

# Two Newly Recorded Species of *Pareurystheus* (Crustacea: Amphipoda: Corophiidae) from Korea

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## ABSTRACT

Two species of *Pareurystheus* belonging to the family Corophiidae are added to the Korean fauna: *Pareurystheus latipes* Tzvetkova, 1977 and *P. anamae* (Gurjanova, 1952). *P. latipes* is similar to the *P. anamae* in the most of morphological characteristics. However, two species differ in the forms of antenna 1, gnathopod 2, pereopods 5-7 and telson. This genus *Pareurystheus* is reported for the first time from Korea. They are described and figured in detail.

**Key words:** *Pareurystheus*, Amphipoda, Corophiidae, Korea

## INTRODUCTION

The genus *Pareurystheus* is one of the five genera (*Cheirimedia*, *Cheiriphotis*, *Goesia*, *Pareurystheus*, *Protomedeia*) within the subfamily Protomedeiinae Myers and Lowry, 2003 belonging to the family Corophiidae. This genus, established by Tzvetkova, 1977, contains only 7 species known to world; *P. anamae* Gurjanova, *P. gurjanovae* Tzvetkova, and *P. latipes* Tzvetkova occur in the Sea of Japan (East Sea), *P. sexdentatus* (Stephensen) in the Liaodong Peninsula, China, *P. dentatus* (Holmes), *P. tzvetkovae* Conlan in the Bering Sea, *P. amakusaensis* Hirayama in the Japan. These species inhabiting cold waters, distribute over the Northern East and West coasts of the Pacific. As a result of the taxonomic studies on the Korean corophiids that were collected from the sublittoral waters of East Sea of Korea, two corophiine species turned out to be new to the Korean fauna of gammaridean amphipods. In this paper, we reported *P. latipes* Tzvetkova, 1977 and *P. anamae* (Gurjanova, 1952) with descriptions and illustrations. This genus *Pareurystheus* is reported firstly from Korea.

## MATERIALS AND METHODS

We collected specimens from sublittoral waters of the East Sea by a fishing net during the period from 2002 to 2007. The specimens were fixed in 80% ethyl alcohol and dissect-

ed in glycerol on Cobb's aluminium hollow slide. Drawings and measurements were performed with the aid of a drawing tube, mounted on SZX 12 stereomicroscope (Olympus) and BX 51 interference contrast microscope (Olympus). The body length was measured from the tip of rostrum to apex of the telson, along the dorsal parabolic line of the body. All examined specimens were deposited in the Department of Biological Science, Dankook University.

## SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816

Suborder Gammaridea Latreille, 1803

Family Corophiidae Leach, 1814

<sup>1</sup>Subfamily Protomedeiinae Myers and Lowry, 2003

<sup>2</sup>Genus *Pareurystheus* Tzvetkova, 1977

<sup>3</sup>*Pareurystheus latipes* Tzvetkova, 1977 (Figs. 1A, 2-4)  
*Pareurystheus latipes* Tzvetkova, 1977, p. 96, figs. 3, 4.

*Material examined.* 3♂♂, Geojin (Goseong-gun), 11 Apr. 2002 (Y.H. Kim); 3♂♂ 4♀♀, Geojin (Goseong-gun), 24 Feb. 2005 (Y.H. Kim); 3♂♂ 1♀♀, Gajin (Goseong-gun), 14 Mar. 2006 (Y.H. Kim); 2♂♂, Gajin (Goseong-gun), 23 Feb. 2007 (Y.H. Kim).

*Description.* Adult male: Body length about 16.5 mm (Fig. 2A). Eye small, rounded; lateral ocular lobe (Fig. 2B) slightly protruding, anteroventral margin with 4 simple setae. Urosomites 1-3 with feeble setae and strong posterodorsal cusp, respectively.

Antenna 1 (Fig. 2C). Lost. Description and illustration are substituted for the other male specimen (11.2 mm) from

