



***Microcope* gen. nov.—a new deep-sea genus of Munnopsidae (Crustacea, Isopoda, Asellota), with description of two new species from the Southern Hemisphere**

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Abstract

A new genus of Munnopsidae Lilljeborg, *Microcope* gen. nov., is described including *Eurycope ovata* Birstein, 1970 from the northwestern Pacific, and two new species, collected in the Cape Basin, and Atlantic Sector of the Southern Ocean. The new genus combines characters common for some genera of Eurycopinae Hansen and Betamorphinae Kuskakin, but cannot be related to any known genus of the existing subfamilies and, thus, still remains *incertae sedis*. *Microcope* gen. nov. is characterized by minute eurycopine-like broad oval body with fused pereonites 5–7 on the one hand, and betamorphin-like face, pereopods 2–4 and uropods, with extended distomedial projection of the protopod on the other hand. The following combination of characters distinguishes the new genus: short head hidden under the anterior flange of pereonite 1, absence of rostrum, slender male pleopods 2, flattened female pleopod 2, and distinct shape and armament of pereopods 5–7 and pleopod 3. The descriptions of *Microcope* gen. nov., as well as the two new species, *M. denticulata* sp. nov., and *M. levissima* sp. nov., are presented.

Key words: Southern Atlantic, Southern Ocean, deep sea, taxonomy, Munnopsidae, new genus, new species, *Microcope*

Introduction

The expeditions of the ANDEEP project (ANtarctic benthic DEEP-sea biodiversity: colonisation history and recent community patterns) have yielded a rich collection of munnopsid species, of which most were new to science (Malyutina & Brandt 2007). Amongst them, there was a high number of so-called rare species, which, however, are taxonomically significant. Very often the types of rare species cannot be reexamined and redescribed because they are either in a bad condition or have been lost. Yet, the reexamination and redescription is especially important if these species have an unclear taxonomic position and cannot be assigned to any described genus, such as *Eurycope ovata* Birstein, 1970. This species had to be excluded from the genus *Eurycope* Sars, as it did not fit the diagnosis of the latter (Wilson & Hessler 1981, Malyutina & Brandt 2006). Wilson and Hessler (1981) put the species in a group of “Ilyarachnoid facies” or ilyarachnid-like eurycopid species. Later, Wilson (1989) revised this problematic group as the newly defined subfamily Lipomerinae Tattersall, but did not include *Eurycope ovata* into any existing or newly erected genera. In his monograph, Kuskakin (2003) provisionally placed the species into *Eurycope*, without including it into the identification key for the genus *Eurycope*. He used Birstein's (1970) description and illustrations because the types of *Eurycope ovata* could not be examined as they were in a bad condition.

During the ANDEEP I–III expeditions several tiny seed-like specimens of strange munnopsids, fortunately well preserved, were collected that proved to be related to *Eurycope ovata* Birstein, 1970 from the Kuril-Kamchatka Trench. Further identification of the specimens showed that they belonged to two species new to science. Careful morphological study of these species revealed that they combine characters common for some genera of Eurycopinae, Betamorphinae and Syneurycopinae Wolff, but cannot be placed into any of these genera. Therefore a new genus, *Microcope* gen. nov. is erected and described including *Eurycope ovata* and two new species, which are illustrated here. The new genus is considered as an intermediate between Eurycopinae and Betamorphinae, of which the latter is a transitional group between Eurycopinae and Ilyarachninae Sars. More detailed future studies of species of *Betamorphia* Hessler and Thistle will allow elucidation of the relationship of the new genus.

Methods

During the ANDEEP I & II (2002) and ANDEEP III (2005) expeditions, specimens of the new species were collected by epibenthic sledge (Brandt & Barthel 1995, Brenke 2005) in the Cape Basin and the Atlantic Sector of the Southern Ocean, and fixed in pre-cooled 96% ethanol. The material was sorted and identified using a Wild M5 stereomicroscope and drawn using an Olympus SZX7 compound microscope equipped with a camera lucida, or a LABOVAL 4 microscope with a Lomo RA-7U4.2 drawing tube. The total body length was measured with an ocular micrometer medially from the frontal margin of head to the posterior margin of pleotelson. For measuring the width, the dorsal view was used, while the length of the body segments was measured in lateral view.

The material was put at the disposal of the author by the Zoological Museum, Hamburg (ZMH) in the context of CeDAMar program. The type material is deposited in the Zoological Museum, Hamburg.

Abbreviations. The following abbreviations are used in the text and figures: ZMH—Zoological Museum, Hamburg; An1—antennula; An2—antenna; lMd—left mandible; rMd—right mandible; Mx1—maxilla 1; Mx2—maxilla 2; Mxp—maxilliped; P1–7—pereopods 1–7; Pl 1–5—pleopods 1–5; Ur—uropod.

Taxonomy

Munnopsidae Lilljeborg, 1864

Microcope gen. nov.

Type species: *M. denticulata* sp. nov.

Species included: *M. denticulata* sp. nov., *M. levissima* sp. nov. and *M. ovata* (Birstein, 1970).

Etymology: The name refers to the minute size in combination with the former generic name of the first species of the genus.

Diagnosis. Head short, not visible, hidden under anterior transparent flange of pereonite 1; rostrum absent, antennulae inserted closely to each other; frons high, triangular; mouthfield narrow, protruded ventrally. Pereonites 1 and 2 longer than pereonites 3 and 4. Natasome larger than ambulosome, with continuous oval configuration, pereonites 5–7 fused dorsomedially, dorsolateral articulations short, about half of natasome height, pereonite 5 longer laterally than combined pereonites 6 and 7, pereonite 7 shortest; pleotelson broader than long, subtriangular, uropods inserted ventrally, anus separated from pleopodal cavity by flattened lengthy space, not covered by operculum. Antennula article 1 about as long as wide, with narrow triangular distomedial lobe, article 3 subequal in length to article 2. Mandible molar process cylindrical, elongate, longer than condyle; palp strong, subequal or longer than mandibular body. Maxilliped epipod about as long as basis, elongate triangular. Pereopods 1–4 basis subequal in length, pereopods 2–4 with conspicuous difference between bulky basis–ischium part and slender carpus–dactylus part. Pereopods 5–7 similar in shape and size,

carpi and propodi moderately expanded (propodi smaller), dactyli slender, almost as long as propodi. Female pleopod 2 ovoid, slightly bulging proximomedially, flattened distally, with dense row of long marginal setae, distal margin truncate. Male pleopod I distolateral lobes pointed, shorter and narrower than rounded distomedial lobes; pleopod 2 protopod slender, length about 4 times width, stylet length 0.8 protopod length, exopod stout. Pleopod 3 endopod distal half almost twice as broad as narrow basal half, distal plumose setae longer than endopod; exopod about as wide and 1.5 as long as endopod, distal seta tiny. Uropod protopod with medial extension, rami inserted in midlength of lateral margin, endopod distinctly longer and broader than exopod.

Additional description. Body highest at ambulosome, head length about 0.2 width, frontal margin with short angled medial prominences, without rostrum, frons triangular, higher than dorsal part of head and clypeus and labrum together, acute anterior, with small medial convexity; clypeus 1.8 as wide and as long as labrum. Pereonites 1–4 tightly articulated, gradually broadening from 1 to 4, 1 and 2 distinctly longer than 3 and 4; anterior flanges overhanging posterior section of preceding segment; pereonites 2–4 lateral margins sinuate, anterolateral projections tipped with stout seta; coxae with anterior lobe, emerging behind the anterolateral projections of pereonite. Pereonites 5–7 dorsomedially fused without sutures, ventrally with sutures, ventrolateral margins rounded, dorsolateral articulations extended posteriorly. Pleonite 1 narrow stripe, pleotelson with ventrolateral row of dense setae, posterior margin rounded.

Antennula article 1 distomedial triangular lobe truncate distally. Mandibular spine row with few spines, molar process more than twice as long as condyle, cylindrical, truncated distally, ventral margin of trituration surface with row of spines and stiff setae; palp strong, not shorter than body, article 3 relatively large, 0.4 as long as longest article 2. Maxilliped epipod elongated, subequal to basis, length about 3 times width, proximal third of lateral margin rounded, slightly protruding; articles 2 and 3 of maxilliped palp expanded, article 3 medial margin dentate, medial lobe of article 4 convergent, with broad basis.

Pereopods 1–4: pereopod 1 shortest, pereopods 3 and 4 longest, about 1.6 as long as pereopod 1; basis 1 most slender, basis 4 most stout; ischium and merus of pereopods 3 and 4 longer and stouter than those of pereopod 2, of the same width, carpi of pereopods 2–4 of the same width, increasing in length from 2 to 4; propodi increasing in length and decreasing in width from 2 to 4. *Pereopods 5–7:* pereopod 6 longest, pereopod 7 shortest; pereopod 5 with shortest and stoutest basis–ischium part and narrowest carpus, pereopod 7 with most elongate basis–ischium, relatively broad and short carpus and long propodus; propodi inserted from distoventral side of carpi more ventrally than on usual swimming paddle-like pereopods; carpi and propodi elongate oval, with 3 different types of setae: usual plumose setae on proximal half of articles, stout plumose setae with short setulae more distally and spine-like stout unequal bifid setae on distal third of articles.

Female operculum ovoid, proximomedial part slightly bulging, distal half flattened, with dense row of plumose whip marginal setae, distal margin truncate, with additional submarginal setae. Male pleopods 1 and 2 covering pleopodal cavity tightly. Pleopod 1 with parallel sides, distal part with lateral setae; distolateral lobes pointed and curving slight toward midline, slightly shorter and clearly narrower than rounded distomedial lobes. Pleopod 2 protopod elongate, lateral margin with long plumose setae; endopod and exopod inserting from distal third of protopod; stylet approximately 0.8 as long as protopod length. Pleopod 3 endopod with 3 plumose distal setae, two of them inserting closely to each other laterally, third seta inserted at distance medially; exopod semicircular, about as wide and 1.5 longer than endopod, with thin lateral setae and tiny distal seta. Pleopod 4 exopod equal in length and half as wide as endopod, with long plumose seta, which is equal in length to plumose setae on pleopod 3. Uropod protopod with row of ventral long setae along lateral margin, endopod slightly shorter than protopod, and longer than exopod.

