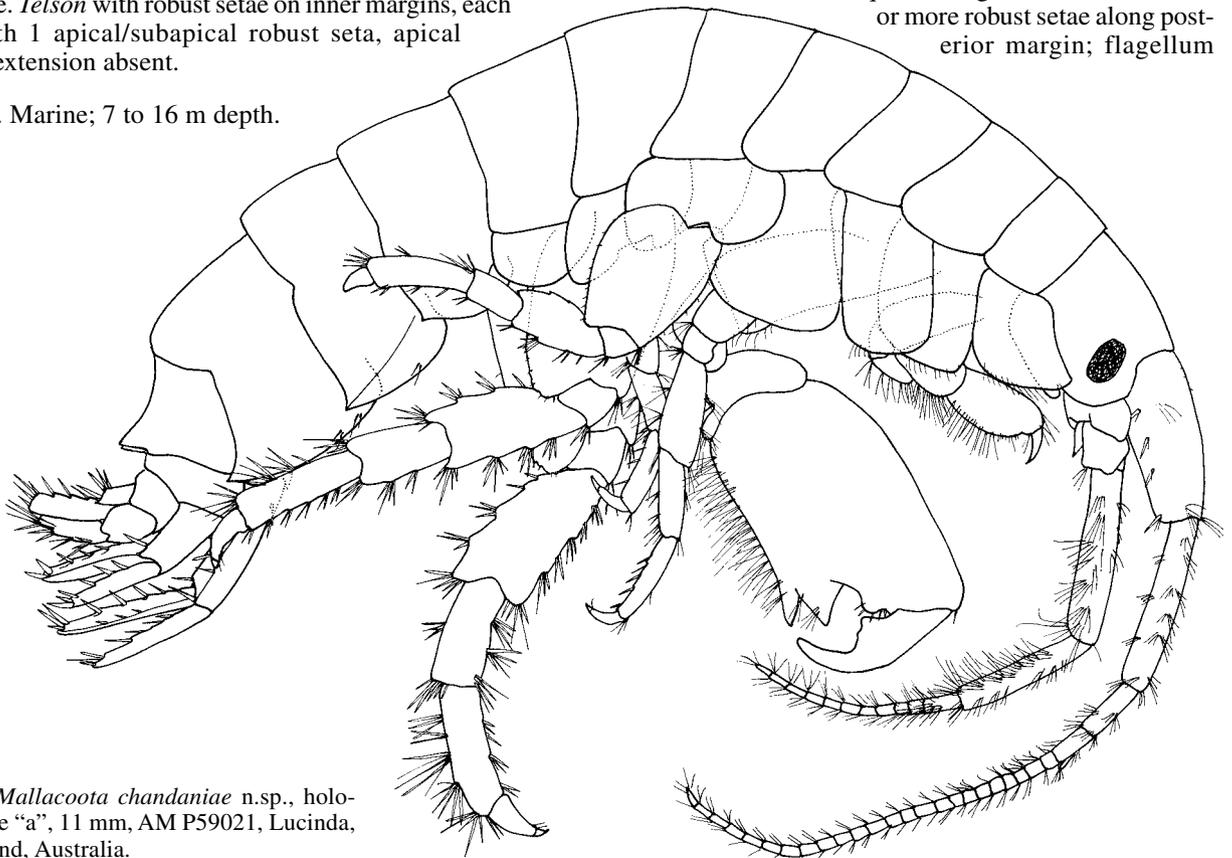


Fig. 17. *Mallacoota chandaniae* n.sp., holotype, male “a”, 11 mm, AM P59021, Lucinda, Queensland, Australia.

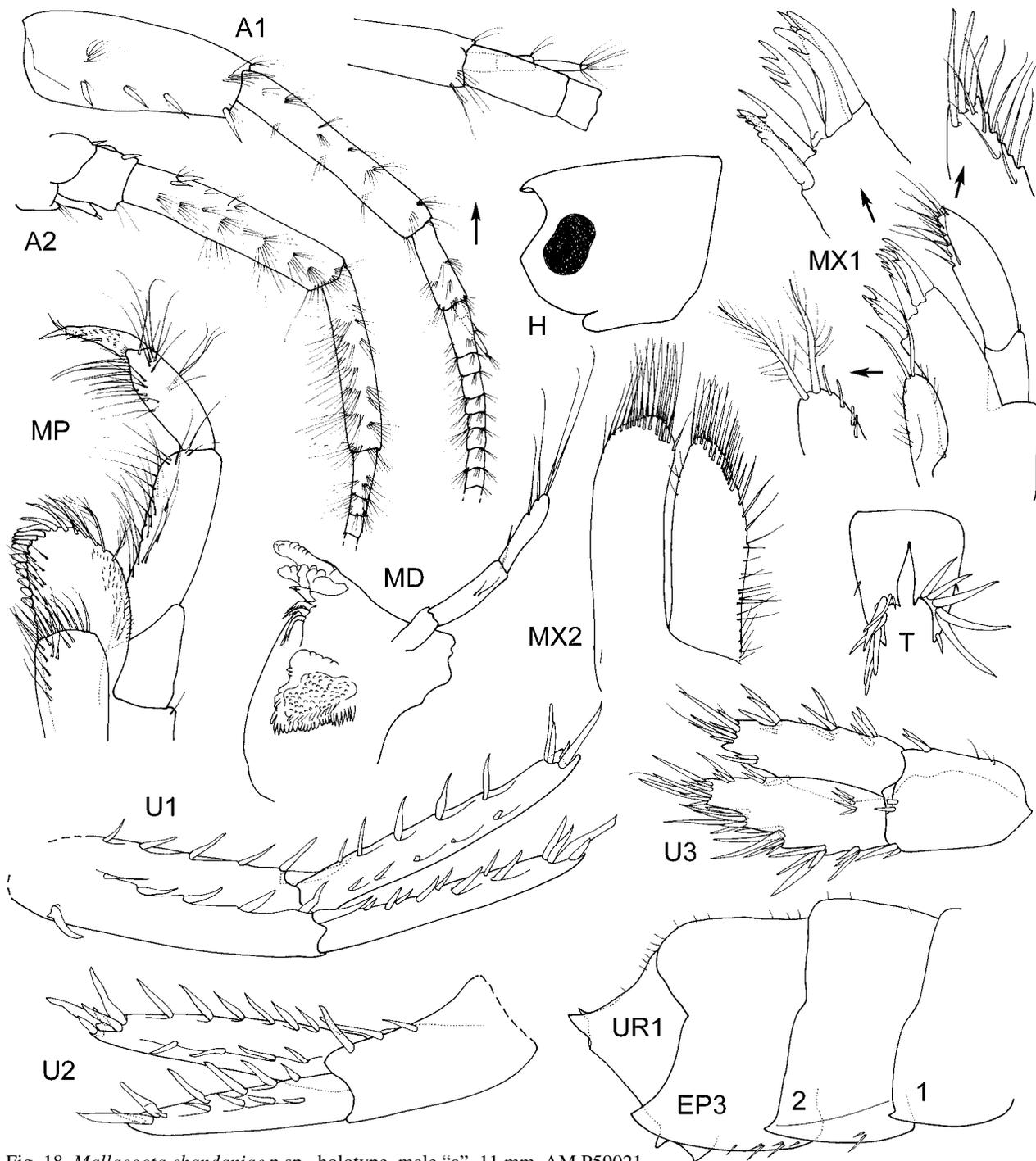


Fig. 18. *Mallacoota chandaniae* n.sp., holotype, male "a", 11 mm, AM P59021, Lucinda, Queensland, Australia.

with about 26 articles; accessory flagellum with 4 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 longer than article 5; flagellum with about 11 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 subequal to article 3; article 1 not produced, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with 2 terminal setae.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, slightly rounded, posteroventral corner notch absent; merus without posterodistal spine; palm acute, convex, without posterodistal corner, defined by posterodistal robust setae.

Gnathopod 2 sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with subquadrate posteroventral corner; carpus compressed; propodus without medial depression, with strong setal bunch, palm slightly acute, sinusoidal, sculptured, with group of anterodistal robust setae, without posterodistal robust setae, defined by posteroventral spine; dactylus apically blunt. *Pereopod 5* basis posterior margin straight, posteroventral corner broadly rounded. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin straight, posteroventral corner broadly rounded. *Pereopod 7* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate.

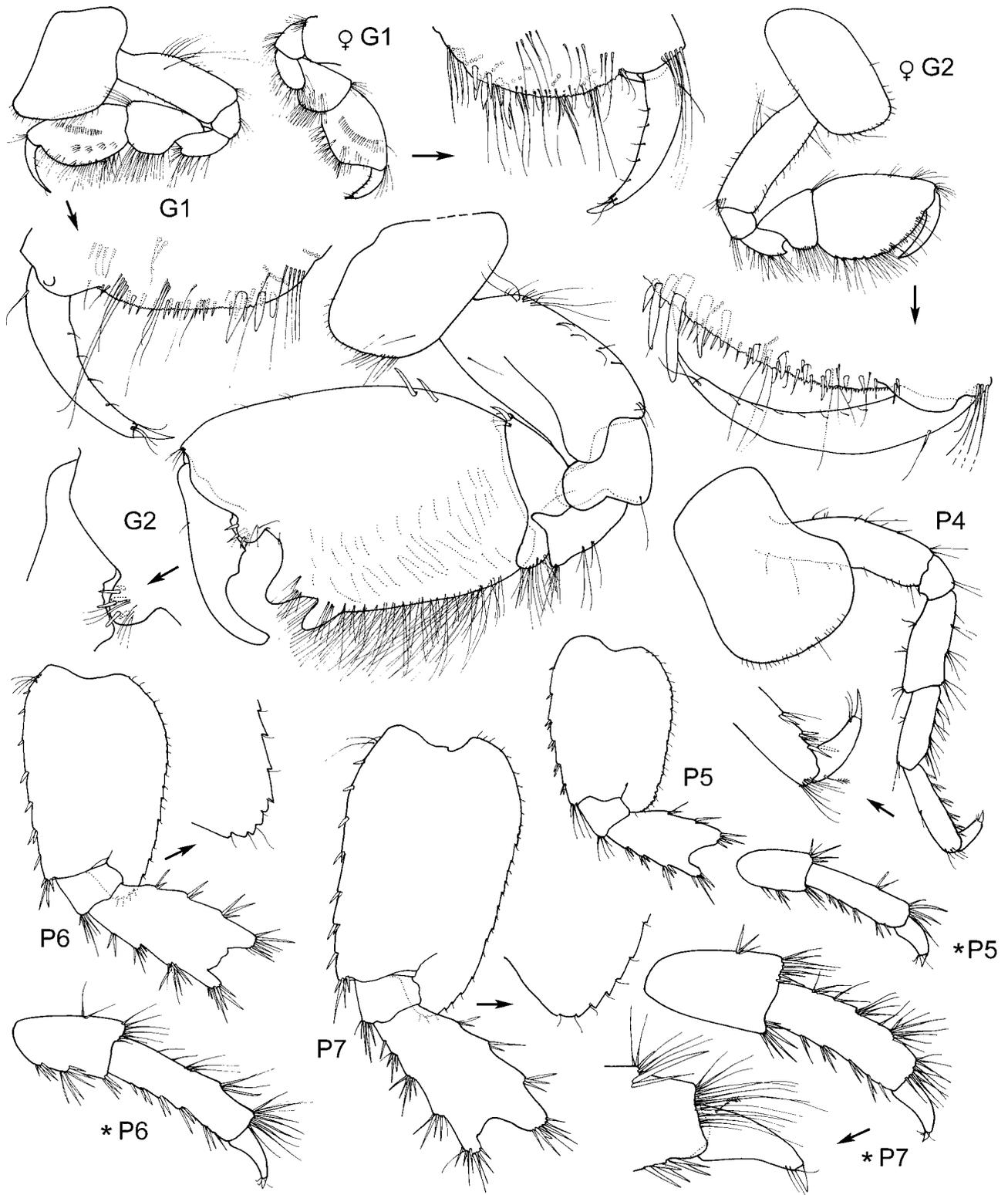


Fig. 19. *Mallacoota chandaniae* n.sp., holotype, male "a", 11 mm, AM P59021, * paratype, male "b", 9.1 mm, AM P62996, Lucinda, Queensland, Australia; paratype, female, "a" 10.8 mm, AM P59020, Weipa, Queensland, Australia.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1-2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate. *Urosomite 1* dorsally bicarinate. *Uropod 3* rami distally truncated; inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe

with 3 or more apical/subapical robust setae, apical conical extension reaching at least halfway along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* merus with sharp posteroventral spine; carpus short; setose, convex, smooth, with sparse robust setae, defined by posterodistal robust setae, without posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; living on encrusted wharf pilings.

Etymology. Named for Chandani Appadoo, in recognition of her work on the melitid amphipods of the Indian Ocean.

Remarks. *Mallacoota chandaniae* is a very distinctive species. For instance no Australian species has a strictly subquadrate epimeron 3 whereas seven species outside of Australia have this characteristic. Only two species within this group, *M. schellenbergi* Ledoyer, 1984 and the *M. subcarinata* of Myers, 1985 have a deeply cleft telson similar to *M. chandaniae*, but neither of these has the almost transverse palm of the male gnathopod 2.

Distribution. *Queensland*: Weipa; Lucinda (both AM).

Australian geographic areas. Northeastern Australia.

***Mallacoota euroka* n.sp.**

Figs. 20–22

Mallacoota subcarinata.—J.L. Barnard, 1972a: 247, fig. 144.—
Barnard & Barnard, 1983: 632 (in part).

Type material. HOLOTYPE, ♂, 10.1 mm, AM P60561; 1 PARATYPE, ♀, AM P60562; 8 PARATYPES, AM P27034, between Troubridge Light and Cape Jervis, South Australia, [approx. 35°20'S 137°40'E], sponges on mud bottom, 20 m, D. Blake & H. Larsen, 14 March 1978.

Type locality. Between Troubridge Light and Cape Jervis, South Australia, [approx. 35°20'S 137°40'E], sponge on mud bottom, 20 m.

Description. Based on holotype male, AM P60561 and paratype female, AM P60562.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 4 or more robust setae along posterior margin; flagellum with about 29 articles; accessory flagellum with 3–4 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 longer than article 5, or article 4 subequal to article 5; flagellum with about 10 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 shorter than article 3; article 1 not produced, subequal to article 2, about twice as long as broad. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch present; merus without posterodistal spine; propodus palm acute, convex, defined by posterodistal corner, without posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch present; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, with strong setal bunch, palm acute,

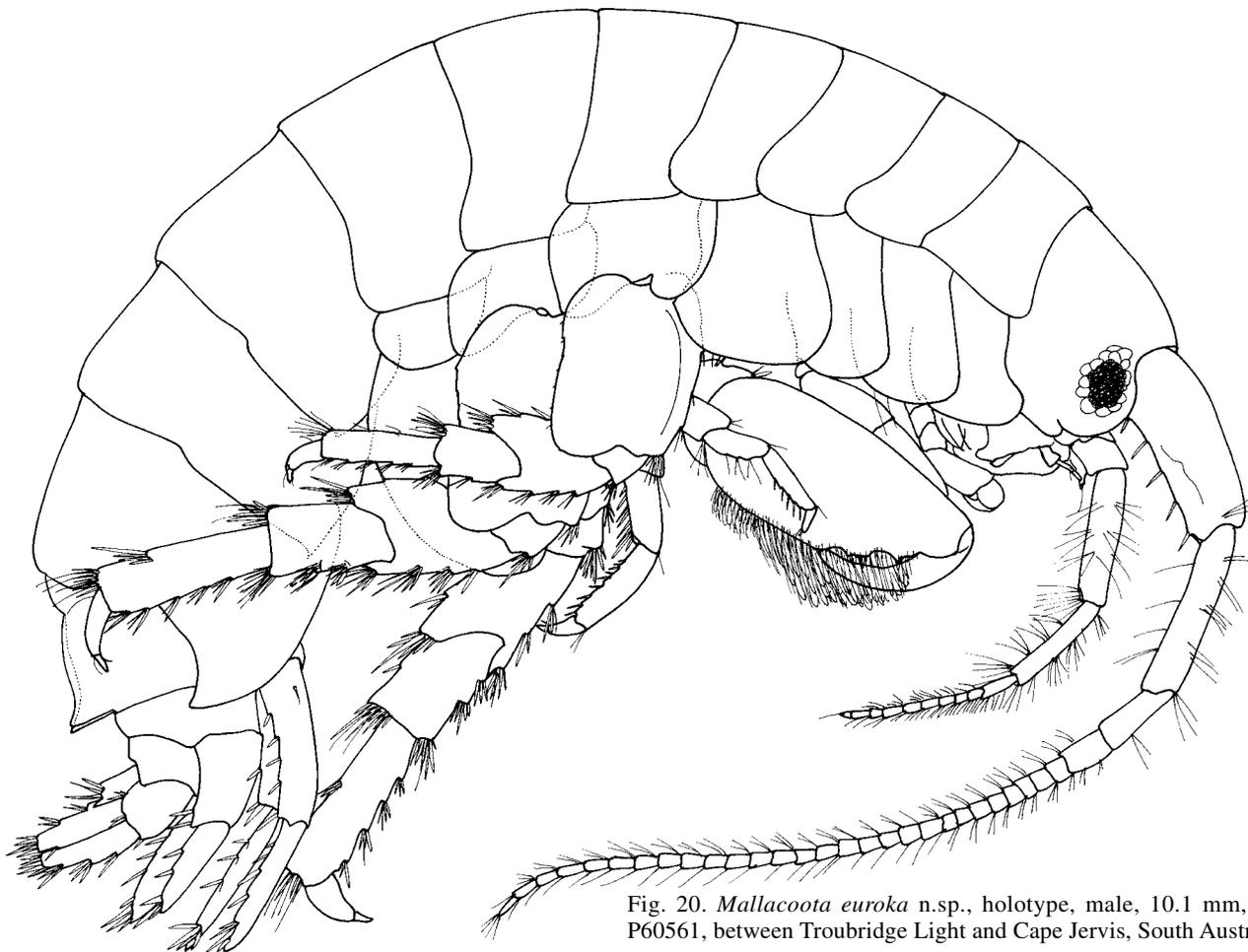


Fig. 20. *Mallacoota euroka* n.sp., holotype, male, 10.1 mm, AM P60561, between Troubridge Light and Cape Jervis, South Australia.

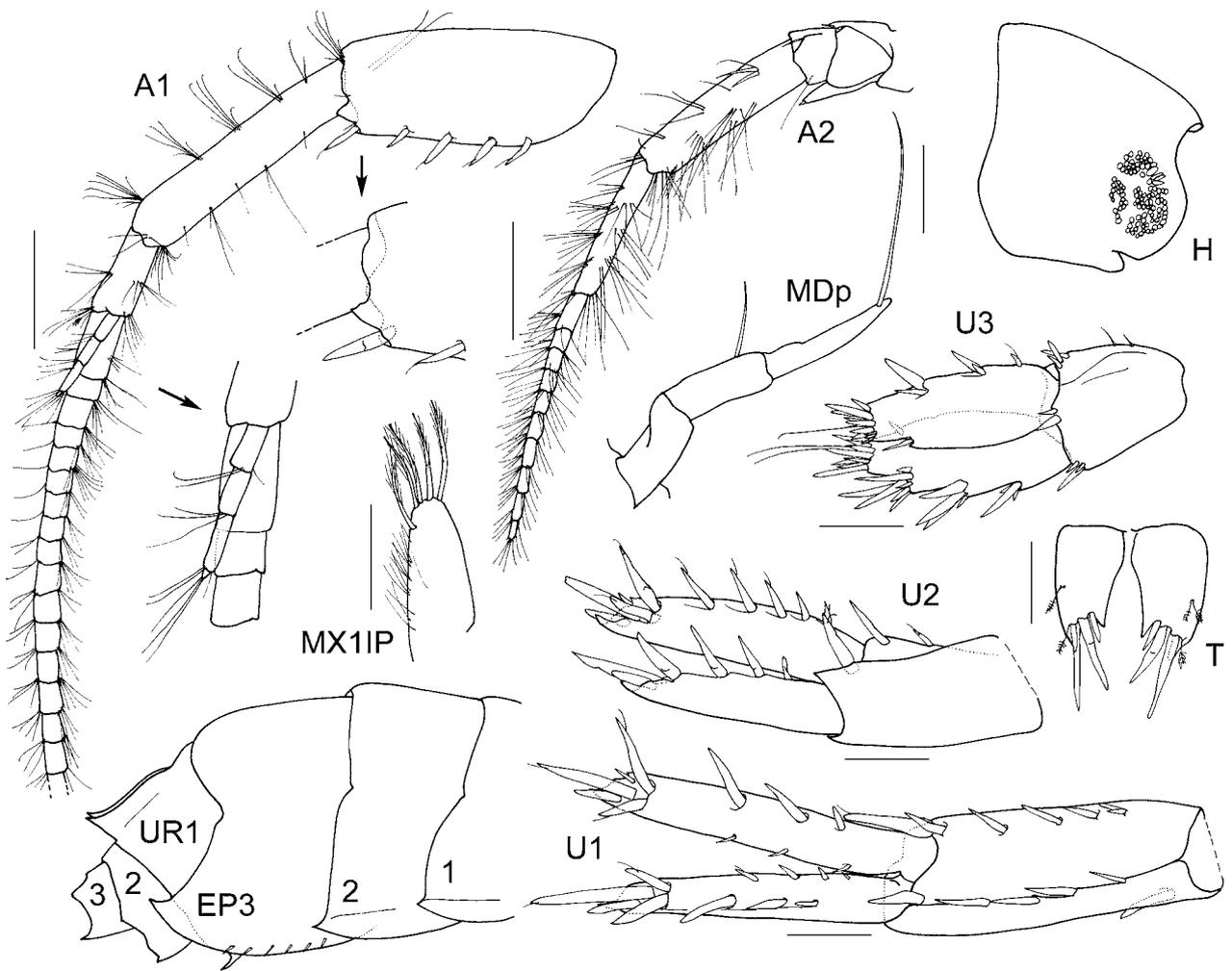


Fig. 21. *Mallacoota euroka* n.sp., holotype, male, 10.1 mm, AM P60561, between Troubridge Light and Cape Jervis, South Australia. Scales for MDp, MX1IP represent 0.1 mm, scales for A1, A2 represent 0.5 mm, remainder represent 0.2 mm.

straight, sculptured, with sparse robust setae and with group of anterodistal robust setae, without posterodistal robust setae, defined by posteroventral spine; dactylus apically blunt. *Pereopod 5* basis posterior margin concave, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin concave, posteroventral corner narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with strongly produced acute spine. *Urosomite 1* dorsally bicarinate. *Urosomite 2* posterior margin smooth. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* carpus short; setose, smooth, without robust setae, defined

by posterodistal robust setae, defined by posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; sponges on mud bottom, 20 m depth.

Etymology. Named for the schooner *Euroka*, built in Brisbane Waters and sunk off the Sandon River mouth, south of Clarence Head, New South Wales, in 1875.

Remarks. This species was originally described as *Mallacoota subcarinata* phenotype A by J.L. Barnard (1972a). It has a large posteroventral spine on epimeron 3, like *M. subcarinata* and *M. diemenensis*. *Mallacoota euroka* differs from *M. diemenensis* in having no dorsal spines on pleonites 1 to 3. It differs from *M. subcarinata* in the number of robust setae on the first peduncular article of antenna 1 (five in *M. euroka* and one to three in *M. subcarinata*), in having posteroventral notches on coxae 1 and 2 and in having a convex posterior margin on the basis of pereopod 7.

Distribution. *Victoria*: Port Phillip (J.L. Barnard, 1972a). *South Australia*: Cape Jervis (AM).

Australian geographic areas. Southern Australia.

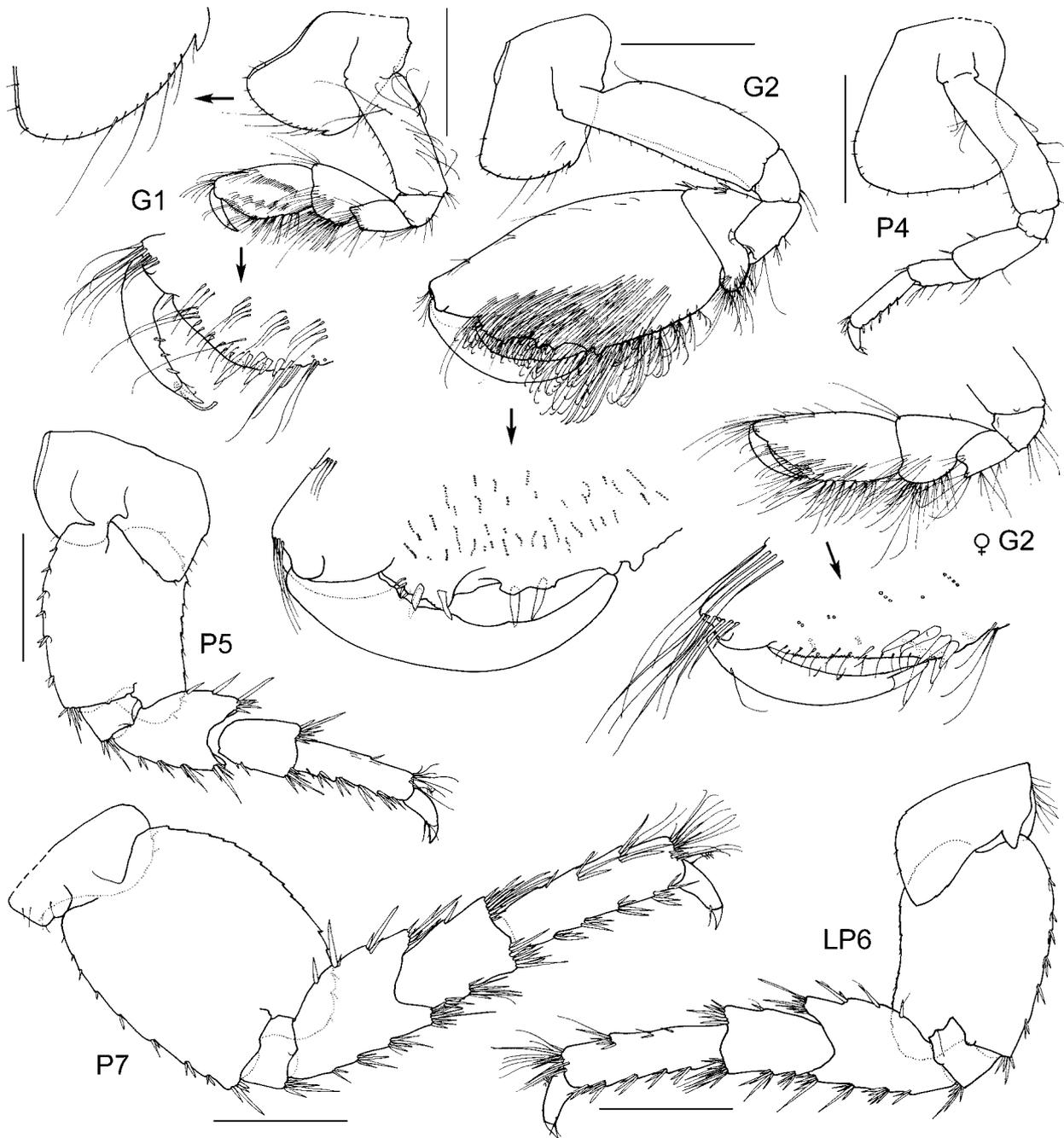


Fig. 22. *Mallacoota euroka* n.sp., holotype, male, 10.1 mm, AM P60561, paratype female, AM P60562, between Troubridge Light and Cape Jervis, South Australia. Scale represents 0.5 mm.

***Mallacoota kameruka* n.sp.**

Figs. 23–25

Elasmopus subcarinatus.—Stebbing, 1888: 1019, pl. 98 (plates labelled as *E. persetosus*).

Mallacoota subcarinata.—J.L. Barnard, 1972a: 247, fig. 145.—Barnard & Barnard, 1983: 632 (in part).—Hutchings *et al.*, 1989: 362.

Type material. HOLOTYPE, ♂ “a”, 10.0 mm, AM P60491; 1 PARATYPE, ♀, 10.0 mm, AM P60492; 10 PARATYPES, 5 ♂♂, 5 ♀♀, AM P60493; 1 PARATYPE, ♂ “b”, AM P60494, northeast of Marys Rock, Cook Island, New South Wales, Australia, 28°11.42'S 153°34.79'E, orange bryozoan, 19 m, R.T. Springthorpe, 8 June 1993, stn NSW-816.

Additional material examined. New South Wales: 41 ♂♂ (including juveniles), 80 ♀♀ (incl. juveniles), AM P54972, type locality.

