

## A new species of the genus *Subeucalanus* (Copepoda: Calanoida: Eucalanidae) from the Sea of Oman

### Новый вид рода *Subeucalanus* (Copepoda: Calanoida: Eucalanidae) из Оманского залива

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**Abstract.** A new species of the genus *Subeucalanus* Geletin, 1976 (Copepoda: Calanoida: Eucalanidae), *Subeucalanus dextrolateralis* sp. nov., is described based on female and male specimens collected in the Sea of Oman in October 2019. The new species is placed in the *S. pileatus* species-group. *Subeucalanus dextrolateralis* sp. nov. differs from its congeners in the shape of the anterior part of the head and the spermathecae pattern in the female, the structure of the fifth leg in the male, and the right-sided position of the longest caudal seta in both sexes. Morphological characters of the ten known species of the genus *Subeucalanus* (including the new species) are discussed. A key to the species of this genus is provided.

**Резюме.** Новый вид рода *Subeucalanus* Geletin, 1976 (Copepoda: Calanoida: Eucalanidae) – *Subeucalanus dextrolateralis* sp. nov. – описан на основе особей обоих полов, собранных в Оманском заливе в октябре 2019 г. Новый вид отнесен к группе вида *S. pileatus*. *Subeucalanus dextrolateralis* sp. nov. отличается от других видов рода формой передней части головы и строением сперматек у самки, структурой пятой ноги у самца и правосторонним положением самой длинной каудальной щетинки у обоих полов. В статье обсуждаются особенности морфологии всех десяти известных видов рода *Subeucalanus* (включая новый вид). Предложен определительный ключ для видов этого рода.

**Key words:** Sea of Oman, copepods, Eucalanidae, *Subeucalanus*, new species

**Ключевые слова:** Оманский залив, копеподы, Eucalanidae, *Subeucalanus*, новый вид

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## Introduction

Copepods of the family Eucalanidae Giesbrecht, 1893 are an essential component of zooplankton communities in the tropical, boreal, and subantarctic zones of the World Ocean. Eucalanids can achieve high abundances in oceanic

ecosystems (Arcos & Fleminger, 1986; Heinrich, 1990; Lavaniegos & Lopez-Cortes, 1997; Suarez-Morales, 1998), and as large-sized copepods, they often dominate in terms of biomass (Vinogradov & Arashkevich, 1969; Musaeva & Kolosova, 1995; Prusova & Smith, 2005). Eucalanids inhabit epi- and mesopelagic depths ranging from

the surface down to 1500 m (Lang, 1965; Roe, 1972; Ohman et al., 1998, Prusova, 2020). Due to their extensive geographical distribution and “visibility” of these large copepods in zooplankton materials, most of the currently recognised species of eucalanids were described between the late 19th and early 20th centuries. Later, three new species were established from previously described eucalanids based on an analysis of their integumental pore patterns (Fleminger, 1973), and two more new species were described from the Persian Gulf and the Arabian Sea (Prusova et al., 2001; Prusova, 2007).

Eucalanidae are characterised by a lack of distinctive sexually modified appendages. Females do not have a fifth pair of legs, species-specific spines, and teeth on the legs 1–4, which may be present in copepods from other families that lack fifth legs. Eucalanid females mainly differ by the general body shape, the shape of the anterior part of the head, the urosome, and the structure of the seminal receptacles (Fleminger, 1973); males can be distinguished by the morphological details of the fifth leg and the setation of the oral appendages (Fleminger, 1973; Prusova, 2003; Prusova et al., 2012).

To date, the family Eucalanidae comprises 20 species belonging to three genera: *Eucalanus* Dana, 1852, *Pareucalanus* Geletin, 1976, and *Subeucalanus* Geletin, 1976 (Razouls et al., 2024; Walter & Boxshall, 2024). The genus *Subeucalanus* has so far accommodated nine species (Goetze, 2010; Razouls et al., 2024; Walter & Boxshall, 2024), of which six species have been recorded from the Arabian Sea region: *S. crassus* Giesbrecht, 1888, *S. flemingeri* Prusova, Al-Yamani et Al-Mutairi, 2001, *S. mucronatus* Giesbrecht, 1888, *S. pileatus* Giesbrecht, 1888, *S. subcrassus* Giesbrecht 1888, and *S. subtenuis* Giesbrecht, 1888 (Madhupratap & Haridas, 1990; Al-Yamani et al., 2011; Prusova et al., 2012; Al-Hashmi et al., 2019). Of the three species of *Subeucalanus* not recorded from the Arabian Sea region, *S. dentatus* (Scott, 1909) is confined to the Flores Sea in the Pacific Ocean, *S. monachus* Giesbrecht, 1888 is considered to inhabit tropical and subtropical waters of the Atlantic Ocean, while *S. longiceps* (Matthews, 1925) has a boreal-temperate, circumglobal distribution within the transition

zone of the Southern Ocean (Fleminger, 1973; Goetze, 2010).

In recent studies on zooplankton in the Sea of Oman conducted by Al-Hashmi et al. (2019), five species of the genus *Subeucalanus* were registered, including *S. pileatus* and its morphotype *S. pileatus* var. “right”. However, the study did not specify the differences between the latter and the original species. In the present study, we examined eucalanids from zooplankton material collected in the Sea of Oman, specifically in the same area where this morphotype was previously reported. The morphological analysis conducted indicates that it belongs to an undescribed species. This work provides a detailed description of this new species, *Subeucalanus dextrolateralis* sp. nov.

## Material and methods

Zooplankton sampling was conducted in the Sea of Oman off the Muscat coast at 23°35'N, 58°43'E on 22 October 2019. A vertical tow was performed using a plankton net with a mesh size of 200 µm, targeting the 0–10 m layer (maximum depth: 100 m). The collected sample was preserved in a 4% buffered formalin solution. Specimens were sorted from the formalin-fixed sample under a stereo microscope, rinsed in seawater, and subsequently transferred to a 50:50 glycerin – distilled water solution. All line drawings were created from glycerin-mounted specimens using a camera lucida attached to a Leica DM LS2 compound microscope.

