

RESULTS OF THE DIVA-1 EXPEDITION OF RV “METEOR” (CRUISE M48/1)

New Cumacea species (Crustacea: Peracarida) from the deep-sea expedition DIVA-1 with RV “Meteor” to the Angola Basin in July 2000. Families Lampropidae, Bodotriidae

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Abstract

Six new deep-sea species from the Angola Basin are described: the family Lampropidae with two species of the genus *Hemilamprops* Sars, 1883, and one *Paralamprops* Sars, 1887; the family Bodotriidae with one new species each of the genera *Atlantocuma* Bacescu and Muradian, 1974, *Bathycuma* Hansen, 1895, and *Cyclaspoides* Bonnier, 1896.

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Keywords: Cumacea; Deep-sea; Angola Basin; Taxonomy

Introduction

The present study is part of DIVA-project (DIVERSITY of the Abyssal Atlantic) which itself is part of the international DIVERSITAS program analysing the biological resources. The focus of the expedition DIVA-1 was the Angola Basin.

The two major aims of the project are the analysis of:

- Latitudinal gradient of species richness and the effect of agriculture and climatic changes in Africa.
- Latitudinal gradient of species richness of the deep Atlantic and the influence of natural (biotic and abiotic) factors on the diversity.

The systematic work is basis for answering the questions given.

As very little work has been done for the Cumacea in this particular part of the Atlantic, many new species were expected.

The following study concentrates on the families Lampropidae and Bodotriidae. The families Leuconidae, Nannastacidae, and Diastylidae will be focus of subsequent papers.

Eleven species in five genera of the family Lampropidae were recorded by Day (1978) for southern Africa, seven of them were new. She stated the fact that deep-water forms are often represented by relatively few species per genus and “many of these are represented by only one sex”. This statement could be enhanced: there are usually also very few individuals per species in deep-sea samples! According to Bacescu (1988) seven species of the family Lampropidae are known for the deep-water region around southern Africa: *Bathylamprops natalensis* Jones, 1969, *Hemilamprops normani* Bonnier, 1896, *H. pellucidus* Zimmer, 1908, *Mesolamprops abyssalis* Reys, 1978, *Paralamprops peringueyi* (Stebbing 1912), *Platysympus phylloides* Day, 1978, and *Stenotyphlops spinulosus* Stebbing, 1912.

A lot more species are known for the southern Africa region from the family Bodotriidae. Day reported in total ten species in six genera for the subfamily Vaunthompsoniinae (1975) and 34 species in nine genera for the subfamily Bodotriinae (1978). However,

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according to Bacescu (1988) only six species of this family are known in deeper water (more than 1000 m depth) of the South East Atlantic: *Atlantocuma benguele* (Bacescu and Muradian 1974), *A. tenue* Jones, 1984, *Cyclaspis spectabilis* Zimmer, 1908, *Cyclaspoides sarsi* Bonnier, 1896, *Bathycuma elongatum* Hansen, 1895, and *Vaunthompsonia cristata* Bate, 1858.

Material and methods

The specimens were collected during the DIVA-1 expedition with RV “Meteor” from 6 July to 2 August 2000 to the Angola Basin (Me 48/1). The most effective gear for collecting cumacean crustaceans was the epibenthic sledge equipped with epi- and supranet, modified after Brandt and Barthel (1995). Very few specimens were collected by box corer samples.

Sampling took place at 12 stations on a 700 km long transect across the eastern margin of the Angola Basin in depths of about 5500 m (Table 1). The material was fixed and preserved in ethanol after a quick dip in freshwater. The type series of the new species are deposited in the Zoological Museum, Hamburg (ZMH).

Results

Family Lampropidae:

Hemilamprops merlini sp.n.

Figs. 1 and 2

Material: one female (holotype), two females damaged, one female dissected, one female, station 318 (epibenthic sledge, epinet); paratypes: one female dissected, two subadult males, two females, one juvenile, station 340 (epibenthic sledge, epinet); one subadult male, three females, one juvenile, station 344 (epibenthic

sledge, epinet); one subadult male, four females, two juveniles, station 348 (epibenthic sledge, epinet); one subadult male, dissected, two subadult males, station 348 (epibenthic sledge, supranet); three subadult males, one ovigerous female, three subadult females, five juveniles, station 350 (epibenthic sledge, epinet); one subadult female, slightly destroyed, station 350 (epibenthic sledge, supranet), ZMH: K 40,417.

Holotype: nonovigerous female, ZMH: K 40,416

Date: 9 July 2000

Leg.: A. Brandt and J.W. Wägele

Locus typicus: Angola Basin, station 318 (epibenthic sledge, epinet): from 22° 20.0'S 03° 18.3'E (depth: 5125 m) to 22° 20.2'S 03° 18.4'E (depth: 5144 m).

Diagnosis: antenna 1 peduncle with basal article little bended, basal and middle articles each distally with “tooth”; five terminal setae at telson of equal length; eight lateral spine-setae at telson margin in male, 4–5 in female.

Etymology: the new species is dedicated to my dear friend Merlin, Ramses' twin.

Description is based on holotype, nonovigerous female, 7 mm long.

Carapace smooth, furrow from posterior lateral end of ocular lobe running to posterior part of dorsomedian line; pseudorostrum short, turned upward; siphonal tube short; ocular lobe minute; eyes missing; antennal notch missing; anterolateral tooth rounded; anteroventral margin of carapace smooth; integument weakly calcified; five thoracic segments visible; pleon longer than carapace and free thoracic segments combined; telsonic segment shorter than telson, telson postanal part shorter than preanal, five basal serrate setae terminally, 4–5 setae at distal margin.

Description of appendages based on paratype non-ovigerous female (station 340, epinet).

Antenna 1 peduncle with basal (longest!) article little bended, proximal and second article distal with one

Table 1. Epibenthic sledge station list

Date	Area	Station	Sample	Position start	Depth (m)	Position end	Depth (m)	Time (min)	Distance (m)
07/09/00	1	318	EBS 01	22°20.0'S, 003°18.3'E	5125	22°20.2'S, 003°18.4'E	5144	79	2438.47
07/10/00	1	320	EBS 02	22°19.9'S, 003°17.8'E	5127	22°20.0'S, 003°17.9'E	5126	88	2716.27
07/15/00	2	326	EBS 03	19°57.4'S, 002°57.5'E	5448	19°57.5'S, 002°56.9'E	5449	76	2345.87
07/16/00	2	328	EBS 04	19°59.8'S, 002°53.9'E	5450	19°59.9'S, 002°53.9'E	5452	71	2191.33
07/16/00	2	329	EBS 05	19°59.0'S, 002°53.7'E	5450	19°59.3'S, 002°53.6'E	5450	75	2315.00
07/18/00	3	332	EBS 06	19°07.2'S, 003°48.4'E	5427	19°07.6'S, 003°48.1'E	5426	82	2531.07
07/20/00	3	335	EBS 07	19°06.9'S, 003°49.2'E	5425	19°07.8'S, 003°49.8'E	5425	153	4722.60
07/22/00	4	338	EBS 08	18°19.4'S, 004°39.7'E	5397	18°20.8'S, 004°38.6'E	5398	114	3518.80
07/22/00	4	340	EBS 09	18°18.3'S, 004°41.3'E	5395	18°19.4'S, 004°41.9'E	5395	140	4321.33
07/25/00	5	344	EBS 10	17°06.2'S, 004°41.7'E	5415	17°07.5'S, 004°42.3'E	5415	145	4475.66
07/28/00	6	348	EBS 11	16°18.1'S, 005°27.2'E	5390	16°19.3'S, 005°27.2'E	5387	145	4475.66
07/29/00	6	350	EBS 12	16°14.3'S, 005°26.8'E	5389	16°14.9'S, 005°26.7'E	5389	103	3179.27

