

A New Report of Anthurid Isopod (Crustacea, Isopoda, Anthuridae) from Korea

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ABSTRACT

In this study, *Caenanthura engimatica* (Kensley and Reid, 1984) is newly reported from Korea along with detailed description and illustrations. This species can be characterized by the following features: cephalon has a rostrum extending as long as anterolateral lobes; pereonites 4–6 have shallow middorsal pits; the mandible palp has 2 articles; article 1 of the mandible palp is twice longer than article 2; and the maxillipedal palp has 1–3 fused and 4–5 fused articles. This is the first report of *C. engimatica* beyond Arabian Gulf, the type locality, and Indian Ocean. Additionally, we proposed a revised key to known species of the genus *Caenanthura* Kensley, 1978.

Keywords: *Caenanthura*, isopod, morphology, taxonomy, Korea

INTRODUCTION

The family Anthuridae Leach, 1814 is the oldest and largest group in superfamily Anthuroidea Leach, 1814, including 25 genera (Chew et al., 2014). This can be recognized from other Anthuroidea isopods by the following characteristics: the body is 10–15 times as long as wide; the flagellum of the antenna is fewer than ten articles and shorter than the peduncle; the maxillipedal palp has five free articles or some fused articles; each propodus palm of pereopods 4–7 has single distal robust seta; the exopod of pleopod 1 is operculiform; the mouthparts are not produced anteriorly; the pleotelson has two statocysts (Poore, 2009). In this family, the genus *Caenanthura* Kensley, 1978 comprises 6 species, *Caenanthura siamensis* (Barnard, 1925), *Caenanthura indica* Negoescu, 1980, *Caenanthura engimatica* (Kensley and Reid, 1984), *Caenanthura gutui* (Negoescu, 1997), *Caenanthura ibex* Bamber, 2008, and *Caenanthura koreana* Song and Min, 2015. They can be distinguished from other anthurid isopods by having one or two mandibular palp articles, two or three maxillipedal articles, and lacking eye (Barnard, 1925; Kensley, 1978; Negoescu, 1980; Kensley and Reid, 1984; Negoescu, 1997; Bamber, 2008; Song and Min, 2015). Kensley and Reid (1984) have erected the genus *Arabanthura* by the following characteristics: the eyes are absent; the mandib-

ular palp has two segmented articles; and the maxilliped is four segmented. However, Wägele (1989) has synonymized *Arabanthura* with *Caenanthura*. Thereafter, Poore (2001) confirmed it based on the morphology of maxilliped and pereopod 1. In this study, we newly report a *Caenanthura* species from Korea, *C. engimatica*, with detailed description and illustrations. This species was originally described from the Arabian Gulf by Kensley and Reid (1984). The present study is the first report of this species from the other region beyond the Arabian Gulf and the Indian Ocean (WoRMS, 2018). We provide a revised key to known species of the genus *Caenanthura* in this paper.

Specimens of *Caenanthura engimatica* were collected from the southern coast of Korea using a sieve with mesh size of 1 mm and the van Veen grab. The collected materials were immediately fixed in 95% ethanol and transferred to the laboratory. A stereomicroscope (Olympus SZH-ILLD, Japan) and a bright field microscope (Nikon Eclipse 80i, Japan) each equipped with a drawing tube were used to observe the habitus and appendages. Measurements and illustrations of the specimens were performed with the aid of a drawing tube and camera lucida. Examined specimens in this study were deposited at the National Institute of Biological Resources (NIBR) and Chosun University in Korea.

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SYSTEMATIC ACCOUNTS

Order Isopoda Latreille, 1817

Family Anthuridae Leach, 1814

Genus *Caenanthura* Kensley, 1978

****Caenanthura engimatica* (Kensley and Reid, 1984)
(Figs. 1–4)**

Arabanthura engimatica Kensley and Reid, 1984: 675.

Caenanthura engimatica Poore, 2001: 108.

