



A new species of Ischnomesidae (Crustacea: Isopoda) from the Southern Ocean, *Stylomesus weddellensis* sp. nov.

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Abstract

Stylomesus weddellensis sp. nov. is described from the abyssal Weddell Sea, Southern Ocean. It can easily be distinguished from the other species of the genus by its typical spine pattern. Besides the long frontolaterally directed projections of pereonite 1, pereonites 1-3 bear two mediolateral to caudolateral blunt spines which are absent in all other Southern Ocean or South Atlantic species of *Stylomesus* Wolff, 1956. The pereopod 7 is present, and is not fused to pleotelson. A list of all currently known 17 species of *Stylomesus* is presented including data on depth and distribution.

Key words: Isopoda, Asellota, Ischnomesidae, *Stylomesus*, deep sea, Antarctica, Southern Ocean, taxonomy, new species

Introduction

During the ANDEEP-Expeditions (ANtartic benthic DEEP-sea biodiversity: colonisation history and recent community patterns) (ANT XIX/3+4, ANT XXII/3) with RV *Polarstern* to the Scotia and Weddell Seas, epibenthic sledge samples were taken at depths between 774 and 6348 m in order to analyse the composition and biodiversity of deep-sea isopods in the Antarctic. The samples contained a high number of new species. Some of the new species belong to the asellote family Ischnomesidae Hansen, 1916, which was frequently found in the samples and is highly diverse. In the present paper one new species of Ischnomesidae is described from off Kapp Norvegia.

Methods

During the expedition ANDEEP III (ANT XXII/3) from January to April 2005, 19 stations in the Southern Ocean deep sea were sampled with an epibenthic sledge (EBS) (Brenke, 2005; Brandt and Barthel, 1995). The samples were immediately fixed in cooled 96% ethanol for later DNA extraction and kept cold for at least 48 hours. The samples were sorted on board and later in the laboratory at the Zoological Institute and Museum, Hamburg. The specimens were examined and drawn using a stereoscope Leica MZ 12 equipped with a camera lucida, then dissected; the limbs were illustrated using a Leica compound microscope with camera lucida.

The material is deposited in the Zoological Museum Hamburg (ZMH).

TAXONOMY

Ischnomesidae Hansen, 1916

Stylomesus Wolff, 1956

Stylomesus Wolff, 1956: 97, 1962: 83; Menzies, 1962: 123; Birstein, 1969: 15, 1971: 204; Kussakin, 1988: 437; Merrin & Poore, 2003: 300; Brökeland & Brandt, 2004: 1770.

Gomphomesus Wolff, 1962: 84

Helomesus Wolff, 1962: 84

Type species: *Rhabdomesus inermis* Vanhöffen, 1914

Diagnosis: A recent diagnosis of the family was given by Merrin & Poore (2003). This is followed here with one exception concerning antenna 1, which usually has six articles, but can have less, like in the present species.

Stylomesus weddellensis sp. nov. (Figs 1–7)

Material examined

Holotype: subadult ♂ (8.2 mm), ZMH K-41523, Weddell Sea; Station 81-8-E, (70°31.08 S-70°32.23 S - 14°34.82 W-14°34.90 W); depth 4382 m; 24 February 2005, RV *Polarstern*.

Allotype: non-ovigerous ♀ (8.5 mm), ZMH K-41524, Weddell Sea; Station 81-8-E, (70°31.08 S-70°32.23 S - 14°34.82 W-14°34.90 W); depth 4382 m; 24 February 2005, RV *Polarstern*.

Paratypes: 1 subadult ♂ (described and illustrated), ZMH K-41525 (slides), Weddell Sea; station 80-9-E, (70°38.45 S-70°39.18 S - 14°42.86 W-14°43.43 W); depth 3100 m, 23 February 2005, RV *Polarstern*; 1 non-ovigerous ♀, ZMH K-41526 (slides), Weddell Sea; station 81-8-E, (70°31.08 S-70°32.23 S - 14°34.82 W-14°34.90 W); depth 4382 m; 24 February 2005, RV *Polarstern*.

Additional material examined: 7♀, 3 Mancas, Weddell Sea; station 80-9-E, (70°38.45 S-70°39.18 S - 14°42.86 W-14°43.43 W); depth 3100 m, 23 February 2005, RV *Polarstern*. 1 ♂, 1♀, 7 Mancas, Weddell Sea; station 81-8-E, (70°31.08 S-70°32.23 S - 14°34.82 W-14°34.90 W); depth 4382 m; 24 February 2005, RV *Polarstern*.

Etymology

The name refers to the Weddell Sea.

Diagnosis

Stylomesus without any spines on head, but with mediolateral to caudolateral blunt spines on pereonites 1–3; antenna 1 consisting of 5 articles, article 2 with 4 sensory setae of varying lengths; pereopod 7 present; pereonite 7 not fused to pleotelson.

Description

Description of subadult holo- and paratype males (Figs 1–5): Body 3.9 times longer than wide (Fig. 1A). Head trapezoidal, 4 times as broad as long, anterolateral margins with strong frontolaterally acute projections; lateral margins of pereonites 2 and 3 rounded; pereonites 1–3 with 2 dorsomedial blunt short spines; pereonite 4 about as long as wide, narrowing at half length, broadest part 1.7 times as broad as narrowest part; pereonite 5 about 3.2 times as long as wide, 0.4 times as long as body, distally broadening, broadest part about twice as broad as narrowest part; pereonites 5–7 not fused; pleonite 1 fused but well distinguishable, about half as long as pereonite 7 and slightly narrower. Pleotelson 0.8 as long as wide, with faint elevation mediodorsally, lateral margins convex, terminal margin somewhat produced, rounded, distance between branchial chamber and anal valves 0.3 times as long as pleotelson. Body surface smooth except for spines on pereonites 1–3 (Fig. 1A, B).

