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Four new records of the gammarids (Crustacea, Amphipoda) from Korean waters

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Four new Korean records of the gammarid (Crustacea, Amphipoda), *Grandidierella fasciata* Ariyama, 1996; *Moolapheonoides acutifalcatus* Kobayashi and Ishimaru, 2005; *Guernea terelamina* Hirayama, 1985; and *Gordonodius zelleri* (Berge, Vader and Coleman, 1999) were reported from the Korean indigenous species survey project funded by the National Institute of Biological Resources (2014-2015). Each of these species is well accorded with the original description for the species except for some minor morphological differences. The genera *Moolapheonoides* Barnard, 1974 and *Gordonodius* Ariyama, 2011 are reported for the first time from Korea.

Keywords: Amphipoda, *Gordonodius*, *Grandidierella*, *Guernea*, Korea, *Moolapheonoides*

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Introduction

Through the Korean Indigenous Species Survey Project funded by the National Institute of Biological Resources (NIBR) during 2014-2015, the authors discovered 19 gammaridean amphipods that were unknown in Korea. Among these species, in this paper, we deal with 4 newly recorded gammaroid species in Korea each belonging to the 4 families Aoridae, Cyproideidae, Dexaminidae, and Odiidae: *Grandidierella fasciata* Ariyama, 1996; *Moolapheonoides acutifalcatus* Kobayashi and Ishimaru, 2005; *Guernea terelamina* Hirayama, 1985; *Gordonodius zelleri* (Berge, Vader and Coleman, 1999). To date, only 1 species of the genus *Grandidierella* and 4 species of the genus *Guernea* have been reported from Korea; *Grandidierella japonica* Stephensen, 1938; *Guernea ezoensis*, Ishimaru, 1987; *G. jejuensis* Kim *et al*., 2011; *G. namhaensis* Kim *et al*., 2011; *G. nullispina* Hirayama, 1985 (KSSZ, 1997; Kim *et al*., 2011). On the other hand, the genera *Moolapheonoides* and *Gordonodius* are reported for the first time from Korea in this paper. Specimens for this study were obtained by hand-net, light trap and SCUBA diving from Korean shallow waters and were preserved in 80% ethyl alcohol. Drawings were done with the aid of a drawing tube mounted on an Olympus SZX16 stereomicroscope and Olympus BX51 interference contrast compound microscope. Body length was measured from the tip of the rostrum to the end of the telson, along the dorsal parabolic line of the body. The specimens are deposited in the collections of the National Institute of Biological Resources (NIBR), Incheon, Korea.

Systematic Accounts

Order Amphipoda Latreille, 1816 단각목
Family Aoridae Stebbing, 1899 큰앞손옆새우과
Genus *Grandidierella* Coutière, 1904 왕큰앞손옆새우속

1. *Grandidierella fasciata* Ariyama, 1996
세돌기큰앞손옆새우 (Fig. 1)
Grandidierella fasciata Ariyama, 1996: 167, figs. 1-5.

Material examined. 1 male, (NIBRIV0000325974), Korea, Jeollanam-do, Gangjin-gun, Misan, 2 July 2004, collected by YH Kim.
Diagnosis. Body subcylindrical, medium sized, about 5.3 mm. Rostrum short. Lateral cephalic lobe short and blunt. Eye rounded, small sized. Antenna 1, peduncular article 2 longer than article 1; accessory flagellum short, uniarticulate. Antenna 2 shorter than antenna 1; peduncular article 5 slightly longer than article 4. Coxae small, relatively short. Gnathopod 1 carpochelate, much larger than gnathopod 2; basis broad, anterior margin straight, posterior margin convex; merus subrectangular, with