Material examined. Korea: 6♀♀, Jeollanam-do: Wandogun, Soan-myeon, Maengseon-ri (34°10'49"N, 126°38'07"E), 27 May 2017; 1♀, Gyeongsangnam-do: Tongyeong-si, Hansan-myeon, Yongho-ri (34°44'44"N, 128°28'07"E), depth 10 m, van Veen grab, 24 Mar 2014; 2♀♀, Chubong-ri (34°45'42"N, 128°32'30"E), depth 8 m, van Veen grab, 19 Mar 2014; 1♀, Yeomho-ri (34°48'04"N, 128°26'20"E), 18 Oct 2014; 1♀, Sanyang-eup, Yeongun-ri (34°48'04"N, 128°26'20"E), 20 Mar 2014; 2♀♀, Geoje-si, Nambu-myeon, Jeoguri (34°43'50"N, 128°35'30"E), depth 10 m, van Veen grab, 17 Oct 2014.

Description. Body 9 times as long as wide, slender, and smooth; length 9.1 mm. Cephalon 0.9 times longer than width, with rostrum extending as long as anterolateral lobes, without eyes. Proportions of body segments: cephalon < pereonite 1 < pereonite 2 < pereonite 3 < pereonite 4 > pereonite 5 > pereonite 6 > pereonite 7 < pleon. Pereonites 4–6 with shallow middorsal pits. Pleonites 1–5 fused, indicated by minute ventral margin; pleonite 6 free, with middorsal notch on posterior margin. Pleotelson slightly convex, dorsoventrally flattened, lanceolate, with rounded posterior margin, 2 basal statocysts, 2 pairs of simple setae on dorsal margin, 5 simple setae on distal margin of pleotelson (Fig. 1A–C).

Antennule with 3 peduncle articles and 1 flagellum consisting of 4 articles; article 1 of peduncle longest, with 1 short simple seta and 1 plumose seta; article 2 with 1 long simple seta, 2 short simple setae, and 1 plumose seta; article 3 with 2 long simple setae, 1 short simple seta, and 1 plumose seta; flagellum article 4 with 3 aesthetascs and 2 simple setae (Fig. 1D).

Antenna with 5 peduncle articles and 1 flagellum composed of single article; peduncle article 2 longest, grooved to accommodate antennule; each peduncle article 2 and 4 with 2 simple setae distally; peduncle article 5 with 5 simple setae and 2 short simple setae; single article of flagellum with several apical setae (Fig. 1E).

Mandible palp with 2 articles; article 1 twice longer than

article 2; each article with 1 simple seta distally; molar small and bluntly rounded; incisor with single rounded cusp on right side and 3 small teeth on left side; lamina dentata unserrated on both sides (Fig. 2A, B).

Maxilla with 1 prominent and 4 smaller spines apically (Fig. 2C).

Maxilliped 4 segmented; endite absent; palp articles 1–3 fused, with 3 simple setae along with lateral margin and 2 long simple setae at distal margin; articles 4–5 fused, with 3 simple setae laterally (Fig. 2D).

Pereopod 1 subchelate, robust; basis bulbous, as long as width, with 2 plumose setae and 4 simple setae; ischium with simple setae on ventral and dorsal margins; merus with simple setae along with ventral margin and anterodistal angle; carpus triangular, crenulated and produced on posterodistal margin, 1 strong fringed proximal spine and numerous simple setae on ventral margin; propodus swollen; palm crenulated and with 1 strong fringed proximal spine and numerous simple setae; unguis longer than other pereopods. Pereopod 2 basis subequal in length to ischium; ischium, merus, carpus, and propodus with long simple setae on ventral margin; ischium and merus with simple setae on dorsal margin; propodus with 1 short robust spine on palm. Pereopod 3 similar to pereopod 2; basis with 1 plumose seta. Pereopods 4–7 similar to each other; bases with 1 or 2 plumose setae on dorsal margin; ischia with 1 simple seta on dorsal margin and numerous simple setae on ventral margin; meri with 2 simple setae on dorsal margin and numerous simple setae on ventral margin; carpi with 1 simple spine and 3–4 simple setae on ventral margin and 1 stout circumplumose spine and 1 simple seta on dorsal margin except for pereopod; propodi with 1 short serrate posterodistal spine; dactyli with fringed margin on ventral margin; unguis very small (Fig. 3A–G).

