

Four new species of Ischnomesidae (Crustacea: Isopoda: Asellota) from off south-eastern Australia

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Abstract

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Four new species of Ischnomesidae Hansen, 1916 are described from the continental slope of south-eastern Australia: *Haplomesus franklinae*, *Ischnomesus tasmanensis*, *I. justii* and *Stylomesus sarsi*. The genera *Haplomesus* and *Stylomesus* are recorded from Australian waters for the first time. The family and three genera are rediagnosed to accommodate the new species.

Keywords

Crustacea, Isopoda, Ischnomesidae, *Haplomesus*, *Ischnomesus*, *Stylomesus*, deep-sea, Australia

Introduction

The asellote isopod family Ischnomesidae is distributed throughout the world's deep oceans and continental slopes with 28% of the 94 described species known from the Southern Hemisphere. Little is known of its diversity in Australia and previous to this study only two species had been described from these waters. These, *Ischnomesus anacanthus* Wolff, 1962 and *Mixomesus pellicides* Wolff, 1962, were collected from the Tasman Sea during the voyage of the Danish research vessel *Galathea* during the early 1950s (Wolff, 1962). More recently, Poore et al. (1994) reported on the distribution patterns of a rich fauna of continental slope isopods from south-eastern Australia, western Tasman Sea and Bass Strait. These collections, made between 1979 and 1988, are part of Museum Victoria's SLOPE program. Among this abundant material were about 13 undescribed ischnomesid species. This paper describes four of these, now lodged at Museum Victoria, Melbourne (NMV) and supplementary specimens from the Australian Museum, Sydney (AM).

Due to their brittle nature, few specimens are intact and several individuals were illustrated to complete the sets of figures. The left side was dissected and drawn in preference, except when an appendage was damaged or missing. If both sexes were available, the most complete specimen was designated holotype and pleopods from the opposite sex were included in the description. Pereopod 1 is drawn figured for male and female as it is sexually dimorphic, being larger and more robust in females. Due to the rarity of material representing both sexes

in ischnomesid samples, there is no consistency concerning the sex of the holotype in the literature.

Ischnomesidae Hansen

Ischnomesini Hansen, 1916: 54.—Wolff, 1956: 86.

Ischnomesidae.—Gurjanova, 1932: 40.—Menzies, 1962: 111.—Wolff, 1962: 71–73.—Birstein, 1971: 198–199.—Menzies and George, 1972: 971.—Chardy, 1974: 1537.—Kussakin, 1988: 418.

Diagnosis. Body elongate, subcylindrical and narrow. Pereonites 4–5 elongate, pereonite 5 longest, at least twice as long as wide, pereonite 4 widest anteriorly, 5 widest posteriorly. Head fused to and embedded in pereonite 1. Pereonites 1 (posterior margin) to 4 free and articulating. Pleon with maximum of 2 free pleonites plus pleotelson. Anus separated from branchial chamber. Eyes absent. Antenna 1 terminating with simple setae, article 1 squat and globular, article 2 elongate, at least twice as long as article 1. Antenna 2 length more than half body length, without squama. Maxilla 2 inferior margin with 2 medial pectinate setae. Pereopod 1 robust, strongly subchelate and haptorial; pereopods 2–7 ambulatory; dactylus with single unguis and 2 simple setae. Pleopod 3 endopod with 3 distal plumose setae, exopod tapering, shorter than endopod, with long distal plumose seta. Pleopod 4 unadorned, simple lobe, exopod absent; pleopod 5 absent. Uropod uniramous, terminal. In females, operculum wider at midpoint than proximally.

Remarks. This family is unique amongst the asellotes in having the fifth pereonite at least twice as long as wide and the head completely fused to the first pereonite, with only a slight

indentation between the somites, and medial pectinate setae on the inferior margin of maxilla 2. This paper acknowledges the often overlooked generic synonymies of Kussakin (1988).

Haplomesus Richardson

Haplomesus Richardson, 1908: 81.—Hansen, 1916: 59.—Gurjanova, 1932: 42.—Birstein, 1960: 6.—Menzies, 1962: 117.—Wolff, 1962: 86.—Birstein, 1963: 59.—Birstein, 1971: 209.—Menzies and George, 1972: 973.—Kussakin, 1988: 445.

Type species. *Ischnosoma quadrispinosum* Sars, 1879 (by monotypy).

Diagnosis. Pereonites 5–7 fused with pleonites; pleotelson fully fused to pereonite 7. Antenna 1 of 6 articles. Mandible palp absent. Maxilliped palp narrower than basal endite, articles 2 and 3 expanded. Pereopod 1 carpus of subequal width throughout length. Male pleopod 2 stylet does not extend beyond sympod. Uropod moderately short and of 1 article (except *Haplomesus franklinae* sp. nov.—with 2 articles).

Remarks. In his description of *Haplomesus*, Hansen (1916) stated that the uropods are of only one article. This is true of all except the new species described below which has two uropodal articles. In *Haplomesus franklinae*, the presence of biarticulate uropods is treated as a specific autapomorphic character. The fusion of pereonites 5–7 with the pleonites and pleotelson, and the stylet of male pleopod 2 not extending beyond the sympod, are two of the characters which preliminary phylogenetic analysis have shown to be key synapomorphies for this genus (unpubl. data). This analysis also shows that if *Haplomesus franklinae* were placed in another genus it would render *Haplomesus* paraphyletic.

Haplomesus franklinae sp. nov.

Figures 1–6

Material examined. Holotype. Australia, Vic., S of Point Hicks (38°25'S, 149°00'E), 1500 m, compacted clay, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 22 Jul 1986 (stn SLOPE 27), NMV J20300 (preparatory female, 6 mm).

Paratypes. Australia, Vic., 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840–1750 m, sandy mud, fine shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 26 Oct 1988 (stn SLOPE 69), NMV J20303 (1 male, 6 mm); same data as holotype, NMV J40686 (1 female, 6 mm).

Other material. NSW, 54 km ESE of Nowra (34°52.72'S, 151°15.04'E), 996–990 m, mud, fine sand, fine shell (stn SLOPE 53), NMV J20301 (1 female). Off Nowra (34°58.40'S, 151°23.20'E), 1750–1650 m, NMV J20305 (1 fragment). Off Nowra (34°51.28'S, 151°21.31'E), 1725–1701 m, (stn SLOPE 13), NMV J20304 (1 fragment). 40° 45'S 149° 09.3'E; 3000–2500 m (stn FR1086-4) Vic., 67 km S of Point Hicks (38°23.95'S, 149°17.02'E), 1277–1119 m, fine mud (stn SLOPE 67), NMV J20302 (2 females, 5 fragments). 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840–1750 m, sandy mud (stn SLOPE 69), NMV J40688 (2 males, 15 females, 41 fragments). S of Point Hicks (38°25'S, 149°0'E), 1500 m, compacted clay (stn SLOPE 27), NMV J40687 (2 females, 2 fragments).

Diagnosis. Body granulate, about 6 times as long as wide. Pereonite 1 with pair of long frontal-facing spines on anterolateral margin and pair of stout dorsal spines on posterior

margin. Pereonites 2–4 each bearing pair of anterolateral spines, posterolateral margins of pereonites 5–7 rounded. Pereonites 4 and 5 about 2 and 7 times as long as pereonite 2 respectively. Pleotelson longer than broad, with wide dorsal keel. Antenna 1 of 6 articles, article 2 13 times as long as wide, 0.6 times as long as entire antenna 1, bearing 3 long flagellate setae and 1 aesthetasc. Antenna 2 article 3 more than twice as long as article 4. Mandible covered with microtrichs, molar elongate, with many small circular pits. Maxilliped palp articles 2 and 3 expanded, narrower than basal endite. Pereopod 1 carpus inferior margin with 1 simple seta, 2 long, robust flagellate setae and 1 long robust seta; propodus inferior margin with 2 short flagellate robust setae. At least pereopods 2–4 carpi with finely serrate distal margin. Pleopod 3 exopod with microtrichs, lateral margin with fringe of fine setae. Uropod of 2 articles, article 1 0.5 times length of article 2; article 2 with 1 brush seta.

Description of female holotype. Body length 6.3 times maximum width of pereonite 3 (excluding spines); cuticle calcified, brittle and granulated, all pereonites bearing numerous short simple setae. Head+pereonite 1 1.1 times as wide as long, with 2 anterolateral spines each as long as head+pereonite 1 and 2 short dorsal spines extending from medial ridge. Ratio of lengths of pereonite 2: pereonite 3: pereonite 4: pereonites 5+6+7+pleon (together), 1.0:1.1:1.9:12.1. Pereonite 2 slightly wider than pereonite 1, with transverse ridge. Pereonites 2–7 progressively decreasing in width posteriorly. Pereonites 2–4 each with pair of anterolateral spines. Anterolateral spines on pereonites 2 and 3 0.4 times as long as spines on pereonite 1; spines on pereonite 4 0.2 times as long as those on pereonite 1. Posterolateral margins on pereonites 5–7 rounded. Pereonites 5–7 and pleon with faint suture lines present at joints of these pereonites on dorsal surface, ventral surface fused completely. Pleotelson broad, dorsally with wide longitudinal ridge. Posterior margin rounded, swollen, with 2 medial subventral lobes.

Antenna 1 article 1 with 3 simple setae and 1 brush seta; article 2 4.0 times as long as and 0.2 times as wide as maximal width of article 1, with 8 simple setae of different lengths, 3 long flagellate setae, 1 brush seta and 1 distal aesthetasc; article 3 0.7 times as long as article 1, with 1 simple seta; article 4 0.6 times as long as article 1, with 3 simple setae and 1 brush seta; article 5 0.5 times as long as article 1, without setation; article 6 0.4 times length of article 1, with 5 distal simple setae. Antenna 2 article 1 quadrangular, without setae; article 2 approximately 0.6 times as long as longest margin of article 1, with no setae; article 3 elongate, about 4.3 times as long as article 1, with at least 11 simple setae; article 4 about 1.7 times as long as article 1, with 3 simple setae and few spinules on distal margin.