13 specimens, AM P57672, 100 m north west of Julian Rocks, Byron Bay, 28°36.8'S 153°37.8'E, red algae *Delisea pulchra*, 16 m, S.J. Keable, 4 March 1992, stn NSW-648. 1 specimen, AM P56677, hand collected at low tide northern shore under Fred Hansen Bridge, Boambee Creek, Sawtell, 30°20.4'S 153°05.5'E, exposed mud flat, Australian Museum party, 8 March 1992, stn NSW-717. 4 specimens, AM P5724, Port Stephens, [approx. 32°42'S 152°06'E], dredged, A. Musgrave, 30 August 1920. 1 specimen, AM P47047, west side of Box Head, Broken Bay, 33°33'S 151°21'E, coralline algae in low intertidal zone exposed to the south, A. Murray, R.T. Springthorpe & H.E. Stoddart, 11 April 1981, stn NSW-2. 2 ♂♂, 2 ♀♀, AM P60495, Port Jackson, [approx. 33°51'S 151°16'E]. 15 specimens, G926, Jervis Bay, [approx. 35°03'S 150°44'E], T. Whitelegge. 1 ♂, AM P52785, Moe's Rock, South of Jervis Bay, 35°09'S 150°45'E, foliose bryozoan, 18 m, R.T. Springthorpe & J.K. Lowry, 29 June 1981, stn NSW-55. 3 ♀♀, AM P52784, southern end of Lighthouse Reef, Ulladulla, New South Wales, 35°22.14'S 150°29.31'E, bryozoan ?*Orthoscuticella* sp., 16 m, P.B. Berents, K.B. Attwood, 30

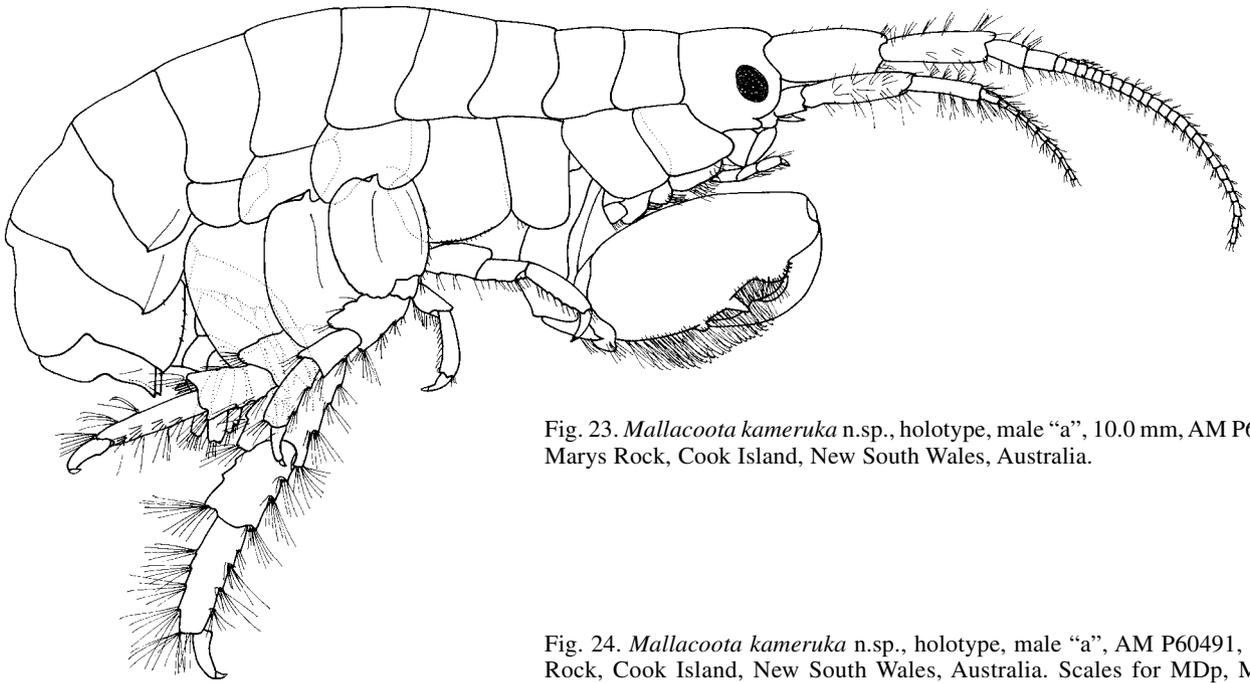
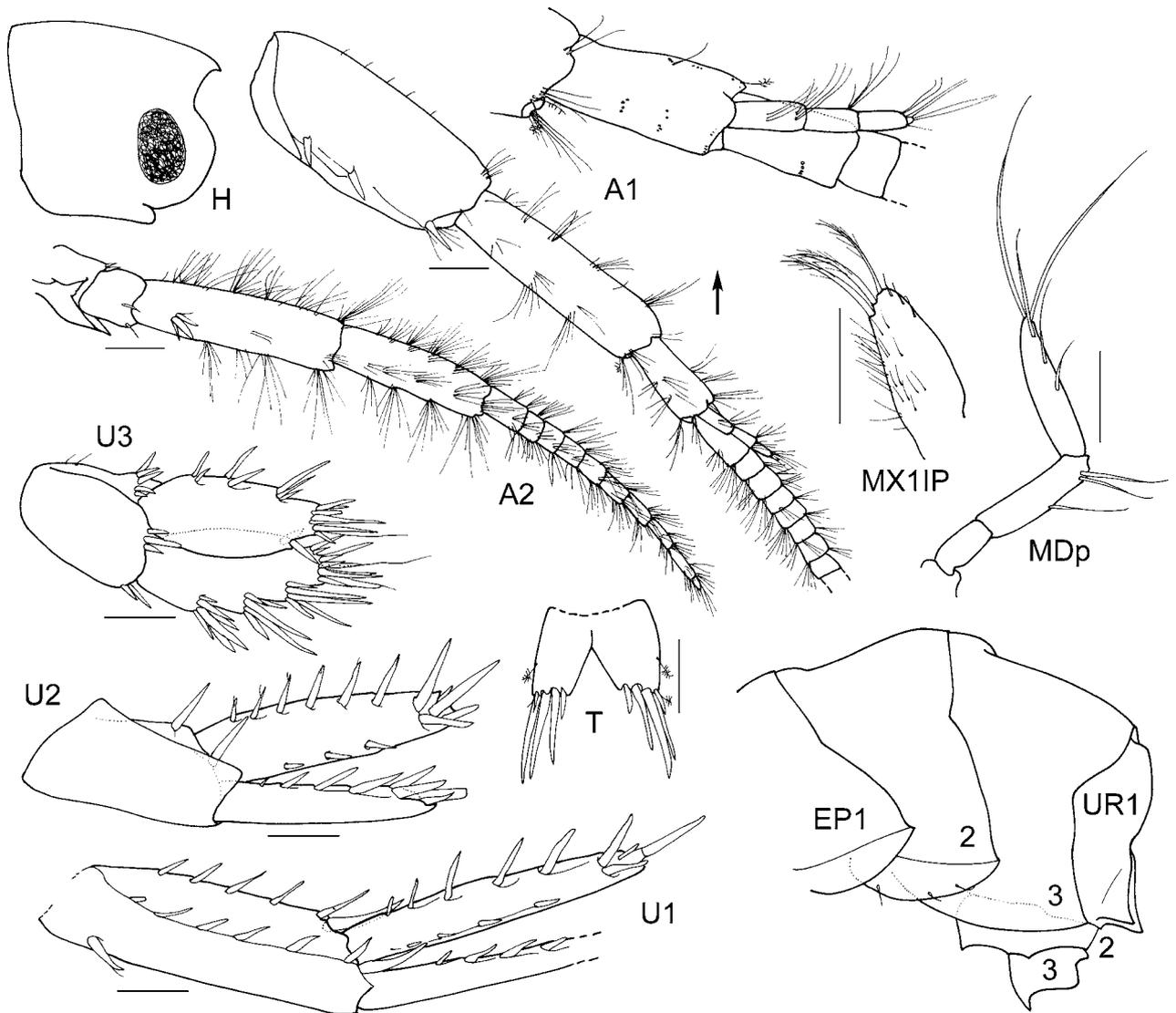


Fig. 23. *Mallacoota kameruka* n.sp., holotype, male "a", 10.0 mm, AM P60491, Marys Rock, Cook Island, New South Wales, Australia.

Fig. 24. *Mallacoota kameruka* n.sp., holotype, male "a", AM P60491, Marys Rock, Cook Island, New South Wales, Australia. Scales for MDp, MX11P represent 0.1 mm, remainder represent 0.2 mm.



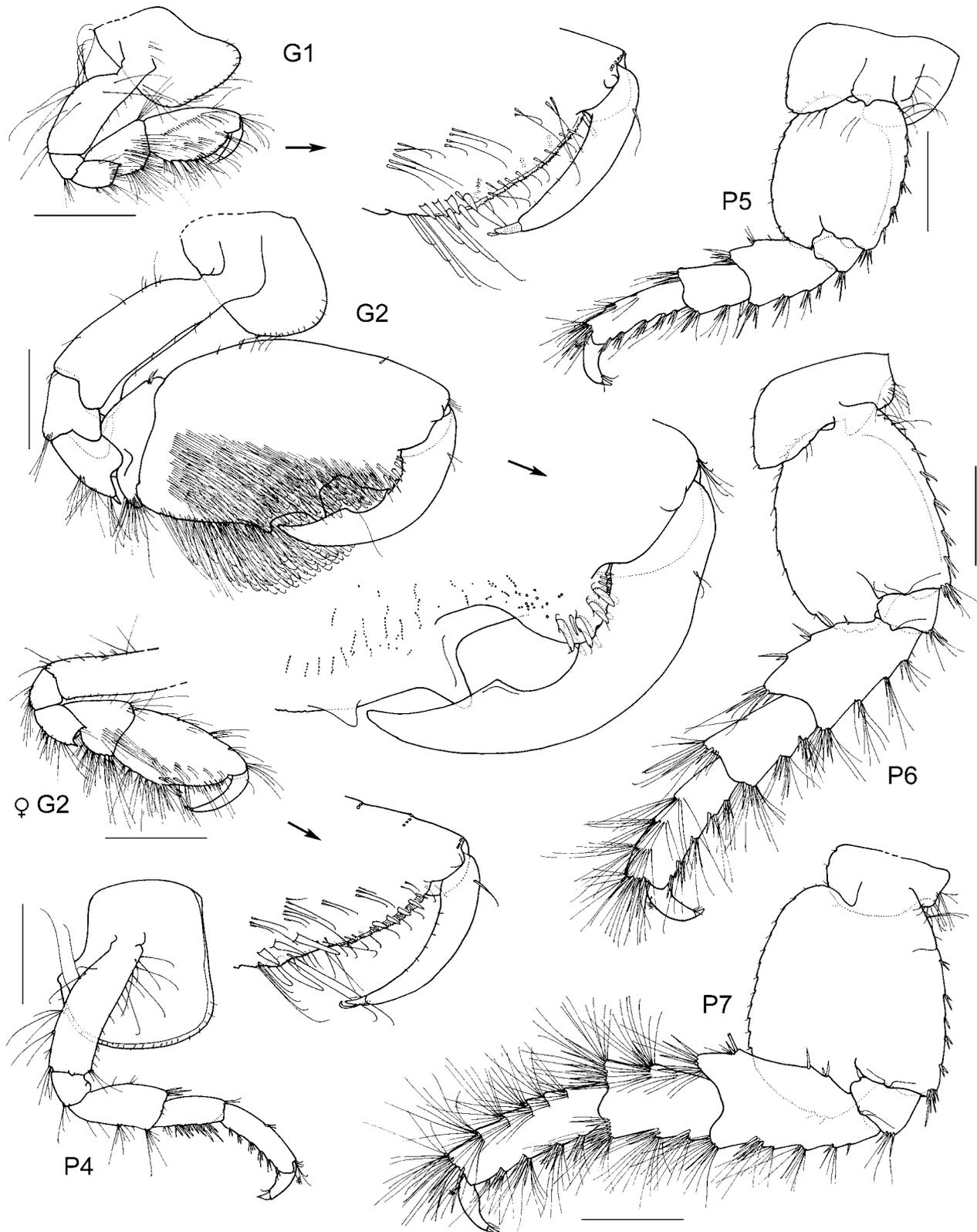


Fig. 25. *Mallacoota kameruka* n.sp., holotype, male "a", AM P60491, paratype female, 10.0 mm, AM P60492, Marys Rock, Cook Island, New South Wales, Australia. Scales represent 0.5 mm.

April 1997, stn NSW-1267. 1♂, AM P47054, Merimbula Wharf, Merimbula, 36°53.92'S 149°55.64'E, mixed red and brown algae, 8 m, K.B. Attwood, 18 May 1995, NSW-1103. 7 specimens, AM P63381, Murrumbulga Point, Twofold Bay, New South Wales, 37°04.7'S 149°53.1'E, subtidal rock platform, S.J Keable, A. Paul, L. Walker, 29 March 1985, stn Q8/9. Queensland: 2♀♀, AM P3493, Port Denison,

[approx. 20°03'S 148°15'E], [AM Old Collection]. 1♀, P 47055, Boat Rock, North Stradbroke Island, 27°25.1'S 153°33.28'E, bryozoans, hydrozoans & brown algae, 28 m, R.T. Springthorpe, 3 June 1993, stn QLD-853. Victoria: 1♂, AM P3494, Griffiths Point, [approx. 38°32'S 145°22'E], [AM Old Collection]. Western Australia: 2 specimens, AM P41234, 300 m southeast of Penguin Island, Wambro Sound, 32°18.5'S

115°41.6'E, seagrass: *Amphibolis griffithii*, 3.5 m, P. Hutchings *et al.*, 7–9 November 1990, stn A.

Type locality. Marys Rock, Cook Island, New South Wales, Australia, 28°11.42'S 153°34.79'E, on a bryozoan, 19 m.

Description. Based on holotype male, AM P60491 and paratype female, AM P60492.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 3 robust setae along posterior margin; flagellum with at least 24 articles; accessory flagellum with 3–4 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 longer than article 5; flagellum with about 11 articles. *Mandible* palp article 3 rectilinear, setose along straight medial margin, longer than article 1; article 2 shorter than article 3; article 1 not produced, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with about 3 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa anteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, with strong setal bunch, palm acute, straight, sculptured, with group of anterodistal robust setae, without posterodistal robust setae, defined by posteroventral spine; dactylus apically falcate. *Pereopod 5* basis posterior margin convex, posteroventral corner broadly rounded; carpus and propodus with many long, slender setae along anterior margin. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin convex, posteroventral corner broadly rounded; carpus and propodus with many long, slender setae along anterior margin. *Pereopod 7* basis posterior margin convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate or with small acute spine. *Urosomite 1* dorsally bicarinate. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust setae, apical conical extension absent.

Female (sexually dimorphic characters). *Gnathopod 2* carpus short; propodus setose, smooth, with sparse robust setae, defined by posterodistal robust setae, defined by posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; living among bryozoans and red algae, 16 to 19 m depth.

Etymology. Named for the coastal steamer *Kameruka*, wrecked on Pedro Reef, off Moruya, New South Wales, in 1897.

Remarks. This species was originally described as *Mallacoota subcarinata* phenotype B by J.L. Barnard (1972a). It appears to be the same as the Challenger specimens Stebbing (1888) described from off Melbourne. *Mallacoota kameruka* is similar to *M. subcarinata* and *M. malua* in the absence of posteroventral notches on coxae 1 and 2. It differs from all Australian species in having convex posterior margins of pereopods 5–7.

Distribution. *Queensland:* Port Denison; North Stradbroke Island (both AM). *New South Wales:* Marys Rock, Cook Island; Julian Rocks, Byron Bay; Boambee Creek, Sawtell; Port Stephens; Broken Bay; Port Jackson; Jervis Bay; Ulladulla; Merimbula (all AM); Munganno Point, Twofold Bay (Hutchings *et al.*, 1989). *Victoria:* Off Melbourne (Stebbing, 1888); Griffiths Point (AM); Port Phillip (J.L. Barnard, 1972a). *Western Australia:* Point Peron; Rottneest Island; Cottesloe Beach (all J.L. Barnard, 1972a); Warnbro Sound (AM).

Australian geographic areas. Northeastern, southeastern, southern and southwestern Australia.

Mallacoota malua n.sp.

Figs. 26–28

Type material. HOLOTYPE, ♂ “a”, 10 mm, AM P56679; 10 PARATYPES, 3 ♂♂, 7 ♀♀, AM P60485; Coffs Harbour Jetty, Coffs Harbour, New South Wales, 30°18.4'S 153°08.5'E, arborescent sponge on jetty pilings, 7 m, S.J. Keable, 9 March 1992, stn NSW-735; 22 PARATYPES, 8 ♂♂, 14 ♀♀, AM P56678, type locality, *Pyura praeputialis* on jetty pilings, 8 m, P.B. Berents & S.J. Keable, 9 March 1992, stn NSW 733; 1 PARATYPE, ♀, 8.5 mm, AM P60486; 1 PARATYPE, ♂ “c”, 7.1 mm, AM P60490, type locality, coral scrapings on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW 726.

Additional material examined. New South Wales: 1 ♂, 2 ♀♀, AM P56674, 50 m west of Split Solitary Island, 30°14.0'S 153°10.8'E, *Herdmania momus*, rocks, sponges & ascidians, 15–17 m, P.A. Hutchings & C.L. Rose, 7 March 1992, stn NSW-677. 1 ♀, AM P56676, Boambee Creek, Sawtell, 30°20.8'S 153°05.6'E, silty sand submerged at low tide, 0.3 m, E. Albertson & S. Keable, 8 March 1992, stn NSW-714. 4 ♂♂, 12 ♀♀, AM P57220, Coffs Harbour Jetty, Coffs Harbour, 30°18.4'S 153°08.5'E, worm tubes encrusted with sponge on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-725. 1 specimen, AM P57221, same locality, coral scrapings on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-738. 5 ♂♂, 6 ♀♀, AM P57301, same locality, finger sponge on jetty pilings, 4 m, R.T. Springthorpe, 9 March 1992, stn NSW-734. 1 ♂, 4 ♀♀, AM P57302, same locality, coral scrapings on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, NSW 726. 7 ♀♀, AM P58230, outer end of Kurnell Pier, Botany Bay, 34°00.2'S 151°12.5'E, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP1 P1–7. 1 ♂ (“b”), AM P60487, same locality. 2 ♂♂, 1 ♀, AM P63071, same locality, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 21 October 1998, BB KP1 P2–3. 1 ♂, AM P58231, Kurnell Pier (near shoreline), Botany Bay, 34°00.5'S 151°12.7'E, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP2 P3–3. 2 ♂♂, 1 ♀, AM P60488, north east corner of Clark Island, Port Jackson, 33°51.85'S 151°14.47'E, red alga, 2 m, I. Takeuchi & D. Bray, 17 April 1996, stn NSW-1250. 6 ♂♂, 5 ♀♀, AM P60623, Port Jackson, 33°51'S 151°16'E, [AM Old Collection].

Type locality. Coffs Harbour Jetty, New South Wales, Australia, 30°18.4'S 153°08.5'E, sponges, ascidians on pilings, 7 m.

Description. Based on holotype male “a”, AM P56679, paratype female, AM P60486, paratype male “c”, AM P60490 and male “b”, AM P60487.

Head. Lateral cephalic lobes broad, truncated, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 3 robust setae along posterior margin; flagellum with at least 23 articles; accessory flagellum with 3–4 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 longer than article 5, or article 4 subequal to article 5; flagellum with about 12 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 subequal to article 3; article 1 not produced, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with about 4 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, convex or straight, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, with strong setal bunch, palm acute, straight, sculptured, with sparse robust setae and with group of anterodistal robust setae, without posterodistal robust setae, defined by posteroventral spine; dactylus apically falcate. *Pereopod 5* basis posterior margin slightly concave, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin slightly concave or straight, posteroventral corner narrowly rounded or subquadrate; propodus expanded posterodistally to from a hood-like projection. *Pereopod 7* basis posterior margin

straight, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate; propodus expanded posterodistally to from a hood-like projection.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate or with small acute spine. *Urosomite 1* dorsally bicarinate. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust setae, apical conical extension absent.

Female (sexually dimorphic characters). *Gnathopod 2* carpus short; propodus setose, slightly convex, smooth, with sparse robust setae, defined by posterodistal robust setae, without posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; among ascidians, sponges and red algae on wharf pilings, 0 to 17 m depth.

Etymology. Named for the wooden steamer *Malua*, built in Botany Bay and sunk at the mouth of Port Hacking, New South Wales, in 1886.

Remarks. *Mallacoota malua* is most closely related to *Mallacoota kameruka*. They differ in the shape of the bases of pereopods 5–7, and in the sculpturing on the palm of gnathopod 2. *Mallacoota malua* is the only species with posterodistal hood-like projections on pereopods 6 and 7.

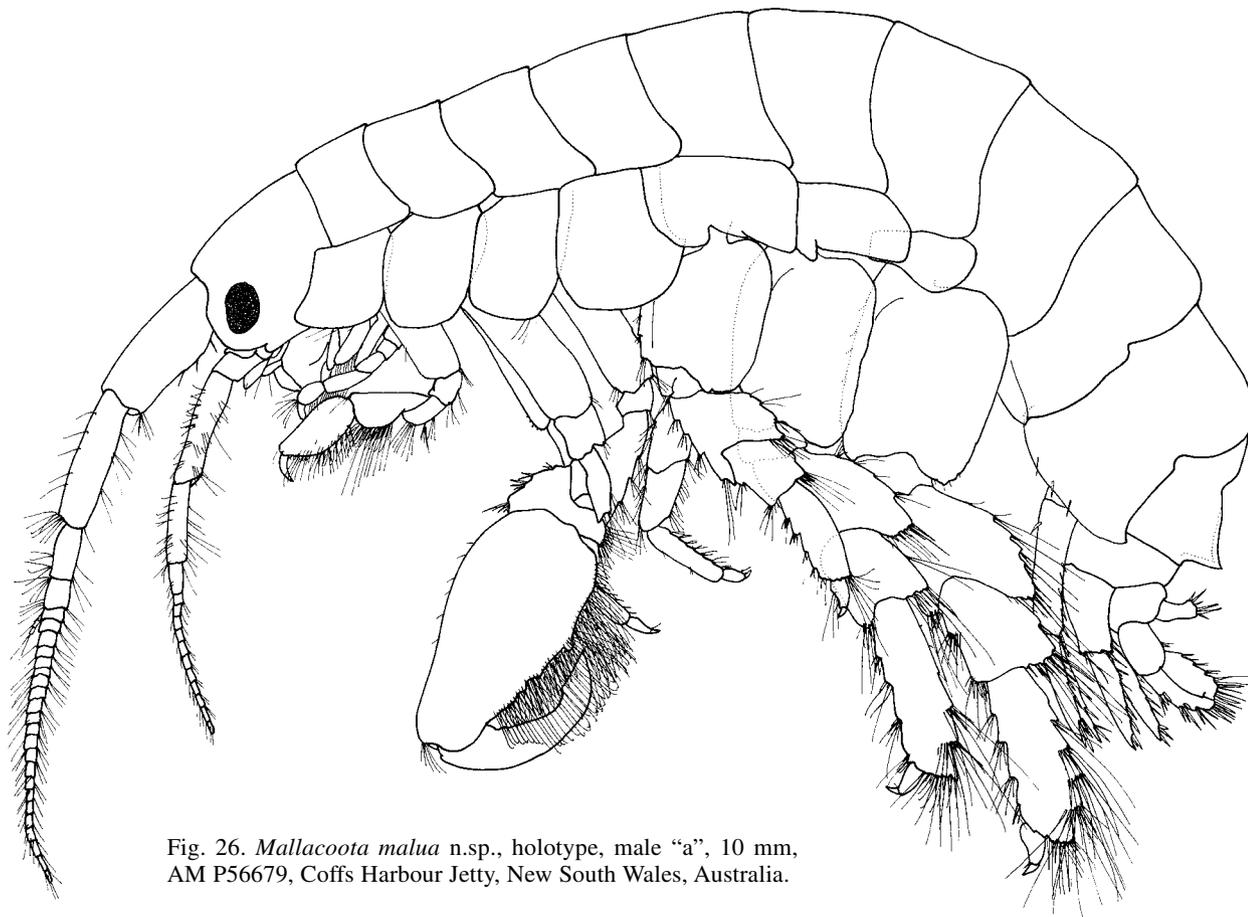


Fig. 26. *Mallacoota malua* n.sp., holotype, male "a", 10 mm, AM P56679, Coffs Harbour Jetty, New South Wales, Australia.

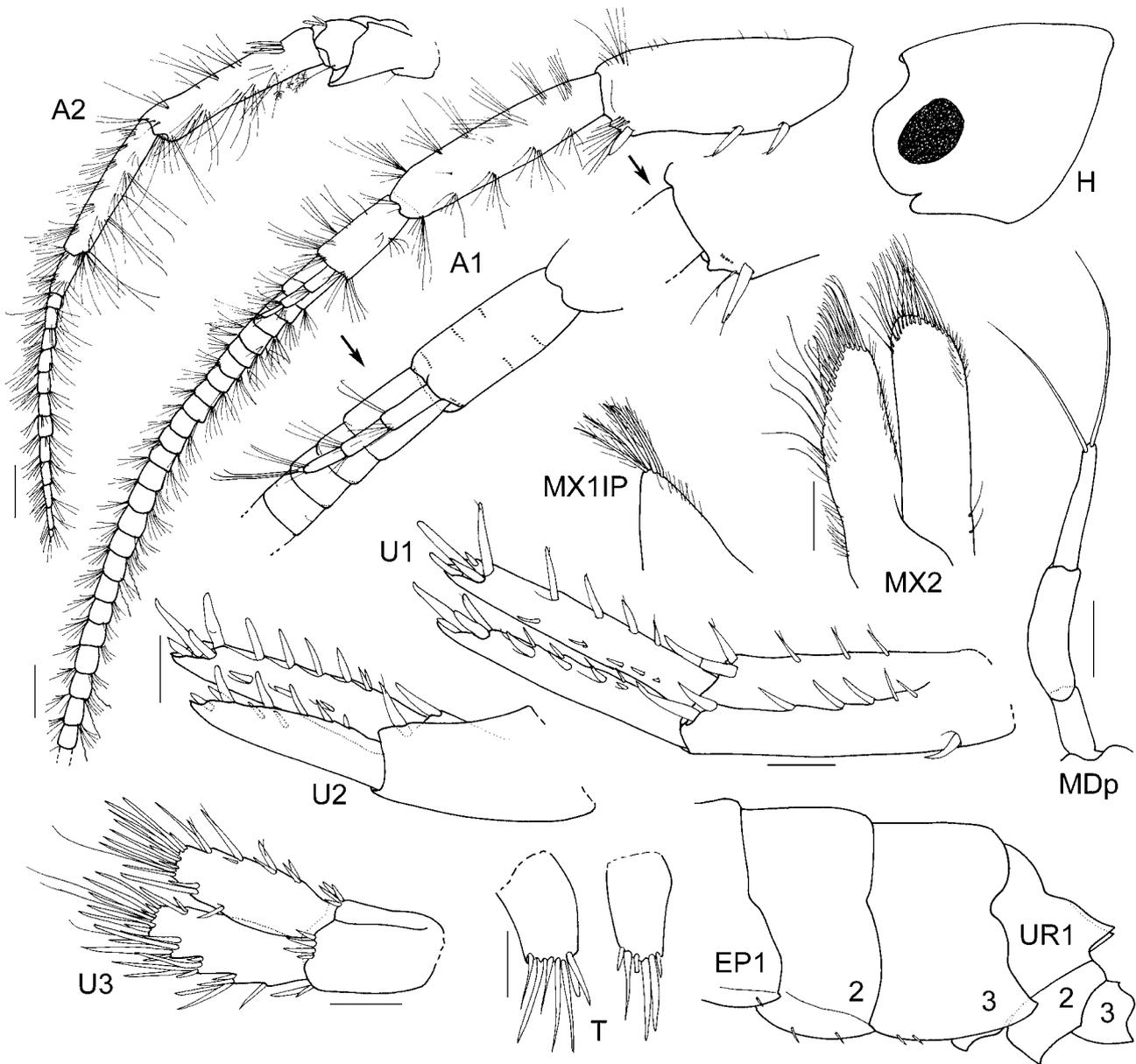


Fig. 27. *Mallacoota malua* n.sp., holotype, male "a", 10 mm, AM P56679, Coffs Harbour Jetty, New South Wales, Australia. Scales for MDp, MX1IP, MX2 represent 0.1 mm, remainder represent 0.2 mm.

Distribution. *New South Wales*: Split Solitary Island; Coffs Harbour; Boambee Creek, Sawtell; Clark Island, Port Jackson; Kurnell, Botany Bay (all AM).

Australian geographic areas. Southeastern Australia.

Mallacoota nananui Myers

?*Elasmopus subcarinatus*.—Chilton, 1915 (in part), 325, fig. 5.
Mallacoota subcarinata.—J.L. Barnard, 1972b: 114, figs 59–60.
Mallacoota nananui Myers, 1985: 121, fig. 95.—Myers, 1986: 1389, fig. 8.

Type material. HOLOTYPE: ♂, 5.7 mm, AM P35209; PARATYPES, 7♂♂, 15♀♀, AM P35210; lagoon, Nananui Ra, Viti Levu, Fiji [17°15'S 178°12'E], on *Halimeda* sp., A.A. Myers, 7 October, 1979, stn 53.

Material examined. *New South Wales*: about 95 specimens, AM P64661, between Comet Hole and the reef, Lord Howe Island lagoon,

[approx. 31°30.5'S 159°03'E], associated with red and brown algae, 2–3 m, J.K. Lowry & G.D. Fenwick, 10 May 1977, stn LHA-11.11 specimens, AM P64662, reef front west of Signal Point, Lord Howe Island Lagoon, [approx. 31°30.5'S 159°03'E], *Caulerpa*, 1.5–2.0 m, G.D. Fenwick, 11 May 1977, stn LHA-15.

Type locality. Lagoon, Nananui Ra, Viti Levu, Fiji [approx. 17°15'S 178°12'E].

Habitat. Marine; littoral; among red and brown algae in lagoons, 0 to 3 m depth.

Remarks. This is the first record of *M. nananui* from Australian waters.

Distribution. *New South Wales*: Lord Howe Island (AM).

Extrinsic distribution. Fiji; Nuie; New Zealand.

Australian geographic areas. Southeastern Australia.

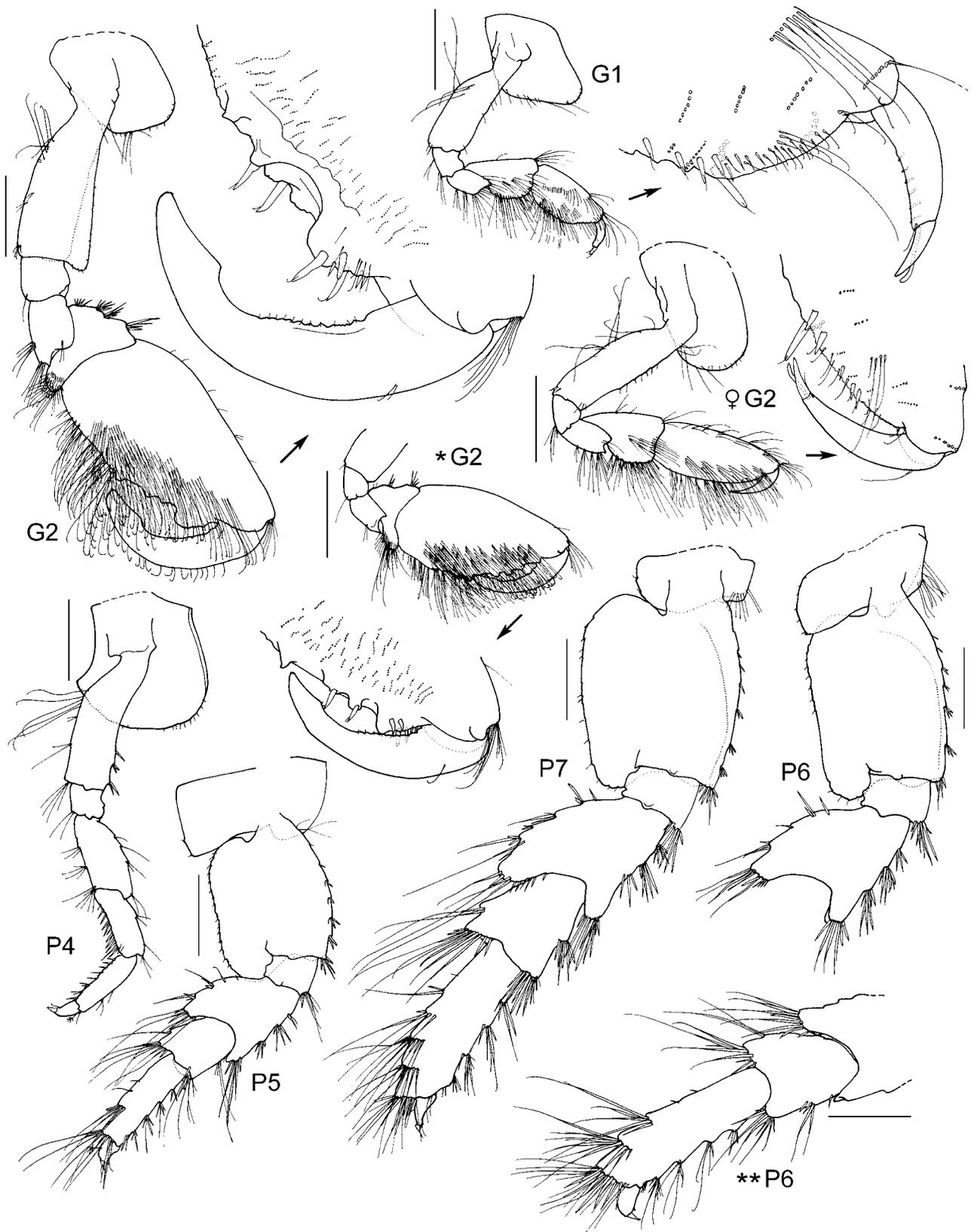


Fig. 28. *Mallacoota malua* n.sp., holotype, male "a", 10 mm, AM P56679, paratype, female, 8.5 mm, AM P60486, *paratype, male "c", 7.1 mm, AM P60490, Coffs Harbour Jetty, New South Wales, Australia; ** male "b", AM P60487, Botany Bay, New South Wales Australia. Scales represent 0.5 mm.

