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A New Stenothoid (Crustacea: Amphipoda: Stenothoidae) from a Shallow Water Hydroid Polyp in British Columbia, Canada

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Abstract. A new stenothoid species is described from a hydroid polyp in British Columbia, Canada. The new species is provisionally assigned to *Metopa* as *M. insolita* sp. nov., pending revision of this genus.

Introduction

During scuba diving fieldwork in British Columbia in 2012, Neil McDaniel discovered a large solitary hydroid that was later named *Zyzzyzus rubusidaeus* Brinckmann-Voss & Calder, 2013. From this polyp, McDaniel also collected a stenothoid amphipod that he sent to the current authors for study. We consider this to be an undescribed species, with an exceptionally shaped gnathopod 2. In this paper, as part of a volume dedicated to the late Jim Lowry, we describe this new species based on morphology, and place it provisionally in *Metopa*, where it rests uneasily, pending a proper revision of this clearly not monophyletic genus.

Materials and methods

The material was collected by Neil McDaniel during scuba diving at 18 m depth on a polyp of *Zyzzyzus rubusidaeus* Brinkmann-Voss & Calder, 2013. The hydroid was attached to a rock in between sponges and barnacles. The diving-location is at Kuldekduma Point, near the northern tip of Vancouver Island in British Columbia, Canada (Fig. 1A) (Brinckmann-Voss & Calder, 2013). Collected material (2 specimens) was initially preserved in formaldehyde before being transferred to ethanol and sent to the authors for identification.

The habitus photo (Fig. 1B) was produced using a Leica M205C equipped with the stacking photography suite, Leica LAS V4.13. Stack-photos were collated using Zerene Stacker v 1.04. One specimen was prepared for microscope slides using a Leica M125 dissecting microscope and mounted using Faure medium before drawing using a camera lucida. Pencil drawings were inked (Adobe CC Illustrator) following the methods described by Coleman (2003, 2009).

Type material is kept in the University Museum of Bergen Zoological collections, Norway (ZMBN).

Keywords: Amphipoda, Stenothoidae, associated species, Hydroida, morphology
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Taxonomy

Order Amphipoda Latreille, 1816

Family Stenothoidae Boeck, 1871

Genus *Metopa* Boeck, 1871

Type species. *Metopa clypeata* (Krøyer, 1842), non Stimpson, 1853 (type by subsequent designation).

Metopa insolita sp. nov.

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Figs 1B, 2–5

Holotype: ZMBN104469, male, 3 mm (four permanent slides), Kuldekduma Point, Pearse Island, British Columbia, Canada, 50°35.299'N 126°50.046'W, depth 18 m, from *Zyzzyzus rubusidaeus* on rock among barnacles and sponges, coll. Neil McDaniel, 30 March 2012. **Paratype**: ZMBN, male, 3 mm (ethanol sample), same locality and collection information as for holotype.

Description. Antenna 1 subequal in length to antenna 2, both almost half body length. Antenna 1 peduncle article 1 slightly longer than article 2, article 3 short; flagellum with 17 articles, no accessory flagellum. Antenna 2 article 4 subequal to article 5; flagellum slightly longer than peduncle article 5, with 12 articles.

Head short, cephalic lobe rounded. Eyes ⅓ of head length, round, well defined.

Mandible without molar; incisor and lacinia mobilis serrate; raker setae narrow; palp 3-articulate, article 2 long, article 3 very short with 2 long apical setae.

Maxilla 1 inner plate rounded with 1 simple seta; outer plate flat at distal margin with 1 strong smooth seta and 3 cuspidate setae; palp 1-articulate, smooth with 2 rows with total of 10 simple setae.

Maxilla 2 outer plate in riding position; inner plate with 3 and outer plate with 14 simple setae.

Maxilliped slender; inner plates separate; outer plates reduced; palp 4-articulate with long, simple setae along inner margin and very few shorter and thin setae at distal outer margins of articles 2 and 3; article 4 with short simple setae along inner margin.

Pereon smooth.

Gnathopod 1 simple; coxa short with convex distal margin; basis long, narrow, with long setae on anterior margin; ischium short; merus suboval, distally free, posterior margin with short posterior and longer distal setae; carpus elongate, long simple setae along posterior margin, 3 simple setae along distal margin and 3 long simple setae medially; propodus subequal to carpus in length and slightly narrower, with long simple setae along posterior margin; dactylus narrow and almost straight, inner margin crenulate with short simple setae.

