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One New Species of Freshwater *Gammarus* (Crustacea, Amphipoda, Gammaridae) from South Korea

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한국 담수산 *Gammarus*속(Crustacea, Amphipoda, Gammaridae)의 1신종

이 경 숙·서 인 순
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적 요

Kim 과 Lee(1977) 그리고 Lee and Kim(1980)이 *Gammarus sobaegensis*의 변이종으로 취급했던 경상북도 봉화군에서 채집된 type 4 를 재검토한 결과 독립된 종으로 확인되어 *Gammarus longisaeta*라고 명명하고 기재한다. 이로써 한국 담수산 *Gammarus*는 9 종이 된다.

Key words: *Gammarus*, Amphipoda, Taxonomy, Korea.

INTRODUCTION

The taxonomic studies of freshwater gammarid amphipods from Korea was introduced by Uéno(1940a). Since Uéno's work, there have been several studies on Korean freshwater gammarids(Uéno 1940b, 1966; Kim and Lee, 1977; Lee and Kim, 1980; Lee, 1986; Lee and Seo, 1990a,b, 1992).

Lee and Kim(1980) reported four new species and categorized seven geographical variation types of

This paper is dedicated to Professor Hoon Soo Kim on the occasion of his 70th birthday.

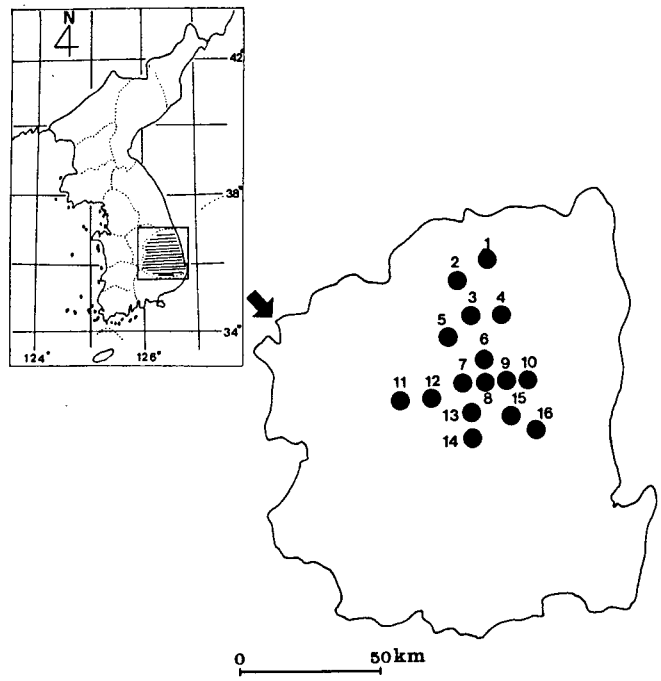

Fig. 1. A map showing the localities where the materials were collected. 1, Ch'unyang-myŏn Ponghwa-gun; 2, Murya-myŏn Ponghwa-gun; 3. 4, Myŏngho-myŏn Ponghwa-gun; 5, Ponghwa-gun; 6, Kungye-dong Andong-gun; 7.8.9.10, Pongjungsa Andong-gun; 11. 12, Sŏhu-myŏn Andong-gun; 13, Shinyang 3-dong Andong-gun; 14, T'aejang 2-dong Andong-gun; 15, Pongseosa Chishin-dong Andong-gun; 16, Hup'yong 2-dong Chinbo-myŏn.

Gammarus sobaegensis from South Korea. Later Karaman(1984) designated the type 4 among the seven variation types as a new subspecies *G. sobaegensis marginalis* only based on the figure 5 of Lee and Kim(1980).

The authors reexamined materials which had been collected from 16 places in Kyŏngsangbuk-do(Fig.1) at years of 1978, 1985. 1986, and 1987.

From our reexamination we concluded that type 4 is not a subspecies of *G. sobaegensis*, but a valid new species. In this paper this new species is fully described and illustrated. The taxonomic charaters were based on Pinkster(1970, 1971. 1972. 1983), Karaman and Pinkster(1977) and Pinkster and Scholl(1984). All the specimens are deposited in the Department of Biology, Dankook University.