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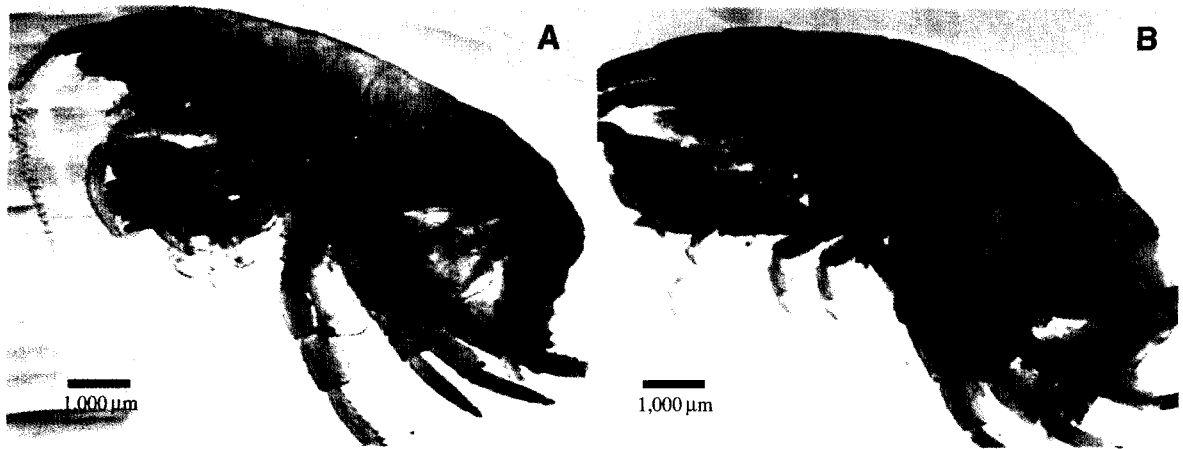


Fig. 1. A, *Pareurystheus latipes* Tzvetkova, 1977, male; B, *Pareurystheus anamae* (Gurjanova, 1952), male.

same collecting region. Peduncular article 1 stout, without posterodistal spine; length ratio of peduncular articles 1-3 = 1.00 : 0.98 : 0.51; its flagellum 22-segmented, accessory flagellum 6-segmented including short distal segment.

Antenna 2 (Fig. 2D). Peduncle about 3.0 times as long as flagellum; peduncular articles 1, 2 ambiguous, but gland cone of article 2 well developed, article 4 slightly longer than article 3; flagellum 11-segmented, slender, provided with small spines at 8-10 segments.

Lower lip (Fig. 2E). Outer and inner lobes with densely pubescence exteriorly; mandibular process well developed.

Mandible (Fig. 2F). Incisor and lacinia mobilis produced forward, with 5 dentate respectively; bearing 7 simple or bifurcate accessory spines, molar process developed, truncate, with molar seta; palp well developed, stout and long, triarticulate, proximal article short, article 2 1.42 times as long as distal article, anterior and posterior margins with 13, 4 simple setae, respectively, article 3 claviform, with simple or unipinnate setae marginally.

Maxilla 1 (Fig. 2G). Inner plate developed, narrow distally, bearing 7 apical and 15 lateral plumose setae; outer plate with 10 sclerotized setal teeth apically; palp biarticulate, extending beyond outer plate, proximal article short, distal article with 9 plumose setae exteriorly and 10 longish conical spines apically.

Maxilla 2 (Fig. 2H). Both plates broad, rounded apically; inner plate smaller than outer plate, with row of 32 oblique pectinate setae interiorly, apical and inner margins with simple and pectinate setae; apical margin of outer plate with 1 plumose and 18 simple setae; apicolateral margin of inner plate and posterior margin of outer plate with densely pubescence.

Maxilliped (Fig. 2I). Inner plate subrectangular, slightly extending 1/2 length of outer plate, with row of pectinate

setae laterally, 3 spines and 18 pectinate setae apically, 1 spine apicolaterally; outer plate almost reaching 1/2 length of article 2 of palp, inner margin with 21 conical teeth, rounded apical margin with 10 plumose setae; palp 4-articulate, inner margin of article 2 with many simple setae, 1.84 times as long as article 1, distal article slightly shorter than 1/2 length of article 3.