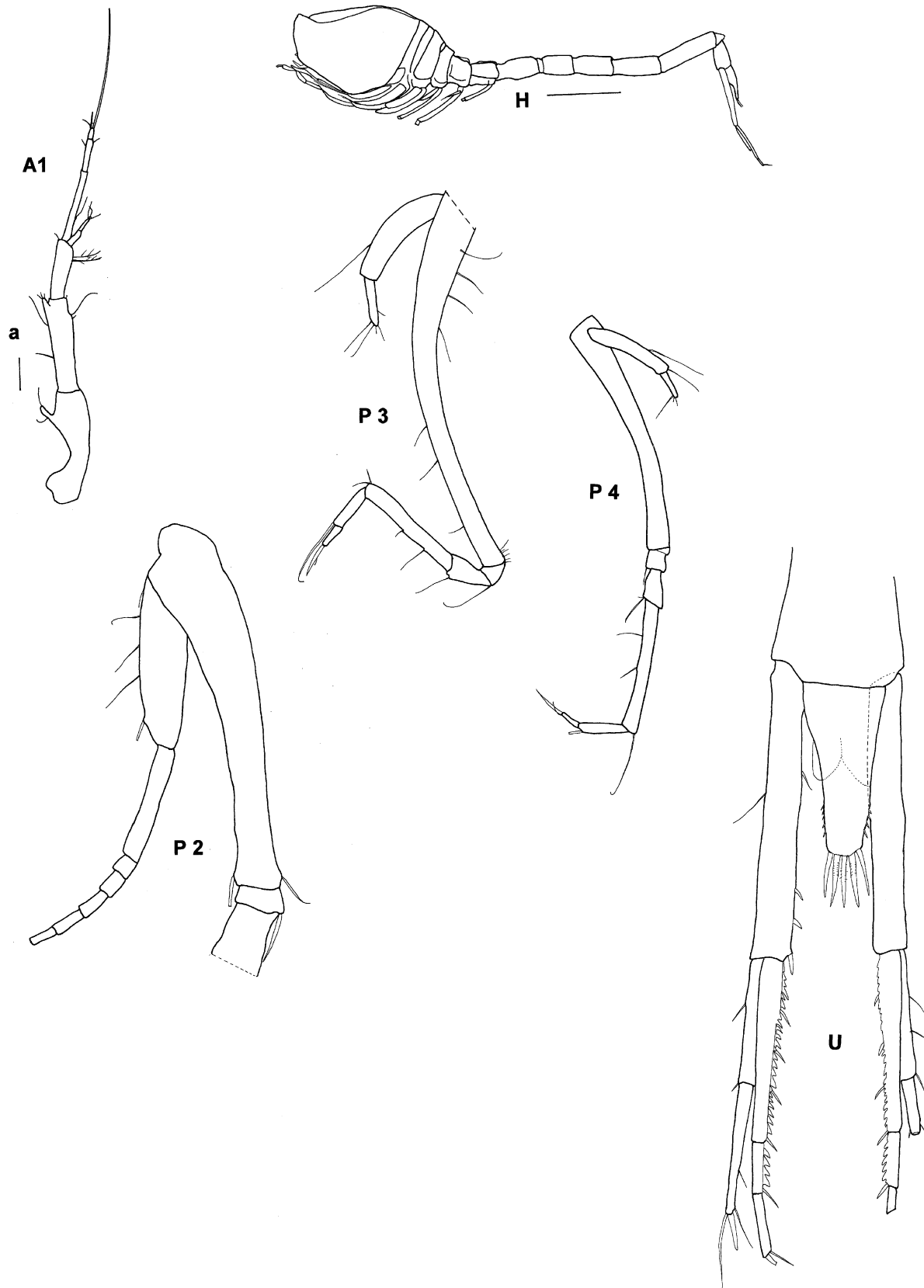


Fig. 1. *H. merlini* sp.n. subadult female H: Habitus (scale: 1 mm), A1: antenna 1, P2: pereopod 2 (broken), P3: pereopod 3, P4: pereopod 4, U: pleonite 6 and uropods. Scale a: 0,1 mm (A1, P2, P3, P4, U).

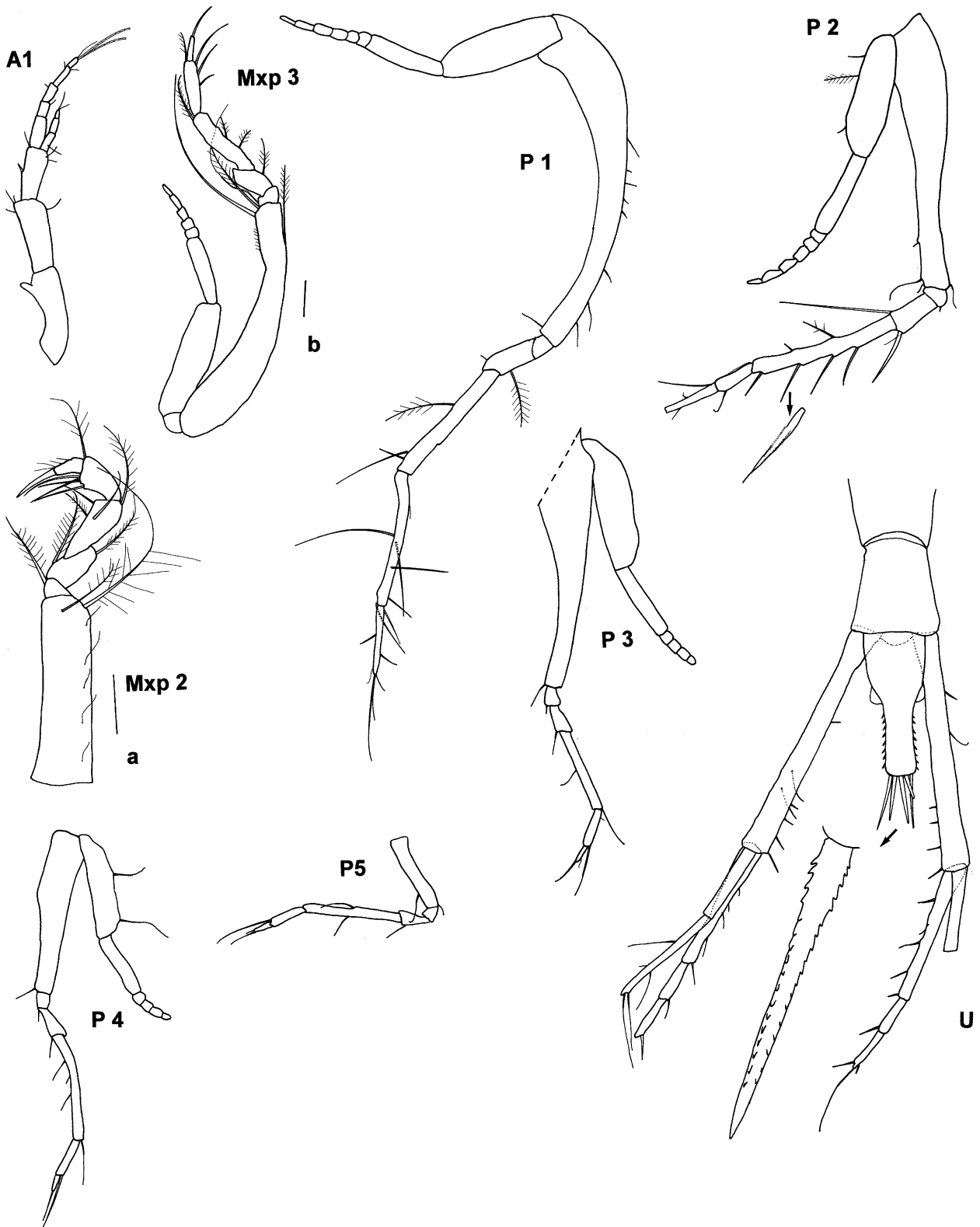


Fig. 2. *H. merlini* sp.n. subadult male A1: antenna 1, Mxp2: maxilliped 2, Mxp3: maxilliped 3, P1: pereopod 1, P2: pereopod 2, P3: pereopod 3, P4: pereopod 4, U: pleonite 6 and uropods. Scale a: 0.1 mm (Mxp2), scale b: 0.1 mm (A1, Mxp3, P1, P2, P3, P4, P5, U).

“tooth” each, third article with two setae distally; accessory flagellum three segmented with terminal article tiny, half as long as basal article of main

flagellum; main flagellum four segmented, terminal article tiny, one long aesthetasc; pereopod 2 broken in merus, basis long and slender, ischium present;

exopod present; pereopod 3 basis longer than rest of appendage, carpus second longest article, dactylus with claw-like seta terminally; exopod reduced; pereopod 4 basis longest article, shorter than rest of appendage, carpus second longest article, dactylus with stout seta terminally; exopod reduced. Uropods' peduncle shorter than endopod, distal with three spine-setae; exopod basal article relatively long, little shorter (0.9 times) than distal, exopod shorter than endopod; endopod three segmented, basal article longer than two distal combined, middle article shortest; two basal articles serrate at inner margin, distal article smooth.

Appendages of subadult male (station 348):

Three pairs of pleopods; antenna 1 peduncle with basal article little bended, distally with "tooth", accessory flagellum three segmented, little shorter than two basal articles of main flagellum, which is five segmented, terminally with two aesthetascs; maxilliped 2 basis longer than rest of appendage, ischium present, merus little produced distally with one plumose seta, carpus second longest article, distal wider than proximal, one long plumose seta distally, propodus wide distally, with several strong simple setae, dactylus short, terminal seta strong, longer than dactylus; maxilliped 3 basis longer than rest of appendage, two long plumose setae distally, ischium present, merus little broadened distally, carpus second longest article, propodus little shorter than carpus, dactylus smaller than propodus; exopod present; pereopod 1 long and slender, basis curved, shorter than rest of appendage, merus little shorter than dactylus, carpus little shorter than propodus; exopod present; pereopod 2 basis little shorter than rest of appendage, ischium present, merus relatively short, carpus second longest article, with five strong, serrate and one plumose setae, propodus shorter than dactylus; exopod present; pereopod 3 basis longer than rest of appendage, carpus second longest article, longer than propodus and dactylus combined; exopod present; pereopod 4 basis shorter than rest of appendage, carpus second longest article, longer than propodus and dactylus combined; exopod present; pereopod 5 basis shorter than rest of appendage, carpus second longest article, longer than propodus and dactylus combined.

Telson preanal part equal in length to postanal part, five terminal serrate setae of equal length, eight pairs of lateral spine-setae.

Uropods' peduncle little shorter than pleonite 6 and telson combined; exopod shorter than endopod, basal segment relatively long, 0.7 times as long as distal article; endopod three segmented, basal article twice as long as two distal articles combined; basal article with five setae at inner margin, middle article with one distally, distal article with one long seta terminally and one shorter subterminally.

Remarks: Most species of the genus *Hemilamprops* have three terminal setae at the telson, only six species

have five. Among these *H. californicus* Zimmer, 1936, *H. japonicus* (Harada 1959), and *H. pacificus* (Harada 1959) have two long, one moderately long and two short telson setae terminally. *H. diversus* Hale, 1946, and *H. glabrus* Day, 1978 have three long and two short terminal spines at the telson, and *H. normani* Bonnier, 1896 has one long and four short ones. The new species is the only one with five terminal setae of equal length at the telson.

