

## A New Species of the Genus *Liljeborgia* (Crustacea, Amphipoda, Liljeborgiidae) from Korea

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*Liljeborgia hwanghaensis*, new species from Yellow Sea is described and illustrated. This new species is compared with the most closely related species, *Liljeborgia dubia* (Haswell, 1880).

**KEY WORDS:** Crustacea, Amphipoda, *Liljeborgia hwanghaensis*, Korea

Continuous studies of the Korean gammaridean amphipod fauna (Kim and Kim, 1987, 1988; Kim and Kim, 1989) have revealed a previously unknown species of the genus *Liljeborgia*. Although the distribution of the species in the genus *Liljeborgia* is worldwide, only two species (*Liljeborgia japonica* Nagata, 1965 and *L. serrata* Nagata, 1965) have been reported in the Far Eastern waters. The present new species is a thirdly recorded one in the genus *Liljeborgia* in the Far Eastern waters.

The body length in "Material Examined" section was measured from the tip of rostrum to the posterior end of telson, along the dorsal outline of the body. All type specimens are deposited in the Department of Zoology, Seoul National University.

*Liljeborgia hwanghaensis*, new species (Figs. 1-3)

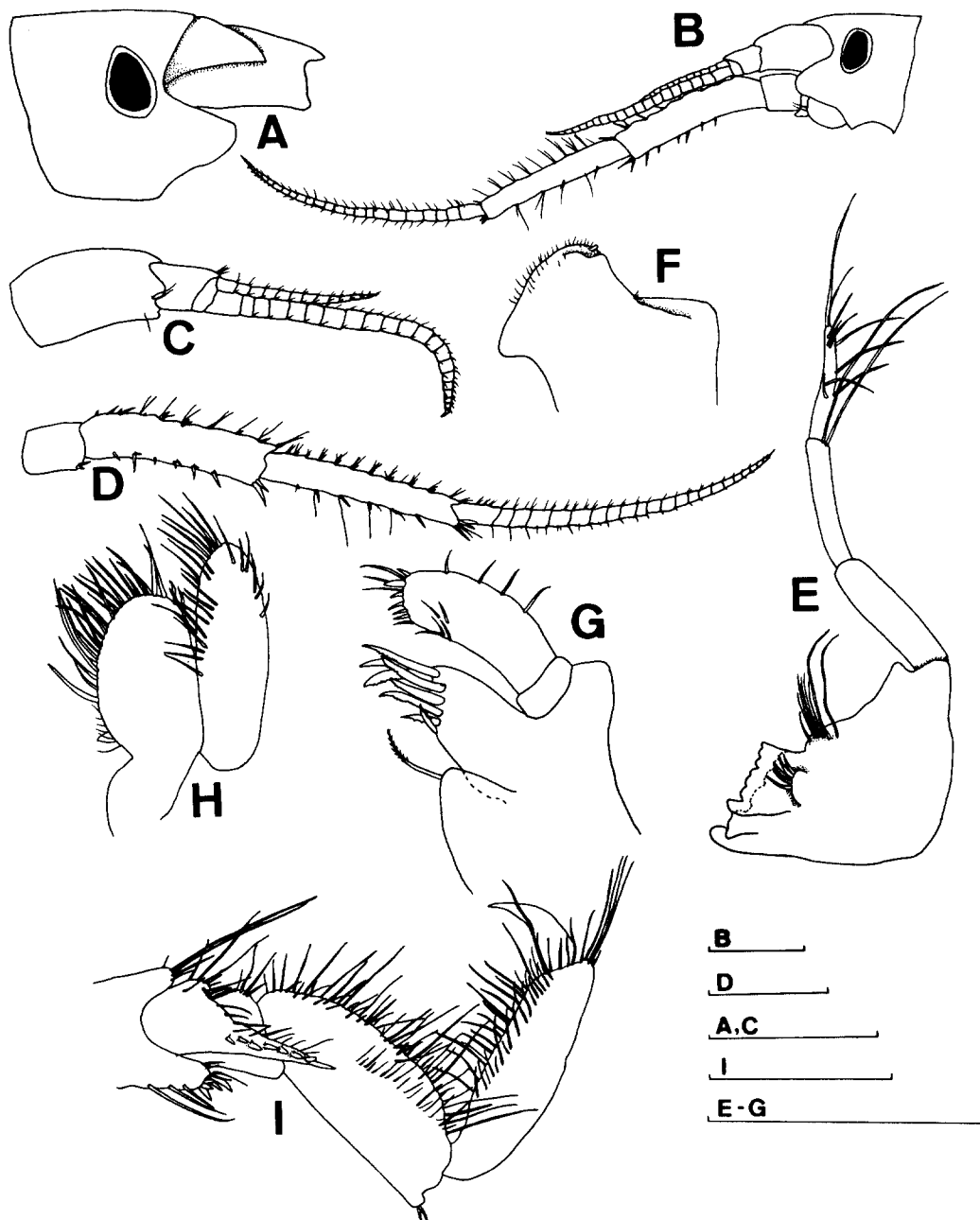
Material Examined.-Holotype: male (SAH 00007), body length: 16 mm, from the sea bottom located at 37°23'N, 126°35'E (Yellow Sea), May 20, 1988 (collector: Dr. C. H. Koh). Paratype: one male (SAP 00021), body length 10.4 mm, collection details same as the holotype.