Mallacoota subcarinata (Haswell)

Figs. 29–33

- Megamoera sub-carinata* Haswell, 1879b: 335, pl. 21, fig. 4.
Elasmopus subcarinatus.—Stebbing, 1906: 441.—Stebbing, 1910a: 602.—Chilton, 1921b: 76.
 Not *Megamoera sub-carinata*.—Chilton, 1885: 1039.
 Not *Moera petriei* Thomson, 1882: 236, pl. 18, fig. 3.—Chilton, 1883: 82, pl. 2, fig. 4.—Chilton, 1885: 1039.
 Not *Moera sub-carinata*.—Chilton, 1884: 230.—Thomson & Chilton, 1886: 146.
 Not *Moera subcarinata*.—Chilton, 1885: 1039.—Thomson, 1889: 261.
 Not *Elasmopus subcarinatus*.—Stebbing, 1888: 1019, pl. 98 (plate labelled as *E. persetosus*). Chilton, 1892: 261.—Walker, 1904: 275, pl. 5, fig. 34.—Stebbing, 1906: 441.—Walker, 1909: 335.—Stebbing, 1910a: 602.—Stebbing, 1910b: 457.—Thomson, 1913: 243.—Chilton, 1915: 321, figs 1–6.—Stephensen, 1931: 11.—K.H. Barnard, 1935: 286.—Pirlot, 1936: 317, figs 136–145.—K.H. Barnard, 1937: 160.
 Not *Maera subcarinata*.—K.H. Barnard, 1940: 460.—Nayar, 1966: 149.

Not *Mallacoota subcarinata*.—J.L. Barnard, 1972a: 247, figs 144–145.—J.L. Barnard, 1972b: 114, figs 59–60.—Lowry, 1974: 112, 125 figs 9b,d (key).—Ledoyer, 1978: 281, fig. 32.—Barnard & Barnard, 1983: 632.—Ledoyer, 1984: 71, 72 figs 34–35.—Myers, 1985: 121, fig. 96.—Myers, 1986: 1390, fig. 9.—Hutchings *et al.*, 1989: 362.—Myers, 1995: 38.

Type material. 1 SYNTYPE, ♂, 9.6 mm, AM G5390; 1 SYNTYPE, ♀, 10.4 mm, AM P63972; 2 SYNTYPES, AM P63973, Port Jackson, New South Wales, Australia, [approx. 33°51'S 151°16'E, [AM Old Collection]]; 3 SYNTYPES, AM P3492, Port Stephens, 32°42'S 152°06'E, [AM Old Collection], [specimens not located, March 1993 (Springthorpe & Lowry, 1994)].

Additional material examined. New South Wales: 2 specimens, AM P22484, east of Mona Vale, 33°41'S 151°19'E, 16 m, Australian Museum Shelf Benthic Survey, 11 May 1972. 2 specimens, AM P22479, east of Long Reef, 33°44'S 151°22'E, 38 m, Australian Museum Shelf Benthic Survey, 24 Aug 1972. 5 specimens, AM P22480, same locality, 36 m, Australian Museum Shelf Benthic Survey, 11 May 1972. 2 specimens, AM P22481, same locality, 32 m, Australian Museum Shelf Benthic Survey, 28 May 1972. 1 specimen, AM P22482, same locality, 15 m, Australian Museum Shelf Benthic Survey, 28 April 1972. 2

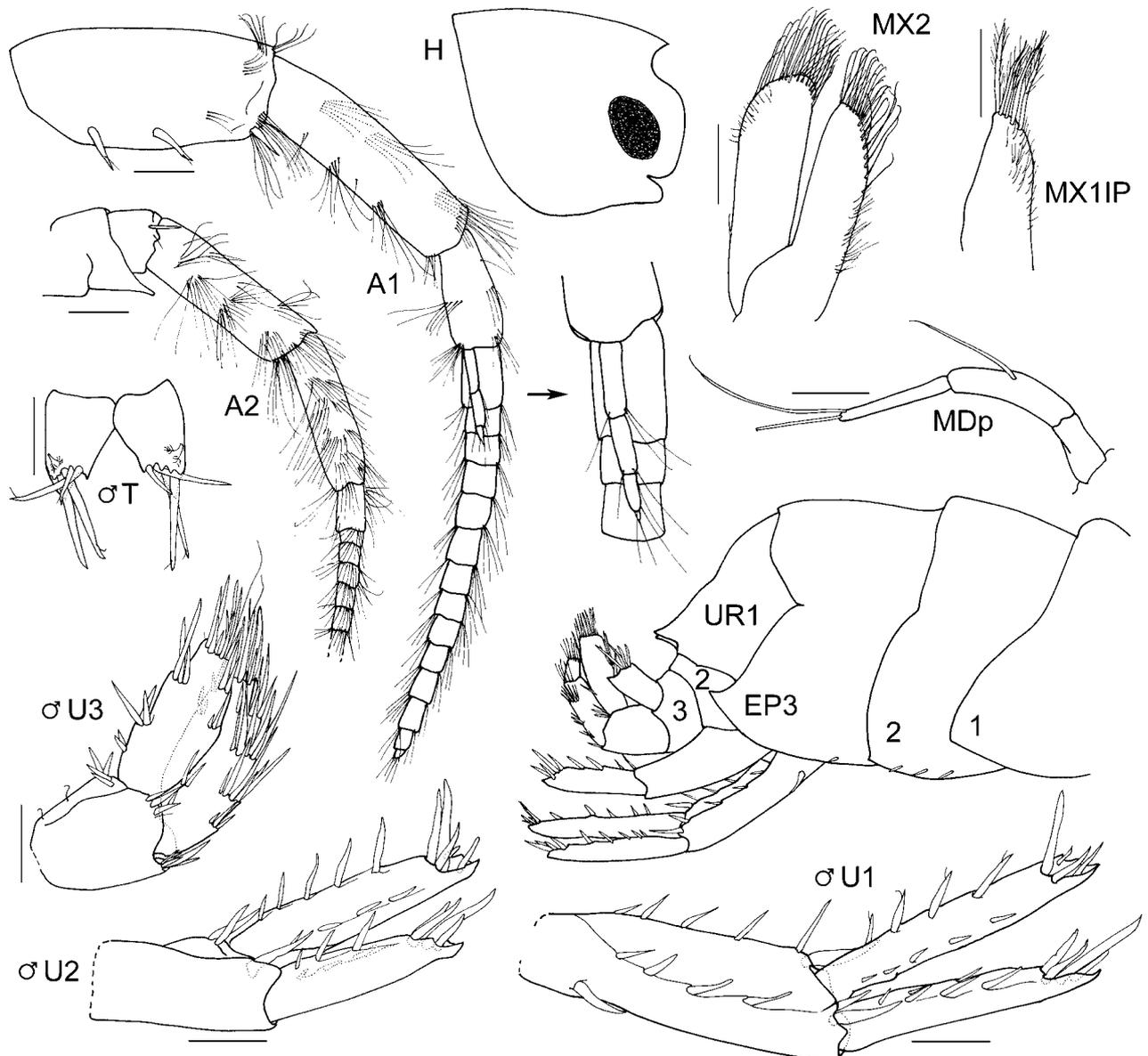


Fig. 29. *Mallacoota subcarinata* (Haswell, 1879b), syntype male, 9.6 mm, syntype, female, 10.4 mm, AM G5390, Port Jackson, New South Wales, Australia. Scales represent 0.2 mm.

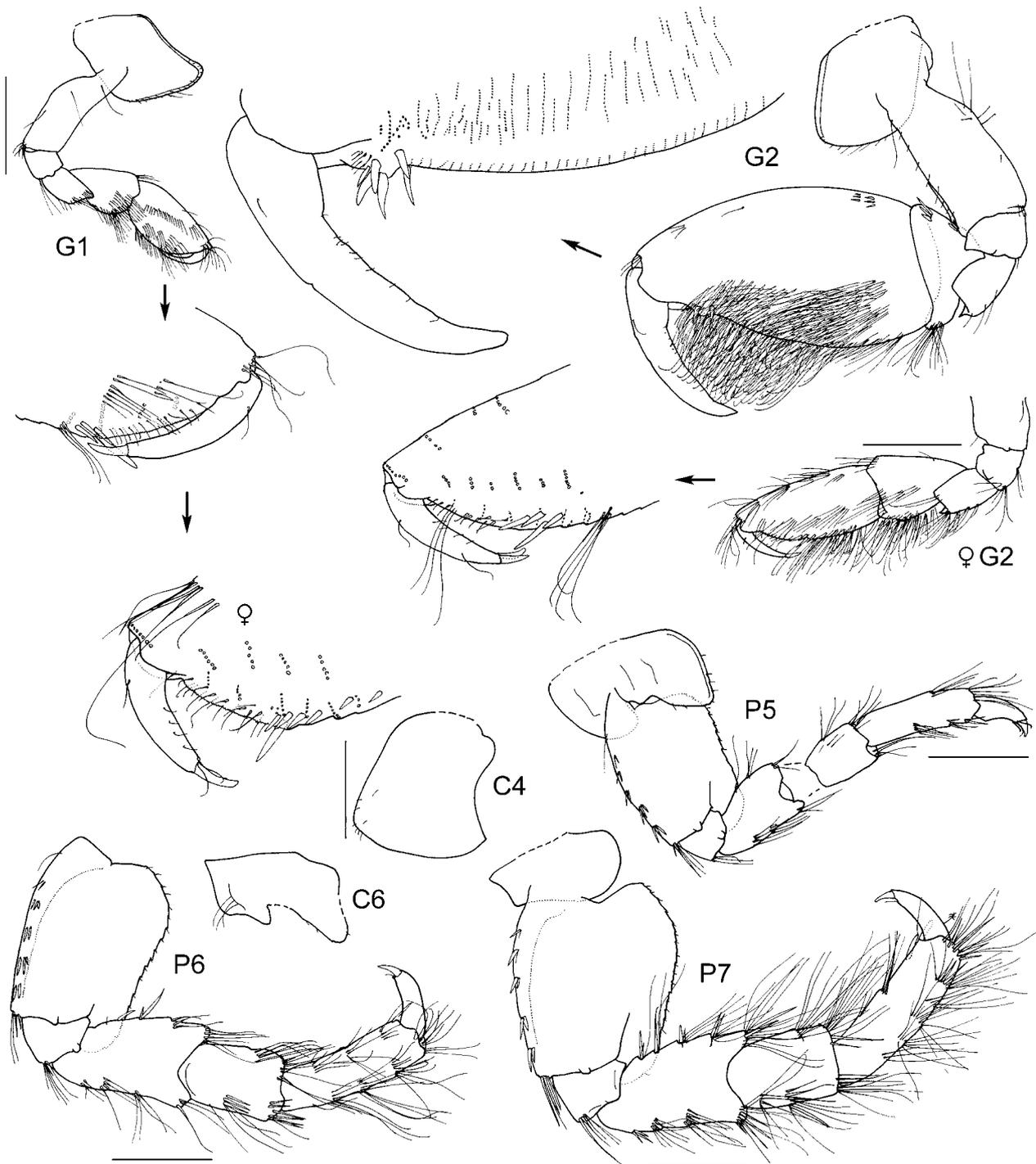


Fig. 30. *Mallacoota subcarinata* (Haswell, 1879b), syntype, male, 9.6 mm, AM G5390, syntype, female, 10.4 mm, AM P63972, Port Jackson, New South Wales, Australia. Scales represent 0.5 mm.

specimens, AM P22483, same locality, Australian Museum Shelf Benthic Survey, 1972. 1 ♂ "a" 10.4 mm, AM P22487, east of Long Reef, 33°44'S 151°22'E, 40 m, Australian Museum Shelf Benthic Survey, 29 June 1972. 1 ♂ "b" 5.7 mm, AM P60563, same locality. 9 specimens, AM P22476, east of North Head, Port Jackson, 33°49'S 151°18'E, host sponge: *Halme gigantea*, 25 m, Australian Museum Shelf Benthic Survey, 26 February 1974, transect 07. 1 specimen, AM P22477, east of North Head, Port Jackson, 33°49.5'S 151°18'E, 32 m, Australian Museum Shelf Benthic Survey, 23 May 1972. 5 specimens, AM P5860, Balmoral, Port Jackson, [approx. 33°49.7'S 151°15.1'E], T. Whitelegge, [AM Old Collection]. 1 specimen, AM P22485, east of South Head, Port Jackson, 33°50'S 151°18'E, host sponge: *Halme gigantea*, 21 m, Australian Museum Shelf Benthic Survey, February 1972, transect 11. 5 specimens, AM P63072, outer end of Kurnell Pier, Botany Bay, 34°00.2'S 151°12.5'E, pylon

scrappings, 7 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP1 P2-7. 3 specimens, AM P63073, Kurnell Pier (near shoreline), Botany Bay, 34°00.5'S 151°12.7'E, pylon scrappings, 3 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP2 P2-3. 6 specimens, AM P2497, 3-4 km off Botany Bay, [approx. 34°05'S 151°15'E], mud, 91-95 m, E.R. Waite on HMCS *Thetis*, 11 March 1898, stn. 37. 1 specimen, AM P2498, 4.5-5 km off Jibbon Point, [approx. 34°07.5'S 151°12'E], sand, mud, 84-101 m, E.R. Waite on HMCS *Thetis*, 12 March 1898, stn. 38. 8 specimens, AM P2494, 5.5-6.5 km off Wattamolla, [approx. 34°10'S 151°11'E], mud, 99-108 m, E.R. Waite on HMCS *Thetis*, 22 March 1898, stn 57. 1 specimen, AM P2499, 11-12.5 km off Wollongong, [approx. 34°27'S 151°04'E], sand, mud, rock, 102 m, E.R. Waite on HMCS *Thetis*, 18 March 1898, stn. 48. 1 ♂, AM P63117, Jervis Bay, [approx. 35°03'S 150°44'E], T. Whitelegge. 2 specimens, AM P62905,

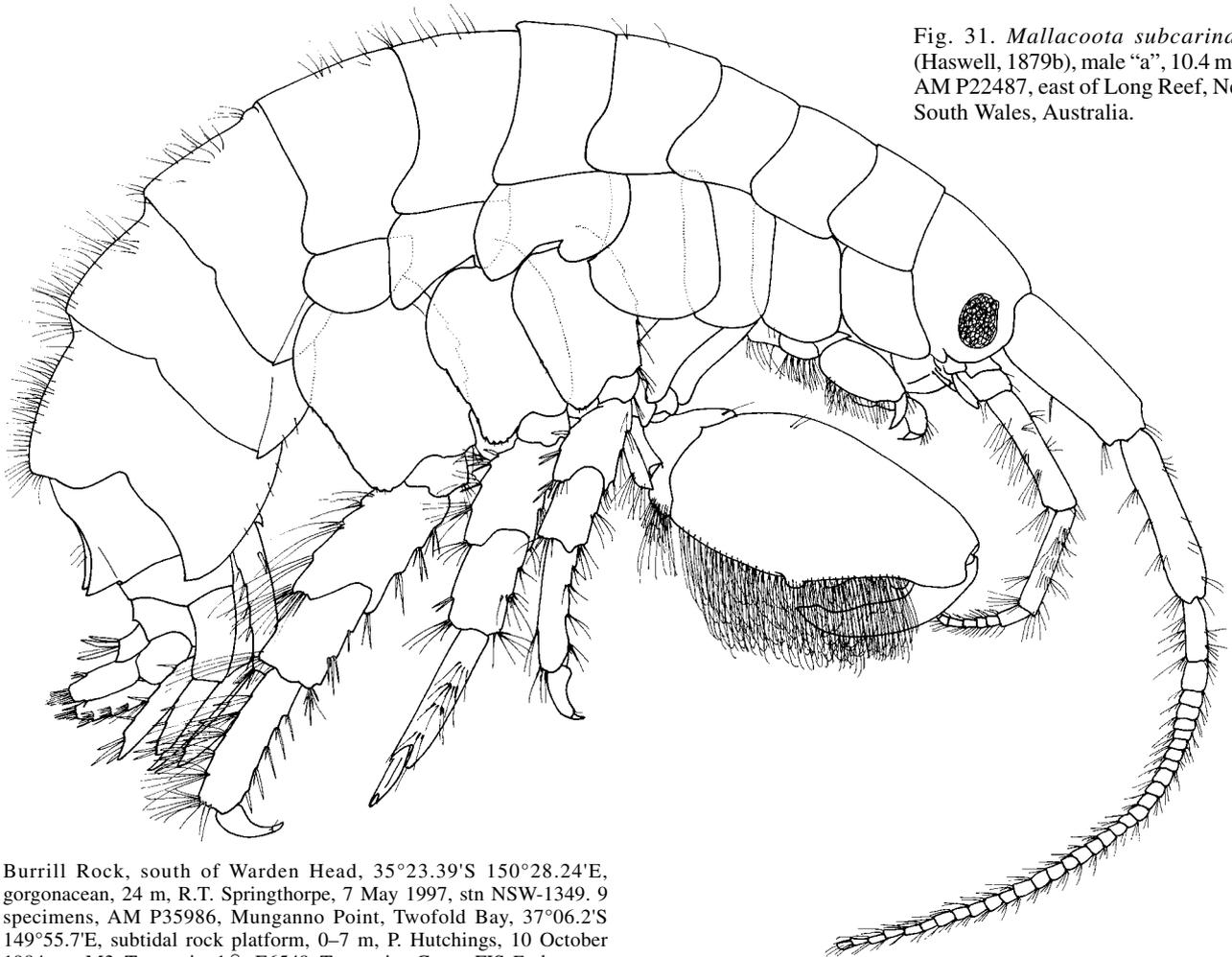


Fig. 31. *Mallacoota subcarinata* (Haswell, 1879b), male "a", 10.4 mm, AM P22487, east of Long Reef, New South Wales, Australia.

Burrill Rock, south of Warden Head, 35°23.39'S 150°28.24'E, gorgonacean, 24 m, R.T. Springthorpe, 7 May 1997, stn NSW-1349. 9 specimens, AM P35986, Munganno Point, Twofold Bay, 37°06.2'S 149°55.7'E, subtidal rock platform, 0–7 m, P. Hutchings, 10 October 1984, stn M3. Tasmania: 1 ♀, E6549, Tasmanian Coast, FIS *Endeavour*, 1909–1914. 2 specimens, E6550, eastern slope of Bass Strait, [approx. 39°00'S 148°40'E], FIS *Endeavour*, 1909–1914. 3 specimens, AM P5936, same locality.

Type locality. Port Jackson, New South Wales (33°51'S 151°16'E) and Port Stephens, New South Wales, Australia, (32°42'S 152°06'E).

Description. Based on male syntype, AM G5390, female syntype, AM P63972, male "a", AM P22487 and male "b", AM P60563.

Head. Lateral cephalic lobes broad, truncated, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 subequal in length to article 2, with 1–3 robust setae on posterior; flagellum with about 31 articles; accessory flagellum with 4–5 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 subequal to article 5; flagellum with about 12 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 subequal to article 3; article 1 not produced, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with 4–5 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa

posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, with strong setal bunch, palm extremely acute, convex or sinusoidal, sculptured, with group of anterodistal robust setae, without posterodistal robust setae, with or without posteroventral corner; dactylus apically blunt or falcate. *Pereopod 5* basis posterior margin straight or slightly concave, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin concave, posteroventral corner serrate. *Pereopod 7* basis posterior margin slightly concave or straight, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner narrowly rounded or subquadrate. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with strongly produced acute spine. *Urosomite 1* dorsally bicarinate. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3 or more apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta or absent.

Female (sexually dimorphic characters). *Gnathopod 2* carpus short; propodus setose, convex, smooth, with sparse robust setae, defined by posterodistal robust setae; dactylus apically acute/subacute.

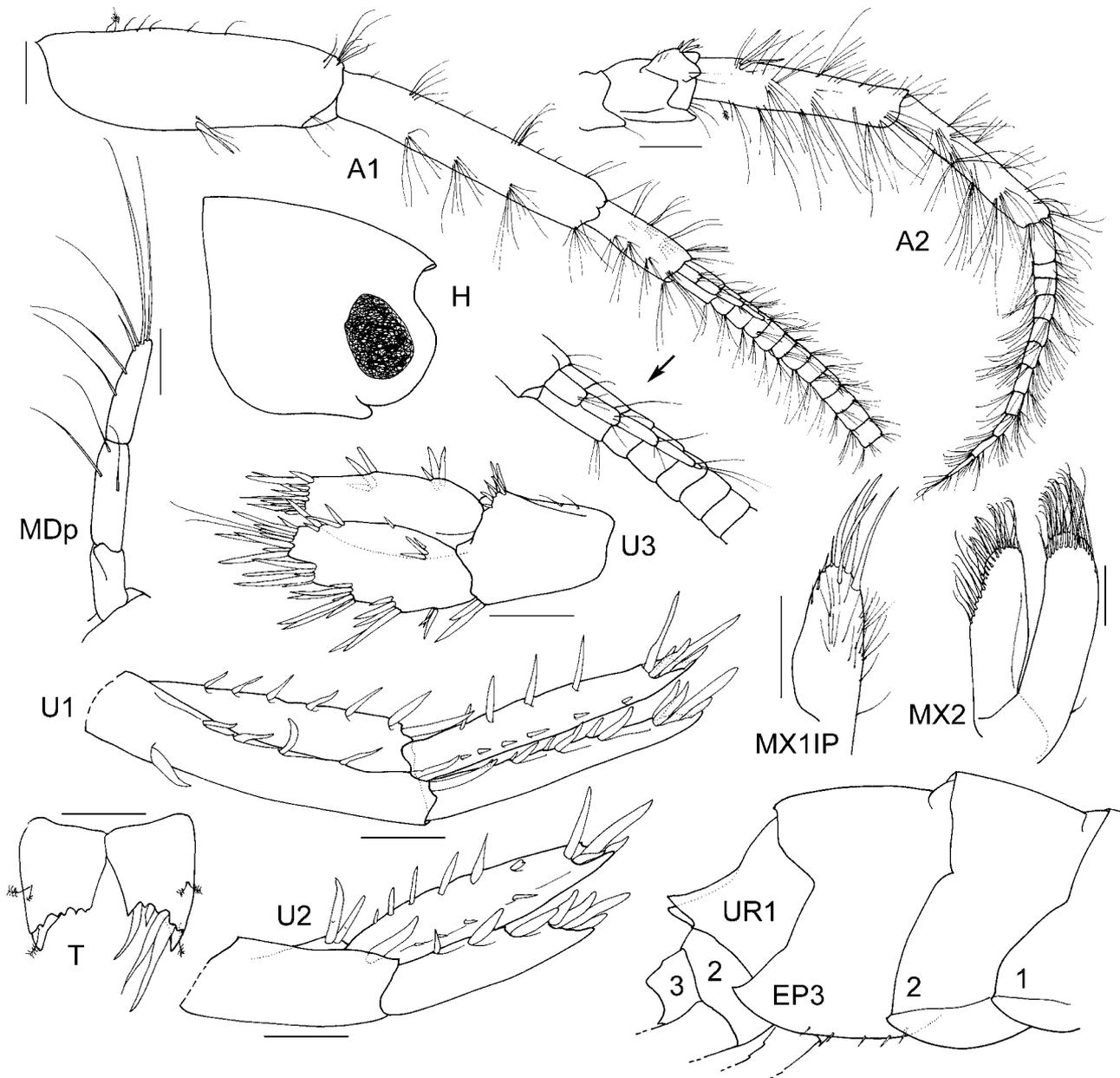


Fig. 32. *Mallacoota subcarinata* (Haswell, 1879b), male "a", 10.4 mm, AM P22487, east of Long Reef, New South Wales, Australia. Scales for MDp, MX1IP, MX2, represent 0.1 mm, remainder represent 0.2 mm.

Habitat. Marine; littoral and continental shelf; subtidal rock platforms, sand, mud, sponges and from jetty pilings, 3.5 to 108 m depth.

Remarks. *Mallacoota subcarinata* Haswell, 1879b appears to be confined to Australian waters. All extrinsic records need to be carefully studied. The species appears to be most similar to those species with a strong posteroventral corner spine on epimeron 3. In Australian waters this includes *M. diemenensis* and *Mallacoota euroka*. *Mallacoota diemenensis* differs from all other Australian species in having dorsal carinae on pleonites 1 to 3. *Mallacoota subcarinata* differs from *Mallacoota euroka* in having only one to three robust setae along the posterior margin of antennal peduncular article 1 and in the posterior margin of the basis of pereopod 7 that is straight in *M. subcarinata* and convex in *M. euroka*.

Distribution. *New South Wales*: east of Long Reef; east of Port Jackson (both AM); Port Jackson (Haswell, 1879b); off Botany Bay; off Jibbon; off Wattamolla; off Wollongong (all Stebbing, 1910a); Jervis Bay; Ulladulla; Munganno Point, Twofold Bay (all AM). *Tasmania*: Bass Strait (Chilton, 1921b).

Australian geographic areas. Southeastern Australia.

Miramaera n.gen.

Type species. *Miramaera thetis* n.sp.

Diagnosis. Head without anteroventral notch; eye ovate to reniform. *Antenna 1* accessory flagellum long, nearly half to more than half length of primary flagellum. *Mandible palp* article 1 strongly produced distally; article 2 longer than article 3; article 3 long, rectilinear. *Maxilla 1* inner plate with mainly apical setae. *Gnathopod 1* coxa anteroventral corner produced, acute or subacute.

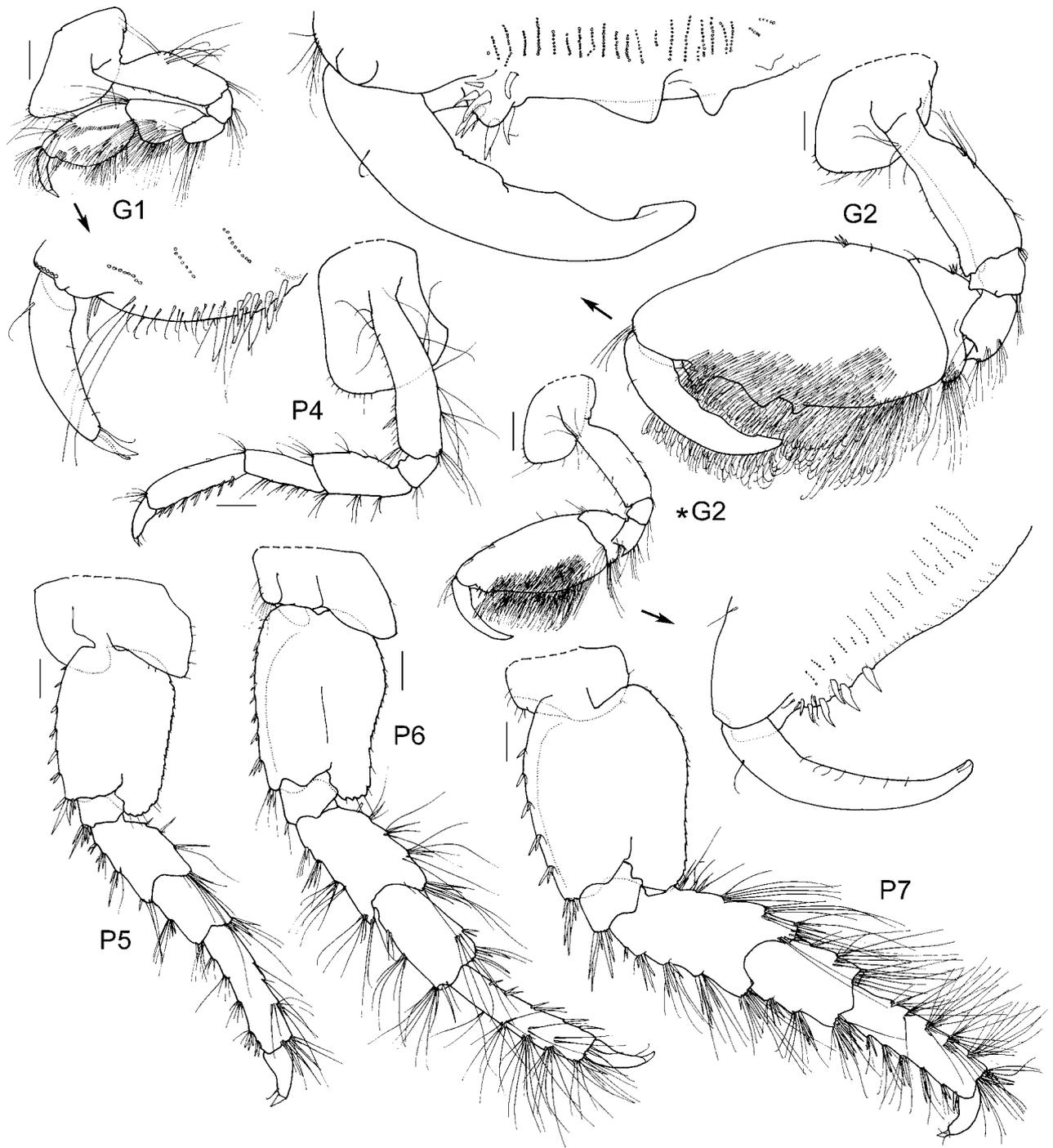


Fig. 33. *Mallacoota subcarinata* (Haswell, 1879b), male "a", 10.4 mm, AM P22487, *male "b", 5.7 mm, AM P60563, east of Long Reef, New South Wales, Australia. Scales represent 0.2 mm.

Gnathopod 2 significantly enlarged in male and female; left and right gnathopods symmetrical in male; palm acute in male and female, both male propodi with well defined corner (greater than 90°), both female propodi with well defined corner (greater than 90°); dactylus with 1 or 2 setae on anterior margin. *Pereopods 5–7* dactyli simple. *Epimeron 3* posterior margin smooth. *Urosomite 1* dorsal and posterior margins smooth. *Uropod 3* rami distally truncated, about 1.5× to 3 or more times peduncle, apical robust setae long or short; outer ramus 1-articulate. *Telson* deeply cleft, lobes truncated with apical cusps, with or without robust setae on outer margins, with short apical robust setae.

Species composition. *Miramaera tepuni* (J.L. Barnard, 1972b); *Miramaera thetis* n.sp.

Etymology. A combination of the Latin word *mirus*, meaning wonderful, with the Latin stem *Maera*.

Remarks. *Miramaera* is excluded from the *Linguimaera* group because of its symmetrical second gnathopods. It is excluded from *Quadrimaera* because of the strong apical notch on the anteroventral margin of the head, the acute palms on the propodi of male gnathopod 2, the simple dactyli on pereopods 5–7 and the telsonic lobes that are truncated with apical cusps. It may be most similar to genera

in the *Maera* group (*sensu stricto*), but it differs from that group in the setation of the dactyli of the second gnathopods. The significant differences between *Miramaera* and *Lupimaera* are that in *Miramaera* the posterior margin of epimeron 3 is smooth, the rami of uropod 3 are longer than the peduncle and the telsonic lobes have apical cusps and short robust setae. *Miramaera* differs from *Maeropsis* in having acute palms and a well defined corner of more than 90° on both male and female propodi of gnathopod 2.