Pleopod 1 peduncle with 3 lateral hooks and 1 plumose seta; rami subequal in length, with long plumose setae apically; exopod 2 times wider than endopod. Pleopod 2 peduncle with 1 plumose seta on inner margin; rami with long plumose setae on apical end; endopod slightly longer than exopod; exopod with 2 short plumose setae laterally. Pleopods 3–5 peduncles with 2 plumose setae on both sides; rami subequal in length, with long plumose setae apically; exopod with 2 short plumose setae on lateral margin. Pleopod 5 smallest; exopod with 1 plumose seta laterally; rami with plumose setae on apical margin (Fig. 4A–E).

Uropodal sympod rectangular, longer than width, with 1 plumose seta on each lateral margins; endopod longer than exopod, with acute distal margin and numerous distal setae on distal margin; exopod elongated oval shape, with sinuous

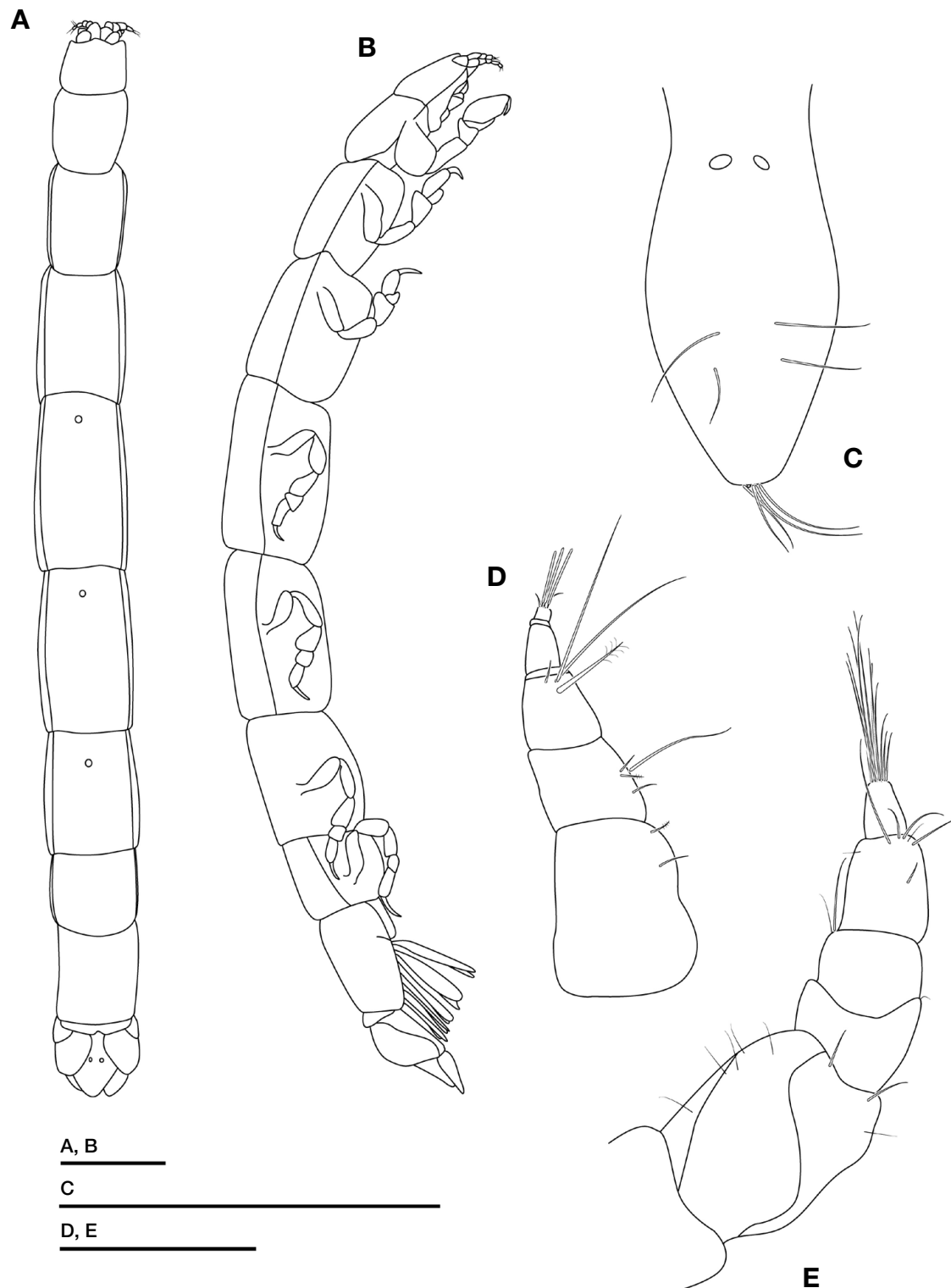


Fig. 1. *Caenanthura engimatica*, female. A, Habitus, dorsal view; B, Habitus, lateral view; C, Pleotelson; D, Antennule; E, Antenna. Scale bars: A-C=1 mm, D, E=0.2 mm.

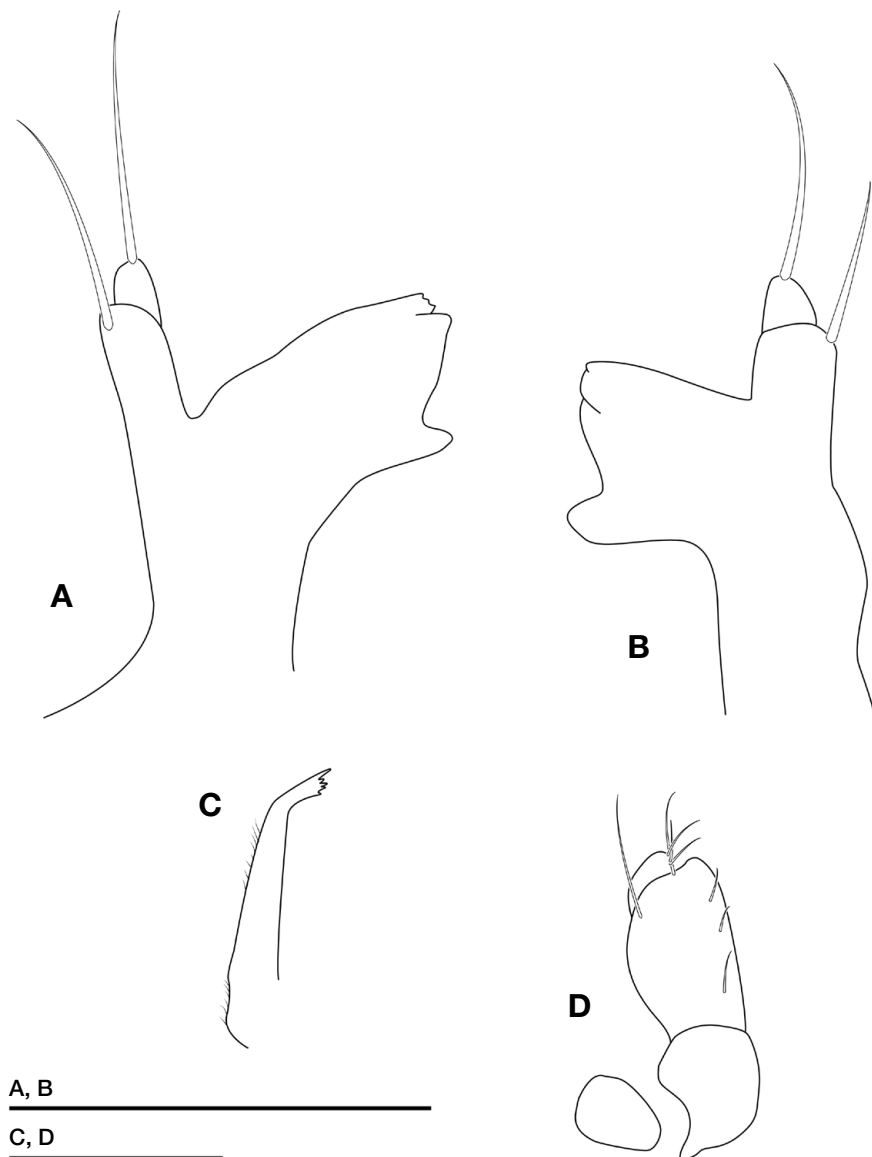


Fig. 2. *Caenanthura engimatica*, female. A, Right mandible; B, Left mandible; C, Maxilla; D, Maxilliped. Scale bars: A–D = 0.2 mm.

outer margin and numerous plumose setae on outer margin (Fig. 4F, G).

