

# THAUMATELSONINE STENOTHOIDS (CRUSTACEA: AMPHIPODA): PART 1

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## Abstract

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The Thaumatelsonidae were separated from Stenothoidae by Walker (1906) and reduced to a subfamily of Stenothoidae by Barnard (1972). The history of the subfamily is reviewed and its included genera placed in two divisions. All genera and species of the less specialised division are revised here. Four new genera are erected, *Raukumara*, *Ptychotelson*, *Pycnopyge* and *Yarra*. *Raumahara waroona* and *Yarra unguiserra* are described as new species, *Raumahara rongo* Barnard placed in the newly erected genus *Raukumara*. All belong to this thaumatelsonine group but it is shown that similar structures in *Pycnopyge* are homoplasies which developed independently. This genus is removed from Thaumatelsoninae.

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## Introduction

While Walker (1906) was studying the amphipods collected during the *Discovery* Antarctic expedition, he noted a totally unusual telson-shape and created a new genus for which he coined the generic name *Thaumatelson* (from Greek “*thauma*”, meaning “wonderful”). Gurjanova (1938) erected *Parathaumatelson* for *Metopella nasica* Stephensen, 1927. At the same time she created the family Thaumatelsonidae, comprising her genus, *Thaumatelson* Walker, 1906, *Prothaumatelson* Schellenberg, 1931 and *Pseudothaumatelson* Schellenberg, 1931, all having a very unusual urosome.

Barnard (1964: 71) was clearly uneasy with the generic division within the Thaumatelsonidae (and indeed the Stenothoidae s.l.) and later (1972b: 158) opined “... the Stenothoidae being unnaturally systematised ... at present signify not phyletic lines but grades of evolution ...” Barnard (1972a: 318) erected *Raumahara* and in 1972b noted (p. 160) “... this genus bridges the differences between Stenothoidae and Thaumatelsonidae to such an extent that the two families become qualitatively inseparable. The concept of a subfamily ‘Thaumatelsoninae’ remains useful.” Barnard had studied this mainly Australian group while having at his disposal very few specimens

(often single representatives) from Australian collections. His species have never been reported since.

Comparison of new material, studied at Museum Victoria (Melbourne), the Australian Museum (Sydney) and the Smithsonian Institution (Washington) revealed some errors in descriptions and drawings of this group. New taxa could be erected, others removed. This paper deals with only one group of thaumatelsonines, those that share a proximally thickened, three-dimensionally inserted and spoon-shaped telson (Table 1). Others will be discussed in later contributions. Similarities and differences between the groups are discussed in Conclusions at the end of this contribution.

The habitus was observed in glycerine, under stereo- as well as phase contrast microscope; dissected parts were mounted in Faure's medium.

The following abbreviations are used (in alphabetic order): AM, Australian Museum, Sydney, Australia; BMNH, Natural History Museum, London, United Kingdom; CTK, personal collection of Traudl Krapp, Bonn, Germany; MVR, Museo Civico di Storia Naturale, Verona, Italy; MNB, Museum für Naturkunde der Humboldt-Universität, Berlin, Germany; NHRS, Naturhistoriska Riksmuseet, Stockholm, Sweden; NMV, Museum Victoria, Melbourne, Australia; NZOI, New Zealand Oceanographic Institut (now National Institute for Water and Atmosphere), Wellington, New Zealand; SAM, South African Museum, Cape Town, South Africa; USNM, US Natural History Museum, Smithsonian Institution, Washington, USA; WAM, Western Australian Museum, Perth, Australia; ZMH, Zoologisches Museum der Universität, Hamburg, Germany.

Table 1. Species treated in this paper, with current generic placement.

Original combination	Current generic placement
<i>Chucullba alla</i> Barnard, 1974	<i>Chucullba</i>
<i>Chucullba warea</i> Barnard, 1974	<i>Chucullba</i>
<i>Pseudothaumatelson patagonicum</i> Schellenberg, 1931	<i>Pseudothaumatelson</i>
? <i>Raumahara viridurorum</i> Krapp-Schickel and Andres, 1998	<i>Ptychotelson</i>
<i>Prothaumatelson carinatum</i> Shoemaker, 1955	<i>Pycnopyge</i>
<i>Raumahara dertoo</i> Barnard, 1972a	<i>Raumahara</i>
<i>Raumahara judithae</i> Moore, 1981	<i>Raumahara</i>
<i>Raumahara noko</i> Barnard, 1974	<i>Raumahara</i>
<i>Raumahara waroona</i> sp. nov.	<i>Raumahara</i>
<i>Raumahara rongo</i> Barnard, 1972b	<i>Raukumara</i>
<i>Pseudothaumatelson cyprioides</i> Nicholls, 1938	<i>Thaumatelsonella</i>
<i>Thaumatelsonella kingelepha</i> Rauschert and Andres, 1991	<i>Thaumatelsonella</i>
<i>Yarra unguiserra</i> gen. et sp. nov.	<i>Yarra</i>

## Taxonomy

### Key to thaumatelsonine species with spoon-shaped telson

- |    |   |                                 |
|----|---|---------------------------------|
| 1. | Gnathopod 2 chelate.....  | 2                               |
| —  | Gnathopod 2 subchelate.....   | 7                               |
| 2. | Gnathopod 1 subchelate.....   | 3                               |
| —  | Gnathopod 1 chelate.....  | <i>Raumahara</i> ...4           |
| 3. | Antenna 1 article 2 swollen.....  | <i>Ptychotelson viridurorum</i> |
| —  | Antenna 1 article 2 slender, ordinary.....                                    | <i>Raukumara rongo</i>          |
| 4  | Uropod 3 ramus article 2 well developed; antenna 2 article 3 subquadrate..... | <i>Raumahara noko</i>           |
| —  | Uropod 3 ramus article 2 reduced; antenna 2 article 3 ovoid.....              | 5                               |
| 5. | Urosomite 1 dorsal hump reaching 50% of telson.....                           | <i>Raumahara dertoo</i>         |
| —  | Urosomite 1 dorsal hump reaching <25% telson.....                             | 6                               |

6. Uropod 1 rami unequal, uropod 3 ramus article 1 with 1 seta shorter than uropod 3 tip; gnathopod 2 propodus proximally bulbous.....*Raumahara judithae*
- Uropod 1 rami subequal, uropod 3 ramus article 1 with long seta sitting upon rounded tip of uropod 3; gnathopod 2 propodus proximally slender.....*Raumahara waroona*
7. Antenna 1 articles 1 and 2 swollen but not nasiform; gnathopods 1 and 2 rectangularly lengthened, palms similarly oblique.....*Chucullba warea*
- Antenna 1 article 1 nasiform, lengthened, considerably or totally overlapping article 2; gnathopods not as above.....8
8. Gnathopods 1 and 2 propodus with parallel margins, palms much shorter than posterior margin, palmar angle on gnathopod 2 more strongly developed than on gnathopod 1.....*Chucullba alla*
- Gnathopods 1 and 2 propodus margins not parallel, palms not as above.....9
9. Antenna 1 article 2 strongly nasiform, geniculate; gnathopods 1 and 2 dactyli strongly serrate.....*Yarra unguiserra*
- Antenna 1 article 1 strongly nasiform; gnathopod 1, 2 dactyli smooth.....10
10. Uropod 2 rami clearly unequal.....*Pseudothaumateson patagonicum*
- Uropod 2 rami scarcely different.....11
11. Gnathopod 1 palmar corner angular; basis of gnathopod 1 with many short setae; uropod 3 peduncle shorter than ramus article 1; ramus article 2 three times as long as wide.....*Thaumatesonella cyproides*
- Gnathopod 1 palmar corner rounded; basis of gnathopod 1 with long, dense setae; uropod 3 peduncle as long as ramus article 1 and as article 2; ramus article 2 about twice as long as wide.....*Thaumatesonella kingelepha*

### ***Raumahara* Barnard**

*Raumahara* Barnard, 1972a: 318. — Barnard, 1972b: 160. — Barnard and Karaman, 1991: 397. — Moore, 1981: 959. — Krapp-Schickel and Andres, 1998: 52.

*Type species. Raumahara dertoo* Barnard, 1972 (original designation).

**Diagnosis.** General habitus bivalve-like (fig. 1). Antenna 1 peduncular article 2 ordinary to swollen, with dorsal process more or less overlapping article 3; accessory flagellum of 1 article. Antenna 2 article 3 rectangularly shortened, ovoid or bulbous. Mandibular palp reduced to 1 short article, or lacking. Maxilla 1 palp biarticulate. Maxilla 2 plates ordinary (tandem), or outer plate riding up on inner one. Maxilliped outer plate present, different, short. Gnathopods 1 and 2 propodochelate-forcinate. Pereopods 3–7 basis rectilinear, dactylus on inner and outer surface with a row of stiff, short setae, distally ending in a second tip. Pereopod 4 elongate, usually same as pereopod 3. Urosomite 1 dorsally thickened to a fold vaulting over urosomite 2 and reaching or overlapping telson insertion. Transparent septae (or wings) on urosomite 3. Uropod 3 ramus clearly of 2 articles, or article 2 reduced or lacking. Telson horizontal, spoon-shaped, dorsally excavated; posterior end of urosomite 1 process possibly fitting in this excavation; proximally

thickened, three-dimensionally coalesced with urosomite 3.

Table 2 tabulates differences between the four species now placed in this genus.

### ***Raumahara dertoo* Barnard**

Figures 1, 18

*Raumahara dertoo* Barnard, 1972a: 318, figs 193–194. — Barnard, 1974: 113, fig. 69, 70.

**Type material.** Holotype. Western Australia, Cape Naturaliste, intertidal, common seaweeds, WAM (female, 1.55 mm).

**Material examined.** Paratypes. 6 specimens (USNM 230426).

Non-type. Western Australia. Walpole, ZMH K38211 (1 individual mounted on slide). Albany, ZMH K38203 (6 specimens in alcohol), ZMH K38204 (6 specimens in alcohol), ZMH K38205 (1 specimen in alcohol). Walpole, ZMH K38211 (1 specimen in alcohol).

**Diagnosis.** Antennae 1 and 2 subequal. Antenna 1 peduncular article 2 ordinary or weakly swollen; accessory flagellum of 1 article. Antenna 2 article 3 ovoid. Ocular lobes short, acute. Mandibular palp lacking. Gnathopod 1 propodochelate; gnathopod 2 propodochelate, dactylus about one-third propodus. Urosomite 1 with thick fold vaulting over urosome and half of telson (fig. 1).

Table 2. Diagnostic characters distinguishing species of *Raumahara* Barnard.

	<i>R. noko</i>	<i>R. dertoo</i>	<i>R. judithae</i>	<i>R. waroona</i>
Antenna 1 peduncular article 2	overlapping article 3 dorsally	weakly swollen	overlapping article 3 dorsally	overlapping article 3 dorsally
Antenna 1 accessory flagellum	2 articles	1 article	2 articles	1 article
Antenna 2 peduncular article 3	subquadrate	ovoid	bulbous	suboval or bulbous
Mandibular palp	rudimentary	absent	absent	absent
Gnathopod 2 dactylus	30–33% propodus	30–33% propodus	40% propodus	33–40% propodus
Gnathopod 2 propodus proximally	slender	slender	bulbous	Slender to bulbous
Urosomite 1 hump	< 25% telson	50% telson	< 25% telson	< 25% telson
Uropod 1 rami	subequal	subequal	unequal	subequal
Uropod 1 peduncle + rami	strong spines on peduncle + rami	small spines on peduncle	1 distal spine on peduncle	lacking spines or small
Uropod 3 rami article 1 apically	1 short seta or weak spine	1 long seta surpassing uropod 3 tip	1 seta shorter than uropod 3 tip	1 long seta sitting upon uropod 3 tip
Uropod 3 ramus article 2	well visible, strong	reduced? to absent	reduced? to absent	totally absent
Telson excavated	weakly	strongly	strongly	strongly

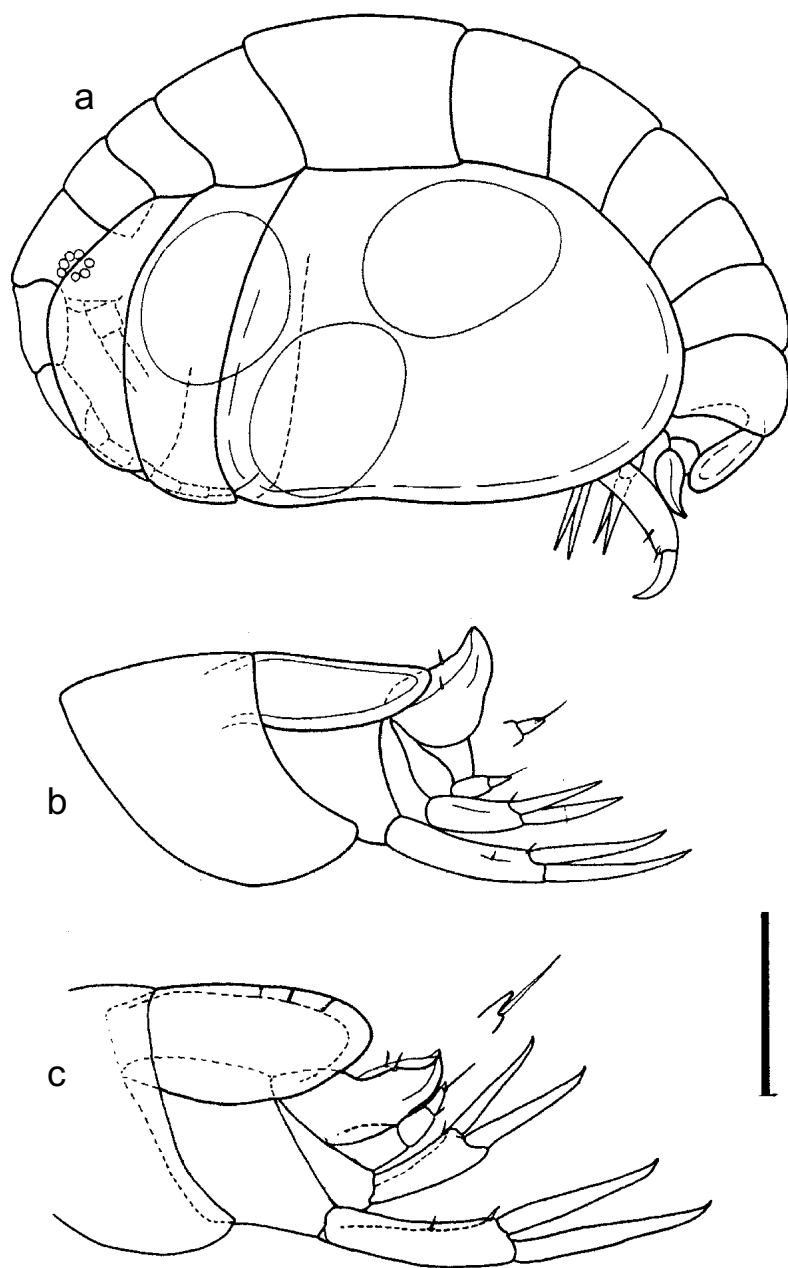


Figure 1. a, general habitus of *Raumahara* or *Ptychotelson* in normal position, where most parts of legs and antennae are hidden by the enlarged coxae; on anterior end thickened peduncle antenna 1, on posterior end thickened urosome plugging or protecting the filter groove.  
 b, *Raumahara dertoo* Barnard, urosome of 1.3 mm juvenile, showing the transparent "wings" connecting telson and uropod 3.  
 c, *Raumahara dertoo* Barnard, urosome of 1.5 mm adult; wings not visible as telson adjacent to uropod 3. Scale = 0.1 mm.

Uropod 3 ramus with long, visible seta subapically on article 1; article 2 may be prolongation on article 1, surpassing insertion of seta (fig. 1). Telson spoon-like, three-dimensional, proximally thickened and coalesced with urosomite 3 ventrally, depth in proximal half about two-thirds total length; directed horizontally.

Length 1.0–1.55 mm.

*Distribution.* Cape Naturaliste to Albany, south Western Australia; intertidal, common seaweeds.

*Biology.* Female ovigerous from September to November.

*Remarks.* Barnard's assignment of this species to Stenothoidae was probably based on the lack of a nasiform process. Antenna 1 article 2 is subquadrate to weakly swollen; antenna 2 article 3 is not rectangular-slender but ovoid (drawn but not in diagnosis of Barnard, 1972a); and uropod 3 ramus consists apparently of 1 article (although article 2 may be the minute, thin prolongation next to a long and striking seta inserted subapically on article 1). Barnard's drawings of the urosome never show the ventral margin of the vaulting process of urosomite 1 which is a very thick fold for fortifying the whole urosome dorsally, and probably also plugs the body posteroventrally if necessary. There are some (glanular?) ducts of unknown function on the dorsal margin of this process (fig. 1). The telson can be in contact with uropod 3 but can also be in an upright position when transparent septae on the dorsal margins of urosomite 3 and uropod 3 peduncle become visible (fig. 1).

#### *Raumahara noko* Barnard

Figures 2, 3

*Raumahara noko* Barnard, 1974: 113–117, figs 71, 72.

*Type material.* Holotype. South Australia, Pearson Island, in algae, 18–24 m, SAM C3535 (female, 1.6 mm, in alcohol).

*Material examined.* Western Australia. Walpole, ZMH K39213, K39214 (1 adult, 1.6 mm, on 2 slides). Albany, ZMH K38204 (2). Ceduna, ZMH K38206 (1). South Australia. Port Lincoln, ZMH K38207 (7). Kangaroo Island, Hartmann, ZMH K38783 (3). Tasmania. The Gardens, St Helens, from tide pools, G.C.B. Poore, Feb 1980, NMV J3278, (1 juvenile on slide).

*Diagnosis.* Antennae 1 and 2 subequal. Antenna 1 peduncular article 2 weakly swollen, with age increasingly vaulting over article 3 proximally; accessory flagellum of 2 articles. Antenna 2 article 3 exceptionally short, subquadrate to

trapezoid. Ocular lobes strong, subacute. Mandibular palp reduced to 1 short but clearly visible article. Gnathopod 1 propodochelate. Gnathopod 2 propodochelate, slender, dactylus about 30% propodus length. Urosomite 1 with fold vaulting over urosomite 2 and one third of telson, less voluminous than in type species. Uropod 3 ramus with 2 robust articles. Telson like a very flat spoon, basally thickened, three-dimensionally coalesced with urosomite 3, directed and inserted horizontally.