Gnathopod 2 coxa suboval, directed forwards, covering Coxa 1, with few short simple setae along posterior margin; basis straight and narrow with short simple setae along anterior margin; ischium short; merus spoon-shaped, distal margin with short simple setae; carpus triangular, posteriorly enveloped by merus, anterior margin with stridulating ridges; propodus peculiar, roughly rectangular but with large anterior protuberance at base of dactylus, palmar corner rectangular with small tooth, palm crenulate with short simple setae, posterior margin with short setae, anterior margin with stridulating ridges proximally, short setae marginally and longer simple setae distally; dactylus longer than palm, narrow and smooth, bent back over propodus.

Pereopod 3 coxa suboval, short setae at distal margin; remainder of leg slim and simple, meral lobe almost absent; dactylus half propodus length.

Pereopod 4 coxa rounded triangulate, distal margin evenly rounded and slightly thickened; remainder of leg slim but less than that of pereopod 3, with shorter and broader articles; meral lobe ¼ length of carpus.

Pereopod 5 coxa with rounded posterior lobe; basis rectilinear; remainder of leg slim with simple setae along anterior margin; meral lobe less than ¼ of carpus; dactylus slightly longer than half propodus.

Pereopod 6 coxa small with subacute posterior lobe; basis twice as long as broad, subrectangular, with posterior margin slightly concave, small posterodistal crenulated lobe; merus broadened, lobe ⅓ of carpus; carpus narrow; dactylus long and narrow, smooth, curved slightly at tip.

Pereopod 7 coxa small; basis broadly rounded with crenulated convex posterior margin; merus broadened, lobe ⅓ of carpus; dactylus long and narrow, smooth, curved slightly at tip.

Pleon smooth. Epimeral plates 1 and 3 posterodistal corner acute. Epimeral plate 2 posterodistal corner rounded.

Urosome smooth. Length of uropod 1 > uropod 2 > uropod 3. Uropod 1 peduncle twice length of rami. Uropod 2 outer ramus shorter than inner ramus; peduncle twice as long as inner ramus. Uropod 3 uniramous, ramus shorter than peduncle.

Telson flappable, long and narrow with rounded tip, 4 pairs of marginal robust setae.

Live colour. Translucent white with dark brown-red and pink patches transversally orientated on pereon segments. Eyes white with dark red margin.

Etymology. Named *insolita* (from Latin "insolitus"—unusual) referring to the unusual shape of the gnathopod 2 propodus in the male.

Ecology. Found sitting on the polyp of the large anthoathecate hydroid, *Zyzzyzus rubusidaeus* Brinckmann-Voss & Calder, 2013.

Discussion

As to generic placement, the new species does not immediately fit into any of the stenothoid genera, even though it is very clearly a stenothoid, given the lack of accessory flagellum, evanescent mandibular molar, vestigial outer plate of the maxilliped, shape and size of coxae 1–4, rectilinear basis of pereopod 5, uniramous uropod 3 and entire telson, following the diagnosis for Stenothoidae presented by Barnard & Karaman (1991). Using the key from Barnard & Karaman (1991), the primary morphological character in separating several genera within Stenothoidae is the shape of article 2 of pereopods 5–7. For the present new species, these are: P5 rectilinear, P6 moderately wide with a posterodistal lobe and a somewhat concave posterior margin, and P7 widely expanded with a crenulated rounded

