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Rhachotropis species (Crustacea: Amphipoda: Eusiridae) of hydrothermal vents and surroundings on the Mid-Atlantic Ridge, Azores Triple Junction zone

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***Rhachotropis* species (Crustacea: Amphipoda: Eusiridae) of hydrothermal vents and surroundings on the Mid-Atlantic Ridge, Azores Triple Junction zone**

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(Accepted 1 August 2006)

Abstract

Three new species of *Rhachotropis* were collected from the Azores Triple Junction zone during three cruises on the Mid-Atlantic Ridge, by three sediment traps deployed on or near vent sites Lucky Strike (37°17'N, 32°16'W, 1686 m depth) and Rainbow (36°14'N, 33°54'W, 2250 m depth). A key of the Atlantic *Rhachotropis* is proposed.

Keywords: *Amphipoda*, *hydrothermal vent*, *Mid-Atlantic Ridge*, *new species*, *Rhachotropis*

Introduction

In the family Eusiridae, only two species have been described from vent communities: *Bouvierella curtirama* and *Luckia striki*, both sampled from Lucky Strike (Bellan-Santini and Thurston 1996). *Rhachotropis* is a genus widely distributed in deep sea but never sampled in hydrothermal vents or surroundings. Three new species, *Rhachotropis flamina*, *R. licornia*, and *R. pilosa*, were identified in material sampled during French (DIVA 2 and MARVEL) and English (FLAME 2) cruises by a sediment trap deployed for several days on or near hydrothermal vent areas, Lucky Strike (37°17'N, 32°16'W, 1700 m depth) and Rainbow (36°14'N, 33°54'W, 2250 m depth), on the Mid-Atlantic Ridge (Khripounoff et al. 2000). Two of these species show calceoli on the antennae which are particularly complex in *R. pilosa*.

Material and methods

Specimens studied here were collected using three sediment traps. The description of the deployment method of this gear is detailed in Khripounoff and Albéric (1991). The first one, “Mooring S” (short-term mooring with three small traps) was deployed for 25 days, at the foot of the active chimney Sintra (MAR, Lucky Strike, 37°17.50'N, 32°16.47'W,

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1630 m), by the submersible Nautille during the DIVA 2 cruise (June 1994). The top-collecting surface of the trap (sampling aperture of 0.07 m²) was 1.5 m above the bottom. The specimens were recovered onboard after the end of the exercise, and fixed in formalin (Khripounoff et al. 2000). The second sediment trap (mooring "M500", PPS-1) was deployed at 500 m north of the vent site Rainbow (MAR, 36°14'N, 33°54'W, 2250 m) during MARVEL cruise (August 1997) and recovered during the FLAME 2 cruise (June 1998), i.e. for 304 days. This trap had a sampling aperture of 1 m², at 160 m above the bottom. Each collection bottle corresponded to a sampling period of 14 days. The third sediment trap (mooring "M1000", PPS-3) was deployed at 2000 m to the east of Rainbow (36°13.45'N, 33°52.81'W, 1937 m) during the same cruises and for the same period. The top-collection was at 310 m above the bottom (Khripounoff et al. 2001).

The scanning electron microscope used for photography was a Hitachi S570.

The holotypes are deposited in the Muséum National d'Histoire Naturelle, Paris.

Taxonomy

Rhachotropis flamina n. sp.

(Figures 1, 2)

Type locality

Mid-Atlantic Ridge, 36°14'N, 33°54'W, 2250 m depth, at 500 m to the north of Rainbow vent area.

Material examined

One female, holotype, 8 mm length. FLAME 2 cruise, 10 September 1997, sampled by the sediment trap PPS1-B1, 160 m above the bottom, MNHN-Am7453.

Diagnosis

Body delicate. Head without rostrum. Segments 1 and 2 of the pleon bear on the back a pair of processes as long as the segments. Segment 3 bears a long median process with two smaller on the side. Accessory flagellum of antenna 1 present, reduced to a small article. Gnathopods 1 and 2 similar, subchelate. Telson entire, triangular, long, and narrow.

Description

Female with oostegites, length 8 mm.

Body delicate, some articles are broken or distorted. Segments 1 and 2 of the pleon bear on the back a pair of processes as long as the segment. Segment 3 bears a long median process with a smaller one on each side. Epimeral plates 1 and 2 rounded, plate 3 indented on the posterior and distal edges. Urosome without process or keel.

Head without rostrum, lateral lobes rounded. Eyes absent. Antennae equal in length, equal to half of body. Antenna 1 peduncle articles 1 and 2 equal, article 3 equal to 0.44 of article 2; accessory flagellum reduced to a small article ended by a seta, flagellum with 12 articles. Antenna 2 peduncle articles 3 and 4 equal, flagellum with 14 articles. Mandible with incisor process well developed, lacinia mobilis denticulate, molar process conical, palp triarticulate, article 1 short, articles 2 and 3 long and little setose. Maxilla 1 inner plate

