JOURNAL OF CRUSTACEAN BIOLOGY, 21(2): 475–483, 2001

ACANTHONOTOZOMELLA RAUSCHERTI (AMPHIPODA, ACANTHONOTOZOMELLIDAE), A NEW SPECIES FROM THE ANTARCTIC OCEAN

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A B S T R A C T

A new species of amphipod crustacean (Acanthonotozomellidae) from the deep-sea of the Drake Passage is described in detail. Its main characteristics that are unique for this species are: slender dorsal carinae on pereon on pleon; small cuticular teeth all over the dorsal surface, the carinae and the coxal plates; coxa 1 with deeply excavate apex.

During cruise 48 (ANT XV/3) of RV "Polarstern" to the Antarctic Peninsula 1998, large quantities of crustaceans were collected by Dr. Martin Rauschert. In one of these samples from the deep-sea of the Drake Passage there was an interesting amphipod species that had never appeared in previous benthic collections from this region. It proved to be new to science and is described in detail herein. The material is deposited in the crustacean collection of the Museum für Naturkunde Berlin.

MATERIALS AND METHODS

The animals were fixed in 70% ethanol, transferred into glycerol for the study, and drawn with a camera lucida on a Leica Wild M8 dissecting microscope. The specimens were dissected, and appendages and mouthparts were transferred onto slides in glycerol and drawn under a Leica DMLB light microscope using a camera lucida.

SYSTEMATICS

Genus *Acanthonotozomella*

Acanthonotozomella Schellenberg, 1926: p. 332.
Paracanthonotozoma Bellan-Santini, 1972: p. 177, Fig. 6 (*Paracanthonotozoma trispinosum*).

Type-species.—Acanthonotozomella alata Schellenberg, 1926: p. 332.

Diagnosis (emended after Barnard and Karaman, 1991).—Body covered with teeth. Antenna 1: peduncular article 2 shorter than 1. Mouthparts projecting conically. Labrum incised, not very broad. Mandibular incisor ordinary, toothed; raker row long; molar broad, blunt, simple. Lower lip (hypopharynx): inner lobes absent. Maxilla 1: palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxilliped: inner plate almost as long but not as broad as outer plate; palp article 2 narrow, not produced; palp article 4 well developed. Coxa 2 short; coxa 4 long, weakly bicuspidate. Pereiopods 1 and 2 alike, articles 5–6 elongate, narrow; both gnathopods simple. Telson broad, entire or weakly excavate.

Key to the Acanthonotozomellidae

1. Body processes bluntly rounded . . . . . *Acanthonotozomopsis* Watling and Holman, 1980
– Body processes acute or formed into distinct dorsal carinae 2
2. Article 2 of maxillipedal palp medially produced . . . . . *Acanthonotozomoides* Schellenberg, 1931
– Article 2 of maxillipedal palp not produced 3
3. Pereionite 1 with 1 dorsal carina. . . . . *Acanthonotozomella* Schellenberg, 1926
– Pereionite 1 with 2 dorsal carinae . . . . . *Amatiguakius* Coleman and Barnard, 1991 (north Pacific genus)

Key to the Species of *Acanthonotozomella*

1. Dorsal surface with small teeth 2
– Dorsal cuticle with carinae, but small teeth lacking 3
2. Coxae smooth . . . . . *A. barnardi* Watling and Holman, 1980
– Coxae covered with small teeth . . . . . *A. rauscherti* new species
3. Coxa 1 and 3 with truncate apex . . . . . *A. alata* Schellenberg, 1926
– Coxa 1 and 3 with excavate apex . . . . . *A. trispinosum* (Bellan-Santini, 1972)

Acanthonotozomella rauscherti, new species
Figs. 1–5

Material Examined.—Holotype: mature male (11 mm) (ZMB 27279, microscopic slide No. 4592), *Locus typicus*: "Polarstern" cruise 48 ANT XV/3, station 336, Drake

Passage, 62°21.9528′S 58°41.1854′W, depth 1,000 m, gear: mini-dredge, mesh size 1 mm, leg. Rauschert, 19.III.1998. Paratypes: 2 juveniles: (a: 5 mm), body with few teeth on body surface and (b: 7 mm) with many short teeth; collection data as for holotype.

Etymology.—The species is dedicated to our dear colleague Dr. Martin Rauschert, who collected these animals.

Description.—Head slightly longer than pereionite 1, with middorsal keel; rostrum only weakly downturned; lateral margins of rostrum and of anterior head margin slightly upturned; eyes colourless in alcohol, more than two times higher than wide.