SYSTEMATIC ACCOUNT

Order Amphipoda Latreille, 1816
Suborder Gammaridea Latreille. 1803
Family Gammaridae Leach, 1813
Genus *Gammarus* Fabricius. 1775

Gammarus longisaeta, n. sp. (Figs. 2, 3, 4)

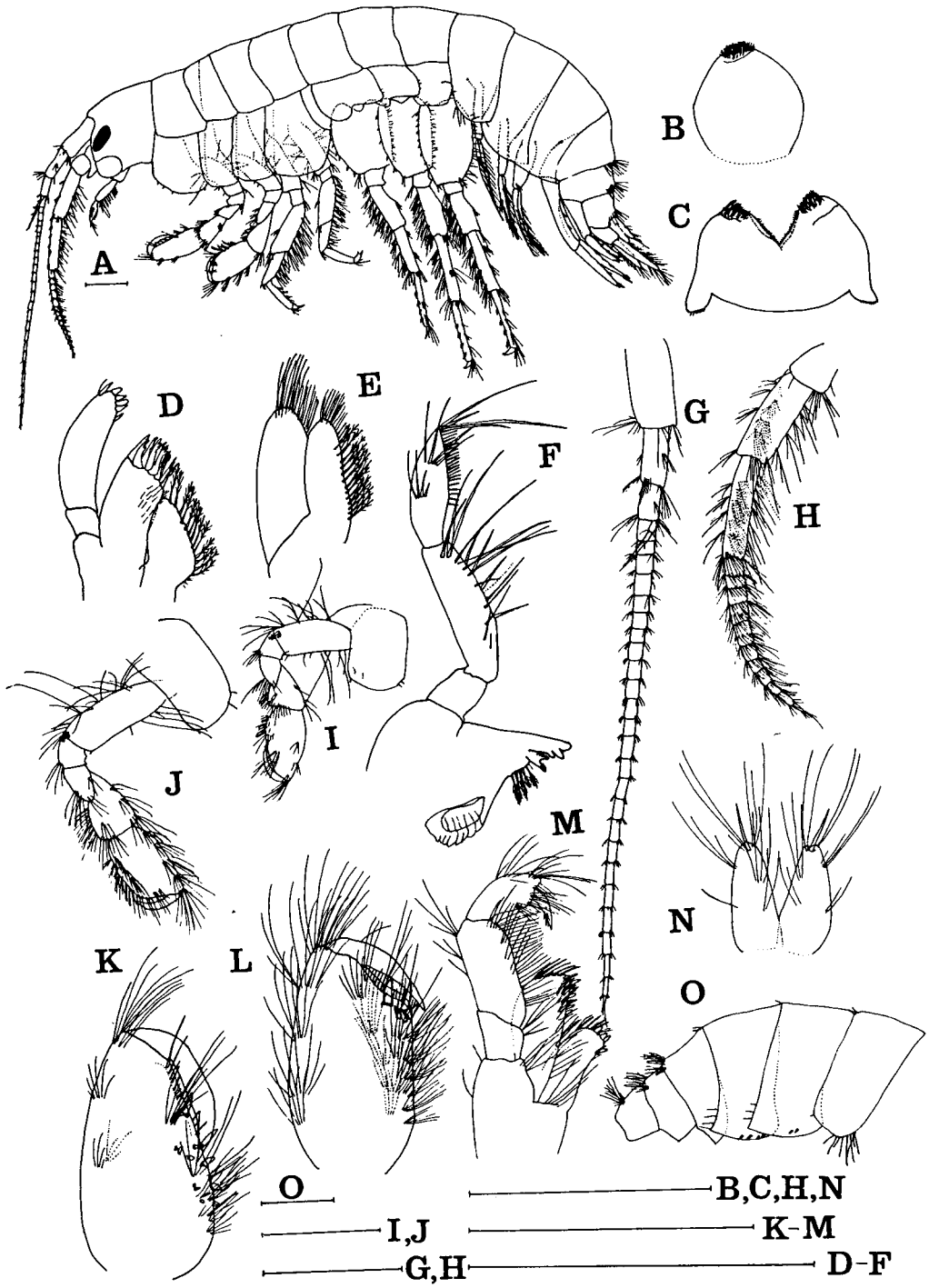

Fig. 2. *Gammarus longisaeta*, n. sp. A, paratype male(left). B-N, holotype male(right). B, upper lip; C, lower lip; D, maxilla 1; E, maxilla 2; F, mandible and mandibular palp(outer face); G, antenna 1; H, antenna 2; I, gnathopod 1; J, gnathopod 2; K, gnathopod 1, palmar margin of propod ; L, gnathopod 2, palmar margin of propod; M, maxilliped; N, telson; O, metasome and urosome. Scale bar = 1mm.