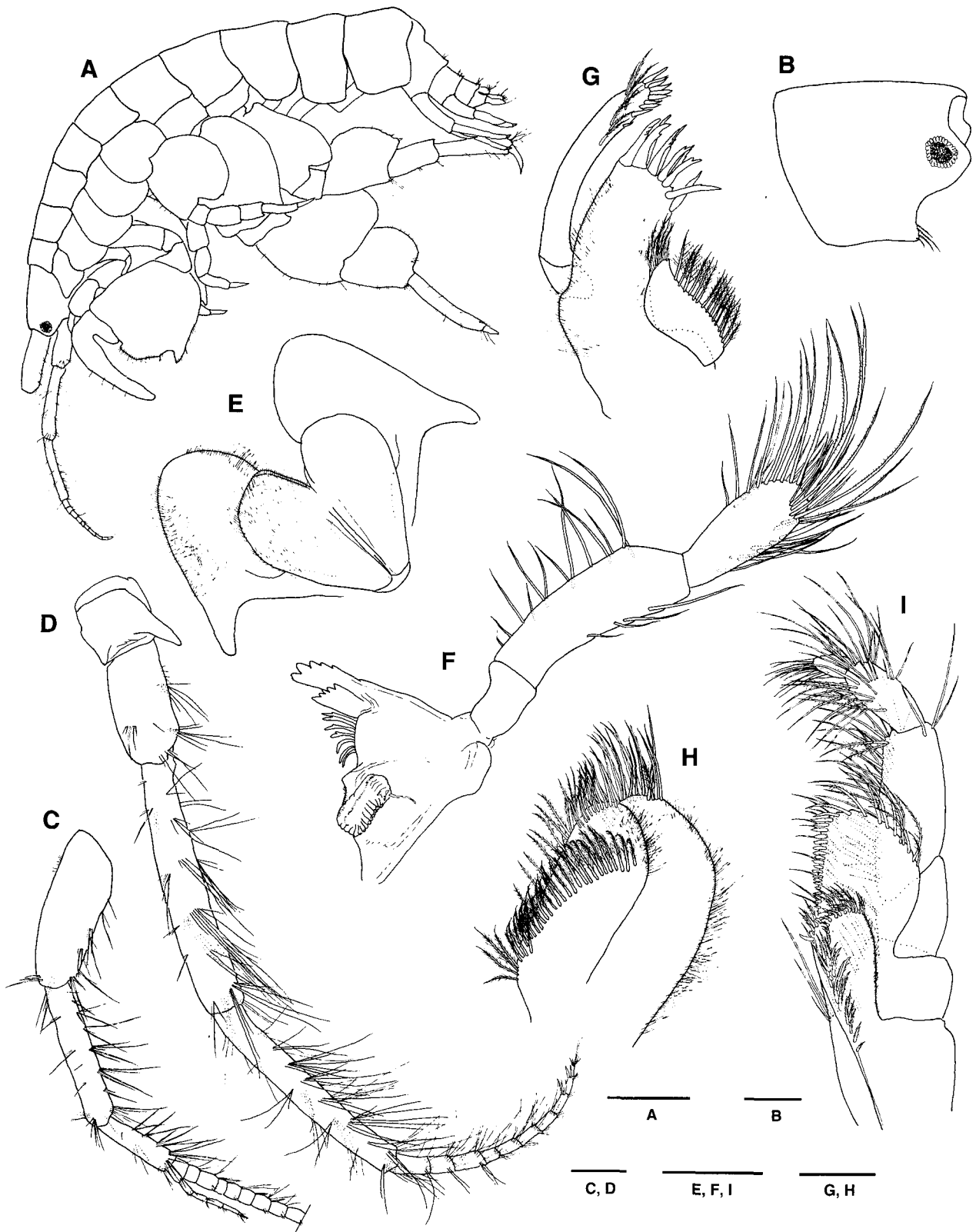
Gnathopod 1 (Fig. 3A). Coxa 1 quadrilateral in shape, anteroventral corner more or less pointed, straight ventral margin with 11 short and long feeble setae; basis rectangular, narrower proximally, posterior margin with row of setae; propodus slightly longer than carpus, palm oblique, finely serrulate, delimited by a 1 spine.

Gnathopod 2 (Fig. 3B). Coxa 2 trapezium shaped, with ventral feeble setae; basis rectangular, 0.73 times as long as propodus; propodus huge, 0.94 times as wide as long, widening distally, palm transverse, bearing longitudinal protrusion with many marginal feeble setae and below groove concavely, delimited by pointed process; dactylus also stout, u-curved proximally.

