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North Atlantic Pleustidae (Crustacea, Amphipoda) with a focus on cold-water coral associations

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Abstract. While amphipods are key players in any marine environment, hardly anything is known about their cold-water coral associations. As part of Remotely Operated Vehicle-examinations of cold-water corals from the Reykjanes Ridge southwest of Iceland, we sampled several species of the amphipod family Pleustidae, often hundreds of specimens from single corals. The live camera sampling allowed an investigation of the host specificy of the amphipods and a detailed taxonomic investigation including in situ images. Several species new to science were discovered; here, we describe *Neopleustes schwentneri* sp. nov. and *Stenopleustes jeskulkeae* sp. nov. in detail. An extensive documentation of morphological details via Scanning Electron Microscope Images gives unprecedented insights into the diversity of Pleustidae in association with cold-water corals.

Keyword. Pleustidae, cold-water corals, deep-sea, SEM, ROV.

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Introduction

Amphipods are amongst the most abundant and diverse macrofauna in marine benthos. Many amphipods live in association with other invertebrates (e.g., Vader & Tandberg 2013, 2015, 2020; Caulier *et al.* 2021; Lörz & Peart 2023; Marin 2023; Tandberg & Vader 2023). Very little is known about the association of amphipods with cold-water corals (e.g., Zettler *et al.* 2022, Navarro-Mayoral *et al.* 2024). The dense canopies of coral gardens can change local physical conditions and generate a three-dimensional habitat, which provides shelter to associated species and, ultimately, increases biodiversity (Freiwald *et al.* 2004; De Clippele *et al.* 2019). In particular, small-bodied crustaceans like Amphipoda and Isopoda, are common and diverse in these cold-

water coral associated ecosystems (Buhl-Mortensen & Mortensen 2004a, 2004b; Buhl-Mortensen & Buhl-Mortensen 2018; Schwentner & Lörz 2021). A 2018 expedition to the Reykjanes Ridge southwest of Iceland sampled many cold-water coral habitats (Devey *et al.* 2018). Here, Amphipoda constituted a major component of the sampled macrofauna and two of the most numerous species of amphipod belonged to the family Pleustidae. Pleustidae is a large family of marine Amphipoda, containing 35 genera, showing a worldwide distribution (Horton *et al.* 2024). Pleustidae mouthpart morphology is suggestive of opportunistic carnivory, preying on small benthic invertebrates, and settling larval stages of larger animals (Hendrycks & Bousfield 2004 and herein Enequist 1949). Pleustidae are known to perch openly on benthic invertebrate and algal substrata, minimizing fish predation by various strategies such as Batesian mimicry (Field 1974) or cryptic and warning coloration (Slattery & Oliver 1987). Pleustidae are also known to live adjacent to the sea ice and partly within its brine channels (Macnaughton *et al.* 2007). A defined habitat for Pleustidae are corals, especially cold-water corals (Buhl-Mortensen & Mortensen 2004a). A detailed molecular investigation of the pleustids from the cold-water corals of the Reykjanes Ridge was carried out by Schwentner & Lörz (2021), their population genetics revealed cryptic species of the family Pleustidae and a recent expansion off Iceland. A thorough taxonomic investigation of these pleustid amphipods was still outstanding and is presented herein.

The family Pleustidae Buchholz, 1874 was first mentioned by Buchholz (1874) as subfamily Pleustinae Buchholz, 1874. The first definition of the family Pleustidae was made by Stebbing (1906) and updated by Gurjanova (1951, 1972) and Barnard (1969). Within the Pleustidae, 12 subfamilies have been recognized based on morphology by Bousfield & Hendrycks (1994) (Labay 2022 and references therein). With the phylogeny of Pleustidae still not well resolved, it seems the words of Barnard & Given (1960) still are valid: "Amphipoda of the family Pleustidae are among the more difficult to identify and classify".

In the North Atlantic/Arctic region, in the areas around Iceland, 23 species of Pleustidae are known. Two species of *Stenopleustes* were previously observed to be associated with cold-water corals: *Stenopleustes malmgreni* (Boeck, 1871) and *Stenopleustes nodifera* (Sars, 1883) (Buhl-Mortensen & Mortensen 2004a; 2004b).

Here, we morphologically describe two species of Pleustidae new to science from cold-water corals: one species of the genus *Neopleustes*, one of the genus *Stenopleustes*. We provide live images of the two new species (Fig. 1), as well as of *Stenopleustes latipes* (M. Sars, 1858) (Fig. 2). We provide detailed scanning electron images of *Pleustes tuberculatus* Spence Bate, 1858, *Parapleustes bicuspis* (Krøyer, 1838), and *N. boecki* (Hansen, 1888) as well as of the two new species.

The sampling with the ROV allowed the rare opportunity to investigate the amphipod to coral-host association on species level. Population genetics were conducted for the first time on deep-sea amphipods from cold-water corals by Schwentner & Lörz (2021). This present paper containing the detailed morphological investigation and the description of new species compliments the molecular work by Schwentner & Lörz (2021).

Material and methods

Samples were taken during the 2018 IceAGE-RR expedition (Icelandic marine Animals: Genetics and Evolution, 28 June 2018 – 8 August 2018) with *RV Maria Sibylla Merian* (cruise no. MSM75) (Devey *et al.* 2018) at the Reykjanes Ridge and during a cruise with *RV Walther Herwig* (cruise no. WH233 12 October 2001 – 23 November 2001) around the southern part of Greenland. The main sampling gear at MSM75 was the ROV PHOCA GEOMAR Kiel, which is equipped with cameras, manipulators and hand nets. Samples of corals were stored separately in the ROVs drawers, and amphipods were taken directly from individual corals, ascertaining that only taxa directly associated with the coral were sampled (Supp. file 1). All sorting was handled according to Riehl *et al.* (2014) using an undisturbed cooling chain protocol. Pleustidae material from the Greenland shelf collections at the Hamburg Museum was investigated for comparison (Stransky & Brandt 2010). An overview of station data for all considered Pleustidae samples is given in Table 1. A map of the sample stations was produced using QGIS 3.10.12-A Coruña (QGIS 2019).

Table 1. Sampling stations from IceAGE-RR and WH 233 with presence of Pleustidae including new species, the gear RD is a Rauschert dredge, ROV a Remotely Operated Vehicle, in this case the Phoca Geomar Kiel.

Project	Date	Cast	Gear	Lat. (°N)	Long. (°W)	Depth (m)
WH233	24 Oct. 2001		RD	63.6	37.6833	236
WH233	25 Oct. 2001		RD	63.5667	39.3000	218
WH233	4 Nov. 2001		RD	61.8667	50.2333	109
IceAGE_RR	13 Jul. 2018	6	ROV	60.24765	29.1379	718
IceAGE_RR	17 Jul. 2018	1	ROV	59.25991	30.4432	992
IceAGE_RR	17 Jul. 2018	11	ROV	59.251	30.484383	866
IceAGE_RR	20 Jul. 2018	6	ROV	59.2898	30.446966	980
IceAGE_RR	28 Jul. 2018	3	ROV	59.25123	30,485016	867
IceAGE_RR	28 Jul. 2018	5	ROV	59.25108	30.488866	869
IceAGE_RR	28 Jul. 2018	6	ROV	59.24786	30.488983	869
IceAGE_RR	1 Aug. 2018	4	ROV	60.23661	60.23661	705
IceAGE_RR	1 Aug. 2018	5	ROV	60.23625	29.1288	646
IceAGE_RR	1 Aug. 2018	6	ROV	60.23741	29.114833	644

Photographs of freshly collected animals from the 2018-cruise were taken on board with a Nikon D200 equipped with an AF Micro Nikkor 60 mm 1:2.8 D lens. Photos were cleaned (the backgrounds removed) using Adobe Photoshop CC ver. 23.2 (released in 2022). The material was sorted and determined in the laboratories of the University of Hamburg and DZMB (Deutsches Zentrum für marine Biodiversitätsforschung, Hamburg, Germany) using a Leica MX 12.5 stereo-microscope. For handling of the samples, each vial with amphipods was given a unique registration database number. The material is stored in the collections of the Leibniz-Institut zur Analyse des Biodiversitätswandels (LIB) in Hamburg (ZMH-K - numbers), the Deutsches Zentrum für Marine Biodiversität (DZMB) and the Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt am Main (SMF - numbers).

Molecular analysis is described by Schwentner & Lörz (2021), sequences are stored in GenBank. We here provide additional COI-sequenses stored in BOLD (BOLD project AMPHIV) (Supp. file 2).

Scanning electron images

Selected specimens and parts of selected specimens (mouthparts, antennae, coxal plates) were air-dried, coated with gold-palladium and investigated via a Scanning electron microscope LEO1525 at the University of Hamburg. Backgrounds of photos were removed with Adobe Photoshop CC ver. 23.2 (released in 2022).

Morphological descriptions

Amphipoda body lengths were measured from tip of the rostrum to the end of the telson. The pencil drawings were made using a Leica M125 and an Olympus BX53. Illustrations were inked using Adobe Illustrator CC 2021, following the protocols of Coleman (2003, 2009). Terminology for seta is according

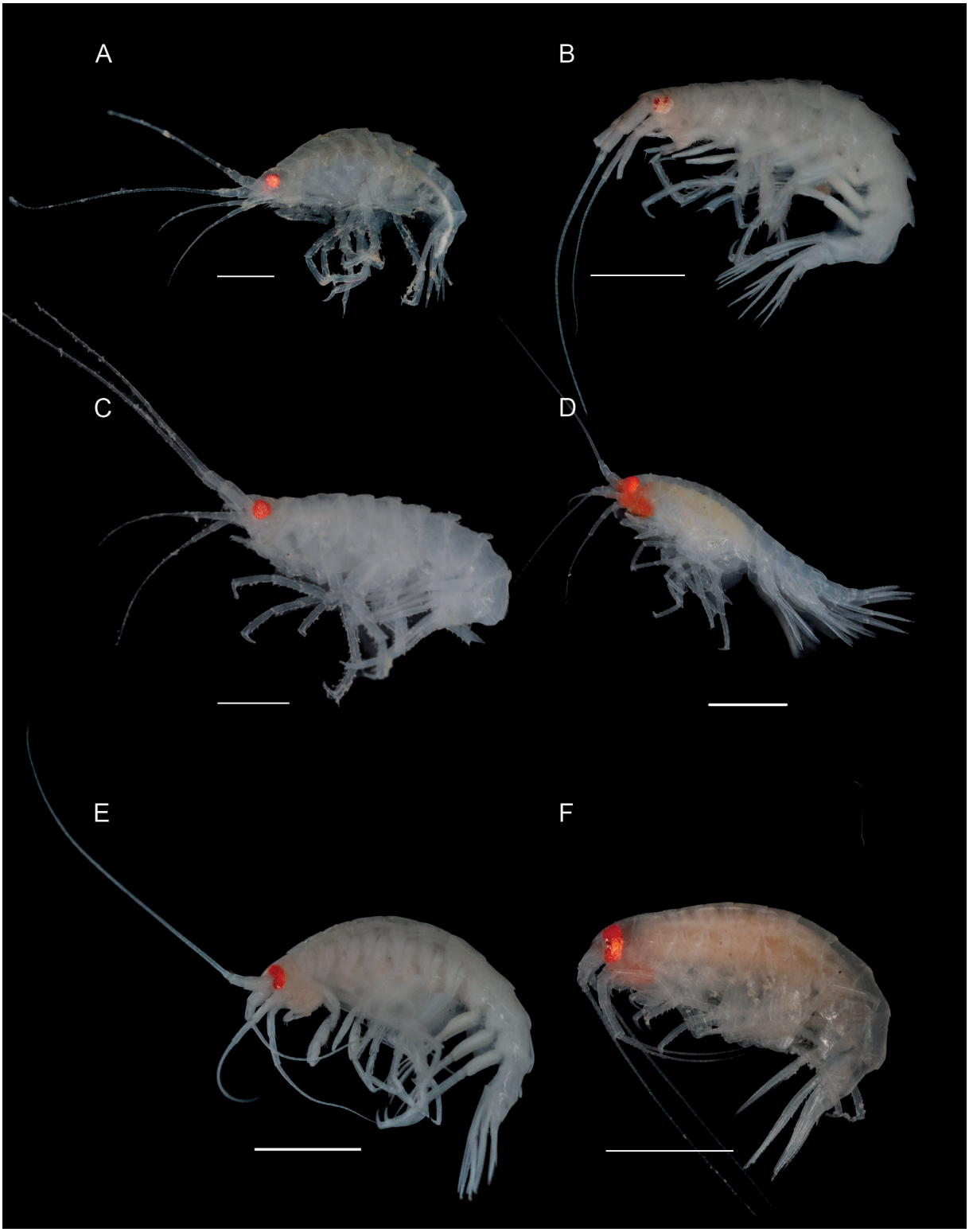

Fig. 1. Photos of live animals. **A**. *Neopleustes schwentneri* sp. nov., DZMB-HH 61725. **B**. *N. schwentneri* sp. nov., DZMB-HH 62367. **C**. *N. schwentneri* sp. nov., DZMB-HH 61712. **D**. *Stenopleustes jeskulkeae* sp. nov., holotype, DZMB-HH 62317. **E**. *Stenopleustes jeskulkeae* sp. nov., DZMN-HH 62368. **F**. *S. jeskulkeae* sp. nov., DZMN-HH 61711. Scale bars = 2 mm. Photos: A.H.S. Tandberg.

to Oshel & Steele (1988), where setae are divided into pore-bearing and not pore-bearing, and from there subdivided according to the sculptures of the seta: serrate, spinulate, pappose, plumose and pectinate (spine-like – no visible sculpture). Pore-bearing setae are being considered chemosensory.

Results

More than two thousand specimens belonging to nine morphotypes of pleustid amphipods were investigated from the North Atlantic. Genetic analyses proved some of the morphotypes to belong to the same taxon, resulting in the lower number final species. Based on ROV sampling cold coral hosts were identified to belong to six different species.

Taxonomy

Order Amphipoda Latreille, 1816
Superfamily Amphilochoidea Boeck, 1871
Family Pleustidae Buchholz, 1874

Diagnosis

A diagnosis of the family Pleustidae is given by Bousfield & Hendrycks (1994).

Subfamily **Neopleustinae** Bousfield & Hendrycks, 1994

Diagnosis

A diagnosis of the subfamily Neopleustinae is given by Bousfield & Hendrycks (1994) and updated by Labay (2021).

Genus ***Neopleustes*** Stebbing, 1906

Neopleustes Stebbing, 1906: 311.
Neopleustes – Gurjanova 1951: 641; 1972: 133, 163. — Barnard 1969: 424. — Barnard & Karaman, 1991: 649. — Hendrycks & Bousfield 2004: 94.

Type species

Amphitoe pulchella Krøyer, 1845: pl. 10.

The genus *Neopleustes* contains seven known species (Horton *et al.* 2024) and a species new to science described herein: *N. boecki* (Hansen, 1888); *N. carinatus* Margulis, 1963; *N. columbianus* Hendrycks & Bousfield, 2004; *N. euacanthoides* Gurjanova, 1972; *N. euacanthus* (G.O. Sars, 1877); *N. kussakini* (Budnikova, 1995); *N. pulchellus* (Krøyer, 1846).

Diagnosis (from Hendrycks & Bousfield 2004 and Labay 2021)

Body middorsally carinate or mucronate, rarely smooth. Rostrum medium to strong, often keeled. Antenna 1 elongate, often longer than body. Antenna 2 distinctly shorter than antenna 1.

Lower lip, outer lobes oblique, widely separated by low flat inner lobes. Mandibular molar process small, thumb-like, without triturating surface; left lacinia 7–10-dentate; palp powerful, length exceeding by 2–3 times that of the mandibular body. Maxilla 2, inner plate, inner marginal seta set apart basally from apical setae. Maxilliped, inner plate truncate, with 3–7 apical button spine-like setae; outer plate slender; palp segments slender; segment 3 with short, outer distal conical projection, dactylus articulated from its medial side.

Coxal plates 1–4 medium, increasing in size posteriorly; coxal plate 1 not bent forwards distally, posterodistally cuspate. Coxal gills medium, sack-like.

Pereopods 1–2 (gnathopods 1–2) weak, subchelate, subsimilar; posterodistal tooth of merus weak or lacking; carpus elongate, shorter than propodus, posterodistal lobe shallow; propodus with short, oblique, weakly toothed palmar margin; posterior margin setose.

Pereopods 5–7 regular, homopodous, bases usually convex behind. Epimeral plates 2–3, posterior corners acute, produced. Uropod 1 with distolateral peduncular spine-like seta; rami subequal.

Telson with proximal keel.

Distribution

Marine waters of the Arctic and boreal parts of the Northern hemisphere.

Neopleustes boecki (Hansen, 1888)
Fig. 3

Paramphithoe boeckii Hansen, 1887: 121, tab. 5, fig 3a–b.

Paramphithoe boeckii – Sars 1895: 348, fig. 2.
Neopleustes boecki (Hansen, 1887) – Stebbing 1906: 312. — Gurjanova 1951: 645, fig. 441. — Margulis 1963: 164. — Kudrjashov 1968: 94. — Barnard & Karaman 1991: 649. — Hendrycks & Bousfield 2004: 94, 100. — Dzhurinskyi 2013: 135.
Neopleustes boecki pacifica Labay, 2021: 286.

Diagnosis

A diagnosis for *Neopleustes boecki* is given by Labay (2021).

Material examined

W GREENLAND – **off Paamiut** • 1 adult, 5.6 mm, SEM stub; SW Greenland shelf; 61.8666667 °N, 50.233333°W; depth 109 m; 4 Nov. 2001.; WH233, station 1075; collected with Rauschert dredge; ZMH-K 444485a • 1 spec., SEM stub; same data as for preceding; ZMH-K 44485b • 1 spec., SEM stub; same data as for preceding; ZMH-K 44485c.

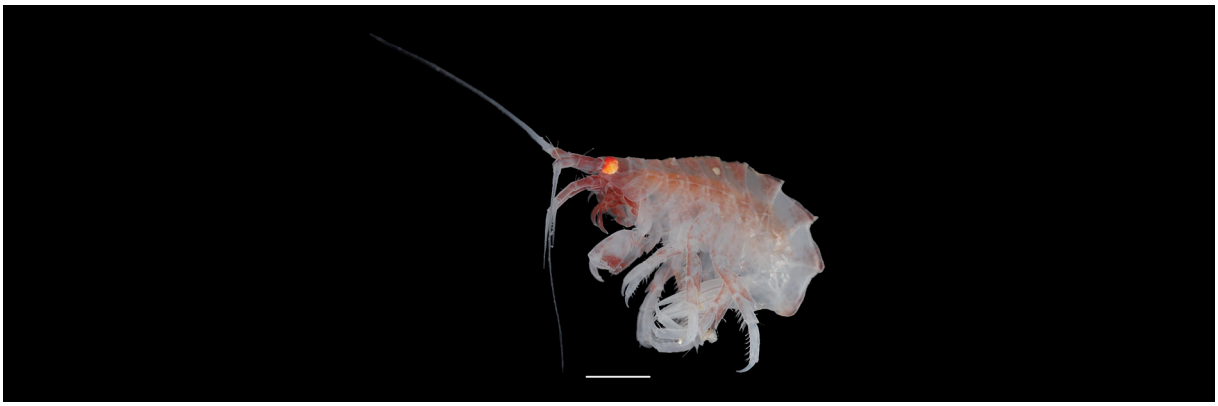

Fig. 2. Live photo of *Stenopleustes latipes* (M. Sars, 1858), DZMB-HH 62405. Scale bar = 2 mm. Photo: A.H.S. Tandberg.

