

New species of *Brucerolis* (Crustacea: Isopoda: Serolidae) from seas around New Zealand and Australia

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Abstract

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Five new species of *Brucerolis* Poore and Storey, 2009 are described, four from deep waters off New Zealand and one from south-eastern Australia. This doubles the number of species in the genus. Seven species are now known from the Tasman Sea and eastern New Zealand, and three from within or close to the Southern Ocean. A key to all species is presented.

Keywords

Crustacea, Isopoda, Serolidae, *Brucerolis*, taxonomy, New Zealand, Australia, new species

Introduction

Poore and Storey (2009) erected the genus *Brucerolis* to distinguish a group of five species of serolid isopods that had previously been confused with *Acutiserolis* Brandt, 1988 by isopod workers who adopted Brandt's (1988 and 1991) revision (e.g., Wägele, 1994; Poore and Brandt, 1997; Held, 2000). *Brucerolis* differs from *Acutiserolis* in having the coxal dorsal plates 2–6 interacting only by means of key-like lobes, coxal plate 6 exceeding the pleotelson by at least the pleotelson length, middorsal spines being absent or obscure, and the pleotelson lacking ridges and keels. The type species, *Brucerolis nowra* Poore and Storey, 2009 is from the continental margin of eastern Australia but is not the only species there. Here, another is described along with four more from seas around New Zealand where they have been collected in their hundreds.

One of the species included by Poore and Storey in *Brucerolis* was *Serolis bromleyana* Willemöes-Suhm, 1876. Hurley (1957) identified deepwater isopods collected from Cook Strait and off the eastern coast of New Zealand as *Serolis bromleyana*. Later, Hurley (1961a) reported the same species from the Tasman Sea, but the specimen illustrated in his plate 1 (p. 226) differed from Antarctic specimens described by Beddard (1884a). Hurley (1961b) summarised these findings in a checklist and key to New Zealand isopods. In a subsequent correspondence with one of us (letter to GCBP, 16 May 1984), Hurley discussed three forms that he could clearly distinguish by depth distribution and colour. The three are described as new

species here. Surveys of the epibenthic macrofauna on the Chatham Rise, New Zealand, indicated three communities, the shallowest of which at 237–602 metres and predominantly sandy sediments is characterised by crustaceans, including “*Serolis bromleyana*” (McKnight and Probert, 1997). Hurley was not the first author to have commented on the morphological variability of specimens similar to *Serolis bromleyana*. Beddard (1884a: pl. 4 figs 3, 6) illustrated a male from New Zealand that, he noted, differed from syntypes of *S. bromleyana* from the Indian Ocean sector of the Southern Ocean in the shape and length of coxa 6, acute rather than emarginate epimeron apices, less pronounced marginal and transverse ridges and lack of anterior spine on pereonite 1 and the presence of fine setae on the ischium, merus and carpus of the male pereopod 2.

Poore and Brandt (1997) illustrated the mouthparts of the syntypes of *Serolis bromleyana*, referred the species to the genus *Acutiserolis* and commented on morphological variation reported in the literature. They stated that material from deep water off southern Australia and New Zealand contained at least three undescribed species. They also reported a *S. bromleyana*-like specimen collected from the West Scotia Basin, Southern Ocean with a long, setose palm and proximal heel of the male pereopod 2 propodus, which they found clearly different from the short palm and median heel of that of the male syntype of *S. bromleyana*. More recently, Held (2000) mentioned the difficulty in placing material of “*Acutiserolis bromleyana*” from the Drake Passage owing to morphological disparity with the description.

In this paper, four new species are described from collections made off New Zealand by the National Institute of Water and Atmosphere, Wellington, New Zealand (NIWA) and one from collections from south-eastern Australia made by Museum Victoria, Melbourne (NMV). Additional material was available from the South Australian Museum (SAM) and the US National Museum of Natural History (USNM). A key is presented for all species of *Brucerolis*.

Adult male and ovigerous female specimens were dissected and examined using a Wild M5 dissecting microscope and an Olympus BX50 and Olympus BH-2 compound microscope and new species were drawn under Nomarski illumination using a camera lucida. Illustrations are of male left limbs unless otherwise noted and are labelled: A1, A2, antenna 1 and 2; MD, MDp, mandible and palp; MX1, MX2, maxilla 1 and 2; MP, maxilliped; P1–P7, pereopods 1–7; PL1–PL5, pleopods 1–5; PS, medial ridge of pleonal sternites; S, pereonal and pleonal sternites of male; U, uropod. Scale bars are 10 mm and refer to habitus drawings only. Body length is measured from the anterior margin of the head to the posterior margin of the pleotelson, excluding the antennae and coxae. Descriptions are essentially of holotype males and differences noted for paratype females. All figures are from the male unless otherwise indicated. Type material is deposited at NIWA, NMV and SAM.

Serolidae Dana, 1853

Brucerolis Poore and Storey, 2009

Key to species of *Brucerolis* Poore and Storey, 2009

The key does not include the two South Atlantic species, *B. maryannae* (Menzies, 1962) or *B. macdonnellae* (Menzies, 1962), both poorly described but apparently similar to *B. bromleyana*.

1. Anterolateral margin of pereonite 1 with acute angle, dorsally with elongate triangular slope connecting to transverse ridge *B. bromleyana* (Willemoes-Suhm, 1876)
- Anterolateral margin of pereonite 1 rounded, without acute projection, dorsally with submarginal ridge or elevated area but not a triangular slope 2
2. Pleonal epimera 2 and 3 with emarginate bifid apices 3
- Pleonal epimera 2 and 3 with acute apices 6
3. Dorsal surface of pereonite 1 without an oblique sinuous ridge separated from lateral margin by shallow trough (fig. 1d, f) 4
- Dorsal surface of pereonite 1 with an oblique sinuous ridge separated from lateral margin by shallow trough (fig. 1h) or with a sculptured elevated area (fig. 1c) 5
4. Anterolateral margin of head obliquely concave, lateral angle considerably more produced anteriorly and elevated than mesial angle; male epimeron 3 well exceeding posterior margin of telson; uropodal endopod 3.5 times as long as wide *B. nowra* Poore and Storey, 2009

- Anterolateral margin of head transversely concave, lateral angle only slightly more elevated and produced anteriorly than mesial angle; male epimeron 3 barely reaching posterior margin of telson; uropodal endopod 3.0 times as long as wide *B. howensis* sp. nov.
- 5. Pleonal epimeron 3 equal to (in female) or exceeding pleotelson; anterolateral region of pereonite 1 with narrow sharp submarginal ridge and groove parallel to margin *B. victoriensis* sp. nov.
- Pleonal epimeron 3 not exceeding pleotelson; anterolateral region of pereonite 1 with broad submarginal pocked area *B. cidaris* (Poore and Brandt, 1997)
- 6. Anterolateral margins of head straight-concave, lateral angle well produced beyond margin of pereonite 1; width of front (between anterolateral corners) 1.6 times as wide as maximum span between lateral margins of eyes *B. brandtae* sp. nov.
- Anterolateral margins of head convex or straight, lateral angle not produced beyond margin of pereonite 1; width of front (between anterolateral corners) less than 1.3 times as wide as maximum span between lateral margins of eyes 7
- 7. Ventral coxal plates 2–4 with transverse ridges on mesial, anterior and posterior margins outlining a transverse depression; coxal plates 6 of male parallel, of female increasingly diverging towards tip; anterolateral corners of head continuous with anterior margin of pereonite 1 *B. osheai* sp. nov.
- Ventral coxal plates 2–4 with a prominent tubercle at anteromesial corner; coxal plates 6 initially diverging then converging slightly towards tip; anterolateral corners of head convex but not continuous with anterior margin of pereonite 1 *B. hurleyi* sp. nov.

Brucerolis brandtae sp. nov.

Figures 1a, 2–5

Material examined. Holotype: New Zealand, Bounty Plateau, 48°58'S, 178°02'E, 1060 m, 23 Jan 1965 (NIWA stn F114), NIWA 27415 (adult male, 35 mm).

Paratypes: New Zealand, Bounty Plateau, 48°07'S, 174°02'E, 1155 m, 21 Jan 1965 (NIWA stn F110), NIWA 27413 (adult female, 35 mm), NIWA 27410 (1 male, 1 juvenile); 49°18.6–17.5'S, 177°54.7–55.5'E, 990 m, 15 Mar 1981 (NIWA stn T48), NIWA 27414 (adult male, 36 mm), NMV J55313 (8 males, 3 females, 8 juveniles); 48°58'S, 178°02'E, 1060 m, 23 Jan 1965 (NIWA stn F114), NIWA 27411 (1 male, 1 female); 48°32'S, 177°59'E, 1051 m, 27 Jan 1965 (NIWA stn F125), NIWA 27409 (2 males, 2 females, 1 juvenile); 48°30.5–32'S, 178°18–23.8'E, 915 m, 19 Mar 1979 (NIWA stn I697), NIWA 27412 (8 males, 8 females, 10 juveniles); 48°50.6'S, 178°41.5'E, 808 m, 17 Mar 1979 (NIWA stn I689), NIWA 27417 (32 males, 14 females, 22 juveniles).

Other material: numerous specimens from 37 NIWA stations.

Description of male holotype. Body length 35 mm. Body 0.8 times as long as greatest width (at coxae 3). Middorsal line with short triangular middorsal processes on posterior margin of head,

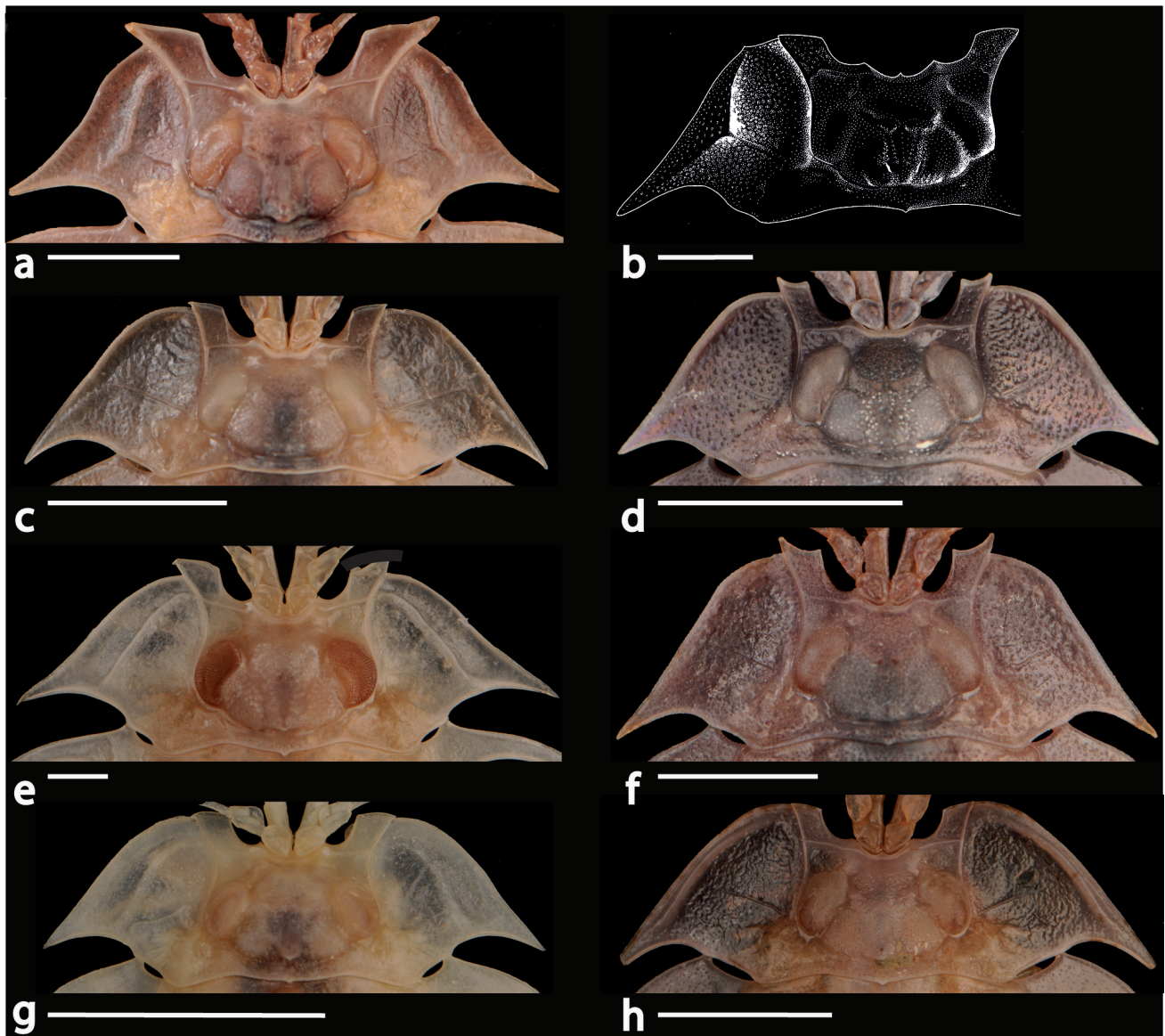


Figure 1. Head and pereonite 1 of species of *Brucerolis*. a, *B. brandtae* sp. nov. (NMV J55313). b, *B. bromleyana* (syntype, BMNH 1889.4.27.20, negative of drawing by Kate Thompson published by Poore & Brandt, 1997). c, *B. cidaris* (NMV J27642). d, *B. howensis* (NMV J55315). e, *B. hurleyi* (NMV J55314). f, *B. nowra* (NMV J19213). g, *B. osheai* (NMV J55316). h, *B. victoriensis* (NMV J19201). Scale bar in each case = 10 mm.

pereonites 2–4 and pleonites 1–3, evident in lateral view. Head, anterolateral margins straight-concave, lateral corners acute and projecting anteriorly; width between anterolateral corners 1.6 times as wide as maximum span between lateral margins of eyes; head with paired strongly projecting curving acute processes on transverse ridge at bases of antennae 1, with prominent paired tubercles between eyes, with small, blunt median posterior tubercle, with obscure lobes lateral to median posterior tubercle. Pereonite 1, lateral margin gently sinuous, lateral margin upturned over anterior half, sharply crested, with sinuous low rounded

oblique ridge more or less parallel to margin, separated from it by a shallow concave trough occupying about one-third of width, dorsal surface with obsolete oblique-transverse ridge reaching sinuous ridge. Coxal dorsal plate 2 0.8 times as long as half pereonite 2 width (following plates increasing in length); plate 4 1.9 times as long as half pereonite 4 width; plate 6 extending beyond tip of pleotelson by 2.2 times middorsal length of pleotelson (minimum estimate), the pair diverging and then converging slightly apically, curving evenly; pleonal epimeron 2 2.2 times length of pleotelson; pleonal epimeron 3 1.2 times