Remarks. In the dorsal view of the holotype of *Eurycope ovata* Birstein (1970: 326, Fig 14) drew a head in front of pereonite 1, which is most likely not a head, but an anterior flange of pereonite 1, as can be seen in both of the new species described here. Birstein also drew a complete suture between pereonites 6 and 7. Yet, in all studied specimens of the new species this line coincides with the border of the pereopod 7 muscle tissue,

which is visible through the integument. At first glance, *E. ovata* illustrated by Birstein resembles small lipomerinas, e.g. some species of *Coperonus* Wilson, 1989 or *Lionectes* Wilson, 1989, due to its small oval body (1–2 mm), lack of rostrum and reduced pereonite 7. In contrast to the Lipomerinae, though, the new genus has fused pereonites 5 and 6, a smaller and flattened female operculum, which does not cover the anus, and a different shape and position of the uropods; pereopod 7 is not reduced and similar to pereopods 5 and 6.

Microcope gen. nov. superficially resembles some Eurycopinae, especially some species of *Disconectes* Wilson and Hessler, 1981 and *Baeonectes* Wilson, 1982, in possessing a broad body with enlarged rounded natasome, fused natasomal pereonites and similar mouthparts. Yet, it cannot be assigned to the Eurycopinae due to the lack of rostrum, different shape and size of opercular pleopods, and modified uropods.

The new genus resembles Betamorphinae in having similar shape and position of the basal articles of antennulae, narrow mouthfield that is protruded ventrally, similar morphology of pereopods 1–4, the extended anterior flange of pereonites 1 and 2, sinuate lateral margin of pereonites 1–4 with coxal lobes emerging behind anterolateral projections of pereonites, the protopod of the uropod with a medial extension and the arrangement of the ventral side of pleotelson. *Microcope* gen. nov. differs from existing genera of Betamorphinae, *Betamorpha* Hessler and Thistle, 1975 and *Amuletta* Wilson and Thistle, 1985, by dorsomedially fused natasomal pereonites (the Betamorphinae have full dorsal articulations); flattened female pleopod 2 without medial keel, which is typical for Betamorphinae; different arrangement of pleopods 3 and 4, and elongated oval carpi of pereopods 5–7, which are broad and triangular in Betamorphinae.

Some characters of the new genus are also common for species of Syneurycopinae, e.g. *Bellibos* Haugness and Hessler, 1979, such as fused pereonites 5–7, shape and position of the operculum in both sexes, which occupies about half of the ventral surface of pleotelson, broad and flattened bridge between the pleopodal cavity and anal operculum with posterior row of long setae. The Syneurycopinae is distinguished by many autapomorphies such as narrow body, reduced natasome and nearly tubular basal articles of antennulae, and cannot be considered as a close relative of *Microcope* gen. nov.

Thus in spite of the above mentioned similarities, *Microcope* gen. nov. cannot be placed into any existing subfamily and remains *incertae sedis*. Distribution of characters in some munnopsid genera is presented in Table 1.

Distribution. The species of the genus *Microcope* gen. nov. were found in the Kuril-Kamchatka Trench (northwestern Pacific), and in the Southern Hemisphere, i.e. in the south-eastern Atlantic (Cape Basin) and Southern Ocean (Scotia and Bellingshausen seas, west of the South Shetland Islands). The depth ranged between 2014 and 5054 m.

***Microcope denticulata* sp. nov. (Figs. 1–6)**

Material examined

Holotype, female (1.8 mm), (ZMH K-41423), ANDEEP III St. 21–7–S, 29 January 2005, 47°39.87'–38.52' S 04°15.79'–14.94' W, 4574 m.

Paratype, preparatory female (2.2 mm), same data as holotype (ZMH K-41424), dissected for description.

Additional material: female with 8 eggs (2.2 mm), (ZMH K-41425), DIVA 2 St. 41–2–E, 28°3.98'S, 07°20.49'E, 5054 m.

Etymology. *Denticulata* refers to the serrulated anterior margins of pereonites 1–4.

Description. Body (Fig. 1) length 1.7–1.9 width of pereonite 5, body height 0.35 of body length. Head length 2 times width, antennulae inserted with narrow gap between, clypeus 1.8 as wide and as long as labrum. *Pereonite 1* 1.3 as wide as head, anterior transparent flange overhanging head and basal part of antennae, pereonite 2 longest, slightly longer than pereonite 1, pereonite 3 slightly shorter than pereonite 1,

TABLE 1. Distribution of some characters in selected munnopsids genera.

Taxa Characters	<i>Microcope</i>	<i>Eurycope</i>	<i>Baeonectes</i>	<i>Disconectes</i>	<i>Betamorphia</i>	<i>Lionectes</i>	<i>Bellibos</i>
Body size, shape	< 2 mm, broad oval, seed-like	> 2 mm, elongate	< 2 mm, broad oval	> 2 mm, broad oval	> 2 mm, elongate	< 2 mm, oval, seed-like	> 2 mm narrow
Head	hidden, not visible	visible,	visible,	visible,	visible,	visible,	visible,
Rostrum	absent	present	present	present	absent	absent	absent
Mouth field	narrow, protruded ventrally	broad, not protruded ventrally	broad, not protruded ventrally	broad, not protruded ventrally	narrow, protruded ventrally	broad, not protruded ventrally	narrow, protruded ventrally
Pereonites 1 and 2 in comparison to 3 and 4	longer	subequal	subequal	subequal	longer	subequal	subequal or longer
Pereonites 2-4 lateral margin	sinuate	straight	straight	straight	sinuate	straight	straight
Pereonites 5-7 dorsal articulation	fused medially	full	fused medially	5 and 6 fused medially	full	6 and 7 fused medially	fused medially
Anus	not covered by operculum	covered by operculum	covered by operculum	covered by operculum	not covered by operculum	covered by operculum	not covered by operculum
Separation between pleopodal cavity and anus	flattened lengthy space	narrow space	narrow space	narrow space	ridge	narrow space	flattened lengthy space
Antennula article 1 distomedial lobe	long, triangular	long, triangular	reduced	reduced	short, triangular	long, rounded distally	reduced
Distance between basal articles of An1	minimal, narrow gap	of rostrum width	of rostrum width	of rostrum width	minimal, narrow gap	narrow gap	subequal to article width
Antennula article 3	subequal to article 2	longer than article 2	shorter than article 2	shorter than article 2	longer than article 2	shorter than article 2	longer than article 2
Pereopods 1-4 basis-ischium in comparison to carpus-dactylus	broader	same width	same width	same width	broader	same width	same width
Pereopods 5-7 carpius	moderate expanded, elongate	expanded, semi-circular	expanded, semi-circular	expanded, semicircular	expanded, triangular	expanded, semi-circular	moderate expanded, triangular
Pereopods 5-7 dactylus in comparison to propodus	subequal or longer	shorter	shorter	subequal or shorter	shorter	reduced, tiny	shorter
Female pleopod 2	small, ovoid, flattened, with proximal bulge	large, broad, with ventromedial keel	large, broad, with ventromedial keel	large, broad, with ventromedial keel	large, broad, with high ventromedial keel	large, broad, with ventromedial keel	small, ovoid, flattened, with proximal bulge
Male pleopod 2 protopod	narrow	broad	broad	broad	broad	broad	slender
Pleopod 3 endopod distal plumose setae	3, longer than endopod	3, shorter than endopod	3, shorter than endopod	3, shorter than endopod	several, shorter than endopod	3, longer than endopod	several, longer than endopod
Pleopod 3 exopod	about as wide as endopod, with 1 tiny distal seta	narrower than endopod, with 1 distal seta	narrower than endopod, with 1 tiny distal seta	narrower than endopod, with 1 tiny distal seta	narrower than endopod, with few distal setae	about as wide as endopod, with few distal setae	about as wide as endopod, with few distal setae
Uropod protopod	with medial extension	tubular	tubular	tubular	with medial extension	nearly tubular	nearly tubular
Uropod rami insertion	on midlength of lateral margin,	terminally	terminally	terminally	on proximolateral part	nearly terminally	terminally

pereonite 4 shortest, length about half of pereonite 1; anterolateral margin of pereonites 1–4 serrated; pereonites 2–4 anterolateral projections distinctly protrude in dorsal view, distal stout seta long; coxae anterior lobe acute, equal in size to anterolateral projections of pereonite, lateral margin of coxa with 3 setae. Natasome length 0.75 body length, width 2.1 head width; pereonite 5 lateral length 1.5 lateral length of pereonites 6 and 7 together; pereonite 7 lateral length 0.1 pereonite 5 length. Pleotelson length 0.7 width, 0.3 body length, pleopodal cavity width 0.4 of pleotelson width, cavity length 0.6 pleotelson length.

Antennula (Fig. 2) one third of body length; article 1 as long as wide, with 4 whip medial, 3 short stout lateral setae, and 1 dorsal broom seta, distomedial lobe with 3 distal stout setae; article 2 length 0.3 of article 1, with 2 distal broom and 1 stout setae; article 3 length 1.3 of article 2, with long whip seta; flagellum of 8–10 articles, article 4 length 0.2 article 3 length, with distal broom seta, following articles shorter than article 3, with 2 small distal setae each, last three articles with aesthetasc.

Antenna incomplete on all specimens (Fig. 2): articles 1–3 subequal in size, with row of stout ventrodorsal setae, scale on article 3 narrow in dorsal view and broad triangular in lateral view, with 4 distal setae; article 4 smaller than preceding articles.