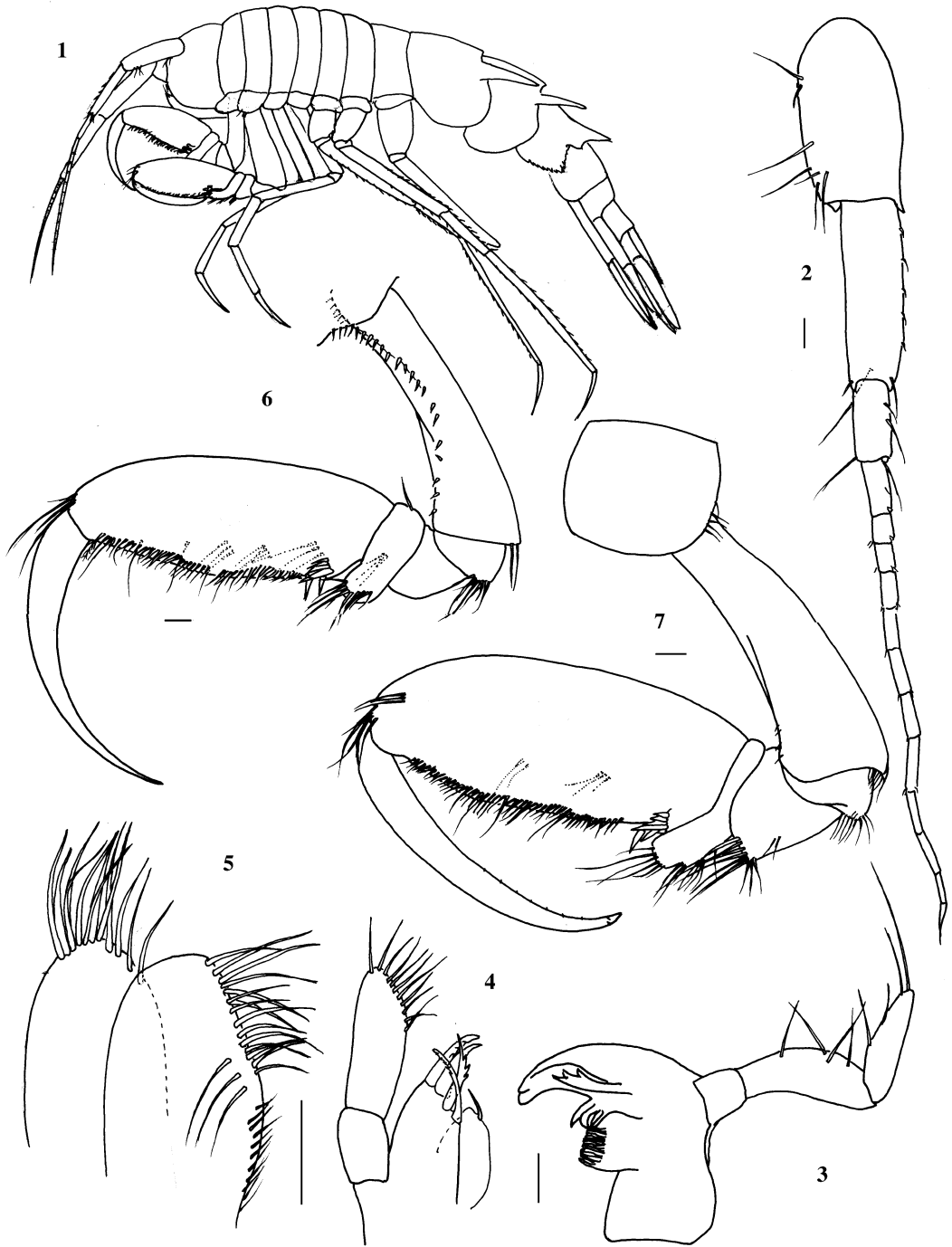


Figure 1. *Rhachotropis flamina*, FLAME 2, PPS1-B1, holotype female, 8 mm. (1) Habitus; (2) antenna 1; (3) mandible; (4) maxilla 1; (5) maxilla 2; (6) gnathopod 1; (7) gnathopod 2. Scale bars: 100 μ m.

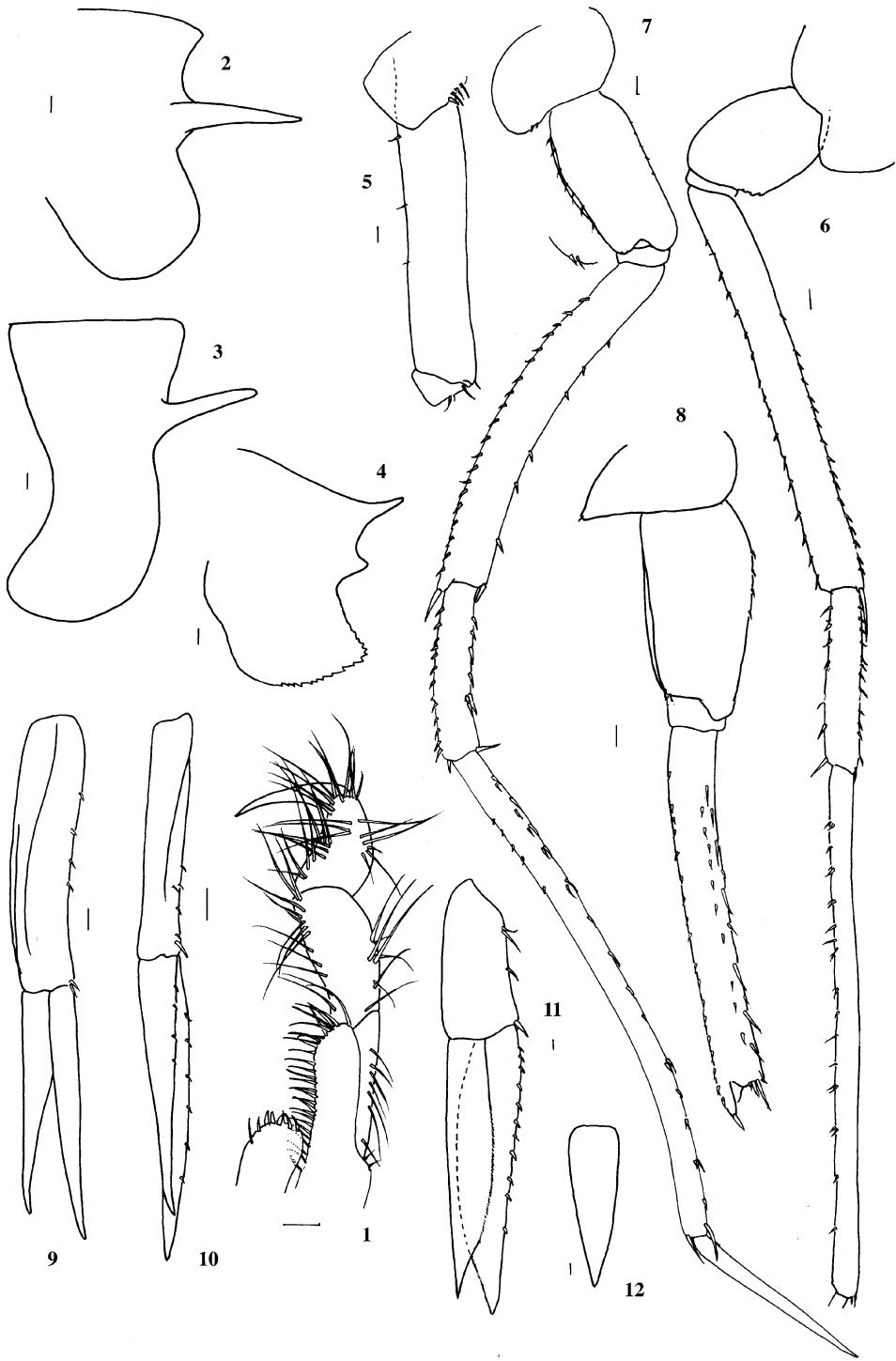


Figure 2. *Rhachotropis flamina*, FLAME 2, PPS1-B1, holotype female, 8 mm. (1) Maxilliped; (2) pleosomite 1; (3) pleosomite 2; (4) pleosomite 3; (5) pereopod 3; (6) pereopod 5; (7) pereopod 6; (8) pereopod 7; (9) uropod 1; (10) uropod 2; (11) uropod 3; (12) telson. Scale bars: 100 μ m.

bearing only one subterminal seta, outer plate with four large denticulate spines, palp biarticulate, article 2 setose. Maxilla 2 inner and outer plates equal in length, both largely setose. Maxilliped inner plate very short, outer plate narrow and longer than inner, palp long and setose.

Coxae 1 and 2 rounded, 4 and 5 subquadrate, all with four to six small setae on the posterior margin. Gnathopods 1 and 2 similar, subchelate. Gnathopod 1 slightly smaller than gnathopod 2. Gnathopod 1 basis fringed at the anterior side by many short spines, carpus lobate but short, propodus narrowly oval, palm long and fringed with many small setae, some of them are longer, palm limited by a row of spines, dactylus as long as propodus, slightly curved. Gnathopod 2 slightly larger than gnathopod 1.