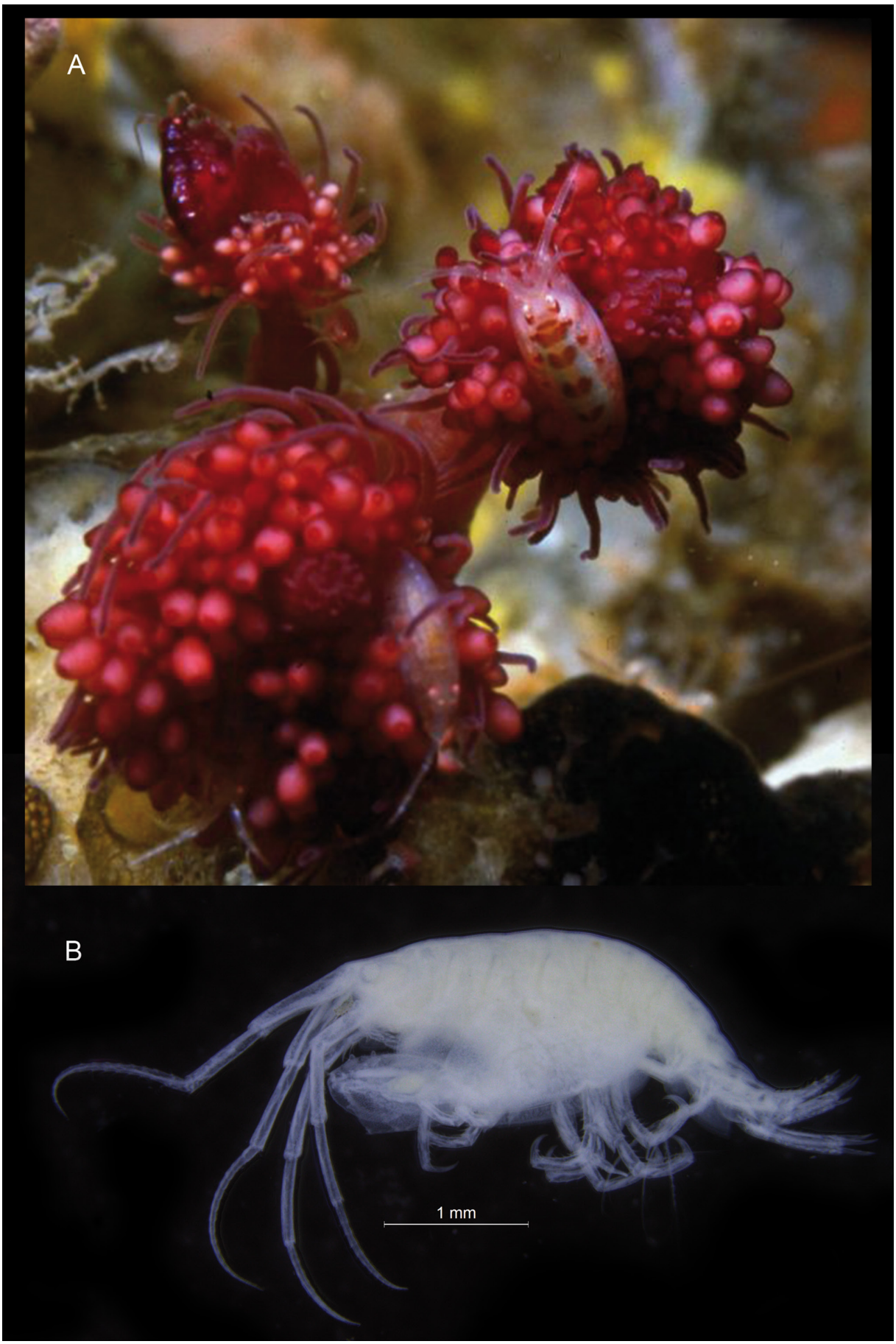

Figure 1. (*A*) *Metopa insolita* sp. nov. sitting on polyp of *Zyzzyzus rubusidaeus* Brinckmann-Voss & Calder, 2013 (Photo: Neil McDaniel); (*B*) habitus photo of paratype of *Metopa insolita* sp. nov. (Photo: A. H. S. Tandberg).

