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# Idoteidae of Australia and New Zealand (Crustacea : Isopoda : Valvifera)

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## Abstract

The isopod family Idoteidae is diagnosed to distinguish it from other valviferan families. It is represented in Australia by 23 species and in New Zealand by four species. Except for the pelagic cosmopolitan species, *Idotea metallica*, all species occur only in shallow macroalgae and sea-grass habitats and are mostly confined to temperate waters. In Australia, the species have more or less limited ranges along the southern coast between Sydney (33°S.) and just north of Perth (29°S.) with the exception of three species which occur in subtropical Western Australia. In New Zealand, no species is found north of Wellington (41°S.).

The valviferan family-groups are briefly reviewed and the Idoteidae rediagnosed. The Australian species *Lyidotea nodata* Hale, 1929 is removed to the arcturid complex, but its family placement is uncertain. Some species from New Zealand, '*Austridotea (Austridotea) annectans* Nicholls, 1937, '*A. (A.) benhami* Nicholls, 1937, '*Notidotea lacustris* (Thomson, 1879), and *Idotea festiva* Chilton, 1885, are regarded as chaetiliids and are also excluded.

A new genus, *Batedotea*, is erected for *Crabyzos elongata* Miers. A neotype is selected for *Idotea stricta* Dana and the species' position in *Euidotea* is confirmed. All genera and species are diagnosed and illustrated and complete synonymies are given. A key for their identification is presented.

The Australian species are: *Batedotea elongata* (Miers), *Crabyzos longicaudatus* Bate, *Engidotea cristata*, sp. nov., *Euidotea bakeri* (Collinge), *E. caeruleotincta* Hale, *E. danai*, sp. nov., *Euidotea halei*, sp. nov., *E. peronii* (Milne Edwards), *E. stricta* (Dana), *I. brevicornis* Milne Edwards, *I. metallica* Bosc, *Paridotea aquarii*, sp. nov., *P. collingei*, sp. nov., *P. miersi*, sp. nov., *P. munda* Hale, *P. simplex*, sp. nov., *P. unguata* (Pallas), *Pentidotea australis* Hale, *Synidotea grisea*, sp. nov., *S. keablei*, sp. nov., *S. watsonae*, sp. nov., *Synidotea* sp. and *Synischia levidensis* Hale.

The New Zealand species are: *Batedotea elongata* (Miers), *Euidotea durvillei*, sp. nov., *I. metallica* Bosc and *Paridotea unguolata* (Pallas).

A more restrictive definition of the *Idotea* implies that many of its Northern Hemisphere species may need to be included in other genera. *Idotea hectica* (Pallas) is placed in *Synischia* Hale.

## Introduction

Members of the isopod family Idoteidae are found in the shallow waters of Australia and New Zealand on macroalgae and sea-grasses, as they are in similar environments in other parts of the world. In both countries, the family is largely confined to temperate regions. In Australia, most species are confined to the southern coast bounded by 29°S. in the west and 33°S. in the east. On the west coast, only three species, all rare in collections, are found further north. In New Zealand and its subantarctic islands none occurs north of 41°S.

The suborder Valvifera, to which this family belongs, is well defined. It comprises those isopods in which the uropods are large and attached laterally to the pleotelson so that they enclose the pleopods in a respiratory chamber. It comprises the following four family-groups.

1. Arcturidae Bate & Westwood, Austrarcturellidae Poore & Bardsley, Amesopodidae Stebbing, Pseudidotheidae Ohlin and Xenarcturidae Sheppard. This is probably a monophyletic group defined on the basis of fusion of pereonite 1 and head, elongate peduncle on pleopod 1, gnathopod-like pereopod 1 and, typically, fusion of all pleonites. The families are poorly separated from each other and are the subject of separate research. About 40 nominal genera are involved. There are numerous species in Australia and New Zealand (Hale 1924; Poore and Bardsley 1992).

2. Holognathidae Thomson, a family of four genera and 20 species, most, until the revision of Poore and Lew Ton (1990), previously listed with the Idoteidae. The family is defined on the basis of a semi-cylindrical body plan, without laterally splayed coxal plates, parallel-sided and usually apically rounded pleotelson, and pereopod 4 much shorter than others and with closely set spiniform setae on the ischium-propodus (Poore and Lew Ton 1990). This last-mentioned paper described the Australian and New Zealand species.

3. Chaetiliidae Dana. The current concept of Chaetiliidae includes the four non-idoteine subfamilies of Idoteidae (e.g. Brusca 1984, summarising earlier authors). They were united as a separate family by Poore (1985) because of their laterally expanded head, broadened and dorsoventrally flattened body, pereopods 1–3 or 1–5 subchelate, and uropods with two rami. The Australian and New Zealand species were listed by Poore (1991).

4. Idoteidae. The family is here defined in a more restrictive manner than has been the case previously and is essentially the Idoteinae as used by Brusca (1984) in his phylogenetic and biogeographic study. The only differences from Brusca's usage are three genera removed to the Holognathidae.

The taxonomy of Australian and New Zealand species of Idoteidae is well known compared with that of other isopod families in the region. Hale (1929) in South Australia and Hurley (1961) in New Zealand provided reliable keys for the species then known. Recent collections have revealed the presence of several new species in both countries, and species that were formerly thought to be widespread in Australia, or to occur in both countries, are now believed to comprise more than one species. In addition, the systematic placement of new taxa sometimes proved difficult using conventional generic concepts, and some of the known genera proved impossible to define with the characters traditionally used.

One Australian species traditionally placed in the Idoteidae, *Lyidotea nodata* Hale, 1929, is not included in this contribution. We have examined it in detail and conclude that it is a member of the arcturid complex. It shares no apomorphies with the Idoteidae that are not

commonplace in other valviferans. More importantly, its habitus, fusion of body segments, pereopod 1, antenna 2 and oostegite 5 are all arcturid-like. Its systematic position within this family complex is at present undecided.

A group of species from New Zealand, also conventionally placed in the Idoteidae, are in fact chaetillids of uncertain generic placement. These are therefore also excluded from this study: '*Austridotea (Austridotea) annectans* Nicholls, 1937, '*A. (A.) benhami* Nicholls, 1937, '*Notidotea lacustris* (Thomson, 1879), and the poorly understood *Idotea festiva* Chilton, 1885.

In this contribution, the genera of Idoteidae present in Australia and New Zealand are rediagnosed on the basis of an examination of type species. These diagnoses are written concurrently with a phylogenetic revision of all valviferan genera. The fauna of 23 species is described and a key for identification is offered. Because several new generic characters were discovered, many species are described in much more detail than previously. Species closely similar to others are diagnosed more briefly using only significant characters.

### Materials and Methods

We wish to define some terms clearly. *Spiniform setae* are special setae, stout and articulating, and occurring especially on pereopodal palms; they have been called spines in earlier works. We confine *spine* to a non-articulating cuticular outgrowth, rare in Idoteidae. The plesiomorphic form for the mouthparts (especially mandibles, maxillae 1 and 2) is seen in such genera as *Idotea* and is referred to as 'typical' in many diagnoses.

*Dorsal and ventral coxal plates* are extensions of the coxa (first article of the pereopods) which replace the lateral parts of tergites and sternites respectively. In all valviferans, as in many other isopods, ventral coxal plates meet in the middle of the ventral surface and replace the sternites. Except in *Paridotea*, where they form a characteristic ridge on pereonite 7, ventral coxal plates are not of taxonomic interest. The development of dorsal coxal plates, on the other hand, varies in different genera and on different pereonites and is taxonomically useful.

The following abbreviations are used in figures: A1, A2, antenna 1 and 2; A2f, antenna 2 flagellum; C, coxa; LM, lacinia mobilis; MD, mandible; MDm, mandibular molar process; MX1, MX2, maxillae 1 and 2; MP, maxilliped; MPe, maxillipedal endite; MPp, maxillipedal palp; P1-P7, pereopods 1-7; PVII, pereonite 7; PL1-PL5, pleopods 1-5; PLI, pleonite 1; U, uropod; P, penes; PT, telson; l, left; r, right. The letters a and b refer to parts drawn from second and third individuals. Scale bars are 1 mm unless otherwise noted.

Material used in this study is derived from museum collections and from our own extensive field work. It is deposited in the Museum of Victoria, Melbourne (NMV); Australian Museum, Sydney (AM); South Australian Museum, Adelaide (SAM); Western Australian Museum, Perth (WAM); Tasmanian Museum and Art Gallery, Hobart (TM); and National Museum of New Zealand, Wellington (NMNZ). Material for comparison has been borrowed from Muséum national d'Histoire naturelle, Paris (MNHN); Natural History Museum, London (BMNH); South African Museum, Cape Town (SAMCT); and the Zoological Museum, Amsterdam (ZMA).

## IDOTEIDAE Samouelle, 1819

### Diagnosis

Valvifera with 2 or fewer pleonites articulating (usually all pleonites fused), 4 or fewer pleonites indicated dorsally by complete or partial non-articulating sutures; head usually free from pereonite 1, not laterally expanded; maxillipedal palp usually of 5 articles, sometimes articles 4+5 fused, rarely 2+3 also; pereopod 1 only moderately subchelate; pereopods 2-7 ambulatory, similar; penes contiguous, free or basally fused or fused completely; uropod with free endopod, without exopod; pleopod peduncles of similar lengths; male pleopod 1 not modified. Oostegites lamellar and functional as brood-pouch on pereopods 1-4 or 1-5.

### Remarks

About 20 genera of Idoteidae have from time to time been recognised but some of these are now considered junior synonyms. Generic relationships were discussed in terms of the antenna 2 flagellum, pleonal structure, pereopods and mouthparts by Brusca (1984). He discussed dorsal coxal plates, but did not include them in his analysis because of

problems of interpretation reported by Nordenstam (1933), Sheppard (1957) and Brusca and Wallerstein (1979).

New, potentially useful, characters became apparent during redescription of the fauna and these are used in the new generic diagnoses presented here. A more complete analysis of generic characters and their evolution is in preparation in a study of the Valvifera as a whole, but some must be introduced here.

It is important to recognise the difference between true articulation of anterior pleonites and the pleotelson, such as seen in Chaetiliidae, Holognathidae and *Idotea*, and indication of pleonites by complete or lateral suture scars on a fused pleotelson. The latter condition is usual in the family. The completeness and presence of sutures is given less weight in our generic diagnoses than was the case by earlier authors. The pleon formulas of Brusca (1984) give the number of complete sutures + number of partial sutures; we use these only for genera in which the pleotelson is fused and refer to them as pleotelsonic formulas.

Although Brusca (1984) did not use coxae as taxonomic characters, we have found patterns in the development of dorsal coxal plates to be useful. In the most primitive genera the dorsal coxal plates are broad on pereopods 2–7 and shield the bases. Reduction is frequent and paralleled in several genera, e.g. *Euidotea* and *Paridotea*.

We have found the degree of setation on the posterior margins of the pereopods to be useful to distinguish genera. In some, setae are numerous and spiniform; in others, only a single spiniform seta is present on the palms of some articles.

Other useful taxonomic characters can be found in the mouthparts and penes. These will be discussed in more detail in a later contribution.

### Key to Australian and New Zealand Species of Idoteidae

Valviferans with cylindrical bodies and shortened pereopod 4 bearing clusters of spiniform setae are members of Holognathidae (see Poore and Lew Ton 1990).

Valviferans with flattened bodies tapering from pereonite 4 to an acute pleotelson, with two uropodal rami, and with subchelate pereopods 1 or 1–3 are members of Chaetiliidae (Poore 1984, 1985, 1991).

Valviferans with pereonite 1 fused to head and with pereopod 1 small and gnathopod-like are members of arcturid-like families. See Hurley (1961) for New Zealand species, and Hale (1924) and Poore and Bardsley (1992) for some others.

This key serves to separate genera. Most species come only from Australia; those from New Zealand are indicated by NZ in the key.

1. 3 pleonites visible, pleonites 1 and 2 articulating, pleonite 3 indicated by ventrolateral sutures only; all dorsal coxal plates contiguous or overlapping; pereopods with spiniform setae on anterior margins of distal articles ..... *Idotea* ..... 2  
 0–3 pleonites visible completely or ventrolaterally only, none articulating; dorsal coxal plates contiguous only posteriorly if at all; pereopods without spiniform setae on anterior margins of distal articles ..... 3
2. Pleotelson apically truncate (NZ, Aus.) ..... *Idotea metallica*  
 Pleotelson with prominent apical lobe ..... *Idotea brevicornis*
3. Dorsal coxal plates 2–4 absent (suture ventral); dorsal coxal plates 5–7 present (suture dorsal if visible); pleotelsonic formula 0+1; female with 4 pairs of oostegites ... *Synidotea* ..... 4  
 Dorsal coxal plates present or absent, not of the above pattern; pleotelsonic formula various; female with 5 pairs of oostegites ..... 7
4. Lateral margins of pereonites angular, pereonite 1 especially produced; mid-dorsal protuberance on head ..... 5  
 Lateral margins of pereonites rounded, no mid-dorsal protuberance on head ..... 6
5. Head and pereonites with mid-dorsal crests; bases of legs with sculptured lobes; head with produced anterolateral corners ..... *Synidotea watsonae*  
 Head with weak mid-dorsal boss; bases of legs weakly sculptured; head without produced anterolateral corners ..... *Synidotea* sp.
6. Body twice as long as wide; lateral margin of pleon evenly curved to broad apical notch .....  
 ..... *Synidotea grisea*  
 Body more than 2.5 × as long as wide; lateral margin of pleon with posterior obtuse angle before apical notch ..... *Synidotea keablei*

7. Pereonite 1 fused to head; mouthparts asymmetrical; body very slender; pleon without sutures visible dorsally, apex sharply tapering ..... *Crabyzos longicaudatus*  
 Pereonite 1 not fused to head; mouthparts symmetrical; body not especially slender; pleon sutures visible or not; apex not especially acute ..... 8
8. Pleon parallel-sided, apically excavate; pleotelsonic formula 1+0; maxilla 2 a single lobe (Aus., NZ) ..... *Batedotea elongata*  
 Pleon tapering, usually apically acute or rounded; pleotelsonic formula variable, never 1+0; maxilla 2 with 2 or 3 lobes ..... 9
9. Pereonites with strongly lobate dorsal coxal plates; pleon laterally excavate; head and pereonite 1 with mid-dorsal crest; maxilla 2 with 2 lobes ..... *Engidotea cristata*  
 Pereonites without lobate dorsal coxal plates; pleon more or less tapering; without mid-dorsal crest; maxilla 2 with 3 lobes ..... 10
10. Lateral margins straight; without dorsal coxal plates (sutures ventral); pereon and pleon with even mid-dorsal ridge ..... *Synischia levidensis*  
 Lateral margins more or less irregular; dorsal coxal plates visible dorsally at least on posterior pereonites; pereon and pleon rarely dorsally ornamented, never with even mid-dorsal ridge ..... 11
11. Body deeply vaulted; pleotelsonic formula 2+1; pleotelson apex acute ... *Pentidotea australis*  
 Body somewhat flattened; pleon with never more than 1 fully marked pleonite; pleotelson apex acute or excavate ..... 12
12. Pereonite 7 with ventral W-shaped ridge between pereopods; maxillipedal palp article 5 free; palms of pereopodal propodi with 1-2 spiniform setae ..... *Paridotea* ..... 13  
 Pereonite 7 without ventral W-shaped ridge between pereopods; maxillipedal palp articles 4+5 fused; palms of pereopodal propodi with clusters of setae ..... *Euidotea* ..... 18
13. Pleotelson apex strongly excavate, posterolateral corners acute ..... 14  
 Pleotelson apex weakly excavate or rounded, posterolateral corners rounded ..... 15
14. Pleotelson tapering; pleotelsonic formula 1+2 (NZ, Aus.) ..... *Paridotea ungulata*  
 Pleotelson widest posteriorly; no pleonites visible dorsally ..... *Paridotea miersi*
15. Pleotelsonic formula 1+0; pleotelson apex barely excavate or not ..... 16  
 Pleotelsonic formula 0+3; pleotelson apex clearly excavate (except in smallest individuals) 17
16. Head as wide as pereonite 1; pleonal apex rounded; maxilla 2 outer lobes short .....  
 ..... *Paridotea simplex*  
 Head narrower than pereonite 1; pleotelson apex excavate; maxilla 2 lobes of equal length ...  
 ..... *Paridotea collingei*
17. Dorsal coxal plates 5 and 6 reaching posterior margin of tergites (in oblique lateral view); dorsal coxal plate 7 acute and clearly exceeding posterior margin of tergite; pleotelson apical excavation almost as deep as wide (except in small individuals) ..... *Paridotea munda*  
 Dorsal coxal plates 5 and 6 not reaching posterior margin of tergites (in obliquelateral view); dorsal coxal plate 7 rounded and just reaching posterior margin of tergite; pleonal apical excavation broader than deep ..... *Paridotea aquarii*
18. Body 9× as long as wide; pleon tapering to finely acute apex; pleonites not visible dorsally .....  
 ..... *Euidotea caeruleotincta*  
 Body at most 6× as long as wide; pleon not especially tapering; 2-3 pleonites visible dorsally ..... 19
19. Dorsal coxal plates clearly visible on posterior pereonites, reaching posterior margin of pereonites 6 and 7; pleotelsonic formula 0+3, first pleonite longer than others ..... *Euidotea halei*  
 Dorsal coxal plates not visible on posterior pereonites; pleotelsonic formula 1+2 or 0+3, first pleonite not longer than others ..... 20
20. Pleonite 1 suture complete dorsally; pleotelsonic formula 1+2 ..... 21  
 Pleonite 1 suture lateral only; pleotelsonic formula 0+3 ..... 22
21. Pleotelson barely tapering to angular apex, twice as long as wide; dorsal coxal plate 7 acute .....  
 ..... *Euidotea peronii*  
 Pleotelson widest posteriorly, 2.5× as long as wide; dorsal coxal plate 7 rounded .....  
 ..... *Euidotea stricta*
22. Pereonite 1 with well-developed shoulders, wider than pereonite 2; pleotelson lateral margins concave, apex with obtuse posterolateral angles (NZ) ..... *Euidotea durvillei*  
 Pereonite 1 without shoulders, as wide as pereonite 2; pleotelson lateral margins convex, without posterolateral angles (except small individuals) ..... 23
23. Pleonite 1 suture obscured by dorsal coxal plate 7; head with dorsal boss; pereonites 1-4 usually with dorsolateral sculpture ..... *Euidotea bakeri*  
 Pleonite 1 suture visible; head and pereonites 1-4 smooth ..... *Euidotea danai*

Genus *Batedotea*, gen. nov.

Type species: *Idotea elongata* Miers, 1876.

*Diagnosis*

Body narrow (male about  $9\times$  as long as wide), smooth, head as wide as pereonite 1, parallel-sided. Pleon without articulating pleonites, pleonite 1 indicated by dorsal suture, 2 and 3 by ventral sutures (pleotelsonic formula 1+2); apically truncate. Antenna 2 multi-articulate. Mandible typical. Maxilla 1 with reduced inner lobe, outer lobe with short stout setae laterally, exposed to view beyond end of maxillipedal endite. Maxilla 2 a single lobe. Maxillipedal endite narrow, with reduced apical setation; palp digitiform, articles free. Coxae 2–7 without dorsal coxal plates, lateral sutures visible dorsally only posteriorly. Pereopod 1 with spiniform seta on palm of propodus; pereopods 2–7 without spiniform setae. Penes fused at base, attached to posterior margin of pleonite 1. Oostegites lamellar on pereopods 1–5.

*Remarks*

*Batedotea* is erected to accommodate a single species from south-eastern Australia and New Zealand previously assigned to *Crabyzos* Bate. *Batedotea* and *Crabyzos* are similar in several respects: both have reduced maxillae 1 and 2 and narrow maxillipedal endite. The major differences between the two genera are in overall habitus (*Batedotea* lacks the fused head, completely fused and acute pleotelson, and asymmetrical mouthparts seen in *Crabyzos*). The outer lobe of maxilla 1 is exposed to view beyond the endite of the maxilliped (unlike other genera), the maxillipedal coxa is free (invisible in *Crabyzos*), the mandibular molar process has a denticulate rim (rounded in *Crabyzos*), the mesial setae on the palm of pereopod 1 are in a typical field (in a row in *Crabyzos*), and the secondary unguis of the pereopods is larger than in *Crabyzos*.

*Etymology*

For C. Spence Bate who described the related Australian idoteid genus *Crabyzos*.

*Batedotea elongata* (Miers)

(Figs 1–3)

*Idotea elongata* Miers, 1876a: 225. — Miers, 1876b: 93, pl. 2, fig. 3; Miers, 1881: 54–5; Chilton, 1883: 517; Thomson, 1883: 333; Thomson and Chilton, 1886: 156; Chilton, 1890: 198–9; Chilton, 1909: 658; Stephensen, 1927: 369.

*Pentidothea elongata*. — Nierstrasz, 1917: 114.

*Crabyzos elongatus*. — Hale, 1929: 319; Nierstrasz, 1941: 268; Hurley, 1961: 265; Poore, 1981: 333.

*Edotia dilatata* Thomson, 1883: 333. — Thomson, 1884: 235, pl. 12, figs 9–10; Thomson and Chilton, 1886: 156; Chilton, 1890: 199; Nierstrasz, 1941: 275; Hurley, 1961: 265, 292 (synonymy).

*Material Examined*

*Illustrated specimens.* New Zealand: North Arm, Boat Harbour, The Snares, algae on rocks, D. S. Horning, University of Canterbury, 10.i.1975, NMV J4747 (♀, 23.0 mm); J4746 (♂, 26.5 mm).

*Other material.* New Zealand: North Arm, Boat Harbour, The Snares, algae on rocks, D. S. Horning, University of Canterbury, 10.i.1975, NMV J1092 (2); Brighton, Canterbury, TM G459/16696 (9); Tucker Cove, Perseverance Harbour, Campbell I. (52°33'S., 169°07'E.), washed ashore at midtide mark, M. A. Frazer, 12.i.1980, AM P38900 (1). Tasmania: Verona Sands, d'Entrecasteaux Channel (43°17'S., 147°9'E.), E. Kenchington, 20.x.1985, TM G3127 (♀, 22.8 mm, 1 slide).

*Description**Male*

Body  $8\times$  as long as wide, not especially flattened, dorsal surface smooth. Head wider than long; rostrum broad, projecting beyond anterolateral lobes. Pereonite 1 free, not as

long as head, pereonites 2–4 progressively longer, pereonites 5–7 progressively shorter, pereonite 7 shortest. Coxal plates barely visible dorsally. Pleotelson  $0.25\times$  whole body length; one pleonal suture extending dorsally, second and third pleonites indicated by small ventral sutures; pleotelson parallel-sided, tapering distally to broadly notched apex.

Antenna 1 peduncles widely separated, frontal lamina clearly visible in dorsal view. Antenna 1 articles 2 and 3 short; flagellum with 9 pairs and 1 terminal aesthetasc. Antenna 2  $0.3\times$  whole body length; peduncle articles 3–5,  $1-2\times$  as long as wide; flagellum of 17 articles,  $2.3\times$  length of peduncle. Frontal lamina broadly rounded. Upper lip symmetrical. Mandibles only slightly asymmetrical. Left mandible incisor with a narrow 3-toothed apex and fourth tooth on its posteroproximal margin; lacinia mobilis 3-toothed; spine row a small cluster; molar process truncate, anteroposteriorly flattened, rimmed by blunt teeth, dense spine row around anterior, proximal and posterior surfaces. Right

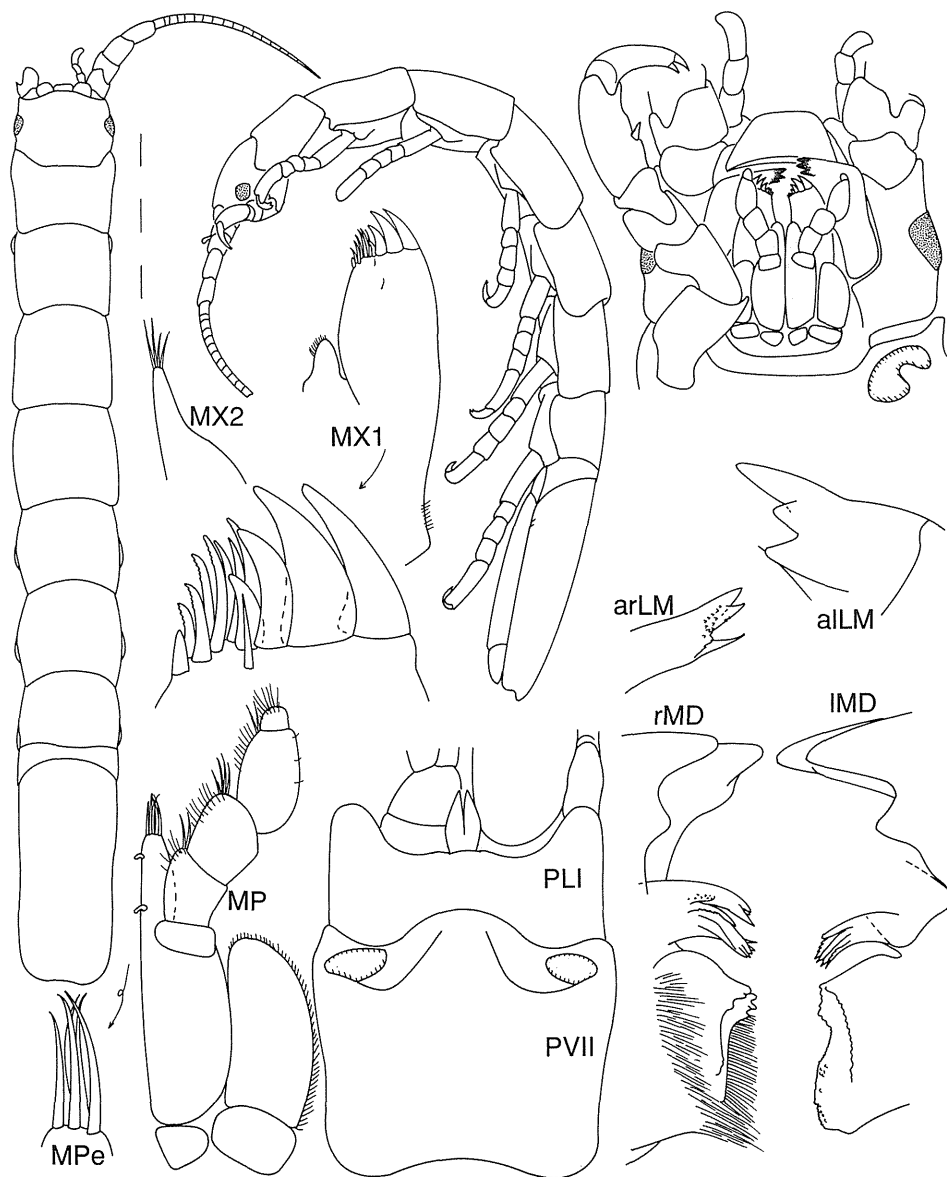


Fig. 1. *Batedotea elongata*. Male, NMV J4746; a, female, NMV J4747.

mandible same as left except lacinia mobilis narrower, with 3 acute apices. Maxilla 1 outer plate with 12 apical spiniform setae, 4 lateral setae markedly stouter than the remainder; inner plate short (as long as wide), without long apical setae. Maxilla 2 posterior to inner plate of maxilla 1; a single asymmetrical lobe with 4 apical setae. Maxilliped with coxal plate and proximal portion of epipod clearly defined; endite slender, with 2 widely separated coupling hooks and 5 long apical setae. Palp digitiform, about  $1.5\times$  as long as proximal portion of basis; articles 2 and 3 approximately quadrangular; article 5 much shorter than article 4; palp without lateral setae; epipod ovate.

Pereopod 1 carpus short, propodus  $2.3\times$  as long as greatest width, palm sinuate, with a strong spiniform seta, mesial face with scattered pectinate setae. Pereopods 2 and 3 propodus palm sinuous, with 2 and 1 strong spiniform setae respectively. Pereopods 4–7 with felt of fine setae posteriorly on merus-propodus.

Pleopods 1 and 2 fringed with short plumose setae; pleopods 3–5 without such setae; appendix masculina on pleopod 2 with spatulate apex. Uropods and pleopodal cavity reaching apex of pleotelson.

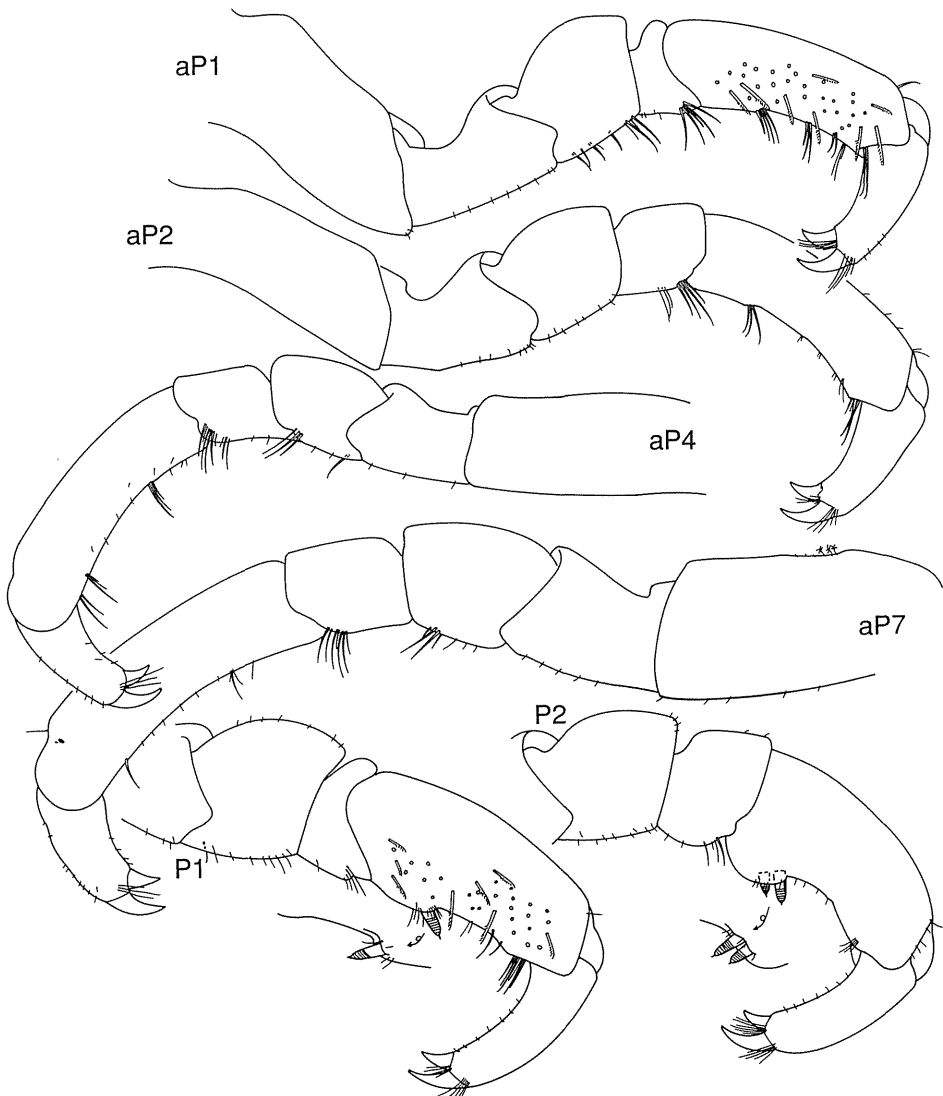


Fig. 2. *Batedotea elongata*. Male, NMV J4746; a, female, NMV J4747.



*Female*

Broader than male ( $5\times$  as long as wide). Pereopods more elongate than in male (e.g. pereopod 1 propodus  $3.0\times$  as long as wide). Pereopods 1–3 without posterior spiniform setae on propodus. Pereopods 4–7 without felt of fine setae.

*Size*

Male to 26.5 mm; female to 23 mm.

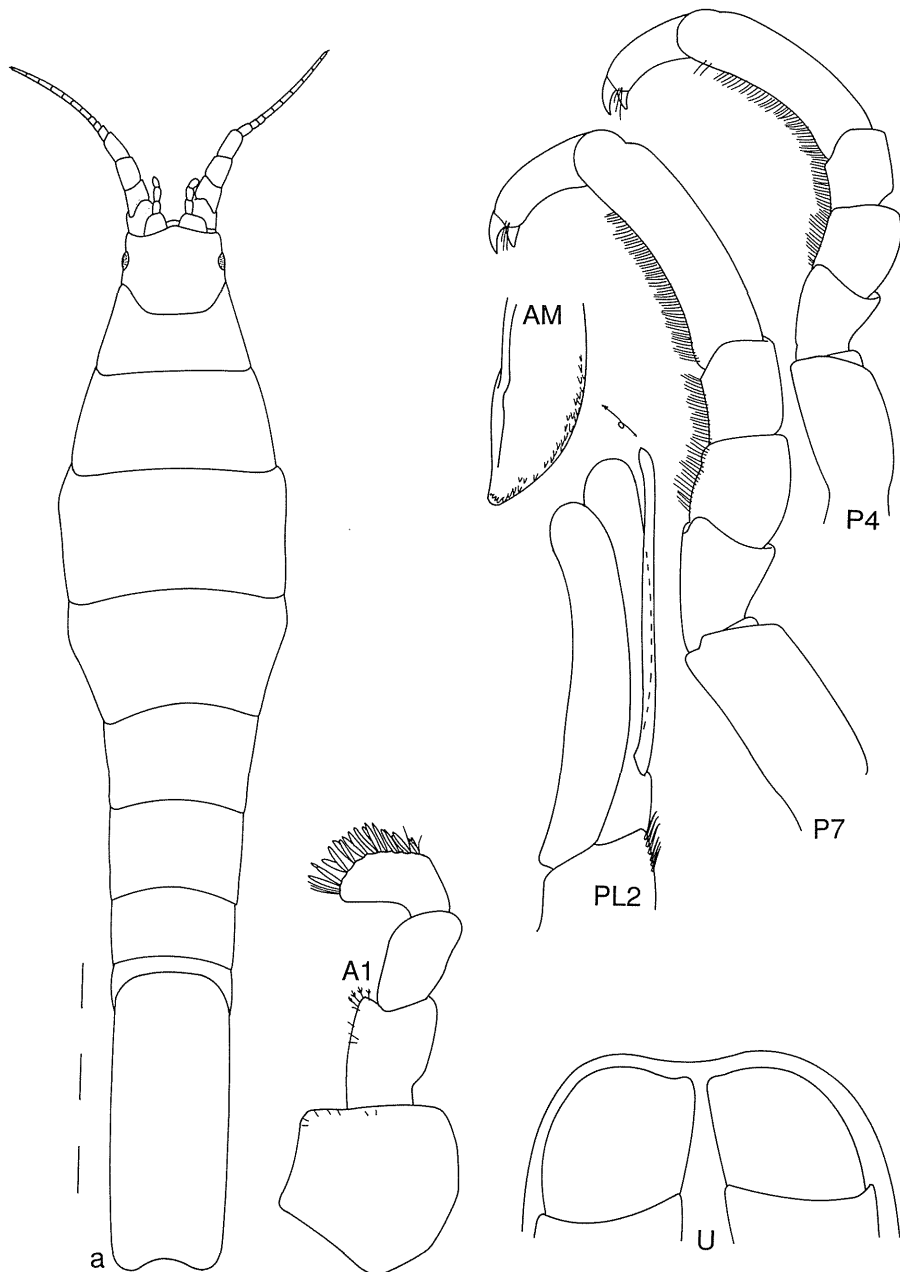


Fig. 3. *Batedotea elongata*. Male, NMV J4746; a, female, TM G3127.

### Distribution

New Zealand: southern South I., subantarctic islands (Hurley 1961; Poore 1981).  
Australia: Tasmania. Falkland Is (Miers 1881).

### Remarks

Syntypes of *Idotea elongata* Miers, 1876 (BMNH 996a-d) from the Auckland Is were not examined, but there seems little likelihood of confusion over the identity of this species. The holotype of *Edotia dilatata* Thomson, 1883, was not traced and its synonymy is based on Hurley's (1961) statement. Thomson's (1883) diagnosis of this species was not informative but is sufficient to allow this as the date of publication; his 1884 description was more complete.

In southern New Zealand and its subantarctic islands it is most easily recognised by being more or less parallel-sided with a shallow pleotelsonic notch. We have been unable to locate the material from Australia identified by Collinge (1916) as *Idotea elongata*.

A single specimen from Tasmania differs slightly from those from New Zealand. Its pereopods are more slender than is typical and the apex of its pleotelson is more square and with a stronger excavation. Until more material becomes available, the specific status of this specimen is uncertain. Hale (1929) stated '... this species has been recently recorded from South Australia, but is seldom met with here'. We have not been able to locate material from this state in Hale's collection and suspect that his record is based on a report from another person. The species could be confused with, perhaps, *Paridotea munda* which is very common.

Miers (1881) reported this species from the Falkland Is but we have not seen these specimens and have not confirmed his identification.

### Genus *Crabyzos* Bate

*Crabyzos* Bate, 1863: 504.—Hale, 1929: 318.

Type species: *Crabyzos longicaudatus* Bate, 1863 (monotypy).

### Diagnosis

Body narrow (about 10× as long as wide), smooth, head as wide as and fused to pereonite 1, parallel-sided. Pleon without articulating pleonites, no pleonites indicated by sutures (pleotelsonic formula 0+0); apically acute. Antenna 2 multiarticulate. Upper lip and mandibles asymmetrical. Mandible with weakly ridged molar process. Maxilla 1 with reduced inner lobe, outer lobe with short stout setae. Maxilla 2 a single lobe. Maxillipedal endite narrow, with reduced apical setation; palp digitiform, articles free, 5 elongate. Coxae 2-7 without dorsal coxal plates, lateral sutures not visible dorsally. Pereopods without spiniform setae on palms of distal articles. Penes fused at base, attached to posterior margin of pleonite 1. Oostegites lamellar on pereopods 1-5.

### Remarks

As now defined, the genus is monotypic and there are several characters that warrant separating *C. longicaudatus* from *Batedotea elongata*. The differences between the two genera were discussed above. *Crabyzos longicaudatus* is the only idoteid known in which the upper lip is strongly asymmetrical, making the species easy to recognise.

### *Crabyzos longicaudatus* Bate

(Figs 4, 5)

*Crabyzos longicaudatus* Bate, 1863: 504, pl. 41, fig. 7.—Haswell, 1882: 278; Hale, 1929: 318-9, fig. 322; Hale, 1924: 217-8, fig. 6; Hale, 1927: 317; Nierstrasz, 1941: 268.

*Idotea longicaudata*.—Miers, 1881: 63-4; Haswell, 1885: 1001.

### Material Examined

*Illustrated specimens.* South Australia: Foul Bay (35°11'S., 137°15'E.), J. Glover, 7.xii.1963, SAM C4114 (1♀, 49 mm); 6 km NNW. of mouth of Port Davis Ck, nr Port Pirie (33°12'S., 138°00'E.), 4-8 m, *Posidonia* and *Amphibolus*, T. Ward, Aug. 1979, SAM C4115 (1♂, 35 mm, 2 slides).

*Other material.* **Tasmania:** numerous specimens from east coast localities, Southgate, Dover, Bruny I., Margate, on seagrass, 0–3 m depth, NMV and TM collections. **Victoria:** numerous specimens from several localities including Corner Inlet, Wilsons Promontory, Western Port, Flinders, Port Phillip Bay, on seagrasses, 0–21 m depth, NMV collections. **South Australia:** numerous specimens from several localities including Giles Point, Port Pirie, Gulf St Vincent, Spencer Gulf, Tiparra Reef, Cape Northumberland, Kangaroo I., Flinders I., on seagrasses, 0–20 m depth, AM, NMV and SAM collections. **Western Australia:** several specimens from region of Rockingham and Cockburn Sound, most dredged, WAM collections.