Descriptive terminology follows Huys & Boxshall (1991) and Ferrari & Ivanenko (2008). Articulating segments of the antennules and mouthparts are indicated using Arabic numerals, while ancestral segments are denoted with Roman numerals. A single seta and a single aesthetasc on a segment of the antennule are designated as 1s + 1ae. Setal formulas are presented in a sequence from proximal to distal. The following abbreviations are used: CR – caudal ramus; Gns – genital double-somite; Mdp – mandibular palp; Mx1 – maxillule; Mxp – maxilliped; Enp1–3 – endopod segments 1–3; P1–5 – legs 1–5; TL – total body length.

The type material is deposited at the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia (ZIN).

## Taxonomy

Subclass **Copepoda** Milne Edwards, 1830

Order **Calanoida** Sars, 1903

Family **Eucalanidae** Giesbrecht, 1893

Genus ***Subeucalanus*** Geletin, 1976

***Subeucalanus dextrolateralis* sp. nov.**

(Figs 1–5)

*Holotype*. Adult female, dissected, 2.08 mm TL, body and dissected appendages in vial, **Oman**, *Sea of Oman*, 23°35'N, 58°43'E, 22 Oct. 2019, coll. S. Al-Khusaibi (ZIN 91180).

*Paratypes*. Adult male, dissected, 1.96 mm TL, body and dissected appendages in vial, other data, as for holotype (ZIN 91181); ten adult females 2.07–2.35 mm TL and one adult male 1.96 mm TL in vial, other data, as for holotype (ZIN 91182).

**Description.** *Female*. Total length in holotype and female paratypes from 2.07 to 2.35 mm (mean  $\pm$  standard deviation =  $2.13 \pm 0.09$  mm,  $N = 11$ ). Cephalosome and pediger 1 fused, pedigers 4 and 5 incompletely separate. Rostrum with two long filaments directed posteriorly. Urosome of three free somites. Genital double-somite widest in middle of length (Fig. 1D, F), with maximum width nearly 1.2 times its length, swollen ventroanteriorly in lateral view, with large seminal receptacles being clearly visible in lateral view and extending dorsoanteriorly (Fig. 1E). Caudal rami fused to anal somite, slightly larger on right (Fig. 1D), with each ramus bearing six plumose setae, without a seta in position I; right inner terminal seta V significantly thicker and longer than other caudal setae, approximately as long as that of cephalosome; seta VII thin, short, situated on ventral surface at base of seta VI.

Antennule (Fig. 1G–H) symmetrical, approximately 1.2 times as long as body, of 24 free segments; ancestral segments I–IV and X–XI fused; armature as follows: I–IV – 9s, V–VI – 2s each, VII – 2s + 1ae, VIII–IX – 2s each, X–XI – 4s + 1ae, XII–XV – 2s each, XVI – 2s + 1ae, XVII–XX – 2s each, XXI–XXIII – 1s each, XXIV–XXVI – 2s each, XXVII–XXVIII – 5s; long setae on segments XXV and XXVI pseudoannulate.

Antenna (Fig. 2A): coxa with one long inner seta, basis with two long inner setae; endopod two-segmented, Enp1 with two inner setae, Enp2

bilobed, with nine and seven setae on proximal and distal lobes, respectively, outer margin supplied with fine setules; exopod slightly shorter than endopod, with segments I–IV fused, ancestral segments I–IX each with long plumose seta, terminal segment X with three terminal setae.

Mandible gnathobase cutting edge (Fig. 2B–C) with approximately seven teeth (grading from larger ventrally to smaller dorsally), one elongated bicuspid dorsal tooth, and one spinose dorsal seta; mandibular palp (Fig. 2D) basis with three setae; endopod two-segmented, with two and four setae, respectively; exopod five-segmented, with 1, 1, 1, 1, 2 setae.

Maxillule (Fig. 2E) praecoxal arthrite with 14 spines; coxal endite absent, coxal epipodite with nine setae; proximal and distal basal endites with four and five setae, respectively; basal exite with one seta; endopod two-segmented, with ancestral segments I and II fused (fusion line visible), with 4, 4, 5 setae; exopod with five setae.

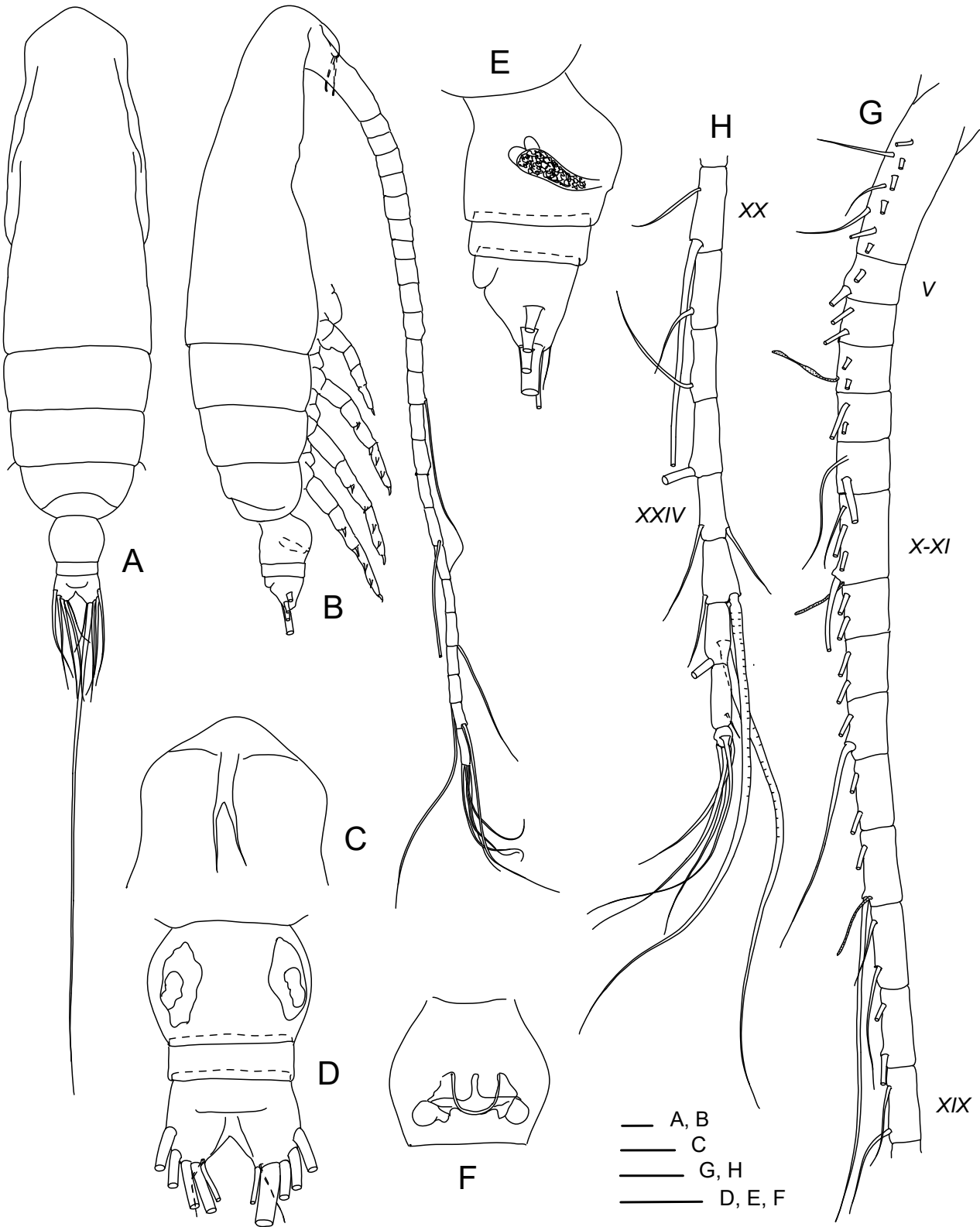
Maxilla (Fig. 2F) praecoxal endite with six setae, coxal endite with three setae, proximal and distal basal endites each with three setae; endopod five-segmented, with enditic-like lobe on proximal segment, bearing four setae, and segments 2–5 with 1, 1, 1, 3 setae, respectively; basis with long plumose outer seta.