Length 1.0–2.0 mm.

*Redescription.* Antenna 1 subequal to shorter antenna 2. Antenna 1 subequal to head + pereonites 1+2 (dorsal length); peduncular articles 1 and 3 without process, article 2 dorsomedially slightly vaulting over article 3, extension depending on age, reaching as far as one third article 3, process bearing a duct and 1 long seta; ratio of lengths of articles 2 : 1  $\leq$  0.5; article 3 longer than article 2 ventrally, subequal dorsally; accessory flagellum short, biarticulate; article 2 much narrower than basal article and with 1 long terminal seta; flagellum longer than peduncle, of 7 articles, aesthetascs present. Antenna 2 peduncular article 3 shortened, subquadrate, article 4 shorter than 5; flagellum subequal to peduncle, of 7 articles.

Upper lip ventrally notched, lobes rounded. Mandibular incisor well developed, with broad cusps; lacinia mobilis on left mandible broad, with major incisions, on right mandible with distal part finely serrated; raker spine row developed, 4 strong spines; molar cusp with 3 robust curved spines; palp clearly developed, of 1 short article; 1–2 setae apically (cf. fig. 2 in juvenile with 1 seta, fig. 3 in adult with 2 setae; cf. also Barnard, 1974: fig. 71 with 1 seta, on other drawings of mandible no palp shown). Lower lip inner lobes coalesced, mandibular lobes well developed. Maxilla 1 inner plate with 1 subapical seta; outer plate mediodistally setose, apically armed with 4 serrate robust spines, 1 stout simple spine and 1 thin, short and stiff one; palp biarticulate, extending beyond outer plate, with spines apically and medioapically. Maxilla 2 plates tandem-grouped; outer plate scarcely extending beyond inner one, apically with 3 setae (cf. fig. 3 here with Barnard, 1974: fig. 71 showing 4 setae), 1 on outer margin; inner plate with 2 long apical setae, on inner margin 1 shorter, stiff one mediodistally. Maxilliped inner plate reaching half length of ischium, with 1 seta and 2 spines apically; outer plate reaching 50% along merus (= palp article 1); with 2 setae apically, 2 medially; palp of 4 articles; length of merus and propodus subequal;

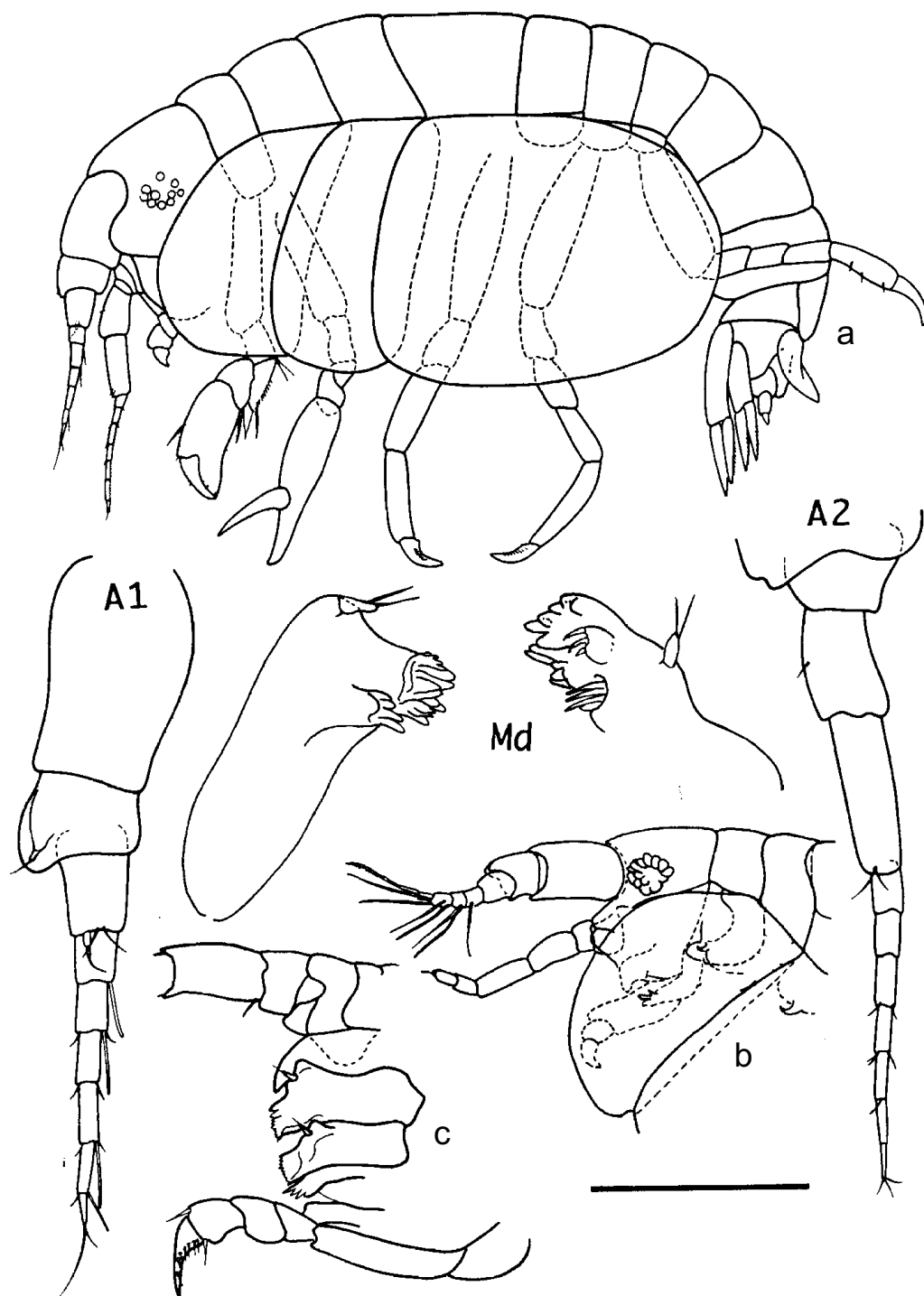


Figure 2. *Raumahara noko* Barnard. a, habitus 1.1 mm, b, anterior body of neonatus. c, sketch of mouthparts in situ. Antennae 1, 2 at scale = 0.1 mm. Mandible at scale = 0.05 mm.

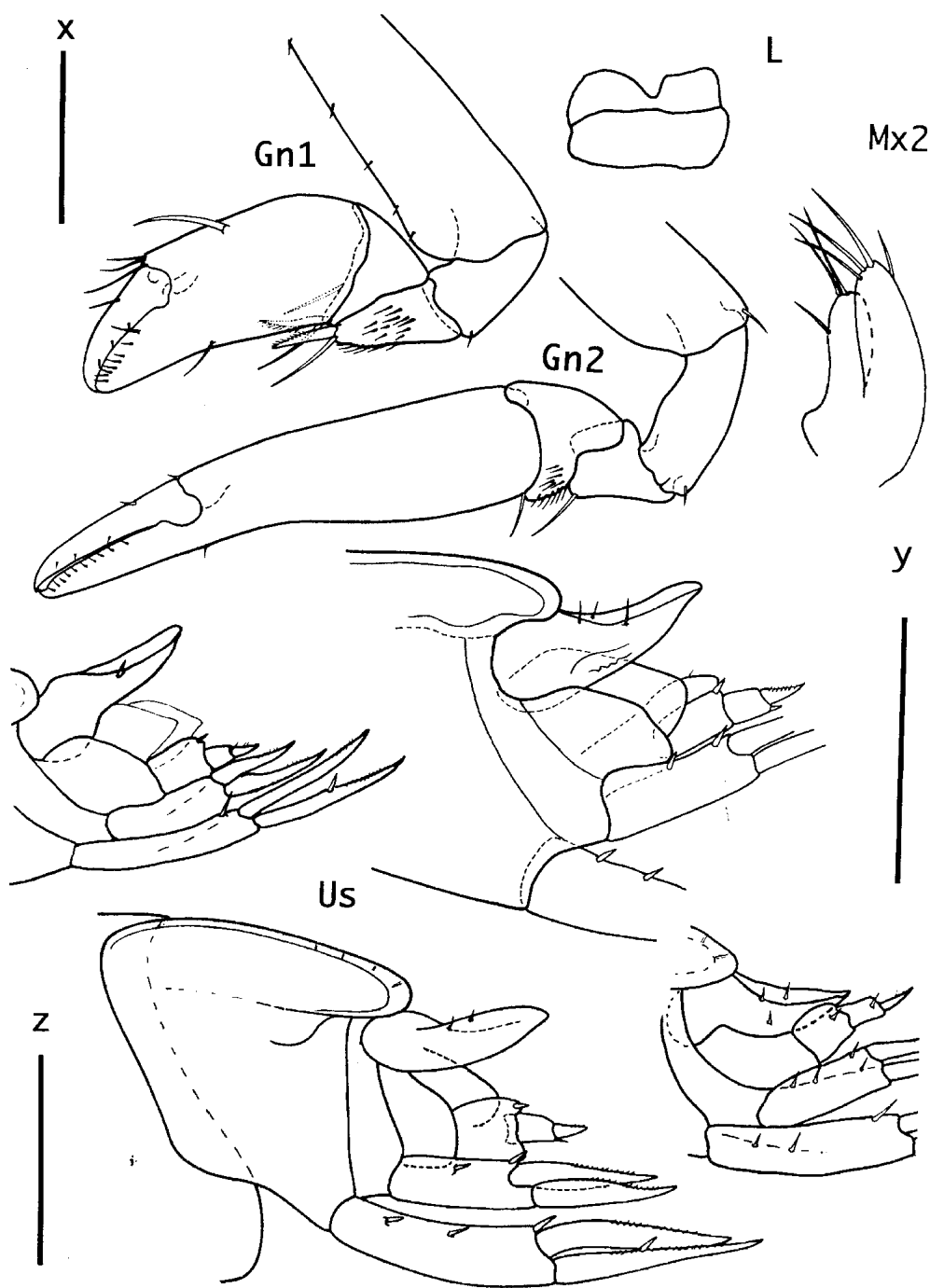


Figure 3. *Raumahara noko* Barnard. Gnathopods 1, 2 at scale  $x = 0.1$  mm; urosome (from 4 different specimens and in different shape of fixation; attention to the “wings” connecting uropod 3 with telson) at scale  $y = 0.1$  mm; upper lip and maxilla 2 at scale  $z = 0.05$  mm.



article 3 (propodus) much narrower than article 2; carpus, propodus distally and dactylus with inner margin furry.

Gnathopod 1 shorter than gnathopod 2. Coxa 1 reduced, subquadrate, covered by coxa 2; basis with translucent lobe; merus posterodistally rounded, about as long as triangular carpus, which is very narrow between merus and propodus distally; propodus with parallel margins anter- and posteriorly, with 1 strong seta anteromedially and 2 weak ones distally; posterior margin slightly concave, length : breadth  $> 2 : 1$ ; propodochelate, palm armed with short setae; palmar corner with a pair of robust spines, tip of propodus upwards curved; dactylus as long as palm, inner margin smooth, beset with few spines. Gnathopod 2 propodochelate-forcinate. Coxa 2 expanded, anterior margin regularly convex, posterior one nearly straight, ventrally straight to rounded; posterior margin with single spines; ischium slim, longer than merus; carpus subtriangular, lobe with dense, short setae and longer, forward-curved spines; propodus slender, length ratio of dactylus : total propodus = 33–40% (in juvenile propodus relatively shorter, thus dactylus more than one third propodus); terminally a hooked cusp and notch; palm with stiff setae; dactylus also terminally hooked, matching well with the propodal notch; inner margin with similar setae; outer margin with 1 long seta.

Pereopods 3 and 4 slender, subequal, but carpus in pereopod 4 longer; dactylus about half propodus length, hind margin on inner and outer surface with dense, stiff setae, at distal end of this row a second tip, thus dactylus seemingly bifid. Coxa 3 more than twice as deep as broad; posterodistally some spines. Coxa 4 dominant, wider than deep, getting wider with age; front margin slightly convex, ventral margin straight, posterior margin strongly convex; depth anteriorly and posteriorly subequal. Pereopods 5–7 slender, ratios of corresponding articles only slightly different; dactylus with prominent setal comb on anterior margin inside and outside. Coxae 5–7 short; coxa 5 trapezoid, weakly produced posterodistally; coxa 6 oblong, roundly produced posteriorly; coxa 7 blunt.

Gills and oostegites on pereopods 2–5, not found on pereopods 6 or 7.

Uropods 1–3 extending less far posteriorly in succession. All rami (and distal regions of peduncles) with very short setae dorsally. Uropod 1 peduncle subequal or longer than subequal rami; peduncle with 3 spines; inner ramus inserted much less distally; outer ramus (extending the further and more distally inserted) with 1 strong

medial spine. Uropod 2 peduncle as long as longer ramus, with 1 strong spine distally, 1 medially; inner ramus very little shorter and inserted more proximally; without spination. Uropod 3 peduncle + ramus about as long as peduncle of uropod 2; peduncle distally with 1 spine, subequal to biarticulate ramus; ramus article 1  $>$  article 2, article 1 distally with 1 spine, article 2 nail-like, well developed. Large, transparent septum on urosomite 3 dorsally; on uropod 3 peduncle dorsally also a thin, transparent “wing”.

Telson not reaching end of uropod 3 ramus; basis situated under the vaulted urosomite 1 and fused with urosomite 3 medially (fig. 3); distally tapering, apex rounded, spoon-like, dorsolaterally and basally with sclerotic clasps; with 1–2 pairs of setae. Telson not always in contact with body as urosomite 3 has 2 thin plates in the gap (figs 2, 3), and uropod 3 and telson may be retracted (and protected?) between them (cf. Barnard, 1974: fig. 71, uropod 3). (This may be what Barnard (1974: 113) meant by “urosomite 3 very distinct.”)

Colour. Antenna 1 articles 1 and 2, eyes, and broad dorsal stripe on pereonites 1–7 brick-red, mesosome and urosome orange, gnathopods 1 and 2 and pereopods 3–7 yellow-green, coxae yellow.

*Distribution.* South coast of Australia from extreme west to Tasmania. Littoral and sublittoral, 18–24 m (Barnard, 1974) including tide pool.

*Biology.* Eggs in December to January.

*Remarks.* Having a well developed uropod 3 article 2, this species is the most plesiomorphic within its genus. Also, the flat spoon-like telson, rectangular antenna 2 article 3 and mandibular palp, though very reduced, confirm this impression. The other species, *R. dertoo*, *R. judithae* and *R. waroona* have reduced or no second article on uropod 3 ramus, an ovoid to bulbous antenna 2 article 3 and no mandibular palp. The process on antenna 1 article 2 shows a (glandular?) duct and a long sensory seta; the process on urosomite 1 has some (glandular?) ducts dorsally.

This species was described from a single female of 1.6 mm and has not been reported since. As Barnard's description is very short a detailed redescription is given.

#### *Raumahara judithae* Moore

Figures 4, 5

*Raumahara judithae* Moore, 1981: 959, figs 14, 15.

*Type material:* Holotype. Tasmania, Tinderbox, from algae, 3–4 m, BMNH 1980:187 (female, 1.5 mm).

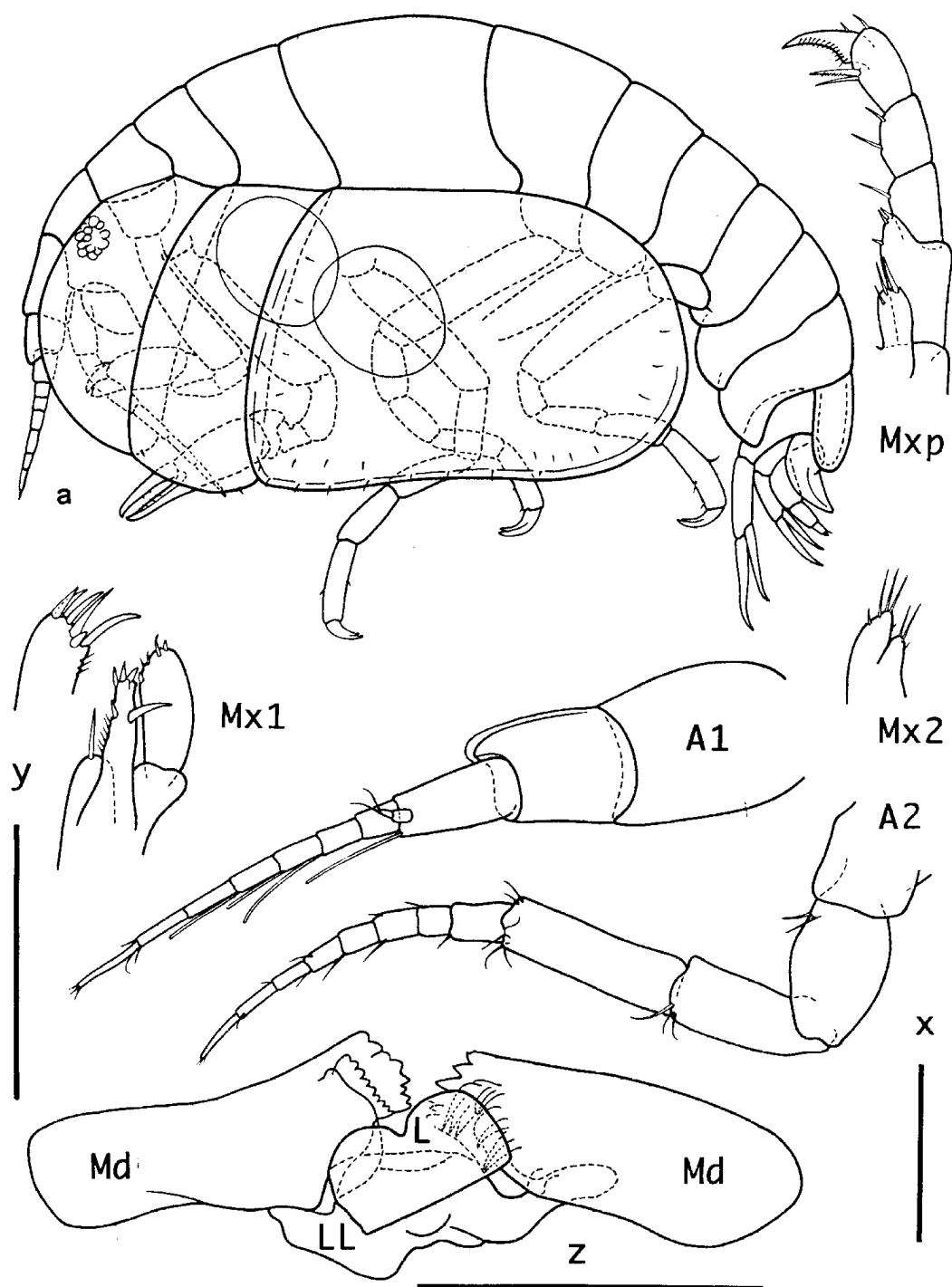


Figure 4. *Raumahara judithae* Moore. Habitus female, 1.8 mm; antenna 1, 2, maxilliped at scale  $x = 0.1$  mm; maxillae 1, 2 at scale  $y = 0.1$  mm; mouthpart-complex (mandible, upper and lower lip) at scale  $z = 0.1$  mm.