Distribution. Australia; New Zealand.

***Miramaera thetis* n.sp.**

Figs. 34–36

Maera inaequipes.—Stebbing, 1910a: 599.—Sheard, 1937: 24.

Type material. HOLOTYPE, ♂ “a”, 7.9 mm, AM P62798; many PARATYPES, AM P27035; 1 PARATYPE, ♀, 6.7 mm, AM P62799; 1 PARATYPE, ♂ “b”, 7.8 mm, AM P62800; 10 PARATYPES, AM P62801, between Troubridge Light and Cape Jervis, South Australia, 35°20'S 137°40'E, sponges on mud bottom, 20 m, D. Blake & H. Larsen, 14 March 1978.

Additional material examined. New South Wales: 1 specimen, AM P2492, 8–9.5 km off Coogee, 33°57'S 151°21.5'E, fine sand, 91 m, E.R. Waite on HMCS Thetis, 15 March 1898, stn 44. South Australia: 1 ovigerous female, E6544, 24 km north west of Cape Jervis, [approx. 35°26'S 137°55'E], 31 m, FIS Endeavour, 1909–1914.

Type locality. Between Troubridge Light and Cape Jervis, South Australia, [approx. 35°20'S 137°40'E], sponges on mud bottom, 20 m.

Description. Based on holotype male, AM P62798 and paratype female, AM P62799.

Head. Lateral cephalic lobes broad, rounded, without notch or slit, anteroventral corner with acute/subacute spine. *Antenna 1* longer than antenna 2; peduncular article 1 slightly shorter than article 2, with 4 or more robust setae along posterior margin; flagellum with 16 articles; accessory flagellum with 9 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 longer than article 5; flagellum with 8 or 9 articles. *Mandible* palp article 3 rectilinear, setose on distomedial margin, longer than article 1; article 2 longer than article 3; article 1 produced distally, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate with 3 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, acute, posteroventral corner notch absent; merus without posterodistal spine; carpus with anterodistal swelling; palm acute, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, palm acute, convex, sculptured, lined with robust setae, defined by posterodistal robust setae, defined by posteroventral spine; apically acute/subacute. *Pereopod 5–6* basis posterior margin slightly concave, posteroventral corner broadly rounded. *Pereopod 7* basis posterior margin slightly convex, with posterior margin castelloserrate, posteroventral corner broadly rounded.

Pleon. *Epimeron 1* posteroventral corner broadly rounded. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate. *Uropod 3* rami distally truncated; inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 2 apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* palm smooth.

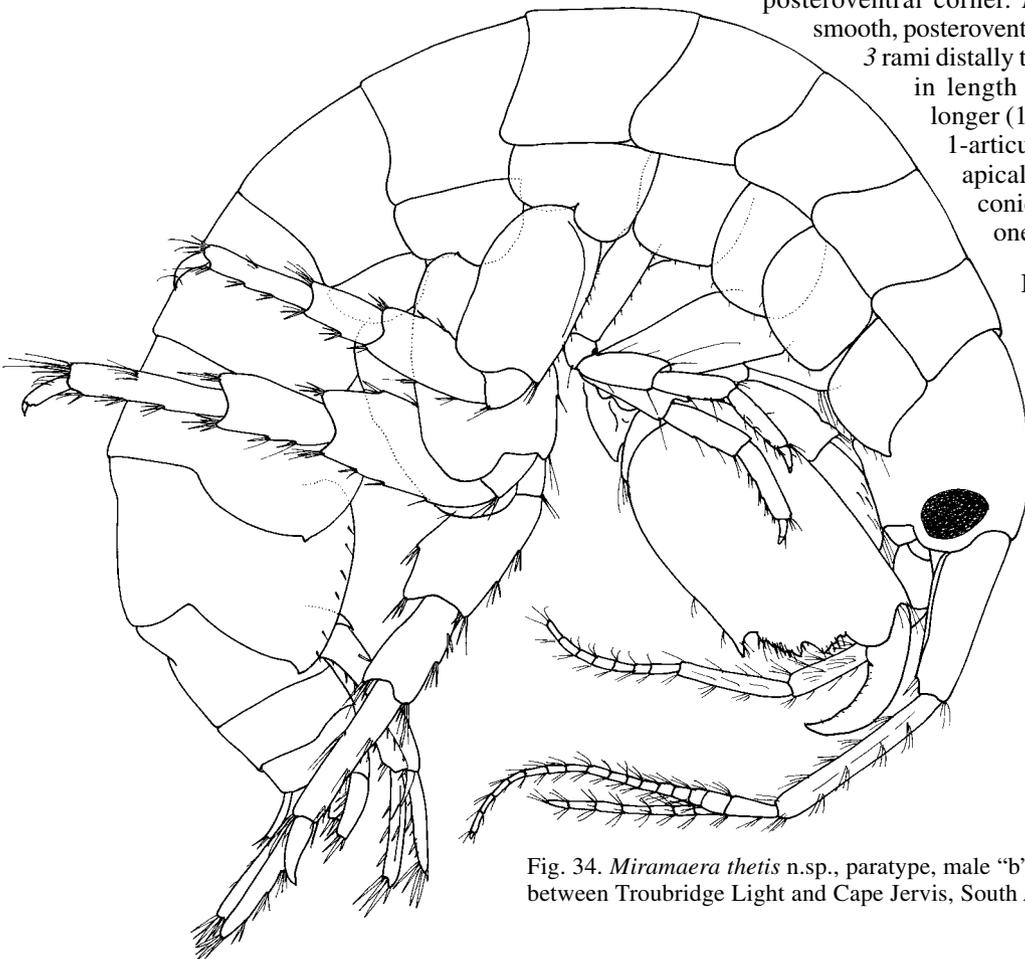


Fig. 34. *Miramaera thetis* n.sp., paratype, male “b”, 7.8 mm, AM P62800, between Troubridge Light and Cape Jervis, South Australia.

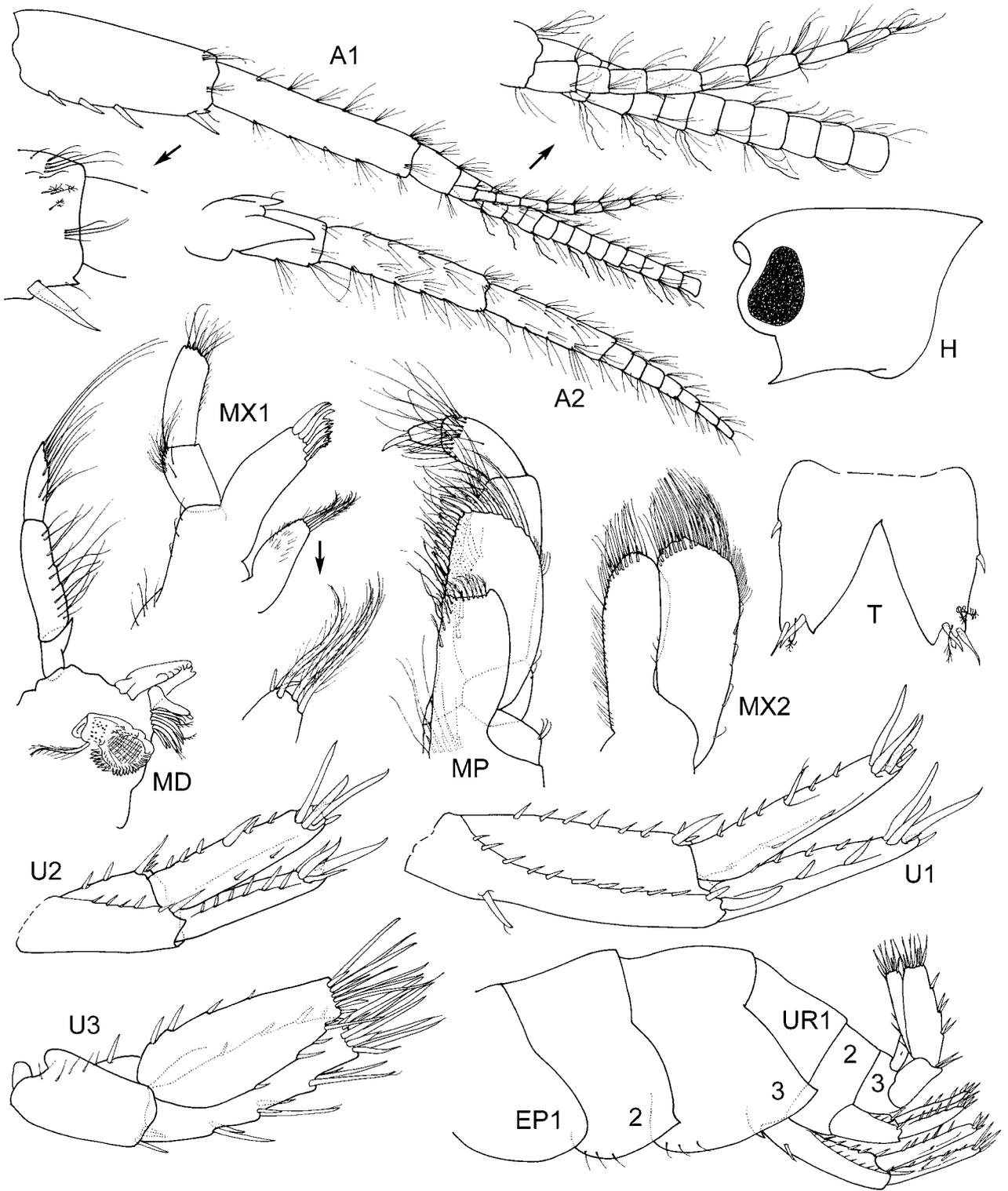


Fig. 35. *Miramaera thetis* n.sp., holotype, male, 7.9 mm, AM P62798, between Troubridge Light and Cape Jervis, South Australia.

Habitat. Marine; sponges on mud bottom, sand; littoral, continental shelf; 20 to 100 m depth.

Etymology. Named for the *Thetis* Expedition, which collected the marine fauna off the coast of Sydney during 1898.

Remarks. *Miramaera thetis* differs significantly from *Miramaera tepuni* (J.L. Barnard, 1972b), the only other

species in the genus, in the rami of uropod 3 that are only half the length of those of *P. tepuni*.

Distribution. *New South Wales*: off Coogee and off Wollongong (both Stebbing, 1910a). *South Australia*: Cape Jervis (AM)

Australian geographic areas. Southeastern and southern Australia.

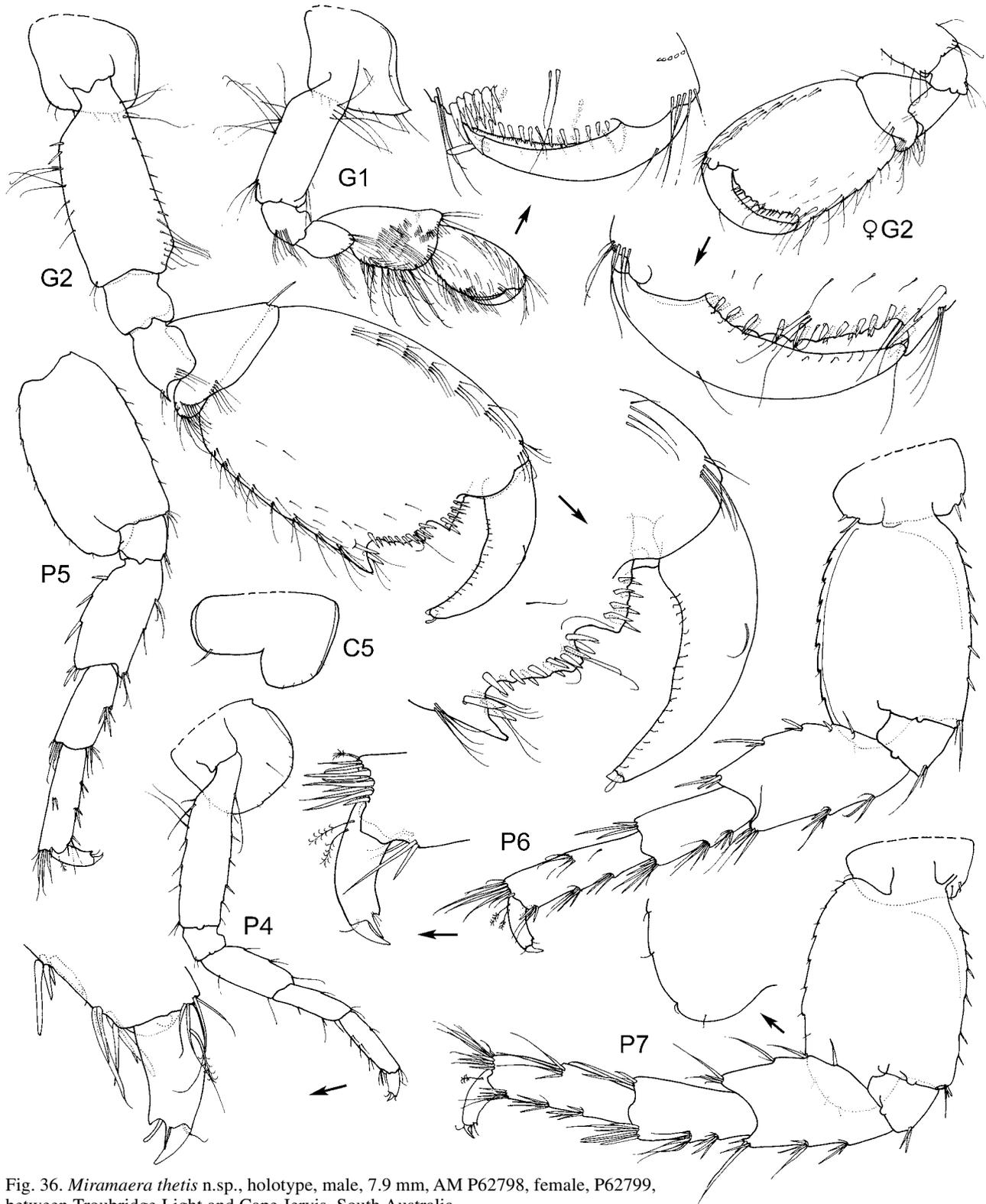


Fig. 36. *Miramaera thetis* n.sp., holotype, male, 7.9 mm, AM P62798, female, P62799, between Troubridge Light and Cape Jervis, South Australia.

***Parelasmopus* Stebbing, 1888**

***Parelasmopus sowpigenensis* n.sp.**

Figs. 37–40

Type material. HOLOTYPE, ♂, 8.9 mm, AM P60496; 1 PARATYPE, ♀, 7.1 mm, AM P60497; 16 PARATYPES, 3 ♂♂, 13 ♀♀, AM P60498; 21 PARATYPES, 13 ♂♂, 8 ♀♀, AM P60499, off Sow and Pigs reef, Port Jackson, New South Wales, Australia, 33°50.3'S 151°16.2'E, shelly sand, 5 m, benthic grab, J.K. Lowry & A.R. Jones, 30 September 1976, stn NSW-184.

Type locality. Sow and Pigs Reef, Port Jackson, New South Wales, 33°50.3'S 151°16.2'E, shelly sand, 5 m.

Description. Based on holotype male, AM P60496 and paratype female, AM P60497.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner with acute/subacute spine. *Antenna 1* longer than *antenna 2*; peduncular article 1 subequal in length to article 2, with 3 robust setae

along posterior margin; flagellum with 22 articles; accessory flagellum with 4 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 longer than or subequal to article 5; flagellum with 6 articles. *Mandible* palp article 3 rectilinear, setose on distomedial margin, subequal to or shorter than article 1; article 2 shorter than article 3; article 1 curved, swollen distally, longer than article 2, at least 3× as long as broad. *Maxilla 1* inner plate with 2 setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner not produced, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus short; propodus without medial depression, without strong concentration of setae, palm nearly transverse, straight, smooth, with group of anterodistal robust setae, defined by posterodistal robust setae, without posteroventral corner; dactylus apically blunt. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin slightly concave, posteroventral corner broadly rounded, narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin straight, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner narrowly rounded or subquadrate. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with small acute spine. *Urosomite 1* dorsally bicarinate. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* each lobe with 3

or more apical/subapical robust setae, apical conical extension reaching scarcely one third along longest seta.

Female (sexually dimorphic characters). *Gnathopod 2* carpus long; propodus palm acute, convex, lined with robust setae, defined by posteroventral corner; dactylus apically acute/subacute.

Habitat. Marine; littoral; shelly sand, 5 m depth.

Etymology. Named for the Sow and Pigs Reef, the type locality.

Remarks. This species fits *Pareiasmopus* because of the highly distinctive mandibular palp with its very long first article and very short second article, but it differs from the generic definition in not having a serrate posteroventral margin on epimeron 3, nor does it have dorsally bicarinate first and second pleonites. J.L. Barnard (1972a) established *Ifalukia* for one species of *Pareiasmopus* that lacked dorsal carinae on the pleonites and urosomites, and lacked posteroventral serrations on epimeron 3. *Pareiasmopus sowpigiensis* is most similar to *Ifalukia*, but differs in having a dorsally bicarinate first urosomite. It therefore strictly fits neither genus. If the mandibular palp is the main synapomorphy defining *Pareiasmopus*, then it appears that some species in the complex have either lost or never had dorsal carinae or serrate ventral margins. Until the phylogenetic implications of these questions can be analysed it is best to maintain a broad concept of the genus.

Pareiasmopus sowpigiensis is therefore a distinctive species differing from other Australian species in having dorsally smooth first and second pleonites and smooth ventral margins on epimeron 3.

Distribution. *New South Wales*: Sow and Pigs Reef, Port Jackson (AM).

Australian geographic areas. Southeastern Australia.

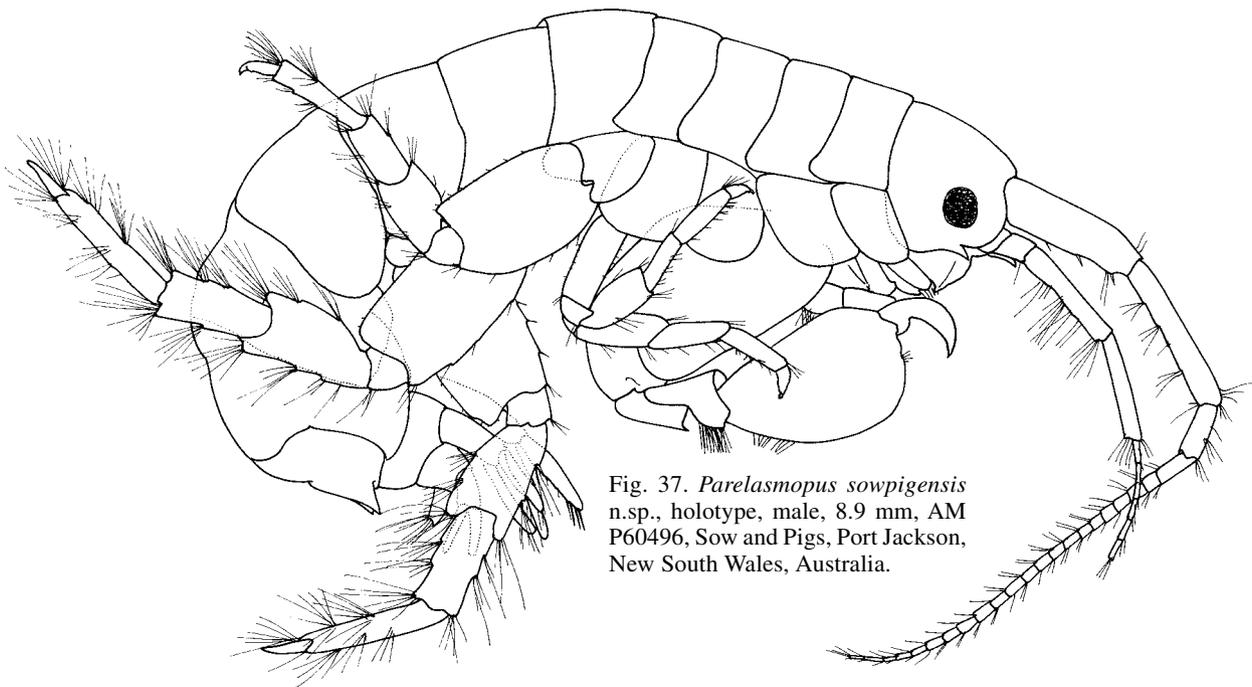


Fig. 37. *Pareiasmopus sowpigiensis* n.sp., holotype, male, 8.9 mm, AM P60496, Sow and Pigs, Port Jackson, New South Wales, Australia.

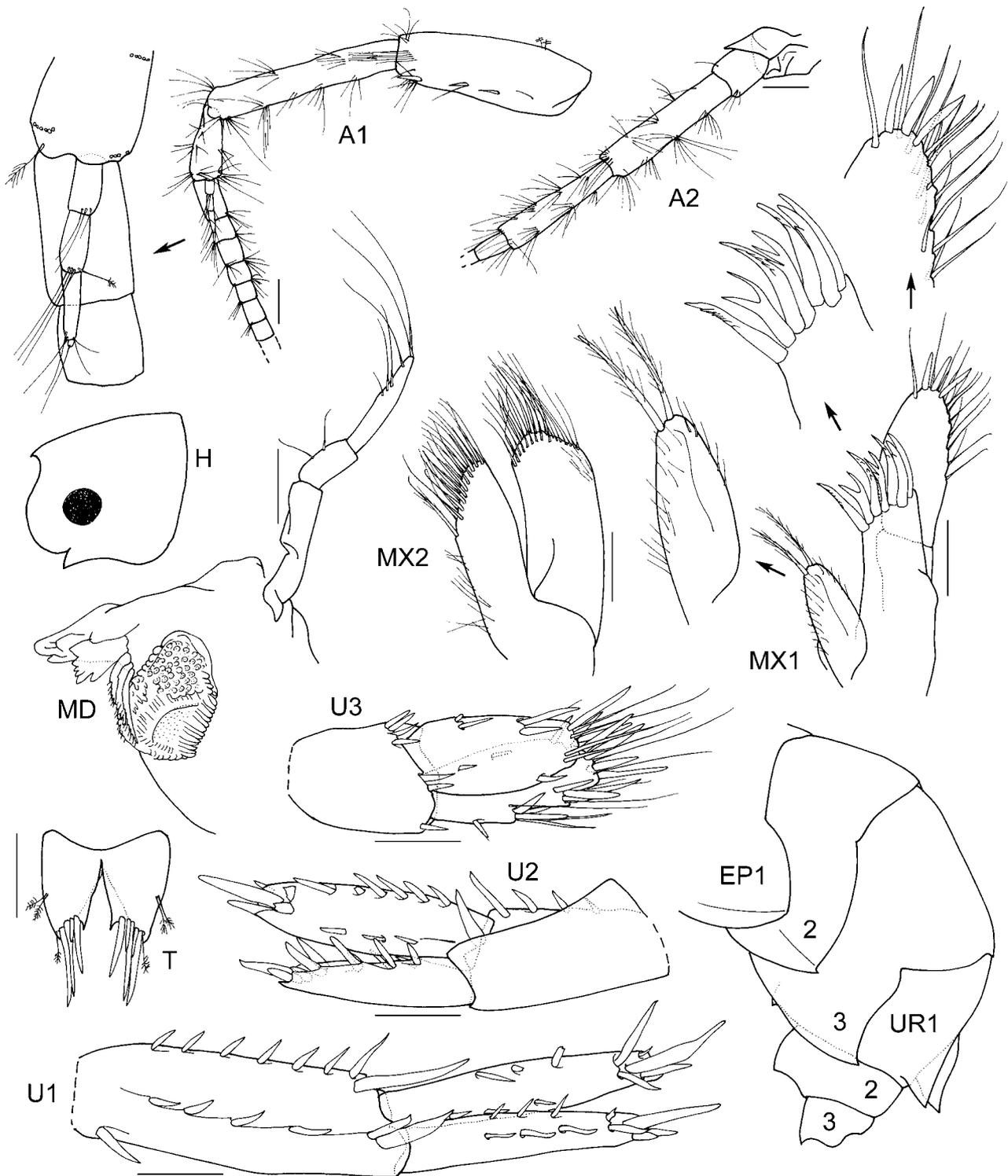


Fig. 38. *Parelasmopus sowpigensis* n.sp., holotype, male, 8.9 mm, AM P60496, Sow and Pigs, Port Jackson, New South Wales, Australia. Scales for mouthparts represent 0.1 mm, remainder represent 0.2 mm.

Quadrivisio Stebbing, 1907

***Quadrivisio sarina* n.sp.**

Figs. 41–43

Type material. HOLOTYPE, ♀, 7.4 mm, AM P60482; 1 PARATYPE, ♂, 8.1 mm, AM P60484; 1 PARATYPE, ♀, AM P60483, Armstrong Beach, Sarina, Queensland, Australia, [approx. 21°46'S 149°29'E], sand beach, mid-tide level, N. Hacking, 18 December 1994.

Type locality. Armstrong Beach, Sarina, Queensland,

Australia, [approx. 21°46'S 149°29'E], sand beach, mid-tide level.

Description. Based on holotype female, AM P60482 and paratype male, AM P60484.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* shorter than antenna 2; peduncular article 1 longer than article 2, with 2 robust setae along posterior margin;

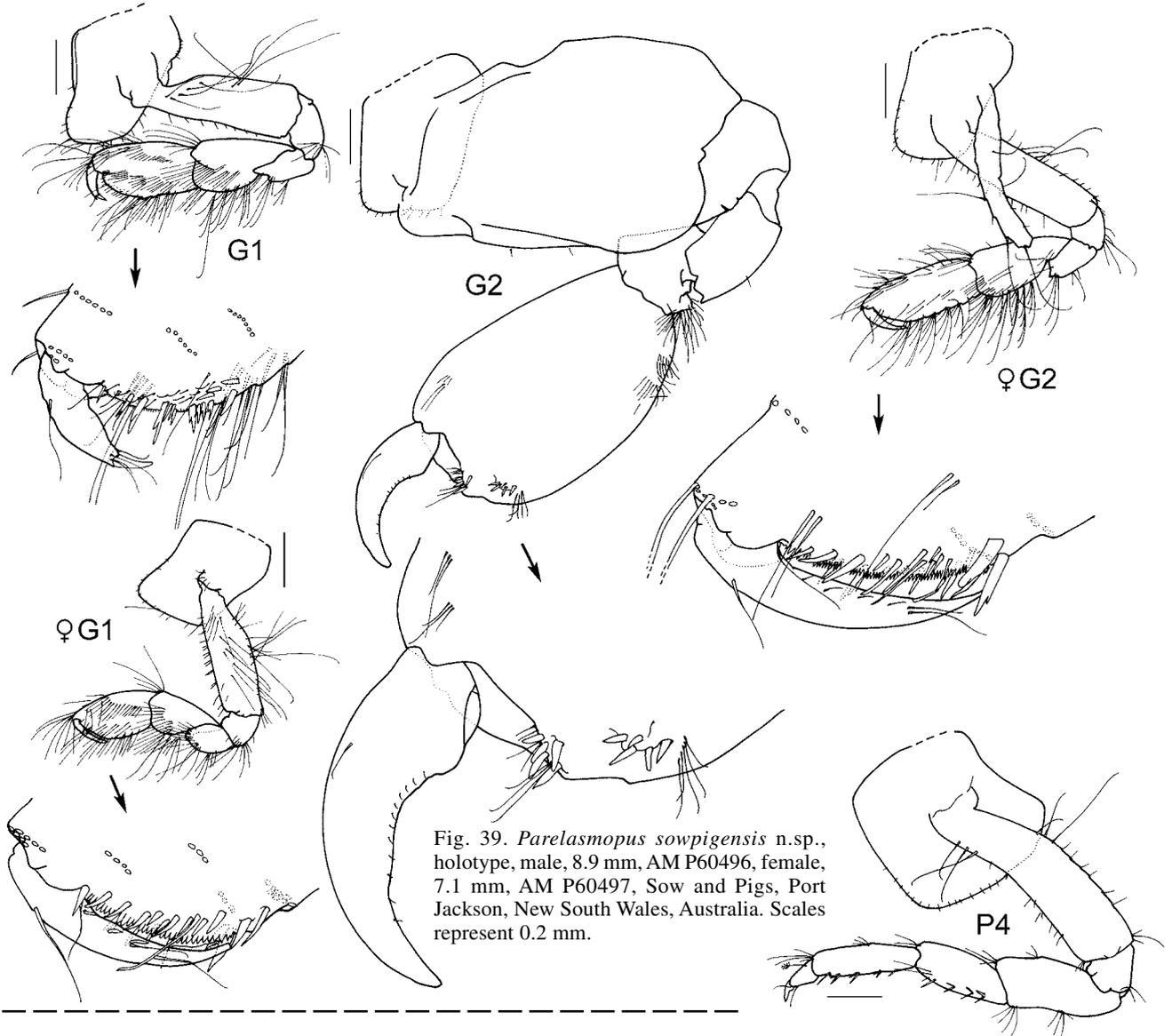


Fig. 39. *Parelasmopus sowpigenis* n.sp., holotype, male, 8.9 mm, AM P60496, female, 7.1 mm, AM P60497, Sow and Pigs, Port Jackson, New South Wales, Australia. Scales represent 0.2 mm.

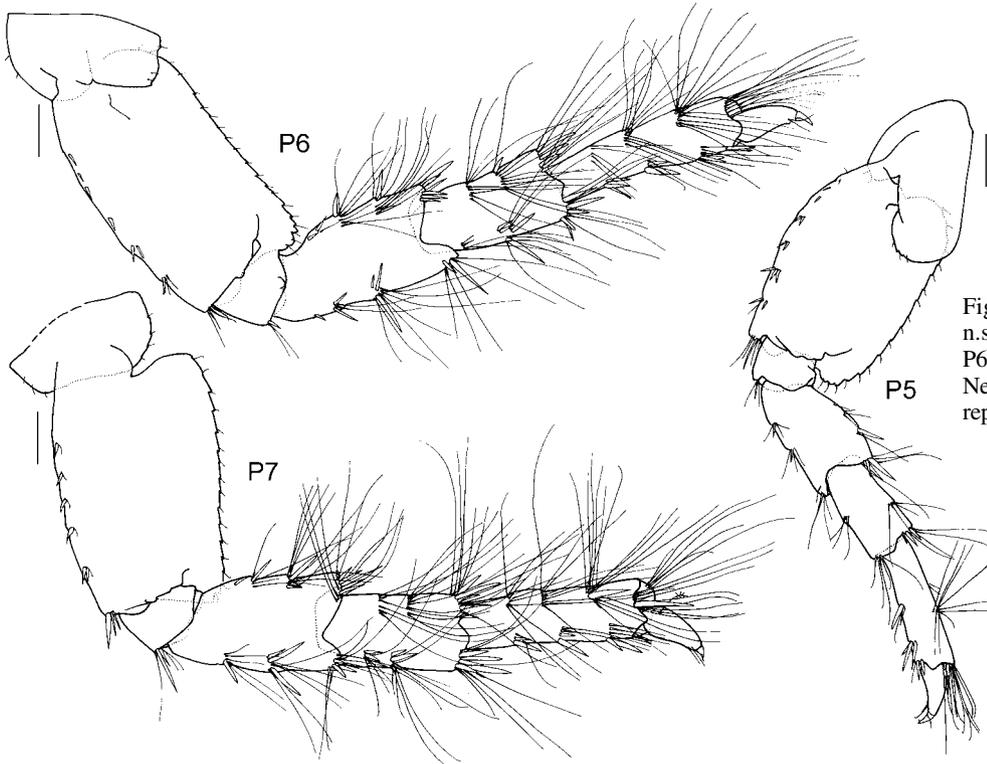


Fig. 40. *Parelasmopus sowpigenis* n.sp., holotype, male, 8.9 mm, AM P60496, Sow and Pigs, Port Jackson, New South Wales, Australia. Scales represent 0.2 mm.

flagellum with at least 14 articles; accessory flagellum with 6 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 subequal to article 5; flagellum with 15 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 subequal to or shorter than article 3; article 1 produced distally, shorter than article 2, about as long as broad. *Maxilla 1* inner plate setose along entire inner margin.