Pereionites 1–7 with narrow dorsal, slightly posteriorly curved carinae, those of pereionites 1–5 about the same length, on pereionites 5–6 longer and more directed posteriorly. Additional lateral wing-like processes on pereionites narrow, slightly curved posteriorly.

Pleonites 1–3 with dorsal carinae, those of pleonites 1–2 similar in shape and length to that of pereionite 7, rather straight and longer than on pereionites 1–6. Dorsal process on pleonite 3 shorter, wider. Epimera 1–3 (Fig. 1e) with long, pointed posterolateral processes, posteroventral angle of epimeral plate 1 tapering distally, rounded, that of plates 2 and 3 pointed. Urosomite 1 with short dorsal process, urosomite 2 shortest; urosomite 3 posteriorly excavate, posterodorsally angular.

Pereionites, pleonites, urosomite 1, and coxae covered with irregular rows of short teeth. Specimen b, however, with fewer teeth on dorsal surface; only 1 row on pereionites 1–6, 2 on pereionite 7; irregular dentition on pleonites, no teeth on lateral wings of pereionites and also wanting on coxae.

Antenna 1 (Fig. 1b) peduncular article 1 longest, expanded, distally ending in 1 short and 1 long, pointed process; article 2 running out into 1 long pointed process; article 3 shorter than 2; 10 flagellar articles present, first of which has 3 groups of setae and long aesthetascs.

Antenna 2 (Fig. 3c) articles 1 and 2 of peduncle partially fused; article 3 slightly expanded distally, with 3 short processes; article 4 about the length of articles 1–3 combined, with short process distally; article 5 longest, narrow; flagellum of 10 articles.

Labrum (Fig. 3b) wider than long, apically rounded with shallow notch.

Mandible (Fig. 2a–c): mandibular body slender, pars molaris absent, setal row consisting of serrate setae (detail of Fig. 2a), incisor dentate, left lacinia mobilis dentate and wide; right lacinia mobilis spine-like (Fig. 2b); palp article 1 stout, article 2 longest, with long setae (Fig. 2c), article 3 slender, curved ventrally.

Lower lip (hypopharynx) (Fig. 1c): hypopharyngeal process rather wide; lobe with mediodistal acute process.

Maxilla 1 (Fig. 1d): inner lobe narrow, with 6 short setae; outer lobe oblique, with 13 medially serrate setae; palp 2-articulate, 2nd article about twice as long as article 1, with some stout setae apically.

Maxilla 2 (Fig. 2f) outer plate slightly wider than inner, long apical setae apicomedially denticulate.

Maxillipeds (Fig. 2d, e): inner plate narrow, with short apical setae and with row of setae along medial anterior margin; outer plate with few relatively short setae on distal and medial margin; palp 4-articulate, slender, with few setae, distal margin of article 2 slightly surpassing outer plate.

Pereiopod 1 (Figs. 2g, 3a) coxa deeply excavate anteriorly, weakly convex posteriorly, apex deeply excavate; basis curved anteriorly, with long setae on posterior margin and anteroproximally; ischium shortest; merus oblique, expanded distally; carpus subrectangular, with long setae posteromarginally; propodus 67% length of carpus, with long setation on posterior margin, posterodistal margin serrate, palm lacking; dactylus with 3 pointed processes on posterior margin (Fig. 2g).

Pereiopod 2 (Fig. 3d, e) coxa excavate anteriorly, weakly convex posteriorly, apex subacutely pointed, with dentate ridge on lateral face; basis elongate, slightly curved anteriorly, with long setae on posterior margin; ischium shortest; merus oblique, expanded distally; carpus subrectangular, with long setae posteromarginally; propodus 62% length of carpus, with long setation on posterior margin, posterodistal margin serrate, palm lacking; dactylus with 3 pointed processes on posterior margin (Fig. 3e).

Pereiopod 3 (Fig. 4c) coxa of similar shape as coxa 2, but slightly longer and wider; basis shorter than coxa, weakly expanded distally; ischium shortest, with anteroproximal notch; merus expanded distally, drawn out into process anteriorly; slightly excavate posteriorly, convex anteriorly.