Description

Detailed descriptions are provided by Hendrycks & Bousfield (2004) and Labay (2021). We supply new illustrations of this species in Fig. 3.

Ecology and distribution

North Atlantic, North Pacific and Arctic.

Taxonomic remark

See Table 2.

Neopleustes schwentneri sp. nov.
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Figs 1A–C, 4–16

Neopleustes aff. *boecki* Schwentner & Lörz, 2021: 7, fig. 3, tab. 1.

Diagnosis

Based on the female holotype, 8.2 mm, SMF 62626.

Body, pereon segments 1–3 without carination, strongly carinated posteriorly from segment 6 to pleon segment 2, pleon segment 3 with sloping low ridge dorsally.

Etymology

This species is named in honour of Dr. Martin Schwentner, a great crustacean researcher and friend. The name is derived of the Latin genitive of his surname.

Type material

Holotype

ICELAND – **off Reykjanes** • ♀ adult, 8.2 mm, ethanol fixed; Reykjanes Ridge; 59.25°N, 30.484383 °W; depth 866 m; 17 Jul. 2018; MSM75, IceAGE-RR exped., station 80-11; collected by ROV KIEL6000, from Plexauridae/*Paramuricea*; SMF 62626.

Paratype

ICELAND – **off Reykjanes** • 1 ♂ adult, 11 mm, glycerin fixed; Reykjanes Ridge; 59.25123°N, 30.485016°W; depth 867 m; 28 Jul. 2018; MSM75, IceAGE-RR exped., station 149-6; collected by ROV KIEL6000, from Plexauridae; SMF 62627.

Additional material

ICELAND – **off Reykjanes** • 6 specs., SEM-stubs; same data as for holotype; DZMB 61786b-e, 62804e, 62850 • 1 adult; same data as for holotype; DZMB-HH 62367. • 1 spec.; Reykjanes Ridge; 60.23661°N, 29.13605°W; depth 646 m; 1 Aug. 2018; MSM75, IceAGE-RR exped., station 188-4; collected by ROV KIEL6000; DZMB-HH 61712. • 1 ♀ adult, oovigerous; Reykjanes Ridge; 60.23741°N, 29.114833°W; depth 644 m; 1 Aug. 2018; MSM75, IceAGE-RR exped., station 188-6; collected by ROV KIEL6000; DZMB-HH 61725 • 1 adult; Reykjanes Ridge; 59.25123°N,30.485016°W; depth 867 m; 28 Jul. 2018; MSM75, IceAGE-RR exped., station 149-6; collected by ROV KIEL6000; ZMH-K 60035 • 1 adult; Reykjanes Ridge; same data as for paratype; ZMH-K 60036 • 9 adults; Reykjanes Ridge; same data as for paratype; ZMH-K 58755 • 1 adult; Reykjanes Ridge; same data as for paratype; ZMH-K 58756.

Fig. 3. *Neopleustes boecki* (Hansen, 1888), ZMH-K 44485a (A), ZMH-K 44485 (B–F). **A**. Habitus. **B**. Mandible palp. **C**. Maxilliped. **D**. Maxilliped palp, close-up. **E**. Urosome. **F**. Telson, setae.

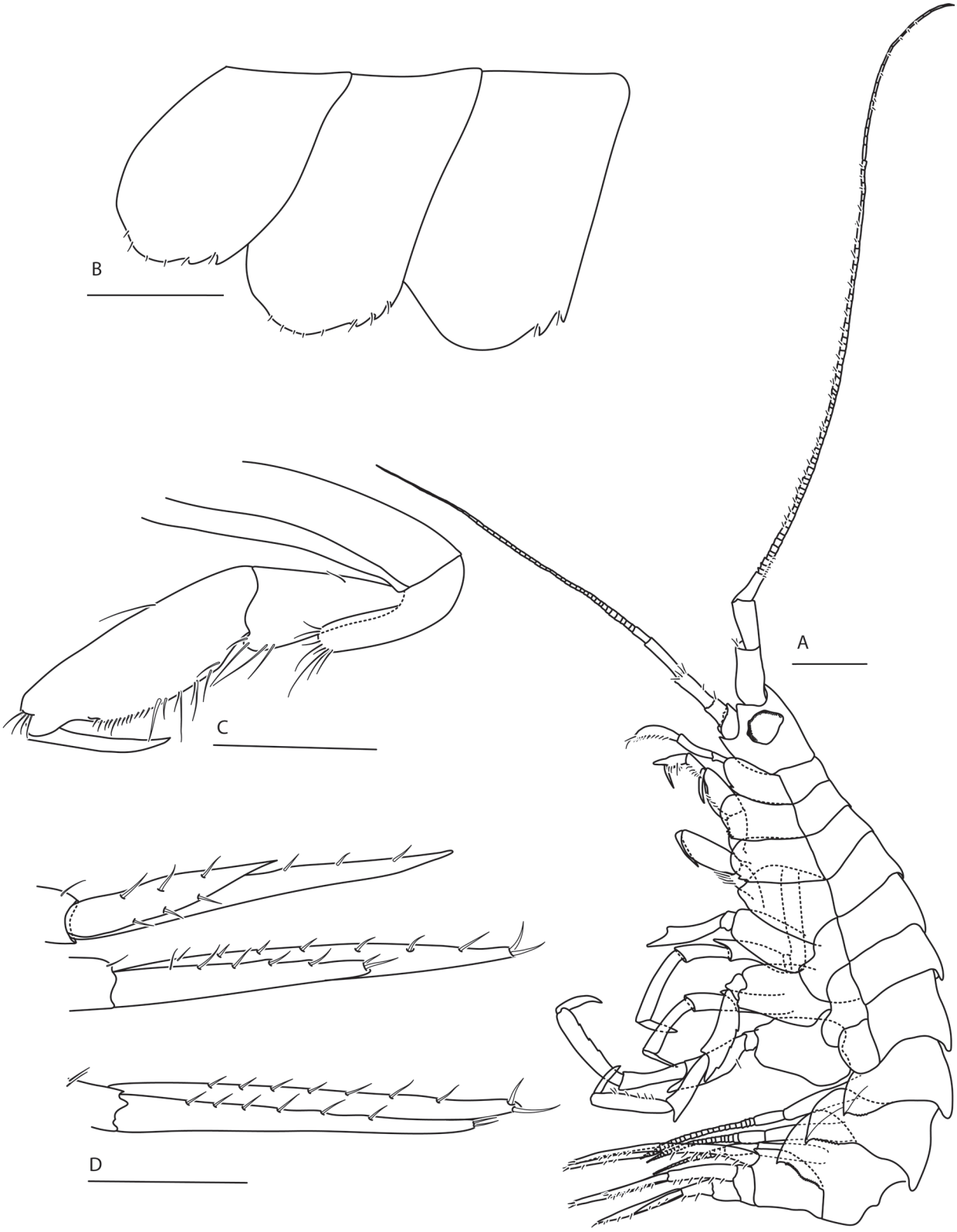

Fig. 4. *Neopleustes schwentneri* sp. nov., paratype, SMF 62627. **A**. Habitus. **B**. Coxae 1–3. **C**. Pereopod 1. **D**. Uropods 1–3. Scale bars: A = 1 mm, B–D = 0.5 mm.

For a full overview of the examined material (36 further specimens), see Supplementary file 2. See Schwentner & Lörz (2021) under "*Neopleustes* aff. *boecki*" for the genetic analyses on this species.

Description

Head with anterodorsal crest. Rostrum medium length, about 0.25 times as long as peduncular segment 1 of antenna 1, apex acute; anterior head lobe rounded, lateral cephalic lobe very deeply recessed sinus, anteroventral corner acute.

Eye large, reniform, pigmented. Antenna 1 very long, longer than body; peduncular segment 1 elongate and strong, equal to segments 2 and 3 together; flagellum length a little over 4 times as long as peduncle, with approximately 90 articles, articles posterodistally with short setae. Antenna 2 is half as long as antenna 1, flagellum with 43 articles.

Mandible, molar rounded and setose, incisor margins with 7 small teeth and two larger on the outer part of the margin; left lacinia mobilis 10-dentate, present on the left side only; accessory spine rows with 13 raker setae; palp very large; palp segment 3 flat, subequal in length to segment 2, inner margin lined with strong pectinate setae, apex with 3 long strong pectinate setae; segment 2, inner margin with few setae only; segment 1 without setae, ⅓ of length of either of the other segments. Lower lip, outer lobes angular, widely spread. Maxilla 1, inner plate with single plumose apical seta, outer plate with 9 slender pectinate setae (spine-like setae); palp extending beyond outer plate, apex subtruncate, with a row of 7 cuspidate setae. Maxilla 2, inner plate slightly shorter and broader than outer plate; both plates with smooth apical

Fig. 5. *Neopleustes schwentneri* sp. nov., holotype, SMF 62626. **A**. Habitus. **B**. Pereopod 1. Scale bars: A = 1 mm, B = 0.5 mm.

Table 2. Morphological differences between *Neopleustes schwentneri* sp. nov. and *Neopleustes boecki* (Hansen, 1888).

	***N. schwentneri* sp. nov.**	***N. boecki* (Hansen, 1888)**
Head	smooth	anterodorsal crest
Coxa 1, 2,3 posteroventrally	two strong teeth	smooth
Pereonites 5, 6 dorsally	strong keel (morphotype A)	smooth
Epimeral plate 3 dorsally	rounded carina	smooth
Epimeral plate 3 posteroventral corner	sharp tooth pointing up	slightly rounded tooth
Epimeral plate 3 posterolaterally	serration along convex border	serration lower fifth of convex border
Telson	emarginate with two cobbled seta	linguiform

seta. Maxilliped, inner plate very short, apex subtruncate; outer plate short, slightly longer than first palp segment , apex narrowly subtruncate; palp narrow, segment 2 subequal in length to segment 3; dactylus slender, slightly curved and slightly shorter than palp segment 3, the distal process of palp segment 3 is strongly present and densely setose on the inner side.

Coxal plates 1–3 posteroventrally multi-cuspate, lower margins rounded; coxal plate 4 much broader, deeply excavated posteroproximally, rounded below; coxal plates 5–6 broadly posterolobate, posteriorly roundly subquadrate, coxal plate 7 trapezoidal, rounded anteroventrally.

Gnathopods 1–2 subchelate, similar in shape. Gnathopod 1, basis with anterior setae, carpus long, about three quarter as long as propodus, posterior lobe broad, shallow; propodus subrectangular, narrow, palm oblique, with small mid-palmar tooth, with clusters of spine-like setae, posterior margin with groups of setae; dactylus as long as palm, with an unguis, inner margin with minuscle setae.

Gnathopod 2, carpus long, about 0.7 times as long as propodus, carpal lobe similar to gnathopod 1; propodus palm oblique, palmar margin with medial tooth and with clusters of strong posterodistal setae, posterior margin with transversal setae clusters; dactylus as long as palm, with an unguis.

Pereopods 3–4 medium strong; basis linear, dactylus slender, 0.3 times as long as propodus. Pereopods 5–7 similar in form, size increasing; all bases bearing ridge, with posterior rounded wing; merus posterodistally produced, acute, anterior and anterior margins with strong setae. Merus: carpus: dactylus is about 3:2:3; dactylus half the length of propodus.

Epimeral plates 1–3, lower margin with short spine-like setae, posteroventral corners acute, slightly produced, posterior margin minutely serrated. Pleopods regular.

Uropod 1, peduncle slightly shorter than inner ramus; margins of peduncle and rami with short spine-like setae. Uropod 2, peduncle three quarter length of inner rami, outer ramus three quarter length of inner rami, margins of peduncle and rami with short spine-like setae. Uropod 3, inner ramus twice as long as peduncle, with a row of small spine-shaped setae along lateral and medial margins each, with acute and naked apex; outer ramus about half as long as inner; outer ramus with a row small spine-shaped setae along lateral and medial margins each.

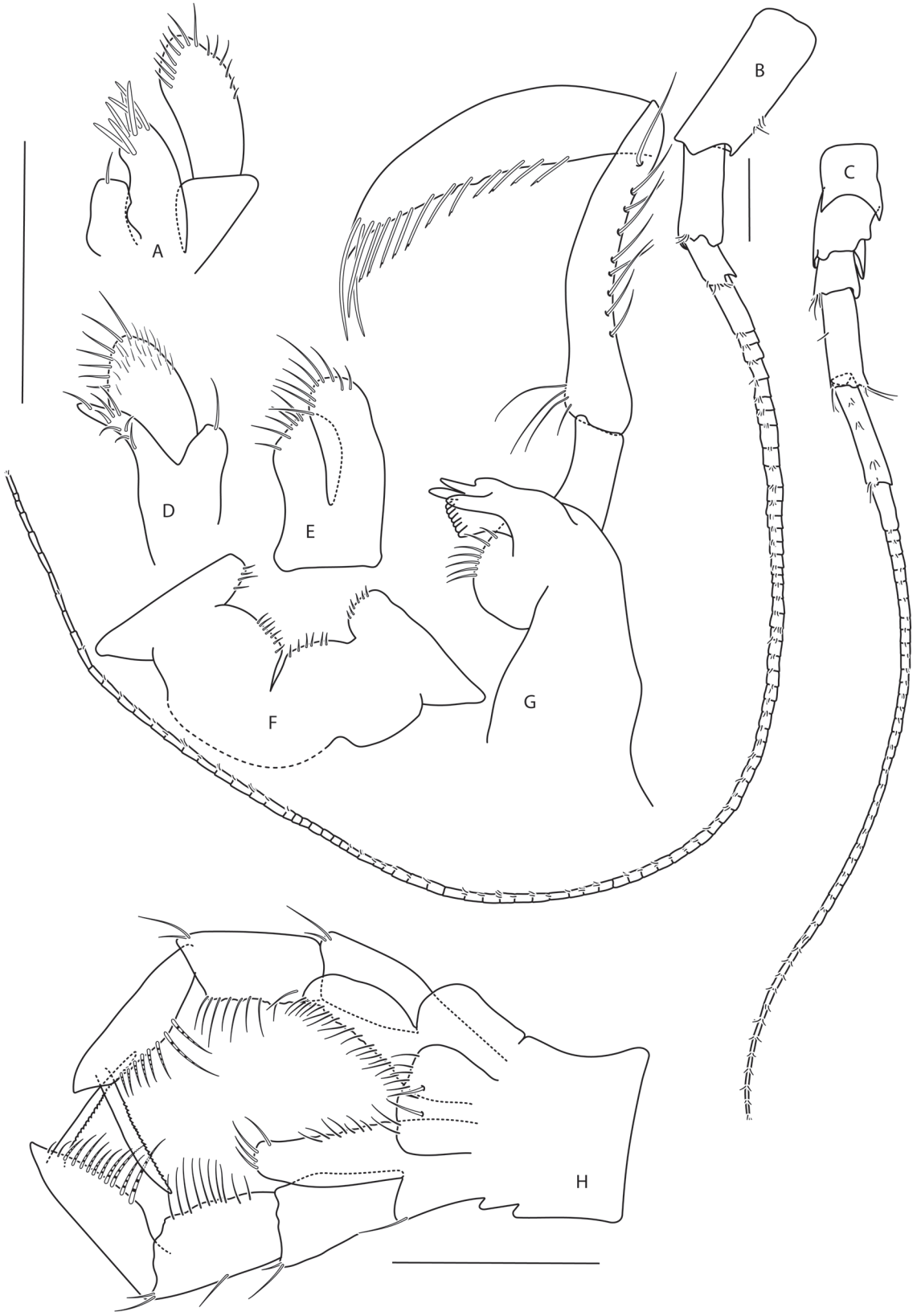

Fig. 6. *Neopleustes schwentneri* sp. nov., holotype, SMF 62626. **A**. Maxilla 1. **B**. Antenna 1. **C**. Antenna 2. **D**. Maxilla 1. **E**. Maxilla 2. **F**. Labium. **G**. Mandible. **H**. Maxilliped. Scale bars = 0.5 mm (shared scale bars for A, D, E–G; for B–C, separate for H.).

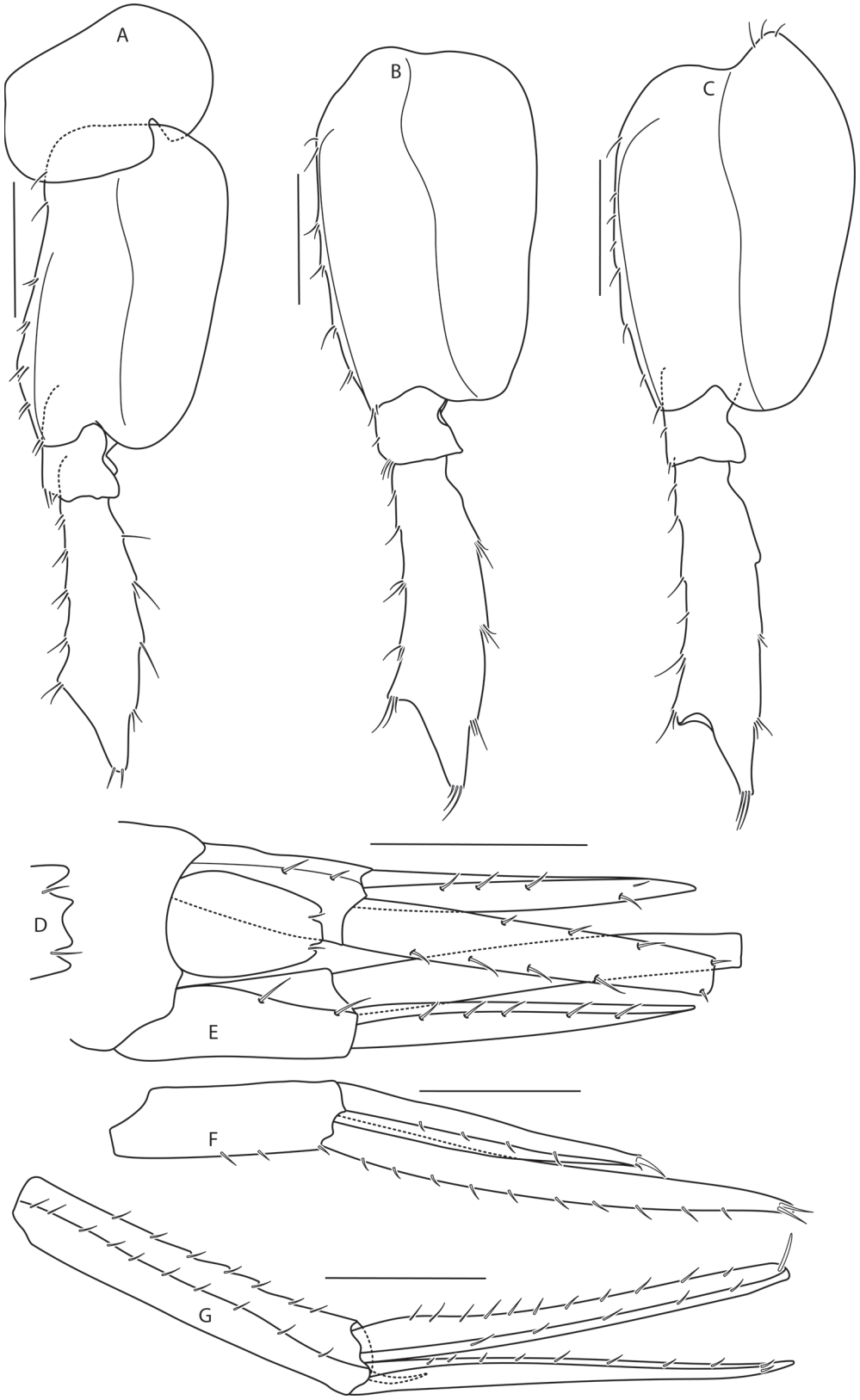

Fig. 7. *Neopleustes schwentneri* sp. nov., holotype, SMF 62626. **A**. Pereopod 5. **B**. Pereopod 6. **C**. Pereopod 7. **D**. Telson tip (no representative scale bar). **E**. Telson, Uropod 3. **F**. Uropod 2. **G**. Uropod 1. Scale bars = 0.5 mm.