Gammarus *sobaegensis* Lee and Kim, 1980 (type 4, p.51, fig, 5)

Gammarus sobaegensis marginalis Karaman, 1984 (pp.145,146);

Barnard & Barnard, 1991 (p.22)

Materials examined: Holotype : 1♂ (DGLH0001), Sŏhu-myŏn Andong-gun, 12 Apr. 1986(S.S.Lee). Allotype:1 ♀ (DGLA0002), collection data same as holotype. Paratypes : 27♂♂, 29♀♀ (DGLP0003), collection data same as holotype ; 9♂♂ (DGLP0004), Murya-myŏn Ponghwa-gun, 15 Aug. 1985(I.S.Seo) ; 9♂♂, 16♀♀ (DGLP0005), Myŏngho-myŏn, Ponghwa-gun 14 Aug. 1985 (I.S.Seo) ; 16♂♂, 22♀♀ (DGLP0006), Myŏngho-myŏn, Ponghwa-gun, 14 Aug. 1985(I.S.Seo) ; 12♂♂, 37♀♀ (DGLP0007), Kumgye-dong, Andong-gun, 12 Apr. 1986 (S.S.Lee); 9♂♂, 4♀♀ (DGLP0008), Pongjungsa, Andong-gun, 12 Apr. 1986 (S.S.Lee) ; 7♂♂, 37♀♀ (DGLP0009), Pongjungsa, Andong-gun, 12 Apr. 1986(H.J.Ma); 19♂♂, 20♀♀ (DGLP0010), Pongjungsa, Andong-gun, 12 Apr. 1986 (H.J.Ma); 12♂♂, 22♀♀ (DGLP0011), Pongjungsa, Andong-gun, 12 Apr. 1986(S.S.Lee) ; 31♂♂, 32♀♀ (DGLP0012), Ch'unyang-myŏn, Ponghwa-gun, 5 May 1987 (I.S.Seo) ; 13♂♂, 9♀♀ (DGLP0013), Sŏhu-myŏn, Andong-gun, 13 Apr. 1986 (S.S.Lee) ; 30♂♂, 31♀♀ (DGLP0014), Shinyang 3-dong, Andong-gun, 13 Apr. 1986 (S.S.Lee) ; 15♂♂ (DGLP0015), T'aejang 2-dong, Andong-gun, 15 Apr. 1986(S.S.Lee); 5♂♂, 45♀♀ (DGLP0016), Pongseosa, Chishin-dong, Andong-gun,12 Apr. 1986(S.S.Lee) ; 8♂♂, 12♀♀ (DGLP0017), Hup'yong 2-dong, Chinbo-myŏn, 3 Oct. 1986 (I.S.Seo) ; 26♂♂ (DGLP0018), Ponghwa-gun, 7 May 1978(K.S.Lee).

Diagnosis: Segments of pereopods 5-7 with dense long setae and segment 2 of pereopod 7 with long setules on posterior margin. Anterior margins of peduncular segments 4 and 5 of antenna 2 bearing 8 and 9 tufts of long setae, respectively.

Description of male (holotype): Antenna 1 (Fig.2G) half as long as body length ; peduncular segment 1 longer than peduncular segments 2 and 3; each of interior margin of peduncular segments 2 and 3 with 1 tuft of slightly long setae ; main flagellum and accessory one composed of 25 and 4 segments, respectively.

Antenna 2 (Fig.2H) shorter than antenna 1; each of peduncular segments 4 and 5 with 3 longitudinal rows composed of tufts of setae; interior, anterior and posterior margins of peduncular segment 4 with 6,7 and 4 tufts of setae, respectively, and length of setae on anterior margin longer than diameter of peduncular segment 4; interior, anterior and posterior margins of peduncular segment 5 with 6,8 and 5 tufts of setae, respectively, and length of setae on anterior margin two times as long as diameter of peduncular segment 5; flagellum with 12 segments.

