AUSTRALOPSYLLUS FALLAX GEN. ET SP. NOV., THE THIRD KNOWN SPECIES OF THE FAMILY THAUMATOPSYLLIDAE (COPEPODA: CYCLOPOIDA)

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SARSIA

MCKINNON, A. DAVID 1994 07 15 *Australopsyllus fallax* gen. et sp. nov., the third known species of the family Thaumatopsyllidae (Copepoda: Cyclopoida). – *Sarsia* 79:27–32. Bergen. ISSN 0036–4827.

The female of *Australopsyllus fallax* gen. et sp. nov., the third monotypic genus of Thaumatopsyllidae is described. *Australopsyllus* differs from *Thaumatopsyllus* SARS, 1913 and *Orientopsyllus* SEWELL, 1949 in tagmosis and segmentation of the antennule. The animals were collected in near surface plankton tows near Queenscliff, Victoria, Australia.

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INTRODUCTION

The copepod family Thaumatopsyllidae is remarkable in that its members lack antennae and mouthparts, characters that occur in only one other copepod family, the Monstrillidae. Juveniles are found in the stomachs of brittle stars (BRESCIANI & LÜTZEN 1962) and adults in the plankton, where they presumably reproduce. On the basis of the absence of mouthparts, SARS (1913: 4) placed the Thaumatopsyllidae within the Monstrilloida, though he regarded this designation as provisional, being 'inclined to believe, that in phylogonetical [sic] respect there is no closer connection between this form and the true Monstrilloida'. SARS (1913) erected a separate section, the Monstrilloida Cyclopimorpha, to accomodate the Thaumatopsyllidae. WILSON (1924) erroneously replaced the name *Thaumatopsyllus* with *Thespesiopsyllus,* but BOWMAN & ABELE (1982) reinstated the earlier name. Despite this, the use of the names *Thespesiopsyllus* and Thespesiopsyllidae persisted in the work of HUYS & BOXSHALL (1991). Authors subsequent to SARS (1913) have been equally unhappy with the allocation of the Thaumatopsyllidae to the Monstrilloida; DAVIS (1949), SEWELL (1949) and FOSSHAGEN (1970) all recognising similarities between Thaumatopsyllidae and the siphonostomatoid family Cancerillidae. Most recently, HUYS & BOXSHALL (1991) removed the Thaumatopsyllidae to the Cyclopoida, because of the median location of the copulatory pore on the female genital double somite, the possession of paired egg sacs, and the structure of the male antennule.

The type species of the family, *Thaumatopsyllus paradoxus* SARS, 1913, was described from three female specimens taken in the plankton. BRESCIANI & LÜTZEN (1962) reared nauplii of *T. paradoxus* obtained from the stomach of the brittle star *Ophiopholis aculeata* (LINNAEUS, 1758) in the laboratory. This technique was adopted by FOSSHAGEN (1970), who also recovered adults of both sexes using an epibenthic plankton net, and described the male for the first time. HUYS & BOXSHALL (1991) made a close examination of both sexes of *T. paradoxus*. The only other member of the family, *Orientopsyllus investigatorus,* was described by SEWELL (1949) from two females collected in plankton from the Nicobar Islands.

This paper describes a third species of Thaumatopsyllidae, sufficiently different from the other two to merit generic distinction. Methods and terminology are those of HUYS & BOXSHALL (1991).

TAXONOMY

Family Thaumatopsyllidae SARS, 1913

Australopsyllus gen. nov.

Diagnosis. The combination of three characters defines *Australopsyllus:* (1) the first pedigerous somite is fused to the head; (2) the fourth pedigerous somite is reduced; (3) the urosome is 3-segmented. Each of these characters is shared with either *Thaumatopsyllus* or *Orientopsyllus,* but the combination is unique (Table 1). In addition, the 8-segmented antennule is autapomorphic.

Etymology. Latin 'australis', southern; Greek 'psylla', flea.