Mandible surface covered with microtrichs; incisor process with 5 cusps; lacinia mobilis with 2 cusps; spine row of 6 spines; molar long, rectangular, with numerous, small round pits, 9 fine simple setae on inferior margin and 5 fine simple setae on proximal margin. Maxilla 1 with both lobes bearing numerous microtrichs and fine simple setae on both margins; mesial lobe 0.9 times as wide as lateral lobe, with 1 dentate and 1 distal simple seta; lateral lobe with fine simple setae and microtrichs on surface and 12 distal, robust, dentate setae. Maxilla 2 lateral and middle lobes of equal width, lateral lobe with clusters of microtrichs on surface and 5 simple setae on inferior margin; lateral and middle lobes both with 4 distal pectinate setae of different lengths; mesial lobe 2.8 times as wide as lateral lobe, with many microtrichs and scale-setae covering surface, 2 long pectinate setae set medially on inferior margin, and distally, 4 dentate, 2 pectinate and 6 simple setae. Maxilliped coxa small, narrow, oblong; basis 1.8 times as long as widest point, with fine simple setae and 1 simple seta each on lateral

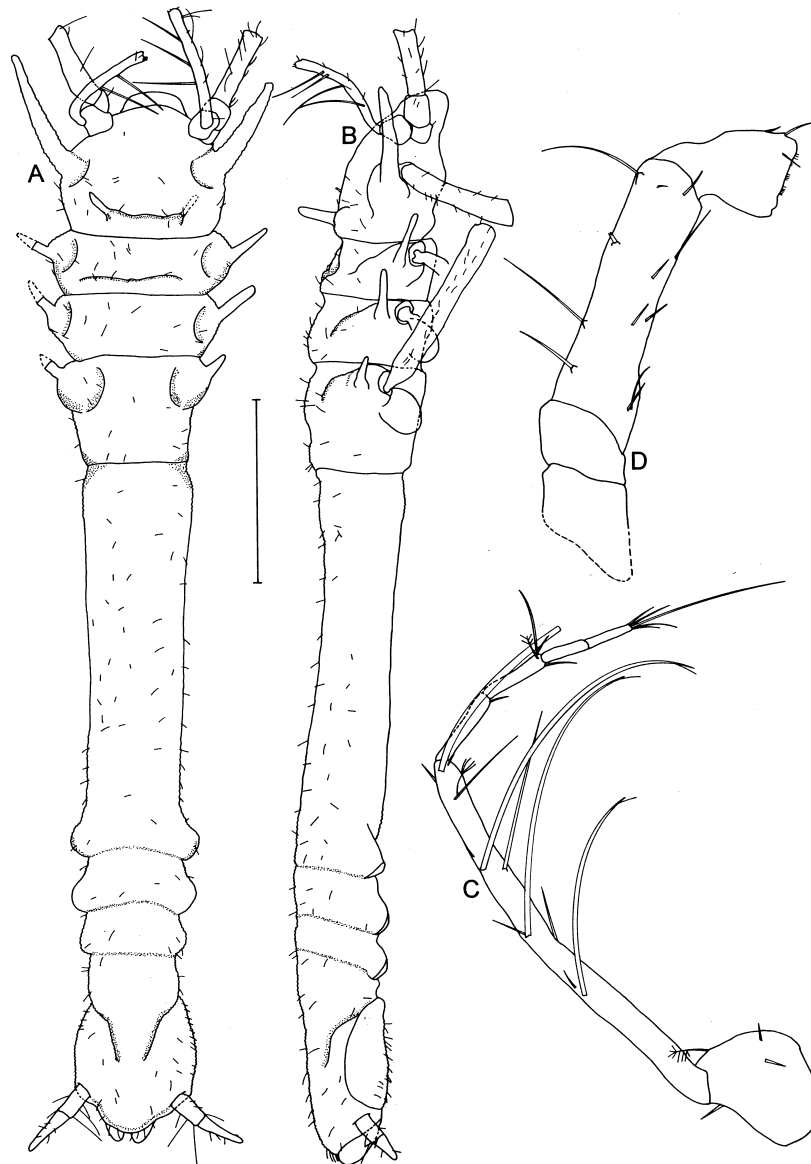


Figure 1. *Haplomesus franklinae* sp. nov., female holotype, NMV J20300: A, dorsal view; B, lateral view; C, antenna 1 (right); D, antenna 2. Scale bar = 1 mm, dorsal and lateral views only.

margin and surface, endite with 3 coupling hooks and distally 3 fan, 5 simple and many fine simple setae. Palp tapering, 2.6 times as long as basal endite; palp article 1 shortest, subrectangular, with few fine simple setae and 1 simple seta; article 2 0.6 times as wide as endite at maximum width, 2.1 times as long and 1.3 times as wide as article 1, with microtrichs on both margins, 2 simple setae and 1 small robust seta; article 3 width and length equal to that of article 2 surface and superior margin with microtrichs and 2 short setae and inferior margin with fringe of fine simple and 3 longer simple setae; article 4 much narrower than article 3, 1.6 times as long as article 1, with few microtrichs and 2 simple setae on distal margin; article 5 length equal to article 4 but narrower, bearing 5 simple setae and 1 thick distal seta. Epipod elongate, semicircular, length 3.5 times width and 1.1 times basis length.

Pereopod 1 basis 0.1 body length; ratio of lengths of articles, basis

to dactylus, 1.0:0.4:0.2:0.4:0.3:0.3; basis with 12 scattered simple setae; ischium with 3 long and 2 short simple setae; merus with 1 long and 1 short seta on distal superior margin and 1 simple, 1 flagellate robust and 1 long robust seta on distal inferior margin; carpus width subequal, superior margin with 3 long, simple slender setae, inferior margin with 1 simple and 2 long flagellate robust setae on proximal half, and more distally with 1 robust seta; propodus width subequal throughout, superior margin with 3 long simple setae and 4 smaller simple setae, 1 simple seta set medially and inferior margin with 1 distal simple seta and 2 robust flagellate setae; dactylus with 4 simple setae on distal superior margin. Pereopods 2, 3 and 5–7 missing.

Pereopod 4 basis 0.2 body length; ratio of lengths of articles, basis to dactylus, 1.0:0.6:0.2:0.8: 0.5:0.2; basis with 22 scattered simple setae; ischium with 10 scattered simple setae; merus with 5 simple setae; carpus with 6 simple setae and 1 distal brush seta on superior



Figure 2. *Haplomesus franklinae* sp. nov., female holotype, NMV J20300: A, mandible; B, maxilla 1; C, maxilla 2; D, maxilliped (right).

margin, 2 simple setae set medially, 3 robust flagellate setae and distally, 1 long robust seta on inferior margin, distal margin finely serrate; propodus superior margin with 7 simple setae and 1 brush seta, inferior margin with at least 5 flagellate robust setae, 1 long robust seta and 1 simple seta; dactylus with 4 simple setae on superior margin.

Additional pereopods from female paratype. Pereopod 1 articles, length ratios same as in holotype; basis with 5 simple setae scattered; ischium with 3 simple setae; merus same as that of holotype, carpus width generally subequal throughout distally, widens slightly proximally, with 2 long and 1 short simple setae on superior margin, inferior margin setation same as holotype; propodus width subequal throughout, with 3 long simple setae and at least 1 smaller simple seta on superior margin, medially 2 simple setae and inferior margin with 2 robust flagellate setae; dactylus same as in holotype.

Pereopod 2 ratio of lengths of articles, basis to dactylus, 1.0:0.4:0.2:0.6:0.3:0.3; basis with 3 robust flagellate setae and 1 brush seta proximally, and 7 simple scattered setae; ischium with 4 simple

setae; merus with 4 simple setae; carpus with 1 simple seta on superior margin and 1 on inferior margin, 2 robust flagellate setae and 1 long robust setae, distal margin finely serrate; propodus bearing 1 simple setae proximally, 1 short robust flagellate and 1 long robust seta on inferior margin and distally 3 simple setae, 1 brush seta and 1 robust flagellate setae and 1 long robust seta; dactylus with 4 short setae on superior margin.

Pereopod 3 ratio of lengths of articles, basis to dactylus, 1.0:0.6:0.1:0.8:0.5:0.3; basis bearing 3 proximal robust flagellate setae, 1 brush seta and 6 scattered simple setae; ischium with 4 simple setae; merus with 3 simple setae; carpus with 4 simple setae and 1 brush seta on superior margin, and inferior margin with 2 flagellate robust and 1 long distal robust setae, distal margin finely serrate; propodus with 1 simple seta on superior margin, inferior margin with 2 robust flagellate setae and 1 long robust setae with few fringed scales in between and distally with 1 robust flagellate, 1 brush and 2 simple setae; dactylus bearing 4 short setae on superior margin.



Figure 3. *Haplomesus franklinae* sp. nov., female holotype, NMV J20300: A, pereopod 1; female paratype, NMV 40686: B, pereopod 1 (right).

Pereopod 4 ratio of article lengths similar to that of holotype; basis bearing 13 simple and 2 brush setae; ischium with 7 simple setae; merus with 5 simple setae; carpus with 5 simple setae, 2 robust flagellate setae and 1 distal brush seta, distal margin finely serrate; propodus with 2 medial simple setae and on inferior margin 2 robust flagellate, 1 long and 1 short robust seta and 4 simple and 1 robust setae distally; dactylus same as in holotype.

Pereopods 5–7 missing.

Operculum length 0.9 times maximum width; numerous simple setae on both lateral margins and scattered on ventral surface, 9 long, plumose setae on posterior margin. Pleopod 3, exopod 0.8 times length of endopod, with few surface microtrichs and fringe of fine simple setae on superior margin. Pleopod 4 length 1.5 times width.

Uropod straight, 0.5 times length of pleotelson; article 1 short, with at least 5 simple setae; article 2 twice as long as article 1, tapering, with 3 simple setae and 1 brush seta.

Male. Pleopod 1 proximal end damaged; lateral margins indented, distal portion covered with microtrichs; medial keel extends distally with 4 simple setae on each side of suture line; distal margin with 5 simple setae on both left and right sides; prominent distolateral horns. Pleopod 2 sympod length 2.4 times maximum width; lateral margin curved with 7 simple setae and 6 distolateral plumose setae; exopod a small lobe, 0.2 times length of sympod; stylet 0.3 length of sympod, narrowing to a point; sperm duct 0.6 length of stylet. Pleopods 3 and 4 similar to female.

Distribution. South-eastern Australia, from Nowra, New South Wales, to Point Hicks, Victoria; 990–1840 m depth.

Etymology. For the CSIRO Research Vessel *Franklin*, from which the material was collected.

Remarks. *Haplomesus franklinae* is the fifth species of this genus to be described from the Southern Hemisphere, and the first to be described from Australian waters. In body form it most closely resembles *Haplomesus modestatenuis* Menzies and George, 1972, with both species having anterolateral spines on pereonites 1–4 and the posterior margin of the pleotelson with two medial subventral lobes. However, *H. franklinae* differs from *H. modestatenuis* in having stouter spines on pereonites 4 and 5, uropods with two articles that extend well past the pleotelson, lack of dorsal hooks on pereonite 7, and no robust setae on the posterolateral margins of the pleotelson (Menzies and George, 1972).

Ischnomesus Richardson

Ischnosoma Sars, 1868: 34 (preoccupied).

Ischnomesus Richardson, 1908: 81.—Hansen, 1916: 56.—Gurjanova, 1932: 40.—Wolff, 1956: 88.—Menzies, 1962: 111.—Wolff, 1962: 73.—Menzies and George, 1972: 971.—Kussakin, 1988: 419 (replacement name).

Rhabdomesus.—Richardson, 1908: 81.

Bactromesus.—Wolff, 1962: 83.

Type species. *Ischnosoma bispinosum* Sars, 1868 (by monotypy).