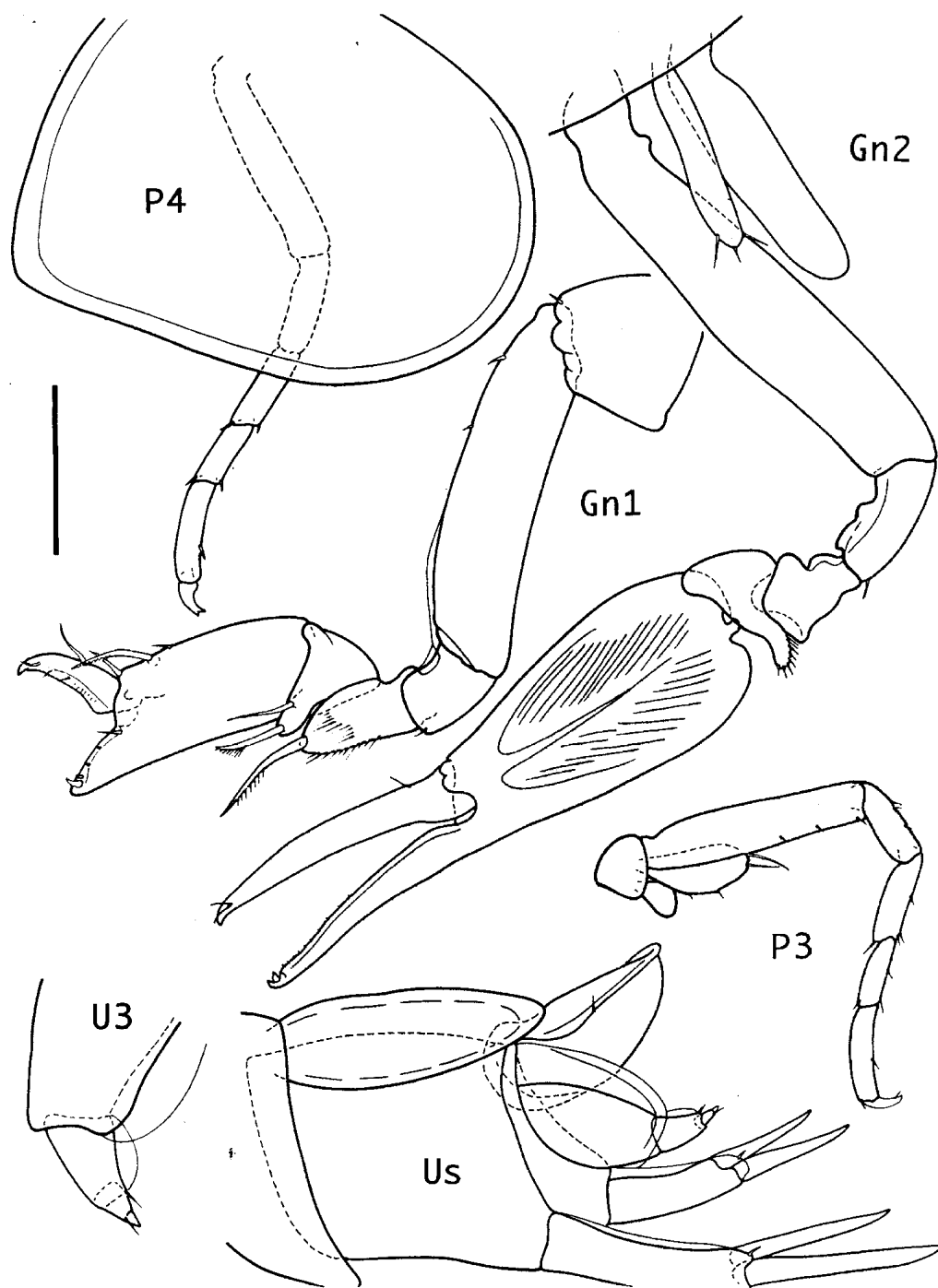


Figure 5. *Raumahara judithae* Moore. Gnathopods 1, 2, urosome at scale = 0.1 mm; pereopods 3, 4 at scale = 0.2 mm; uropod 3 in free enlargement.

*Material examined.* Western Australia, Albany, ZMH K38785 (2). South Australia, Kangaroo Island, ZMH K38210 (3).

*Diagnosis.* Antenna 1 peduncular article 2 nasiform, swollen; accessory flagellum with 2 articles. Antenna 2 article 3 bulbous. Mandibular palp lacking. Gnathopod 1 propodochelate. Gnathopod 2 propodochelate, propodus strongly bulging anteroproximally and less slender than in other species; dactylus about 40–50% of propodus length. Urosomite 1 with fold vaulting over urosomite 2 and insertion of telson; uropod 3 ramus with 2 articles, article 2 minute, vanishing, spiniform, articulation between article 1 and article 2 vanishing; telson boat-like, three-dimensional, proximally coalesced with urosomite 3, inserted horizontally.

Length 1.2–2.0 mm.

*Distribution.* Tasmania; Kangaroo Island (South Australia), Albany (Western Australia); 3–4 m depth.

*Biology.* Female ovigerous in November and December.

*Remarks.* Gnathopod 1 propodus has 1 or 2 medial (plus 1 distal) spines anteriorly. Gnathopod 2 appears to be more powerful than in other species, the bulbous basis of propodus showing strong bundles of muscles. Because of the “wings” or septae on urosomite 3 the insertion of uropod 3 is partly hidden. Uropod 3 ramus article 2 is reduced to a tiny, spine-like peak on article 1, and the articulation is scarcely visible. But, as mentioned by Barnard (1974: 113), article 2 shows always (as in article 1) a seta at its insertion and this indicates the region of the barely observable articulation. Coxa 4 is trapezoid, anteriorly deeper than posteriorly, only little overlapping coxa 3.

The urosome is specialised compared to other members of this genus being the only species with the rami of uropod 1 clearly different in length, while in uropod 2 the rami are as in all species slightly unequal. Uropod 3 is reduced, directly in line with the lengthened urosomite 3 as a robust, solid short cone with spine-like article 2 nearly fused to article 1. Spination is extremely poor; uropod peduncles have only one spine each, rami are smooth, and the telson has 0–2 setae.

The species was described from a single specimen and has not been reported again until now.

### *Raumahara waroona* sp. nov.

Figures 6, 7

*Material examined.* Holotype. Western Australia. Groyne, Cape Peron (32°16'S, 115°41'E), R. Springthorpe, AM P54514 (1 slide, sex?, 1.2 mm).

Paratype. Type locality, AM P54515 (1 specimen in alcohol, sex?, 1.2 mm).

Additional material. Type locality, AM P54516 (2 specimens in alcohol); AM P54517–P54520 (4 slides).

*Diagnosis.* Antenna 1 peduncular article 2 with strong process dorsally. Antenna 2 peduncular article 3 suboval to subrectangular. Mandibular palp lacking. Maxilla 1 palp of 2 articles. Maxilla 2 inner plate reduced. Maxilliped very slender, outer plate short. Gnathopod 1 propodochelate. Gnathopod 2 propodochelate-forcipate, dactylus about 33–40% length of propodus. Urosomite 1 very elongate, with large hump overlapping; urosomite 2 reduced to small triangle; urosomite 3 rectangular, fused with broad basis of telson. Uropods 1 and 2 with subequal rami, subequal to peduncle, without spines or setae; uropod 3 ramus clearly of only 1 article, semicircularly rounded, not reaching ramus insertion of uropod 2, article 2 absent; with 1 apical, centrally inserted, long seta. Hump of urosomite 1 reaching half way along telson. Telson spoon-like, deeply excavated.

Length 1.0–1.2 mm.

*Description.* Body smooth, very similar to most species of *Raumahara*. Head about as long as pereonite 1. Rostrum inconspicuous. Eyes of stenothoid shape, normal. Lateral cephalic lobes shortly produced, rounded. Midcephalic keel and epistome developed. Pereonite 4 about as long as pereonites 1–3 together. Urosomites 1 and 2 free; urosomite 3 broadly coalesced with telson. Urosomite 1 with large dorsal hump vaulting over urosomite 2 and insertion of telson, hump showing similar structure as nasiform process on antenna 1 article 2.

Antenna 1 shorter than antenna 2, as long as head + pereonites 1–3 together (dorsal lengths). Antenna 1 peduncle articles 1 and 3 without process, article 2 nasiform dorsomedially, with very dense aesthetascs; length ratio of articles 1 : 2 : 3, about 5 : 3 : 2 on dorsally visible margin, but articles strongly overlapping; accessory flagellum short, broad, unarticulate, 2 terminal setae; flagellum longer than peduncle, of 7 articles, with many long aesthetascs. Antenna 2 peduncle article 3 suboval to subrectangular, article 3 as long as article 4, article 4 shorter than article 5; flagellum shorter than peduncle, of 7 articles.

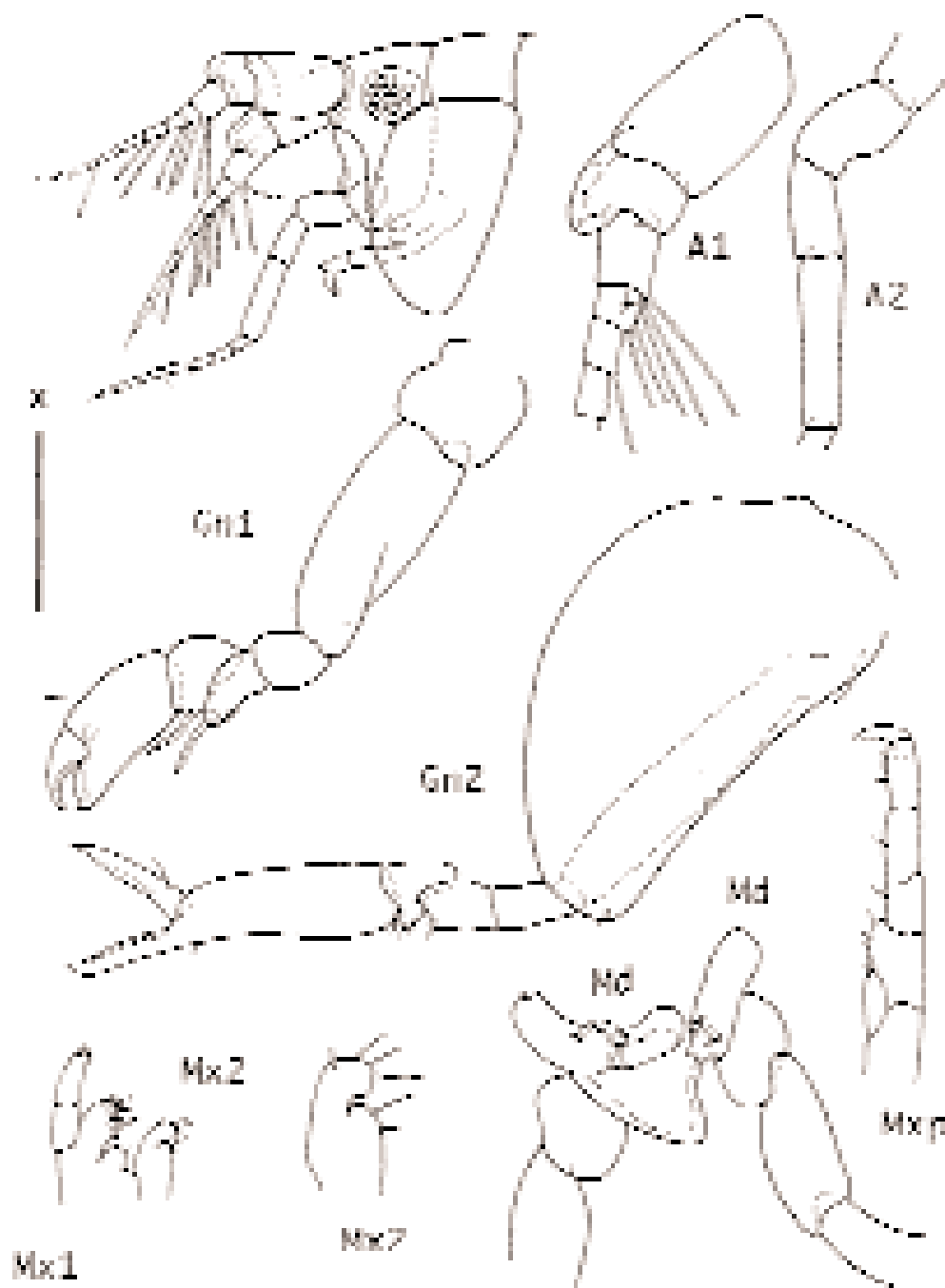


Figure 6. *Raumahara waroona* sp. nov. Antennae 1, 2, gnathopods 1, 2 at scale 0 = 0.1 mm; maxilla 1, 2, mandible, upper lip, maxilliped at scale y = 0.1 mm; maxilla 2 in free enlargement.

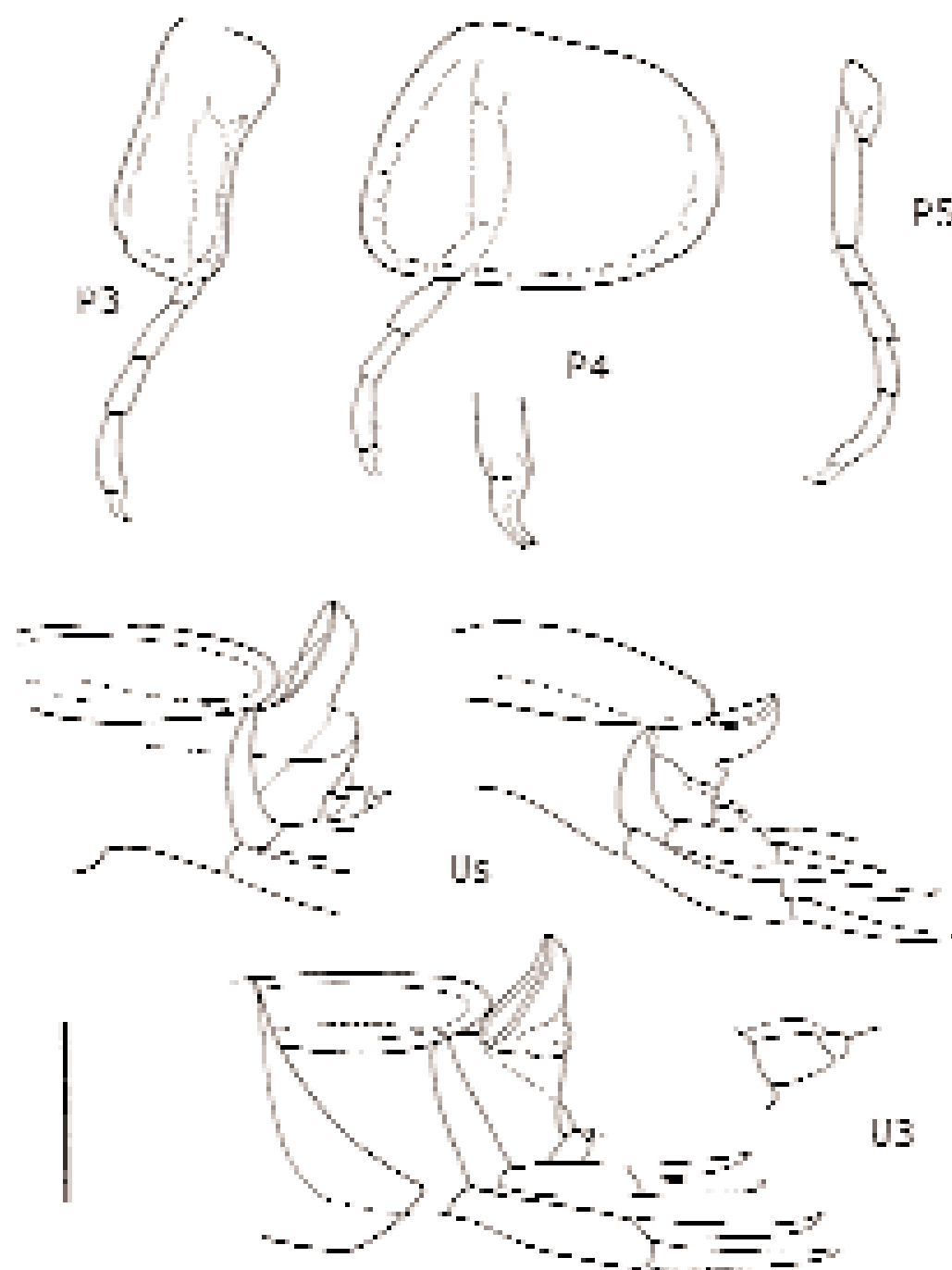


Figure 7. *Raumahara waroona* sp. nov. Pereopods 3, 4, 5 at scale  $x = 0.1$  mm; urosome from 3 specimens and in different fixation, at scale  $y = 0.1$  mm; uropod 3 in free enlargement.

