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***Anthessius kimjensis*, a new species of Anthessiidae (Copepoda; Poecilostomatoida) associated with the pelecypod *Solen grandis* Dunker in Korea**

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Key words: *Anthessius kimjensis* n. sp., poecilostomatoid copepod, Korea

Abstract

Anthessius kimjensis n. sp. is described based on the specimens recovered from the pelecypod *Solen grandis* Dunker in the Korean coast of the Yellow Sea. The new species is distinguished from congeners by having a combination of characters: setal formula II, I, 5 on distal segment of leg 4 exopod, three terminal hooks on distal segment of second antenna, and ratio of length to width on caudal ramus (2.2:1).

Introduction

In his revision, Stock *et al.* (1963) recognized 23 species of the genus *Anthessius* Della Valle, 1980. Since then, 16 more species have been added by Stock (1964), Humes & Ho (1965), Humes & Stock (1965), Reddiah (1966), Humes (1973, 1976), Ho (1983), Do & Kajihara (1984), Avdeev & Kazatchenko (1985), Suh & Choi (1991), Ho & Kim (1992), and López-González *et al.* (1992). However, four species of *Anthessius* (*A. alatus* Humes & Stock, 1965; *A. amicalis* Humes & Stock, 1965; *A. discipedatus* Humes, 1976; *A. solidus* Humes & Stock, 1965) have been removed by Nair (1988) to his new genus, *Tridachnophilus*, based on the host affiliation of these species. Thus the genus *Anthessius* presently includes 35 known species.

This paper gives an illustrated description of the new species under the name *Anthessius kimjensis* n. sp. This is the sixth report of the genus *Anthessius* from the western North Pacific.

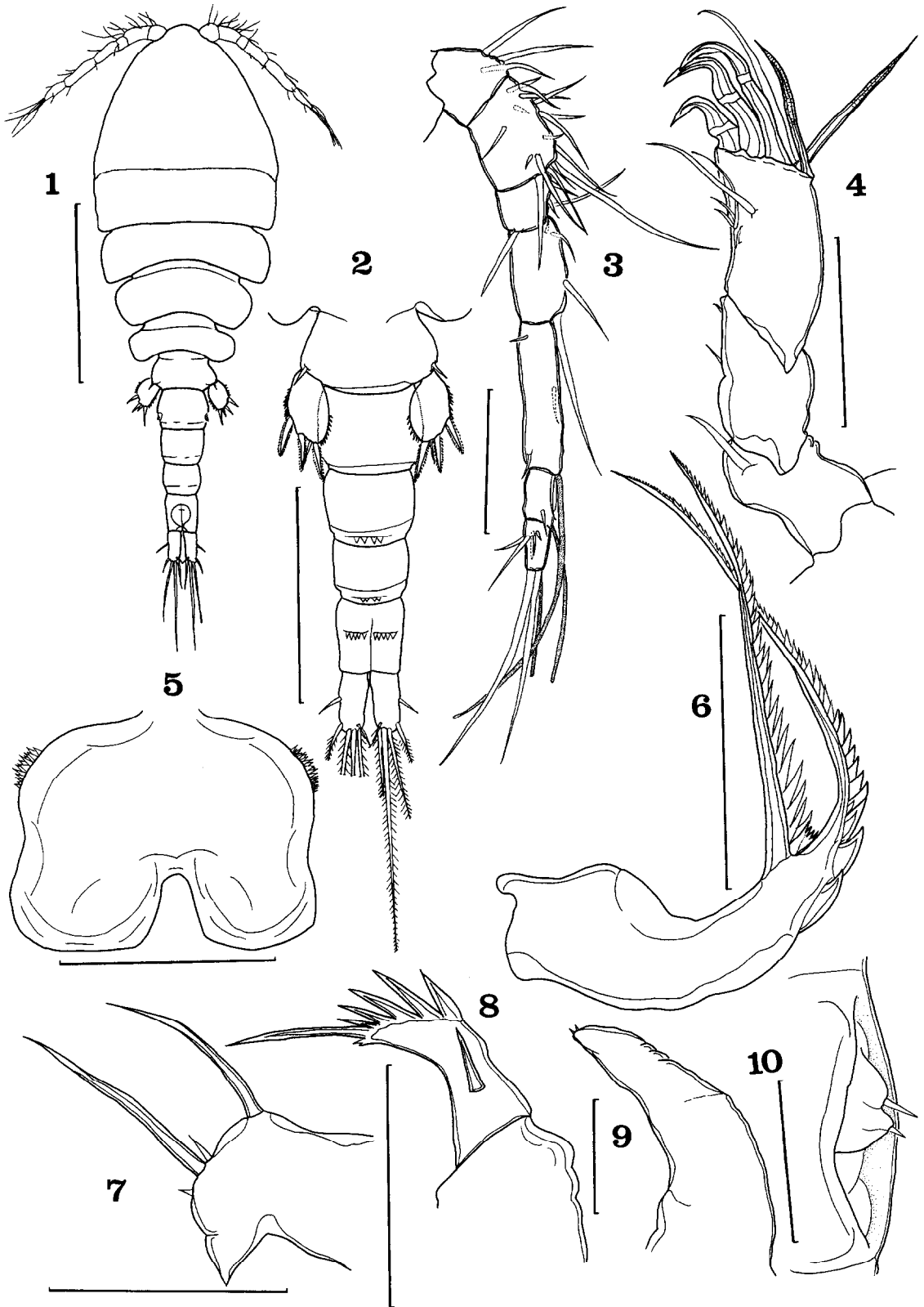
Anthessius kimjensis n. sp. (Figs 1–20)