Pereiopod 4 (Fig. 4b) coxa about same

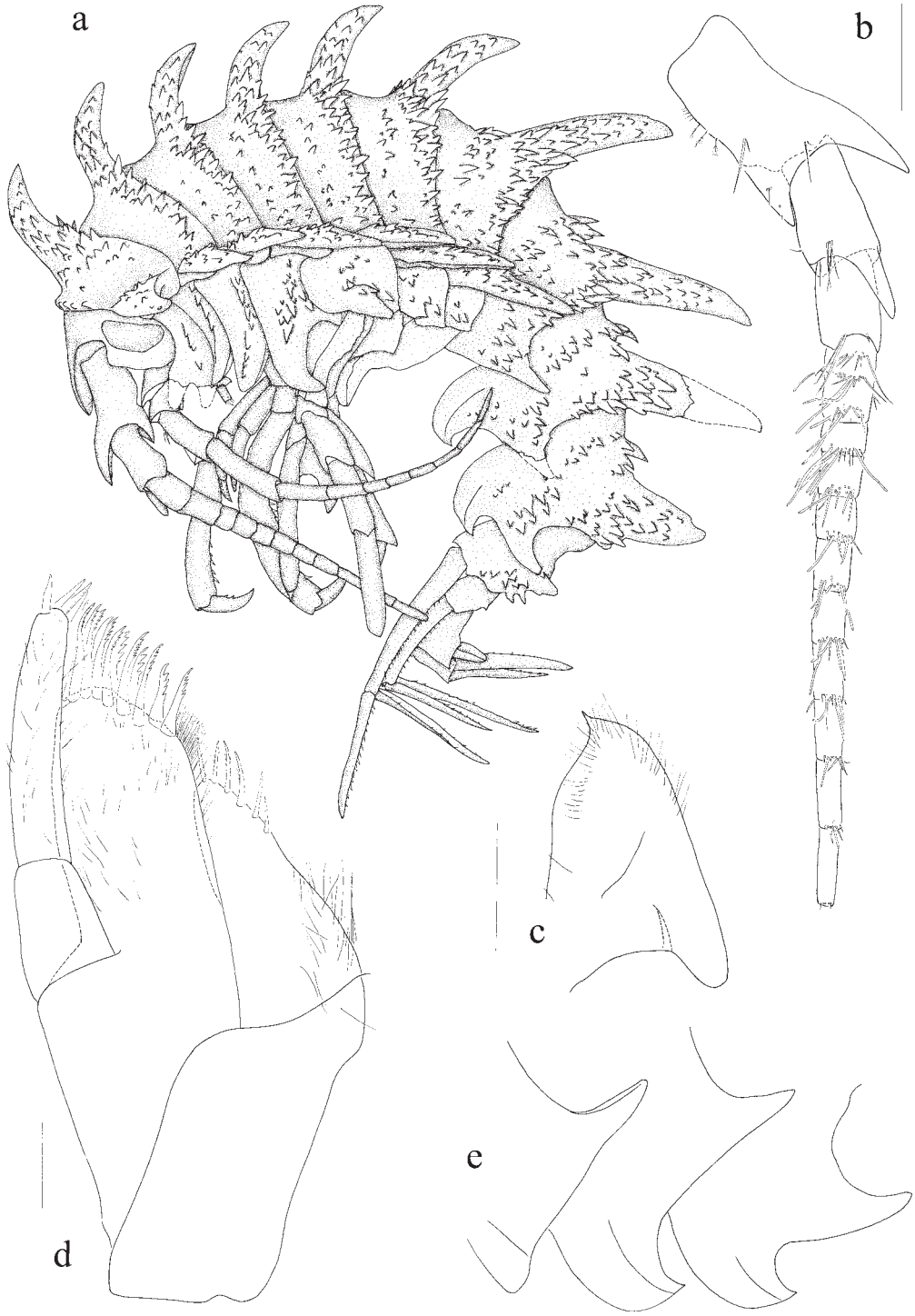

Fig. 1. *Acanthonotozomella rauscherti*, new species, holotype male, 11 mm. a, left side habitus; b, antenna 1; c, hypopharynx, damaged; d, maxilla 1; e, epimeral plates 1–3, from left to right. Scales = a: 1 mm; b, c: 500 µm; d: 200 µm.