Habitat. Mud flat.

Distribution. Indian Ocean, Saudi Arabia, Korea (in this study).

Remarks. *Caenanthura engimatica* (Kensley and Reid, 1984) is similar to *C. siamensis* (Barnard, 1925) in terms of the pereonites having dorsal pits. However, the former differs from the latter in terms of the segmented mandibular palp (bi-segmented palp article in the former vs. uni-segmented palp article in the latter), the number of simple setae on the 1–3 fused article of the maxillipedal palp (three in

the former vs. zero in the latter), and the morphology of the carpus (with produced posterodistal margin in the former vs. without that in the latter) (Barnard, 1925; Kensley, 1978).

Caenanthura engimatica also differs from *C. indica* Negoescu, 1980 by the number of mandibular palp articles (bi-segmented palp article in the former vs. uni-segmented palp article in the latter), the length of the rostrum (as long as anterolateral lobes in the former vs. much shorter than anterolateral lobes in the latter), and the presence of the dorsal pit on the pereonites (vs. absence in the latter) (Negoescu, 1980).

Caenanthura engimatica can be distinguished from *C. gutui* (Negoescu, 1997) by the presence of dorsal pits on the

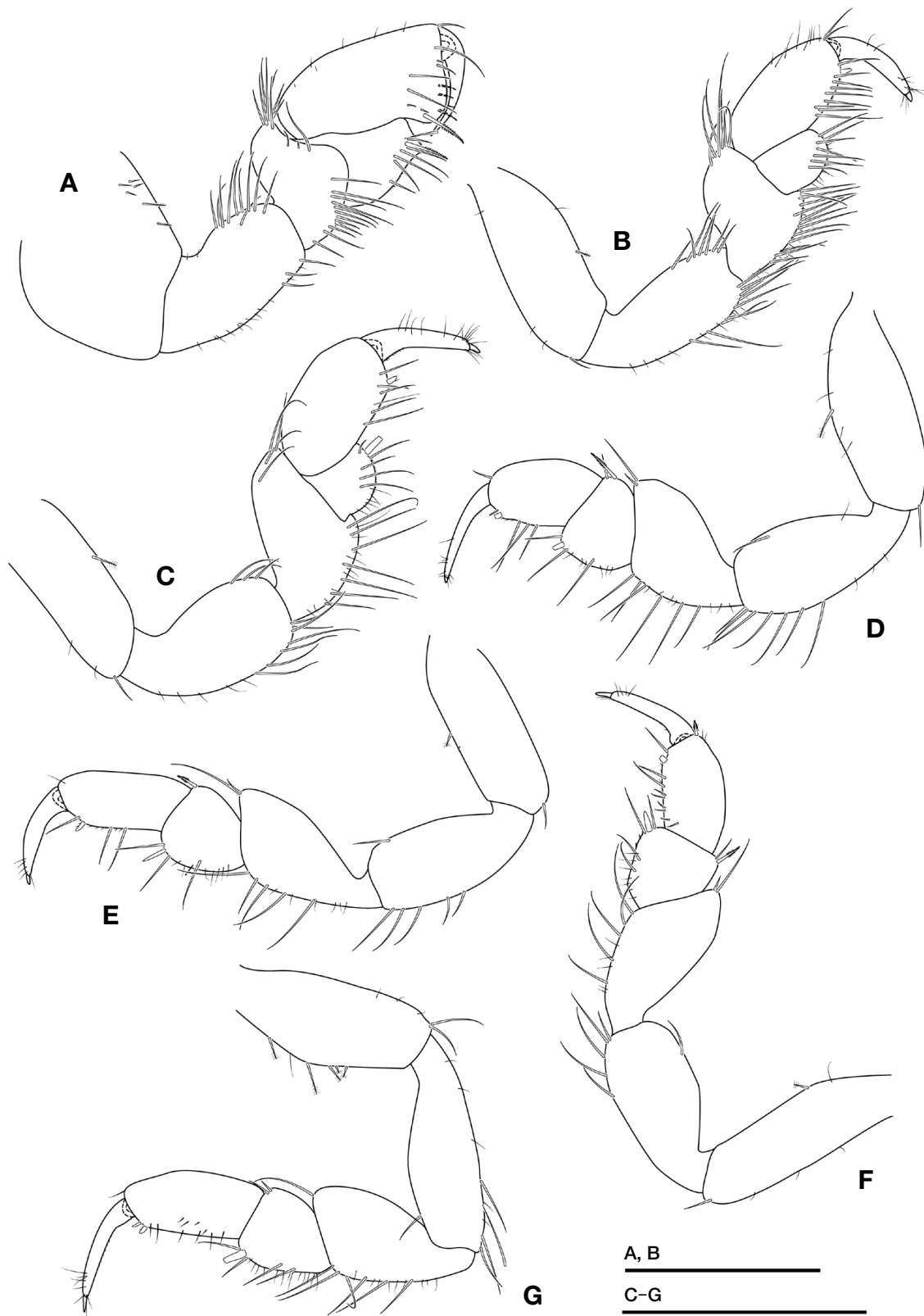


Fig. 3. *Caenanthura engimatica*, female. A, Pereopod 1; B, Pereopod 2; C, Pereopod 3; D, Pereopod 4; E, Pereopod 5; F, Pereopod 6; G, Pereopod 7. Scale bars: A-G=0.5 mm.