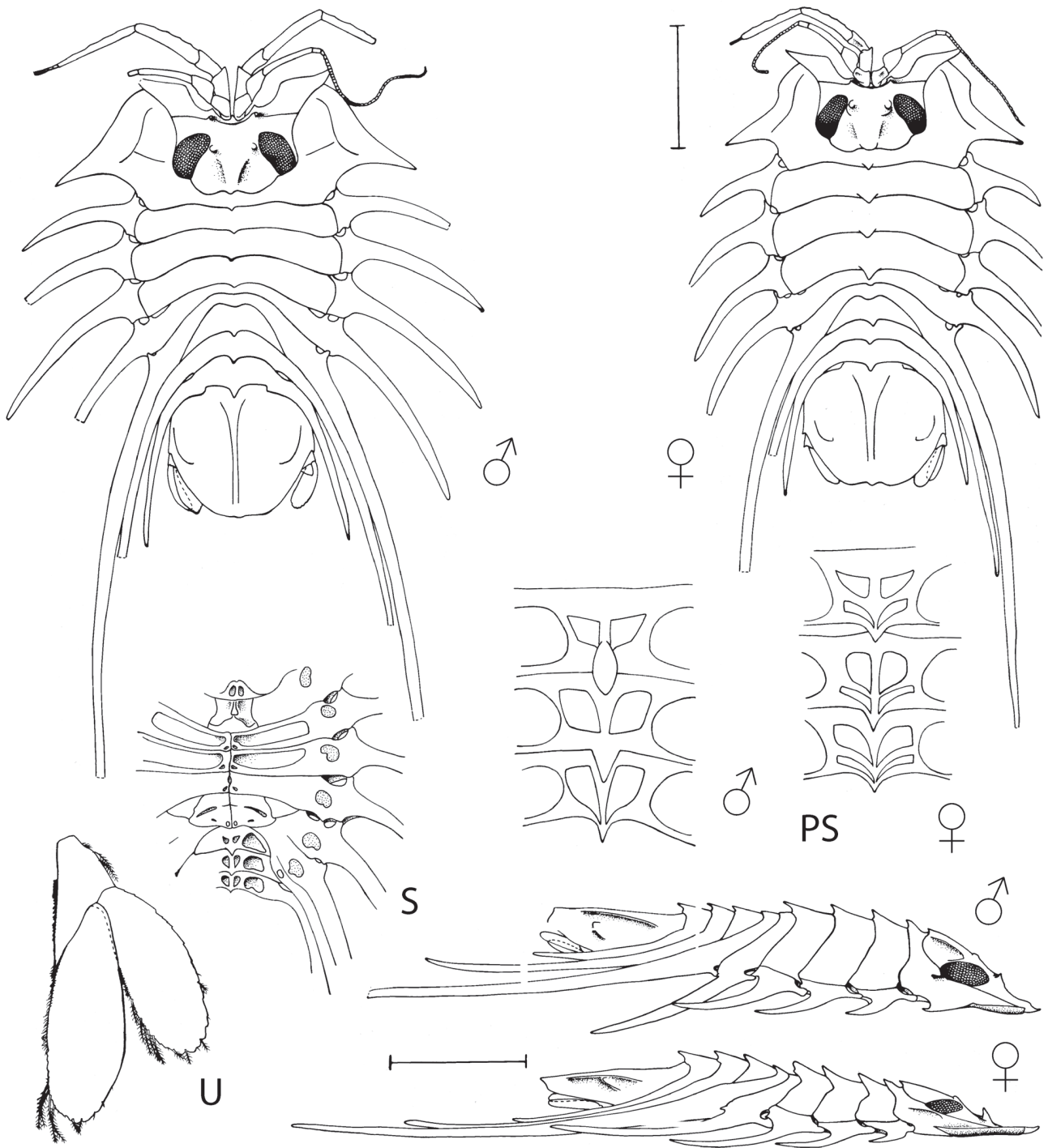


Figure 2. *Brucerolis brandtae* sp. nov. Holotype male (NIWA 27415): dorsal and lateral views, sternites of pereonites 1–7, pleonites 1–3, medial ridge of pleonites 1–3. Paratype female (NIWA 27413): dorsal and lateral views, medial ridge of pleonites 1–3. Paratype male (NIWA 27414): uropod. Scale = 10 mm.

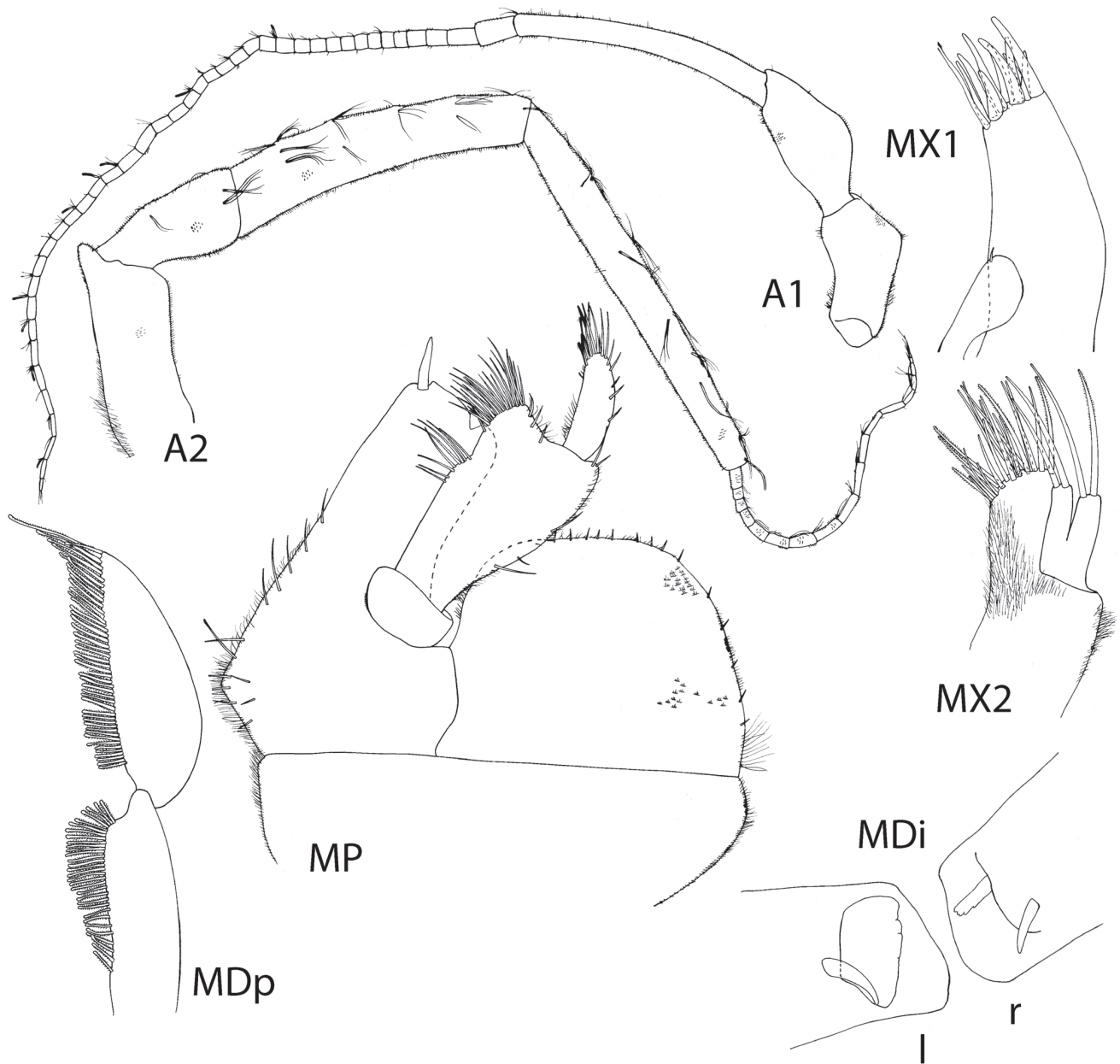


Figure 3. *Brucerolis brandtae* sp. nov. Holotype male (NIWA 27415): antenna 1, mandibular incisors, palp, maxillae 1, 2, maxilliped. Paratype male (NIWA 27414): antenna 2.

length of pleotelson; pleonal epimera 2 and 3 with acute apices. Ventral coxal plates 2–4 with transverse ridges on mesial, anterior and posterior margins outlining a transverse depression. Antenna 1 peduncle articles 3+4 2 times as long as article 2 (anterior margin); flagellum of about 42 articles. Antenna 2 peduncle article 5 1.4 times as long as article 4; flagellum of 18 articles. Pereopod 1 propodus 2.2 times as long as greatest width. Pereopod 2 palm dorsal length 1.8 times greatest width, straight,

sharply angled at free proximal margin, with 20 robust setae in U-shaped row. Pereopod 7 carpus 5 times as long as greatest width; propodus 4.5 times as long as greatest width, propodus tapering from near base, lower margin straight; dactylus curved, 0.45 times as long as propodus. Pleopod 2 endopod with convex distal margin, sharply tapering to base of appendix masculina; appendix masculina 3.8 times as long as straight margin of endopod. Uropodal exopod 0.85 length of endopod.

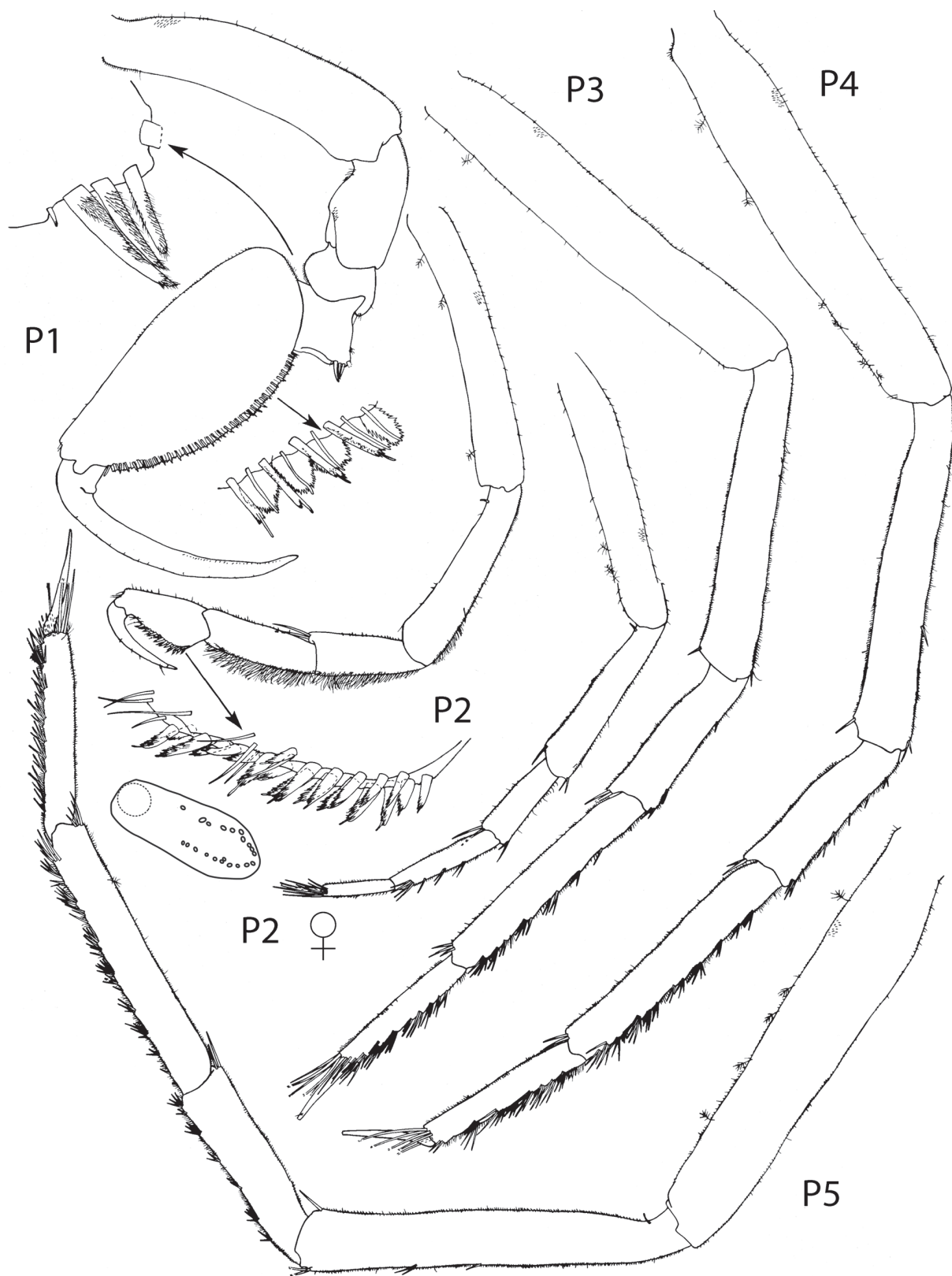


Figure 4. *Brucerolis brandtae* sp. nov. Holotype male (NIWA 27415): pereopods 1–5. Paratype female (NIWA 27413): pereopod 2.

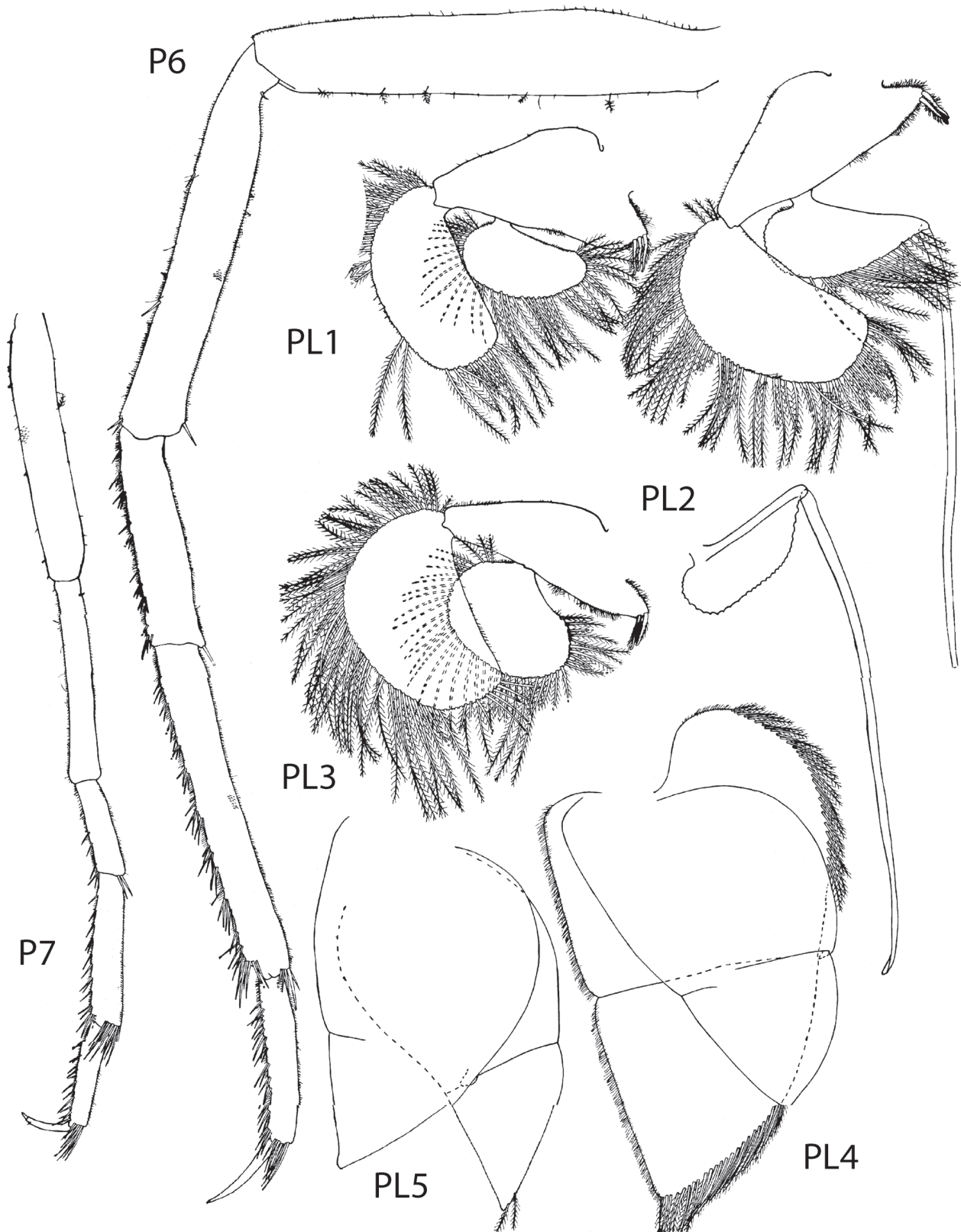


Figure 5. *Brucerolis brandtae* sp. nov. Holotype male (NIWA 27415): pereopods 6, 7, pleopods 1–5. Paratype male (NIWA 27414): pleopod 2 endopod and appendix masculina.