Mandible (Fig. 2) *pars incisiva* with 5 cusps; *lacinia mobilis* of left mandible slender, length 0.8 length of *pars incisiva*, with 4 teeth; spine row with 3 and 4 spines on left and right mandibles respectively; condyle length 0.4 molar process length; palp as long as mandibular body, article 1 with 2 long distal setae, article 2 twice as long as article 1, with 5 slender medial and 2 stout distal setae, article 3 with row of slender distal setae. *Maxilla 1* (Fig. 3) lateral endite width 1.2 mesial endite width, almost all 12 distal spine-like setae denticulate, 2 longest distolateral setae slightly longer than endite width. *Maxilla 2* (Fig. 3) middle endite shortest, lateral endites longest, with 2 long and 2 short distal setae each; mesial endite as wide as middle and lateral endites together, with 10 comb-like and numerous distal setae. *Maxilliped* (Fig. 3) basis length 2.5 width, endite with 3 coupling hooks, distal margin serrated, with 5 stiff setae and numerous simple slender setae; palp article 2 lateral margin straight, length 1.5 length of medial margin, medial margin with 3 long whip setae; article 3 medial margin dentate, with whip setae, medial length equal to lateral length of article 2; articles 3–5 subequal in length laterally, medial lobe of article 4 almost as long as article 5, convergent, with broad basis, with 4 long distal setae; article 5 with 5 long setae. Epipod length 3 times width and as long as basis.

Pereopods 1–4 (Fig. 4): *pereopod 1* length 0.5 body length, length ratios of ischium–dactylus to basis: 0.5, 0.2, 0.6, 0.7, 0.2; basis length 4.7 width, with sparse simple setae; ischium length 3.1 width, with 4 stout distodorsal setae and 3 ventral setae; merus length 1.4 width, with 2 distoventral setae; carpus length 6.3 width, with 4 dorsal and 5 ventral setae; propodus length 8.2 width, with 4 dorsal and 7 ventral setae; claw length 0.35 dactylus length. *Pereopod 2* length 1.2 pereopod 1 length, length ratios of ischium–dactylus to basis: 0.6, 0.2, 0.9, 0.7, 0.5; basis length 3.9 width, with 4 distoventral setae, 4 short stout ventral setae and 8 dorsal setae; ischium length 2.6 width, with 4 stout distodorsal setae and 3 stout ventral setae; merus length 1.3 width, with 4 distal setae; carpus length 7.2 width, with 5 ventral and 2 dorsal setae; propodus length 8.7 width, with 1 ventral and 5 distal setae; dactylus length 11.2 width, claw length 0.1 dactylus length. *Pereopod 3* length 1.6 pereopod 1 length, length ratios of ischium–dactylus to basis: 0.75, 0.3, 1.3, 1.0, 0.6; basis length 3.4 width, with 3 distoventral setae, 3 short stout ventral setae, 5 dorsal setae; ischium length 2.6 width, with 2 dorsal, 5 stout distodorsal setae and 3 stout ventral setae; merus length 1.5 width, with 2 ventral and 2 distodorsal setae; carpus length 10.8 width, with 9 ventral, 2 dorsal and 4 distal setae; propodus length 20 times width, with 6 ventral, 2 dorsal and 2 distal setae; dactylus length 15.5 width, claw length 0.15 dactylus length. *Pereopod 4* not complete, length ratios of ischium–merus to basis: 0.9, 0.3; basis length 2.8 width, with 3 distoventral setae, 4 short simple and 2 broom dorsal setae; ischium length 3.1 width, with 1 dorsal, 4 stout distodorsal setae and 7 stout ventral setae; merus length 1.6 width, with 2 distal setae.

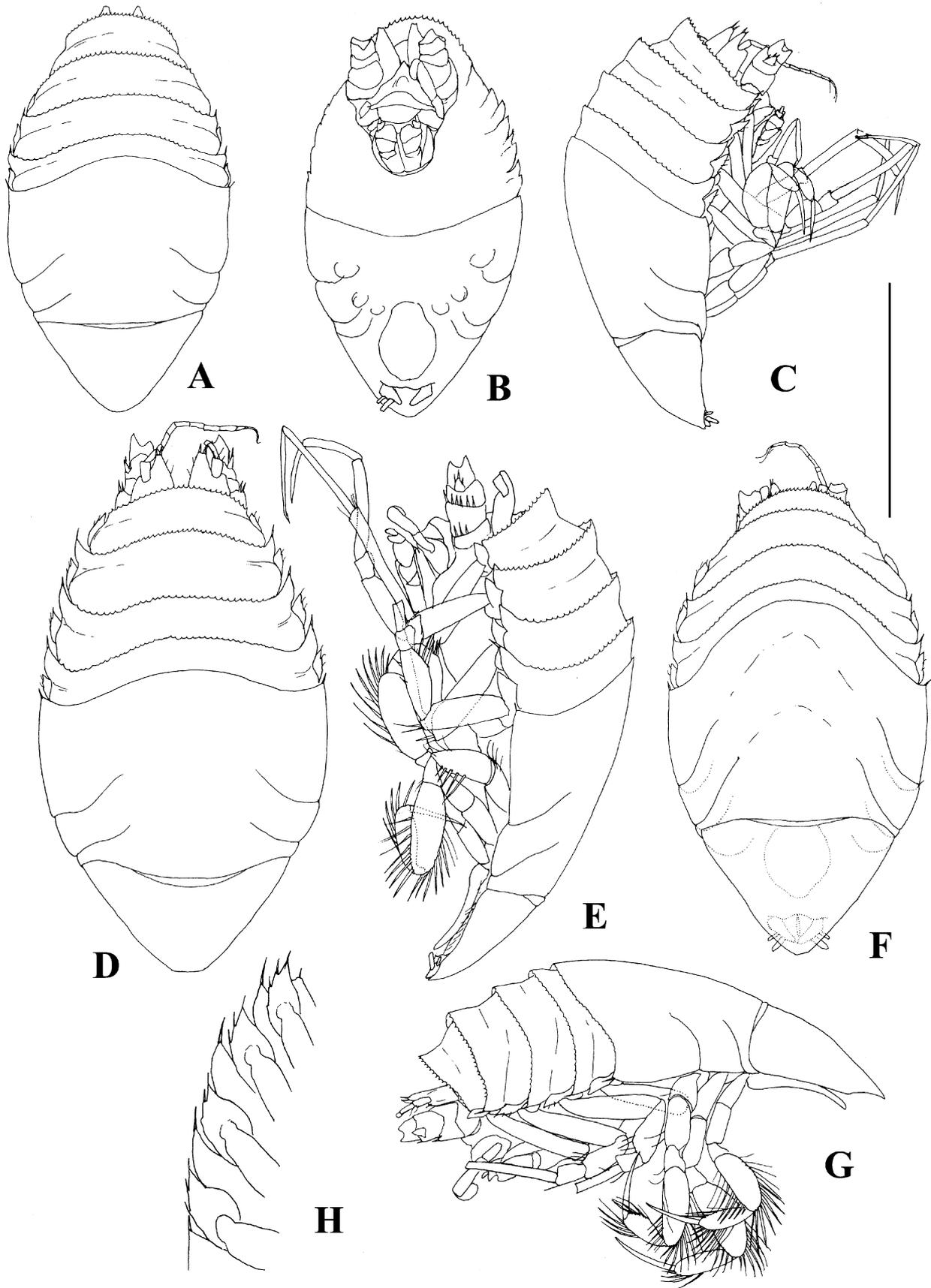


FIGURE 1. *Microcope denticulata* sp. nov., holotype female, ZMH K-41423: A, body dorsal view; B, body ventral view; C, body lateral view; paratype female, ZMH K-41424: D, body dorsal view; E, body lateral view; Additional material from DIVA 2, female, ZMH K-41425: F, body dorsal view; G, body lateral view; H, lateral margin of ambulosome, ventral view. Scale bar 1 mm.