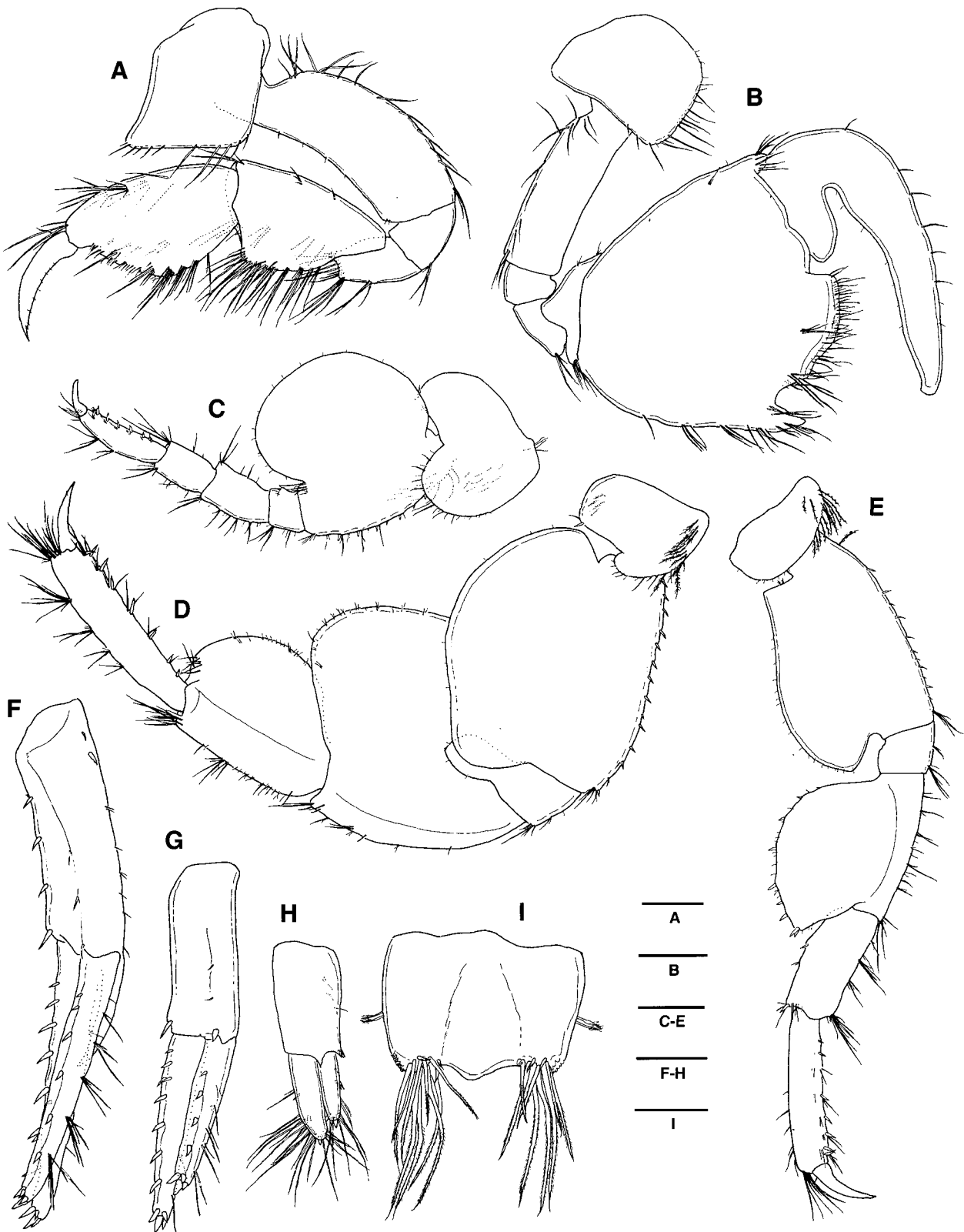
Pereopod 5 (Fig. 3C). Coxa 5 bilobate, anterior lobe protruding roundly downward; posterior margin of basis rounded, expanding backward, posterodistal lobe reaching somewhat end of ischium; propodus bearing rows of spines and setae; length ratio of articles 2-7 = 1.00 : 0.20 : 0.39 : 0.29 : 0.49 : 0.19.

Pereopod 6 (Fig. 3D). Coxa 6 bilobate, anterior margin with plumose setae; basis, merus and carpus extremely plump, broadly expanded posteriorly.