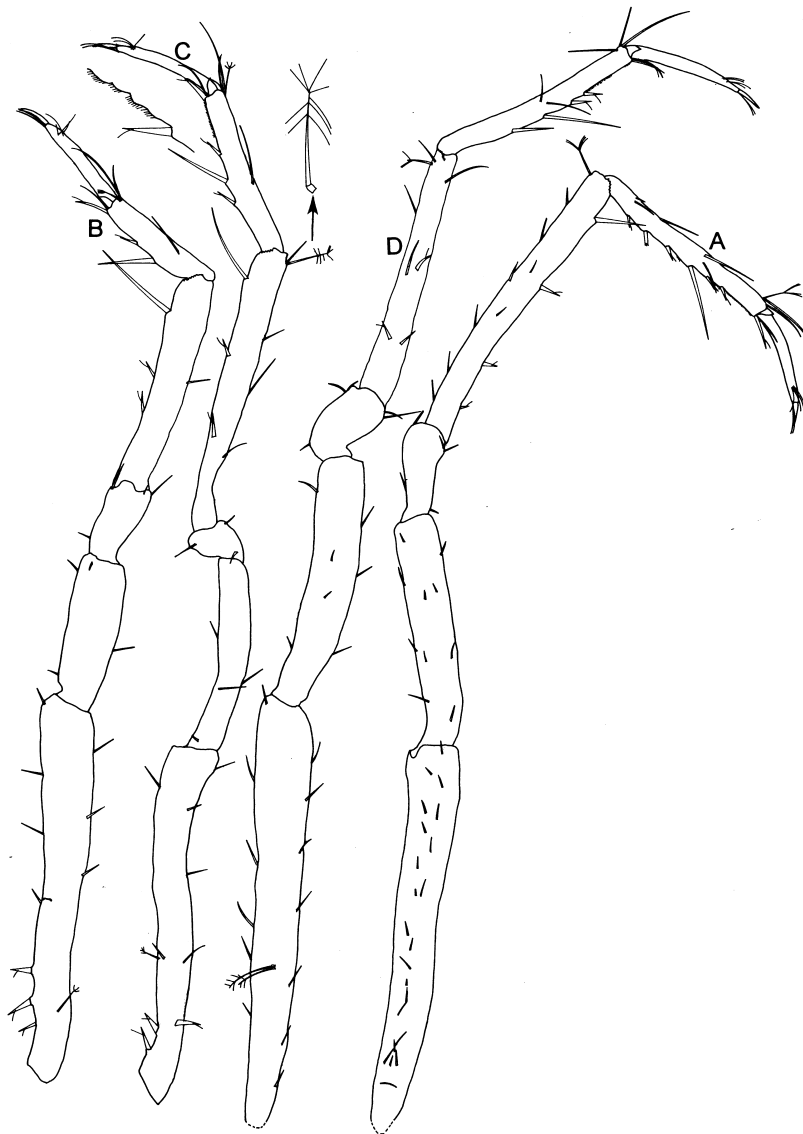


Figure 4. *Haplomesus franklinae* sp. nov., female holotype, NMV J20300: A, pereopod 4 (right); female paratype, NMV J40686: B, pereopod 2; C, pereopod 3 (twisted at merus); D, pereopod 4.

Diagnosis. Pereonites 5–7, pleonite 1 and pleotelson free and articulating. Remaining pleonites fused with pleotelson. Antenna 1 of at least 6 articles. Mandible palp usually absent. Maxilliped palp width at least equal with or wider than basal endite; articles 2 and 3 expanded. Carpus of pereopod 1 inferior margin usually expanded proximally. Stylet of male pleopod 2 either longer or shorter than sympod, if longer, can be whip like. Uropod long and of 2 articles (except *Ischnomesus justii* sp. nov.—with 1 article).

Remarks. The presence of a mandibular palp, the ancestral state in isopods, is confined to five species of *Ischnomesus* (namely *I. justii* sp. nov., *I. roseus* Wolff, 1962, *I. simplissimus* Menzies, 1962, *I. calcificus* Menzies and George, 1972 and *I. carolinae*

Chardy, 1974), being absent in all other species in the family. The presence of a mandibular palp has never been considered as a character to remove these species from the family or even the genus *Ischnomesus*. A preliminary phylogenetic analysis placed those species with a palp within the '*Ischnomesus* clade' (unpubl. data).

In describing *Ischnomesus*, Hansen (1916) stated that the uropods are of two articles. In *Ischnomesus justii* the uropod is of one article. This character state has never been reported in this genus and, while such uropod characters are usually considered to be of generic significance (for example see Wolff, 1962), *I. justii* has free and articulating pereonites 5–7 and pleonite 1. This is the principal diagnostic of this genus. For further discussion, see *Remarks* under *I. justii* below.



Figure 5. *Haplomesus franklinae* sp. nov., female holotype, NMV J20300: A, operculum; B, pleopod 3; C, pleopod 4; D, uropod.

***Ischnomesus tasmanensis* sp. nov.**

Figures 7–11

Material examined. Holotype. Australia, Vic., 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840–1750 m, sandy mud, fine shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 26 Oct 1988 (stn SLOPE 69), NMV J20280 (immature male, 7 mm).

Paratypes. Australia, type locality, NMV J40684 (1 male, 7 mm; 1 female, 8 mm).

Other material. Australia, Vic., 67 km S of Point Hicks (38°23.95'S, 149°17.02'E), 1277–1119 m, fine mud, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 25 Oct 1988 (stn SLOPE 67), NMV J20279 (2 fragments). Type locality, NMV J40685 (4 fragments).

Diagnosis. Body covered in short setae, about 6 times as long as wide. Pereonite 1 with pair of 2 frontal-facing, long antero-

lateral spines and 2 stout dorsal spines. Pereonites 2–4 each with pair of stout dorsal spines; pereonites 2–4 each with pair of anterolateral spines; pereonites 5–7 each with pair of posterolateral spines. Pereonites 4 and 5, about 4 and 6 times the length of pereonite 2 respectively, pereonite 5 with 7 pairs of protrusions extending from each lateral margin, most terminating with long, thick simple setae. Pleotelson longer than broad, lateral margins with 3 large spines. Antenna 1 of 6 articles, with long simple setae present on articles 2 and 3. Antenna 2 article 1 fused to head, with 3 spines; articles 2–4 with numerous simple setae. Mandible without palp. Maxilliped palp article 2 widest; epipod with 3 simple setae. Pereopod 1 carpus with 2 long robust setae and several robust flagellate setae on inferior margin. Pleopod 3 exopod over half epipod length, superior margin with numerous fine simple setae and 9 simple setae.

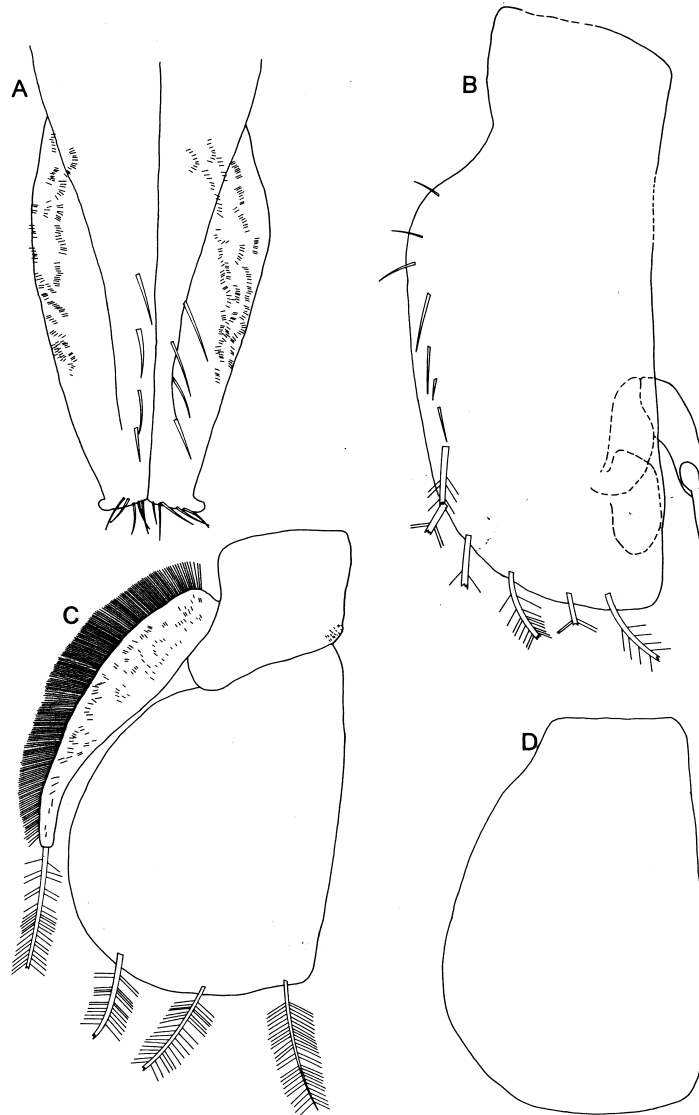


Figure 6. *Haplomesus franklinae* sp. nov., male paratype, NMV J20303: A, pleopod 1; B, pleopod 2 (right); C, pleopod 3 (right); D, pleopod 4 (right).

Uropod elongate, with article 2 1.4 length of article 1, both articles with many simple setae of different lengths, terminating with 3 long simple setae.

Description of immature male holotype. Body length 5.8 times maximum width of pereonite 3 (excluding spines). Body cuticle calcified and brittle, with numerous scattered simple long setae. Head+pereonite 1 length 0.8 times maximum width (excluding spines), with 2 long anterolateral spines that do not reach beyond front of head and 2 stout dorsal spines set posteriorly on pereonite. Although fused, head differentiated from pereonite 1, maximum width 0.7 times width of pereonite 1 (excluding spines), with pair of dorsal tubercles. Ratio of lengths of pereonites 2 : 3 : 4 : 5 : 6 : 7: pleonite 1 : pleotelson, 1.0:1.0:4.2:5.5:1.3:1.0:0.3:3.2. Pereonite 1 widest, pereonites 2–4 width subequal at widest point, pereonites 5–7 decreasing in width posteriorly. Pereonites 2–4 with 2 anterolateral and 2 stout dorsal spines. Pereonites 5–7 with 2 posterolateral spines. Pereonite 5 with 7

pairs of long, thick, simple setae extending from small projections of cuticle. Pleotelson length 1.2 times width (excluding spines), elliptical, with 3 pairs of posterior-facing lateral spines extending from margin; posterior margin dorsal surface with small projection each side of median large projection; smaller projections are insertion point for uropod; ventral surface with triangular medial extension, not extending past margin.

Antenna 1 not complete, article 1 short, rectangular, distal end rounded, with 3 simple setae; article 2 elongate, 5.3 times as long as article 1, bearing 16 simple setae of different lengths and distally, 1 brush seta; article 3 2.9 times as long as article 1, with 12 simple setae of different lengths; article 4 1.0 times as long as article 1, with 1 simple seta and distally, 1 brush seta. Antenna 2 not complete, article 1 fused to head with 3 robust setae and 1 simple seta; article 2 with 11 simple setae; article 3 0.5 times as long as article 2, with 2 simple setae; article 4, damaged, portion present with 40 simple setae.