Pereopods 3 and 4 articles narrow and elongate. Pereopod 5 basis oval with the postero-distal corner notched, ischium short, merus long and narrow fringed on both sides by small spines, carpus short fringed on both sides by small spines, propodus long fringed by small spines only anteriorly, dactylus long; ratio basis/ischium/merus/carpus/propodus=4/0.3/12.5/5.5/15.6. Pereopod 6 basis longer than basis of pereopod 5, bearing two small spines on the postero-distal corner and eight small spines on the posterior edge, ischium short, merus long fringed on both sides by small spines, carpus short, propodus long, both articles fringed on both sides by small spines, dactylus long; ratio basis/ischium/merus/carpus/propodus/dactylus=5.5/0.5/11/5/17.5/6. Pereopod 7 basis longer than basis of pereopod 6, ischium short, merus long and fringed on both sides by small spines, carpus broken.

Uropod 1 rami slightly unequal, without spine, shorter than peduncle. Uropod 2 rami slightly unequal, longer than peduncle, bearing small spines. Uropod 3 rami lanceolate, longer than peduncle. Telson entire, triangular, long, and narrow.

Etymology

Name of the species is derived from the name of the FLAME cruise.

Relationship

Rhachotropis flamina has a certain number of specific characteristics that are just conspicuous: no rostrum, blind, gnathopods subchelate and little different in shape and in size; segments 1 and 2 of pleon with two long processes; segment 3 of pleon with a long median process and two smaller lateral processes, epimeral plate 3 denticulate, telson long and entire.

In the 22 species of *Rhachotropis* now found in the Atlantic Ocean, only two have an entire telson, *R. caeca* Ledoyer, 1977 and *R. integricauda* Carausu, 1948. *Rhachotropis caeca* has only a small median process on segments 1 and 2 of the pleon and one small median process and two lateral on segment 3, epimeral plate 3 is smooth. *Rhachotropis integricauda* has a pointed rostrum, eyes well developed, the three segments of the pleon are armed with three short spines but no long process. *Rhachotropis gloriosae* Ledoyer, 1982 is the third species of *Rhachotropis* in the world with an entire telson, it is known from two fragments from Glorious Islands; this species has a long rostrum, short lateral spines on segments 1 and 2 of the pleon, the basis of pereopod 7 has an angulate infero-posterior lobe.

Distribution and habitat

This single specimen was collected at 500 m north of the vent site Rainbow (Mid-Atlantic Ridge, 2250 m depth), thus in an area without vent, and at 160 m above the bottom. This

species with a delicate body, blind, with long pereopods, is probably a bathypelagic species. It was not observed in the samples collected on the vent area.

***Rhachotropis licornia* n. sp.**
(Figures 3–5)

Type locality

Mid-Atlantic Ridge, 36°13.45'N, 33°52.81'W, 1937 m, at 2000 m to the vent site Rainbow.

Material examined

Holotype, 10 mm length. FLAME 2 Cruise, 20 May 1997, collected by the sediment trap PPS3-H20, 300 m above the bottom, MNHN-Am7454.

Diagnosis

Body smooth. Eyes absent. Antenna 1 longer than antenna 2, article 1 robust, twice as long as head; bearing at the infero-distal corner a long curved spine covered with hook-shaped scales, no accessory flagellum. Gnathopods subchelate. Telson long and tapered, deeply cleft.

Description

Length 10 mm.

Head shorter than the first segment of the pereon. Body smooth. Eyes absent. Rostrum short, lateral lobe rounded. Antenna 1 longer than antenna 2, article 1 robust, twice as long as head; bearing at the infero-distal corner a long curved spine covered with hook-shaped scales in the distal half; the inferior edge fringed with five tufts of setae; article 2 1.5 times as long as article 1, bearing at the inferior edge two rows of calceoli. The calceoli with attachment stalks in the central line and the distal element orientated toward the exterior. Accessory flagellum absent; flagellum with 80 articles each bearing a calceolus at the posterior edge and a seta at the anterior edge. Antenna 2 shorter than antenna 1, peduncle article 4 a little shorter than 5, bearing 14 tufts of setae on the anterior margin and more at the posterior margin; article 5 fringed anteriorly with calceoli and bearing distally three long plumose setae; flagellum 34-articulate, the 21 proximal articles each bear a calceolus. Maxilla 1 palp biarticulate, inner plate rounded with two setae on the inner edge, outer plate with seven dentate spines. Maxilla 2 inner plate broader than outer, both fringed with numerous setae. Maxilliped inner plate short, outer plate large, both hardly setose, palp four-articulate, articles 2 and 3 ovate, densely setose, article 4 falcate.

Coxa 1 quadrate, distal edge rounded, distal posterior corner notched. Coxa 2 subrectangular, distal posterior corner notched, posterior edge with a spine in the middle. Coxa 3 subrectangular, distal posterior corner notched, posterior edge with a spine in the middle. Coxa 4 anteriorly rounded, the posterior edge weakly concave.

Gnathopods subchelate. Gnathopod 1 anterior edge of basis fringed by numerous setae, ischium and merus short, carpus lobate, propodus enlarged, length/breadth ratio 3.5:2.5, palm fringed with numerous short setae, delimited by a tuft of spines, dactylus as long as