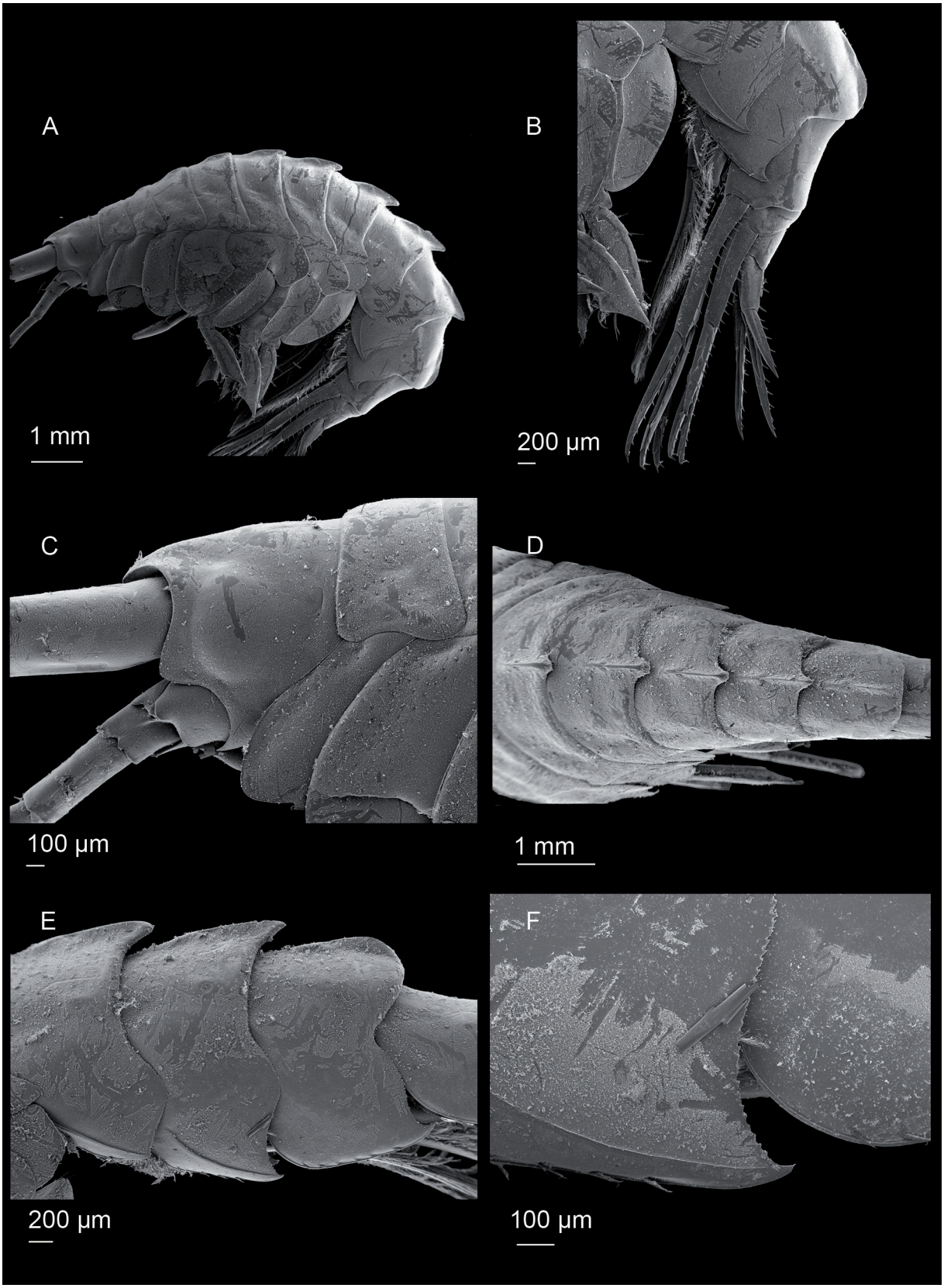

Fig. 8. *Neopleustes schwentneri* sp. nov., DZMB 62804e (A–C), DZMB 62850 (D–F). **A**. Habitus. **B**. Urosome. **C**. Head. **D**. Epimeron and urosome, dorsal view. **E**. Epimeron. **F**. Epimeral plate 2.

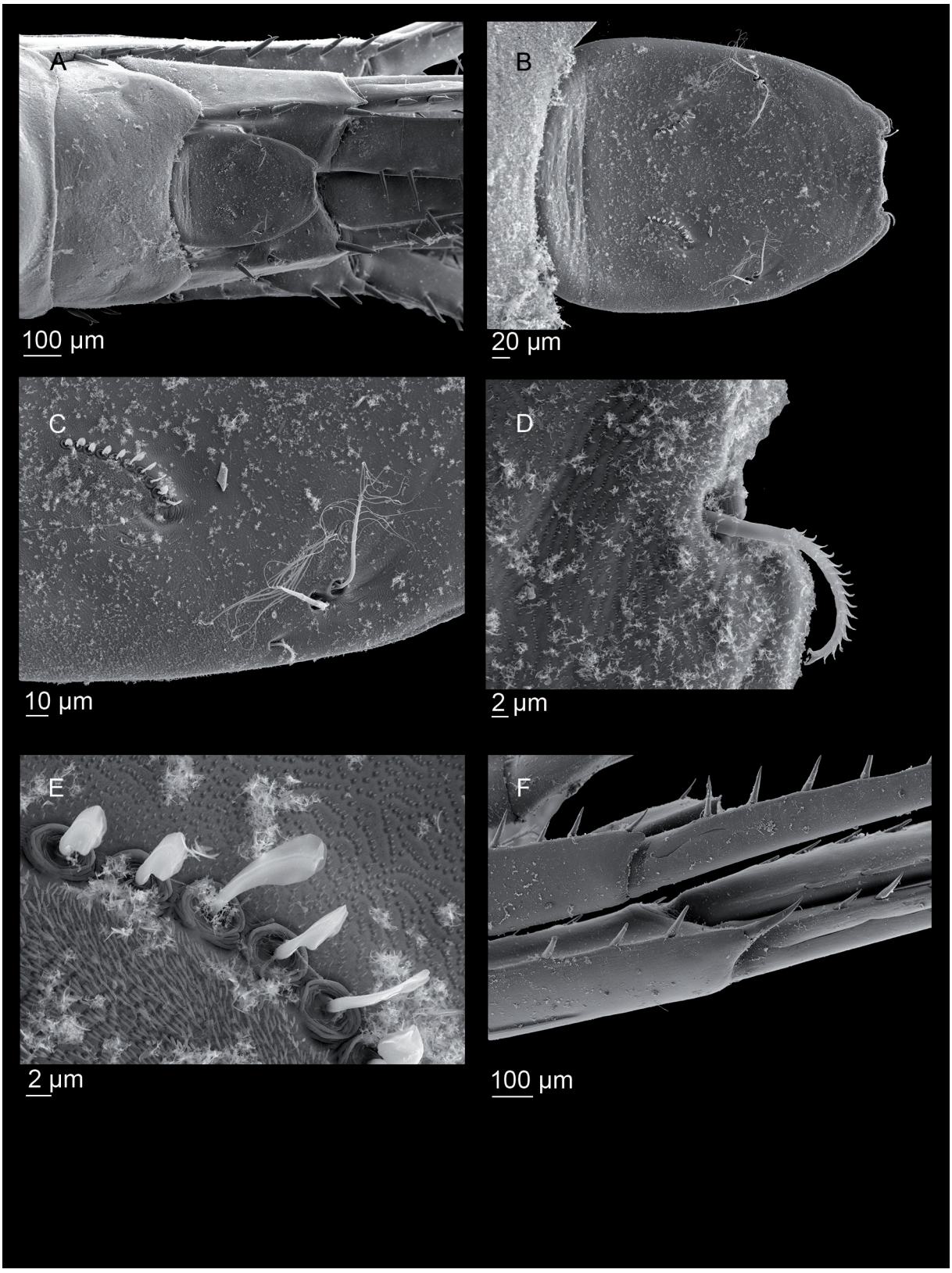

Fig. 9. *Neopleustes schwentneri* sp. nov., DZMB 62804e (A–E), DZMB 62850 (F). **A**. Urosome, dorsal view. **B**. Telson. **C**. Telson setation. **D**. Telson, seta at tip. **E**. Telson, 'swan-neck' setae. **F**. Uropods 2–3 (peduncles).

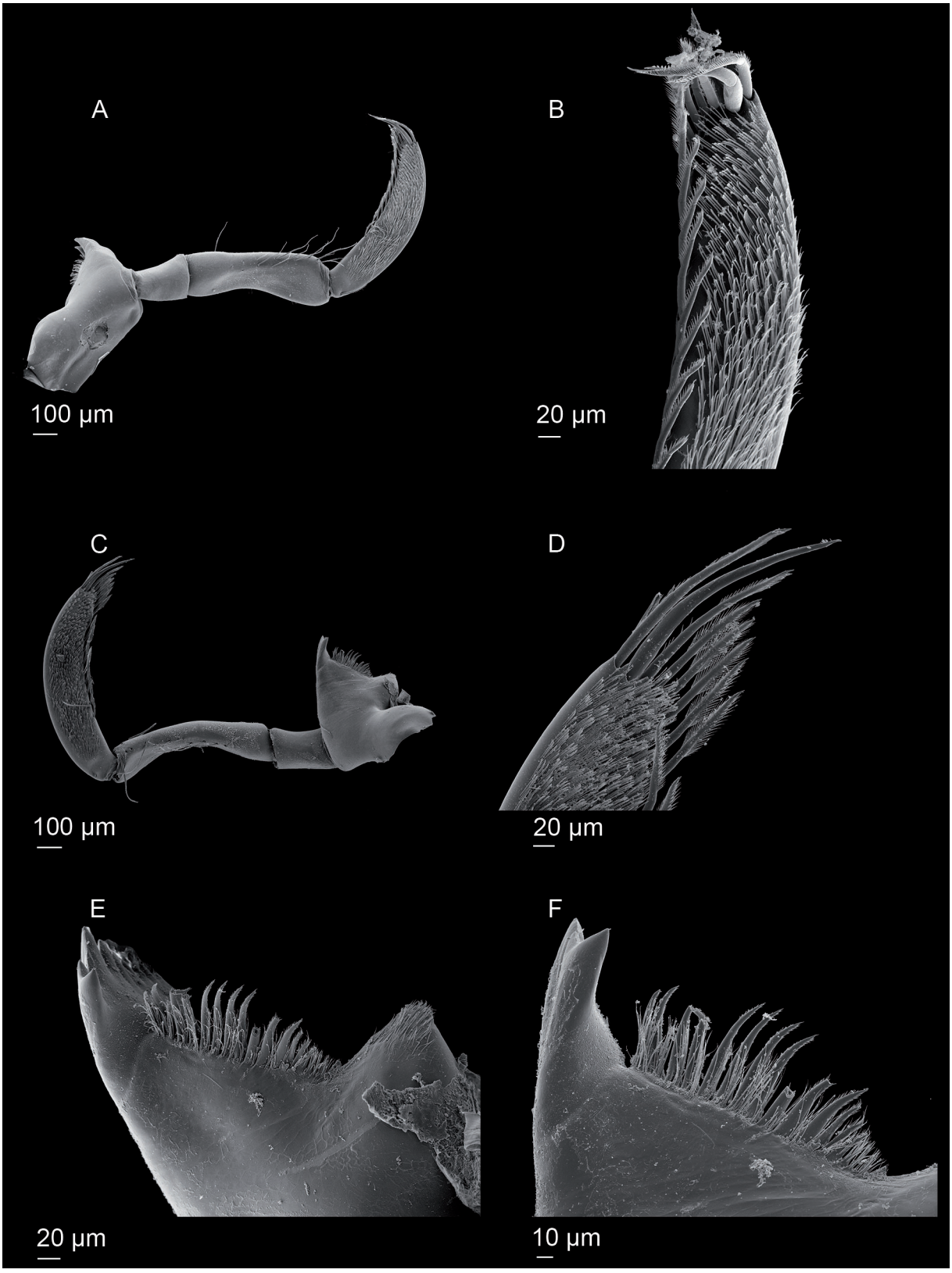

Fig. 10. *Neopleustes schwentneri* sp. nov., DZMB 62804e (A–B), DZMB 62850 (C–F). **A**. Mandible. **B**. Mandible palp tip. **C**. Mandible. **D**. Mandible palp tip. **E**. Mandible incisor. **F**. Mandible incisor, closeup.

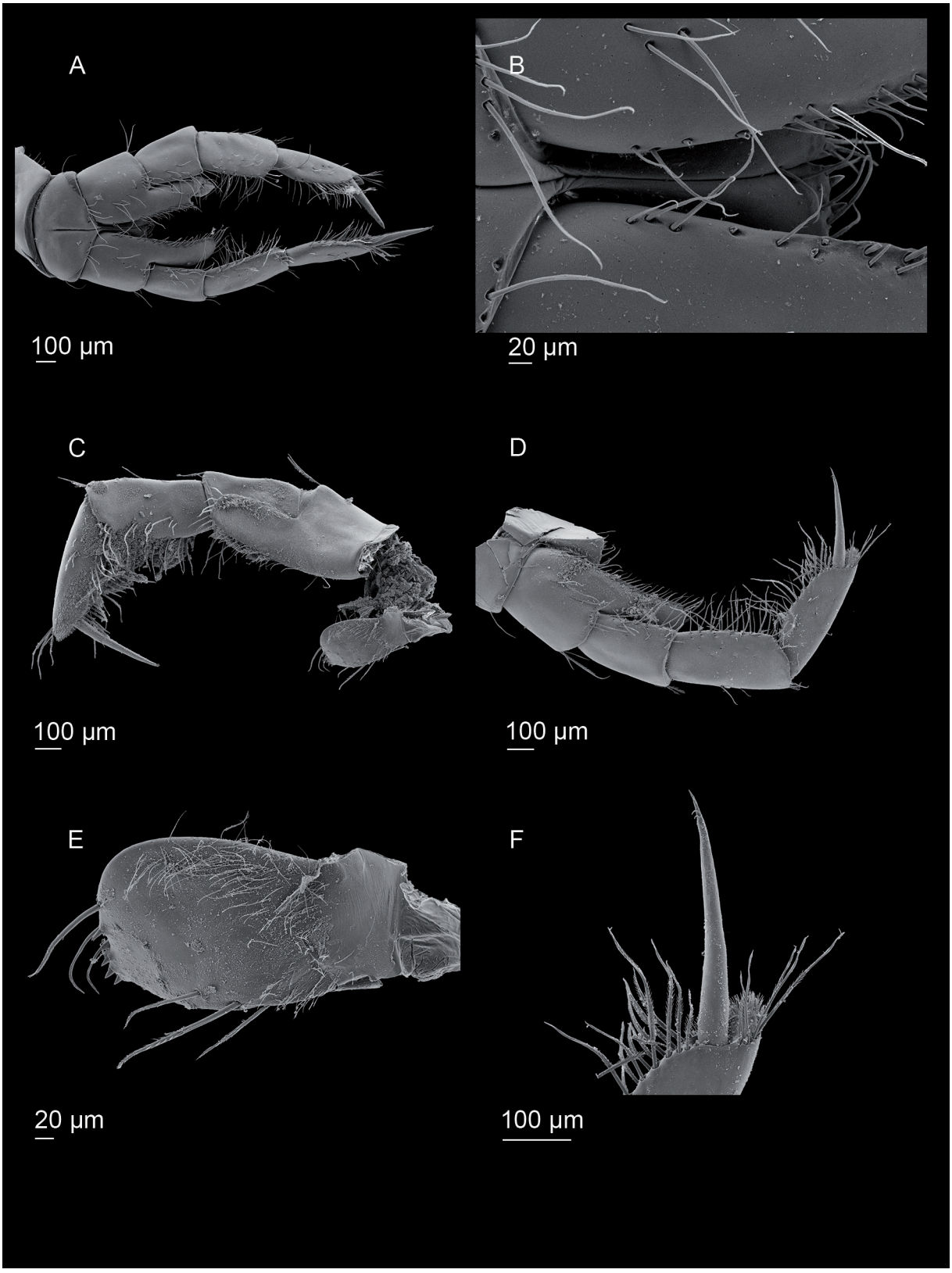

Fig. 11. *Neopleustes schwentneri* sp. nov., DZMB 62804e (A–B), DZMB 62850 (C–F). **A**. Maxilliped, ventral view. **B**. Maxilliped, closeup inner plate, ventral view. **C**. Maxilliped, right side, 'upside' view. **D**. Maxilliped, left side, ventral view. **E**. Maxilliped, right inner plate. **F**. Maxilliped, left dactylus.