Maxilliped (Fig. 2G) slender, syncoxa with 1, 2, 3, 3 setae; basis with three setae; endopod of six segments bearing 2, 4, 4, 3, 3 + 1, 3 + 1 setae, respectively.

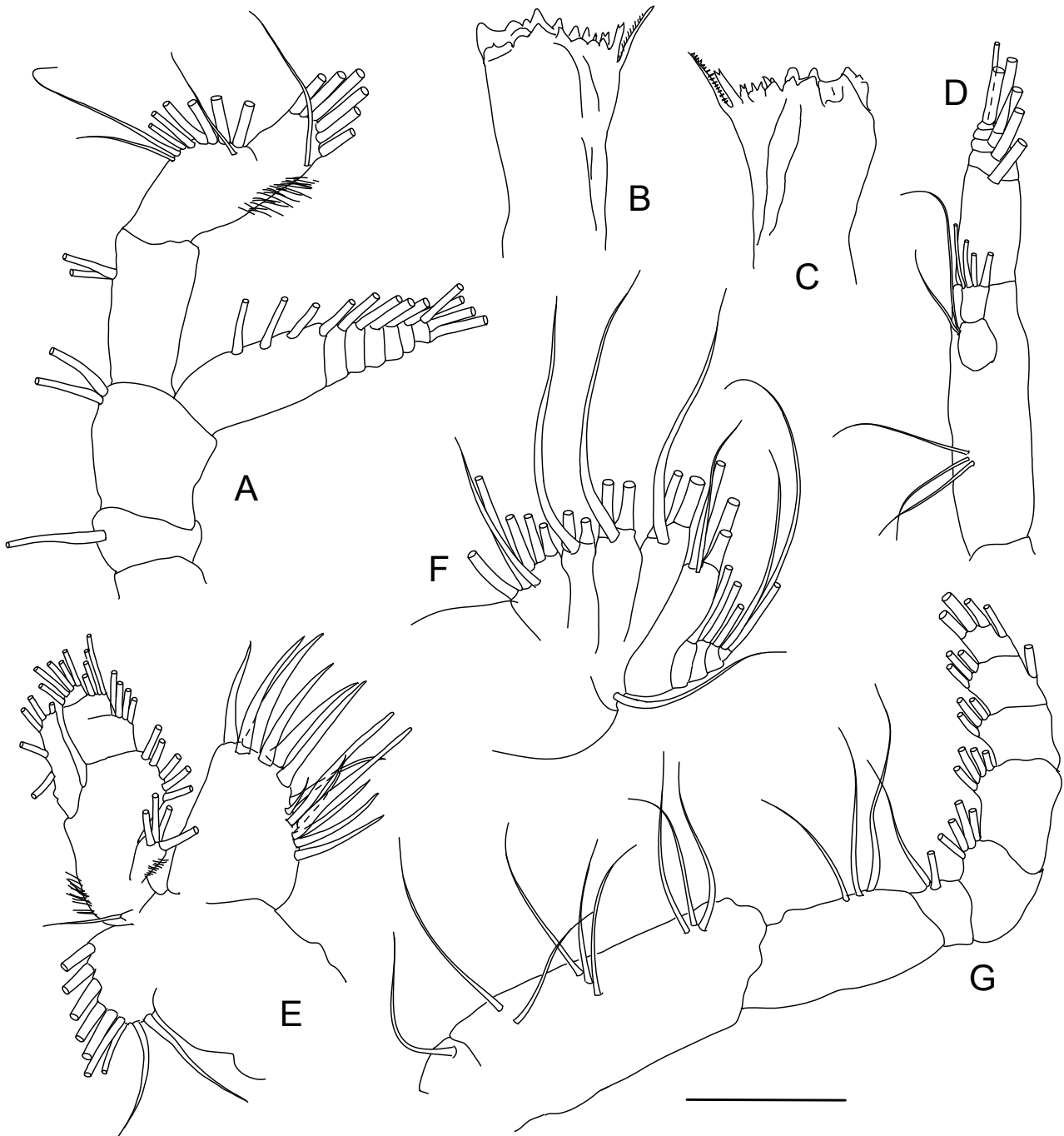
Legs 1–4 (Fig. 3A–D, Table 1). Leg 1 coxa and basis with a row of fine setae on inner margin; basis with long, densely plumose seta on inner distal margin; endopod two-segmented, Enp1 distal outer margin with broad rounded extension cupping Enp2 on anterior surface (Fig. 3E); exopod three-segmented. Legs 2–4 exo- and endopods three-segmented; Enp2 with small sharp protrusion on outer margin in median part (arrowed); Enp3 outer seta much shorter and thinner than other setae of this segment. Spine and seta formulas as in Table 1.

