

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. unguolata* (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 chaetiliids 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 unguolata*
Pleotelson widest posteriorly; no pleonites visible dorsally *Paridotea miersi* 16
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
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 oblique lateral view); dorsal coxal plate 7 rounded and just reaching posterior margin of tergite; pleonal apical excavation broader than deep *Paridotea aquarii* 18
18. Body 9× as long as wide; pleon tapering to finely acute apex; pleonites not visible dorsally *Euidotea caeruleotincta* 19
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* 20
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* 21
Pleotelson widest posteriorly, 2.5× as long as wide; dorsal coxal plate 7 rounded *Euidotea stricta* 22
22. Pereonite 1 with well-developed shoulders, wider than pereonite 2; pleotelson lateral margins concave, apex with obtuse posterolateral angles (NZ) *Euidotea durvillei* 23
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* 23
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× 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× 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 aesthetascs. 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

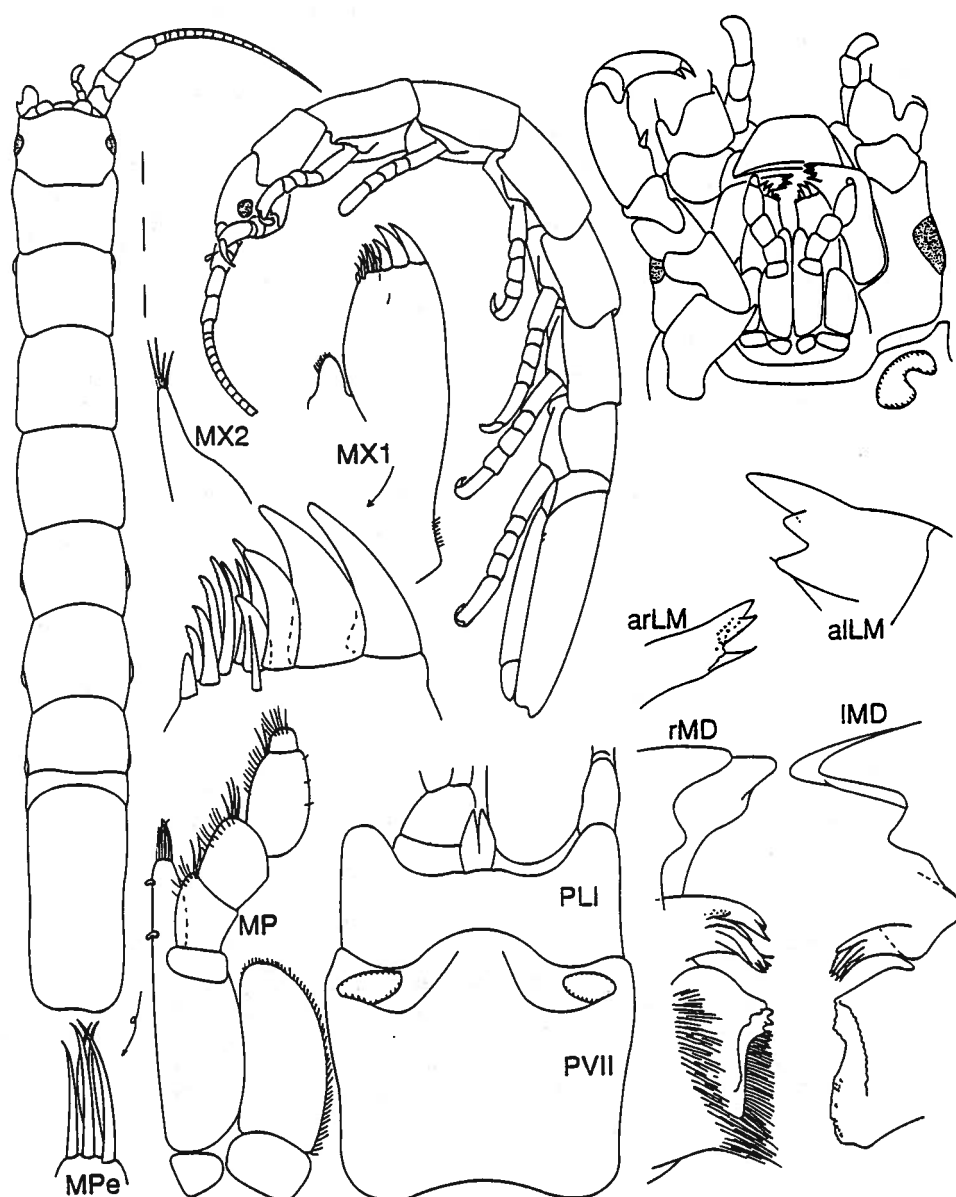


Fig. 1. *Batedotea elongata*. Male, NMV J4746; a, female, NMV J4747.

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.

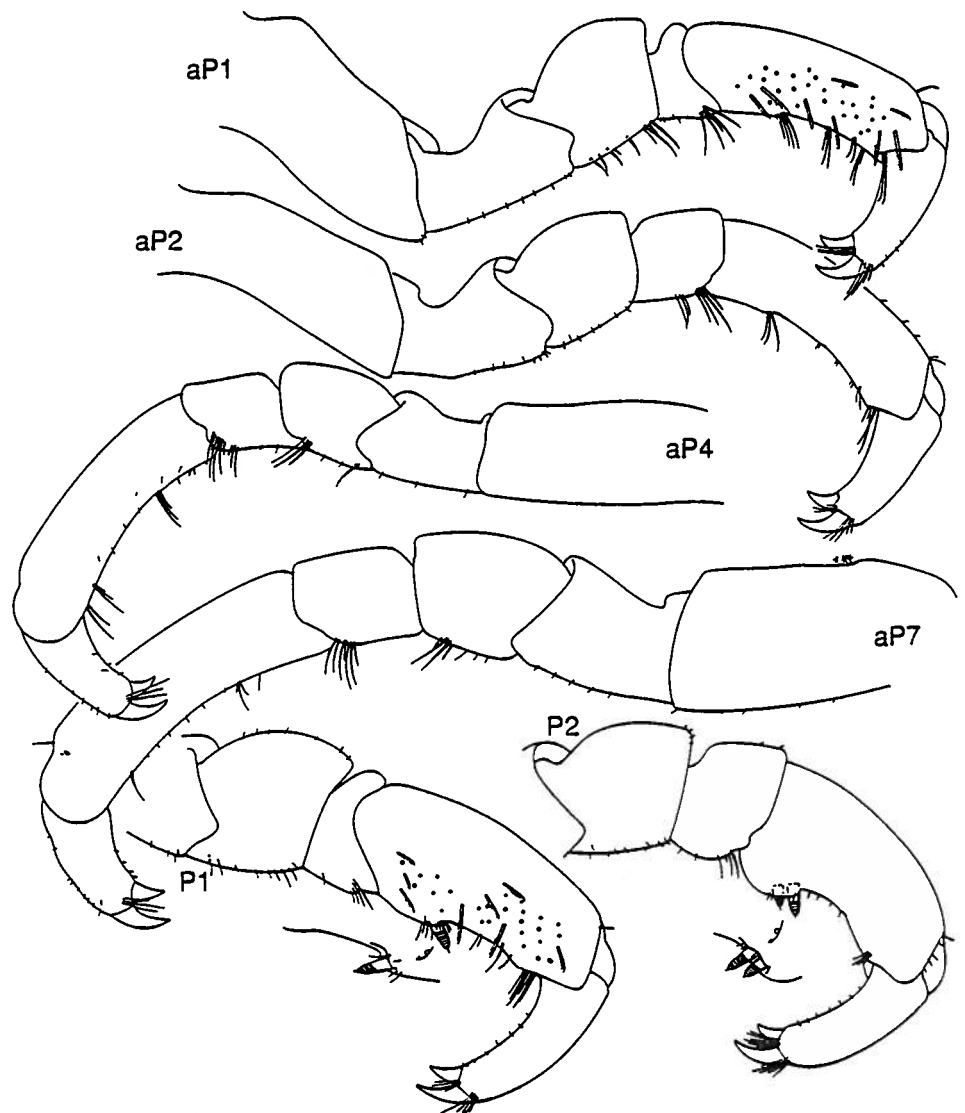


Fig. 2. *Batedotea elongata*. Male, NMV J4746; a, female, NMV J4747.

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.

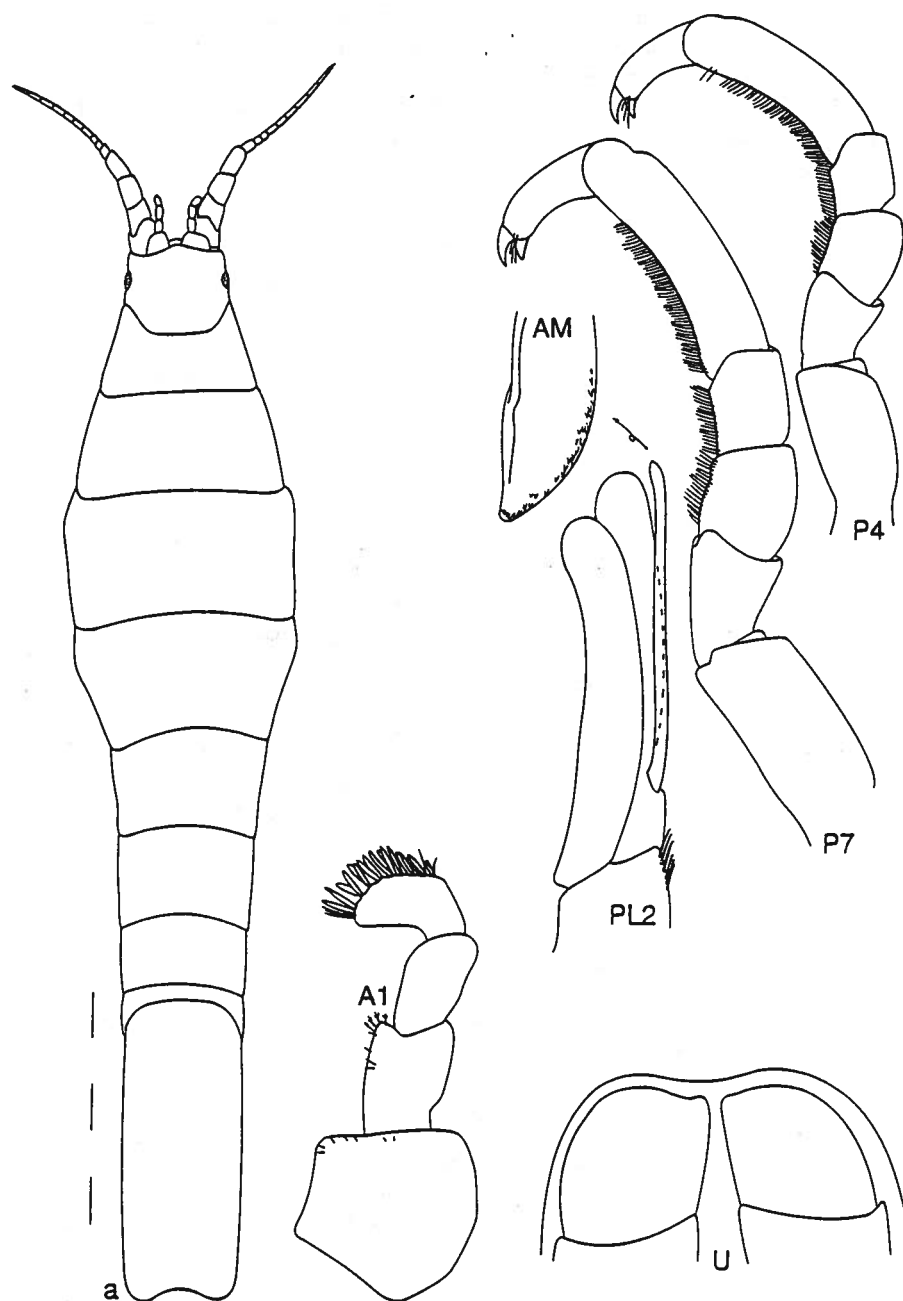


Fig. 3. *Batedotea elongata*. Male, NMV J4746; a, female, TM G3127.