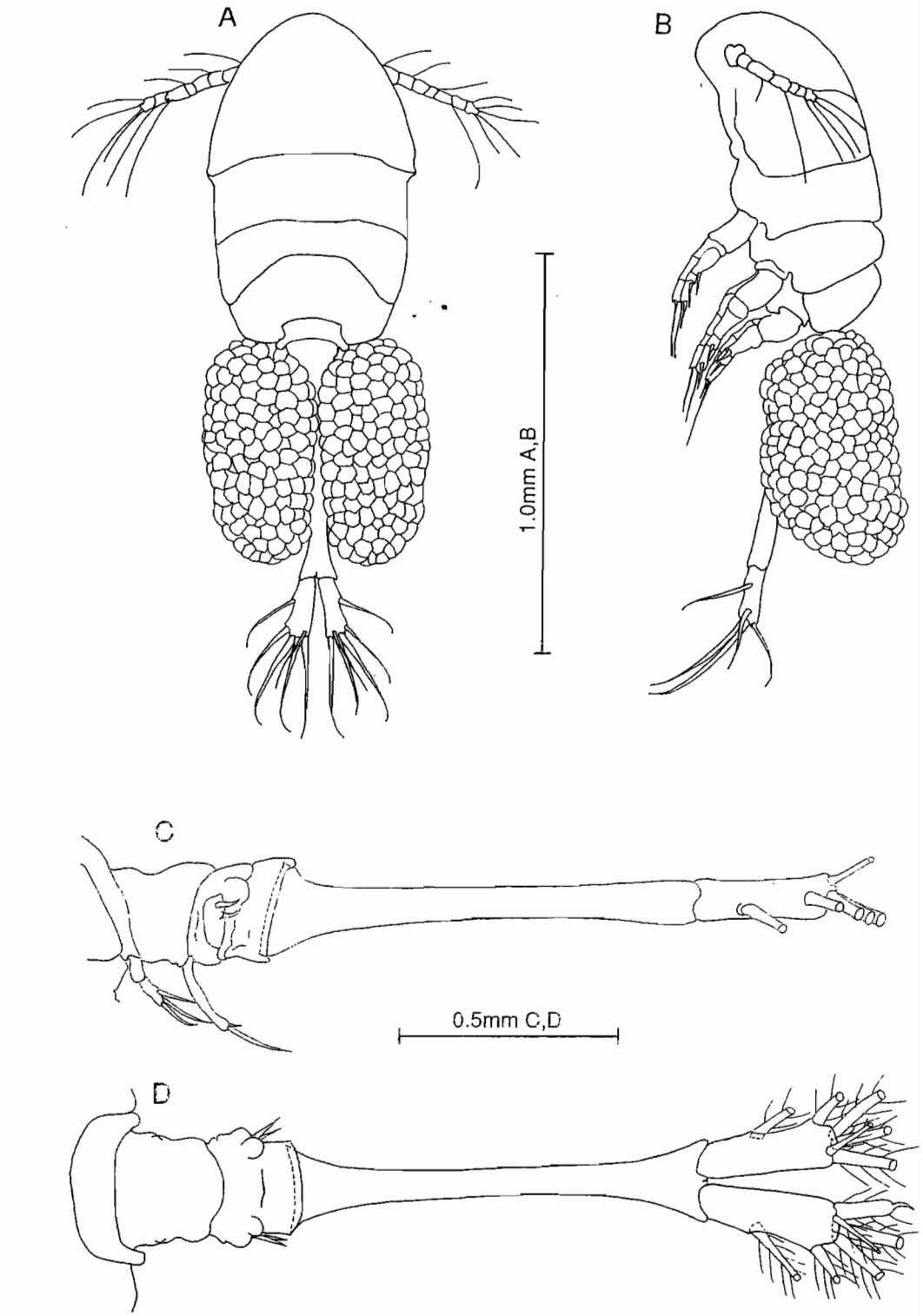

Fig. 1. *Australopsyllus fallax* gen. et sp. nov. female A. Habitus, dorsal. B. Habitus, lateral. C. Urosome, lateral. D. Urosome, dorsal.