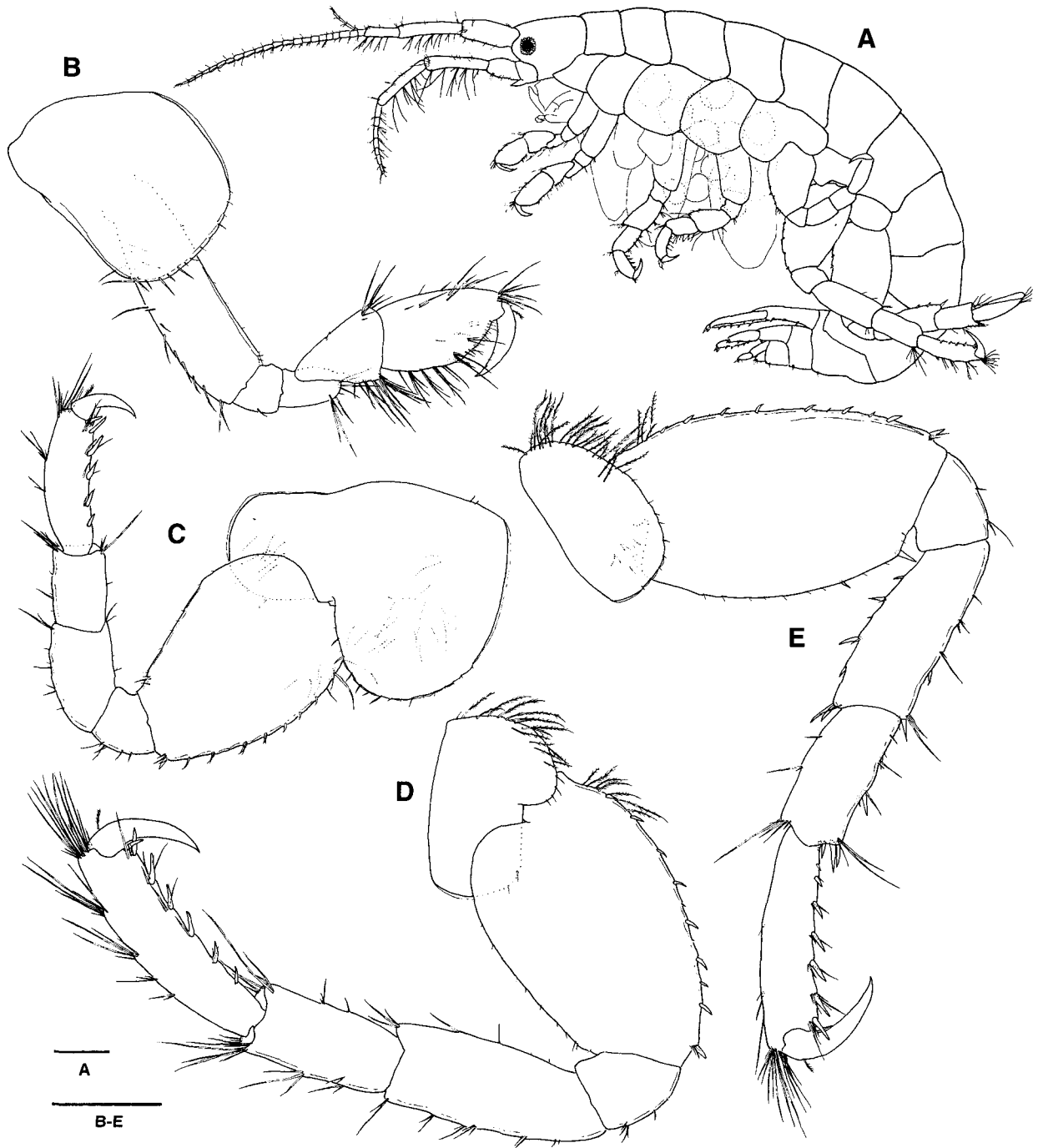
Pereopod 7 (Fig. 3E). Coxa 7 small, ventral margin curved slightly, with 15 plumose setae anteroventrally; basis expanded, 0.59 times as wide as long, anterior margin straight, with row of spines, posterior margin broadly expanded, posterodistal lobe protruding downward; merus 0.85 times as



**Fig. 2.** *Pareurystheus latipes*, male. A, habitus, lateral; B, head; C, antenna 1 (11.2 mm); D, antenna 2; E, lower lip; F, mandible; G, maxilla 1; H, maxilla 2; I, maxilliped. Scales bars=2 mm (A), 0.5 mm (B), 0.4 mm (C, D), 0.3 mm (E, F, I), 0.2 mm (G, H).



**Fig. 3.** *Pareurystheus latipes*, male. A, gnathopod 1; B, gnathopod 2; C, pereopod 5; D, pereopod 6; E, pereopod 7; F, uropod 1; G, uropod 2; H, uropod 3; I, telson. Scales bars=0.4 mm (A, F-H), 2 mm (B-E), 0.2 mm (I).