### Description

#### Male

Body 11 × as long as wide, dorsoventrally flattened, dorsal surface smooth. Head as long as wide, rostrum poorly defined, not projecting as far as anterolateral lobes. Pereonite 1

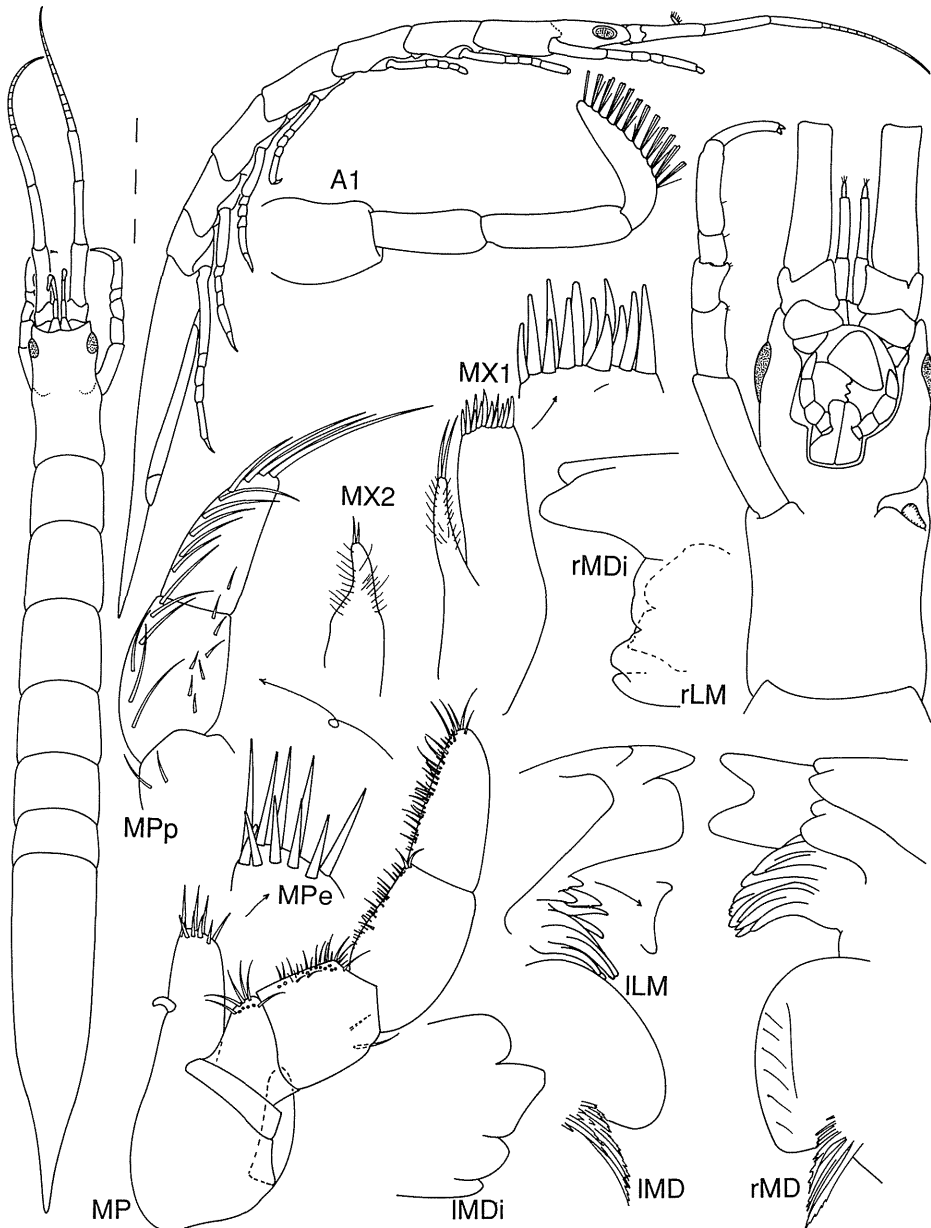


Fig. 4. *Crabyzos longicaudatus*. Male, SAM C4115. Incisors and laciniae mobiles from distal views.

fused to head, suture indicated by shallow grooves which are present laterally, grooves absent mid-dorsally and mid-ventrally. Pereonite 1 as long as head, pereonites 2-4 progressively longer, pereonites 5-7 progressively shorter, pereonite 7 shortest. Coxal plates not visible dorsally. Pleotelson  $0.4 \times$  whole body length, pleonal sutures absent dorsally and ventrally; pleotelson parallel-sided over proximal half, tapering distally to attenuated apex.

Antenna 1 peduncles closely opposed. Antenna 1 peduncle articles 2 and 3 elongate; flagellum with 10 pairs and 1 single aesthetascs. Antenna 2  $0.3 \times$  whole body length; peduncle articles 3-5 at least  $5 \times$  as long as wide; flagellum of 10-15 articles,  $0.7 \times$  length of peduncle. Upper lip asymmetrical, left side lobed posteriorly on figured specimens. Mandibles asymmetrical. Right mandible incisor a toothed blade with a strong bifid tooth on posterior corner; lacinia mobilis a toothed blade about half width of incisor; spine row a compact cluster; molar process a boss with shallow transverse grooves and a cluster of toothed spines on anterodorsal area. Left mandible incisor with 4 blunt subequal teeth; lacinia mobilis very short, with teeth at each corner; spine row a compact cluster; molar

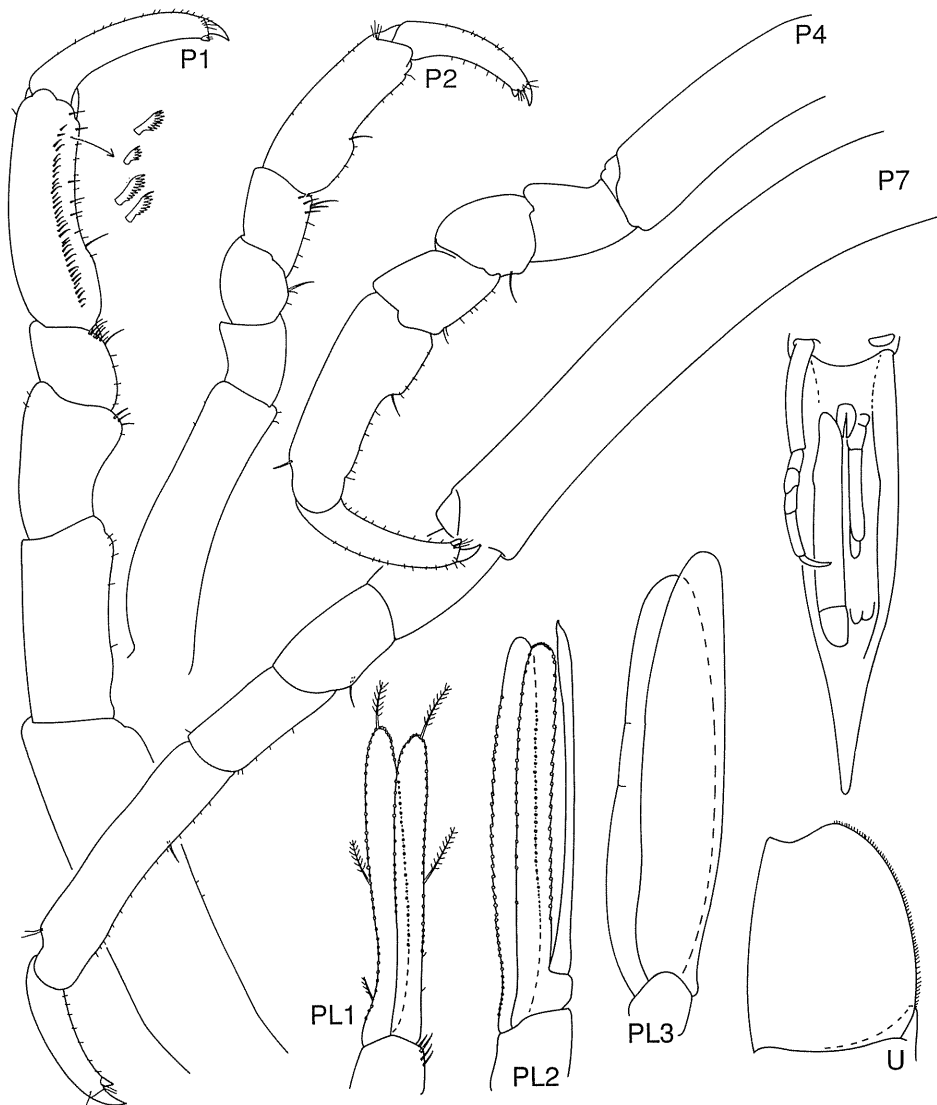


Fig. 5. *Crabyzos longicaudatus*. Male, SAM C4115.

process as on right but smooth. Maxilla 1, outer plate with 12 apical spiniform setae, inner plate slender (length  $3 \times$  base width), with 2 apical setae. Maxilla 2 posterior to inner plate of maxilla 1, a single asymmetrical lobe with 2 apical setae. Maxilliped with coxal plate and basal portion of epipod fused to rest of maxilliped; endite with a single coupling hook, apically with 10 spiniform setae in 2 rows. Palp digitiform, of 5 articles, about  $3 \times$  as long as proximal portion of basis; articles 4 and 5 of equal length, elongate and with long anterolateral setae. Epipod linguiform, short.

Pereopods 1–3 directed anteriorly, decreasing in length posteriorly; pereopods 4–7 directed posteriorly, increasing in length posteriorly; all pereopods with linear propodus. Pereopod 1 without posterior spiniform setae, carpus quadrate, propodus with a single row of pectinate setae mesially. All pereopods without spiniform setae, posterior margin with sparse scattered setae; propodus with a stepped palm, most marked on pereopods 2–4, less pronounced on posterior limbs.

Pleopods 1 and 2 fringed with short plumose setae; pleopods 3–5 without such setae; appendix masculina on pleopod 2 with acute apex. Uropods and pleopodal cavity not reaching apex of pleotelson. Uropodal endopod distally excavate.

#### *Female*

Broader than male, especially pereonites 3 and 4,  $8 \times$  as long as wide.

#### *Size*

Male to 35 mm; female to 49 mm.

#### *Distribution*

Southern Australia from Cockburn Sound (W.A.) to Corner Inlet (Vic.) and southern Tasmania; near-shore habitats, often with seagrass.

#### *Remarks*

The syntypes of this species were not examined but the elongate acute pleotelson, flattened parallel-sided habitus, and fused head-pereonite 1 immediately identify this species. *Euidotea caeruleotincta* is superficially similar but is more irregular in dorsal view and has a free head. In many specimens examined from Victoria the asymmetry of the mouthparts is reversed: the upper lip is produced posteriorly on the right side and the left mandible has the bifid tooth on the incisor, the larger lacinia mobilis and the ridged molar process.

The species is commonly encountered in samples from seagrass beds and is as brilliant green as the plants with which it lives.

#### Genus *Engidotea* Barnard

*Engidotea* Barnard, 1914: 203–4.

Type species: *Idotea lobata* Miers, 1881 (monotypy).

#### *Diagnosis*

Body broad (about  $3 \times$  as long as wide), smooth or with mid-dorsal crest anteriorly, head narrower than pereonite 1, generally flattened, lateral margins of pereonites produced. Pleon without articulating pleonites, pleonite 1 sometimes indicated dorsally, pleonites 2 or 2–3 indicated by minute suture laterally only (pleotelsonic formula  $1+2$  or  $0+3$ ). Antenna 2 multiarticulate. Mandible with molar process or a soft setose lobe. Maxilla 1 typical. Maxilla 2 with only 2 lobes (outer lobe absent, middle lobe reduced). Maxillipedal endite with apical setation; palp broad, articles 4 and 5 sometimes fused. Coxae 2–7 with non-contiguous non-articulating, dorsal coxal plates extending as lateral plates. Pereopod 1 with spiniform setae proximally on palm of carpus and propodus; pereopods 2–7 with fewer spiniform setae on palm of propodus, sometimes 1 on carpus. Penes fused at base, attached near posterior margin of pleonite 1.

### Remarks

This new diagnosis provides considerably more detail than did Barnard (1914) when he erected the genus for the South African type species. Material of *Engidotea lobata* from South Africa has been examined to confirm the unusual characters of the mouthparts. We place the new Australian species in this genus on the basis of overall habitus, especially the 'lobate' nature of the dorsal coxal plates, setation of the pereopods and, importantly, the reduction of maxilla 2.

### *Engidotea cristata*, sp. nov.

(Figs 6–8)

#### Material Examined

*Holotype*. South Australia: 1.3 km off Cape Northumberland (38°04'S., 140°40'E.), 15 m, red algae, S. A. Shepherd, 1976–77, SAM C4111 (♂, 32 mm, with 2 slides).

*Paratypes*. **South Australia**: collected with holotype, SAM C4112 (juv., 25 mm); SAM C4113 (juv., 10 mm, with 1 slide); NMV J23744 (♂, 25 mm). **Western Australia**: nr Cervantes (30°30'S., 115°04'E.), WAM 677-92 (dry specimen).

#### Description

##### Male

Body about  $3.2 \times$  as long as wide, lateral margin of pereonites and pleotelson expanded. Head twice as wide as long, front over-ridden by a strong mid-dorsal crest. Pereonite 1, and to lesser degree pereonites 2 and 3 with mid-dorsal crests; pereonites 2–7 subequal in length, longer than head. Coxal plates 2–7 clearly visible dorsally as obtusely acute lateral lobes. Pleotelson  $0.3 \times$  whole body length, with strong lateral lobe anteriorly and less prominent lobe posteriorly; 3 pleonites indicated by minute ventral sutures (pleotelsonic formula 0 + 3).

Antenna 1 peduncles separated. Antenna 1 peduncle article 3 about as long as article 2; flagellum as long as peduncle article 3. Antenna 2  $0.25 \times$  body length; peduncle article 3 distomedially lobed; article 4 ovate and flattened; flagellum of 11 articles,  $0.8 \times$  length of peduncle. Frontal lamina simple, clypeus produced laterally, upper lip symmetrical. Mandibles asymmetrical; incisor 4-toothed, broad; left lacinia mobilis 3-toothed, broad; right lacinia mobilis narrower; spine row of about 20 blade-like spines; molar process a simple lobe without a trituration face, bearing numerous long curved setae. Maxilla 1 inner lobe with 2 distal plumose setae, outer lobe with 12 simple apical spiniform setae. Maxilla 2 with 2 lobes: inner lobe with row of 10 setae; outer lobe with 4 short curved setae. Maxilliped with coxal plate and basal portion of epipod indistinct; endite with single coupling hook, apically with 8 setae. Maxillipedal palp operculiform, about  $2.5 \times$  as long as proximal portion of basis; articles 4 and 5 fused together, combined length  $1.5 \times$  width, without anterolateral setae. Epipod longer than broad.

Pereopod 1 shortest, basis flanged, merus with 1 posterodistal short spiniform seta; carpus with cluster of spiniform setae posterodistally; propodus with cluster of spiniform setae on concave palm, mesial face with about 30 pectinate setae. Pereopods 2–7 ambulatory, bases more strongly flanged than in pereopod 1, increasing in length posteriorly, propodi curved, with concave palms. Pereopod 2 carpus with few short spiniform setae posteroproximally; propodus with 1 small spiniform seta posterodistally. Pereopods 3–7 similar to pereopod 2, setation less well developed. Dorsal coxal plates 2–7 laterally expanded, not contiguous and marked by a clear suture dorsally.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina tapering to obliquely truncate apex, longer than endopod. Uropods and pleopodal cavity parallel-sided over most of length, reaching near apex of pleotelson. Uropodal endopod subtriangular.

##### Female

Unknown.

*Juvenile*

Lateral margins of pereonites 2-4 formed by tergite (dorsal coxal plates not laterally expanded, suture ventral); from pereonites 5 to 7 dorsal coxal plates are progressively expanded. In smallest specimen there is little lateral expansion of tergum or of dorsal coxal plates.

*Size*

Maximum 32 mm.

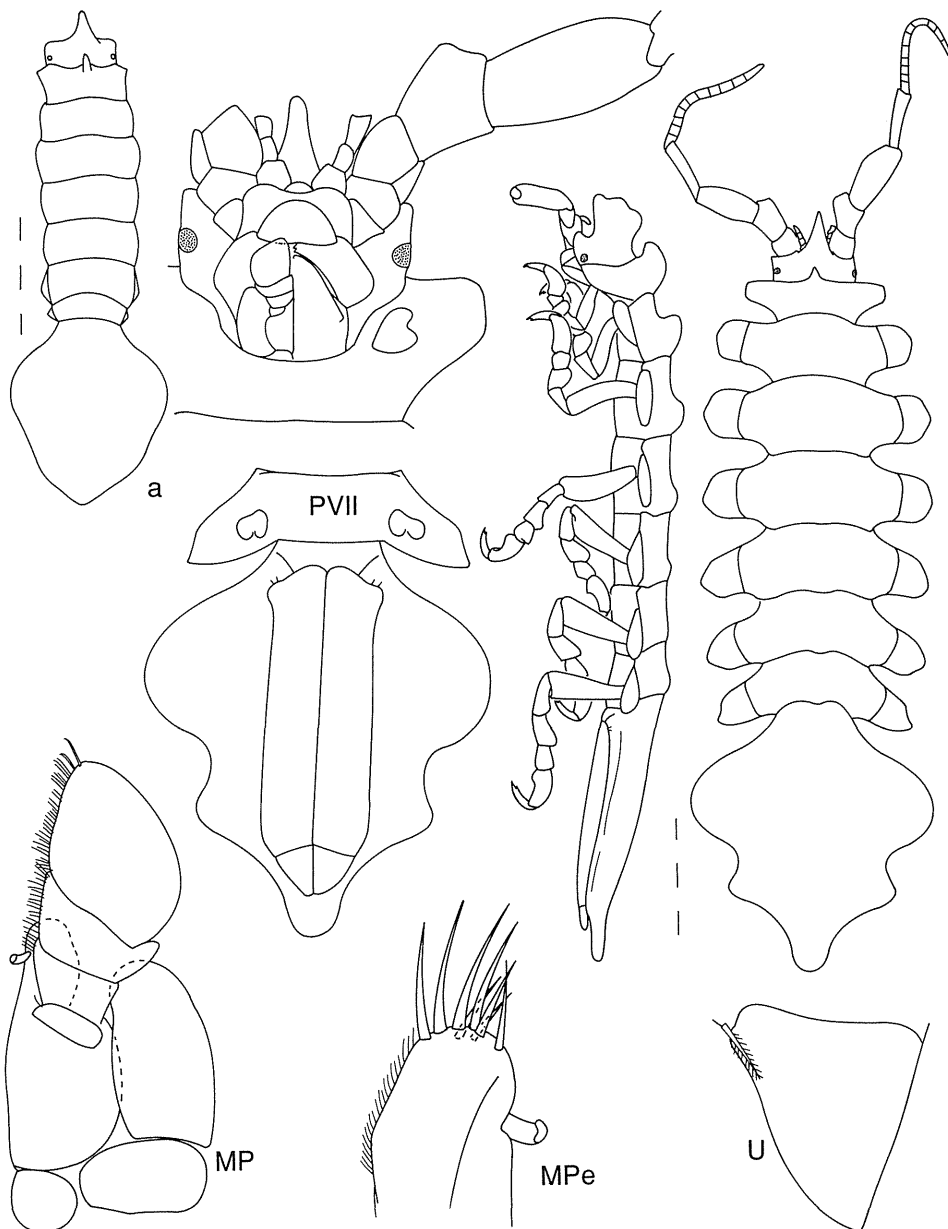


Fig. 6. *Engidotea cristata*. SAM C4111, holotype; a, SAM C4113, paratype.

*Distribution*

South Australia and south-western Western Australia, subtidal algal communities (rare).

*Remarks*

This is only the second species to be assigned to this genus. It is more ornamented than the South African species. It is rare, but most easily recognised in Australia by its spectacular decoration. In adults, dorsal coxal plates 2–7 are well developed and separated from tergites by a dorsal suture. The juvenile is superficially very different, with reduced ornamentation and expansion of the anterior dorsal coxal plates.

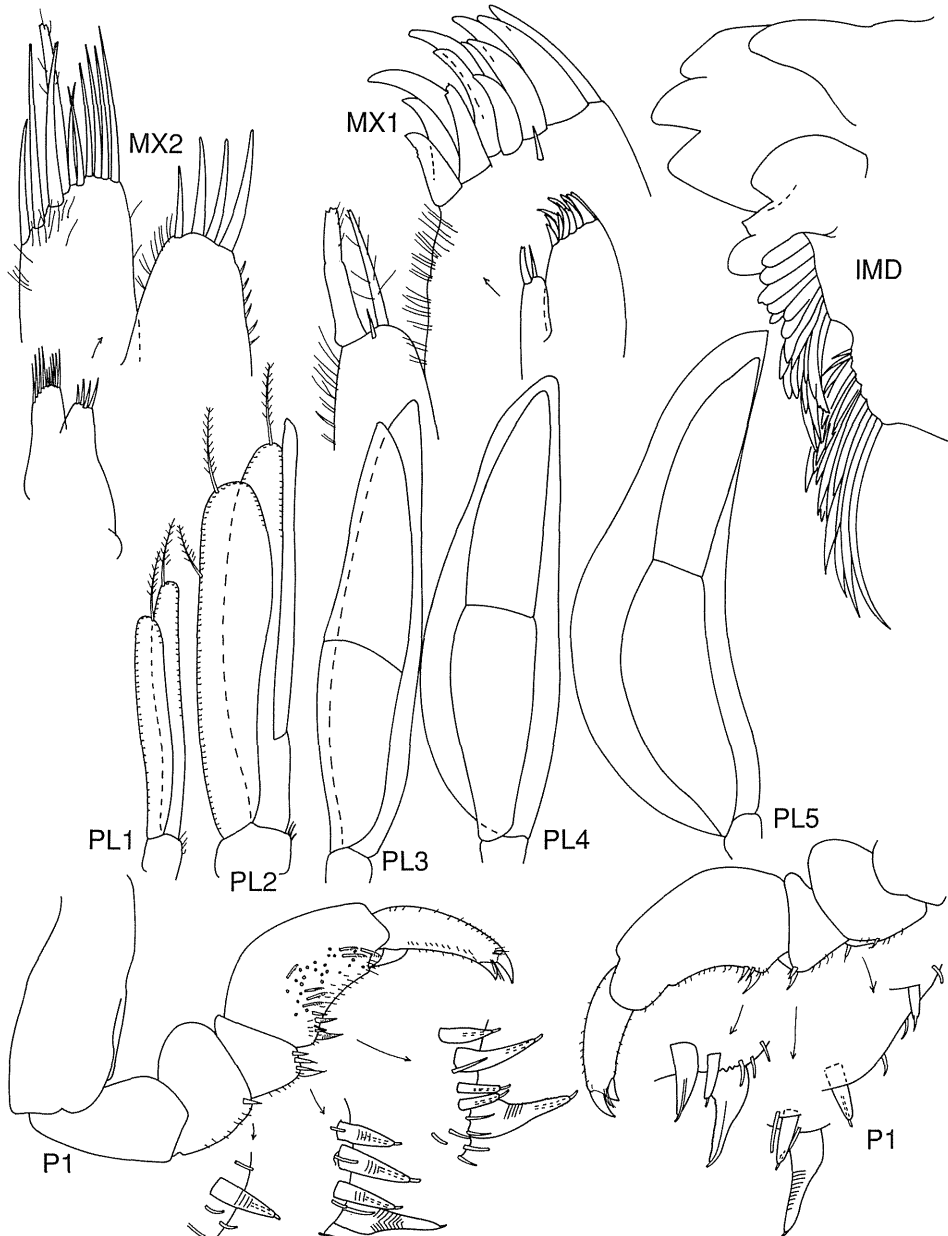


Fig. 7. *Engidotea cristata*. SAM C4111, holotype.



*Etymology*

*Cristata* (L.), with a cock's comb, alluding to the crest of the head.

Genus *Euidotea* Collinge

*Euidotea* Collinge, 1917b: 84.

Type species: *Idotea peronii* Milne Edwards, 1840 (monotypy).

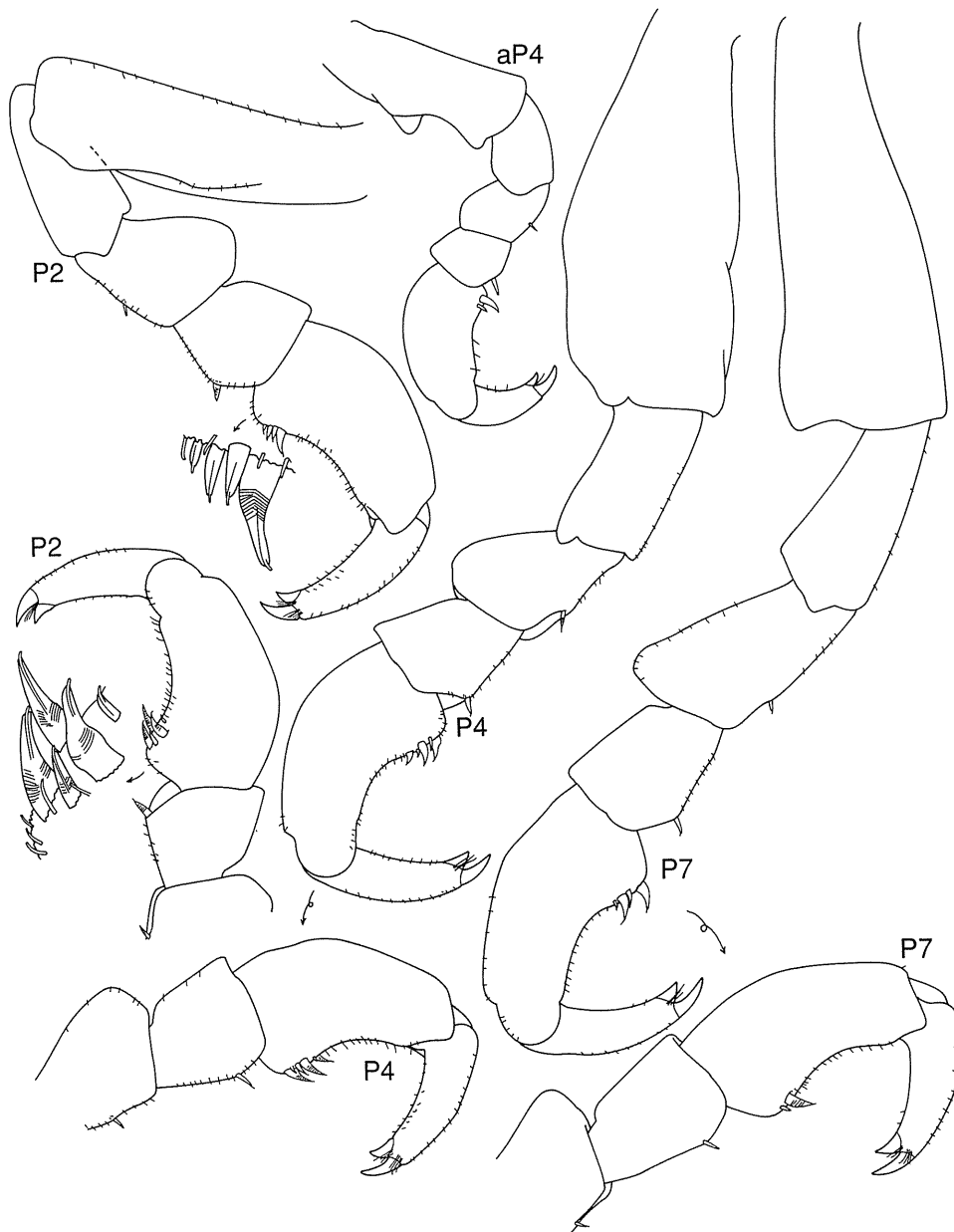


Fig. 8. *Engidotea cristata*. SAM C4111, holotype; a, SAM C4113, paratype.

*Diagnosis*

Body moderately broad (usually about  $4\times$  as long as wide), smooth, head narrower than pereonite 1, body widest at pereonite 4. Pleon without articulating pleonites, pleonites 1–2 or 1–3 indicated by suture ventrolaterally only, 1 sometimes indicated completely dorsally (pleotelsonic formula  $0+2$ ,  $0+3$  or  $1+2$ ). Antenna 2 multiarticulate. Mandible, maxillae 1 and 2 typical. Maxillipedal endite with apical setation; palp broad, articles 4 and 5 fused, rarely articles 2 and 3 fused. Coxae 2–7 with non-contiguous non-articulating, dorsal coxal plates more visible posteriorly than anteriorly. Pereopods with transverse clusters of spiniform setae on palm of merus, carpus and propodus, much reduced on more posterior pereopods. Penes fused at base, attached ventrally or near posterior margin of pleonite 1. Oostegites lamellar on pereopods 1–5.

*Remarks*

*Euidotea* comprises only seven Australian and New Zealand species; species recorded from other places can be disregarded. The record of *E. distincta* (Guérin-Méneville), a supposed synonym of *E. peronii*, from South Africa, has never been confirmed (Kensley 1978). A Japanese species, *E. ocellata* Nunomura, 1984, lacks the pereopod setation and maxillipedal structure characteristic of the genus and is more probably a species of *Paridotea*.

*Euidotea peronii* has been recorded from both Australia and New Zealand; we see real and consistent differences between the two populations and describe a new species for that from New Zealand. The problematic species, *Idotea stricta* Dana, 1853, is assigned to this genus.

*Euidotea bakeri* (Collinge) is first described in detail as a typical member of the genus and other species are diagnosed in less detail.

*Euidotea bakeri* (Collinge)

(Figs 9–11)

*Paridotea bakeri* Collinge, 1917a: 112–3, pl. 6.

*Euidotea bakeri*.—Hale, 1924: 215–7, fig. 5; Hale, 1927: 315; Hale, 1929: 317, fig. 320.

*Euidotea bakeri*.—Nierstrasz, 1941: 274.

*Paridothea bakeri*.—Nierstrasz, 1941: 267.

*Material Examined*

*Illustrated specimens.* South Australia: Sir Joseph Banks Group, reef E. of Blythe I. ( $34^{\circ}36'S.$ ,  $136^{\circ}16'E.$ ), 1.5 m, reef, rubble, W. Zeidler and K. L. Gowlett-Holmes, 29.i.1986, SAM C4123 ( $\sigma$ , 23 mm, 2 slides), C4124 (juv., 18 mm).

*Other material.* **Tasmania:** numerous specimens from several localities including Bathurst Harbour, Port Latta, Rocky Cape, Deal I., King I., Coles Bay, on algae and seagrasses, 0–8 m depth, AM, NMV, SAM and TM collections. **New South Wales:** Montagu I., 15 m, AM collection. **Victoria:** numerous specimens from many localities including Gabo I., Wilsons Promontory, Venus Bay, Cape Paterson, Cape Woolamai, San Remo, Western Port, Flinders, Port Phillip Bay, Aireys Inlet, Port Fairy, Lady Julia Percy I., on algae and seagrasses, 0–9 m depth, NMV and AM collections. **South Australia:** numerous specimens from several localities including Cape Northumberland, Robe, West I., Kangaroo I., Tiparra Reef, Flinders I., coralline algal turf and seagrass, 0–17 m depth, AM, NMV, SAM and TM collections. **Western Australia:** several specimens from Esperance, Cape Naturaliste, Rottnest I., Onslow, intertidal, AM, SAM and WAM collections.

*Description**Male*

Body about  $4.2\times$  as long as wide, not especially flattened. Head twice as wide as long, front concave, rostrum absent, with dorsal boss prominent in lateral view, and shallow posterior groove. Pereonite 1 shorter than head; pereonites 2–7 subequal, longer than head. Pereonites 1–7 and pleotelson with a mid-dorsal longitudinal ridge, pereonites 1–4 only with poorly defined dorsolateral longitudinal ridge. Coxal plates 2–7 clearly visible dorsally.

Pereonites 1-7 and pleonite 1 sternites each with transverse row of denticles. Pleotelson  $0.3 \times$  whole body length, 3 pleonites indicated by ventrolateral sutures (pleotelsonic formula  $0+3$ ); in dorsal and lateral aspect anterior suture obscured by coxal plate 7. Pleotelson broadest at midpoint, lateral margins rounded; tapering over posterior third to a broadly pointed apex.

Antenna 1 peduncles widely separated. Antenna 1 peduncle article 3 almost as long as first 2 combined; flagellum  $0.7 \times$  length of peduncle article 3, with 8 pairs and 1 single aesthetascs. Antenna 2  $0.3 \times$  body length; peduncle articles 3-5,  $1.6-3 \times$  as long as wide, flagellum of 10 articles,  $0.8 \times$  length of peduncle. Frontal lamina bifid, clypeus produced, upper lip symmetrical. Mandibles asymmetrical; incisor 4-toothed, broad; left lacinia mobilis

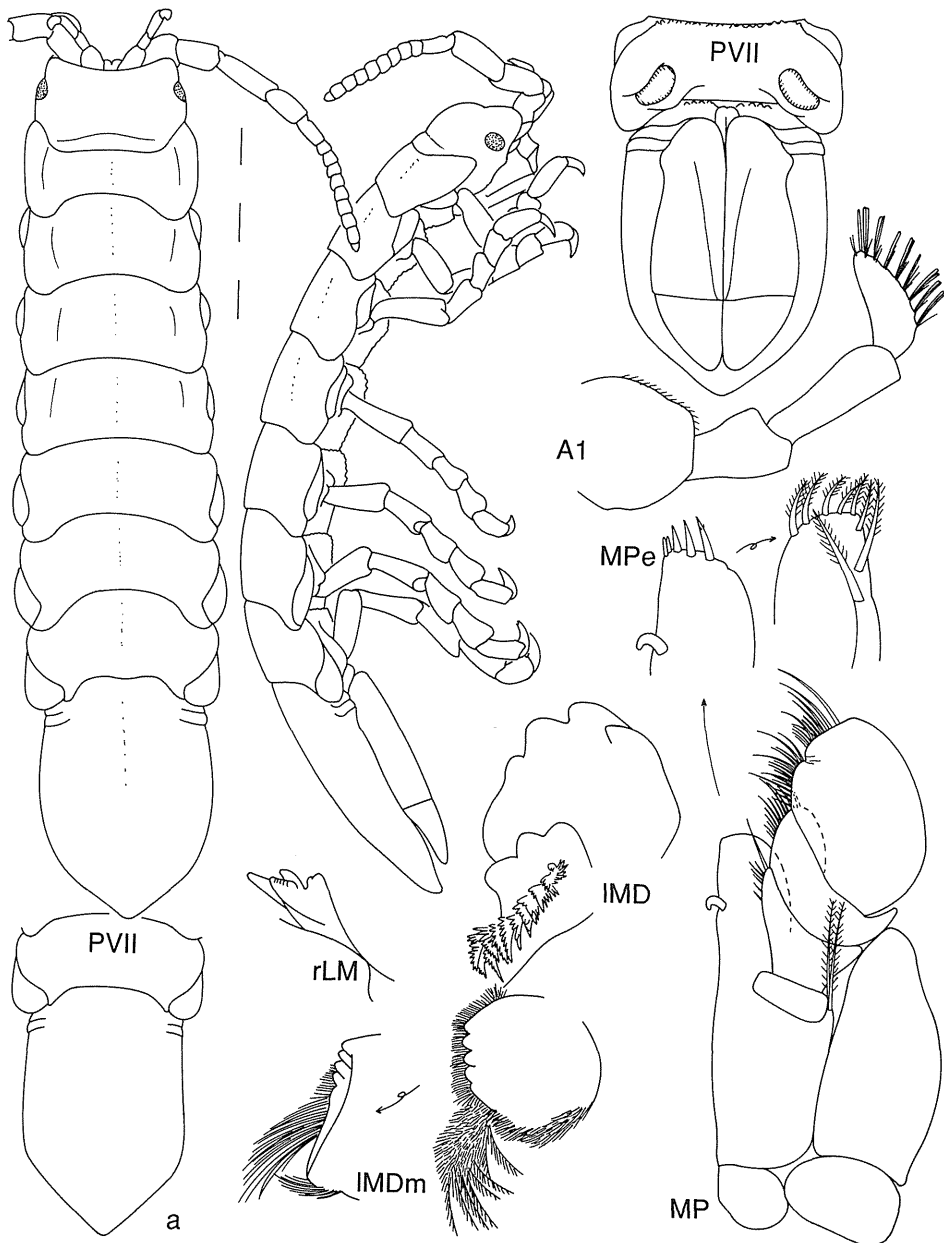


Fig. 9. *Euidotea bakeri*. Male, SAM C4122; a, juvenile, SAM C4124.

3-toothed, broad; right lacinia mobilis elongate, irregularly 4-toothed; spine row of 11 multifid curved spines; molar process truncate, rimmed by blunt teeth anterodistally, with anterior proximal cluster of long complex spines plus simple spines on anterior and proximal surface. Maxilla 1 inner lobe with 3 distal plumose setae, outer lobe with 12 apical spiniform setae, some denticulate. Maxilla 2 with 3 lobes: inner anterior lobe with 2 mesiodistal rows of 11 and 8 plumose setae and 11 apical thin setae; middle and outer posterior lobes with 10 and 14 curved, finely denticulate setae respectively. Maxilliped with coxal plate and basal portion of epipod distinct; endite with a single coupling hook, apically with 5

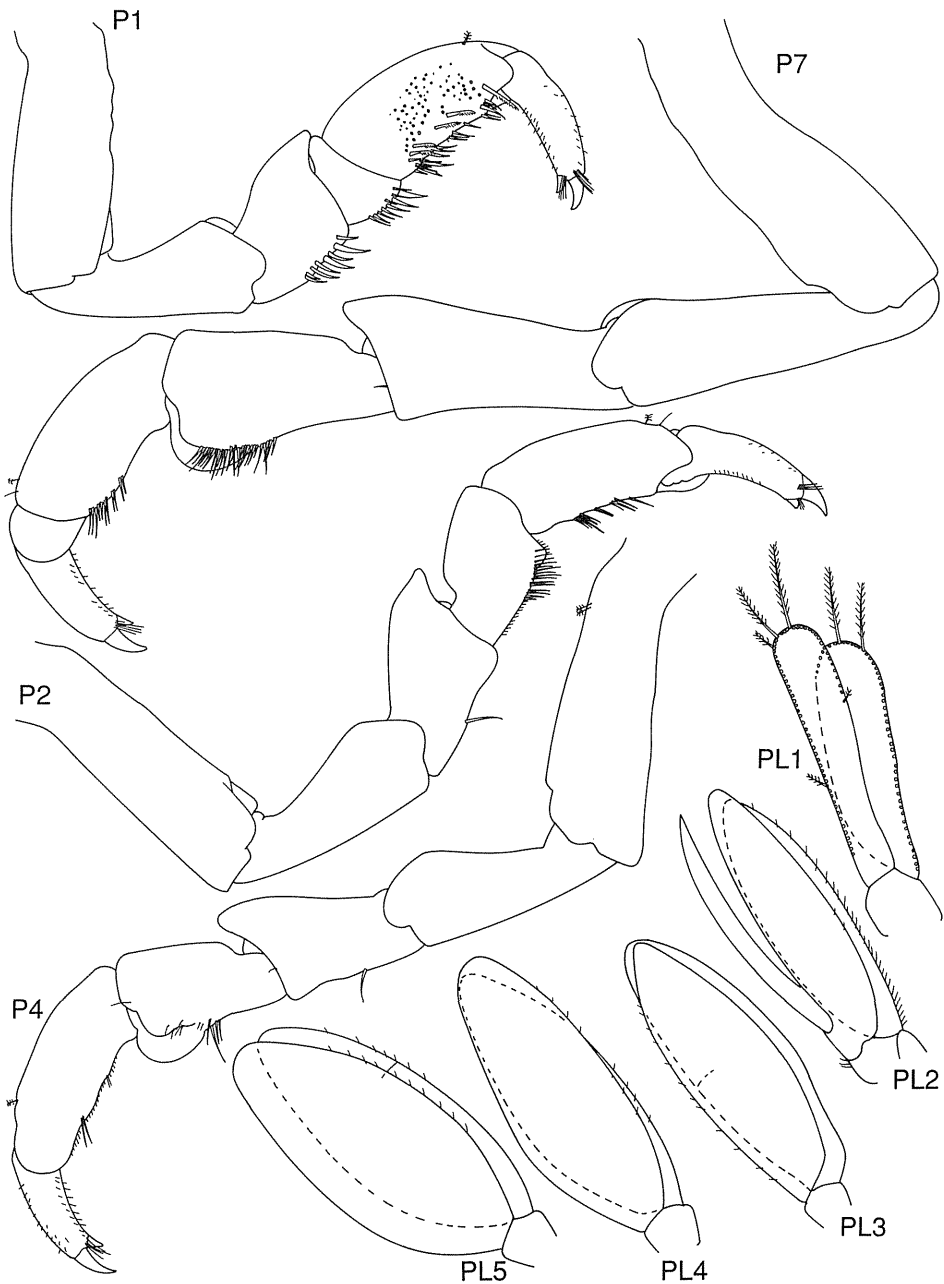


Fig. 10. *Euidotea bakeri*. Male, SAM C4122.

spiniform setae and 5 plumose setae arranged in 2 rows; 3 plumose setae on anterior face; 2 plumose setae at lateral base of palp. Maxillipedal palp operculiform, about twice as long as proximal portion of basis; articles 4 and 5 subequal, fused together, combined length  $1.2\times$  width, without anterolateral setae. Epipod ovoid.