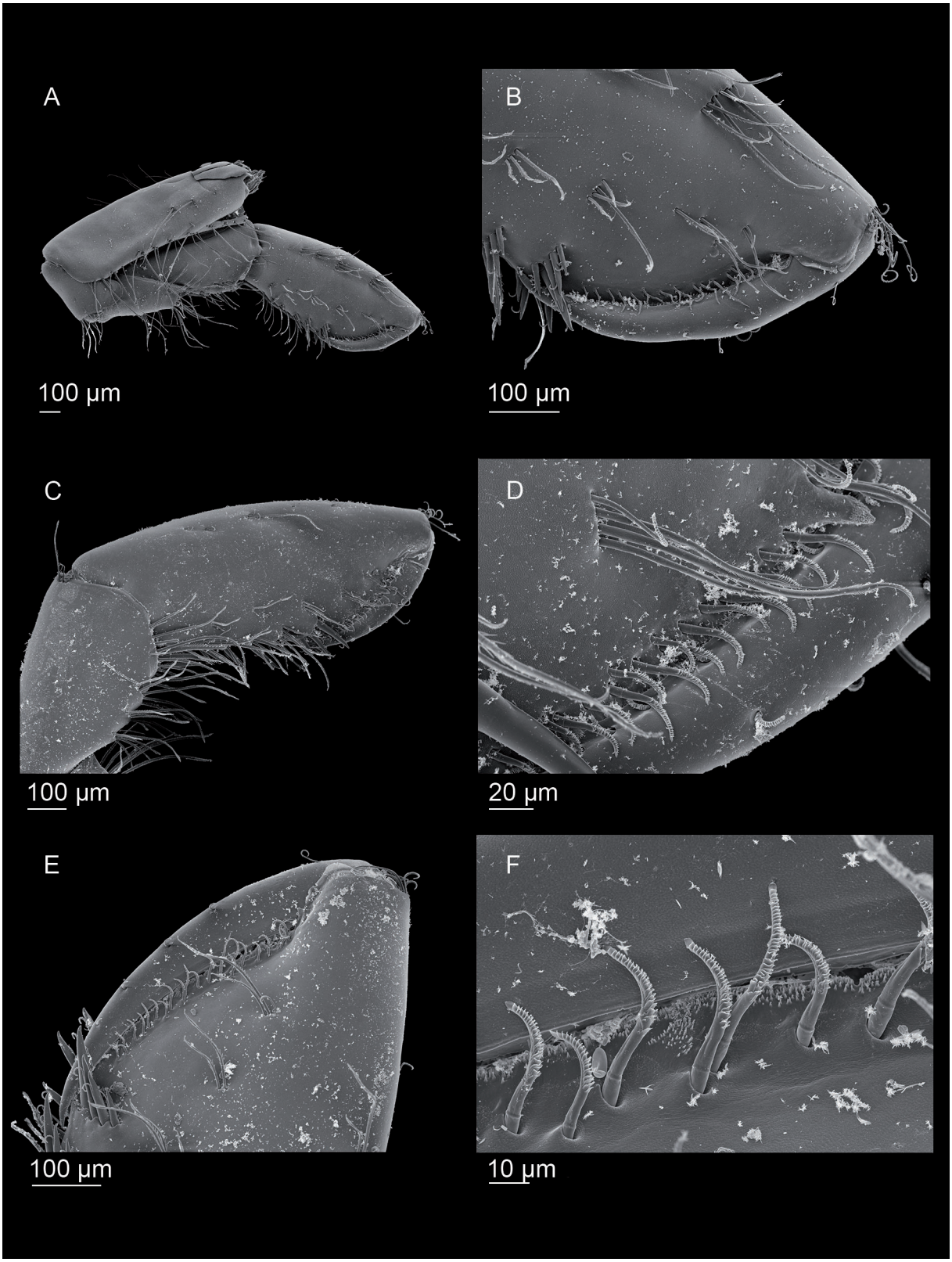

Fig. 12. *Neopleustes schwentneri* sp. nov., DZMB 62804e (A–B), DZMB 62850 (C–F). **A**. Pereopod 1. **B**. Pereopod 1, propodus palm and dactylus. **C**. Pereopod 2. **D**. Pereopod 2, propodus palm and dactylus, closeup. **E**. Pereopod 2. **F**. Pereopod 2, closeup palmar setae.

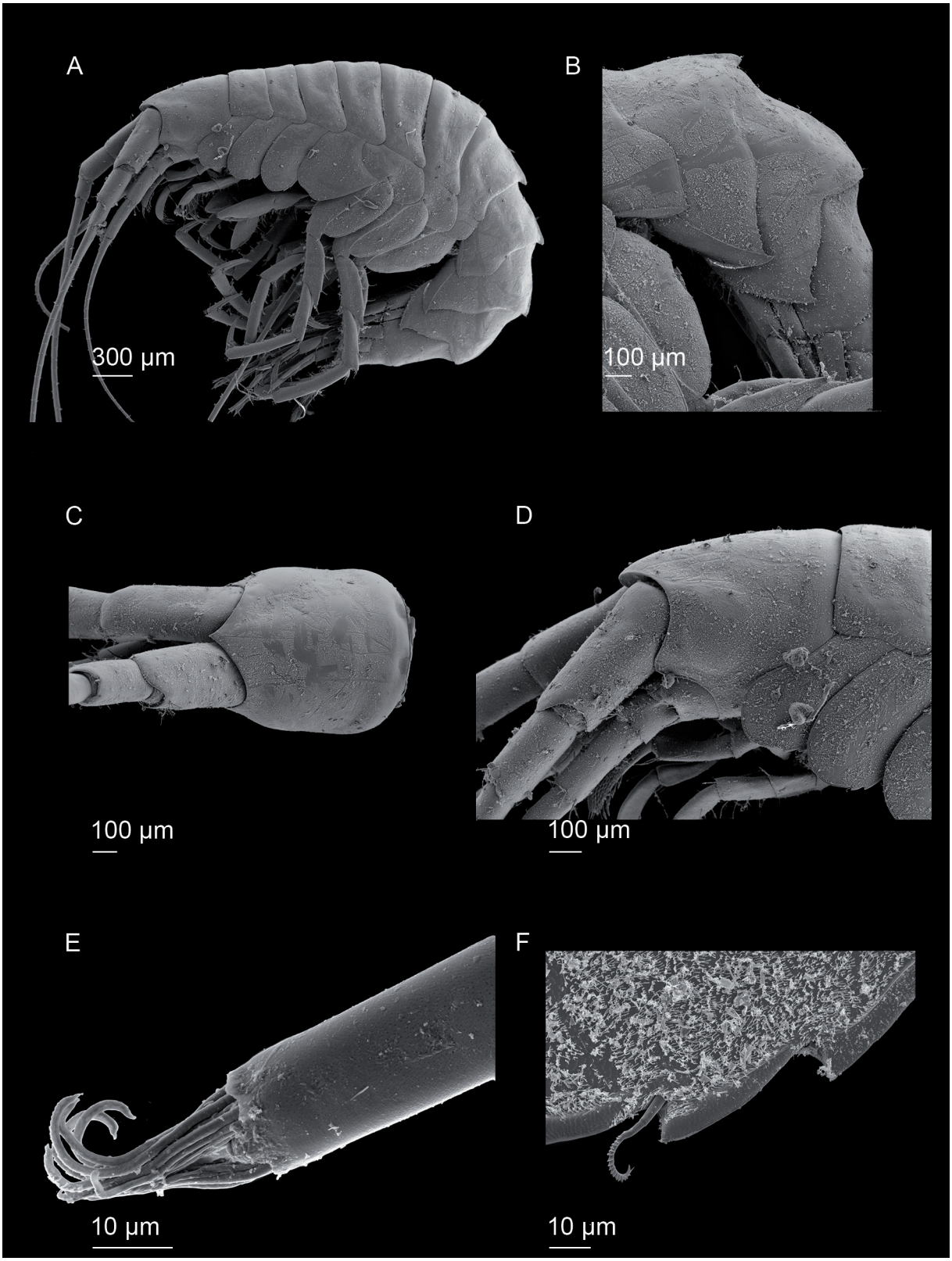

Fig. 13. *Neopleustes schwentneri* sp. nov., DZMB 61786b (A–B), DZMB 61786e (C), 61786b (D, F), 61786d (E). **A**. Habitus. **B**. Epimeron. **C**. Head, dorsal view. **D**. Head, lateral view. **E**. Antenna 1, tip. **F**. Coxa 2, serrations.

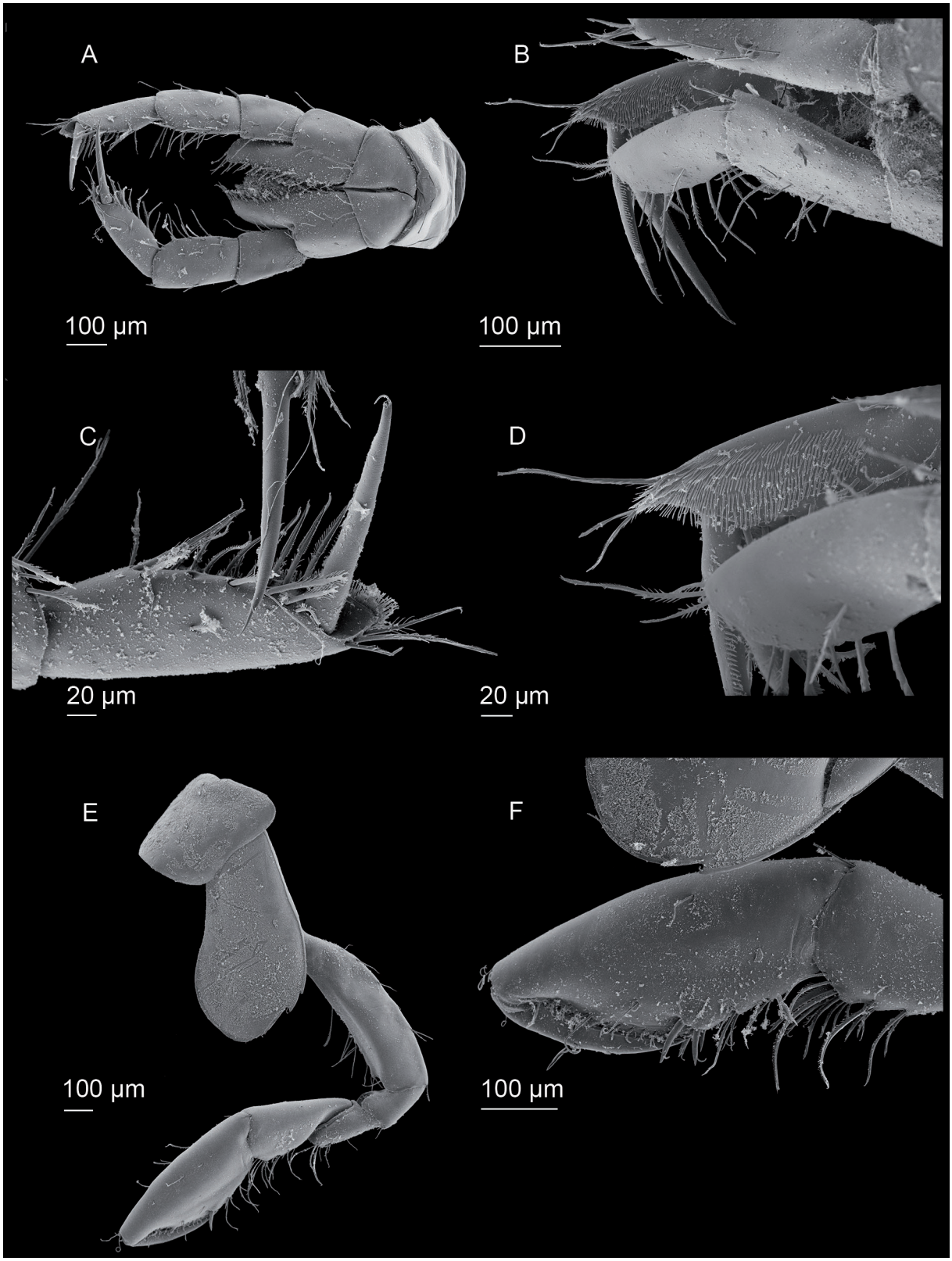

Fig. 14. *Neopleustes schwentneri* sp. nov., DZMB 61786e (A, C, F), DZMB 61786c (B, D), DZMB 61786d (E). **A**. maxilliped. **B**. Maxilliped palp. **C**. Maxilliped palp dactylus. **D**. Maxilliped palp propodus. **E**. Pereopod 1. **F**. Pereopod 2.

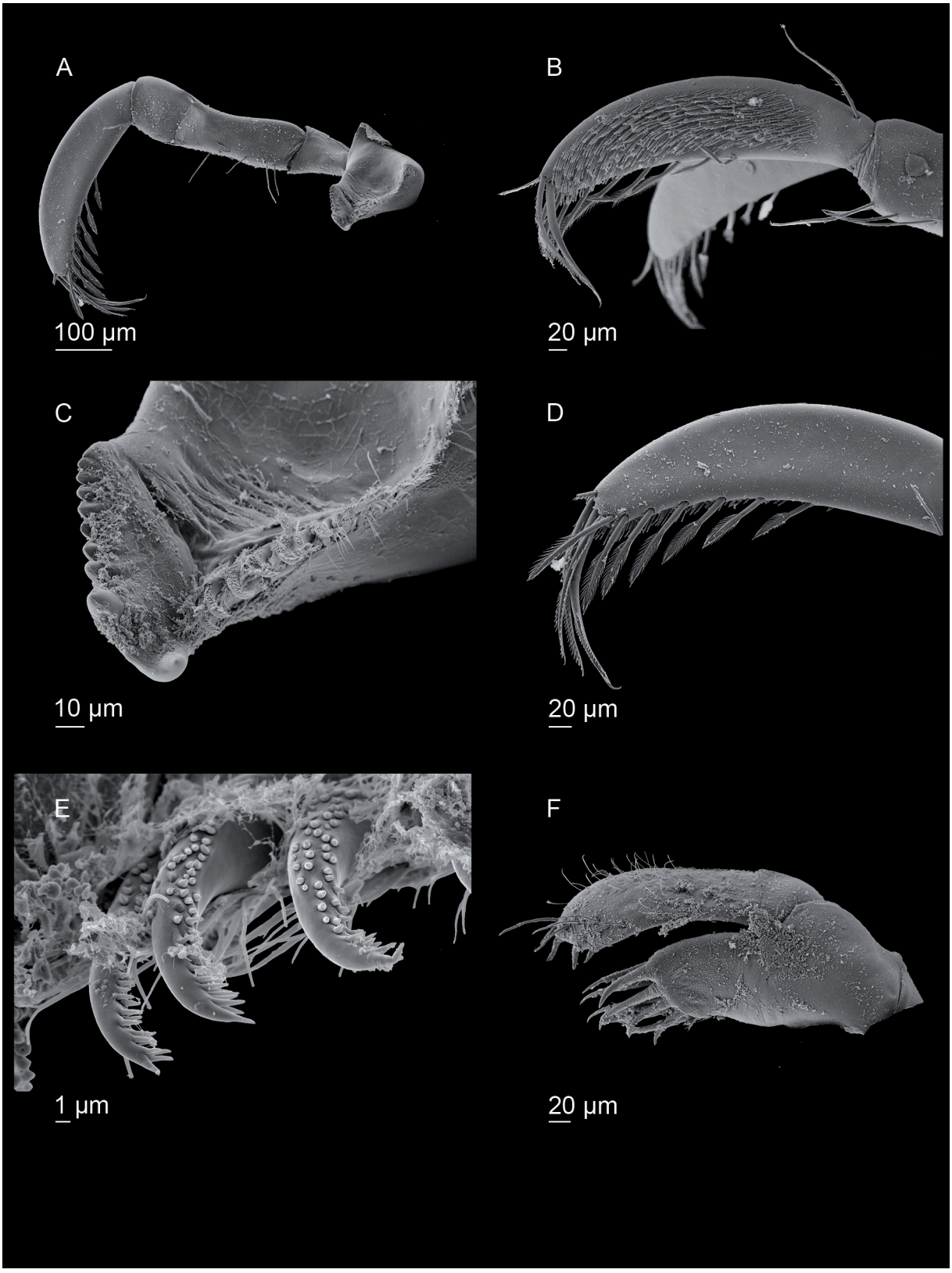

Fig. 15. *Neopleustes schwentneri* sp. nov., DZMB 61786e (A, C–F), DZMB 61786c (B). **A**. Mandible. **B**. Mandible palp. **C**. Mandible incisor. **D**. Mandible palp article 3 tip. **E**. Mandible raker setae. **F**. Maxilla 1.

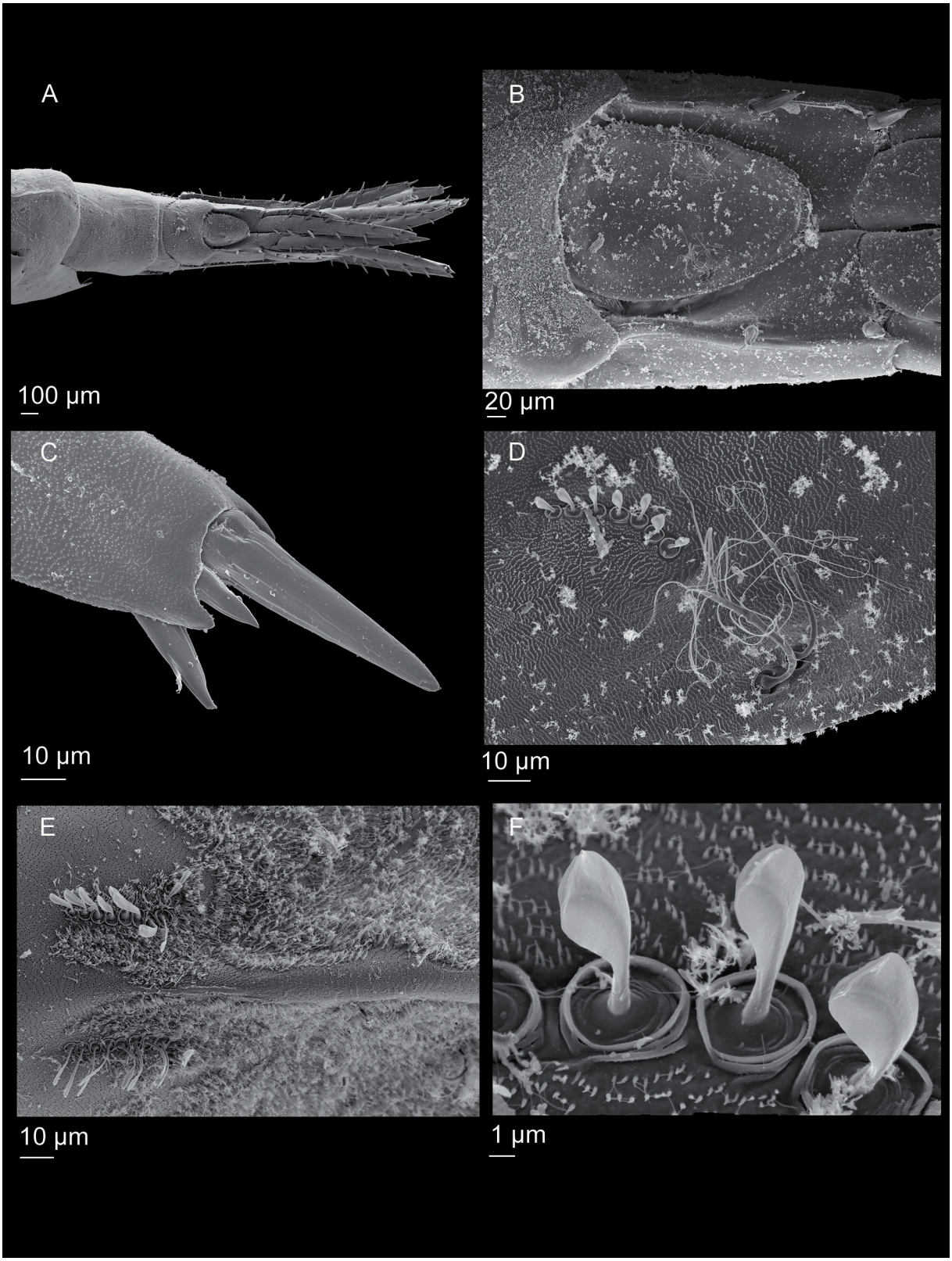

Fig. 16. *Neopleustes schwentneri* sp. nov., DZMB 61786d (A–B, D–F), DZMB 61786c (C). **A**. Urosome. **B**. Telson. **C**. Uropod 2, outer ramus. **D**. Telson, setae. **E**. Epimeron, dorsal keel. **F**. Telson, 'swan-neck' setae.

Telson linguiform, apically rounded, length about 1.5 × width, with proximal ventral keel, with lateral subapical short setae.