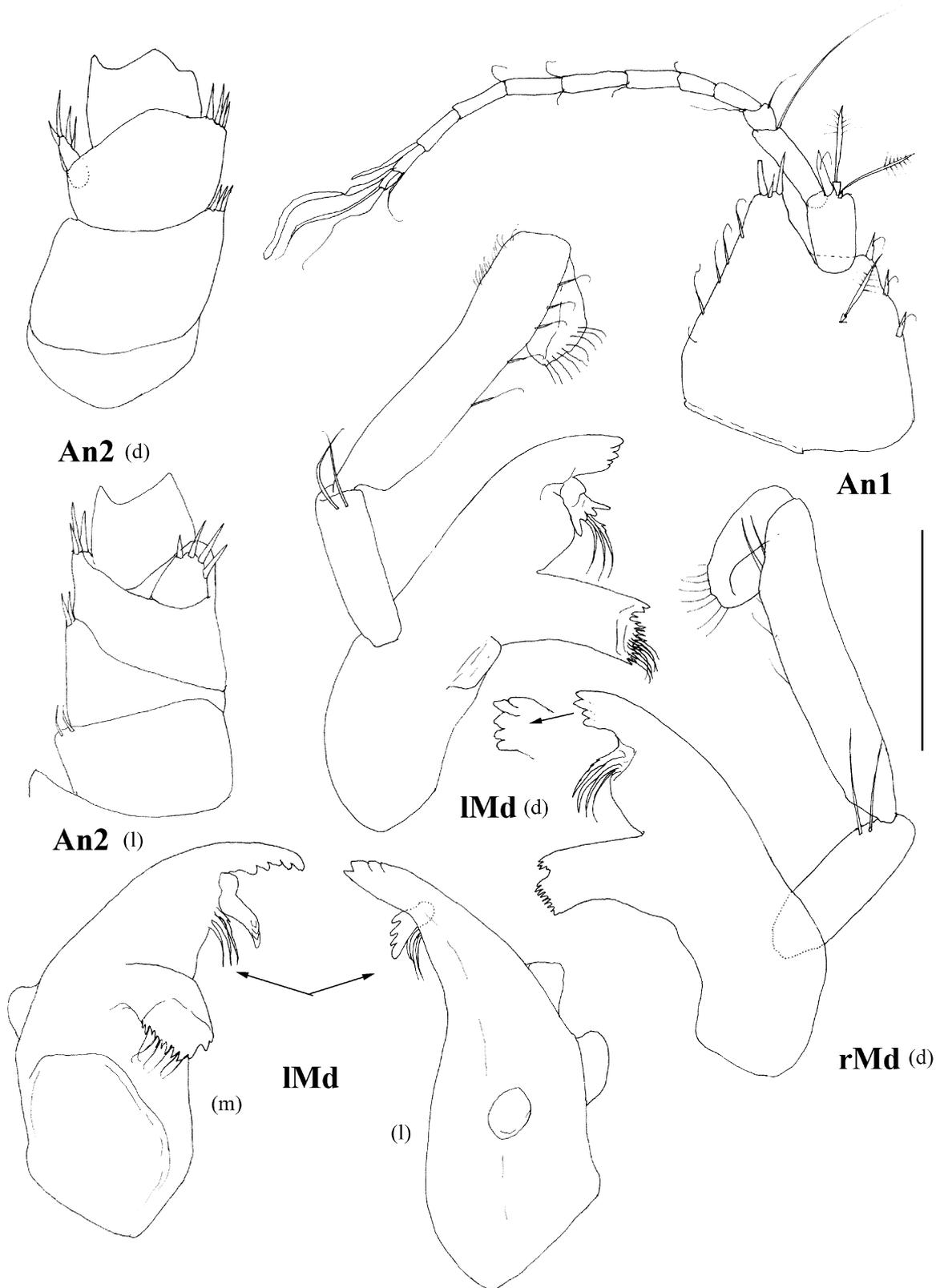


FIGURE 2. *Microcope denticulata* sp. nov., female, paratype, ZMH K-41424: right antennula, dorsal view, antenna 2 dorsal (d) and lateral (l) views and mandibles: dorsal (d), medial (m) and lateral (l) views. Scale bar 0.1 mm.

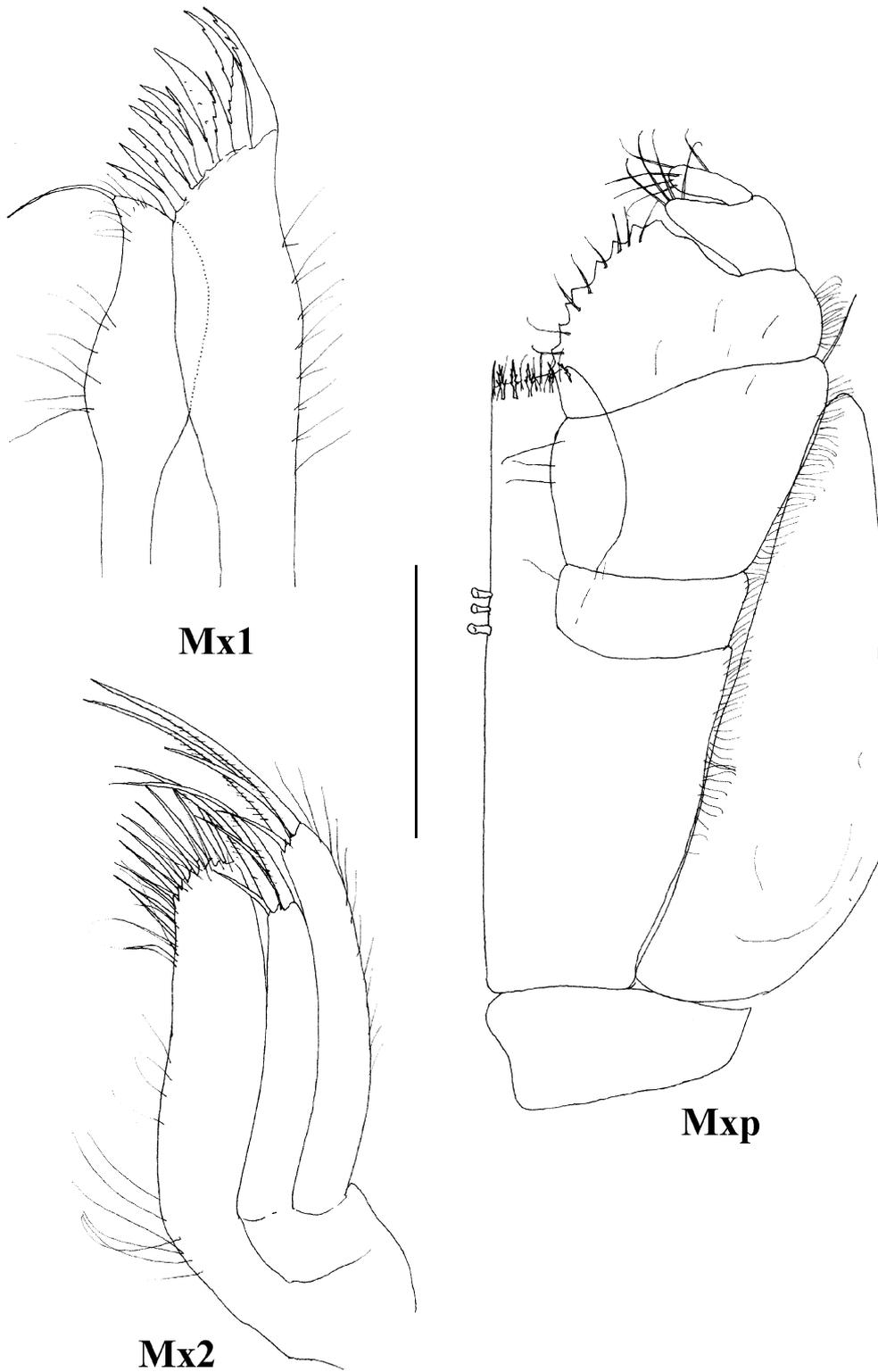


FIGURE 3. *Microcope denticulata* sp. nov., female, paratype, ZMH K-41424: maxillae and maxilliped, ventral view. Scale bar 0.1 mm.

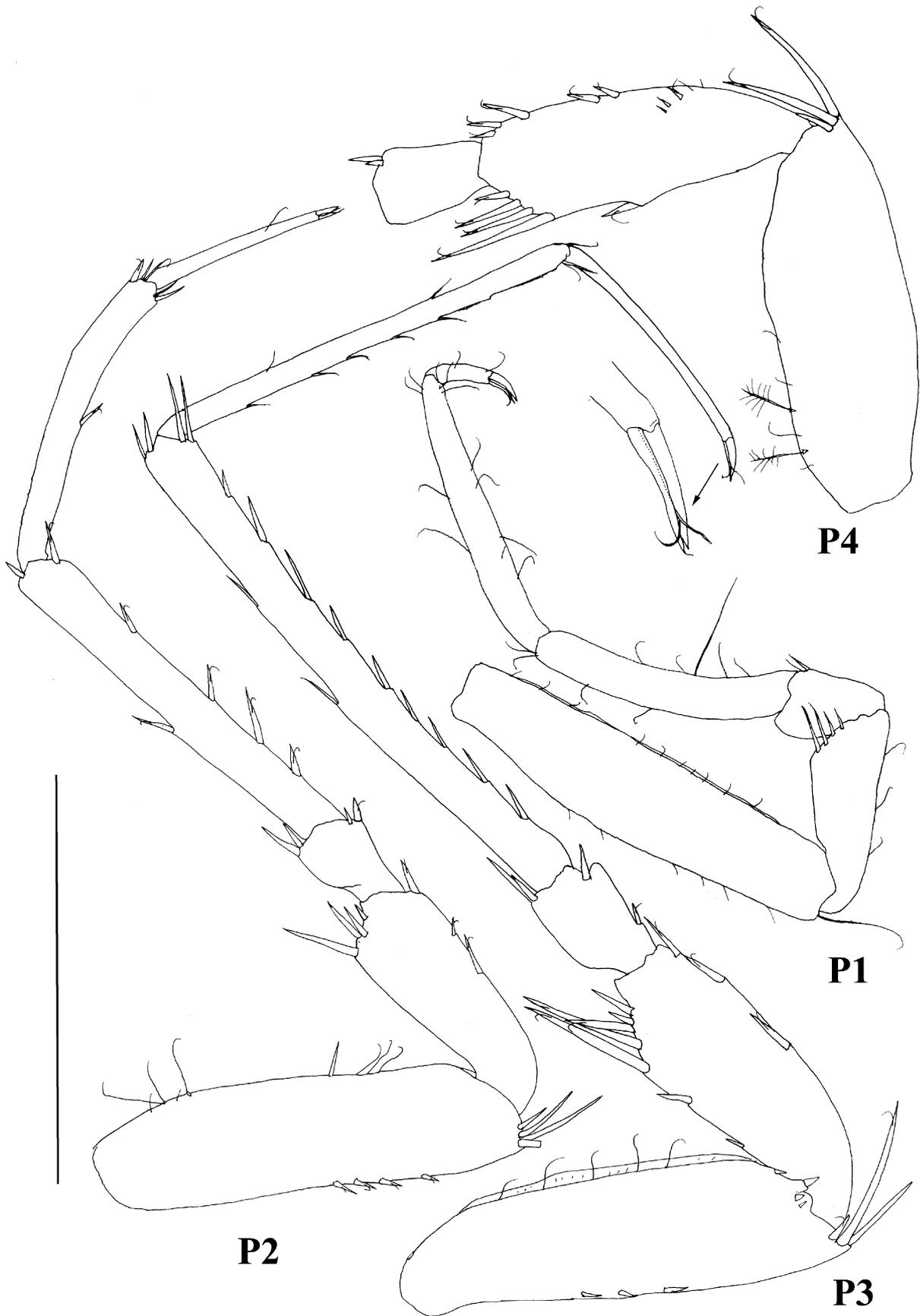


FIGURE 4. *Microcope denticulata* sp. nov., female, paratype, ZMH K-41424: pereopods 1–4. Scale bar 0.5 mm.