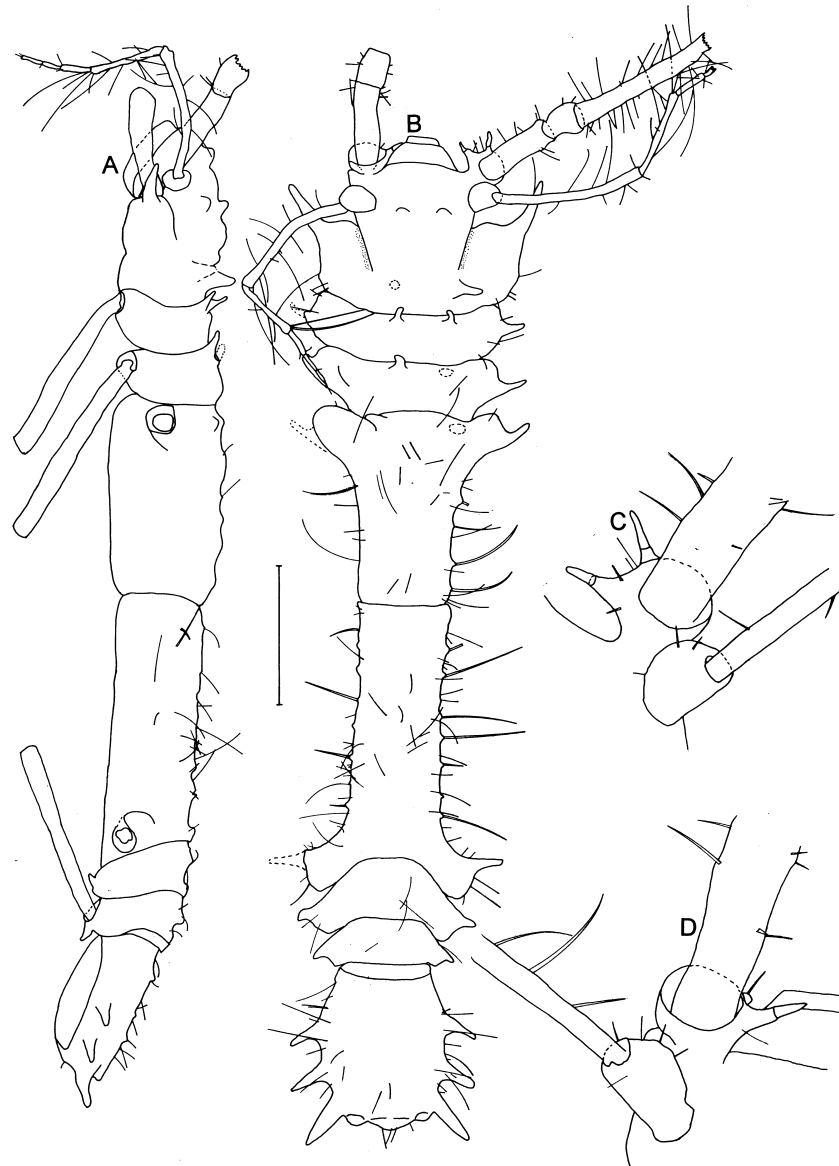


Figure 7. *Ischnomesus tasmanensis* sp. nov., male holotype, NMV J20280: A, lateral view; B, dorsal view; C, left antenna base; D, right antenna base. Scale bar = 1 mm, dorsal and lateral views only.

Mandible incisor process and lacinia mobilis each with 4 cusps; spine row of 7 spines; molar wide, rectangular, with row of 6 medial simple setae. Maxilla 1, both lobes with numerous fine simple setae on both margins; mesial lobe 0.7 times width of lateral lobe; with 1 short dentate and 7 simple distal setae; lateral lobe with 8 simple setae on distolateral margin, 12 distal, strong, dentate setae and few proximal microtrichs. Maxilla 2 lateral lobe 1.2 times width of middle, with many rows of microtrichs on superior margin and 6 simple setae on inferior margin; middle lobe with few microtrichs; both lateral and middle lobes with 4 long distal pectinate setae of different lengths; mesial lobe 2.4 times width of lateral lobe, with numerous fine simple setae and microtrichs on surface, 5 simple setae and 2 long pectinate setae medially set on inferior margin, and distally, 3 dentate setae, 2 long robust simple setae, 2 small pectinate and 11 simple setae of various lengths. Maxilliped coxa small, rectangular; basis length 2.1 as long as wide at widest point, endite with 3 coupling hooks, distally

with 6 simple setae, 6 pectinate setae and 3 fan setae, flap with margin of fine simple setae. Palp narrowing, 3.2 times length of basal endite; article 1 squat and rectangular, with 1 simple setae on superior margin; article 2 1.4 times as wide as basal endite at maximum width, 1.6 times wider and 2.3 times as long as article 1, with 1 simple setae on superior and 4 simple setae inferior margin; article 3 width equal with article 2 at widest point, 2.0 times as long as article 1, with 1 simple setae on superior and 6 simple setae on inferior margin; article 4 1.7 times as long as article 1, much narrower than article 3, with 2 long simple setae on distal inferior margin; article 5 length equal to 4, with 2 simple setae and terminating with 2 robust simple setae; posterior face of palp, article 1 with 1 additional simple setae, article 2 with 2, article 3 with 2, article 4 with 2 and no additional setae on article 5. Epipod elongate, length 2.8 times width, 1.3 times basis length, with 3 long simple setae and microtrichs on superior margin.

Pereopod 1 basis 0.1 body length; ratio of lengths of articles, basis to

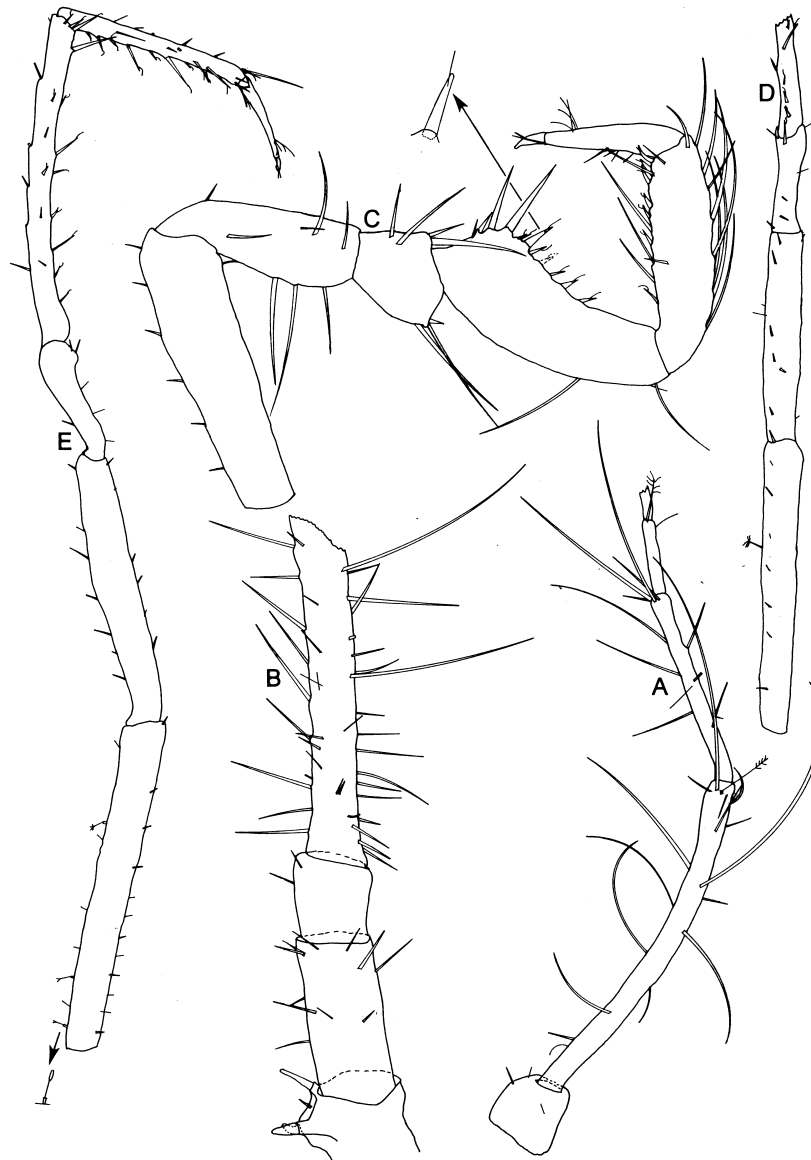


Figure 8. *Ischnomesus tasmanensis* sp. nov., male holotype, NMV J20280: A, antenna 1 (right); B antenna 2 (right); C, pereopod 1 (right); D, pereopod 2 (right); E, pereopod 3 (right).

dactylus, 1.0:0.7:0.3:0.8:0.7:0.4; basis with 7 simple setae, all except 1 on inferior margin; ischium with 8 simple setae of various lengths; merus with 2 long simple and 1 short robust setae on distal superior margin and 2 simple and 2 robust setae of different lengths on inferior margin; carpus wider proximally, superior margin with 2 long and 1 short simple setae and inferior margin with 1 short simple seta, 1 short and 2 long robust setae and 7 flagellate robust setae; propodus width subequal throughout, with 9 long simple setae on superior margin and inferior margin with 6 simple setae of different lengths interspersed between 7 flagellate robust setae; dactylus with 4 simple setae in inferior margin and clump of 4 simple setae on distal superior margin.

Pereopod 2 basis 0.2 body length; ratio of lengths of articles, basis to merus (carpus–dactylus missing) same as in pereopod 1; basis with 7 simple setae and 1 medial brush seta; ischium with 11 simple setae; merus with 6 simple setae and 1 distal flagellate robust seta; part of carpus intact, with 1 simple seta and 5 robust flagellate setae.

Pereopod 3 basis 0.2 body length; ratio of lengths of articles, basis to dactylus, 1.0:0.8:0.4:1.0:0.5:0.3; basis with 17 simple setae, and superior margin also with 2 fork and 1 brush setae; ischium with 13 simple setae; merus with 6 simple setae; carpus with at least 8 simple setae and 13 flagellate robust setae, 3 of these on distal margin; propodus with at least 11 simple setae and inferior margin with 6 long and 5 short alternating flagellate robust setae on inferior margin; dactylus with 4 small simple setae on distal superior margin.

Pereopods 4–7 missing.

Pleopod 1 length 3.5 times proximal width; lateral margins each with 4 simple setae; ridge overlapping dorsal lobes at 0.9 length, with 6 simple setae on left and 7 on right; small distolateral horns extend from dorsal lobes. Penes triangular, 0.2 length of pleopod 1. Pleopod 2 sympod elongate, length 2.6 times maximum width, with 12 long, distal, simple setae; exopod short, roughly oval, length 0.2 times sympod length; stylet 0.8 length of sympod undeveloped. Pleopod 3 exopod 0.9



Figure 9. *Ischnomesus tasmanensis* sp. nov., male holotype, NMV J20280: A, mandible; B, maxilla 1; C, maxilla 2; D, maxilliped; E, basal endite of maxilliped, distal margin.

times endopod length with fine simple setae on both margins and 9 simple setae on superior margin. Pleopod 4 slightly elongate, length 1.8 times width.

Uropod (from male paratype) of 2 articles, elongate and slender; article 1 with at least 11 long simple setae; article 2 length 1.4 times article 1, narrower, with 21 simple setae and 3 long simple setae distally.

Female. Pereopod 1 thicker and more setose than in male; ratio of lengths of articles, basis to dactylus, 1.0:0.5:0.7:0.6:0.6:0.3; basis with 15 simple setae; ischium with 10 simple setae of different lengths; merus with 7 simple setae, 2 short robust setae and 2 long robust setae; carpus similar in shape but more robust than in male, with at least 6 simple setae on superior margin, inferior margin with 9 robust flagellate setae, 2 short robust setae, 2 long robust setae and at least 5 simple setae; propodus with 21 simple setae of different lengths on superior margin and 3 simple setae on surface, inferior margin with 11

robust flagellate setae and 4 long simple setae; dactylus similar to that in male although with 5 simple setae on inferior margin and clump of 3 on distal superior margin.

Distribution. South-eastern Australia, eastern Bass Strait; 1119–1840 m depth.