Ecology

Neopleustes schwentneri sp. nov. was collected from the corals *Paramuricea* sp. and *Paragorgia arborea* (Linnaeus 1758). Collected in July, several females had eggs.

Distribution

Reykjanes Ridge, south of Iceland, depth 644–992 m.

Taxonomic remarks

There is a high variability in the dorsal carination. While the specimens belong to the same genetic haplotype, there are two morphotypes in respect of the sculpturing of pereonites and pleonites. Morphotype A is more robust, extensions start on pereonite 4 (Fig. 8), whereas morphotype B is smoother, the carinae starts on pereonite 7 (Fig. 13). Both morphotypes occur sympatrically, on the same coral. SEM photos of morphotype A are Figs 8–12, for morphotype B Figs 13–16.

Neopleustes schwentneri sp. nov. is generally morphologically closest to *N. boecki* (Hansen, 1888). The main morphological differences between *N. schwentneri* and *N. boecki* are summarized in Table 2.

Genbank numbers for *N. schwentneri* sp. nov., as listed in Schwentner & Lörz (2021) as *Neopleustis* aff *boecki* are: MT317424, MT317425, MT317427, MT317428, MT317432–MT317452. Additional samples with Bold accession-numbers: AMPIV 316-22; AMPIV 317-22; AMPIV 319-22; AMPIV 303-22; AMPIV 310-22; 311-22; for details see Supp. file 2.

Subfamily **Parapleustinae** Bousfield & Hendrycks, 1994

Parapleustinae Bousfield & Hendrycks, 1994: 41.

A diagnosis of the subfamily Parapleustinae is given by Bousfield & Hendrycks (1994).

Genus ***Parapleustes*** Buchholz, 1874

Parapleustes Buchholz, 1874: 337.
Incisocalliope J.L. Barnard in Barnard & Reish, 1959: 22.

Parapleustes – Barnard 1969: 425. — Gurjanova 1972: 131. — Lincoln 1979: 428. — Barnard & Karaman 1991: 649. — Bousfield & Hendrycks 1994: 41.

Type species

Parapleustes gracilis (Buchholz, 1874).

The genus *Parapleustes* contains 12 known species (Horton *et al.* 2024): *P. americanus* Bousfield & Hendrycks, 1995; *P. assimilis* (G.O. Sars, 1883); *P. bicuspis* (Krøyer, 1838); *P. gracilis* (Buchholz, 1874); *P. ishimarui* Bousfield & Hendrycks, 1995; *P. major* (Bulyčeva, 1952); *P. mielcki* (Sokolowsky, 1925); *P. monocuspis* (G.O. Sars, 1893); *P. sinuipalmus* Dunbar, 1954; *P. triangulocultatus* (Bulyčeva, 1952); *P. tricuspis* Ishimaru, 1984.

The separation of the genera *Parapleustes* and *Pleustes* has been considered subjective (Barnard & Given 1960: 39).

Diagnosis

A detailed diagnosis of the genus *Parapleustes* is provided by Ishimaru (1984).

Distribution

North Pacific, North Atlantic, and Arctic.

Parapleustes bicuspis (Krøyer, 1838)
Fig. 17

Ampithoe bicuspis Krøyer, 1838: 273.
Parapleustes bidentatus McIntosh, 1874: no page number (Horton *et al.* 2024).
Neopleustes bicuspis – Stebbing 1906: 313.
Parapleustes bicuspis Chevreux & Fage, 1925: 185. — Barnard & Given 1960: 40. — Schellenberg 1942: 96.

Diagnosis

A detailed diagnosis of *Parapleustes bicuspis* is provided by Lincoln (1979): 430.

Material examined

W GREENLAND – **off Paamiut** • 1 adult, 9.5 mm, SEM stub; SW Greenland shelf; 61.8666667°N, 50.233333°W; depth 109 m; 4 Nov. 2001.; WH233, station 1075; collected with Rauschert dredge; ZMH-K 444486a • 1 spec., SEM stub; same data as for preceding; ZMH-K 44486b • 1 spec., SEM stub; same data as for preceding; ZMH-K 44486c. See Fig. 17.

Ecology

No information available.

Distribution

North Atlantic and Arctic.

Subfamily **Pleustinae,** Buchholz 1874

Diagnosis

A diagnosis of the subfamily Pleustinae is given by Bousfield & Hendrycks (1994).

Genus ***Pleustes*** Spence Bate, 1858

Pleustes Spence Bate, 1858: 362 (partim.)

Pleustes – Barnard 1969: 421 (partim.). — Gurjanova 1951: 634 (partim.). – Barnard & Karaman 1991: 650. — Bousfield & Hendrycks 1994: 39.

Type species

Pleustes tuberculata Spence Bate, 1858.

The genus *Pleustes* contains 12 known species in two subgenera (Horton *et al.* 2024): *Pleustes* (*Catapleustes*) *angulatus* Shoemaker, 1955; *Pleustes* (*Catapleustes*) *constantinus* Bousfield &

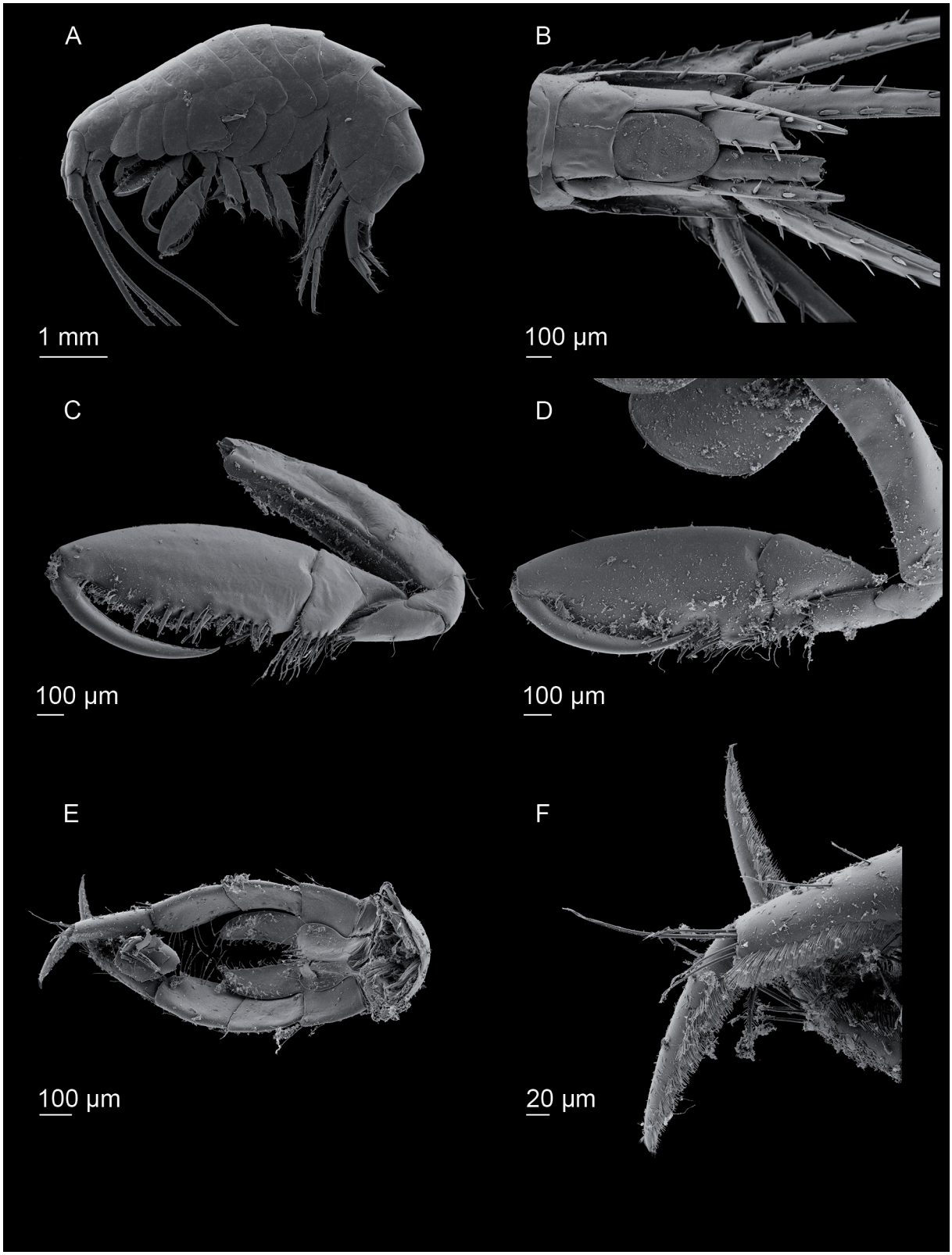

Fig. 17. *Parapleustes bicuspis* (Krøyer, 1838) ZMH-K 44486a (A), ZMH-K 44486b (B, C), ZMH-K 44486c (D, E–F). **A**. Habitus. **B**. Urosome, dorsal view. **C**. Pereopod 1. **D**. Pereopod 2. **E**. Maxilliped. **F**. Maxilliped, dactylus, closeup.

Hendrycks, 1994; *Pleustes* (*Catapleustes*) *japonensis* Gurjanova, 1972; *Pleustes* (*Catapleustes*) *paradoxus* Gurjanova, 1972; *Pleustes* (*Catapleustes*) *victoriae* Barnard & Hendrycks, 1994; *Pleustes* (*Pleustes*) *auctirostris* Bousfield & Hendrycks, 1994; *Pleustes* (*Pleustes*) *gurjanovae* Bousfield & Hendrycks, 1994; *Pleustes* (*Pleustes*) *lawrencianus* Bousfield & Hendrycks, 1994; *Pleustes (Pleustes) obtusirostris* Gurjanova, 1972; *Pleustes* (*Pleustes*) *panoplus* (Krøyer, 1838); *Pleustes* (*Pleustes*) *sibiricus* Gurjanova, 1972; *Pleustes* (*Pleustes*) *tuberculatus* Spence Bate, 1858.

Diagnosis

A diagnosis of the genus *Pleustes* is provided by Bousfield & Hendrycks (1994).

Distribution

North Atlantic, North Pacific, Arctic.

Pleustes tuberculatus Spence Bate, 1858
Figs 18–19

Pleustes tuberculata Bate, 1858: 362.
Pleustes panoplus tuberculatus Gurjanova, 1951: 637.
Pleustes tuberculata – Sars 1895: 344. — Stebbing 1906: 311. — Stephensen 1938: 253.
Pleustes panoplus tuberculatus – Gurjanova 1972: 148, figs 4B, 6. (Kara Sea).

Diagnosis

A diagnosis can be found in Bousfield & Hendrycks (1994): 39.

Material examined

E GREENLAND – **off Scoresbysund** • 1 adult, 5.2 mm, SEM stub; E Greenland shelf; 63.5666667°N, 39.3°W; depth 219 m; 25 Oct. 2001; WH233, station 1016; collected with Rauschert dredge; ZMH-K 44487a • 1 spec., SEM stub; same data as for preceding; K44487b • 1 spec., SEM stub; same data as for preceding; ZMH-K 44487c • 5 specs, ethanol preserved specimen; same collection data as for preceding; ZMH-K 56230 , ZMH-K 56231, ZMH-K 56240, ZMH-K 56241, ZMH-K 56242 • 1 spec., E Greenland Shelf; 63.6000°N, 37.6833°W; depth 238 m; 24 Oct. 2001; WH233, station 1013; collected with Rauschert Dredge; ZMH-K 065823. See Figs 18–19 • 2 specs; same data as for preceding; ZMH-K 56228, ZMH-K 56229.

Ecology

Associated with hydroids (Marin & Sinelnikov 2017).

Distribution

North Atlantic.

Subfamily **Stenopleustinae** Bousfield & Hendrycks, 1994

Stenopleustinae Bousfield & Hendrycks, 1994: 35.

Diagnosis

A diagnosis of the subfamily Stenopleustinae is given by Bousfield & Hendrycks (1994).

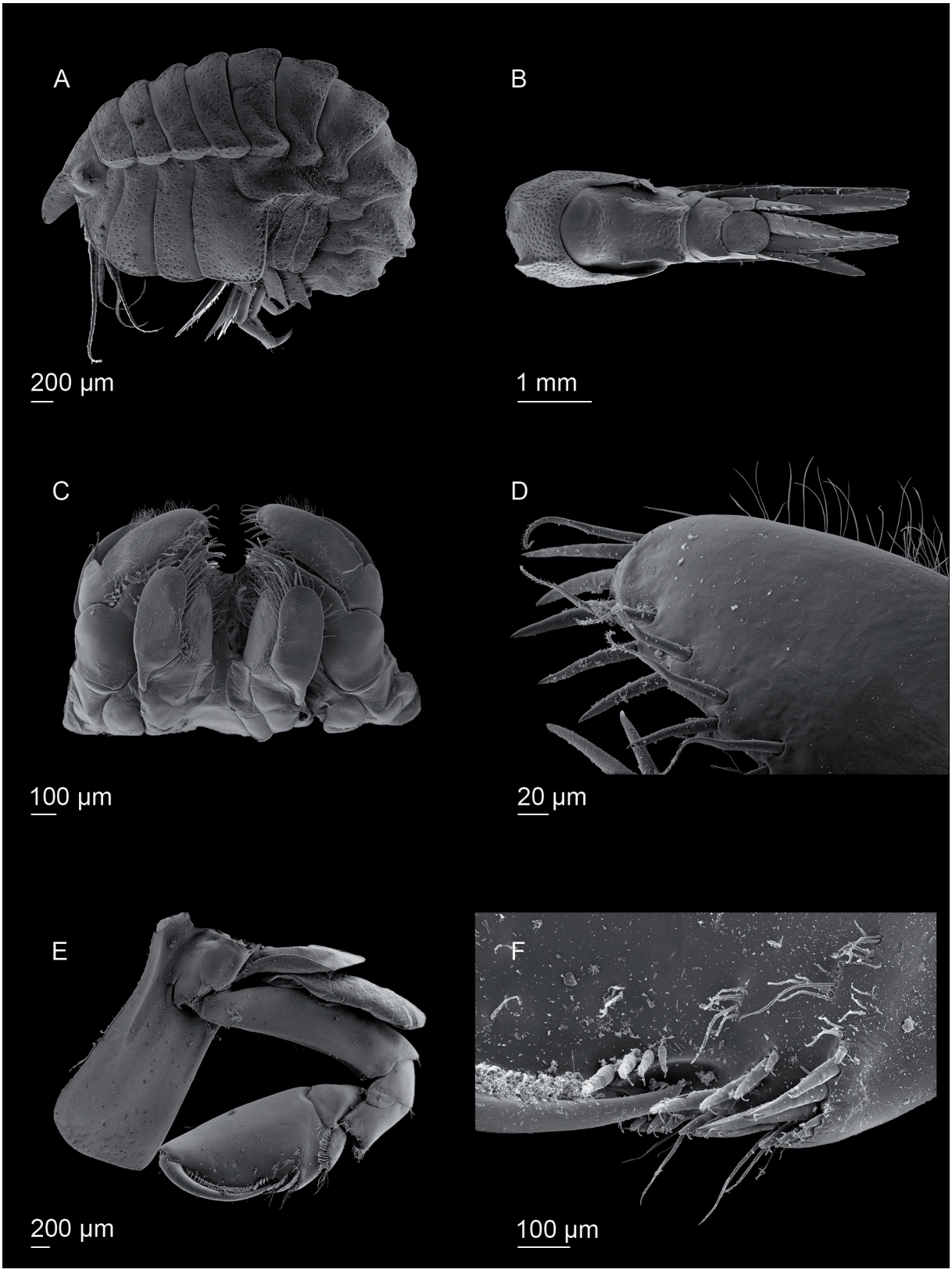

Fig. 18. *Pleustes* (*Pleustes*) *tuberculatus* Spence Bate, 1858. ZMH-K 44487a (A), ZMH-K 44487b (B–F). **A**. Habitus. **B**. Urosome, dorsal view. **C**. Mouthpart bundle: Maxilla 1 and maxilla 2. **D**. Maxilla 1, closeup. **E**. Pereopod 2. **F**. Pereopod 2, closeup palmar corner.

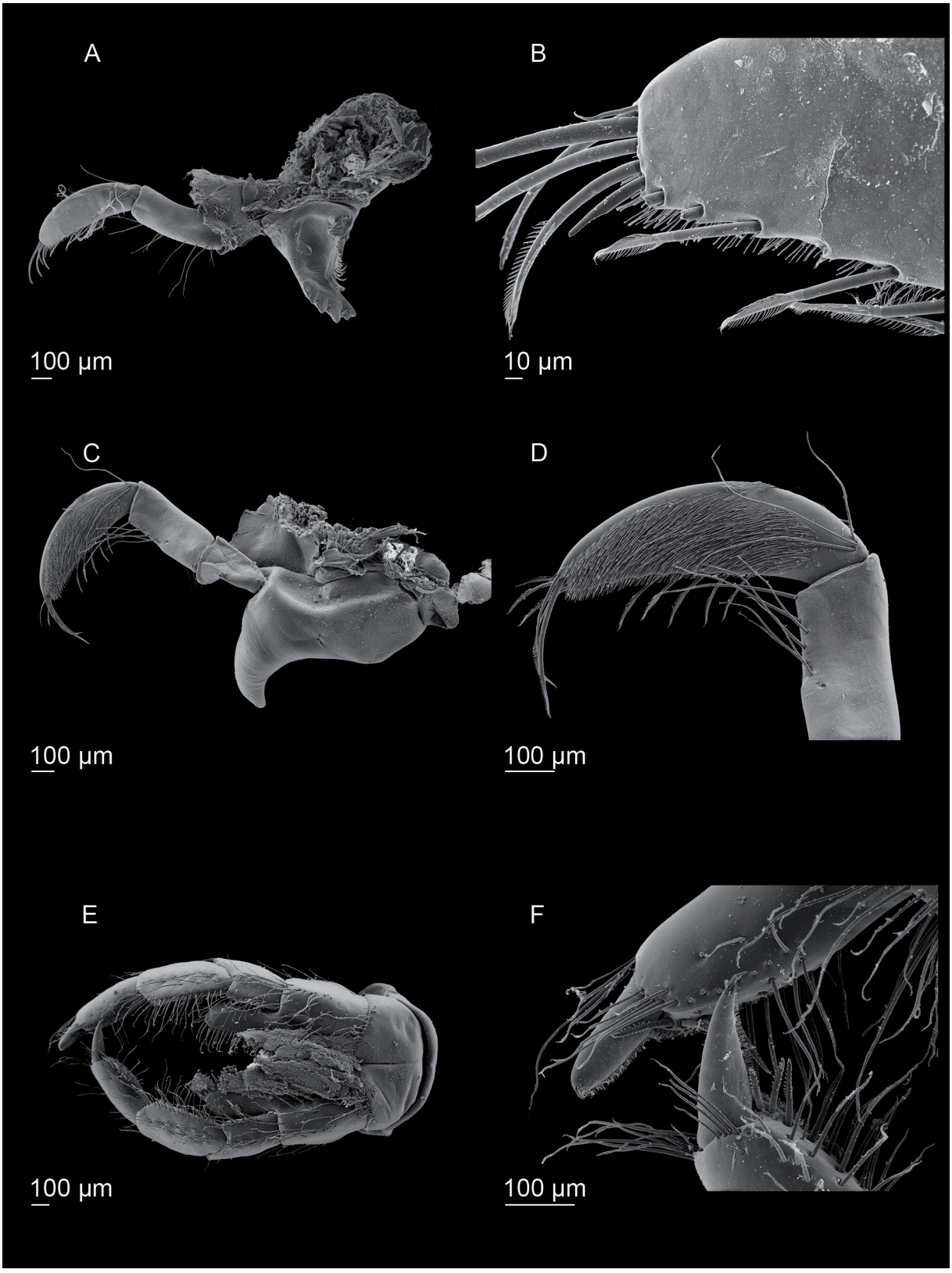

Fig. 19. *Pleustes* (*Pleustes*) *tuberculatus* Spence Bate, 1858. ZMH-K 44487b (A–F). **A**. Left mandible. **B**. Left mandible close-up, palp tip. **C**. Right mandible. **D**. Right mandible palp, close-up. **E**. Maxilliped. **F**. Maxilliped palp, close-up.