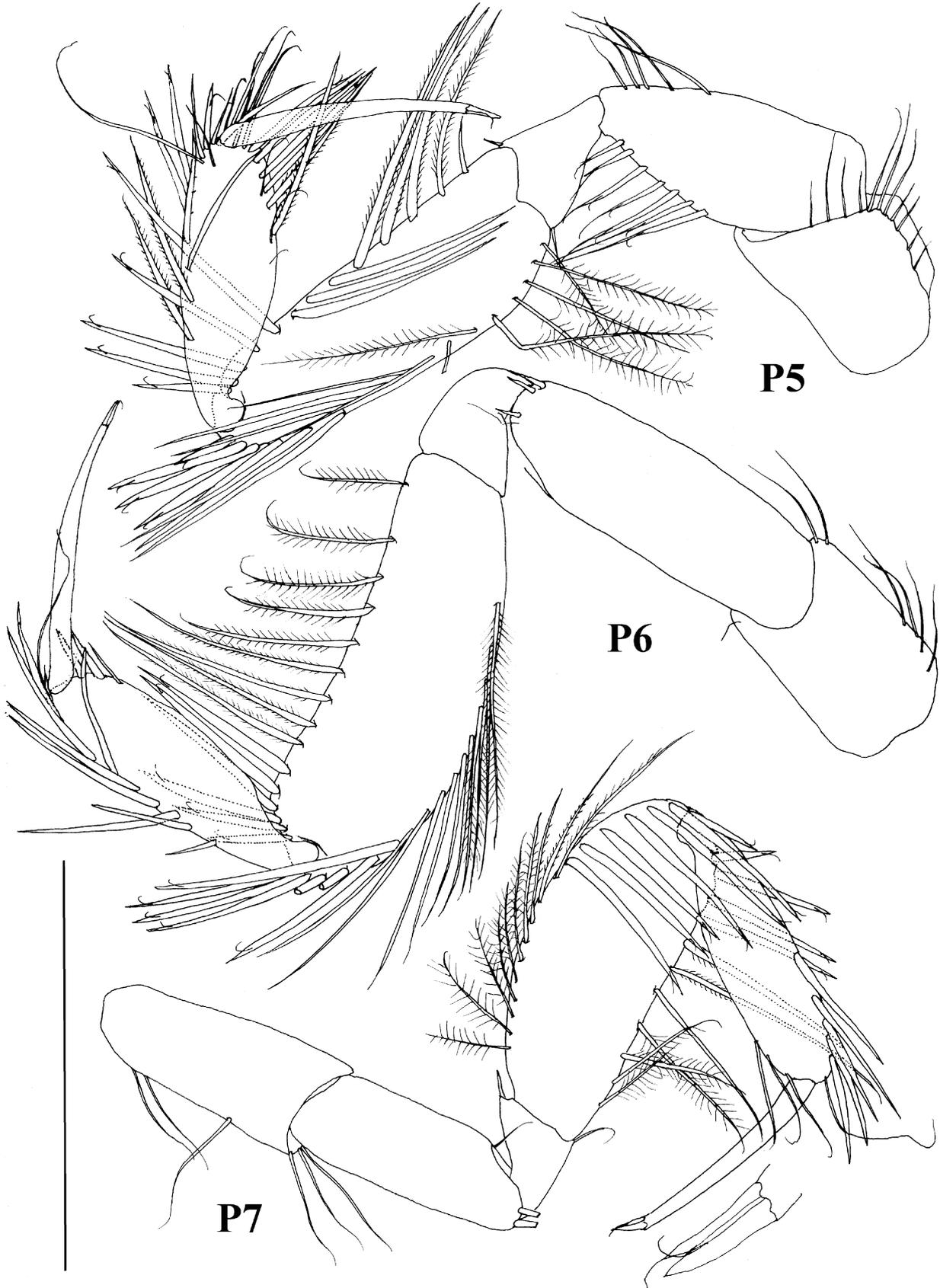


FIGURE 5. *Microcope denticulata* sp. nov., female, paratype, ZMH K-41424: pereopods 5–7. Scale bar 0.5 mm.

Pereopods 5–7 (Fig. 5): *Pereopod 5* length 1.1 pereopod 1 length, length ratios of ischium–dactylus to basis: 1.5, 0.5, 2.1, 1.5, 1.5; basis length 1.2 width, with row of 11 ventral setae; ischium length 2.4 width, with 5 ventral and 7 stout dorsal setae; merus as long as wide, with 2 distal setae; carpus length 2.8 width, with 13 ventral and 17 dorsal setae; propodus length 3.2 width with 10 ventral and 13 dorsal setae; dactylus length 10.3 width, claw length 0.1 dactylus length. *Pereopod 6* length 1.1 pereopod 5 length, length ratios of ischium–dactylus to basis: 1.6, 0.6, 2.1, 1.5, 1.4; basis length 1.2 width, with 6 ventral setae; ischium length 3 times width, with 3 stout distal setae; merus length 1.6 width; carpus length 2.8 width, with 15 ventral and 17 dorsal setae; propodus and dactylus similar in shape to those of pereopod 5, but slightly longer. *Pereopod 7* length 0.95 pereopod 5 length, length ratios of ischium–dactylus to basis: 1, 0.3, 1.3, 1.1, 0.9; basis length 2.6 width, with 6 ventral setae; ischium length 2.8 width, with 2 stout distoventral setae; merus with 2 distal setae; carpus length 2.3 width, with 12 ventral and 16 dorsal setae; propodus length 3.6 width, dactylus as in pereopods 5 and 6. Carpus/propodus length ratios: 1.4, 1.4, 1.1 for pereopods 5–7 respectively; carpus/propodus width ratios: 1.5, 1.6, 1.8 for pereopods 5–7 respectively.

Pleopods (Fig. 6): *Female pleopod 2* length 1.3 width, distal margin width 0.7 proximal edge width. *Pleopod 3* endopod length 4.8 width of proximal half and 2.5 width of distal half, distal plumose setae as long as endopod together with protopod; exopod 1.3 length and as wide as endopod, basal article with 18 lateral plumose setae and thin setulae basally, distal article separated, length 0.3 basal article length. *Pleopod 4* endopod length 1.5 width, exopod length 0.9 endopod length, distal plumose seta as long as exopod. *Pleopod 5* length 1.4 width.

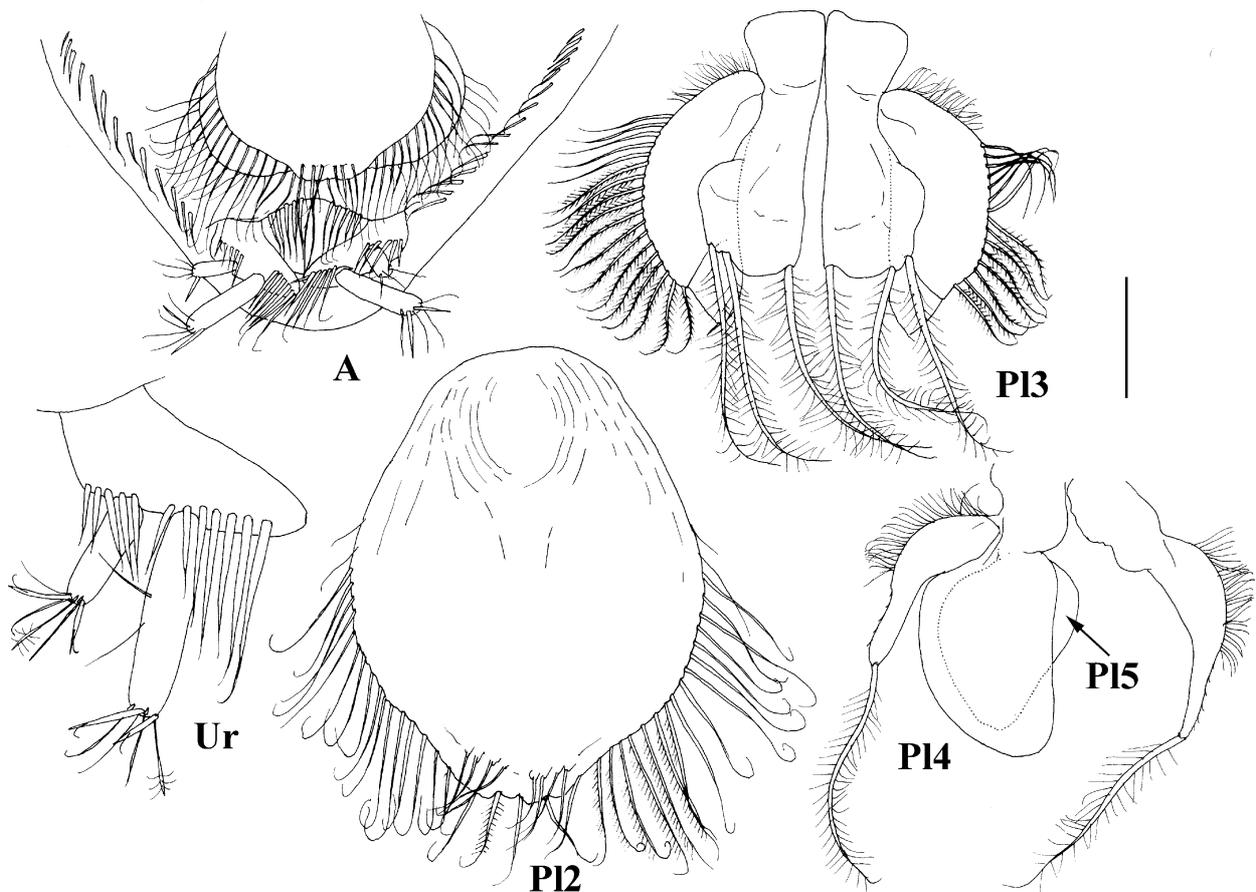


FIGURE 6. *Microcope denticulata* sp. nov., female, paratype, ZMH K-41424, pleopods 2–5, pleotelson, ventral view (A) and uropod. Scale bar 0.1 mm

Uropod (Fig. 6) 0.2 pleotelson length. Protopod length 2.6 width, medial extension after endopod insertion 0.4 of protopod length; endopod length 0.8 protopod length, with 2 lateral simple setae, 2 stout, 1 broom and 3 simple distal setae; exopod 0.6 of endopod length and width, with 2 stout, 1 broom and 3 simple distal setae.