Locality and material examined

The intertidal zone in Kimje, now designated the type-locality of the new species, is located at the Korean coast of the Yellow Sea (35° 51' N, 126° 35' E). Ten ♀♀ and 9 ♂♂, collected from washing of 30 specimens of *Solen grandis* Dunker on 20 April, 1992, were examined for description. Holotype ♀ (USNM 257138), allotype ♂ (USNM 257143) and paratypes 2 ♀♀, 3 ♂♂ (USNM 257144) were deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. The remaining paratypes (5 ♀♀, 5 ♂♂) are retained in the author's collection.

Female (Figs 1–15)

Body (Fig. 1) elongate. Cephalosome subtriangular, separated from the first pedigerous somite (Fig. 1). Prosoma flat, about 1.8 times longer than urosome. Ratio of length to width of prosoma



about 1.86:1. Urosome (Fig. 2) 5-segmented. Genital complex about 1.02 times wider than long. First two postgenital somites (Fig. 2) each wider than long, with short membranes and four spinules on its posteroventral margins. Anal somite (Fig. 2) about 1.14 times longer than wide, with 10 spinules on ventromedian region. Caudal ramus about 2.17 times longer than wide, with 6 setae.

Dimensions (based on 5 specimens): Total length exclusive of caudal setae 1.64 (1.54–1.78) mm; prosome length 0.99 (0.90–1.05) mm, width 0.53 (0.49–0.58) mm; genital complex length 147 (130–155) μm , width 150 (145–160) μm ; anal somite length 110 (100–118) μm , width 96 (95–100) μm ; caudal ramus length 90 (80–100) μm , width 41 (40–45) μm .

First antenna (Fig. 3) 7-segmented, with setal formula; 3, 16, 4, 4, 4 + 1 aesthete, 1 + 1 aesthete, and 7 + 1 aesthete. Second antenna (Fig. 4) 3-segmented. First segment with one strong seta. Second segment with one inner seta and one setule. Terminal segment with 3 strong hooks, 3 long setae, and 5 inner setae (two of them long).

Labrum (Fig. 5) broad, with a central incision on posterior margin and clumps of spinules on anterolateral margins. Mandible (Fig. 6) with short dentate lamella between apical lash and long setiform element. First maxilla (Fig. 7) bilobed distally. Inner lobe with one short element. Outer lobe with 2 long and 2 short setae. Distal segment of second maxilla (Fig. 8) with 6 long and 2 short teeth on lateral margin and one spine on posterior surface. Maxilliped (Fig. 9) indistinctly 3-segmented. Third segment with 2 small terminal setules.