Etymology. For the Tasman Sea.

Remarks. This is the second species of *Ischnomesus* reported from the Tasman Sea off south-eastern Australia. The first, *I. anacanthus* Wolff, 1962, was described from only the anterior half of one specimen. The first four pereonites of *I. anacanthus* are totally devoid of both lateral and dorsal spines. Of other species, *I. tasmanensis* most resembles *I. birsteini* Wolff, 1962 (the anterior half of the type specimen was too damaged for an



Figure 10. *Ischnomesus tasmanensis* sp. nov., male holotype, NMV J20280: A, pleopod 1; B, pleopod 2; C, pleopod 3; D, pleopod 4. Male paratype, NMV J40684; E, uropod.

accurate description) and *I. spaercki* Wolff, 1956, both from the Kermadec Trench. All three species have long simple setae on lateral projections of the cuticle on pereonite 5, the pleotelson with posterior-facing lateral spines extending from margin and the second uropod article terminated with long simple setae. However, *Ischnomesus tasmanensis* can be distinguished from those two species by its pleotelson, which has three lateral spines on each margin and lacks spines on the dorsal surface. It can be further distinguished from *I. spaercki* by a pair of short dorsal spines on each of the first four pereonites as opposed to *I. spaercki* having a pair of dorsal spines on pereonite 1, 4 dorsal spines on pereonites 2 and 3, and short dorsal spines on pereonites 6 and 7.

***Ischnomesus justii* sp. nov.**

Figures 12–14

Material examined. Holotype. Australia, NSW, 54 km ESE of Nowra (34°52.72'S, 151°15.04'E), 996–990 m, mud, fine sand, fine shell, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 22 Oct 1988 (stn SLOPE 53), NMV J20306 (female, 5 mm).

Paratype. Tasmania, eastern Bass Strait, 87 km ENE of North Point, Flinders I. (39°28.2'S, 148°52.4'E), 841 m, muddy sand, naturalists' dredge, G.C.B. Poore, HMAS *Kimbla*, 29 March 1979 (stn BSS 37), NMV J20309 (1 immature male, 5 mm).

Other material. Tasmania, 48 km ENE of Cape Tourville (42°00.25'S, 148°43.55'E), 1264–1130 m, gravel with lumps of sandy mud aggregate, WHOI epibenthic sled, G.C.B. Poore et al., RV *Franklin*, 30 Oct



Figure 11. *Ischnomesus tasmanensis* sp. nov., male holotype, NMV J20280: A, pleotelson, ventral view. Female paratype, NMV J40684: B, pereopod 1.

1988 (stn SLOPE 81), NMV J20307 (1 male, 1 female). Eastern Bass Strait, 87 km ENE of North Point, Flinders I. (39°28.2'S, 148°52.4'E), 841 m, muddy sand, naturalists' dredge, G.C.B. Poore, HMAS *Kimbla*, 29 Mar 1979 (stn BSS 37), NMV J20308 (1 female). Paratype locality, NMV J40690 (1 fragment). Type locality, NMV J40689 (2 females, 1 fragment).

Diagnosis: Body smooth, about 6 times as long as wide. Pereonite 1 bearing pair of stout anterolateral spines. Pereonites 2–4 anterolateral margins and pereonites 5–7 posterior margin rounded, lacking spines. Pereonites 4 and 5 elongate, about 2 and 3 times length of pereonite 2 respectively. Pleotelson paddle-like, proximally with wide proximal keel. Antenna 1 with 6 articles, article 2 with several long flagellate setae. Antenna 2, article 1 not fused to head; articles 2 and 3 with 1 long robust seta on distolateral margin. Mandible with palp. Maxilliped palp article 2 widest; epipod broad, rounded, with no setae. Pereopod 1 carpus inferior margin with only long pectinate and simple setae. Pleopod 3 exopod small, length less than half of endopod. Uropod of single article, inserted at about 90° in pleotelson with 4 simple setae.

Description of female holotype. Body length 5.8 times maximum width of pereonite 3. Body cuticle smooth, calcified and brittle, with few short simple setae scattered over pereonites. Head+pereonite 1 curved around in lateral view, with 2 short anterolateral spines. Ratio of lengths of pereonites 2 : 3 : 4 : 5 : 6 : 7 : pleonite 1 : pleotelson, 1.0:1.3:2.2:2.9:0.9:0.8:0.3:1.6. Widths of pereonites 1 (including spines) to 3 equal; pereonites 4–7 widths decreasing (at widest part) posteriorly. Pleotelson long, paddle-like in dorsal view, length 1.3

times widest point; apex broadly rounded, with angular posterolateral corners.

Antenna 1 article 1 conical, bearing 1 short simple seta and 1 distal brush seta; article 2 elongate, 4.4 times as long as article 1, with 6 simple setae, 4 long flagellate setae and 1 brush seta; article 3 1.8 times length of article 1, with 2 distal simple setae; article 4 0.6 times length of article 1, with 3 simple setae; article 5 0.8 times length of article 1, with 1 simple seta; article 6 length equal to article 5, with 2 short simple setae and 4 simple setae of different lengths distally. Antenna 2 not complete; article 1 broad and short, with 1 simple seta; article 2 with longer lateral margin, 1.4 times length of article 1, with 1 simple seta and 1 distal lateral robust simple seta; article 3 elongate, 2.1 times length of article 1, with 2 simple setae and 1 distal lateral long robust seta; article 4 quadrangular, 1.5 times length of article 1, with 3 simple setae.

Mandible body with 1 simple seta near palp; incisor process with 5 cusps; lacinia mobilis with 4 cusps; spine row of 5 spines; molar rectangular, angled tightly towards spine row, with microtrichs and cusp on proximal margin; palp article 1 with 1 simple seta; article 2 1.7 times as long as article 1 with many microtrichs and 2 pectinate setae on inferior distal margin; article 3 0.5 times as long as article 1 with microtrichs on the inferior margin and terminating with 1 pectinate seta. Maxilla 1 with mesial lobe 0.6 times width of lateral lobe, with numerous fine simple setae on superior margin, and distally 2 simple setae, 1 pectinate seta and 1 dentate seta; lateral lobe with many fine simple setae on face and superior margin, distally 2 simple and 12 strong, dentate setae. Maxilla 2 lateral lobe wider than middle, with a few fine simple setae, 19 simple setae and distally, 1 long pectinate and 3 long simple setae; middle lobe 0.8 times width of lateral lobe, with 2 simple setae on inferior margin and distally, 1 long pectinate and 2 long

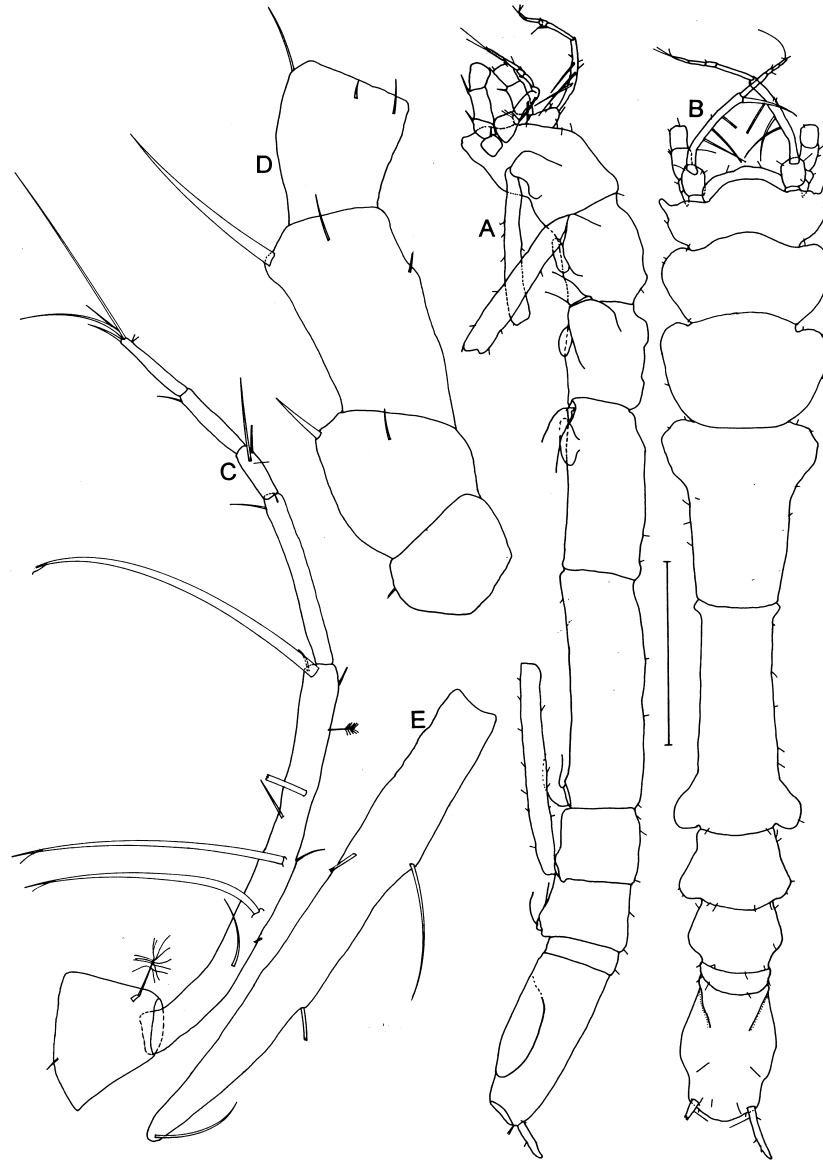


Figure 12. *Ischnomesus justi* sp. nov., female holotype, NMV J20306: A, lateral view; B dorsal view; C, antenna 1; D, antenna 2; E, uropod (right). Scale bar = 1 mm, dorsal and lateral views only.

simple setae; mesial lobe 2.0 times as wide as lateral lobe with many fine simple setae covering face, inferior margin with 7 simple setae, medially 2 long pectinate setae, and distally 3 small pectinate, 1 dentate and 13 simple setae. Maxilliped coxa large, rectangular; basis 1.7 times as long as widest point, curved over on inferior margin with fringe of fine simple setae, 2 simple setae and endite with 3 coupling hooks, and distally 3 fan and 7 simple setae. Palp tapering, 2.6 times length of basal endite; palp article 1 shortest, wide, rectangular, bearing 4 simple setae; article 2 wide, triangular, 0.9 times maximum width of basal endite, 3.0 times length of article 1, with 3 simple and 1 robust setae; article 3 same width as widest point of article 2, 2.1 times length of article 1, with 1 robust and 11 simple setae; article 4 narrower than article 3, 1.4 times length of article 1 with 6 simple setae; article 5 twice as long as wide, 1.8 times length of article 1, with 4 simple setae and 1 thick distal seta. Epipod with broad rounded tip, length 2.9 times width and 1.2 times basis length.

Pereopod 1 basis 0.2 body length; ratio of lengths of articles, basis to dactylus, 1.0:0.4:0.2:0.4:0.4:0.2; basis with 5 simple setae; ischium with 7 simple setae of various lengths, all distal; merus with 3 simple setae on distal superior margin and medially, at least 4 simple and 2 long pectinate setae; carpus width subequal throughout, with 3 long and 2 short simple setae on distal superior margin and inferior margin with at least 7 simple and 13 pectinate setae of different lengths, with small fringed scale-setae between; propodus width subequal throughout, superior margin with 11 long simple setae and inferior margin with 4 robust flagellate setae, at least 20 simple setae of various lengths and with small fringed scale-setae between on margin; dactylus with 8 short simple setae.