Female. Pereonite 1, lateral margin of female convex anteriorly, with distinct step-like interruption and straight posteriorly. Coxal dorsal plate 2 of female 0.8 times as long as half pereonal tergite 2 width; plate 4 of female 1.4 times as long as half pereonal tergite 4 width (following plates increasing in length); plate 6 of female extending beyond tip of pleotelson by 2 times middorsal length of pleotelson (or more), the pair diverging over entire length, curving evenly.

Size. Male length: 24–40 mm, female length: 27–35 mm.

Distribution. New Zealand, eastern slope, Chatham Rise, Bounty Plateau, northern Campbell Plateau, 39°S–51°S, 167°E–179°W, 494–1500 m. One record NE of North Island, 2500 m, and one record W of South Island.

Etymology. *Brucerolis brandtae* is named for Professor Angelika Brandt, who studied the phylogeny of serolids and described new serolid genera and species.

Remarks. The large size of males and females (up to 40 and 35 mm respectively) of *Brucerolis brandtae* and the wide anterolateral head lobes with a straight or convex anterior margin are useful characters for identifying this species. Like *B. hurleyi* and *B. osheai*, the anterior transverse ridge on the head of *B. brandtae* has a strongly acute, posteriorly curved dorsal projection immediately adjacent to the insertion of antenna 1 on both sides.

Brucerolis bromleyana (Willemöes-Suhm, 1876)

Figure 1b

Serolis bromleyana Willemöes-Suhm, 1876: 591. — Beddard, 1884b: 331. — Beddard, 1884a: 53–57, pl. 4 (except figs. 3, 6). — Sheppard, 1933: 280, 329–330.

Acutiserolis bromleyana. — Brandt, 1988: 17, 21. — Brandt, 1991: 131. — Poore and Brandt, 1997: 153–156, figs. 1–2.

Serolis (Acutiserolis) bromleyana. — Wägele, 1994: 53.

Not *Serolis bromleyana.* — Beddard, 1884a: pl. 4, figs. 3, 6 (identity uncertain). — Hurley, 1957: 13 (identity uncertain). — Hurley, 1961a: 228–229, pl. 1 (? = *B. hurleyi*). — Hurley, 1961b: 269, 285 (identity uncertain). — McKnight and Probert, 1997: 508 (identity uncertain).

Not *Acutiserolis bromleyana.* — Held, 2000: 167 (identity uncertain).

Brucerolis bromleyana. — Poore and Storey, 2009: 152–153.

Distribution. The type locality and only confirmed record is at 3612 m depth, from a bottom of diatom ooze, 62°26'S, 95°44'E, Southern Indian Ocean.

Remarks. *Brucerolis bromleyana* can be identified by the small acute projection on the anterolateral margins of pereonite 1, the emarginate tips of epimera 2 and 3 and the short, concave palm on the male pereopod 2 propodus. The only other species with a small acute projection on the anterolateral margins of pereonite 1 are *B. maryannae* and *B. macdonnellae*, both from the South Atlantic. *Brucerolis maryannae* can be distinguished from *B. bromleyana* by the serrulate anterior margin of the head and pereonite 1 and by the rounded posterior margin of the pleotelson (that of *B. bromleyana* is concave). *Brucerolis macdonnellae* also has a rounded posterior margin of the

pleotelson and also differs from *B. bromleyana* by the acute tips of epimera 2 and 3.

Poore and Brandt (1997: 15, fig. 3) illustrated a male of “*Acutiserolis* sp.” that shares with these three species an acute projection on the margin of pereonite 1. It differed in a more erect submarginal ridge and more elongate propodus on pereopod 2 and may well represent another similar species of *Brucerolis* close to or in the Southern Ocean.

Brucerolis cidaris (Poore and Brandt, 1997)

Figure 1c

Acutiserolis cidaris Poore and Brandt, 1997: 157–160, figs. 4–6.

Brucerolis cidaris. — Poore and Storey, 2009: 152–153.

Distribution. Coral Sea, Australia, near Townsville and Chesterfield Islands, 17°12.15'S–21°15.01'S, 147°10.80'E–157°51.33'E, 891–1491 m.

Remarks. *Brucerolis cidaris* is diagnosed by its small size, emarginate tips of epimera 2 and 3 and pock-marked anterolateral region of pereonite 1. *Brucerolis hurleyi* and *B. osheai* are similar to *B. cidaris* but both have a covering of long setules on the lower margin of the male pereopod 2, a dorsal curved acute process on the anterior margin of the head and acute tips of epimera 2 and 3.

Brucerolis howensis sp. nov.

Figures 1d, 6–9

Material examined. Holotype: Tasman Sea, Lord Howe Rise, 34°59.3'S, 162°11.28'E, 1573 m, 26 Sep 1982 (NIWA stn U198 SEB), NIWA 27431 (adult male, 29 mm).

Paratypes: collected with holotype, NIWA 27428 (adult female, 27 mm), NIWA 27428 (adult male, 29 mm), NIWA 27427 (2 males, 7 juveniles), NMV J55315 (1 male, 1 female); Tasman Sea, Lord Howe Rise, 31°34.0'S, 159°26.5'E, 1828–1808 m, 08 May 1979 (NIWA stn I722), NIWA 27428 (1 male, 1 female).

Other material: Tasman Sea, S of Lord Howe Plateau, 37°00'S, 170°00'E, 2096 m, 18 Apr 1970 (NZOI stn J39), NIWA (1 female).

Description of male holotype. Body length 29 mm. Body 1.1 times as long as greatest width (at coxae 3). Middorsal line without midposterior processes, not elevated in lateral view. Head, anterolateral margins concave, lateral corners acute and projecting anteriorly; width between anterolateral corners as wide as maximum span between lateral margins of eyes; head without paired processes on transverse ridge at bases of antennae 1, without paired tubercles between eyes, with small, blunt median posterior tubercle, with obscure lobes lateral to median posterior tubercle. Pereonite 1 lateral margin gently sinuous, lateral margin upturned over anterior half, obscurely duplicated, without submarginal ridge, dorsal surface with oblique-transverse ridge reaching near margin. Coxal dorsal plate 2 0.9 times as long as half pereonal tergite 2 width (following plates increasing in length); plate 4 1.3 times as long as half pereonal tergite 4 width; plate 6 extending beyond tip of pleotelson by 2.3 times middorsal length of pleotelson, the pair diverging over entire length, almost straight except at apex; pleonal epimeron 2 1.7 times length of pleotelson; pleonal

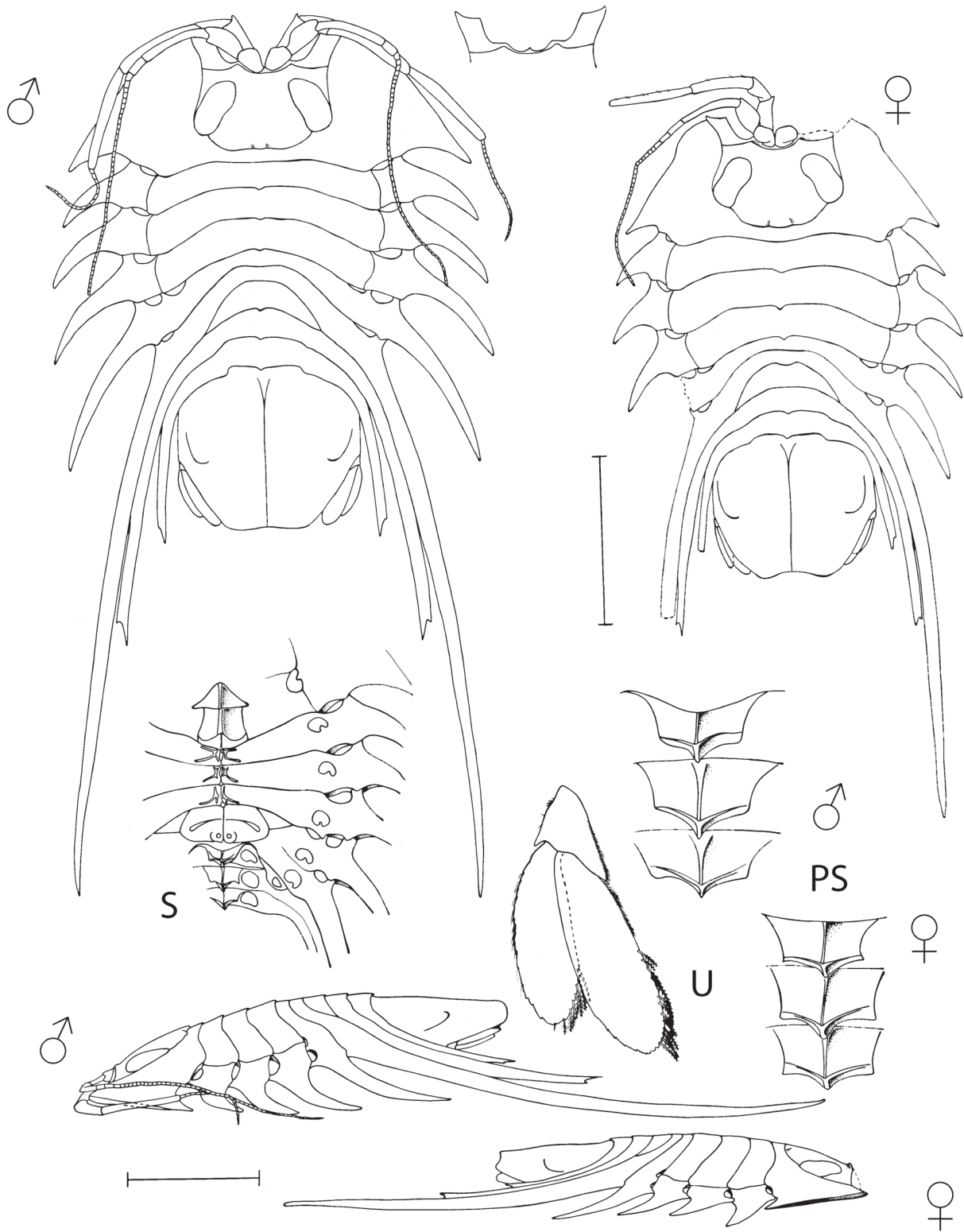


Figure 6. *Brucerolis howensis* sp. nov. Holotype male (NIWA 27431): dorsal and lateral views, detail of front of head, sternites of pereonites 1–7, pleonites 1–3, medial ridge of pleonites 1–3, uropod. Paratype female (NIWA 27428): dorsal and lateral views, medial ridge of pleonites 1–3. Scales = 10 mm.

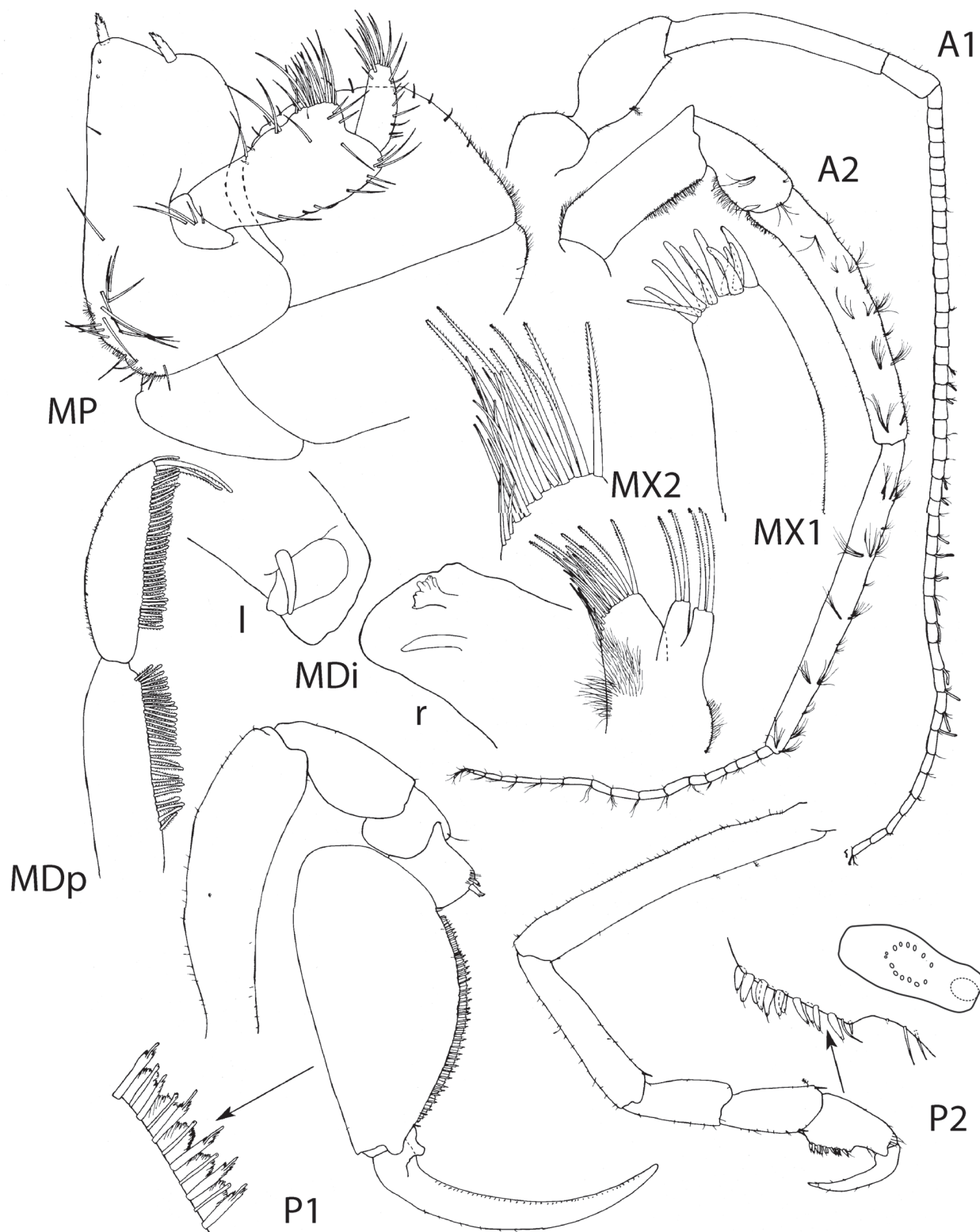


Figure 7. *Brucerolis howensis* sp. nov. Holotype male (NIWA 27431): antennae 1, 2, mandibular incisors, palp, maxilliped, pereopods 1, 2.