Male unknown.

Remarks. *M. denticulata* sp. nov. differs from the two other known species of the genus by serrated anterior margin of pereonites 1–4, more prominent anterolateral projections of pereonites 2–4 and larger and more acute coxae of pereopods 1–4. The characters distinguishing the new species from the most similar *M. levissima* sp. nov. are discussed after the description of the latter. 14

Distribution. The species is only known from the Cape Basin, between 4574 and 5054 m depth.

***Microcope levissima* sp. nov. (Figs. 7–11)**

Material examined

Holotype, male (1.1 mm), (ZMH K-41426), ANDEEP III St. 153–7–S, 29 March 2005, 62°32.52'–31.31' S 64°36.44'–37.53' W, 2014 m.

Paratypes (ZMH K-41427): 2 preparatory females dissected for description, (1.2 and 1.3 mm), 1 juv. (0.8 mm) and 2 males (1.2 mm) dissected for description, same data as the holotype.

Additional material: ANDEEP I & II: 1 damage female (ZMH K-41428), St. 41–3–E, 26 January 2002, 59°22.24'–22.57' S 60°04.06' W, 2370 m; 2 females dissected for description, 1 male (ZMH K-41429), St. 114–4–S, 17 February 2002, 61°43.54' S 60°44.21'–44.43' W, 2921 m; 1 female (ZMH K-41430), St. 140–8–S, 21 March 2002, 58°15.98'–16.28' S 24°53.73'–54.09' W, 2970 m.

Etymology. *levissima* refers to the smooth anterior margins of pereonites 1–4 of the species.

Description. *Body* (Figs 7, 8) length 1.7–1.9 width, body highest on ambulosome, height 0.35–0.4 of body length. Head length 0.2 width, antennulae inserted almost without gap in-between; clypeus 1.8 as wide and as long as labrum. *Pereonites* 1–2 subequal in length, pereonite 4 shortest, length about 0.3 pereonite 1 length; anterolateral margin of pereonites 1–4 smooth, pereonites 2–4 anterolateral projections moderately protruding, coxae anterior lobe more or less rounded, lateral margin of coxa with 3 setae. Natasome length 0.85 body length, width 1.6–1.8 head width; pereonite 5 lateral length 1.7–1.8 lateral length of pereonites 6 and 7 together. Pleotelson length 0.85 width, 0.35 body length, pleopodal cavity width 0.45 of pleotelson width, length 0.5 pleotelson length.

Antennula (Fig. 10) 0.4 of body length; article 1 length 1.1 width, with 3 short lateral setae, distomedial lobe with 1 long and 3 short distal robust setae; article 2 length 0.5 of article 1, with 2 distal broom and 2 simple setae; article 3 length 0.8 of article 2, flagellum of 4 articles, article 4 length 0.25 article 3 length, following two articles as long as article 3, last two articles slightly shorter than preceding, with 3 aesthetasc.

Antenna incomplete on all specimens (Figs 7, 8): article 1 shortest, articles 2–4 subequal in length, with ventrodistal stout setae, scale on article 3 with 4 distal setae.

Mandibles (Fig. 9) *pars incisiva* with 5 cusps; *lacinia mobilis* of left mandible slender, about as long as *pars incisiva*, with 4 teeth; spine row with 4 and 5 spines on left and right mandibles respectively; condyle length 0.3 molar length; palp strong, length 1.3 mandibular body length, width equal to molar process width, article 1 with 2 long distal setae, article 2 length 1.7 article 1 length, with 4 distal setae. *Maxilla 1* (Fig. 9) lateral endite 1.2 width of mesial endite. *Maxilla 2* (Fig. 9) mesial endite shortest, lateral endites longest, like middle endite with 2 long and 2 short distal setae. *Maxilliped* (Fig. 9) basis length 2.6 width, endite with 2 coupling hooks, distal margin with numerous simple and serrated slender setae; palp article 2 lateral margin straight, with 2 long whip setae, length 1.3 length of medial margin, article 3 medial length 3 times lateral length, distal half of medial margin dentate, with few setae; articles 3 and 4 subequal in lateral length, article 5

1.5 longer than article 4 laterally; medial lobe of article 4 broader and shorter than article 5, with 4 long distal setae, article 5 with 2 distal setae. Epipod slightly longer than basis, length 3 times width.

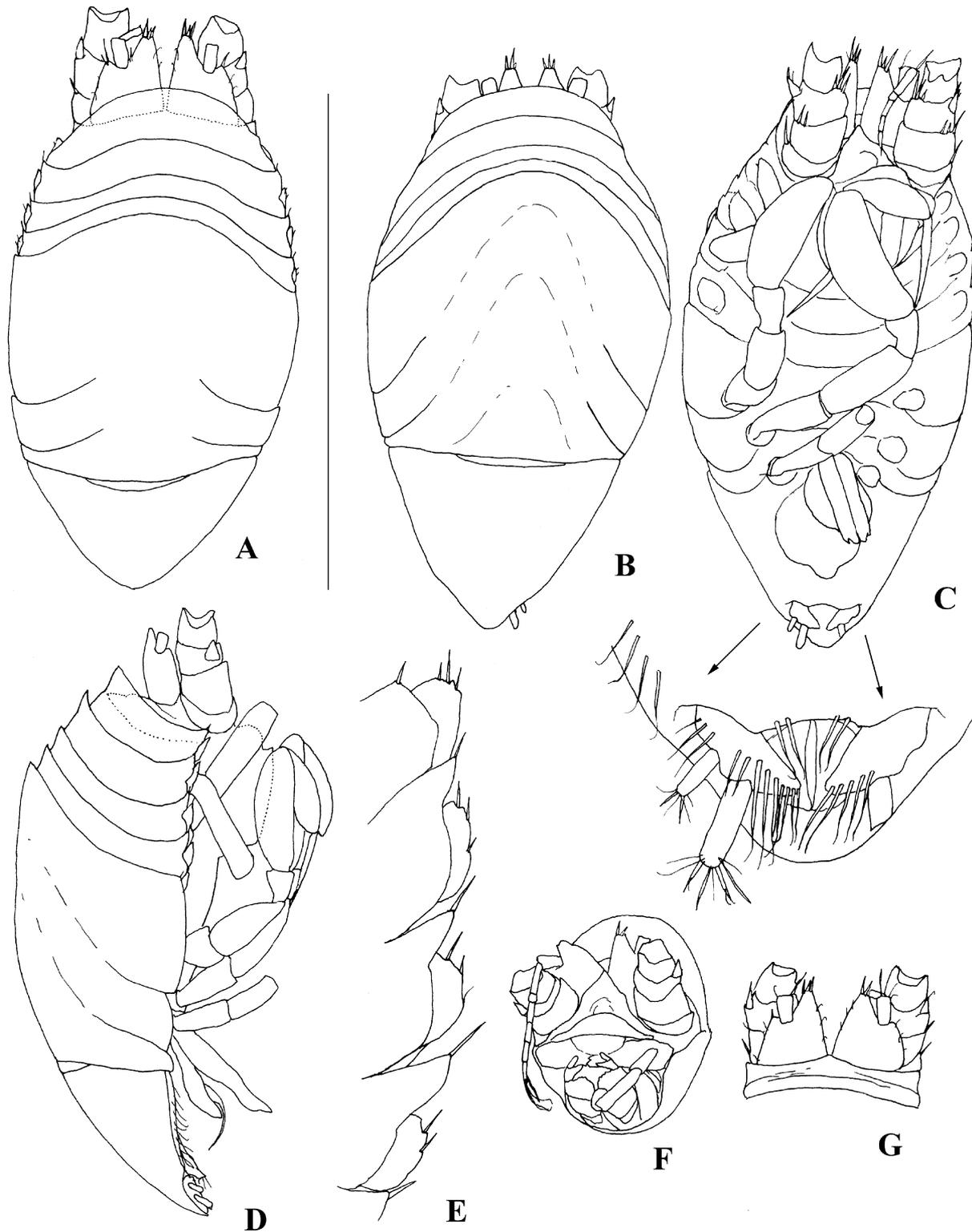


FIGURE 7. *Microcope levissima* sp. nov., holotype male, ZMH K-41426: A, B, body dorsal views, from different aspect angles; C, body ventral view with enlarged posterior part; D, body lateral view; E, enlarged lateral margin of ambulosome, dorsal view; F, head, frontal view; G, head, dorsal view. Scale bar 1 mm