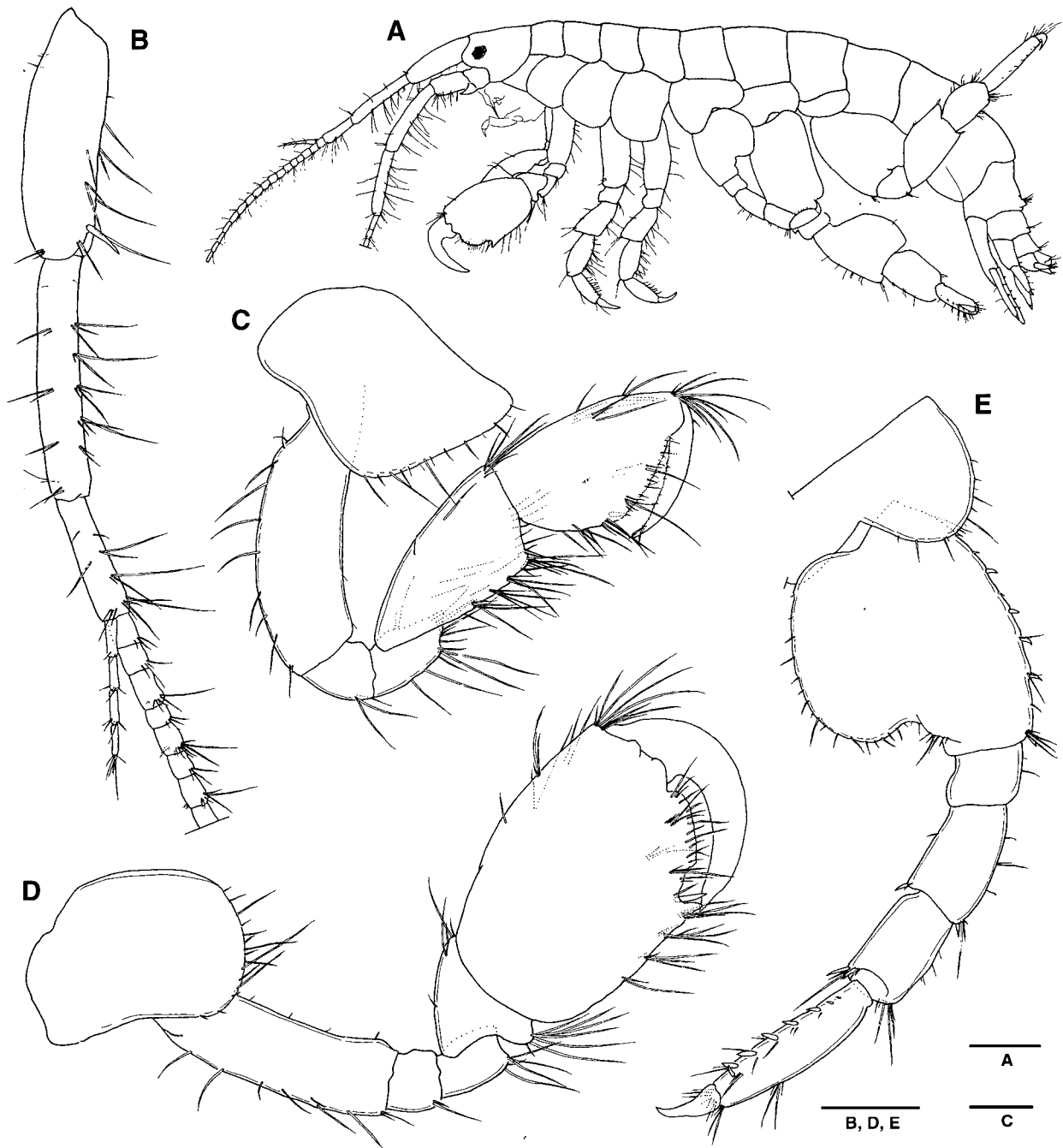
**Fig. 4.** *Pareurystheus latipes*, female. A, habitus, lateral; B, gnathopod 2; C, pereopod 5; D, pereopod 6; E, pereopod 7. Scales bars=1 mm (A), 0.6 mm (B-E).

wide as long, anterior margin with feeble setae, posterior margin expanded, with row of 9 spines and feeble setules; propodus 1.38 times as long as carpus, anterior margin with 7 spines and feeble setae.

Uropod 1 (Fig. 3F). Peduncle slightly shorter than rami,

typically with enlarged peduncular spinous process, 2 feeble dorsolateral, 4 medial and 2 basofacial spines; outer ramus 0.94 times as long as inner one, with 6 dorsal spines and 5-6 cluster of ventral setae.

Uropod 2 (Fig. 3G). Peduncle 1.11 times as long as outer



**Fig. 5.** *Pareurystheus anamae*, male. A, habitus, lateral; B, antenna 1; C, gnathopod 1; D, gnathopod 2; E, pereopod 5. Scales bars=1.0 mm (A), 0.4 mm (B, D, E), 0.2 mm (C).