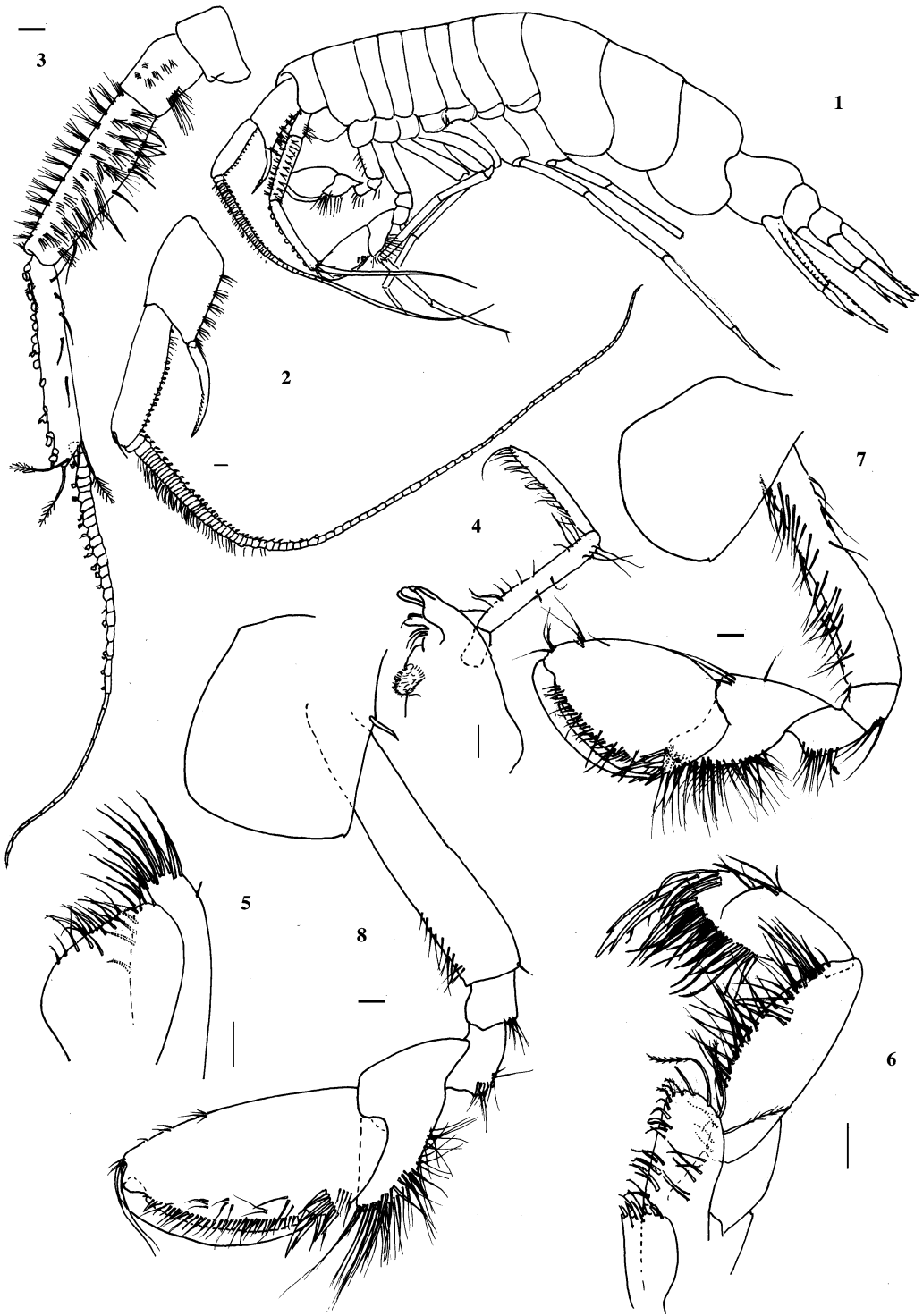


Figure 3. *Rhachotropis licornia*, FLAME 2, PPS3-H20, holotype, 10 mm. (1) Habitus; (2) antenna 1; (3) antenna 2; (4) mandible; (5) maxilla 2; (6) maxilliped; (7) gnathopod 1; (8) gnathopod 2. Scale bars: 100 μ m.

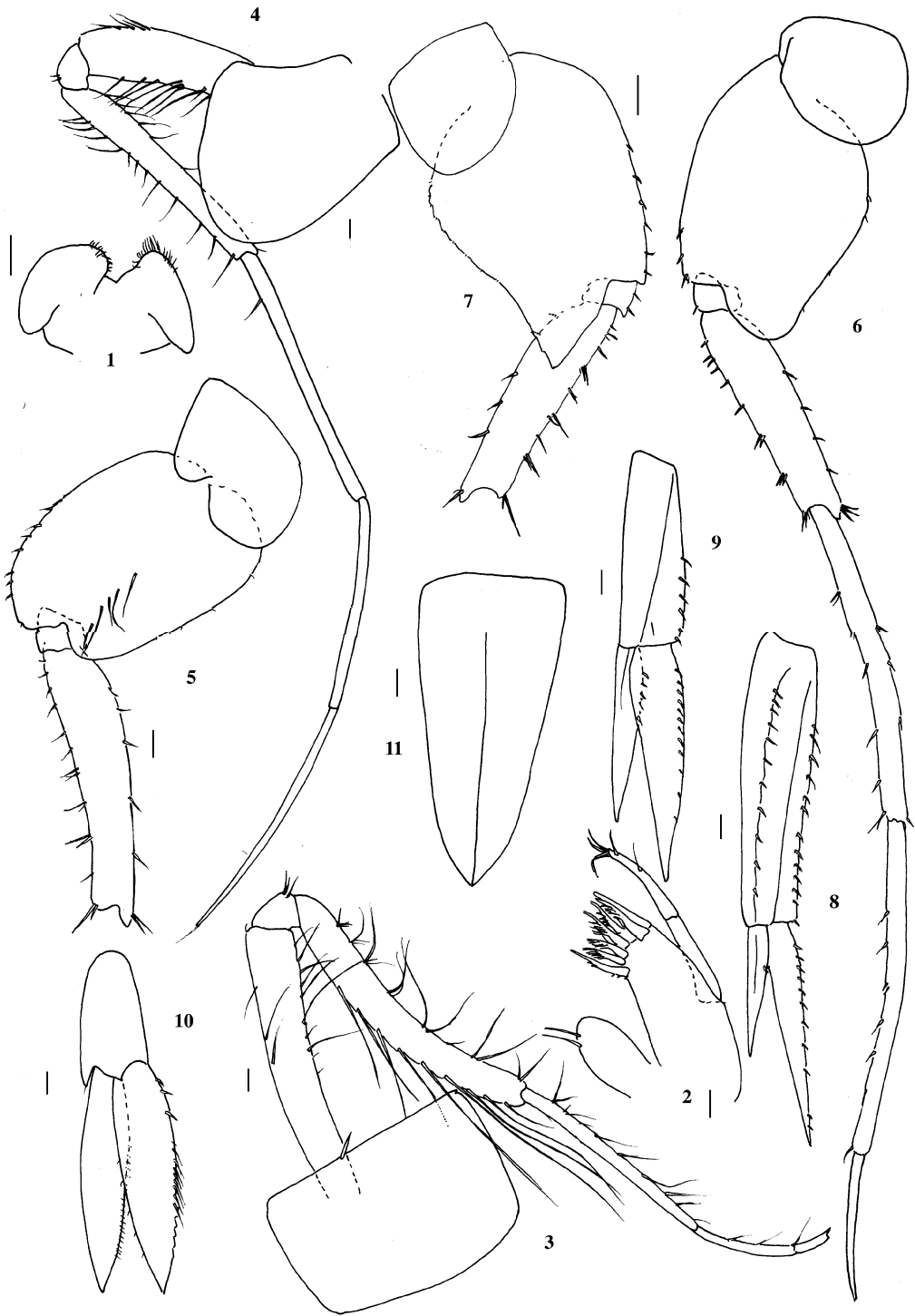


Figure 4. *Rhachotropis licornia*, FLAME 2, PPS3-H20, holotype, 10 mm. (1) Labium; (2) maxilla 1; (3) pereopod 3; (4) pereopod 4; (5) pereopod 5; (6) pereopod 6; (7) pereopod 7; (8) uropod 1; (9) uropod 2; (10) uropod 3; (11) telson. Scale bars: 100 μ m.