Pereon. *Gnathopod 1* coxa anteroventral corner not produced, posteroventral corner notch absent; merus without posterodistal spine; propodus palm nearly transverse, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with rounded posteroventral corner, or with subquadrate posteroventral corner; carpus compressed; propodus with medial depression, without strong concentration of setae, palm extremely acute, convex, smooth, lined with robust setae, defined by posterodistal robust setae, without posteroventral corner; dactylus apically acute/subacute. Pereopod 5–6 basis posterior margin convex, posteroventral corner narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate.

Pleon. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with small acute spine. *Urosomite 1* with posterodorsal spine. *Urosomite 2* with two groups of 1–3 small dorsolateral robust setae. *Uropod 3* inner ramus subequal in length to outer ramus; outer ramus longer (1.2 to 2× length) than peduncle, 1-articulate. *Telson* with 1 robust seta per lobe on inner margins, each lobe with 3 or more apical/subapical robust setae, apical conical extension absent.

Female (sexually dimorphic characters). *Gnathopod 2* merus with sharp posteroventral spine or with subquadrate posteroventral corner; propodus without medial depression, defined by posteroventral corner or without posteroventral corner.

Habitat. Marine; littoral; intertidal sand beach, mid-tide level.

Etymology. Named for the Queensland town of Sarina, near the type locality of the species.

Remarks. This is the first record of *Quadrivisio* in Australian waters. It is most similar to *Q. bengalensis* Stebbing, 1907, in having robust setae on the inner margins of the telson. *Quadrivisio sarina* differs from that species in the shape of the basis of pereopod 7 and in the shape of the palm of gnathopod 2. The antennae and rami of uropod 3 are generally less setose in *Quadrivisio sarina*.

Distribution. Queensland: Armstrong Beach, near Sarina (AM).

Australian geographic areas. Northeastern Australia.

Eriopisa group

Victoriopisa Karaman & Barnard, 1979

Victoriopisa australiensis (Chilton)

Figs. 44–46

Niphargus australiensis Chilton, 1923: 80, fig. 1.—Sheard, 1937: 24. *Victoriopisa australiensis*.—Stock, 1980: 383.—Stock & Platvoet, 1981: 30 (key).—Barnard & Barnard, 1983: 670.—Karaman, 1984: 58.—Jones, *et al.*, 1986: 541.—Jones, 1987: 623.—Hutchings *et al.*, 1989: 362.

Type material. Holotype, AM P5852, in South West Creek, 400 m from the sea, Macleay River, South West Rocks, Trial Bay, New South Wales, [approx. 30°53'S 153°03'E], tidal lagoon, J.R. Kinghorn, 1920.

Additional material examined. New South Wales: 4 specimens, AM P63955, near boat ramp, Hickey Island, Clarence River, New South Wales, Australia, 29°26.039'S 153°21.552'E (GPS), sand silt, van Veen grab, 3 m, P. Hutchings *et al.*, 25 February 2003, stn NSW-2120. 1 specimen, AM P56683, near Fred Hansen Bridge Boambee Creek, Sawtell, 30°20.8'S 153°05.6'E, seagrass (*Zostera*) and mud, 0.2 m, Australian Museum party, 8 March 1992, stn NSW-718. 1 ♂, 11.1 mm, AM P56684, 50 m upstream from Fred Hansen Bridge, Boambee Creek, Sawtell, New South Wales, Australia, 30°20.8'S 153°05.6'E, seagrass (*Zostera*), 0.5 m, sweep net at low tide, Australian Museum party, 8 March 1992, stn NSW-719. 1 specimen, AM P60599, 50 m upstream from Fred Hansen Bridge, Boambee Creek, Sawtell, 30°20.8'S 153°05.6'E, seagrass (*Zostera*), 0.5 m, sweep net at low tide, Australian Museum party, 8 March 1992, stn NSW-719. 2 specimens, AM P54276, Wallis Lake, [approx. 32°17'S 152°30'E], M. Lincoln-Smith, stn *Zostera* Bay 5. Many specimens, AM P30831-P30971, near mangroves, north west side Fullerton Cove, Hunter River, [approx. 32°50'S 151°46.5'E], soft mudflat, 0–3.5 m, Australian Littoral Society, NSW Division, between 8 June 1975 and 12 November 1977, transects A1–4, B1–3, C6–7. 1 specimen, AM P54283, Ermington Bay, Parramatta River, 33°49.2'S 151°04.1'E, Coast and Wetlands Society

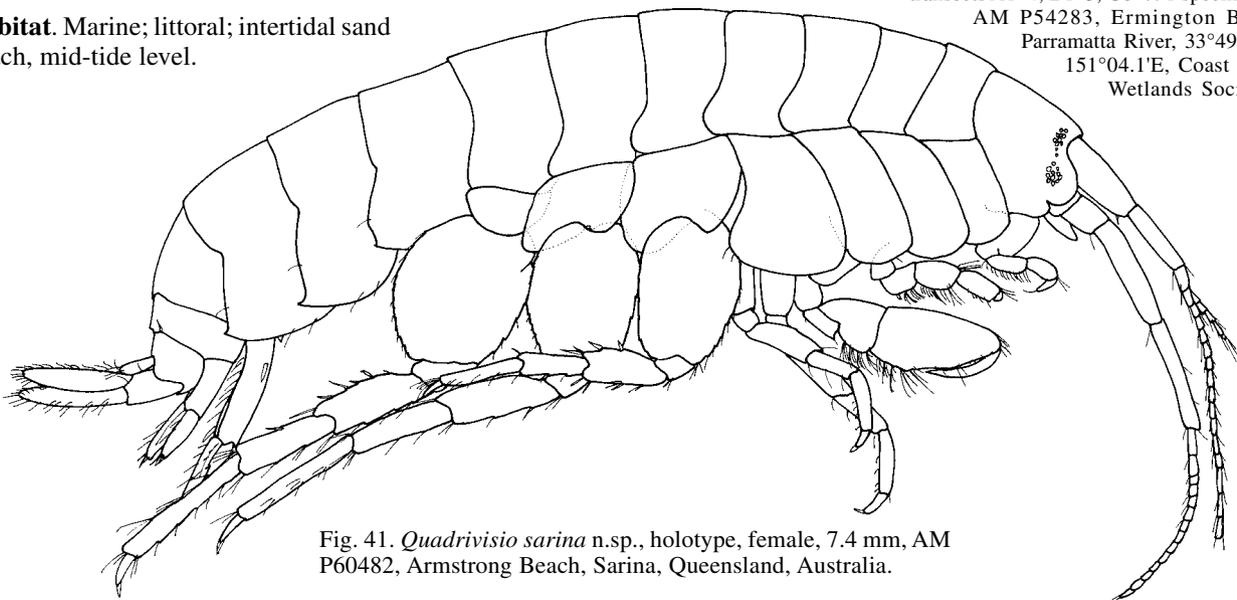


Fig. 41. *Quadrivisio sarina* n.sp., holotype, female, 7.4 mm, AM P60482, Armstrong Beach, Sarina, Queensland, Australia.

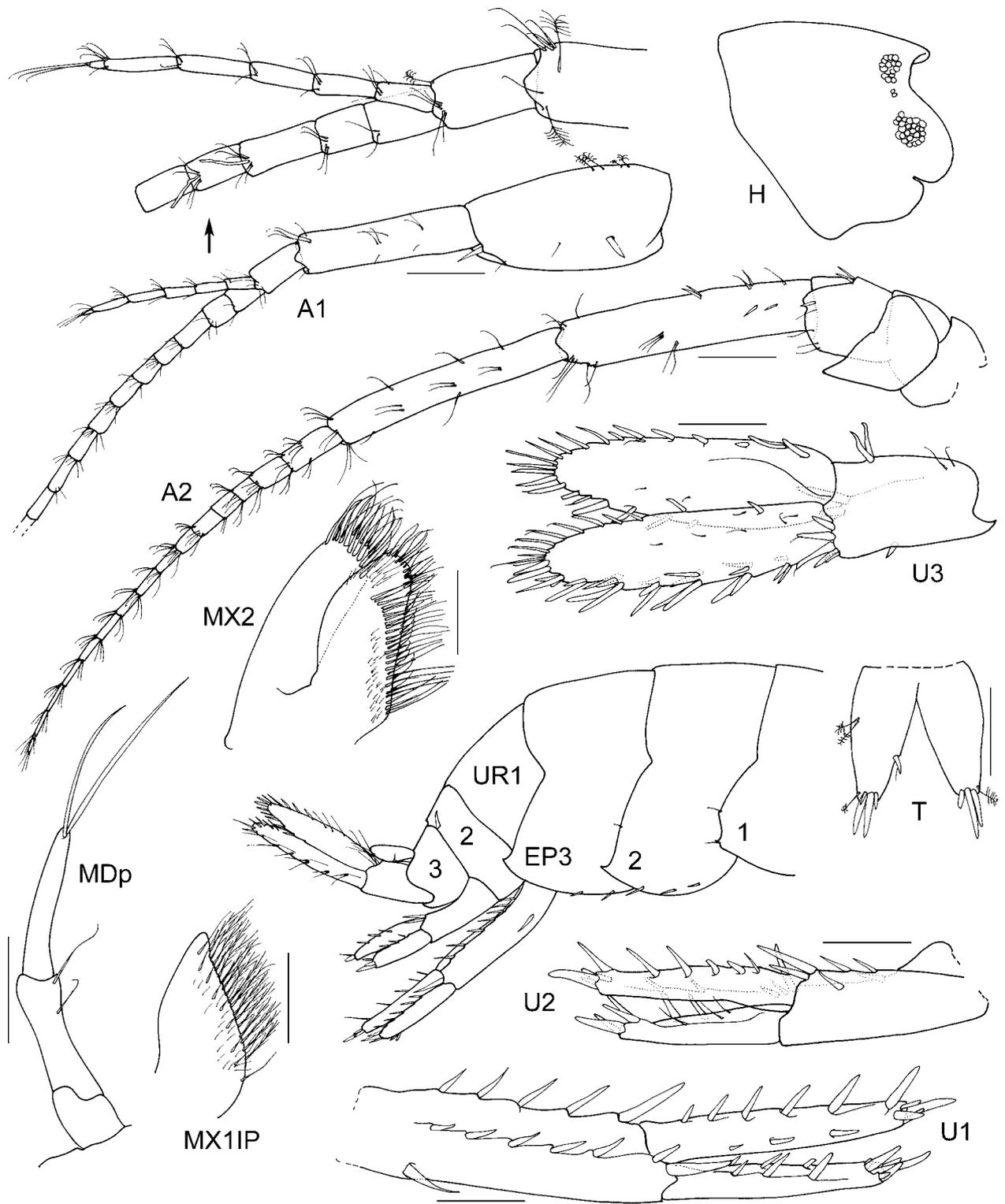


Fig. 42. *Quadrivisio sarina* n.sp., holotype, female, 7.4 mm, AM P60482, Armstrong Beach, Sarina, Queensland, Australia. Scales for mouthparts represent 0.1 mm, remainder represent 0.2 mm.

Survey, 8 October 1985, stn 6, 6. 5 specimens, AM P55282, 1 km upstream of Thackeray Street footbridge, Parramatta River, New South Wales, 33°49.24'S 151°02.17'E, muddy sand, 3.3 m, P. Berents & party, 7 December 1994, Site 2, Rep 1, Upper Parramatta River Dredging Survey, 1992–1994. 4 specimens, AM P54282, Brays Bay, Parramatta River, 33°50.0'S 151°05.5'E, Coast & Wetlands Society Survey, 8 October 1985, stn 1, 8. 2 specimens, AM P54284, Homebush Bay, Parramatta River, 33°50'S 151°05'E, Coast & Wetlands Society Survey, 8 October 1985, stn 5, 6. 50 specimens, AM P41818, south end of Homebush Bay, New South Wales, 33°50.03'S 151°04.73'E, 2.5 m, Van Veen grab, P.

Berents & party, 26 November 1992, site 25. 2 specimens, AM P54277, Cabarita, Parramatta River, 33°51'S 151°07'E, L. Garcia, 8 September 1988, stn D7.r1. 1 specimen, AM P55249, Back Creek mangrove, Tuross Lake, 36°03.67'S 150°06.43'E, mud, Australian Museum Eurobodalla Shire Estuary Survey, 16 September 1974. 2 specimens, AM P36699, Shadrachs Creek, Twofold Bay, 37°04.8'S 149°52.5'E, *Zostera*, infauna, S. Keable & A. Reid, 26 June 1985, stn L2.

Type locality. South West Rocks, Trial Bay, New South Wales, [approx. 30°53'S 153°03'E], tidal lagoon.

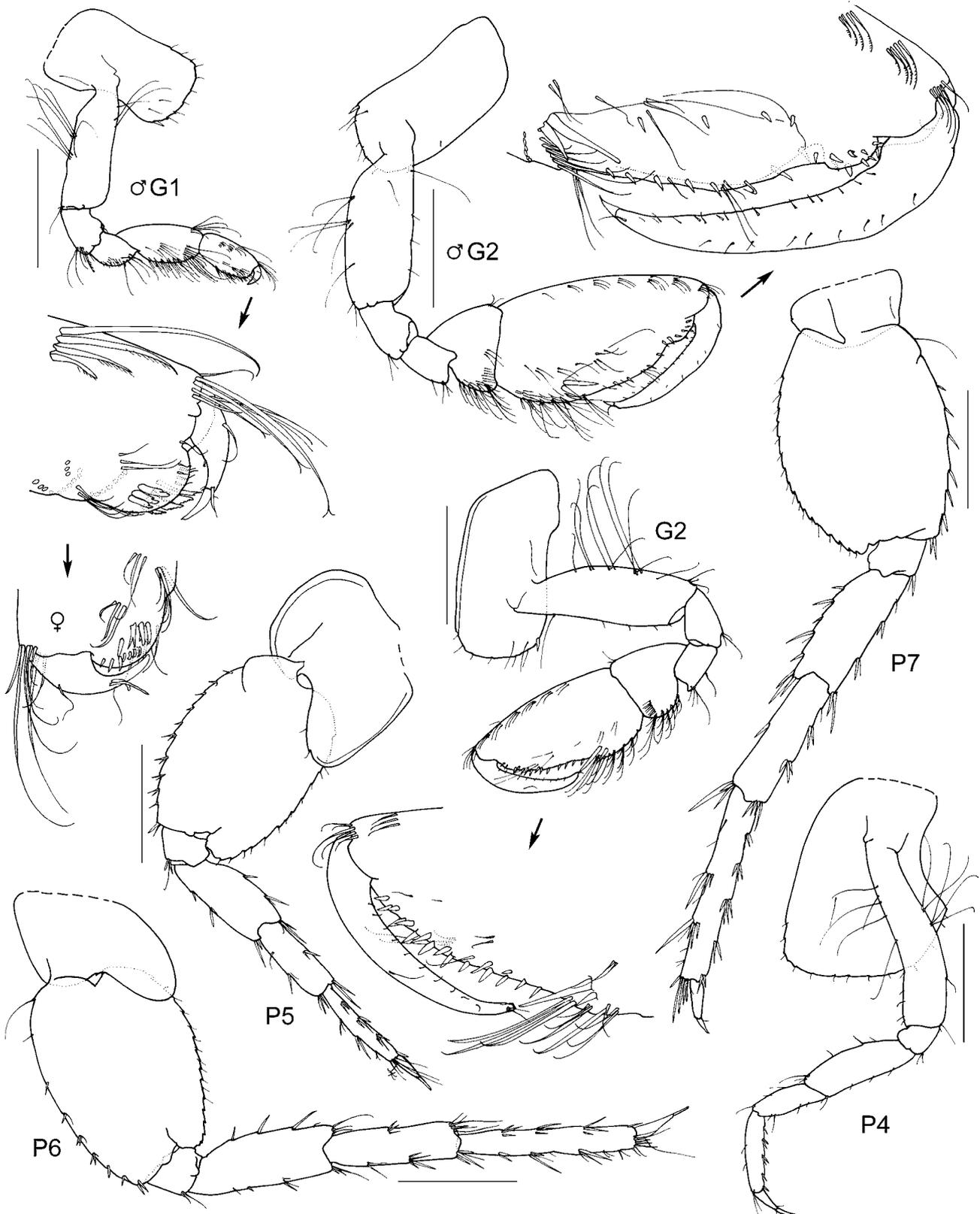


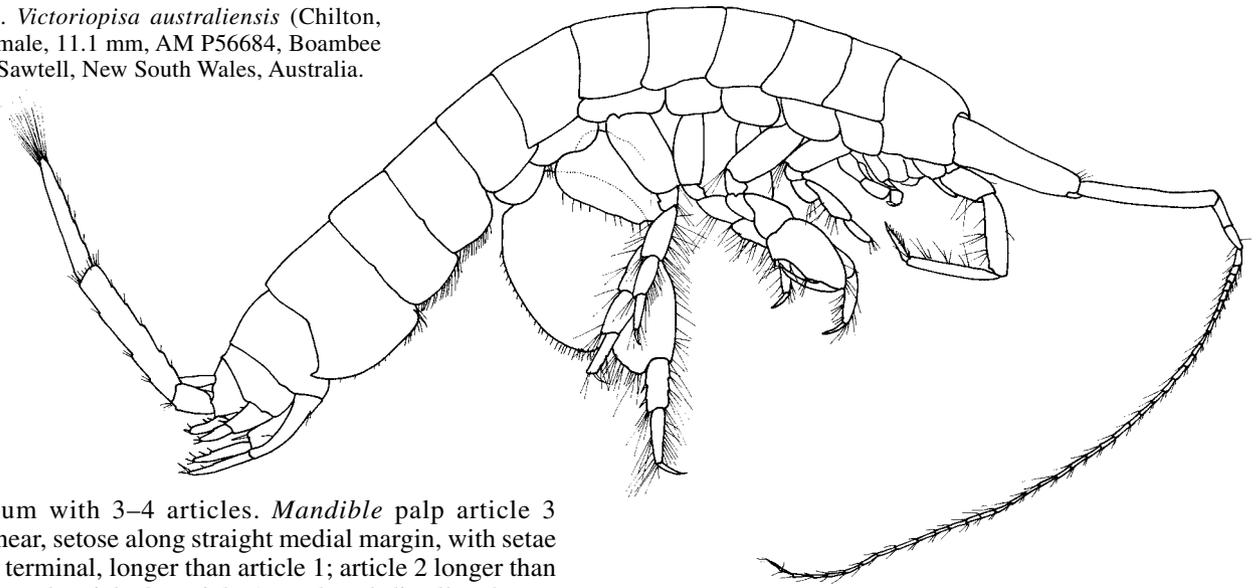
Fig. 43. *Quadrivisio sarina* n.sp., holotype, female, 7.4 mm, AM P60482, paratype male, 8.1 mm, AM P60484, Armstrong Beach, Sarina, Queensland, Australia. Scales represent 0.5 mm.

Description. Based on male, AM P56684.

Head. Eyes absent; lateral cephalic lobes absent, lacking notch or slit, anteroventral corner rounded. *Antenna 1* longer than *antenna 2*; peduncular article 1 subequal in length to

article 2, without robust setae along posterior margin; peduncular article 2 geniculate with article 3; flagellum with 33 articles; accessory flagellum with 2 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 shorter than article 5;

Fig. 44. *Victoriopisa australiensis* (Chilton, 1923), male, 11.1 mm, AM P56684, Boambee Creek, Sawtell, New South Wales, Australia.



flagellum with 3–4 articles. *Mandible* palp article 3 rectilinear, setose along straight medial margin, with setae mostly terminal, longer than article 1; article 2 longer than or subequal article 3; article 1 produced distally, shorter than article 2, about as long as broad. *Maxilla 1* inner plate setose along entire inner margin.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; propodus palm nearly transverse, convex, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* not sexually dimorphic, subchelate; coxa posteroventral corner notch absent; merus with rounded or

subquadrate posteroventral corner; carpus short; propodus without medial depression, palm acute, concave, smooth, with sparse robust setae, defined by posteroventral corner; dactylus apically acute/subacute. *Pereopods 5–6* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate; carpus and propodus with many long, slender setae along anterior margin. *Pereopod 7* basis posterior margin convex, with

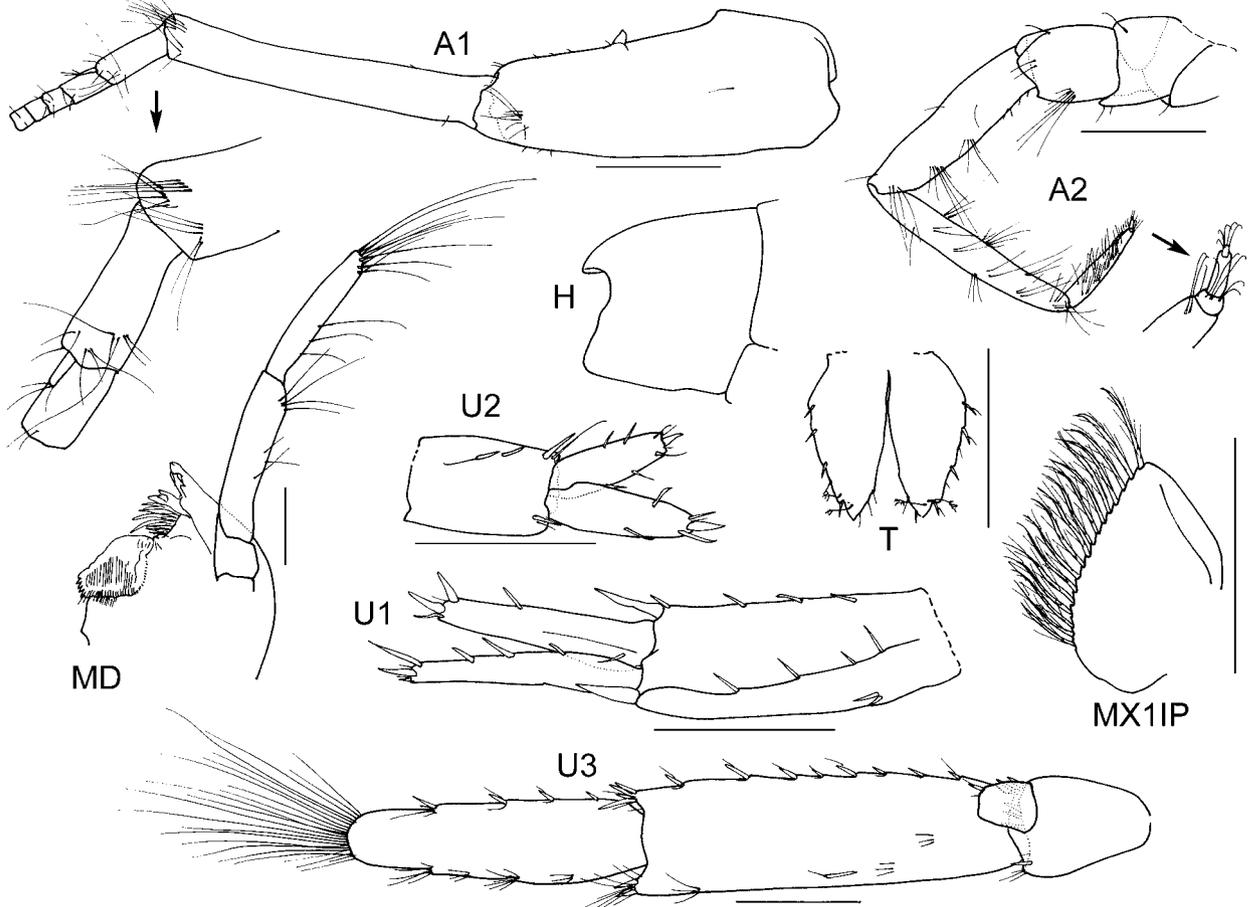


Fig. 45. *Victoriopisa australiensis* (Chilton, 1923), male, 11.1 mm, AM P56684, Boambee Creek, Sawtell, New South Wales, Australia. Scales for MD, MX1IP represent 0.2 mm, remainder represent 0.5 mm.

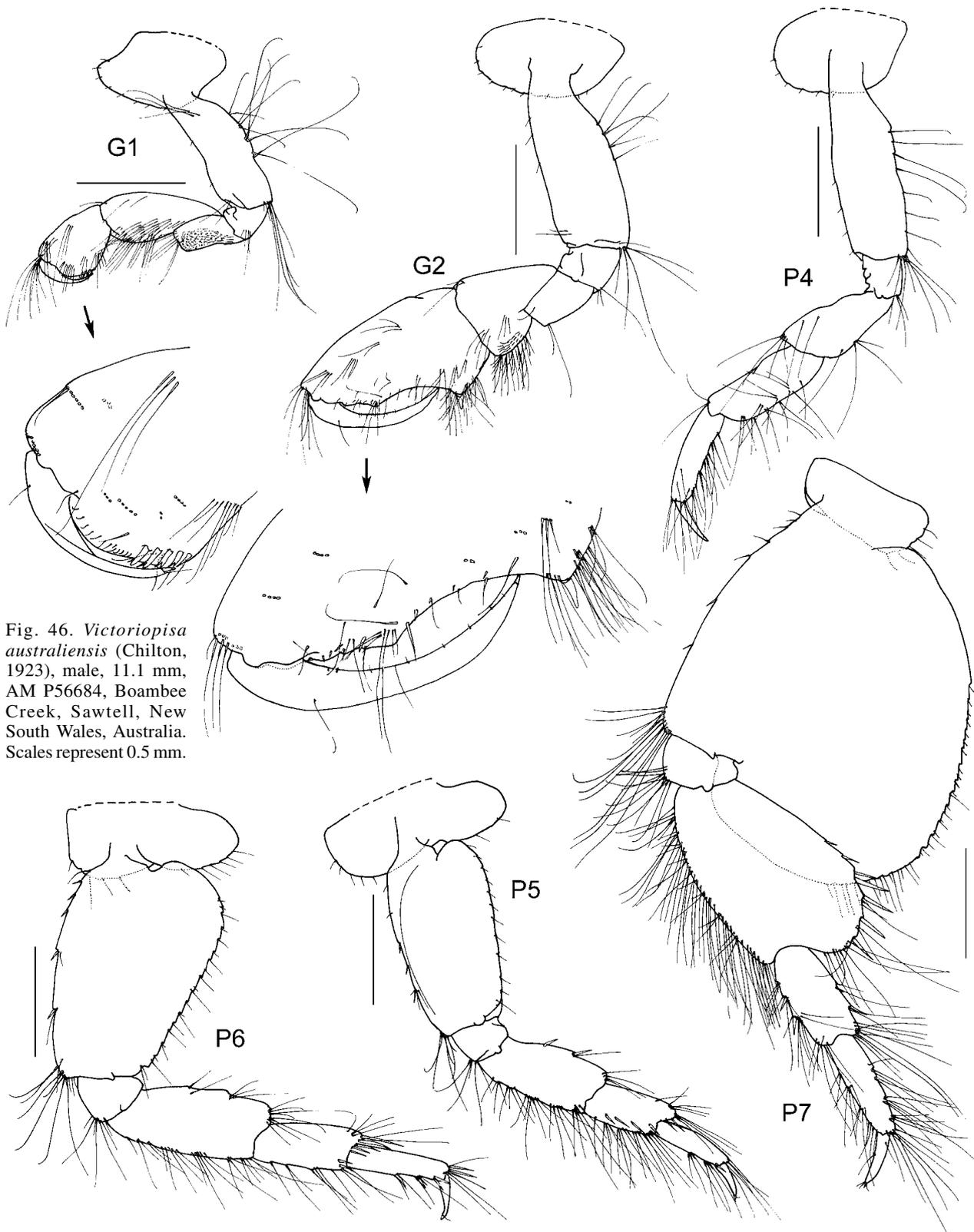


Fig. 46. *Victoriopisa australiensis* (Chilton, 1923), male, 11.1 mm, AM P56684, Boambee Creek, Sawtell, New South Wales, Australia. Scales represent 0.5 mm.

posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded; merus posterodistal margin broadly rounded.

Pleon. *Epimeron 1* posteroventral corner narrowly rounded or subquadrate. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with small acute spine

or with strongly produced acute spine. *Uropod 1* peduncle with 2 basofacial robust setae. *Uropod 3* inner ramus scale-like, much shorter than outer ramus; outer ramus much longer (more than 2× length) than peduncle, 2-articulate. *Telson* without apical robust setae, apical conical extension absent.

Habitat. Estuarine; littoral; mangrove mud flats and seagrasses; 0 to 3 m depth.

Remarks. The holotype (AM P5852) was originally deposited in Australian Museum, but assumed to be lost (Springthorpe & Lowry, 1994). Consequently another specimen from near the type locality (AM P56684) was illustrated and used for the description. Since then the type specimen has been located.

Victoriopisa australiensis and *V. marina* differ most obviously from each other as follows. In *V. australiensis* the male gnathopod 2 has a short carpus and the palm of the propodus is broadly excavate and not bordered by robust setae, whereas in *V. marina* the carpus is compressed and the palm is narrowly excavate and bordered by robust setae. *Victoriopisa australiensis* has a large, broadly expanded basis and merus on pereopod 7 with many slender setae distally. In *V. marina* the basis and merus are narrower and the distal part of the pereopod is not nearly as setose.

Distribution. *New South Wales:* Southwest Creek, Trial Bay (Chilton, 1923); Boambee Creek, Sawtell; Wallis Lake; Fullerton Cove, Hunter River; Hawkesbury River (Jones *et al.*, 1986; Jones, 1987); Pittwater; Parramatta River; Botany Bay; Tuross; Twofold Bay (all AM).

Australian geographic areas. Southeastern Australia.

***Victoriopisa marina* n.sp.**

Figs. 47–49

Victoriopisa sp. 2 Jones *et al.*, 1986: 541

Victoriopisa sp. Jones, 1987: 623.

Type material. HOLOTYPE, ♂, 8.1 mm, AM P61227, Cobblers (Bate Bay), New South Wales, Australia, [approx. 34°07'S 151°10'E], 65–70 m, grab, Ecology Lab, October 1990, stn T3-135. 1 PARATYPE, ♀, 7.4 mm, AM P41961, 800 m southwest of airport runway, Botany Bay, New South Wales, Australia, 33°58.33'S 151°10.22'E, 7 m, Australian Museum party, 7 April 1992, stn NSW-771.