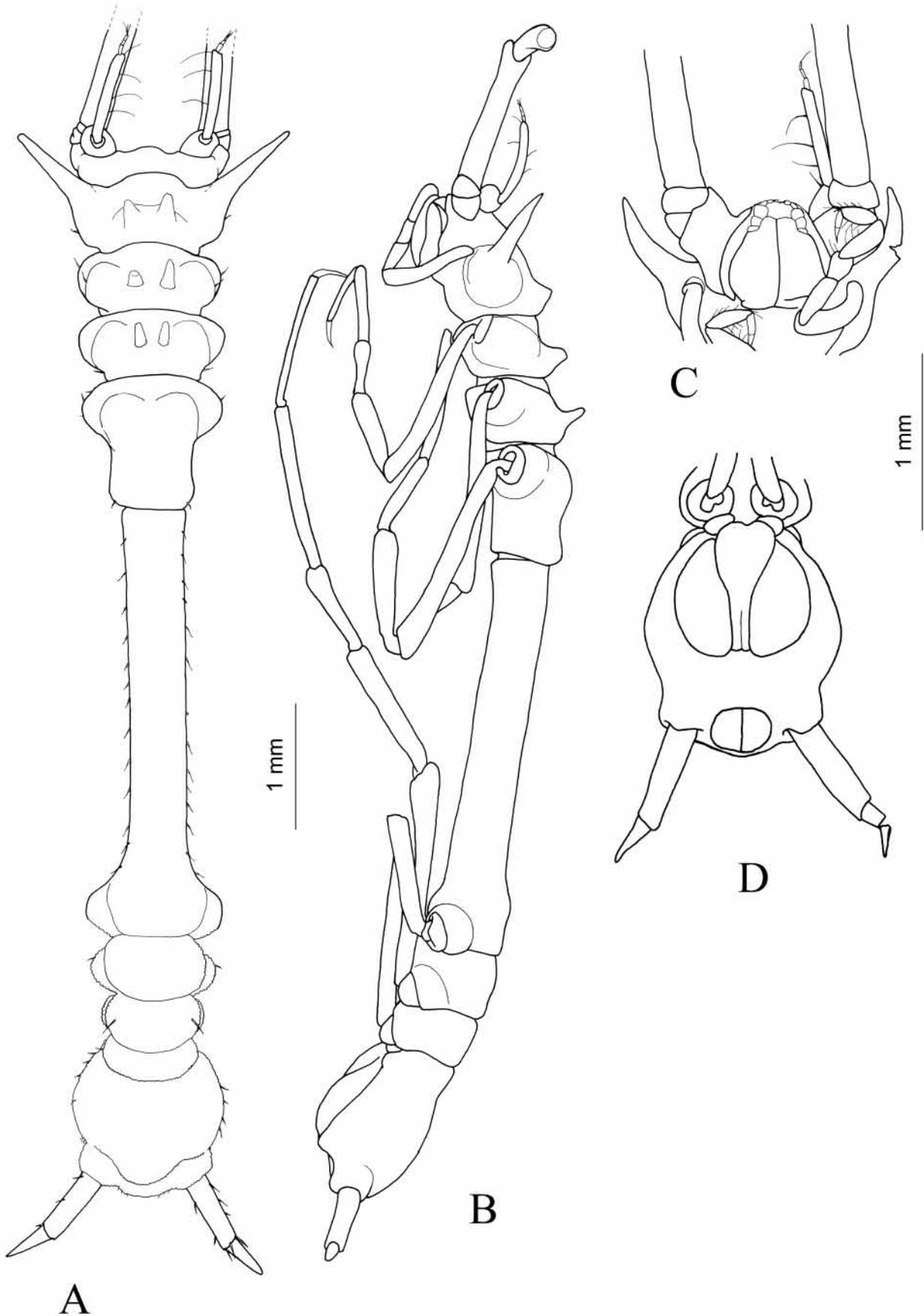


FIGURE 1, *Stylomesus weddellensis* sp. nov., holotype ♂ (8.5 mm), ZMH K-41523. A, habitus, dorsal view. B, habitus, lateral view. C, head, ventral view. D, pleotelson, ventral view.

Antenna 1 (Fig. 2A) about 0.12 as long as body, with 5 articles; article 1 almost quadrangular, 0.9 times as long as wide, with 1 distal feather-like seta and 2 lateral simple setae; article 2 slender, 2.2 times as long as article 1, inserted in distomedial half of article 1, only half as wide as article 1, with 1 distal feather-like seta and a small lateral one, 7 lateral simple setae of varying lengths, and 4 stout sensory setae, 2 being longer than article; articles 3–5 short, last article with 3 simple setae.

Antenna 2 (Fig. 2B) about 0.7 times as long as body, peduncle 1.5 times as long as flagellum, peduncular article 1 triangular in ventral view, short and narrow (see Fig. 1C), article 2 slightly longer than article 1, with stout spine-like sensory seta on small distoventral conical projection; article 3 0.9 times as long as article 5, with 2 simple setae, 4 spine-like sensory setae, 1 of which inserts on ventral conical projection, 1 distoventrally, and 2 shorter dorsally; article 4 about 0.3 times as long as article 3, without setae; article 5 more slender than article 3, with 7 simple setae; article 6 about 1.2 times as long as article 5, with several simple setae. Flagellum with 21 articles, article 1 about 1.7 as long as following articles, each article with 2–5 simple distal setae.

Mandibles (Fig. 2C, D) with smooth outer margin. Incisor with 5 blunt teeth, spine row of 4/5 serrated spines on right/left mandibles; lacinia mobilis of left mandible with 4 blunt teeth, right mandible with short serrated spine instead. Molar with smooth grinding surface and 7 setulated subapical setae, distal part of molar with several short rows of small bristles, left and right molars with 3 lateral simple setae.

Hypopharynx (Fig. 3F) consisting of 2 lobes. Outer lobes much larger than inner lobes, distomedially with 6 blunt serrated setae and few short setules below; inner lobes distally only with short thin setules.

Maxilla 1 (Fig. 3A) outer lobe with 13 large serrated spine-like apical setae; medial margin with several rows of simple setae, lateral margin with rows of fine bristles, longest proximally. Inner lobe (see detail) with many slender apical simple setae and a subapical spine-like distally serrated seta, lateral margin with numerous fine bristles.