Pereopod 2 basis 0.2 body length; ratio of lengths of articles, basis to dactylus, 1.0:0.8:0.4:0.7:0.3:0.2; basis with 7 simple and 1 distal short flagellate seta; ischium with 5 simple setae and at least 5 short flagellate setae; merus with at least 9 simple setae of different lengths;



Figure 13. *Ischnomesus justi* sp. nov., female holotype, NMV J20306: A, mandible; B, maxilla 1; C, maxilla 2; D, maxilliped (right).

carpus with at least 16 simple setae of various lengths, at least 3 robust flagellate setae, 1 of these on distal inferior margin and 1 brush seta on distal superior margin; propodus with 20 simple setae and 5 short robust flagellate setae on inferior margin; dactylus with 4 simple setae.

Operculum length 1.3 times maximum width; heart-shaped, margin with small simple setae, 4 slightly longer simple setae on posterior margin. Pleopod 3 exopod small and slender, 0.3 times endopod length; endopod elongate, rounded distal margin. Pleopod 4 elongate, length 2.7 times maximum width.

Uropod of 1 article, straight, 0.4 times length of pleotelson; sitting up in socket almost 90° degrees to body, with 4 simple setae.

Immature male. Pereopod 1 more slender than in female; ratio of lengths of articles, basis–dactylus, 1.0:0.3:0.2:0.5:0.4:0.2; basis with 6 simple setae; ischium with 3 long simple setae; merus with 2 long simple setae on distal superior margin and medially 2 long simple setae and 2 long pectinate setae; carpus width subequal throughout, with 2 long simple setae on distal superior margin, inferior margin with at least 20 pectinate setae of various lengths and small fringed scale-setae

between; propodus with 17 simple setae of different lengths and inferior margin with 4 fringed scale-setae and 3 short, robust flagellate setae; dactylus with 5 simple setae.

Pleopod 1 length 2.6 times maximum width; completely fused, with no ornamentation, margin slightly compressed, widens towards distal end and curves inwards, indenting in the middle. Pleopod 2 sympod length 2.6 times maximum width, with 1 small simple seta; exopod rounded distally, 0.1 times as long as sympod; stylet, undifferentiated, fused with endopod, rounded distally. Pleopod 3 exopod short, length 0.4 times that of endopod; endopod distal margin coming to a wide point. Pleopod 4 elongate, length 2.0 times width.

Distribution. South-eastern Australia, from Nowra, New South Wales, to Cape Tourville, Tasmania; 841–1264 m depth.

Etymology. For Jean Just, distinguished isopod taxonomist, who sorted and made preliminary identifications of the material on which this study is based.



Figure 14. *Ischnomesus justi* sp. nov., female holotype, NMV J20306: A, pereopod 1; B, pereopod 2 Male paratype, NMV J J20309: C, pereopod 1.

Remarks. Although the uropods of *Ischnomesus justi* have only one article, the species displays all the other diagnostic characters that characterise *Ischnomesus*. *Ischnomesus justi* is similar to *I. calcificus* Menzies and George, 1972 and *I. simplex* Menzies and George 1972 (both species from the Peru–Chile Trench) and *I. roseus* Wolff, 1962 (from the Gulf of Panama and Eastern Pacific Ocean, off Costa Rica). There are many characters that link these four: pereonites 2–4 rounded, with pereonite 1 having either small spines or tubercles; *I. calcificus*, *I. justi* and *I. roseus* all have a three-articled mandibular palp (not illustrated in *I. simplex*) with two pectinate setae on the distal inferior margin; and pereopod 1 in both *I. calcificus* and *I. justi* has scale-setae on the inferior margin of the carpus and propodus. The uropods are

undescribed for *I. calcificus* and *I. roseus*, and are of two articles in *I. simplex*. *I. justi* is distinguished from the others by the uropod having a single article, pereonites 1–4 being broadly rounded, and the pleotelson with only slight lateral bulges and an anterior keel.

Stylomesus Wolff

Stylomesus Wolff, 1956: 97.—Birstein, 1960: 15.—Menzies, 1962: 123.—Wolff, 1962: 83.—Birstein, 1971: 204.—Kussakin, 1988: 437.

Gomphomesus.—Wolff, 1962: 84.

Helomesus.—Wolff, 1962: 84.

Type species. *Rhabdomesus inermis* Vanhöffen, 1914 (by monotypy).

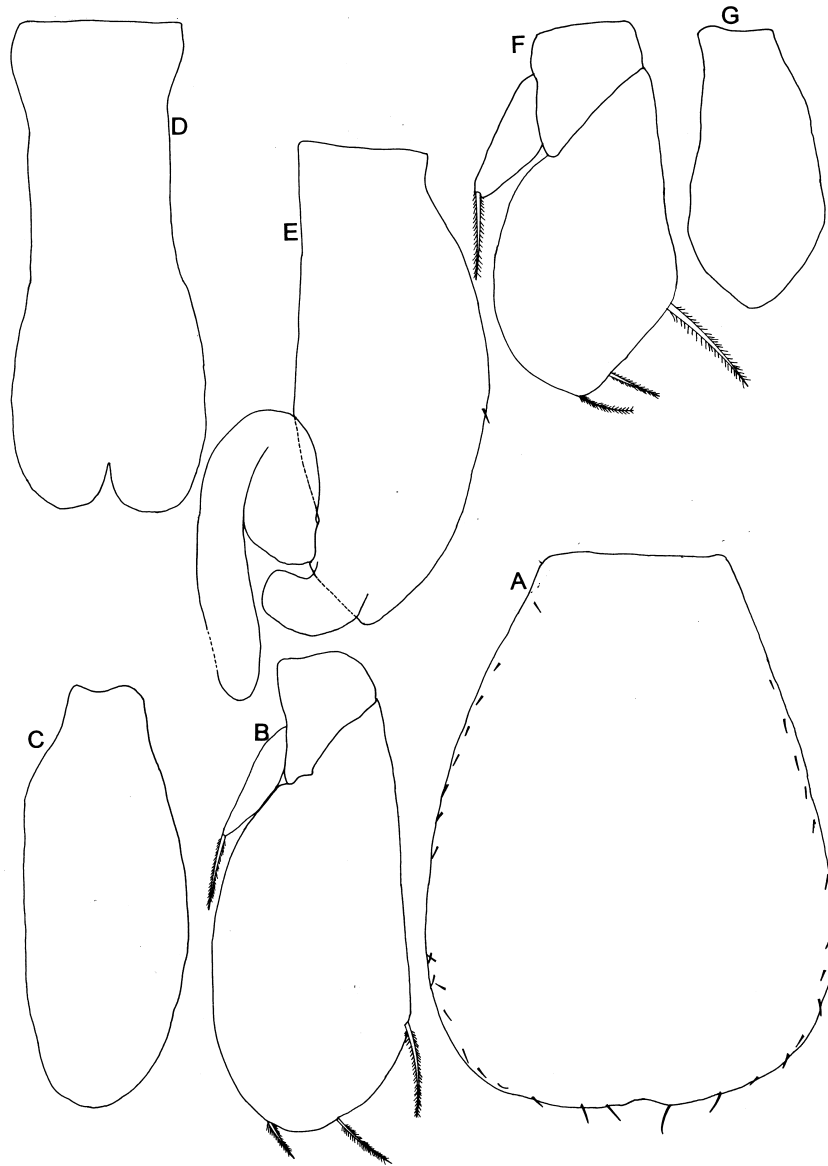


Figure 15. *Ischnomesus justi* sp. nov., female holotype, NMV J20306: A, Operculum; B, pleopod 3; C, pleopod 4. Male paratype, NMV J20309: D, pleopod 1; E, pleopod 2; F, pleopod 3 (right); G, pleopod 4 (right).

Diagnosis. At least pereonite 7 fused with pleon. Antenna 1 with 6 articles. Antenna 2 supported by anterolateral projections extending from head. Mandibular palp absent. Maxilliped basis endite large, wider than palp, palp articles 2 and 3 not expanded. Pereopod 1 carpus width usually subequal throughout length. Stylet of male pleopod 2 not extending past distal margin of sympod. Uropod long and of 2 articles.

Remarks. The fusion of at least pereonite 7 to the pleotelson and the autapomorphy of the presence of anterolateral projections extending from the head and supporting the antennae is a modification of Wolff's original description but agrees with that given by Kussakin (1988).

***Stylomesus sarsi* sp. nov.**

Figures 16–20

Material examined. Holotype. Tasmania., continental slope (40°45'S, 149° 09.3'E – 40° 46.54'S 149°00.27'E), 3000–2400 m, WHOI epibenthic sled, P. Hutchings et al., RV *Franklin*, 10 Dec 1986 (stn FR1086–4), AM P63900 (male, 5 mm).

Paratypes. Collected with holotype, AM P63901 (1 female, 5 mm; 1 male, 5 mm).

Other material. Australia, Tasmania., 48 km ENE of Cape Tourville (42°00.25'S, 148°43.55'E), 1264–1130 m, gravel with lumps of sandy mud aggregate (stn SLOPE 81), NMV J20299 (2 females, 1 male, 1 fragment). Tasmania., continental slope, 40°45'S, 149°09.3'E – 40°46.54'S, 149°00.27'E, 3000–2400 m, (stn FR1086-4), AM

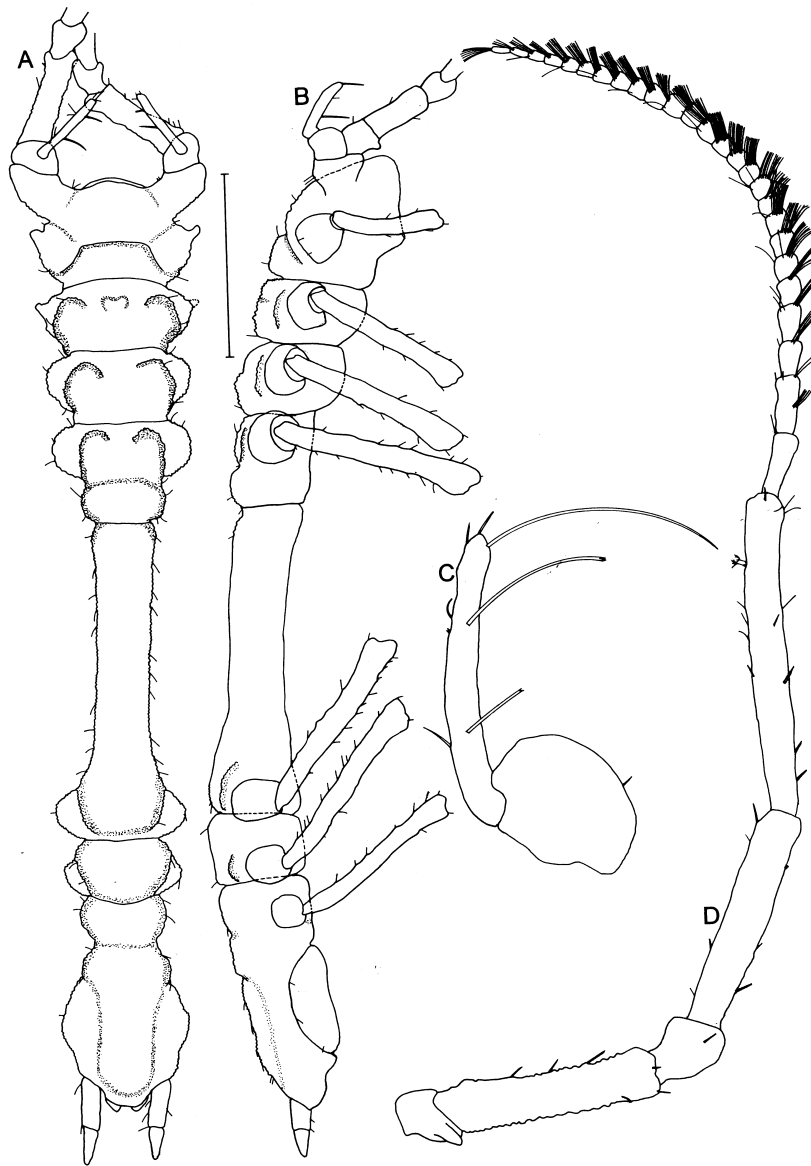


Figure 16. *Stylomesus sarsi* sp. nov., male holotype, AM P63900: A, dorsal view; B, lateral view; C, antenna 1; D, antenna 2. Scale bar = 1 mm, dorsal and lateral views only.