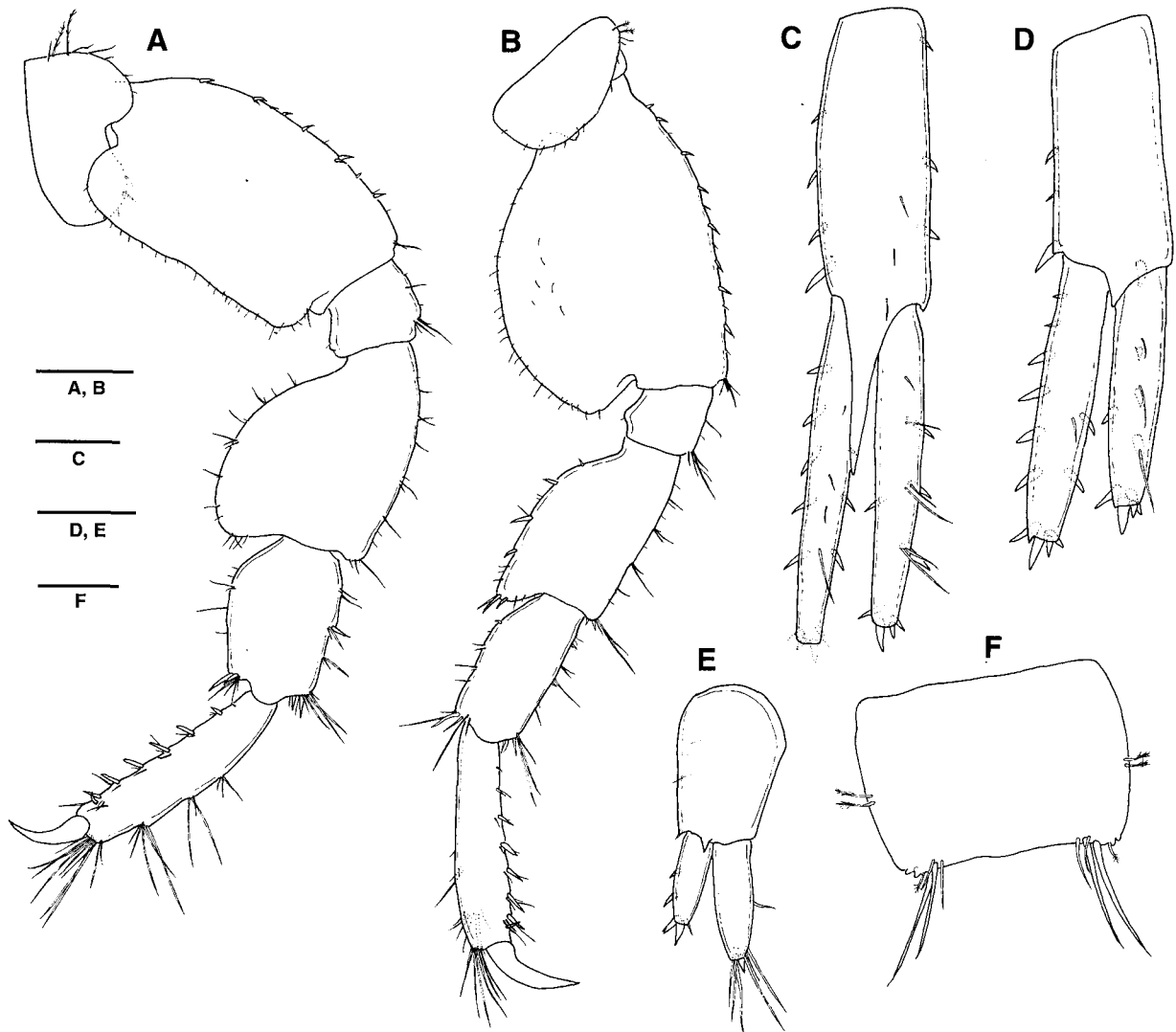
ramus; outer ramus 0.87 times as long as inner ramus.

Uropod 3 (Fig. 3H). Peduncle longer than rami, outer ramus 1.26 times as long as inner one; distal portion of both rami surrounded by setae and 1 apical spine, respectively.

Telson (Fig. 3I). Subquadrate, fleshy, concave medial surface, each lobe with pair of lateral supple penicillate

setae and cluster of long terminal pectinate setae, respectively.

*Ovigerous female.* Body length about 14.3 mm (Fig. 4A). Oostegites enveloped in 15 eggs. Eye and ocular lobe rounded. Similar to male in shape, but it is obviously distinguished from male by the several appendages form; propodus of



**Fig. 6.** *Pareurystheus anamae*, male. A, pereopod 6; B, pereopod 7; C, uropod 1; D, uropod 2; E, uropod 3; F, telson. Scales bars= 0.5 mm (A, B), 0.2 mm (C-E), 0.1 mm (F).

gnathopod 2 (Fig. 4B) is ordinary form, palm oblique, finely serrulate, delimited by 1 spine; basis or merus of pereopods 5-7 (Figs. 4C-E) not expanded posteriorly.

*Distribution.* Russian Far Eastern seas, Korea (East Sea).

*Remarks.* *Pareurystheus latipes* is characterized by having the expanded basis and merus of pereopod 7 in male, eye reniform, peduncular article 1 of antenna 1 lacking a posterodistal spine and peduncular spinous process of uropod 1 less than half the length of the longest ramus. Our specimens are accorded with Tzvetkova (1977)'s original description. However, two morphological differences are found between our specimens and Tzvetkova (1977)'s: (1) in the

original description, eye reniform, while our specimens with ovals rounded eye like *P. sexdentatus* (Stephensen); (2) the posterodistal lobe of basis of pereopod 5 is not protruding downward in the original description, while protruding roundly downward in our specimens, but this difference is caused by age variation. This species distributed in the boreal regions of north-east Pacific and occurred in the high latitudes of East Sea only during winter and spring.