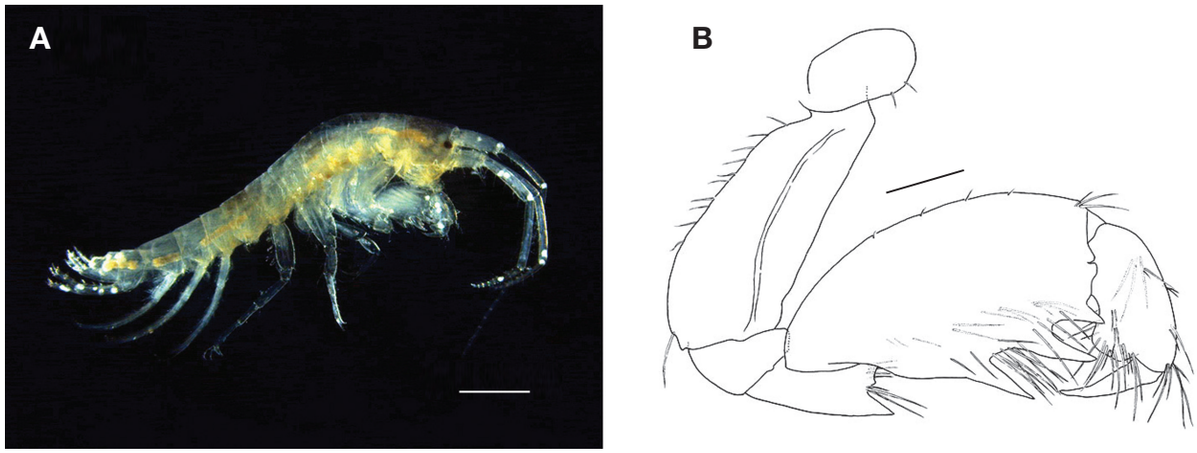

Fig. 1. *Grandidierella fasciata* Ariyama, 1996, male: A, habitus, lateral view; B, Gnathopod 1. Scale bars = 1 mm (A), 0.5 mm (B).

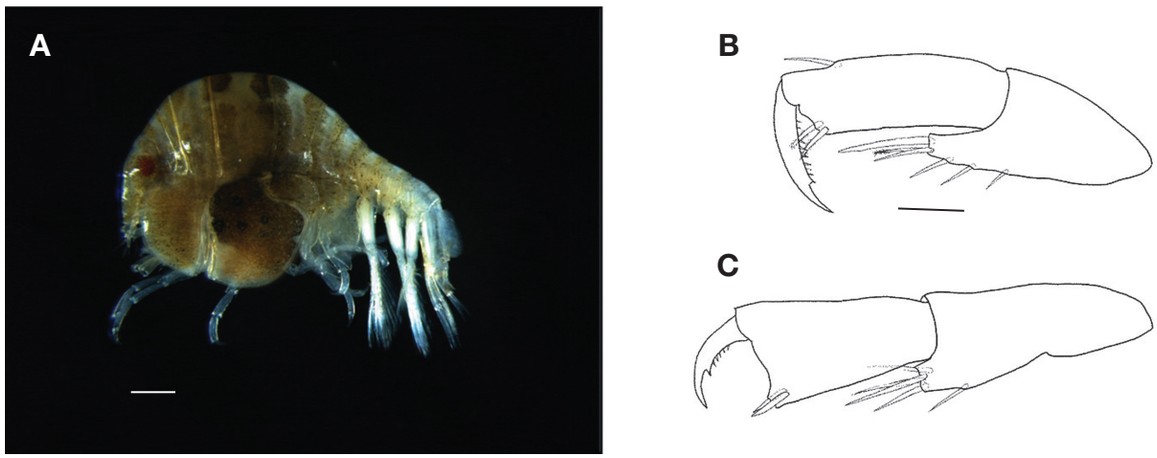

Fig. 2. *Moolapheonoides acutifalcatus* Kobayashi and Ishimaru, 2005; female: A, habitus, lateral view; B, Gnathopod 1; C, Gnathopod 2. Scale bars = 0.5 mm (A), 0.1 mm (B, C).

acute projection posteroditally; carpus massive, subovate; palm characteristic in form with 2 posterior large and 1 posterodistal small acute projections. Gnathopod 2 subchelate; propodus, palm transverse. Pereopods 6, 7 slender, similar to each other. Epimera 1-3 rounded posteroventrally. Urosomites 1-3 separate. Uropods 1, 2 biramous; rami shorter than peduncle, subequal in length. Uropod 3 uniramous; ramus slightly longer than peduncle. Telson entire, wider than long.

Distribution. Japan, Korea.

Remarks. *Grandidierella fasciata* is easily distinguishable by having the 3 posterior projections on carpus of gnathopod 1. Our male specimen is well accorded with Ariyama (1996)'s original description.

Family Cyproideidae Barnard, 1974 넓은마디옆새우과

Genus *Moolapheonoides* Barnard, 1974
사이넓은마디옆새우속 (신칭)

2. *Moolapheonoides acutifalcatus* Kobayashi and Ishimaru, 2005 굽은손넓은마디옆새우 (신칭) (Fig. 2)

Moolapheonoides acutifalcatus Kobayashi and Ishimaru, 2005: 171, figs. 1-3.

Material examined. 1 female, (NIBRIV0000325972), Korea, Ulreungdo Is., Tonggumi, 20 May 2015, by light trap, collected by YH Kim and JH Heo.