Upper lip ventrally notched, lobes rounded. Mandible incisor on both sides well developed, left and right mandible not very different; raker spine row developed, of 3 (–4?) spines; molar cusp with 3 robust spines; palp absent. Lower lip inner lobes coalesced, mandibular lobe present. Maxilla 1 inner plate subquadrangular, truncate, with 1 subapical seta; outer plate with 1 medio-distal long seta, apically armed with 4 serrate, robust spines, 1 stout simple spine and 1 thin, short and stiff one; palp biarticulate, ratio of lengths, 2 : 5, extending much beyond outer plate, with few spines and teeth apically and medioapically. Maxilla 2 inner plate reduced, short, and outer plate curved over inner plate (always, or artefact in slide?); outer plate apically with 3 long setae, 1 on outer margin; inner plate with 1 long apical seta, 1 shorter on inner margin medio-distally. Maxilliped inner plate reaching half length of ischium, with 1 seta and 1 spine apically; outer plate reaching one third of merus (= palp article 1); with 1 seta subapically, 1 medially; palp of 4 articles; article 3 (propodus) narrow like article 2; propodus distally and dactylus inner margin furry.

Gnathopod 1 shorter than gnathopod 2; coxa 1 reduced, subquadrate, covered by coxa 2; merus posterodistally rounded, about as long as triangular carpus, which is slightly produced between merus and propodus; propodus rectangular, anterior margin slightly convex, with 1 seta; posterior slightly concave; length : breadth about 2 : 1; propodochelate, palm armed with small distal and medial spines; palmar corner curved upwards; dactylus about 40% of propodus length. Gnathopod 2 propodochelate-forcepate; coxa 2 expanded, longer than basis, anterior margin regularly convex, posterior one nearly straight, ventrally rounded; posterior and posteroventral margin with single, short spines; ischium longer than merus; carpus subtriangular, lobe with dense, short setae, distoapically some longer ones; propodus slender, length ratio of dactylus: total propodus = 33–40%; terminally a hooked cusp and notch, but no defining spines; dactylus also terminally hooked, matching well with the propodal notch.

Pereopods 3 and 4 slender, subequal; dactylus about half propodus length, hind margin on inner and outer surface with dense, stiff setae; coxa 3 more than twice as deep as wide. Coxa 4 dominant, wider than deep, front margin slightly convex, ventral margin straight or very slightly concave, posterior margin strongly convex, anteriorly deeper than posteriorly. Pereopods 5–7

slender, ratios of corresponding articles only slightly different; dactylus with prominent setal comb on anterior margin inside and outside; coxae 5–7 short; coxa 5 trapeziform, produced posterodistally; coxa 6 oblong, roundly produced posteriorly; coxa 7 blunt.

Uropod 2 extending less far posteriorly than uropod 1, uropod 3 very short. Uropod 1 peduncle subequal to subequal rami, without spines, setae or pectination. Uropod 2 peduncle as long as subequal rami, inner one inserted more proximally; no spination or pectination like uropod 1. Uropod 3 ramus consisting of 1 clear article, semicircular, not reaching ramus insertion of uropod 2, article 2 absent; with 1 apical long seta, centrally inserted. Urosomite 1 very long, large hump vaulting over urosomite 2 and shortly over telson insertion; urosomite 2 reduced to small triangle; urosomite 3 rectangular, fused with broad basis of telson.

Telson spoon-like, shorter than uropod 1 rami, about half length of hump of urosomite 1, horizontally inserted, deeply excavated and with characteristic semicircular hump proximoventrally; insertion of telson three-dimensionally thickened and fused with urosomites 3 and 2.

*Distribution.* Cape Peron, Western Australia.

*Etymology.* This material was found on Cape Peron, south of Perth. A nearby locality with an aboriginal name is Waroona, which with its double “o” reminded me of *R. dertoo*, the closest species.

*Remarks.* This species is very similar to *R. judithae*. While in *R. noko* uropod 3 is composed of peduncle and a biarticulate ramus, in *R. dertoo* and *R. judithae* article 2 is vanishing; in *R. waroona* sp. nov. no traces of article 2 are to be found, article 1 is as long as wide and bears apically one long seta. Thus this new species resembles the genus *Chucullba* in having uropod 3 reduced to only one article, probably the peduncle, with the — steadily present — apical long seta. Also, maxilla 2 of the present species is similar to *Chucullba* but the latter has fewer setae. Finally, reduced body length is common to both. While basic *Raumahara* females are ovigerous at 2 mm, the new species, *R. waroona*, reaches only 1.2 mm and the specialised species of *Chucullba* are also rarely longer than 1 mm. However, the morphology of the gnathopods and the nasiform swollen antenna 1 article 2 (instead of article 1) places this new species undoubtedly in *Raumahara*.

***Raukumara* gen. nov.**

*Type species. Raumahara rongo* Barnard, 1972b.

**Diagnosis.** Antenna 1 ordinary, peduncle slender. Mandibular palp lacking. Maxilla 2 plates ordinary, i.e. in tandem, but outer plate unusually slender, with 2 long setae apically. Coxa 4 trapezoid, enlarged. Gnathopod 1 subchelate-rectipalmate. Gnathopod 2 propodochelate-forcinate, strong. Dactylus of pereopods unusually short, inside and outside with comb-like row of setules; propodus to merus feeble, ischium very long. Urosomites free, no dorsal process, but urosomites 2 and 3 triangular, dorsally much shorter than ventrally; urosomite 1 longer than urosomites 2+3 together. Uropod 3 ramus of 2 articles. Telson flat, but spoon-like and excavated dorsally, horizontally inserted, basically fused with urosomite 3.

**Etymology.** For the Raukumara Range on Auckland Island, New Zealand, alluding also to *Raumahara* which the new genus resembles (feminine).

**Remarks.** Barnard (1972b: 318) wrote “The retention of *R. rongo* in *Raumahara* is provisional and based on the probability that other species will be discovered that will clarify the generic partition of the thaumatelsonin stenothoids.”

Characters shared with species of *Raumahara* are: antenna 2 peduncular article 3 ovoid, as in *R. dertoo*; shape of gnathopod 2 with dactylus c. 40% of propodus as in *R. judithae*; a comb of setules on inner and outer sides of pereopodal dactyli; the pereopodal dactyli bifid as in all species of *Raumahara*; urosomite 3 and peduncle uropod 3 forming transparent “wings” dorsally; and the telson basically coalesced with urosomite 3.

Differences from specialised species of *Raumahara* and *Ptychotelson* gen. nov. are: antenna 1 peduncular article 2 ordinary, slender (even in hyperadults), and urosomite 1 ordinary, without dorsal prolongation, and not longer than urosomites 2+3 together.

One character shared with *Ptychotelson* is the subchelate-rectipalmate first gnathopod.

The characters unique to *Raukumara* are: pereopods 3–7 dactyli extremely short, their propodus to merus elongate, feeble, and ischium very long, 3–4 times as long as wide (versus twice as long as wide in other genera).

This new genus differs from the others in the following main characters: from *Raumahara* and *Ptychotelson* gen. nov. in the shape of antenna 1 peduncular article 2; ratio of gnathopod 1 to

gnathopod 2; shape of pereopods 3–7; length of urosomite 1 and spination of uropod 1 peduncle. It differs from *Raumahara* in having the gnathopod 1 subchelate-rectipalmate and from *Ptychotelson* in having no mandibular palp.

Removal of this species from the (now monophyletic genus) *Raumahara* seems justified.

***Raukumara rongo* (Barnard) comb. nov.**

Figure 8

*Raumahara rongo* Barnard, 1972b: 160–162, figs 91, 92.

**Type material.** Holotype. New Zealand, Kaikoura, NZOI 102 (female, 2.1 mm).

**Material examined.** Type locality. USNM 2304273 (3 ovigerous females, 1.8–2.0 mm; 2 juveniles in alcohol). USNM 230427 (1 female, 1.9 mm, on slide).

**Diagnosis.** Antenna 2 peduncular article 3 ovoid. Coxa 2 anterior margin more parallel to posterior one, less concave than in species of *Raumahara*. Gnathopod 2 propodochelate, dactylus more than one third (about 40%) propodus, proximally thickened; propodus gnathopod 1 less than half as long as that of gnathopod 2. Coxa 4 trapezoidal, anteriorly deeper than posteriorly. Urosomite 3 and uropod 3 peduncle with transparent “wing” dorsally. Uropod 3 ramus with spine-like article 2, about as long as article 1. Telson like a flat spoon.

Length 1.5–2.0 mm.

**Distribution.** New Zealand (Kaikoura, Gisborne, Whangaparaoa Peninsula, Leigh). *Caulerpa brownii*, 5–6 m; in crevices in *Durvillaea*-zone, barnacles encrusted with sponge.

**Biology.** Female ovigerous in January.

**Remarks.** The “missing seta on maxilla 1 IP” (Barnard 1972b: fig. 92e) is present as in other species. The telson is horizontally flat but not stenothoid-like, as it is dorsally excavated like a flat canoe or spoon, and — more importantly — proximally thickened and coalesced with urosomite 3. The “numerous setules” of Barnard’s description are totally lacking within his type series but are probably crystals derived during preservation.

***Pycnopyge* gen. nov.**

*Type species. Prothaumatelson carinatum* Shoemaker, 1955.

**Diagnosis.** Antennae 1 and 2 ordinary; accessory flagellum of 1 rudimentary article. Mandibular palp lacking. Maxilla 1 palp long, no articulation



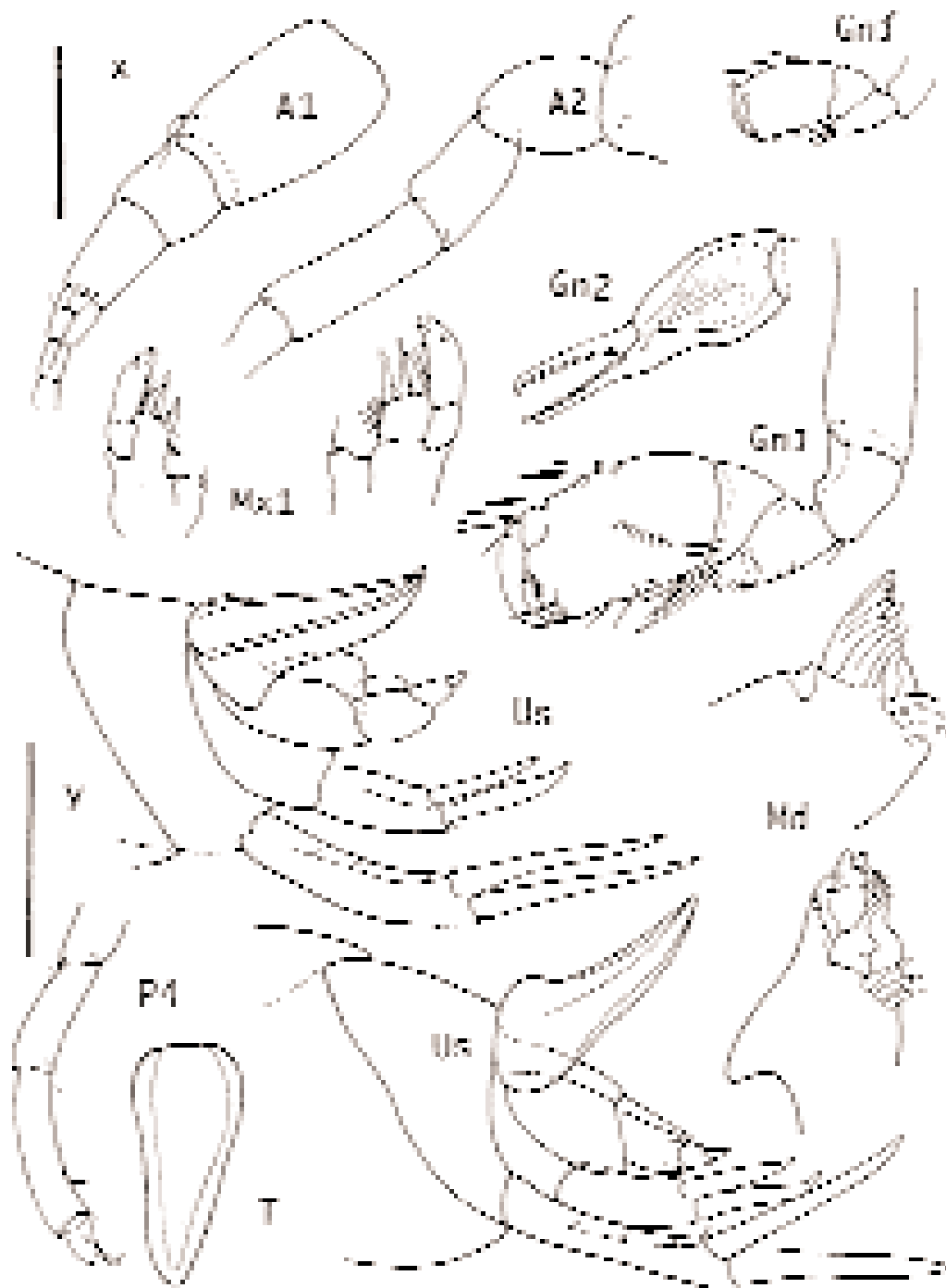


Figure 8. *Raukumara rongo* (Barnard). Maxilla 1 (left), antenna 1, 2, gnathopod 1, pereopod 4 distally, urosome of 2 specimens, telson at scale 0 = 0.1 mm; maxilla 1 (right) at scale y = 0.1 mm; mandible at scale y = 0.05 mm; gnathopod 1', gnathopod 2 at scale x = 0.2 mm.

concernable, thus of 1 article. Maxilla 2 ordinary. Maxilliped outer plate vanishing, inner plate fused. Gnathopod 1 subchelate. Gnathopod 2 propodochelate-forcinate. Pereonite 4 very large. Urosomite 1 with dorsal fold, but not overlapping urosomite 2; thus uropod 2 lies over not after uropod 3. Urosomites 2 and 3 coalesced so that uropod 3 lies over, not after, uropod 3. Uropod 3 ramus article 2 well developed. Telson flat, horizontal, not coalesced with urosomite 3, not spoon-like or dorsally excavated.

**Etymology.** The Greek word *pyge*, *pygaion* means rump, back, while *pyknos* (Greek) signifies a condensed, thickened area. Together they describe the special habitus, the dorsal fold on urosomite 1 not overlapping urosomite 2, and the fusion of urosomites 2 and 3 (neuter).

**Remarks.** Shoemaker (1955) described, inadequately, a species from Alaska as *Prothaumatelson carinatum*. Barnard (1972a) removed it from that genus, assigning it provisionally to *Raumahara*, although he lacked information about important details.

Characters shared with *Raumahara* are: urosomite 1 with a dorsal fold (but only protecting urosomite 1 and not vaulting over urosomite 2 as in *Raumahara*); propodochelate gnathopod 2.

Differences from *Raumahara*: antennae 1 and 2 peduncles ordinary, flagellae reduced, very short (versus article 1 nasiform or article 2 swollen to nasiform in *Raumahara*); maxilla 1 palp without discernable articulation, thus probably 1-articulate (v. 2 articles); maxilla 1 outer plate very broad and blunt, subquadrate (v. slim); maxilliped outer plate vanishing (v. present); gnathopod 1 propodus subchelate, without palmar corner (v. chelate-subchelate-rectipalmate), carpus and merus strongly lobate (v. ordinary); pereopods 3–7 dactyli ordinary, very long, longer than half propodus, smooth (v. with a characteristic double row of setae inside and outside); oostegites large (v. small); uropod 1 peduncle clearly longer than rami (v. about equal); urosomite 1 with thickened fold dorsally, but not overlapping the rest of urosome (v. vaulting over urosomites 2 and 3 and part of telson); urosomites 2 and 3 coalesced (v. free); telson ordinary (v. coalesced with urosomite 3, thickened proximally, spoon-like excavated dorsally).

Removal from (the exclusively Australian) *Raumahara* is necessary and a separate genus justified.

***Pycnopyge carinatum* (Shoemaker) comb. nov.**

Figures 9, 10

*Prothaumatelson carinatum* Shoemaker, 1955: 33–34, fig. 13.

*Raumahara carinata*. — Barnard, 1972a: 318.

**Material examined.** Type specimens. Off Point Barrow, Alaska, USNM 181883 (1 slide). USNM 195166 (4 specimens in alcohol).

**Diagnosis.** Antennae 1 and 2 ordinary, both with very short flagellum; accessory flagellum rudimentary article. Mandibular palp lacking. Gnathopod 1 subchelate, no palmar corner; carpus strongly and merus weakly lobed. Gnathopod 2 propodochelate, dactylus about 40% of propodus length. Pereopods 3–7 dactyli very long, longer than half propodus, smooth. Urosomite 1 dorsally thickened as a fold, not overlapping. Urosomites 2 and 3 coalesced. Uropod 1 peduncle exceeding rami. Uropod 3 ramus of 2 articles, well developed. Uropod 3 exceeding uropod 2 peduncle. Telson flat, horizontal, not coalesced with urosomite 3.

Length 1.8–3.0 mm.

**Distribution.** Arctic Ocean, Alaska, off Point Barrow (USA). 217 ft (66 m), perforated rocks, stones.

**Remarks.** Though having chelate gnathopod 2, this species does not belong to the (southern Australian-Antarctic) thaumatelsonine stenothoids, as the telson is not fused with urosomite 3, nor spoon-like or dorsally excavated, and the palp of maxilla 1 has only one article. Fortification of the urosome is created in another way, and chelation of gnathopod 2 is probably a homoplasious development in Arctic regions.

***Ptychotelson* gen. nov.**

**Type species.** ?*Raumahara virduorum* Krapp-Schickel and Andres, 1998.

**Diagnosis.** Antenna 1 peduncular article 2 swollen. Mandibular palp of ordinary length, articulation doubtful, seemingly articles coalesced; maxilla 2 ordinary. Coxa 4 trapezeshaped, enlarged. Gnathopod 1 subchelate-rectipalmate, gnathopod 2 propodochelate-forcinate. Urosome segments free, urosomite 1 with dorsal fold vaulting over urosome, > urosomite 2 + 3; uropod 3 ramus 2 articles well developed. Telson spoon-like excavated dorsally, horizontally inserted, proximally coalesced with urosomite 3.