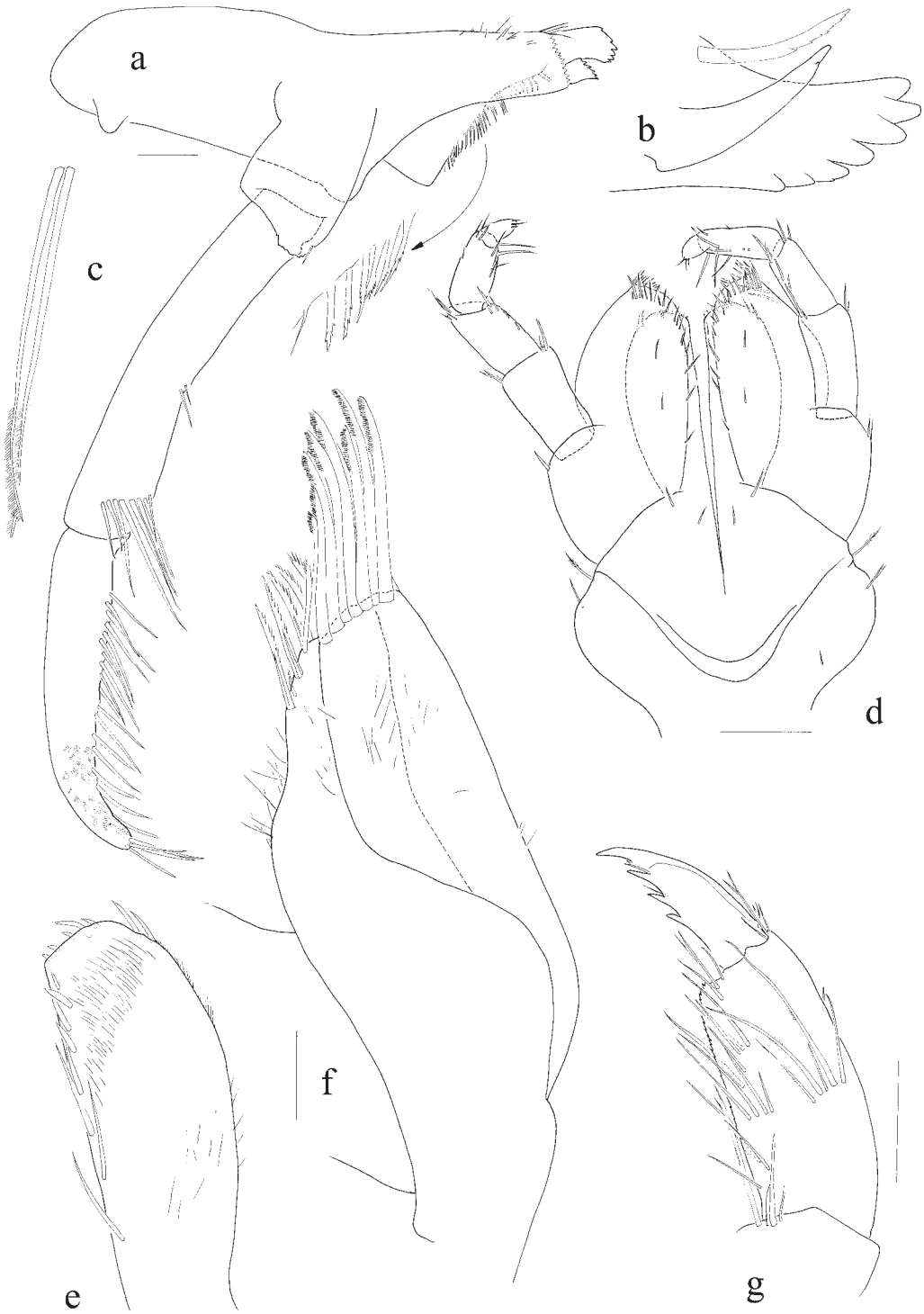

Fig. 2. *Acanthonotozomella rauscherti*, new species, holotype male, 11 mm. a, left mandible, incisor region damaged, palp article 3 with exemplary microtrichs covering the lateral face; b, right incisor region with lacinia mobilis; c, apical setae of second palp article; d, maxillipeds, posterior aspect; e, inner plate of maxilliped, anterior aspect; f, maxilla 2; g, propodus and dactylus of pereiopod 1. Scales = a: 100 µm; d: 200 µm; f, g: 100 µm.