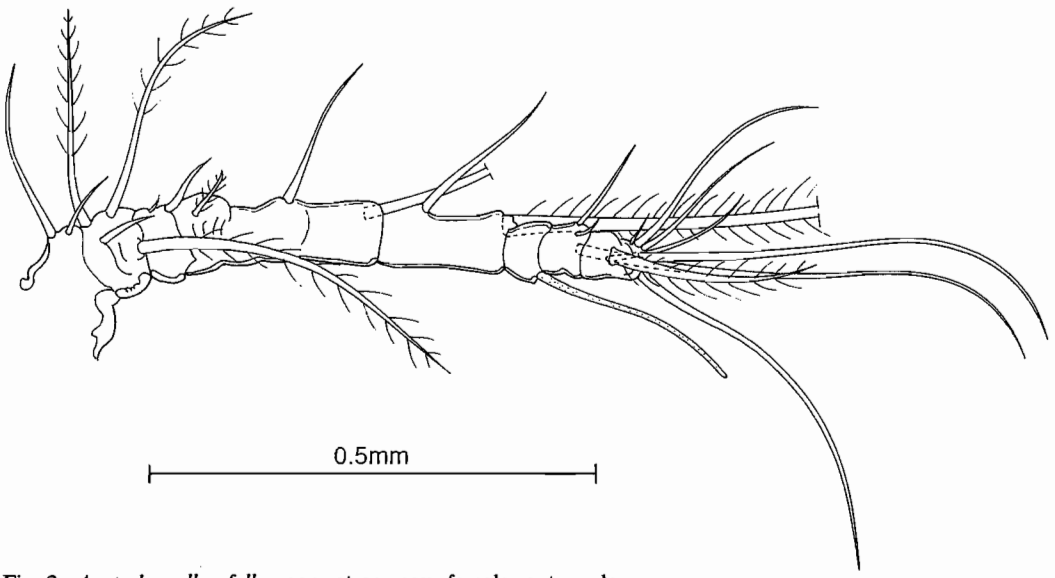

Fig. 2. *Australopsyllus fallax* gen. et sp. nov. female, antennule.

Australopsyllus fallax, gen. et sp. nov.
(Figs 1–4)

Types. 9 ♀♀ collected in plankton off Queenscliff, Victoria, Australia (38° 16.5' S, 144° 40.8' E) on 26 February 1984, by G.P. Jenkins. The holotype female (J34868, with two slides), and eight paratype females (J34869, J34870 with one slide, J34871 on SEM stub) have been deposited in the Museum of Victoria, Melbourne, Australia.

Description. Female (holotype). Prosome (Figs 1A,B; 4A) 1.56 mm TL, cyclopiform, comprising the cephalosome, which is incompletely fused to the first pedigerous segment, and three separate pedigerous somites, the last of which is greatly reduced (Figs 1A,C,D; 4C). The head is produced anteroventrally into a broad, blunt rostrum, which is fused with the cephalic shield. The margin of the cephalic shield is perforated by numerous pores (Fig. 4A). The head carries only the paired antennules and a vestigial labrum (Fig. 4B), all other cephalic appendages being lost. I could find no trace of scars associated with the location of lost limbs, as has been reported in *Thaumatopsyllus paradoxus* by Huys & Boxshall (1991). The urosome comprises the fifth pedigerous somite, genital double somite, and an elongate anal segment, 4.7 times longer than wide. There is no anus (Fig. 4E,F). The genital double somite has the dorsal integument fused, and extending ventrally past the lateral midline, but the ventral integument is incompletely fused (Fig. 4B,D). An antero-lateral lappet with two dorsally recurved spines represents leg 6. The large paired egg sacs each contain approximately 400 eggs of 50 μm diameter. The caudal rami (Fig. 4E,F) are 2.9 times longer than wide, each carrying two setae on outer margin, three terminally, and one dorsal. The left caudal ramus of the holotype bears an abnormal terminal seta (Fig. 1D). Caudal ramus seta I, reported present in *Thaumatopsyllus paradoxus* by Huys & Boxshall (1991), is absent.

The antennule (Fig. 2) is 8-segmented, with armature formula 2,4,2,3,2,1,3,8 elements. The second segment has complex folding, representing the incomplete fusion of probably four segments. Similarly, segments 3, 4, and 5 represent fusion of 2, 2 and 3 segments respectively, of the corresponding segmentation pattern found in *Thaumatopsyllus*.