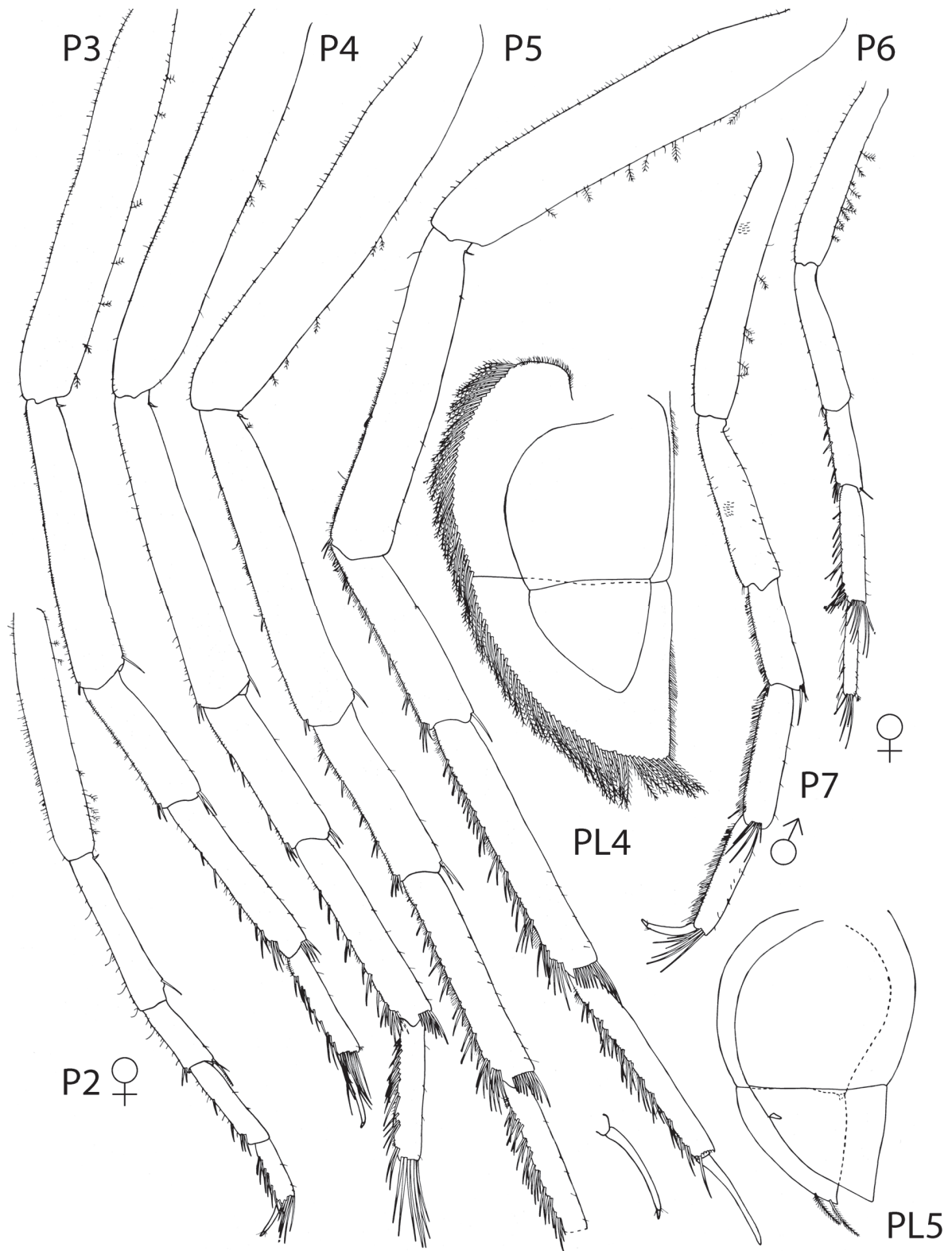


Figure 8. *Brucerolis howensis* sp. nov. Holotype male (NIWA 27431): pereopods 3–7, pleopods 4, 5. Paratype female (NIWA 27428): pereopods 2, 7.

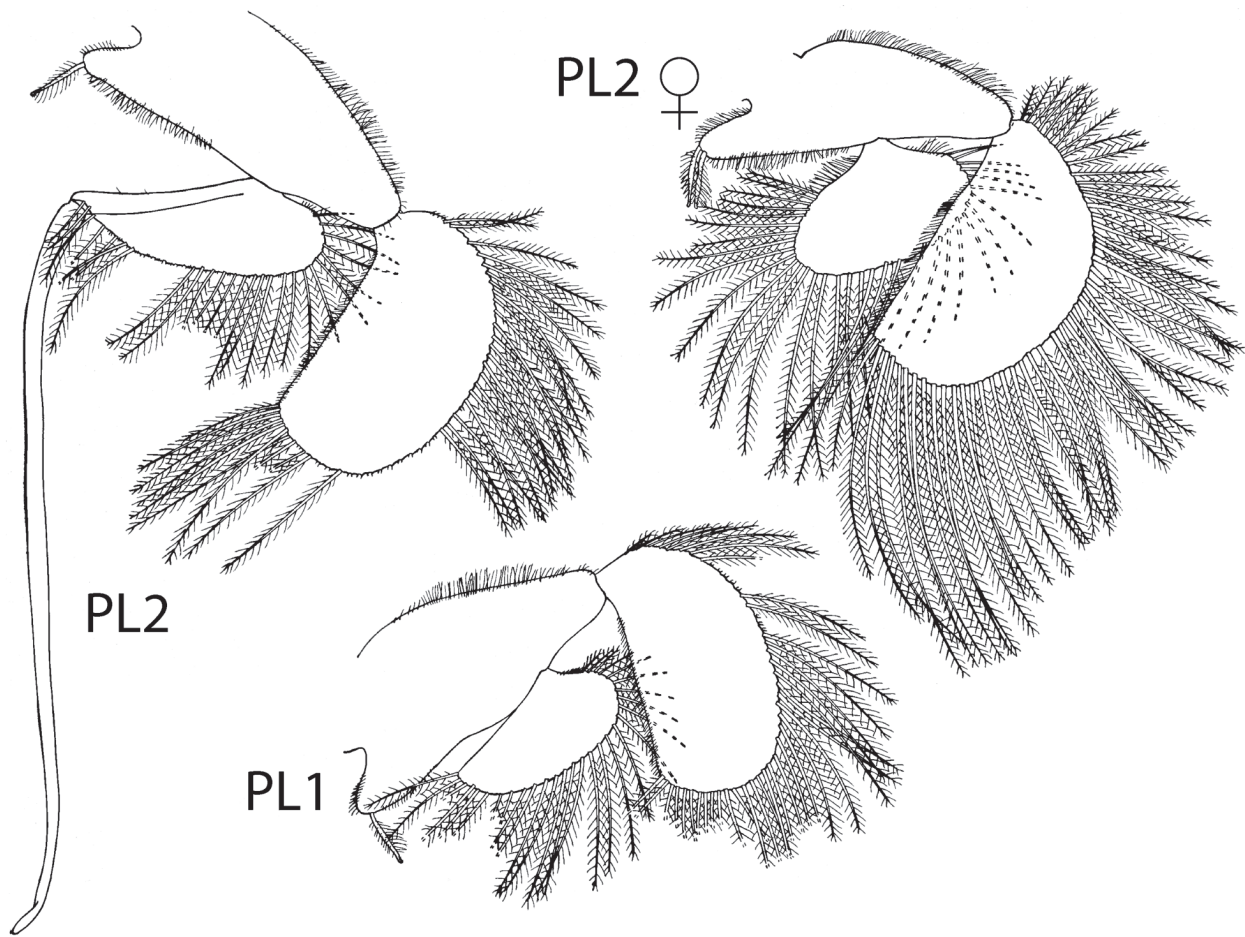


Figure 8. *Brucerolis howensis* sp. nov. Holotype male (NIWA 27431): pereopods 3–7, pleopods 4, 5. Paratype female (NIWA 27428): pereopods 2, 7.

epimeron 3 as long as pleotelson; pleonal epimera 2 and 3 with emarginate apices. Ventral coxal plates 2–4 with transverse ridges on mesial, anterior and posterior margins outlining a transverse depression. Antenna 1 peduncle articles 3+4 2 times as long as article 2 (anterior margin); flagellum of about 43 articles. Antenna 2 peduncle article 5 1.2 times as long as article 4; flagellum of 16 articles. Pereopod 1 propodus 2 times as long as greatest width. Pereopod 2 palm dorsal length 1.5 times greatest width, with short heel, straight setose proximal palm, convex distal palm, with 14 robust setae arranged in oval. Pereopod 7 carpus 3 times as long as greatest width; propodus 4.2 times as long as greatest width, propodus tapering from near base, lower margin straight; dactylus curved, 0.5 times as long as propodus. Pleopod 2 endopod with evenly tapering distal angle bearing appendix masculina; appendix masculina 3.8 times as long as straight margin of endopod. Uropodal exopod 0.85 length of endopod.

Female. Pereonite 1, lateral margin of female convex

anteriorly, with distinct step-like interruption and straight posteriorly. Coxal dorsal plate 2 of female 0.5 times as long as half pereonal tergite 2 width; plate 4 of female 0.8 times as long as half pereonal tergite 4 width (following plates increasing in length); plate 6 of female extending beyond tip of pleotelson by 1.8 times middorsal length of pleotelson, the pair diverging over entire length, almost straight except at apex.

Size. Male length: 28–30 mm; female length: 27–30 mm.

Distribution. Tasman Sea, mid-Lord Howe Rise and Lord Howe Plateau, 31°S–37°S, 159°E–170°E, 1573–2096 m.

Etymology. This species is named for its distribution on the Lord Howe Rise.

Remarks. *Brucerolis howensis* is most similar to *B. nowra* (Fig. 1f), *B. victoriensis* and *B. cidaris*, all four with emarginate epimera apices. *Brucerolis howensis* can be distinguished by the combination of the weak projection of the anterolateral

lobes of the head, the concave anterior margin and lack of submarginal sculpture on the dorsal surface of pereonite 1 and male epimeron 3 barely reaching (female epimeron 3 not reaching) the posterior margin of the telson.

***Brucerolis hurleyi* sp. nov.**

Figures 1e, 10–13

Material examined. Holotype: New Zealand, Chatham Rise, 43°29.69'S, 178°59.55'W, 499 m, 08 Sep 1989. (NIWA stn V366 TAM), NIWA 27424 (adult male, 23 mm).

Paratypes: collected with holotype, NIWA 27423 (adult female, 23 mm), NIWA 27425 (12 males, 17 females, 15 juveniles). New Zealand, Chatham Rise, 43°30'S, 179°15'E, 410 m, 24 Jan 1968 (NIWA stn G273), NIWA 27419 (6 males, 5 females, 1 juvenile); 43°31'S, 179°07'E, 413 m, 24 Jan 1968 (NIWA stn G283A), NIWA 27424 (5 males, 4 females, 3 juveniles); 43°58.5'S, 178°40'W, 460 m, 30 Mar 1969 (NIWA stn D904 TAS), NIWA 27420 (5 males, 4 females, 1 juvenile); 44°13.5'S, 177°04.7'W, 403 m, 23 Mar 1978 (NIWA stn Q33), NIWA 27418 (7 males, 6 females, 1 juvenile); 43°49.62–49.23'S, 176°59.82–59.57'E, 498–497 m, 16 Sep 1989 (NIWA stn V387 TAM), NMV J55314 (5 males, 16 females, 26 juveniles). Chatham Rise (Portobello Marine Laboratory Chatham Expedition stn 6), NIWA 27422 (2 males, 5 females, 3 juveniles). W of Chatham Is, 44°00'S, 178°06'E to 44°03'S, 178°09'E, 430 m, USS *Eltanin*, 29 Nov 1964, NMV J11625 (donation from USNM 123962) (1 male, 1 female).

Other material: numerous specimens from 82 NIWA stations.

Description of male holotype. Body length 29 mm. Body 0.9 times as long as greatest width (at coxae 3). Middorsal line without midposterior processes, not elevated in lateral view. Head, anterolateral margins concave, lateral corners acute and projecting anteriorly; width between anterolateral corners 1.2 times as wide as maximum span between lateral margins of eyes; head with paired strongly projecting curving acute processes on transverse ridge at bases of antennae 1, with prominent paired tubercles between eyes, with small, blunt median posterior tubercle, with obscure lobes lateral to median posterior tubercle. Pereonite 1 lateral margin convex anteriorly, straight over most of length, lateral margin upturned over anterior half, sharply crested, with sinuous rounded oblique ridge more or less parallel to margin, separated from it by a deep trough occupying about one-third of width, dorsal surface with obsolete oblique-transverse ridge reaching sinuous ridge. Coxal dorsal plate 2 1.1 times as long as half pereonal tergite 2 width (following plates increasing in length); plate 4 1.8 times as long as half pereonal tergite 4 width; plate 6 extending beyond tip of pleotelson by 2.6 times middorsal length of pleotelson, the pair diverging over entire length, almost straight except at apex; pleonal epimeron 2 1.8 times length of pleotelson; pleonal epimeron 3 1.1 times length of pleotelson; pleonal epimera 2 and 3 with acute apices. Ventral coxal plates 2–4 with a prominent tubercle at anteromesial corner, without marginal ridges. Antenna 1 peduncle articles 3+4 1.9 times as long as article 2 (anterior margin); flagellum of about 41 articles. Antenna 2 peduncle article 5 1.2 times as long as article 4; flagellum of 17 articles. Pereopod 1 propodus 2 times as long as greatest width. Pereopod 2 palm dorsal length 1.3 times greatest width, with short heel, straight setose proximal palm, convex distal palm, with 16 robust setae in U-shaped row. Pereopod 7

carpus 3.1 times as long as greatest width; propodus 4 times as long as greatest width, propodus elongate oval, widest at midpoint; dactylus curved, 0.4 times as long as propodus. Pleopod 2 endopod with evenly tapering distal angle bearing appendix masculina; appendix masculina 4.8 times as long as straight margin of endopod. Uropodal exopod 0.8 length of endopod.

Female. Pereonite 1, lateral margin of female as in male. Coxal dorsal plate 2 of female 0.6 times as long as half pereonal tergite 2 width; plate 4 of female 1.1 times as long as half pereonal tergite 4 width (following plates increasing in length); plate 6 of female extending beyond tip of pleotelson by 2 times middorsal length of pleotelson, the pair diverging over entire length, almost straight except at apex.

Size. Adult male and female body length 17–30 mm.

Distribution. New Zealand, western Cook Strait to eastern slope of New Zealand, Chatham Rise, Bounty Plateau, Campbell Plateau, 40°S–53°S, 168°E–176°W, 315–1024 m.