Maxilla 2 (Fig. 3B) basis with numerous rows of short stout setae; outer and middle lobes each with 4 apical setulated spine-like setae and several rows of fine setae on lateral margin; outer lobe with several simple apical setae; inner lobe 3.5 times as broad as median or outer lobes, distal margin bearing 3 stout strongly serrated setae, 8 serrated setae, 4 of these swollen, spoon-like in distal half, many simple setae and numerous fine bristles; medial margin with 2 setulated prominent long setae, 1 stout simple seta proximally of these and several slender setae; surface with several rows of setae.

Maxillipeds (Fig. 3C, D, E) with 1–5 retinaculae and 3 cuticular tooth-like setae on medial margin, one distally serrated. Palp articles with 1–6 long simple setae each, article 3 with additional fine bristles proximomedially, article 1 0.4 as long as wide, articles 2–3 of almost equal width, 0.6 times as broad as endite. Palpal article 4 about half as broad as article 3, with 2 apical simple setae, article 5 narrowest, with 4 long and slender simple setae and 2 stout spine-like setae (see detail in Fig. 3C, D). Endite almost twice as long as broad, vaulted medial margin with numerous simple setae, most of these distally; apical margin with 4 fan setae, medial seta broadest, 2 short, blunt simple spine-like setae and some simple setae, 1 coupling hook. Epipod (not illustrated) sickle-shaped, as long as endite.

All pereopods (Fig. 4A–G) without larger teeth.

Pereopod 1 (Fig. 4A) basis 5.3 times as long as broad, ischium 2.4 times as long as broad; merus 1.3 times as long as broad, with 2 distal sensory spine-like setae of different lengths; carpus about twice as long as wide, slightly tapering distally after one third of length, ventral margin with 2 long sensory spine-like setae in proximal half and 2 shorter ones in distal half, 1 long simple seta distodorsally; propodus about 2.4 times as long as wide, 0.8 times as long as carpus, with 2 spine-like sensory setae and 1 simple seta ventrally, 1 simple seta laterally and 3 simple setae of varying lengths dorsally, dactylus with 4 lateral setae near unguis insertion.

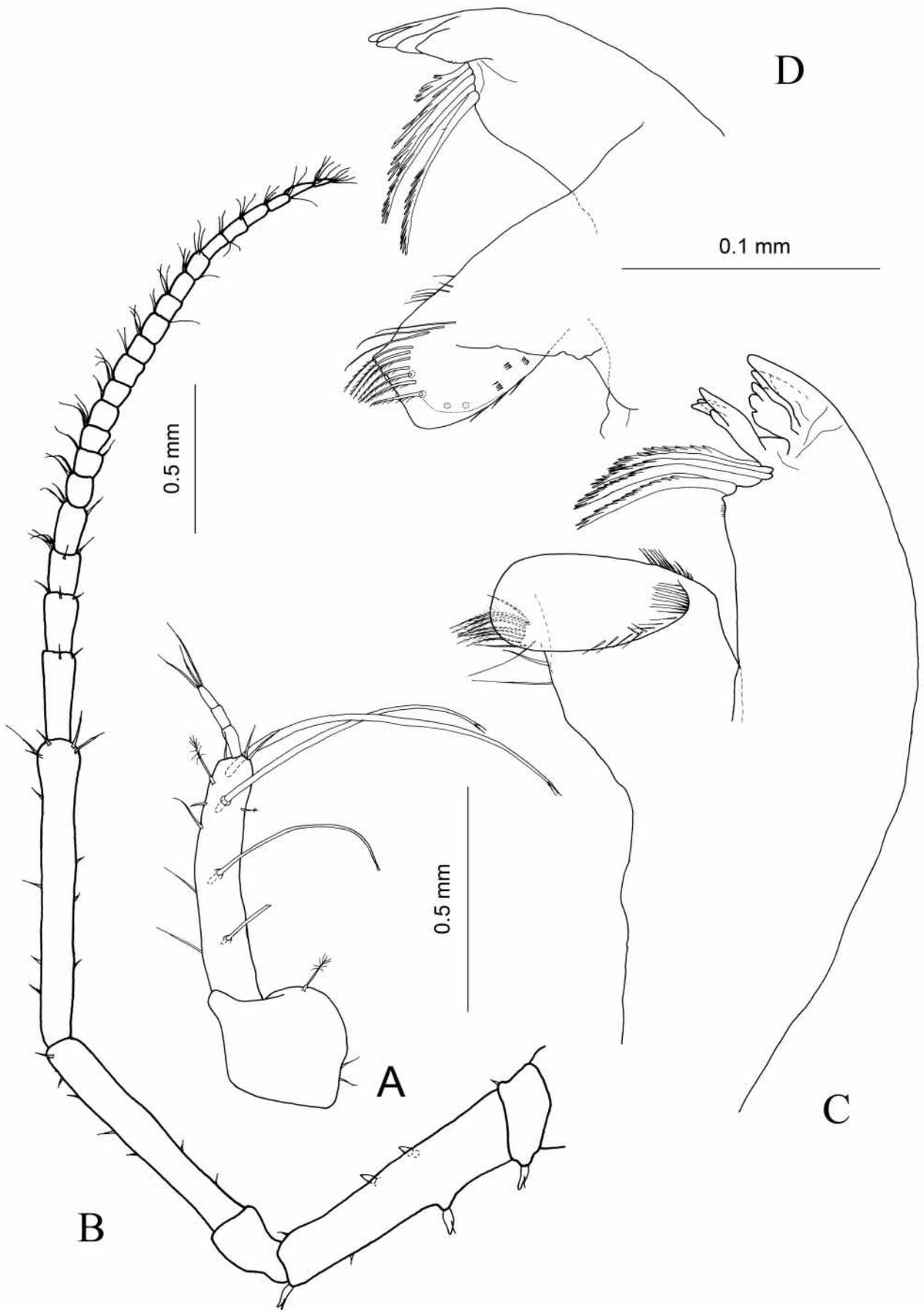


FIGURE 2, *Stylomesus weddellensis* sp. nov., paratype ♂, ZMH K-41525. A, antenna 1. B, antenna 2. C, left mandible. D, right mandible.