Legs 1 to 3 are biramous, each ramus comprising three segments (Fig. 3A–C; Table 1). The outer terminal seta of leg 3 is spiniform. The basipod of legs 1–3 has a rounded process produced anteriorly between the insertion of exopod and endopod. In the holotype, this process on right leg 3 is abnormal (Fig 3C), the apical portion appearing inverted. The intercoxal plate of leg 4 is fused to the ventral integument (Fig. 4C). Leg 4 (Fig. 3D) is 3-segmented, with segment 1 with one outer distal seta; segment 2 unarmed, and segment 3 with three terminal setae and two inner lateral setae. The segmentation between segments 2 and 3 is weak. Leg 5 (Fig. 3E) is 2-segmented, with segment 1 unarmed, and segment 2 with one long terminal seta and a short, inner spiniform seta.

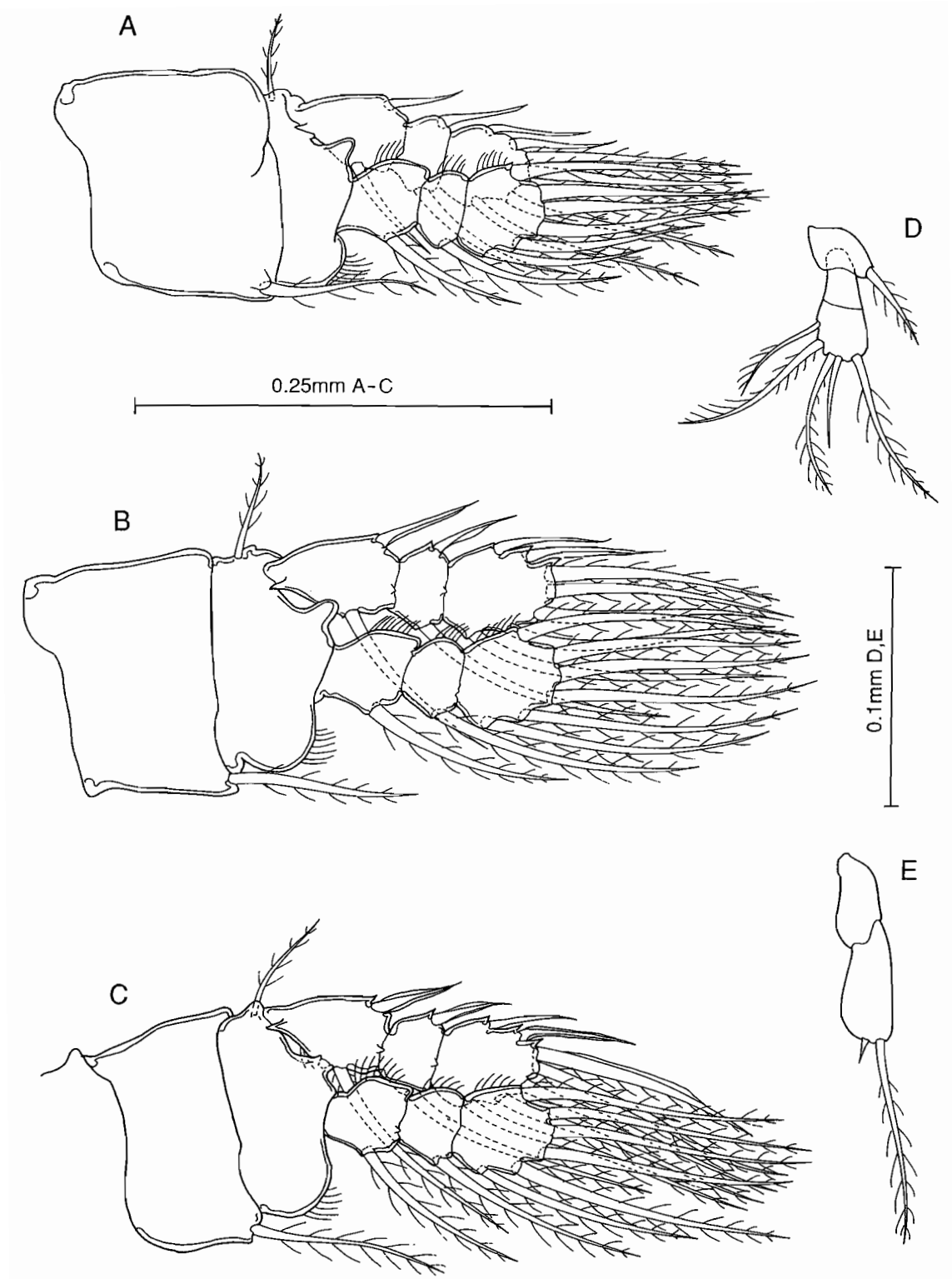

Fig. 3. *Australopsyllus fallax,* gen. et sp. nov. female A. Leg 1, anterior. B. Leg 2, anterior. C. Leg 3, anterior D. Leg 4, anterior. E. Leg 5, anterior.