Etymology. *Brucerolis hurleyi* is named for Dr Desmond E. Hurley, who first noted morphological variation within what he called *Serolis bromleyana* around New Zealand.

Remarks. *Brucerolis hurleyi* and *B. osheai* are similar, both with acute epimera apices, similarly shaped anterior head margin (although in *B. hurleyi*, the anterolateral corners of head are not continuous with anterior margin of pereonite 1), setose lower margins of the ischium, merus and carpus of male pereopod 2 and setulose carpus and propodus of male pereopod 7. *Brucerolis hurleyi* can be recognised by: strongly convex propodus palm of male pereopod 2; ventral coxal plates with an anteriorly projecting, circular tubercle on the anterior margin adjacent to the midline suture; lack of setules on the merus of the male pereopod 7; and absence of the colour pattern seen in most individuals of *B. osheai*. The species is unusual in the possession on antenna 1 flagellum articles of a row of denticles.

One unusual adult male specimen (NIWA stn D9 DR, SE Macquarie Island) has an appendix masculina on pleopods 2 and 3 on both sides.

***Brucerolis macdonnellae* (Menzies, 1962)**

Serolis (Serolis) macdonnellae Menzies, 1962: 188–189, fig. 66.

Acutiserolis macdonnellae. — Brandt, 1988: 18, 21. — Brandt, 1991: 131. — Poore and Brandt, 1997: 159.

Serolis (Acutiserolis) macdonnellae. — Wägele, 1994: 53.

Brucerolis macdonnellae. — Poore and Storey, 2009: 152–153.

Distribution. South Atlantic, western side of South Sandwich island arc between Visokoi and Lesokov Island, 56°43'S, 27°41'W, 2741 m (only type known).

Remarks. Pereonite 1 of *Brucerolis macdonnellae* and *B. bromleyana* has an acute projection on the anterolateral margin and prominent submarginal and transverse ridges on the dorsal surface. In as far as the description of the damaged material allows, *Brucerolis macdonnellae* can be differentiated by the acute tips of epimera 2 and 3, shorter epimeron 3 and shorter, more curved coxal dorsal plates.

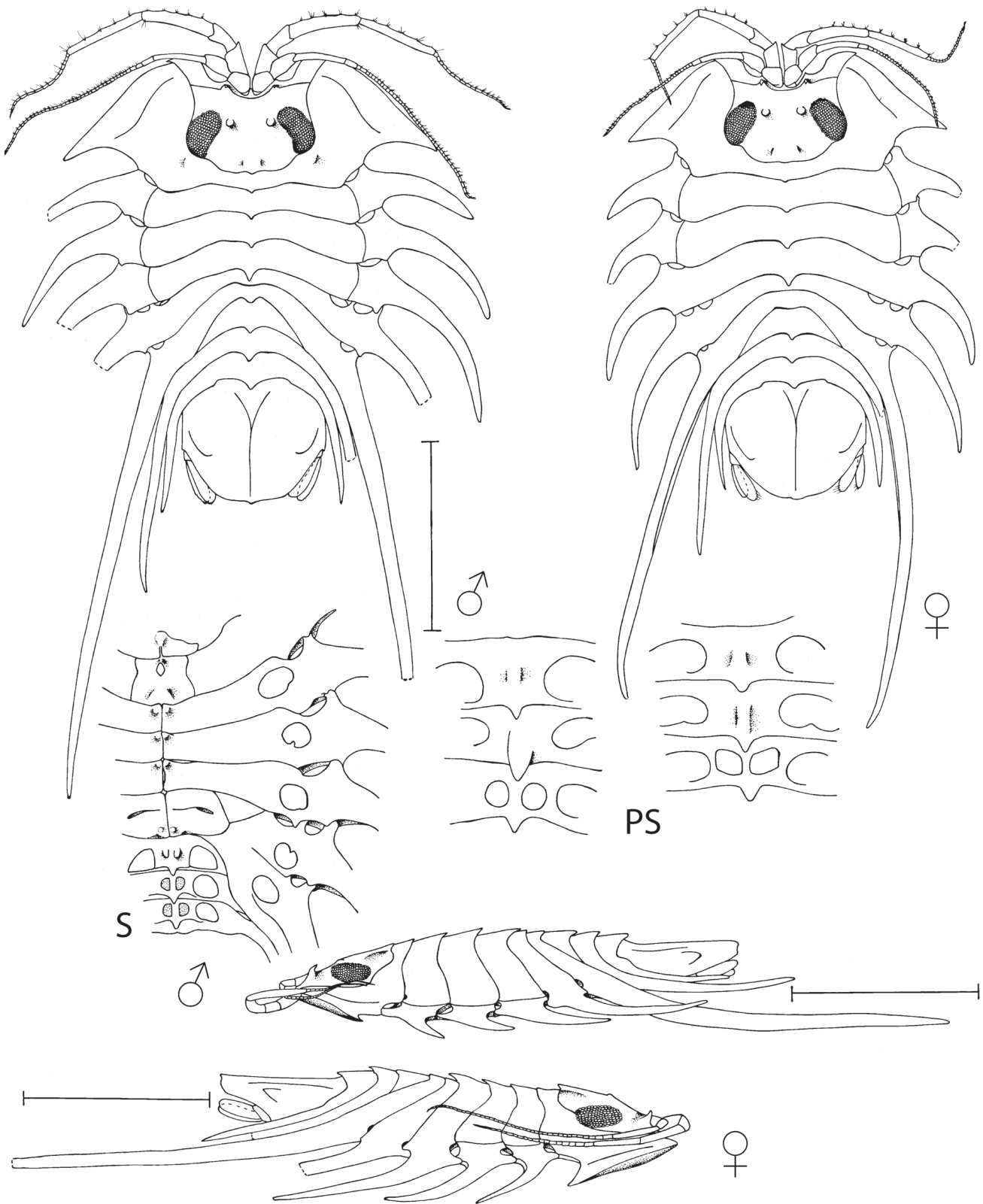


Figure 10. *Brucerolis hurleyi* sp. nov. Holotype male (NIWA 27424): dorsal and lateral views, sternites of pereonites 1–7, pleonites 1–3, medial ridge of pleonites 1–3. Paratype female (NIWA 27423): dorsal and lateral views, medial ridge of pleonites 1–3. Scale = 10 mm.

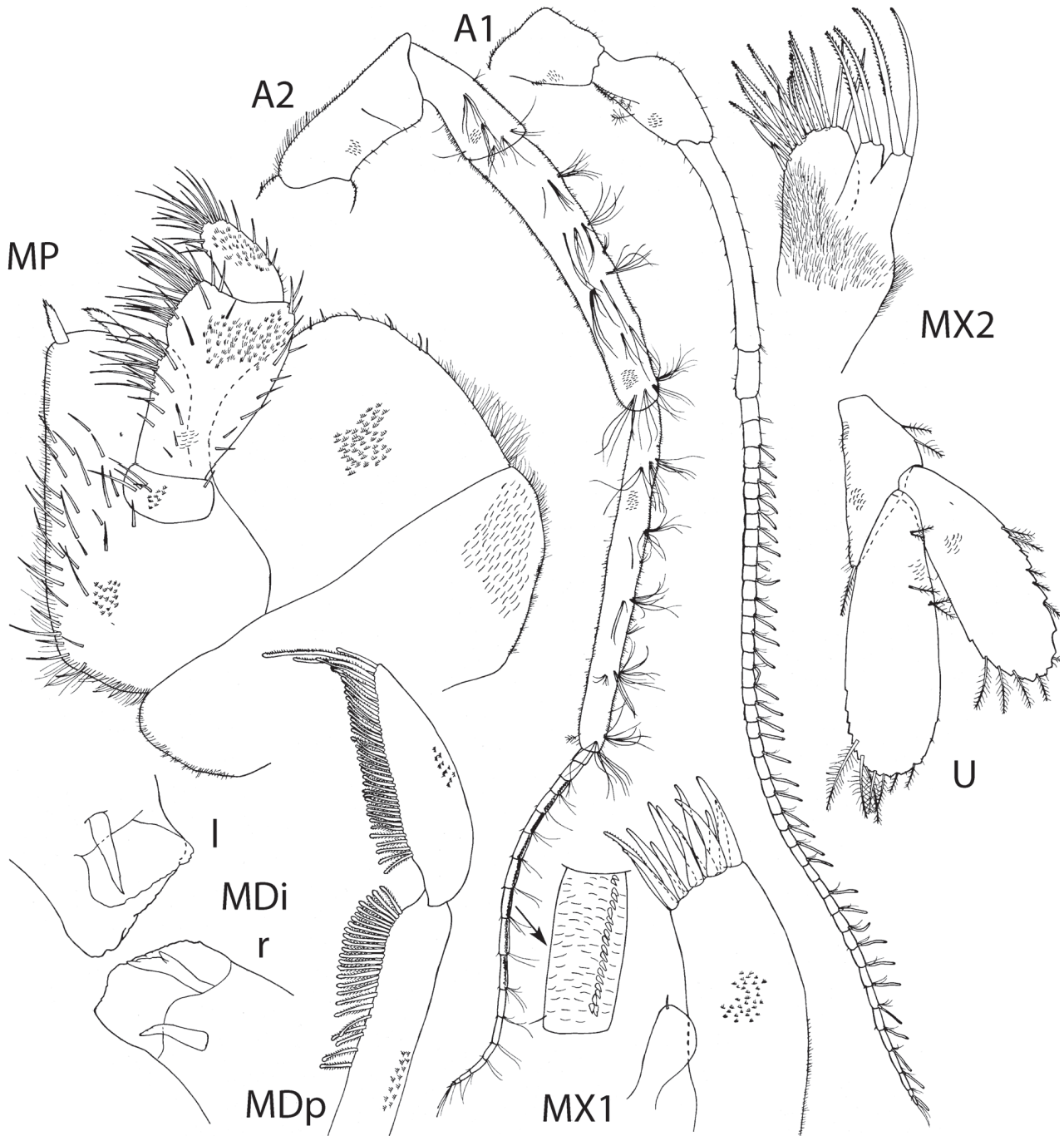


Figure 11. *Brucerolis hurleyi* sp. nov. Holotype male (NIWA 27424): antennae 1, 2 (with detail of antenna 2 flagellar article), mandibular incisors, palp, maxilla 2, maxilliped. Paratype female (NIWA 27423): dorsal view, uropod. Scale = 10 mm.

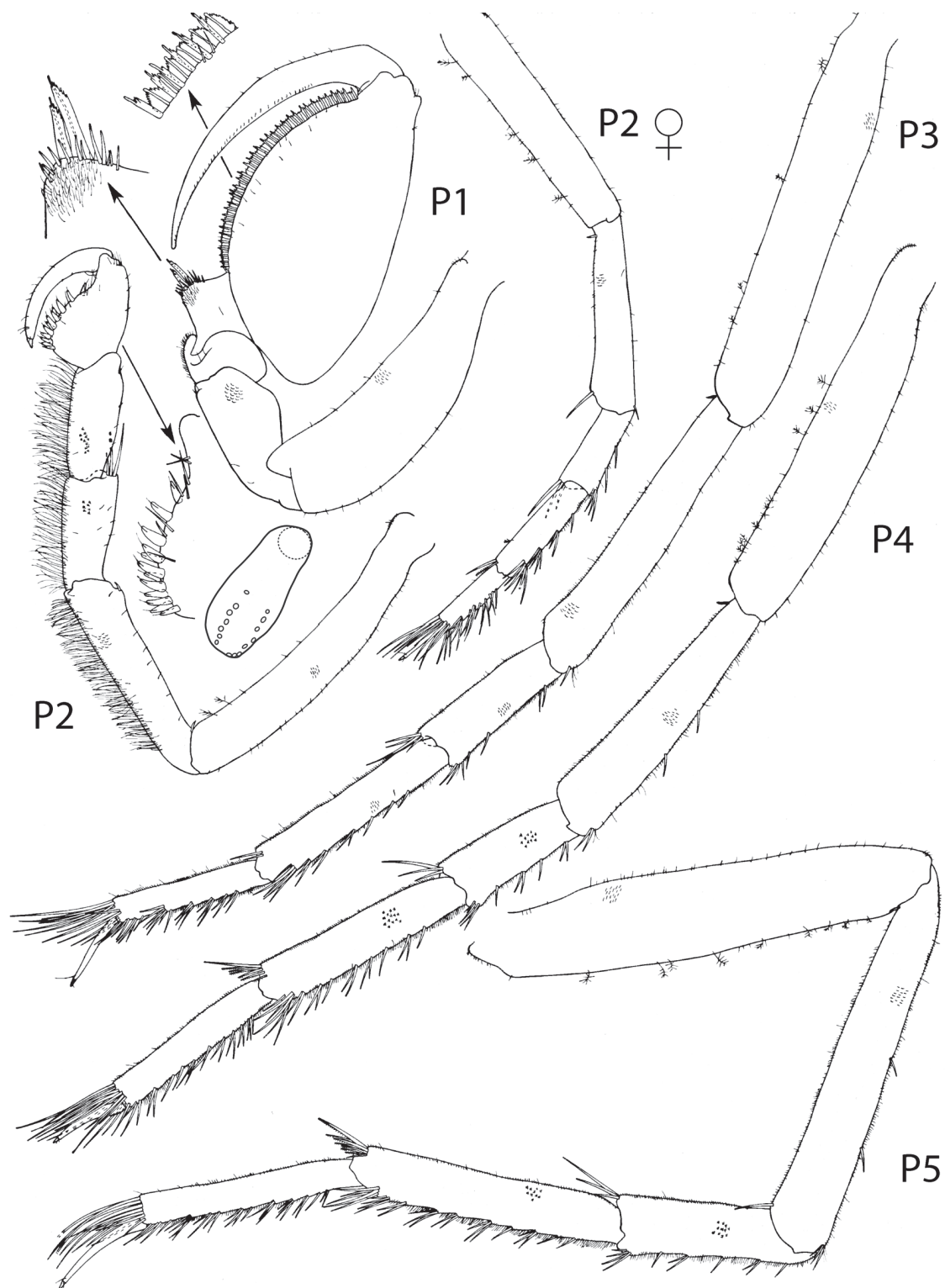


Figure 12. *Brucerolis hurleyi* sp. nov. Holotype male (NIWA 27424): pereopods 1–5. Paratype female (NIWA 27423): pereopod 2.