Legs 1–4 (Figs 11–14) with setal formula as follow:

Leg 1: Prp 0–1; 1–0 Exp I–0; I–1; III, I, 4
Enp 0–1; 0–1; I, 5

Leg 2: Prp 0–1; 1–0 Exp I–0; I–1; III, I, 5
Enp 0–1; 0–2; III, 3

Leg 3: Prp 0–1; 1–0 Exp I–0; I–1; III, I, 5
Enp 0–1; 0–2; IV, 2

Leg 4: Prp 0–1; 1–0 Exp I–0; I–1; II, I, 5
Enp 0–1; 0–2; IV, 1

Leg 5 (Fig. 15) about 1.83 times longer than wide, measuring 85 (70–100) μm \times 47 (40–62) μm , with row of spines on each outer and inner margin, and one seta and 3 spines. Leg 6 (Fig. 10) with 2 setae in genital area.

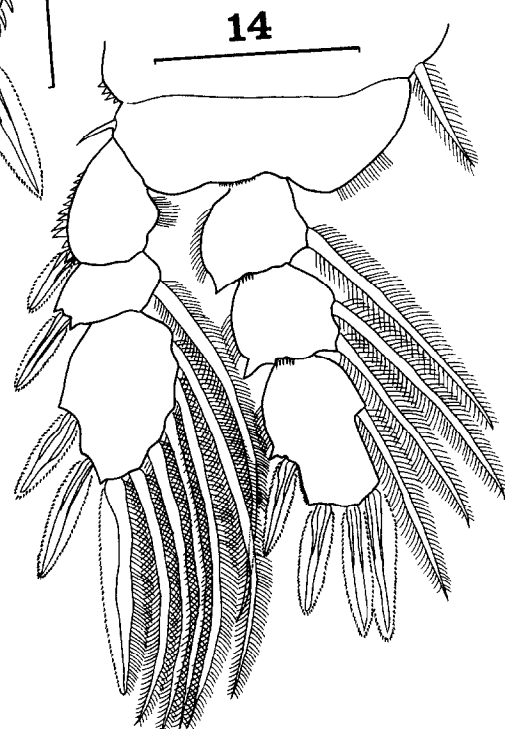
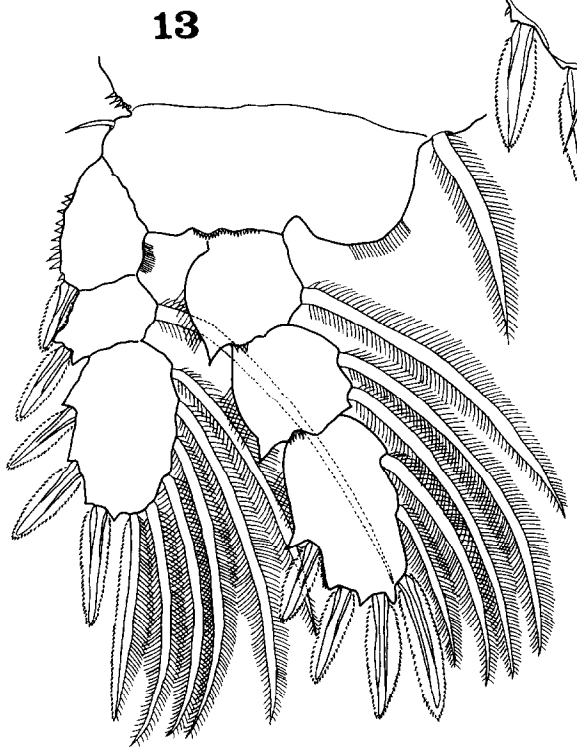
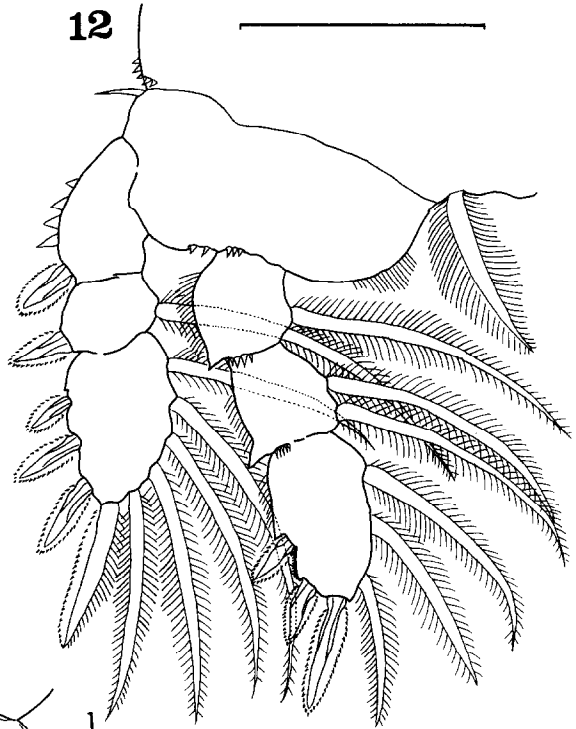
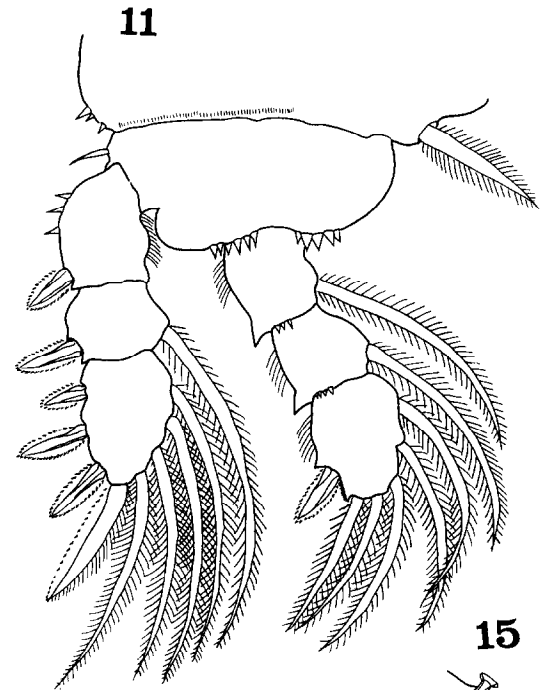
Male (Figs 16–20)