***Hemilamprops brenkei* sp.n.**

Fig. 3

Material: one male (holotype), station 350 (epibenthic sledge, supranet); paratypes: one damaged ovigerous female, station 318 (epibenthic sledge, epinet), ZMH: K 40,419.

Holotype: male, ZMH: K 40,418

Date: 29 July 2000

Leg.: A. Brandt and J.W. Wägele

Locus typicus: Angola Basin, station 350 (epibenthic sledge, supranet) from 16° 14.3'S 05° 26.8'E (depth: 5389 m) to 16° 14.9'S 05° 26.7'E (depth: 5389 m).

Diagnosis: basal article of uropods' exopod little longer than distal; telson with three terminal spine-setae of equal length, and three pairs of lateral spine-setae, 2.3 times longer than pleonite 6; pseudorostrum acute, moderately long, with few tiny "teeth" in female.

Etymology: the new species is dedicated to Nils Brenke, who busied himself keeping the epibenthic sledge running and did a great amount of sorting.

Description is based on holotype, male, 5.8 mm long from tip of pseudorostrum to tip of telson.

Carapace with indistinct carina starting lateral of frontal lobe swinging mediadorsad to middle of carapace, pseudorostrum moderately long, acute, siphonal tube not visible; ocular lobe present, eyes without lenses in male; antennal notch small, anterolateral tooth not protruding, blunt; anteroventral margin of carapace smooth; five thoracic segments visible, pleon with three pairs of pleopods, pleonite 6 is 0.3 times in length to uropods' peduncle; telson 2.3 times longer than pleonite 6, with three terminal and three pairs of lateral spine-setae.

Description of appendages based on paratype, ovigerous female with damaged carapace.

Antenna 1 basal article longest, with six hair-like setae, middle article with six hair-like seta and three compound setae at distal margin, flagella broken off; maxilliped 2 basis with two plumose setae at inner distal margin and one simple strong seta at outer margin; ischium present, merus half as long as carpus, the latter with five plumose setae at inner, one strong seta at distal outer margin; propodus shorter than carpus but longer than merus, with six plumose setae at inner and one at outer margin; dactylus half as long as ischium and merus combined, with three terminal and two subterminal simple setae; maxilliped 3 basis little longer than rest

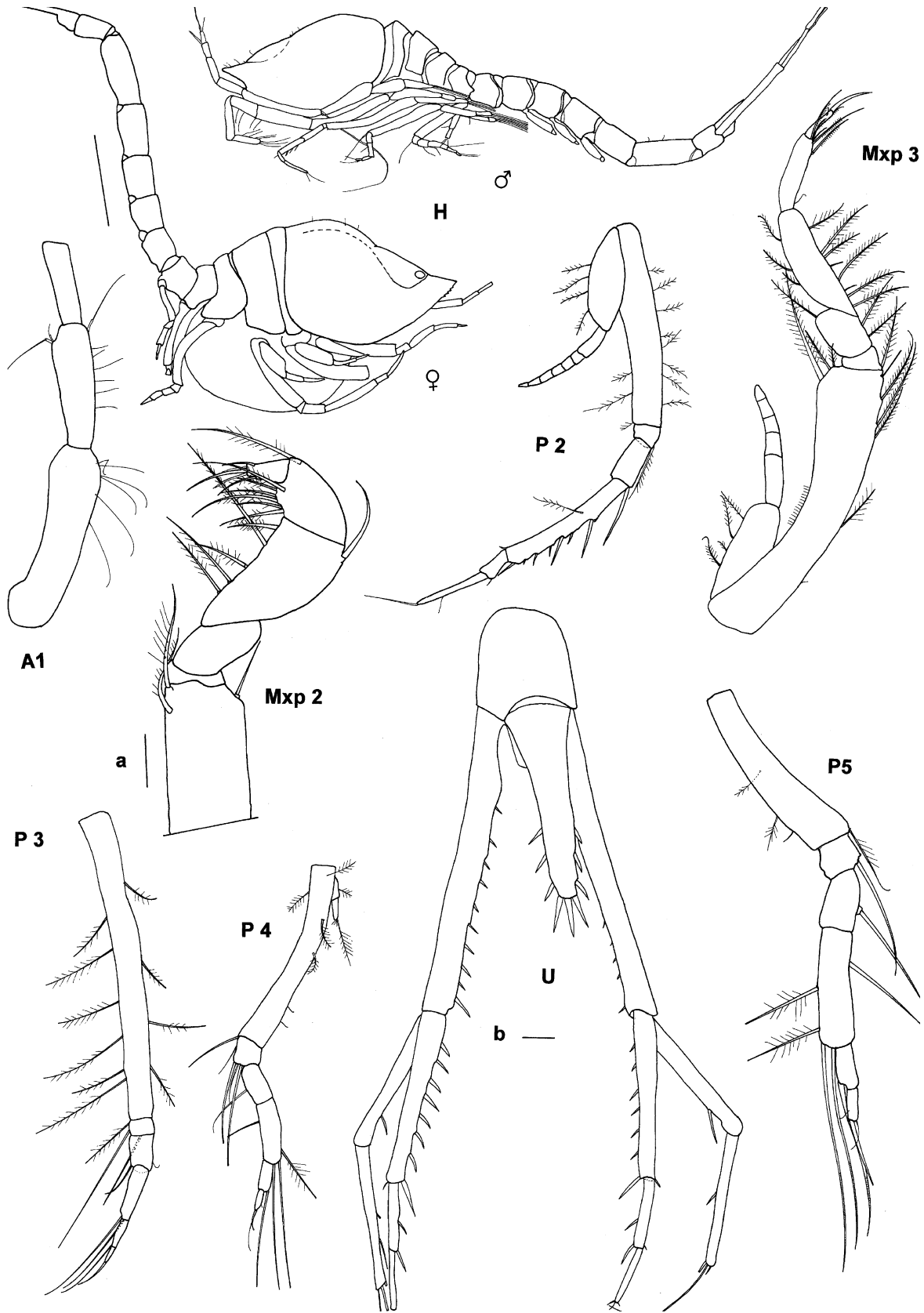


Fig. 3. *H. breakei* sp.n. H: Habitus subadult male and ovigerous female (scale: 1 mm), A1: female antenna 1, flagella broken, Mxp 2: female maxilliped 2, Mxp3: female maxilliped 3, P2: female pereopod 2, P3: female pereopod 3 (rudimentary exopod broken off, not figured), P4: female pereopod 4, U: male pleonite 6 and uropods. Scale a: 0.1 mm (A1, Mxp2, P2, P5); scale b: 0.1 mm (Mxp3, P3, P4, U).

of appendage, four plumose setae at inner and three at outer distal margin; merus twice as long as ischium, carpus more than twice as long as merus; propodus as long as ischium and merus combined, with five serrate and terminally annulate setae at distal part; dactylus short, as long as its terminal claw-like seta, subterminally with two short setae; exopod present; pereopod 1 broken after basis, exopod present (not figured); pereopod 2 basis shorter than rest of appendage, with 11 fine, plumose setae at inner and outer margin, ischium short, with one plumose setae at distal margin, merus twice as long as ischium, with strong distal seta, carpus second longest article after basis, with seven strong setae along inner margin; propodus short, only little longer than ischium, dactylus slender, tapering, terminal fine seta little shorter than dactylus; exopod present; pereopod 3 basis nearly twice as long rest of appendage, with ten fine, plumose setae at inner and outer margin, ischium less than half as long as merus, with one plumose and two long simple setae; merus with two simple distal setae, carpus as long as ischium and merus combined, with two long, simple setae at distal margin; propodus shorter than carpus, with one long distal setae, dactylus short, with claw-like terminal seta, which is longer than dactylus, exopod rudimentary (not figured); pereopod 4 basis little longer than rest of appendage, with about four plumose setae at proximal and two compound setae at distal part of article, ischium only little shorter than merus, with three long distal setae, merus and ischium combined subequal in length to carpus, which is second longest article after basis, having two long, simple setae distally and one subterminal plumose seta; propodus as long as ischium, with one long distal seta; dactylus shortest article, with one long and one short terminal and one subterminal very short seta; rudimentary exopod with two short articles, one long, plumose seta terminally and three tiny ones; pereopod 5 in total (0.9 mm) more than twice as long as basis of preceding appendage (0.4 mm); basis shorter than rest of pereopod, ischium with two strong distal setae, merus with one strong seta in middle of article; carpus second longest article after basis, with two very long, simple, terminal annulate setae at distal margin, two plumose at outer and one simple seta at inner margin, propodus short, shorter than merus, with one long, simple, terminal annulate seta at distal margin; dactylus shortest article, with one strong and one hair-like terminal setae. Uropods in female paratype broken.

Uropods' peduncle of male holotype with ten setae at inner margin, 3.7 times longer than pleonite 6 and 1.6 times longer than telson; exopod little shorter than endopod, basal article longer (1.1 times) than distal, three terminal setae, mostly broken; endopod three segmented, basal article with seven to eight setae at inner margin, longer than distal two articles combined,

middle article with two setae, distal article with three short terminal setae.