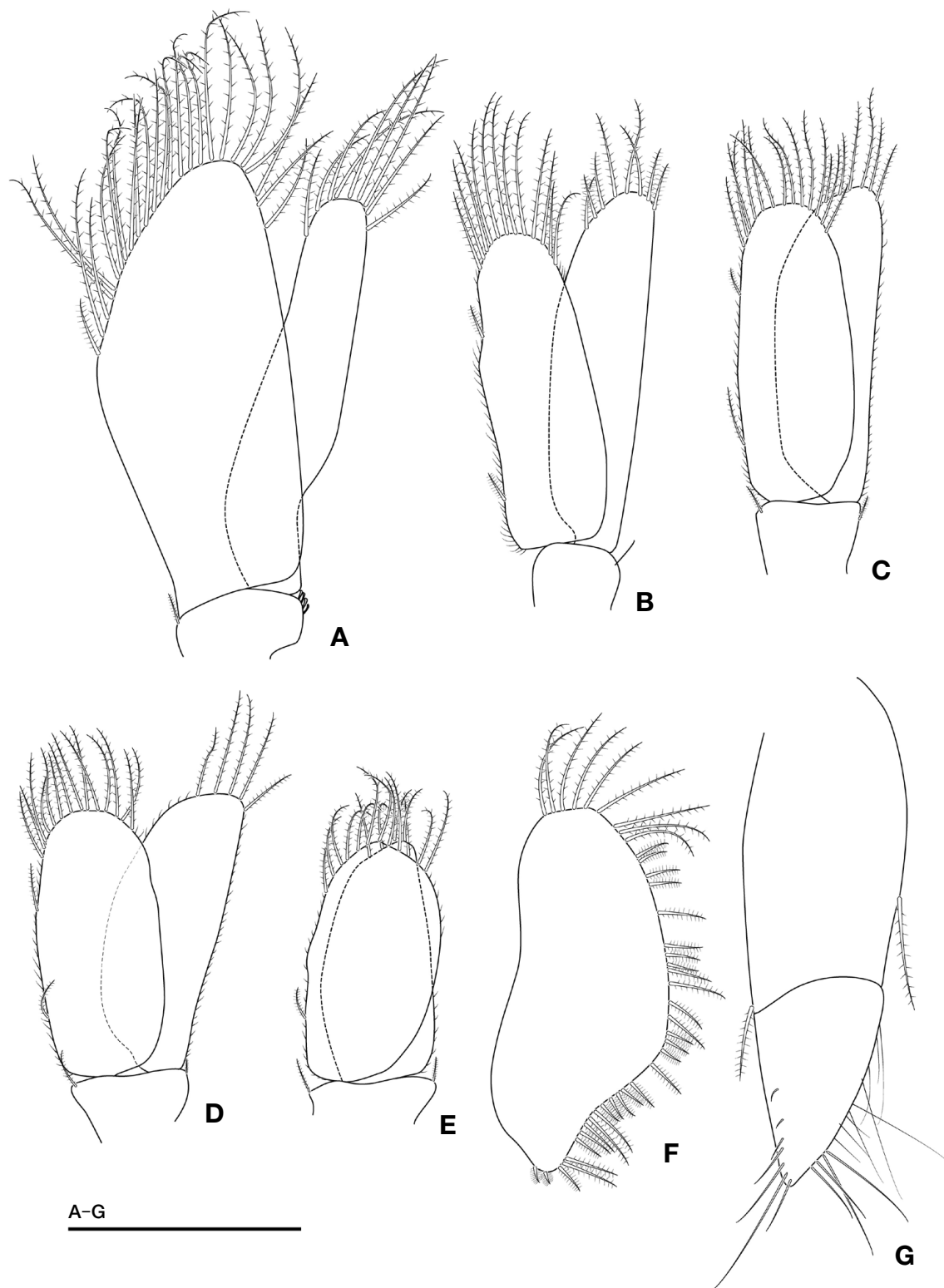


Fig. 4. *Caenanthura engimatica*, female. A, Pleopod 1; B, Pleopod 2; C, Pleopod 3; D, Pleopod 4; E, Pleopod 5; F, Uropodal exopod; G, Uropodal endopod. Scale bars: A-G=0.5 mm.

pereonites (vs. absence in the latter) and the number of the maxillipedal palp articles (bi-segmented in the former vs. 3-segmented in the latter) (Negoescu, 1997).

Caenanthura engimatica differs from *C. ibex* Bamber, 2008 in terms of the presence of dorsal pits on the pereonites (vs. absence in *C. ibex*) and the shape of lacinia dentate on mandible (smooth in the former vs. serrated in the latter) (Bamber, 2008).

Caenanthura engimatica is similar to *C. koreana* Song and Min, 2015 in body length and having 2 segmented mandibular palp and the rostrum as long as anterolateral lobes. However, the former is distinguishable from the latter by the presence of dorsal pits on the pereonite (vs. absence in the latter) and the number of maxillipedal palp articles (bi-segmented in the former vs. 3-segmented in the latter) (Song and Min, 2015).

The Korean materials of *C. engimatica* corresponded well with the original description of the species by having the rostrum as long as anterolateral lobes, bi-segmented mandibular palp, 4-segmented maxilliped, one simple seta on 1–3 fused article of the maxillipedal palp, dorsal pits on pereonites 4–6, and the carpus of pereopod 1 having produced posterodistal margin (Kensley and Reid, 1984). However, these Korean materials