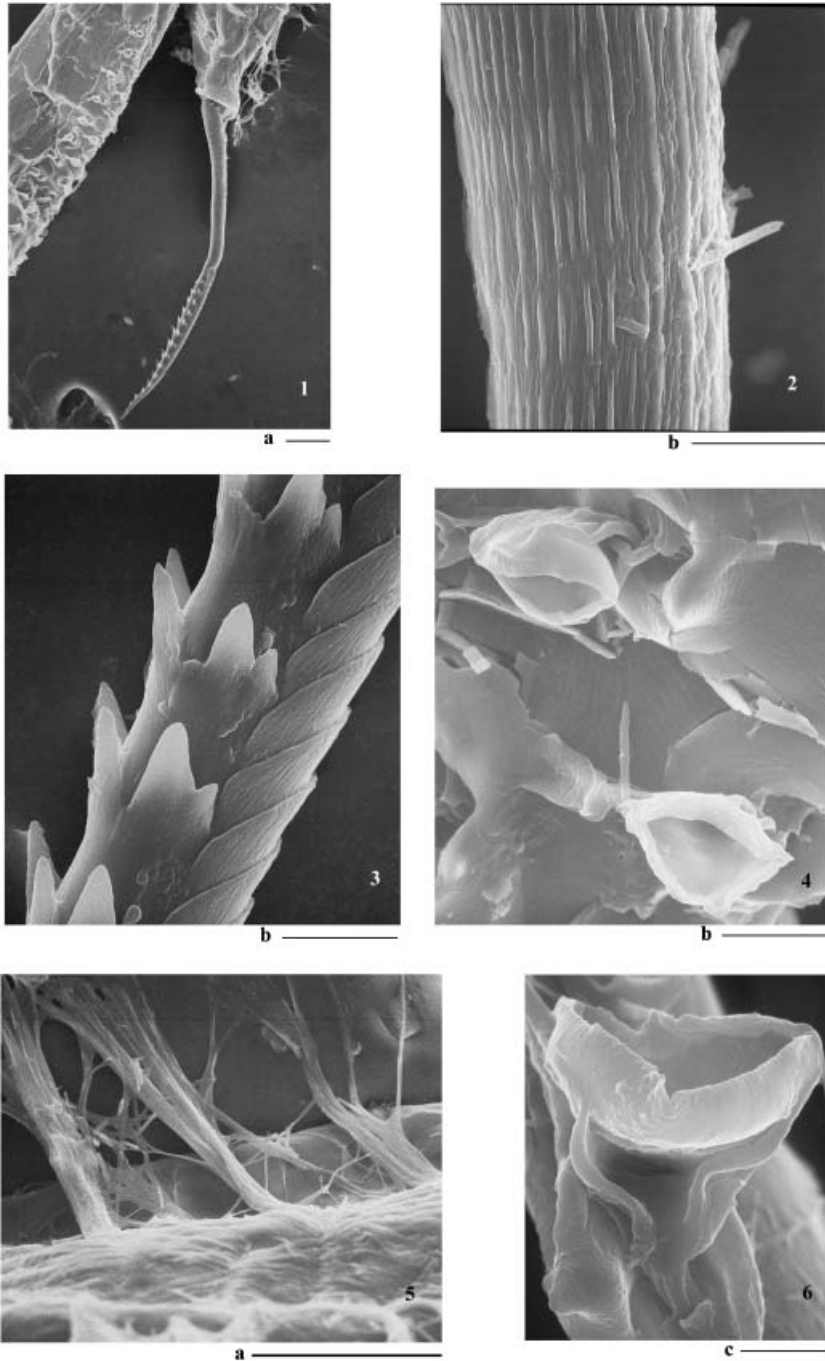


Figure 5. *Rhachotropis licornia*, FLAME 2, PPS3-H20, holotype, 10 mm. (1) Antenna 1, spine of the infero distal corner, article 1 of the peduncle; (2) antenna 1, article 1, shaft of the spine; (3) antenna 1, article 1, scales hook-shaped in the half distal part of the spine; (4) antenna 1, calceoli of article 2; (5) antenna 2, setae tufts of the anterior margin of article 4; (6) antenna 2, calceolus of article 5. Scale bars: 100 μm (a); 20 μm (b); 10 μm (c).

palm. Gnathopod 2 basis weakly setose on the anterodistal part, ischium and merus short, carpus lobate posteriorly, lobe extended, propodus less wide than gnathopod 1, length/breadth ratio 2:1, palm fringed with numerous short setae, palm delimited by a tuft of spines, dactylus as long as palm.

Pereopods 3–4 slender and elongate, each article except ischium long and slender. Pereopod 5 basis lobate, anterior edge rounded and fringed with small spines, ischium short, carpus, propodus, and dactylus elongate. Pereopod 6 basis distally lobate, lobe reaching merus, ischium short, merus, carpus, propodus, and dactylus slender and elongate. Pereopod 7 basis distally lobate, lobe triangular, reaching anterior third of the merus, ischium short, merus, carpus elongate, propodus broken.

Epimeral plates rounded. Uropod 1 peduncle long and spinose, rami short, outer ramus/inner ramus ratio 1:2, inner ramus fringed with small spines, outer ramus with one small spine. Uropod 2 peduncle slightly shorter than inner ramus, outer ramus shorter than inner ramus, peduncle and rami bear short spines. Uropod 3 peduncle short, rami subequal and foliaceous. Telson long and tapered, deeply cleft.

Remarks

This species is characterized by the long spine at the inferodistal corner of article 1 of antenna 1. This long curved spine is fluted on the proximal surface and is scaly and hooked on the distal part. Article 2 of antenna 1 bears two rows of calceoli on the inferior edge in front of the spine of the first article.

The hypothesis of sonar or sound receptor function for the calceoli put forward by Lincoln and Hurley (1981), based on the radar reflector form of the calceoli, may be reinforced by the presence in *Rachotropis licornia* of the spine-bearing scales, similar to a vibrator positioned in front of the double rows of calceoli on article 2.

Etymology

The name is suggested by the spine of antenna 1, with a strange morphology resembling the horn of the mythological Licorne.

Relationship

A similar antenna 1 has not been described before. This species, with a smooth body, lacking a rostrum, with a long deeply cleft telson, is assigned to the complex *Rachotropis* genus but it perhaps represents a new genus.

Distribution and habitat

Mid-Atlantic Ridge, Central Atlantic Ocean. This species was sampled in a sediment trap deployed 2000 m of the vent site Rainbow, at 300 m above the bottom. Thus, it is considered to be a bathypelagic species.

***Rachotropis pilosa* n. sp.**

(Figures 6–8)

Type locality

Mid-Atlantic Ridge, vent area Lucky Strike, site Sintra, 37°17.50'N, 32°16.47'W, 1630 m.