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

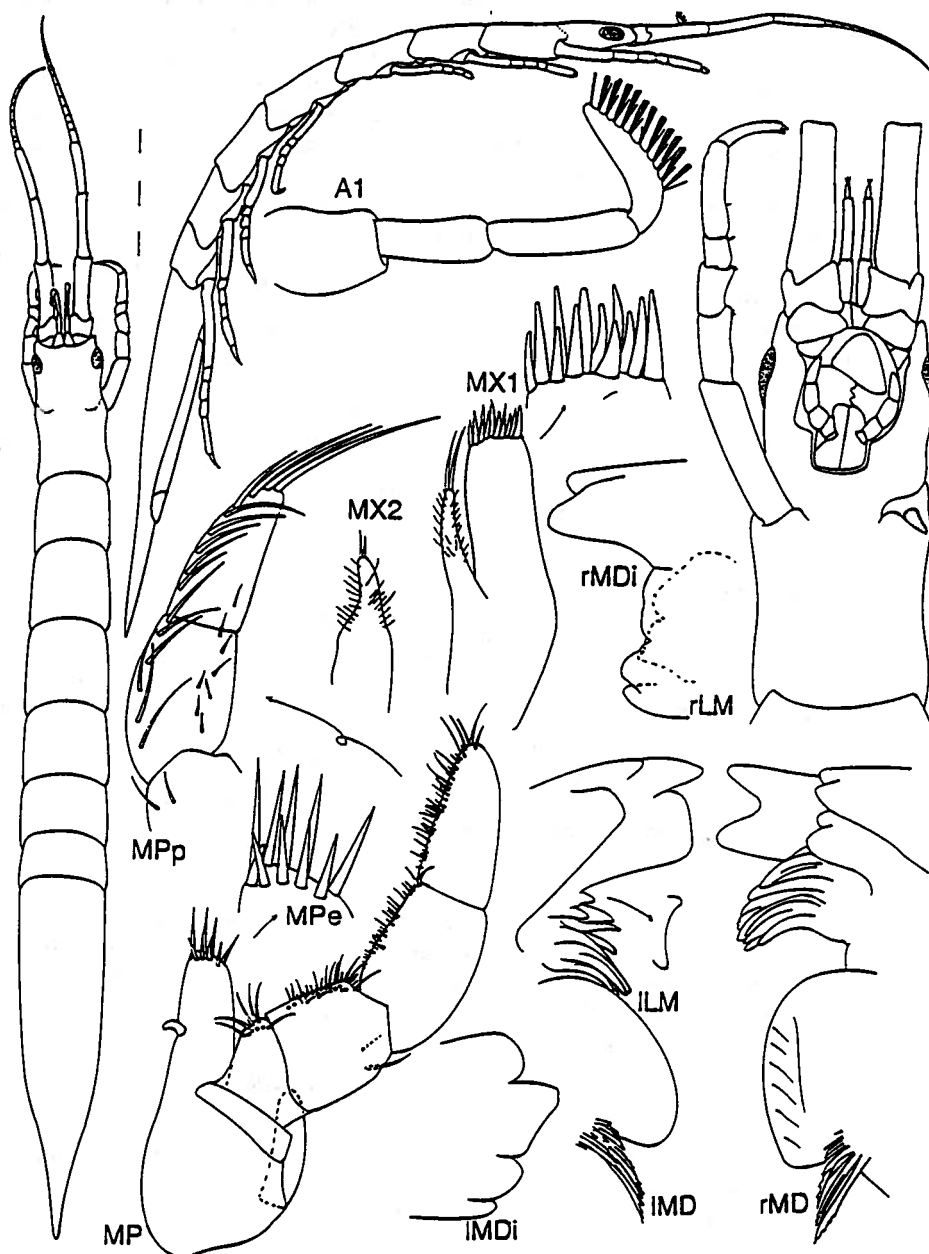


Fig. 4. *Crabyzos longicaudatus*. Male, SAM C4115. Incisors and laciniae mobiles from distal views.

fused to head, suture indicated by shallow grooves which are present laterally, groove 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 plate: 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

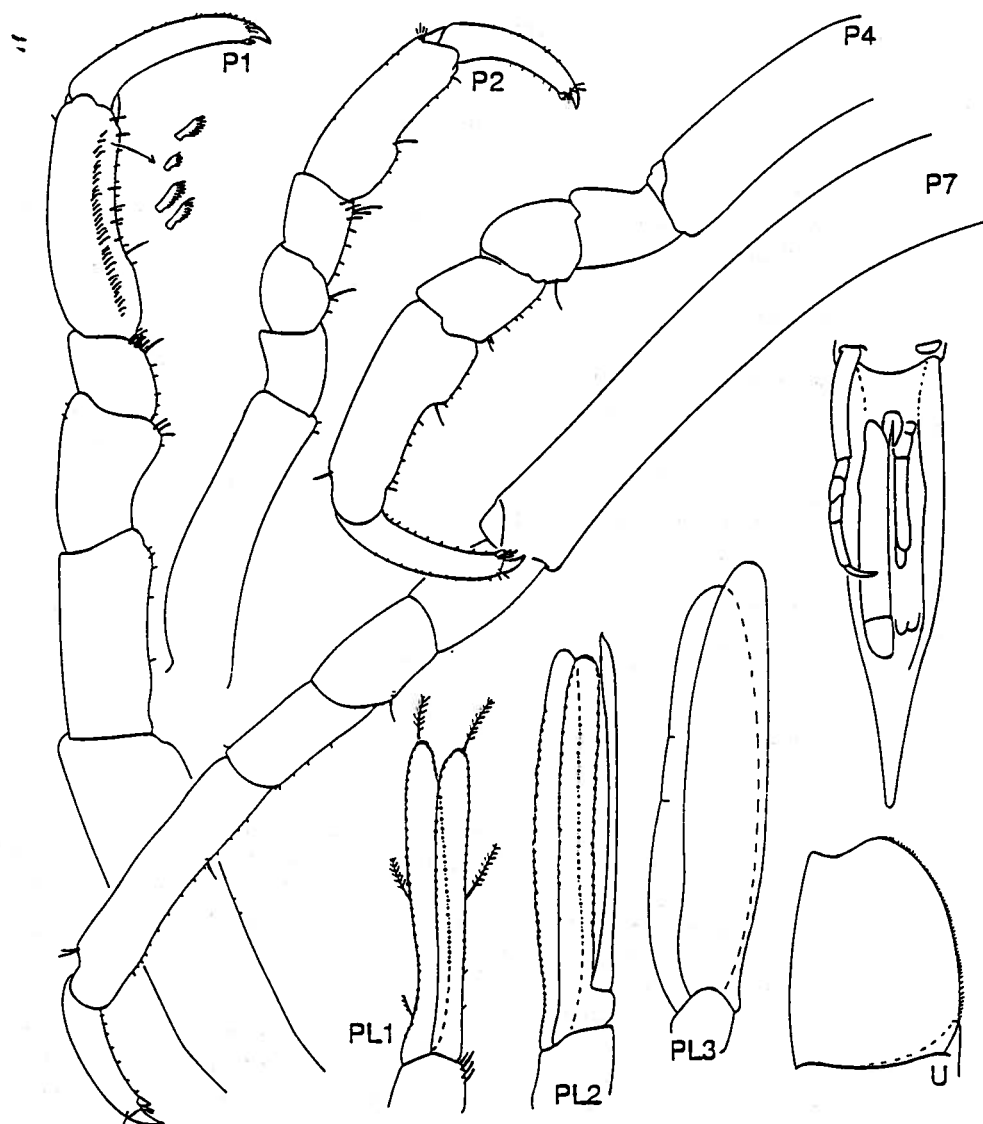


Fig. 5. *Crabyzos longicaudatus*. Male, SAM C4115.

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 × 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 × 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 × body length; peduncle article 3 distomedially lobed; article 4 ovate and flattened; flagellum of 11 articles, 0.8 × 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 triturating 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 × as long as proximal portion of basis; articles 4 and 5 fused together, combined length 1.5 × 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 postero-proximally; 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.