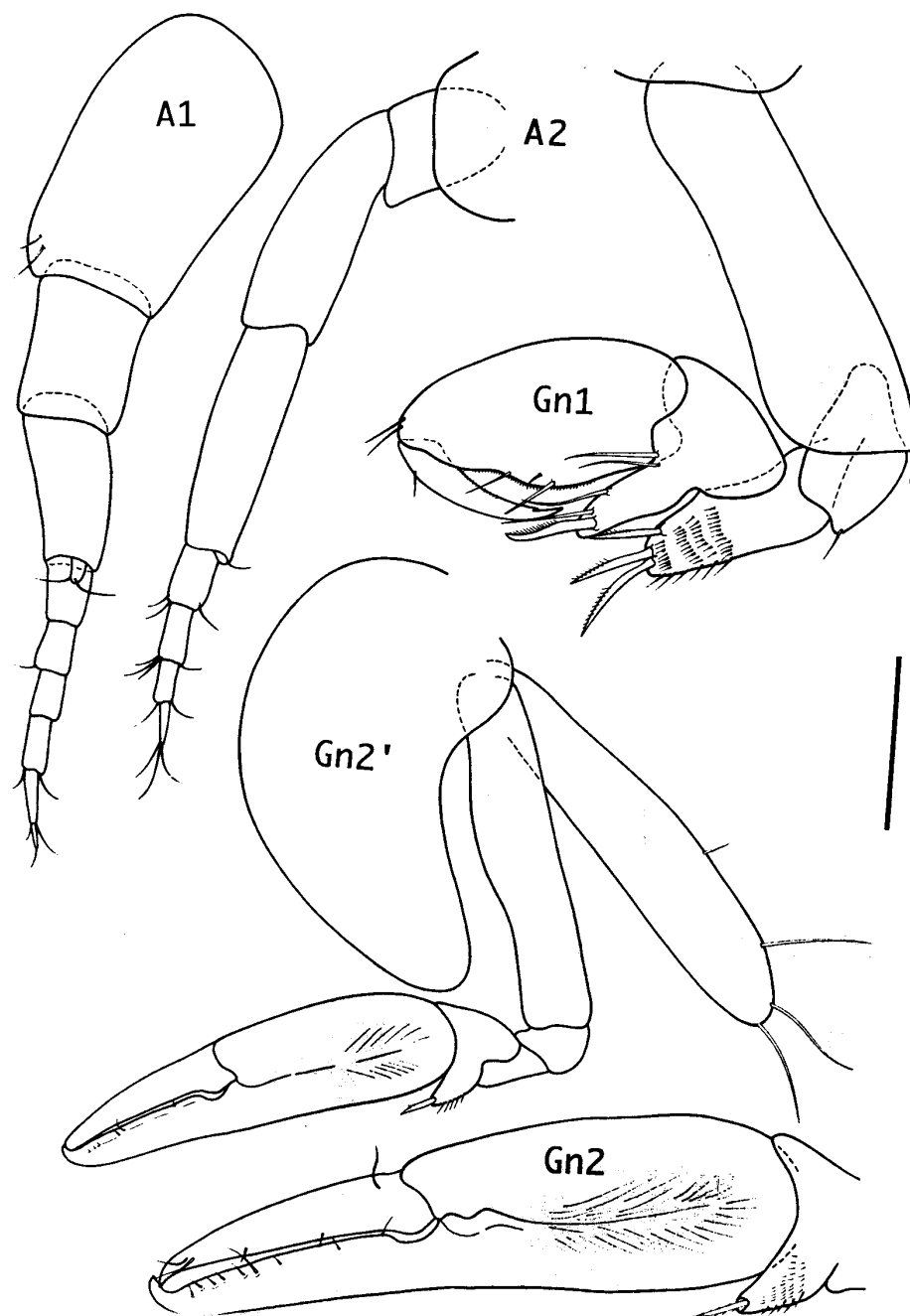


Figure 9. *Pycnopyge carinatum* (Shoemaker). Antennae 1, 2, gnathopods 1, 2 (detail) at scale = 0.1 mm; gnathopod 2' (complete) at scale = 0.2 mm.

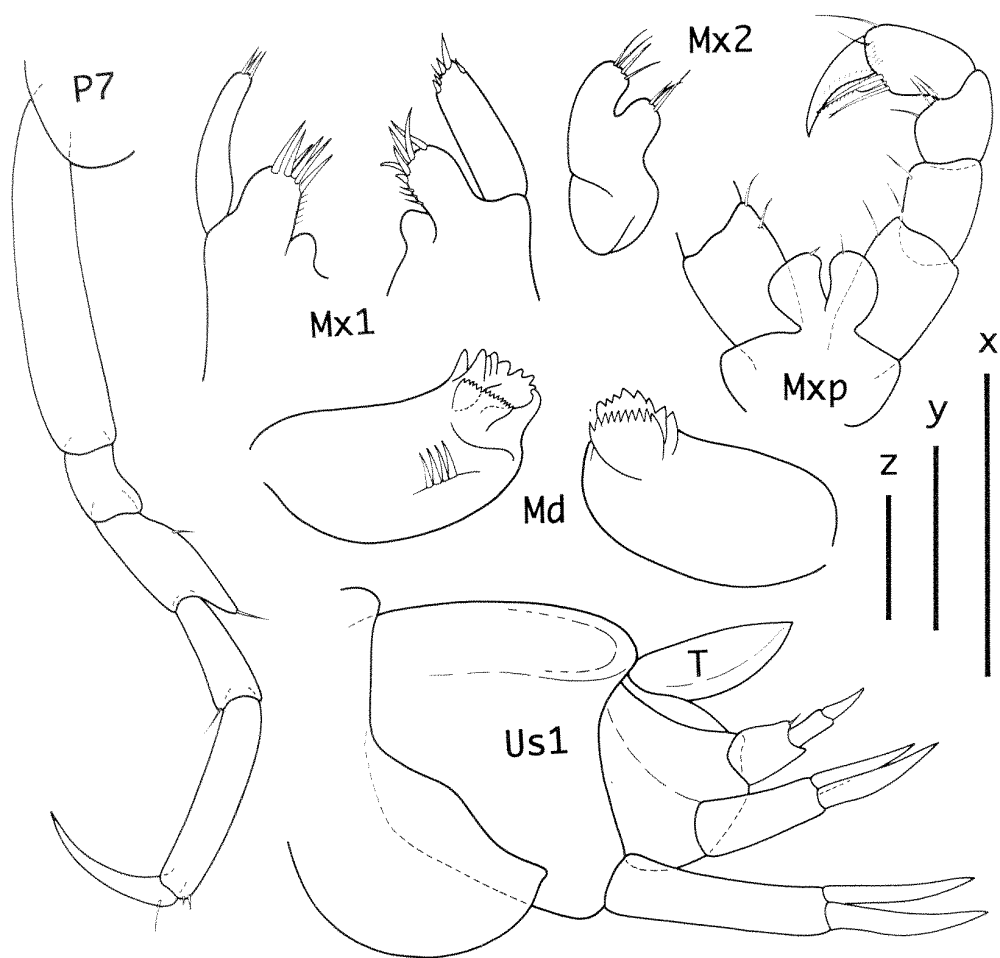


Figure 10. *Pycnopyge carinatum* (Shoemaker). Maxilla 1 at scale  $x = 0.1$  mm; mandible, maxilla 2, maxilliped at scale  $y = 0.1$  mm; pereopod 7, urosome at scale  $z = 0.1$  mm.

**Etymology.** Greek *ptyx*, *-ychos* means fold, referring to the three-dimensional, boat- or spoon- shaped telson and process of urosomite 1 overlapping the urosome like a fold or pleat.

**Remarks.** Krapp-Schickel and Andres (1998) were doubtful of the generic placement of *?Raumahara viridurorum* and recognised that a thorough revision was needed to understand its relationship to other species with subchelate-rectipalmate gnathopod 1 or long mandibular palp. Now, after a detailed study of type material, it can be shown that the two species with similar gnathopod 1 are not closely related. *Prothaumatelson nasutum* has a vertical telson but very similar mandibular palp; *Raukumara rongo* has a less

specialized urosome, a non-swollen ordinary antenna 1 peduncle and lacks a mandibular palp.

With the closely related species of *Raumahara*, *R. dertoo*, *R. noko*, *R. judithae* and *R. waroona*, the new taxon shares specialised characters of “swollen” antenna 1 peduncular article 2 (in *R. dertoo* only weakly), propodochelate gnathopod 2, a row of setae inside and outside dactyli of pereopods 3–7, special construction of the urosome with its combination of vaulting urosomite 1 and excavated telson. *Ptychotelson* is less specialised in the mandibular palp being of ordinary length (probably 1-articulate) and the gnathopod 1 subchelate-rectipalmate.

This new genus differs from its nearest

relatives in the following main characters: from *Raukumara* in antenna 1 peduncular article 3 swollen and produced (versus slender, ordinary); mandibular palp long (v. absent); urosomite 1 with a thick fold fortifying the urosome (v. urosomite 1 lengthened but not thickened or folded); and from *Raumahara* in long mandibular palp (v. reduced to a short stump or absent); and gnathopod 1 subchelate-rectipalmate (v. chelate).

***Ptychotelson virdurorum***

(Krapp-Schickel and Andres) comb. nov.

Figures 11, 12

?*Raumahara virdurorum* Krapp-Schickel and Andres, 1998: 56–58, figs 1, 2.

*Material examined.* Holotype. South Australia. Steatford Bay, Port Lincoln, ZMH K38388 (ovigerous female, 1.6 mm, 1 slide). Type locality, ZMH K38389 (41 specimens in alcohol). Victoria. Point Lonsdale, ZMH K308390 (4); Cape Otway, NMV J39258, J39264, J39265 (3 slides); Port Phillip Bay, CTK (1 slide).

*Diagnosis.* Antenna 1 peduncular article 2 dorsally prolonged and swollen (sometimes article 1 also a little thickened). Antenna 2 peduncular article 3 subquadrate. Mandibular palp well developed, but no articulation visible. Gnathopod 1 subchelate-rectipalmate. Gnathopod 2 propodochelate-forcinate, dactylus c. one third propodus. Urosomite 1 with thick fold vaulting over urosome and insertion of telson. Uropod 3 ramus with 2 articles. Telson spoon-like, three-dimensional, proximally coalesced with urosomite 3, inserted horizontally.

Length 1.0–1.6 mm.

*Distribution.* South Australia to Victoria; intertidal, algae (mostly Rhodophyceae including corallines and epiphytes).

*Biology.* Female ovigerous in December.

*Remarks.* Drawings of young and adult specimens are presented to show how ratios on limbs and body segments change with age. This allometry can also be noticed in *R. judithae* and *R. waroona*.

***Chucullba* Barnard**

*Chucullba* Barnard, 1974: 108.

*Type species.* *Chucullba alla* Barnard, 1974 (original designation).

*Diagnosis.* Antenna 1 peduncular article 1 weakly swollen or with strong nasiform process; accessory flagellum of 1 very short article. Antenna 2 peduncular article 3 subrectangular or

trapezoidal. Mandibular palp lacking, mandible body vestigial. Maxilla 1 palp biarticulate. Maxilla 2 outer plate riding upon reduced inner one, plates partly coalesced. Maxilliped outer plate vanishing. Gnathopods 1 and 2 propodus very similar, subchelate, rectangularly lengthened, palm shorter than posterior margin which is parallel to anterior one. Pereopods 3–7 similar, basis rectilinear, ischium elongate, length much greater than twice breadth (cf. *Raukumara*); dactyli smooth or with comb of setae. Pereonite 4 elongate, longer than head + pereonites 1–3. Urosomites 2 and 3 coalesced basally. Uropods 1 and 2, dorsal margins of peduncle and rami pectinate, inner ramus shortened. Uropod 3 reduced to 1 short article (probably peduncle) plus long seta. Telson spoon-like, three-dimensional, proximally coalesced with urosomite 3, inserted horizontally, deeply excavated.

*Remarks.* Strong processes on antenna 1 also exist in *Raumahara*, but on article 2 and not, as here, on article 1. The maxilla 2 has riding plates as in *Raumahara waroona*. Gnathopods 1 and 2 have propodi alike and with lengthened parallel margins as is found in *Parathaumatelson*. The characteristic comb on dactyli of pereopods 3–7, inside and outside, always present in *Raumahara*, is present in one species of *Chucullba* and absent in the other. Uropodal rami are reduced to a different degree also in *Raumahara*. However, in the latter urosomites 2 and 3 are separated, though dorsally narrowed and ventrally much wider, thus giving a triangular shape in lateral view while in *Chucullba* articulation between urosomites 2 and 3 is scarcely visible. *C. alla* is more specialised than *C. warea* in antenna 1, maxilla 1, gnathopods, pereopodal dactyli (only one seta instead of a comb), length of uropods 1 and 2 inner ramus, and length of uropod 3.

Antenna 2 peduncular article 4 is always shorter than article 5 in *Raumahara*, *Pycnopyge*, *Raukumara* and *Chucullba*, whereas it is always longer in *Yarra*, *Pseudothaumatelson* and *Thaumatelsonella*. As the members of the first group live in shallow algae and the latter predominantly in deeper sands, this difference could be correlated with feeding behaviour.

***Chucullba alla* Barnard**

*Chucullba alla* Barnard, 1974: 108–110, figs 65, 66.

*Type material.* Holotype. Western Australia. Middleton Beach, Albany, intertidal, sandy rocks, coralline algae, WAM 134-71 (female, 1.41 mm).

*Material examined.* Western Australia (USNM, 141159; 141160 (4 specimens in alcohol); AM P43271

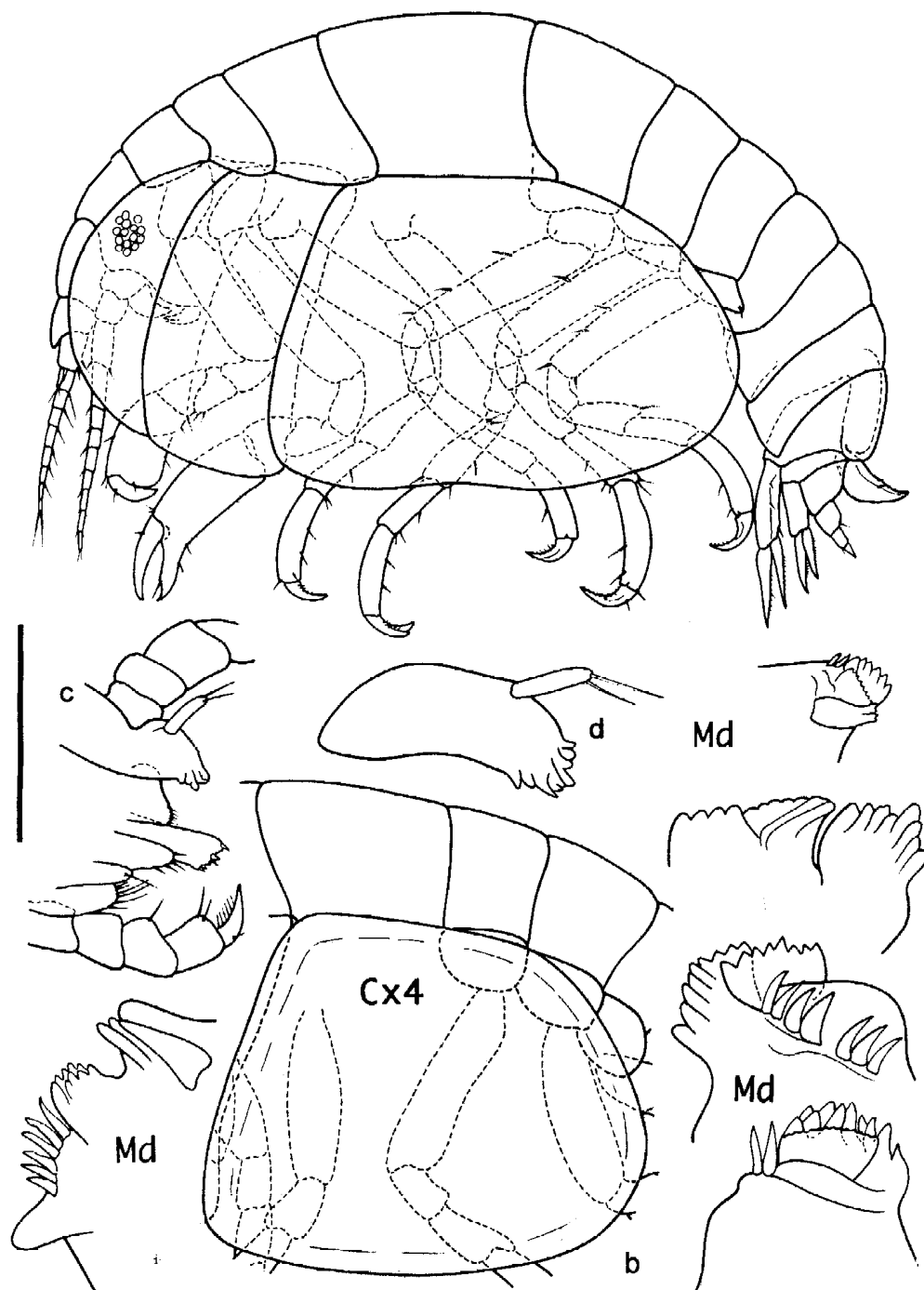


Figure 11. *Ptycholaelson viridurorum* (Krapp-Schickel and Andres). a, habitus of adult female, 1.6 mm. b, middle of body of juvenile, 1.1 mm. c, sketch of mouthparts in situ, d, complete mandible and distal part seen from other side; other figures, 4 enlargements of different views of mandible at scale = 0.025 mm.