P63902 (17 females, 8 males, 22 fragments). NSW, 67 km ENE of Nowra (34°41.97'S, 151°22.44'E), 1896–1642 m (stn SLOPE 59), NMV J20294 (8 females, 2 fragments). Off Nowra (34°58.40'S, 151°23.20'E), 1750–1650 m, (stn SLOPE 15), NMV J20291 (1 fragment). Vic., 67 km S of Point Hicks (38°23.95'S, 149°17.02'E), 1277–1119 m, fine mud (stn SLOPE 67), NMV J20296 (7 females, 1 fragment). 76 km S of Point Hicks (38°29.33'S, 149°19.98'E), 1840–1750 m, sandy mud, fine shell (stn SLOPE 69), NMV J20297 (12 females, 2 males, 7 fragments), NMV J20298 (4 females, 2 males, 1 fragment). 96 km S of Point Hicks (38°40.29'S, 149°18.06'E), 2900–2900 m, compacted clay (stn SLOPE 66), NMV J20295 (8 females, 8 fragments). S of Point Hicks (38°25'S, 149°0'E), 1500 m, compacted clay (stn SLOPE 27), NMV J20293 (12 females, 2 males, 7 fragments). S of Point Hicks (38°25.90'S, 148°58.60'E), 1850 m, muddy, sandstone (stn SLOPE 25), NMV J20292 (1 male).

Diagnosis. Body granulate, about 7 times as long as wide. Head+pereonite 1 bearing 2 anterolateral extensions supporting antennae. Pereonites 1 and 2 with pair of stout anterolateral spines. Pereonites 2–4 each with pair of elevated dorsal bosses. Pereonites 4 and 5, about 1.4 and 4.5 times length of pereonite 2 respectively. Pleotelson longer than wide, with wide medial ridge. Antenna 2 articles 2 and 3 length subequal, article 3 about quarter length of article 4, flagellum of 26 articles, each setose. Mandible molar quadrangular, with broad face. Maxilliped with fringe of fine simple setae on basis, palp article 1 widest, with each article narrower than the previous. Pereopod 1 merus with 2 robust setae on distal inferior margin, carpus width generally subequal throughout length, 0.4 length of basis, bearing 1 long robust seta and 3 smaller, robust flag-



Figure 17. *Stylomesus sarsi* sp. nov., male paratype, AM P63901: A, mandible; B, maxilla 1; C, maxilla 2; D, maxilliped.

ellate setae. Pereopods 2–7 slim, carpus with finely serrate distal margin. Uropod with 2 articles, article 2 0.8 times length of article 1.

Description of male holotype. Body length 6.5 times maximum width of pereonite 3. Body cuticle highly granulated, calcified and brittle, with all pereonites bearing short simple setae. Head+pereonite 1 1.7 times as wide as long, with 2 anterolateral projections of head supporting antennae. Ratio of lengths of pereonites 2 : 3 : 4 : 5 : 6 : 7+pleon, 1.0:1.0:1.4:4.5:0.9:2.8. Pereonites 1 and 2 with pair of stout anterolateral spines. Pereonite 2 slightly narrower than pereonite 1, pereonites 2–4 widths subequal (excluding anterolateral spines), 5–7 decreasing posteriorly. Pereonites 2–4 each with pair of raised dorsal bosses. Pleotelson oval in dorsal view, length 1.1 times width, with wide, medial longitudinal ridge; posterior margin with 2 subventral lobes.

Antenna 1 article 1 broad, roughly oval, bearing 1 simple seta;

article 2 length 2.2 as long and 0.25 times as wide of article 1, bearing 3 long flagellate setae and 5 shorter simple setae. Antenna 2 of 31 articles; article 1 small, lacking setae, with a lateral protrusion; article 2 granulated, 5.5 times as long as article 1, with 6 simple setae; article 3 short, 1.7 times as long as article 1 with 1 simple setae; article 4 5.6 times length of article 1, with 7 simple setae; article 5 longest, 8.0 times as long as article 1, with many simple and 2 distal brush setae; flagellum of 26 articles decreasing in length, each setose.

Mouthparts (of male paratype). Mandible incisor process with 5 cusps; lacinia mobilis with 4 cusps; spine row of 4 spines; molar wide, rectangular, with broad, distal grinding surface with 3 fine simple setae on face and proximally 6 fine simple setae. Maxilla 1 with mesial lobe 0.6 times width of lateral lobe; both lobes with numerous fine simple setae on inferior and superior margins; mesial lobe distal margin with 1 short dentate and 1 simple setae; lateral lobe with 12 distal, robust, dentate setae. Maxilla 2 lateral lobe with several rows of microtrichia on superior margin; middle lobe 0.9 times width of lateral lobe, no



Figure 18. *Stylomesus sarsi* sp. nov., male holotype, AM P63900: A, pereopod 1; B, pereopod 2. Female paratype, AM P63901: C, pereopod 1; D, operculum; E, pleopod 3 (right); F, pleopod 4.

ornamentation, both lateral and middle lobes with 4 distal pectinate setae of different lengths; mesial lobe with many microtrichs and fine simple setae covering surface, 2 long, pectinate setae set medially on inferior margin, and distally, 3 dentate, 2 small pectinate and 6 simple setae. Maxilliped coxa small, rectangular; basis 1.8 times as long as widest point, with fringe of fine simple setae on superior margin and in its surface, endite with 3 coupling hooks and distally 3 fan and 3 simple setae. Palp tapering, 2.4 times length of basal endite; palp article 1 shortest, almost rectangular bearing 2 simple setae; article 2 0.5 times as wide as maximum width of basal endite and width equal to and 1.4 times length of article 1, with 2 simple setae and few fine simple setae; article 3 as wide as and 1.8 times as long as article 1, with 1 simple seta and 1 stronger distal seta on inferior margin and numerous fine simple setae; article 4 1.6 times length of article 1, narrower than article 3, with 2 distal simple setae and numerous fine simple setae; article 5 narrower than article 4, 1.3 times the length of article 1, with 1

thick distal seta and 4 slightly thinner simple setae. Epipod length 2.8 times width, 1.1 times basis length, with proximal end square, distal tip curved inward and a few microtrichs.

Pereopod 1 basis 0.1 body length; ratio of lengths of articles, basis-dactylus, 1.0:0.4:0.2:0.4:0.3:0.2; basis with 8 simple setae; ischium with 3 simple setae; merus with 2 simple and on inferior distal margin, 1 simple and 2 long, robust setae; carpus width subequal throughout, inferior margin with 3 flagellate robust setae and 1 long robust seta; propodus width subequal throughout, with 4 simple setae on superior margin, 1 simple seta on surface and inferior margin with 2 flagellate, robust and 1 long simple seta; dactylus with 4 short simple setae on distal superior margin.

Pereopods 2–7, basis 0.2 body length; ratio of lengths of articles, basis to dactylus, 1.0:0.5:0.3:0.6:0.4:0.2.

Pereopod 2 basis with 12 simple setae; ischium with 8 simple setae; merus with 4 simple setae; carpus with 5 simple setae on superior

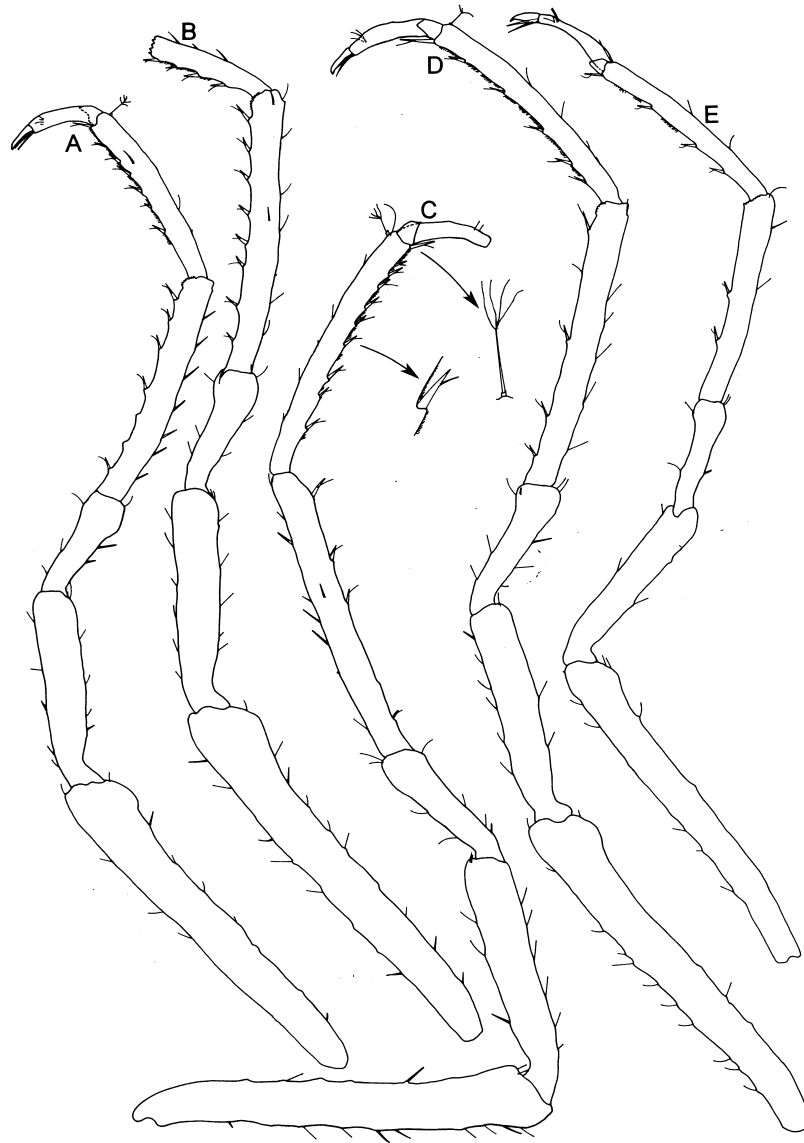


Figure 19. *Stylomesus sarsi* sp. nov., male holotype, AM P63900: A, pereopod 3 (right); B, pereopod 4; C, pereopod 5; D, pereopod 6; E, pereopod 7 (right).

margin and on inferior margin 5 flagellate robust and 1 long, robust seta, distal margin finely serrate; propodus with 3 simple setae on superior margin, 6 flagellate robust setae with small fringed scale-setae between each on inferior margin; dactylus with 2 short distal setae.