Remarks: a small group of six species within the genus *Hemilamprops* have the uropods' exopod with the basal article being longer or equal to the distal article: *H. canadensis* Vassilenko, 1988 (Arctic Atlantic), *H. gracilis* Hart, 1930 (northwestern Canada), *H. miyakei* Gamô, 1967 (Japan), *H. pectinatus* Lomakina, 1955 (Sea of Ochotsk), *H. pellucidus* Zimmer, 1908 (southern Atlantic), and *H. tanseianus* Gamô, 1967 (Japan). As the new species has no lateral carina like *H. gracilis*, and only three pairs of lateral spine-setae at the distal telsonic margin its habitus resembles most closely *H. canadensis*. The new species differs from this deep-sea species in having an acute, moderately long pseudorostrum with four "teeth" in female and an even more elongate pseudorostrum in male, while *H. canadensis* has a blunt, serrate pseudorostrum in female, and a longer but rounded pseudorostrum in male. The length proportions of telson to pleonite 6 differ between the new species and *H. canadensis*: as the telson is 2.3 times longer than the pleonite 6 in *H. brenkei* sp.n. this proportion is only 1.5 times in *H. canadensis*; the telson in *H. canadensis* has four pairs of lateral spine-setae distally and a serrate margin proximally, while it has only three pairs with a smooth margin in *H. brenkei* sp.n.

***Paralamprops carpusserratus* sp.n.**

Figs. 4 and 5

Material: one female (holotype), station 318 (epibenthic sledge, epinet); paratype: 1 slightly damaged adult male, station 340 (epibenthic sledge, supranet), ZMH: K 40,421.

Holotype: subadult female, broken into two pieces, ZMH: K 40,420

Date: 9 July 2000

Leg.: A. Brandt and J.-W. Wägele

Locus typicus: Angola Basin, station 318 (epibenthic sledge, epinet): from 22° 20.0'S 03° 18.3'E (depth: 5125 m) to 22° 20.2'S 03° 18.4'E (depth: 5144 m).

Diagnosis: pereopod 5 shorter than basis of pereopod 4; carapace in dorsal view nearly circular with crenulated lateral margin; crenulation of lateral carina of carapace of equal size from the anterior to the posterior part; in female the first antenna's accessory flagellum with two articles and one tiny third, uropod exopod's tip reaching middle of distal article of endopod, carpus of second pereopod serrate in male and female.

Etymology: the new species is named after its typical character, the serrate carpus of the second pereopod.

Description is based on holotype, subadult female.

Carapace smooth, 1.3 mm long, nearly circular in dorsal view, with crenulated lateral margin, pseudorostrum short, meeting in front of ocular lobe; siphonal tube short; ocular lobe small, without lenses; antennal notch missing; integument smooth, weakly calcified; five

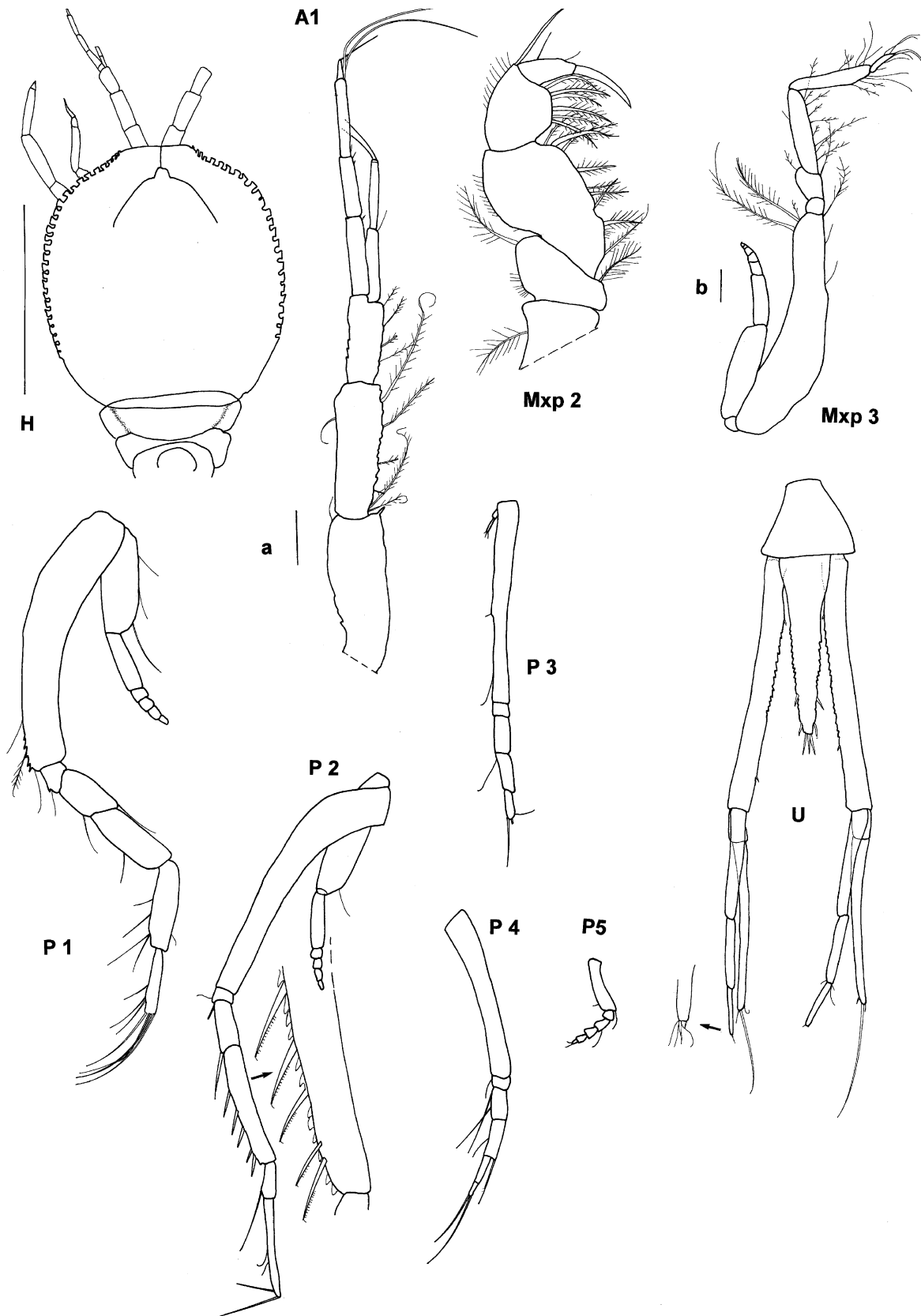


Fig. 4. *P. carpusserratus* sp.n. female H: Carapace from above (scale: 1 mm), A1: antenna 1, Mxp2: maxilliped 2, Mxp3: maxilliped 3, P1: pereiopod 1, P2: pereiopod 2, P3: pereiopod 3, P4: pereiopod 4, P5: pereiopod 5, U: pleonite 6 and uropods. Scale (a): 0.1 mm (A1, Mxp2); scale (b): 0.1 mm (Mxp3, P1, P2, P3, P4, P5, U).