<sup>1</sup>*\*Pareurystheus anamae* (Gurjanova, 1952)

(Figs. 1B, 5, 6)

*Eurystheus anamae* Gurjanova, 1952, p. 190, figs. 15, 16.

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*Pareurystheus anamae*: Tzvetkova, 1977, p. 94, fig. 2.

**Material examined.** 2♂♂, Geojin (Goseong-gun), 24 Feb. 2005 (Y.H. Kim); 10♂♂ 10♀♀, Gajin (Goseong-gun), 14 Mar. 2006 (Y.H. Kim); 3♂♂, Gajin (Goseong-gun), 22 Feb. 2007 (Y.H. Kim); 1♂ 3♀♀, Bongpo (Goseong-gun), 23 Feb. 2007 (Y.H. Kim).

**Description.** Male: Body length about 9.9 mm (Fig. 5A). Cephalon small, subequal in length to pereonites 1, 2 combined. Eye subcircular, lateral ocular lobe rounded. Urosomites 1-3 with feeble setae and strong posterodorsal cusp, respectively.

Antenna 1 (Fig. 5B). Peduncular article 1 subequal in length to article 2, about 1/2 length of article 3, with 1 posterodistal spine; flagellum 17-segmented, slightly shorter than peduncle, accessory flagellum 5-segmented including short distal segment.

Gnathopod 1 (Fig. 5C). Coxa 1 subquadrate, anteroventral corner slightly pointed; basis 1.49 times as long as carpus, with row of setae posteriorly; propodus subequal in length to carpus, palm oblique, weakly serrulate, delimited by 1 spine; dactylus 0.72 times as long as propodus, inner margin finely serrulate.

Gnathopod 2 (Fig. 5D). basis rectangular, 1.92 times as long as ischium and merus combined; propodus huge, subrectangular, 0.71 times as wide as long, 2.66 times as long as carpus, palm slightly oblique, bearing longitudinal protrusion with many marginal feeble setae and below groove concavely, delimited by small pointed process and 1 spine; dactylus stout, falcate.

Pereopod 5 (Fig. 5E). Coxa 5 bilobate, anterior lobe protruding roundly downward; basis 1.41 times as long as ischium and merus combined, anterior margin with row of spines and setae, posterior margin rounded, greatly expanding backward; merus subequal in width to carpus, 1.15 times as long as carpus; propodus narrower than carpus, 1.42 times as long as merus, with row of longitudinal spines and setae; dactylus falcate, 0.34 times as long as propodus.

Pereopod 6 (Fig. 6A). Coxa 6 bilobate, anterior margin with plumose setae, posteroventral margin with 2 small spines and 1 seta; basis subrectangular, more or less plump, 1.77 as long as wide; merus plump, subequal in width to basis, gradually widening distally; carpus 0.72 times as long as merus, propodus narrow, 0.59 times as long as merus and carpus combined.

Pereopod 7 (Fig. 6B). Basis subovate, anterior margin with row of spines and feeble setae, posterior margin plump medially, posterodistal corner does not reach end of ischium;

length ratio of articles 2-7=1.00 : 0.23 : 0.65 : 0.47 : 0.68 : 0.29.

Uropod 1 (Fig. 6C). Peduncle slightly shorter than rami, with enlarged peduncular process, 4 dorsolateral, 2 medial and 1 basofacial spine; outer ramus 0.93 times as long as inner one.

Uropod 2 (Fig. 6D). Peduncle 1.05 times as long as outer ramus, 0.90 times as long as inner one.

Uropod 3 (Fig. 6E). Peduncle stout, longer than rami; outer ramus 1.34 times as long as inner one, with 1 seta laterally, 1 spine and 6 setae apically.

Telson (Fig. 6F). Subquadrate, each lobe with pair of supple penicillate setae laterally, cluster of 4 long setae and 1 feeble penicillate seta apically.

**Distribution.** Russian Far Eastern seas, Korea (East Sea).

**Remarks.** *Pareurystheus anamae* has the closest affinity to *P. latipes* by greatly expanded basis and merus of pereopods 6 and 7 and inner ramus of uropod 3 which is longer than half of the length of the outer ramus. However, *P. anamae* is apparently discernible from *P. latipes* by the following characteristics: the peduncular article 1 of antenna 1 of *P. anamae* bearing a posterodistal spine, while *P. latipes* lacking a posterodistal spine; the propodus of gnathopod 2 trapezoid, gradually widening, broad and huge in mature male of *P. latipes*, while it is subrectangular in *P. anamae*. Our specimens are congruent with Gurjanova (1952) and Tzvetkova (1977)'s descriptions.

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