Leg 5 absent.

*Male*. Total length in paratypes from 1.92 to 1.96 mm (mean  $\pm$  standard deviation =  $1.94 \pm 0.02$  mm,  $N = 3$ ). Body elongate (Fig. 4A–B), with prosome 4.2–4.3 times as long as urosome. Cephalosome and pediger 1 fused, pedigers 4 and 5 incompletely separate. Anterior part of head



**Fig. 1.** *Subeucalanus dextrolateralis* sp. nov., female. **A**, habitus, dorsal view; **B**, habitus, lateral view; **C**, anterior part of head with rostrum, ventral view; **D**, urosome, dorsal view; **E**, urosome, lateral view; **F**, genital double-somite, ventral view; **G**, antennule, segments I–XIX; **H**, antennule, segments XX–XXVIII. Holotype (A–E, G–H); paratype (F). Scale bars: 0.1 mm.



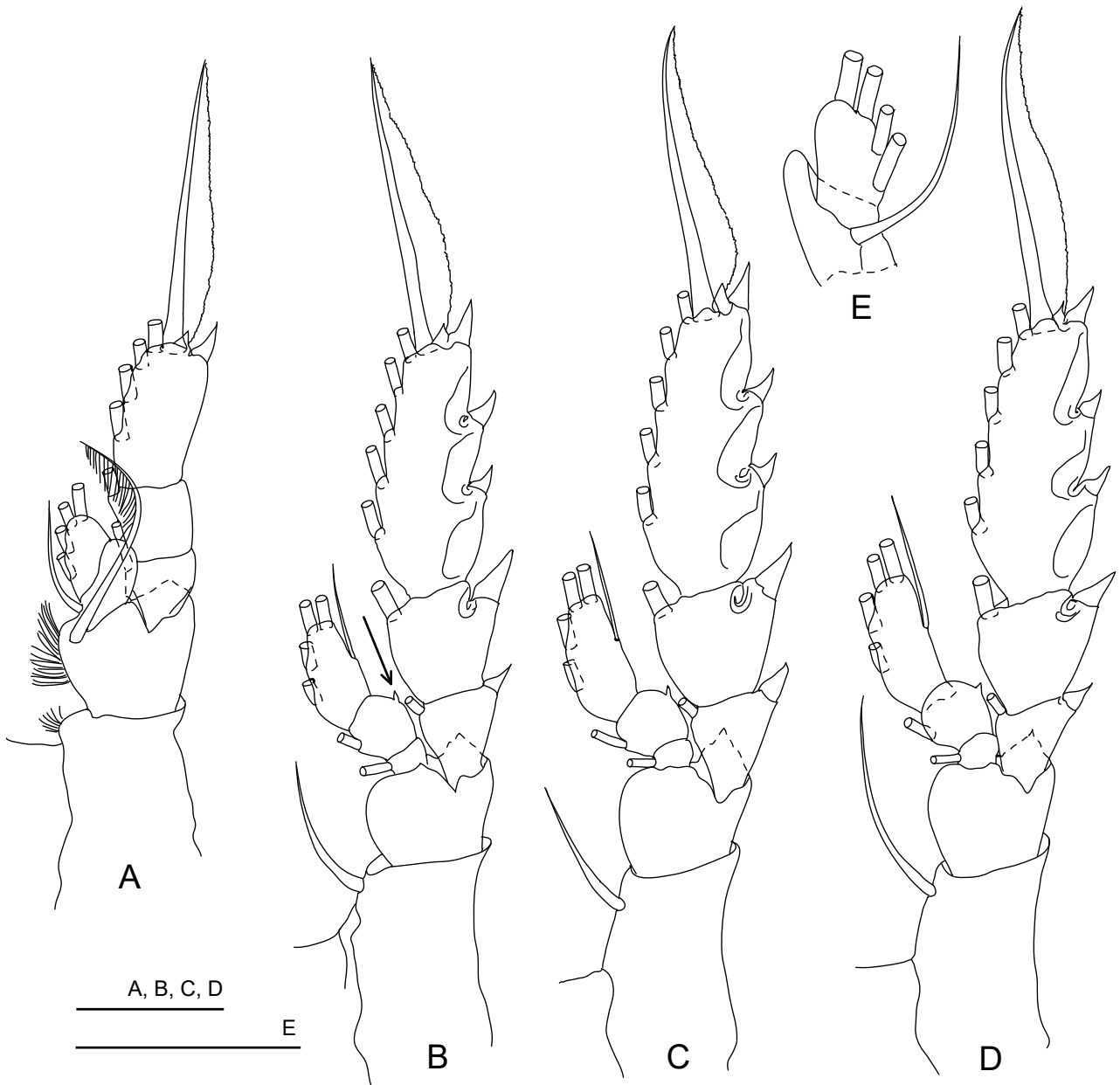
**Fig. 2.** *Subeucalanus dextrolateralis* sp. nov., female, holotype. **A**, antenna; **B**, left mandible gnathobase; **C**, right mandible gnathobase; **D**, mandibular palp; **E**, maxillule; **F**, maxilla; **G**, maxilliped. Scale bar: 0.1 mm.

rounded, rostrum with two long filaments directed posteriorly. Urosome of five free somites (Fig. 4C); genital somite with gonopore opening at right lateral corner; caudal rami fused to anal somite, being larger on right, with each ramus bearing six plumose setae, without seta in position I; right inner terminal seta V thicker and longer

than other caudal setae, approximately 0.8 times as long as cephalosome; seta VII thin, short, situated on ventral surface at base of seta VI.