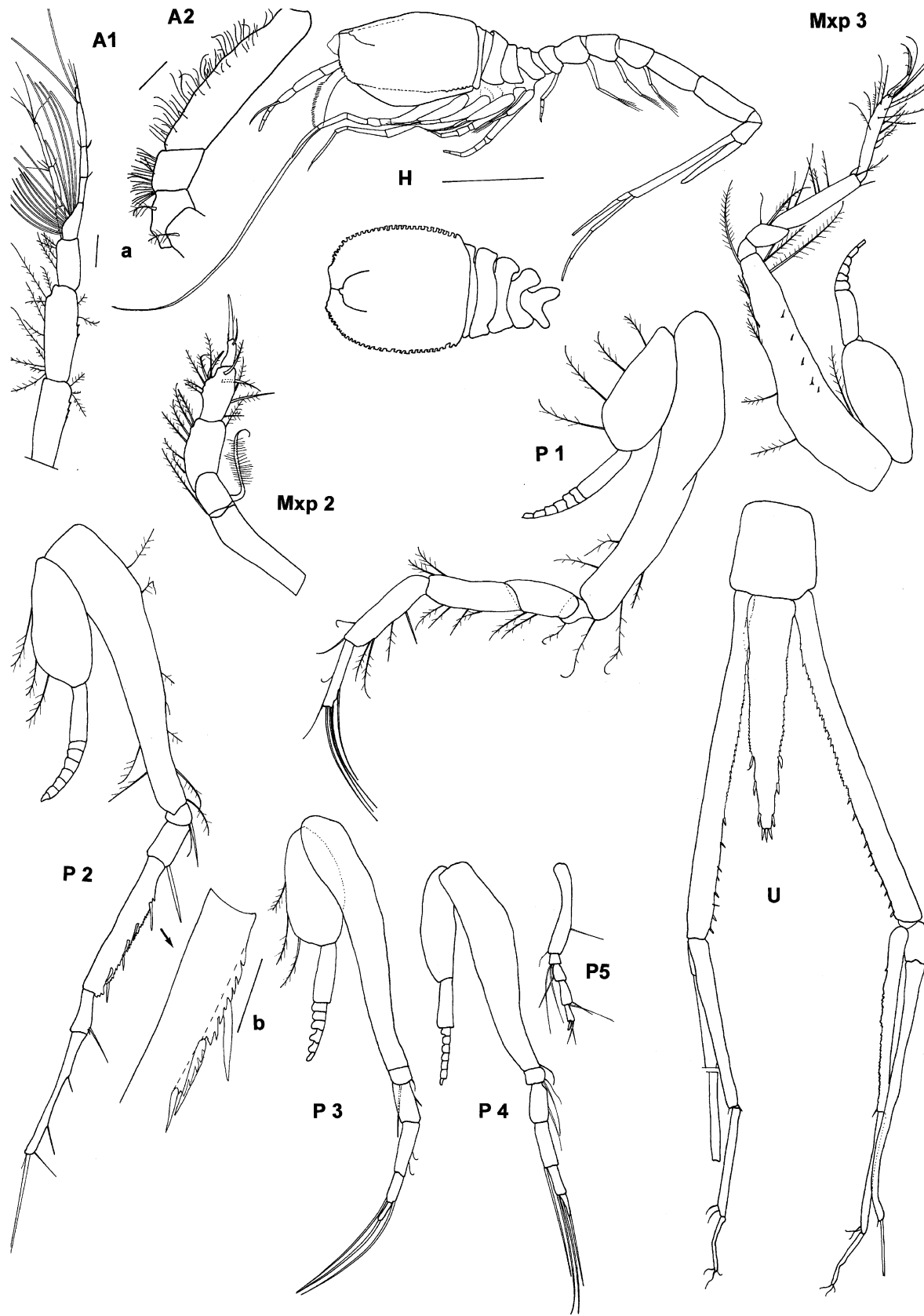


Fig. 5. *P. carpusserratus* sp.n. male H: Habitus from lateral and carapace from above (scale: 1 mm), A1: antenna 1, A2: peduncle of antenna 2 (scale: 0.1 mm), Mxp2: maxilliped 2, Mxp3: maxilliped 3, P1: pereiopod 1, P2: pereiopod 2, P3: pereiopod 3, P4: pereiopod 4, P5: pereiopod 5, U: pleonite 6 and uropods. Scale (a): 0.1 mm (A1, Mxp2, Mxp3, P1, P2, P3, P4, P5, U); scale b: 0.1 mm (higher magnification of serrate margin, P2 carpus).

thoracic segments visible, pleon broken off, telsonic segment short, telson about three quarter of uropods' peduncle, three terminal spine-setae, two pairs of lateral spine-setae.

Description of appendages based on holotype, female, all appendages show scaly structure in higher magnification:

Antenna 1 peduncle basal article longest, distally with one "tooth", second article with at least six plumose setae, two hairlike setae, two broken setae; accessory flagellum with two long and terminally one tiny article, as long as two basal segments of main flagellum; main flagellum four segmented, two aesthetascs; maxilliped 2 ischium missing, merus short, with two plumose setae, carpus second longest article after basis, with nine plumose setae at inner margin, propodus little less wide than carpus, with six plumose setae; dactylus small, terminal seta clawlike; maxilliped 3 carpus second longest article after basis, with numerous (nine) plumose setae, propodus little shorter than carpus, dactylus small with clawlike terminal seta, exopod present.

Pereiopod 1 basis longest article, carpus and propodus equal in length, carpus little wider than propodus, dactylus as long as merus but 1/3 in width, dactylus with four terminal setae, exopod present; pereiopod 2 carpus second longest article after basis, with five setulated setae, and inner margin serrate, propodus short, dactylus tapering, exopod present; pereiopod 3 merus and carpus subequal in length, rudimentary exopod present; pereiopod 4 similar in shape to preceding walking leg, rudimentary exopod not yet developed (?); pereiopod 5 min, shorter than basis of pereiopod 4, basis longest article, the following four articles similar in length, dactylus short.

Uropods' peduncle long, inner margin denticulate, with two short spine-setae; exopod shorter than endopod, long terminal seta, two short hairlike setae subterminally. Endopod with three articles, basal longest, distal article with three hair-like, one short and one medium setae.

Male: carapace as in female, but seen from above the outline is more oval than circular, the male with three pleopods and exopods at maxilliped 3, pereiopods 1–4. Telson 0.7 times in length to uropods' peduncle, and 2.4 times longer than pleonite 6, with three pairs of lateral spine-setae. First antenna with more setae at three basal articles, main flagellum with five articles, the basal one wider than the distal four, with 15 aesthetascs, two aesthetascs at distal margin of fourth article, terminal article with three simple hair-like setae, accessory flagellum with three articles and one tiny fourth one, in total not reaching articulation 3–4th article of main flagellum; second antenna long, reaching beyond third pleonite; maxilliped 3 basis with row of five spines, distally four plumose setae, ischium and merus short, carpus and propodus equal in length, dactylus short,

appendage with more setae in male than in female; pereiopod 1 basis longest article, about equal in length to rest of appendage; ischium and merus short, carpus and propodus equal in length, dactylus only little shorter than propodus, with three terminal and two subterminal setae; pereiopod 2 basis longest article but shorter than rest of appendage, ischium and merus each with strong seta distally, carpus second longest article after basis, with six thorn-like setae at inner serrate margin, propodus short, dactylus slender and little shorter than carpus, terminal seta as long as dactylus; pereiopod 3 basis longer than rest of appendage, ischium and merus combined equal in length to carpus, propodus shorter than merus, dactylus equal in length to ischium, terminal seta as long as ischium, merus and carpus combined; pereiopod 4 similar to pereiopod 3 but shorter; pereiopod 5 tiny, shorter than basis of pereiopod 4. Uropods' peduncle with eight to eleven short spine-setae at inner distal margin, proximal margin serrate, uropods' endopod three segmented, longer than exopod.

Remarks: The new species doubtlessly belongs to the genus *Paralamprops* because of the very short pereiopod 5 being shorter than the basis of pereiopod 4 and the male having three pairs of pleopods. Seven species within the genus *Paralamprops* have the lateral carina with ornamentation; from these seven species four have the ornamentation being acute, teeth-like spines, three species have the ornamentation crenulate like in the new species. The latter differs from these other species, *P. corollifera* Gamô, 1984 (Japan), *P. girardi* Reys, 1978 (northern Atlantic), and *P. tuberculatus* Roccatagliata, 1994 (northern Atlantic) in the following characters:

the carapace in dorsal view is more circular than in *P. tuberculatus* and the first antenna is slender and not enlarged and widened in the second article as it is in *P. tuberculatus*;

second pereiopod's carpus is serrate at inner margin and additionally bears six strong setae in the new species and is smooth with four setae in *P. girardi*, the telson of the new species has three apical spine-setae and two pairs of lateral spine-setae in female and three lateral pairs of spine-setae in male, in *P. girardi* it is vice versa;

the crenulation in *P. corollifera* is big in the anterior part of the carapace and tapering to the posterior, while it is of equal size from the anterior to the posterior part in *P. carpuserratus* sp.n.

Family Bodotriidae:

Atlantocuma ramses sp.n.

Figs. 6 and 9

Material: one female (holotype) station 344 (epibenthic sledge, epinet); paratypes: 1 male, used for SEM, station 338 (epibenthic sledge, supranet); one female,