Pereopod 1 shortest, merus with dense band of mesiodistal setae, carpus with dense setae and 1 stout seta posterodistally, propodus with setae in transverse bands across palm, mesial face with about 70 pectinate setae. Pereopods 2–7 ambulatory, increasing in length posteriorly, articles more or less cylindrical. Pereopod 2 carpus with excavate distal margin fringed by setae posteriorly, propodus with 3 transverse bands of setae. Pereopod 4 setation as for pereopod 2, transverse bands on palm of propodus less well defined. Pereopods 5–7 similar to pereopod 4. Coxal plates 2–4 on anterior margin of pereonites; coxal plate 5 in dorsal aspect occupying middle part of lateral margin of pereonite 5, rounded in outline; coxal plate 6 in dorsal aspect reaching to posterior edge of pereonite 6, rounded in outline; coxal plate 7 extending beyond posterior margin of pereonite 7, rounded in outline.

Pleopod 1 rami with setose margins; pleopods 2–5 rami without long marginal setae; appendix masculina tapering to acute apex, as long as endopod. Uropods and pleopodal cavity reaching near apex of pleotelson. Uropodal peduncle with broad ridge along midline; endopod subtriangular.

#### *Female*

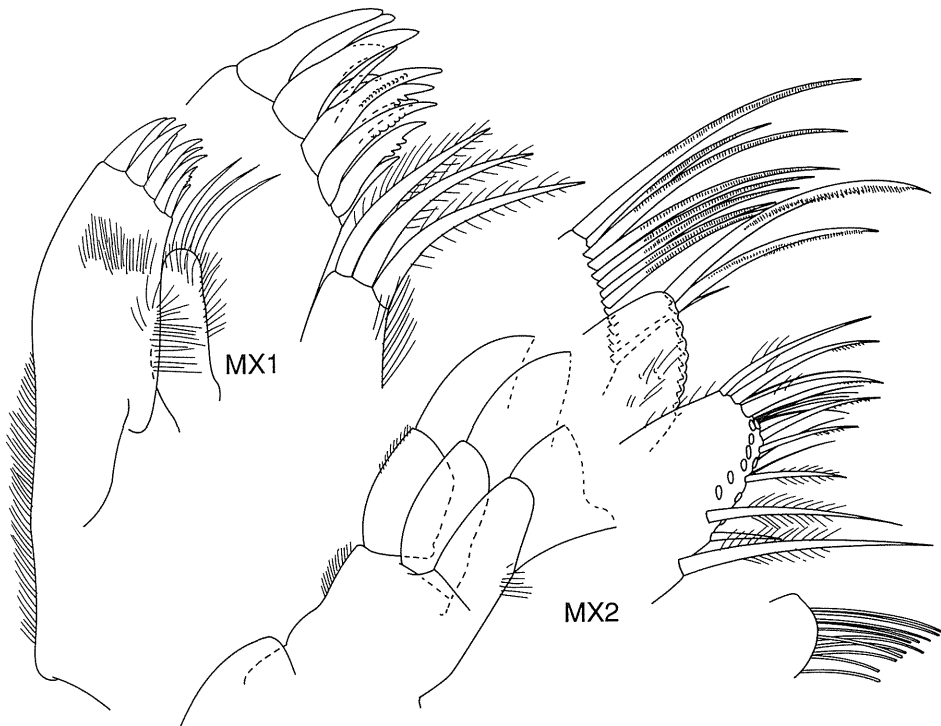
Broader than male, especially pereonites 3 and 4. Pereopods 4–7 more slender than in male.

#### *Size*

Female to 23 mm; male to 18 mm.

#### *Distribution*

Southern New South Wales, Victoria, Tasmania, South Australia, Western Australia as far north as 22°S.



**Fig. 11.** *Euidotea bakeri*. Male, SAM C4122 (maxilla 2 inner lobe also drawn to show apical styles).

*Remarks*

The whereabouts of the types of this species are unknown.

*Euidotea bakeri* is one of the most frequently encountered idoteids from shallow algal communities of southern Australia. It is rare in Western Australia and is one of only three species found in tropical waters. *E. peronii* is probably more common and may be confused with it. In *E. bakeri* the pleotelson is more rounded distolaterally than in *E. peronii*, and the posterior dorsal coxal plates are rounded rather than acute. There is a dorsal boss on the head but this is less obvious in smaller specimens. *Euidotea halei*, sp. nov. possesses a similar boss but differs in being much more elongate. In some juveniles and small males, the lateral margins of the pleotelson are straight rather than curved, there is a mid-dorsal longitudinal ridge on the pleotelson, and the apex is more acute (Fig. 9a). The shape of dorsal coxal plate 7 is more consistent and can be a more reliable character to distinguish small specimens from *E. peronii*.

*Euidotea caeruleotincta* Hale

(Figs 12, 13)

*Euidotea caeruleotincta* Hale, 1927: 316–7, fig. 4.—Hale, 1929: 315–6, fig. 317.

*Euidotea caeruleotincta* [sic].—Nierstrasz, 1941: 274.

*Material Examined*

*Types.* South Australia: Kangaroo I., Bay of Shoals (35°37'S.,137°36'E.), SAM C869 (holotype with 3 slides); SAM C822 (10 paratypes).

*Illustrated specimens.* South Australia: nr Ceduna, Davenport Ck (32°8'S.,133°41'E.), S. Doyle, Apr. 1982, SAM C4143 (♂, 27 mm, 2 slides).

*Other material.* **South Australia:** Giles Point, by boat ramp (35°3'S.,137°46'E.), *Amphibolus* and *Posidonia* meadow, hand dredge, G. C. B. Poore and H. M. Lew Ton, 19.iii.1985 (stn SA 35), NMV J14399 (3); Corny Point township, beach at end of Sinclair Rd (34°55'S.,137°5'E.), 1 m, fine sand with scattered *Posidonia*, hand dredge, G. C. B. Poore and H. M. Lew Ton, 17.iii.1985 (stn SA 23), NMV J14400 (2); Flinders I., 1 km off bay on N. shore (33°40'·50'S.,134°22'E.), 20 m, drift algae on sand, G. C. B. Poore on FV *Limnos*, 19.iv.1985 (stn SA 68), NMV J14401 (1); Port Pirie (33°12'S.,138°00'E.), 5 km NNW. of mouth of Port Davis Ck, 2·8 m, *Posidonia*, T. Ward, Aug. 1979, SAM C4144 (1), unregistered (2); Home Bay, Reevesby I. (34°42'S.,136°17'E.), Sir Joseph Banks Group, 24.i.1986, SAM unregistered (1). **Western Australia:** King George Sound, N. of False I. (35°0'·7'S.,118°10'·1'E.), 25 m, *Ecklonia* holdfasts, SCUBA, G. C. B. Poore and H. M. Lew Ton, 15.iv.1984 (stn SWA 56), NMV J14403 (1).

*Diagnosis**Male*

Body about 9 × as long as wide. Head wider than long, flat, eyes prominent. Pleotelson 0·38 × whole body length, 2 pleonites indicated by ventrolateral sutures (pleotelsonic formula 0+2). Pleotelson broadest at midpoint, lateral margins rounded; tapering over posterior half to a pointed apex.

Antenna 1 peduncles contiguous. Antenna 1 peduncle article 3 longer than article 2; flagellum as long as peduncle article 3, with 7 pairs and 1 single aesthetascs. Antenna 2 0·45 × body length; flagellum of 12 articles, 0·8 × length of peduncle. Frontal lamina triangular, upturned, clypeus with dorsolateral lobes freely projecting from base of antennae. Maxillipedal palp with articles 2+3 and 4+5 fused.

Pereopod 1 merus with few short setae and spiniform setae, carpus with few setae posterodistally, propodus with scattered setae and spiniform setae on palm, mesial face with about 33 pectinate setae. Pereopods 2 and 3 carpus with straight posterodistal margin, a cluster of setae posteriorly, propodus with cluster of spiniform setae proximally and others scattered along palm. Pereopods 4–7 with few spiniform setae on carpus, few in proximal cluster on propodus; with fewer on posterior limbs. Coxal plates 2–7 visible laterally, 5–7 dorsally, all small, visible as oblique plates laterally, small triangular projections on 5–7.

Pleopods 1 and 2 rami with setose margins; pleopod 3 exopod with long marginal setae apically, endopod not setose; appendix masculina tapering to acute apex, as long as

endopod. Pleopods 4 and 5 rami without long setae. Uropods and pleopodal cavity reaching only  $\frac{2}{3}$  way along pleotelson.

*Female*

Similar to male.

*Size*

Male to 26 mm; female to 26 mm.

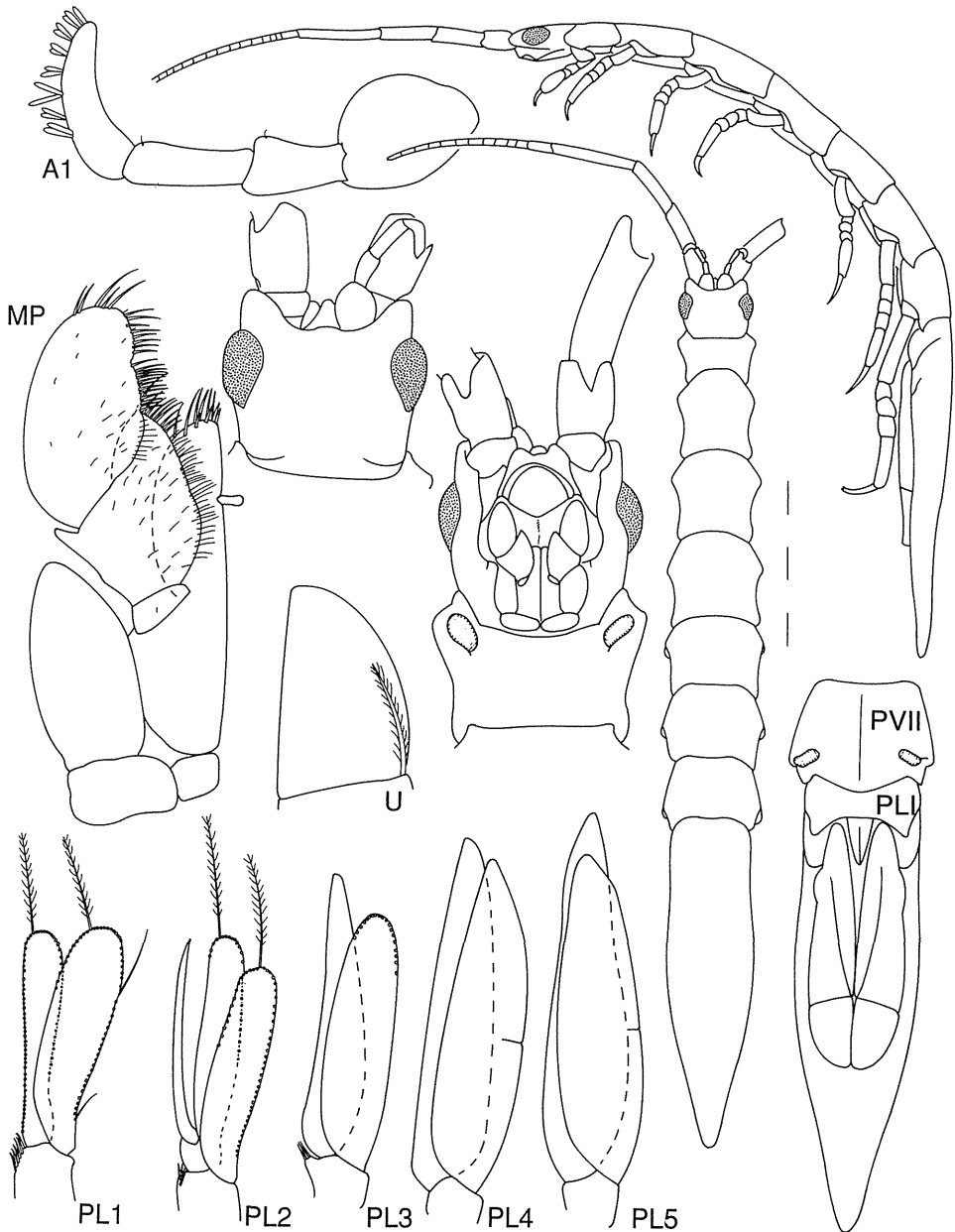


Fig. 12. *Euidotea caeruleotincta*. Male, SAM C4143.

*Distribution*

South Australia (Kangaroo I. to Ceduna) and Western Australia (King George Sound only); shallow sea-grass and algae.

*Remarks*

*Euidotea caeruleotincta* is the most distinctive of all species of the genus with its elongate flattened form and acute pleotelson. It differs from all other species of *Euidotea* in having maxillipedal palp articles 2 and 3 fused, a fact not noted in Hale's description. In general habitus it tends to resemble species of *Paridotea* but differs from them in the presence of clusters of spiniform setae on the pereopods and the broad maxillipedal palp with fused

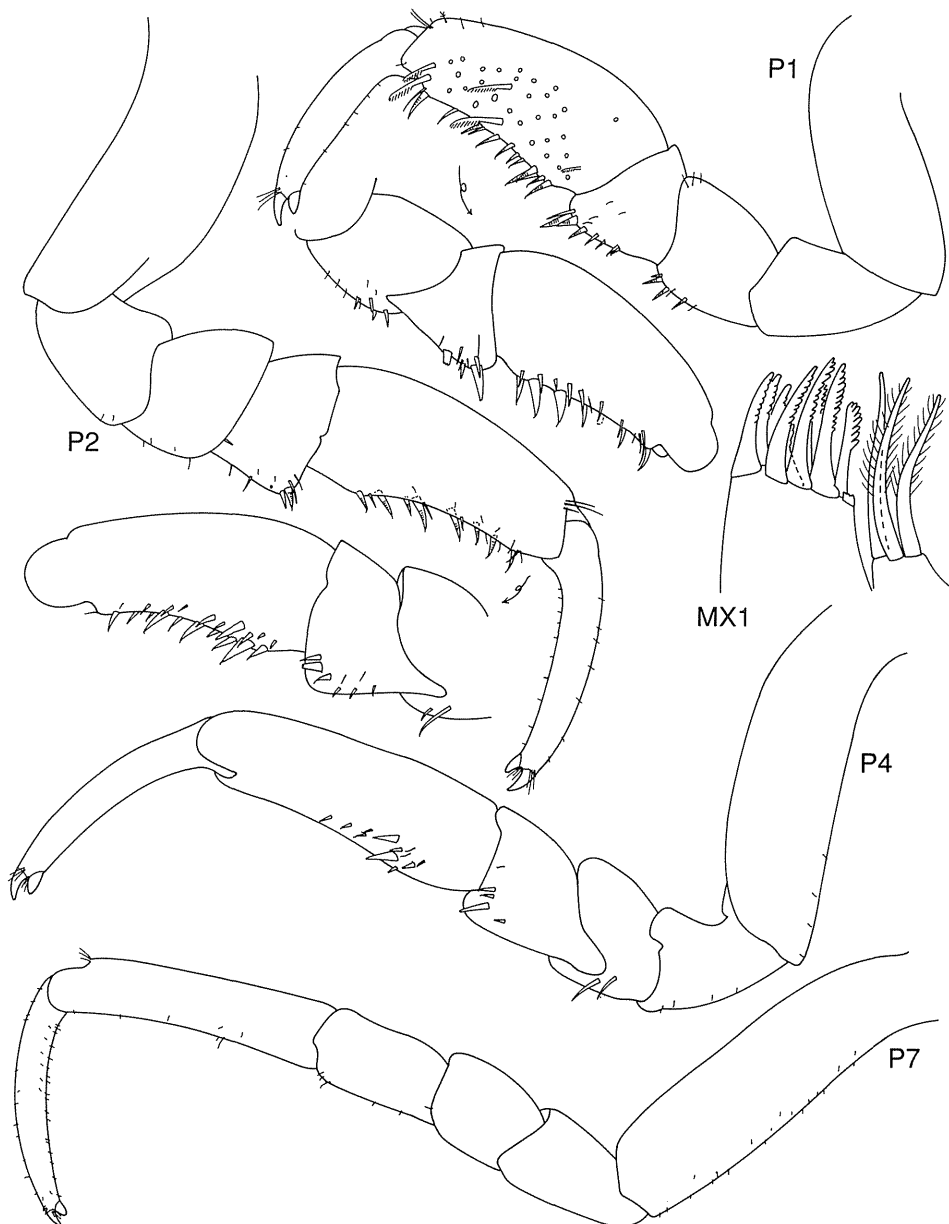


Fig. 13. *Euidotea caeruleotincta*. Male, SAM C4143.



articles. It may also be confused with *Crabyzos elongatus* but in that species the head is fused to pereonite 1. Hale (1929) noted that the species was variable in colour (bright green, yellow or rich purplish brown) but always possessed an iridescent blue spot mid-posteriorly on each pereonite and on the pleotelson.

*Euidotea danai*, sp. nov.

(Figs 14, 15)

*Material Examined*

*Holotype*. South Australia: Port Victoria, 2 km N. of township (34°30'S., 137°29'E.), *Zostera* on fine sand, hand dredge, G. C. B. Poore and H. M. Lew Ton, 18.iii.1985 (stn SA 27), NMV J15665 (♂, 10.7 mm).

*Paratypes*. **South Australia**: type locality, NMV J14391 (4); Giles Point, S. side (35°3'S., 137°46'E.), muddy sand in *Zostera* meadow, dredge, G. C. B. Poore and H. M. Lew Ton, 19.iii.1985 (stn SA 33), NMV J14394 (2); Torrens I., Barker Inlet (34°47'S., 138°32'E.), mudflat, 12.xi.1980, SAM C4127 (1 juv., 13.2 mm); Outer Harbour, SAM C4130 (1♂, 2♀, det. *E. stricta* Dana by Hale); Ardrossan, intertidal flats, Oct. 1981, SAM C4128 (1 juv., 11.0 mm); Dry Creek, ICI Saltworks, M. Coan, Mar. 1975, SAM C4129 (5 juv., 4♂, 2♀).

*Diagnosis*

*Male*

Body about 4.6× as long as wide, not especially flattened. Head almost twice as wide as long, with shallow posterior groove. Pleotelson 0.3× whole body length, 3 pleonites clearly indicated by ventrolateral sutures (pleotelsonic formula 0+3). Pleotelson broadest anteriorly, lateral margins rounded; tapering over posterior half to broadly pointed apex.

Antenna 1 peduncles widely separated. Antenna 1 peduncle article 3 as long as article 2; flagellum as long as peduncle article 3, with groups of 1, 2, and 3 aesthetascs. Antenna 2 0.45× body length; flagellum of 12 articles, 1.2× length of peduncle. Frontal lamina simple, clypeus produced. Maxillipedal palp articles 4+5 fused.

Pereopod 1 merus and carpus with few mesiodistal setae, carpus with 1 stout seta posterodistally, propodus with about 10 setae on palm, 2 stronger; mesial face with 25 pectinate setae. Pereopods 2-7 merus with few posterior setae, carpus with excavate distal margin fringed by few setae posteriorly, propodus with weak transverse bands of setae. Coxal plates 2-7 clearly visible dorsally; plates 2-4 on anterior margin of pereonites; plate 5 in dorsal aspect occupying middle part of lateral margin of pereonite 5, rounded in outline; plates 6 and 7 in dorsal aspect reaching to posterior edge of pereonites, squarish in outline.

Pleopods 1 and 2 rami with setose margins; pleopods 3-5 rami without long marginal setae; appendix masculina tapering to acute finely denticulate apex, longer than endopod. Uropods and pleopodal cavity reaching near apex of pleotelson.

*Female*

Similar to male except slightly broader.

*Size*

Both sexes to 13 mm.

*Distribution*

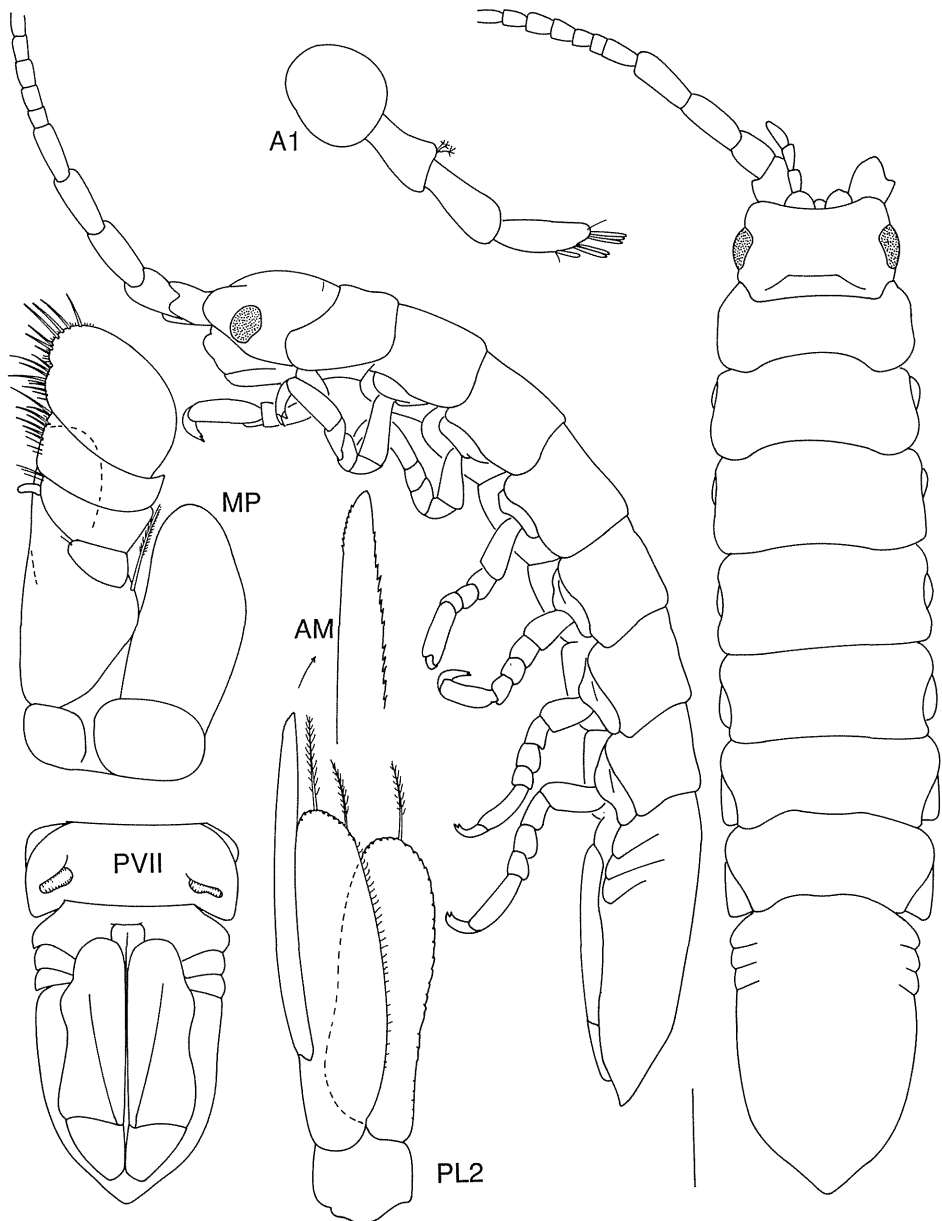
South Australian Gulfs.

*Remarks*

*Euidotea danai* is most similar to *E. bakeri*, but differs in the arrangement of pleonite sutures, the shape of the dorsal coxal plates, and the absence of a dorsal head boss. Some material in the South Australian Museum labelled *E. stricta* Dana by H. M. Hale is referable to this species, but the specimen figured by him in his book (1929) is *E. halei* sp. nov.

*Etymology*

For James D. Dana, who visited the eastern coast of Australia in the 1840s while on the cruise of the United States Exploring Expedition. He described many species of Crustacea from these shores, and had the unfortunate experience of having much of his type material lost by shipwreck.



**Fig. 14.** *Euidotea danai*. Male, NMV J15665, holotype.

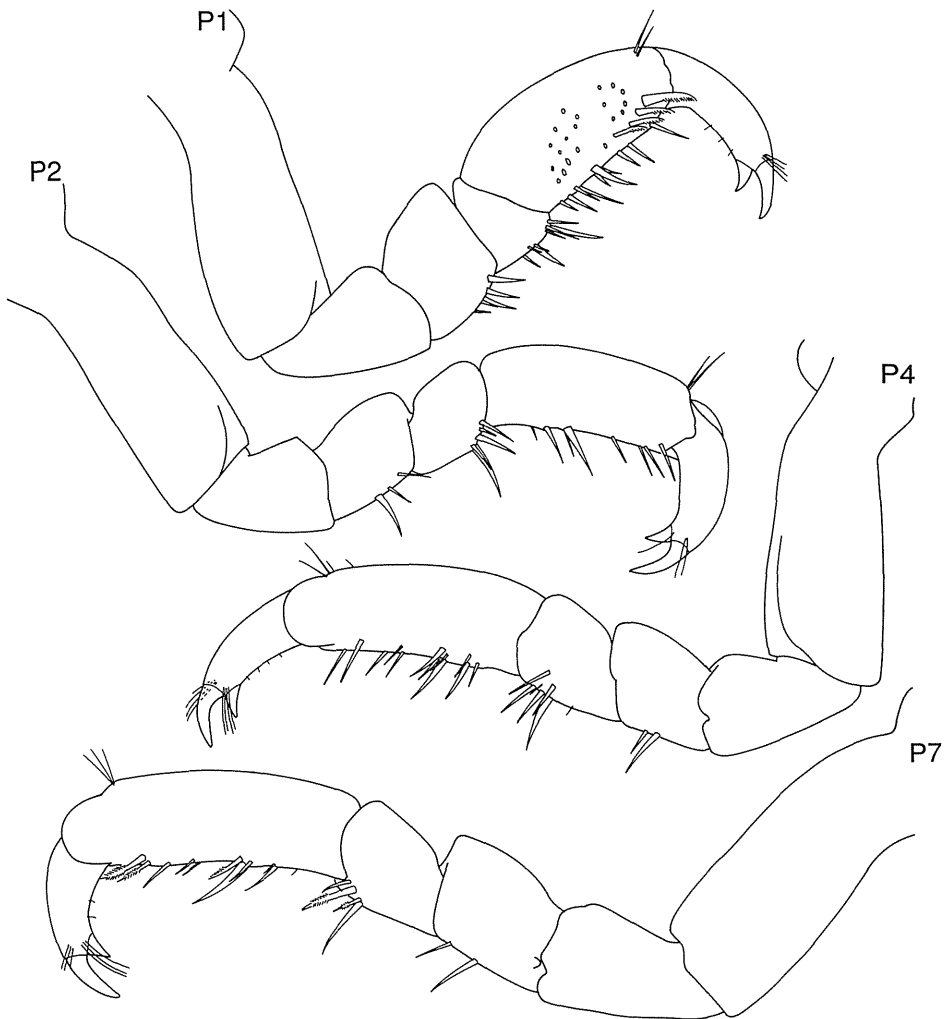


Fig. 15. *Euidotea danai*. Male, NMV J15665, holotype.

*Euidotea durvillei*, sp. nov.

(Figs 16, 17)

*Idotea peronii*.—Chilton, 1890: 199–203; Chilton, 1905: 272–3 (not Milne Edwards, 1840).

*Euidotea peroni*.—Nierstrasz, 1941: 274.

*Euidotea peronii*.—Hurley, 1961: 265, 282; Poore, 1981: 333.

*Euidotea stricta*.—Hurley, 1961: 265, 282; Morton and Miller, 1968: 218, not fig. 73.1. (not Dana, 1853).

*Material Examined*

*Holotype*. New Zealand: The Snares, W. side of Ho Ho Bay (48°07'S., 166°38'E.), algae, C. E. Holmes, 16.ii.1975, NMNZ Cr8891, (♂, 24.7 mm).

*Paratypes*. New Zealand: Wellington Harbour, G. R. F. Hicks, Dec. 1974, NMNZ Cr5684 (1 juv.); Wellington, Island Bay, seaweed, A. N. Baker, 9.i.1972, NMNZ Cr5685 (1♀, 16.0 mm); Kaikoura (42°25'S., 173°42'E.), dipnetted by light near wharf, G. R. F. Hicks, Feb. 1985, NMNZ Cr5683 (1♀, 20.3 mm; 7 juv., 10.0–14.6 mm); NMV J1093 (1♀); North Otago 9 m, J. Graham, 1962, NMNZ Cr5688 (1♂, 30.8 mm, det. *E. stricta* presumably by D. E. Hurley).

*Diagnosis**Male*

Body about  $3.9 \times$  as long as wide, not especially flattened. Head twice as wide as long, with shallow posterior groove. Pleotelson  $0.35 \times$  whole body length, 3 pleonites indicated by ventrolateral sutures (pleotelsonic formula  $0+3$ ). Pleotelson broadest anteriorly, lateral margins concave; apex very broadly acute.

Antenna 1 peduncles widely separated. Antenna 1 peduncle article 3 as long as article 2; flagellum as long as peduncle article 3, with 11 pairs and 1 single aesthetascs. Antenna 2  $0.5 \times$  body length; flagellum of 15 articles, as long as peduncle. Frontal lamina simple. Maxillipedal palp articles 4+5 fused.

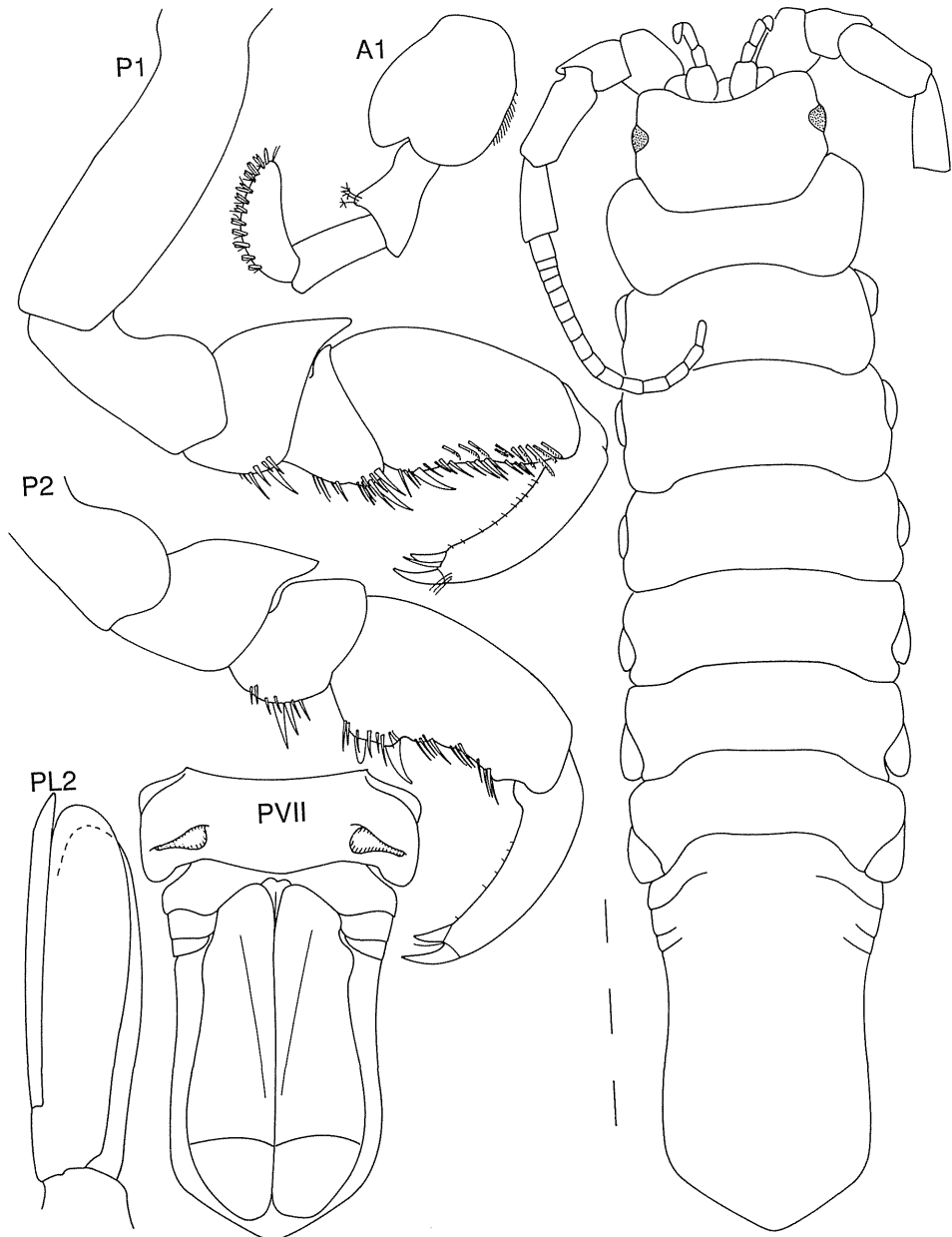


Fig. 16. *Euidotea durvillei*. Male, NMNZ Cr8891, holotype.

Pereopod 1 merus with few mesiodistal setae; carpus with dense setae and 1 stout seta posterodistally; propodus with setae in weak transverse bands across palm, mesial face with 12 pectinate setae. Pereopods 2-7 carpus with excavate distal margin fringed by setae posteriorly; propodus with proximal heel weakly produced, with weak transverse bands of setae plus 2 stronger setae. Pereopod 7 carpus with strong posterodistal lobes. Coxal plates 2-7 clearly visible dorsally; plates 2-4 on anterior margin of pereonites; plate 5 in dorsal aspect occupying middle part of lateral margin of pereonite 5, rounded in outline; plate 6 in dorsal aspect reaching to posterior edge of pereonite 6, rounded posteriorly; plate 7 extending beyond posterior margin of pereonite 7, square or obliquely truncated posteriorly.

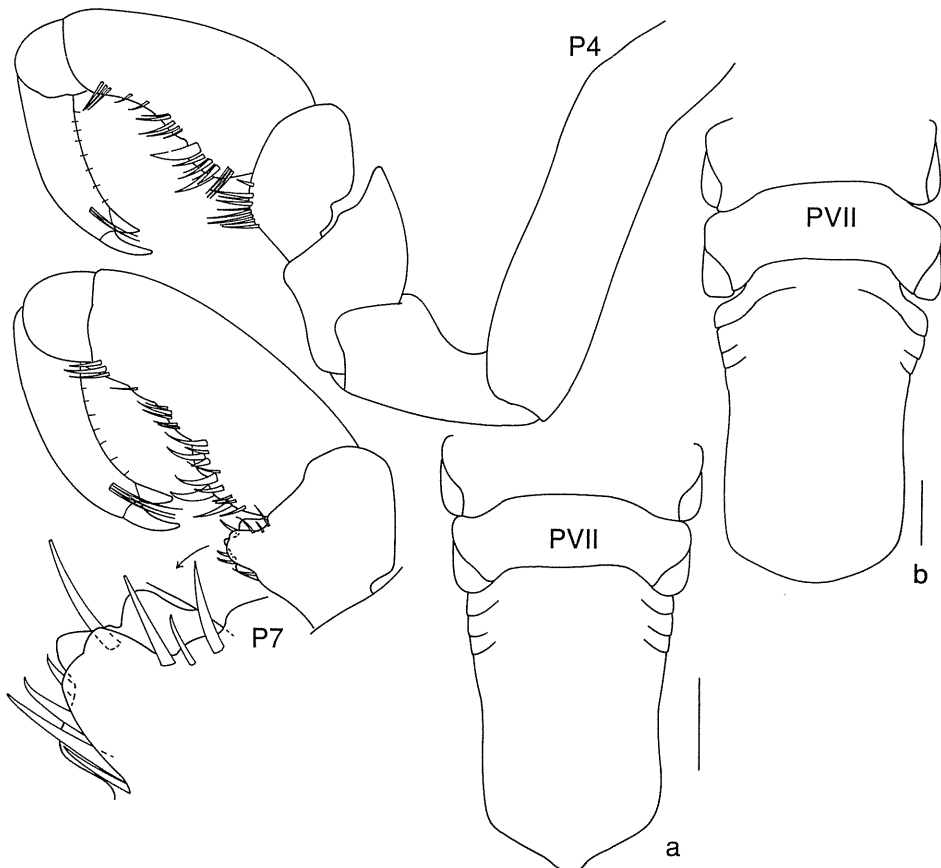
Pleopods 1 and 2 rami with setose margins; pleopods 3-5 rami without long marginal setae; appendix masculina tapering to acute apex, little longer than endopod. Uropods and pleopodal cavity reaching near apex of pleotelson.

#### *Female*

Similar to male except broader,  $3.1 \times$  as long as wide, and lacking posterodistal lobes on carpus of pereopod 7.

#### *Size*

Males to 30.8 mm; females to 20.3 mm.



**Fig. 17.** *Euidotea durvillei*. Male, NMNZ Cr8891, holotype; a, female, NMNZ Cr5683; b, male, NMNZ Cr5688.

### Distribution

New Zealand: South Island, southern North Island, subantarctic islands, Chatham Is.

### Remarks

There is some variation in key characters in this species. Coxal plate 7 is squarer in some specimens than in others and the apex of the pleotelson ranges from moderately acute in smaller specimens to almost rounded in the largest male (Fig. 17*a, b*). However, the consistent nature of the pleonal sutures and the overall shape of the pleotelson distinguish this species from the six Australian species of *Euidotea*. The species has often been referred to *E. peronii*, the most common Australian idoteid, and may be its sister-species. The two are separated most clearly on the shape and sutures of the pleotelson as well as on the shape of pereonite 1 (widest more anteriorly in *E. durvillei*). The posterior pereopods of *E. durvillei* are stouter than in *E. peronii* and, in males, there is a posterodistal toothed ridge on the carpus of pereopod 7 not seen in the Australian species.