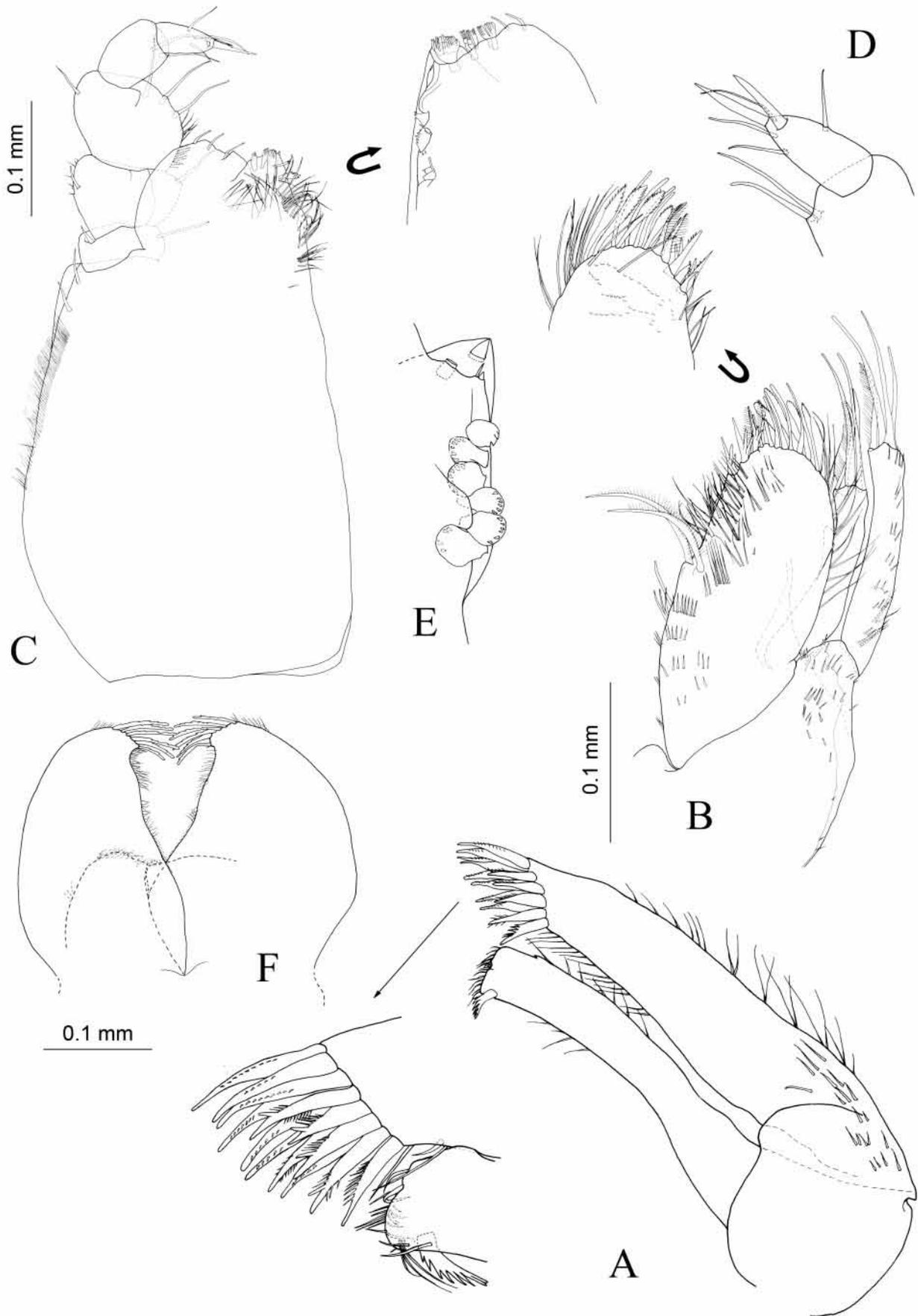


FIGURE 3, *Stylomesus weddellensis* sp. nov., paratype ♂, ZMH K-41525. A, maxilla 1, B, maxilla 2. C - E, maxilliped; dactylus of opposite body side (D), retinaculæ of opposite body side (E). F, hypopharynx.