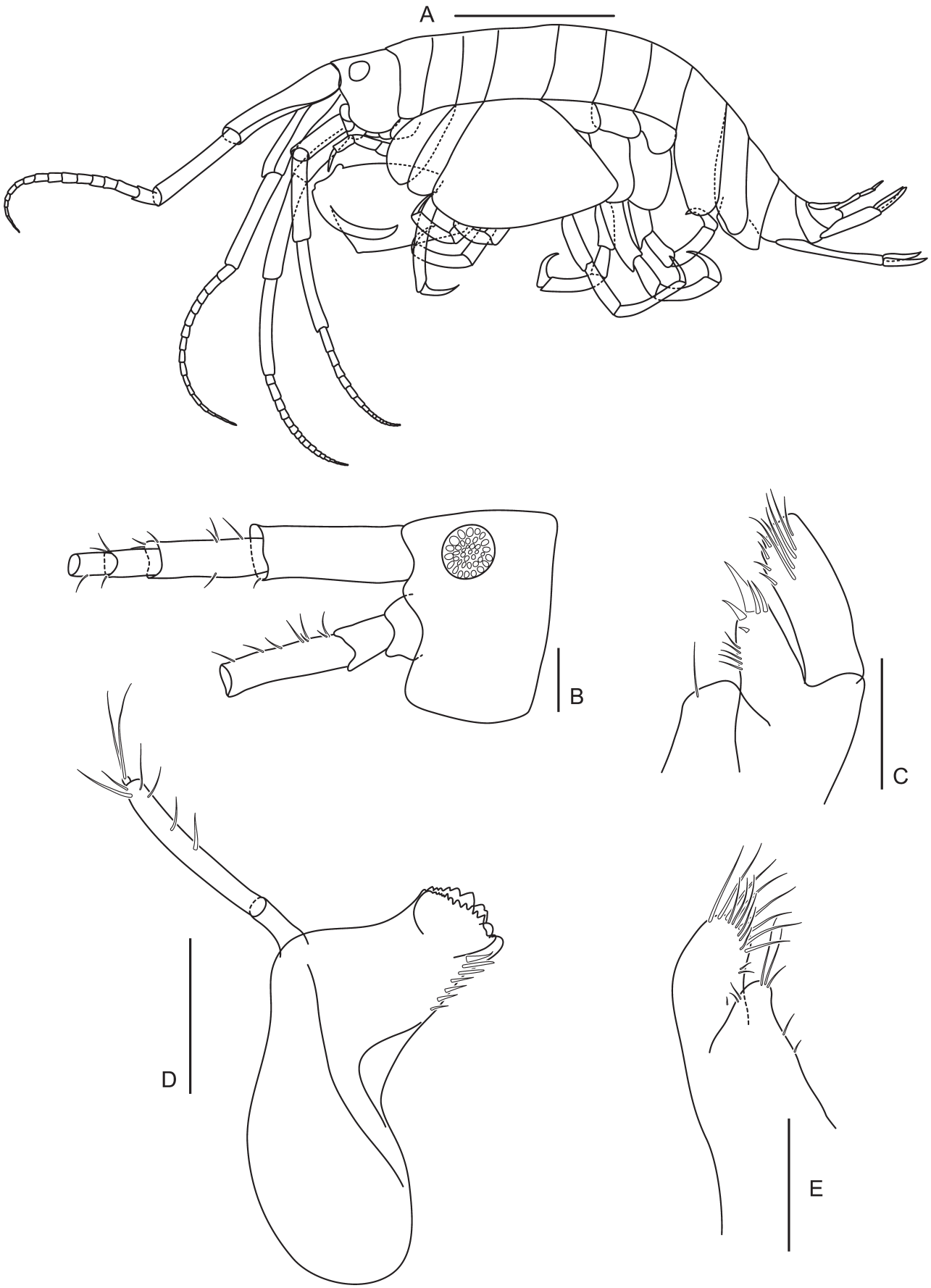

Figure 2. *Metopa insolita* sp. nov., male holotype, ZMBN 104469: (*A*) habitus; (*B*) head with antennae; (*C*) maxilla 1; (*D*) mandible; (*E*) maxilla 2. Scale: A = 1 mm; B–E = 0.1 mm.