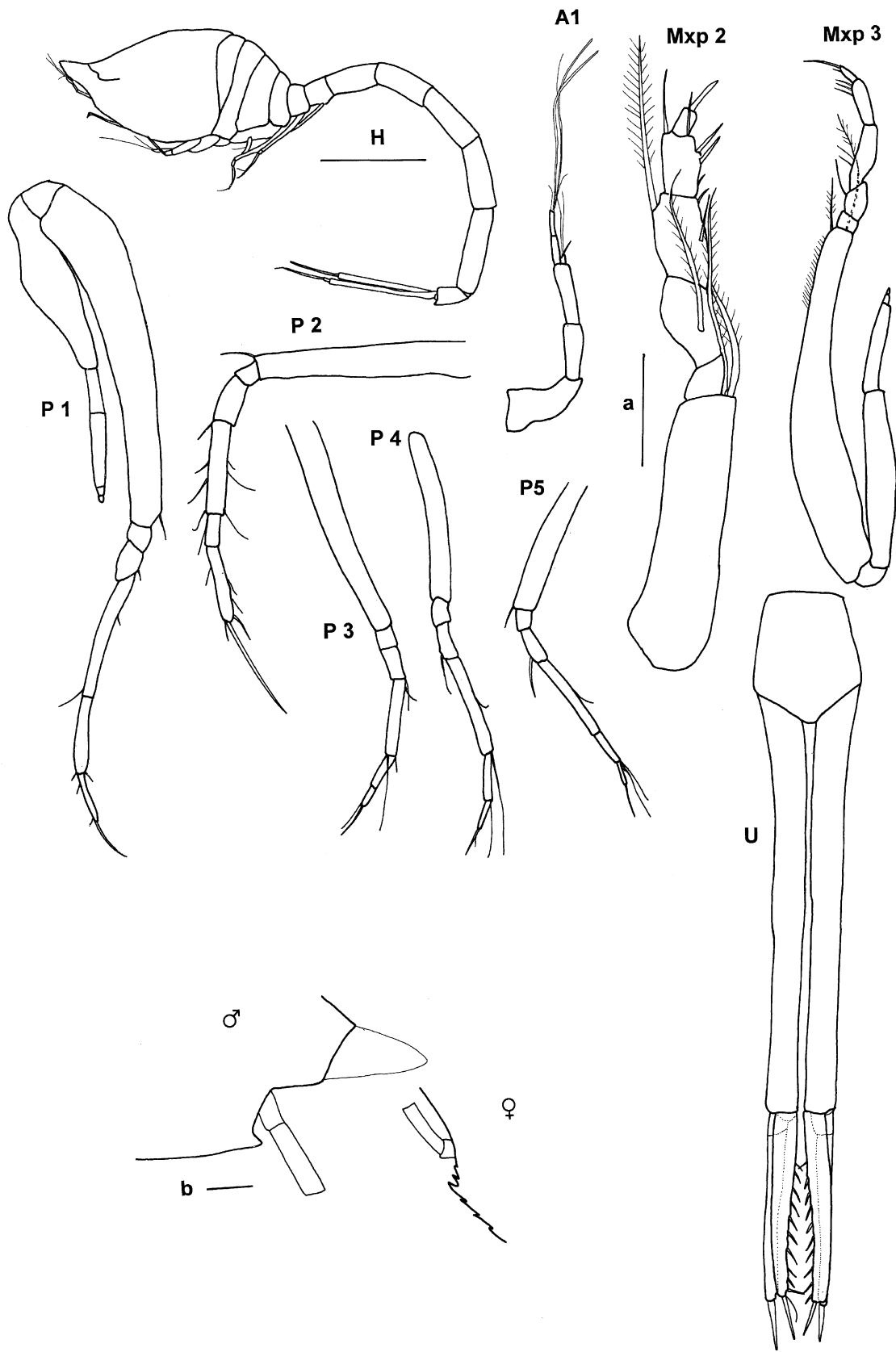


Fig. 6. *A. ramses* sp.n., female H: Habitus (scale: 1 mm), A1: antenna 1, Mxp2: maxilliped 2, Mxp3: maxilliped 3, P1: pereopod 1, P2: pereopod 2, P3: pereopod 3, P4: pereopod 4, P5: pereopod 5, U: pleonite 6 and uropods, antennal notch in male (left) and female (right). Scale a : 0.1 mm (Mxp2); scale b: 0.1 mm (antennal notch, A1, Mxp3, P1, P2, P3, P4, P5, U).

dissected, station 340 (epibenthic sledge, epinet), ZMH: K 40423.

Holotype: female ZMH: K 40422

Date: 25 July 2000

Leg.: A. Brandt and J.-W. Wägele

Locus typicus: Angola Basin, station 344 (epibenthic sledge, epinet): 17° 06.2'S 04° 41.7'E (depth: 5415 m) to 17° 07.5'S 04° 42.3'E (depth: 5415 m).

Diagnosis: Anterolateral angle of female's carapace has three teeth, antennal notch is rectangular in the males, uropods' peduncle very long and slender.

Etymology: the new *Atlantocuma* species is dedicated to my dear friend Ramses, Merlin's twin.

Description is based on holotype, female 6.1 mm long.

Carapace smooth; pseudorostrum moderately long, straight; siphonal tube short; ocular lobe small, without lenses; antennal notch shallow, anterolateral angle with three teeth; integument weakly calcified, ventral margin of carapace with lamellar structure; five thoracic segments visible, shorter than carapace; pleon longer than carapace and free thoracic segments combined; telsonic segment much shorter than uropod's peduncle.

Description of appendages based on paratype, female (station 340, epinet).

Antenna 1 geniculate between peduncle's basal and second article, accessory flagellum short, less than half as long as main flagellum's basal article, main flagellum with two long and a tiny distal article, two aesthetascs; maxilliped 2 basis longest article with two distal long, plumose setae, merus and carpus subequal in length, each with a long, plumose seta, propodus little shorter than two preceding articles, carpus with one, propodus

with two strong spine-setae at inner margin, dactylus short, with strong distal spine-seta; maxilliped 3 basis very long and slender, longer than following articles combined; carpus second longest article, exopod present; slender pereopod 1, basis longer than rest of appendage, ischium and merus short, carpus second longest article, as long as propodus and dactylus combined, exopod present; pereopod 2 without exopod, basis shorter than rest of appendage, merus little longer than ischium, carpus second longest article after basis, propodus short, dactylus long, tapering; pereopods 3–5 similar in shape but progressively getting shorter, mainly due to reduction of basis, merus little longer than ischium, carpus second longest article after basis, propodus short, little longer than dactylus.

Uropods' peduncle long and slender, more than three (3.25) times longer than pleonite 6, more than twice as long as rami; exopod two segmented, very little longer than unsegmented endopod; endopod with ten spine-setae at inner margin, one strong terminal and one slender subterminal seta.

Male: The male's antennal notch is rectangular and slightly more pronounced than in female, single subrostral tooth; uropods' peduncle with four hair-like setae at inner margin.

Remarks: the new species resembles *A. benguelae* Bacescu and Muradian, 1974 and *A. tenuis* Jones, 1984 in the slender basis of maxilliped 3 and the geniculate peduncle of the first antenna (compare Table 2); it differs from the species mentioned in the following characters: the pseudorostrum is longer in the female of *A. tenuis* than in *A. ramses* sp.n., the anterolateral angle

Table 2. Comparing selected characters of the *Atlantocuma* species

	<i>A. benguelae</i> Bac and Mur, 1974 SATl.	<i>A. bidentata</i> Ledoyer, 1988 Mozambique	<i>A. elongatum</i> Ledoyer, 1993 Weddell Sea	<i>A. tenuis</i> Jones (1984) Atlantic	<i>A. ramses</i> sp.n. Angola Basin
Pseudorostrum, male	Truncate	n.d.	n.d.	Acut, longer	Short
Pseudorostrum, female	Normal	Elongate	Medium	Elongate	Medium
Subrostral tooth in female	Acute	Two teeth	Two teeth	Blunt spine	Three teeth
Subrostral tooth in male	No	n.d.	n.d.	No	One tooth
Antennal notch, female	Small, distinct	Shallow	Angular	Indistinct	Shallow
Antennal notch, male	Missing	n.d.	n.d.	Missing	Rectangular
Elevation of carapace in female	Shallow	Shallow	Shallow	Pronounced	Pronounced
<i>Length proportions</i>					
Uro.peduncle:pleonite 6	2.6	1.4	1.8	2.4	3.25
Uro.peduncle: endopod	2.3	2.2	2.1	2.2	2.2
Mxp3 basis: rest of extremity	1.7	1.7	1.45	1.7	1.96
Longest uropod ramus	Equal	Exo	Equal	Endo	Equal
Uro. Endopod teeth at inner margin, female	7	4	6	11	9
First antenna	Geniculated	Straight	n.d.	Geniculated	Geniculated
Mxp 3 basis	Slender	More stout	More stout	Slender	Slender
P2	Slender	Slender	Short and stout	Slender	Slender

n.d. = no details given.

has three teeth in the new species while it has a blunt spine or an acute tip in the other two species, the antennal notch is rectangular in the males of the new species while it is missing in the other two species. The unique character of the new species is the very long and slender uropods' peduncle which is 3.25 times longer than the pleonite 6 compared to 2.6 in *A. benguelae* and 2.4 in *A. tenuis*.

***Bathycuma squamosa* sp.n.**

Fig. 7

Material: one juvenile male (holotype), station 318 (epibenthic sledge, epinet); paratype: 1 juvenile male, station 340 (epibenthic sledge, epinet), ZMH: K 40,425;