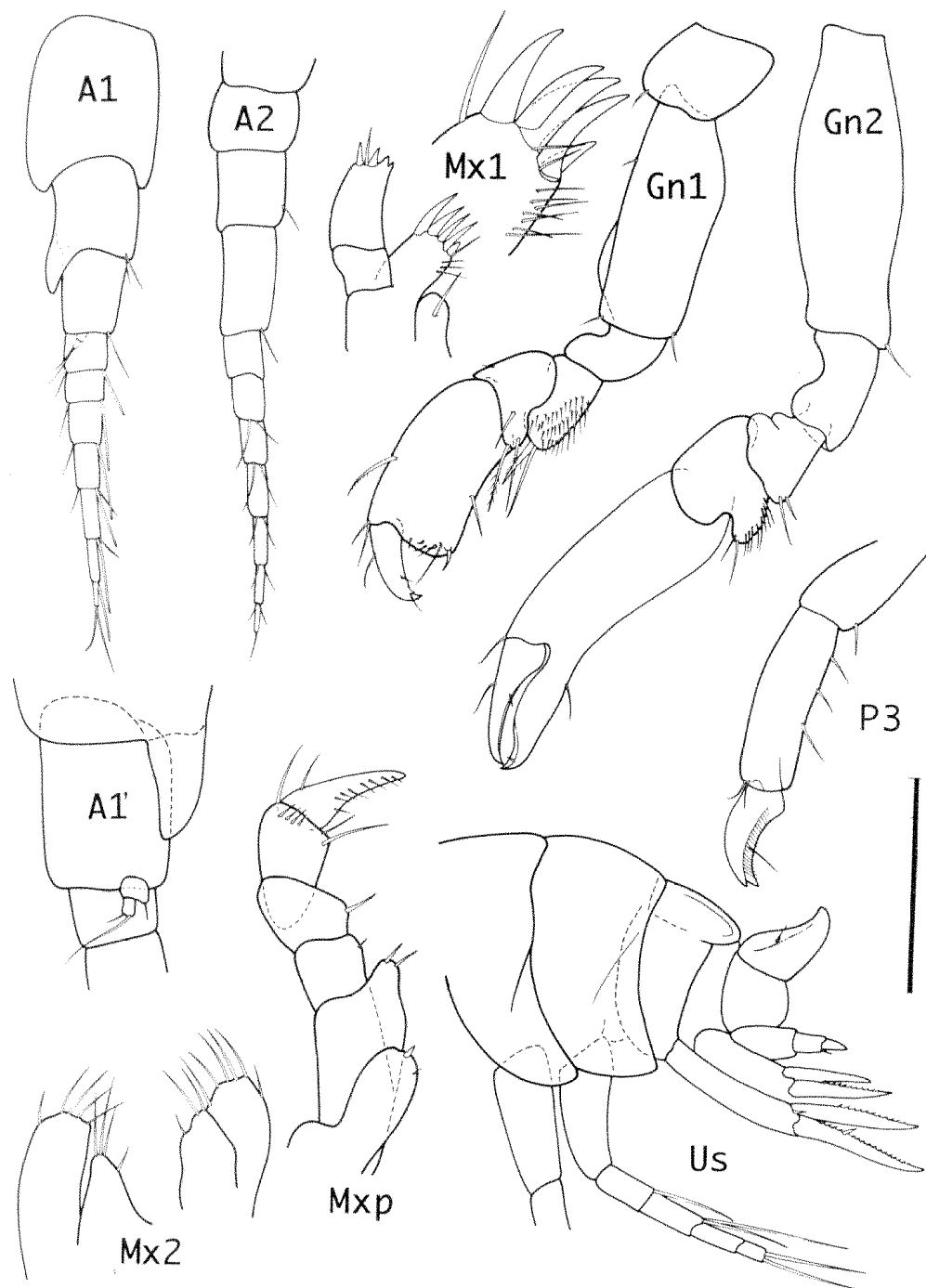


Figure 12. *Ptychotelson viridurorum* (Krapp-Schickel and Andres). Antennae 1, 2, gnathopods 1, 2, pereopod 3 or 4 distally, urosome at scale = 0.1 mm; maxilla 1, 2, maxilliped, antenna 1' at scale = 0.05 mm; maxilla 1 outer plate enlarged.

(1 specimen in alcohol). Western Australia. Cape Naturaliste, ZMH K38213; Margaret River, ZMH K38215, K38216; Walpole-Albany, ZMH K38217, K38219, K38220, K38221. South Australia. Ceduna-Adelaide, ZMH K38217, K38224. Victoria. Melbourne, Geelong, ZMH K38218d. (In all c. 100 specimens in alcohol).

**Diagnosis.** Midcephalic keel weak. Antenna 1 peduncular article 1 strongly nasiform, largely to totally overlapping article 2. Maxilla 1 inner plate lacking seta. Maxilla 2 in riding position but separate lobi still distinguishable. Gnathopods 1 and 2 similar, rectangularly lengthened, with parallel margins, but gnathopod 1 palm oblique and gnathopod 2 palm nearly subchelate-rectipalmate. Pereopods 3–7 dactyli smooth. Urosomite 1 with thick fold vaulting over urosome and insertion of telson. Uropod 3 consisting of 1 minute article and short, tiny seta.

Length 1.1–1.4 mm.

**Distribution.** Western Australia to Victoria. Intertidal, sandy rocks and coralline algae.

**Biology.** Female ovigerous at end of September.

#### *Chucullba warea* Barnard

*Chucullba warea* Barnard, 1974: 110–112, figs. 67, 68.

**Type material.** Western Australia. Cape Naturaliste, intertidal, algae and rocks, WAM 135-71 (female, 1.19 mm).

**Material examined.** Type locality, USNM 230428, USNM 141161 (2 specimens in alcohol). Cape Naturaliste, ZMH K38214 (2). South Australia, Ceduna, ZMH K38223 (2).

**Diagnosis.** Antenna 1 peduncular article 1 and article 2 (weakly) swollen. Maxilla 1 inner plate with seta. Maxilla 2 in riding position, lobi fused. Gnathopods 1 and 2 similar, both palms oblique. Pereopods 3–7 dactylus with comb of short setae as in *Raumahara*. Urosomite 1 with thick fold vaulting over urosome and insertion of telson. Uropod 3 ramus with 1 minute article (probably peduncle) and long seta apically.

Length 1.2 mm.

**Distribution.** Cape Naturaliste, Western Australia; Ceduna, South Australia. Intertidal, algae and rocks.

**Biology.** Female ovigerous in September.

#### *Pseudothaumatelson* Schellenberg

*Pseudothaumatelson* Schellenberg, 1931:110.

**Type species.** *Pseudothaumatelson patagonicum* Schellenberg, 1931 (original designation).

**Diagnosis.** Antenna 1 peduncular article 1 nasiform, accessory flagellum of 1 article. Mandibular palp present, stout, without articulation, as long or longer than incisor. Maxilla 1 palp of 2 articles. Maxilla 2 ordinary. Gnathopods 1 and 2 subchelate, shape similar, size different. Pereopods 3–7 bases rectilinear, dactyli smooth. Pereonite 4 elongate. Urosomites 1–3 free; urosomite 1 with long process vaulting over urosomite 2 and most of telson. Telson medium, marginally sclerotized, horizontally inserted, excavated, margins thickened.

#### *Pseudothaumatelson patagonicum* Schellenberg

*Pseudothaumatelson patagonicum* Schellenberg, 1931: 110–112, fig. 60. — Rauschert and Andres, 1991: 228, fig. 1.

*Pseudothaumatelson cyproides*. — Bellan-Santini and Ledoyer, 1986: 425–427, fig. 29. — Branch et al., 1991: 12 [not Nicholls, 1938].

**Material examined.** Syntypes of *Pseudothaumatelson patagonicum*. Falkland Is, NHRS 738 (slide), 3603 (1 ovigerous female in alcohol). Falkland Is, MNB 22802 (1 juvenile in alcohol, partly damaged).

Other material. Prince Edward Is, MVR Cr3389–Cr3397 (slides).

The two other specimens deposited by Bellan-Santini and Ledoyer (1986: 425) in SAM could unfortunately not be found in South Africa or in Marseille.

**Diagnosis.** Antenna 1 peduncular article 1 nasiform. Mandibular palp long, obtuse, without articulation, 2 apical and 1 subapical setae. Gnathopods 1 and 2 subchelate, propodi gnathopods 2 : 1 subequal; on both bases anteriorly few long setae. Gnathopod 1 palmar corner rounded, basis with few setae anteriorly. Gnathopod 2 palmar corner excavated, with distal hump and 2 strong spines. Urosomite 1 with vaulting process. Uropod 1 rami a little different, longer ramus subequal to peduncle. Uropod 2 rami clearly different, both shorter than peduncle. Uropod 3 peduncle shorter than subequal rami. Telson dorsally shallow excavated, fused with urosomite 3.

Length 1.8–2.5 mm.

**Redescription.** After Schellenberg (1931), Rauschert and Andres (1991), material of Bellan-Santini and Ledoyer (1986) and complemented from material examined [square brackets].

Eyes large. Antenna 1 peduncular article 1 nasiform, accessory flagellum [of 1 article]. Mandibular palp as long as incisor, of 1 article, with 2 apical and 1 subapical setae. Gnathopod 1 subchelate, much smaller than gnathopod 2, palm oblique, about same length as posterior margin of



propodus, palmar corner rounded, with spines; basis with a few long setae anteriorly. Gnathopod 2 subchelate (rudimentarily carpochele, as carpus acutely prolonged and propodus proximally narrowed), palm with "pearls" (Bellan-Santini and Ledoyer lacking), distally concave, defined by hump with 2 strong spines; anterior margin smooth or with 1 or 2 long setae; basis with few long setae on anterior margin. Pereonite 4 elongate, as long as pereonites 1–3. Pereopods 5–7 basis rectilinear, with about 12 short setae. Urosomites 1–3 free. Urosomite 1 with process vaulting over urosomites 2 and 3 and overreaching most of telson. Uropod 1 with long, spinose peduncle, longer than barely unequal rami [Rauschert and Andres (fig. 1) show the rami much shorter than peduncle but this is misleading as rami in type material are broken]; uropod 2 peduncle long, spinose, rami unequal, the longer shorter than peduncle. Uropod 3 peduncle robust, article 1 about twice as long as large, article 2 in type material broken [as long as article 1, pointed]. Telson medium, half length of urosomite 1 dorsally, marginally sclerotized, horizontally inserted, shallow excavated, coalesced with urosomite 3, with 2 setae.

*Distribution.* Falkland Islands; Prince Edward and Marion Islands (subantarctic), 95–197 m.

*Biology.* Female ovigerous in November.

*Remarks.* This species was first described from two individuals, reexamined by Rauschert and Andres (1991). Since the description of *Pseudothaumateson cyproides* by Nicholls (1938) it has always been doubtful that two species existed. Barnard and Karaman (1991: 697) stressed the "strong dissimilarity" in the sizes of gnathopods 1 and 2 (less obvious in shapes) but there are many other similarities between the two nominal species. However, their localities are not close: Schellenberg's *P. patagonicum* comes from the Falkland Islands (subantarctic, 197 m), while Nicholls found his *P. cyproides* in Adelie Bay, Antarctica (c. 50 m). Three additional specimens, discovered at more than 95 m depth from subantarctic Marion and Prince Edward Islands (Bellan-Santini and Ledoyer, 1986; Branch et al., 1991) were attributed to *P. cyproides* without discussion. These probably refer to *Pseudothaumateson patagonicum*.

Bellan-Santini and Ledoyer (1986) figured two different 1-articulate mandibular palps; one fits with the description of *P. patagonicum*, the other

one is sitting under the mandible body but has a corresponding length. Their figure of maxilla 1 is misleading (Rauschert and Andres, 1991: 227) but reorientation of the slide (MVR CR3389) could confirm a normally shaped maxilla 1 with 2-articulate palp.

*Distribution.* Falkland Islands; Prince Edward and Marion Islands, 95–197 m.

### *Thaumatesonella* Rauschert and Andres

*Thaumatesonella* Rauschert and Andres 1991: 230.

*Type species.* *Thaumatesonella kingelepha* Rauschert and Andres, 1991 (original designation).

*Diagnosis.* Antenna 1 peduncular article 1 nasiform, accessory flagellum of 1 article. Mandibular palp present, of 3 clearly articulated articles, article 3 slim. Maxilla 1 palp of 2 articles, Maxilla 2 ordinary. Gnathopods 1 and 2 subchelate, shapes similar, sizes different. Pereopods 3–7 bases rectilinear, dactyli smooth. Pereonite 4 elongate. Urosomites 1–3 free. Urosomite 1 with long process vaulting over urosomite 2 and most of telson. Telson medium, horizontally inserted, dorsally excavated.

### *Thaumatesonella kingelepha* Rauschert and Andres

*Thaumatesonella kingelepha* Rauschert and Andres, 1991: 230–235, fig. 1, 2.

*Material examined.* Holotype. King George Island, Antarctica, sublittoral, sponges and bryozoans, 50 m, MNB 27271 (female 2.5 mm). Paratypes. Collected with holotype, MNB 4582–4586 (male 2.1 mm, 2 females 2.4 and 2.6 mm).

Additional material: Near Elephant Islands, Antarctica, fine sand, 260m, ZMH K33480 (male, 1.9 mm), ZMH K33481 (male, 2.1 mm).

*Diagnosis.* Antenna 1 peduncular article 1 nasiform. Mandibular palp of 3 articles. Gnathopods 1 and 2 subchelate, ratio of lengths of propodus gnathopod 2 : 1 less than 2; bases gnathopods 1 and 2 with long, dense setae. Gnathopod 1 palmar corner rounded, carpus distally widened. Gnathopod 2 palmar corner rounded (female) or with small hump and little excavation (male), with 1–2 setae on anterior margin; carpus with triangular process, densely beset with short setae. Urosomite 1 with process vaulting over urosomites 2 and 3 and two-thirds of telson. Uropod 1 rami scarcely different, shorter than peduncle. Uropod 2 peduncle spinose, rami scarcely different, little shorter than peduncle. Uropod 3 strong, peduncle as long

as each article of ramus, each about twice as long as wide. Telson folded, excavated, fused with urosomite 3.

Length 2.1–2.6 mm.

*Distribution.* King George Is and Elephant Is, sublittoral, on Porifera, Bryozoa, sandy bottom. 50–260 m.

*Biology.* Female ovigerous in February.

***Thaumatelsonella cyproides***

(Nicholls) comb. nov.

Figures 13, 14

*Pseudothaumatelson cyproides* Nicholls, 1938: 53–55, fig. 28 [non Bellan-Santini and Ledoyer, 1986: 425–427, fig. 29. —non Branch et al., 1991: 12].

*Type material.* Syntypes. Commonwealth Bay, Antarctica, AM P18730 (1 male, 1 female, 2 mm).

*Material examined:* Cape Bird, AM P43242 (1 specimen, slide).

*Diagnosis.* Antenna 1 peduncular article 1 nasi-form. Mandibular palp of 3 articles. Gnathopods 1 and 2 subchelate, propodus of gnathopod 2 less than twice as long as gnathopod 1; basis of gnathopod 1 with many short setae; basis of gnathopod 2 with many long setae. Gnathopod 1 palmar corner angular. Gnathopod 2 palm rounded (female), distally scarcely excavated, proximally straight (male), without hump. Urosomite 1 vaulting over urosomites 2 and 3 and most of telson. Uropod 1 rami subequal, shorter than peduncle. Uropod 2 rami scarcely different, longer ramus subequal to peduncle. Uropod 3 strong, robust peduncle shorter than ramus article 1, shorter than article 2; peduncle less than twice as long as wide, ramus more than twice as long as wide, ramus article 2 more than 3 times as long as wide. Telson dorsally excavated, fused with urosomite 3.

Length: 2.0–2.1 mm.

*Redescription.* Body smooth. Head shorter than or equal to pereonites 1+2. Rostrum inconspicuous. Eyes of stenothoid shape, normal. Lateral cephalic lobes rounded. Pereonite 4 about as long as pereonites 1–3 together. Urosomites 1 and 2 free. Urosomite 3 broadly coalesced with telson. Urosomite 1 with large dorsal hump vaulting over urosomite 2 and most of telson.

Antenna 1 shorter than antenna 2, as long as head plus pereonites 1–3 (dorsal lengths together); peduncular articles 2 and 3 without process, article 1 elongate, nasiform dorsomedially; ratio of lengths of articles 1 : 2 : 3 about 7 : 4 : 3

(visible margin dorsally, but article 1 strongly overlapping); accessory flagellum short, broad, uniarticulate, with 3 terminal setae; flagellum subequal to peduncle, of 7 articles, with many long aesthetascs. Antenna 2 with article 4 longer than article 5; flagellum subequal to peduncle, of 10 articles.

Mandibular incisors not different, narrow and weak; with 2 broad raker spines; small molar cusp with 2 robust spines; mandibular palp well developed, of 3 articles, distal one much narrower. Lower lip inner lobes coalesced, outer ones regularly rounded. Maxilla 1 inner plate subquadrangular, truncate, with 1 apical seta; outer plate with 4 serrate, robust spines, 1 stout simple spine and 1 thin, short and stiff spine; palp biarticulate, ratio of lengths of articles 2:5, extending much beyond outer plate, with spines apically and 1 seta subapically. Maxilla 2 ordinary, outer plate and inner plate with long setae apically. Maxilliped inner plate reaching two-thirds along ischium, with 1 seta and 1 spine apically; outer plate reaching half along merus (palp article 1); with 1 seta apically, 3 medially; palp of 4 articles; palp article 3 (propodus) narrower than article 2; propodus distal margin and dactylus inner margin setose.

Gnathopod 1 subchelate, much shorter than gnathopod 2. Coxa 1 reduced, subquadrate, covered by coxa 2; basis anteriorly with many dense, short setae; merus setose, posterodistally rounded, about as long as triangular carpus, which is slightly produced between merus and propodus; propodus triangular, anterior margin slightly convex, with 2–3 setae; posterior margin shorter than palm, palmar corner pronounced, with 2 robust spines; ratio length : breadth about 3 : 2, palm armed with long distal and medial spines and setae; dactylus about half of propodus length. Gnathopod 2 subchelate. Coxa 2 expanded, longer than basis, anterior margin convex with slight corner, posterior margin straight, ventrally rounded; posteroventral margin with single, short spine; basis anteriorly densely beset with many long setae; ischium much shorter than merus, which is posterodistally pointed; carpus subtriangular, posterodistal corner reaching proximal third of propodus, moderately pointed, with dense, short setae, distoapically some longer ones; propodus widened, hind margin regularly rounded, with 3 long setae, palm defined by 2 strong spines and a palmar corner of  $>150^\circ$ , no defining hump or excavation; propodus on anterior margin 1 long seta; ratio of lengths of dactylus : propodus = 33–40%, dactylus on inner margin with many setae.