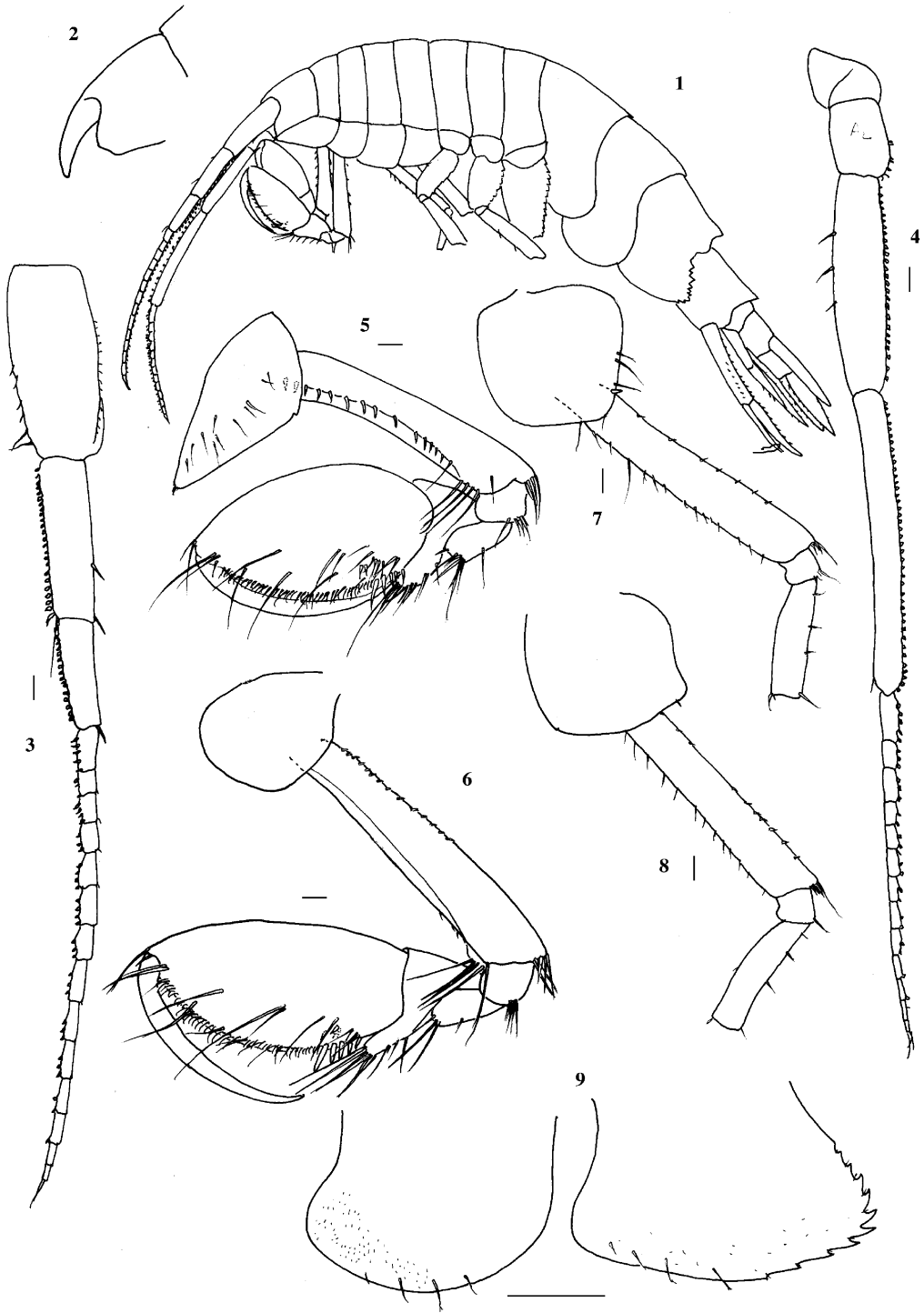


Figure 6. *Rhachotropis pilosa*, DIVA 2, Lucky Strike, Sintra, holotype female, 10 mm. (1) Habitus; (2) head with rostrum; (3) antenna 1; (4) antenna 2; (5) gnathopod 1; (6) gnathopod 2; (7) pereopod 3; (8) pereopod 4; (9) epimeral plates 2-3. Scale bars: 100 μ m.

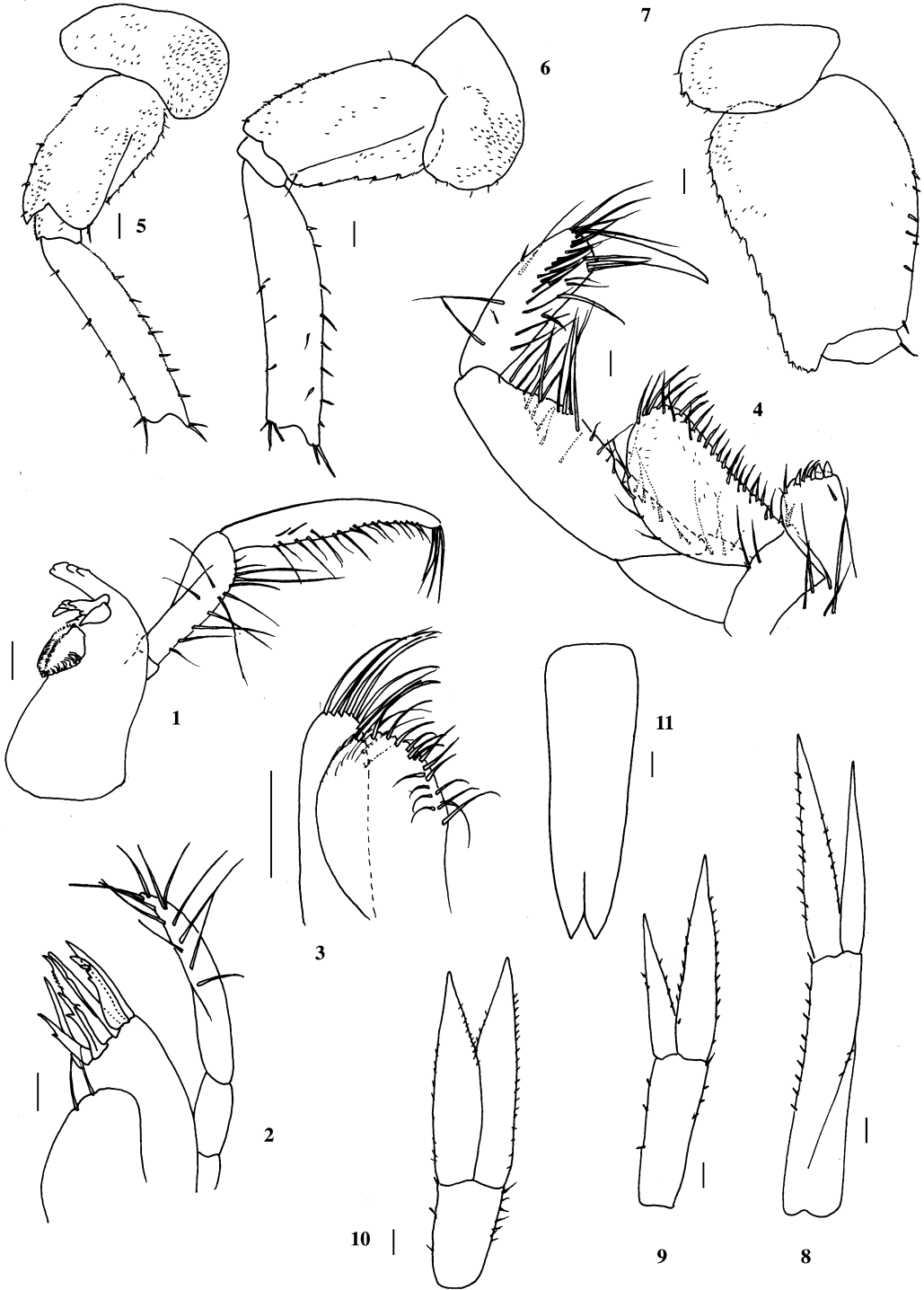


Figure 7. *Rhachotropis pilosa*, DIVA 2, Lucky Strike, Sintra, holotype female, 10 mm. (1) Mandible; (2) maxilla 1; (3) maxilla 2; (4) maxilliped; (5) pereopod 5; (6) pereopod 6; (7) pereopod 7; (8) uropod 1; (9) uropod 2; (10) uropod 3; (11) telson. Scale bars: 100 μ m.