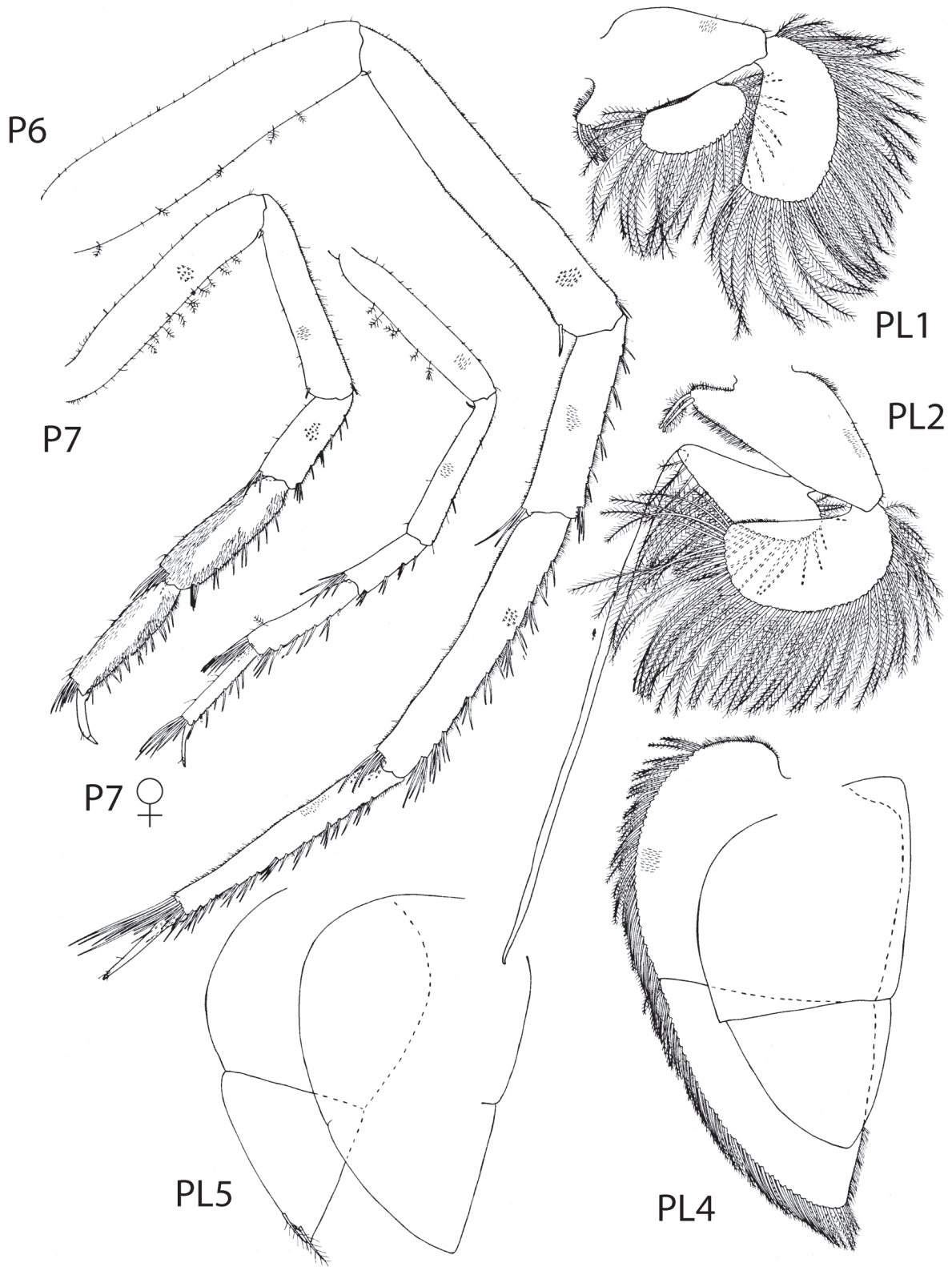


Figure 13. *Brucerolis hurleyi* sp. nov. Holotype male (NIWA 27424): pereopods 6, 7, pleopods 1, 2, 4, 5. Paratype female (NIWA 27423): pereopod 7.

Brucerolis maryannae (Menzies, 1962)

Serolis (Serolis) maryannae Menzies, 1962: 189, fig. 68.

Acutiserolis maryannae.—Brandt, 1988: 18, 21. — Brandt, 1991: 131. — Poore and Brandt, 1997: 159.

Serolis (Acutiserolis) maryannae. — Wägele, 1994: 53.

?*Brucerolis maryannae*. — Poore and Storey, 2009: 152–153.

Distribution. South Atlantic, continental rise S of Staten I., northwest Scotia Sea, 55°31.2'S, 64°07.5'W, 3839 m (only type known).

Remarks. *Brucerolis maryannae* is the only species in the genus to have a serrulate anterior margin of the head and pereonite 1. It shares with *B. bromleyana* the acute projection on the anterolateral margin of pereonite 1 and emarginate tips of epimera 2 and 3. These features and the long coxal plates and epimera suggest a relationship to this species. Menzies's (1962) illustration would indicate that the coxal keys and intervening apertures are absent. It may be possible that the keys are not visible in dorsal view on such a small female (18.8 mm) or that the drawing is incorrect.

Brucerolis osheai sp. nov.

Figures 1g, 14–17

Material examined. Holotype: New Zealand, Challenger Plateau, 49°30.5'S, 167°40'E, 594 m, 16 Jan 1965 (NIWA stn F90), NIWA 27442 (adult male, 21 mm).

Paratypes: collected with holotype, NIWA 27441 (adult female, 21 mm), NIWA 27440 (adult female, 22 mm), NMV J55316 (1 male, 1 female, 1 juvenile), NIWA 27438 (2 males, 1 juvenile). New Zealand, Challenger Plateau, 48°45'S, 172°00'E, 649 m, 21 Jan 1965 (NIWA stn F107), NIWA 27437 (9 males, 7 females, 3 juveniles); 52°21'S, 173°09'E, 603 m, 01 Jan 1965 (NIWA stn F1470), NIWA 27432 (3 males, 4 females, 1 juvenile); 51°20'S, 172°42'E, 539 m, 30 Jan 1965 (NIWA stn F136 TAM), NIWA 27436 (2 males); 50°31.5'S, 168°00'E, 433 m, 15 Jan 1965 (NIWA stn F88 TAM), NIWA 27433 (2 males, 2 juveniles); 48°32'S, 168°54.5'E, 695 m, 18 Jan 1965 (NIWA stn F99 TAM), NIWA 27439 (7 males, 2 females, 2 juveniles).

Description of male holotype. Body length 21 mm. Body 0.85 times as long as greatest width (at coxae 3). Middorsal line without midposterior processes, not elevated in lateral view. Head, anterolateral margins convex and continuous with anterior margin of pereonite 1; width between anterolateral corners 1.2 times as wide as maximum span between lateral margins of eyes; head with paired strongly projecting curving acute processes on transverse ridge at bases of antennae 1, with prominent paired tubercles between eyes, with small, blunt median posterior tubercle, with obscure lobes lateral to median posterior tubercle. Pereonite 1 lateral margin convex anteriorly, straight over most of length, lateral margin upturned over anterior half, sharply crested, with sinuous broadly rounded oblique ridge more or less parallel to margin, separated from it by a shallow concave trough occupying about one-third of width, dorsal surface with obsolete oblique-transverse ridge. Coxal dorsal plate 2 as long as half pereonal tergite 2 width (following plates increasing in length); plate 4 1.8 times as long as half pereonal tergite 4 width; plate 6 extending beyond tip of pleotelson by 2.2 times middorsal

length of pleotelson, the pair parallel, straight distally; pleonal epimeron 2 1.7 times length of pleotelson; pleonal epimeron 3 as long as pleotelson; pleonal epimera 2 and 3 with acute apices. Ventral coxal plates 2–4 with transverse ridges on mesial, anterior and posterior margins outlining a transverse depression. Antenna 1 peduncle articles 3+4 2 times as long as article 2 (anterior margin); flagellum of about 50 articles. Antenna 2 peduncle article 5 1.1 times as long as article 4; flagellum of 16 articles. Pereopod 1 propodus 1.9 times as long as greatest width. Pereopod 2 palm dorsal length 1.7 times greatest width, with short right-angled heel, convex palm, with 13 robust setae in U-shaped row. Pereopod 7 carpus 3 times as long as greatest width; propodus 3.5 times as long as greatest width, propodus elongate oval, widest at midpoint; dactylus curved, 0.4 times as long as propodus. Pleopod 2 endopod with evenly tapering distal angle bearing appendix masculina; appendix masculina 6 times as long as straight margin of endopod. Uropodal exopod 0.9 length of endopod.

Female. Pereonite 1, lateral margin of female as in male. Coxal dorsal plate 2 of female 0.6 times as long as half pereonal tergite 2 width; plate 4 of female as long as half pereonal tergite 4 width (following plates increasing in length); plate 6 of female extending beyond tip of pleotelson by 1.9 times middorsal length of pleotelson, the pair diverging over entire length, almost straight except at apex.

Size. Male length: 21–22 mm; female length: 19–22 mm.

Distribution. New Zealand, Campbell Plateau, 48°S–52°S, 168°E–174°E, 347–735 m.

Etymology. For Steve O'Shea, who arranged for the loan of the material from New Zealand on which much of this work is based.

Remarks. *Brucerolis osheai* is similar to *B. hurleyi* but may be distinguished by a more pronounced median posterior tubercle on the head, the anterolateral corners of head continuous with anterior margin of pereonite 1, a generally smaller body with characteristic pigment spots on the antennae, head and pereonites, a setulate lower margin of the male pereopod 7 merus, carpus and propodus and ridged ventral coxae.

Brucerolis victoriensis sp. nov.

Figures 1h, 18–21

Material examined. Holotype: Australia, Victoria, 85 km S of Point Hicks, 38°31.41'S, 149°21.10'E to 38°30.58'S, 149°21.50'E, 1360–1986 m, 26 Oct 1988, G.C.B. Poore et al., RV *Franklin* (stn SLOPE 72), NMV J55376 (adult male, 34 mm).

Paratypes: Australia, Tasmania, 27 nautical miles W of Sandy Cape, 41°25.39'S, 144°12.66'E to 41°23.40'S, 149°09.01'E, 1165–1180 m, 11 Mar 1989, FRV *Soela*, SAM C6809 (adult female, 31 mm); Victoria, S of Point Hicks, 38°25.90'S, 148°58.60'E, 1850 m, 26 Jul 1986 (stn SLOPE 25), NMV J19212 (1 male, 1 female, 1 juvenile); NSW, 67 km ENE of Nowra, 34°41.97'S, 151°22.44'E, 1642–1896 m, 22 Oct 1988 (stn SLOPE 59), NMV J19208 (1 male, 1 female, 4 juveniles); Victoria, 67 km S of Point Hicks, 38°23.95'S, 149°17.02'E, 1119–1277 m, 25 Oct 1988 (stn SLOPE 67), NMV J19207 (1 male, 28 mm); Victoria, 85 km S of Point Hicks, 38°31.41'S, 149°21.10'E to 38°30.58'S, 149°21.50'E, 1360–1986 m, 26 Oct 1988 (stn SLOPE 72), NMV J19203 (2 adult males, 30 mm), NIWA 49602 (1 male); Victoria,

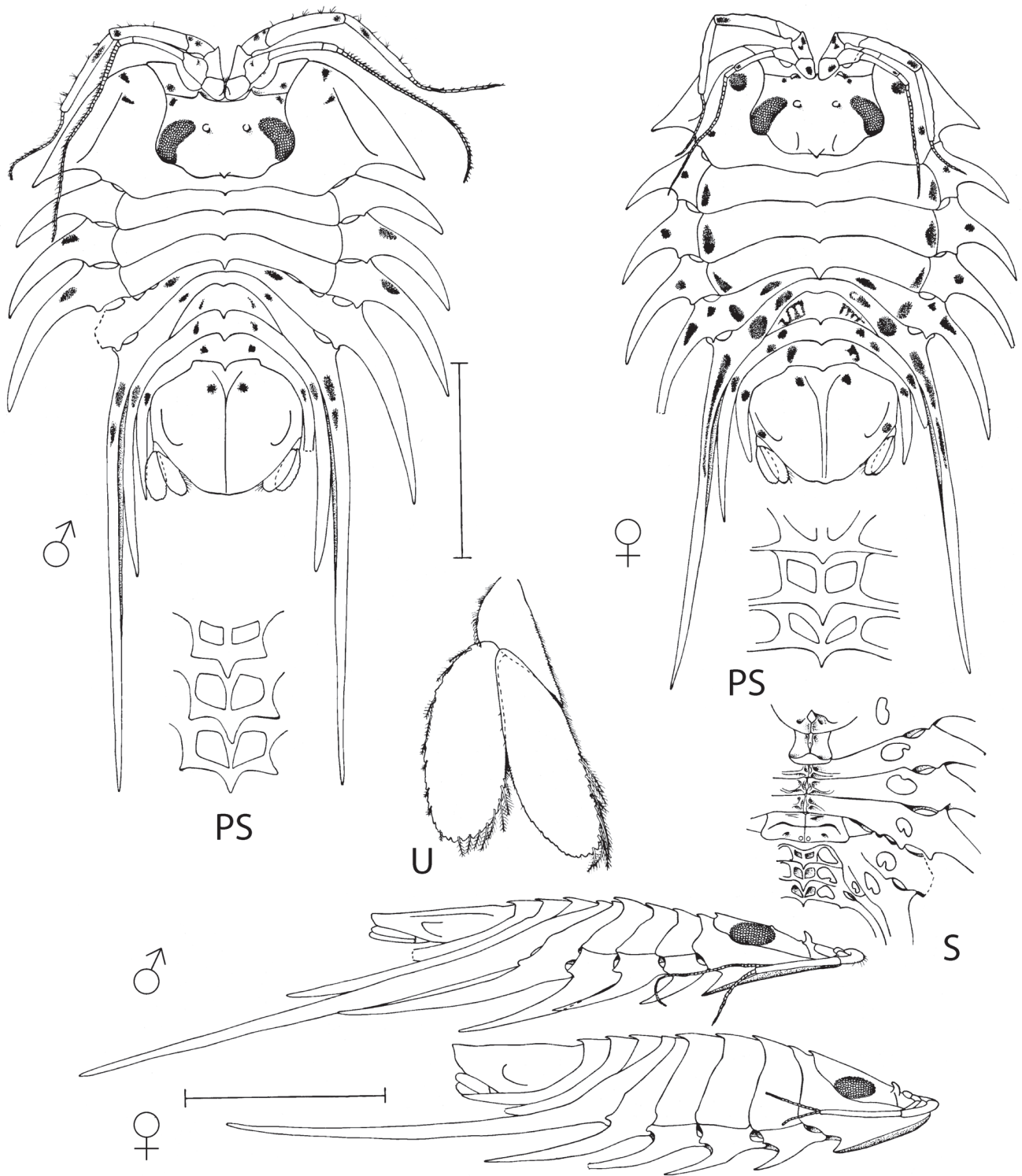


Figure 14. *Brucerolis osheai* sp. nov. Holotype male (NIWA 27442): dorsal and lateral views, sternites of pereonites 1–7, pleonites 1–3, medial ridge of pleonites 1–3, uropod. Paratype female (NIWA 27441): dorsal and lateral views, medial ridge of pleonites 1–3. Scale = 10 mm.