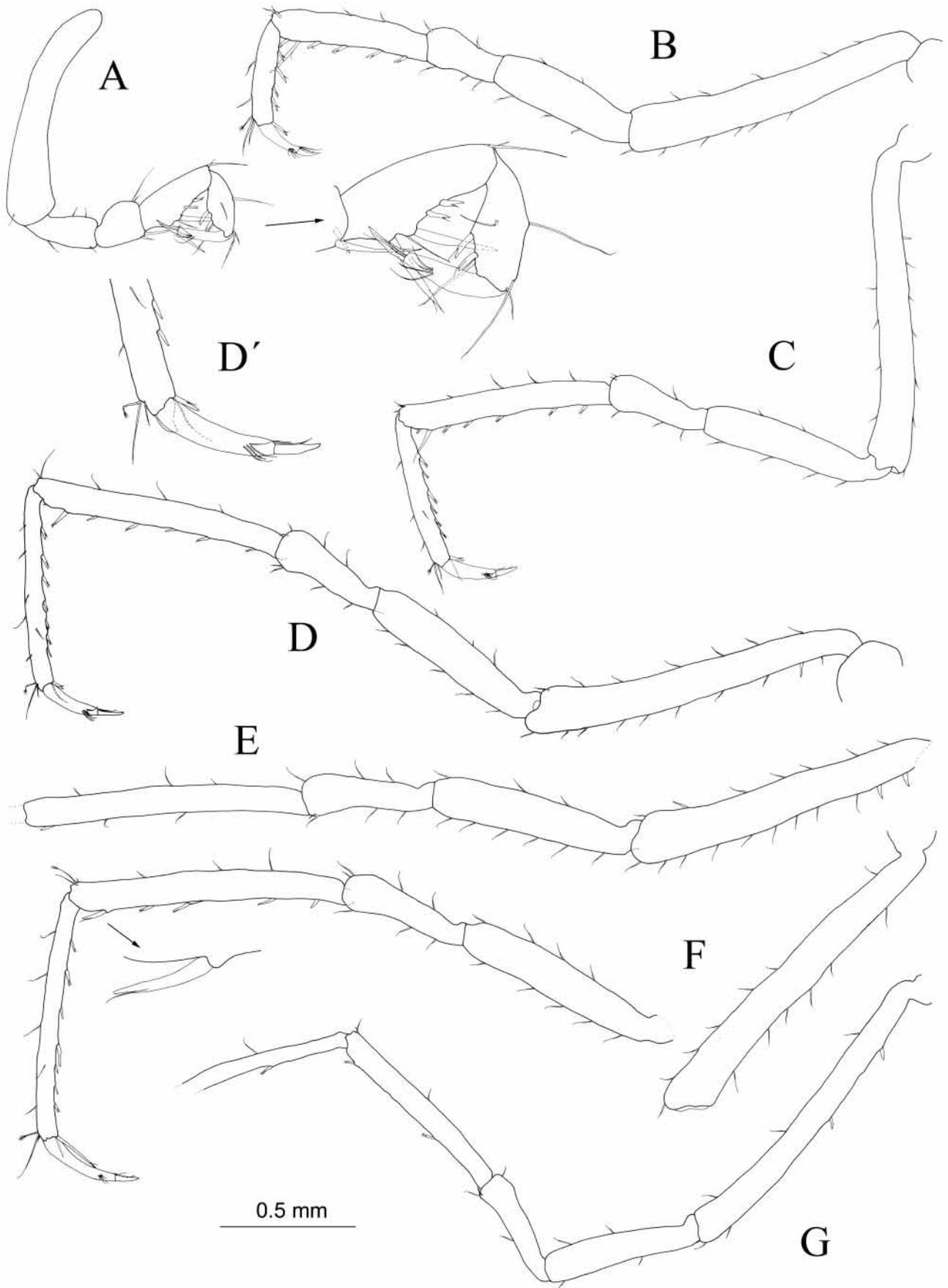


FIGURE 4, *Stylomesus weddellensis* sp. nov., paratype ♂, ZMH K-41525. A, pereopod 1. B, pereopod 2. C, pereopod 3. D and D', pereopod 4; dactylus enlarged (D'). E, pereopod 5. F, pereopod 6. G, pereopod 7.

Pereopods 2–7 present, all similar (Fig. 4B–G), walking legs, increasing in lengths from pereopod 2–6, pereopod 7 slightly shorter than 6. Bases longest articles, with few scattered dorsal and/or ventral small cuticular teeth, basis of P3–P7 ventrally with proximal spine-like sensory setae, basis and ischium with up to 16 short simple setae; ischium of P3–P6 with few small cuticular teeth; merus of pereopods with 3 to 4 ventral setae and 2–3 dorsal setae; carpus of pereopods 2–6 with 6–7 ventral sensory setae, second distal seta longest and strongest, 2–5 dorsal simple setae, pereopods 3, 4 and 6 with distodorsal feather-like seta (possibly broken off in the other legs); propodus about 0.75 times as long as carpus, with 5–8 ventral sensory setae, distal one longest, 3–6 dorsal simple setae and 1 dorsal subapical feather-like seta; dactyli of all pereopods with 4 lateral setae and 2 setae inserting ventrally near base of unguis. Propodi and dactyli of P5 and P7 of paratype are broken off, but are similar to those of the other walking legs.

Pleopod 1 (Fig. 5A) 2.3 times as long as wide proximally, only slightly bent ventrally, narrowest part in distal third, 0.7 times as wide as proximal part, with longitudinal keels distally of narrowest part, distal expansion 1.2 times as wide as narrowest part. Distal tip broken off in paratype on one side, distal margin of inner lobes rounded, outer lobes projected, narrow, 0.25 width of inner one.

Pleopod 2 (Fig. 5B) sympod 2.4 times as long as wide, margins slightly rounded, with row of 11 plumose setae and 2 simple setae proximally; endopod inserting in distal half of sympod, stylet 0.5 times as long as sympod, with broad rounded tip; exopod oval, not surpassing sympod, thick.

Pleopod 3 (Fig. 5C) endopod, almost semicircular, 1.8 times as long as broad, with 3 distal plumose setae; exopod 0.7 times as long and 0.3 times as wide as endopod, with apical plumose seta and a fringe of fine bristles on outer margin.

Pleopod 4 (Fig. 5D) uniramous, 1.9 times as long as wide, without setation.

Pleopod 5 absent.

Uropod (Fig. 5E) 2-articulated, 0.6 times as long as pleotelson, inserting posterolaterally, exceeding terminal margin of pleotelson, sympod about 1.6 times longer than ramus, with 8 setae, terminal ramus narrowing distally, with 1 lateral seta and bifid tip.

Description of non-ovigerous allo- and paratype females (only differences are illustrated and described, Figs 6, 7): Body surface smooth, except for the small blunt projections of pereonites 1–3 (Fig. 6A, B). Body 5.6 times as long as wide. Head trapezoidal, 2.0 times as broad as long, with antennae inserting on large dorsolateral projections. Pereonite 1 slightly broader than head, anterolateral and lateral margins with small blunt projections, lateral margin of pereonite 2 also with small blunt spines, of pereonite 3 almost rounded; pereonites 1–3 with 2 caudomedial blunt projections; pereonite 4 0.8 times as long as wide, narrowing in posterior third, narrowest part 0.7 times as broad as broadest part; pereonite 5 about 3.1 times as long as wide, 0.3 times as long as body, caudally broadening more gradually than in male, broadest part about 1.5 times as broad as narrowest part, pereonite 7 not fused with pleotelson, pereopod 7 present; pleonite 1 distinguishable but completely fused with pleotelson. Pleotelson slightly longer than wide, without ornamentation, lateral margins slightly convex, terminal margin slightly concavely rounded, anal valves visible in dorsal view, distance between branchial chamber and anal valves 0.2 times as long as pleotelson.