### Etymology

For Jules-Sebastien-César Dumont d'Urville, who visited New Zealand in 1827 on a voyage of discovery on the *Astrolabe*.

### *Euidotea halei*, sp. nov.

(Figs 18, 19)

*Euidotea stricta*.—Hale, 1924: 214–5, fig. 4; Hale, 1927: 315; Hale, 1929: 316, figs 318, 319 (not Dana, 1853).

### Material Examined

*Holotype*. Western Australia: Cottesloe (31°59'S., 115°45'E.), *Posidonia*, L. Glauert, 21.viii.1922, WAM 678-92 (♂, 14.1 mm).

*Paratypes*. **Western Australia**: type locality, WAM 642-86 (3); NMV J24039 (1♀, 13.9 mm); Ledge Bay, 100 m off beach (35°0.8'S., 118°E.), 2 m, fine sand, hand dredge, G. C. B. Poore and H. M. Lew Ton, 16.iv.1986 (stn SWA 59), NMV J15605 (1 manca); Dongara–Port Dennison beach, 300 m offshore (29°16'S., 114°55'E.), 3 m, seagrass detritus on sand, hand dredge, G. C. B. Poore and H. M. Lew Ton, 25.iv.1986 (stn SWA 94), NMV J15603 (8 juv.); Seven Mile Beach, N. of Dongara (29°12'S., 114°53'E.), 1 m, detritus on *Halophila* bed, G. C. B. Poore and H. M. Lew Ton, 24.iv.1986 (stn SWA 90), NMV J15604 (1 juv.). **Tasmania**: E. of Rocky Cape lighthouse, below Rocky Cape cave (40°51'S., 145°31'E.), 2 m, sand among boulders, hand, G. C. B. Poore and H. M. Lew Ton, 15.iii.1988 (stn TAS 52), NMV J23725 (1♂).

*Other material*. **Tasmania**: E. of Rocky Cape lighthouse, below Rocky Cape cave (40°51'S., 145°31'E.), 1 m, *Amphibolus antarcticus*, G. C. B. Poore and H. M. Lew Ton, 15.iii.1988 (stn TAS 53), NMV J15608 (2). **Victoria**: Phillip I., Red Rock (38°28'S., 145°14'E.), sublittoral, W. F. Seed and R. Leonard, 29.ix.1974, NMV J3091 (1); Balnarring, W. F. Seed, 12.xii.1968, NMV J14348 (16). **South Australia**: Point Rickaby beach, 200 m N. of jetty (34°0'S., 137°0'E.), hand dredge, G. C. B. Poore and H. M. Lew Ton, 18.iii.1985 (stn SA 29), NMV J15609 (1♀); Flinders I., 1 km off bay on N. shore (33°40.5'S., 134°22'E.), 20 m, drift algae on sand, hand dredge, G. C. B. Poore on FV *Limnos*, 19.iv.1985 (stn SA 68), NMV J14418 (1); locality unknown, SAM C245 (9 slides labelled 'Euidotea stricta det. H. M. Hale'). **Western Australia**: Two Peoples Bay, point at N. end of Little Beach (34°58.2'S., 118°10.8'E.), 5 m, red, coralline algae, SCUBA, G. C. B. Poore and H. M. Lew Ton, 18.iv.1986 (stn SWA 72), NMV J15607 (1 manca); Cape Riche, N. side (34°37'S., 118°47'E.), 7 m, shelly sand in *Zostera* bed, SCUBA, G. C. B. Poore and H. M. Lew Ton, 14.iv.1984 (stn SWA 48), NMV J15606 (1 manca); Seven Mile Beach, nr Dongara (29°15'S., 114°56'E.), 1985, NMV J23684 (4).

### Diagnosis

#### Male.

Body about 5.7 × as long as wide, dorsally convex. Head twice as wide as long, with obscure dorsal boss. Pleotelson 0.3 × body length, 3 pleonites indicated by ventrolateral sutures (pleotelsonic formula 0+3), pleonite 1 as long as next two together. Pleotelson

broadest anteriorly, lateral margins straight; tapering over posterior third to broadly pointed apex; with obscure mid-dorsal keel at apex.

Antenna 1 peduncles separated. Antenna 1 peduncle article 3 as long as article 2; flagellum as long as peduncle article 3, with 5 pairs and 1 single aesthetascs. Antenna 2  $0.5 \times$  body length; flagellum of 12 articles,  $1.2 \times$  length of peduncle. Frontal lamina simple. Maxillipedal palp articles 4+5 fused.

Pereopod 1 merus with dense band of mesiodistal setae; carpus with dense setae and 1 stout seta posterodistally; propodus with setae in uneven transverse bands across palm, mesial face with 13 pectinate setae. Pereopods 2-7 carpus with excavate distal margin fringed by setae posteriorly; propodus with 3 uneven transverse bands of setae plus 1

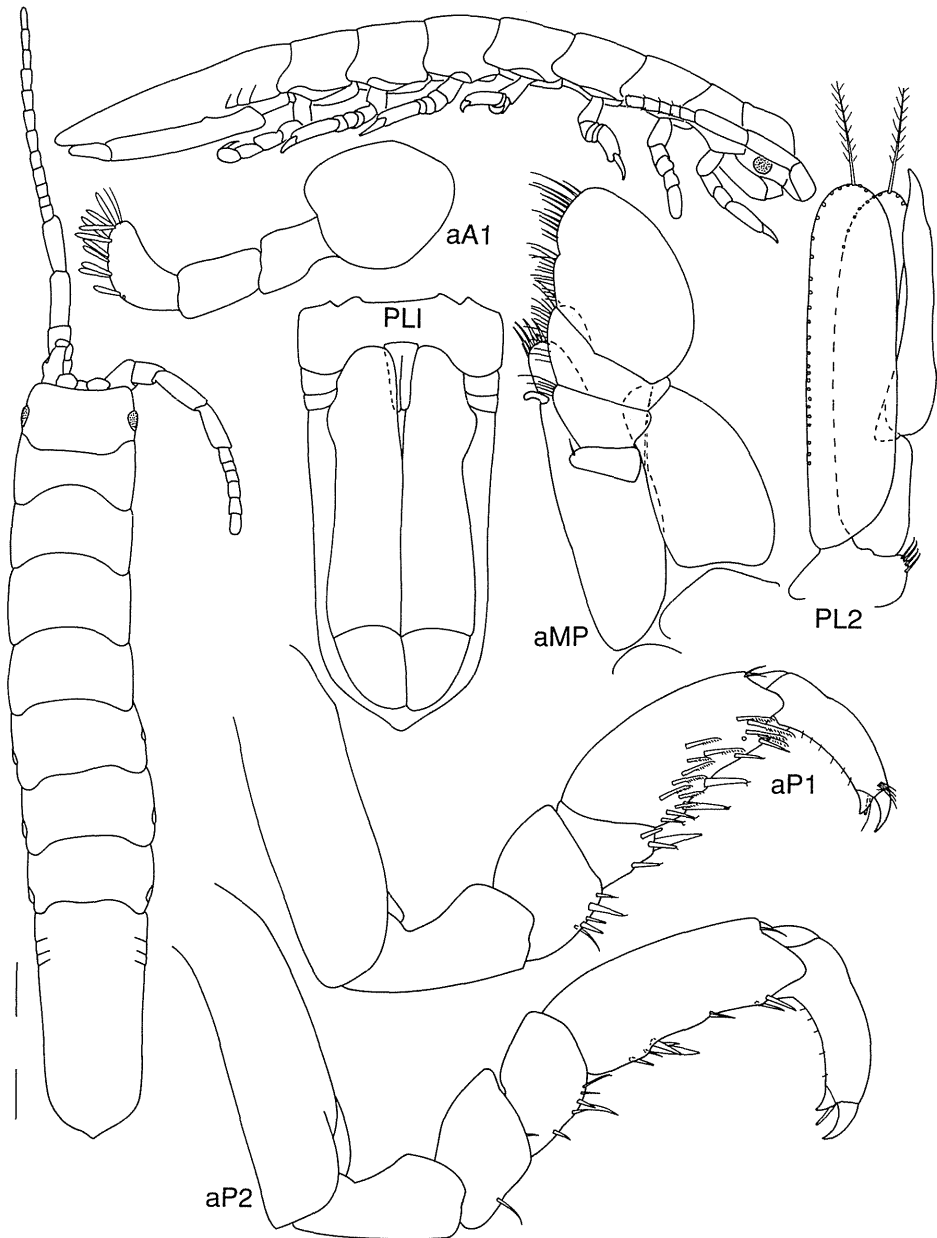


Fig. 18. *Euidotea halei*. Male, WAM 678-92, holotype; a, female, WAM 642-86.

stronger proximal spiniform seta. Coxal plates 2–7 visible laterally, 5–7 visible dorsally; plates 2–4 on ventrolateral margin of pereonites; plates 5–7 in dorsal aspect occupying short middle part of lateral margin of pereonites.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina stout, tapering to acute apex, little longer than endopod. Uropods and pleopodal cavity reaching near apex of pleotelson.

#### *Female*

Essentially the same as the male; slightly broader, 5.0× as long as wide.

#### *Size*

Both sexes to 14 mm.

#### *Distribution*

Southern Western Australia, South Australia, Victoria and northern Tasmania.

#### *Remarks*

*Euidotea halei* is differentiated from other species by the possession of a tapering pleotelson with pleonite 1 as long as the next two pleonites together so that the pleonal sutures are distant from the anterior margin of the pleotelson. There is a mid-dorsal boss on the head as in *E. bakeri* but these two species differ in the shape of pleotelson.

In the female from South Australia (NMV J15609) the telson is flatter than in specimens from the type locality; in those from Tasmania the boss on the head is more prominent.

The microslides labelled *Euidotea stricta* by Hale (SAM C245) clearly belong to this species, not to Dana's. The animal from which they were taken cannot now be found in the South Australian Museum but it may be the specimen illustrated by him under this name in his book (1929). Other complete specimens labelled in the same way by Hale (SAM C4130) belong to another newly described species, *Euidotea danai*.

#### *Etymology*

For Herbert M. Hale (1895–1963), who contributed so much to crustacean systematics in southern Australia, including a review of the Valvifera.

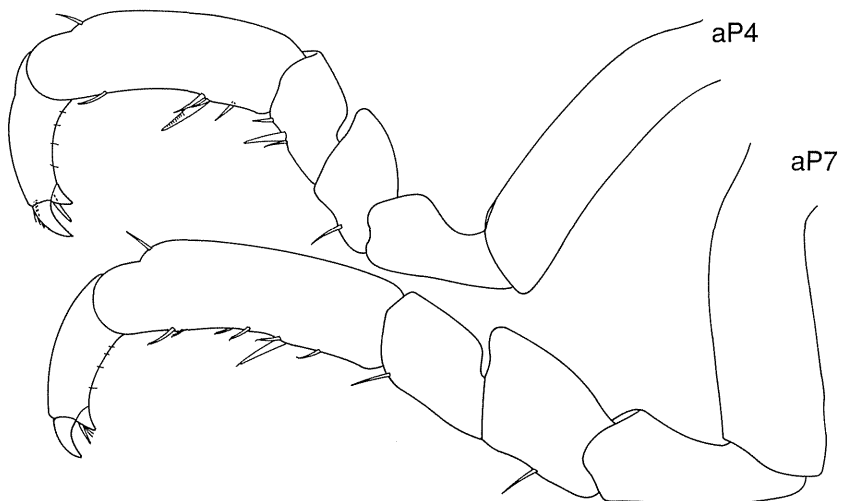


Fig. 19. *Euidotea halei*. a, female, WAM 642-86.



*Euidotea peronii* (Milne Edwards)

(Figs 20, 21)

*Idotea peronii* Milne Edwards, 1840: 133. —Miers, 1881: 55–7, pl. 2, figs 6, 7; Haswell, 1885: 1001.*Idotea caudacuta* Haswell, 1881: 181, pl. 4, fig. 4 (part). —Haswell, 1882: 276–7.*Paridotea peronii*. —Stebbing, 1910: 433.*Euidotea peronii*. —Collinge, 1917*b*: 84–5, pl. 8, figs 32, 33; Hale, 1924: 214, fig. 4e–g; Hale, 1927: 315; Hale, 1929: 316–7, fig. 19.*Euidothea peroni*. —Nierstrasz, 1941: 274.*Idothea caudacuta*. —Nierstrasz, 1941: 272.*Material Examined**Holotype* of *Idotea peronii*. King I., N. Baudin and F. Péron expedition, 1802, MNHN Is.2879 (♂).*Syntypes* of *Idotea caudacuta*. **Victoria**: Griffith Point (38°32'S., 145°22'E.), AM G5320 (2 dry specimens labelled 'type' = *Euidotea peronii*; the larger specimen is here selected as a lectotype); AM G5321 (1 dry specimen = *Euidotea bakeri*).*Possible syntypes*. **Victoria**: Port Phillip, AM G5323 (2 dry specimens = *Euidotea stricta*, 1 dry specimen = cf. *Cleantioides* sp.). **Tasmania**: no specific locality, AM G5324 (2 dry specimens = *Euidotea peronii*).*Illustrated specimen*. South Australia: Sir Joseph Banks Group, Partney I., North-east Point (34°31'S., 136°15'E.), under rocks in shallow water, S. Parker, 29.i.1985, SAM C4121 (♂, 32.0 mm, 2 slides).*Other material*. **Tasmania**: numerous specimens from several localities including Coles Bay, St Helens, Burnie, King I., intertidal on algae, AM, NMV, SAM and TM collections. **Victoria**: numerous specimens from many localities W. of Waratah Bay including Walkerville, San Remo, Phillip I., Flinders, Port Phillip Bay, Point Leo, Apollo Bay, intertidal on algae, AM and NMV collections. **South Australia**: numerous specimens from many localities including Port Macdonnell, Robe, Kangaroo I., Gulf St Vincent, Spencer Gulf, Flinders I., Nuyts Archipelago, intertidal on algae, AM, NMV and SAM collections.*Diagnosis**Male*

Body about  $4.0 \times$  as long as wide, not especially flattened. Head twice as wide as long, with shallow posterior groove. Pereonites 1–7 and pleonite 1 sternites smooth. Pleotelson  $0.3 \times$  whole body length, pleonite 1 indicated by complete dorsal suture, pleonites 2 and 3 indicated by ventrolateral sutures (pleotelsonic formula 1 + 3). Pleotelson broadest anteriorly, only slightly tapering over most of length, apex obtusely acute.

Antenna 1 peduncles widely separated. Antenna 1 peduncle article 3 shorter than first 2 combined; flagellum as long as length of peduncle article 3, with 10 pairs and 1 single aesthetascs. Antenna 2  $0.35 \times$  body length; flagellum of 15 articles,  $0.8 \times$  as long as peduncle. Frontal lamina bifid. Maxillipedal palp articles 4 + 5 fused.

Pereopod 1 merus with dense band of mesiodistal setae, 1 stronger; carpus with dense setae and 1 stout seta posterodistally; propodus with setae in transverse bands across palm, 5 more spiniform, mesial face with about 70 pectinate setae. Pereopods 2–7 carpus with excavate distal margin fringed by setae posteriorly, 1 spiniform; propodus with 5 unequal transverse bands of setae and 2 stronger spiniform setae. Coxal plates 2–7 clearly visible dorsally; plates 2–4 on anterior half of margin of pereonites; plate 5 in dorsal aspect occupying middle part of lateral margin of pereonite 5, rounded in outline; plate 6 in dorsal aspect reaching to, but not beyond, posterior edge of pereonite 6, squarish posteriorly; plate 7 extending beyond posterior margin of pereonite 7, apically acute, not rounded.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina tapering to acute apex, as long as endopod. Uropods and pleopodal cavity reaching near apex of pleotelson.

*Female*

Slightly broader than male.

*Size*

Males to 32 mm; females to 23 mm.

*Distribution*

Southern Australia from Waratah Bay (Vic.) to Flinders I. (S.A.), Bass Strait islands and Tasmania.

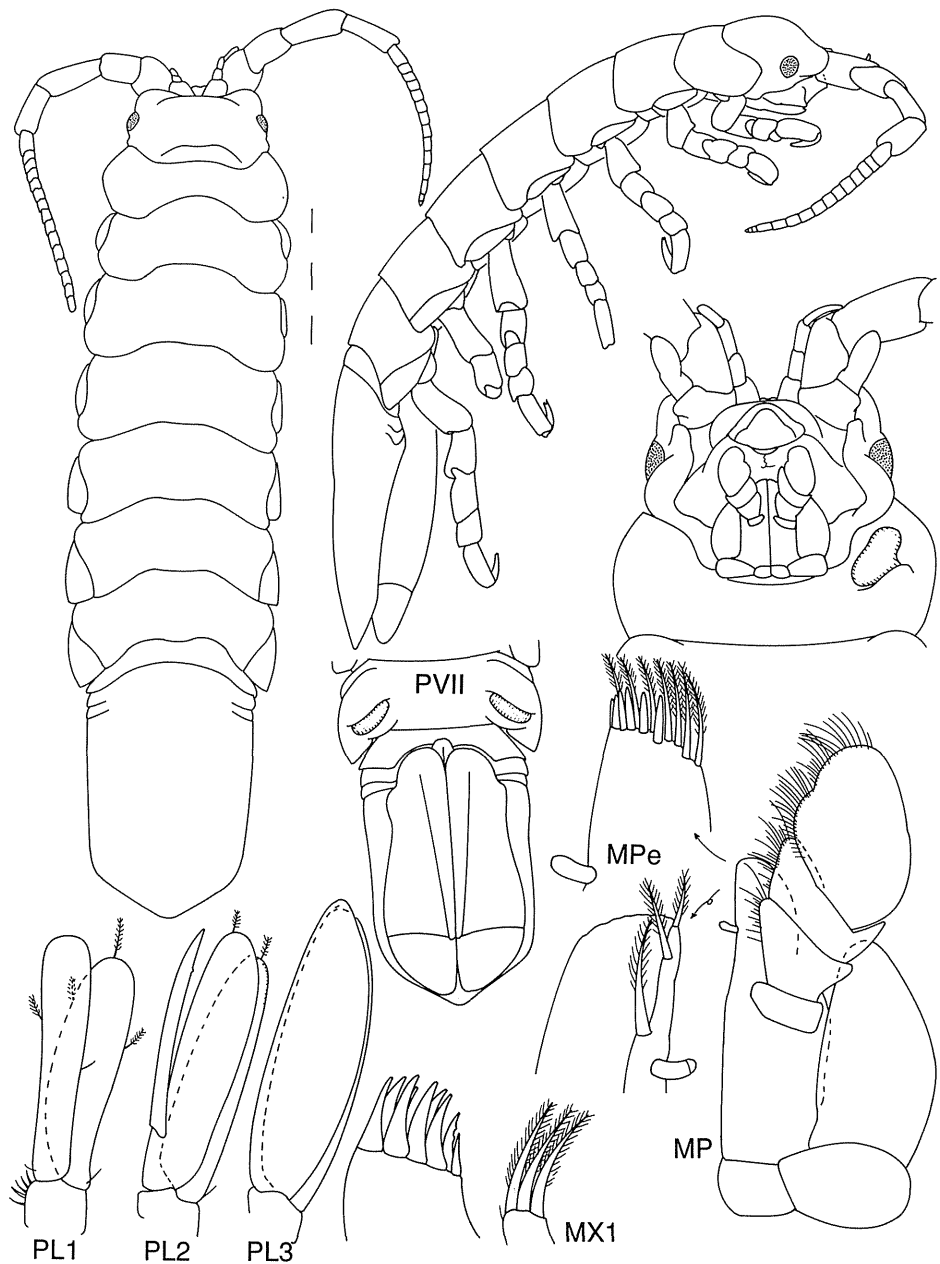


Fig. 20. *Euidotea peronii*. Male, SAM C4121.

*Remarks*

*Euidotea peronii* is the most commonly taken idoteid in shallow-water algal communities of southern Australia. It is especially common in drift weed in tide pools. Populations are often made up of individuals of different colours, usually brown or dark green with patches of white.

Synonymy of *Idotea caudacuta* Haswell, 1881, with this species is based on examination of syntypes which comprise four species. A lectotype is selected to confirm current usage. Records of *E. peronii* from New Zealand (Chilton 1890; Poore 1981) are here ascribed to a new species, *E. durvillei*, which is differentiated from *E. peronii* on the basis of the shape and sutures of the pleotelson and other characters.

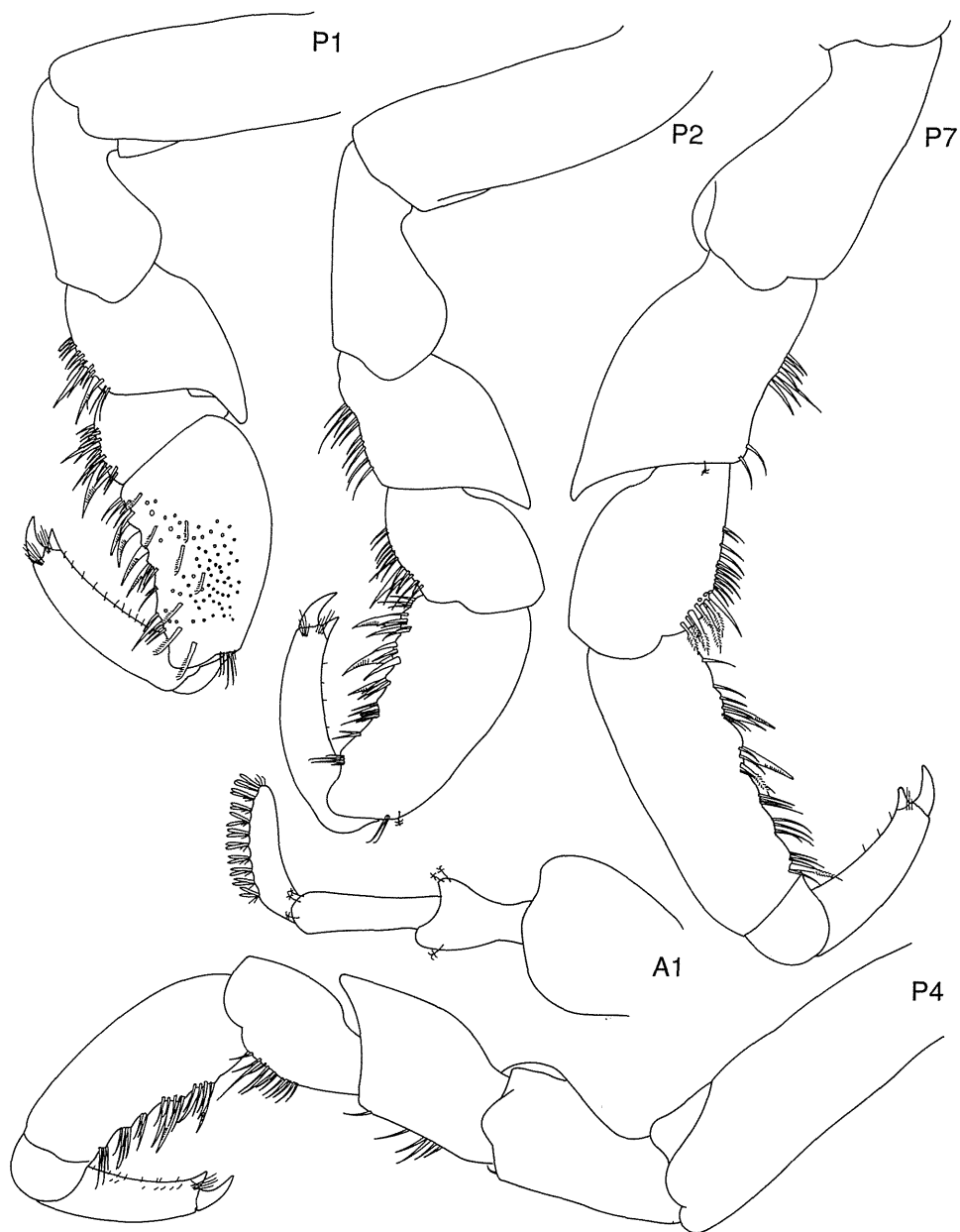


Fig. 21. *Euidotea peronii*. Male, SAM C4121.

Miers (1881) synonymised *Idotea distincta* Guérin-Méneville, 1843, from South Africa with this species. The types, which were not figured, cannot now be found. No material attributable to this species has been recorded from South Africa since its original discovery, and its presence there may be based on a doubtful identification (Kensley 1978). Kensley's figure is not of the Australian species.

*Euidotea stricta* (Dana)

(Figs 22, 23)

*Idotea stricta* Dana, 1853: 704, 705, pl. 46, fig. 7a, b.

*Idotea stricta*.—Miers, 1881: 62–3; Haswell, 1882: 276; Haswell, 1885: 1001.

*Euidotea stricta*.—Nierstrasz, 1941: 274.

*Material Examined*

*Neotype (herein selected)*. New South Wales: Twofold Bay, Calle Calle Bay, middle of Aislings Beach (37°3'S., 149°56'E.), 8.5 m, S. J. Keable *et al.*, 22.ii.1985, AM P36068 (♂, 32 mm).

*Illustrated specimen*. South Australia: Pearson I. (33°58'S., 134°17'E.), weed on rocks, W. Zeidler, 22.xi.1976, SAM C4151 (♂, 2 slides).

*Other material*. **New South Wales**: neotype locality, NMV J24047 (4); numerous specimens from Maroubra, Queenscliffe Lagoon, Wollongong, AM collections. **South Australia**: numerous specimens

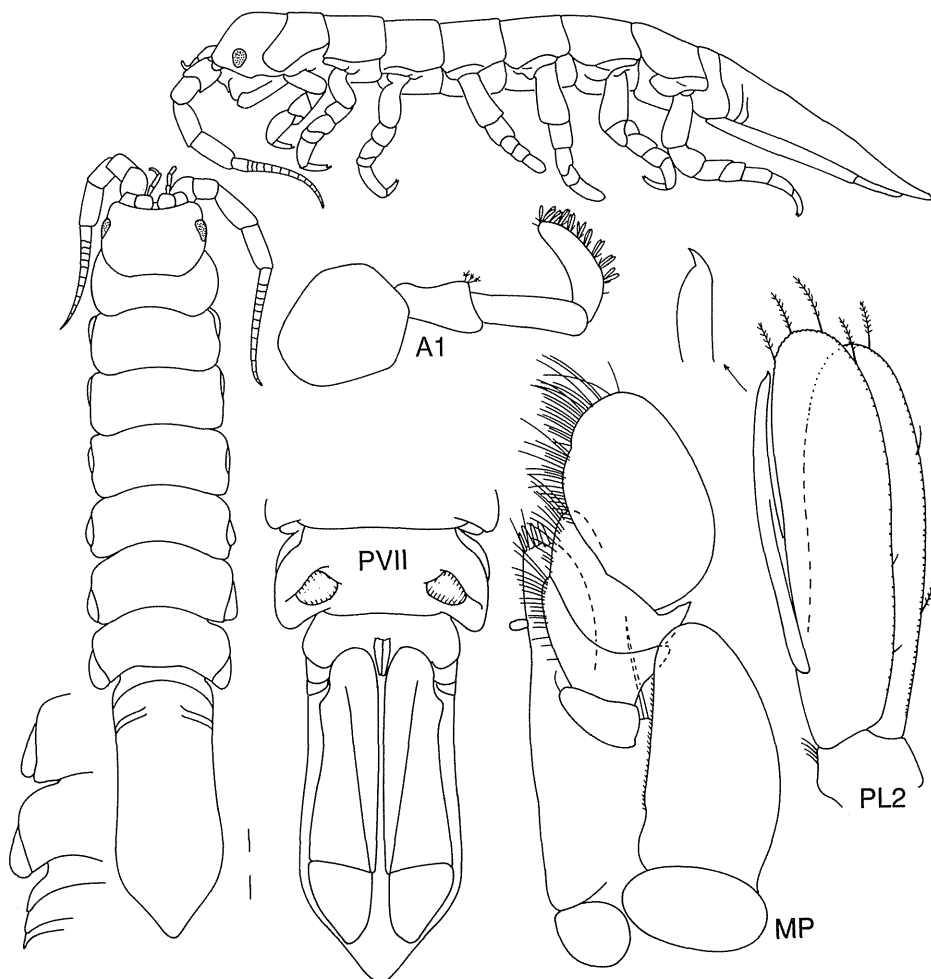


Fig. 22. *Euidotea stricta*. Male, SAM C4151.

from many localities including Goolwa, Kangaroo I., Yorke Peninsula, Adelaide, Port Pirie, Pearson I., Flinders I., Ceduna, Talia Caves, mostly intertidal on algae or seagrasses, AM, NMV and SAM collections. **Tasmania:** NW. coast, H. B. Somerset, May 1966, TM G1236 (2). **Victoria:** several specimens from Walkerville, French I., Flinders, Shoreham, Mornington, Barwon Heads, Point Lonsdale, intertidal, NMV collections. **Western Australia:** numerous specimens from Cottesloe and Rottnest I. region, also Eucla, intertidal to 38 m, WAM collections.

### Diagnosis

#### Male

Body about  $6.3\times$  as long as wide, not especially flattened. Head  $1.5\times$  as wide as long. Pleotelson  $0.36\times$  whole body length, pleonite 1 indicated by complete dorsal suture, pleonites 2 and 3 indicated by ventrolateral sutures (pleotelsonic formula 1+3). Pleotelson broadest  $\frac{3}{4}$  along, lateral margins concave; sharply tapering over posterior quarter to rounded apex.

Antenna 1 peduncles separated. Antenna 1 peduncle article 3 little longer than first; flagellum as long as peduncle article 3, with 9 pairs and 1 single aesthetascs. Antenna 2

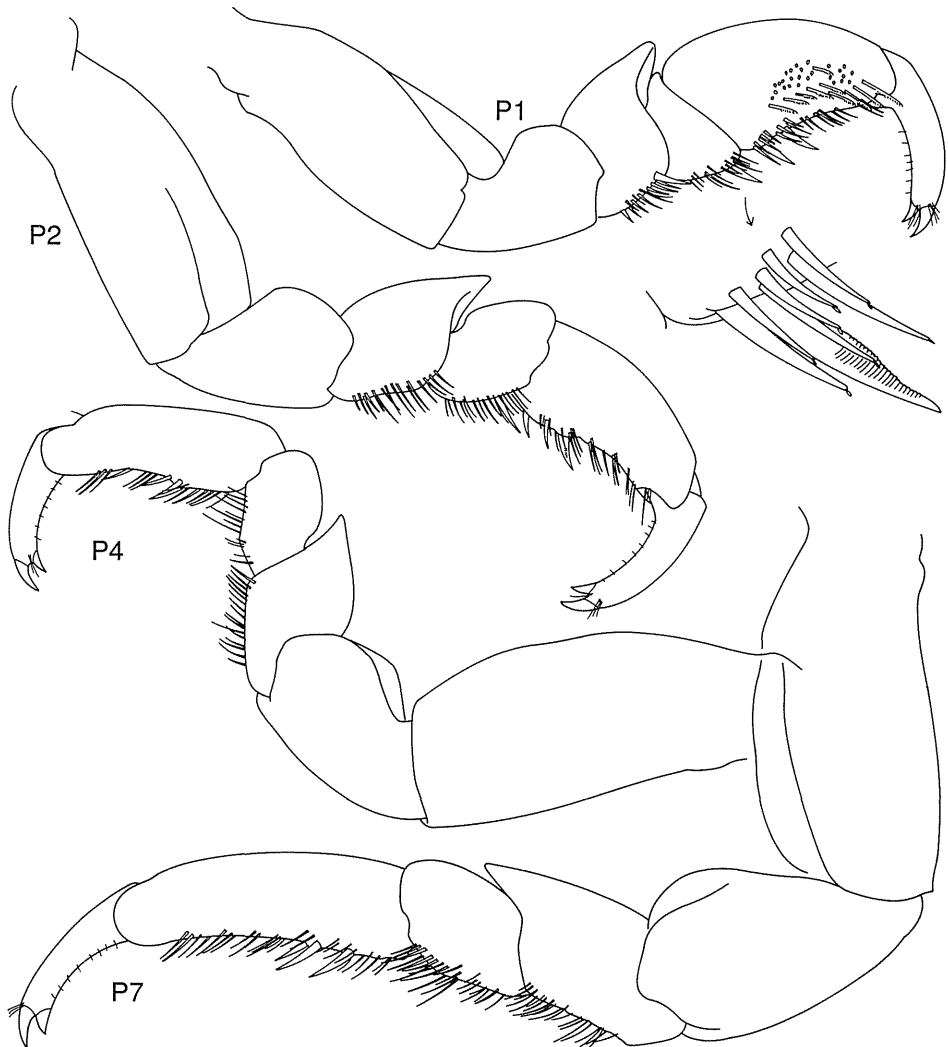


Fig. 23. *Euidotea stricta*. Male, SAM C4151.

0.4 × body length; flagellum of 12 articles, 0.8 × length of peduncle. Frontal lamina bifid. Maxillipedal palp articles 4 + 5 fused.

Pereopod 1 merus with dense band of mesiodistal setae; carpus with dense setae and 1 stout seta posterodistally; propodus with setae in transverse bands across palm, 2 setae stronger, mesial face with 40 pectinate setae. Pereopods 2–7 carpus with excavate distal margin fringed by setae, 1 stronger, posteriorly; propodus with 4 or 5 transverse bands of setae and 2 stronger setae. Coxal plates 2–7 clearly visible dorsally; plates 2–4 on anterior half of margin of pereonites; plates 5 and 6 in dorsal aspect extending further posteriorly along lateral margin of pereonites, rounded posteriorly; plate 7 extending beyond posterior margin of pereonite 7, rounded-angular in outline.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina tapering to digitiform apex, shorter than endopod. Uropods and pleopodal cavity reaching near apex of pleotelson.

#### *Female*

Essentially the same as the male; slightly broader, 4.1 × as long as wide.

#### *Size*

Males to 32 mm; females to 23 mm.

#### *Distribution*

Southern Australia from Sydney, N.S.W (34°S.), Victoria, northern Tasmania, South Australia, to Perth, W.A. (32°S.).

#### *Remarks*

Dana's species name has been used in keys, now out of date, to idoteids from Australia (Hale 1929) and New Zealand (Hurley 1961) and even assigned to a species from British Columbia (Bate 1866). Morton and Miller's (1968) figure of a New Zealand species probably follows Hurley's misidentification and, although it resembles Dana's figure, its source is unknown. It is essential, therefore, that the name be established among the known Australian species or declared *nomen dubium*. Although type material does not exist, Dana's habitus figure is clear and can be reconciled with the material described here. This species is the only Australian idoteid in which the pleotelson is elongate and slightly wider posteriorly than anteriorly, just as figured and described by Dana. Dana drew only one partially complete pleonite and we must assume that this is an error; no similar known Australian idoteid has this pleotelsonic formula. A neotype is selected from New South Wales, the type locality.

Bate's (1866) Canadian material has not been reidentified although it is recognised as an erroneous identification (Rafi and Laubitz 1990).

The distinctive shape of the pleotelson identifies the species.

### Genus *Idotea* Fabricius

*Idotea* Fabricius, 1798: 302.

Type species: *Cymothoa emarginata* Fabricius, 1798, designated under plenary powers (ICZN 1963: Opinion 643).

#### *Diagnosis*

Body semi-cylindrical, deeply vaulted, smooth, head narrower than pereonite 1, body widest at pereonite 4. Pleon with 2 articulating pleonites, pleonite 3 indicated by suture ventrolaterally only; pleotelson apically rounded, excavate or pointed. Antenna 2 multi-articulate. Mandible with well-developed truncate molar process, spine row, lacinia, and toothed incisor. Maxilla 1 inner lobe with apical setae; outer lobe with 12 apical spiniform setae. Maxilla 2 inner lobe with complex setation, middle and outer lobes with distal rows of numerous denticulate setae. Maxillipedal endite with apical setation; palp digitiform,

articles 4 and 5 fused. Coxae 2–7 with well-developed contiguous weakly articulating dorsal coxal plates more or less shielding coxal-basal articulation from lateral view. Pereopods with transverse clusters of spiniform setae on palms of merus, carpus and propodus, reduced on more posterior pereopods; spiniform setae on anterior margins of distal articles. Penes separate but contiguous at base, attached to anteroventral margin of pleonite 1. Oostegites lamellar on pereopods 1–5.

#### Remarks

This new diagnosis is based on examination of the type species, *Idotea emarginata*, from the Natural History Museum, London. The cosmopolitan species *I. metallica* described here conforms with this diagnosis, as do three species of which we have seen specimens: *I. pelagica*, *I. balthica* and *I. chelipes*. Many other European and North Pacific species presently assigned to *Idotea* have reduced dorsal coxal plates, fused penes, fused anterior pleonites, and lack anterior setae on pereopodal margins, thereby being excluded from the genus as herein diagnosed (see Naylor 1955, 1972; Kussakin 1982). With the exception of *I. hectica*, removed to *Synischia* below, the correct generic placement of these species, which we have not seen, is undecided.

*Idotea* is the only idoteid genus in which the anterior pleonites are truly articulating, and there are transverse rows of spiniform setae on the anterodistal margins of distal pereopodal articles. Our figures cannot distinguish between articulating and non-articulating pleonites; articulation can only be tested by attempting to move the pleonites against each other. Both of these character states are considered plesiomorphic within the family. In all other genera, pleonal sutures are immobile and pereopods have only weak anterior setation. In these characters, *Idotea* resembles members of the Chaetiliidae.

#### *Idotea brevicornis* Milne Edwards

(Fig 24)

*Idotea brevicornis* Milne Edwards, 1840: 130.

*Idotea brevicornis*.—Miers, 1881: 27, 30 (as junior synonym of *Idotea marina*).

*Idothea duplicata* Nierstrasz, 1941: 270–2, figs 52–66 (new synonym).

*Idothea baltica*.—Nierstrasz, 1941: 268–9, figs 47–51 [not *Idotea balthica* (Pallas) auctorum].

#### Material Examined

*Syntypes*. Western Australia: Shark Bay (26°S., 114°E.) [labelled: Baie de Chiens marins Freycinet, *Idotea brevicornis* M. Edw. G. Miers det. Type], MNHN Is.2301 (4).

*Other material*. **Indonesia**: Irian Jaya, west coast [Atjatuning, W. Küste Neu Guinea's, riffe], Siboga stn 169, ZMA (1♂, 7 mm, labelled *Idotea balthica* by Nierstrasz); ZMA (1♀, 13 mm, holotype of *Idotea duplicata* Nierstrasz).

Specimens of *Idotea balthica* from England and eastern U.S.A. (NMV collections).

#### Distribution

North-western Australia, Indonesia (Irian Jaya).

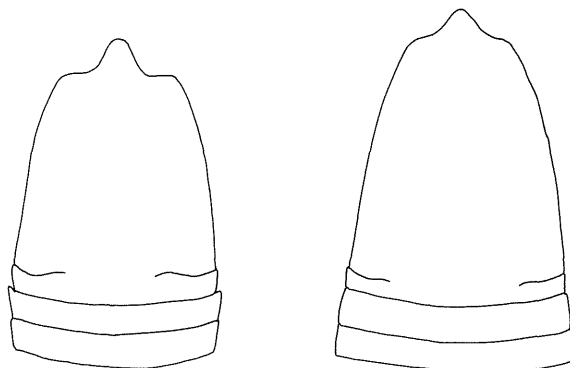


Fig. 24. *Idotea brevicornis*. MNHN, Is.2301, pleotelsons from two of four syntypes.