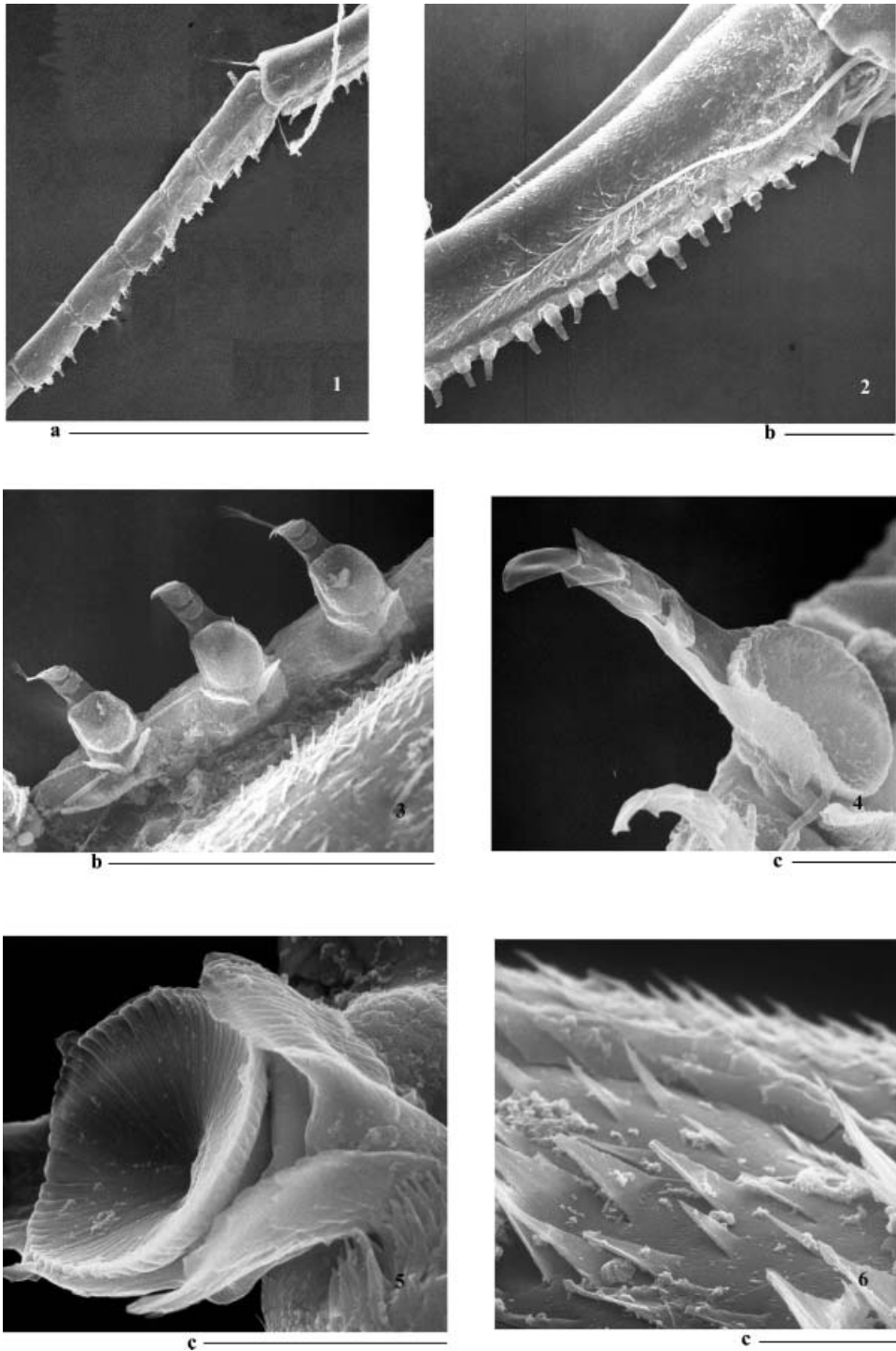


Figure 8. *Rhachotropis pilosa*, DIVA 2, Lucky Strike, Sintra, holotype female, 10 mm. (1) Antenna 1, flagellum; (2) antenna 1, article 3 of peduncle; (3) antenna 1, calceoli of article 3 of peduncle; (4, 5) antenna 1, calceoli; (6) surface of antenna 1. Scale bars: 1 mm (a); 100 μ m (b); 10 μ m (c).

Material examined

One female, holotype, 10 mm length. DIVA 2 cruise, sediment trap “Mooring S” deposited 4 June to 1 July 1994, 1.5 m above the bottom, MNHN-Am7455.

Diagnosis

Body smooth except for segment 3 of the pleon which has a small median process. Head with a long rostrum. Eyes absent. Antenna 1 with accessory flagellum not visible. Gnathopods subchelate. Telson long, cleft for one-fifth of the length, each lobe with a pointed tip.

Description

Female with oostegites, length 10 mm.

Body smooth except segment 3 of the pleon with a small median process. First urosomite with a small distal dorsal process. Head with a long rostrum, rostrum/head ratio 1.7:2. Eyes absent. Antennae approximately equal, slightly longer than half of body length. Antenna 1 with the three first articles of decreasing size ratio 6/5/3.5, accessory flagellum not visible, flagellum with 14 articles. Antenna 2 article 5 longer than article 4, ratio 9.5:7, flagellum with 14 articles. Numerous calceoli well developed on the two antennae. Mandible incisor process denticulate, lacinia mobilis denticulate, molar process well developed, palp triarticulate, article 1 short, article 3 longer than 2, ending with four long setae. Maxilla 1 inner plate shorter than outer with two subterminal setae, outer plate with seven large indented spines, palp biarticulate. Maxilla 2 inner plate shorter and broader than outer, both largely setose. Maxilliped inner plate short with four distal spines and four setae, outer plate broad with a row of setae along the inner side, scattered setae on the outer side, palp long.

Coxa 1 produced anteriorly with one small seta at the antero-distal corner, postero-distal corner notched, small setae on the surface. Coxae 2 and 3 rounded. Coxa 4 with a small hump at the postero-distal corner.

Gnathopods subchelate. Gnathopod 1 basis with a row of small spines anteriorly, long setae distally, carpus narrow but lobate, lobe fringed with setae, some of them are spinose; propodus oval, palm rounded, fringed with small setae and limited by a group of spines; dactylus long as palm, curved. Gnathopod 2 similar to gnathopod 1 but propodus narrower and longer than gnathopod 1. Pereopods 3 and 4 basis long, fringed on both sides by small setae, ischium short, carpus broken. Pereopods 5–7 broken in part. Coxae 5–7 in part covered with small “hairs” which are in fact greatly enlarged (Figure 8) triangular expansions of the cuticle; coxae 5 and 6 bilobate, lobes equal in coxa 5, asymmetric, with the posterior lobe largest in coxa 6; coxa 7 oval, indented posteriorly with four small setae. Pereopod 5 basis and ischium covered with small “hairs”, slightly lobate posteriorly, carpus broken. Pereopod 6 basis covered with small “hairs”, slightly lobate posteriorly, posterior edge indented, carpus broken. Pereopod 7 basis widely lobate, posteriorly finely indented, each indentation with a small seta, distal lobe exceeds ischium, merus broken.

Epimeral plates 1 and 2 rounded, 3 indented at the posterior edge, the distal edge is indented in the distal half, and smooth with four setae in the proximal half edge, the three plates are in part covered with small “hairs”. Uropod 1 peduncle longer than unequal rami, inner ramus fringed with small setae, outer ramus smooth. Uropod 2 peduncle short, rami unequal, fringed with small setae. Uropod 3 peduncle short, rami subequal lanceolate,

fringed with small setae. Telson long, length/breadth ratio 9:2.8, cleft for one-fifth of the length, each lobe ending with a pointed tip.