Holotype: juvenile male, ZMH: K 40,424

Date: 9 July 2000

Leg.: A. Brandt and J.-W. Wägele

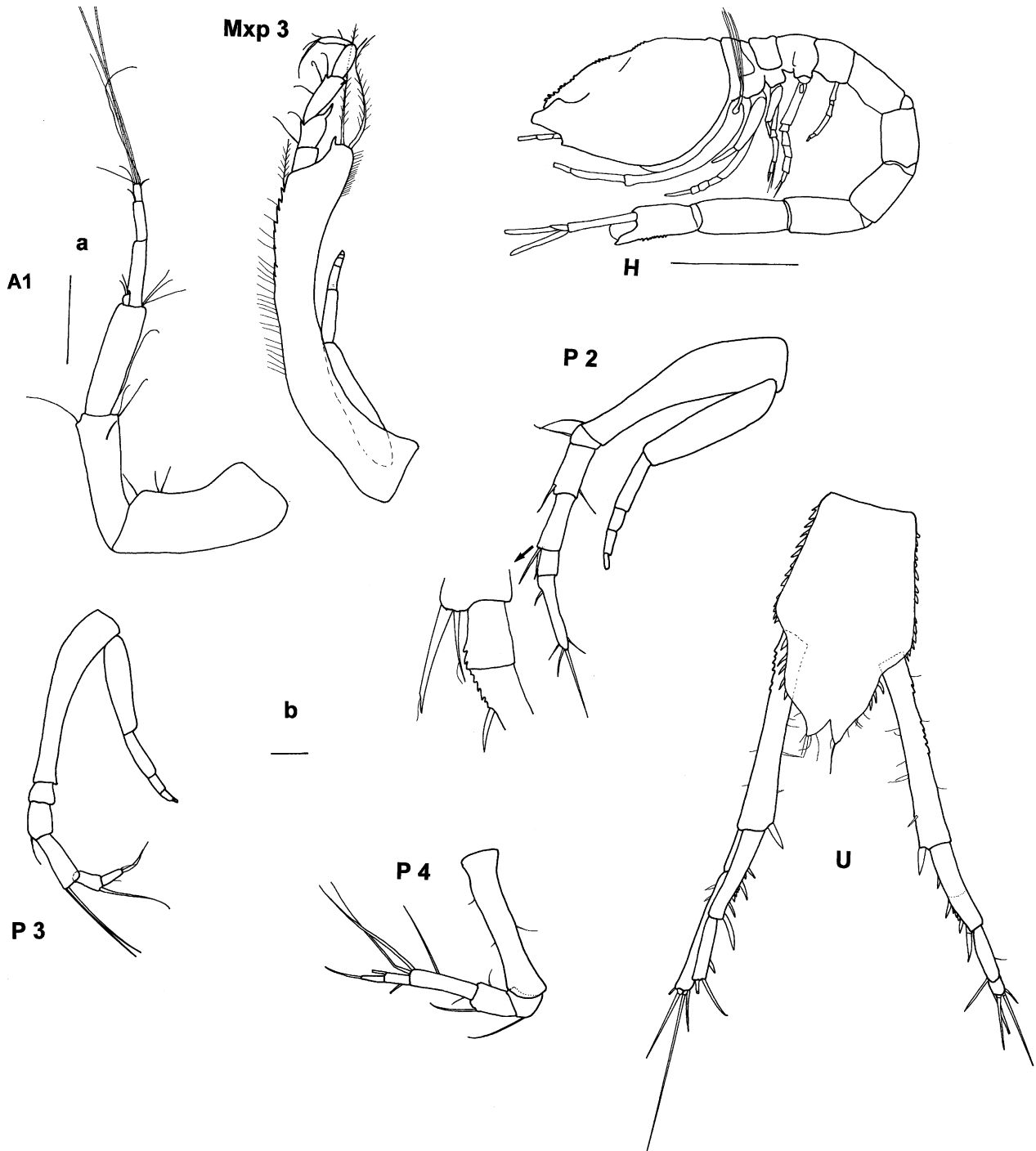


Fig. 7. *B. squamosa* sp.n. juvenile male H: Habitus (scale: 1 mm), A1: antenna 1, Mxp3: maxilliped 3, P2: pereiopod 2, P3: pereiopod 3, P4: pereiopod 4, U: pleonite 6 and uropods. Scale a: 0.1 mm (A1); scale b: 0.1 mm (Mxp 3, P2, P3, P4, U).

Locus typicus: Angola Basin, station 318 (epibenthic sledge, epinet): from 22° 20.0'S 03° 18.3'E (depth: 5125 m) to 22° 20.2'S 03° 18.4'E (depth: 5144 m).

Diagnosis: very long pleonite 6 with scaly structure, uropods' exopod longer than endopod.

Etymology: the new species is named after the scaly surface of the pleonite 6.

Description is based on holotype, subadult male 5.9 mm long.

Carapace with dorsomedian line and anteroventral margin weakly serrate; pseudorostrum short, lobes meeting in front of ocular lobe; siphonal tube short; ocular lobe reduced; antennal notch shallow, with anterolateral edge not prominent; integument calcified; eyes missing; five thoracic segments visible, the first one short; pleon longer than carapace and free thoracic segments combined; pleopods not yet developed; pleonite 6 long, longer than uropods' peduncles, projecting posteriorly more than $\frac{1}{4}$ of uropods' peduncles length, with scaly surface.

Description of appendages based on paratype, juvenile male, pereopod 5 and pleopods not yet developed.

Antenna 1 peduncle geniculate between articles 1 and 2, basal article longest, accessory flagellum tiny, main flagellum three segmented, two aesthetascs; maxilliped 3, basis much longer than rest of appendage with one tooth at little prolonged distal outer margin and serrate inner distal margin, merus with one tooth each at inner and outer distal margin, little longer than ischium, carpus more slender than merus, with one small tooth each at inner and outer distal margin, propodus shorter than carpus but longer than dactylus, exopod present; pereopod 1 broken; pereopod 2 with six free articles, merus little shorter than carpus, the latter with two strong distal spine-setae, propodus short, distal margin serrate, dactylus tapering, proximal margin serrate, exopod present; pereopod 3 with carpus second longest article after basis, merus subequal in length to propodus, dactylus shorter than preceding article, exopod present; pereopod 4 similar in shape to pereopod 3, exopod not yet developed; pereopod 5 not yet developed.

Uropods' peduncle shorter than pleonite 6, strong spine-seta at inner distal margin; exopod two segmented, longer than endopod; endopod two segmented, basal article with 4 strong spine-setae and serration between the setae at inner margin, longer than distal article, which carries one short, strong spine-seta at distal inner margin and one (broken) terminal and one subterminal spine-seta.

Female unknown.

Remarks: besides from *B. squamosa* n. sp. there is only one species besides the new described from the genus *Bathycuma* from the Atlantic and Indian Ocean (Table 3) with a long pleonite 6: *B. capense* (Zimmer 1921). In this species the integument of pleonite 6 is

smooth and the uropods' rami are equal in length while the pleonite 6 is scaly and the uropods' exopod longer than the endopod in the new species. The Japanese *Bathycuma* species have the uropod peduncle longer than the pleonite 6 or a smooth pleonite 6.

***Cyclaspoides longimerus* sp.n.**

Figs. 8 and 9

Material: one ovigerous female (holotype), station 348 (epibenthic sledge, supranet); paratypes: one subadult male, one female, dissected, one ovigerous female, two subadult females (one used for SEM), station 348 (epibenthic sledge, epinet); one subadult male, station 330 (box corer no. 5), ZMH: K 40,561.

Holotype: ovigerous female, ZMH: K 40,560

Date: 28 July 2000

Leg.: A. Brandt and J.-W. Wägele

Locus typicus: Angola Basin, station 348 (epibenthic sledge, supranet): 16° 18.1'S 05° 27.2'E (depth: 5390 m) to 16° 19.3'S 05° 27.2'E (depth: 5387 m).

Diagnosis: pereopod 2 third longest article (after basis and dactylus) is merus, ischium incompletely fused to basis, uropod endopod unsegmented, uropod exopod longer than endopod, first antenna's peduncle's third article reaching beyond tip of pseudorostrum, maxilliped 3 basis' distal prolongation reaching to articulation carpus/propodus.

Etymology: the new species is named after its typical character, the second pereopod's long merus.

Description is based on holotype, ovigerous female, 5.8 mm in length.

Carapace with fine scaly structure, anteroventral margin finely serrate; pseudorostrum moderately long; siphonal tube long; ocular lobe reduced, eyes missing; antennal notch narrow but distinct; integument with granular structure; two free thoracic segments visible, segments 1–3 fused to carapace; pleon with lateral articular processes, longer than carapace and free thoracic segments combined; telsonic segment longer than pleonite 5, much longer than uropods' peduncle, produced between uropods' peduncles.

Description of appendages based on paratype, ovigerous female carrying 16 embryos.

Antenna 1 distal article of peduncle longest, basal article shortest and slightly geniculate, accessory flagellum reduced, main flagellum two segmented, one long and one shorter aesthetasc; maxilliped 2 basis longer than rest of appendage, ischium well developed, as long as carpus, merus little longer; maxilliped 3 basis longer than rest of appendage, distally produced, ischium well developed, merus with distal prolongation reaching beyond carpus/propodus articulation, exopod slender; pereopod 1 basis longest article, shorter than rest of appendage, ischium, merus and dactylus subequal in length, carpus and propodus equal in length, second longest articles, exopod present; pereopods 2 and 3 inserting more ventrally, appearing separated from

Table 3. Comparing selected characters of the *Bathycuma* species from the Atlantic and Indian Ocean

<i>Bathycuma</i> species	<i>Brevirostre</i> (Norman, 1879) NE Atlantik	<i>Capense</i> (Zimmer 1921) Agulhas Bank Male/female	<i>Datum</i> Day (1975) South Africa Female	<i>Elongatum</i> Hansen (1895) Cap Verdes Female	<i>Magnum</i> Jones (1969) Indian Ocean Female	<i>Natalensis</i> Stebbing (1912) South and West Africa Female	<i>Squamosa</i> sp.n. Angola Basin Subad. male
<i>Uropod endopod length proportion</i>							
Basal to distal article	n.d.	2.2	1.1	1.1	n.d.	Broken	1.4
Pseudorostrum, male	n.d.	short	n.d.	n.d.	n.d.	Longer	Short
Pseudorostrum, female	n.d.	n.d.	Very short	Short	Short	Short	n.d.
Anterolateral angle, female	n.d.	Acute	Acute	Acute	Acute	Acute	n.d.
Anterolateral angle, male	n.d.	Rounded	n.d.	n.d.	n.d.	n.d.	Indistinct
Anterolateral angle, female	n.d.	Shallow	Small	Distinct	Shallow	Distinct	n.d.
Anterolateral angle, male	n.d.	Vertical	n.d.	n.d.	n.d.	Oblique	Oblique
Anteroventral margin of carapace	n.d.	Slightly serrate	Smooth	Slightly serrate	Slightly serrate	Slightly serrate	Slightly serrate
Pleonite 6, serrate or not	n.d.	No	No	No	n.d.	No	Yes
<i>Length proportions</i>							
Uro.peduncle:pleonite 6	n.d.	0.8	1.3	1	n.d.	1.2	0.8
Uro.peduncle: endopod	n.d.	1.2	1.2	1.3	n.d.	n.d.	1.3
Longest uropod ramus	n.d.	Equal	Exo	Equal	n.d.	n.d.	Exo
Uro.endopod teeth at inner margin	n.d.	Eleven setae	Twelve setae	Twelve setae	n.d.	Thirteen spines	Five teeth
A1 straight or geniculate?	n.d.	Bended	Bended, serrate	Bended, serrate	Bended	Bended	Bended
Mxp 3, with teeth at article	B,I,M	No	No	C	No	B, I, M, C	B, M, C
P1, with teeth?	B	No	No	n.d.	No	No	n.d.

n.d. = no details given; B = basis, I = ischium, M = merus, C = carpus; uro. = uropod.