Additional material examined. *New South Wales:* 1 ♂, 1 ♀, AM P53976, Royal Motor Yacht Club, Pittwater, 33°39.2'S 151°18.0'E, fine mud, 12 m, C. Rose, December 1992, stn RMYC A5. 1 ♂, AM P61360, between Juno Head and Hungry Beach, Hawkesbury River, 33°34'S 151°16'E, muddy sand, 10 m, Smith-McIntyre grab, A.R. Jones & C. Watson-Russell, 7 August 1979, stn HES 1–3.

Type locality. Cobblers (Bate Bay), New South Wales, Australia [approx. 34°07'S 151°10'E], 65–70 m.

Description. Based on holotype male, AM P61227 and paratype female, AM P41961.

Head. Eyes absent; lateral cephalic lobes absent, lacking notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 shorter than article 2, without robust

setae along posterior margin; peduncular article 2 geniculate with article 3; flagellum with 30 articles; accessory flagellum with 2 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 shorter than article 5; flagellum with 2–3 articles. *Mandible* palp article 3 rectilinear, with setae mostly terminal, longer than article 1; article 2 subequal to or longer than article 3; article 1 produced distally, shorter than article 2, about twice as long as broad. *Maxilla 1* inner plate setose along entire inner margin.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; propodus palm acute, convex, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* not sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with subquadrate posteroventral corner; carpus compressed; propodus without medial depression, without strong concentration of setae, palm acute, concave or sinusoidal, sculptured, with sparse robust setae and with group of anterodistal robust setae, defined by posteroventral robust setae, defined by posteroventral corner; dactylus apically acute/subacute. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate. *Pereopod 7* basis posterior margin convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded.

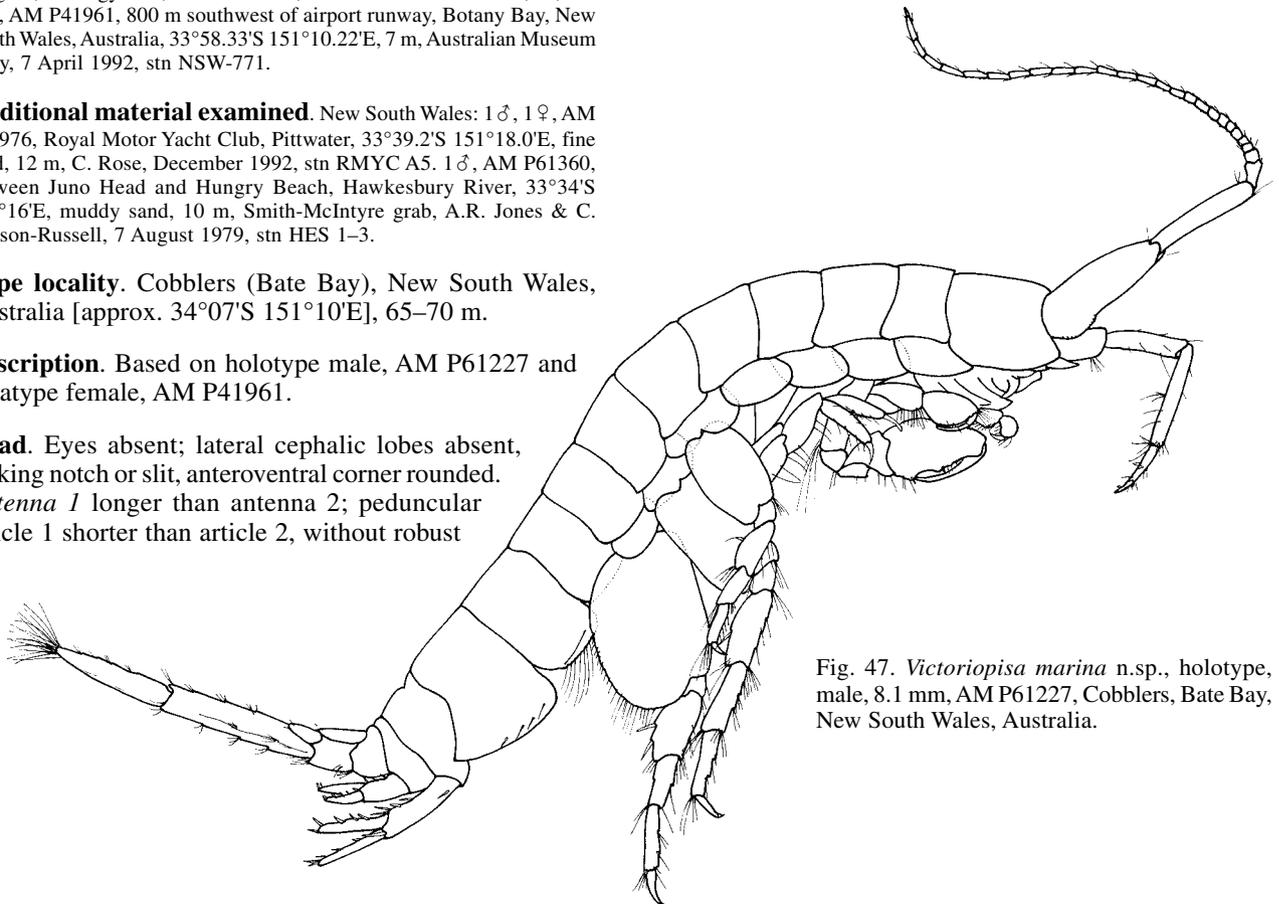


Fig. 47. *Victoriopisa marina* n.sp., holotype, male, 8.1 mm, AM P61227, Cobblers, Bate Bay, New South Wales, Australia.

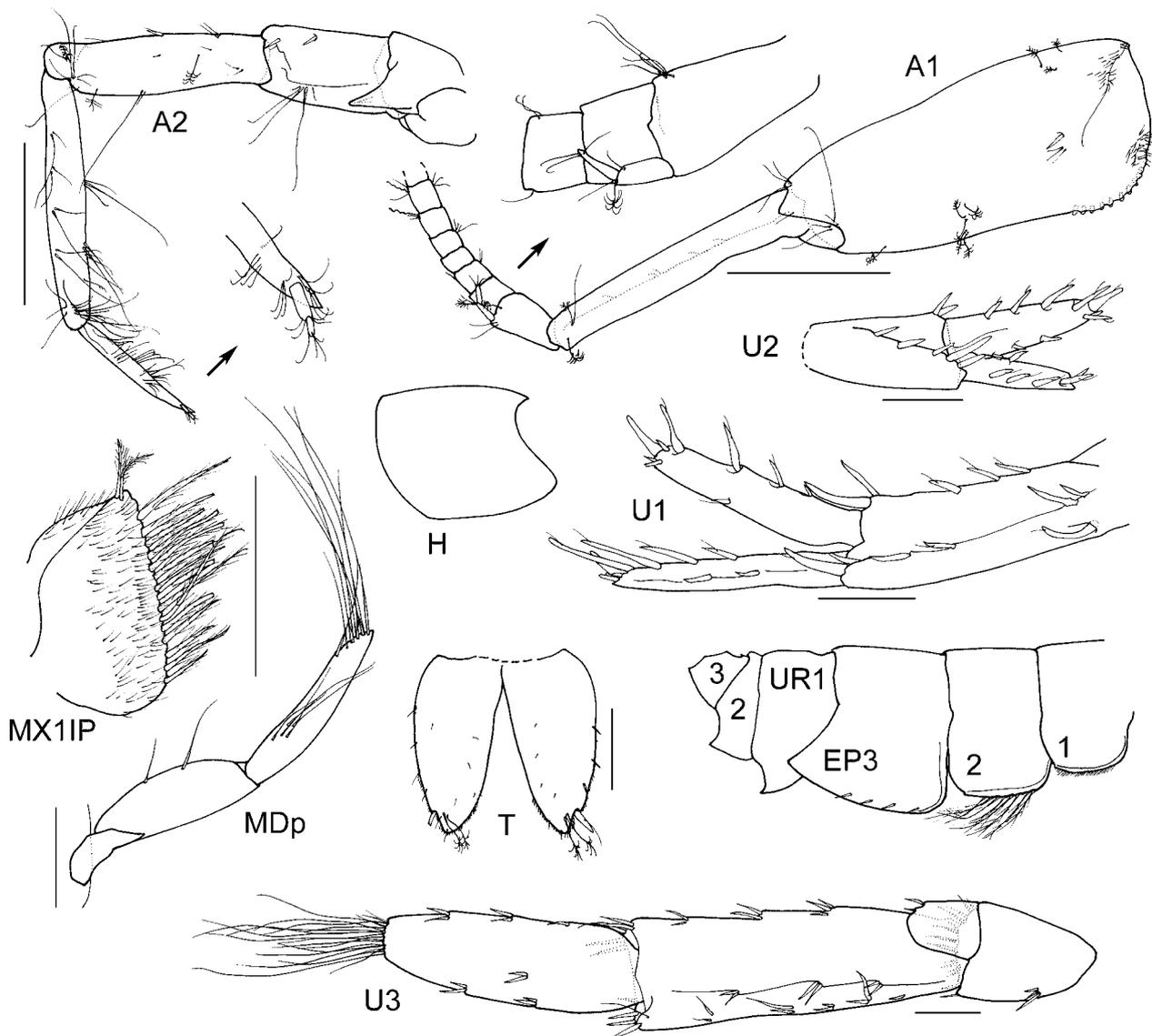


Fig. 48. *Victoriopisa marina* n.sp., holotype, male, 8.1 mm, AM P61227, Cobblers, Bate Bay, New South Wales, Australia. Scales for A1, A2, U3 represent 0.5 mm, remainder represent 0.2 mm

Pleon. *Epimeron 1* posteroventral corner broadly rounded. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with small acute spine or with strongly produced acute spine. *Urosomite 1–3* dorsally smooth. *Uropod 3* inner ramus scale-like, much shorter than outer ramus; outer ramus much longer (more than 2× length) than peduncle, 2-articulate. *Telson* without apical robust setae, apical conical extension absent.

Habitat. Marine and estuarine; littoral and continental shelf; fine to sandy mud, 7 to 70 m depth.

Remarks. *Victoriopisa marina* is most similar to species of *Victoriopisa* with slender seventh pereopods. It differs from all of these species in the extremely broadened palm of gnathopod 1 and the shape of the palm of gnathopod 2.

Distribution. *New South Wales:* Hawkesbury River (Jones *et al.*, 1986; Jones, 1987); Pittwater; Botany Bay; Cobblers, Bate Bay (all AM).

Australian geographic areas. Southeastern Australia.

Melita group

Dulichella Stout, 1912

Dulichella australis (Haswell)

Figs. 50–53

Melita australis Haswell, 1879a: 264, pl. 9, figs 6–7.—Haswell, 1882: 252.

Melita fresnelii.—Stebbing, 1906: 423 (in part).—Stebbing, 1910a: 596–597, 642.—Chilton, 1921b: 70.—Hale, 1927: 314.

Melita appendiculatus.—Stebbing, 1906: 428 (in part).

Dulichella australis.—Karaman & Barnard, 1979: 152.—Barnard & Barnard, 1983: 668.—Hutchings *et al.*, 1989: 362.

Type material. 5 SYNTYPES, AM G5393; 1 Syntype, AM P3495, Port Jackson, New South Wales, Australia, [approx. 33°51'S 151°16'E], [AM Old Collection]

Additional material examined. Queensland: many specimens, AM P61134, Lizard Island, Queensland, 14°40'S 145°28'E, October 1978. New South Wales: 3 specimens, AM P55002, northeast of Marys Rock, Cook Island, 28°11.42'S 153°34.79'E, tan sponge with large osculi, 18 m, G.D.F. Wilson, 8 June 1993, stn NSW-810. Several specimens, AM P56651; 1 specimen, AM P57284, 100 m north west of Julian Rocks,

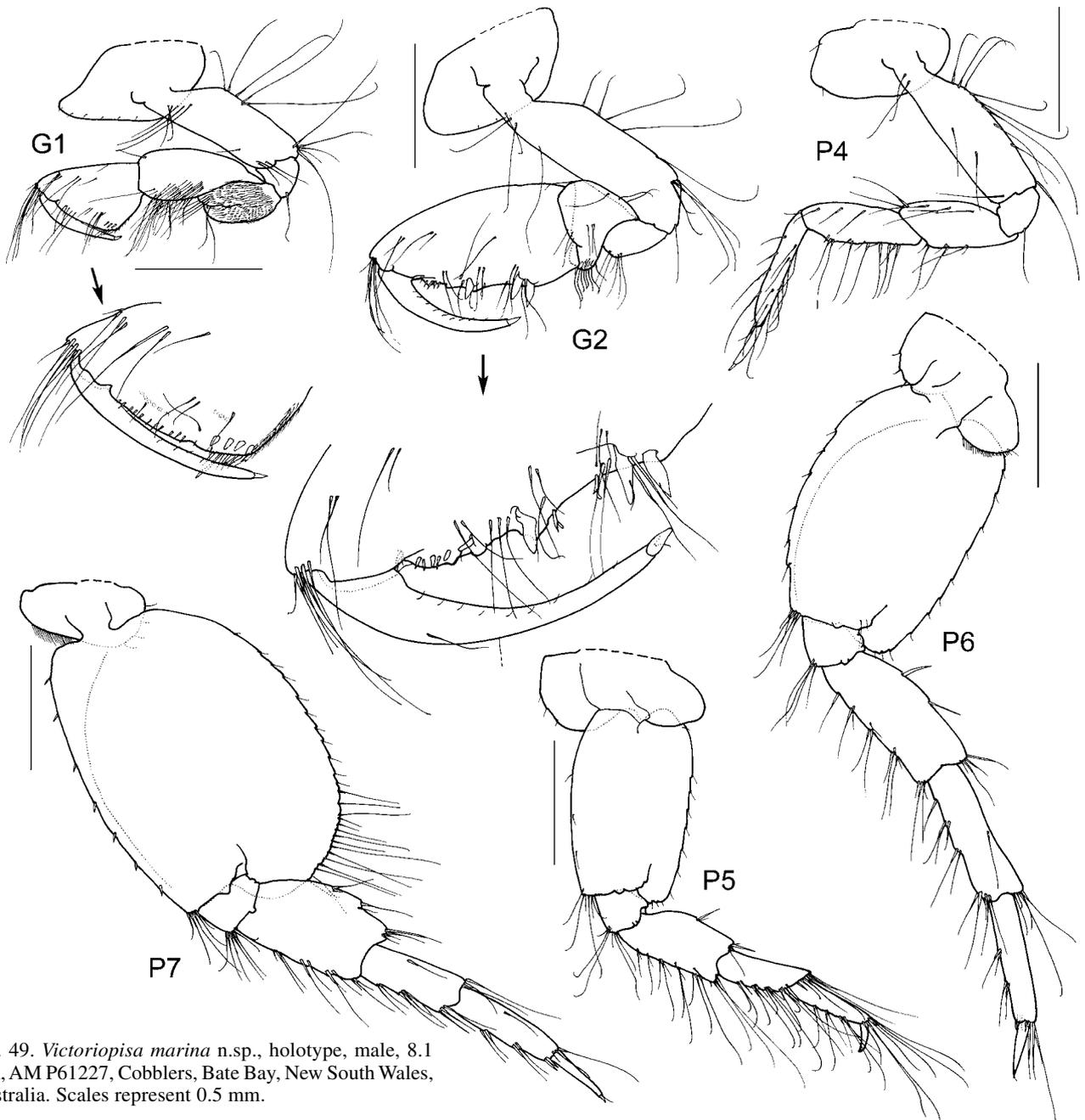


Fig. 49. *Victoriopisa marina* n.sp., holotype, male, 8.1 mm, AM P61227, Cobblers, Bate Bay, New South Wales, Australia. Scales represent 0.5 mm.

Byron Bay, 28°36.8'S 153°37.8'E, rock with finger sponge, 15 m, E.L. Albertson, R.T. Springthorpe & G.D.F. Wilson, 3 March 1992, stn NSW-635. 2 specimens, AM P57684, same locality, erect plate sponge, 15 m, E.L. Albertson, R.T. Springthorpe & G.D.F. Wilson, 3 March 1992, stn NSW-639. 5 specimens, AM P57285, same locality, mixed sponges, 17 m, stn NSW-642. 7 specimens, AM P56650, 100 m north west of Split Solitary Island, 30°14.0'S 153°10.8'E, plate coral, solitary ascidian, gorgonian & sponges, 15–17 m, G.D.F. Wilson, 7 March 1992, stn NSW-687. 4 specimens, AM P57105, same locality, under rock ledges, 15–17 m, R. Gentle (URG), 7 March 1992, stn NSW-697. 4 specimens, AM P57286, same locality, lace bryozoan, 17 m, R.T. Springthorpe & S.J. Keable, 7 March 1992, stn NSW-681. 5 specimens, AM P57287, same locality, sponge, 15–17 m, R.T. Springthorpe, 7 March 1992, stn NSW-683. 1 specimen, AM P57288, same locality, mixed red algae, 6 m, S.J. Keable, 7 March 1992, stn NSW-693. 3 specimens, AM P27266, Split Solitary Island, [approx. 30°15'S 153°12'E], 10 m, J. Marshall, 23 March 1978. 5 specimens, AM P56653, Coffs Harbour Jetty, Coffs Harbour, 30°18.4'S 153°08.5'E, orange sponge on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-729. Several specimens, AM P56654, same locality, *Pyura praeputialis* on jetty pilings, 8 m, P.B. Berents & S.J. Keable, 9 March 1992, stn NSW-733. Many specimens, AM P56655, same locality, arborescent sponge on jetty

pilings, 7 m, S.J. Keable, 9 March 1992, stn NSW-735. 24♂♂, 26♀♀, AM P57103, same locality, worm tubes encrusted with sponge on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-725. 1♂, AM P57104, same locality, coral scrapings on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-738. 11♀♀, 5♂♂, AM P57289, same locality, coral scrapings on jetty pilings, 6 m, R.T. Springthorpe, 9 March 1992, stn NSW-726. 2 specimens, AM P57290, same locality, *Diopatra* tubes at base of jetty pilings, 6.5 m, S.J. Keable & R.T. Springthorpe, 9 March 1992, stn NSW-730. 28♀♀, 16♂♂, AM P57291, same locality, finger sponge on jetty pilings, 4 m, R.T. Springthorpe, 9 March 1992, stn NSW-734. Many specimens, AM P61141, same locality, *Diopatra* tubes at base of jetty pilings, 8.5 m, S.J. Keable, 9 March 1992, stn NSW-728. 1 specimen, AM P56652, 150 m downstream of Fred Hansen Bridge, Boambee Creek, Sawtell, 30°20.4'S 153°05.5'E, exposed flat of sandy mud, 1.2 m, van Veen grab, Australian Museum party, 8 March 1992, stn NSW-724. 25 specimens, AM P3496, Port Stephens, [approx. 32°42'S 152°06'E], [AM Old Collection]. 1 specimen, AM P23158, 500 m east of Burwood Beach, 32°57.52'S 151°44.72'E, coarse sand bottom, 14 m, Shipek collection, Australian Museum Hunter District Water Board Survey, 18 December 1975, stn HDWBS06030101, transect 3. 1♂, AM P53923, west side of Box Head, Broken Bay, 33°33'S 151°21'E, bryozoan on rocky substrate with small crinoid *Antedon*

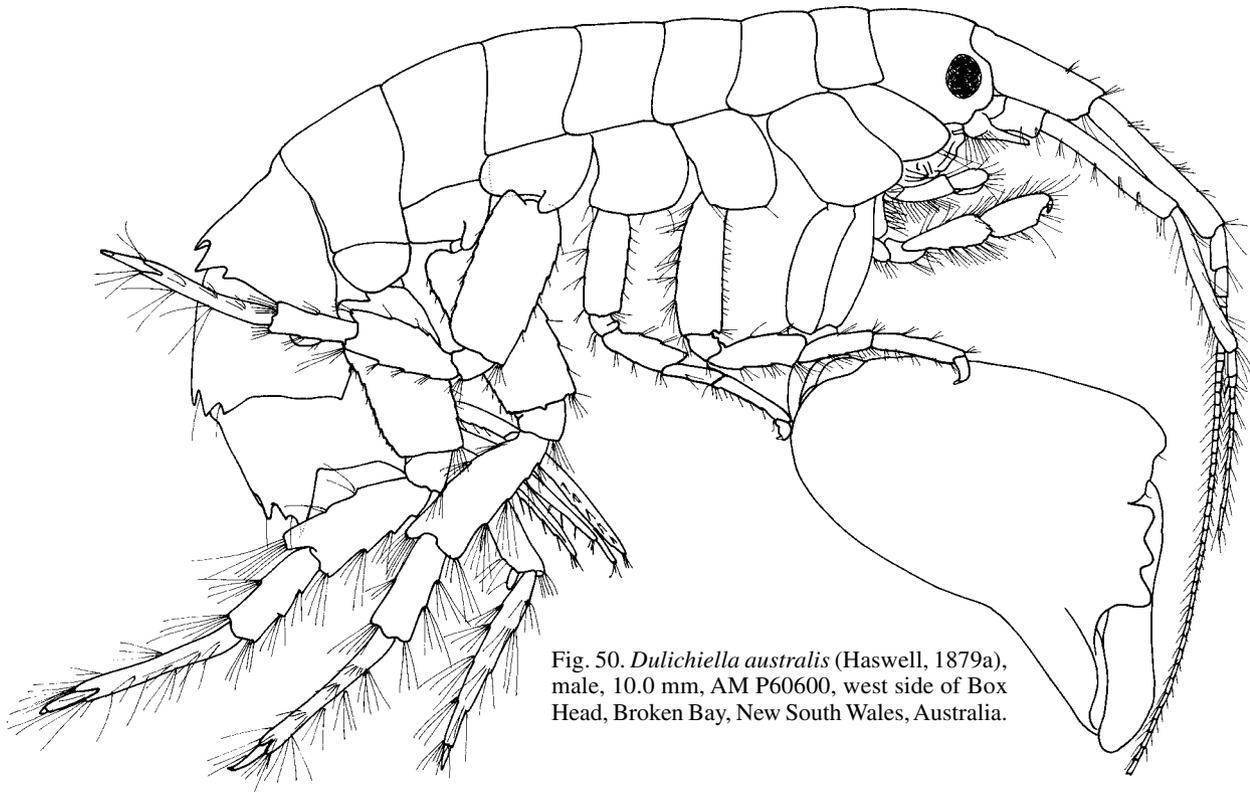


Fig. 50. *Dulichiella australis* (Haswell, 1879a), male, 10.0 mm, AM P60600, west side of Box Head, Broken Bay, New South Wales, Australia.

incomoda, 15 m, J.K. Lowry & R.T. Springthorpe, 22 November 1982, stn NSW-158. Many specimens, AM P53924, same locality, bryozoan, stn NSW-159. Many specimens, AM P53925, same locality, sponges, stn NSW-165. 4 specimens, AM P53926, same locality, sponge, stn NSW-166. Several specimens, AM P53927, same locality, stn NSW-167. Many specimens, AM P53928; 1♂, AM P60600; 1♀, AM P60601, same locality, sponge *Echinoclathria* sp., stn NSW-173. 4 specimens, AM P22493, east of Long Reef, [approx. 33°44'S 151°22'E], 40 m, Australian Museum Shelf Benthic Survey, 29 June 1972. 2 specimens, AM P22494, same locality, 36 m, 11 May 1972. 5 specimens, AM P22495, same locality, 38 m, 24 August 1972. Many specimens P22488, east of North Head, Port Jackson, [approx. 33°49'S 151°20'E], host sponge: cf *Teichonella labrinthica*, 21 m Australian Museum Shelf Benthic Survey, 20 February 1973, transect 9. 1 specimen, AM P22489, same locality, host sponge: *Polymastrea craticia*. 1 specimen, AM P22490, same locality, host sponge: *Halme gigantea*, 25 m, 26 February 1974, transect 07. 3 specimens, AM P22497, same locality, host sponge: *Polymastrea craticia*, 19 m, 19 February 1973, transect 10. 3 specimens, AM P22498, same locality, host sponge: *Halme gigantea*, 19 m, 19 February 1973 transect 10. 1 specimen, AM P22499, same locality, sponge 19 m, 19 February 1973 transect 10. Many specimens, AM P22501, same locality, host sponge: cf *Teichonella labrinthica*, 19 m, 19 February 1973 transect 10. 20 specimens, AM P22491, east of North Head, Port Jackson, [approx. 33°49.5'S 151°18'E], 28 m, Australian Museum Shelf Benthic Survey, 13 December 1971. 1 specimen, AM P22492, same locality, among sewage outfall, 12 May 1972. Several specimens, AM P18198, off Sydney Heads, [approx. 33°50'S 151°28'E], 119 m, [AM Old collection]. Many specimens, AM P22496, east of South Head, Port Jackson, [approx. 33°50'S 151°18'E], host sponge: *Halme gigantea*, 21 m, Australian Museum Shelf Benthic Survey, February 1974, transect 11. 3 specimens, AM P5334, Port Jackson, [approx. 33°51'S 151°16'E], W.A. Haswell, 1918. 8 specimens, AM P61140, north east corner of Clark Island, Port Jackson, 33°51.85'S 151°14.47'E, red algae, 2 m, I. Takeuchi & D. Bray, 17 April 1996, stn NSW-1250. 2♂♂, AM P63067, Brotherson Dock Berth 2, Botany Bay, 33°58.2'S 151°12.6'E, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 22 October 1998, stn BB BD2 P2-7. 1 specimen, AM P63068, Bulk Liquids Berth, Botany Bay, 33°58.5'S 151°12.6'E, pylon scraping, 7 m, NSW Fisheries/CRIMP Survey, 19 October 1998, stn BB BLB P3-7. 2♀♀, AM P63069, Channel Marker 4, Botany Bay, 33°59.3'S 151°12.6'E, pylon scraping, 7 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB CH4 P1-7. 2 specimens, AM P63083, same locality, pylon scraping, 3 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB CH4 P1-3. 3 specimens, AM P58236, outer end of Kurnell Pier, Botany Bay, 34°00.2'S

151°12.5'E, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP1 P1-7. 1♀, AM P63070, Kurnell Pier (near shoreline), Botany Bay, 34°00.5'S 151°12.7'E, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 21 October 1998, stn BB KP2 P2-3. 1 specimen, AM P2486, 3-4 km off Botany Bay, [approx. 34°05'S 151°15'E], mud, 91-95 m, E.R. Waite on HMCS *Thetis*, 11 March 1998, stn 37. 1 specimen, AM P2487, 5.5-6.5 km off Wattamolla, [approx. 34°10'S 151°11'E], mud, 99-108 m, E.R. Waite on HMCS *Thetis*, 22 March 1898, stn 57. 2 specimens, AM P63548, Boat Basin, Wollongong Harbour, 34°25.35'S 150°54.4'E, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 17 May 2000, stn PK WHB P1-3. 1 specimen, AM P63549, same locality, pylon scrapings, 0.5 m, NSW Fisheries/CRIMP Survey, 17 May 2000, stn PK WHB P2-0. Many specimens, AM P63550 same locality, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 17 May 2000, stn PK WHH. 1 specimen, AM P44306, off Wollongong, 34°26.54'S 150°57.98'E, *Globigerina* ooze, 50 m, baited trap, J.K. Lowry & K. Dempsey on MV *Robin E*, 27-28 March, 1994, SEAS project, stn NSW-939. Many specimens, AM P63543, Inflammable Liquids Berth, Port Kembla Outer Harbour, 34°27.95'S 150°54.25'E, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 13 May 2000, stn PK ILB P2-7. 4 specimens, AM P63546, east end No.6 Jetty, Port Kembla Outer Harbour, 34°28.25'S 150°54.1'E, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 14 May 2000, stn PK J60 P1-3. 2 specimens, AM P63547, same locality, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 14 May 2000, stn PK J60 P1-7. Many specimens, AM P63544, south end No.3 Jetty, Port Kembla Outer Harbour, 34°28.6'S 150°54.5'E, pylon scrapings, 3 m, NSW Fisheries/CRIMP Survey, 16 May 2000, PK J30 P2-3. 2 specimens, AM P63545, same locality, pylon scrapings, 7 m, NSW Fisheries/CRIMP Survey, 16 May 2000, stn PK J30 P2-7. 1♂, 1♀, AM P53870, off Moona Moona Creek, Jervis Bay, 35°02.9'S 150°41.0'E, from surface of ascidian *Herdmania momus*, in *Ecklonia* bed, 4.5 m, P.B. Berents, 13 November 1981, stn NSW-249. 2 specimens, AM P53871, same locality, *Ecklonia* holdfasts, 5 m, P. Berents, 15 August 1981, stn NSW-87. 1 specimen, AM P54274, Jervis Bay, 35°03'S 150°44'E, sponge, scallop beds, 17 m, P. Berents, 13 August 1981. Many specimens, AM P30799; many specimens, AM P30800, south east of Tathra Head, 36°45-48'S 150°02-03'E, 64 m, trawl, FRV *Kapala*, 10 June 1980, stn K80-07-02. 2♂♂, AM P36221, Murrumbulga Point, Twofold Bay, 37°04.7'S 149°53.1'E, subtidal rock platform, 2-9 m, S. Keable & E. Bamber, 11 December 1984, stn Q1. 1 specimen, AM P18318, Twofold Bay, 37°05'S 149°55'E, W.A. Haswell. 108♀♀, 92♂♂, AM P35980, Munganno Point, Twofold Bay, 37°06.2'S 149°55.7'E, subtidal wharf pile, 6 m, S. Keable, 10 October 1984, stn M5. Tasmania: 1♂, AM P60602; many specimens, AM P61142, north side of Esperance

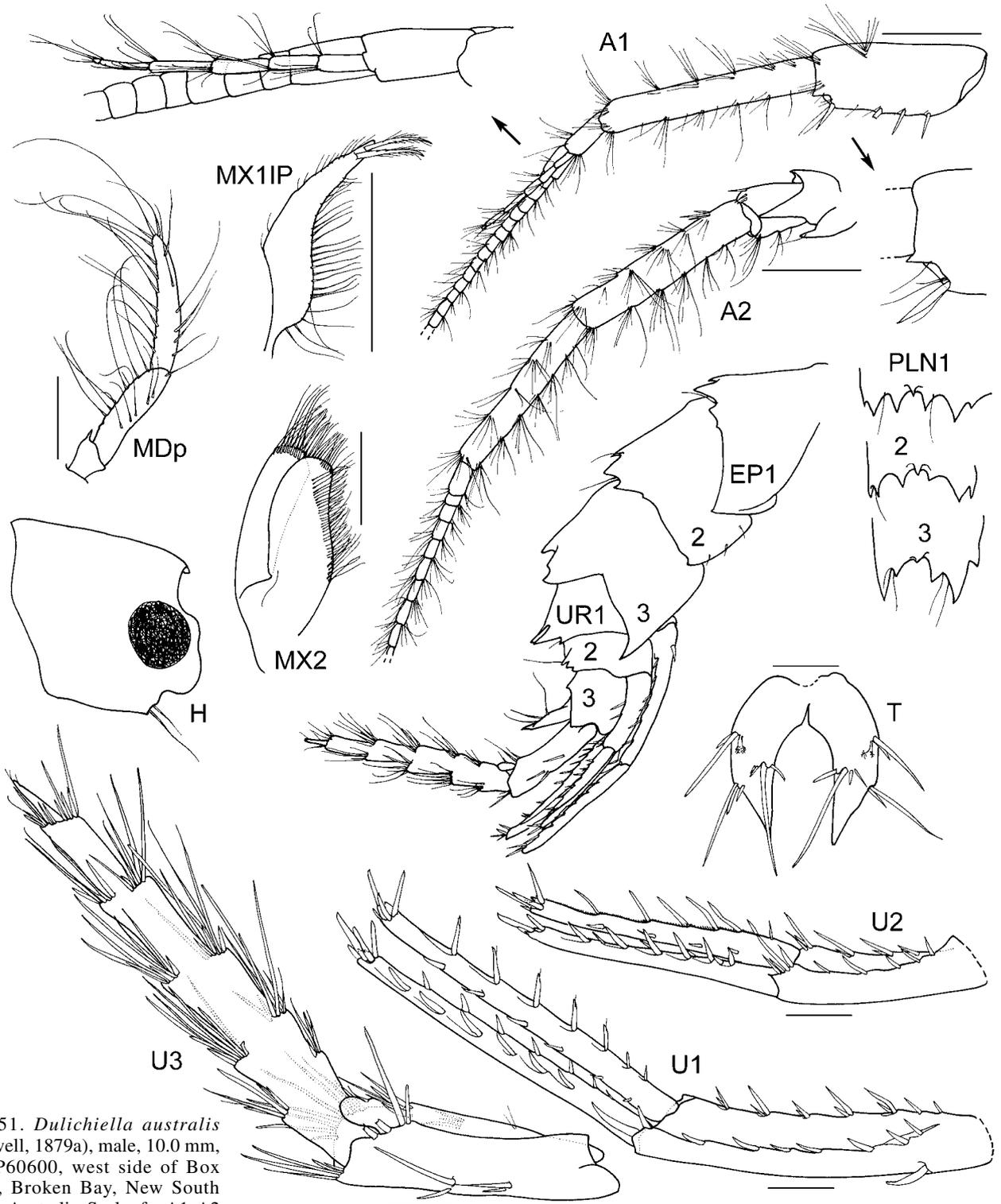


Fig. 51. *Dulichiella australis* (Haswell, 1879a), male, 10.0 mm, AM P60600, west side of Box Head, Broken Bay, New South Wales, Australia. Scales for A1, A2 represent 0.5 mm, remainder represent 0.2 mm.