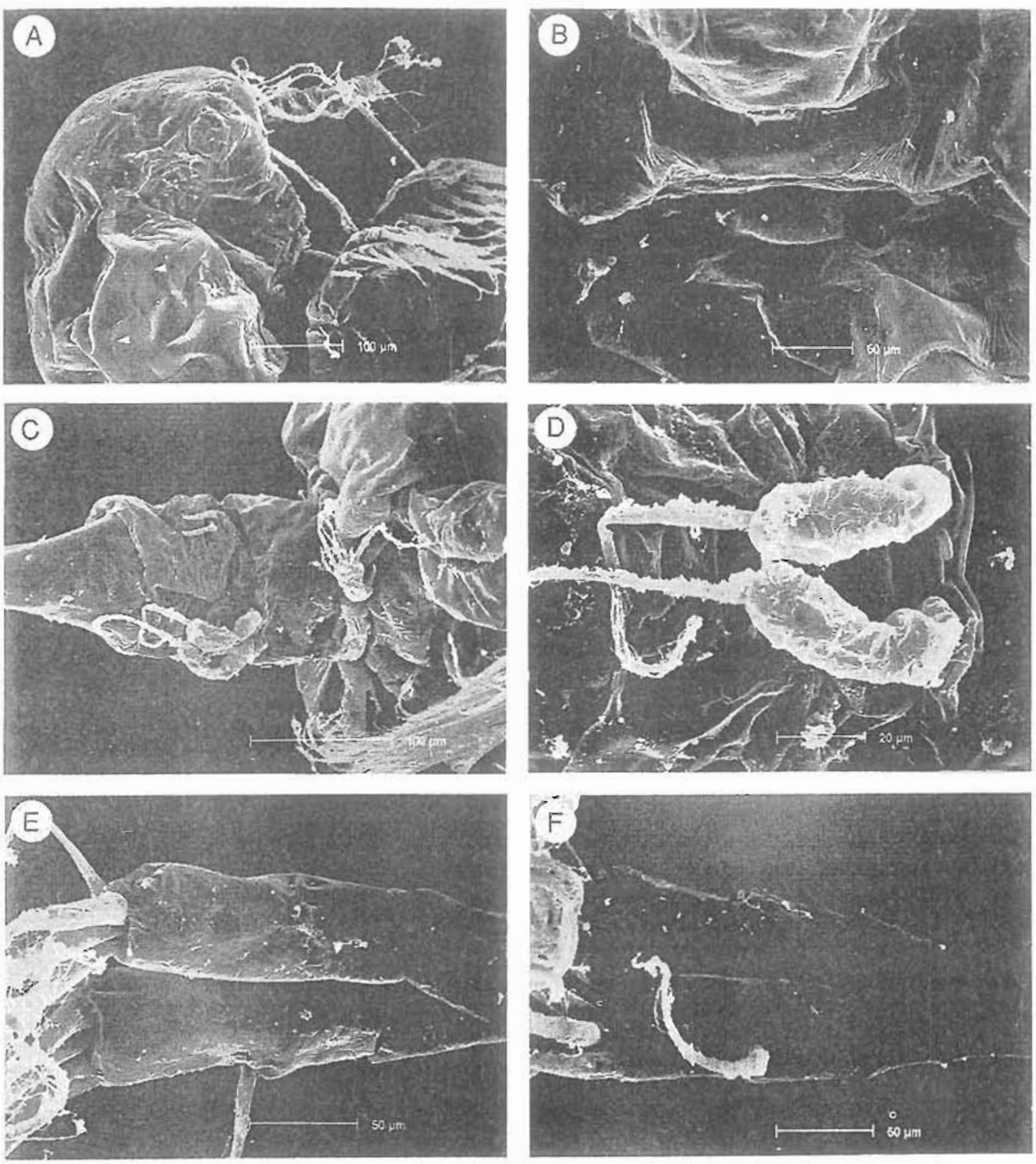

Fig. 4. *Australopsyllus fallax*, gen. et sp. nov. female A. Cephalosome and rostrum, ventral, right antennule missing. Integumental pores are indicated by arrowheads. B. Labrum, ventral. C. Prosome:urosome articulation, showing disposition of the fourth pedigerous somite, and legs 4, 5, and 6. D. Leg 5 and ventral face of genital complex. E. Caudal rami (dorsal). F. Caudal rami (ventral).

Male. Unknown.

Etymology. Latin, 'fallax', treacherous, referring to the nature of the waters in the vicinity of Queenscliff, the type locality.

DISCUSSION

A comparison of characters present in this material, *Thaumatopsyllus* and *Orientopsyllus* (Table 1) illustrates the confusion of character states within the family. *Australopsyllus* is similar to *Thaumato-*

Table 1. Comparison of features of the females of three genera of Thaumatopsyllidae. Armature formulae for legs presented as outer margin first, Roman numerals indicate spines, Arabic numerals setae. For legs 1–3, the first line represents that of the coxa, the second the basis, the third the exopod, and the fourth the endopod. For *Thaumatopsyllus,* some specimens may have a 1- segmented endopod, with one terminal seta, on leg 4 (see text).

Character	*Thaumatopsyllus*	*Orientopsyllus*	*Australopsyllus*
Pediger 1	fused to cephalosome	separate	fused to cephalosome