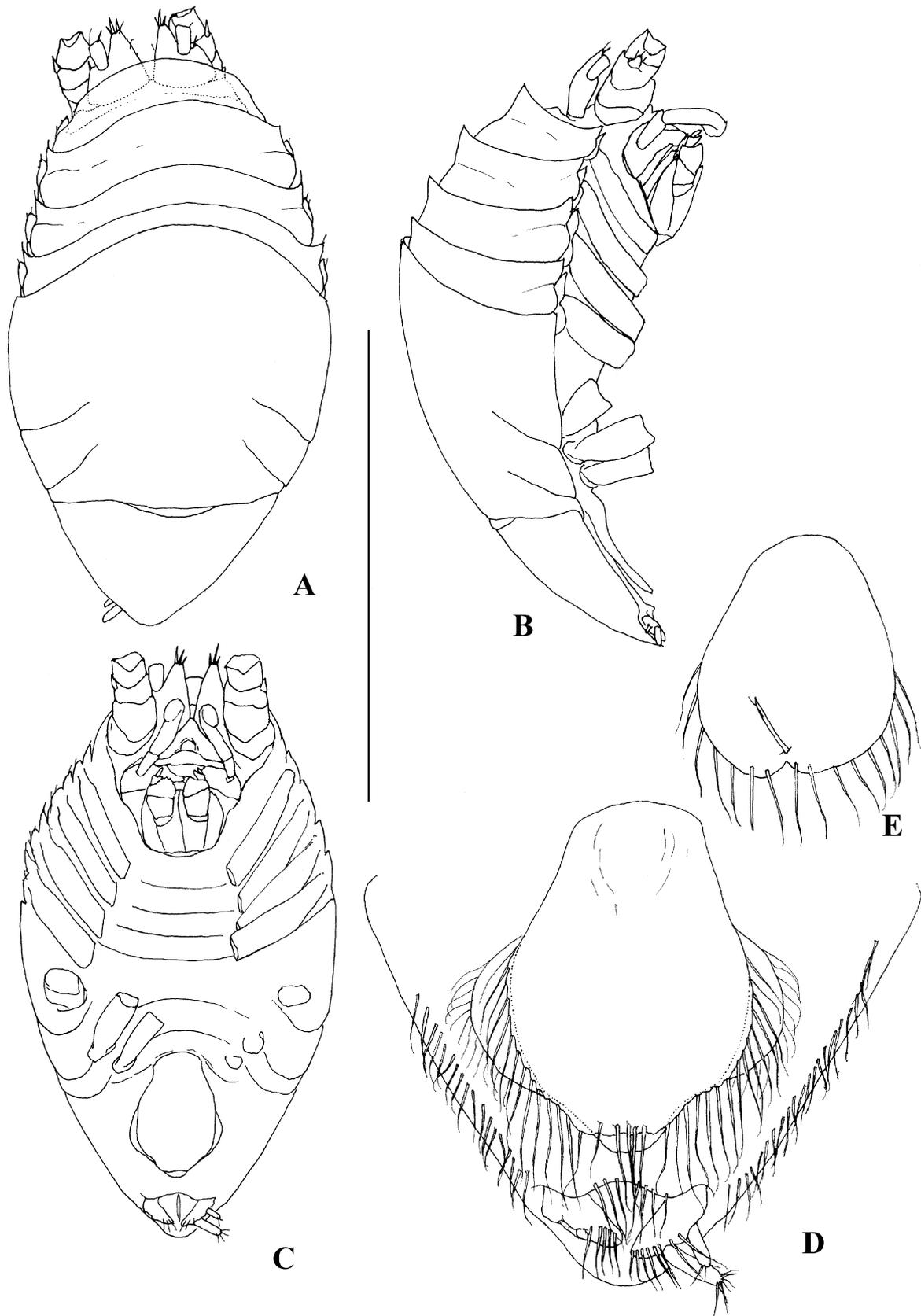


FIGURE 8. *Microcope levissima* sp. nov., paratype female, ZMH K-41427: A, body dorsal views; B, body lateral view; C, body ventral view. Scale bar 1 mm. D, enlarged pleotelson ventral view; E, pleopod 2 of juvenile female.

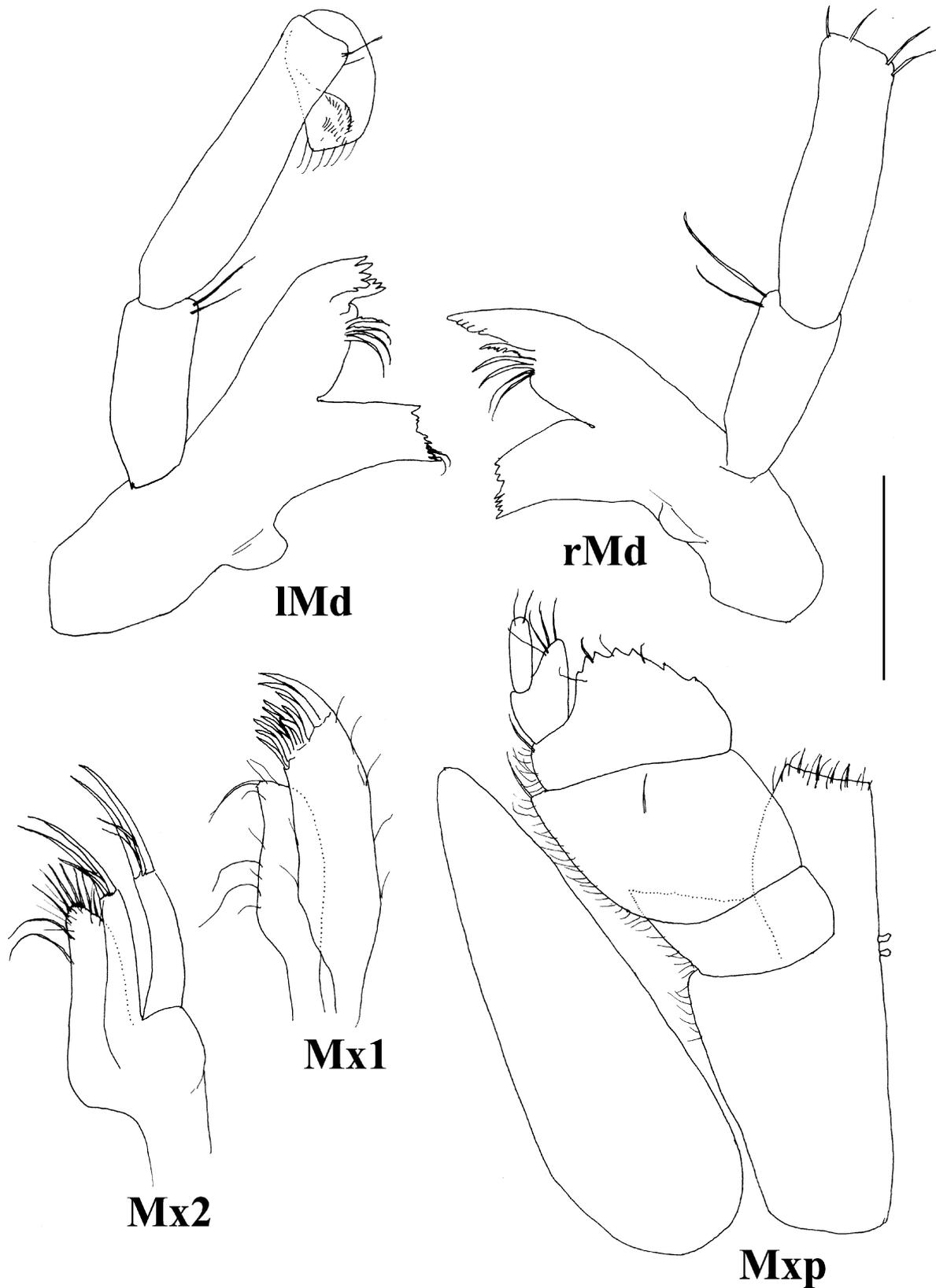


FIGURE 9. *Microcope levissima* sp. nov., female, paratype, ZMH K-41427, mandibles, dorsal view, maxillae and maxilliped, ventral view. Scale bar 0.1 mm

Pereopods (Fig. 10). *Pereopod 1* length 0.5 body length, length ratios of ischium–dactylus to basis: 0.4, 0.2, 0.5, 0.5, 0.2; basis length 5.7 width, with sparse simple setae; ischium length 2.3 width, with 1 stout and 2 simple distodorsal setae and 2 ventral setae; merus length 1.3 width, with 2 distodorsal and 2 distoventral setae; carpus length 5.5 width, with 3 distodorsal and 4 ventral setae; propodus length 6 times width, with 3 distodorsal setae. *Pereopods 2–4* incomplete on all specimens, basis length/width: 3.9, 3.5, 3 respectively.