Description.-Rostrum (Fig. 1A) relatively strong and long, about 62% as long as article 1 of antenna 1, far over-reaching tip of lateral cephalic lobe. Lateral cephalic lobe produced anteriorly, distal

part rounded. Eye moderate in size, oval.

Antenna 1 (Fig. 1B, C) almost reaching to middle of article 5 of antenna 2; article 1 strong, much longer than articles 2, 3 combined; article 2 about half as long as article 1; article 3 small and short; flagellum about two times as long as peduncle, composed of 20-21 segments; accessory flagellum half as long as flagellum of antenna 1, composed of 13 segments. Antenna 2 (Fig. 1B, D) much longer and stronger than antenna 1; article 4 almost as long as article 5, dorsal margin covered with nine bundles of spines and with six bundles of setae, ventral margin with six bundles of spines and no setae, each of dorsal and ventral margin provided with two spines distally; article 5 narrower than article 4, dorsal margin provided with 11 spines and 11 bundles of setae, ventral margin covered with six spines and four bundles of setae composed of one or two relatively long setae, ventral margin provided with two strong spines distally; flagellum slightly shorter than articles 4, 5 combined, composed of 20-23 segments.

Mandible (Fig. 1E) with incisor bearing five blunt teeth; lacinia mobilis armed with seven teeth; molar obsolescent, spine row with five spines; eight long setae on middle part. Mandibular palp triarticulate; article 1 as long as article 2; article 2 with two long setae distally; article 3



**Fig. 1.** *Liljeborgia hwanghaensis*, new species, holotype male. A, head (right antennae excluded); B, head and antennae 1, 2; C, antenna 1; D, antenna 2; E, right mandible; F, left part of lower lip; G, inner view of right maxilla 1; H, inner view of right maxilla 2; I, right maxilliped. Bars: A – D = 1 mm, E – I = 0.5 mm.

shorter than article 2, with setae on lateral surface and apex. Outer lobe of lower lip (Fig. 1F) with one denticle and dense setae. Inner plate of maxilla 1 (Fig. 1G) with one strong plumose seta; outer plate armed with eight serrate spines on apex; palp biarticulate, article 2 with seven spines and three setae on apex, with four or five setae on inner and outer margins. Plates of maxilla 2 (Fig. 1H) subequal in size; inner and outer margins of each plate with dense setae. Inner plate of maxilliped (Fig. 1I) with five spines on apex and three long setae on inner margin; inner margin of outer plate with eight spines from medial part to sub-apical part; palp 4-articulate, articles 2, 3 setaceous on inner margin; dactyl shorter than article 3.