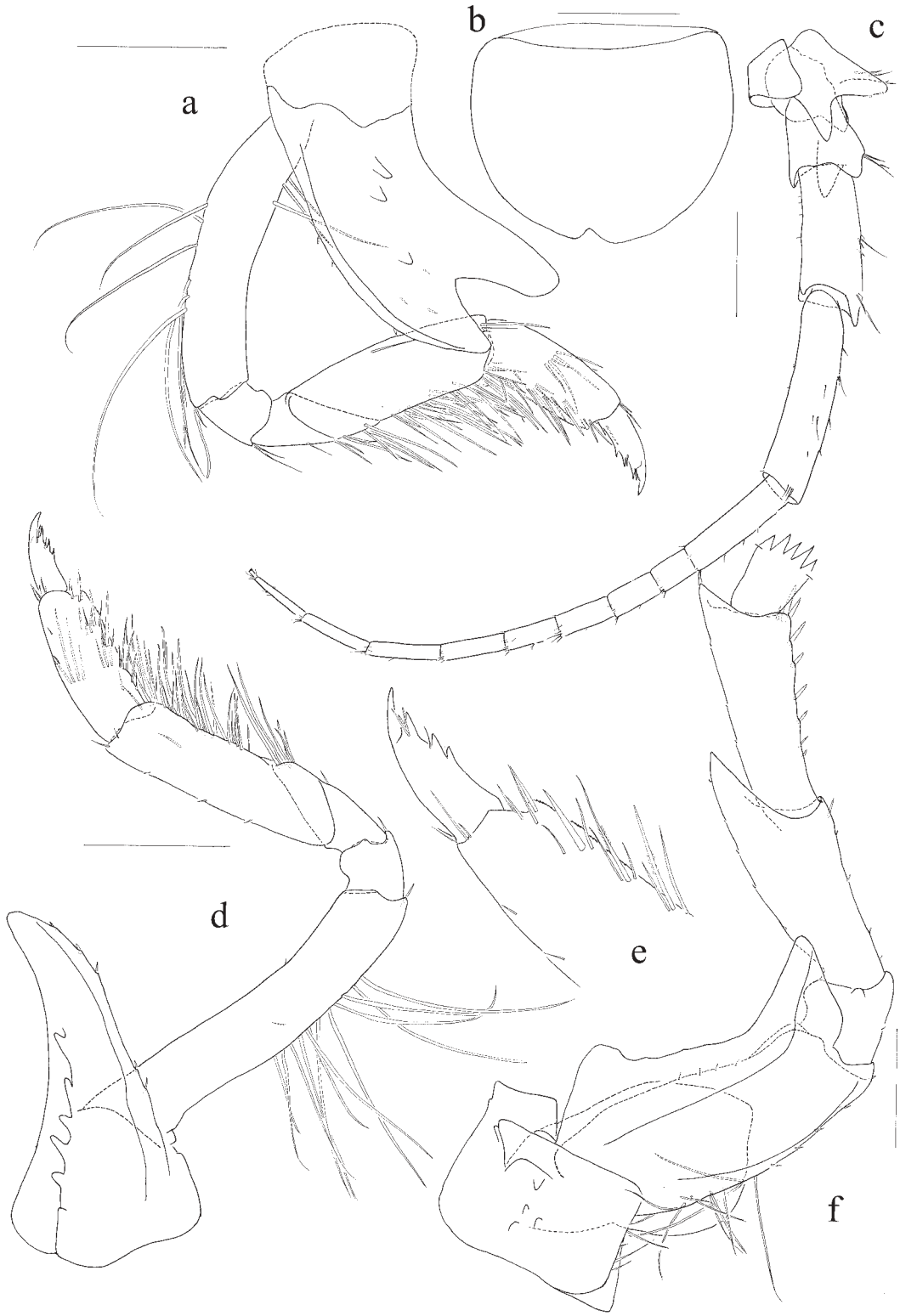

Fig. 3. *Acanthonotozomella rauscherti*, new species, holotype male, 11 mm. a, pereiopod 1, basal part of coxa damaged; b, labrum; c, antenna 2; d, pereiopod 2; e, propodus and dactylus of pereiopod 2; f, pereiopod 6, propodus and dactylus missing. Scales = a: 500 μm, b: 200 μm, c–e: 500 μm.