Pereopod 3 basis with 10 simple setae; ischium with 10 simple setae; merus with 6 simple setae; carpus with 7 simple setae on superior margin and at least 5 flagellate robust setae on inferior margin, distal margin finely serrate; propodus with at least 2 simple setae, inferior margin with 7 flagellate robust setae with fringed scale-setae between each and 1 brush seta on distal superior margin; dactylus with 4 small distal simple setae.

Pereopod 4 basis with 15 simple setae; ischium with 13 simple setae; merus with 8 simple setae; carpus with at least 8 simple setae and inferior margin with 8 flagellate robust setae, distal margin finely serrate; half of propodus intact with superior margin with 3 simple

setae and inferior margin with 4 flagellate robust setae with fringed scale-setae between them.

Pereopod 5 basis with 13 simple setae; ischium with 11 simple setae; merus with 8 simple setae; carpus with at least 8 simple setae and at least 4 flagellate robust setae on inferior margin; propodus with 6 simple setae, 10 flagellate robust setae with fringed scale-setae between them and 1 brush seta on distal superior margin; dactylus superior margin with 2 small simple setae.

Pereopod 6 basis with 13 simple setae; ischium with 9 simple setae; merus with 9 simple setae; carpus superior margin with 6 simple setae and inferior margin with 1 simple and 4 flagellate robust setae, distal margin finely serrate; propodus with 4 simple setae on superior margin, 6 flagellate robust setae with fringed scale-setae between each on inferior margin and 1 brush seta on distal superior margin; dactylus with 3 small simple setae.

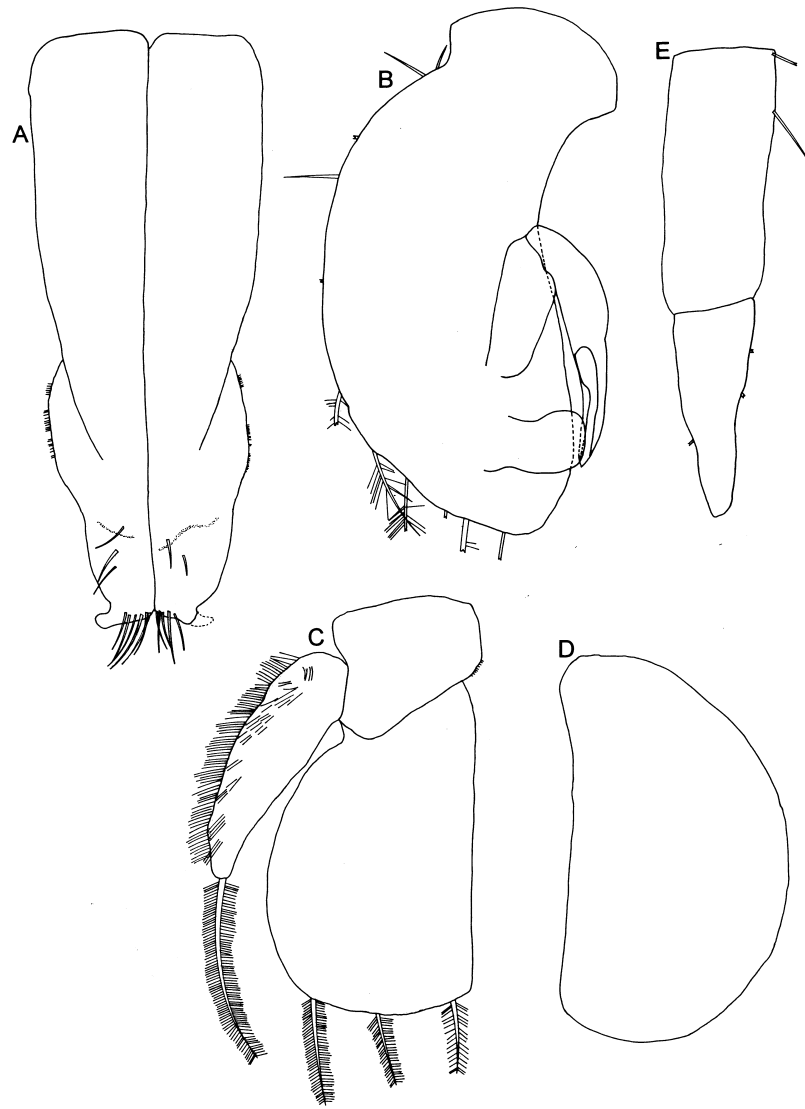


Figure 20. *Stylomesus sarsi* sp. nov., male holotype, AM P63900: A, pleopod 1; B, pleopod 2; C, pleopod 3; D, pleopod 4; E, uropod (right).

Pereopod 7 basis with at least 8 simple setae; ischium with 3 simple setae; merus with 5 simple setae; carpus with 3 simple setae on superior margin, 2 flagellate setae on inferior margin and distal margin finely serrate; propodus with 3 simple setae on superior margin and on the inferior margin, 4 flagellate robust setae with some fringed scale-setae between; dactylus with 4 small distal simple setae.

Pleopod 1 length 2.6 times maximum width; margins indent at 0.6 of length from proximal end; 5 simple setae near a small transverse ridge near distal margin; 6 simple setae on right and 5 simple setae on left of distal margin; prominent distolateral horns. Pleopod 2 sympod length 2.2 times maximum width; lateral margins curved, with few simple setae and 6 distolateral, plumose setae; exopod short, 0.1 times sympod length, rounded distally; stylet 0.4 length of sympod tapering to a point; sperm duct 0.5 length of stylet. Pleopod 3 exopod length 0.7 times endopod length with a fringe of fine simple setae on surface and extended from superior margin. Pleopod 4 length 1.8 times width.

Uropod straight, 0.6 times length of pleotelson; article 1 with 2 simple setae; article 2 tapering, 0.8 times length of article 1, with 3 simple setae.

Female. Pereopod 1 shorter and more robust than in male; ratio of lengths of articles, basis–dactylus, 1.0:0.4:0.2:0.5:0.4:0.2; basis with 8 simple setae; ischium with 3 simple setae; merus with 2 simple setae on distal superior margin and 2 long robust setae on distal inferior margin; carpus slightly broader at proximal end, 1 long robust seta on superior margin, inferior margin with 1 simple seta, 5 robust flagellate setae and 1 long robust seta; propodus with 5 simple setae and 2 flagellate, robust setae on inferior margin; dactylus narrower than propodus, with 4 short simple distal setae.

Operculum slightly wider than long, length 0.9 times maximum width; curves to slight keel at apex, with few simple setae on lateral margins, plumose setae and microtrichs on posterior margin. Pleopod 3 similar to male, exopod length 0.8 times endopod. Pleopod 4 length 1.6 times width, with 3 slight dents on lateral margin.

Distribution. South-eastern Australia, from Nowra, New South Wales, to Cape Tourville, Tasmania; 1119–3000 m depth.

Etymology. In honour of the Norwegian carcinologist, Georg

Ossian Sars (1837–1927), the first person to describe taxa of Ischnomesidae.

Remarks. *Stylomesus sarsi* is the first species of *Stylomesus* recorded from Australian waters. It resembles *Stylomesus natalensis* Kensley, 1984 from south-western Indian Ocean off South Africa. Both species have granulate integuments, short anterolateral spines on pereonites 1 and 2 and in both the mandible molars have a broad distal surface. However, *S. sarsi* can be distinguished from *S. natalensis* by the lack of tubercles set medially on pereonites 1 and 2, less elongate pleotelson, and longer flagellum of antenna 2. The maxilliped palp of *S. sarsi* has setae present on all articles, while on *S. natalensis*, setae are present only on the last three articles.

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References

- Birstein, J.A. 1960. The family Ischnomesidae (Crustacea, Isopoda, Asellota) in the north-western part of the Pacific and the problem of amphiboreal and bipolar distribution of the deep-sea fauna. *Zoologicheskii Zhurnal, Moscow* 34: 3–28. In Russian.
- Birstein, J.A. 1963. *Deep water isopods (Crustacea. Isopoda) of the north-western part of the Pacific Ocean*. Akademia Nauk, SSSR: Moscow. 213 pp. English translation by the Indian National Scientific Documentation Centre, New Dehli, 1973.
- Birstein, J.A. 1971. Fauna of the Kurile-Kamchatka Trench. Additions to the fauna of isopods (Crustacea, Isopoda) of the Kurile-Kamchatka Trench. Part II. Asellota 2. *Trudy Instituta Okeanologii, Akademiya Nauk SSSR, Moscow* 92: 162–238. In Russian.
- Chardy, P. 1974. Compléments à l'étude systématique des Ischnomesidae (Isopodes Asellotes) de l'Atlantique. Description de quatre espèces nouvelles. *Bulletin Mensuel de la Société Linnéenne de Lyon* (3) 179: 1537–1552.
- Gurjanova, E. 1932. *Tableaux analytiques de la faune de l'URSS, publiés par l'Institut Zoologique de l'Académie des Sciences. Les isopodes des mers arctiques*. Moscow. 181 pp. In Russian.
- Hansen, H.J. 1916. Crustacea Malacostraca III: V. The Order Isopoda. *Danish Ingolf Expedition* 3: 1–262 pls 1–16.
- Kussakin, O.G. 1988. Marine and brackish-water Crustacea (Isopoda) of cold and temperate waters of the Northern Hemisphere. 3. Suborder Asellota 1. Janiridae, Santiidae, Dendrotionidae, Munnidae, Haplomunnidae, Mesosignidae, Haplomiscidae, Mictosomatidae, Ischnomesidae. *Opredeliteli po Faune SSR, Akademiya Nauk, SSSR* 152: 1–501 [in Russian].
- Menzies, R.J. 1962. The isopods of abyssal depths in the Atlantic Ocean. *Vema Research Series* 1: 79–206.
- Menzies, R.J., and George, R.Y. 1972. Isopod Crustacea of the Peru–Chile Trench. *Anton Bruun Report* 9: 1–124.
- Poore, G.C.B., Just, J. and Cohen, B.F. 1994. Composition and diversity of Crustacea Isopoda of the southeastern Australian continental slope. *Deep-Sea Research* 41: 677–693.
- Richardson, H. 1908. Some new Isopoda of the superfamily Aselloidea from the Atlantic coast of North America. *Proceedings of the United States National Museum* 35: 71–86.
- Sars, G.O. 1868. Beretning om en i Sommeren 1865 foretagen zoologisk Reise ved Kysterne af Christianias og Christiansands Stifter. *Forhandling i Videnskaps-Selskapet in Kristiania* 1868: 1–47.
- Vanhöffen, E. 1914. Die Isopoden der Deutschen Südpolar-Expedition 1901–1903. *Deutsche Südpolar-Expedition, 1901–03* 15: 449–598.
- Wolff, T. 1956. Isopoda from depths exceeding 6000 m. *Galathea Reports* 2: 85–157.
- Wolff, T. 1962. The systematics and biology of bathyal and abyssal Isopoda Asellota. *Galathea Reports* 6: 1–320.