have some minor differences from the original description in the presence of the dorsal pit on pereonite 1 (absent in the former vs. present in the latter), the number of the simple seta on the mandibular palp (each article of the mandibular palp with 1 simple seta in the former vs. only distal article with 1–2 simple setae in the latter), and the number of simple setae on the distal margin of pleotelson (five in the former vs. six in the latter) (Kensley and Reid, 1984). These minor differences are regarded as variations of regional populations.

Revised key to known species of the genus

Caenanthura (based on Song and Min, 2015)

1. Dorsal pits absent on pereonites 2
– Dorsal pits present on pereonites 5
2. Rostrum much short than anterolateral lobes.....*C. indica*
– Rostrum as long as anterolateral lobes..... 3
3. Maxillipedal palp with 2 articles.....*C. ibex*
– Maxillipedal palp with 3 articles..... 4
4. Distal article of mandibular palp 3 times longer than proximal article*C. koreana*
– Distal article of mandibular palp 2 times longer than proximal article *C. gutui*
5. Mandibular palp with single article *C. siamensis*
– Mandibular palp with 2 segmented article...*C. engimatica*

ACKNOWLEDGMENTS

This study was supported by the research funds from Chosun

University (2017) and the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR 201801202).

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Received April 26, 2018

Revised July 16, 2018

Accepted July 16, 2018