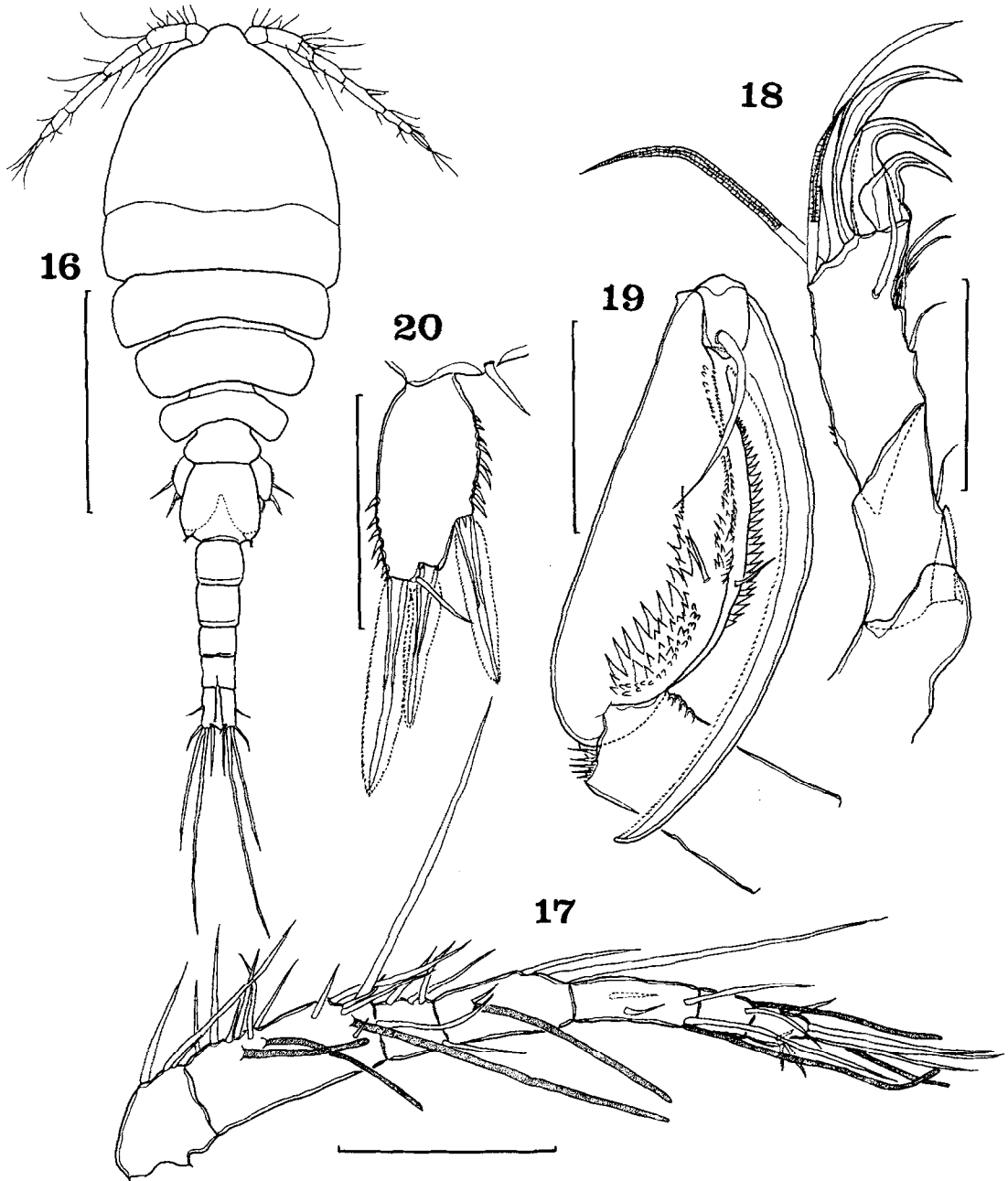
Body about 1.17 times larger than that in female (Fig. 16). Prosome 1.65 times longer than wide. Urosome 6-segmented. Genital somite about 1.06 times longer than wide. Anal somite slightly longer than wide (1.01:1). Caudal ramus 2.73 times longer than wide.