Genus ***Stenopleustes*** G.O. Sars, 1893

Stenopleustes G.O. Sars, 1895: 354.

Stenopleustes – Stebbing 1906: 316. — Gurjanova 1972: 132. — Barnard & Karaman 1991: 652. — Hendrycks & Bousfield 2004: 53.

Type species

Amphithopsis malmgreni Boeck, 1871.

The genus *Stenopleustes* contains seven known species (Horton *et al.* 2024) and a species new to science described herein: *Stenopleustes eldingi* Gurjanova, 1930, *S. latipes* (M. Sars, 1858), *S. malmgreni* (Boeck, 1871), *S. nodifer* (G.O. Sars, 1883), *S. olriki* (Hansen, 1888) and *S. rainbowi* Bellan-Santini, 2007.

Diagnosis

Body robust, compressed. Head with rostrum and lateral lobes, only slightly produced. Coxal plates moderately large. Antenna 1 slender and much longer than 2; accessory flagellum absent or represented by vestigial scale. Mandible with molar large, surface triturative or ridged. Maxilliped palp article 3 with prominent apical process. Gnathopods subchelate, biramous, rami lanceolate. Telson entire. Sexes similar (Lincoln 1979). See Table 3 for the morphological differences of the *Stenopleustes* species.

Distribution

North Atlantic and Arctic.

Stenopleustes jeskulkeae sp. nov.

urn:lsid:zoobank.org:act:68BB5166-88EA-42C5-9F9B-BC91914B2DF1

Figs 1D–F, 20–27

Stenopleustes aff. *nodifera A* Schwentner & Lörz, 2021: fig 3, tab. 1.

Diagnosis

Pereon and third epimeral plate dorsally smooth, without carination, first two pleonites dorsally with two pointed extensions each.

Etymology

Stenopleustes jeskulkeae is named for our good colleague Karen Jeskulke, who tirelessly helped with keeping order in all our specimens. The name is derived of the Latin genitive of her surname.

Type material

Holotype

ICELAND – **off Reykjanes** • ♀ adult, 7.3 mm, ethanol fixed; Reykjanes Ridge; 59.251°N, 30.484383°W; depth 866 m; 17 Jul. 2018; MSM75, IceAGE-RR exped., station 80-11; collected by ROV KIEL6000, from Plexauridae/*Paramuricea*; AMPIV308-22; ZMH-K 60037.

Paratypes

ICELAND – **off Reykjanes** • 3 specs., SEM-stubs; same data as for holotype; DZMB 61788a-c.

Additional material

ICELAND – **off Reykjanes** • 1 spec., ethanol fixed; same data as for holotype; ZMH-K 58759 • 3 specs, SEM-stubs; same data as for holotype; DZMB 61787a-c • 1 spec.; same data as for holotype; AMPIV312-22; DZMB 62368 • 1 spec.; same data as for holotype; AMPIV313-22; DZMB 62369 • 1 spec.; same data as for holotype; DZMB 61800_d • 1 spec.; same data as for holotype; AMPIV314-22; DZMB-HH_62370 • 1 spec.; same data as for holotype; AMPIV315-22; DZMB-HH_62371 • 3 specs.; Reykjanes Ridge; 59.24786°N, 30.488983°W; depth 869 m; 28 Jul. 2018; MSM75, IceAGE-RR exped., station 149-6; collected by ROV KIEL6000, from Plexauridae/*Paramuricea*; ZMH-K 58760 • 1 spec.; Reykjanes Ridge; 60.24765°N, 29.1379°W; depth 718 m; 13 Jul. 2018; MSM75, IceAGE-RR exped., station 67-6; collected by ROV KIEL6000, from *Paragorgia arborea*; ZMH-K 58765 • 1 spec.; same data as for preceding; ZMH-K 58767 •1 spec.; same data as for preceding; ZMH-K 58768 •1 spec.; same data as for preceding; ZMH-K 58769 • 1 spec.; same data as for preceding; AMPIV304-22; DZMB-HH 62314 • 1 spec.; same data as for preceding; AMPIV301-22; DZMB-HH 62311 • 1 spec.; same data as for preceding; AMPIV302-22; DZMB-HH 62312 • 1 spec.; same data as for preceding; AMPIV305-22; DZMB-HH 62315 • 1 spec.; same data as for preceding; AMPIV306-22; DZMB-HH 62316 • 1 spec.; Reykjanes Ridge; 60.237°N, 29.136°W; depth 705 m; 1 Aug. 2018; MSM75, IceAGE-RR exped., station

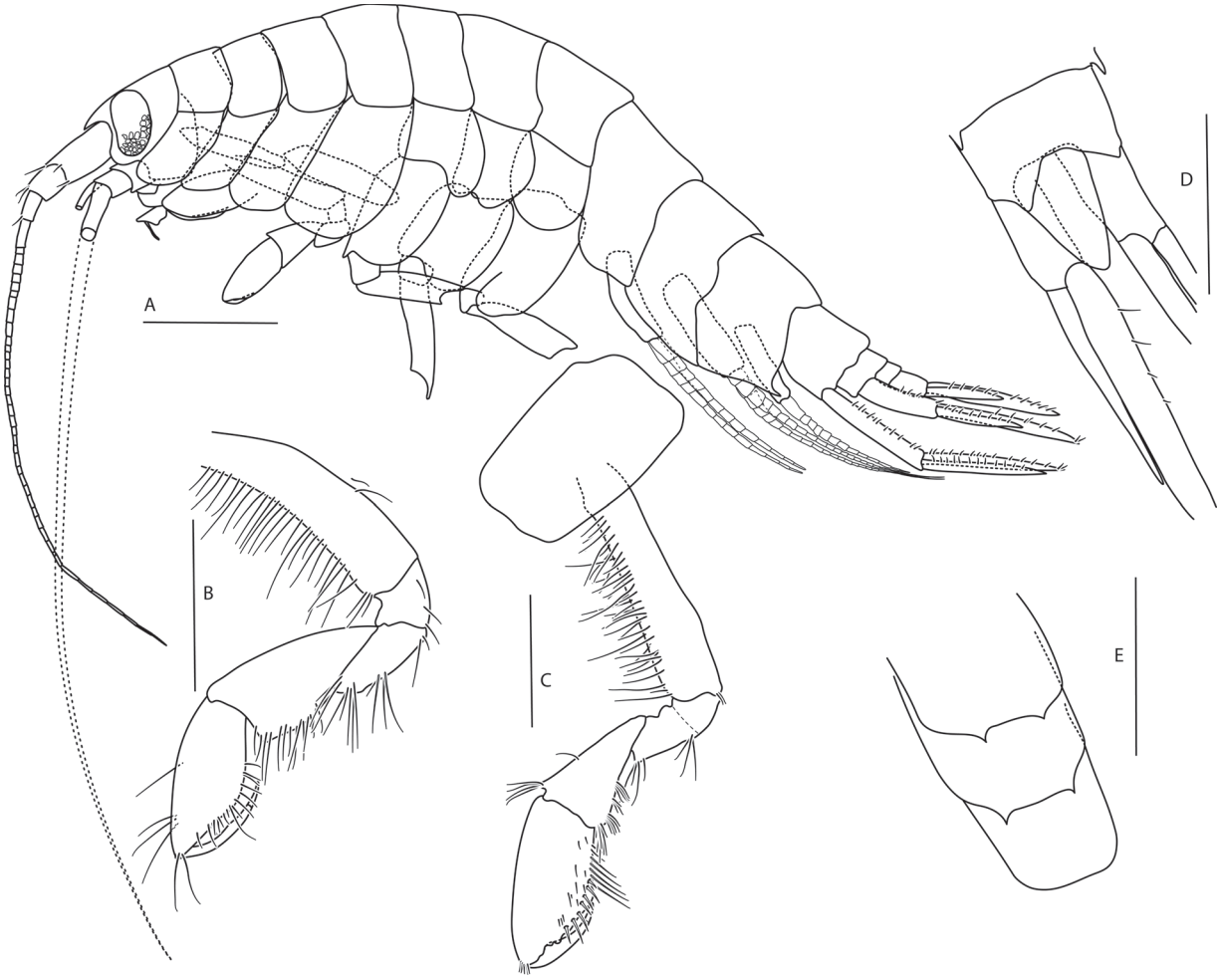

Fig. 20. *Stenopleustes jeskulkeae* sp. nov., holotype, ♀, 7.3 mm (ZMH-K 60037). **A**. Habitus. **B**. Pereopod 1. **C**. Pereopod 2. **D**. Telson uropod 3. **E**. Epimeron, dorsal view. Scale bars: A = 1 mm, B–E = 0.5 mm.

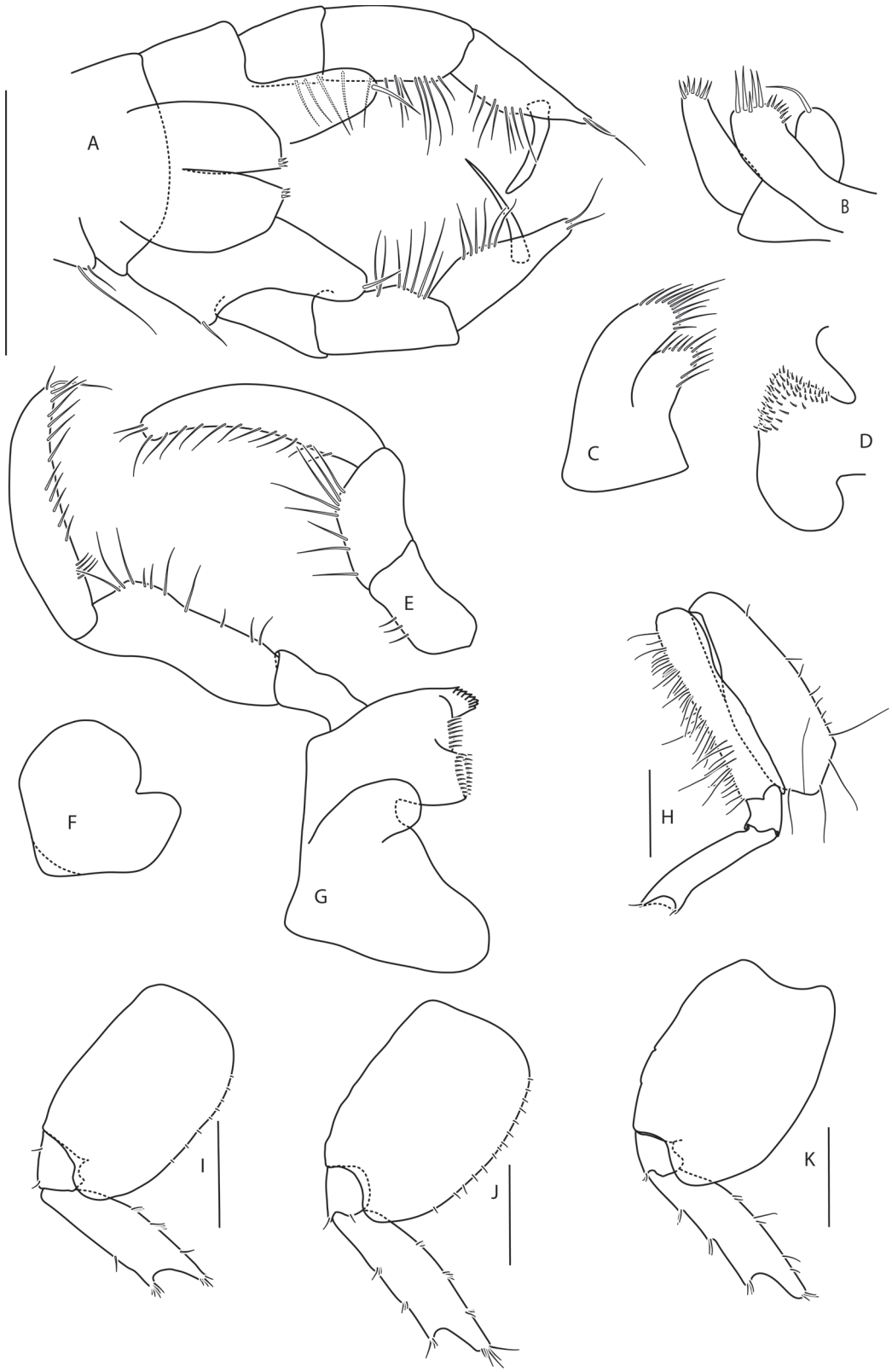

Fig. 21. *Stenopleustes jeskulkeae* sp. nov., holotype, ♀, 7.3 mm (ZMH-K 60037). **A**. Maxilliped. **B**. Maxilla 1. **C**. Maxilla 2. **D**. Labium. **E**. Mandible palp. **F**. Labrum. **G**. Mandible. **H**. Pereopod 4. **I**. Pereopod 5. **J**. Pereopod 6. **K**. Pereopod 7. Scale bars = 0.5 mm. (shared scale bar for all mouthparts, separate for each of the legs.)

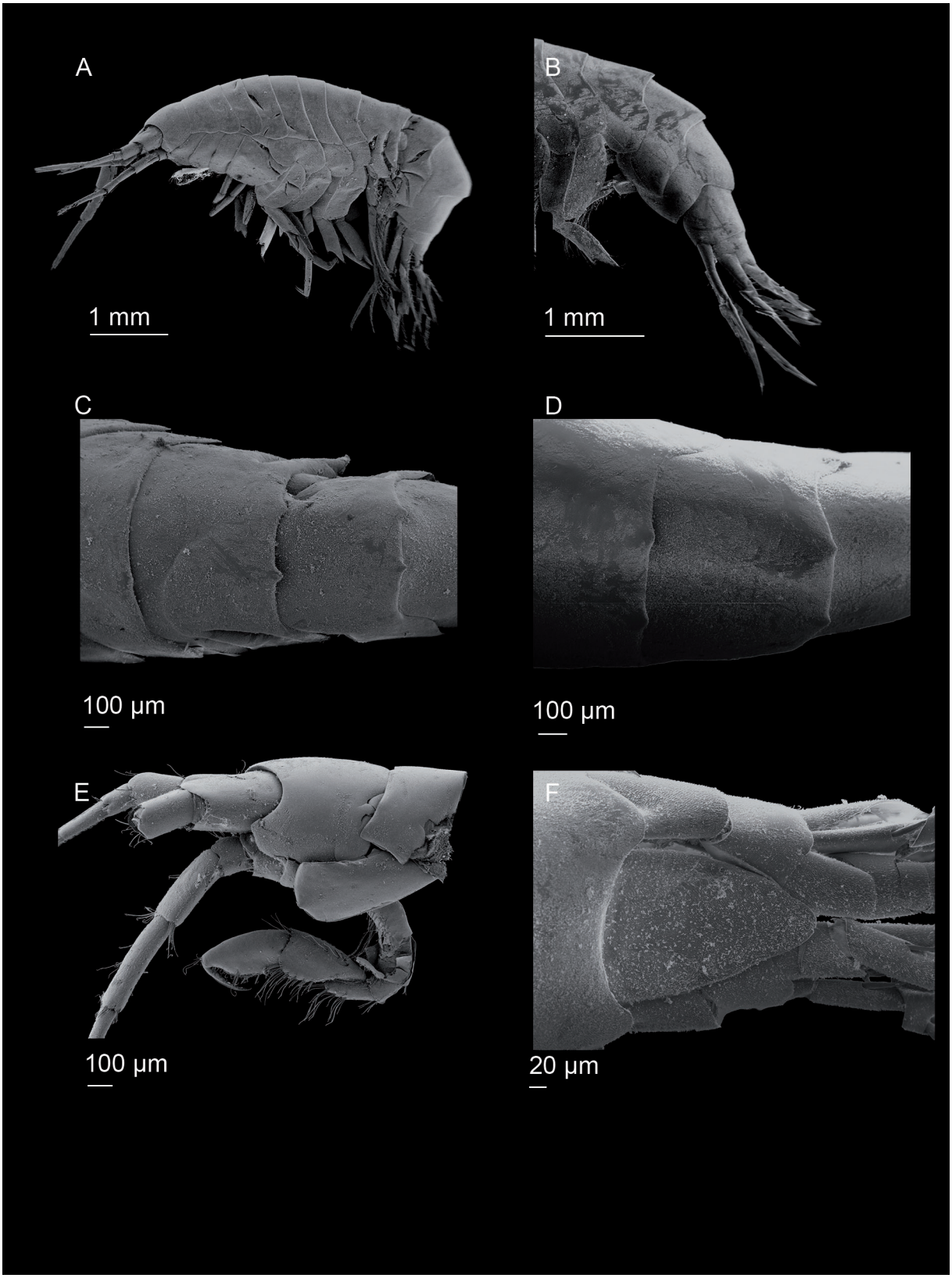

Fig. 22. *Stenopleustes jeskulkeae* sp. nov., DZMB 61787b (A, C), DZMB 61787a (B, D, F), DZMB 61787c (E). **A**. Habitus. **B**. Epimeron and urosome. **C**. Epimeron, dorsal view. **D**. Epimeron, dorsal view. **E**. Head and pereopod 1. **F**. Telson.