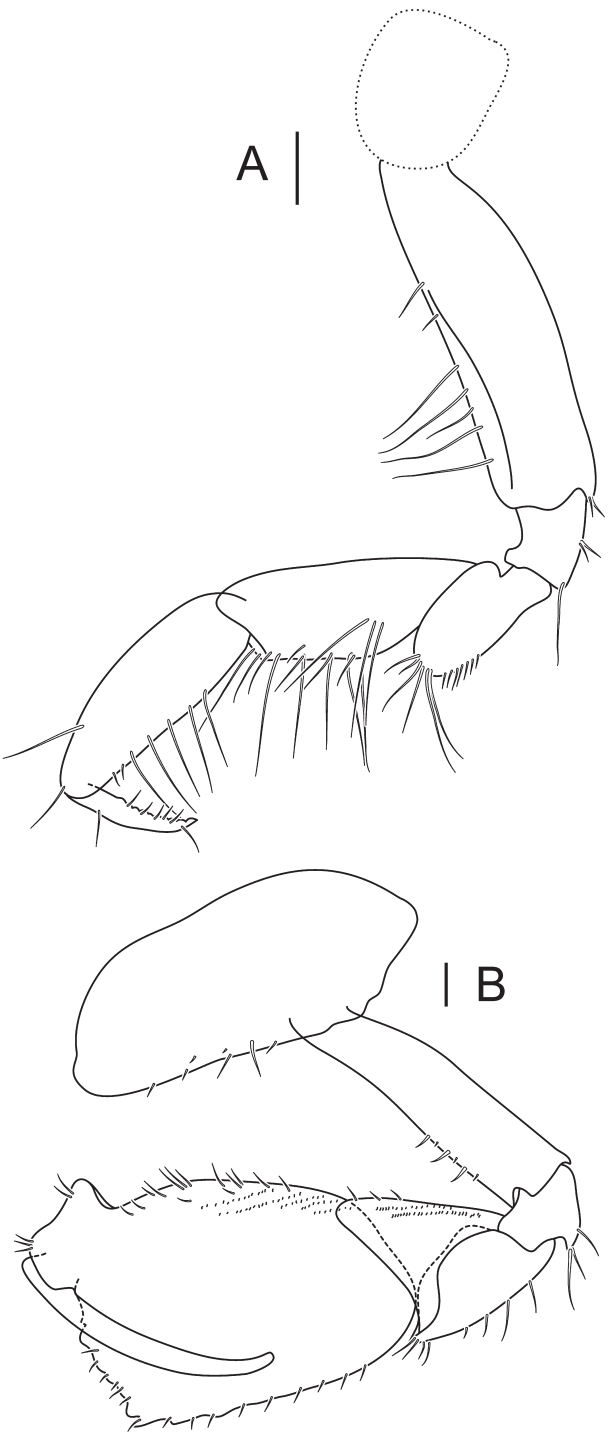

Figure 3. *Metopa insolita* sp. nov., male holotype, ZMBN 104469: (*A*) gnathopod 1; (*B*) gnathopod 2. Scale 0.1 mm.

posterior margin. With this combination of features, the new species keys out to either *Mesoproboloides* Gurjanova, 1938, or *Metopella* G. O. Sars, 1892. However, using the diagnosis for these genera in Barnard & Karaman (1991), the new species does not fully fit into either *Mesoproboloides* or *Metopella*. The diagnosis given by Barnard & Karaman (1991: 692) for *Mesoproboloides* states: "Gnathopods 1–2 subchelate, scarcely different from each other except in size…Gnathopod 2 slightly enlarged, palm oblique, article 5 short, lobed, article 6 slightly expanded apicad, elongate" and for *Metopella*: "Gnathopods 1–2 different from each other in size and shape…Gnathopod 2 slightly enlarged, palm weakly oblique, articles 4–5 short, 5 lobed. Pereopods 5–7 with rectolinear [sic] article 2, but article 2 on pereopod 7 broader than on pereopods 5 and 6 (variable)". Disregarding the difference in expansion in the bases of P6 and P7, our new species keys out to *Metopa*, with which the diagnosis of Barnard & Karaman (1991: 692) agrees in all other particulars: "Gnathopods 1–2 subchelate, different from each other in size and shape: gnathopod 1 small, almost simple (variable), article 4 incipiently chelate; article 5 elongate, barely lobed; article 6 scarcely expanded, almost linear. Gnathopod 2 enlarged, palm oblique, articles 4–5 short, 5 lobed. Pereopod 5 with rectolinear [sic] article 2, pereopods 6–7 with expanded, lobate article 2". Previous studies (Krapp-Schickel & Koenemann, 2006; Tandberg, 2011) have shown that the genus *Metopa* is not monophyletic, with great differences in especially gnathopod 1 and the mandibular palp. Pending an integrative revision of the genus *Metopa*, we have provisionally placed this new species in *Metopa*, as this presently "catch-all genus" contains other species with a somewhat similar, although less extreme, shape of the posterior pereopods (*M. boecki* G. O. Sars, 1892; *M. dawsoni* J. L. Barnard, 1962; *M. pusilla* G. O. Sars, 1892; and *M. tenuimana* G. O. Sars, 1892). *Metopa insolita* sp. nov. does not appear to be morphologically congeneric with the type species of *Metopa*, *M. clypeata* (Krøyer, 1842), which, however, in many aspects is morphologically divergent from the majority of the species now included in the genus, highlighting the need for an integrative revision of *Metopa*.