Antenna 1 (Fig. 7A, A') about 0.11 times as long as body, with 5 articles; article 1 almost globular, about as long as wide, with one distal feather-like seta and a proximal simple seta; article 2 3.6 times as long as article 1, with 2 distal feather-like setae, 5 lateral sensory setae of different lengths, 3 medial simple setae and 2 setules; articles 3–5 minute, decreasing in size, article 3 with 1 small seta, article 5 with 1 short and 3 longer setae (2 of these broken off, see detail in Fig. 7A').

Antenna 2 (Fig. 7B) about 0.7 times as long as body, peduncle 1.8 times as long as flagellum, peduncular article 1 triangular (Fig. 7B); article 2 with stout spine-like sensory seta on distoventral conical projection and 2 simple setae on distal margin; article 3 about 2.9 times as long as articles 1 and 2 together, with several simple setae, 2 stout spine-like sensory setae on ventral conical projections; article 4 about 0.3 times as long as article 3, with 2 simple setae; article 5 about as long as article 3, more slender, with several short simple setae

and 1 rather long distal seta; article 6 about 1.4 times as long as article 5, with several simple setae, 2 long distal setae and 3 feather-like setae in distal fifth of article. Flagellum with 18 articles, article 1 longest, each article with 1–5 simple distal setae, except for last article with 8 distal simple setae.

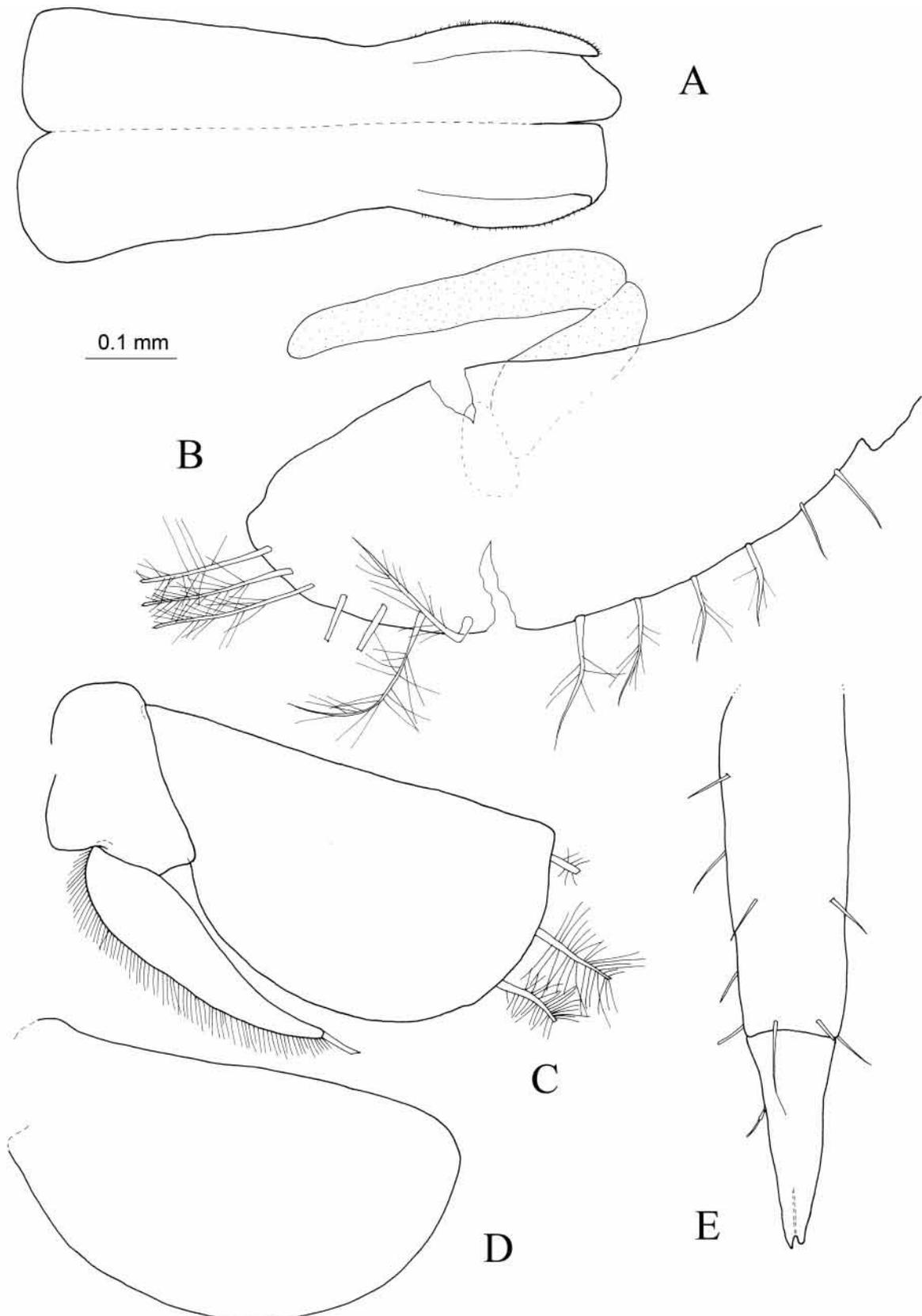


FIGURE 5. *Stylomesus weddellensis* sp. nov., paratype ♂, ZMH K-41525. A, pleopod 1. B, pleopod 2. C, pleopod 3. D, pleopod 4. E, uropod.