Point, D'Entrecasteaux Channel, Tasmania, 43°19.5'S 147°05.5'E, lace bryozoan, 13 m, S.J. Keable, J.K. Lowry & R.T. Springthorpe, 18 April 1991, stn TAS-186. 3 specimens, AM P61143, same locality, 13 m, S.J. Keable, J.K. Lowry & R.T. Springthorpe, 18 April 1991. 3 ♀♀, AM P60603, same locality, sponges, lace bryozoan, red algae and ?*Vitticella* sp., 13 m, S.J. Keable, J.K. Lowry & R.T. Springthorpe, 18 April 1991, stn TAS-187. South Australia: E6541, 3 specimens, Sanders Bank, Kangaroo Island, [approx. 35°50'S 137°15'E], 51 m, FIS *Endeavour*, 1909–1914. 3 specimens, AM P5923, same locality. 1 specimen, E4849, Spencer's Gulf, [approx. 34°00'S 137°00'E], FIS *Endeavour*, 1909–1914.

Type locality. Port Jackson, New South Wales, Australia, [approx. 33°51'S 151°16'E].

Description. Based on a male, 10 mm, AM P60600 and a female, AM P60601.

Head. Lateral cephalic lobes broad, truncated, lacking notch or slit, anteroventral corner subquadrate. *Antenna 1* longer than *antenna 2*; peduncular article 1 shorter than article 2, with 4 or more robust setae along posterior margin;

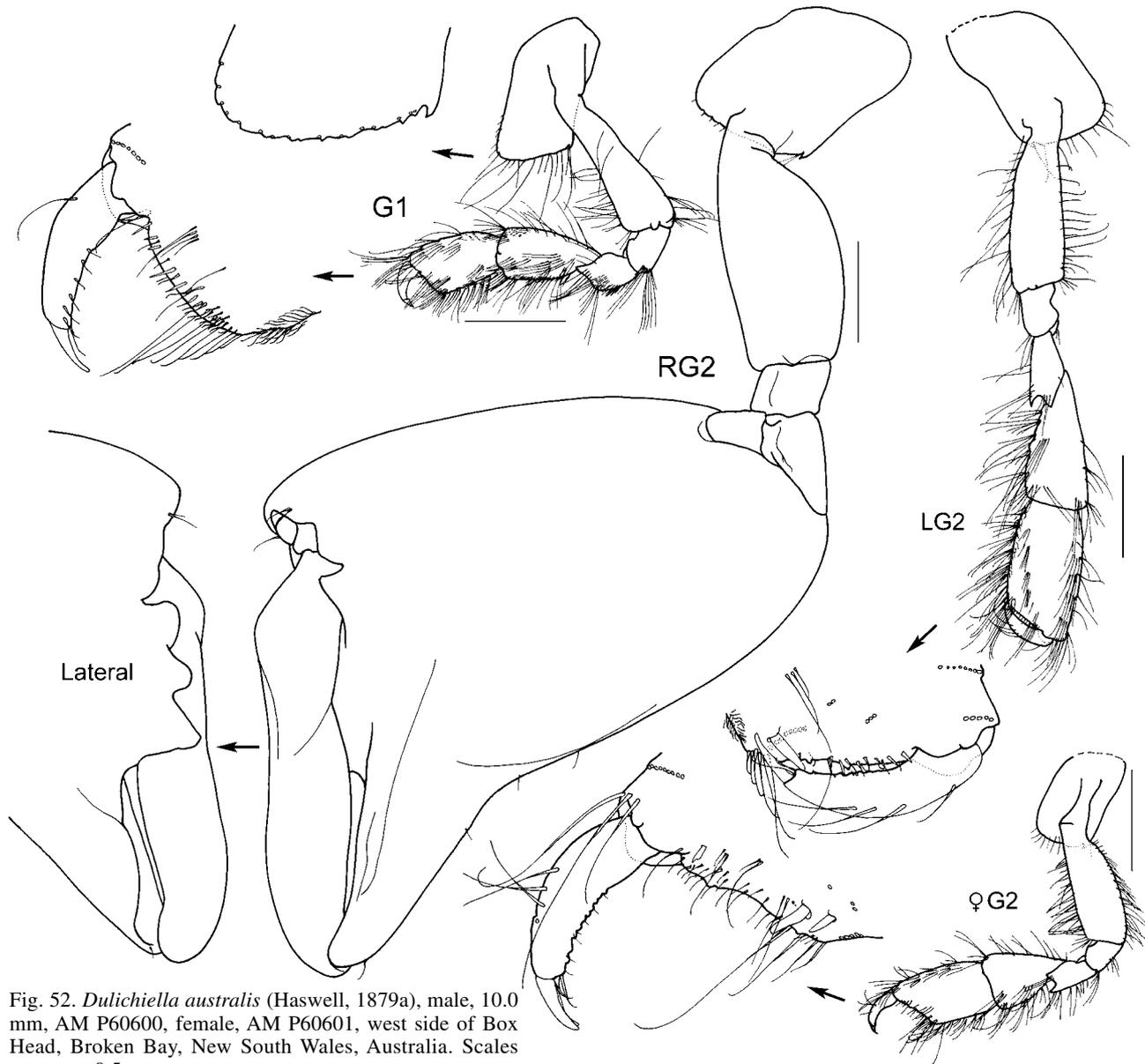


Fig. 52. *Dulichiella australis* (Haswell, 1879a), male, 10.0 mm, AM P60600, female, AM P60601, west side of Box Head, Broken Bay, New South Wales, Australia. Scales represent 0.5 mm.

flagellum with at least 40 articles; accessory flagellum with 6 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 subequal to article 5; flagellum with about 12 articles. *Mandible* palp article 3 rectilinear, setae along both margins and terminal, longer than article 1; article 2 shorter than article 3; article 1 produced distally, shorter than article 2, about as long as broad. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner not produced, posteroventral corner notch present; merus without posterodistal spine; propodus palm nearly transverse, slightly convex or straight, defined by posterodistal corner, without posterodistal robust setae. *Gnathopod 2* sexually dimorphic; left and right gnathopods unequal in size; coxa posteroventral corner notch present; (larger) chelate; merus with rounded posteroventral corner; carpus compressed; propodus, distolateral margin with 3 rounded indistinct spines; palm angle obtuse, straight, posterodistal spine absent, without robust setae; dactylus apically blunt; (smaller) subchelate; merus with sharp

posteroventral spine; carpus long; propodus palm straight, without posteroventral spine. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate; carpus and propodus with many long, slender setae along anterior margin; dactylus unguis anterior margin with accessory spine. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate; carpus and propodus with many long, slender setae along anterior margin; dactylus unguis anterior margin with accessory spine. *Pereopod 7* basis posterior margin straight or slightly subsigmoidal, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate; dactylus unguis anterior margin with accessory spine.

Pleon. *Pleonites 1–3* with dorsal serrations, with dorsodistal spine. *Epimeron 1* posteroventral corner with small acute spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with strongly produced acute

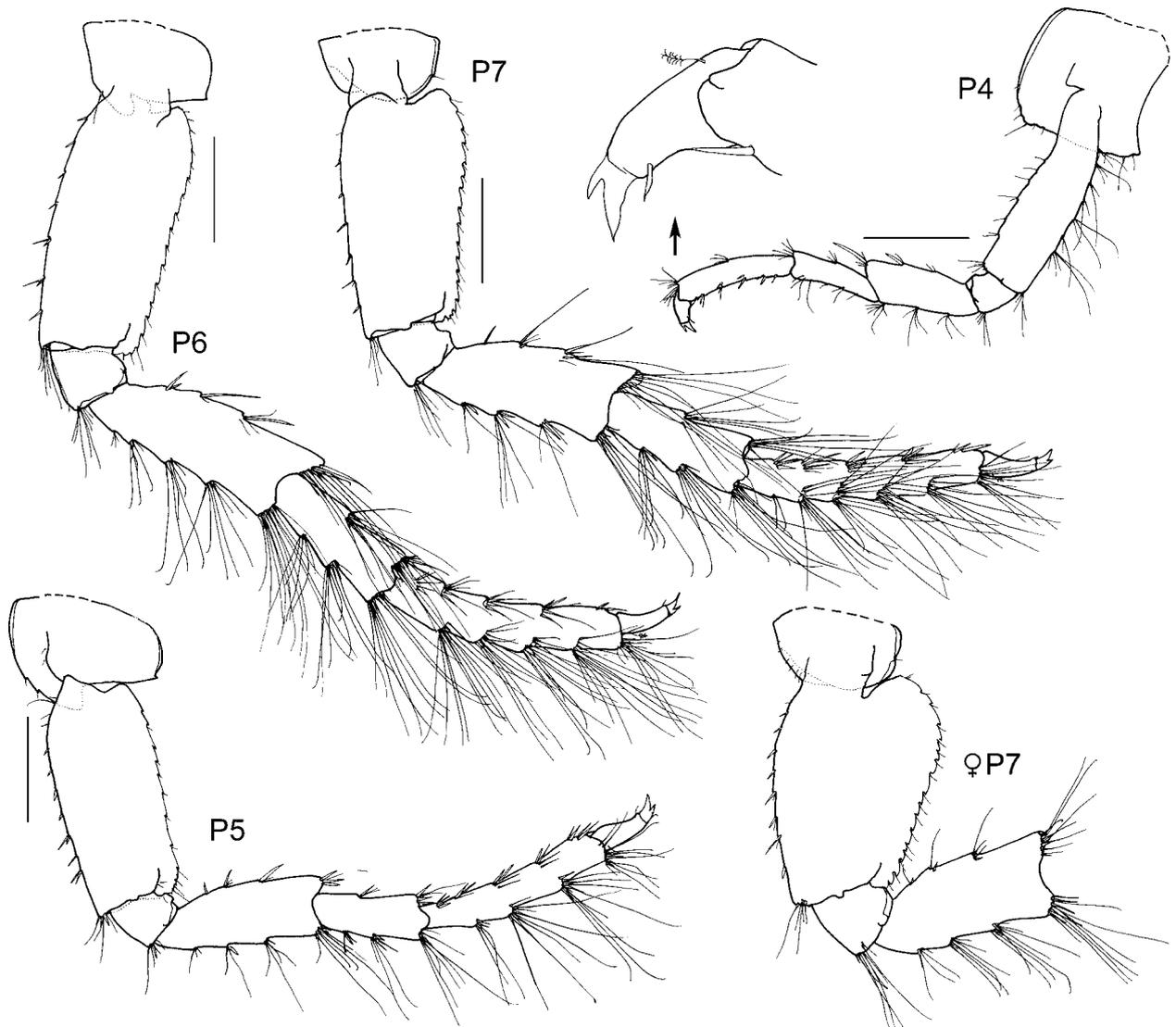


Fig. 53. *Dulichella australis* (Haswell, 1879a), male, 10.0 mm, AM P60600, female, AM P60601, west side of Box Head, Broken Bay, New South Wales, Australia. Scales represent 0.5 mm.

spine. *Urosomite 1* with broad dorsal midline gape, rarely bearing midline spines, dorsally bicarinate. *Urosomite 2* posterior margin serrate, with two groups of 1–3 small dorsolateral robust setae. *Uropod 3* inner ramus scale-like, much shorter than outer ramus; outer ramus much longer (more than 2× length) than peduncle, 2-articulate. *Telson* without apical robust setae, apical conical extension absent.

Female (sexually dimorphic characters). *Gnathopod 2* subchelate; merus with sharp posteroventral spine; carpus short; propodus without medial depression, palm slightly acute, straight or slightly concave, smooth, without robust setae, defined by posterodistal robust setae, defined by posteroventral corner; dactylus apically acute/subacute. *Pereopod 7* basis posterior margin straight.

Habitat. Marine; littoral and continental shelf; living among bryozoans, sponges, ascidians and algae, 4.5 to 120 m depth.

Remarks. There are at least two distinctive species of *Dulichella* along the east coast of Australia. Their ranges overlap along the Great Barrier Reef. *Dulichella australis*

and *D. pacifica* are easily distinguished by the spines on the distolateral margin of male gnathopod 2. In *D. australis* there are 3 rounded, rather indistinct spines and in *D. pacifica* there are 4 acute distinct spines. In addition pereopods 6 and 7 are more setose in *D. australis*.

Distribution. *Queensland:* Lizard Island (AM). *New South Wales:* Julian Rocks, Byron Bay; Marys Rock, Cook Island; Split Solitary Island; Coffs Harbour; Boambee Creek, Sawtell (all AM); Tacking Point (Haswell, 1879a); Manning River (Stebbing, 1910a); Port Stephens; off Burwood Beach; Box Head, Broken Bay; off Long Reef (all AM); Port Jackson (Haswell, 1879a); Clark Island, Port Jackson; Botany Bay; off Wattamolla; off Wollongong; Jervis Bay (all AM); Twofold Bay (Hutchings *et al.*, 1989). *Victoria:* Western Port (NMV). *Tasmania:* Esperance Point, D'Entrecasteaux Channel (AM). *South Australia:* Sanders Bank, Kangaroo Island (Chilton, 1921b); Spencers Gulf (AM).

Australian geographic areas. Northeastern Australia, southeastern Australia, southern Australia.

Dulichchiella pacifica n.sp.

Figs. 54–57

Dulichchiella appendiculata.—Berents, 1983: 111, fig. 9.—Ledoyer, 1986: 187, fig. 9S.

Type material. HOLOTYPE, ♂ “a”, 4.4 mm, AM P61112; 1 PARATYPE, ♀, 5.9 mm, AM P61113; 9 PARATYPES, 1 ♂, 5 ovigerous females, 3 non-ovigerous females, AM P61117, between Tandai Point and Koilo Point, Guadalcanal, Solomon Islands, 9°22.5'S 159°52.2'E, coral rubble, 10 m, R.T. Springthorpe, 24 September 1991, SI-3; 1 PARATYPE, ♂ “b”, 4.1 mm, AM P61114; 4 PARATYPES, males, AM P61115, Tandai Point, Guadalcanal, Solomon Islands, 9°23'S 159°52.5'E, sand with low algal turf, 20 m, hand dredge, R.T. Springthorpe, 11 October 2001, SI-36; 1 PARATYPE, ♂, AM P61116, same locality, black finger sponges from rubble bottom, 16 m, R.T. Springthorpe, 11 October 2001, SI-38.

Additional material examined. Queensland: 1 specimen, AM P30123, outer slope, Yonge Reef, 14°36'S 145°38'E, reef rock with *Halimeda* and *Lithothamnion*, 36 m, P.B. Berents & P.A. Hutchings, 9 January 1975, stn 75 LIZ D-1. 6 specimens, AM P30124, Watsons Bay, Lizard Island, 14°40'S 145°28'E, *Halophila*, *Caulerpa*, *Udotea* & drift algae, 7 m, J.K. Lowry & P.A. Hutchings, 29 September 1978, stn LI-2. 5 specimens, AM P30125, fringing reef between Bird Islet and South Island, Lizard Island, 14°40'S 145°28'E, *Halophila*, mixed algae, sediment from grass beds off reef, 24 m, J.K. Lowry, 9 October 1978, stn LI-27. 2 specimens, AM P30126, same locality, P.C. Terrill, 9 October 1978, stn LI-28. New Caledonia: 1 specimen, AM P47550, off Ilot Maitre, New Caledonia, 22°19.35'S 166°25.85'E, dead branching coral, 21 m, ORSTOM divers, 10 November 1995, stn NCL-72. 3 specimens, AM P47556; 7 specimens, AM P47563, same locality, large sea fan covered in sponges & other epiflora & epifauna, air lift, 21 m, J.K. Lowry, 10 November 1995, stn NCL-65. 1 specimen, AM P47522, Ilot Maitre, New Caledonia, 22°19.61'S 166°24.07'E, *Padina*-like alga, 10.5 m, G. Bargibant, ORSTOM, 14 November 1995, stn NCL-98. Several specimens, AM P47528, same locality, coralline algal “reef”, 10.5 m, G. Bargibant, ORSTOM, 14 November 1995, stn NCL-99. 5 specimens, AM P48322, Ilot Maitre, New Caledonia, 22°20.57'S 166°25.43'E, red alga, 20 m, I. Takeuchi, 7 November 1995, stn NCL-38. 3 specimens, AM P48332, same locality, dead coral, 20 m, ORSTOM divers, 7 November 1995, NCL-40. 10 specimens, AM P47334; 2 specimens, AM P47347, between Ilot Maitre and Croissant reef, New Caledonia, 22°19.7'S 166°23.3'E, *Sargassum* sp., 10 m, I. Takeuchi, 6 November 1995, stn NCL-28, 30. 1 specimen, AM P47506, between Ilot des Goelands and Grand Recif Abore, New Caledonia, 22°24.10'S 166°20.90'E, *Halimeda* sp. fine red alga, 10 m, J.K. Lowry, 16 November 1995, stn NCL-111. 1 specimen, AM P47590, between Ile Ngé & Sèche Croissant, New Caledonia, 22°19.41'S 166°20.89'E, purple bryozoan, *Iodyctium buchneri*, 20 m, ORSTOM divers, 9 November 1995, stn NCL-

57. 1 specimen, AM P47967, same locality, sediment sample (sand), 20 m, J.K. Lowry, 9 November 1995, stn NCL-56. 1 specimen, AM P48354, 200 m off Poé Plage, New Caledonia, 21°36.41'S 165°22.73'E, *Sargassum*, 1–2 m, J.K. Lowry, 19 November 1995, stn NCL-212. 4 specimens, AM P48379, fringing reef Thio, New Caledonia, dead coral, 1 m, A.A. Myers, 20 November 1995, stn NCL-217. Several specimens, AM P48460, same locality, “felt like” alga, 1 m, A.A. Myers, 20 Nov 1995, NCL-218. Singapore: 1 ♂, AM P61135, Pulau Sakia, Singapore, [approx. 01°16'N 103°42'E], Smith-McIntyre grab, C.S.C. Lee, University of Singapore, 23 May 1991, stn E, ZRC-1991-16108. Many specimens, AM P61136, Changi Floating Fish Farm, Singapore, [approx. 01°24'N 103°58'E], 1 m, J.B. Sigurdsson, 7 May 1997, associated with biofouling.

Type locality. Between Tandai Point & Koilo Point, Guadalcanal, Solomon Islands, (9°22.5'S 159°52.2'E), coral rubble.

Description. Based on holotype male “a”, AM P61112, paratype female, AM P61113, and paratype male “b”, AM P61114.

Head. Lateral cephalic lobes broad, truncated, lacking notch or slit, anteroventral corner subquadrate. *Antenna 1* slightly longer than antenna 2; peduncular article 1 shorter than article 2, with 3 robust setae along posterior margin; flagellum with about 28 articles; accessory flagellum with 4 articles. *Antenna 2* peduncular article 2 cone gland reaching at least to end of peduncular article 3; article 4 subequal to article 5; flagellum with 12 articles. *Mandible* palp article 3 rectilinear, setae along both margins and terminal, longer than article 1; article 2 subequal to article 3; article 1 produced distally, shorter than article 2, about as long as broad. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner not produced, posteroventral corner notch present; merus without posterodistal spine; propodus palm acute, convex, without posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* sexually dimorphic; left and right gnathopods unequal in size; coxa posteroventral corner notch present; (larger) chelate; merus with rounded posteroventral corner; carpus compressed; propodus, distolateral margin with 4 acute distinct spines; palm angle

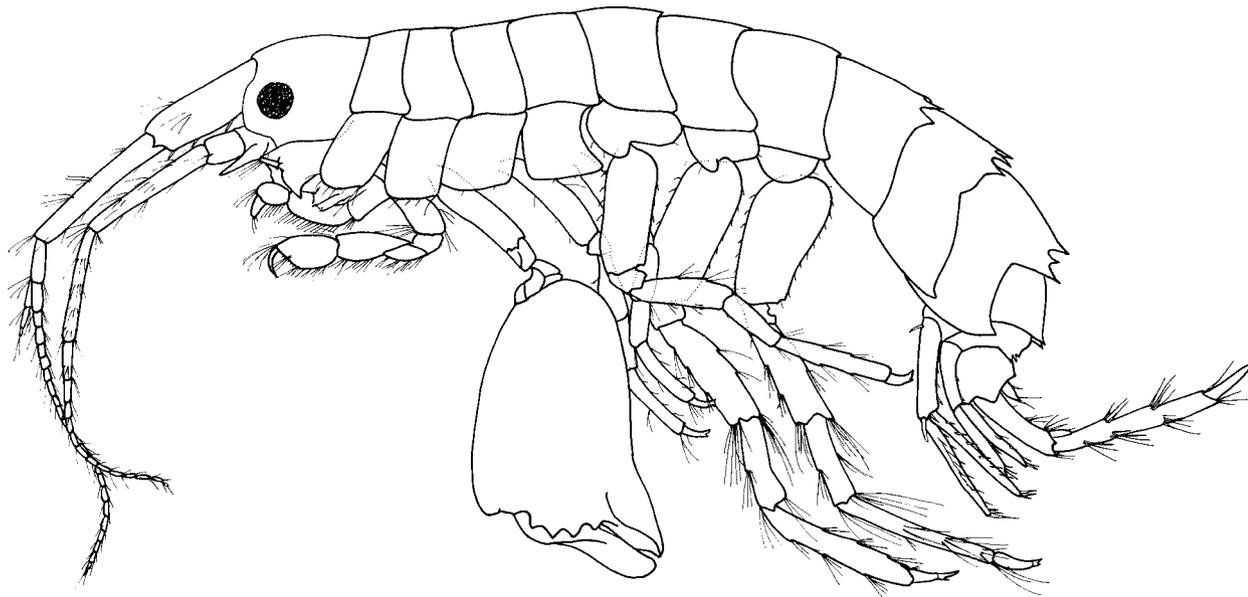


Fig. 54. *Dulichchiella pacifica* n.sp., paratype, male “b”, 4.1 mm, AM P61114, Tandai Point, Guadalcanal, Solomon Islands.

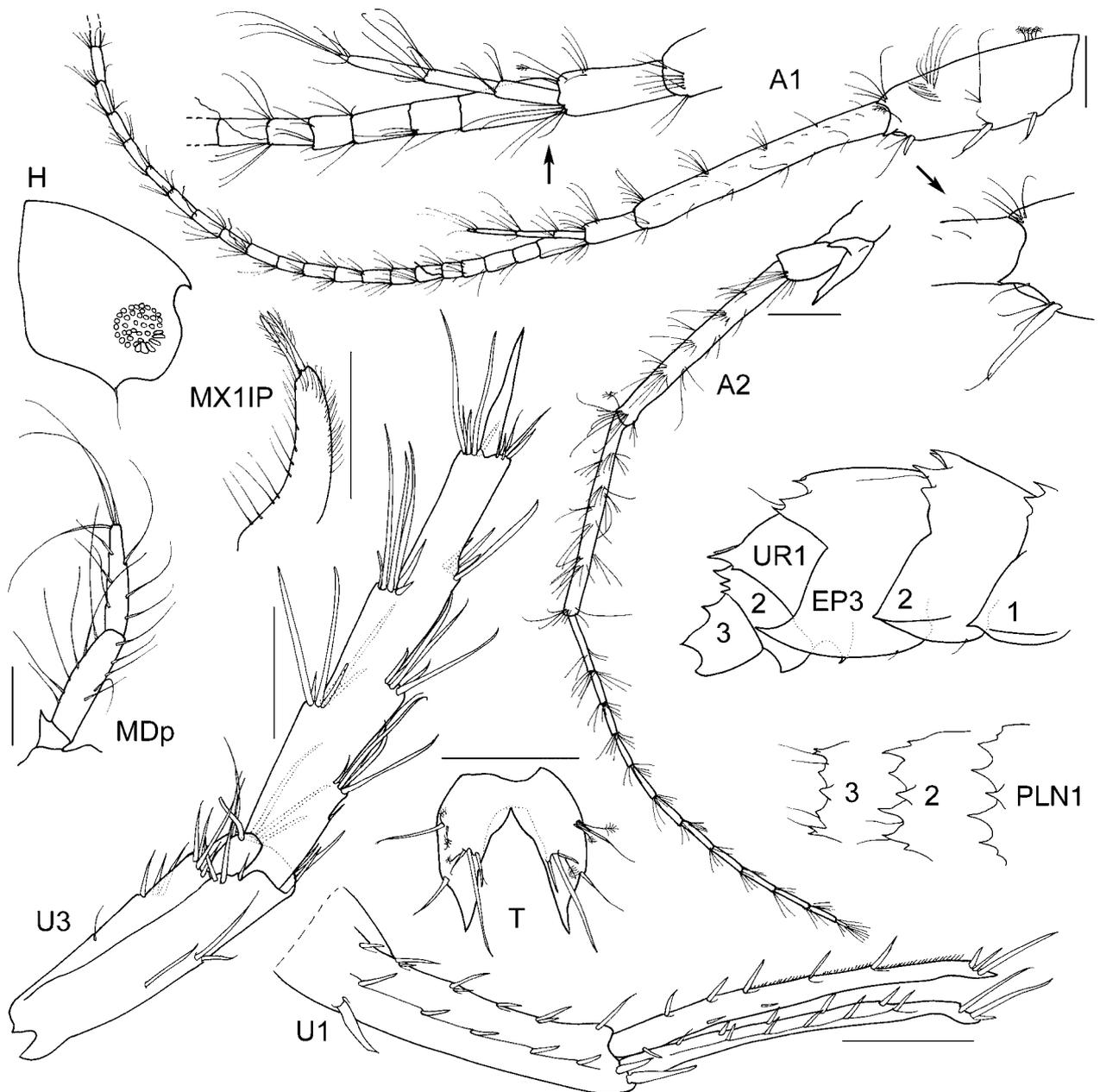


Fig. 55. *Dulichiella pacifica* n.sp., holotype, male "a", 4.4 mm, AM P61112, Tandai Point, Guadalcanal, Solomon Islands. Scales for MDp, MX1IP represent 0.1 mm, remainder represent 0.2 mm.

obtuse, straight, posterodistal spine absent, without robust setae; dactylus apically blunt; (smaller) subchelate; merus with sharp posteroventral spine; carpus long; propodus palm straight, without posteroventral spine. *Pereopod 5* basis posterior margin straight, posteroventral corner narrowly rounded or subquadrate; dactylus unguis anterior margin with accessory spine. *Pereopod 6* coxa anterior lobe ventral margin slightly produced, rounded; basis posterior margin slightly concave, posteroventral corner narrowly rounded or subquadrate; dactylus unguis anterior margin with accessory spine. *Pereopod 7* basis posterior margin straight, with posterior margin smooth or minutely castelloserrate, posteroventral corner narrowly rounded or subquadrate; dactylus unguis anterior margin with accessory spine.

Pleon. *Pleonites 1–3* with dorsal serrations, with dorsodistal spine. *Epimeron 1* posteroventral corner with small acute

spine. *Epimera 1–2* posteroventral margin without spines above posteroventral corner. *Epimeron 3* posterior margin smooth, posteroventral corner with strongly produced acute spine. *Urosomite 1* with broad dorsal midline gape, rarely bearing midline spines, dorsally bicarinate. *Urosomite 2* posterior margin serrate. *Uropod 3* inner ramus scale-like, much shorter than outer ramus; outer ramus much longer (more than 2× length) than peduncle, 2-articulate. *Telson* without apical robust setae, apical conical extension absent.

Female (sexually dimorphic characters). *Gnathopod 2* subchelate; merus with sharp posteroventral spine; carpus long; propodus without medial depression, palm acute, concave, smooth, with sparse robust setae, defined by posterodistal robust setae, defined by posteroventral corner; dactylus apically acute/subacute. *Pereopod 7* basis posterior margin subsigmoidal.