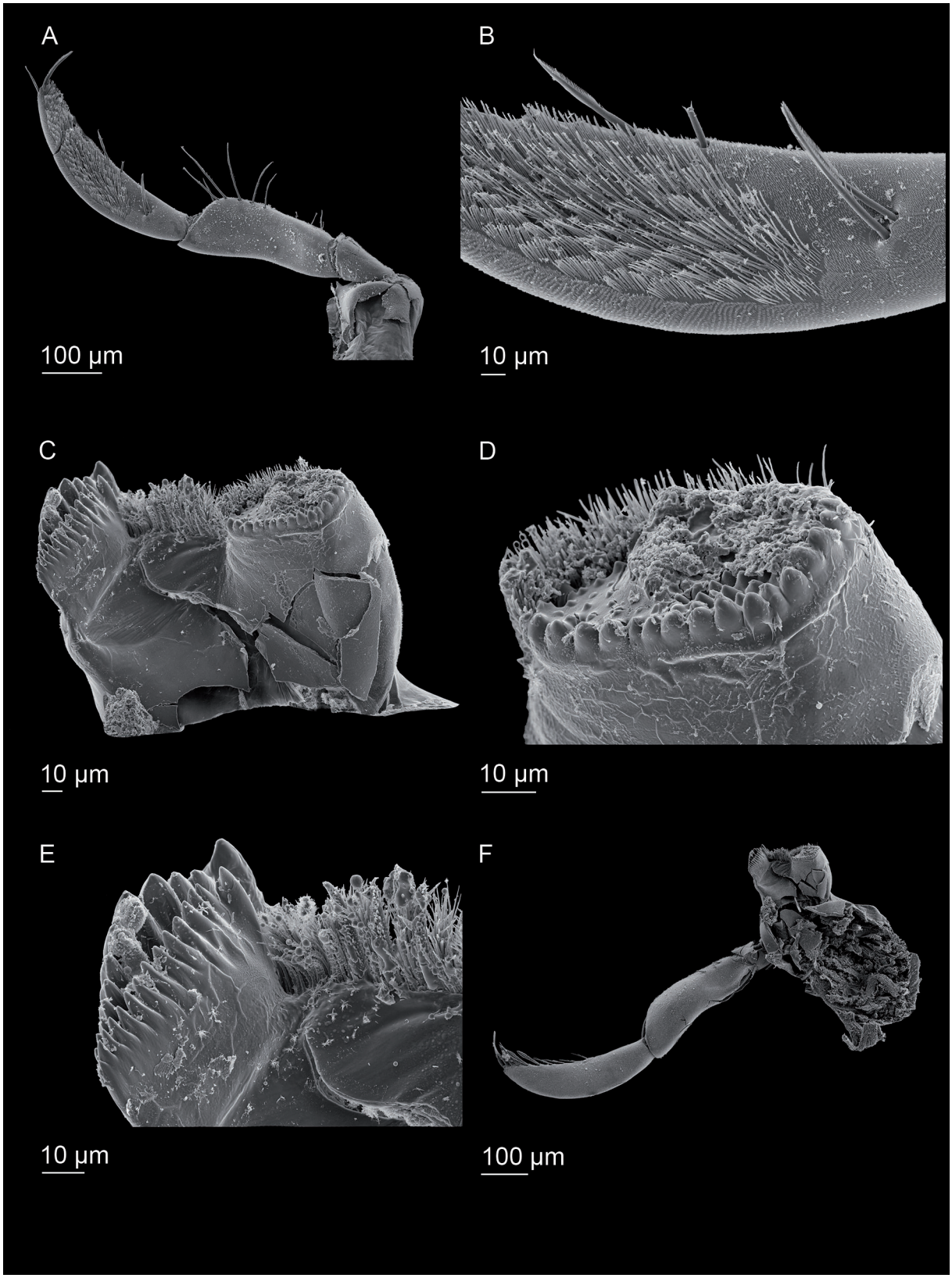

Fig. 23. *Stenopleustes jeskulkeae* sp. nov., DZMB 61787c. **A**. Mandible palp. **B**. Mandible palp, close-up. **C**. Mandible, closeup. **D**. Mandible molar. **E**. Mandible incisor. **F**. Right mandible.

188-4; collected by ROV KIEL6000, from *Paramuricea*; AMPIV320-22; DZMB-HH_61711 • 1 spec.; Reykjanes Ridge; 60.23625°N, 29.1288°W; depth 646 m; 1 Aug. 2018; MSM75, IceAGE-RR exped., station 188-5; collected by ROV KIEL6000, from *Paramuricea*; AMPIV318-22; DZMB 61715 • 5 specs; same data as for preceding; DZMB 62851_b • 12 specs; same data as for preceding; DZMB 62852_b.

Description

Rostrum small, about 0.2 times as long as peduncular segment of antenna 1, apex acute; anterior head angular.

Eyes very large, reniform, covering almost length of head. Antenna 1–2 very long, A1 as long as body; A1 peduncular segment 1 elongate and strong, equal to segments 2–3 together; flagellum length about 5 times as long as peduncle with more than 60 articles. Antenna 2 nearly as long as antenna 1, flagellum with more than 50 articles.

Upper lip oval, strong, smooth. Lower lip with dense setae outer lobes. Mandible palp very large, second segment 2 × as long as first and 0.8 × as long as third segment. Mandibular palp segment 1 smooth, second article nine setae, third article with ten strong pectinate setae at inner apical margin, anterior tip with two smaller pectinate setae, inner side of mandibular palp densely setose , left and right mandibular palp alike, molar strongly triturative, 12 teeth at the incisor, with 14 teeth also at lacinia mobilis.

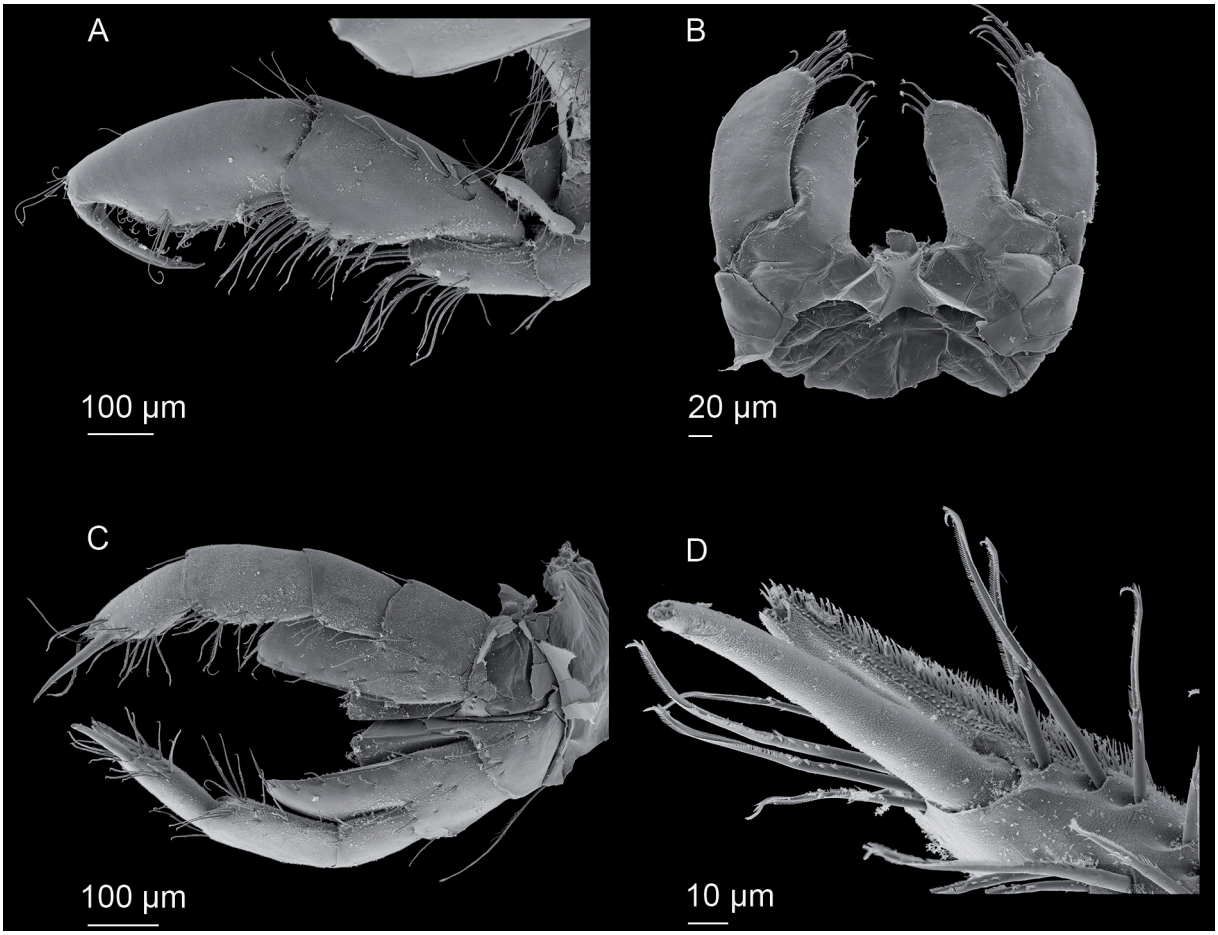

Fig. 24. *Stenopleustes jeskulkeae* sp. nov., DZMB 61787c. **A**. Pereopod 1. **B**. Maxilla 2. **C**. Maxilliped. **D**. Maxilliped palp, close-up dactylus.

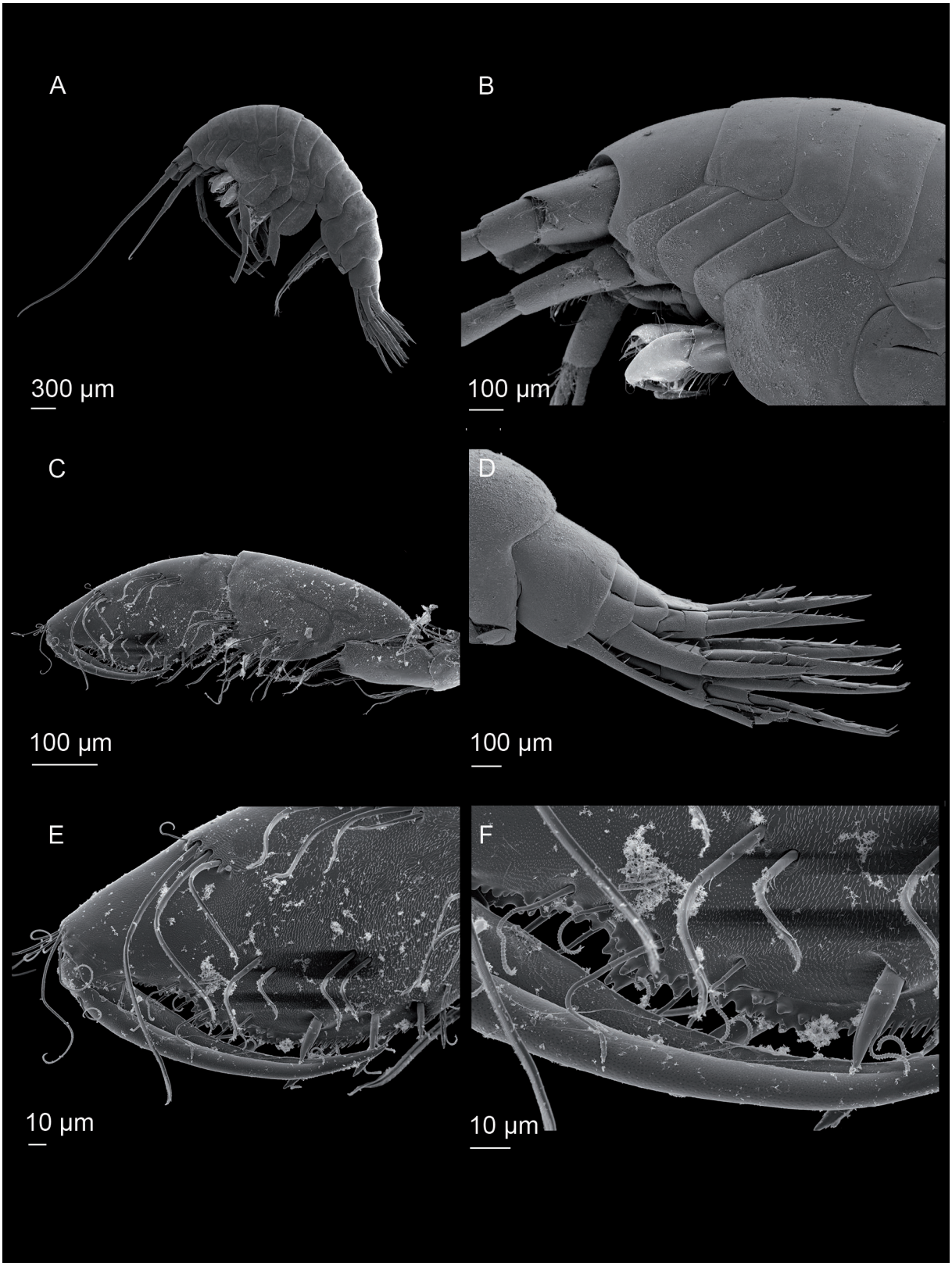

Fig. 25. *Stenopleustes jeskulkeae* sp. nov., paratypes, DZMB 61788b (A–B, D), DZMB 61788a (C, E–F). **A**. Habitus. **B**. Head and front. **C**. Pereopod 2. **D**. Urosome. **E**. Pereopod 2 propodus palm. **F**. Pereopod 2 propodus palm, close-up.

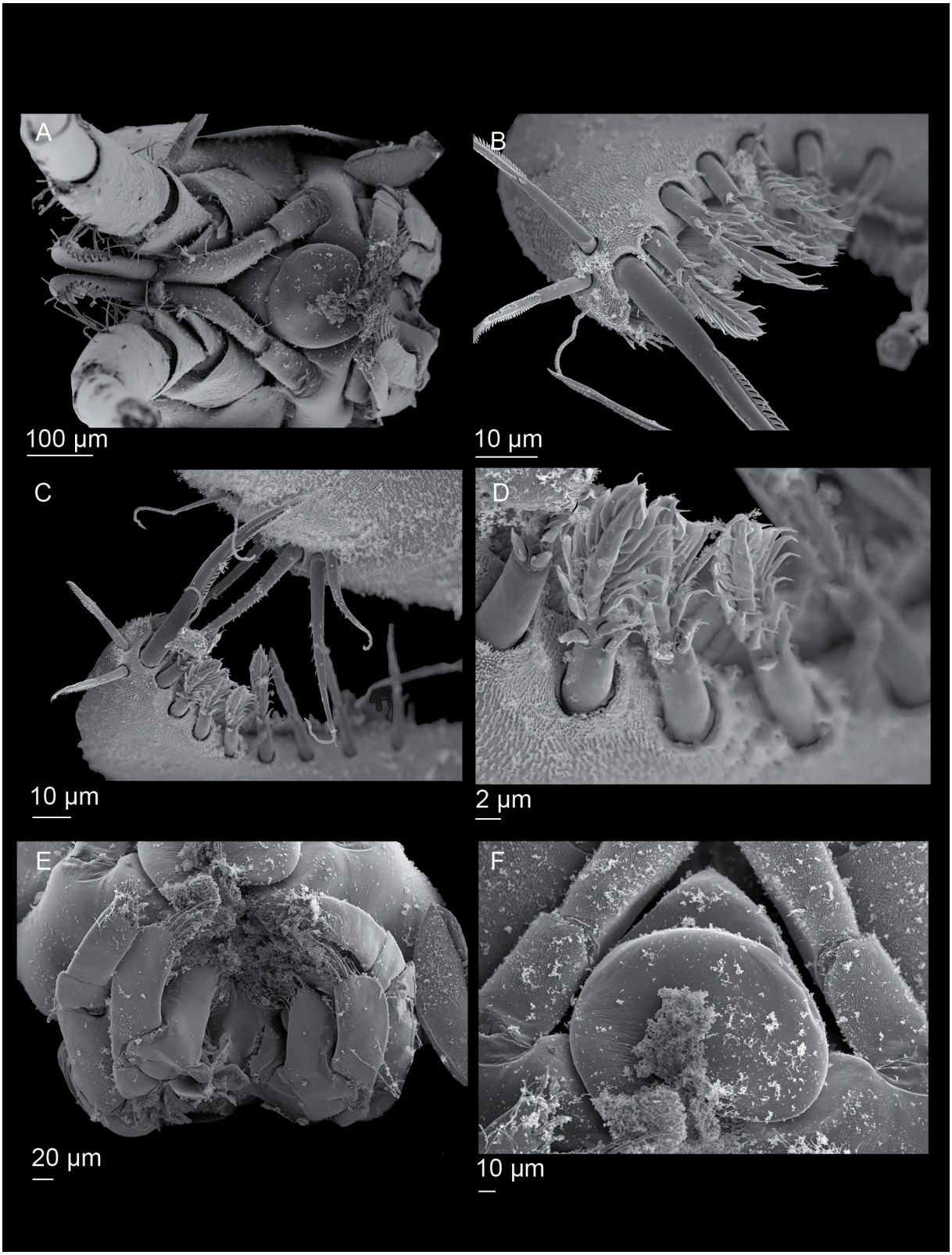

Fig. 26. *Stenopleustes jeskulkeae* sp. nov., paratypes, DZMB 61788c (A, E–F), DZMB 61788a (B–D). **A**. Head, ventral view. **B**. Maxilliped dactylus, closeup. **C**. Maxilliped dactylus, tip. **D**. Maxilliped dactylus setae, closeup. **E**. Mouthpart bundle maxilla 2 and maxilla 1. **F**. Labium.

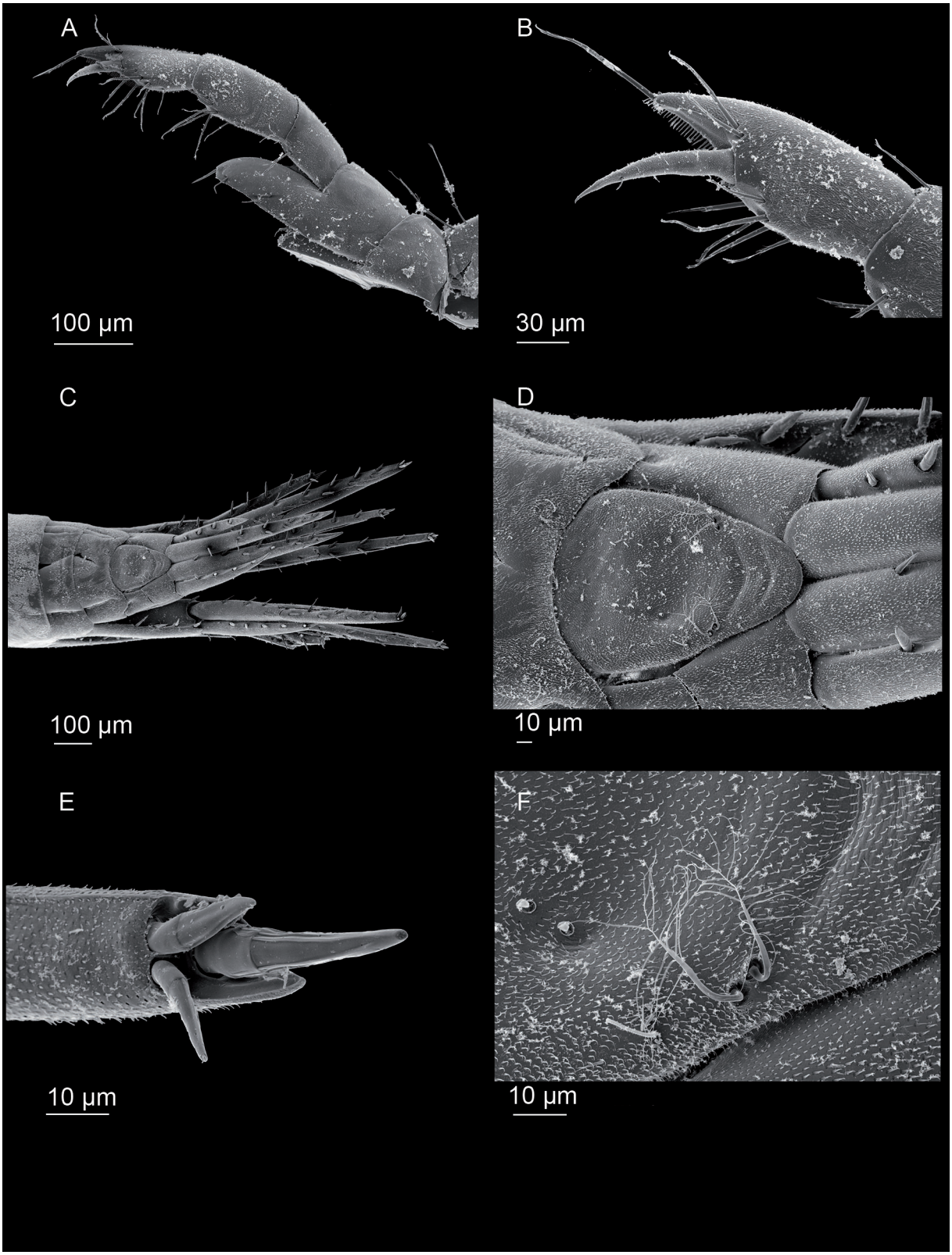

Fig. 27. *Stenopleustes jeskulkeae* sp. nov., paratype, DZMB 61788c. **A**. Maxilliped left side, ventral view. **B**. Maxilliped left side, dactylus, close-up. **C**. Urosome. **D**. Telson. **E**. Uropod 2 inner ramus tip. **F**. Telson setae.