Antennule (Fig. 4D–E) symmetrical, about 1.2 times as long as body, of 24 free segments; ancestral segments I–IV and X–XI fused; armature as follows: I–IV – 7s + 6ae, V–IX – 2s + 2ae each,





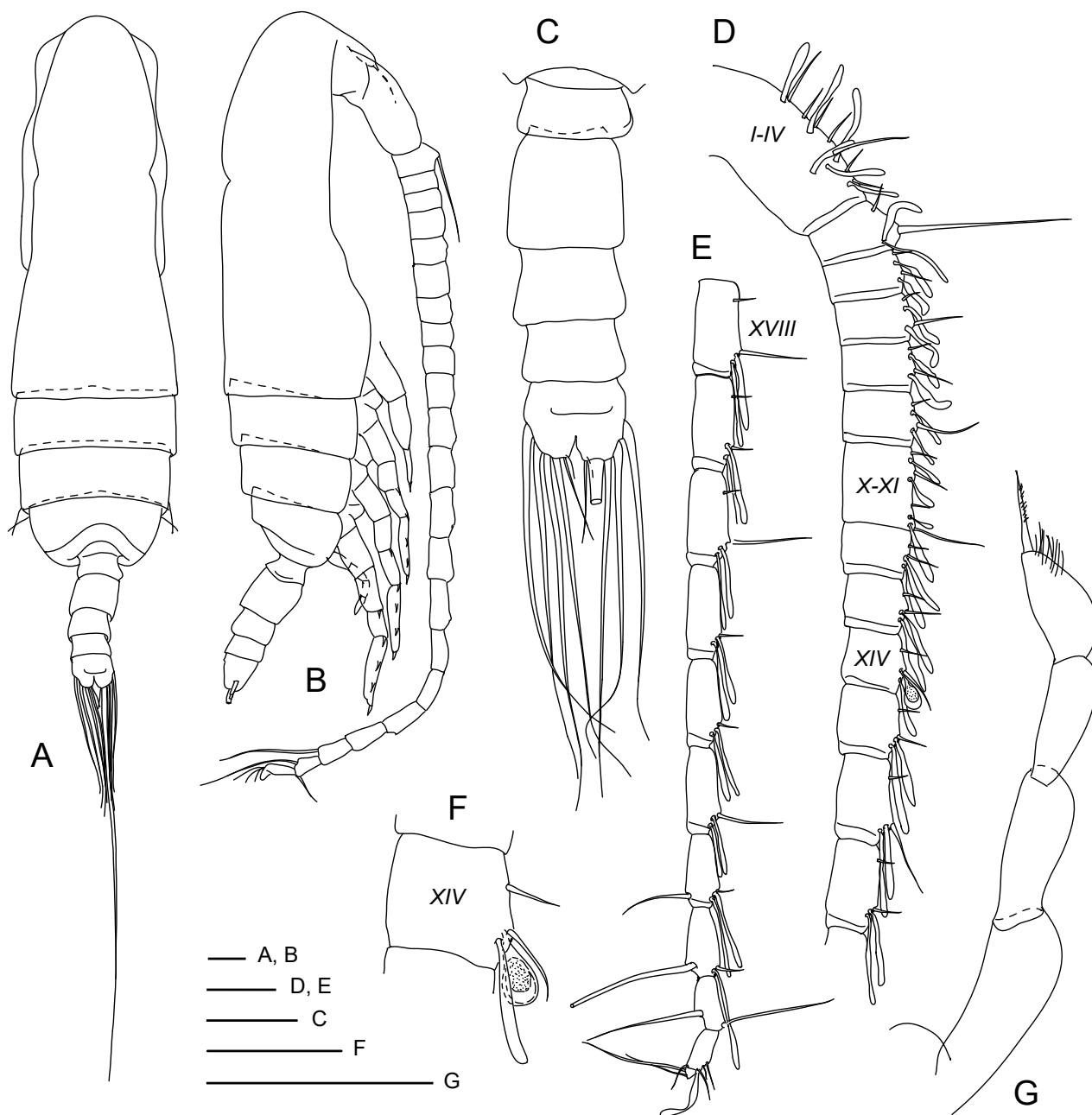
**Fig. 3.** *Subeucalanus dextrolateralis* sp. nov., female, holotype. **A**, leg 1; **B**, leg 2; **C**, leg 3; **D**, leg 4; **E**, leg 1 endopod. Anterior view (A–D), lateral view (E). Scale bars: 0.1 mm.

X–XI – 4s + 4ae, XII–XX – 2s + 2ae each, XXI–XXIII – 1s + 2ae each, XXIV – 2s + 2ae, XXV – 2s + 1ae, XXVI – 2s, XXVII–XXVIII – 6s + 1ae. Dorsally situated aestetasc on segment XIV modified: short and round (Fig. 4F).

Antenna (Fig. 5A) coxa with one small inner seta, basis with two inner setae; endopod two-segmented; Enp1 with two inner setae, outer distal margin covered with fine setulae; Enp2 bilobed, with eight and six setae on proximal and

distal lobes, respectively, with small patch of setulae on distal margin at base of terminal setae; exopod slightly shorter than endopod, ancestral segments I–IV fused, with four setae from which three most proximal setae smaller and thinner than distalmost seta, segments V–IX each with a long plumose seta, terminal segment X with three terminal setae.

Mandible gnathobase (Fig. 5B) as in female; mandibular palp (Fig. 5C) basis and exopod short-



**Fig. 4.** *Subeucalanus dextrolateralis* sp. nov., male, paratypes. **A**, habitus, dorsal view; **B**, habitus, lateral view; **C**, urosome, dorsal view; **D**, antennule, segments I–XVII; **E**, antennule, segments XVIII–XXVIII; **F**, antennule segment XIV with modified aestetasc; **G**, leg 5, anterior view. Scale bars: 0.1 mm.

er and wider compared to those of female; seta formula as in female.