Dimensions (based on 9 specimens): Total length exclusive of caudal setae 1.92 (1.73–1.98) mm; prosome length 1.09 (1.05–1.10) mm, width 0.66 (0.60–0.70) mm; genital complex length 212 (190–220) μm , width 224 (215–240) μm ; anal somite length 94 (80–110) μm , width 93 (90–100) μm ; caudal ramus length 113 (110–125) μm , width 41 (40–45) μm .

First antenna (Fig. 17) 7-segmented, with setal formula; 3, 13 + 3 aesthetes, 4, 3 + 1 aesthete, 4 + 1 aesthete, 1 + 1 aesthete, and 7 + 1 aesthete. Second antenna (Fig. 18) with one enlarged seta on distal margin of basal segment and about 4 more spinules on outer margin of terminal segment than that of female.

Labrum, mandible, first maxilla and second maxilla as in female. Maxilliped (Fig. 19) highly dimorphic, 3-segmented including claw. First segment with distolateral clump of spinules. Second segment tapered apically, with 2 equal setae and 3 patches of spinules on median region. Third





Figs 16–20. *Anthessius kimjensis* n. sp. Male. 16, habitus, dorsal; 17, first antenna; 18, second antenna; 19, maxilliped; 20, leg 5. Units of scales: 16 = 0.5 mm; 17–20 = 0.1 mm.