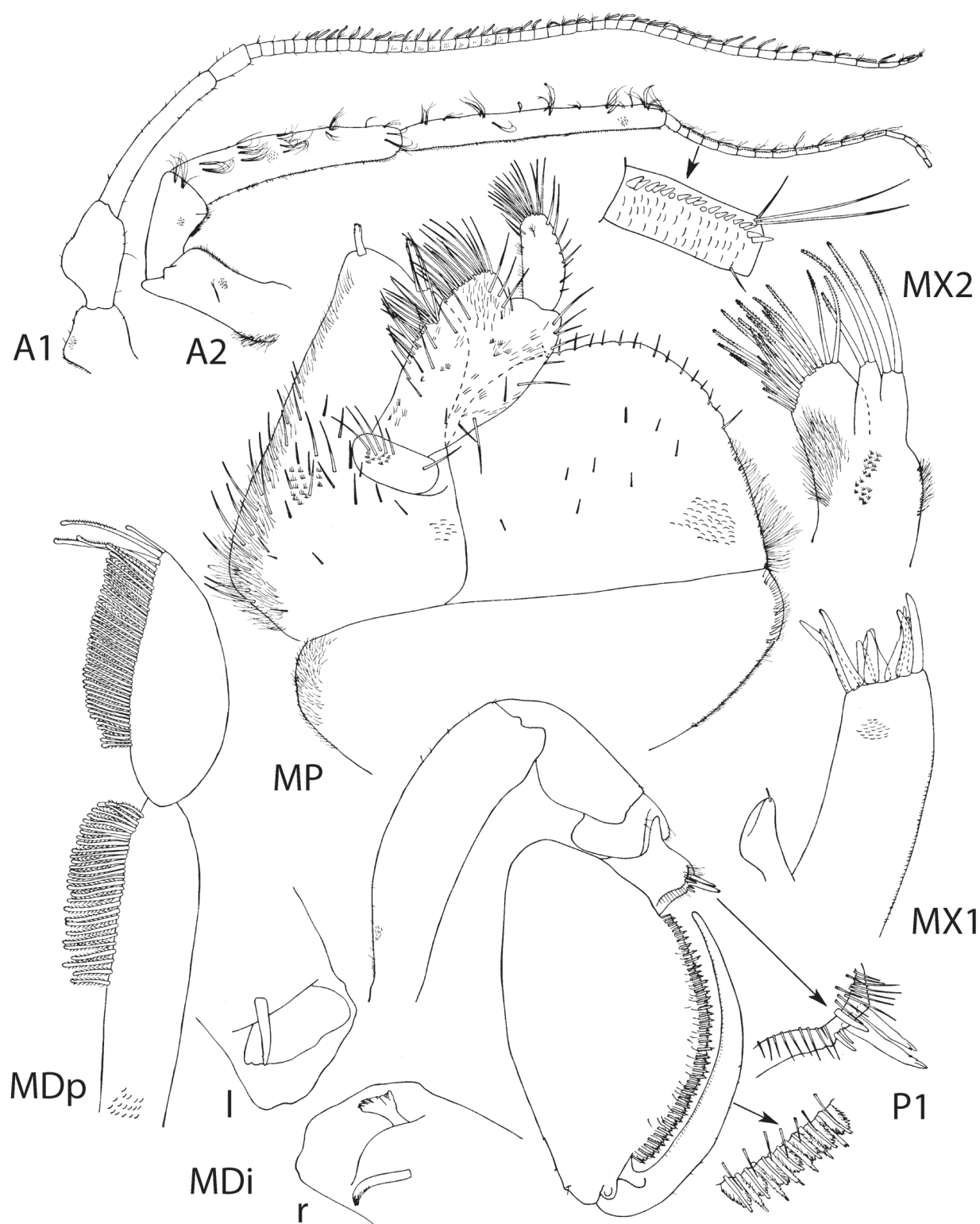


Figure 15. *Brucerolis osheai* sp. nov. Holotype male (NIWA 27442): antennae 1, 2 (with detail of antenna 2 flagellar article), mandibular incisors, palp, maxillae 1, 2, maxilliped, pereopod 1.

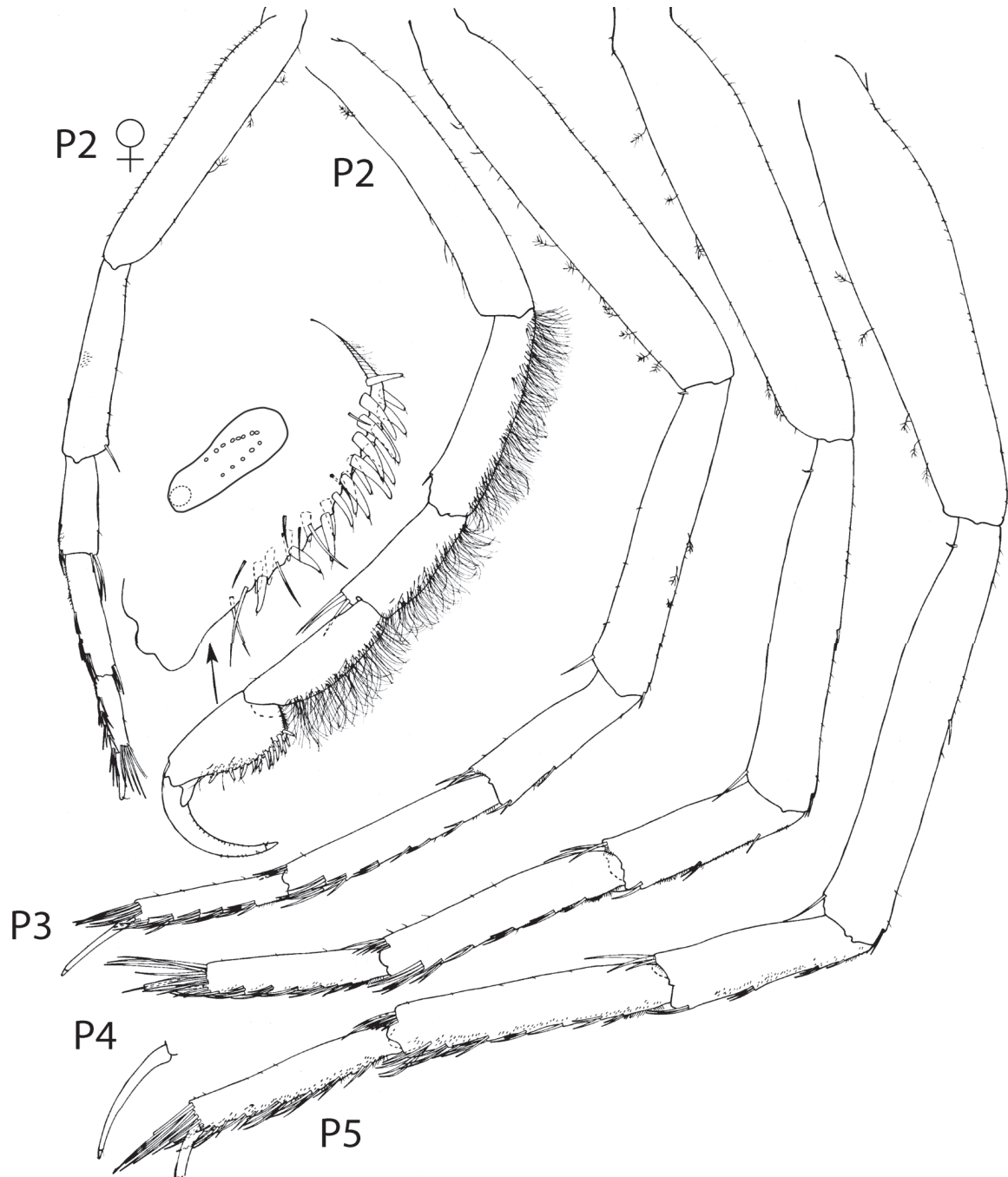


Figure 16. *Brucerolis osheai* sp. nov. Holotype male (NIWA 27442): pereopods 2–5. Paratype female (NIWA 27441): pereopod 2.

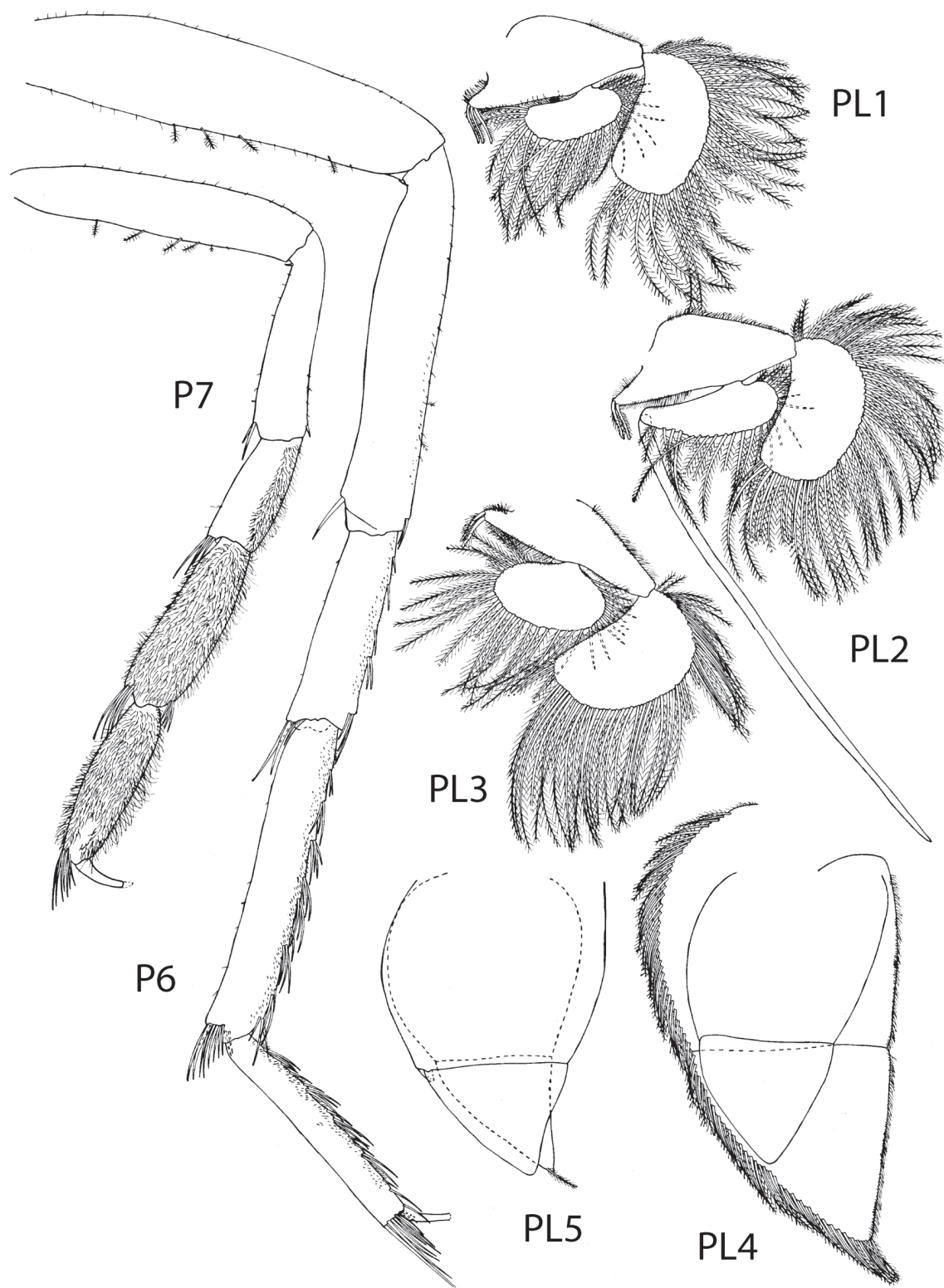


Figure 17. *Brucerolis osheai* sp. nov. Holotype male (NIWA 27442): pereopods 6, 7, pleopods 1–5.

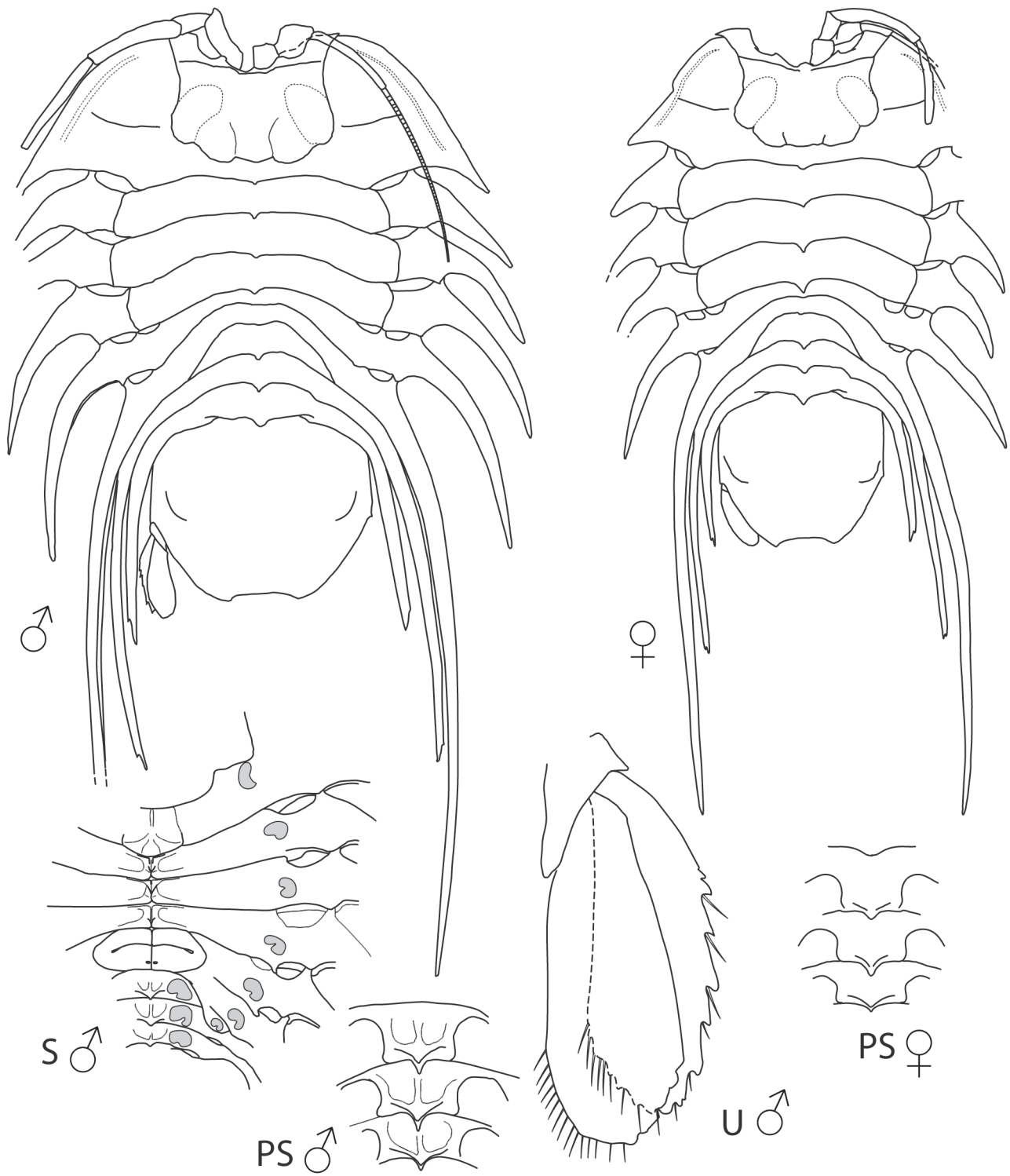


Figure 18. *Brucerolis victoriensis* sp. nov. Holotype male (NMV J55376): dorsal view, sternites of pereonites 1–7, pleonites 1–3, medial ridge of pleonites 1–3, uropod. Paratype female (SAM): dorsal view, medial ridge of pleonites 1–3. Scale = 10 mm.