Propod of gnathopod 1 (Figs. 2 I,K) pyriform in shape, and with 14 small spines on distal surface near palm ; palm of propod oblique, and with 1 strong spine on medial part. Propod of gnathopod 2 (Figs. 2J,L) quadrangular in shape, and with 4 spines on distal surface near palm; palm of propod transverse, and with 1 strong spine on medial part.

Segment 2 of pereopod 5 (Fig.3C) with 18 setules on posterior margin; each of anterior margins of segments 4 and 5 with 5 tufts of setae, and length of these setae longer than each diameter of segments 4 and 5 . Segment 2 of pereopod 7 (Figs. 3E,4D) with 17 very long setules on posterior margin and 3 long setae near posterodistal corner; segment 4 with 5 tufts of setae on anterior magin, and length of these setae longer than diameter of segment 4 ; segment 5 with 5 tufts of setae on anterior margin, and length of these setae longer than diameter of segment 5.

Dorso-lateral part of urosome(Figs.2N,4B) dense with long setae. Inner ramus of uropod 3(Fig. 3I) almost 2/3 as long as outer one, and inner and outer margins of inner ramus with plumose setae; inner margin of outer ramus with plumose setae, and outer margin dense with simple setae. Each lobe of telson (Fig.2N)

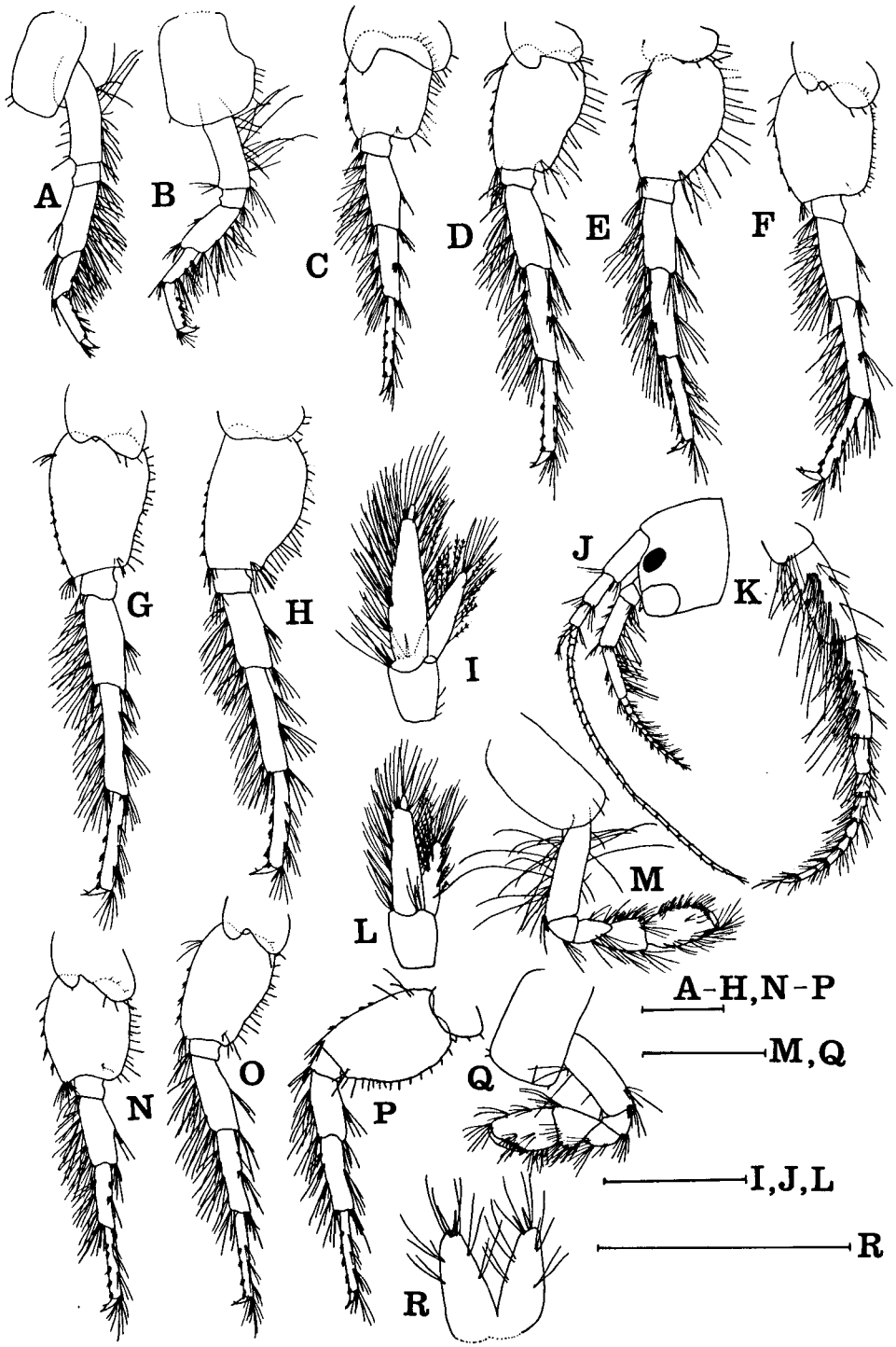

Fig. 3. *Gammarus longisaeta*, n. sp. A-E, I, holotype male(right). A, pereopod 3; B, pereopod 4; C, pereopod 5; D, pereopod 6; E, pereopod 7. F-H, paratype male(right). F, pereopod 5; G, pereopod 6; H, pereopod 7; I,uropod 3; J-R, allotype female(all right appendages, except J). J, head; K, antenna 2; L, uropod 3; M, gnathopod 2; N, pereopod 5; O, pereopod 6; P, pereopod 7; Q, gnathopod 1; R, telson. Scale bar = 1mm.