### Remarks

The presence of this species in Australia is based only on a record from the early nineteenth century. *Idotea brevicornis* was described by Milne Edwards (1840) from material collected by Baudin and Péron from 'les côtes de la Nouvelle-Hollande'. Milne Edwards' (1840: 130) description is consistent with the four supposed syntypes which were labelled 'type' only by Miers who saw the specimens 41 years after their description. Miers (1881) referred to the species as a junior synonym of *Idotea marina*, the species now referred to *I. balthica*. We cannot distinguish the syntypes from the individual from Irian Jaya labelled *I. balthica* by Nierstrasz or from the holotype of *I. duplicata* Nierstrasz, 1941, both specimens taken from the same station by the Siboga Expedition. *I. duplicata* is therefore a junior synonym.

The species is very close to the Atlantic and Scandinavian *I. balthica* but differs in not having the posterolateral corners of the pleotelson as produced, in the whole pleon being relatively broader (62% as wide as long v. 68%), and in the posterior coxae and epimera of pleonites 1 and 2 being more rectangular.

The wide geographic separation of these species supports continued recognition of Milne Edwards' species but the existence of a single, variable, widespread but very rare species may be possible. Miers (1881: 30) and Hurley (1961) recorded *Idotea marina* from New Zealand on the basis of a male collected by M. Petit and deposited in the museum in Paris. This specimen was examined by GCBP in 1992 and could be referable to *I. balthica*. This name is now suppressed (ICZN 1963) and the species to which the name refers is usually *Idotea balthica*. No species like this has since been recorded from New Zealand.

We include only figures of the pleotelsons of two of the syntypes of *I. brevicornis*. None of the syntypes is in good enough condition to illustrate fully. The species' absence from modern collections is curious but there have been no recent investigations for small crustaceans in Shark Bay.

### *Idotea metallica* Bosc

(Figs 25–28)

*Idotea metallica* Bosc, 1802: 179, pl. 15, fig. 6. — Miers, 1881: 35–8; Thomson, 1883: 332; Thomson and Chilton, 1886: 155; Hansen, 1887: 188; Chilton, 1890: 193–4; Dollfus, 1895: 8, fig. 24; Richardson, 1900: 226; Richardson, 1901: 541; Norman, 1904: 443; Barnard, 1914: 203; Vanhöffen, 1914: 526–7; Gurjanova, 1936: 135; Naylor, 1955: 486; Hurley, 1961: 265; Kensley, 1978: 38, fig. 17B; Poore, 1981: 335.

*Idotea (Idotea) metallica*. — Kussakin, 1982: 125–6, fig. 90.

*Idotea peloponesiaca* Roux, 1830: pl. 30, figs 10, 12.

*Idotea atrata* Costa, 1838: pl. 11, fig. 3.

*Idotea rugosa* Milne Edwards, 1840: 131.

*Idotea robusta* Krøyer, 1846: 108. — Krøyer, 1849: pl. 26, fig. 3; Reinhardt, 1857: 35; Stimpson, 1863: 133; Verrill, 1871: 360; Harger and Verrill, 1873: 439, 569, pl. 5, fig. 24; Lütken, 1875: 150, footnote; Harger, 1879: 160; Harger, 1880: 349, pl. 6, figs 30–2.

*Idotea algerica* Lucas, 1849: 61, pl. 6, fig. 2. — Heller, 1866: 727–8; Stalio, 1877: 1353.

*Idotea annulata* Dana, 1849: 426. — Dana, 1853: 701, pl. 46, fig. 3; Cunningham, 1871: 499; Miers, 1881: 76.

*Idotea argentea* Dana, 1849: 426. — Dana, 1853: 698, pl. 46, fig. 1; Miers, 1876b: 92.

*Idotea margaritacea* Dana, 1853: 700, pl. 46, fig. 2. — Miers, 1876b: 92; Miers, 1881: 38–39; Thomson, 1883: 332; Haswell, 1885: 1001.

*Idothea margaritacea*. — Miers, 1876b: 92; Nierstrasz, 1941: 272.

*Idothea metallica*. — Richardson, 1905: 362, figs 392, 393; Richardson, 1909: 107–8; Nierstrasz, 1917: 112; Nordenstam, 1933: 94; Nierstrasz, 1941: 272.

### Material Examined

*Illustrated specimen.* Port Jackson, in Woolloomooloo Bay (33°53'S., 151°13'E.), from floating cork, F. A. McNeill, AM P41325 (♂, 20 mm); P41326 (♀, 11 mm).

*Other material.* **New South Wales:** off Wollongong, stn NSW-436 (34°26'S., 150°53'E.), floats at surface, among lepadid barnacles, J. K. Lowry on MV Robin E, 25.xi.1990, AM P40527 (many specimens); NMV J23686 (20); from buoy approx. 6 km off Crescent Heads (31°11'S., 152°59'E.),



SAM C4137 (2); Collaroy Beach (33°44'S.,151°18'E.), from log, AM P13172 (2); Port Jackson, from floating cork in Woolloomooloo Bay, F. A. McNeill, AM P9991 (2); Maroubra Bay (33°57'S., 151°16'E.), AM G5377 (1); S. of Sydney (34°03'S.,151°41'E.), commensal on *Physalia*, N.S.W. State Fisheries, FV Kapala, 1.iii.1971, AM P18619 (2).

**New Zealand:** Cook Strait (41°S.,164°E.), on floating kelp, J. Graham, 1960, NMV J15666 (2); Kaikoura, about 3 km offshore, on floating *Durvillaea*, 4.iv.1965, NMNZ Cr5681 (3♂, 19–29 mm; 2♀, 18 mm); The Snares (48°07'S.,166°38'E.), Ho Ho Bay, in craypot, 24 m, D. S. Horning, 26.xii.1974, NMNZ Cr2306 (1).

**U.S.A.:** Massachusetts, Vineyard Sound (41°25'N.,70°40'W.), U.S. Fisheries Commission, NMV J3074 (2).

Localities unknown. Lidthe de Jeude collection, 1886, NMV J3166 (3); J3165 (3).

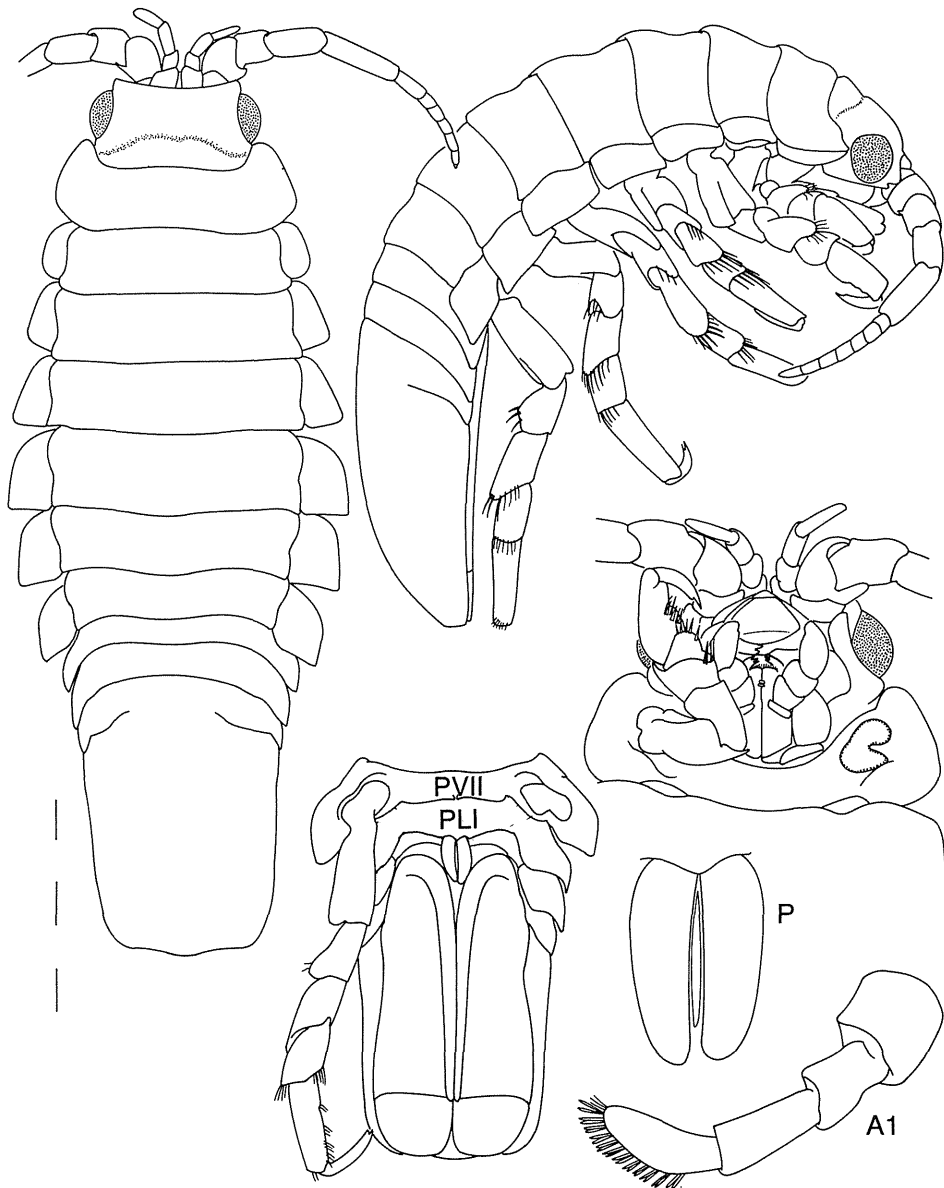


Fig. 25. *Idotea metallica*. Male, AM P41325.

*Description**Male*

Body about  $3.9\times$  as long as wide, strongly vaulted. Head  $2.2\times$  as wide as long, front concave, with sharply defined curved posterior groove; eyes prominent. Pereonites 1-7 and pleotelson often slightly rugose. Pleotelson  $0.4\times$  body length, 2 pleonites free and articulating with pleotelson; pleonite 3 indicated by lateral sutures. Pleotelson broadest anteriorly, tapering to a truncate deep apex.

Antenna 1 peduncles separated. Antenna 1 peduncle article 3 almost  $\frac{3}{4}$  length of first 2 combined; flagellum as long as peduncle article 3, with 12 pairs of aesthetascs. Antenna 2  $0.4\times$  body length; flagellum of 7-10 articles, half length of peduncle. Frontal lamina simple, clypeus produced. Mandibles asymmetrical; incisor 4-toothed, broad; left lacinia mobilis 3-toothed broad; right lacinia mobilis narrower, irregularly 3-toothed; spine row of 11 multifid curved spines; molar process truncate, rimmed by sharp teeth anterodistally and posteriorly, with anterior proximal cluster of long complex spines plus ring of simple spines. Maxilla 1 inner lobe with 3 distal plumose setae, outer lobe with 12 apical spiniform setae.

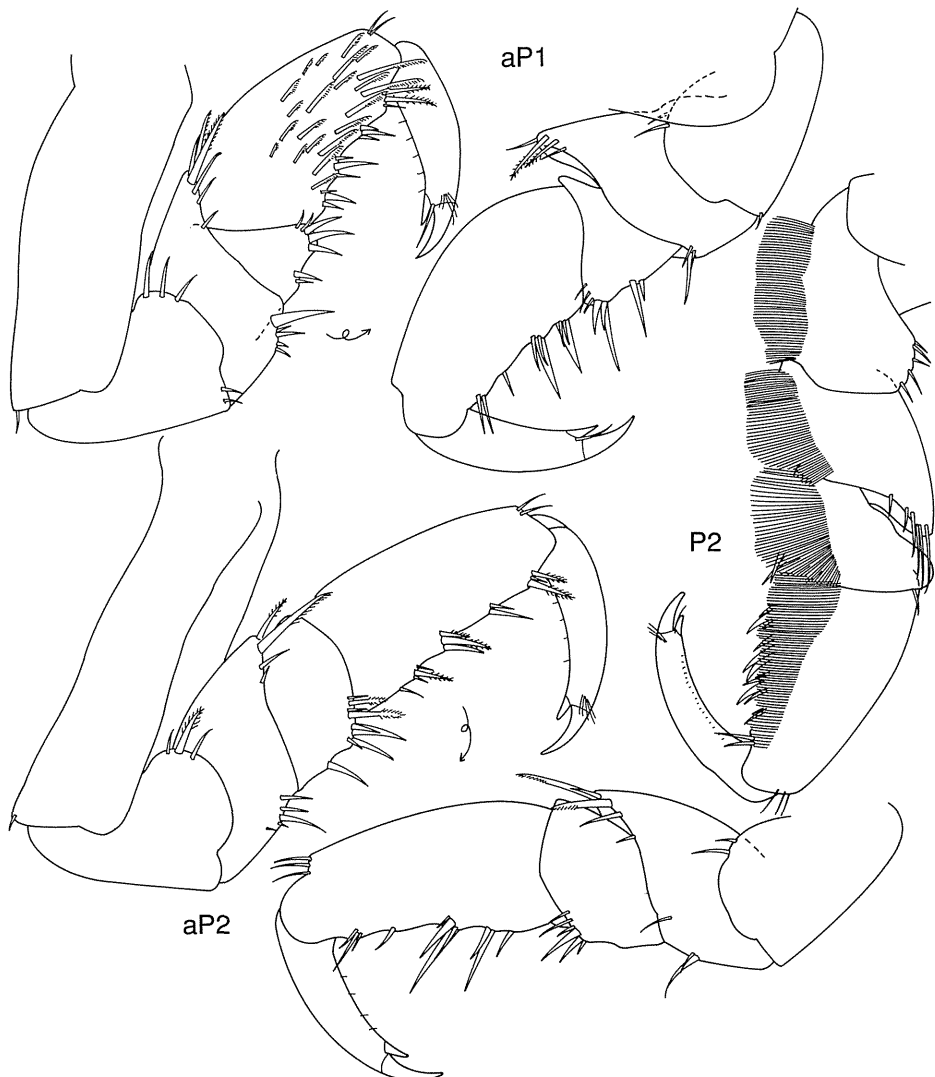


Fig. 26. *Idotea metallica*. Male, AM P41325.

Maxilla 2 inner lobe with anterior oblique row of 11 setae, posterior row of 10 setae, distal group of 8 straight setae; middle and outer lobes with 10 and 11 denticulate setae respectively. Maxilliped with coxal plate and basal portion of epipod distinct; endite with a single coupling hook, apically with 6 spiniform setae and 7 plumose setae arranged in 2 rows; 3 plumose setae on anterior face; 1 plumose seta at lateral base of palp. Maxillipedal palp about  $3\times$  as long as proximal portion of basis; articles 4 and 5 fused together, combined length twice width, article 5 much smaller than 4. Epipod ovoid.

Pereopod 1 shortest; ischium and merus with spiniform setae on anterodistal margins; ischium with few posterior spiniform setae; merus with about 10 posterior spiniform setae; carpus with 2 transverse rows of about 10 spiniform setae; propodus with 3 irregular transverse bands of about 10 spiniform setae across palm, central ones stronger; mesial face with about 22 pectinate setae. Pereopods 2-7 ambulatory, increasing in length posteriorly, articles more or less cylindrical. Pereopod 2 ischium and merus with anterodistal spiniform setal rows; ischium to propodus with dense mat of fine hairs posteriorly; carpus with few posterior spiniform setae; propodus with weak transverse bands of spiniform setae. Pereopods 3-4 setation as for pereopod 2 but with mat of hairs less well developed. Pereopods 4-7 similar, without hairs; ischia, meri and carpi with anterodistal setae; ischia with few posterior spiniform setae; meri with 2 transverse rows of spiniform setae; propodi

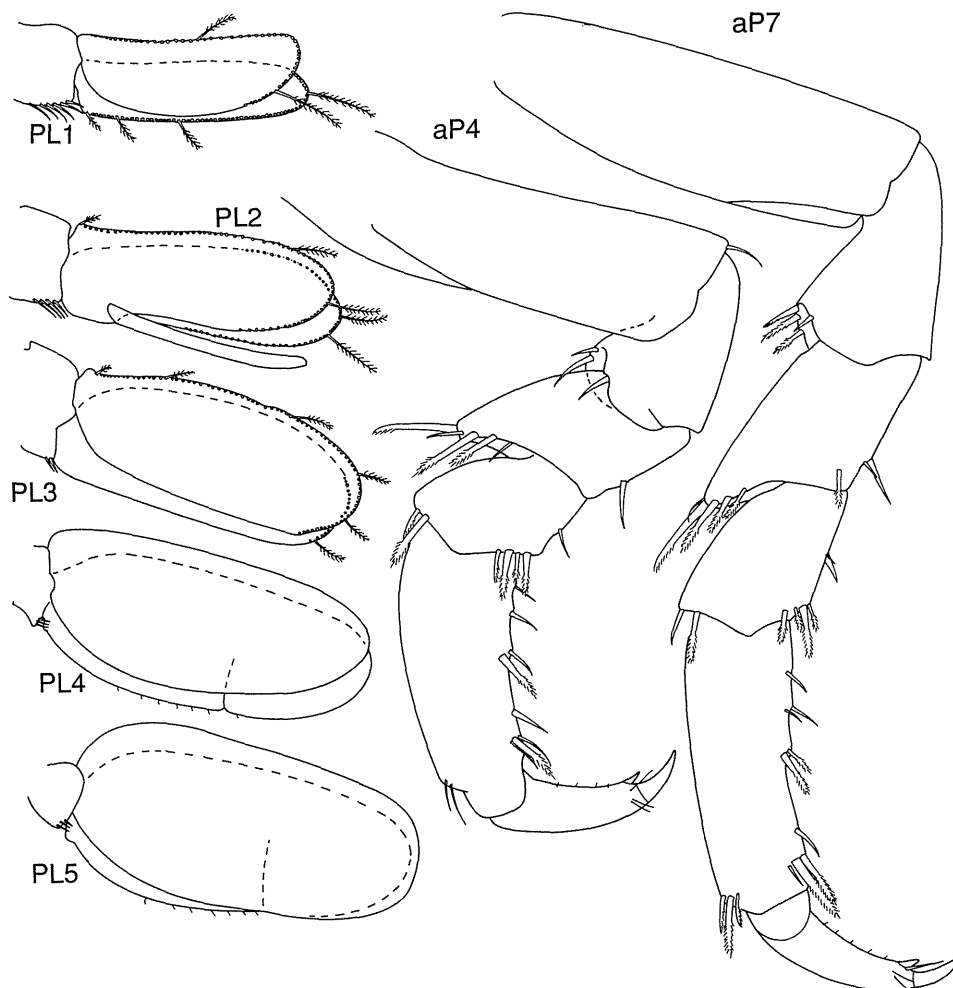


Fig. 27. *Idotea metallica*. Male, AM P41325; a, AM P41326.

with 3, 3, 4, 5 transverse rows of spiniform setae respectively, palms sinuous, less so on posterior limbs. Coxal plates 2-7 clearly visible dorsally, all concave dorsally and splayed; occupying all of lateral margin of pereonites.

Pleopods 1-3 rami with setose margins; pleopods 4, 5 rami without long marginal setae; appendix masculina tapering to rounded apex, shorter than endopod. Uropods and pleopodal cavity reaching to apex of pleotelson. Uropodal peduncle with strong longitudinal crest; endopod subrectangular. Penes close but separated by medial sternal keel.

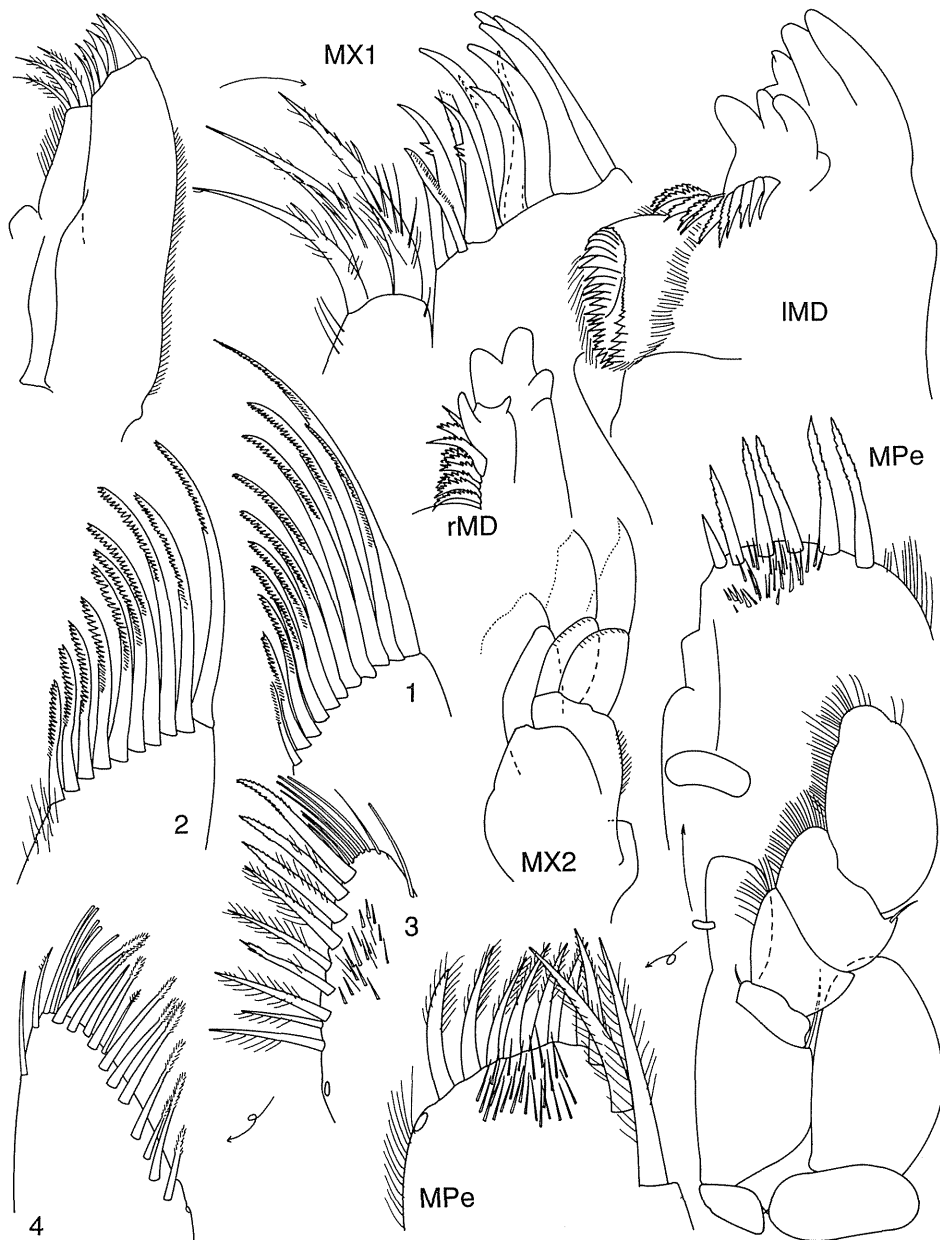


Fig. 28. *Idotea metallica*. Male, AM P41325 (rMD, incisor and lacinia mobilis only; MX2: 1, outer lobe; 2, middle lobe; 3, inner lobe, posterior view; 4, inner lobe, anterior view; MPe, anterior and posterior views).

*Female*

Differs from male in smaller size (maximum 18 mm); greater width ( $2.3\times$  as long as wide); fewer spiniform setae on posterior margins of pereopods and without mat of hairs on pereopods 2-4; coxae not splayed.

*Size*

Males to 29 mm; females to 18 mm.

*Distribution*

In Australia known only from southern New South Wales; New Zealand as far south as The Snares; North Pacific as far south as the Gulf of California in America; North Atlantic Ocean and coasts; Indian Ocean; Tasman Sea; and southern South America (Richardson 1905, 1909; Kussakin 1982). A pelagic species often taken from drifting kelp in oceanic environments and taken on the coast in association with drift logs, kelp, etc.

*Remarks*

The unusual pelagic way of life of this species may be responsible for its very limited distribution in Australia. No specimens have been taken from attached seaweeds, which are the usual habitat of other idoteids.

*Idotea metallica* is a widespread species with a long synonymy. We were unable to find any significant differences between the Southern and Northern Hemisphere material available to us. Adult males from Australia and the U.S.A. were notable for the possession of a thick mat of hairs on ischium-propodus of pereopod 2, which was less obvious on pereopods 3 and 4. In males from New Zealand this mat was obvious only on pereopod 2. Tinturier-Hamelin (1962) noted a similar sexual differentiation in other species of *Idotea*. It is also present in some chaetiliids, holognathids and *Synidotea*.

Genus *Paridotea* Stebbing

*Paridotea* Stebbing, 1900: 52.

Type species: *Oniscus ungulata* Pallas, 1772 (monotypy).

*Diagnosis*

Body about  $4\times$  as long as wide, smooth, head only slightly narrower than pereonite 1, body more or less parallel-sided. Pleon without articulating pleonites, pleonite 1 indicated ventrolaterally only, sometimes dorsally, pleonites 2 or 2 and 3 indicated by suture laterally only (pleotelsonic formula 1+2, 0+3 or 0+2); pleotelson often apically excavate. Antenna 2 multiarticulate. Mandible, maxillae 1 and 2 typical. Maxillipedal endite with apical setation; palp digitiform, 5 articles free. Coxae 2-7 with non-contiguous, non-articulating dorsal coxal plates usually more visible posteriorly. Pereopods with 1-2 spiniform setae on only palm of propodi, sometimes absent on more posterior pereopods. W-shaped ridge between bases of pereopods 7. Penes fused basally, attached to posterior margin of pleonite 1. Oostegites lamellar on pereopods 1-5.

*Remarks*

Species of *Paridotea* are recognisable by a combination of characters: narrow maxillipedal palp with five free articles, pleonites only weakly indicated and, more importantly, with no more than 3 spiniform setae, and very little other setation on the palms of the pereopods. Most have an excavate apex to the pleotelson; the only exception, *P. simplex*, is a simplified species that has all the other features of the genus. A feature of all species, not noted in other genera, is the W-shaped ridge between the bases of pereopods 7. It is more obvious in some species than others; the bases of pereopods 7 fit loosely against the ridge. The ridge is derived from the posterior margin of the ventral coxal plates whose posteromedial angles form the centre of the W.

In terms of pleonal structure, the genus cannot be differentiated from *Euidotea* but both are variable and *Euidotea* has much stronger setation on the pereopods and a broader maxillipedal palp with fused articles.

The type species, *Paridotea ungulata*, is described first in detail and other Australian species are diagnosed more briefly. In fact, the type species differs from the others in overall habitus, being much more vaulted and with better developed dorsal coxal plates. It also has more setae on the maxilliped and pereopods and the most plesiomorphic pleotelsonic condition. This species is the only one found on all southern continents.

### *Paridotea ungulata* (Pallas)

(Figs 29–31)

*Oniscus ungulatus* Pallas, 1772: 62–4, pl. 4, fig. 11.

*Idotea ungulata*. —Lamarck, 1818: 160; Miers, 1881: 52–4; Thomson, 1883: 332–3; Filhol, 1885: 436; Thomson and Chilton, 1886: 156; Chilton, 1890: 196–8; Nierstrasz, 1918: 133.

*Idotea affinis* Milne Edwards, 1840: 133. —Krauss, 1843: 61; Heller, 1865: 130–1; Miers, 1876*b*: 93; Thomson, 1879: 232.

*Idotea lalandii* Milne Edwards, 1840: 132, pl. 31, fig. 7. —Krauss, 1843: 61.

*Idotea edwardsii* Guérin-Méneville, 1843: 33.

*Idotea nitida* Heller, 1861: 497.

*Idotea nitida*. —Heller, 1865: 131–2, pl. 12, fig. 1.

*Idotea excavata* Haswell, 1881: 182–3; Haswell, 1882: 277–8.

*Paridotea ungulata*. —Chilton, 1890: 196–8; Stebbing, 1900: 53–5; Stebbing, 1902: 56; Chilton, 1905: 272; Chilton, 1909: 660; Stebbing, 1910: 433; Vanhöffen, 1914: 527; Collinge, 1917*b*: 81–2; Hale, 1924: 221, fig. 9*e, f*; Hale, 1927: 317; Hale, 1929: 320–1, fig. 325*b*; Sheppard, 1957: 151–3, fig. 4; Hurley, 1961: 265; Morton and Miller, 1968: 219, not fig. 73.2; Kensley, 1978: 40, fig. 17*I*.

*Paridothea ungulata*. —Nierstrasz, 1917: 113–14, figs 43–48; Nierstrasz, 1941: 267.

*Paridotea ungulata* var. *atrovirens* Collinge, 1917*b*: 82.

*Idothea excavata*. —Nierstrasz, 1941: 272.

#### Material Examined

*Possible syntypes of Idotea excavata.* Tasmania, AM G5325 (3 specimens).

*Illustrated specimens.* South Australia: Laura Bay, mangrove area (32°15'S., 133°49'E.), 20.ix.1981, SAM C4116 (1♂, 34 mm, 2 slides); Davenport Ck, Ceduna (32°8'S., 133°41'E.), S. Doyle, Apr. 1982, SAM C4117 (♂, 37 mm, 2 slides).

*Other material.* **Tasmania:** Southport, rock platforms SE. of pier (43°26'00'S., 146°56'50'E.), epifauna from *Zostera*, R. S. Wilson, 27.iv.1985 (stn TAS 34), NMV J14393 (2); Coles Bay, nr boatramp (42°7'S., 148°17'E.), *Zostera*, R. S. Wilson, 21.iv.1985 (stn TAS 14), NMV J14366 (1); Georges Bay (41°19'S., 148°17'E.), amongst oysters, G. E. Nicholls, Feb. 1927, WAM 640-86 (1). **New South Wales:** Wally Newtons beach, Nadgee Reserve, in pools, 27.iv.1967, AM P16138 (4). **Victoria:** numerous specimens from several localities including Wilsons Promontory, Western Port, San Remo, Flinders, Sorrento, Portsea, Port Phillip Bay, intertidal and shallow subtidal, NMV collections. **South Australia:** Port Willunga, intertidal limestone reef platform (35°16'S., 138°28'E.), under rocks, 22.i.1965, WAM 659-86 (1). **Western Australia:** Torrens I., Barker Inlet (33°48'S., 121°20'E.), mudflats, Oct. 1983, NMV J14367 (1).

**New Zealand:** Otago Harbour, on seawall outside Portobello Marine Laboratory, G. F. R. Hicks, June 1980, NMNZ Cr5679 (14).

**Solomon Is:** questionable locality (08°N., 159°E.), G. Officer, Sept. 1901, NMV J3424 (2).

**South Africa:** no locality, SAMCT 14906 (1), SAMCT 14907 (2).

#### Description

##### Male

Body about 4.6× as long as wide, deeply vaulted, half as deep as wide. Head 1.7× as wide as long, front with a median notch, rostrum absent. Pereonite 1 shorter than head in midline; pereonites 2–7 shorter posteriorly. Pleotelson 0.37× body length, pleonites 1 and 2 indicated by completely dorsal sutures, pleonite 3 with ventrolateral sutures only,

pleotelson essentially rigid. Pleotelson broadest anteriorly, lateral margins evenly tapering to a broad excavate apex defined by acute distolateral angles.

Antenna 1 peduncles contiguous, article 3 longer than second; flagellum as long as peduncle article 3, with 10 pairs and 1 single aesthetascs. Antenna 2  $\frac{1}{3}$  body length; flagellum of 18 articles, longer than peduncle.

Frontal lamina acute, simple, clypeus produced, upper lip symmetrical. Mandibles asymmetrical; incisor 4-toothed, broad; left lacinia mobilis 3-toothed; right lacinia mobilis with V-shaped 5-toothed cutting edge; spine row of complex spines fused basally to lacinia mobilis; molar process truncate, oval flat surface with a simple sharp rim, with antero-lateral cluster of long setae plus shorter setae on anterior and proximal surface. Maxilla 1 inner lobe with 4 distal plumose setae; outer lobe with 14 apical spiniform setae, 2 of which

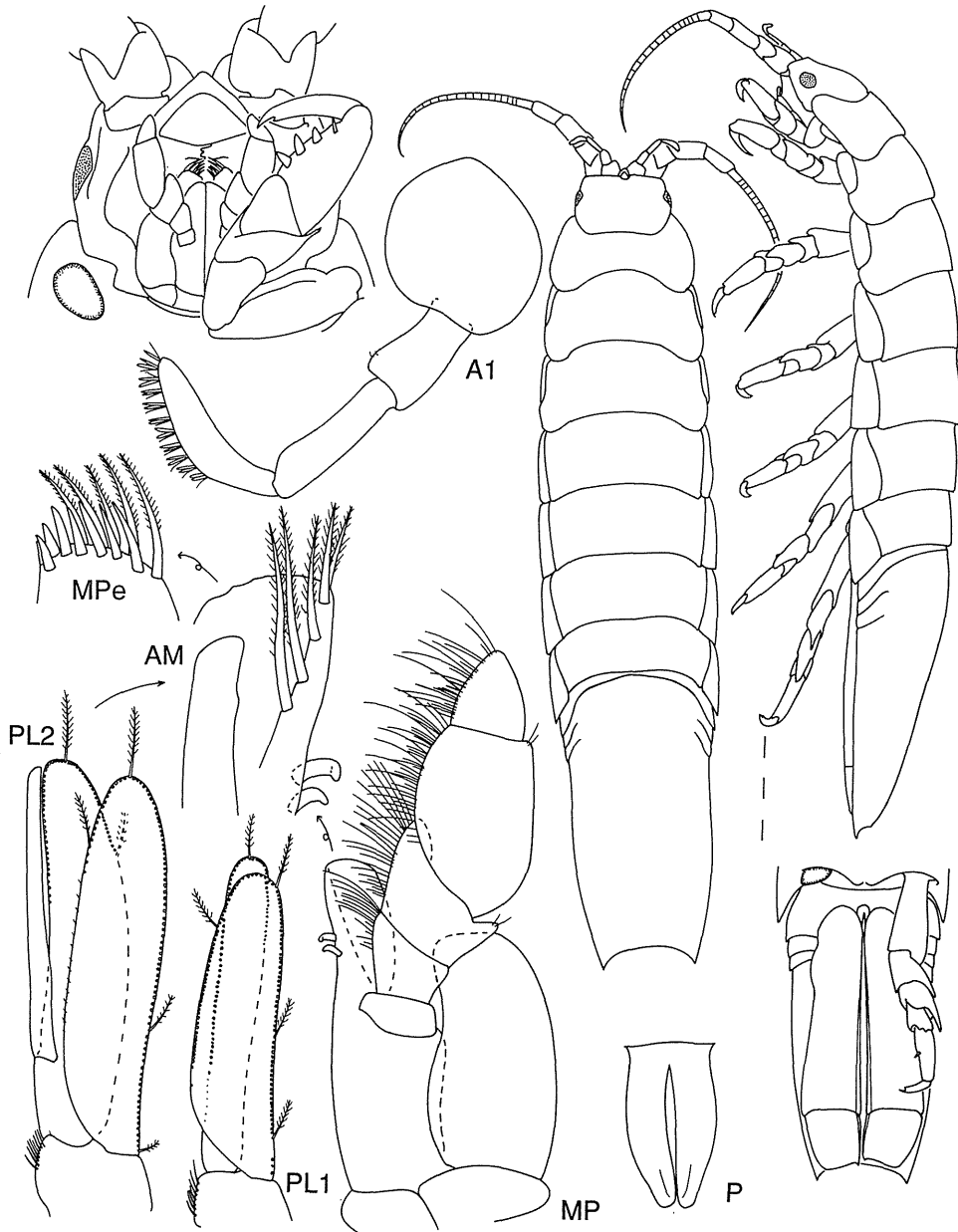


Fig. 29. *Paridotea unguolata*. Male, SAM C4117.

pectinate, plus seta on distal anterior face. Maxilla 2 with 3 subequal lobes; outer and middle lobes with 9 and 12+3 setae respectively; inner lobe as long as others, distal margin with 2 rows of 15 and 8 setae, some complex. Maxilliped with coxal plate and basal portion of epipod distinct; endite with 2 coupling hooks, apically with 8 spiniform setae and 6 plumose setae arranged in 2 rows; 4 plumose setae on anterior face; without setae at lateral base of palp. Maxillipedal palp 2.7× as long as proximal portion of basis; article 3 mediodistally lobed; article 4 ovoid, with mesial setae only; article 5 free, subtriangular. Epipod with rounded-truncate apex.

Pereopods 1–6 merus-propodus with a dense fur of fine setae on posterior margin; pereopod 7 without fine setae; pereopods 5–7 with ischium and merus anterodistally produced; pereopod 1 propodus with 3 strong palmar spiniform setae, pereopod 2 with 2 and pereopods 3–7 with 1 each; pereopod 1 propodus with about 80 pectinate setae on mesial face. Coxal plates 2–7 visible dorsally, more so posteriorly, with sharp ventral ridge enclosing socket of pereopods. Coxal plates 2 and 3 on anterior half of pereonites; coxal plates 4–7 occupying all of ventral margin of pereonites; coxal plate 7 extending beyond posterior margin of pereonite 7.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina a simple rod, as long as endopod. Uropods and pleopodal cavity reaching to apex of pleotelson. Uropodal endopod with straight distal margin.

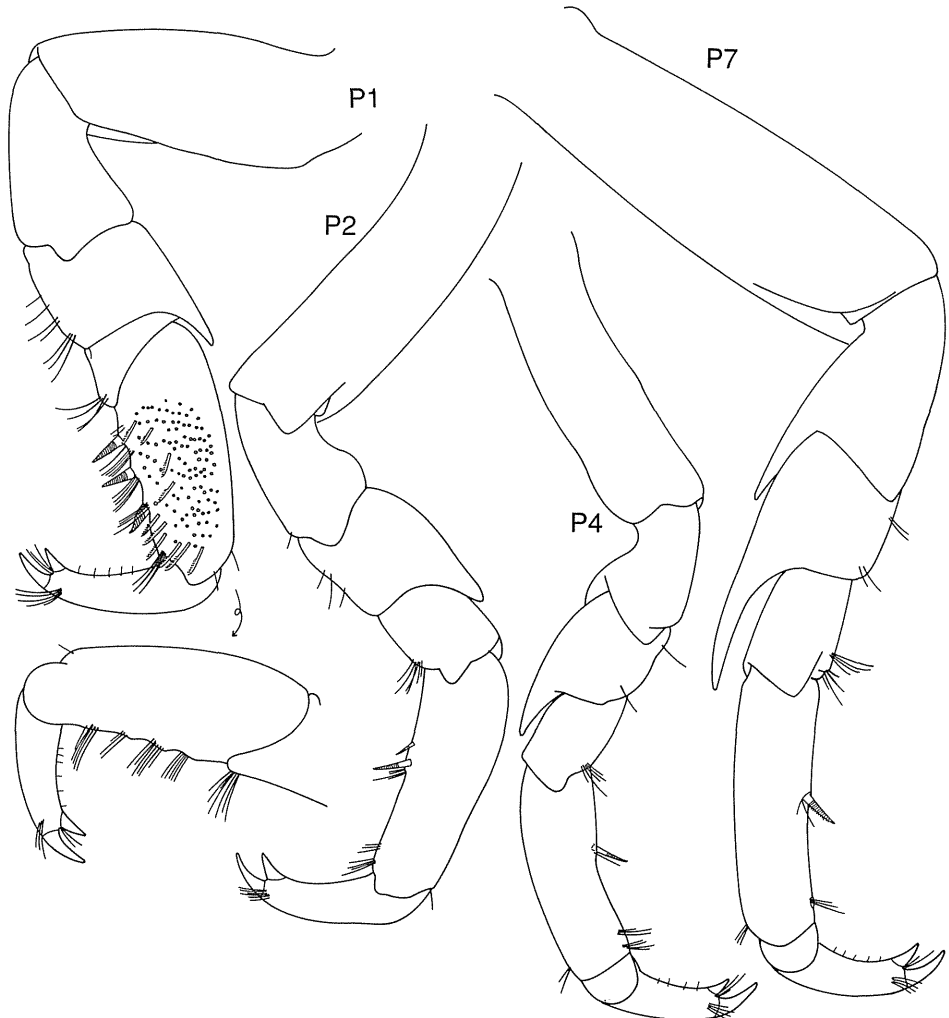


Fig. 30. *Paridotea ungulata*. Female, SAM C4116.