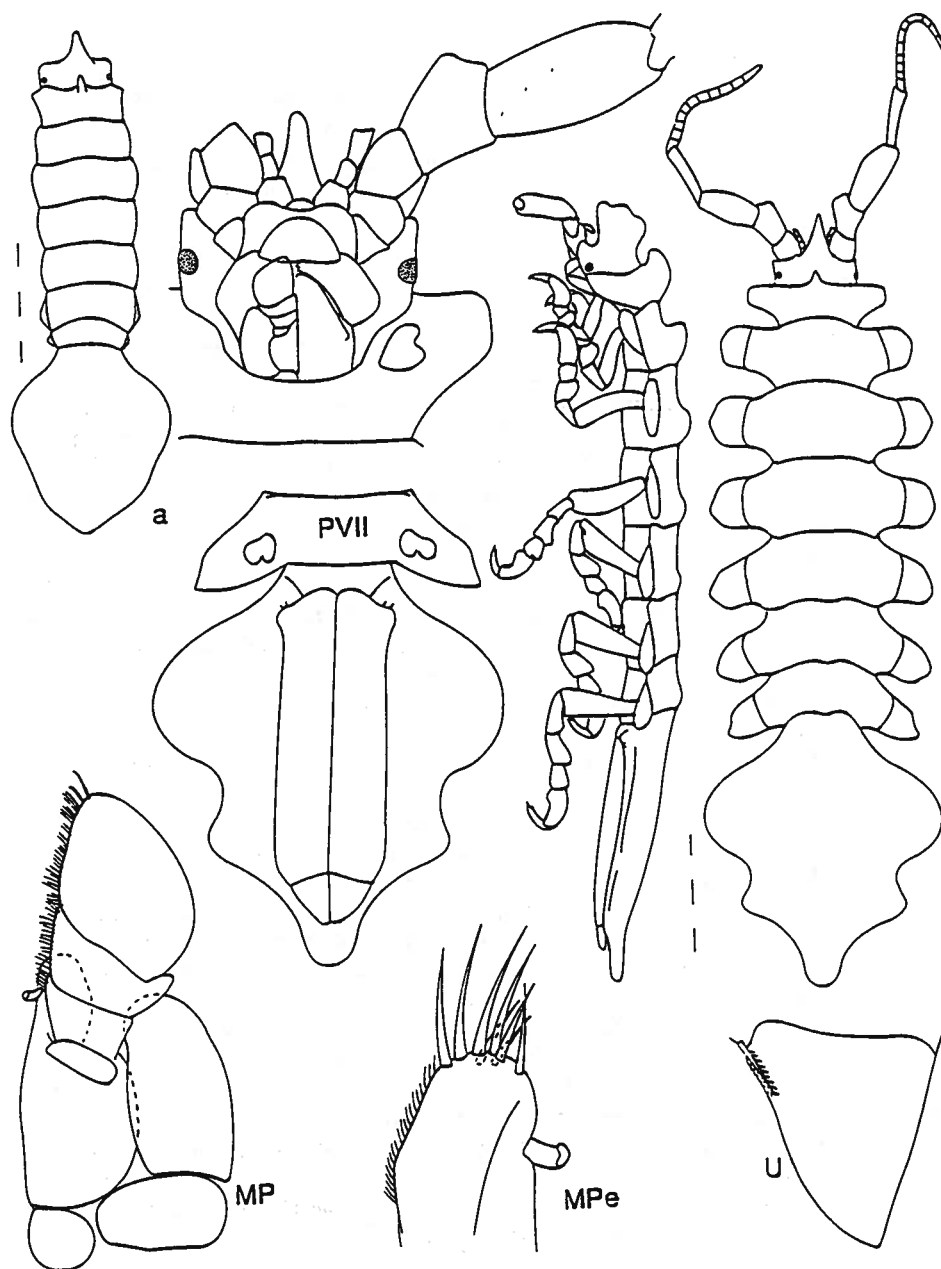


Fig. 6. *Engidotea cristata*. SAM C4111, holotype; a, SAM C4113, paratype.

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.

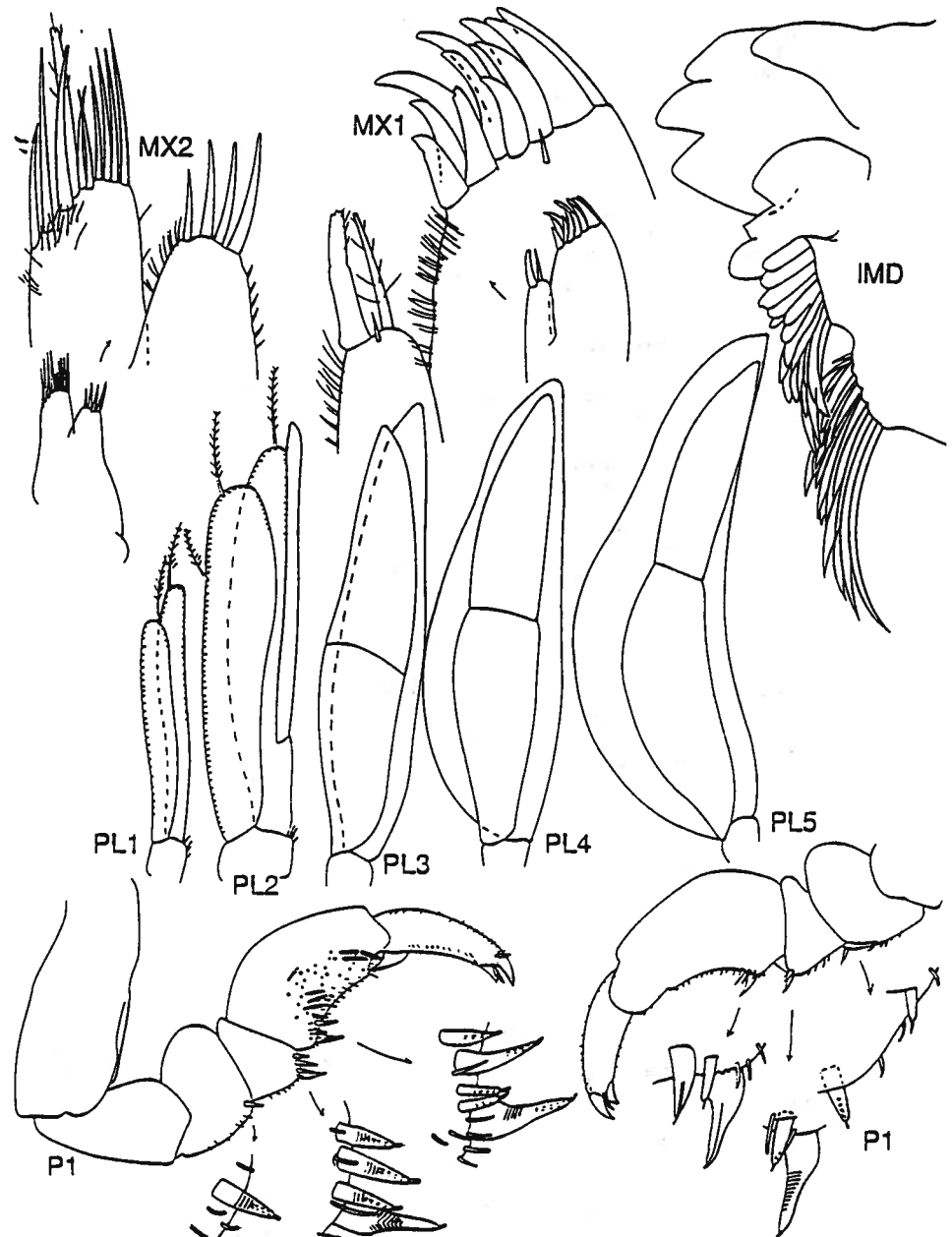


Fig. 7. *Engidotea cristata*. SAM C4111, holotype.

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).

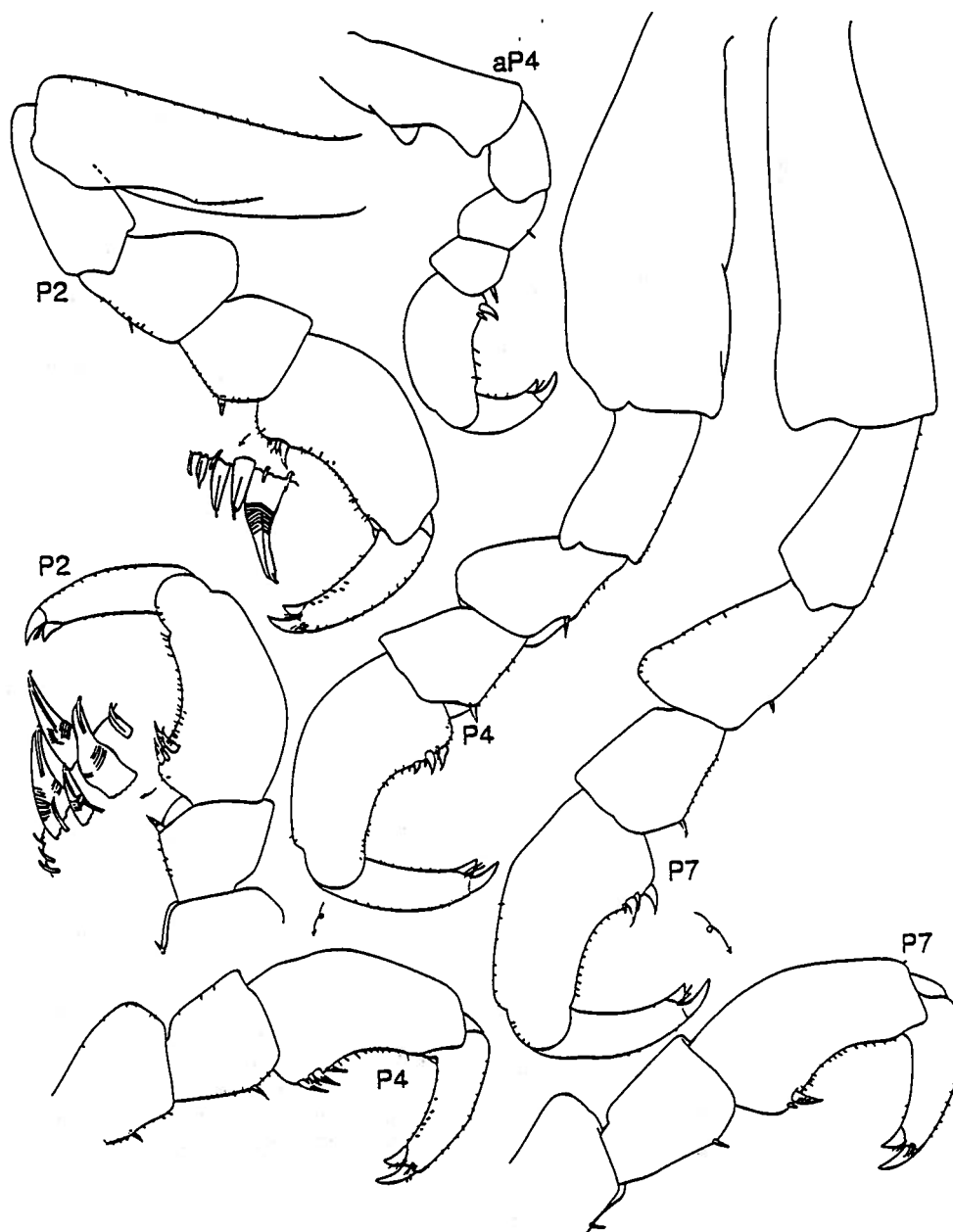


Fig. 8. *Engidotea cristata*. SAM C4111, holotype; a, SAM C4113, paratype.