Pediger 4	reduced	not reduced	reduced
Urosome	5-segmented	3-segmented	3-segmented
Antennule	9-segmented	6-segmented	8-segmented
Leg 1	0–1	0–1	1–0
	1–0	1–0	1–0
	I–1;I–1;II–I–3	I–1;I–1;II–I–3	I–1;I–1;II–I–3
	0–1;0–1;1–2–3	0–1;0–1;1–2–3	0–1;0–1;1–2–3
Leg 2	similar to leg 1?	similar to leg 1?	0–1
			1–0
			I–1;I–1;II–I–3
			0–1;0–1;1–2–3
Leg 3	0–1	0–1	0–1
	1–0	1–0	1–0
	I–1;I–1;II–I–4	I–1;I–1;II–I–4	I–1;I–1;II–I–4
	0–1;0–1;1–2–3	0–1;0–2;1–2–3	0–1;0–1;1–2–3
Leg 4	1–0;0–0;0–2–0	0–0;1–0;0–4–0	1–0;0–0;0–5–0
Leg 5	0–0;0–0;0–1–0	0–2–0	0–0;0–2–0

psyllus in having the first pedigerous somite fused with the cephalosome and in having a reduced fourth pedigerous somite. The urosome of *Australopsyllus* is similar to that of *Orientopsyllus,* but the number of antennule segments is intermediate between that of *Thaumatopsyllus* and *Orientopsyllus.* The setation of legs 1–3 is similar in all three genera, except that Ri2 of *Orientopsyllus* has two inner setae rather than one. Leg 4 is 3-segmented in all, but differs in setation patterns in each. FOSSHAGEN (1970: 35) commented on the presence of a 1-segmented endopod on leg 4 of some female specimens of *Thaumatopsyllus paradoxus.* This feature was illustrated by HUYS & BOXSHALL (1991), but not by SARS (1913, 1921) and therefore may be variable. Leg 5 differs in segmentation in each genus.

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