*Female*

As male except pereopods without dense fur of fine setae.

*Size*

To 43 mm.

*Distribution*

In Australia, south-eastern Australia from New South Wales (Nadgee Reserve) to South Australia (Spencer Gulf) and south-eastern Tasmania, southern South America (Miers 1881), Tristan da Cunha (Sheppard 1957), New Zealand (Hurley 1961), South Africa (Kensley 1978), and an unlikely record from the Solomon Islands.

*Remarks*

*Paridotea ungulata* is an easily recognised species with a characteristic excavate pleotelson and acute posterolateral angles. The pleotelson of *P. miersi* could be described in the same way but it is different in detail; the latter has smaller dorsal coxal plates than *P. ungulata*. We have examined material from South Africa and New Zealand and can see no differences between these and the Australian specimens. For this reason, we have no hesitation in

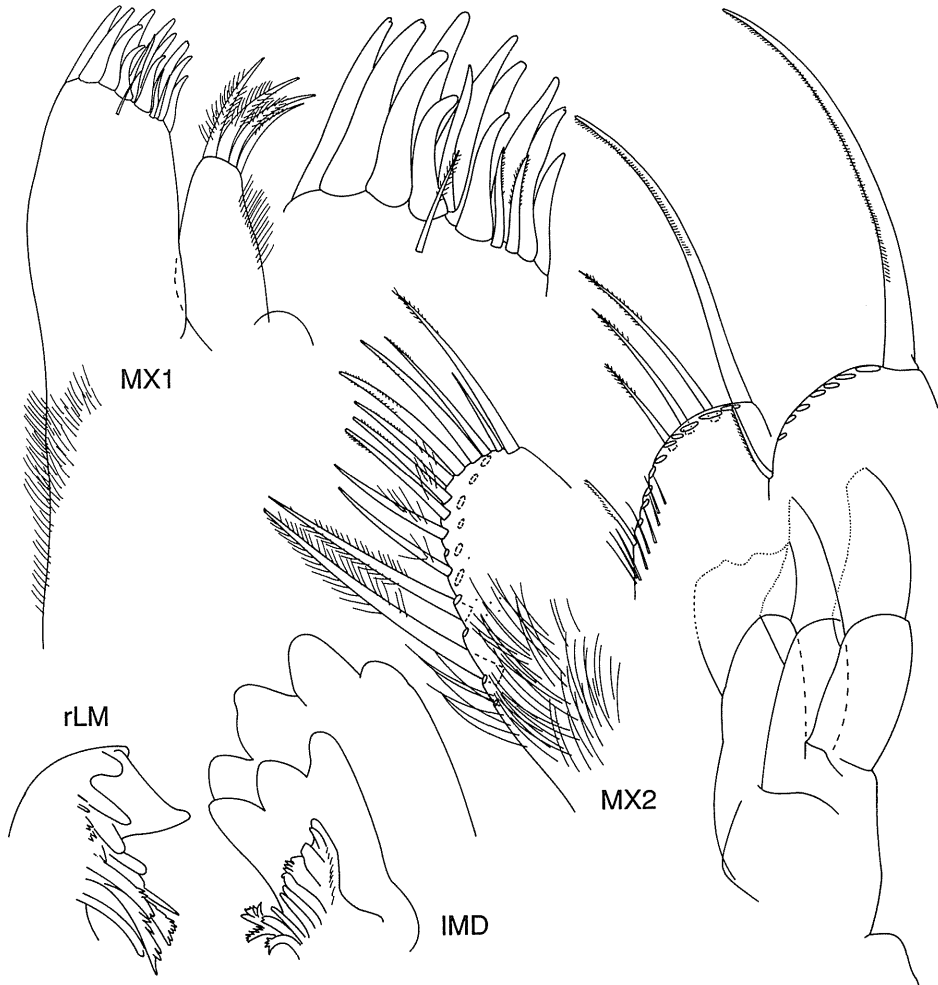


Fig. 31. *Paridotea ungulata*. Male, SAM C4117.

synonymising Collinge's (1917*b*) subspecies, *P. ungulata atrovirens*, from Port Phillip Bay although the types of this cannot be found.

Morton and Miller's (1968) figure 73.2 of a New Zealand idoteid looks more like a female specimen of *Batedotea elongata*.

Sheppard (1957) figured the mouthparts and first oostegite.

The collections of the Museum of Victoria have a specimen allegedly taken in 1901 in the tropical Solomon Is; given the southern distribution of all other records, this locality seems improbable.

*Paridotea aquarii*, sp. nov.

(Figs 32, 37*a*)

*Material Examined*

*Holotype.* Western Australia: Watermans Bay, Perth (31°51'S.,115°45'E.), *Sargassum* sp., J. Keesing, 13.xii.1984, WAM 117-86 (♂, 24.5 mm).

*Paratypes.* **Western Australia:** type locality, WAM 679-92 (1♂, 3♀, 1 juv.); Rottneest I., Thompson Bay (32°1'S.,115°30'E.), reef, 27.xi.1945, SAM C4135 (4 juv.); Rottneest I., North Point (32°1'S., 115°30'E.), reef, 28.xi.1945, SAM C4134 (1 juv.); Rottneest I., Green I., limestone reef platform (32°1'S.,115°30'E.), amongst weed and rock, L. M. Joll, 25.iv.1972, WAM 657-86 (3 juv.); same locality, 8.vi.1972, WAM 646-86 (1 juv.); Rottneest I., Clune Point (32°1'S.,115°30'E.), 29.xi.1945, SAM C4136 (18 juv.); SAM C4133 (1♂); Cottesloe Reef (31°59'S.,115°45'E.), *Sargassum* sp., 20.vii.1984, WAM 108-86 (1 juv.); NMV J15712 (1♂, 2♀, 2 juv.); Watermans Bay, Perth (31°51'S.,115°45'E.), *Sargassum* sp., 20.vii.1984, WAM 118-86 (5 juv.).

*Diagnosis*

*Male*

Very similar to *Paridotea munda* except: pleotelson tapering to a shallow excavate apex defined by broadly rounded distolateral projections. Antenna 2.0·4 × body length; flagellum of 20 articles, twice as long as peduncle. Pereopod 7 propodus without fur of fine hairs on palm. Coxal plate 4 on anterior  $\frac{2}{3}$  of ventral margin of pereonite; coxal plates 5 and 6 occupying  $\frac{3}{4}$  of margin, posteriorly subacute; coxal plate 7 occupying all of ventral margin of pereonites, not extending beyond posterior margin of pereonite 7, rounded posteriorly.

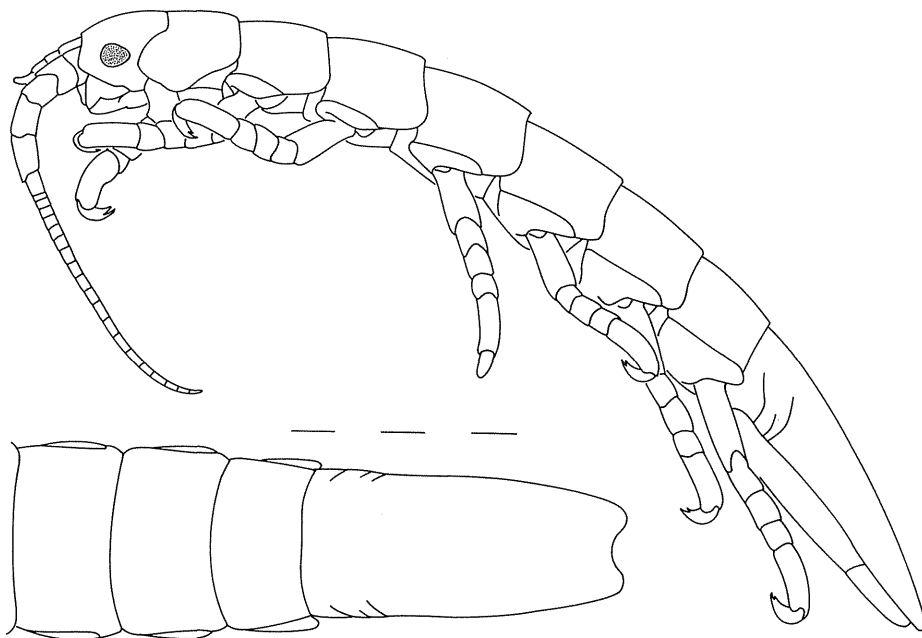


Fig. 32. *Paridotea aquarii*. Male, WAM 117-86, holotype.

*Female*

Essentially as male except pereonites 3 and 4 broader, body  $3.8\times$  as long as wide.

*Size*

To 24.5 mm.

*Distribution*

Region of Perth and Rottnest I., W.A.; subtidal, mostly from *Sargassum*.

*Remarks*

There are three Australian species of *Paridotea* in which the apex of the pleotelson is apically excavate and its posterolateral angles rounded. In *P. collingei*, the excavation is very small and pleonite 1 is completely marked. The other two have very similar pleotelsons but that of *P. aquarii* is less excavate than in *P. munda*. These two are more easily differentiated by the extent of the posterior coxal plates (Fig. 37). In *P. aquarii*, coxal plates 5 and 6 do not reach the posterior margin of the tergite (which they do in *P. munda*); coxal plate 7 is short and rounded in *P. aquarii* but longer and acute in *P. munda*. *P. aquarii* is recorded only from the region of Perth in Western Australia; *P. munda* is a southern species which reaches the southern coast of Western Australia. Both species are similar to *P. fucicola* Barnard from South Africa.

*Etymology*

From *Aquarius* (L.), a water-carrier, an allusion to the type locality.

*Paridotea collingei*, sp. nov.

(Figs 33, 34)

*Material Examined*

*Holotype*. South Australia: off Cape Northumberland (38°04'S.,140°40'E.), *Macrocystis*, S. A. Shepherd, 14.vii.1974, SAM C4106 (♂, 41 mm, 2 slides).

*Paratypes*. **South Australia**: Pearson I. (38°58'S.,134°17'E.), 30.5 m, 10.i.1960, SAM C4109 (1♀, 27 mm); Cape Northumberland, 1300 m offshore (38°04'S.,140°40'E.), 15 m, red algae, S. A. Shepherd, 1976, SAM C4107 (1♂, 42 mm; 1♀, 29 mm); Cape Northumberland (38°04'S.,140°40'E.), 15 m, algae, S. A. Shepherd, 1977, SAM C4110 (1 juv., 33 mm); West I., Seal Rock (35°37'S., 138°36'E.), 15 m, red algae, S. A. Shepherd, 15.iv.1976, SAM C4108 (1♂, 30 mm); NE. side of Topgallant I., Investigator Group (33°43'S.,134°36.6'E.), 20 m, *Cystophora* spp., *Plocamium*, SCUBA, K. Brandon and G. C. B. Poore on FV Limnos, 21.iv.1985 (stn SA 80), NMV J14402 (1 juv., 16 mm); Flinders I., 'The Hotspot' reef, 5 n.mi. W. of N. end of Flinders I. (33°40.5'S.,134°22.0'E.), 12 m, brown, green and red algae, large forms, SCUBA, S. A. Shepherd on FV Limnos, 19.iv.1985 (stn SA 64), NMV J14369 (2 juv., 1♀); NMV J14368 (1 manca, 1 juv., 2♀, 1♂). **Tasmania**: Pegleg Cove, Deal I., between Pulpit Cove and Winter Cove (39°28'S.,147°22'E.), 6 m, red algae, SCUBA, H. M. Lew Ton, 13.iv.1983, NMV J15771 (1♂). **Victoria**: 75 m SW. of Eagles Nest, Venus Bay (38°40'S.,145°40'E.), 8 m, rocky, SCUBA, R. Wilson and G. Barber, 5.iii.1982 (stn CPA 3), NMV J15770 (1 juv.).

*Diagnosis**Male*

Body about  $10.7\times$  as long as wide. Head  $1.3\times$  as wide as long, front slightly excavate medially. Pleotelson  $0.30\times$  body length, pleonite 1 indicated by complete suture, pleonites 2 and 3 sometimes indicated ventrally by faint sutures. Pleotelson broadest anteriorly, lateral margins tapering, especially distally, to shallow excavate apex defined by rounded distolateral projections.

Antenna  $2.0.4\times$  body length; flagellum of about 40 articles, much longer than peduncle. Maxilla 2 with 3 lobes subequal, inner lobe slightly longer and broader than middle and outer lobes. Maxillipedal endite with 1 coupling hook, apically with 6 short simple spiniform setae and 8 setae; without plumose setae on anterior face; without setae at lateral base of

palp. Maxillipedal palp  $1.7\times$  as long as proximal portion of basis; article 3 mediolaterally lobed; article 4 ovoid, with long mesial setae only; article 5 free, as long as wide. Epipod with oblique apex twisted behind palp.

Pereopods sparsely setose; pereopods 1–3 propodus with 2 palmar spiniform setae; pereopods 4–7 with 1 palmar spiniform seta; pereopod 1 propodus with about 40 pectinate setae on mesial face; pereopods 5–7 carpus and propodus with narrow fur of fine hairs on palm; on merus also on pereopod 7. Coxal plates 2–7 barely visible dorsally, without ventral ridge, pereopod sockets visible laterally. Coxal plates 2 and 3 poorly defined; coxal plates 4–6 on anterior  $\frac{2}{3}$  to  $\frac{3}{4}$  of pereonites; coxal plate 7 occupying all of ventral margin of pereonites; all acute-rounded posteriorly.

#### Female

Essentially as male except pereonites 3 and 4 broader, body  $7\times$  as long as wide; antenna 2 flagellum of about 30 articles; pereopods without palmar fur.

#### Size

To 43 mm.

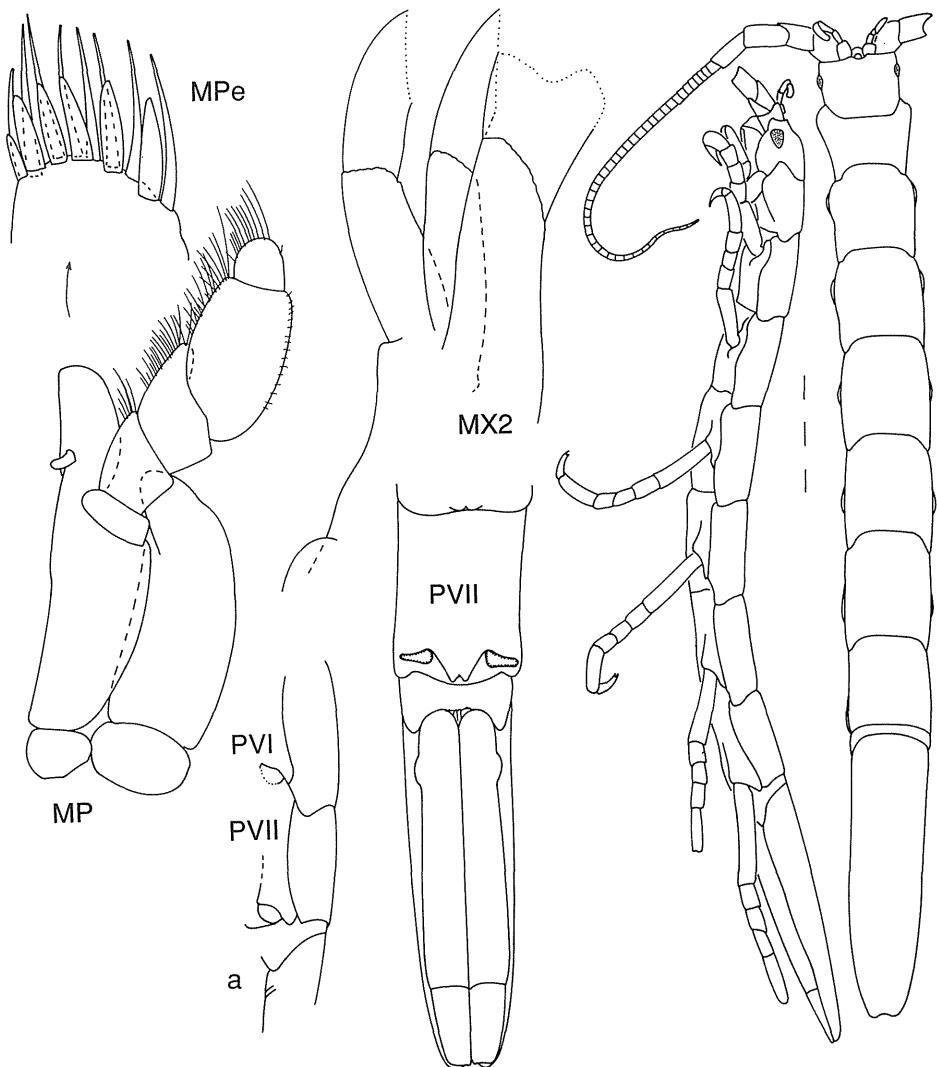


Fig. 33. *Paridotea collingei*. Male, C4106, holotype; a, female, SAM C4109, paratype.

*Distribution*

Southern Australia, from the central Victorian coast (including northern Bass Strait islands of Tasmania) to western South Australia.

*Remarks*

*Paridotea collingei* is an elongate species with a very weak pleotelsonic excavation. Pleonite 1 is marked completely dorsally, but pleonites 2 and 3 are minutely visible only under the anterior edge of the uropod.

*Etymology*

For Walter E. Collinge, who, between 1916 and 1918 while at the University of St Andrews, Scotland, published 10 papers on the structure and systematics of valviferan isopods.

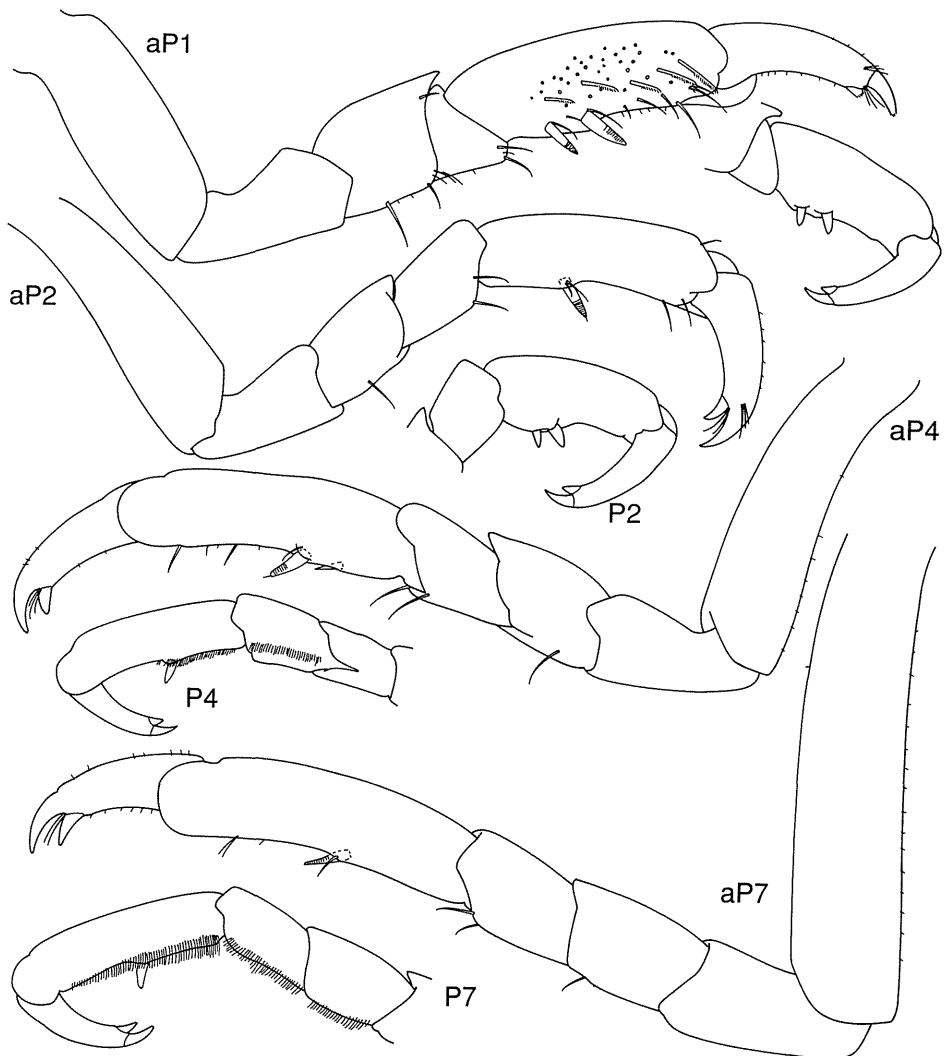


Fig. 34. *Paridotea collingei*. Male, C4106, holotype; a, female, SAM C4109, paratype.

*Paridotea miersi*, sp. nov.

(Figs 35, 36)

*Material Examined*

*Holotype.* South Australia: Investigator Strait (35°27'S.,136°50'E.), J. E. Watson, 20.i.1971, NMV J14334 (♂, 30 mm).

*Paratypes.* Western Australia: 14 km W. of Seal I. (32°16'8"S.,115°31'3"E.), 37 m, dredge, R. W. George and N. Sarti on FV Flinders, 29.vi.1971, WAM 655-86 (1♂, 31 mm); Shark Bay (24°54'S.,113°20'E.), intertidal reef, P. Barrett-Lennard on FV Flinders, Sept. 1960, WAM 534-73 (1 juv., 27 mm).

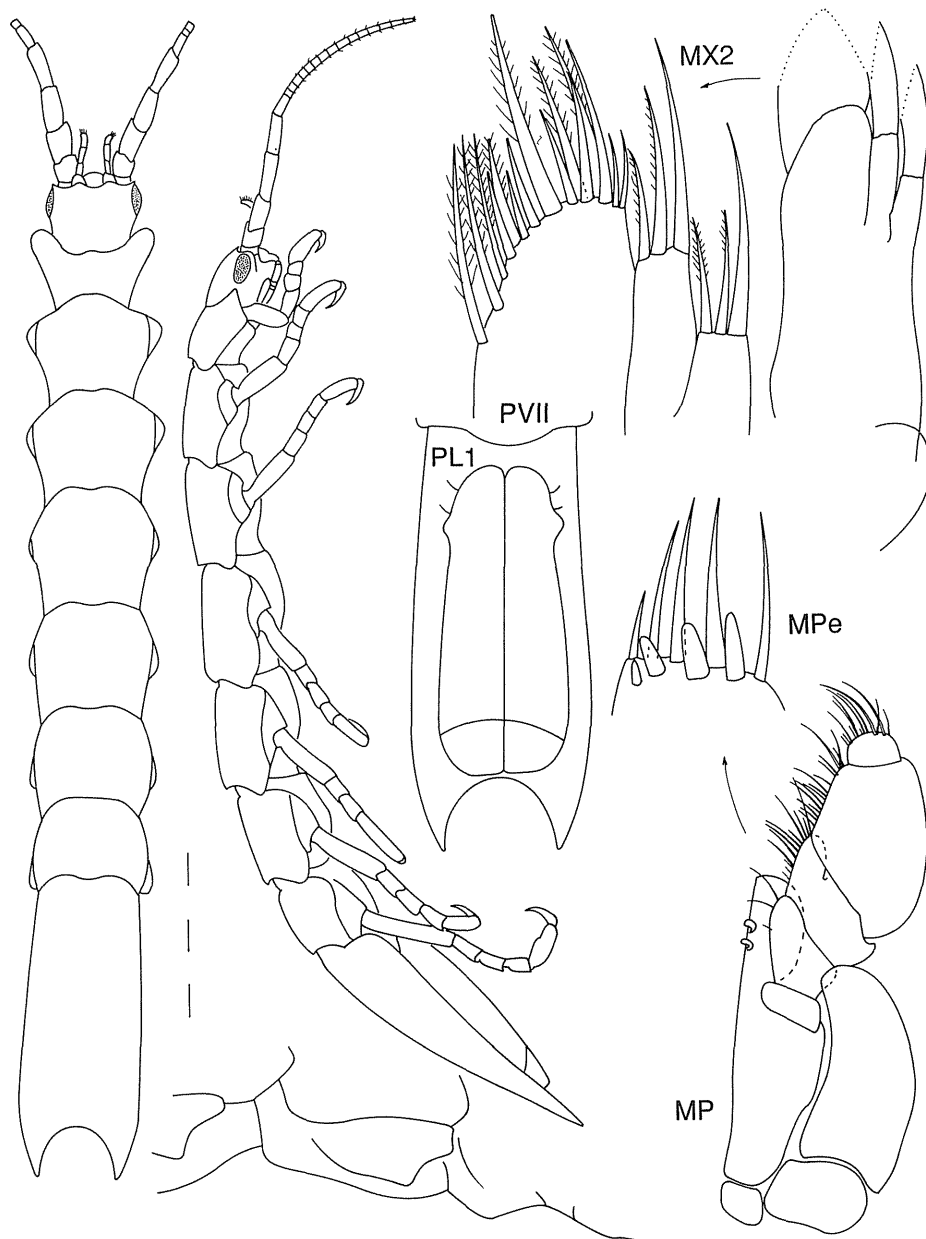


Fig. 35. *Paridotea miersii*. Male, NMV J14334, holotype.

*Diagnosis**Male*

Body about  $7.3\times$  as long as wide, lateral margin irregular in dorsal view, especially on pereonites 1–3. Head  $1.4\times$  as wide as long, front excavate medially. Pleotelson  $0.30\times$  body length, pleonites 1 and 2 indicated ventrally by faint sutures. Pleotelson lateral margins diverging, broadest  $\frac{4}{5}$  way along, distally tapering to 2 acute apices enclosing a deep terminal excavation.

Antenna  $2.03\times$  body length; flagellum of about 16 articles, slightly longer than peduncle. Maxilla 2 with middle and outer lobes progressively shorter than broader inner lobe. Maxillipedal endite with 2 coupling hooks, apically with 4 short simple spiniform setae and 5 setae; without plumose setae on anterior face; without setae at lateral base of palp. Maxillipedal palp  $1.8\times$  as long as proximal portion of basis; article 3 mediodistally lobed; article 4 ovoid, with long mesial setae only; article 5 free, shorter than wide. Epipod with oblique apex twisted behind palp.

Pereopods sparsely setose; pereopods 1–3 propodus with 2 palmar spiniform setae; pereopods 4–7 with same 2 palmar spiniform setae plus third near dactylus; pereopod 1 propodus with about 40 pectinate setae on mesial face. Coxal plates 2–7 prominent dorsally, without ventral ridge, pereopod sockets visible laterally. Coxal plates 2–4 on anterior half

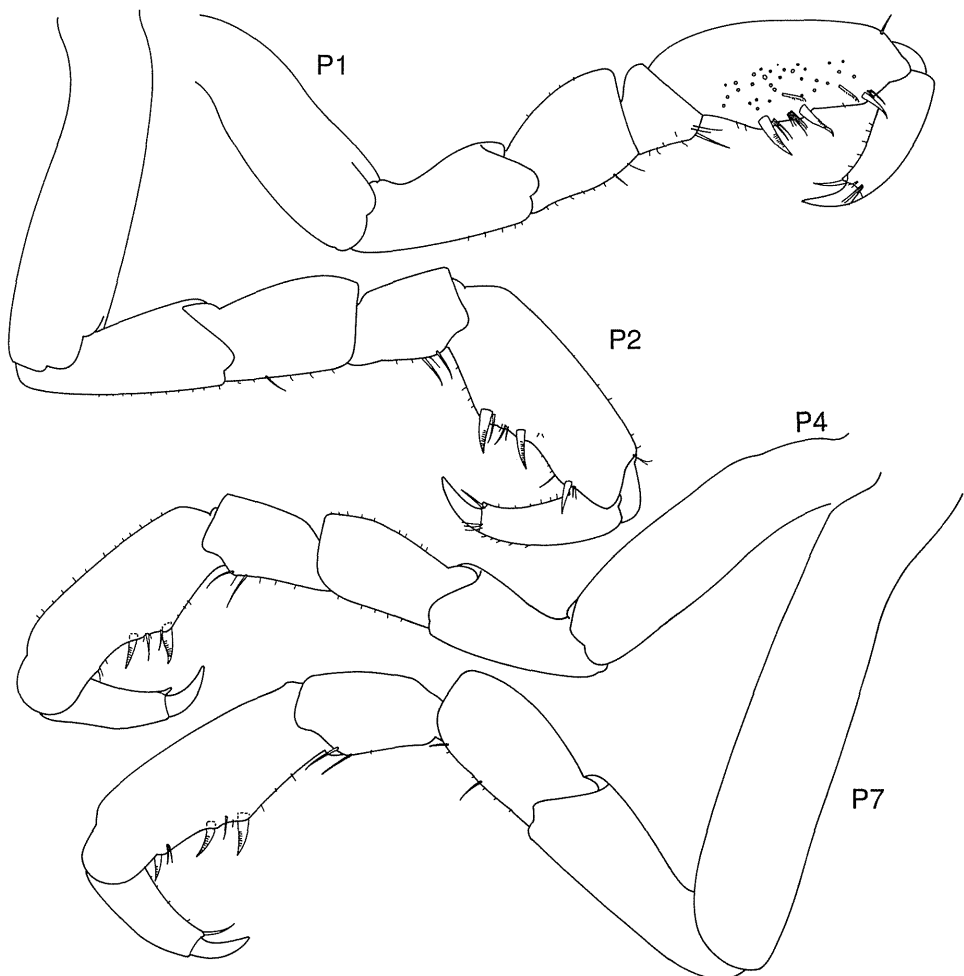


Fig. 36. *Paridotea miersii*. Male, NMV J14334, holotype.

of pereonite; coxal plates 5 and 6 on anterior  $\frac{3}{4}$  of pereonites; coxal plate 7 occupying all of ventral margin of pereonites, truncate posteriorly.

*Female*

Not known.

*Size*

To 31 mm.

*Distribution*

Known only from three localities in central South Australia and central and south-western Western Australia; subtidal.

*Remarks*

*Paridotea miersi* is unusual in some respects. The acute posterolateral angles of the pleotelson are similar to those of *P. unguolata* but its reduced coxal plates are more similar to those of all other species. The lateral lobes of maxilla 2 are shortened, unlike those of other species.

*Etymology*

For Edward J. Miers, carcinologist at the British Museum, whose detailed 1881 revision of the Idoteidae is still an important source for valviferan taxonomy.

*Paridotea munda* Hale

(Figs 37, 38)

*Paridotea munda* Hale, 1924: 221–3, fig. 9.—Hale, 1929: 319–20, fig. 324, 325a.

*Paridothea munda*.—Nierstrasz, 1941: 267.

Not *Paridotea munda* Nunomura, 1988 (junior homonym).

*Material Examined*

*Holotype*. South Australia: Marino Reef, H. M. Hale, SAM C249 ( $\sigma$ ).

*Paratypes*. **South Australia**: Port Willunga Reef, S. Stokes, 18.iv.1924, SAM C250 (allotype  $\varnothing$ ); C251 ( $\sigma$ ,  $\varnothing$ ); Marino Reef, H. M. Hale, C252 (4 specimens and 3 slides from a fifth specimen). **Tasmania**: locality unspecified, A. M. Lea, SAM C253 (3).

*Illustrated specimen*. South Australia: Cape Northumberland, 1.3 km offshore (38°04'S., 140°40'E.), 15 m, red algae, S. A. Shepherd, 1976, SAM C4119 ( $\sigma$ , 29 mm, 2 slides).

*Other material*. **Tasmania**: 20 km SSW. of Babel I. (40°06.8'S., 148°24.3'E.), 22 m, coarse shell, R. S. Wilson on RV Tangaroa, 14.xi.1981 (stn BSS 166), NMV J8710 (1); Ninepin Point (43°17'S., 147°15'E.), NMV J15714 (1); E. of Rocky Cape lighthouse, below Rocky Cape cave (40°51'S., 145°31'E.), 2 m, sponge, *Caulerpa* and coralline algae, NMV J23706 (3); 2 m, red algae, J23705 (4). **New South Wales**: specimens from Collaroy, Shellharbour and Bermagui, AM collections. **Victoria**: numerous specimens from several localities including Mallacoota, Venus Bay, Bunurong Coast, Flinders, Port Phillip Bay, Aireys Inlet, Wye R., Apollo Bay, Lady Julia Percy I., Portland, intertidal and subtidal, NMV and AM collections. **South Australia**: numerous specimens from several localities including Cape Northumberland, Topgallant I., Flinders I., down to 15 m depth, algal communities, SAM, AM and NMV collections. **Western Australia**: Thistle Cove, eastern end (34°0'S., 122°12'E.), 10 m, sponges, brown algae, SCUBA, G. C. B. Poore and H. M. Lew Ton, 11.iv.1984 (stn SWA 34), NMV J14397 (16).

*Diagnosis*

*Male*

Body about 5.3 × as long as wide. Head 1.8 × as wide as long, front slightly excavate medially. Pleotelson 0.34 × body length, 3 pleonites indicated by ventrolateral sutures, second not reaching as far dorsally as other 2, none defined dorsally. Pleotelson broadest



anteriorly, lateral margins tapering to a deeply excavate apex defined by rounded distolateral projections.

Antenna 2 half body length; flagellum of 36 articles, much longer than peduncle. Maxilla 2 with 3 subequal lobes. Maxillipedal endite with 1 coupling hook, apically with 7 short simple spiniform setae and 9 plumose setae; 3 plumose setae on anterior face; without setae at lateral base of palp. Maxillipedal palp twice as long as proximal portion of basis; article 3 mediolaterally lobed; article 4 ovoid, with mesial setae only; article 5 free, oval. Epipod with excavate oblique apex.

Pereopods sparsely setose; pereopods 1–3 propodus with 2 palmar spiniform setae; pereopods 4–7 with 1 palmar spiniform spine; pereopod 1 propodus with about 20 pectinate

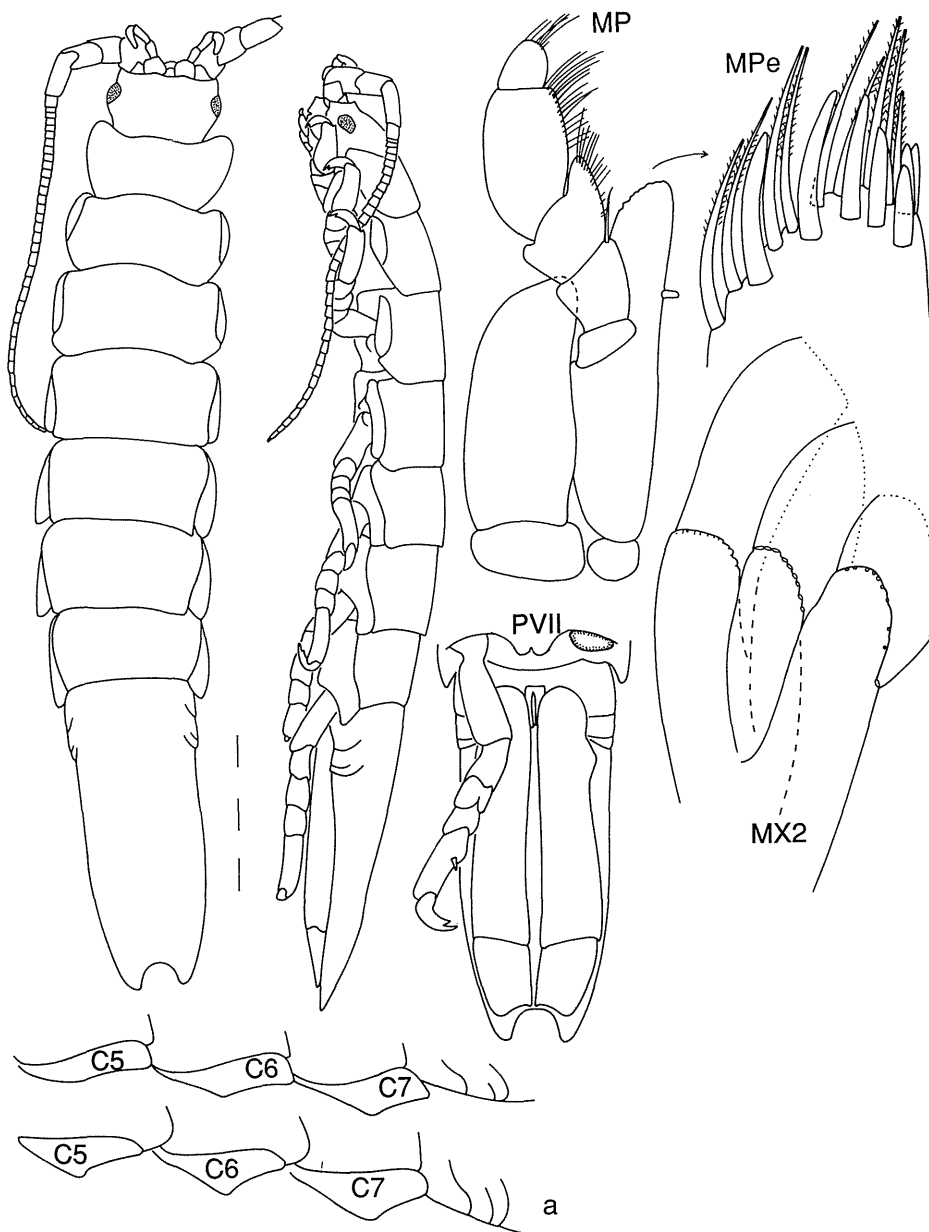


Fig. 37. *Paridotea munda*. Male, SAM C4119; a, *Paridotea aquarii*, oblique view of left coxae 5–7 and pleon compared with *P. munda* above.

setae on mesial face; pereopod 7 propodus with narrow fur of fine hairs on palm. Coxal plates 2–7 visible dorsally, more so posteriorly, without well-defined ventral edge, pereopod sockets visible laterally. Coxal plates 2 and 3 on anterior half of pereonites; coxal plate 4 on anterior  $\frac{3}{4}$ ; coxal plates 5–7 occupying all of ventral margin of pereonites, all rounded-truncate posteriorly; coxal plate 7 extending well beyond posterior margin of pereonite 7, with an acute angle ventrally.

*Female*

Essentially as male except pereonites 3 and 4 broader, body  $4.1\times$  as long as wide; pereopod 7 fur less obvious than in male.

*Size*

To 29 mm.

*Distribution*

Southern Australia from central New South Wales (Sydney) to south-eastern Western Australia (Cape Legrand), including Tasmania; widely distributed in Victoria and South Australia only.