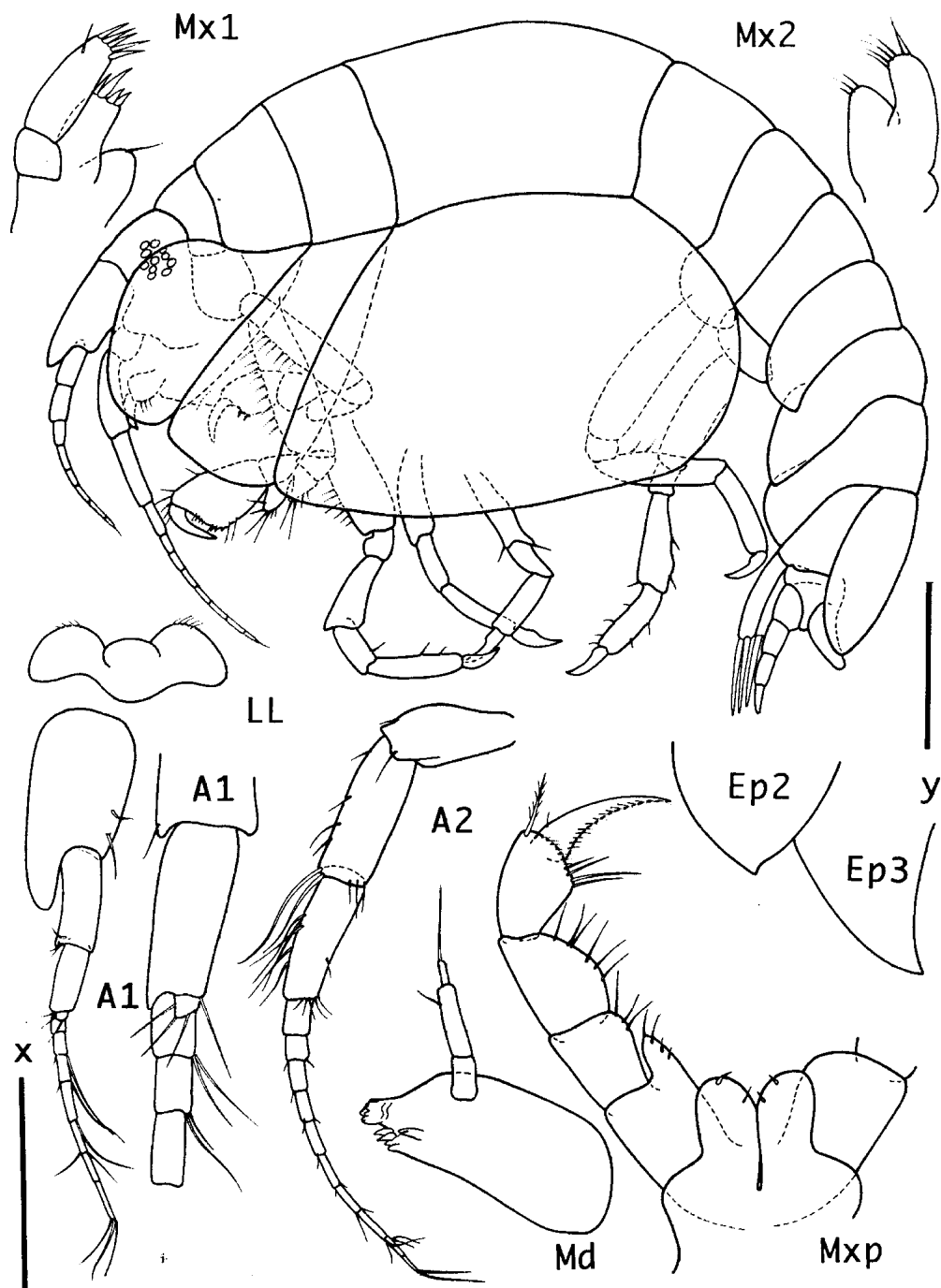


Figure 13. *Thaumatesonella* Nicholls. Habitus ovigerous female, 2.1 mm; antenna 1' at scale  $x = 0.1$  mm; maxillae 1, 2, lower lip, mandible, maxilliped at scale  $y = 0.1$  mm; antennae 1, 2, epimeral plates 1, 2 at scale  $y = 0.05$  mm.

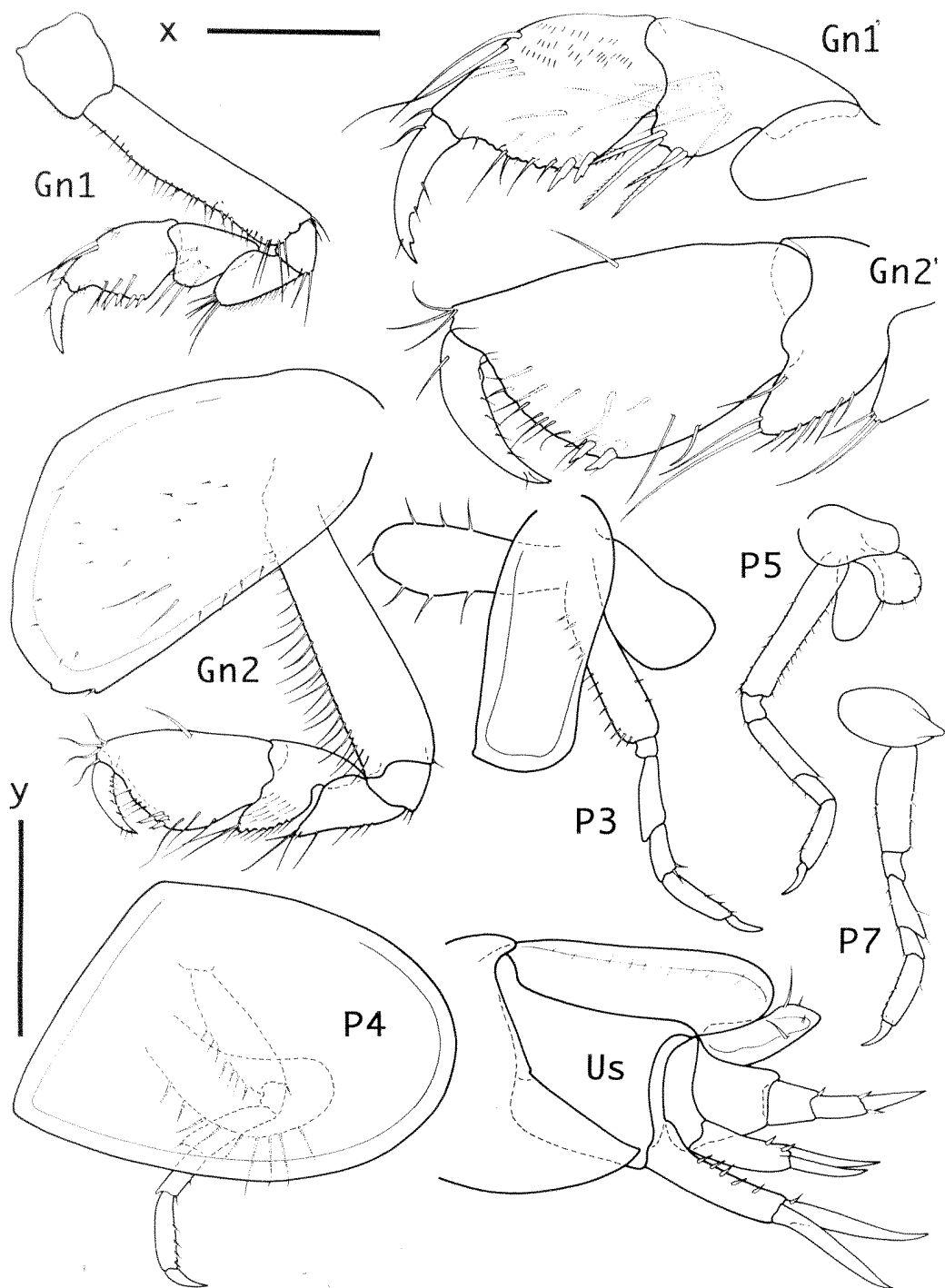


Figure 14. *Thaumotelsonella cyproides* Nicholls. Gnathopods 1, 2 (left), urosome at scale  $x = 0.2$  mm; gnathopods 1', 2' at scale  $x = 0.1$  mm; pereopods 3, 4, 5, 7 at scale  $x = 0.4$  mm.

Pereopods 3 and 4 slender, subequal, bases anteriorly with dense, short setae, dactyli about half propodus length. Coxa 3 ratio of length to width 3. Coxa 4 dominant, wider than long, front margin straight, ventral margin slightly convex, posterior margin rounded, anteriorly not deeper than posteriorly. Pereopods 5–7 slender, ratio of corresponding articles only slightly different, on all bases anteriorly and posteriorly many short setae.

Uropod 2 extending less posteriorly than uropod 1. Uropod 3 extending as far as uropod 1. Uropod 1 peduncle longer than subequal rami, with many spines; rami lacking spines or setae. Uropod 2 peduncle shorter than subequal rami, without spination or pectination on rami, similar to uropods 1 and 3. Uropod 3 peduncle subquadrate, with 1 apical spine, ramus clearly of 2 articles, robust; article 1 with 2 apical spines, slender, about twice as long as broad; article 2 narrow, sharply pointed, smooth. Urosomite 1 very long, with large hump vaulting over urosomite 2 and most of telson. Urosomite 2 reduced, articulation not oblique as in *P. patagonicum*, but vertical to dorsal prolongation of urosomite 1. Urosomite 3 rectangular, subquadrate, fused with broad basis of telson.

Telson spoon-like, shorter than uropod 1 rami, about two-thirds length of urosomite 1 hump, horizontally inserted, excavated; insertion of telson three-dimensionally thickened and fused with urosomite 3 but not urosomite 2.

Colour. Red eyes, orange back.

*Distribution.* Cape Bird, Ross Sea (77°S) and Commonwealth Bay, Terre Adelie Coast (67°S), Antarctica, 46 m (25 fm)–130 m.

*Biology.* Female ovigerous in November.

*Remarks.* Nicholls described this species from two specimens. His figures and text are poor and the mouthparts unknown. The species was mentioned again by Bellan-Santini and Ledoyer (1986) and Branch et al. (1991) both referring to the same material. The validity of this species was often doubted (cf. *P. patagonicum*) but important details were missing.

At the Australian Museum I was lucky to find another specimen of this species with material of *Metopoides* from Cape Bird, Antarctica. This specimen and its geographical locality correspond with Nicholls' description of *P. cyproides*. Its mandibular palp corresponds with that of *Thaumatesonella* and its generic position is changed accordingly.

The differences between *Thaumatesonella*

*kingelepha* and *T. cyproides* are exceedingly small, and concern antenna 1 article 1, coxa 3, palmar corners of gnathopods 1 and 2, and setation of bases and proportions of uropod 3 articles. It is quite probable that these are due to body size as the described material of *T. kingelepha* is 2.5 mm while that of *T. cyproides* is 2.1 mm. It has been shown for *Raumahara* that allometry is present to a high degree. But before making a definite decision on the specific distinctness of these two taxa, one from the subantarctic and the other from Antarctica, I await additional material.

The essential difference between *Pseudothaumateson* and *Thaumatesonella* is in the structure of the mandibular palp. Jerry Barnard discussed "several examples of species with obvious gnathopodal relationships now separated from each other generically on the basis of metameric differences in mandibular and maxillary palps ..." (see *Introduction*). The small size of mandibular palp article 3 in *Thaumatesonella* suggests only small steps from a 3-articulate palp to a palp with length of article 1 + article 2, but vanishing articulation between them. Having both these conditions in one genus would be analogous to having a rudimentary and absent palp as is seen in *Raumahara*.

In this complex the condition of mandibular palp of "1 article" includes species with a short stump and other with a palp of nearly full length but without articulation. Future descriptions should indicate length of the palp relative to the incisor. In *Raumahara* (and in the *Stenothoe monoculoides*-species complex) the arrangement of maxilla 2 plates varies from in tandem to a riding position, probably in response to different feeding strategies. But in *Raumahara* and *Stenothoe* more species are known from greater numbers of specimens. The division of *Pseudothaumateson* and *Thaumatesonella* is retained until a more detailed analysis of more species reveals the significance of a robust, long mandibular palp with coalesced articles versus the ordinary, 3-articulate palp or a short stump of one article.

#### *Yarra* gen. nov.

*Type species.* *Yarra unguiserra* sp. nov.

*Diagnosis.* Antennae 1 and 2 geniculate. Antenna 1 peduncular article 2 a nasiform process; accessory flagellum lacking. Mandibular palp lacking. Maxilla 1 palp of 2 articles. Maxilla 2 plates aberrant, in riding position. Maxilliped inner plate with apical knob, outer plate absent. Gnathopods

1 and 2 subchelate, different in size, similar in shape. Urosomite 1 with dorsal fold, vaulting over urosomites 2 and 3 and part of telson. Uropods 1 and 2 smooth, rami unequal. Uropod 3 robust, ramus of 2 articles. Urosomites free. Telson horizontally inserted, spoon-like, dorsally excavated, marginally scleritic.

*Etymology.* Following Jerry Barnard's habit of using local names, the genus is named for the scenic Yarra River which meanders behind the Abbotsford Annexe, Museum Victoria, in whose collections this exciting animal was found.

*Yarra unguiserra* sp. nov.

Figures 15–18

*Material examined.* Holotype. Australia, eastern Bass Strait, 15.5 km from Point Ricardo, 37°53.18'S, 148°28.96'E, 45 m, sand-shell, 26 Sep 1990, Smith-McIntyre grab (stn MSL-EG 44), NMV J45739 (sex?, 2 mm, slide).

Paratype. Australia, eastern Bass Strait, 7.3 km SSW of Cape Conran, 37°52.67'S, 148°42.06'E, 48 m, sand-shell, 28 Sep 1990, Smith-McIntyre grab (stn MSL-EG 60), NMV J22638 (1 specimen in alcohol, 1.2 mm).

Additional material. Type locality, NMV J45737 (1 in alcohol). Eastern Bass Strait, 24 km NNE of Eddystone Point, 40°43.9'S, 140°32.5'E, 56 m, muddy sand, 14 Nov 1981, epibenthic sled, RV Tangaroa, NMV J3767 (1 specimen, 1.2 mm, slide). Eastern Bass Strait, 15.5 km SW of Point Ricardo, 37°53.14'S, 148°28.94'E, 45 m, medium sand, 4 Jun 1991, Smith-McIntyre grab (stn MSL-EG 81), NMV J45738 (1 specimen in alcohol, sex?, 1.2 mm).

*Diagnosis.* Antenna 1 peduncle forming a knee in article 2, thus forcing article 3 to insert subrectangularly. Antenna 2 knee between peduncular articles 4 and 5. Maxilla 2 plates riding, each with 1 apical spine. Gnathopods 1 and 2 palmar corner well defined, palm longer than posterior margin, slightly concave, serrated; dactyli characteristically serrated inside. Gnathopod 1 dactylus with 2 sharp teeth. Gnathopod 2 dactylus with 3 huge sharp teeth, in the gaps a deep incision and a long seta inserted. Uropods 1 and 2 smooth, peduncle strong, rami unequal, dorsally pectinate. Uropod 3 robust, of 2 articles. Urosomites 1–3 free, covered with external "skin", linking the dorsal fold of urosomite 1 with uropod 1 insertion. Telson horizontally inserted, spoon-like, dorsally excavated, margins scleritic.

Length 1–2 mm.

*Etymology* The specific name (*unguis* (L.), nail, + *serra* (L.), saw) describes the morphology of the palm and dactylus of the gnathopods (noun in apposition).

*Description.* Body smooth, stout, coxae 2–4 dominating, coxae 3 and 4 incised on anteroventral corner. Head high, narrow. Rostrum inconspicuous. Eyes normal. Lateral cephalic lobes rounded. Pereonite 4 about same width as head + pereonites 1–3. Urosomites free. Urosomite 1 with large dorsal hump vaulting over urosomites 2 and 3 and great part of telson. Urosomites 2 and 3 not arranged horizontally, but vertically. Urosomite 3 broadly coalesced with telson.

Antenna 1 shorter than antenna 2, geniculate; peduncular articles 1 > 2 > 3; article 1 subquadrate, 1.5 times as long as wide; article 2 dorsally with nasiform process, ventrally with right angled margin, forcing geniculate insertion of article 3; accessory flagellum lacking; flagellum shorter than peduncle article 1, of 5 articles, with long aesthetascs. Antenna 2 geniculate between peduncular articles 4 and 5; article 3 subquadrate; article 4 on outer side of knee longer than article 5 as apical margin oblique; flagellum shorter than peduncle, of 5 articles.

Upper lip lobes asymmetrically rounded. Mandibular incisors on both sides well developed; raker spines huge, bifurcate; molar cusp well visible; palp absent. Lower lip not found. Maxilla 1 inner plate small, without spines or setae; outer plate with 6 robust, acute spines, arranged not bilaterally but in a crown, not very different from each other; palp biarticulate, length ratio 1: 4, extending much beyond outer plate, with 1 stout spine and 1 acute, setose spine. Maxilla 2 plates subequal in size but sitting in riding position, with 0 or 1 apical small spines. Maxilliped inner plate scarcely reaching half way along ischium, with 1 seta subapically, 1 knob apically; outer plate absent; palp of 4 articles, article 3 (propodus) narrow, beset with many setae as on dactylus.