Diagnosis. Body rounded, small sized, about 4.8 mm. Eye red, rounded, medium sized. Pereonites 3-5 broad, deep, swollen in dorsal view. Coxae 1, 2 small, hidden by coxa 3. Coxae 3, 4 enlarged. Pleonites much narrower than pereonites. Mandibular palp triarticulate. Antenna 1 short, stout, subequal to head and pereonite 1 com-

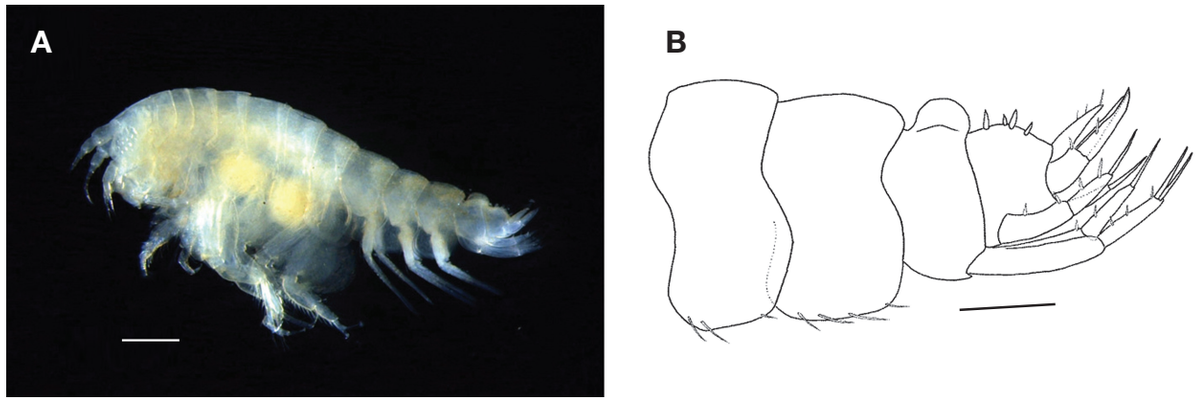

Fig. 3. *Guernea terelamina* Hirayama, 1985; female: A, habitus, lateral view; B, urosomites. Scale bars = 0.3 mm (A), 0.2 mm (B).

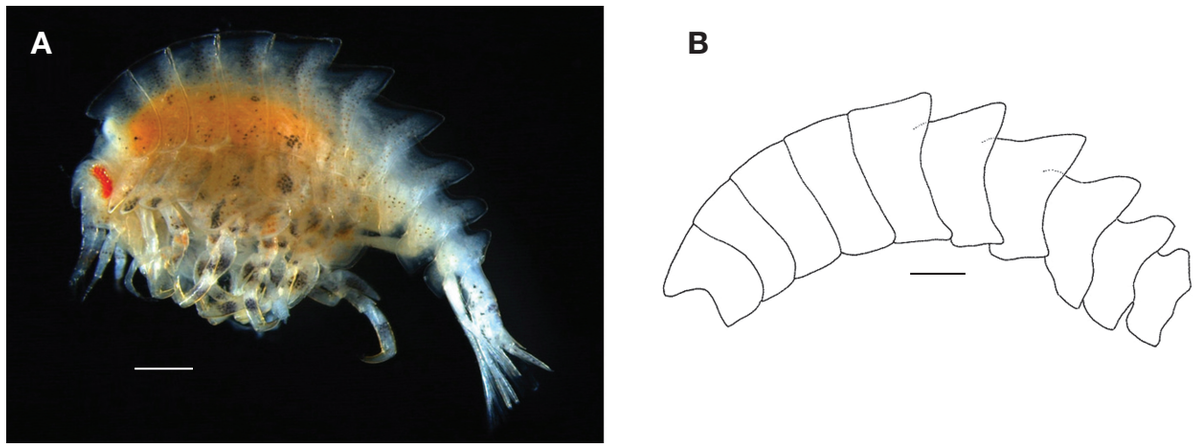

Fig. 4. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999), female: A, habitus, lateral view; B, pereonites and pleonites. Scale bars = 0.5 mm (A, B).

bined. Antenna 2 slender, slightly shorter than antenna 1. Gnathopod 1 subchelate; carpus shorter than propodus, posteroventral lobe produced prominently; propodus rectangular, palm short, slanted, defined by 2 pinnate spines; dactylus falcate, 0.6 × propodus, strongly overlapping palm, with 1 accessory tooth and row of small spines. Gnathopod 2, propodus subrectangular, gradually widening distally, shorter than carpus, lacking posterior setae, palm concave, defined by 2 spines, palmar corner blunt; dactylus fitting palm, curved, with accessory tooth and row of 5 spines. Pereopod 5, basis slender, linear; ischium shorter than merus. Pereopods 6, 7, basis expanded posteriorly. Urosomite 1 dorsally keeled and truncate, elongate, subequal to pereonite 7. Uropods 1-3 slender, peduncles and rami medially pectinate. Telson subtriangular, entire, longer than wide.

Distribution. Japan, Korea.