Figs 11–15. *Anthessius kimjensis* n. sp. Female. 11, leg 1; 12, leg 2; 13, leg 3; 14, leg 4; 15, leg 5. Units of scales: 11–15 = 0.1 mm.

segment shortest. Claw proximally with one long naked seta and one setule. Claw arched, longer than second segment.

Legs 1–4 as those of female. Leg 5 (Fig. 20) with marginal spinules, about 2.21 times longer than wide.

Etymology

The specific name alludes to the locality of discovery, Kimje, Korea.

Remarks

To determine the identity of the present species, it is necessary to carry out comparisons with all species of *Anthessius* that have the formula of the third segment of leg 4 exopod, II, I, 5. There are 14 species in this category. Twelve species of *Anthessius* are clearly distinguishable from this species by having four distal claws of second antenna. They are: *A. dolabellae* Humes & Ho, 1965, *A. graciliunguis* Do & Kajihara, 1984, *A. investigatoris* Sewell, 1949, *A. leptostylis* (Sars, 1916), *A. longipedis* Ho & Kim, 1992, *A. lophiomi* Avdeev & Kazatchenko, 1985, *A. navanacis* (Wilson, 1935), *A. nortoni* Illg, 1960, *A. proximus* Stock *et al.*, 1963, *A. saecularis* Stock, 1963, *A. sensitivus* Stock *et al.*, 1963, and *A. varideus* Stock *et al.*, 1963. Moreover, *Anthessius pinnae* Humes, 1958 is also strikingly different from *A. kimjensis* n. sp. It has two claws in distal margin of second antenna.

The remaining two species, *Anthessius atrinae* Suh & Choi, 1991 and *A. dilatatus* (Sars, 1918), are close to this species due to their possession of three claws of second antenna. However, *Anthessius atrinae* can be distinguished from the present species by longer caudal ramus (ratio of length to width = 5.6:1, compared with 2.2:1 of *A. kimjensis* n. sp.) and the shapes of leg 5 (ratio of length to width = 1.6:1) and first antenna. Moreover, it is much larger than *A. kimjensis* n. sp., the total length of its female being 2.53 mm. On the other hand, *Anthessius dilatatus* has not been adequately

described since their discovery. But this Norwegian species is smaller than the present species (1.40 mm in total length), and has a longer caudal ramus (4:1) and slender leg 5 (3.4:1). Adding to them the differences in the identity of the host and geographic locality, these three copepods cannot be considered conspecific. Consequently, it should be accorded the status of an independent species.

It is noted that female of *Anthessius* generally is larger than male. The three exceptions are *A. fitchi* Illg, 1960, *A. pinctadae* Humes, 1973, and *A. kimjensis* n. sp., which have smaller female with the ratios of female to male of 0.97:1, 0.71:1, and 0.85:1, respectively.

Of these 35 known species in the genus *Anthessius*, five species of *Anthessius* are currently known from the western North Pacific. They comprise *A. atrinae* Suh & Choi, 1991, from the pelecypod *Atrina pectinata* (Linné), *A. graciliunguis* Do & Kajihara, 1984, from the pelecypod *Mytilus galloprovincialis* Lamarck, *A. longipedis* Ho & Kim, 1992, from the gastropod *Thais bronni* (Dunker), *A. lophiomi* Avdeev & Kazatchenko, 1985, from fishes, and *A. pectinis* Tanaka, 1961, from the pelecypod *Pecten laqueatus* Sowerby.

The two reports of *Anthessius* species from Korea waters were made by Suh & Choi (1991) and Ho & Kim (1992). The present report deals with the third species of Korean *Anthessius*. In addition, *A. kimjensis* n. sp. is the third copepod associated with the pelecypod *Solen grandis* Dunker in Korea. The two others comprise *Leptinogaster digita* Kim & Ho, 1991 and *Herrmannella soleni* Kim & Ho, 1991.

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