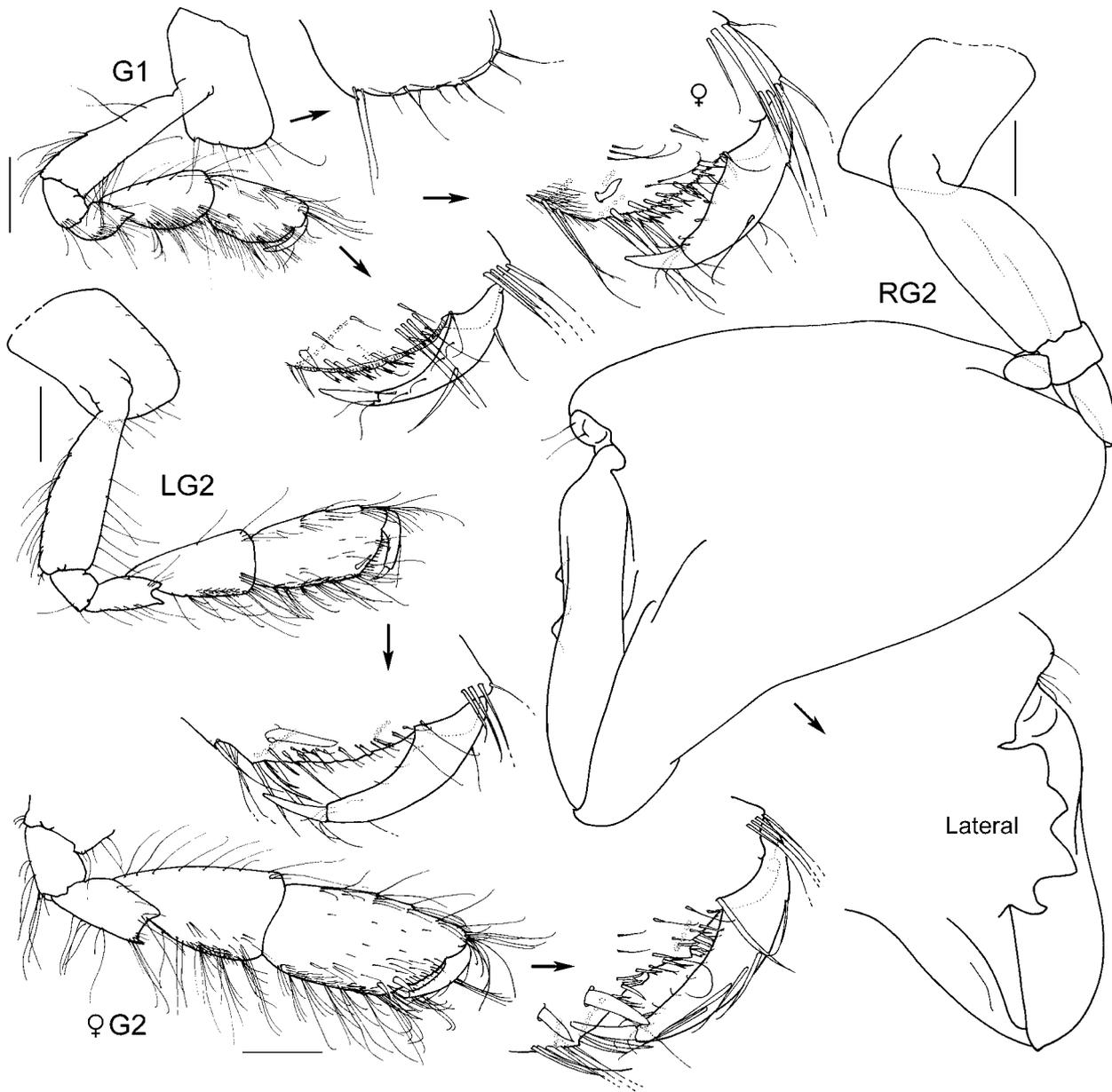


Fig. 56. *Dulichiella pacifica* n.sp., holotype, male “a”, 4.4 mm, AM P61112, paratype, female, 5.9 mm, AM P61113, Tandai Point, Guadalcanal, Solomon Islands. Scales represent 0.2 mm.

Habitat. Marine; littoral; coral rubble, sponges, sand with low algal turf, 10 to 20 m depth.

Etymology. Named for its widespread distribution in the Pacific Ocean.

Remarks. This distinctive species was illustrated from Senegal by Ledoyer (1986). It is common in Singapore and occurs along the archipelago that runs from New Guinea to Fiji. A closely related, undescribed species has been reported from Florida and Bermuda by LeCroy (2000). See remarks under *D. australis* for differences between these species.

Distribution. *Queensland:* Yonge Reef, Great Barrier Reef; Lizard Island (Berents, 1983; AM).

Extrinsic distribution. Senegal, Singapore, New Guinea, Solomon Islands, New Caledonia.

Australian geographic areas. Northeastern Australia.

Melita Leach, 1814

***Melita ophiocola* n.sp.**

Figs. 58–61

Type material. HOLOTYPE, ♀, 9.6 mm, AM P55192, west side, Bottle and Glass Rocks, Port Jackson, 33°50.9'S 151°16.15'E, 4 m, J.K. Lowry & R.T. Springthorpe, 23 March 1982, stn NSW-100. PARATYPES (114): 1 paratype, ♂, AM P46263; 1 paratype, ♀, AM P46264, type locality, 10 m, J.K. Lowry & R.T. Springthorpe, 21 January 1982, stn NSW-97; 8 paratypes, AM P25456, type locality, 9 m, G.D. Fenwick, 29 August 1977; 1 paratype, AM P55193; 1 paratype, AM P55194; 4 paratypes, AM P55199; 9 paratypes, AM P55200, type locality; 27 paratypes, AM P55195; 5 paratypes, AM P55196; 4 paratypes, AM P55197; 1 paratype, AM P55198, type locality, 4 m, 23 April 1982, stn NSW-101; 2 paratypes, AM P55236, type locality, 26 Feb 1982, stn NSW-99; 18 paratypes, AM P55241; 18, AM paratypes, AM P55242, type locality, 4 m, 26 November 1982, stn NSW-177; 11 paratypes, AM P55245, type locality, 4 m, R.T. Springthorpe & P.N. Weber, 24 December 1982, stn NSW-267; 3 paratypes, AM P55240, south of Vaucluse Point, Port Jackson, New South

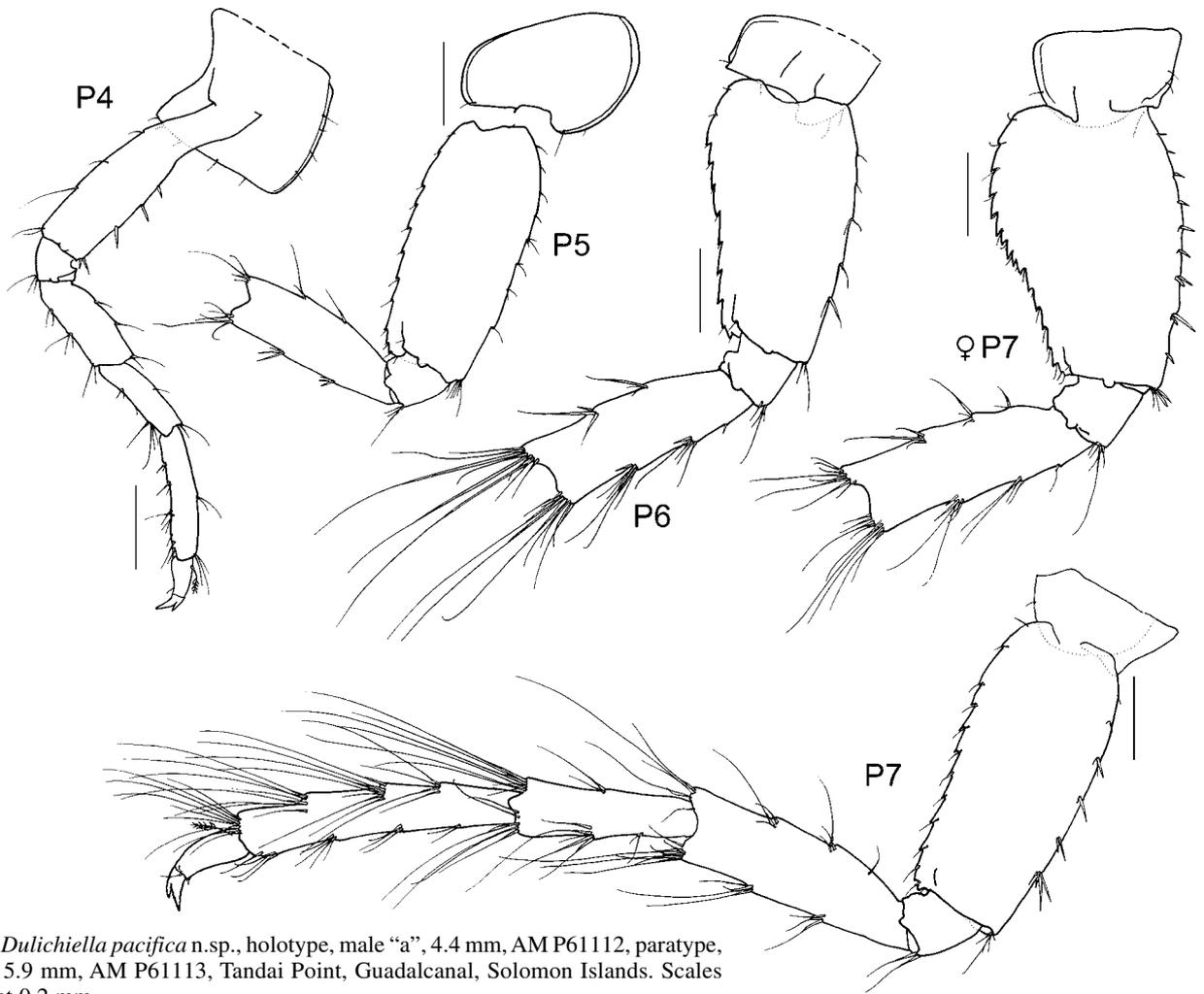


Fig. 57. *Dulichiella pacifica* n.sp., holotype, male "a", 4.4 mm, AM P61112, paratype, female, 5.9 mm, AM P61113, Tandai Point, Guadalcanal, Solomon Islands. Scales represent 0.2 mm.

Wales, Australia, 33°52'S 151°17'E, under rocks, shelley substrate, in association with ophiurid *Ophioneis schayeri*, 2 m, J.K. Lowry & R.T. Springthorpe, 22 June 1982, stn NSW-107.

Additional material examined. New South Wales: 1♀, AM P62903, northern cove of Boondelbah Island, Port Stephens, 32°42.28'S 152°13.47'E, under small boulders, 19.6 m, airlift, R.T. Springthorpe, P.B. Berents & A. Murray, 28 May 1998, stn NSW-1401. 92 specimens,

AM P31161 (4); AM P31162 (3); AM P31163 (1); AM P31164 (1); AM P31165 (2); AM P31166 (15); AM P31167 (14); AM P31168 (2); AM P31169 (1); AM P31170 (1); AM P31171 (4); AM P31172 (2); AM P31173 (11); AM P31174 (7); AM P31175 (8); AM P31176 (12); AM P31177 (2); AM P31178 (2), Little Box Head, Broken Bay, [approx. 33°33'S 151°16'E], sandy-muddy, very fine silt, 13 m, S. Arnam & R. Springthorpe, 18 November 1980. 68 specimens, AM P31142 (7); AM P31143 (5); AM P31144 (2); AM P31145 (2); AM P31146 (1); AM P31147 (3); AM P31148 (5); AM P31149 (1); AM P31150 (2); AM P31151 (3); AM P31153 (1); AM P31154 (2); AM P31155 (1); AM P31156 (10); AM P31157 (5); AM P31158 (8);

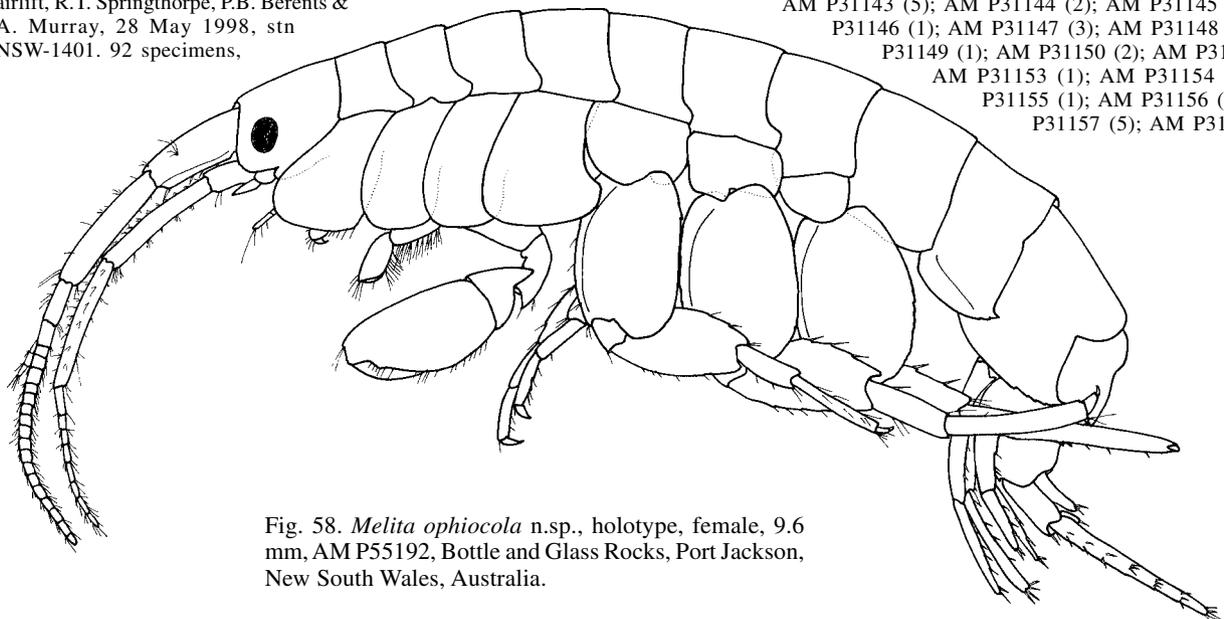


Fig. 58. *Melita ophiocola* n.sp., holotype, female, 9.6 mm, AM P55192, Bottle and Glass Rocks, Port Jackson, New South Wales, Australia.

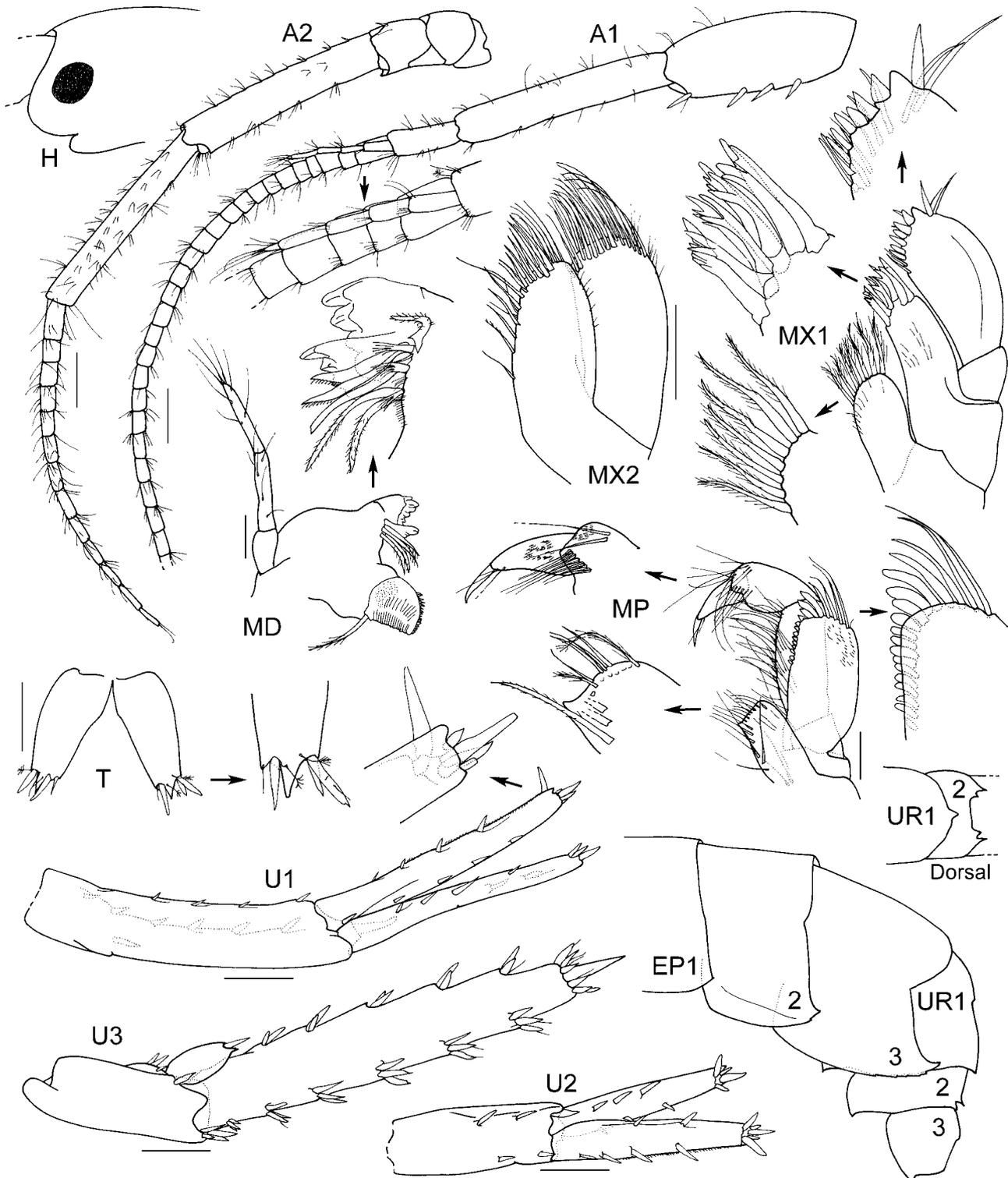


Fig. 59. *Melita ophiocola* n.sp., holotype, female, 9.6 mm, AM P55192, Bottle and Glass Rocks, Port Jackson, New South Wales, Australia. Scales for MD, MX1, MX2, MP represent 0.1 mm, remainder represent 0.2 mm.

AM P31159 (4); AM P31160 (6), 90 m south of Fairlight Pool, Port Jackson, 33°48.1'S 151°16.3'E, under stones, muddy sand, shell, in association with ophiuroid *Ophionereis schayeri*, 10 m, S. Arnam & R. Springthorpe, 13 October 1980. 2 ♀♀, AM P45267, 50 m north of Cannae Point, Port Jackson, 33°49'S 151°, on brittle star: *Ophionereis schayeri*, 5 m, P.B. Berents, P. Castro, G. Towner, 21 June 1995, stn NSW-1138. 67 specimens, AM P31134 (8); AM P31135 (2); AM P31136 (47); AM P31137 (1); AM P31138 (1); AM P31139 (5); AM P31140 (1); AM P31141 (2), type locality, 0.5 m, S. Arnam, J.K. Lowry & R.T. Springthorpe, 29 September 1980. 19 specimens, AM P55243 (17); AM P55244 (2), south of Vaucluse Point, Port Jackson, 33°50.9'S

151°16.15'E, rocky with sediment patches, in association with ophiuroid *Ophionereis schayeri*, 2 m, J.K. Lowry & R.T. Springthorpe, 27 May 1982, stn NSW-105. 7 specimens, AM P55234 (4); AM P55235 (3), South of Vaucluse Point, Port Jackson, 33°52'S 151°17'E, under rocks on soft substrate, in association with ophiuroid *Ophionereis schayeri*, 4 m, R.T. Springthorpe & A. Murray, 30 September 1982, stn NSW-156. 1 ♂, AM P55233, type locality. 2 specimens, AM P55237, type locality, 26 February 1982, stn NSW-99. 4 specimens, AM P55238 (2); AM P55239 (2), type locality, 10 m, 21 January 1982, stn NSW-97. 6 specimens, AM P55246, type locality, 4 m, R.T. Springthorpe & P.N. Weber, 24 December 1982, stn NSW-267. 6 specimens, AM P36648,

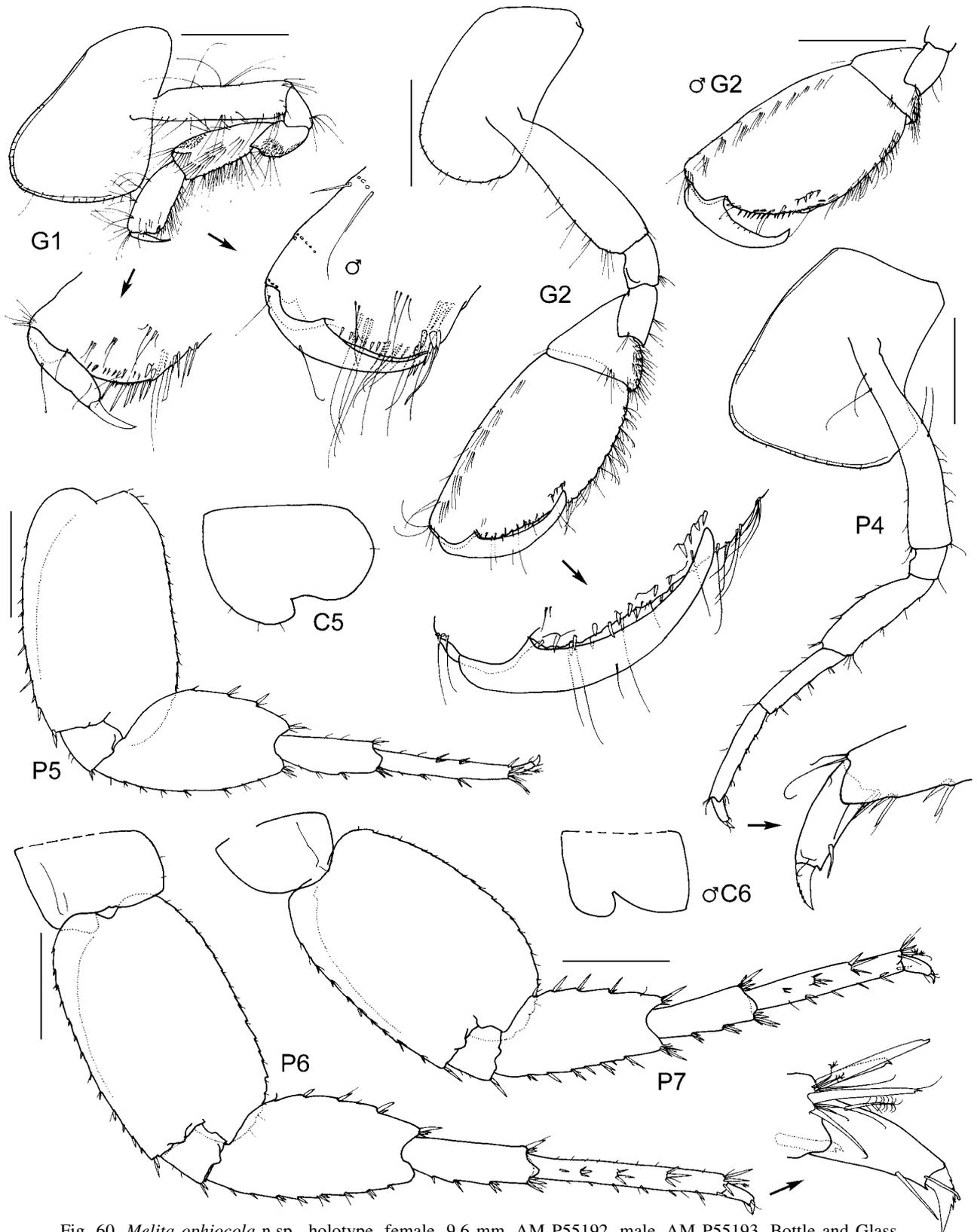


Fig. 60. *Melita ophiocola* n.sp., holotype, female, 9.6 mm, AM P55192, male, AM P55193, Bottle and Glass Rocks, Port Jackson, New South Wales, Australia. Scales represent 0.5 mm.

Murrumbulga Point, Twofold Bay, 37°04.7'S 149°53.1'E, subtidal rock platform, 3 m, S. Keable, 9 October 1984, stn Q2. 1♂, AM P55117, Munganno Point, Twofold Bay, 37°06'S 149°56'E, subtidal rock platform, 6 m, S.J. Keable, 10 October 1984, stn M6.

Type locality. Bottle and Glass Rocks, Port Jackson, New South Wales, Australia, 33°50.9'S 151°16.15'E, living in

association with the ophiuroid *Ophionereis schayeri* under rocks, 4 m.

Description. Based on holotype female, AM P55192 and paratype male, AM P55193.

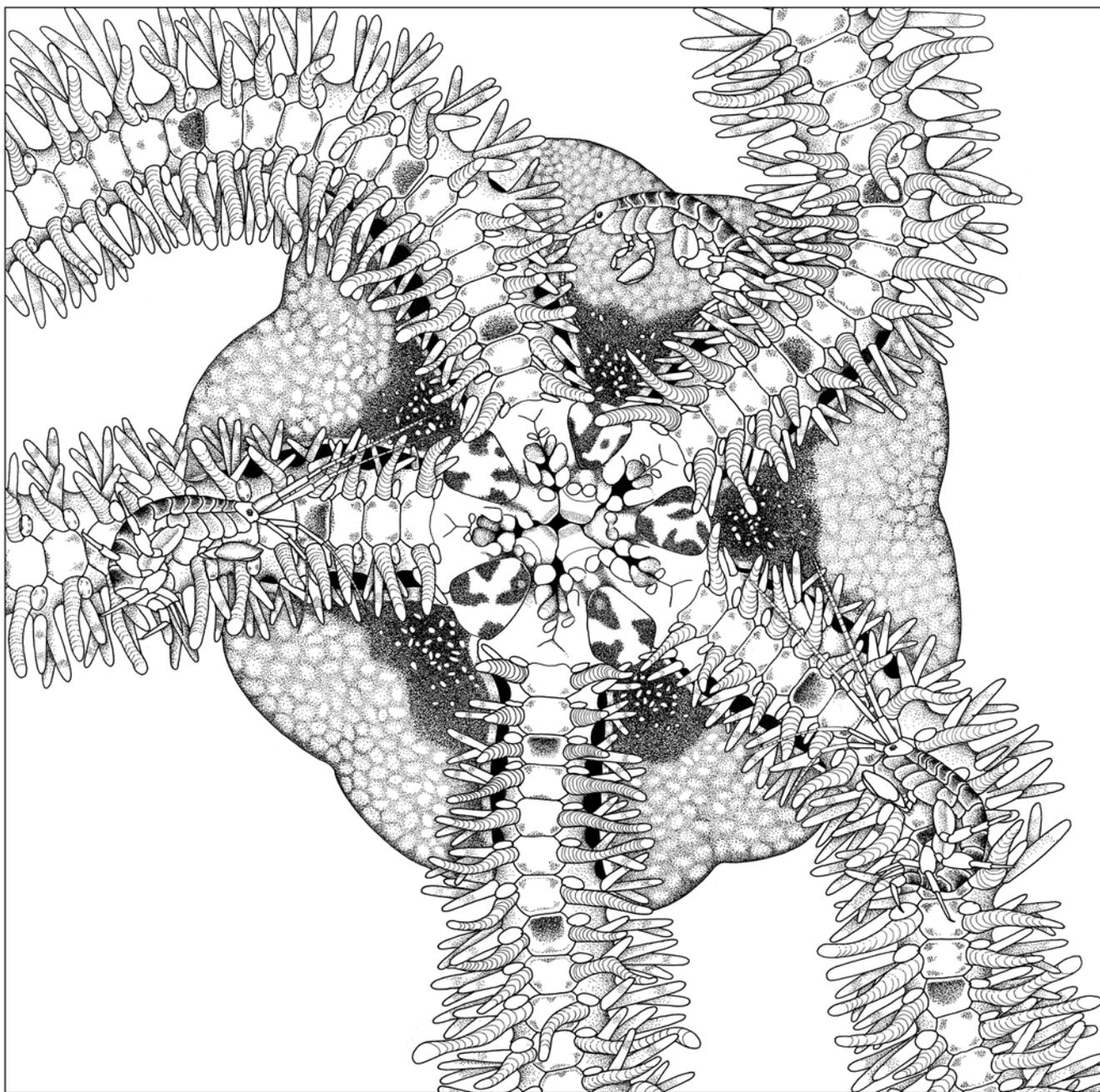


Fig. 61. *Melita ophiocola* n.sp., paratype male and female, AM P55240, in association with ophiuroid *Ophionereis schayeri*, south of Vacluse Point, Port Jackson, New South Wales, Australia. Illustration by Sharne Weidland.

Head. Lateral cephalic lobes broad, rounded, with anteroventral notch or slit, anteroventral corner rounded. *Antenna 1* longer than antenna 2; peduncular article 1 longer than article 2, with 4 or more robust setae along posterior margin; flagellum with about 30 articles; accessory flagellum with about 5 articles. *Antenna 2* peduncular article 2 cone gland not reaching to end of peduncular article 3; article 4 subequal to article 5; flagellum with about 13 articles. *Mandible* palp article 3 rectilinear, setose along straight medial margin, longer than article 1; article 2 subequal to article 3; article 1 not produced, shorter than article 2. *Maxilla 1* inner plate with setae mainly terminal.

Pereon. *Gnathopod 1* coxa anteroventral corner produced, rounded, posteroventral corner notch absent; merus without posterodistal spine; carpus about 3× as long as broad; propodus palm acute, slightly convex, defined by posterodistal corner, defined by posterodistal robust setae. *Gnathopod 2* not sexually dimorphic; subchelate; coxa posteroventral corner notch absent; merus with sharp posteroventral spine; carpus compressed; propodus without medial depression, without strong concentration of setae, palm broadly rounded, convex, smooth, with sparse small robust setae, defined by posterodistal robust setae, without posteroventral corner; dactylus apically acute/subacute.

Pereopod 5-6 basis posterior margin straight, posteroventral corner broadly rounded; dactylus unguis anterior margin with 2 or more accessory spines. *Pereopod* 7 basis posterior margin slightly convex, with posterior margin smooth or minutely castelloserrate, posteroventral corner broadly rounded; dactylus unguis anterior margin with 2 or more accessory spines.

Pleon. *Epimeron* 1 posteroventral corner with small acute spine. *Epimera* 1-2 posteroventral margin without spines above posteroventral corner. *Epimeron* 3 posterior margin smooth, posteroventral corner with strongly produced acute spine, posteroventral margin smooth or minutely serrate. *Urosomite* 1 with spines at midline, no conspicuous medial gape, with posterodorsal spine. *Uropod* 3 inner ramus scale-like, much shorter than outer ramus; outer ramus much longer (more than 2× length) than peduncle, 2-articulate. *Telson* each lobe with 3 apical/subapical robust setae, apical conical extension reaching at least halfway along longest seta.

Female (sexually dimorphic characters). *Pereopod* 6 coxa anterior lobe ventral margin slightly produced, rounded.

Habitat. Marine; living in association with the ophiuroid *Ophionereis schayeri* under rocks.

Depth zone. Littoral (1 to 13 m).

Remarks. *Melita ophiocola* is an unusual and distinctive species of the genus. It is an obligate commensal of the brittle star *Ophionereis schayeri* (Muller & Troschel). Preliminary results of experimental data indicate that the largest adult amphipods tend to occur in heterosexual pairs on the host and occasionally more than one pair may occur. Over 80% of individuals sampled were juveniles and there can be as many as 50 young per host. Juveniles occur throughout the year.

Mate selection experiments involving live animals showed that a significant number of large adults initially released on an overcrowded host move to another host and form heterosexual pairs (Peter Castro, pers. comm.). This apparent mobility may explain the high infection rates of over 90% observed in the field.

In a highly unusual situation for species of *Melita*, there is virtually no sexual dimorphism between males and females. We assume that this is because the female and male are always present together on the host and so there is no need for precopulatory amplexus and its associated morphological modifications.

Ophionereis schayeri is found in shallow water beneath large rocks and in crevices. It is more active at night when it may forage in the open. It moves by sinuous flexing of its arms and feeds on detritus that is transported to the mouth by the tube feet. It is assumed that *M. ophiocola* feeds on the detritus collected by its host. *Melita ophiocola* has a banded colour pattern of purple and cream dorsally with purple gnathopods and pereopods tending to cream distally. This is similar to the colour pattern of the aboral surface of its host. *Melita ophiocola* is able to move freely over the body and arms of the brittle star but lives mostly on the oral surface of the arms between the two rows of tube feet.

Distribution. *New South Wales*: Boondelbah Island, Port Stephens; Broken Bay; Port Jackson; Twofold Bay (all AM).

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