Diagnosis

Body moderately broad (usually about 4× as long as wide), smooth, head narrower than pereonite 1, body widest at pereonite 4. Pleon without articulating pleonites, pleon 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. Mandibles with 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. 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), supposed synonym of *E. peronii*, from South Africa, has never been confirmed (Kenyon, 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 consistent differences between the two populations and describe a new species for the one 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°33'136°16'E.), 1.5 m, reef, rubble. W. Zeidler and K. L. Gowllett-Holmes, 29.i.1986, SAM C4123 (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, 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, Port Paterson, Cape Woolamai, San Remo, Western Port, Flinders, Port Phillip Bay, Aireys Inlet, 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 Kangaroo I., Tiparra Reef, Flinders I., coralline algal turf and seagrass, 0-17 m depth, AM, NMV 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× as long as wide, not especially flattened. Head twice as wide as high, 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 high. Pereonites 1-7 and pleotelson with a mid-dorsal longitudinal ridge, pereonites 1-4 only 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

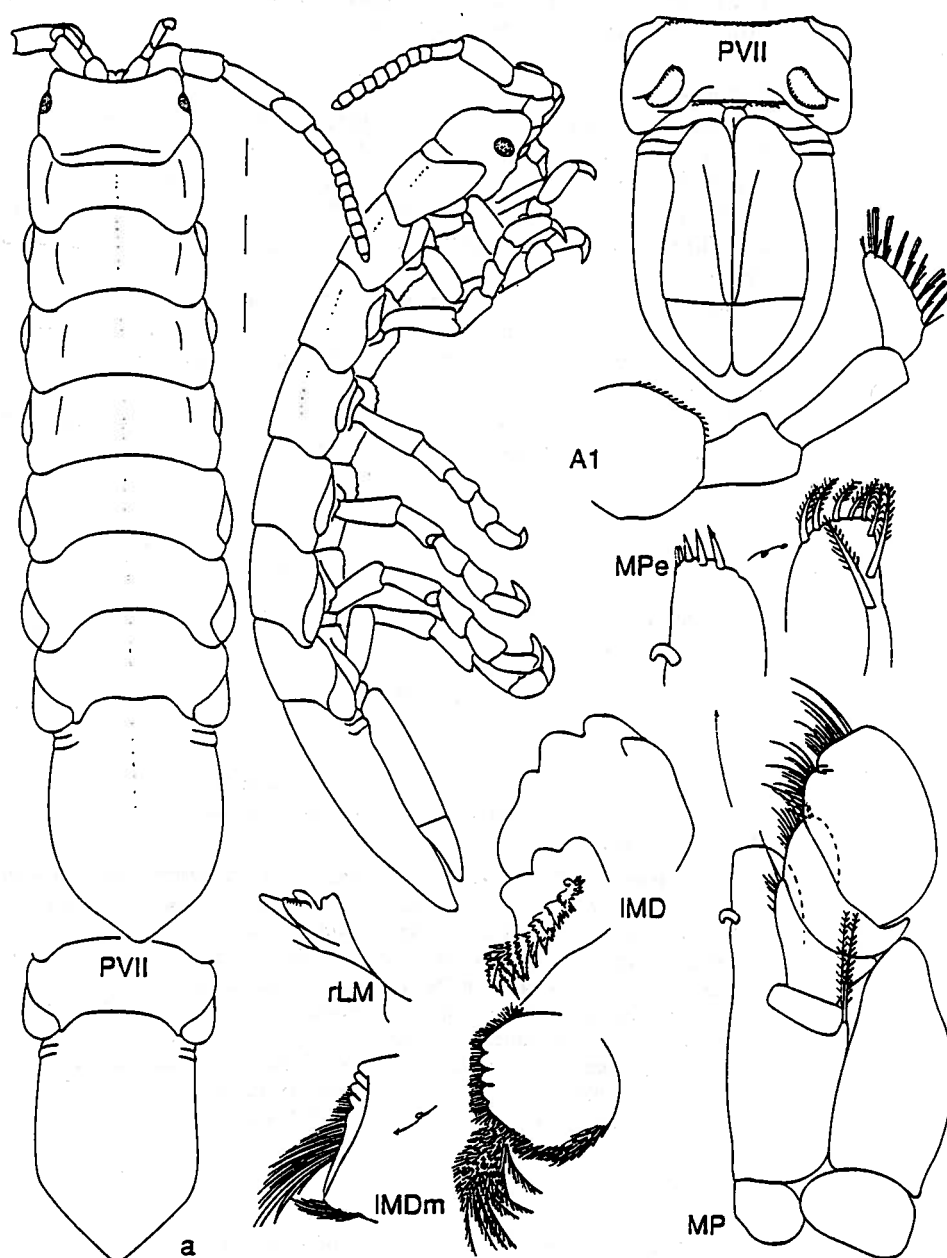


Fig. 9. *Euidotea bakeri*. Male, SAM C4122; a, juvenile, SAM C4124.

3-toothed, broad; right lacinia mobilis elongate, irregularly 4-toothed; spine row of 1 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 row 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

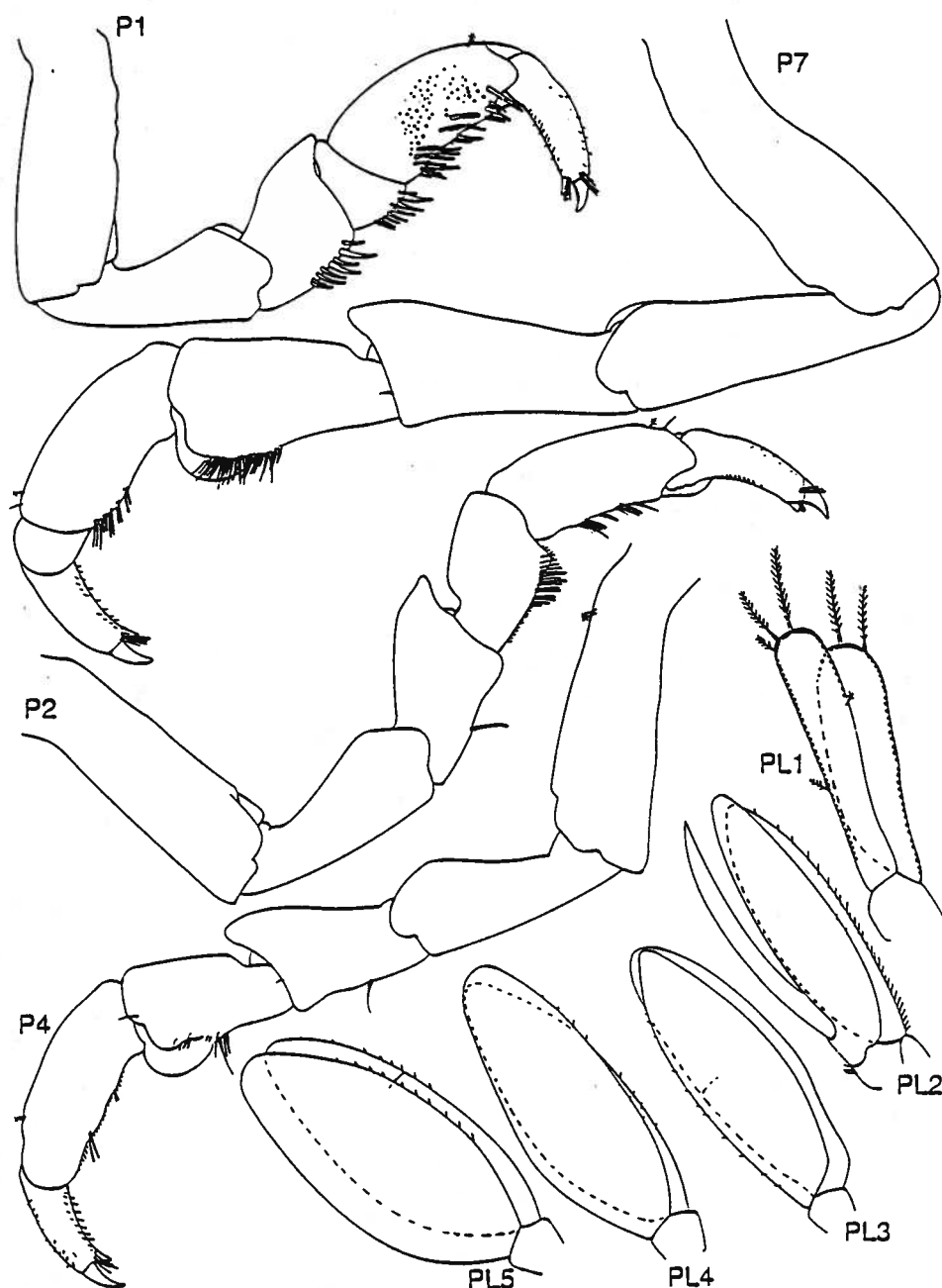


Fig. 10. *Euidotea bakeri*. Male, SAM C4122.

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.

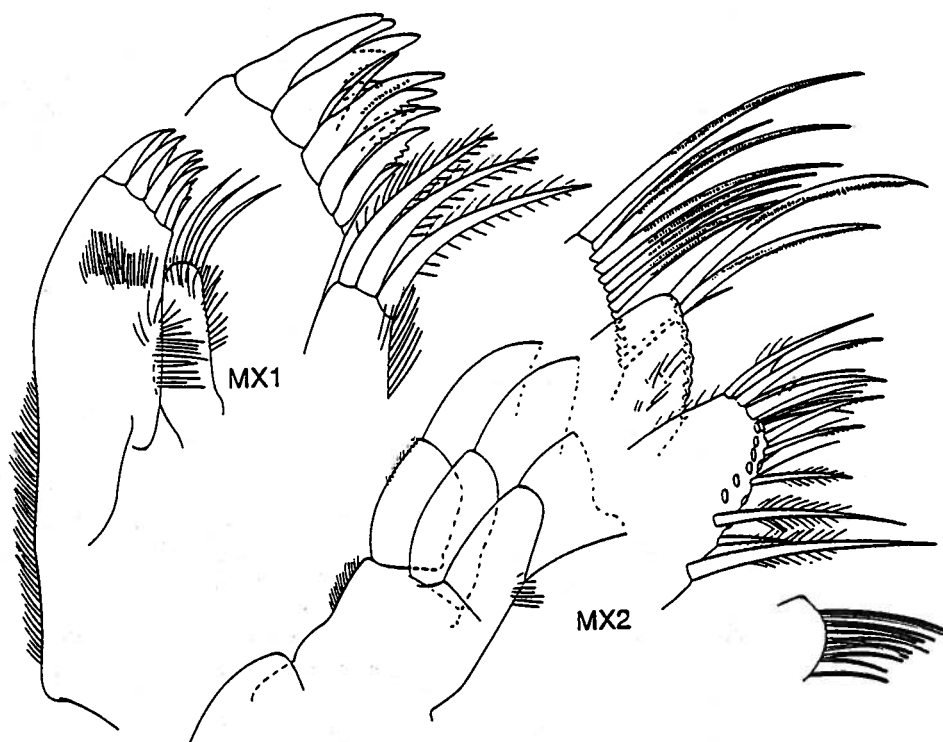


Fig. 11. *Euidotea bakeri*. Male, SAM C4122 (maxilla 2 inner lobe also drawn to show apical styles).