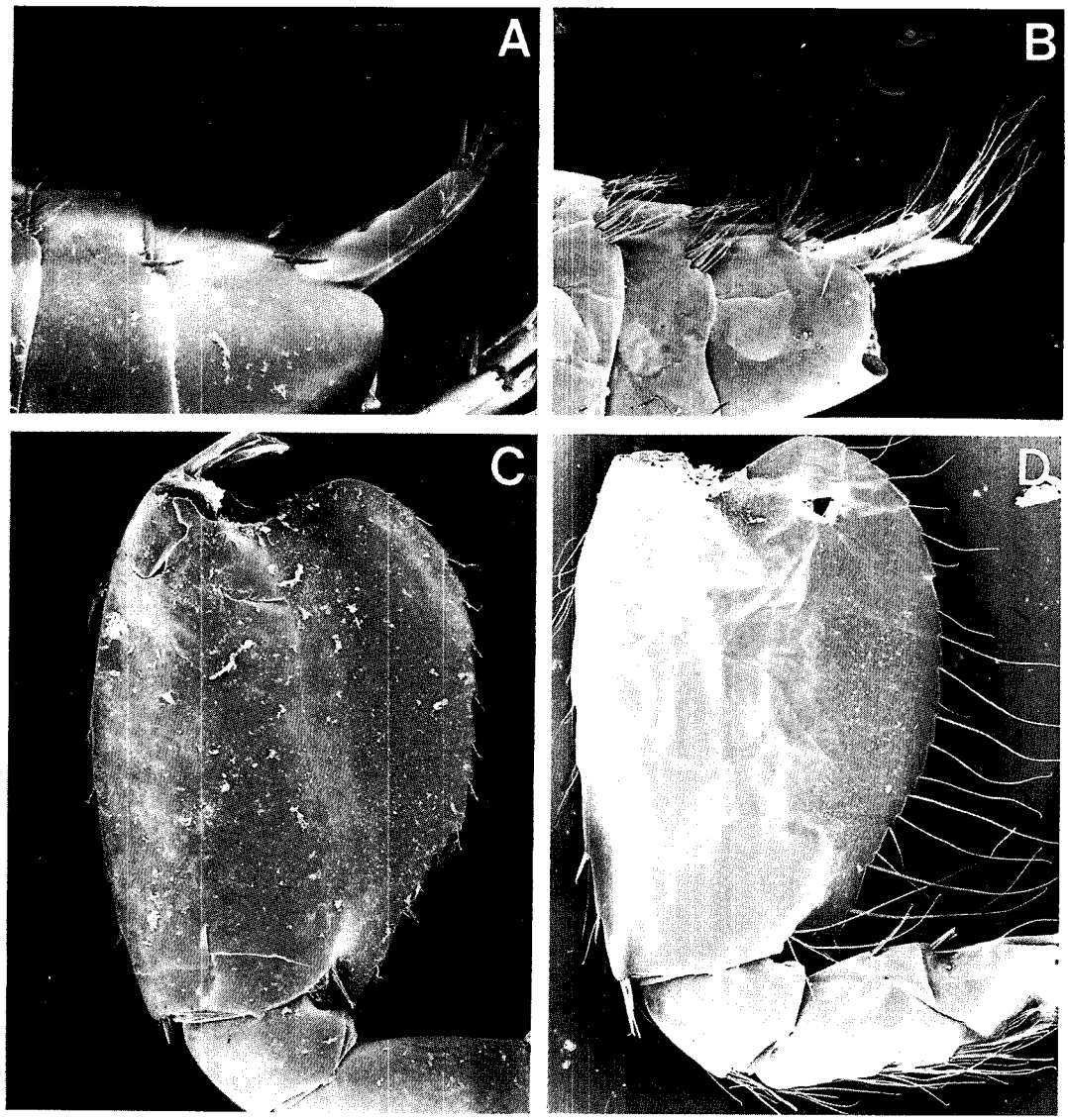

Fig. 4. Scanning electron micrographs of *Gammarus sobaegensis and G. longisaeta:* A, lateral view of urosome and telson of *Gammarus sobaegensis* (X100); B, lateral view of urosome and telson of *Gammarus longisaeta* (X100); C, inner part of segment 2 of left pereopod 7 of *Gammarus sobaegensis* (X100); D, inner part of segment 2 of left pereopod 7 of *Gammarus longisaeta* (X100).

with 2 groups of long setae along outer and inner margins.

Description of female (allotype): Smaller than male. Setae on peduncular segments of antenna 2(Fig. 3K) longer than those of male, but the length of setules on posterior margins of segment 2 of pereopods 5-7 (Figs.3N,O,P) shorter than those of male. Each propod of gnathopods 1 and 2 and uropod 3 smaller than those of male.

Variations: Variations of the length of setules along posterior margins of segment 2 of pereopods

5-7(Figs.3F,G,H) being in intrapopulation and interpopulation, but these are longer than those of *G. sobaegensis*.

Remarks: This new species is similar to *G. sobaegensis* in most characters. But, the present species is different from *G. sobaegensis* in the following characteristics : (1) The setae of anterior margins of segments 4 and 5 of pereopods 5-7 in this species are longer than those of *G. sobaegensis;* (2) Setules of posterior margin of segment 2 of pereopod 7 (Fig.4D) in this species are very longer than those of *G.sobaegensis* (Fig. 4C); (3) Posterodistal corner of segment 2 of pereopod 7 (Fig.4D) with several long setae in this species, whereas *G. sobaegensis* with 1 spine or 1-2 short setae (Fig.4C); (4) Setae of telson and dorsal surface of urosome (Fig.4B) in this species are longer than those of *G.sobaegensis* (Fig.4A).

The female specimens of this new species can be easily confused with those of *G. sobaegensis;* the characteristics of antennae, gnathopods, pereopods and uropod 3 in this new species are similar to those of *G. sobaegensis*.

This new species is different from *G. kyonggiensis* Lee and Seo, 1990 by the number of tufts of setae on peduncular segment 4 of antenna 2: the former has 6, 8 and 5 tufts of setae on the interior, anterior and posterior margins , respectively, while the latter has 3, 3 and 4 tufts of setae on those margins, respectively.

Etymology: The specific name is from the Latin *longi*(long) + *saeta*(seta), referring to very long setules on posterior margin of segment 2 of pereopod 7 and dense long setae on anterior margin of segments 4 and 5 of male pereopods 5-7.

ABSTRACT

Seven geographical variation types of *G.sobaegensis* in South Korea were reported by Kim and Lee (1977) and Lee and Kim (1980). After extensive reexamination, we considered type 4, one of the variation types collected from various localities of Kyŏngsangbuk-do Pongwha-gun, as a new species. This new species is named as *Gammarus longisaeta* and fully described and illustrated. Adding this new species, total 9 species of freshwater *Gammarus* are known to Korea.

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