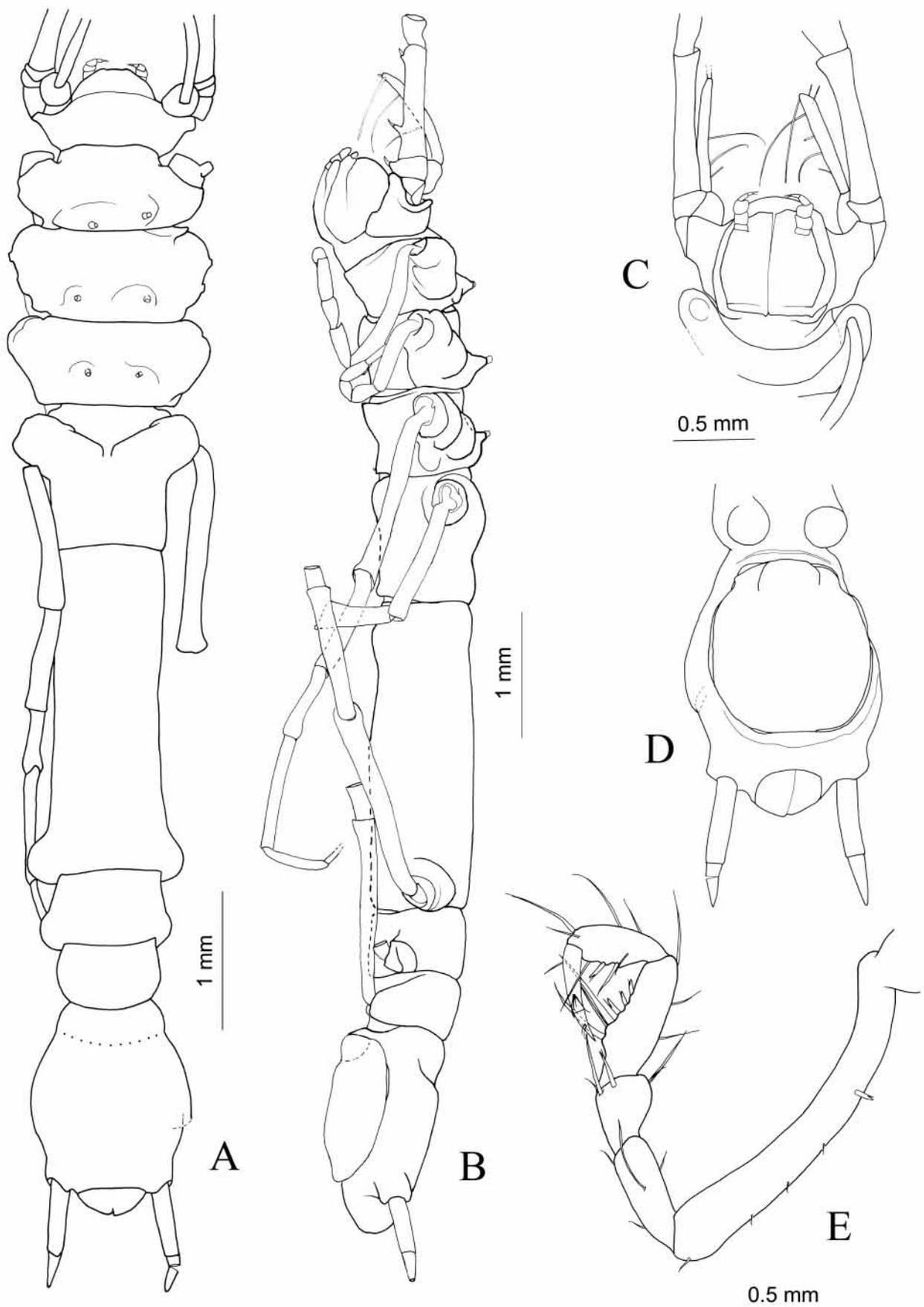


FIGURE 6. *Stylomesus weddellensis* sp. nov., allotype ♀ (8.2 mm) ZMH K- 41524. A, habitus, dorsal view. B, habitus, lateral view. C, head, ventral view. D, pleotelson, ventral view. E, paratype ♀, ZMH K- 41526, pereopod 1.