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.

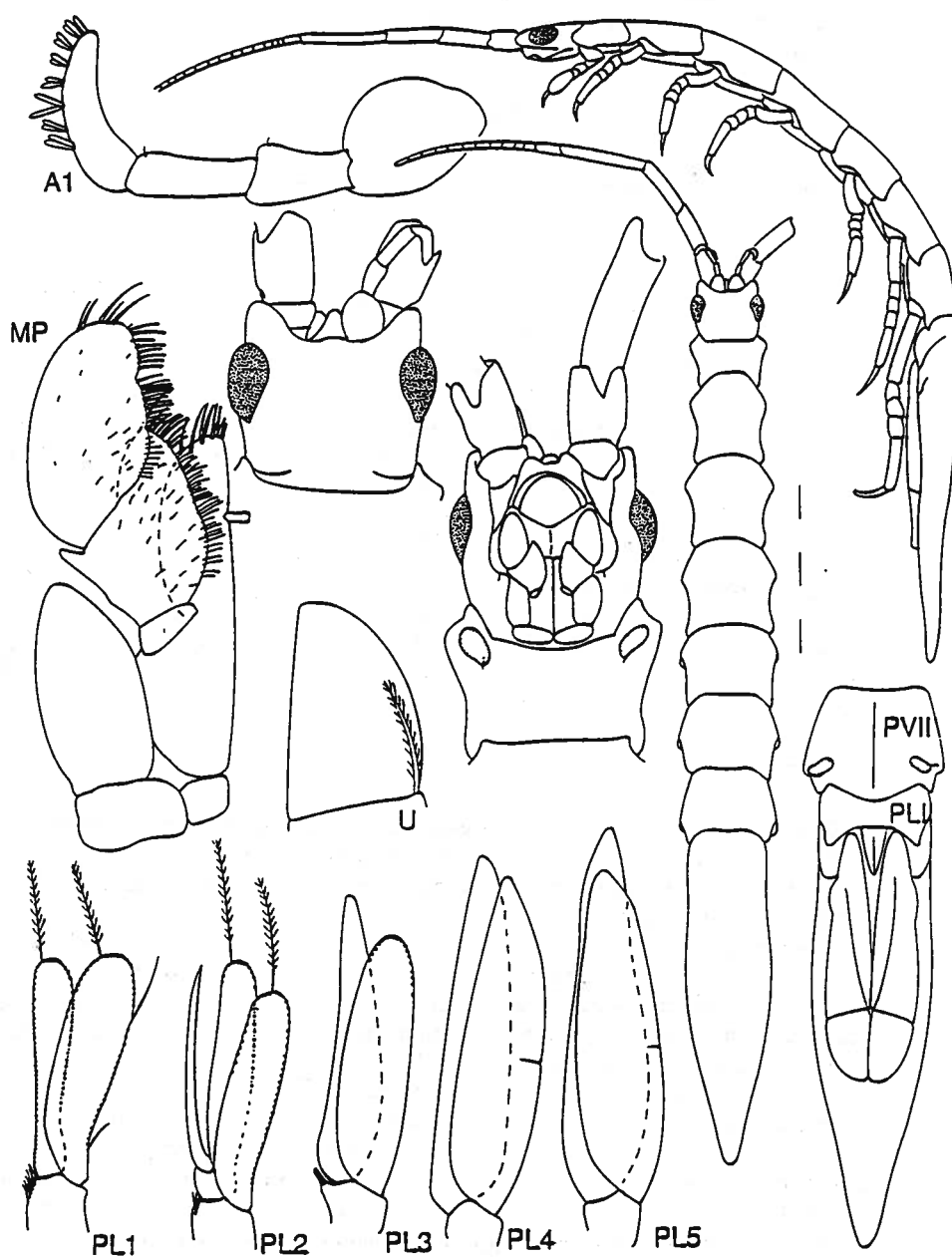


Fig. 12. *Euidotea caeruleotincta*. Male, SAM C4143.

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

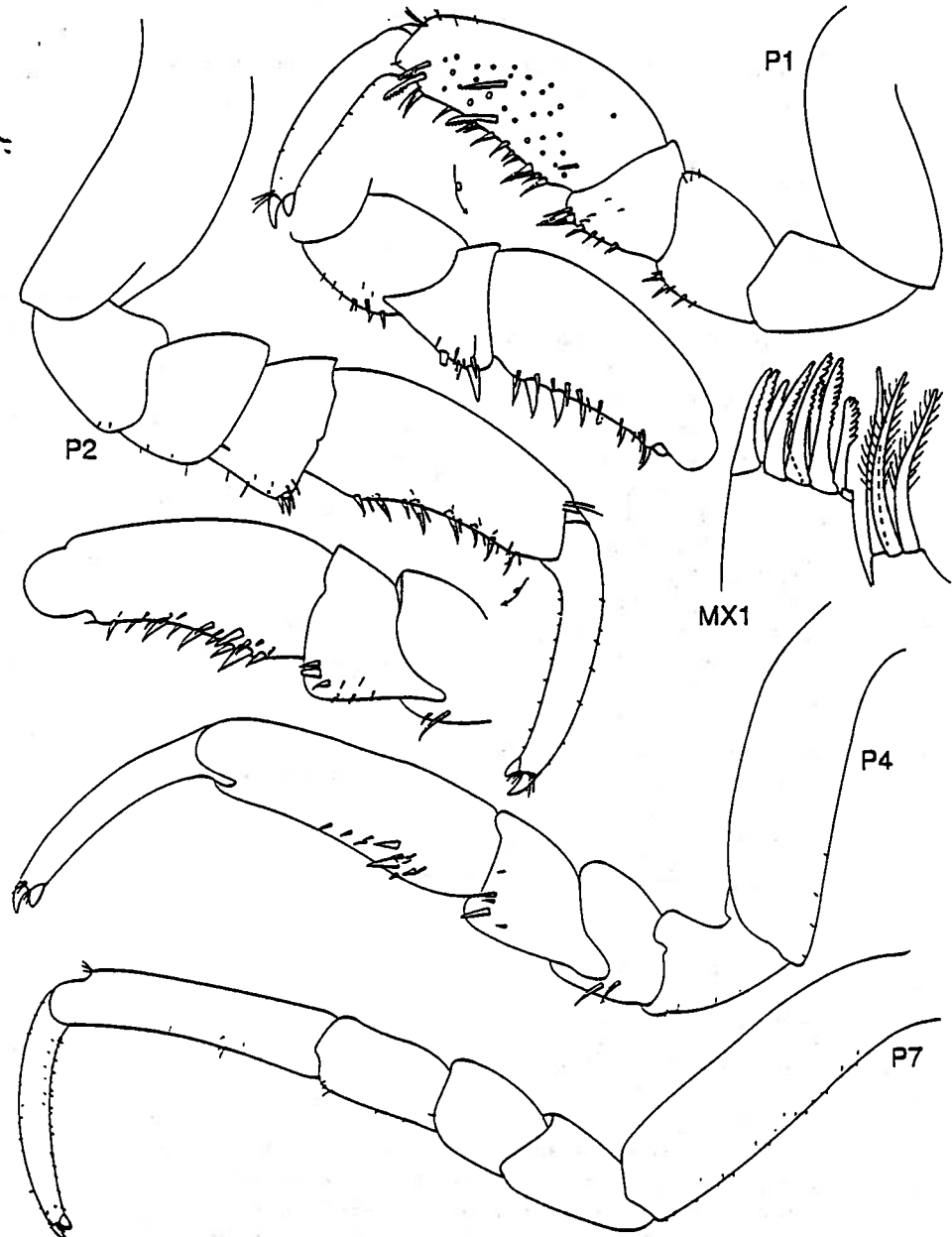


Fig. 13. *Euidotea caeruleotincta*. Male, SAM C4143.

articles. It may also be confused with *Crabyzos elongatus* but in that species the head is fused to peronite 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.