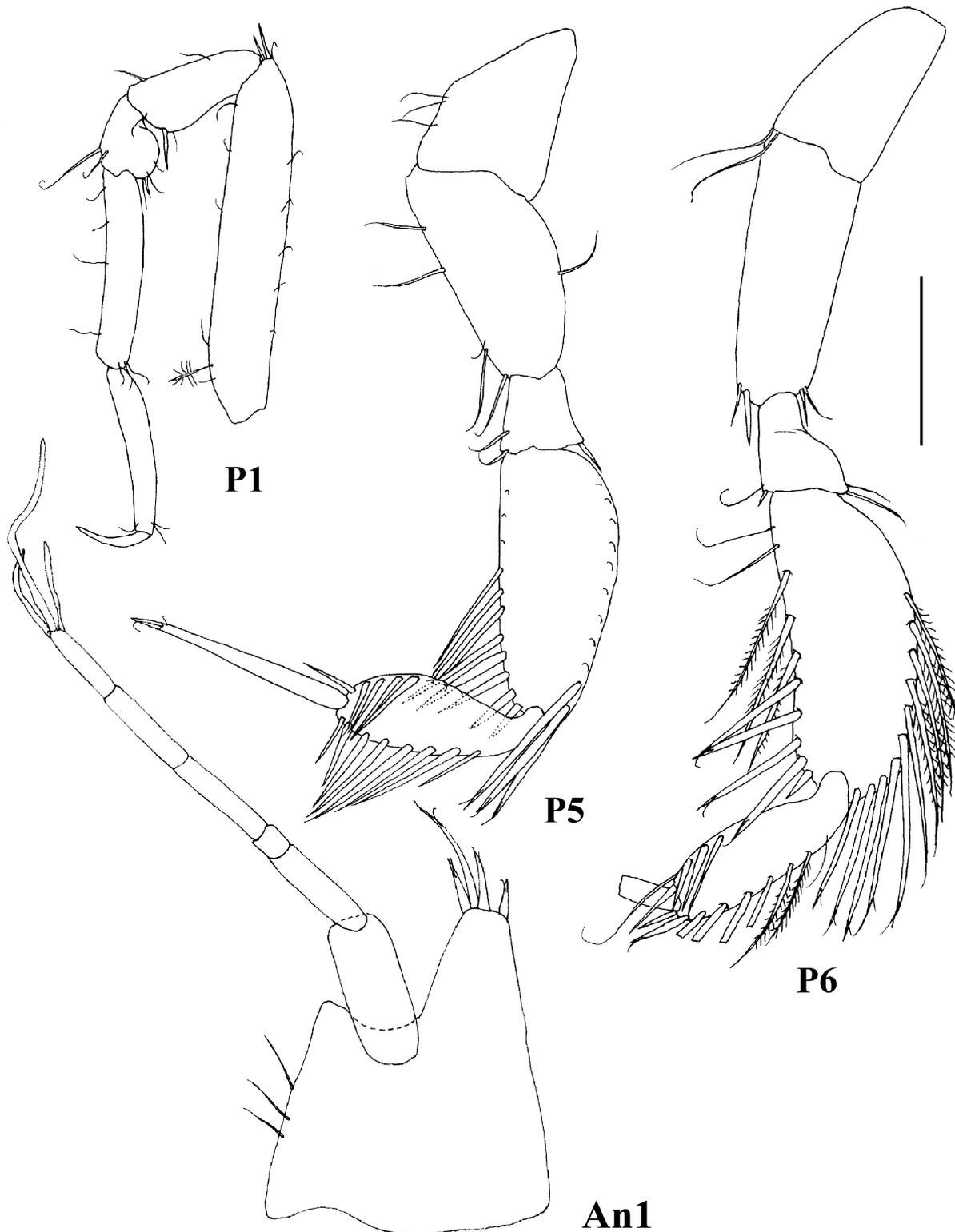


FIGURE 10. *Microcope levissima* sp. nov., female, paratype, ZMH K-41427: pereopods 1, 5 and 6. Scale bar 0.1 mm.

Pereopods 5 and 6 (Fig. 10): carpus/propodus length ratios: 1.6, 1.4 for pereopods 5 and 6 respectively; carpus/propodus width ratios: 1.7, 1.5 for pereopods 5 and 6 respectively. *Pereopod 5* length 1.2 pereopod 1 length, length ratios of ischium–dactylus to basis: 1.25, 0.5, 1.5, 1.1, 1.25; basis length 1.5 width, with few ventral setae; ischium length 2 times width, with 1 dorsal and 4 ventral simple setae; merus as long as wide, with 3 distal setae; carpus length 2.4 width, with 8 ventral and 12 dorsal setae; propodus length 2.7 width, with 7 ventral and 7 dorsal setae; dactylus length 11.3 width, claw length 0.15 dactylus length. *Pereopod 6* length ratios of ischium–dactylus to basis: 1.5, 0.6, 1.8, 1.2, 1.3; basis length 2.5 width, with 2 distoventral setae; ischium length 2.6 width, with 4 stout distal setae; merus length 1.1 width, with 2 distoventral and 2 distodorsal setae; carpus length 2.7 width, with 11 ventral and 11 dorsal setae; propodus and dactylus similar in shape and size to those of pereopod 5.

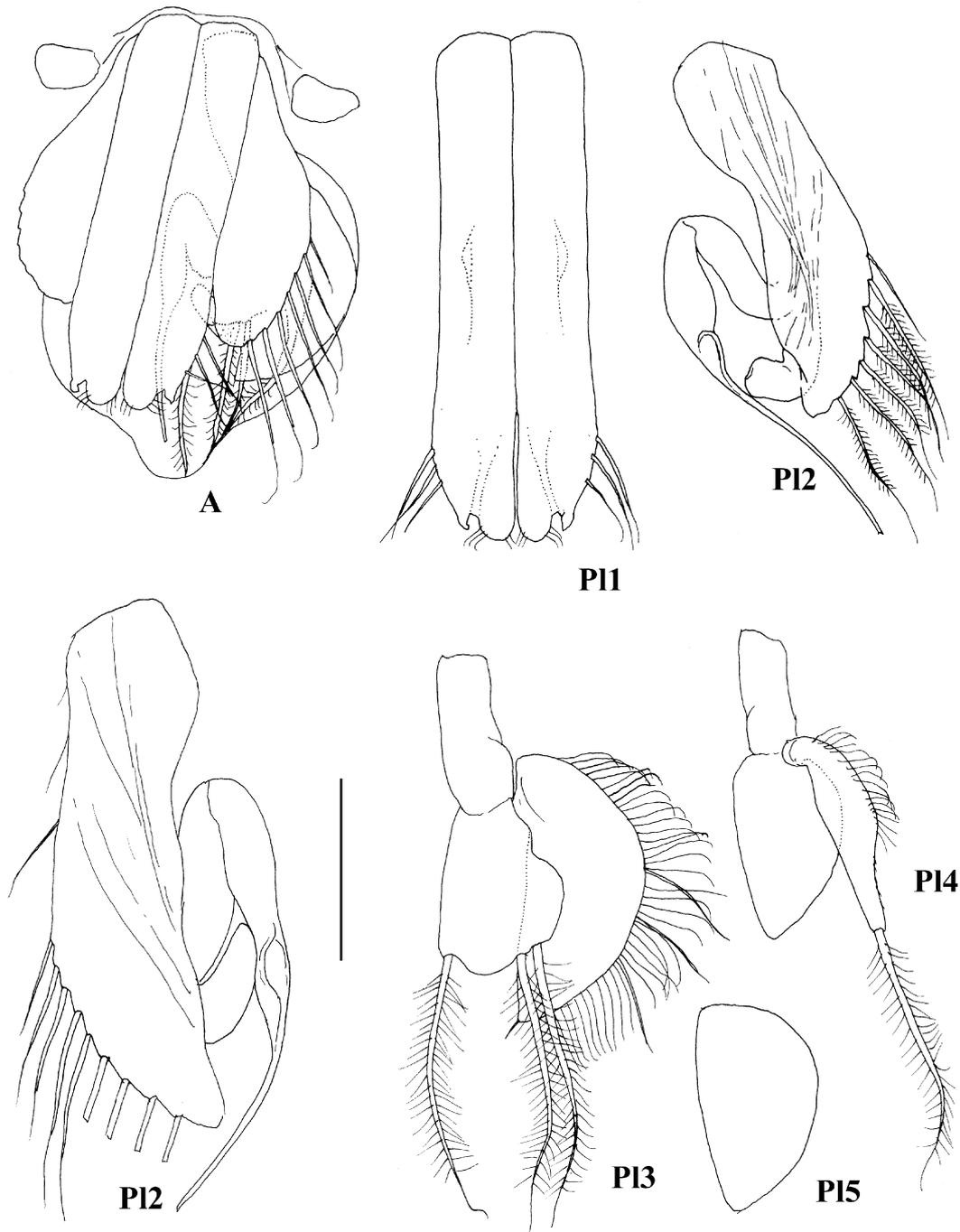


FIGURE 11. *Microcope levissima* sp. nov., male, paratype, ZMH K-41427: pleopods 1–5 and pleotelson (A), ventral view. Scale bar 0.1 mm.

Pleopods (Fig. 11): *Male pleopod 1* length 3.1 width, distolateral margin with 3 plumose setae; distal margin: medial lobes rounded, slightly longer and 3.5 wider than lateral lobes, each with 6–8 distal setae. *Pleopod 2* protopod length 3.6–3.8 width, distolateral margin with 7–8 setae, stylet length subequal to protopod length, sperm duct opened at midlength of stylet; exopod stout, as wide as basal article of endopod, 0.2 of protopod length. *Pleopod 3* protopod as long as endopod, endopod length 2.3 of proximal width and 1.3 width of distal part, exopod 1.6 length and same width as endopod, with 3–4 lateral plumose and many thin simple setae, distal article weakly separated. *Pleopod 4* endopod length 1.8 width, exopod as long as endopod, distal plumose seta longer than exopod. *Pleopod 5* length 1.8 width. *Female pleopod 2* (Fig. 8) length 1.45 width, distal truncate margin about as wide as proximal edge.

Uropod (Fig. 7) length 0.15 pleotelson length. Protopod length 2.7 width, medial extension after endopod insertion 0.3 of protopod length; endopod length 0.9 protopod length, with 2 stout, 2 broom and 4 simple distal setae; exopod 0.5 of endopod length and width, with 6 distal setae.

Remarks. *Minicope levissima* sp. nov. is similar to *M. denticulata* sp. nov., but can be distinguished from the latter by the following characters: smooth anterior margin of pereonites 1–4 (the margin is serrated in *M. denticulata*); the distance between antennulae in *M. levissima* is smaller than that in *M. denticulata*; the coxae of pereopods 1–4 are less acute and more rounded, whereas in *M. denticulata* they are larger and more acute. The female pleopod 2 of *M. levissima* has a broader distal margin than that of *M. denticulata*; the uropod protopod of *M. levissima* has a shorter distomedial extension than that of *M. denticulata*.

Distribution: The species is only known from the type locality. Compared to the bathymetric distribution of the two other species of the genus, this species is known from the shallowest location, occurring in depths between 2014 and 2970 m.

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