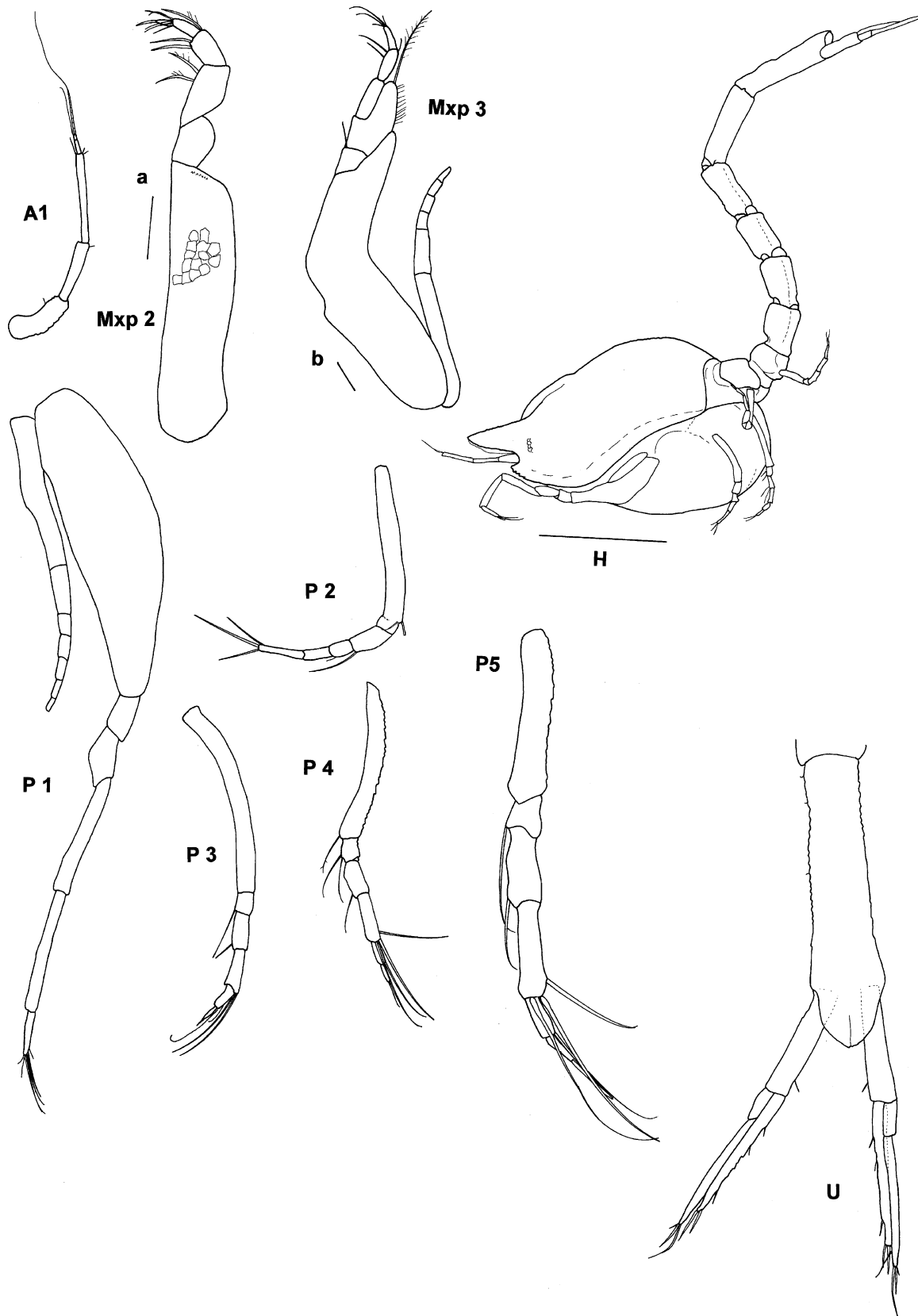


Fig. 8. *C. longimerus* sp.n. ovigerous female za: Habitus (scale: 1 mm), A1: antenna 1, Mxp2: maxilliped 2, Mxp3: maxilliped 3, P1: pereopod 1, P2: pereopod 2, P3: pereopod 3, P4: pereopod 4, P5: pereopod 5, U: pleonite 6 and uropods. Scale a: 0.1 mm (Mxp2, P5); scale b: 0.1 mm (A1, Mxp3, P1, P2, P3, P4, U).

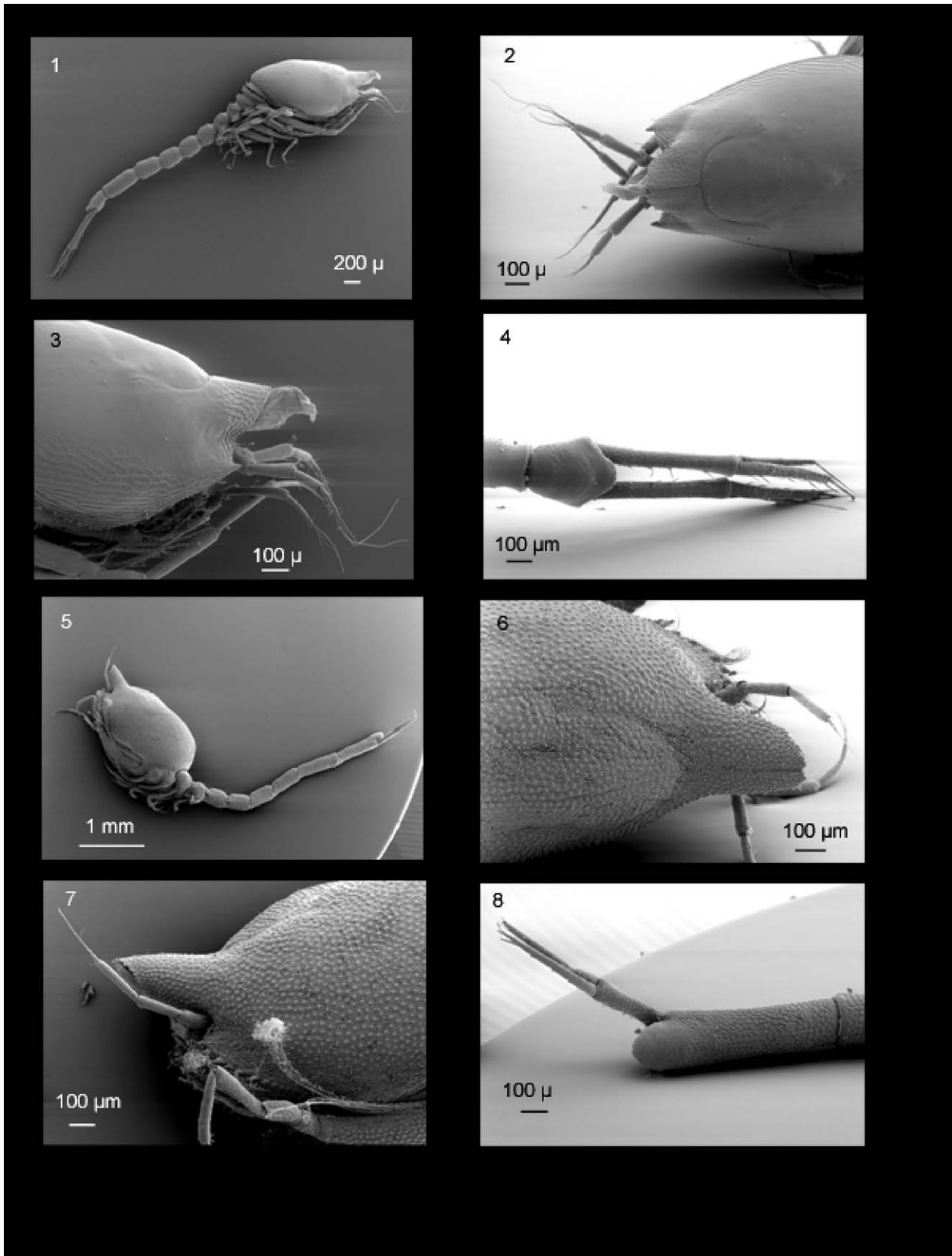


Fig. 9. *A. ramses* sp.n. male, SEM photos: (1) habitus, (2) anterior part of carapace in dorsal view, (3) anterior part of carapace in lateral view, (4) pleonite 6 and uropods *C. longimerus* sp.n. subadult female, SEM photos (5) habitus, (6) anterior part of carapace in dorsal view, (7) anterior part of carapace in lateral view, (8) pleonite 6 and uropods.

pereionite to which they belong; pereopod 2 short, basis longer than rest of appendage, ischium present, dactylus second longest article, tapering; pereopod 3 basis longer than rest of appendage, merus little shorter than carpus, dactylus short; pereopod 4 similar in shape to pereopod 3, terminal seta at dactylus with articulation indistinct; pereopod 5 basis shorter than rest of appendage, carpus second longest article after basis, two distal and one subdistal long, terminal annulated setae, carpus one distal seta, dactylus terminal seta longer than dactylus. Uropods' peduncle length relation to pleonite 6 is 0.4, peduncle shorter than endopod; exopod longer than endopod, endopod unsegmented, three setae at inner margin, inner margin serrate, one terminal and one subterminal seta.

Remarks: the new species resembles *C. pellucidus* Day, 1978 described for South Africa, it differs from the known species in the following characters:

in the new species the second pereopod's ischium is incompletely fused to the basis and the merus is the third longest article (after basis and dactylus), but in *C. pellucidus* the ischium is fused to basis and the propodus is equal in length to merus; the uropod endopod is unsegmented in the new species but two segmented in *C. pellucidus*, and the uropod exopod is longer than endopod in the new species but shorter in *C. pellucidus*.

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