Many stenothoid amphipods have been found living in association with other marine invertebrates, often cnidarians. For a survey of such cases, see Krapp-Schickel & Vader (2015).

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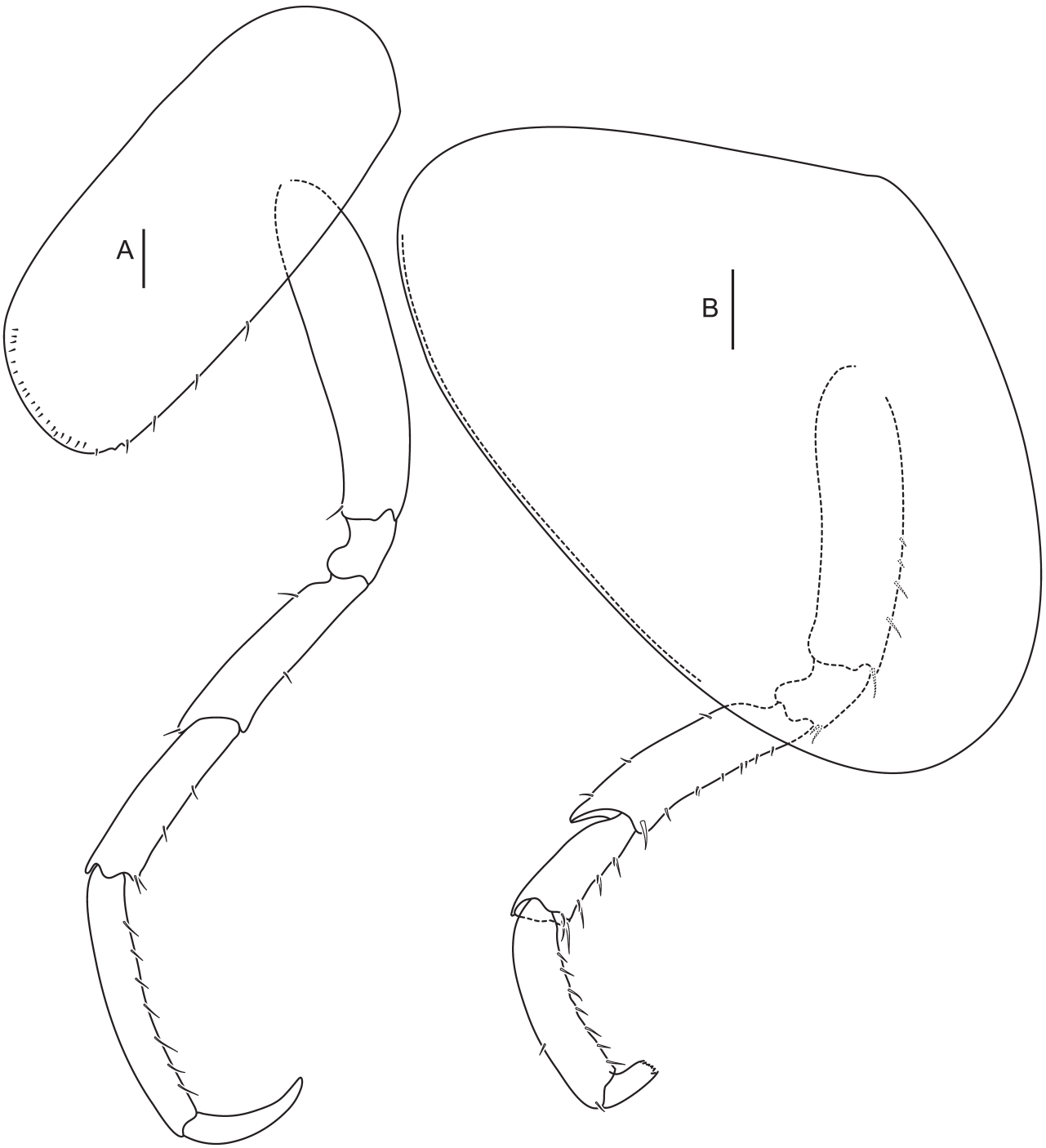

Figure 4. *Metopa insolita* sp. nov., male holotype, ZMBN 104469: (*A*) pereopod 3; (*B*) pereopod 4. Scale 0.1 mm.