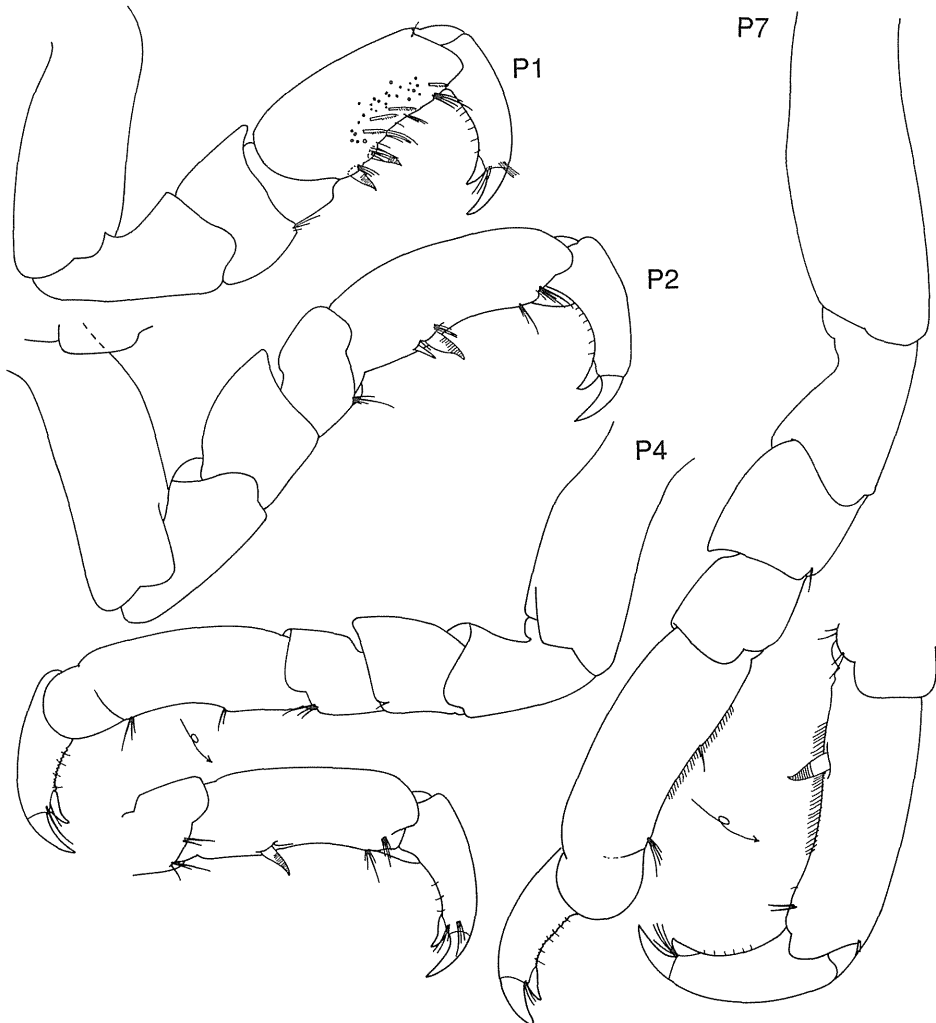


Fig. 38. *Paridotea munda*. Male, SAM C4119.

*Remarks*

*Paridotea munda* is the commonest species of its genus in Victoria and South Australia and is most easily recognised by the excavate pleotelson margin. This excavation is less obvious on the smallest specimens. The species is most similar to *P. aquarii* (q.v.) but the two species do not co-occur.

A species from South Africa, *P. fucicola* Barnard, of which we have seen specimens, is similar in the form of coxal plates and pleotelson. It differs in having pleonite 1 completely defined dorsally.

*Paridotea munda* Nunomura, 1988 from Japan is a junior homonym.

*Paridotea simplex*, sp. nov.

(Figs 39, 40)

*Material Examined*

*Holotype*. South Australia: Restless Point, West I. (35°37'S., 138°36'E.), S. A. Shepherd, SAM C4138 (♂, 14 mm).

*Paratypes*. **Tasmania**: Ninepin Point (43°17'S., 147°15'E.), 1 m, red, green and brown algae, G. C. B. Poore and H. M. Lew Ton, 20.iii.1988 (stn TAS 69), NMV J15799 (2♂). **Victoria**: E. side of south point, Twin Reefs, 50 m offshore (38°41'S., 145°39'E.), 11 m, rocky, SCUBA, C. Larsen *et al.*, 4.iii.1982 (stn CPA 6), NMV J3182 (1♂, 8.5 mm, 1 slide; 1 juv., 1 slide); Honeysuckle Point, Western Port (38°26'S., 145°04'E.), T. Crawford, 29.xii.1976, NMV J3152 (3).

*Diagnosis**Male*

Body about 14× as long as wide. Head as wide as long, front slightly concave. Pleotelson 0.30× body length, pleonite 1 indicated completely but weakly dorsally, pleonites 2 and 3 very weakly laterally by minute sutures. Pleotelson broadest anteriorly, lateral margins tapering slightly to a broadly rounded apex.

Antenna  $2\frac{1}{4}$  body length; flagellum of 8 articles (fewer in small specimens), as long as peduncle. Maxilla 2 with 3 unequal lobes: inner lobe with 7 complex distal setae; middle lobe shorter, with 2 distal setae; outer lobe shorter than middle, with 2 distal setae. Maxillipedal endite with 1 coupling hook, apically with 3 short simple spiniform setae and 6 plumose setae; without setae at lateral base of palp. Maxillipedal palp almost twice as long as proximal portion of basis; article 3 mediolaterally lobed; article 4 ovoid, with mesial setae only; article 5 free, little shorter than wide. Epipod with oblique apex.

Pereopods very sparsely setose; pereopods 1–3 propodus with 1 palmar spiniform seta; pereopods 4–7 without palmar spiniform setae; pereopod 1 propodus with about 14 pectinate setae on mesial face. Coxal plates 2–7 not visible dorsally, not easily separable from pereonites, without well-defined ventral edge, pereopod sockets visible laterally. Coxal plates 2 and 3 on anterior half of pereonites; coxal plates 5 and 6 on anterior  $\frac{3}{4}$ ; coxal plate 7 occupying all of ventral margin of pereonite, rounded posteriorly.

*Female*

Not known.

*Size*

To 14 mm.

*Distribution*

Southern Australia from South Australia, central Victoria and eastern Tasmania (four records only).

*Remarks*

*Paridotea simplex* is the only species in its genus in which the apex of the pleotelson is not excavate, but this is consistent with the general simplicity of the species. *P. simplex* carries reduction of pereopodal setation further than any other species; single spiniform setae are present only on pereopods 1–3. The species co-occurs with *P. munda* on the south-eastern coast of Tasmania but the degree of fusion of the pleonites distinguishes the two species; the apex of the pleotelson of very small *P. munda* is barely excavate which may lead to confusion.

Only the holotype male has more than 3 flagellar articles on antenna 2. The situation on smaller juveniles and males is one large article plus 1 or 2 much smaller articles. In this, the antenna approaches the condition seen in Brusca's (1984) idoteid lineage A. The outer lobes of maxilla 2 are shorter than the inner lobe, a condition approached in *P. miersi*.

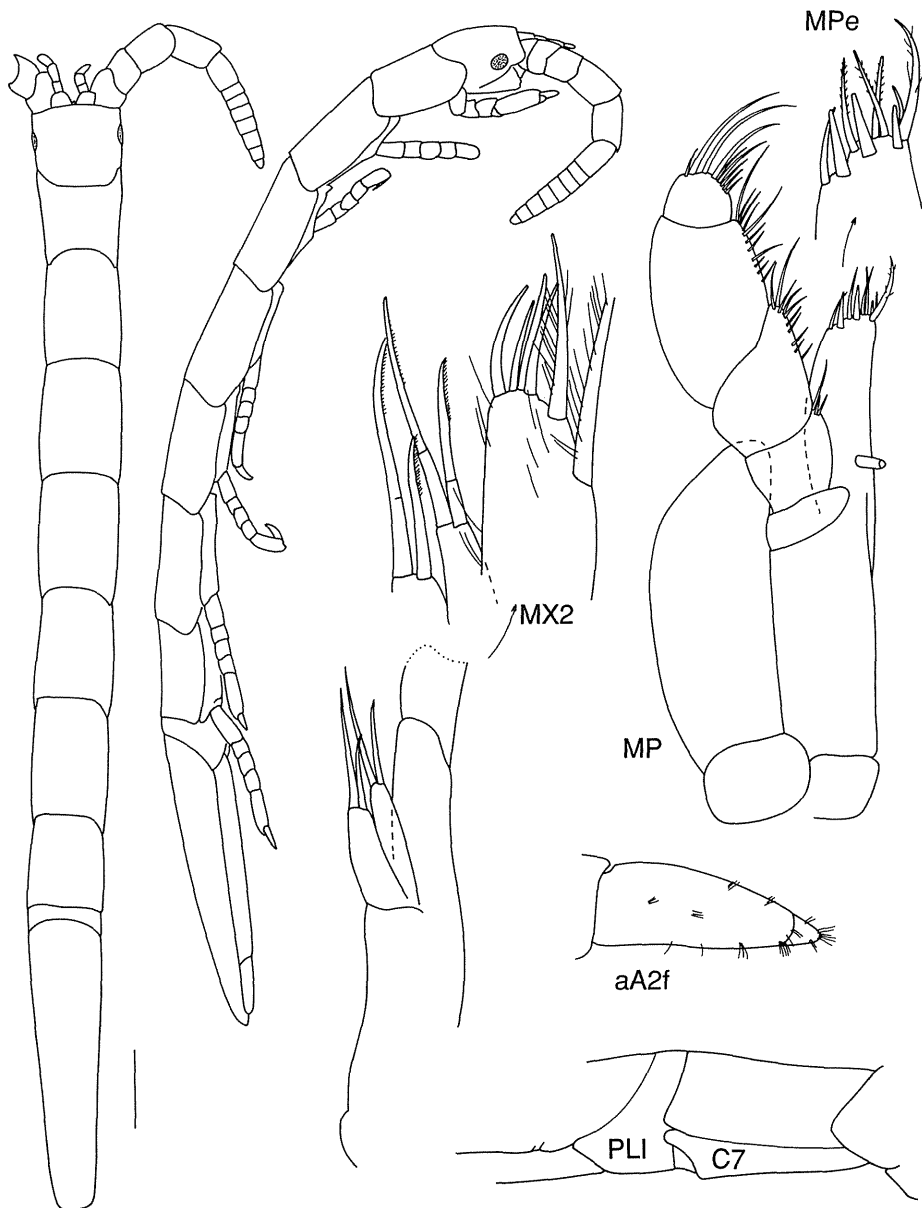


Fig. 39. *Paridotea simplex*. Male, SAM C4138, holotype; a, NMV J15799, paratype.

*Etymology*

*Simplex* (L.), simple, alluding to the reduction of the pleotelson and pereopods.

Genus *Pentidotea* Richardson

*Pentidotea* Richardson, 1905: 368.

*Idotea* (*Pentidotea*). —*sensu* Menzies, 1950: 170; Brusca and Wallerstein, 1979: 266; Rafi and Laubitz, 1990: 2655–65.

Type species: *Idotea resecata* Stimpson, 1857 (subsequent designation by Hale 1924).

*Diagnosis*

Body moderately broad (about  $5\times$  as long as wide), strongly vaulted, smooth, head narrower than pereonite 1, body only slightly wider at middle. Pleon without articulating pleonites, pleonites 1 and 2 indicated by suture dorsally, 3 ventrolaterally only; pleotelson apically acute. Antenna 2 multiarticulate. Mandible, maxillae 1 and 2 typical. Maxillipedal endite with apical setation; palp digitiform, all articles free. Coxae 2–7 with contiguous articulating, dorsal coxal plates shielding coxal-basal articulation from lateral view. Pereopods with transverse rows of spiniform setae on palm of carpus and propodus. Penes fused at base, on posterior margin of pleonite 1. Oostegites lamellar on pereopods 1–5.

*Remarks*

Some authors (Menzies 1950; Brusca 1984; Rafi and Laubitz 1990) considered *Pentidotea* a subgenus of *Idotea* on the grounds that the presence of a suture between maxillipedal palp articles 4 and 5 is an insufficient generic criterion. Menzies noted that juvenile *P. resecata* have only four articles, indicating that the character was unreliable. We agree with this assessment of the maxilliped, but note other more significant differences: complete pleonal fusion, absence of anterior spiniform setae on pereopods, and partially fused penes. We have examined specimens of the type species and *P. wosnesenskii*. Part of the problem facing these western American authors is the fact that many of the species from the North Pacific assigned to *Idotea* are not true species of this genus. That is, they have fused pleonites,

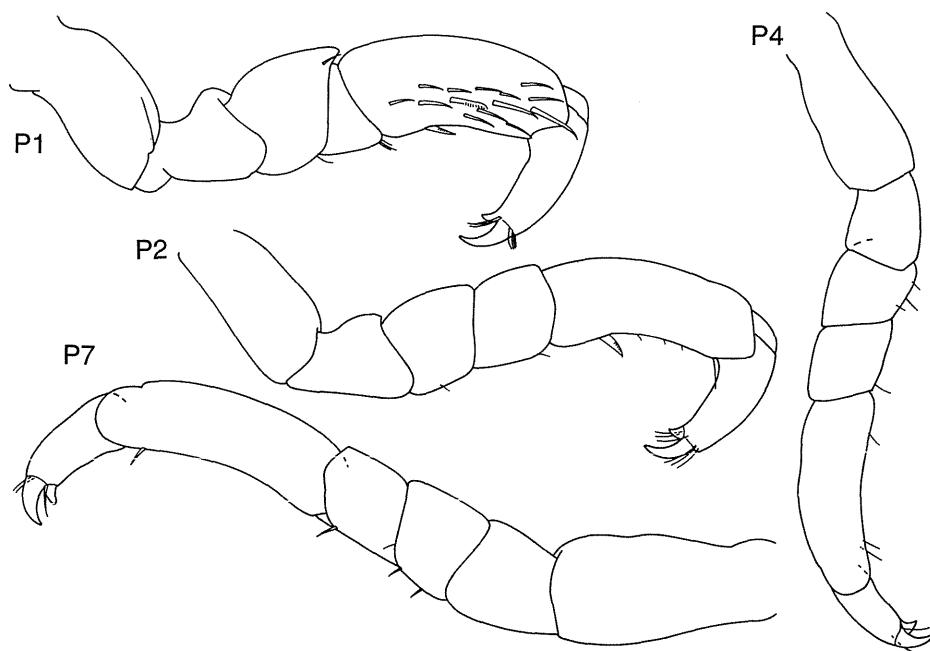


Fig. 40. *Paridotea simplex*. Male, SAM C4138, holotype.

partially fused penes and reduced coxae. Our diagnosis of *Idotea* (see above) is more restrictive and allows only species with free pleonites, anterior spiniform setae on pereopods, and free penes.

We have been unable to find a type species designation prior to that of Hale (1924).

*Pentidotea australis* Hale

(Figs 41–43)

*Pentidotea australis* Hale, 1924: 220–1, fig. 8.—Hale, 1927: 318, fig. 5; Hale, 1929: 319, fig. 323.

*Pentidothea australis*.—Nierstrasz, 1941: 265.

*Material Examined*

*Holotype*. South Australia: Kangaroo I. (35°50'S.,138°3'E.), SAM C234 (♂, 3 slides).

*Illustrated specimen*. South Australia: Eight Mile Ck Beach (33°06'S.,137°31'E.), J. Jamieson, Aug. 1981, SAM C4132 (♂, 64 mm).

*Other material*. **South Australia:** Beachport (37°29'S.,140°0'E.), 6.xii.1971, SAM C4131 (1♀, 44 mm); Cape Northumberland (38°04'S.,140°40'E.), off Middle Point, 5 m, S. A. Shepherd, 19.iii.1974, SAM unregistered (1). **Victoria:** Port Phillip Bay (38°09'S.,144°52'E.), from fish gut, Feb. 1959, NMV J3419 (7); Warrnambool (38°23'S.,142°31'E.), AM P38550 (16).

*Description*

*Male*

Body about 4.7 × as long as wide, deeply vaulted, half as deep as wide. Head 1.7 × as wide as long, front convex, rostrum absent. Pereonite 1 as long as head; pereonites 2–7 subequal, longer than dorsal length of pereonite 1. Pleotelson 0.4 × body length, pleonites 1 and 2 indicated by complete dorsal sutures, pleonite 3 by ventrolateral sutures only, pleotelson rigid (pleotelsonic formula 2 + 1). Pleotelson broadest anteriorly, lateral margins evenly tapering to an acute apex.

Antenna 1 peduncles contiguous, article 3 about as long as second; flagellum as long as peduncle article 3, with 15 pairs and 1 terminal aesthetascs. Antenna 2  $\frac{1}{4}$  body length; flagellum of 16 articles, half length of peduncle.

Frontal lamina acute, simple, clypeus produced, upper lip symmetrical. Mandibles asymmetrical; incisor 4- or 5-toothed, broad; left lacinia mobilis 3-toothed,  $\frac{2}{3}$  width of incisor; right lacinia mobilis irregularly 4-toothed; spine row of about 18 multifid curved spines fused basally to lacinia mobilis; molar process truncate, oval flat surface with a simple sharp rim, with anteriolateral cluster of long setae plus shorter setae on anterior and proximal surface. Maxilla 1 inner lobe with 4 distal plumose setae plus 1 simple short seta, outer lobe with 12 apical spiniform setae. Maxilla 2 outer and middle lobes with 16 and 13 setae respectively; inner lobe longer than others, distal margin with about 50 setae, some complex. Maxilliped with coxal plate and basal portion of epipod distinct; endite with a single coupling hook, apically with 10 plumose setae arranged in 2 rows; 3 plumose setae on anterior face; 2 plumose setae at lateral base of palp. Maxillipedal palp 2.4 × as long as proximal portion of basis; article 3 mediolaterally lobed; article 4 ovoid, with lateral and mesial setae; article 5 free, quarter length of article 4. Epipod with rounded-truncate apex.

Pereopod 1 shortest, merus with oblique row of distal setae, carpus with dense cluster of about 50 setae, propodus with setae in 4 transverse clusters across palm; mesial face with 16 pectinate setae. Pereopods 2–7 prehensile, increasing in length posteriorly, articles more or less cylindrical. Pereopods 2 and 3 merus with 1 small spiniform seta, carpus with excavate distal margin fringed by clusters of about 15 setae posteriorly, propodus with transverse bands of setae, densest on proximal heel. Pereopods 4–7 merus with small posterior spiniform seta, carpus with distal marginal row of setae, propodus with 4 weakly defined transverse bands of setae, 2 central ones longer. Coxal plates 2–7 visible dorsally, more so posteriorly. Coxal plates 2–4 on anterior half of pereonites; coxal plates 5–7 reaching further posteriorly, coxal plate 7 reaching posterior margin of pereonite 7, truncate in lateral view.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina a simple rod,  $\frac{3}{4}$  length of endopod. Uropods and pleopodal cavity reaching near apex of pleotelson. Uropodal endopod with excavate distal margin. Penes fused proximally only, attached to posterior margin of pleonite 1.

*Female*

As male except sexual structures.

*Size*

To 64 mm.

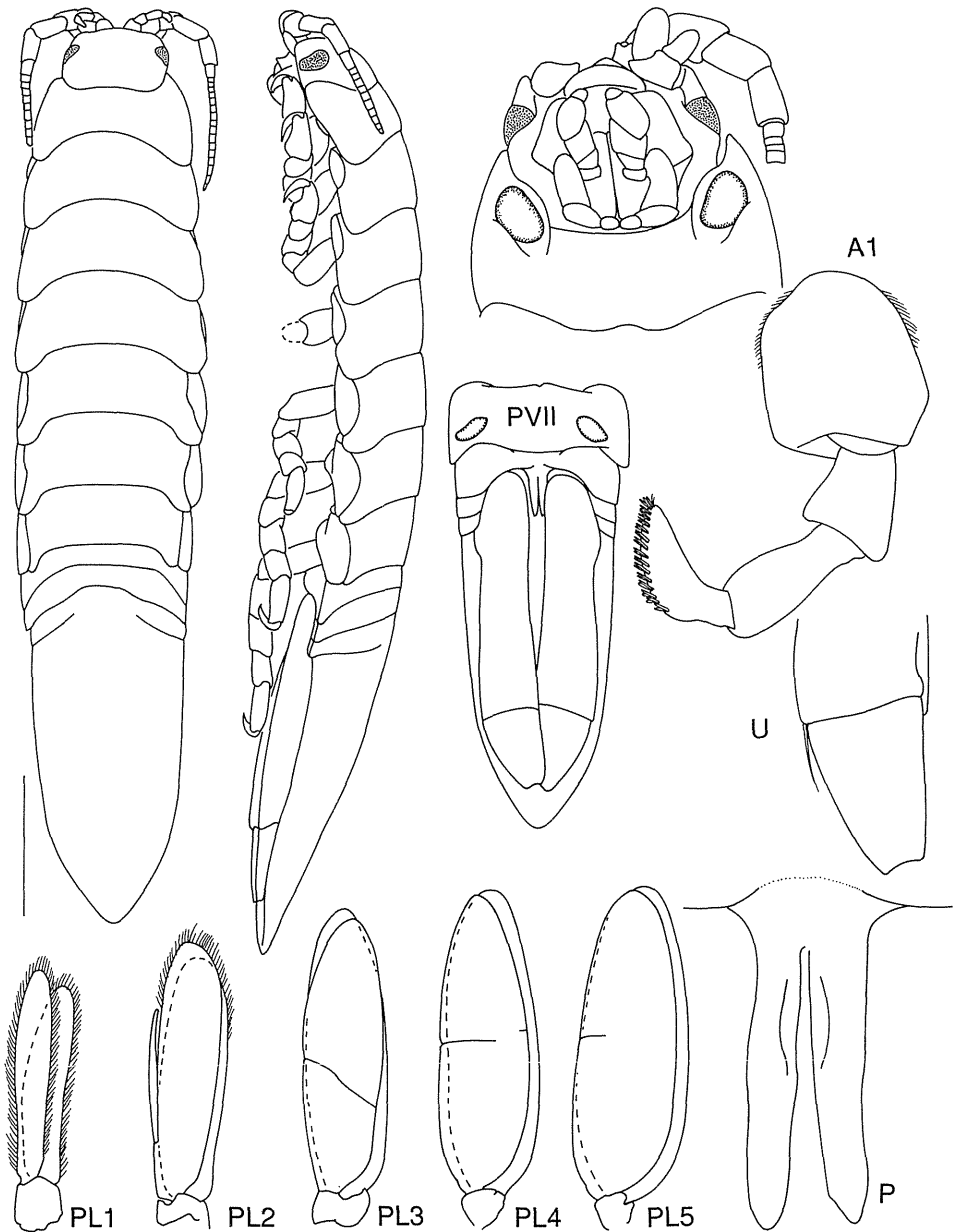


Fig. 41. *Pentidotea australis*. Male, SAM C4132 (scale line = 10 mm).

*Distribution*

Central and western Victoria and south-eastern South Australia; subtidal algae.

*Remarks*

This is the largest idoteid known from Australia, reaching 64 mm in length. Its deeply vaulted habitus with acute pleotelson differentiate it from other species. The species has a very limited distribution.

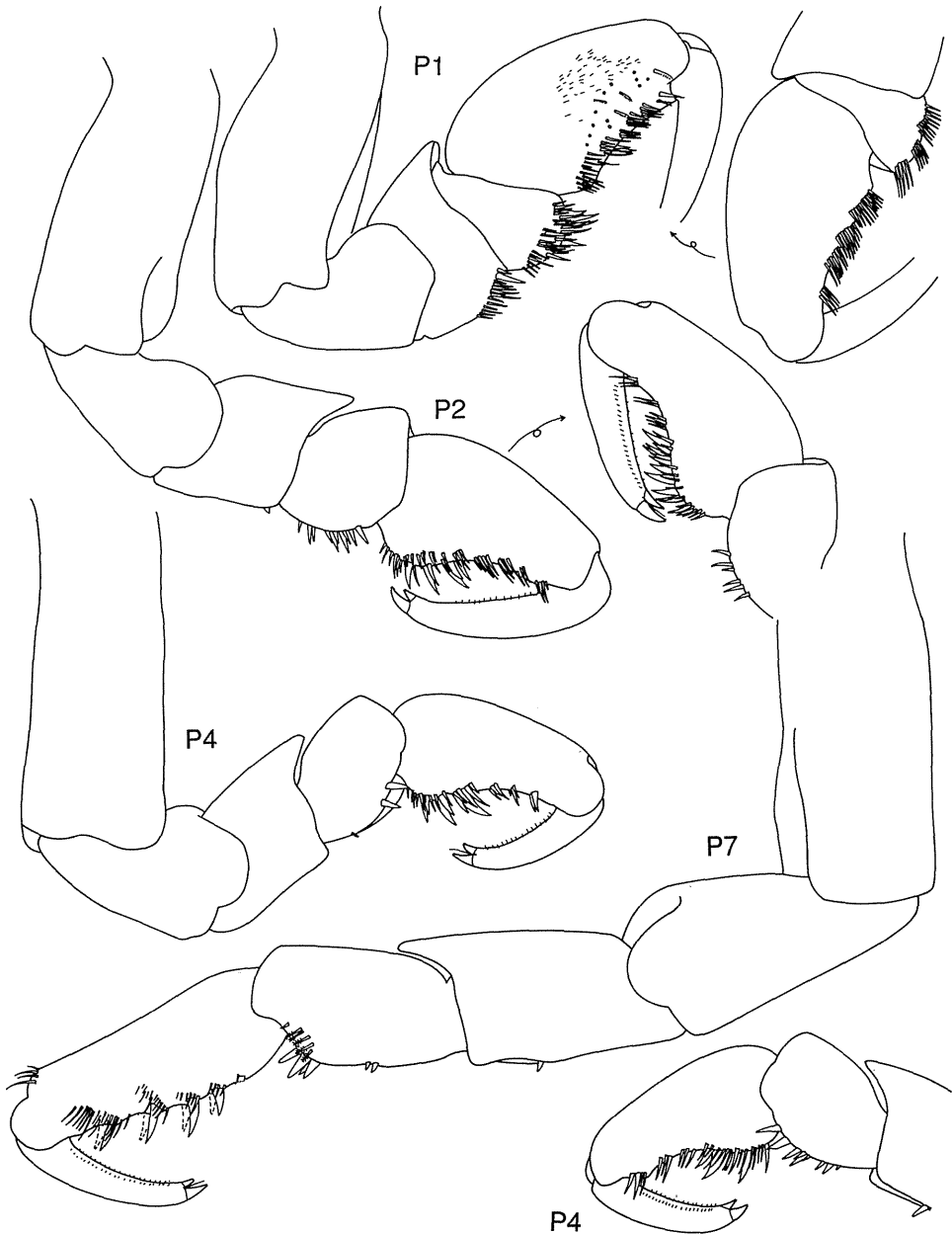


Fig. 42. *Pentidotea australis*. Male, SAM C4132.



Genus *Synidotea* Harger

*Synidotea* Harger, 1878: 374. — Richardson, 1905: 376; Sheppard, 1957: 153; Kussakin, 1982: 189; Rafi and Laubitz, 1990: 2672.

*Barnardidotea* Menzies & Miller, 1956: 358–60.

Type species: *Idotea nodulosa* Krøyer, 1846 (original designation).

*Diagnosis*

Body broad (about twice as long as wide), sometimes ornamented or setose, head narrower than pereonite 1, body widest at pereonite 4. Pleon without articulating pleonites,

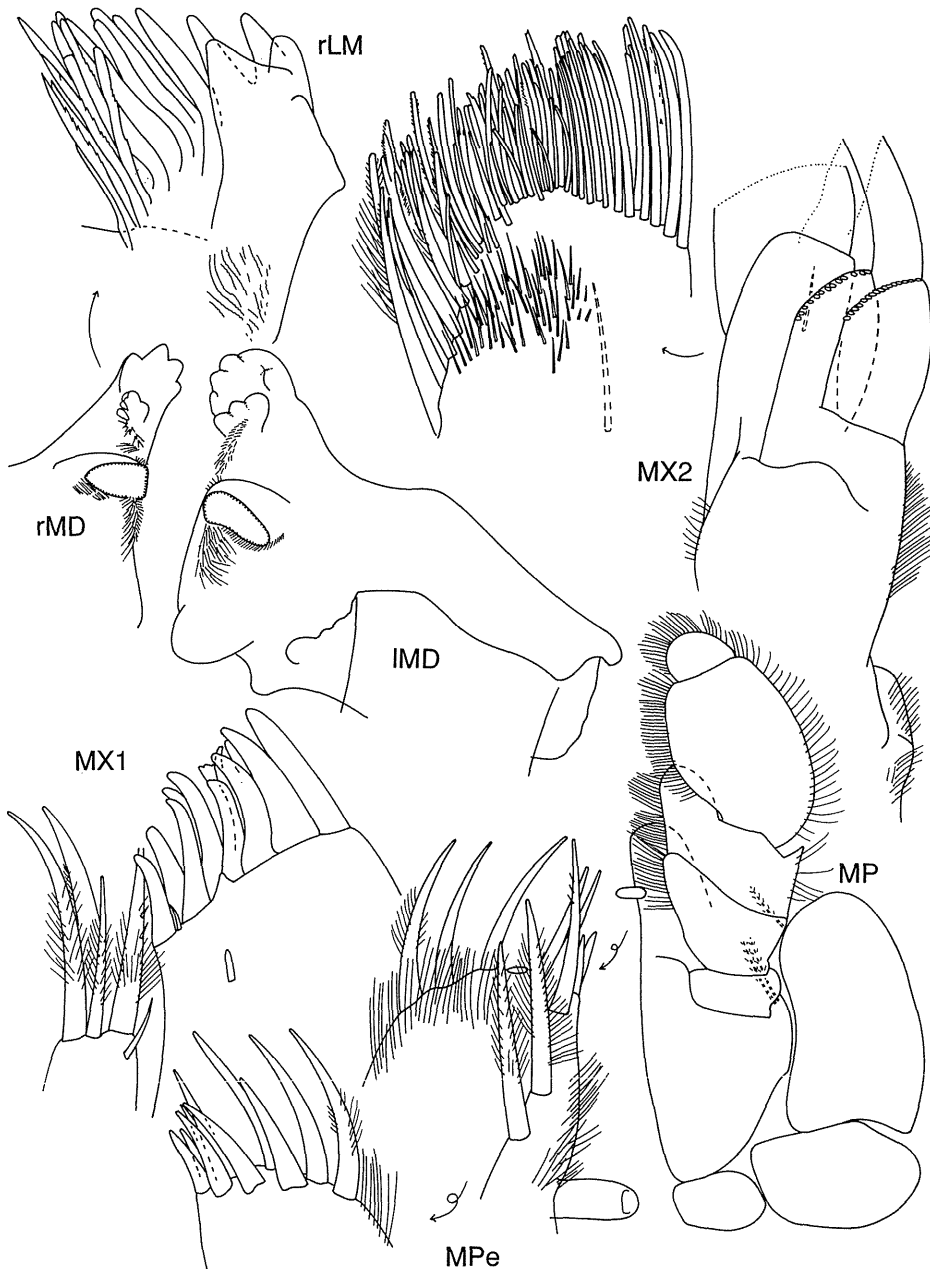


Fig. 43. *Pentidotea australis*. Male, SAM C4132 (rLM, lacinia mobilis and spine row).

pleonite 1 indicated by suture ventrolaterally only; apically acute, rounded or excavate. Antenna 2 multiarticulate. Mandible typical except for secondary tooth on lacinia mobilis. Maxillae 1 typical. Maxilla 2 outer lobe of male sometimes expanded and with long plumose setae. Maxillipedal endite with apical setation; palp broad, articles 2 and 3 fused, 4 and 5 fused. Coxae 2–4 without dorsal coxal plates, pereonal margin defined by tergites; coxae 5–7 with expanded dorsal coxal plates defining pereonal margin, plate-tergal suture not, weakly or obviously marked. Pereopods richly setose, especially along and near posterior margin. Penes fused along length and swollen distally, attached to posterior margin of pleonite 1. Oostegites lamellar on pereonites 1–4.

#### Remarks

Diagnoses of *Synidotea* vary in the extent to which the coxal plates are said to be visible on pereonites 5–7; Richardson (1905) admitted that sutures are sometimes weakly visible dorsally but Rafi and Laubitz (1990) stated that none is visible. In most specimens of the Australian species these sutures are quite clear. It seems that the degree of fusion varies with species and growth stage. However, the basic pattern is constant, as Sheppard (1957) suggested. On pereonites 2–4 there are no dorsal coxal plates, and sutures separating the tergites from the coxae can be seen around the sockets in which the bases of pereopods 2–4 articulate. No sutures are seen in this place on pereonites 5–7 but *may* be present dorsally, where the broad dorsal coxal plates meet the tergites. We have confirmed our observation on five North American and Japanese species.

Our observation that the females of *Synidotea* lack oostegites on pereopods 5 seems never to have been made before and distinguishes the genus from most other idoteid genera.

Rafi and Laubitz (1990) noted that lateral expansion of the outer lobe of maxilla 2 is a feature of males, and illustrations of many species in the literature show this. They treated it as a generic character but the only adult males in our collection (of *S. keablei*) are not modified in this way. This dimorphism may not be universal. An apparent unique diagnostic feature of the genus not noted previously is the presence of a secondary tooth on the lacinia mobilis (Fig. 46).

In Australia, species of *Synidotea* are rare although the genus is by far the biggest in the Idoteidae, with more than 50 species mostly in the Northern Hemisphere. They are recognised by their overall oval shape and the pattern of dorsal coxal plates described above.

The species described below are the first recorded from Australia and are diagnosed using, in part, the characters of Rafi and Laubitz (1990).

#### *Synidotea grisea*, sp. nov.

(Figs 44–46)

#### Material Examined

*Holotype*. New South Wales: Twofold Bay, East Boyd Bay, NE. of Whale Beach (37°05'S., 149°56'E.), 7·6 m, dredge, S. J. Keable *et al.*, 22.ii.1985, AM P36069 (ovigerous ♀, 7·5 mm).

*Paratype*. **Victoria**: Woodside Beach, 1·1 km offshore (38°33'S., 146°59'E.), 10 m, SCUBA, J. E. Watson, 1981, NMV J3435 (1 juv.).

#### Diagnosis

Body twice as long as wide, with obscure dorsolateral sculpture, dark grey, finely setose. Head with concave anterior margin, anterior and posterior transverse grooves, longitudinal lateral grooves, prominent eyes. Margins of pereonites convex, weakly flared upwards in cross-section; pleotelson 0·35 × body length, tapering with convex lateral margins to narrow excavate apex. Dorsal coxal plates 5–7 well defined. Pereopod 1 propodus with sinuate palm, dactylus closing on carpus; all other pereopods simply linear, with simple and pectinate setae.

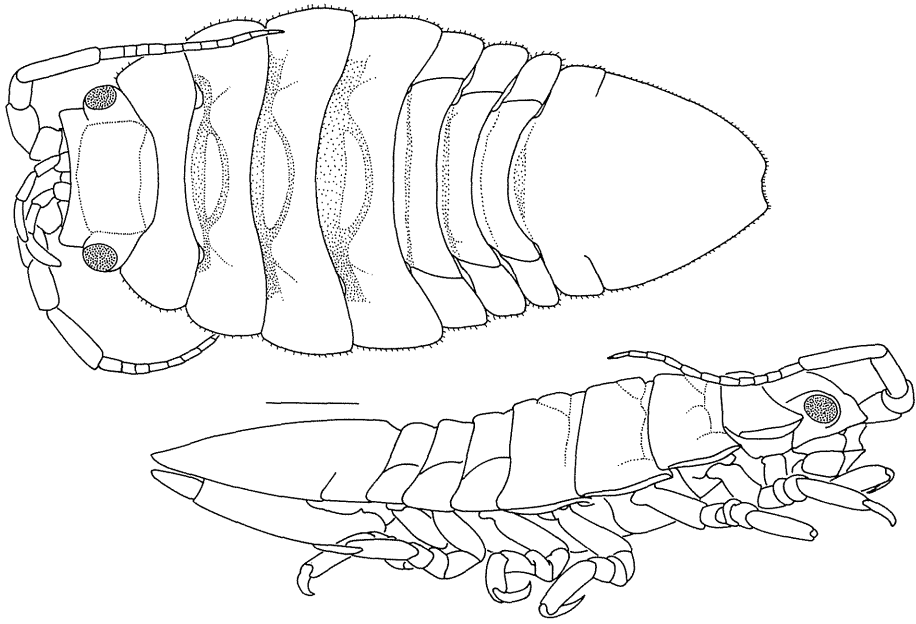


Fig. 44. *Synidotea grisea*. Female, AM P36069, holotype.

*Size*

To 7.5 mm.

*Distribution*

Southern New South Wales and eastern Victoria; shallow algal communities.

*Remarks*

The much smaller paratype is more brownish than the holotype and the pleotelsonic notch is shallower. The new Australian species is similar to *S. consolidata* Stimpson and *S. epimerata* Richardson from the north-eastern Pacific, but is broader and has more prominent eyes. The posterior dorsal coxal plates are clearly visible.

*Synidotea grisea* co-occurs in southern New South Wales with *S. keablei* and may be distinguished from it by its broader body form and extreme setation of the pereopods.

*Etymology*

*Grisea* (L.) grey, in reference to the colour.

*Synidotea keablei*, sp. nov.

(Figs 47, 48)

*Material Examined*

*Holotype*. New South Wales: Twofold Bay, off mouth of Myrial R. (37°5'S.,149°54'E.), 10 m, dirty sand, J. K. Lowry and S. J. Keable, 27.xi.1988, AM P41329 (♂, 16.9 mm).

*Paratypes*. **New South Wales:** Twofold Bay, off middle of Calle Calle Bay (37°03.5'S.,149°55.1'E.), 8 m, dirty sand, trap, J. K. Lowry and S. J. Keable, 26.xi.1988, NMV J15815 (1 juv.); off Sydney (33°53'S.,151°13'E.), at surface, A. A. Racek, Oct. 1959, WAM 649-86 (2♂, 1 juv.); Belmont Beach, nr Newcastle, 500 m offshore, 15 m, 28.i.1976 (33°02.6'S.,151°40.9'E.), AM P41330 (1♀); 1 km offshore, 18 m, 18.iii.1975, AM P41331 (1 juv.).

*Other material*. Localities uncertain: Lidthe de Jeude collection, 1886, NMV J3167 (3); Lidthe de Jeude collection, NMV J3089 (1♀, 1 juv.).