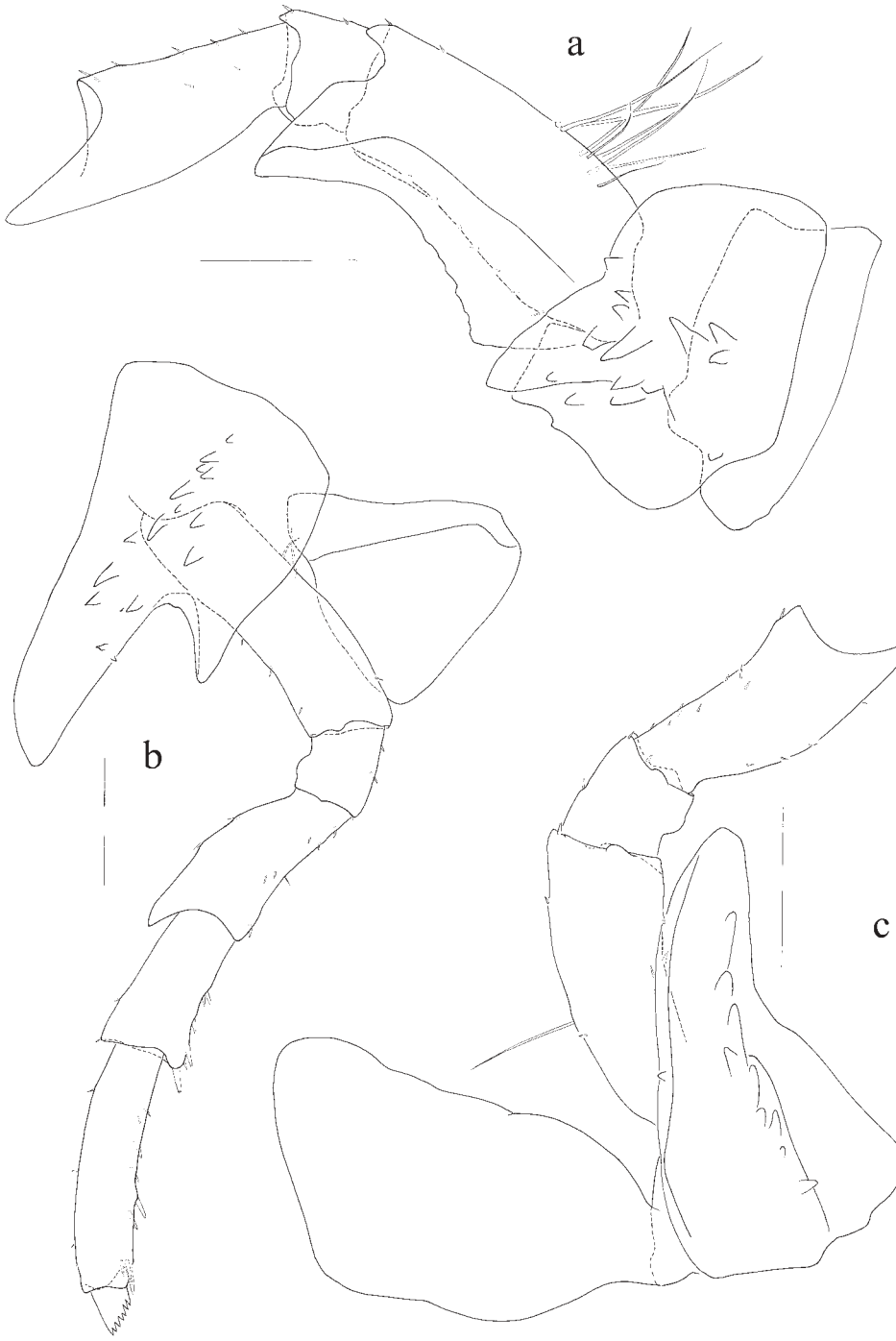

Fig. 4. *Acanthonotozomella rauscherti,* new species, holotype male, 11 mm. a, pereiopod 5, carpus to propodus missing; b, pereiopod 4, dactylus damaged; c, pereiopod 3, carpus to propodus missing. Scales = a–c: 500 µm.