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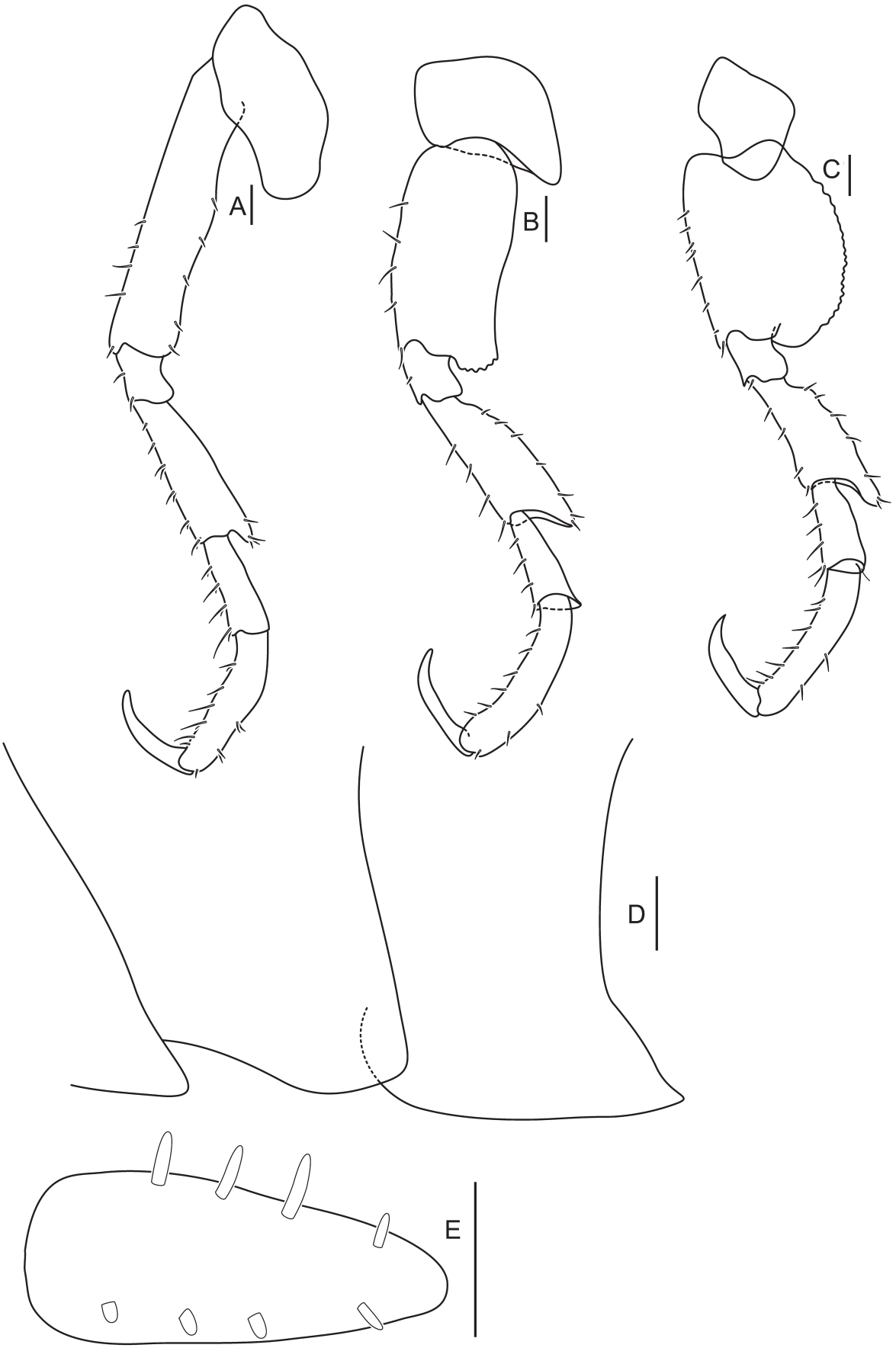

Figure 5. *Metopa insolita* sp. nov., male holotype, ZMBN 104469: (*A*) pereopod 5; (*B*) pereopod 6; (*C*) pereopod 7; (*D*) epimeral plates 2–3; (*E*) telson. Scale 0.1 mm.