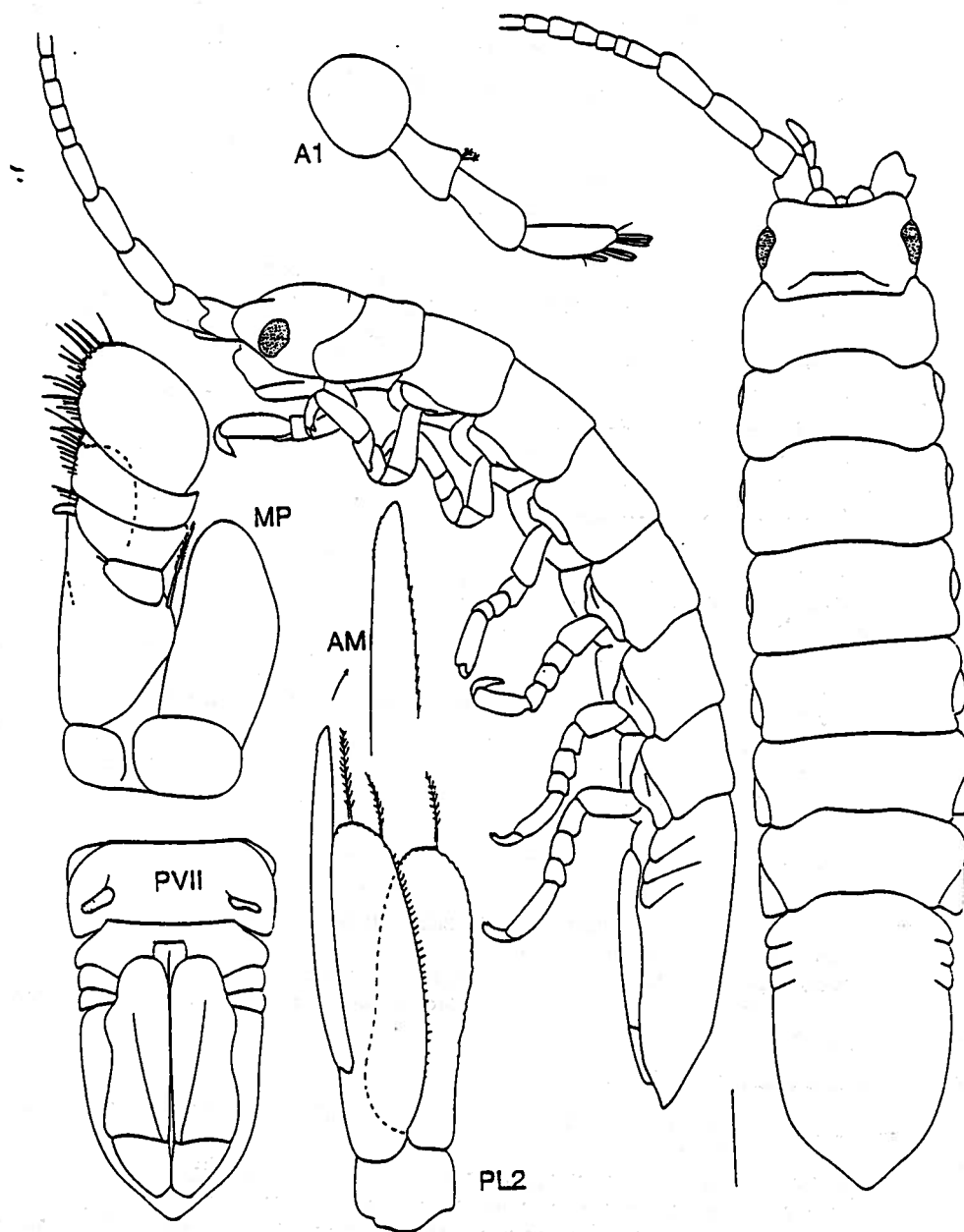


Fig. 14. *Euidotea danai*. Male, NMV J15665, holotype.

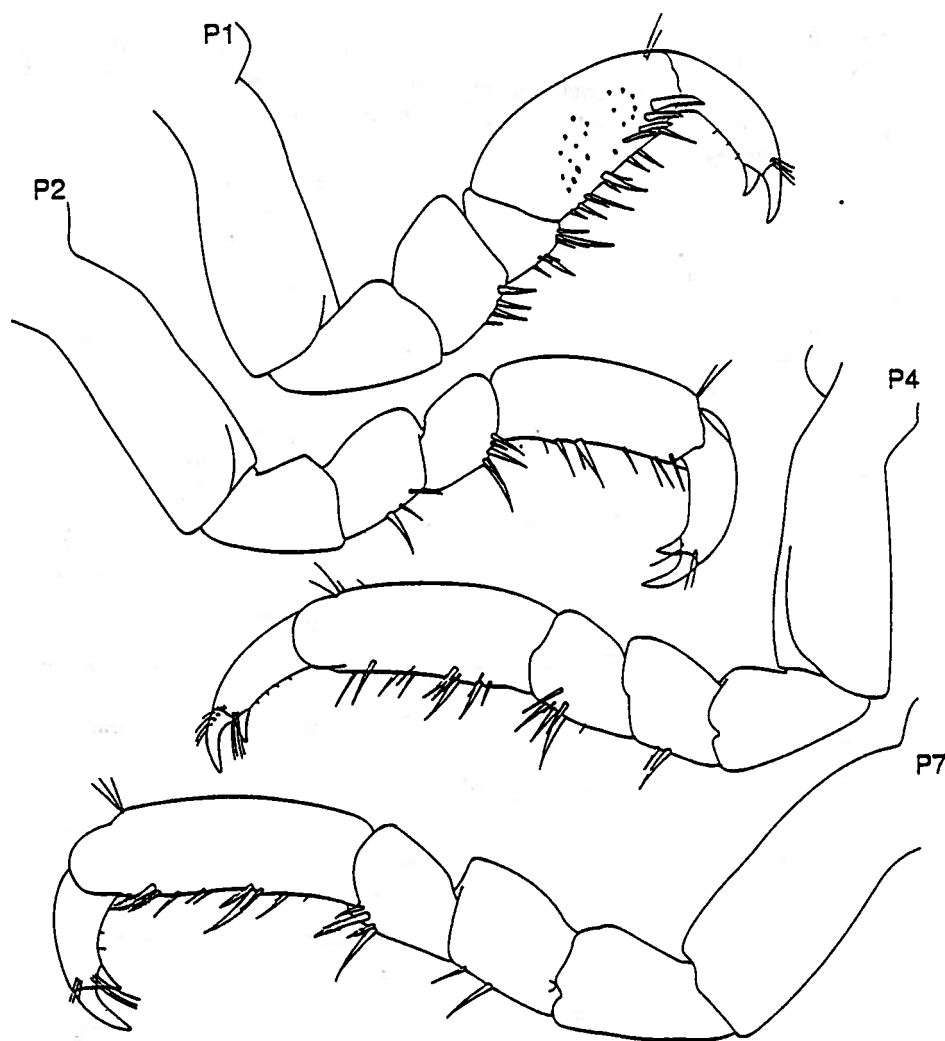


Fig. 15. *Euidotea danai*. Male, NMV J15665, holotype.

Euidotea durvillei, sp. nov.

(Figs 16, 17)

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

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

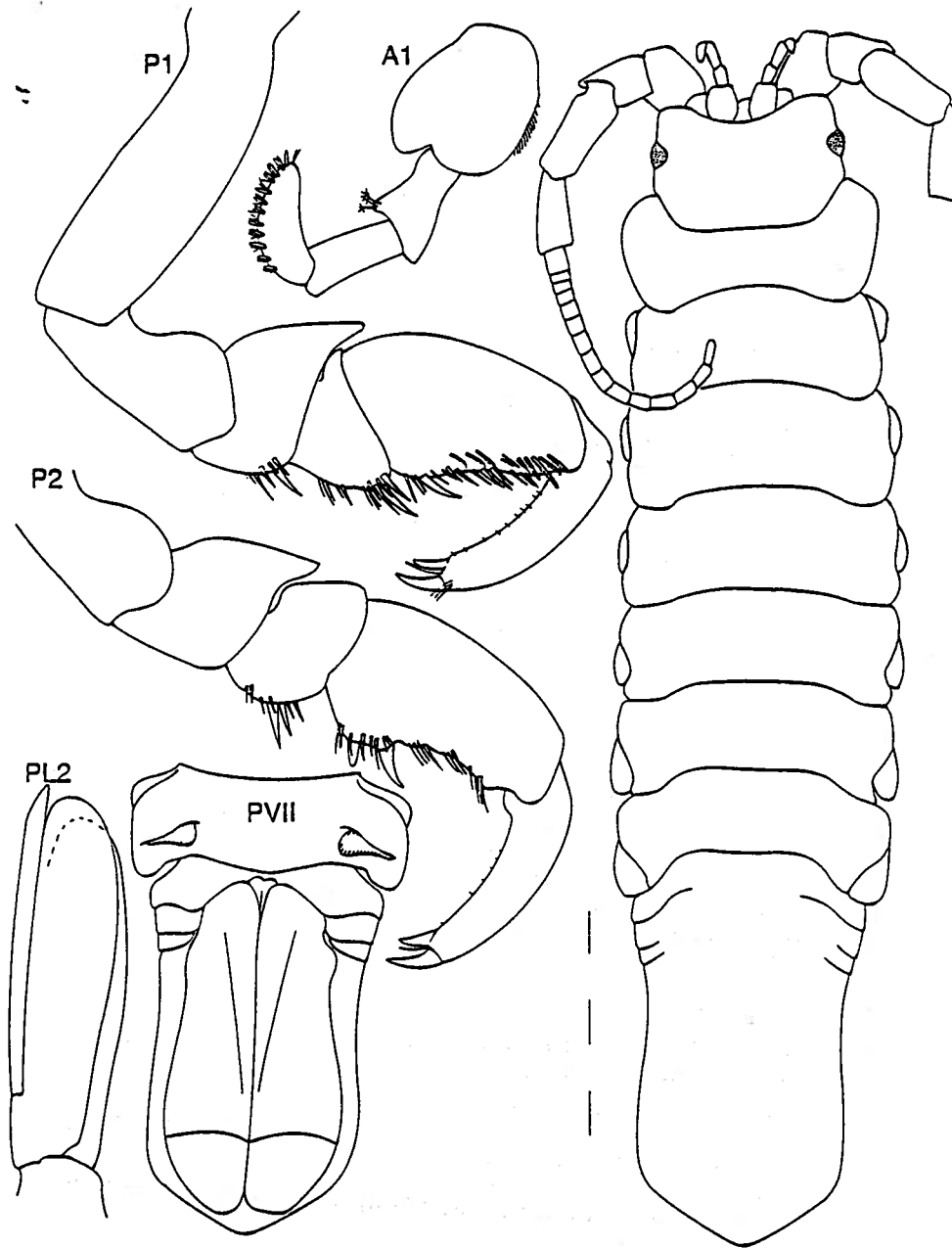


Fig. 16. *Euidotea durvillei*. Male, NMNZ Cr8891, holotype.

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.

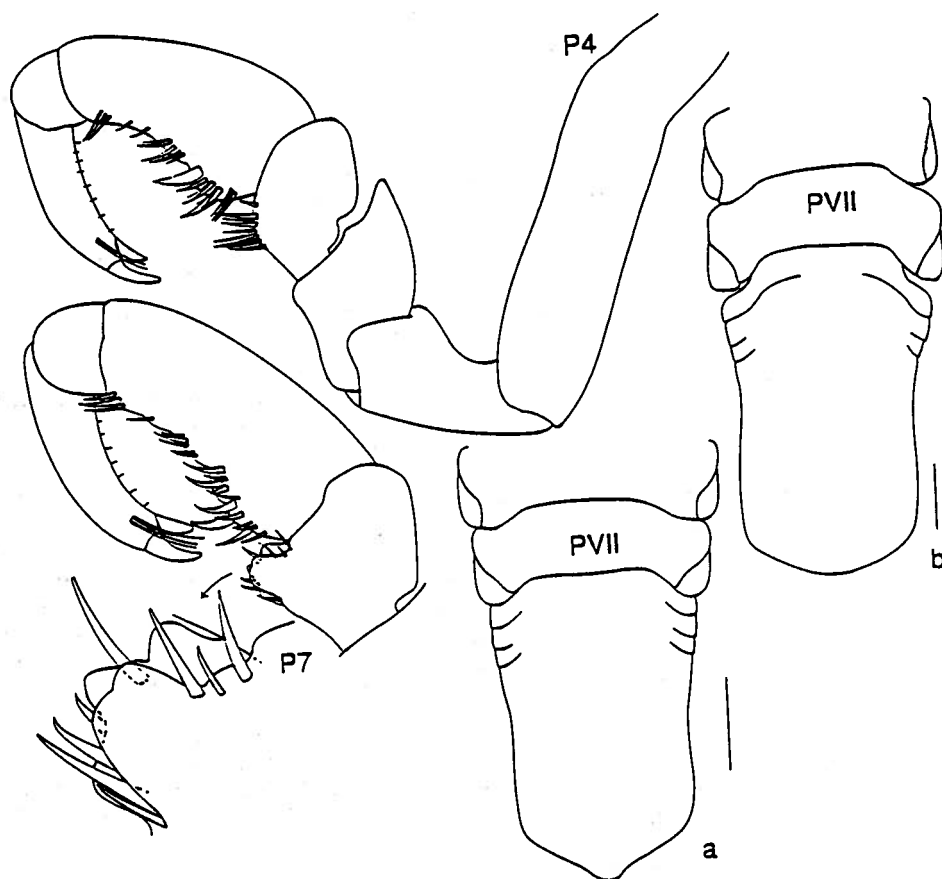


Fig. 17. *Eudotea durvillei*. Male, NMNZ Cr8891, holotype; a, female, NMNZ Cr5683; b, male, NMNZ Cr5688.