Table 3 (continued on the next page)**.** Overview of all *Stenopleustes* species worldwide, the rudimentary characters of *S. eldingi*, are based on the original descrription of Gurjanova (1930), which is based on one female with broken off antennae and lacking parts of its urosome.

	S. jeskulkeae sp. nov	***S. eldingi*** Gurjanova, 1930	***S. latipes*** (M. Sars, 1858)	***S. malmgreni*** (Boeck, 1871)	***S. nodifer*** (G.O. Sars, 1883)	***S. olriki*** (Hansen, 1888)	***S. rainbowi*** Bellan-Santini, 2007
Eyes	large, depth ashead	large, half depth of head	large, depth ashead	large, depth ashead	large, depth ashead	small, half depth of head	absent
Coxa 1	same depth as C2	missing in description	shorter than 2	same depth, rounded	same depth, squarish	shorter than 2	same depth as C2
Peropod 2 palm	weakly oblique, weak u-shaped serrated incision	slightly oblique	transverse, sculptured incision	oblique, rounded, smooth	oblique, rounded, smooth	oblique, with strong palmar protrusion	transverse, not sculptured
Coxa 5	evenly lobate	missing in description	deeply postereo-lobate	deeply postereo-lobate	deeply postereo-lobate	deeply posterolobate	deeply posterolobate
Pereonite dorsally	smooth	smooth	smooth	smooth	smooth	smooth	blunt process
Pereonite 7 dorsally	smooth	smooth	blunt process	smooth	double cuspidate	smooth	blunt process
Dorsal sculpting epimeron 1 and 2	2 pointed extensions	smooth	carina	smooth	2 rounded extensions	smooth	strongly bumpy

Table 3 (continued)**.** Overview of all *Stenopleustes* species worldwide, the rudimentary characters of *S. eldingi*, are based on the original descrription of Gurjanova (1930), which is based on one female with broken off antennae and lacking parts of its urosome.

	S. jeskulkeae sp. nov	***S. eldingi*** Gurjanova, 1930	***S. latipes*** (M. Sars, 1858)	***S. malmgreni*** (Boeck, 1871)	***S. nodifer*** (G.O. Sars, 1883)	***S. olriki*** (Hansen, 1888)	***S. rainbowi*** Bellan-Santini, 2007
Epimeral plate 2 postero-distal corner	tiny projection	tiny projection	projection	rounded	tiny projection	squarish	rounded
Epimeral plate 3 postero-distal corner	squarish	tiny projection	projection	squarish	tiny projection	tiny projection	tiny projection
Telson	entire, triangular, with two plumose setae on both apical margins	missing	rounded, no seta	entire, linguiform, no setae	elongate, subtriangular,	entire, rounded triangle	entire, oval
Depth (m)	718–980	100–143	50–1500	90–275	30–300	90	2295

Table 4. Pleustidae new to science sampled on corals during IceAGE RR on R/V *Maria Sibylla Merian* MSM75 in 2018 on the Reykjanes Ridge via ROV Phoca.

Station	Lat. (°N)	Long. (°W)	Depth (m)	Coral	Pleustidae	Pleustidae
					Neopleustes schwentneri sp. nov	*Stenopleustes jeskulkeae* sp. nov
67-6	60.24765	29.13790	718	*Paragorgia*		x
80-11	59.251	30.48438	866	Plexauridae/ *Paramuricea*	x	x
111-6	59.2898	30.44697	980	*Acanthogorgia*		x
149-3	59.25123	30.48502	867	Plexauridae	x	x
149-6	59.24786	30.48898	869	*Paragorgia arborea*		x
188-4	60.23661	29.13605	705	*Paragorgia arborea*	x	x
188-5	60.23625	29.12880	646	*Paramuricea*	x	
188-6	60.23741	29.114833	644	coral rubble	x	

Maxilla 1 palp extending over outer plate, apex subtruncate, with a row of 7 cuspidate setae, inner plate with one terminal setae.

Maxilla 2, inner plate slightly shorter and broader than outer plate; outer plates with 8 long setae at terminal end, inner plate with 3 long setae at terminal end, inner margin of outer plates setose.

Maxilliped, inner plate short, apex inner angle subtruncate, outer rounded; outer plate longer than first palp segment, apex narrowly subtruncate; palp narrow, segment 2 subequal in length to segment 3; articles one to three with row of setae at inner side, dactylus erect at two thirds of third palp article, slender, slightly curved.

Coxa plate 1 lower margin slightly rounded, coxa 2–3 similar, coxae 4 much wider, margin slightly rounded. Coxal plate 5–6 broadly posterolobate, coxal plate 7 squareish.

Gnathopods 1–2 subchelate, similar in shape. Merus posteriorly extended, carpus broad, as long as propodus, long pectinate setae on inner margin; propodus with groups of pectinate setae, palm serrate with four strong setae, on inner margin up to mid palm; dactylus slender with inner rim, reaching more than half the length of propodus.

Pereopods 3–4 similar in shape. Pereopods 5–7 basis strong ridge, entire length. Pereopods 5–6 basis slightly rounded, basis of pereopod 7 convex. Merus of pereopodS 5–7 drawn out posteriorly.

Epimeral plate 1 smooth, epimeral plateS 2–3 with ridge, slightly drawn out posteroventral corner. Dorsally epimeral plates 2–3 have two small pointed extensions. Pleopods regular.

Uropod 1, peduncle same length as inner ramus; margins of peduncle and rami with short spine-like setae, the tip of both rami bear three distinct spines. Uropod 2, peduncle slightly shorter than inner ramus; margins of peduncle and rami with short spine-like setae, outer ramus length more than half of inner ramus; the tip of inner ramus bearing distinct spines. Uropod 3 inner ramus more than twice as long as peduncle, with strong spine like setae.

Telson triangular, entire, with two plumose setae on both apical margins.

Ecology and distribution

Found on the corals *Paragorgia* Milne-Edwards, 1857, Plexauridae Gray, 1859, *Acanthogorgia* Gray, 1857 and *Paramuricea* Kölliker, 1865 at dephts of 705–980 m. (For further information, see Table 4.)

Taxonomic remarks

The new species is morphologically similar to *Stenopleustes nodifer* (G.O. Sars, 1883); however, the latter has rounded dorsal projections on the posterior edges of pleonites 1–2, with a deep u-shaped elevation whereas *Stenopleustes jeskulkeae* sp. nov. has pointed small tips.

There is a morphological variation.

Three juveniles of 2.0 mm length were taken from the marsupium of the holotype of *Stenopleustes jeskulkeae* sp. nov., these have much larger heads and thicker antennae in comparison to the adults.

The colour of the eyes of freshly caught individuals appears to be red for adults, and white for juveniles.

New BOLD numbers: AMPIV 320-22; AMPIV 304-22; AMPIV 301-22; AMPIV 302-22; AMPIV 305-22; AMPIV 306-22; AMPIV 307-22; AMPIV 308-22; AMPIV 312-22; AMPIV 313-22; AMPIV 314-22; AMPIV 315-22; for details see Supp. file 2.

Stenopleustes jeskulkeae sp.nov. has the following Genbank numbers, named as *Stenopleustes nodifera A* in Schwentner & Lörz (2021) MT317332–MT317339, MT317343–MT317352, MT317354-MT317357, MT317360, MT317362, MT317366, MT317368, MT317369–MT317381, MT317385, MT317386, MT317387, MT317390-MT317392, MT317397-MT317400.

Stenopleustes latipes (M. Sars, 1858)
Fig. 2

Amphithoe latipes Sars, 1858 :139.
Calliope ossiani Bate, 1862: 149.
Calliope fingalli Bate, 1862: 377.

Calliope ossiani – Bate & Westwood 1862: 261.
Calliope fingalli – Bate & Westwood 1862: 263.
Amphilhopsis latipes – Boeck 1871: 200; 1876: 355.
Parapleusles latipes – Sars 1893: 360, pl. 127.
Sympleusles latipes – Stebbing 1906: 317. – Chevreux & Fage 1925: 189.
Slenopleusles latipes – Barnard 1969: 425.

Diagnosis

A detailed diagnosis is provided by Lincoln (1979: 424).

Material examined

ICELAND – **off Reykjanes** • 1 spec., 13 mm.; Reykjanes Ridge; 59.25108°N, 30.488866°W; depth 869 m; 28 Jul. 2018; MSM75, IceAGE-RR exped., station 149-5; collected by ROV KIEL6000, from Plexauridae/*Paramuricea*; AMPIV309-2; DZMB 62405. See Fig. 2.

Description

A good description can be found in Lincoln (1979: 424).

Ecology

Associated with cold-water corals and hydroids (Lincoln 1979).

Distribution

North Atlantic and Arctic.

Discussion

Our current knowledge of cold-water coral associated taxa, their diversity, distribution, population structure, and potential host specificity is still very limited (Buhl-Mortensen & Mortensen 2004a; Navarro-Mayoral *et al.* 2024). For most of these, our current knowledge is even too limited to understand how strongly various taxa are associated with these corals and how they might be affected by a decline of cold-water coral ecosystems. Due to their slow growth, old age and low recovery rate, cold-water corals are especially threatened by destructive fisheries, pollution, mineral mining, and climate change (Fosså *et al.* 2002, Orr *et al.* 2005, Georgian *et al.* 2020, Morato *et al.* 2020, Sanna & Freiwald 2024), several coral species are also listed as near threatened (NT) in the IUCN Red List of Threatened Species. The Food and Agriculture Organisation of the United Nations rated cold-water corals as Vulnerable Ecosystems (FAO 2019). A better understanding of these complex and putatively fragile ecosystems is crucial to guide current and future conservation measures. In the North Atlantic, cold-water corals are found predominantly along the Norwegian coast, the regions between Iceland, Norway, and Great Britain and to the south-west of Iceland along the Reykjanes Ridge (Taranto *et al.* 2023; Loulidi *et al.* 2024; Buhl-Mortensen & Buhl-Mortensen 2018). Here, cold-water corals occur to a depth of ~2000 m (depending on the species), with most records from around 1000 m or shallower (Buhl-Mortensen *et al.* 2018). The herein studied Reykjanes Ridge is part of the northern extension of the Mid-Atlantic Ridge, extending ~900 km to the south-west of Iceland.

The goal of this paper was to gain first insights into the biodiversity of deep-sea Amphipoda associated with cold-water corals focusing on species of the family Pleustidae. All studied specimens from the Reykjanes Ridge were collected directly from corals by ROVs (Remote Operating Vehicles), ascertaining that all studied species are indeed part of the cold-water coral ecosystem. Additional pleustid amphipods from South Greenland can not be linked to corals as they were sampled by a simple dredge. The discovery of the new species of Amphipoda from cold-water corals would not have been possible without designated ROV video transects for habitat description (Fig. 28). Video- and image-based tools provide exclusive insights into the habitats and community structure of deep-sea ecosystems (Taylor *et al.* 2017, Morganti *et al.* 2021, Meyer *et al.* 2023). Thus, ROV-based sampling improves our understanding of community structure, species interactions, and biological habitats (Lörz *et al.* 2024). This makes it increasingly clear that many more deep-sea benthic species live in association with other specific specimens, such as cold-water coral species than are currently described.

Cold-water corals are regarded as biodiversity hotspots (e.g., Cathalot *et al.* 2015). Here, we present two new amphipod species from specific corals (Table 4). Genetically very similar individuals of *Stenopleustes jeskulkeae* sp. nov. were observed on various corals like *Acanthogorgia* Gray, 1857,

Paragorgia Milne-Edwards, 1857, and *Paramuricea* Kölliker, 1865; *Neopleustes schwentner*i sp. nov. was sampled from *Paragorgia* and *Paramuricea*. Both species new to science described herein do not seem specialized to a specific host coral (Tab. 4).

Images taken by the ROV and of animals directly after sampling (Figs 1–2) allow the *in situ* colours to be seen before they fade in the fixation. Detailed SEM-images with 1000-fold magnifications show details of pleustid morphology such as special setae, most functions remain unknown. While we do not know the function of many details observed, we prefer to show these for further scientific explorations. For comparison of the specific morphological structures we have shown in these new species, we include SEM-illustrations of other Pleustidae from the North Atlantic; *Pleustes tuberculatus*, *Parapleustes bicuspis* and *Neopleustes boecki*. Detailed morphological characters, e.g. michrotrics (sensu Steele 1991) are here shown in great detail, and for the first time in Pleustidae.

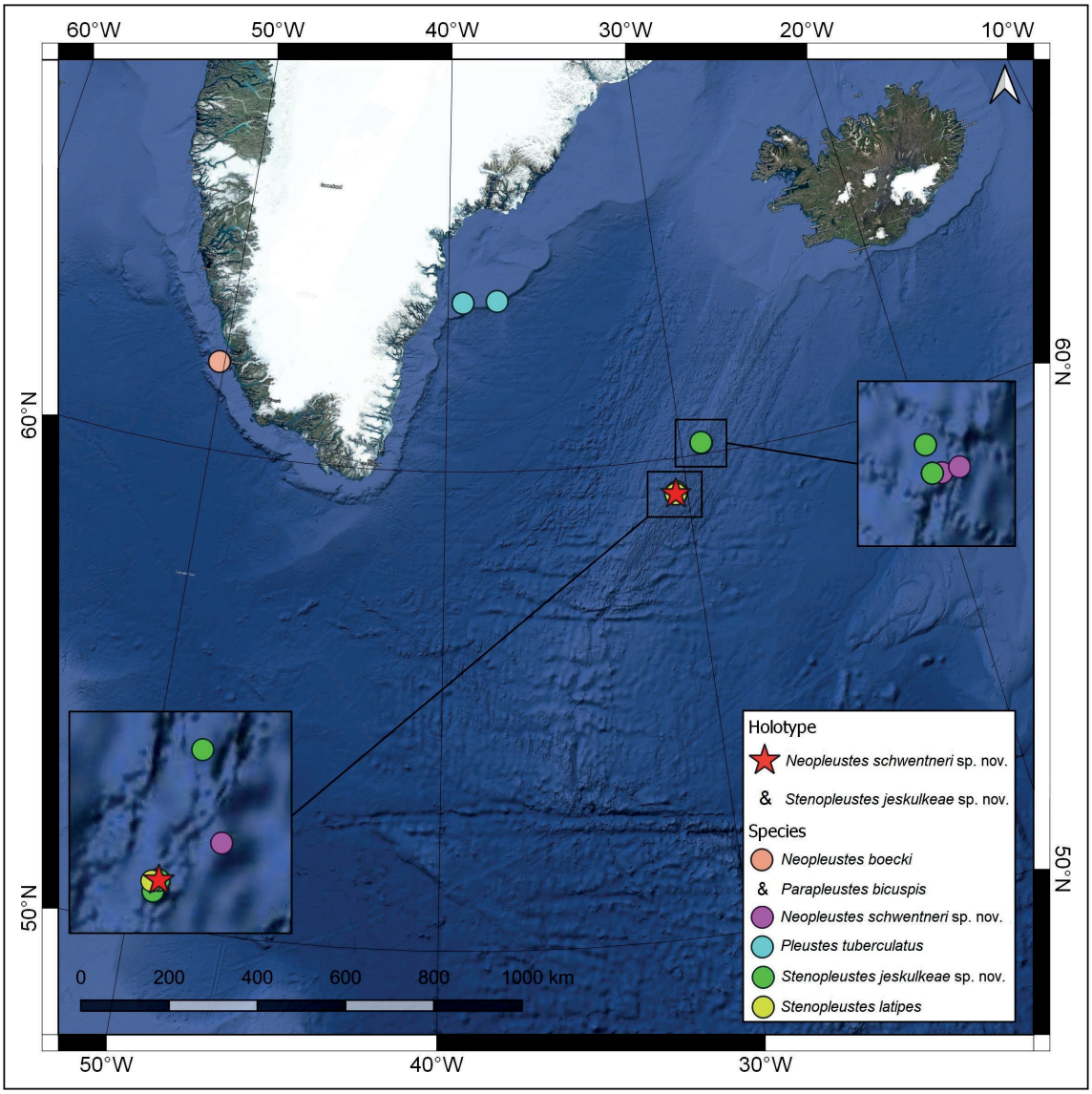

Fig. 28. Sampling localities in the North Atlantic of the species of Pleustidae, Amphipoda investigated in this study.

The Reykjanes Ridge contains many corals which are regarded as indicator taxa (Burgos *et al.* 2020). Here, we presented a taxonomic approach of the pleustid amphipods living on various corals of the Reykjanes Ridge as well as a detailed SEM investigation of three further pleustid species off Greenland. It is remarkable that while the North Atlantic belongs to the best studied marine environments of the world (Watling & Buhl-Mortensen 2023), we still only have a glimpse of what species live there in the deep sea.

On a global scale, we are facing increased biodiversity loss and inefficient protection of ecosystems, especially aquatic ecosystems. We are able to identify the cryptic diversity using available molecular tools, but these species are rarely described because of the traditions of taxonomic practice (Schwentner & Lörz 2021). There is an unjustified expectation that all species will display easily discernable morphological differences. As a result, the cryptic species and so called 'difficult species' (animals of a small body size showing minute but consistent morphological differences) remain undescribed and therefore cannot be protected by the law or assessed for any systematic conservation tool such as the Red List for Threatened Species. Deep-sea biodiversity deserves our full attention, an appropriate taxonomic treatment including scientific naming along with careful study of their biological traits to enable an appropriate assessment of their value for conservation.

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Printed versions of all papers are deposited in the libraries of four of the institutes that are members of the *EJT* consortium: Muséum national d'Histoire naturelle, Paris, France; Meise Botanic Garden, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Royal Belgian Institute of Natural Sciences, Brussels, Belgium. The other members of the consortium are: Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Leibniz Institute for the Analysis of Biodiversity Change, Bonn – Hamburg, Germany; National Museum of the Czech Republic, Prague, Czech Republic; The Steinhardt Museum of Natural History, Tel Aviv, Israël.

Supplementary files

Supp. file 1. Film of collection of corals with associated amphipods. IceAGE-RR cruise (MSM75) in 2018. Images from ROV Kiel6000, GeoMAR. https://doi.org/10.5852/ejt.2025.1009.3017.13525

Supp. file 2. Overview of all specimens used for this work, with information about sampling locality, sampling physical conditions, collection numbers and if available genetic repository number. https://doi.org/10.5852/ejt.2025.1009.3017.13527