Remarks. Presently, the genus *Moolapheonoides* contains 8 species worldwide (WoRMS, 2016). Among them, *M. acutifalcatus* is closely similar to *M. kadee* Barnard, 1974, but distinguished from the latter in having short accessory flagellum, strongly curved dactylus on gnathopod 2, and truncate dorsal keel of urosomite 1. Our male specimen is accorded with Kobayashi and Ishimaru (2005)'s original description, except palmar corner of gnathopod 2 blunt. In this paper the genus *Moolapheonoides* is reported from Korea for the first time.

Family Dexaminidae Leach, 1814 붙은꼬리옆새우과
Genus *Guernea* Chevreux, 1887 올찬붙은꼬리옆새우속

3. *Guernea terelamina* Hirayama, 1985
둥근붙은꼬리옆새우 (신칭) (Fig. 3)

Guernea (*Prinassus*) *terelamina* Hirayama, 1985: 8, figs. 129-131.

Guernea terelamina: Bousfield and Kendall, 1994: 54.

Material examined. 1 female, (NIBRIV0000597284), Korea, Jeollanam-do, Goheung-gun, Yongdong-ri, Yongdong Port, 22 Jun 2014, by light trap, collected by YH Kim.

Diagnosis. Body small sized, about 2.2 mm, strongly chitinized, laterally compressed. Rostrum short, minute. Cephalic lobe rounded. Eye medium, subcircular, composed of numerous ommatidia. Pereonites and pleonites dorsally smooth. Antennae 1, 2 short, as long as head and pereonites 1, 2 combined. Gnathopods 1, 2 subchelate, similar to each other; palm oblique, defined by 4 spines. Pereopods 3, 4 similar to each other in size and form, except coxa 4 more concave posteriorly. Coxa 5 enlarged. Pereopods 3-6, dactylus shorter than propodus. Urosomite 1 with rounded dorsal carination which is slightly extending backward above following urosomite. Urosomites 2, 3 coalesced, with a pair of 3 or 4 dorsal spines in dorsal view. Telson deeply cleft.

Remarks. The shape of the dorsal process of urosomite 1 is a unique and characteristic feature for the genus *Guernea*. Our female specimen is in good agreement with the original description of Hirayama (1985), as it pertains to urosomite 1.

Family Odiidae Coleman and Barnard, 1991
민등옆새우과
Genus *Gordonodius* Ariyama, 2011
돌기민등옆새우속 (신칭)

4. *Gordonodius zelleri* (Berge, Vader and Coleman, 1999) 돌기민등옆새우 (신칭) (Fig. 4)

Postodius zelleri Berge, Vader and Coleman, 1999: 246, figs. 3-7.

Gordonodius zelleri: Ariyama, 2011: 27, figs. 17-20, 21E.

Material examined. 1 female (NIBRIV0000597283), Korea, Jeollanam-do, Yeosu-si, Samsan-myeon, Geomundo Is., 31 May 2014, by light trap, collected by SS Hong and SH Kim.

Diagnosis. Body medium sized, about 5.3 mm, somewhat stout; rostrum well developed. Cephalic lobe subrounded. Eye large, reniform. Maxillipedal palp triarticulate. Antenna 1 short and stout; accessory flagellum present, slender, uniarticulate in male, vestigial in female. Antenna 2 shorter than antenna 1. Pereonite 1, anterodorsal corner produced forward. Pereonites 5-7 and pleonites 1-3 with distinct dorsal projections. Pleonite 3 without projection posterolaterally. Urosomites smooth, without dorsal projections. Gnathopod 1 simple, slender. Gnathopod 2 subchelate, larger than gnathopod 1; palm transverse, serrulate; dactylus fitting palm, with small nail. Pereopod 7, basis relatively broad, posterodistal lobe roundly expanded ventrally; merus overhanging and tapering posterodistally, nearly reaching end of carpus. Uropod 1 longer than uropod 2. Uropod 3 biramous, outer ramus about 0.5× inner ramus. Telson entire, narrowing distally.

Distribution. Japan, Korea.

Remarks. The monotypic genus *Gordonodius* Ariyama, 2011 is characterized by the presence of dorsal distinct projections and accessory flagellum in male and presently only one species, *G. zelleri*, has been reported from Japan. Our female specimen is accorded with Ariyama (2011)'s description, however, Korean specimen also display some important differences, such as the longer and slenderer peduncular articles 1-3 of antenna 1, coxa 1 more acute distally, and variation in color pattern. However, as we have not had the opportunity to examine the Japanese material of Ariyama (2011), we cannot confidently determine whether our species is novel. Therefore at this time we conservatively maintain our Korean specimens as *G. zelleri* until a detailed, comparative study can be made on the Japanese material.

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