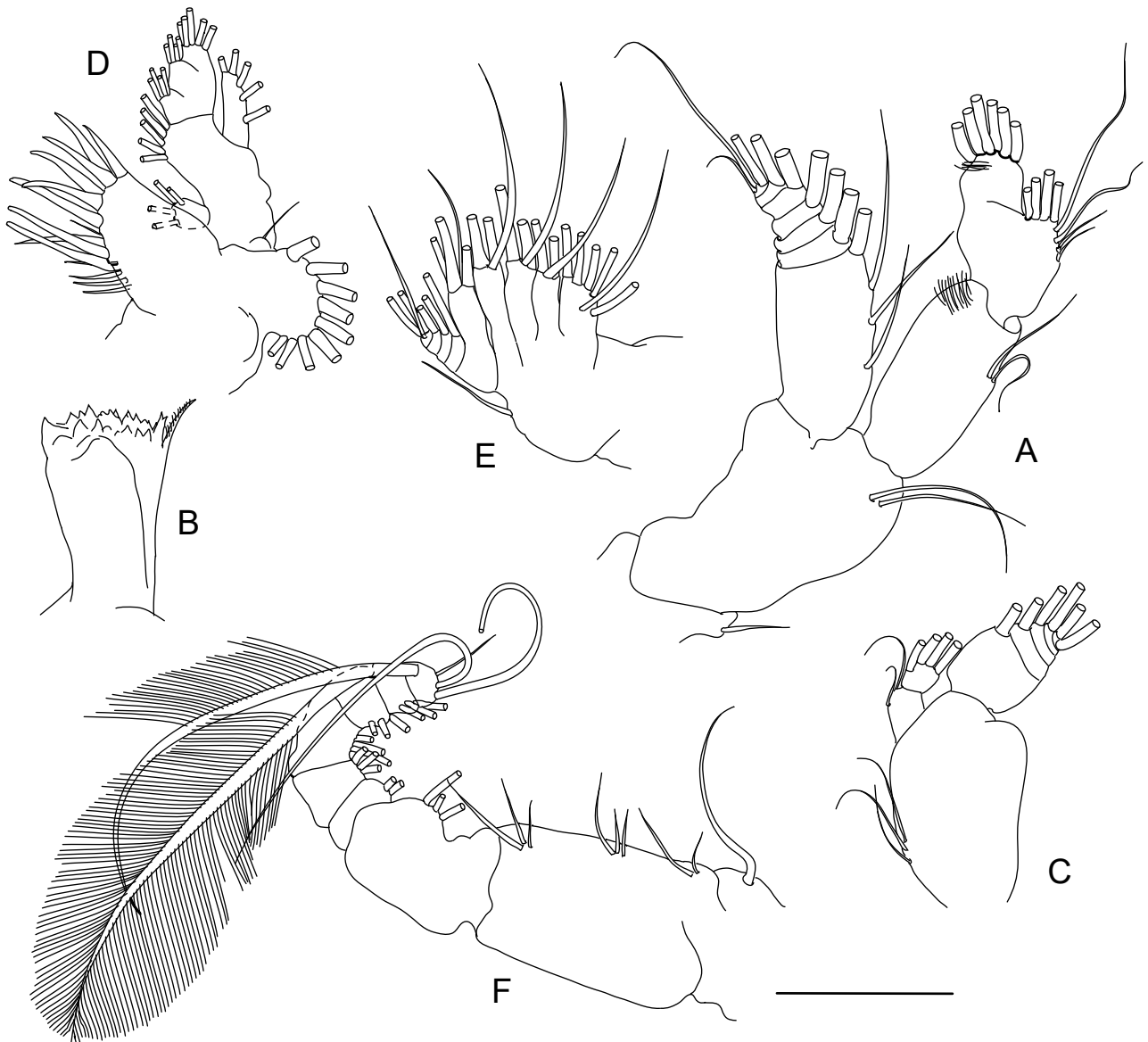
Maxillule (Fig. 5D) and maxilla (Fig. 5E) as in female.

Maxilliped (Fig. 5F) with different number and direction of endopod setae compared to those of female; syncoxa with one long seta and 2, 3, 3 small setae; basis with three setae; endopod of six

segments, with 2, 3, 3, 3, 3 + 1 enlarged plumose seta and 3 + 1 enlarged plumose seta, respectively; enlarged setae directed proximally towards base of limb.

Legs 1–4 as in female.

Leg 5 (Fig. 4G) uniramous, left leg absent; right leg four-segmented, three distalmost segments of approximately equal length, fourth segment end-



**Fig. 5.** *Subeucalanus dextrolateralis* sp. nov., male, paratype. **A**, antenna; **B**, mandible gnathobase; **C**, mandibular palp; **D**, maxillule; **E**, maxilla; **F**, maxilliped. Scale bar: 0.1 mm.

ing with terminal seta being slightly shorter than segment; distal margin of terminal segment covered with fine setulae.

**Comparison.** The most noticeable distinguishing feature of *Subeucalanus dextrolateralis* sp. nov. is the position of its longest caudal seta. In all currently known species of the genus *Subeucalanus*, the longest caudal seta in specimens of both sexes, as well as the genital pore and the uniramous fifth leg in the male, are situated on the left. In *S. dextrolateralis* sp. nov., these structures are located on the right.

The genus *Subeucalanus* (as now defined) includes the *S. crassus*, *S. pileatus* and *S. subtenuis* species-groups (Fleminger, 1973; Goetze, 2010). Morphologically, the species in all the species-groups are quite similar, but the *S. crassus* species-group most clearly differs from the other two in morphological and morphometric characteristics (Table 2). There is no clear diagnostic differentiation between the *S. pileatus* and *S. subtenuis* species-groups based on morphological characters, while the *S. pileatus* species-group is generally homogeneous in the general body shape, head shape, and



setation on the oral appendages. Based on morphological features, *S. dextrolateralis* sp. nov. should be placed in the *S. pileatus* species-group.