Gnathopod 1 much smaller than gnathopod 2; coxa 1 reduced, anteroventrally with 1 seta; basis medioposteriorly with 2 long, smooth setae; merus and ischium with many short setae; ischium not reaching propodus; propodus hind margin about same length as slightly concave, serrate, oblique palm; palmar corner well defined; outer margin with group of apical, short setae, and subapical long ones, medially with small and short ones; dactylus with deep serration on inner margin. Coxa 2 regularly rounded anteriorly, much widened, with short setae along anterior margin; basis three-quarters length of coxa 2, with 2 long, smooth setae posteriorly; ischium to proximal propodus posterior margin beset with many short setae; merus and carpus each with 1

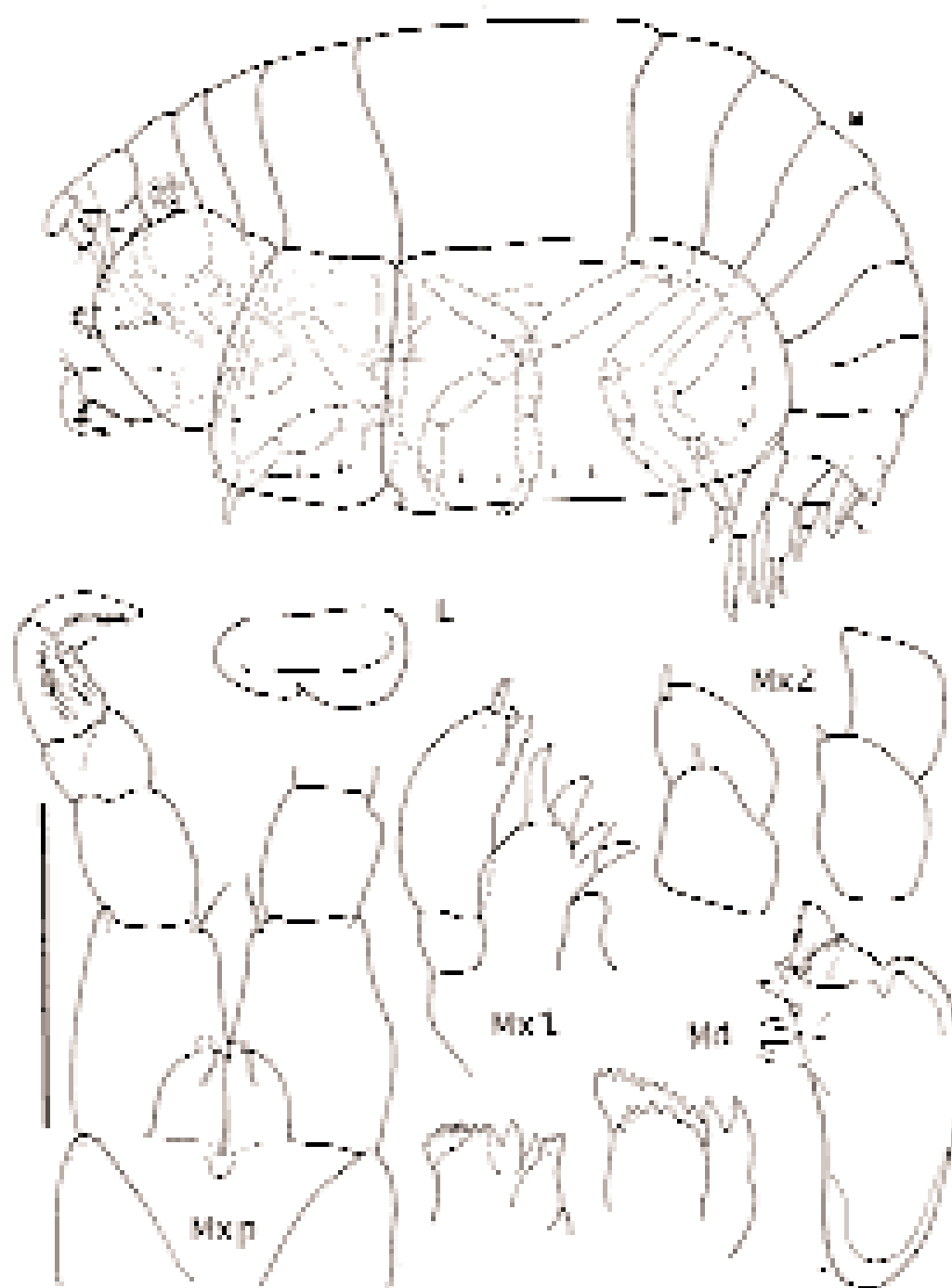


Figure 15. *Yarra unguiserra* gen. and sp. nov. Habitus of 1.2 mm specimen; mouthparts at scale = 0.1 mm, except middle sketch of mandible in free scale.

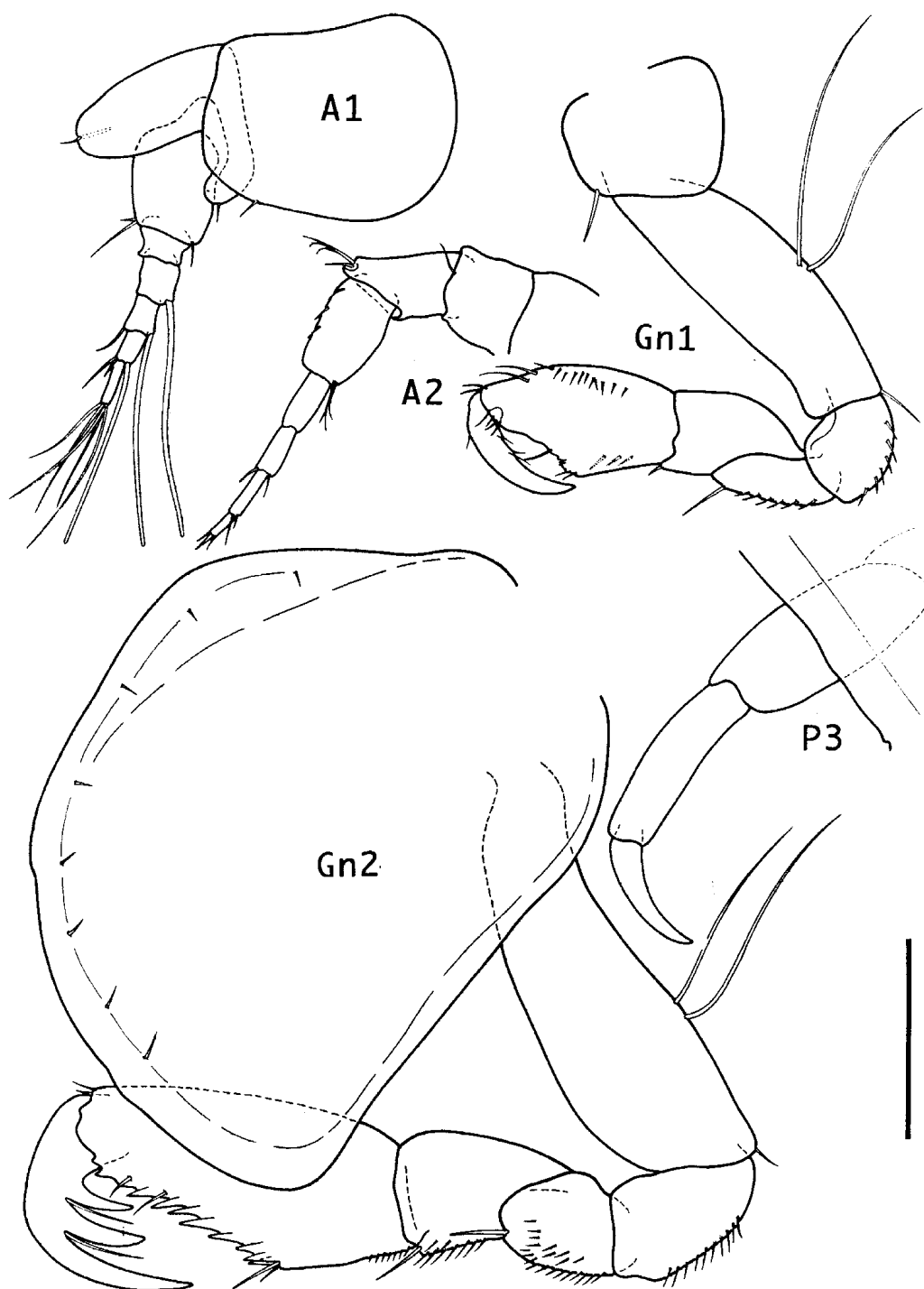


Figure 16. *Yarra unguiserra* gen. sp. nov., Antennae 1, 2, gnathopods 1, 2, pereopod 3 at scale = 0.1 mm.



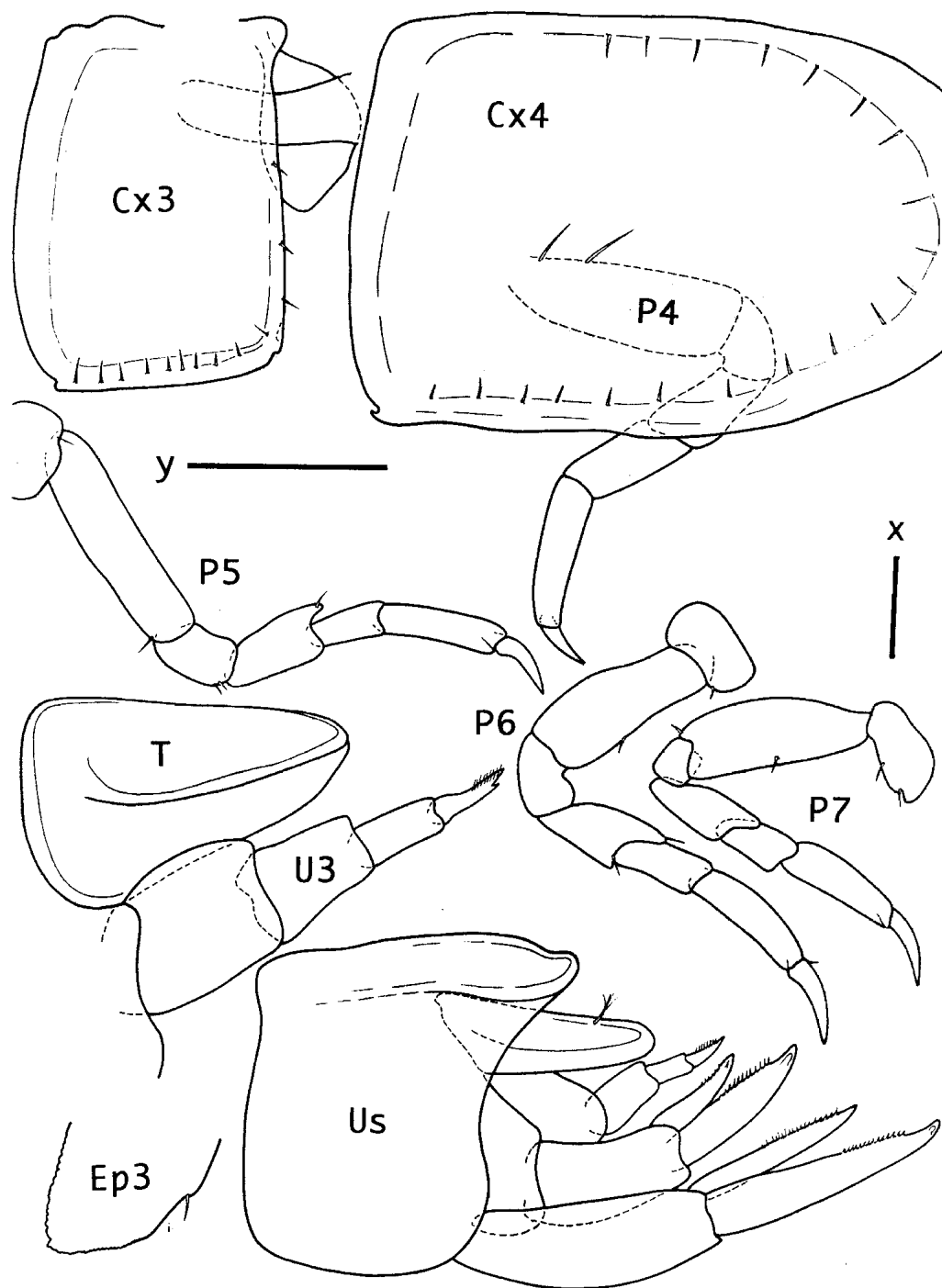


Figure 17. *Yarra unguiserra* gen. nov., sp. nov. Coxae 3, 4, pereopods 4, 5, 6, 7 at scale  $x = 0.05$ ; urosome complete and epimeral plate 3 at scale  $y = 0.1$  mm, telson + urosomite 3 + uropod 3 detail at scale  $y = 0.05$  mm.

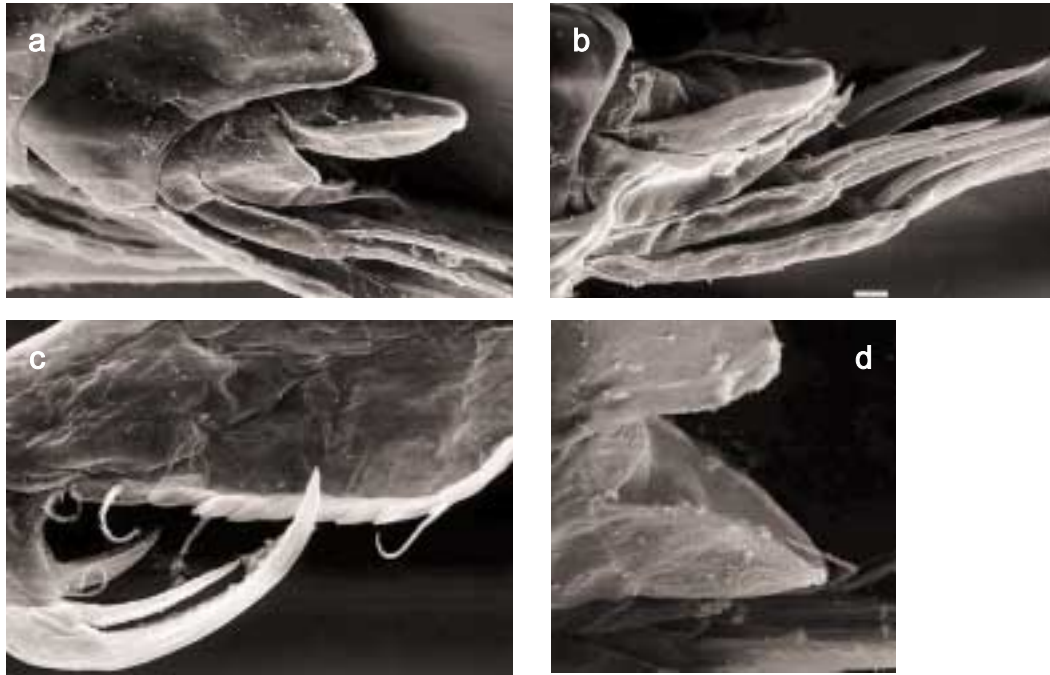


Figure 18. SEM pictures. a, b, *Raumahara dertoo* Barnard, urosome with shallow spoon-shaped telson. *Yarra unguiserra* gen. and sp. nov. c, gnathopod 2; d, urosome with telson about as deep as wide.

long seta distoposteriorly; propodus length of palm twice hind margin; palm strongly serrate, with 10–12 teeth, deeply incised; palmar corner beset with 2 setae; propodus anterior margin smooth, anterodistally with 2 short setae; dactylus with “triple tip”, created by strong and expanded dactylus, twice deeply incised on inner margin, having one long seta in each notch.

Pereopods 3 and 4 strikingly smooth and simple, only scarce and very short setae on distal end of some articles; basis, like gnathopod, posteriorly with 2 setae. Pereopod 3 (in juvenile) articles similar to pereopod 4; in adult (see figures of habitus or detail) carpus swollen, while articles of pereopod 4 are similarly slender. Pereopods 5–7 slender, ratios of corresponding articles similar; length diminishing from 5 to 7.

Uropods 1–3 extending less posteriorly in succession. Uropod 1 totally unarmed; peduncle subequal to longer ramus, ratio of lengths of rami 2 : 3; both rami dorsodistally finely pectinate. Uropod 2 similar in shape to uropod 1 but shorter and stouter. Uropod 3 robust, with smooth peduncle, articles of ramus much shorter and narrower, of subequal length, article 2 dorsally pectinate.

Telson spoon-like, horizontally inserted, dorsally excavated, with 1–2 plumose setae on distal third; more than half length fused with urosomite 3.

*Distribution.* Bass Strait, Australia, 45–48 m depth, medium sand or shell-sand.

*Remarks.* In Barnard and Karaman’s (1991: 684) key to genera of Stenothoidae this species keys out to *Pseudothaumatelson* in spite of having the antenna 1 article 2 strongly nasiform (instead of article 1) and, with article 3, geniculate. However, the mandibular palp is totally lacking and maxilla 2 is riding, both supposedly apomorphic character states shared only with *Chucullba*. The most striking differentiating characters are the much more specialized urosome in *Chucullba*, antenna 1 article 2 thickened (like *Raumahara*, *Raukumara*, *Ptychotelson*) instead of article 1 (*Chucullba*) and the very aberrant, deeply serrate dactylus in gnathopods 1 and 2 of *Yarra* (instead of smooth margin in all other genera of this group). This surprising species, placed here in a separate genus, may use a pair of long setae on the bases of gnathopods 1 and 2 and pereopods 3 and 4 as or in addition to

oostegites. No females with typical oostegites were found. Coxa 4 is very broad with nearly rectangular margins, like coxae 3+4 together in Cyproideidae.

### Conclusions

Having studied these — until now all called thaumatelsonine — genera, I feel certain that Gurjanova's idea of separating classical stenothoid genera from those ones with a "wonderful telson" is still valid. In spite of Barnard's fears (1972a: 318) there are no problems in defining a vertically inserted, hugely elevated, rudder-like telson such as in *Antatelson*, *Ausatelson* and *Thaumatelson*. This clade (which will be treated in Part 2 of this series) is highly aberrant, all living in the south of Australia (Bass Strait) and Antarctica, and all are reported to have a similar ecology.

Less striking are those genera which Barnard saw as bridging stenothoids and thaumatelsonids and which are better known now. Their common character is a telson with sclerified margins, basically coalesced with urosomite 3. This telson can be adjacent to the urosome (see *R. rongo* Barnard, 1972b: fig. 92; *R. noko* Barnard, 1974: fig. 71, and figures herein). It may also be separate from the urosome or upright (see *Raumahara judithae* Moore, 1981: fig. 14; *Pseudothaumatelson cyproides* Nicholls, 1938: fig. 28, and figures herein), thus appearing variously boat-, shovel- or spoon-like. In the habitus drawings of *Pseudothaumatelson cyproides* (Nicholls, 1938) and *Thaumatelsonella kingelepha* (Rauschert and Andres, 1991), or in figures given in this paper, the vaulted prolongation of urosomite 1 is shown to fit in the excavation of the telson, thus strengthening the unity of the urosome.

While the bulge on urosomite 1 is differently developed, the three-dimensionally inserted, proximally thickened, folded, marginally stiffened and partly coalesced telson is always present, thus offering a well defined synapomorphy. This paper illustrates different types of telson within stenothoid genera:

1. a flat, horizontally inserted, 2-dimensional, free telson (basic Stenothoidae);
2. a proximally thickened, three-dimensionally inserted, basically coalesced, marginally stiffened and dorsally excavate telson, which is described by different authors as boat- or spoon-like (treated here); and
3. a vertically , 2-dimensionally inserted, hugely enlarged telson (treated in Part 2 of thaumatelsonine species).

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