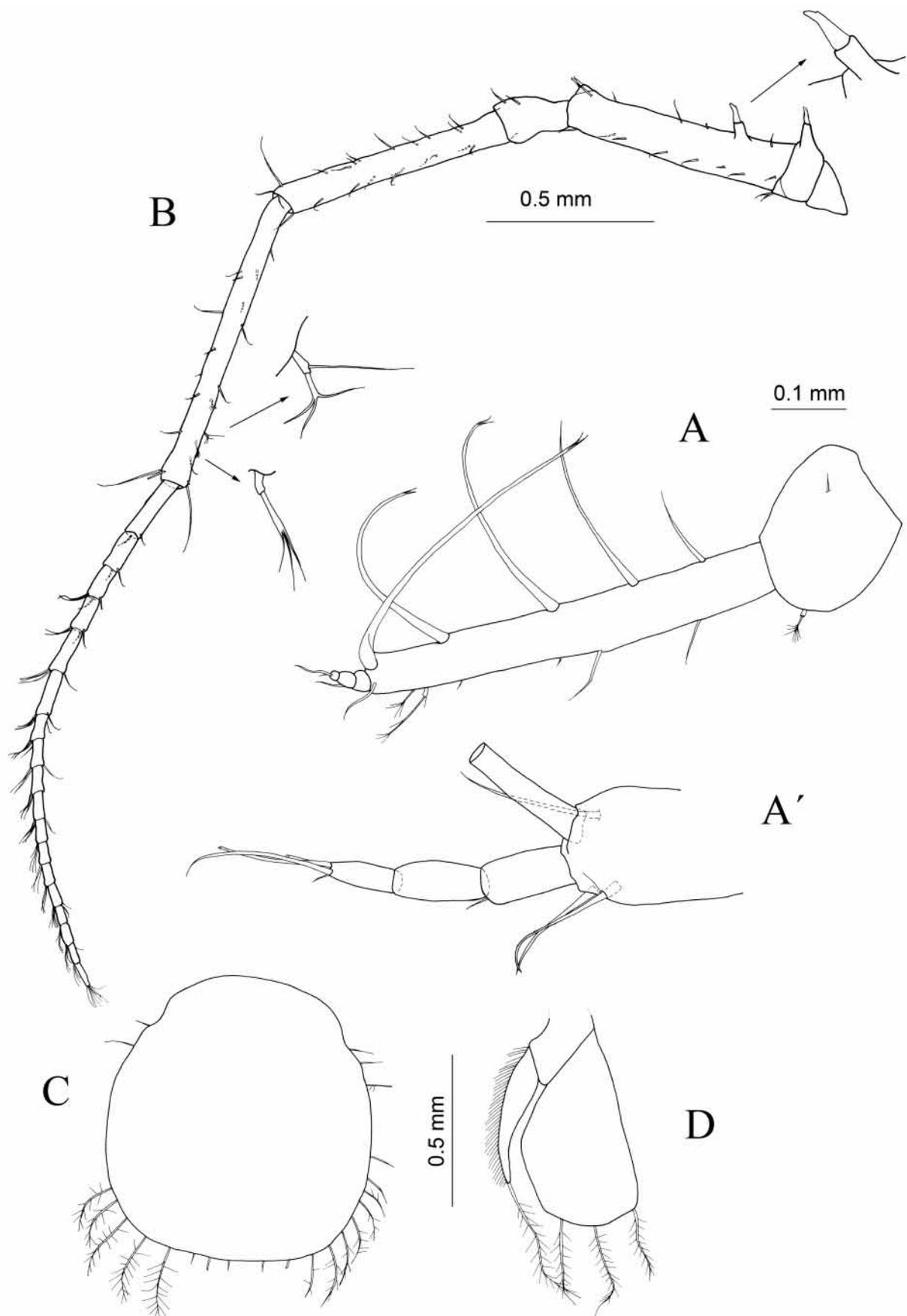


FIGURE 7, *Stylomesus weddellensis* sp. nov., paratype ♀, ZMH K-41526. A, antenna 1, 3 terminal articles not levelled. A', antenna 1, three terminal articles of opposite body side, levelled. B, antenna 2. C, pleopod 2. D, pleopod 3.

Maxilliped with up to 7 retinaculæ.

Pereopod 1 (Fig. 6D) basis 6.3 times as long as broad, with 1 ventral sensory seta and a few setules; ischium 3 times as long as broad, with 1 long and 3 shorter setae; merus 1.1 times as long as broad, with 2 dis-
toventral sensory setae of different lengths, 1 ventral setule and 1 long simple dorsal seta; carpus about 3.0
times as long as wide, slightly tapering distally after one third of length, 1 ventral simple seta and 2 long sen-
sory setae in proximal half and 5 shorter sensory setae in distal half, 3 simple setae of different lengths dor-
sally; propodus about 2.7 times as long as wide, 0.7 times as long as carpus, with 2 long sensory setae and 2
simple setae ventrally, and 4 simple setae of varying lengths dorsally; dactylus with 1 simple dorsal seta and 4
lateral setae near unguis insertion.

Pleopod 2 (operculum) (Fig. 7C) subcircular, almost round, 0.7 times as long as pleotelson, ventral sur-
face smooth, with approximately 16 small and short plumose setae, medial ones broken off, and 2–3 proximo-
lateral simple setae.

Pleopod 3 (Fig. 7D) endopod teardrop-like, 1.3 times as long as broad, with 3 distal plumose setae; exo-
pod 0.5 as long and 0.3 times as wide as endopod, with apical plumose seta and a fringe of fine bristles on lat-
eral margin.

Remarks

Stylomesus weddellensis sp. nov. is most similar to *Stylomesus natalensis* Kensley, 1984 from South
Africa, but can easily be distinguished by the mediolateral to caudolateral blunt spines on pereonites 1 – 3.
Stylomesus natalensis has a pair of very small blunt spines mediocaudally of the head and frontomedially of
pereonites 1 and 2. Moreover, contrary to *S. weddellensis*, antenna 1 of *S. natalensis* has only 2 articles and the
second article bears only 3 long sensory setae and not 4 as in *S. weddellensis*. *Stylomesus weddellensis* is the
third species of the genus described from Antarctica (Table 1). The other Antarctic species can easily be dis-
tinguished from *S. weddellensis*. *Stylomesus hexapodus* Brökeland & Brandt, 2004 can easily be distinguished

TABLE 1: Species list and distribution of species of *Stylomesus* Wolff, 1956.

Species	locality	depth (m)
<i>Stylomesus gracilis</i> Birstein, 1960	N.W. Pacific	5680–5690
<i>Stylomesus granulatus</i> Menzies, 1962	S.E. Atlantic	4588
<i>Stylomesus hexapodus</i> Brökeland & Brandt, 2004	Antarctic, Weddell Sea	1121
<i>Stylomesus hexaspinosus</i> Birstein, 1963	N.W. Pacific	3874
<i>Stylomesus hexatuberculatus</i> Birstein, 1971	N.W. Pacific	5005–6135
<i>Stylomesus inermis</i> (Vanhöffen, 1914)	Antarctic	2450–6079
<i>Stylomesus menziesi</i> Birstein, 1960	N.W. Pacific	5680–5690
<i>Stylomesus natalensis</i> Kensley, 1984	South Africa	690–850
<i>Stylomesus pacificus</i> Birstein, 1960	N.W. Pacific	5450
<i>Stylomesus productus</i> Menzies, 1962	S.W. Atlantic	5293
<i>Stylomesus regularis</i> Menzies, 1962	S.W. Atlantic	4144–4166
<i>Stylomesus sarsi</i> Merrin & Poore, 2003	Tasmania, Australia	2400–3000
<i>Stylomesus simplex</i> Menzies, 1962	S.W. Atlantic	4885–5843
<i>Stylomesus simulans</i> Menzies, 1962	S.W. Atlantic	5293
<i>Stylomesus spinulosus</i> Menzies, 1962	S.W. Atlantic	5024
<i>Stylomesus weddellensis</i> sp. nov.	Antarctic, Weddell Sea	3100–4382
<i>Stylomesus wolffi</i> Birstein, 1960	N.W. Pacific	4000–6015

by its neoteny; adult males bear only 6 pereopods. Besides, this species, like *S. inermis* (Vanhöffen, 1914) lack the caudomedial spines on pereonites 1–3 which are characteristic for *S. weddellensis*. All other species which are described by Menzies (1962) and are known from the Atlantic Ocean lack this character as well.

Distribution

Type locality and a station in close proximity, 3100–4382 m depth.

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