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. 17a, 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); Balmarring, 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

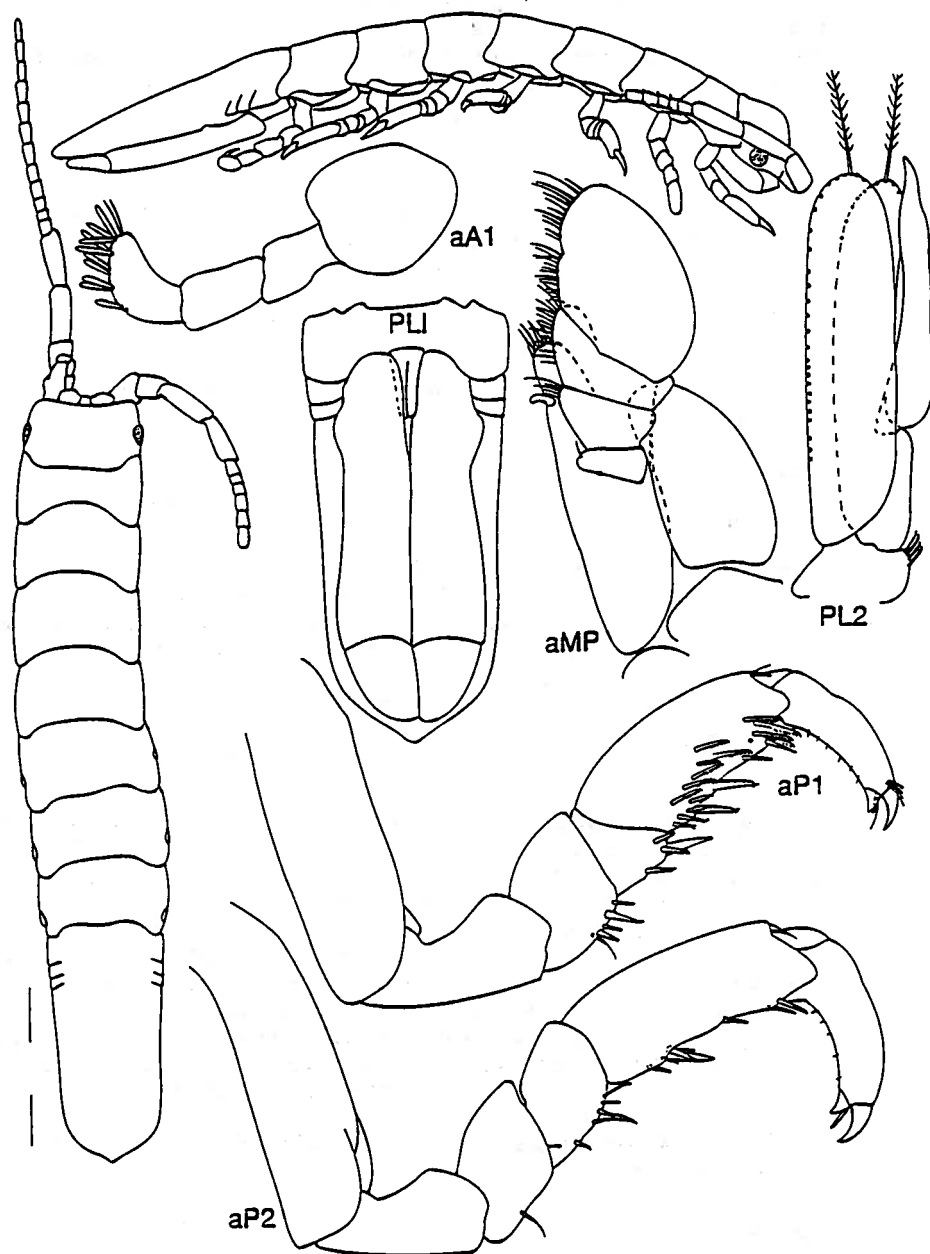


Fig. 18. *Euidotea halei*. Male, WAM 678-92, holotype; a, female, WAM 642-86.

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.

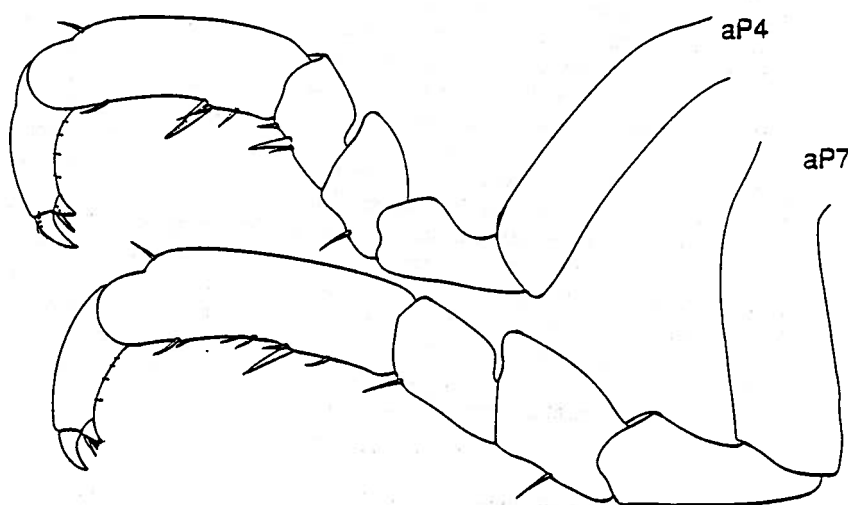


Fig. 19. *Euidotea halei*. a, female, WAM 642-86.

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, 1917b: 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. *Cleantoides* sp.). Tasmania: no specific locality, AM G5324 (2 dry specimens = *Euidotea peronii*).

Illustrated specimen. South Australia: Sir Joseph Banks Group, Portney 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 × 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 × 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 × body length; flagellum of 15 articles, 0.8 × 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.

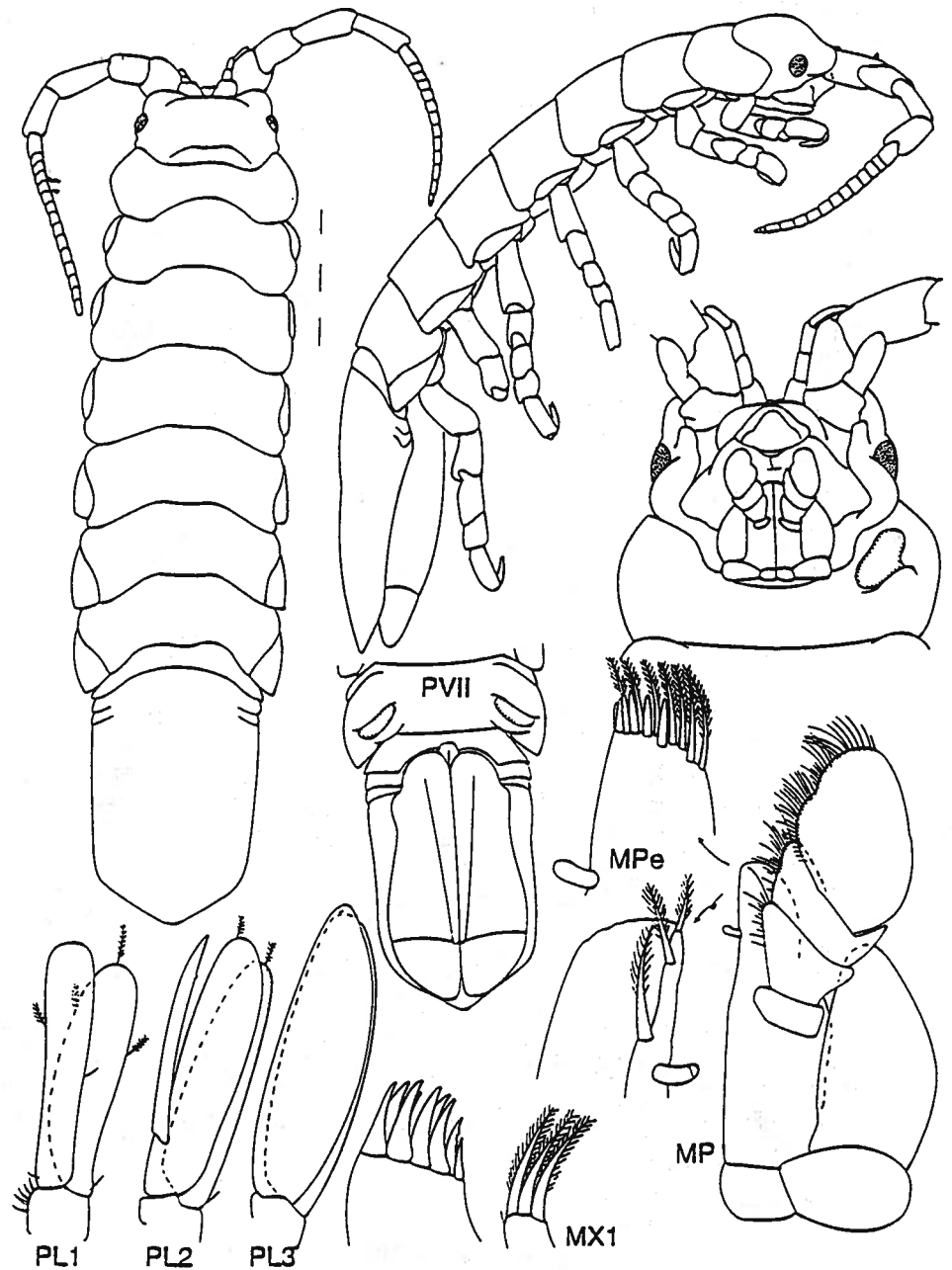


Fig. 20. *Euidotea peronii*. Male, SAM C4121.