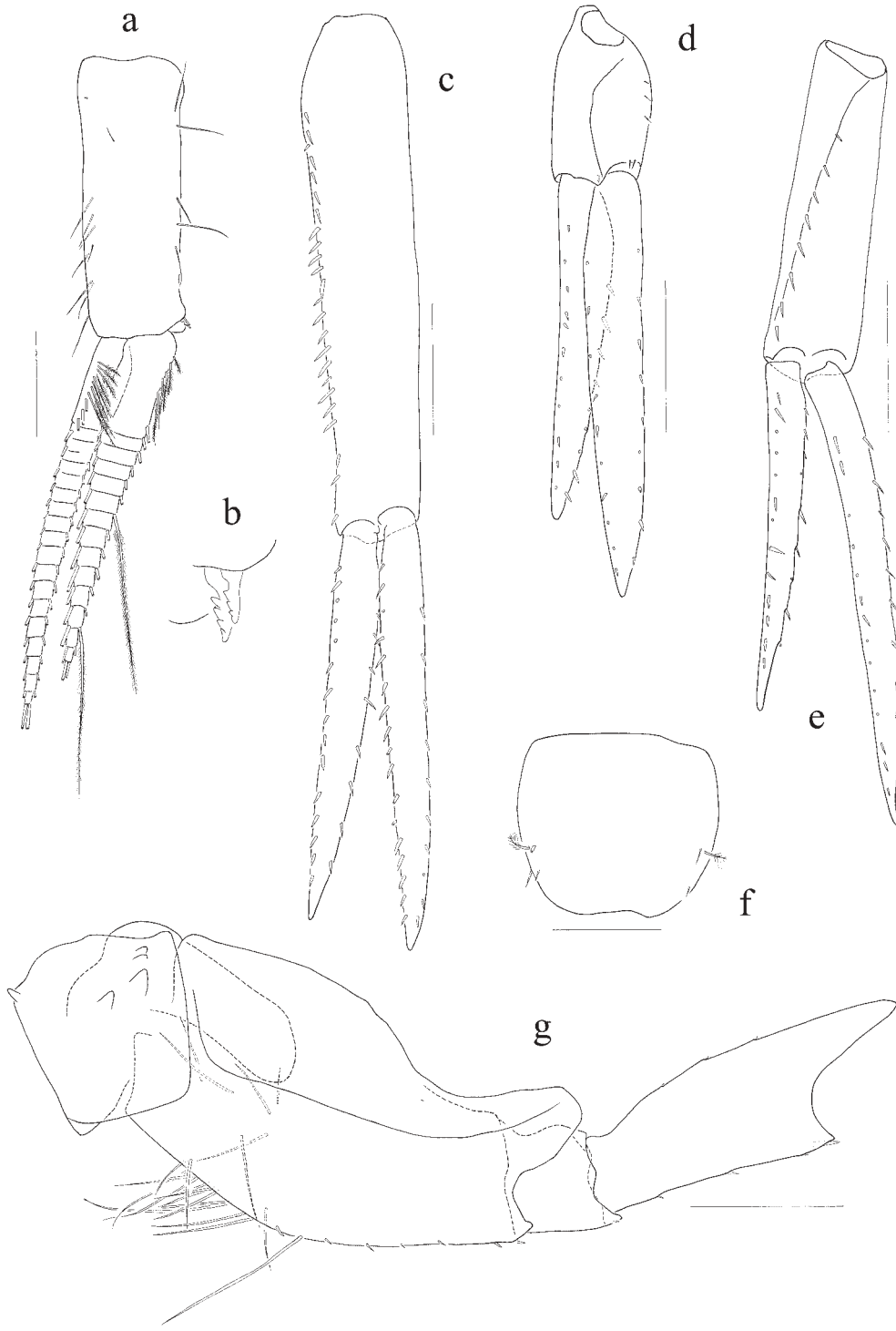

Fig. 5. *Acanthonotozomella rauscherti*, new species, holotype male, 11 mm. a, pleopod 1; b, coupling hooks of pleopod 1; c, uropod 1; d, uropod 3; e, uropod 2; f, telson; g, pereiopod 7, carpus to propodus missing. Scales = a–e, g: 500 μm, f: 250 μm.

Table 1. Differences between *A. rauscherti* n. sp. and *A. barnardi.*

	A. rauscherti	*A. barnardi*
dorsal carinae	narrow, upright, long	on pereionite 1 wide and short, on other segments short and strongly curved posteriorly
teeth on dorsal body surface	dense, also carinae covered with teeth laterally	sparse, not on carinae
teeth on lateral face of coxae	present	absent
peduncular articles 1–2 of antenna 1	with long processes distally	without processes
coxa 1 apex	deeply excavate	rounded
coxa 2 apex	acute	truncate
coxa 3 apex	subacute	truncate
posteroventral corner of epimera 2–3	produced and pointed	angular
posterior margin of pereiopod 5 basis	excavate	straight
posterior margin of pereiopod 6 basis	deeply excavate, with proximal rounded lobe and posteroventral acute process	only weakly excavate, posteroventrally rounded

width as coxa 3 proximally, anterior margin weakly sinuous, apex subacute; posteromarginal process directed ventrally; basis shorter than coxa, subrectangular; ischium shortest; merus weakly expanded distally, anterodistal angle acutely drawn out; carpus weakly shorter than merus, expanded distally, with short, stout setae posteromarginally; propodus slender, with similar posteromarginal setation as carpus; dactylus missing.