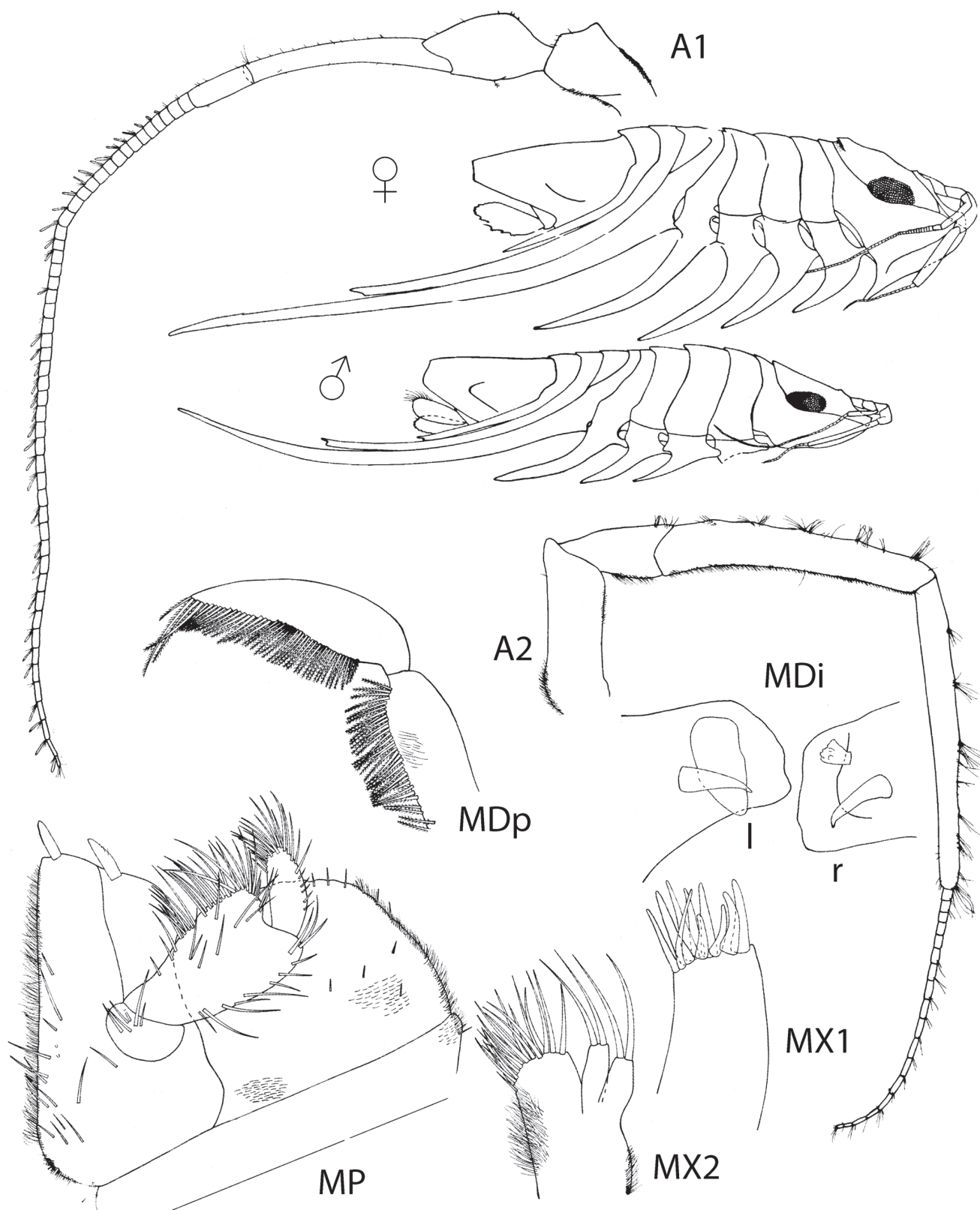


Figure 19. *Brucerolis victoriensis* sp. nov. Holotype male (NMV J55376): lateral view, antennae 1, 2, mandibular incisors, palp, maxillae 1, 2, maxilliped. Paratype female (SAM C6809): lateral view. Scale = 10 mm.

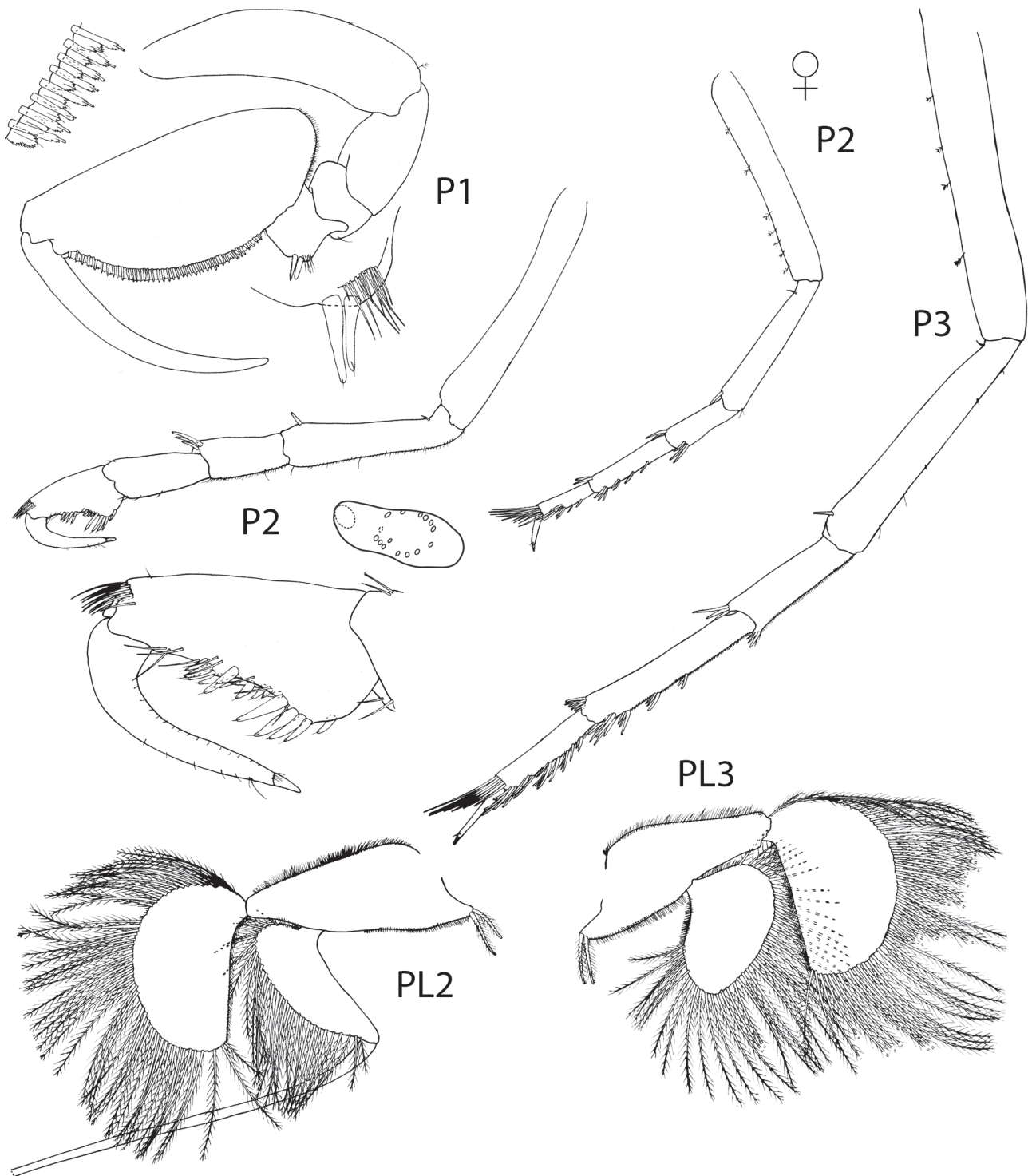


Figure 20. *Brucerolis victoriensis* sp. nov. Holotype male (NMV J55376): pereiopods 1–3, pleopods 2, 3. Paratype female (SAM C6809): pereiopod 2.

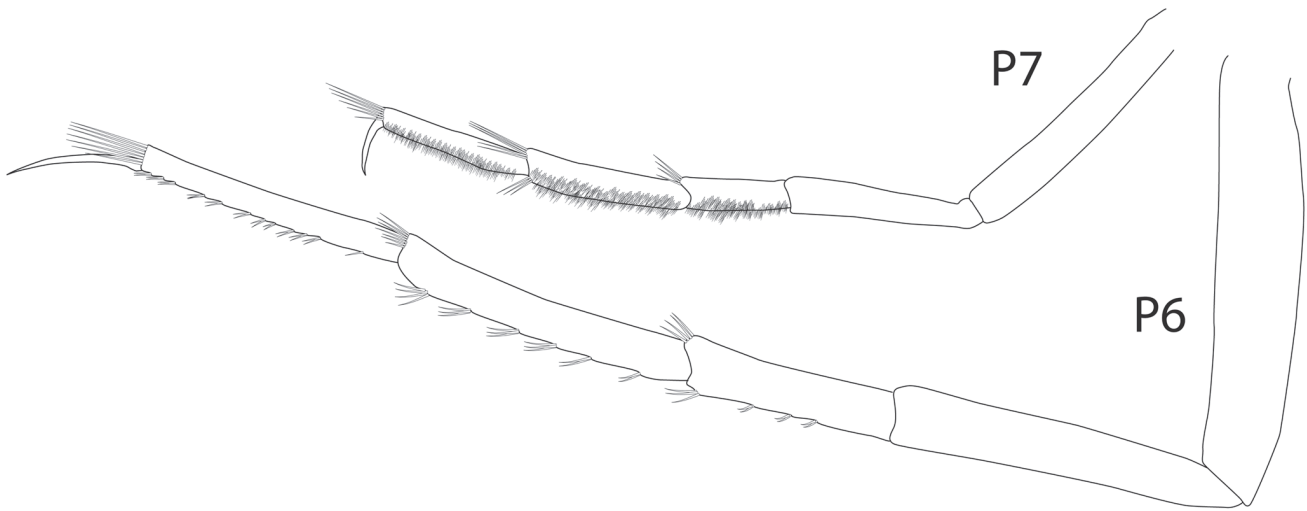


Figure 21. *Brucerolis victoriensis* sp. nov. Holotype male (NMV J55376): pereopods 6, 7.

63 km S of Point Hicks, 38°22.61'S, 149°20.20'E, 1073–1169 m, 25 Oct 1988 (stn SLOPE 68), NMV J19206 (3 males, 32 mm), NIWA 49603 (2 males); Victoria, 76 km S of Point Hicks, 38°29.33'S, 149°19.98'E, 1750–1840 m, 26 Oct 1988 (stn SLOPE 69), NMV J19204 (2 males, 32 mm, 20 juveniles, 6–24 mm); Victoria, S of Point Hicks, 38°30.33'S–38°30.88'S, 149°22.98'E–149°21.63'E, 19 Apr 2000 (stn SS01/00/172), NMV J19208 (5 males, 4 juveniles).

Other material: South Australia, Bonney Coast, Bonney Canyon, 37°52.48'S–37°53.39'S, 139°19.75'E–139° 20.60'E), 2010 m, 16 Feb 2008 (stn SS02/2008/PC3), SAM (5 males, 33–38 mm, 3 females, 34–36 mm, 13 juveniles, 19–30 mm).

Description of male holotype. Body length 34 mm (). Body as long as greatest width (at coxae 3). Middorsal line with small midposterior processes, barely elevated in lateral view. Head, anterolateral margins concave, lateral corners acute and projecting anteriorly (slightly); width between anterolateral corners as wide as maximum span between lateral margins of eyes; head without paired processes on transverse ridge at bases of antennae 1, with obsolete paired tubercles between eyes, with small, blunt median posterior tubercle, with obscure lobes lateral to median posterior tubercle. Pereonite 1 lateral margin anteriorly convex, straight over most of length, lateral margin upturned over anterior half, sharply crested, with sinuous high rounded oblique ridge more or less parallel to margin, separated from it by a shallow trough occupying about one-quarter of width, dorsal surface with obsolete oblique-transverse ridge reaching sinuous ridge. Coxal dorsal plate 2 slightly more than half as long as pereonal tergite 2 width (following plates increasing in length); plate 4 1.5 times as long as half pereonal tergite 4 width; plate 6 extending beyond tip of pleotelson by 2.1 times middorsal length of pleotelson, the pair diverging and then converging slightly apically, curving evenly; pleonal epimeron 2 1.9 times length of pleotelson; pleonal epimeron 3 1.1 times length of pleotelson; pleonal epimera 2 and 3 with acute apices. Ventral coxal plates 2–4 with transverse ridges on mesial, anterior and posterior margins outlining a transverse depression. Antenna 1

peduncle articles 3+4 1.9 times as long as article 2 (anterior margin); flagellum of about 50 articles. Antenna 2 peduncle article 5 similar length to article 4; flagellum of 18 articles. Pereopod 1 propodus 2.2 times as long as greatest width. Pereopod 2 palm dorsal length 1.9 times greatest width, with short right-angled heel, convex palm with 15 robust setae arranged in oval (several shorter than others). Pereopod 7 carpus 4.7 times as long as greatest width; propodus 5.6 times as long as greatest width, propodus tapering from near base, lower margin straight; dactylus curved, 0.4 times as long as propodus. Pleopod 2 endopod with convex distal margin, sharply tapering to base of appendix masculina. Uropodal exopod 1 length of endopod.

Female. Pereonite 1, lateral margin of female convex anteriorly, with distinct step-like interruption and straight posteriorly. Coxal dorsal plate 2 of female 0.6 times as long as half pereonal tergite 2 width; plate 4 of female as long as half pereonal tergite 4 width (following plates increasing in length); plate 6 of female extending beyond tip of pleotelson by 1.9 times middorsal length of pleotelson, the pair diverging and then converging slightly apically, curving evenly.

Size. Adult male and female body length: 28–38 mm.

Distribution. Australia, eastern and southern continental slope of NSW, Vic., Tas. and eastern SA, 34°42'S–41°25'S, 1073–2010 m.

Etymology. For Victoria, the Australian state where most specimens have been taken.

Remarks. The submarginal anterolateral groove on pereonite 1, defined by its upturned margin and sharp inner ridge identify *Brucerolis victoriensis*. The species shares with the non-New Zealand species (*B. howensis* and *B. cidaris*) emarginate epimera and absence of projections on the transverse ridge of the head.

Acknowledgements

We thank Steven O'Shea and Kareen Schnabel of NIWA, Wellington, New Zealand, Keith Probert from the Portobello Marine Station, University of Otago, New Zealand, and Wolfgang Zeidler and Thierry Laperousaz, South Australian Museum, Adelaide, for the loan of material. We thank Joanne Taylor for handling, cataloguing and otherwise organising the bulky loans at Museum Victoria. We especially thank Niel Bruce, now at Museum of Tropical Queensland, Townsville, Australia, for critical comments on a first draft of this manuscript and alerting us to the "Acutiserolis-Cuspidoserolis problem".

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