Among species of the *S. pileatus* species-group, *S. dextrolateralis* sp. nov. is most closely related to *S. pileatus* and *S. subcrassus* (Table 2, Fig. 6). The females of *S. dextrolateralis* sp. nov. and *S. subcrassus* are similar in the proportions of the anterior part of the head: the *ad/bd* and *eh/fh* ratios (Fig. 7A) are closely matched in these species, but their spermathecae patterns in lateral view differ (Fig. 7B). The males of *S. dextrolateralis* sp. nov. and *S. subcrassus* differ in the structure of the fifth leg: in *S. dextrolateralis* sp. nov., the second segment of P5 is about twice as long as wide and the terminal spine is shorter than the terminal segment (*vs.* the second segment is three to four times as long as wide, the terminal spine slightly longer than the terminal segment) (Fig. 7C). In the females of *S. dextrolateralis* sp. nov. and *S. pileatus*, the proportions of the elements of the anterior part of the head are different: in *S. pileatus*, the head apex is more elongated upward in both dorsal and lateral projections (Fig. 7A). The spermathecae patterns in these species are very similar (Fig. 7B). The fifth legs of the males of *S. dextrolateralis* sp. nov. and *S. pileatus* are very similar in structures (Fig. 7C), but differ in dextral and sinistral orientations, respectively.

**Etymology.** The specific name means “right-sided” and is derived from the Latin adjective *dexter* (right) and the noun *latus* (side, flank).



**Fig. 6.** Indian Ocean species of the genus *Subeucalanus*, *S. pileatus* species-group, females. **A**, *S. pileatus*; **B**, *S. subcrassus*; **C**, *S. flemingeri*; **D**, *S. dextrolateralis* sp. nov. Sea of Oman, October 2019 (A, B, D); Arabian Sea, April 1999 (C). Scale bar: 1 mm.

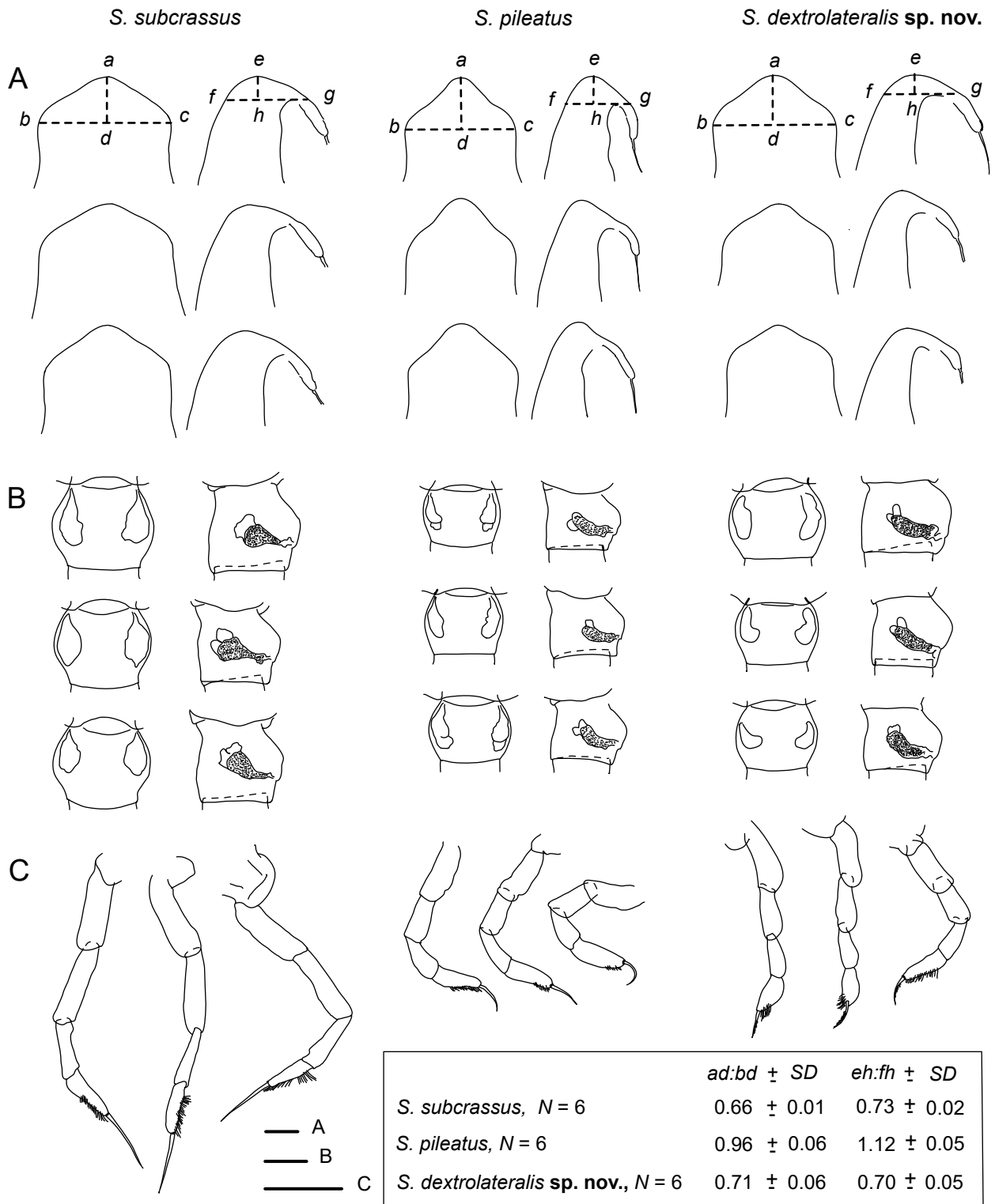
**Key to the *Subeucalanus* species (based on the original and literature data indicated in Table 2)**

*Adult females*

- 1 Mx1 proximal basal endite with three setae . . . . . 2
- Mx1 proximal basal endite with four setae . . . . . 3
- 2 Anterior part of head in dorsal and lateral views broadly rounded, short; prosome wide oval . . . . . ***S. crassus***
- Anterior part of head in dorsal and lateral views elongated, tapering upward; prosome narrow oval . . . . . ***S. monachus***
- 3 P2–4 Enp2 small protrusion on outer margin absent; anterior part of head greatly elongated upward, with rounded apex . . . . . ***S. longiceps***