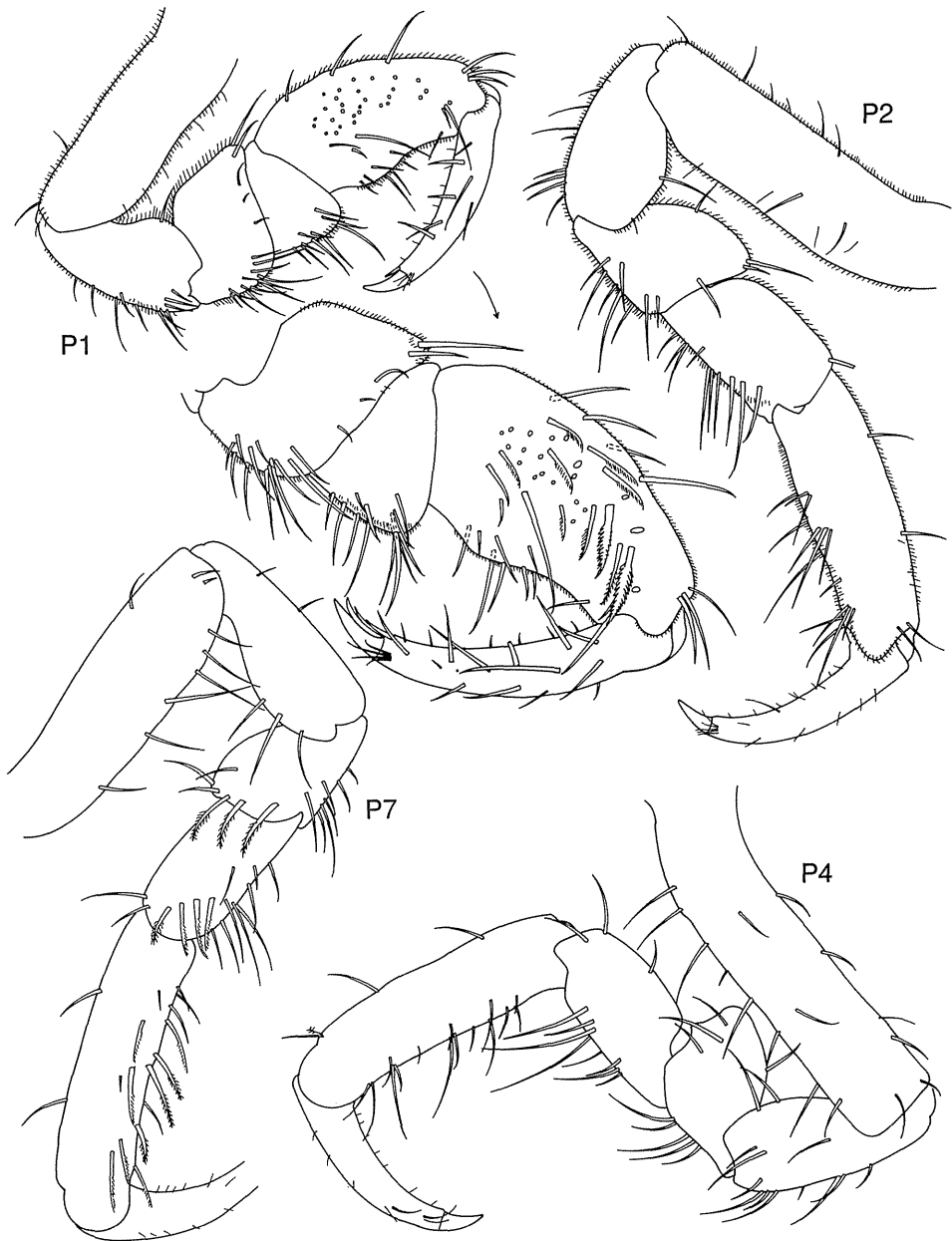


Fig. 45. *Synidotea grisea*. Female, AM P36069, holotype.

#### *Diagnosis*

Body  $2.6\times$  as long as wide, pereonites with transverse curved grooves, finely setose. Head with concave anterior margin, anterior and posterior transverse grooves, longitudinal lateral grooves, prominent eyes. Margins of pereonites convex, flared upwards in cross-section; pleotelson  $0.32\times$  body length, tapering gradually proximally, more abruptly on posterior quarter to narrow excavate apex. Dorsal coxal plates 5–7 well defined or not visible. Pereopod 1 propodus with deeply concave palm, dactylus closing on merus; all other pereopods simply linear, with few simple setae.

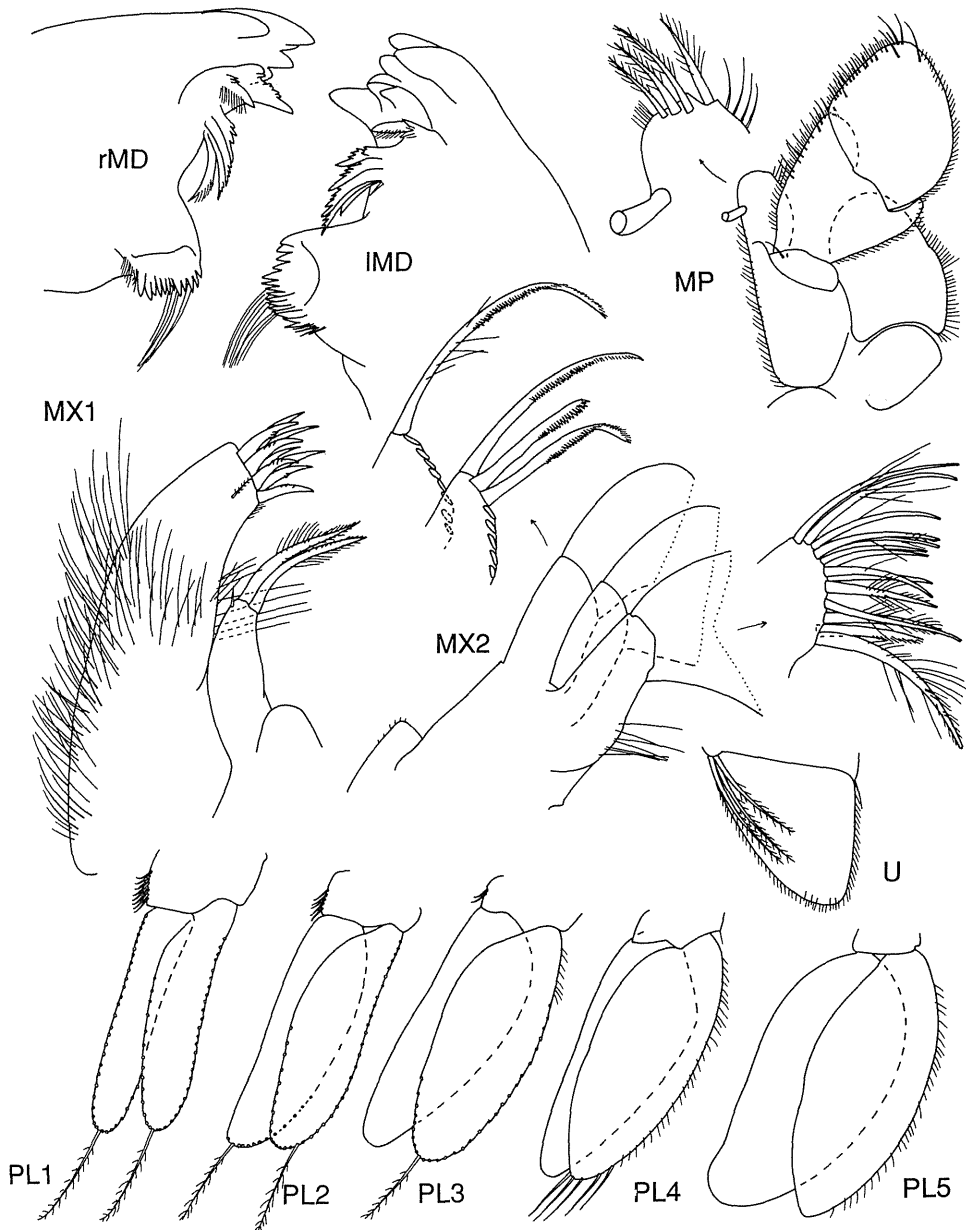


Fig. 46. *Synidotea grisea*. Female, AM P36069, holotype.

*Male*

Penes fused, waisted, apically rounded. Maxilla 2 outer lobe not expanded. Pereopods with mat of fine setae on posterior margins of ischium-propodus. Appendix masculina broadest at apex of pleopod 2 endopod and extending beyond it.

*Female*

Without mat of fine setae on pereopods.

*Size*

To 17 mm.

*Distribution*

Central and southern New South Wales; shallow algal communities.

*Remarks*

This species bears a superficial resemblance to *Synidotea laevidorsalis* (Miers), the presence of which in Australia was predicted by Chapman and Carlton (1991) on the basis of its supposed widespread artificial distribution from Japan to western North America and eastern South America. In terms of the allometric criteria adopted by these authors (ratios of widths of pereonite 4 and pleotelson, lengths of body and pleotelson, and length of article 5 of antenna 2), our specimens are indistinguishable from *S. laevidorsalis* and from north-western American specimens originally described as *S. laticauda* Benedict.

However, we have compared our specimens with Japanese material that we have identified as *S. laevidorsalis* from Kussakin's (1982: figs 186, 187) figures, with specimens of the similar South African species, *S. hirtipes* (Milne Edwards, 1840), from the Natural History Museum, London (1928:12.1.1329.38), and with specimens of *S. laticauda* from San Francisco (NMV collections). In *S. hirtipes*, the pleon is relatively narrower than in

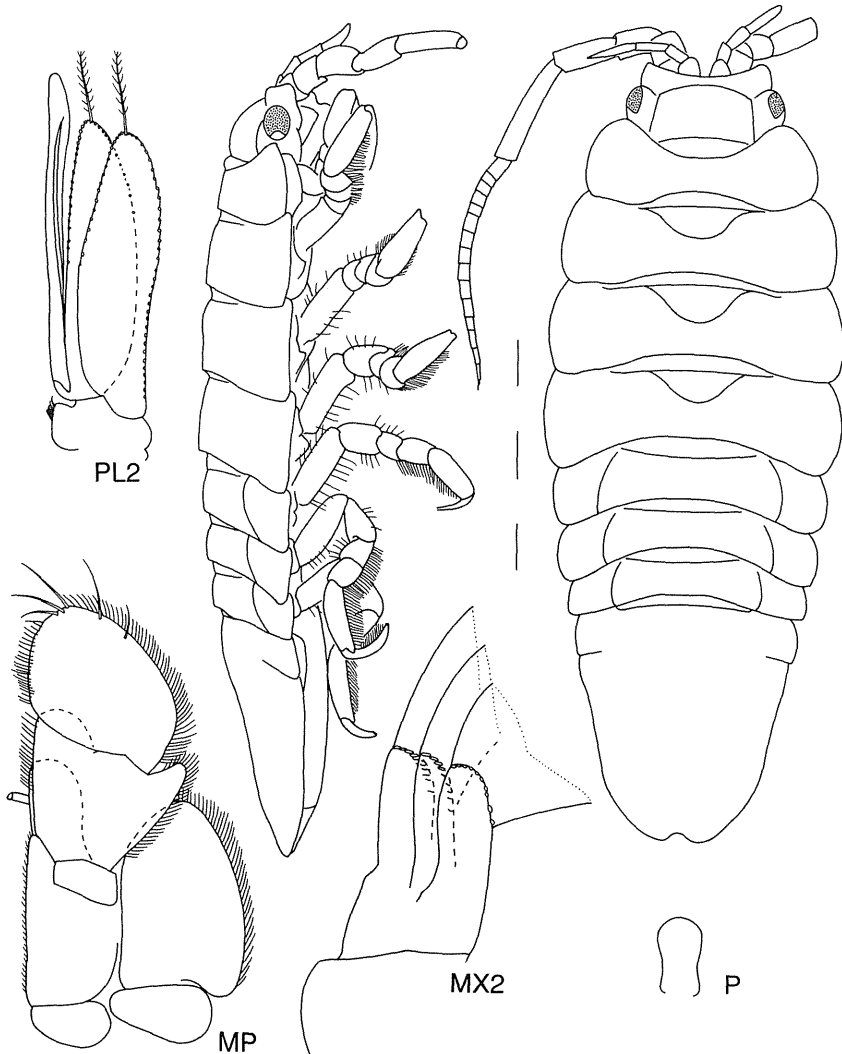


Fig. 47. *Synidotea keablei*. Male, AM P41329, holotype.

*S. keablei* (length:width in males, 0·84 v. 0·94) and the apical notch is wider. The lateral margins of the pereonites are convex and flaring upwards in *S. keablei* but straight and continuously curved with the tergum in the Japanese and South African species. The penial papilla has an evenly rounded apex in the Australian and North American species but has distolateral lobes and a narrower apex in both the Japanese and South African species. There are consistent differences between the material from the four localities so we have no hesitation in erecting a new species.

Our Japanese material and Kussakin's figure of *S. laevidorsalis* is of a narrower species with a longer pleotelson than specimens from north-western America measured and figured by Chapman and Carlton (1991). Chapman and Carlton's synonymy of the American *S. laticauda* Benedict with *S. laevidorsalis* is therefore questionable and the role played by shipping in their distribution doubtful.

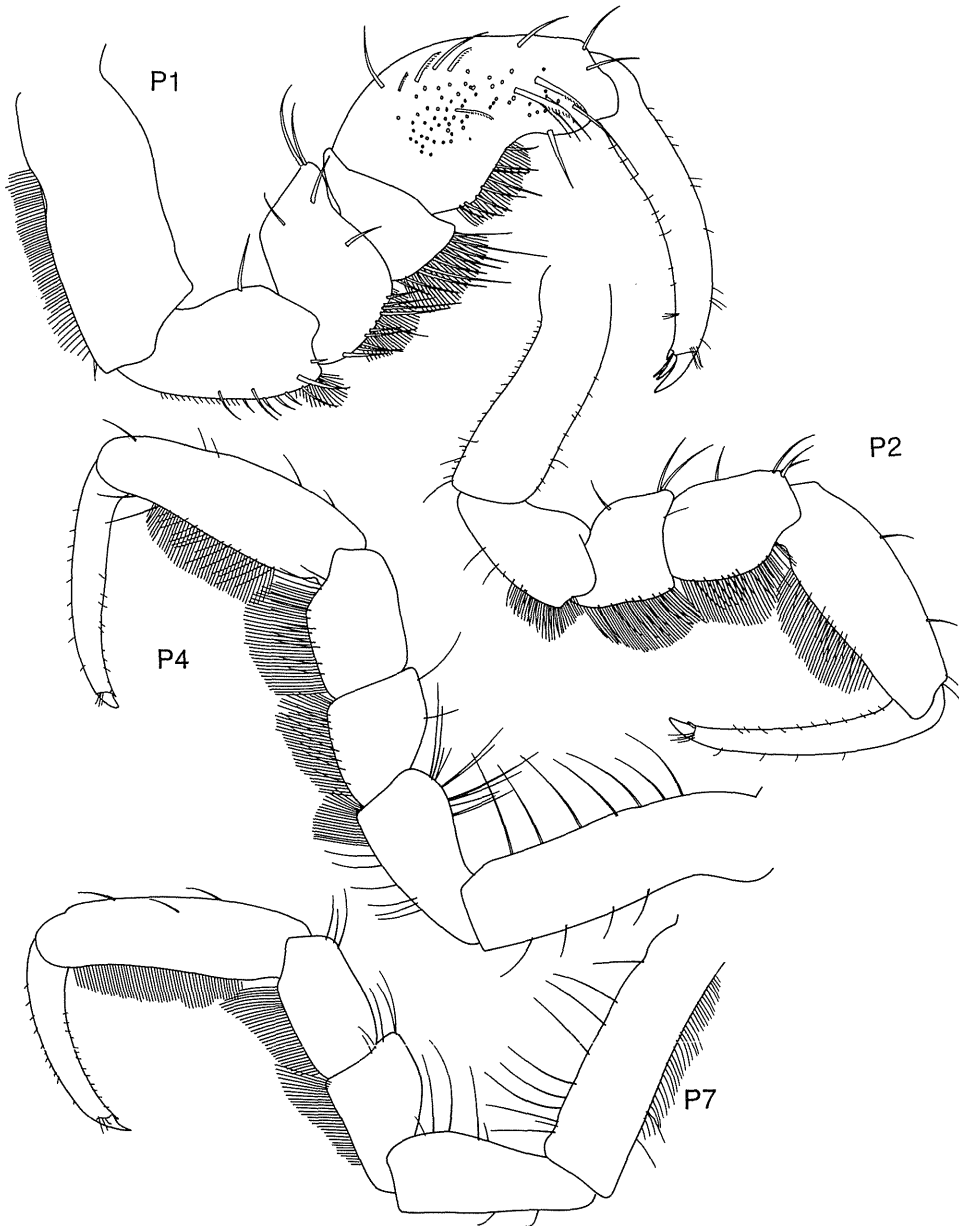


Fig. 48. *Synidotea keablei*. Male, AM P41329, holotype.

*Etymology*

For Steven J. Keable, student of Crustacea, who collected the holotype.

*Synidotea watsonae*, sp. nov.

(Figs 49–51)

*Material Examined*

*Holotype*. Western Australia: Thistle Cove, eastern end (34°0'S., 122°12'E.), 7 m, red algae, SCUBA, G. C. B. Poore and H. M. Lew Ton, 11.iv.1984 (stn SWA 27), NMV J15801 (♀, 11.9 mm).

*Paratype*. **Victoria**: 4 km outside Port Phillip Heads (38°18'S., 144°39'E.), 35 m, J. E. Watson, 28.iii.1976, NMV J14342 (1♀, 14 mm).

*Diagnosis*

Body 2.1× as long as wide, with strong mid-dorsal protuberances on head and pereonites, weaker dorsolateral sculpture on pereonites 2 and 3. Head with concave anterior margin, anterolateral corners produced, prominent eyes. Margin of pereonite 1 squarely lobed anterolaterally; margins of pereonites 2–4 angular, following ones less marked; coxal

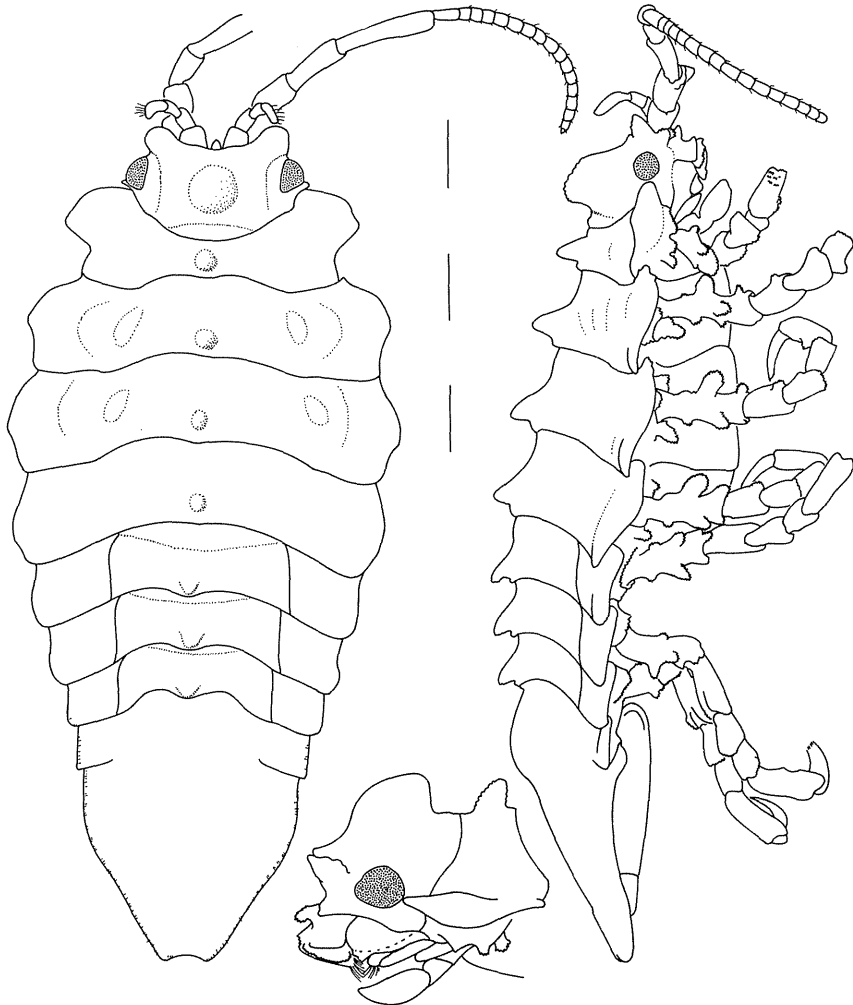


Fig. 49. *Synidotea watsonae*. Female, NMV J15801, holotype (head with antennae 1 and 2 removed).



plates with complex ventral sculpture; pleotelson  $0.32 \times$  body length, anteriorly parallel-sided, pleonite 1 stepped, posterior half tapering to narrow excavate apex. Dorsal coxal plates 5-7 well defined. Pereopods ornately sculptured, especially anteriorly; bases decorated with ornate protuberances, other articles less so. Pereopod 1 merus anteriorly lobed, carpus posteriorly lobed, propodus broad, palm with strong lobe, dactylus closing on carpus; all articles with irregularly placed spiniform setae. Pereopods 2-7 more ambulatory, carpus and propodus with simple lobe on palms, with few simple and pectinate setae.

*Size*

To 14 mm.



Fig. 50. *Synidotea watsonae*. Female, NMV J15801, holotype.

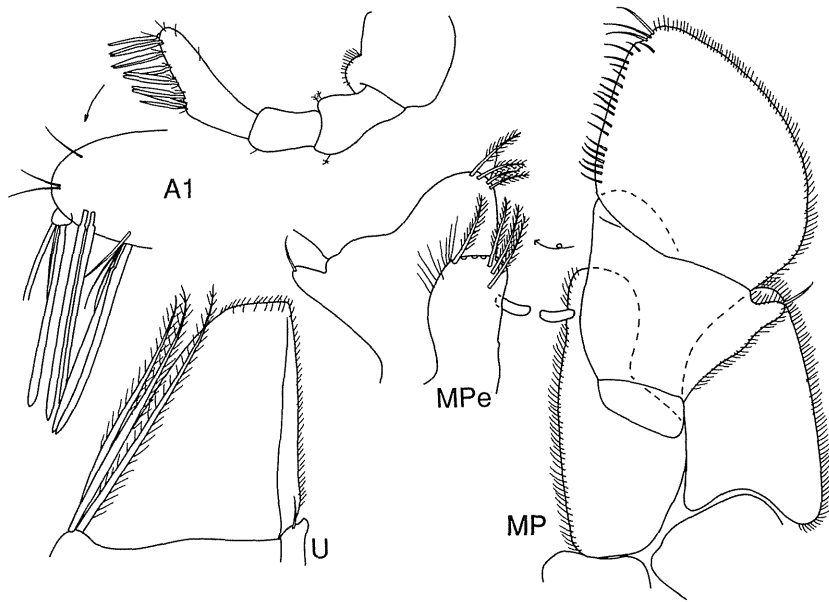


Fig. 51. *Synidotea watsonae*. Female, NMV J15801, holotype.

*Distribution*

Central coastal Victoria and southern Western Australia; shallow algal communities.

*Remarks*

The extraordinary sculpture on the head, pereon and pereopods of this species instantly identify this species which is unlike any other species of *Synidotea*.

*Etymology*

For Jeanette E. Watson, whose knowledge and collections of marine invertebrates in southern Australia have contributed so much to the marine biology of this part of the world.

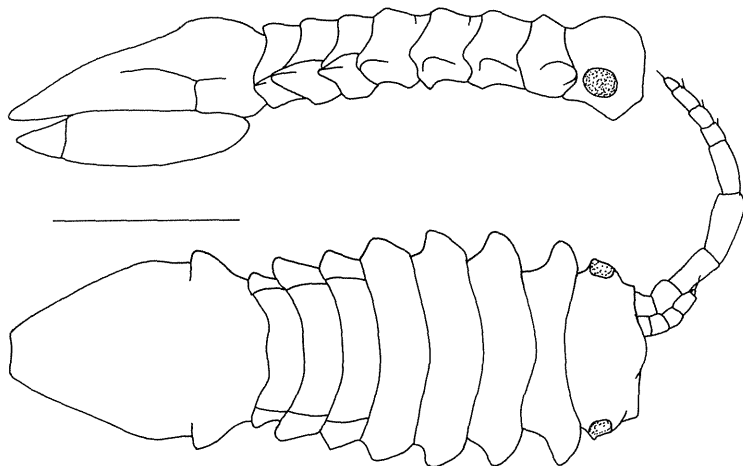


Fig. 52. *Synidotea* sp. Manca, NMV J23689.

*Synidotea* sp.

(Fig. 52)

*Material Examined*

Western Australia: Seven Mile Beach, N. of Dongara (29°12'S., 114°53'E.), G. Edgar, 1985–86, NMV J23689 (1 manca, 3.5 mm).

*Remarks*

The unique figured specimen is a manca with undeveloped seventh pereopods. It is superficially similar to *S. pettiboneae* Hatch from the north-eastern Pacific (Rafi and Laubitz 1990), but lacks strong dorsal ornamentation. Because juveniles may be quite different from adults, the specimen is not named.

Genus *Synischia* Hale

*Synischia* Hale, 1924: 218–9. — Hale, 1929: 318.

Type species: *Synischia levidensis* Hale, 1924 (original designation).

*Diagnosis*

Body narrow (about 6× as long as wide), flattened, with weak mid-dorsal ridge, head little narrower than pereonite 1, more or less parallel-sided. Pleotelson without articulating pleonites, pleonites 1–2 indicated fully or ventrolaterally, pleonite 3 ventrolaterally only. Antenna 2 multiarticulate. Mandible, maxillae 1 and 2 typical. Maxillipedal endite with apical setation; palp broad, all articles free or 4–5 fused. Coxae 2–7 without dorsal coxal plates (lateral sutures ventral), lateral margin of pereonites defined by tergite. Pereopod 1 spiniform setae on palm of merus, carpus and propodus; pereopods 2–7 with 1 spiniform seta on palm of propodus. Penes fused at base, attached at posterior margin of pleonite 1. Oostegites lamellar on pereopods 1–5.

*Remarks*

The genus has long been regarded as monotypic and confined to southern Australia. We have examined material of *Idotea hectica* (Pallas, 1772) from the north-eastern Atlantic and Mediterranean. It resembles *Synischia levidensis* in the complete absence of dorsal coxal plates and the presence of a mid-dorsal ridge. Its pleotelsonic formula (2 + 1) differs from that of *S. levidensis* (0 + 3) but is similar in the number of pleonites that are at least partially visible. The maxillipedal palp of *I. hectica* has its fifth article fused but the articles are of similar proportions to those in *S. levidensis*. For these reasons we move *I. hectica* to *Synischia*.

*Synischia levidensis* Hale

(Figs 53–55)

*Synischia levidensis* Hale, 1924: 219–220, fig. 7. — Hale, 1929: 318, fig. 321; Nordenstam, 1933: 268.

*Material Examined*

*Holotype*. South Australia: Gulf St Vincent, 6 miles N. of Outer Harbour (34°33'S., 138°10'E.), SAM C242 (♂, 20.0 mm, 8 slides).

*Illustrated specimens*. Western Australia: Wreck Rock, Marmion Lagoon (31°48'S., 115°40'E.), 9 m, *Heterozostera*, *Halophila*, CSIRO Division of Fisheries, 28.v.1986, NMV J14351 (♀, 18.4 mm); J14354 (♂, 24.3 mm).

*Other material*. **South Australia**: Point Rickaby beach, 200 m N. of jetty (34°S., 137°E.), hand dredge, G. C. B. Poore and H. M. Lew Ton, 18.iii.1985 (stn SA 29), NMV J14352 (1♂, 17.6 mm); uncertain locality, rock pool, 1.v.1977, SAM C4150 (1♀). **Western Australia**: Wreck Rock (31°48'S., 115°40'E.), 9 m, P. Unsworth, May 1986, NMV J14353 (1♀, 19.4 mm); NMV J15716 (1♀).

*Description**Male*

Body about  $6\times$  as long as wide, with obtusely angled mid-dorsal ridge. Head  $1.6\times$  as wide as long, front concave. Pereonite 1 shorter than head; pereonites 2–7 subequal, longer than head. Pleotelson  $0.3\times$  body length, 3 pleonites indicated by ventrolateral sutures. Pleotelson broadest anteriorly, tapering gradually over anterior  $\frac{3}{4}$  to acute apex.

Antenna 1 peduncles contiguous; article 3 longer than second; flagellum as long as peduncle article 3, with 7 pairs and 1 terminal aesthetascs. Antenna 2  $0.4\times$  body length; flagellum of 16 articles, longer than peduncle. Frontal lamina simple, clypeus produced, upper lip symmetrical. Mandibles asymmetrical; incisor 4-toothed, broad; left lacinia mobilis

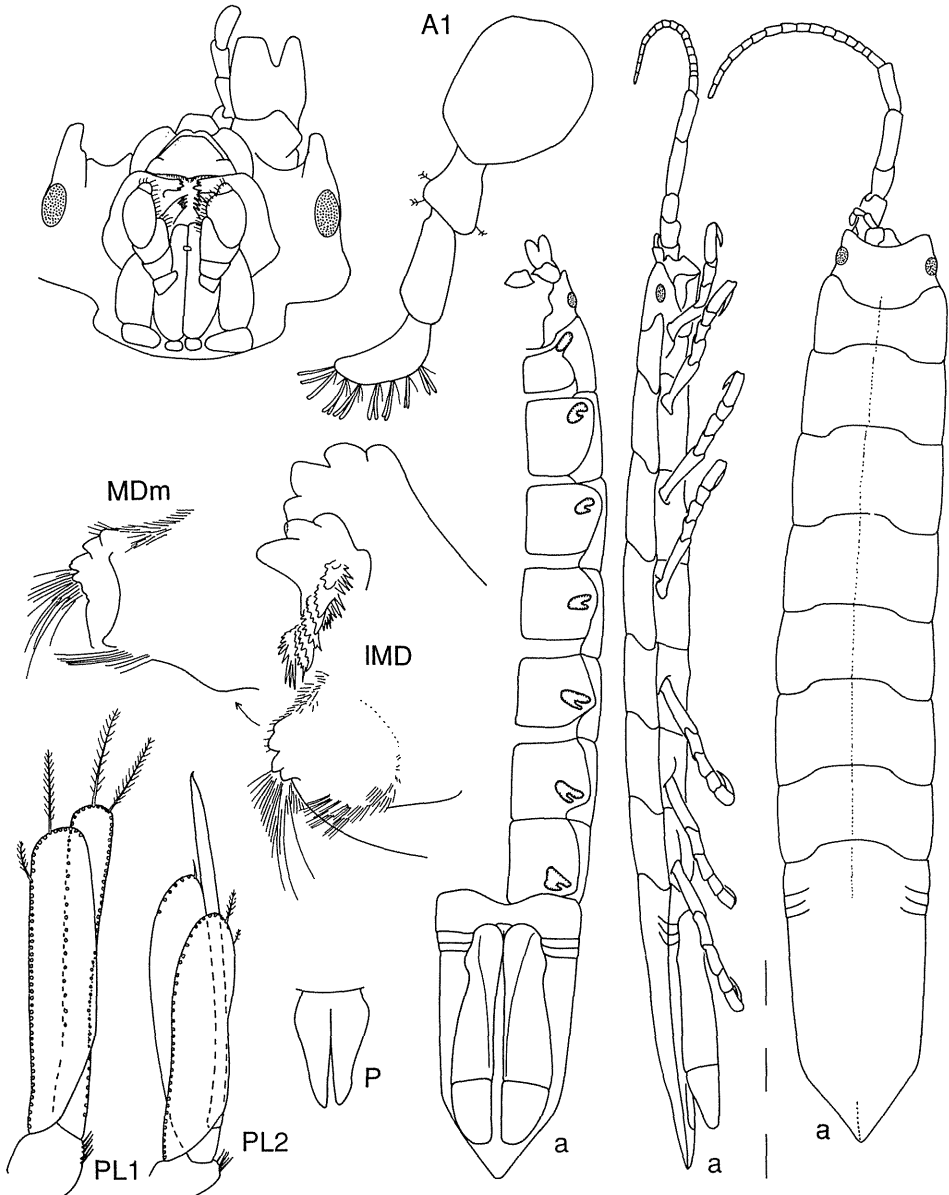


Fig. 53. *Synischia levidensis*. Male, NMV J14354; a, SAM C242, holotype.

4-toothed, broad; right lacinia mobilis elongate, irregularly 4-toothed; spine row of about 7 multifid curved spines; molar process truncate, with blunt teeth anterodistally, with anterior proximal cluster of long complex spines plus simple spines on anterior and proximal surface. Maxilla 1 inner lobe with 3 distal plumose setae, outer lobe with 11 apical spiniform setae, some secondarily toothed. Maxilla 2 outer lobe with 8 setae, middle lobe with 7, and inner lobe with anterior and posterior rows each of 6 plumose setae plus distal group of 6 narrow spiniform setae. Maxilliped with coxal plate and basal portion of epipod distinct; endite with a single coupling hook, apically with 3 spiniform setae and 4 plumose setae; 3 plumose setae on anterior face; 1 plumose seta at lateral base of palp. Maxillipedal palp operculiform, about twice as long as proximal portion of basis; article 3 mesiodistally lobed, article 4 ovoid, article 5 minute. Epipod with rounded apex.

Pereopod 1 shortest, merus and carpus with few mesiodistal setae and spiniform setae, propodus with few spiniform setae in transverse bands across palm; mesial face with

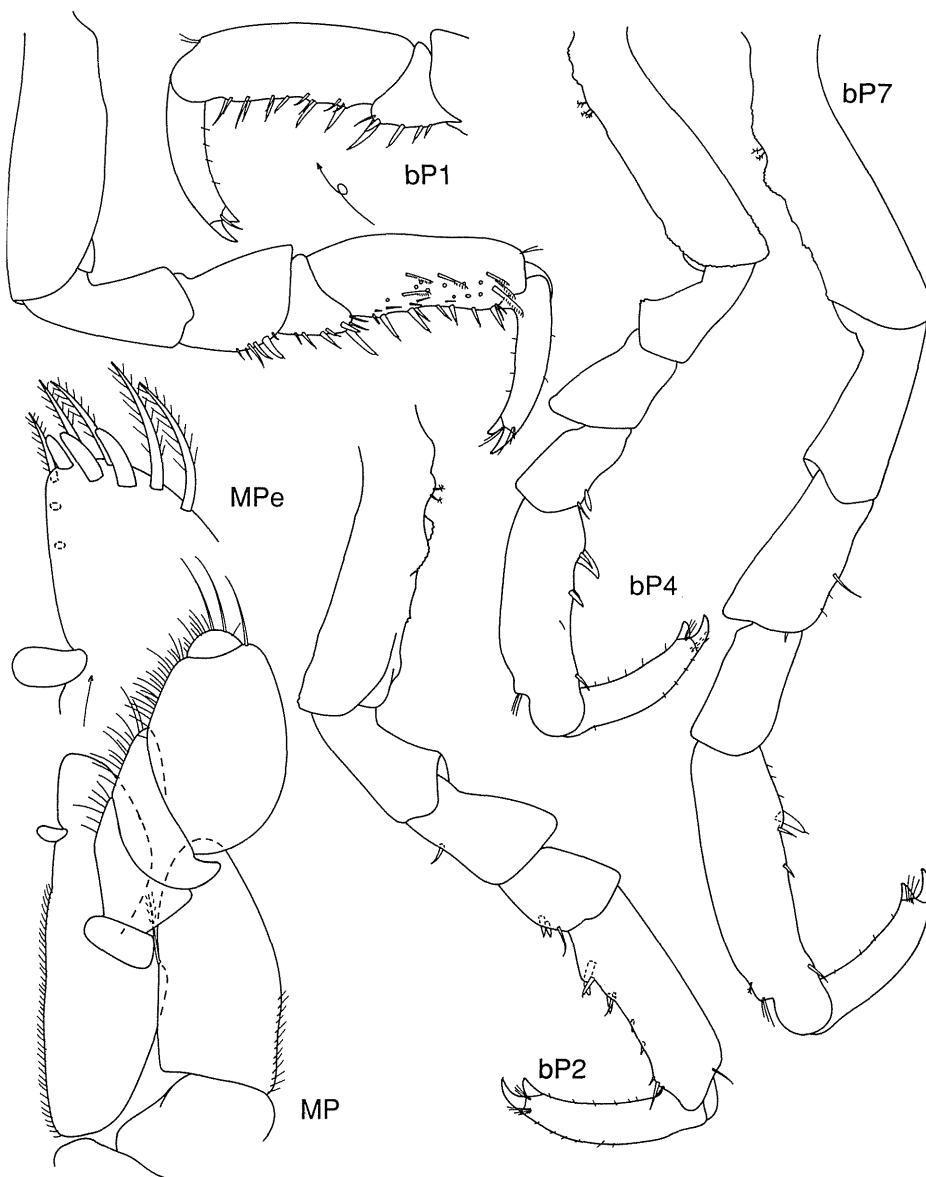


Fig. 54. *Synischia levidensis*. Male, NMV J14354; b, female, NMV J14351.

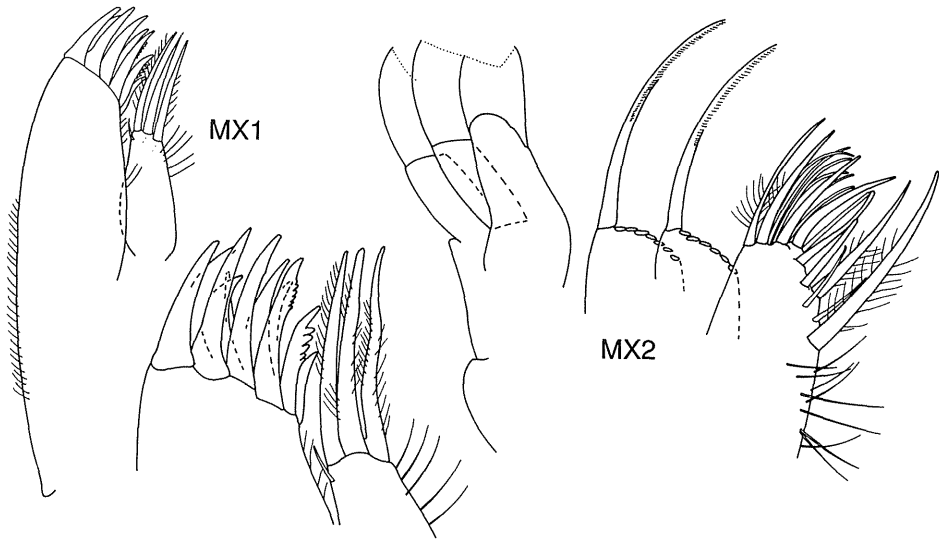


Fig. 55. *Synischia levidensis*. Male, NMV J14354.

about 18 pectinate setae. Pereopod 2 basis with ornamented anterior margin, merus and carpus with few posterior setae, propodus with strong proximal spine on palm plus weaker spiniform setae. Pereopods 3–7 similar to pereopod 2. Coxal plates 2–7 visible only ventrally, not defining lateral margin of pereon.

Pleopods 1 and 2 rami with setose margins; pleopods 3–5 rami without long marginal setae; appendix masculina tapering to acute apex,  $1.3\times$  as long as endopod. Uropods and pleopodal cavity reaching near apex of pleotelson. Uropodal endopod shape of quarter-circle. Penes fused proximally, attached to posterior margin of pleonite 1.

#### *Female*

Broader than male at midpoint,  $5\times$  as long as wide.

#### *Size*

To 24 mm.

#### *Distribution*

Southern Australia from Gulf St Vincent (S.A.) to Marmion (W.A.).

#### *Remarks*

The easiest way to identify this species is from its acute apex on the pleotelson and the complete absence of dorsal coxal plates such that the lateral sutures of the coxae are all ventral.

#### **Acknowledgments**

This study was made possible with the aid of a grant from the Australian Biological Resources Study, Canberra. We thank Graham Milledge who inked all the figures, and Tania Bardsley who assisted with cataloguing the specimens and participated in many useful discussions. Rick Brusca, San Diego, made valuable comments on the manuscript.

We thank staff of the South Australian Fisheries Division, in particular Scoresby Shepherd and his team, and Les Bail from Albany, for assistance in the field.

We are grateful to the many who lent material described in this contribution and used for comparison: Rick Brusca (Los Angeles), John Chapman (Newport), Joan Ellis (London),

Alison Green (Hobart), Jim Lowry (Sydney), Geoff Hicks and Des Hurley (Wellington), Ray George and Gary Morgan (Perth), John Jillett and Anthony Harris (Dunedin), Ian Mannering (Christchurch), Michele van der Merve (Cape Town), Michèle de Saint Laurent (Paris), Wolfgang Zeidler (Adelaide).

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