Etymology

The name of the species is derived from its particular “haired” cuticle.

Remarks

The antennae of this species bears at the inferior edge of antenna 1, and superior edge of antenna 2, rows of calceoli. The type of these calceoli is complex with a large stalk, a basal receptacle in two petals, a proximal element concave, with radii protuberant, a distal element long as a tongue with four petals. These calceoli measure 12 µm for the proximal element diameter and 40 µm for the total calceolus.

Relationship

Rhachotropis pilosa has a certain number of particular characteristics unique for this species: a long rostrum, blind, subchelate gnathopods and little different in size, only segment 3 of pleon with a short median process, segment 1 of urosome with a short distal process, epimeral plate 3 indentate, telson long and slightly cleft.

In the 22 species of *Rhachotropis* found in the Atlantic Ocean, four species have a long rostrum and are blind: *Rhachotropis distincta* (Holmes, 1908), *R. faeroensis* Stephensen, 1944, *R. proxima* Chevreux, 1911, and *R. rostrata* Bonnier, 1896. *Rhachotropis distincta* has a rounded rostrum and the four segments of pereon with a dorsal carina produced into a sharp tooth. *Rhachotropis faeroensis* has “three metasome segments and first urosome segment each with a median tooth, second metasome segment besides with two pairs of very small dorso lateral tooth” (Stephensen 1944). *Rhachotropis proxima* has a very long rostrum, strongly curved, reaching the end of the first article of the antenna 1 peduncle, lateral lobes long and narrow; mesosome and first segment of urosome with a carina prolonged in a median tooth with two lateral teeth on the two first segments, the third bearing a large tooth, the first urosomite a small median tooth. *Rhachotropis rostrata* has a “rostrum reaching two third length of first joint of antenna 1”, pleon segment 1 slightly carinate behind, without carinate, segments 2, 3, and 4 tricarinate, ending obtusely on segment 3, the central produced into a tooth on segment 4.

Distribution and habitat

Central Atlantic Ocean, Mid-Atlantic Ridge, Lucky Strike, at the foot of the vent chimney Sintra, near the bottom but in a small trap not in sediment, this species is probably also bathypelagic.

Comments

The genus *Rhachotropis* consists of 47 species of which 26 are known from the Atlantic Ocean. Three new species are described from the Mid-Atlantic Ridge zone.

A certain number of species have been described with calceoli on antennae 1 and/or 2, in the female only or in both sexes. *Rhachotropis calceolata* is described with “strong antennal calceolation”.

Lincoln and Hurley (1981) pointed out that the Eusiridae have remarkable calceoli with a “distinct separation of the proximal and distal elements and the remarkable cup-shaped configuration of the former. The proximal cup is robust, deeply concave, often set well apart from the distal element and is attached to the receptacle only by a small basal connection”. They figure *Rhachotropis aculeata*, *R. helleri*, and *R. macropus*. The diameter of the cups of these species is: *Rhachotropis aculeata* 45–70 µm, *R. helleri* 23–27 µm, and *R. macropus* 23–30 µm. We have not observed calceoli in *Rhachotropis flamina* but *R. licornia* has calceoli of 25–30 µm (Figure 5) and *R. pilosa* of about 40 µm (Figure 8).

The genus *Rhachotropis* is very heterogeneous, it possesses a short or long rostrum, the eyes are large or absent, the pereon, pleon, and urosome are smooth or dentate, the pereopods have the basis lobate or not, coxa 1 is quadrate or anteriorly lobate, epimeral plate 3 is smooth or denticulate, and the telson long or short, entire, emarginate, or cleft. *Rhachotropis* has been considered a genus by the combination of the different characters. We have made a phylogenetic analysis considering 38 characters; this study has not given a parsimonious tree and a coherent consensus tree was impossible to compute.

A key for Atlantic species except *Rhachotropis anocolata* J. L. Barnard, 1962, *Rhachotropis anomala* K. H. Barnard, 1916, and *Rhachotropis paeneglaber* K. H. Barnard, 1916, for which there is insufficient description, is proposed.

Key to Atlantic *Rhachotropis*

- 1. Telson entire 2
- Telson cleft or emarginate 4
- 2. Eyes present *R. integricauda*
- Eyes absent 3
- 3. Pleon, segments 1 and 2 with dorsal tooth only *R. caeca*
- Pleon, segments 1 and 2 with lateral tooth only *R. flamina* n. sp.
- 4. Rostrum long or medium 5
- Rostrum short 14
- 5. Eyes present 6
- Eyes absent 10
- 6. Telson emarginated 7
- Telson cleft 8
- 7. Pereon, segment 7 and pleon segments 1-3 with median dorsal tooth *R. proxima*
- Pereon, segment 7 and pleon segments 1-3 smooth smooth *R. glabra*
- 8. Epimeral, plate 3 hardly denticulate 9
- Epimeral, plate 3 not hardly denticulate *R. inermis*
- 9. Pereon, segments 6-7 with acute dorsal processes *R. aculeata*
- Pereon, segment 6 smooth, segment 7 with a posterodorsal mucronation *R. oculata*
- 10. Epimeral, plate 3 hardly denticulate 11
- Epimeral, plate 3 weakly denticulate 12

11. Pleon, segments 1-2 armed	<i>R. rostrata</i>
– Pleon, segments 1-2 not armed	<i>R. pilosa</i> n. sp.
12. Pleon, segment 1 with one dorsal and two lateral teeth	<i>R. proxima</i>
– Pleon, segment 1 smooth	13
13. P7 basis lobate, “accessory flagellum could not be found”	<i>R. faeroensis</i>
– P7 basis not lobate, accessory flagellum present but minute	<i>R. distincta</i>
14. A1, article 1 with a terminal spine	<i>R. licornia</i> n. sp.
– A1, article 1 without terminal spine	15
15. Eyes present	16
– Eyes absent	21
16. Eyes yellowish white	<i>R. leucophthalma</i>
– Eyes not white	17
17. Eyes reduced in size	<i>R. lomonosovi</i>
– Eyes large	18
18. Pleon, segment 3, dorsally rounded without tooth	<i>R. inflate</i>
– Pleon segment 3 with dorsal tooth	19
19. Pereon, segments 1-3 “raised dorsally” (Sars dixit)	<i>R. helleri</i>
– Pereon, segments 1-3 not (raised dorsally)	20
20. Urosome, segment 1 smooth	<i>R. grimaldii</i>
– Urosome, segment 1 with a tooth	<i>R. macropus</i>
21. P5-7 basis expanded in an acute projection	<i>R. palporum</i>
– P5-7 basis not expanded in an acute projection	22
22. Telson cleft for one-third length	23
– Telson emarginate	24
23. Urosome, segment 1 weakly carinate. Coxa 1 strongly produced	<i>R. thordisae</i>
– Urosome, segment 1 without carina. Coxa 1 weakly produced	<i>R. gislui</i>
24. Urosome, segment 1 without tooth	<i>R. portoricana</i>
– Urosome, segment 1 with dorsal tooth	25
25. Pleon, segments 1-2 weakly tridentate dorsally	<i>R. thorkelli</i>
– Pleon, segments 1-2 slightly humped with low dorsal tooth	<i>R. arii</i>

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