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.

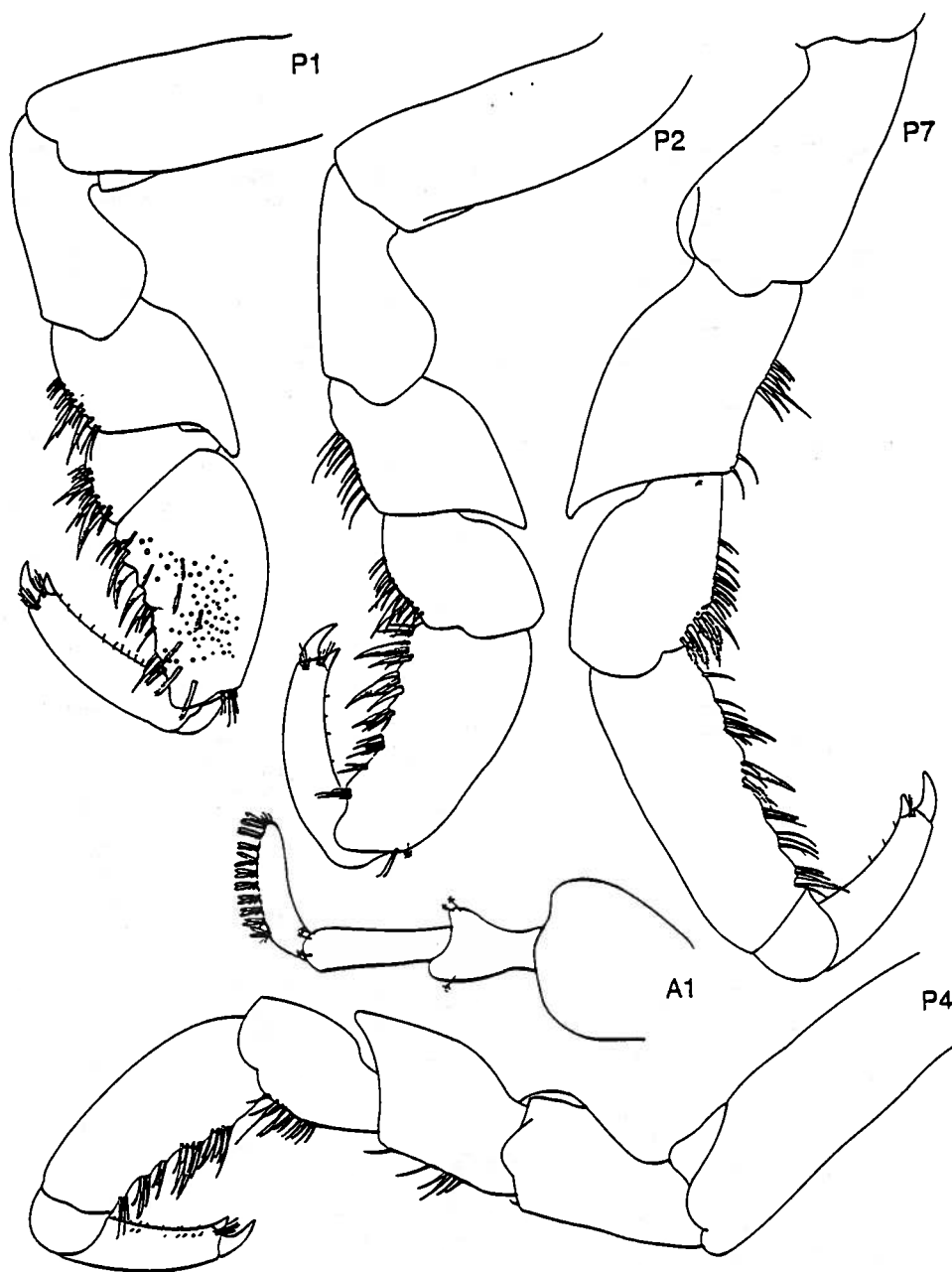


Fig. 21. *Euidotea peronii*. Male, SAM C4121.

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

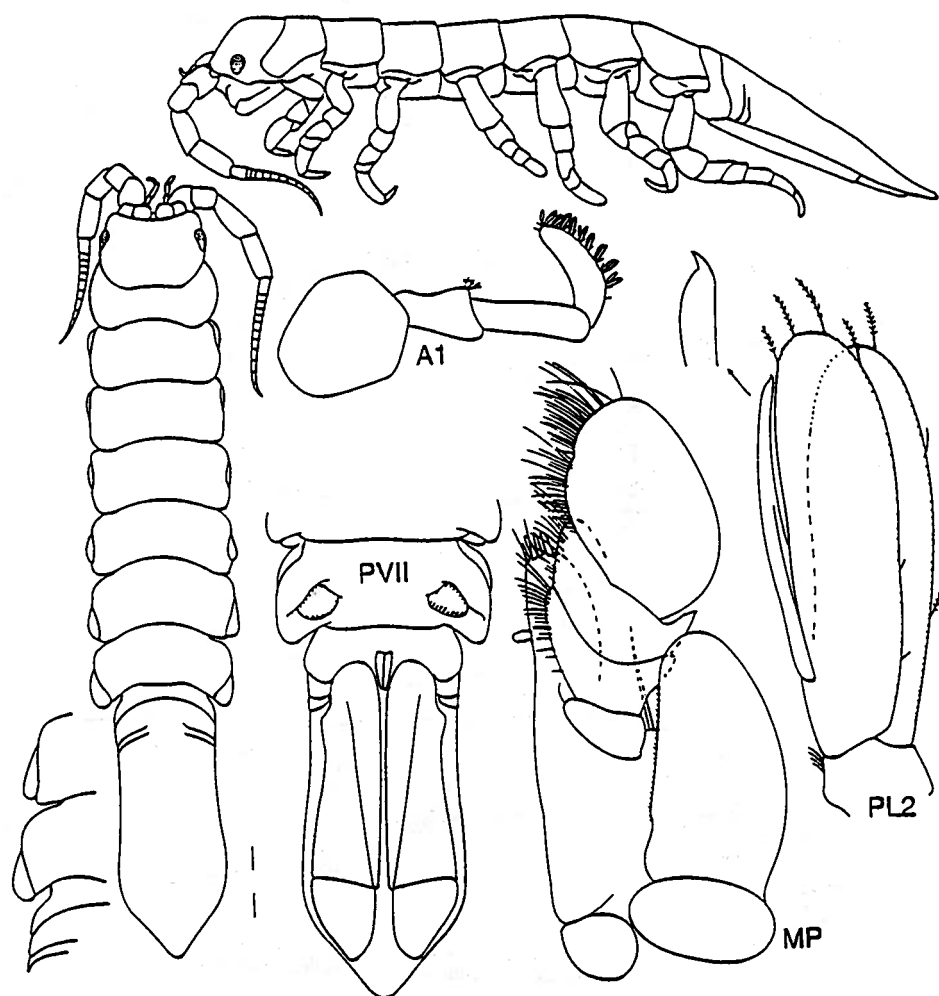


Fig. 22. *Euidotea stricta*. Male, SAM C4151.

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 Eucia, 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 $\frac{1}{4}$ 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

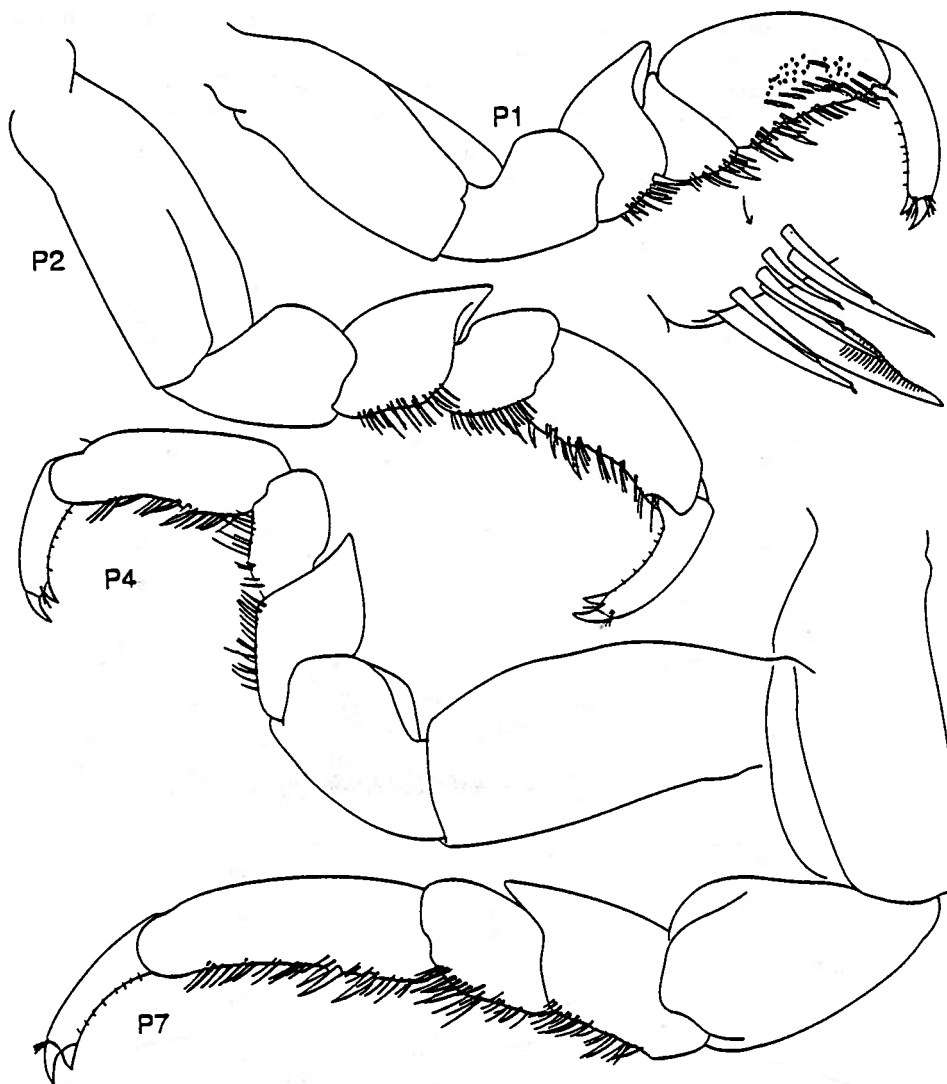


Fig. 23. *Euidotea stricta*. Male, SAM C4151.