Pereiopod 5 (Fig. 4a) coxa wider than long, convexly rounded anteriorly, lobate posteriorly, with stout process directing posteroventrally; basis with group of long setae anteromarginally, posterior margin excavate (proximal and posteroventral processes); ischium shortest, with short point anterodistally; merus expanded distally, drawn out into long process posterodistally; carpus to dactylus missing.

Pereiopod 6 (Fig. 3f) coxa wider than long, acute anteriorly and posteriorly; coxal face with 1 stout process and additional small teeth; basis to merus of similar shape to pereiopod 5; carpus expanded distally, anterior margin with stout setae, posterodistal angle acute but shorter than on merus; propodus and dactylus missing.

Pereiopod 7 (Fig. 5g) coxa subquadrate, with subacute posteroventral angle; basis anteromarginally convex, with long setae proximally, posterior margin sinuous, excavation on distal half, posteroventral angle subacute; ischium and merus as for pereiopod 5.

Pleopod 1 (Fig. 5a) length of peduncle 3 × width; coupling hooks with some lateral teeth (Fig. 5b); inner ramus shortened.

Uropod 1 (Fig. 5c) peduncle longer than rami, setation only on lateral margin; outer ramus slightly shorter than inner.

Uropod 2 (Fig. 5e) peduncle shorter than inner ramus, setation only on lateral margin; outer ramus 75% length of inner.

Uropod 3 (Fig. 5d) peduncle shortest, outer ramus 85% length of inner ramus.

Telson (Fig. 5f) wider than long, with shallow depression apically.

Remarks

The genus *Acanthonotozomella* currently consists of four species: *A. alata* Schellenberg, 1926; *A. trispinosum* (Bellan-Santini, 1972), *A. barnardi* Watling and Holman, 1980, and *A. rauscherti* n. sp.

The new species is similar to *A. barnardi* in the following characters: a single row of dorsal carinae on pereon and pleon; lateral pointed and projecting processes on pereon segments; fine teeth that cover part of the pereionites and pleonites dorsally; shape of dorsal head keel and raised lateral margins of rostrum. However, there are a number of differences between these taxa (Table 1).

The two other species from the genus *Acanthonotozomella* can easily be distinguished from the new species. *Acanthonotozomella alata* does not have any short teeth on the dorsal body cuticle, and the apices of

coxal plates 1–4 are very different: coxa 1 truncate, coxa 2 shortened considerably and rounded, coxa 3 obliquely truncate, coxa 4 only weakly excavate posteriorly. Also, *A. trispinosum* differs in many respects from the new species: it has no small teeth dorsally; coxa 1 is strongly expanded anterodistally and has a shallow apical depression; coxa 3 is similarly to coxa 1 anterodistally widened; basis, merus, and carpus of pereiopods 5–6 with acutely produced processes posteriorly.

Acknowledgements

We thank Ms. I. Kilias for her help with scientific literature.

Literature Cited

Barnard, J. L., and G. S. Karaman. 1991. The families and genera of marine gammaridean Amphipoda (except marine gammaroids).—Records of the Australian Museum Supplement 13: 1–866.

Bellan-Santini, D. 1972. Invertébrés marins des XII^{ème} et XV^{ème} expédition Antarctiques francaises en Terre Adélie. 10. Amphipodes gammariens.—Tethys Supplement 4: 157–238.

Coleman, C. O., and J. L. Barnard. 1991. *Amatiguakius forsberghi*, a new genus and species from Alaska (marine Amphipoda: Epimeriidae).—Proceedings of the Biological Society of Washington 104: 279–287.

Schellenberg, A. 1926. Die Gammariden der Deutschen Südpolar-Expedition 1901–1903, Südpolar-Expedition XVIII.—Zoologie X: 238–414.

———. 1931. Gammariden und Caprelliden des Magellangebietes, Südgeorgien und der Westantarktis.—Further Zoological Results of the Swedish Antarctic Expedition 1901–1903 2: 1–290.

Watling, L., and H. Holman. 1980. New Amphipoda from the Southern Ocean, with partial revision of the Acanthonotozomatidae and Paramphithoidae.—Proceedings of the Biological Society of Washington 93: 609–654.

Received: 29 February 2000.
Accepted: 19 October 2000.