**Table 1.** Armature and elements of legs 1 to 4 of the female of *Subeucalanus dextrolateralis* sp. nov.

	Coxa	Basis	Endopod	Exopod
Leg 1	0–0	0–1	0–1; 0,2,2	0–1; 0–1; I,1,4
Leg 2	0–1	0–0	0–1; 0–1; 1,2,2.	I–1; I–1; III,1,5
Leg 3	0–1	0–0	0–1; 0–1; 1,2,2	I–1; I–1; III,1,5
Leg 4	0–1	0–0	0–1; 0–1; 1,2,2	I–1; I–1; III,1,5



**Fig. 7.** Schematic illustration of the differences between *S. dextrolateralis* sp. nov., *S. subcrassus*, and *S. pileatus* by their main morphological and morphometric characters. **A**, female anterior part of head, dorsal and lateral views; **B**, female genital double-somite, dorsal and lateral views; **C**, male fifth legs, posterior view. Each species is represented by three specimens. Dashed lines  $ad$  and  $eh$  are the altitudes in the conditional triangles  $abc$  and  $efg$ , respectively;  $SD$  – standard deviation;  $N$  – number of specimens measured. The description of interspecific differences in the proportions of the upper part of the head in females is given in the text. Scale bars: 0.1 mm.

**Table 2.** Main morphological characters of females in the species of the genus *Subeucalanus*.

Species-group	Species	Anterior part of head dorsally	Anterior part of head laterally	Mdp basis	Mx1 basal proximal endite	Mx1 basal distal endite	Mxp Enp(from proximal to distal)	P2-4 Enp2 small protrusion on outer margin	Source
<i>S. crassus</i>	<i>S. crassus</i>	rounded and short		3	3	4	2,3,3,3,3+1,3+1	–	Prusova et al., 2012
<i>S. pileatus</i>	<i>S. dentatus</i>	elongated upward into spiniform process		3	4	5	?,?,4,4,3(?) + 1,4(?) + 1	+	A. Scott, 1909; Mulyadi, 2004
	<i>S. flemingeri</i>	rounded and short		3	4	5	2,4,4,3,3+1,3+1	+	Prusova, 2001
	<i>S. pileatus</i>	rounded, elongated upward		3	4	5	2,4,4,3,3+1,3+1	+	present study
	<i>S. subcrassus</i>	rounded and short		3	4	5	2,4,4,3,3+1,3+1	+	present study
	<i>S. dextrolateralis</i> <b>sp. nov.</b>	rounded and short		3	4	5	2,4,4,3,3+1,3+1	+	present study
<i>S. subtenuis</i>	<i>S. longiceps</i>	greatly elongated with rounded apex		3	4	5	2,3,4,3,3+1,3+1	–	Bradford-Grieve, 1994
	<i>S. monachus</i>	rounded, elongated upward		3	3	4	2,3,3,2,2+1,3+1	+	Corral Estrada, 1970
	<i>S. mucronatus</i>	triangular with apex sharply pointed	apex weakly curved ventrally	0	4	4	2,4,4,3,3+1,3+1	+	Prusova et al., 2012
	<i>S. subtenuis</i>	triangular with apex rounded	apex not curved	3	4	4	2,4,4,3,3+1,3+1	+	Prusova et al., 2012

- P2-4 Enp2 small protrusion on outer margin present; anterior part of head broadly rounded or triangular, with rounded or pointed apex . . . . . 4
- 4 Anterior part of head in dorsal view triangular, with clearly defined angle at apex . . . . . 5
- Anterior part of head in dorsal view broadly rounded. . . . . 7
- 5 Mx1 distal basal endite with five setae. . . . . *S. dentatus*
- Mx1 distal basal endite with four setae . . . . . 6
- 6 Mdp basis without setae; head apex sharply pointed . . . . . *S. mucronatus*
- Mdp basis with three setae; head apex rounded . . . . . *S. subtenuis*
- 7 Outline of spermatheca in lateral view shaped as funnel expanding dorsally and tapering ventrally . . . . 8
- Outline of spermatheca in lateral view of subcylindrical shape . . . . . 9
- 8 Ratio of widest part of Gns in dorsal view to its length approximately 1.17; TL 2.01–2.14 mm . . . . . *S. flemingeri*
- Ratio of widest part of Gns in dorsal view to its length approximately 1.28; TL 2.24–2.83 mm . . . . . *S. subcrassus*
- 9 Anterior part of head in dorsal and lateral views elongated upward; longest caudal seta located on left CR. . . . . *S. pileatus*
- Anterior part of head in dorsal and lateral views short, broadly rounded; longest caudal seta located on right CR . . . . . *S. dextrolateralis* **sp. nov.**

Adult males\*

- 1 Longest caudal seta on right CR; P5 on right. . . . .  
..... *S. dextrolateralis* sp. nov.
- Longest caudal seta on left CR; P5 on left. . . . . 2
- 2 Mx1 proximal basal endite with three setae . . . . .  
..... *S. crassus*
- Mx1 proximal basal endite with four or five setae. . . 3
- 3 Mx1 distal basal endite with four setae . . . . . 4
- Mx1 distal basal endite with five setae. . . . . 5
- 4 Mdp basis with three setae; Enp1 with two setae . . .  
..... *S. subtenuis*
- Mdp basis without setae; Enp1 with one seta . . . . .  
..... *S. mucronatus*
- 5 TL 3.2–4.5 mm\*\* . . . . . *S. longiceps*
- TL 1.8–2.7 mm . . . . . 6
- 6 P5 second segment about two times as long as wide;  
terminal spine shorter than terminal segment; TL  
1.8–2.0 mm . . . . . *S. pileatus*
- P5 second segment three to four times as long as  
wide; terminal spine slightly longer than terminal  
segment. . . . . 7
- 7 TL 1.9–2.1 mm . . . . . *S. flemingeri*
- TL 2.2–2.7 mm . . . . . *S. subcrassus*

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\* Due to the lack of detailed descriptions of *S. monachus* and *S. dentatus* males in the literature, the males of these two species are not included in this key.

\*\* Bradford-Grieve (1994) indicated a range of the total body length of the *S. longiceps* males as 3.2–8.8 mm. Specifying 8.8 mm as the maximum length is likely a typo. According to Razouls et al. (2024), the length of the *S. longiceps* male ranges between 3.3–4.5 mm.

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