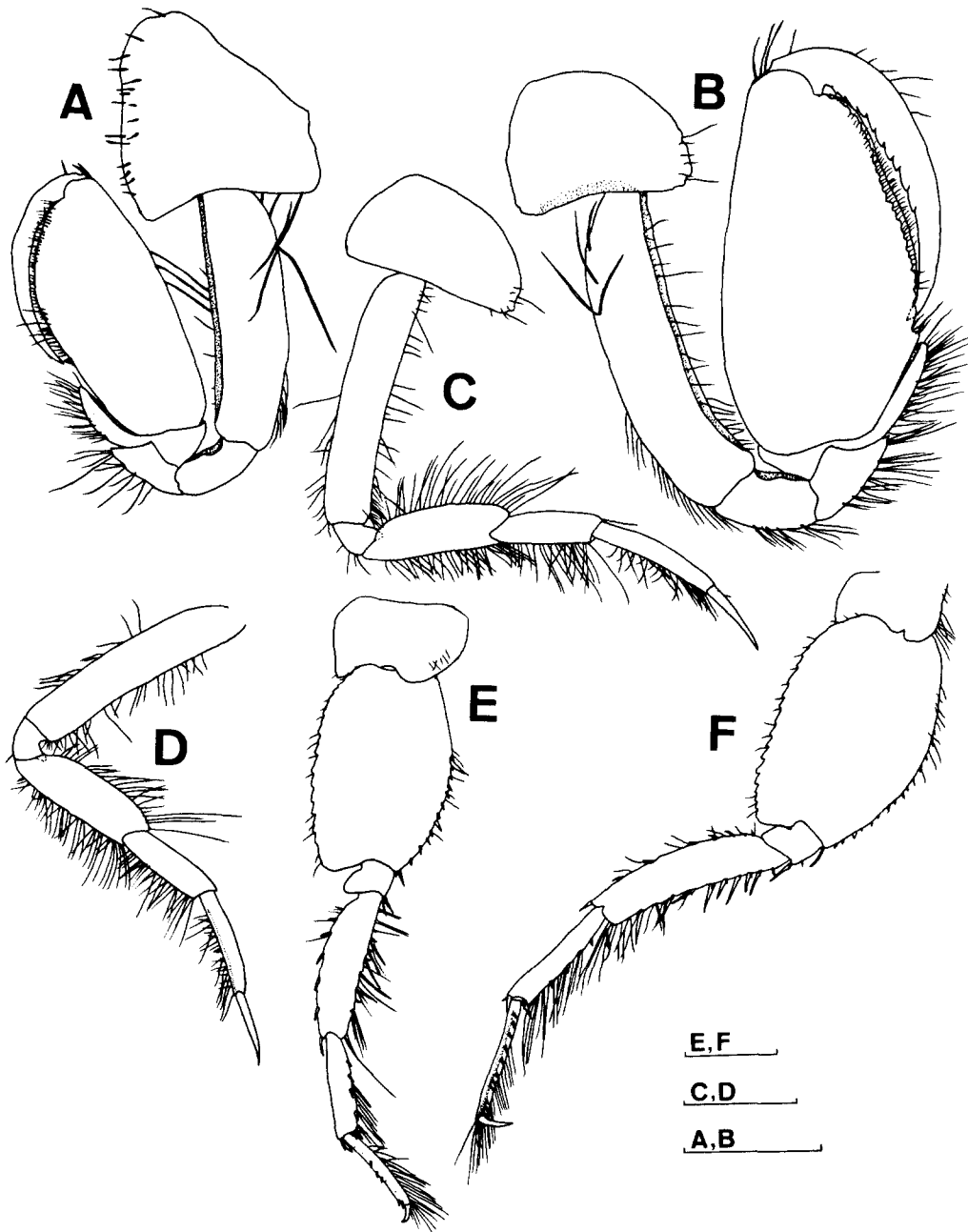
Gnathopod 1 (fig. 2A) smaller than gnathopod 2. Coxa dilatant toward anterior part, anterior submargin covered with short setae. Article 2 with long and short setae along dorsal margin; ventral margin with long setae on proximal part and with slender and short setae on distal part. Article 3 almost as long as article 4. Ventral margin of article 4 produced with sharp tip distally, covered with five bundles of setae. Second half of article 5 produced with round tip distally, guiding ventral margin of article 6, with dense setae on ventral margin of produced part. Article 6 almost as long as article 2, dorsal and ventral margins almost parallel; palm convex, covered with dense setae, defined by two spines. Dactyl fitting palm, ventral margin with three blunt teeth on joint part with article 6. Gnathopod 2 (Fig. 2B) larger than gnathopod 1. Coxa narrowing toward anterior part, anterior margin and anterior submargin with setae, distal margin concave. Article 2 with setae along dorsal margin; ventral margin with long setae on proximal part and with slender and short setae on distal part. Article 3 almost as long as article 4. Ventral margin of article 4 produced with sharp tip distally, covered with six bundles of setae. Second half of article 5 produced with round tip distally, guiding full length of ventral margin of article 6, with dense setae on ventral margin of produced part. Article 6 slightly dilatant toward distal part, dorsal margin almost 3.5 times as long as ventral margin; palm oblique, rather convex, defined by one spine, covered with denticles and setae densely. Dactyl fitting palm, ventral

margin with 9-10 blunt teeth.

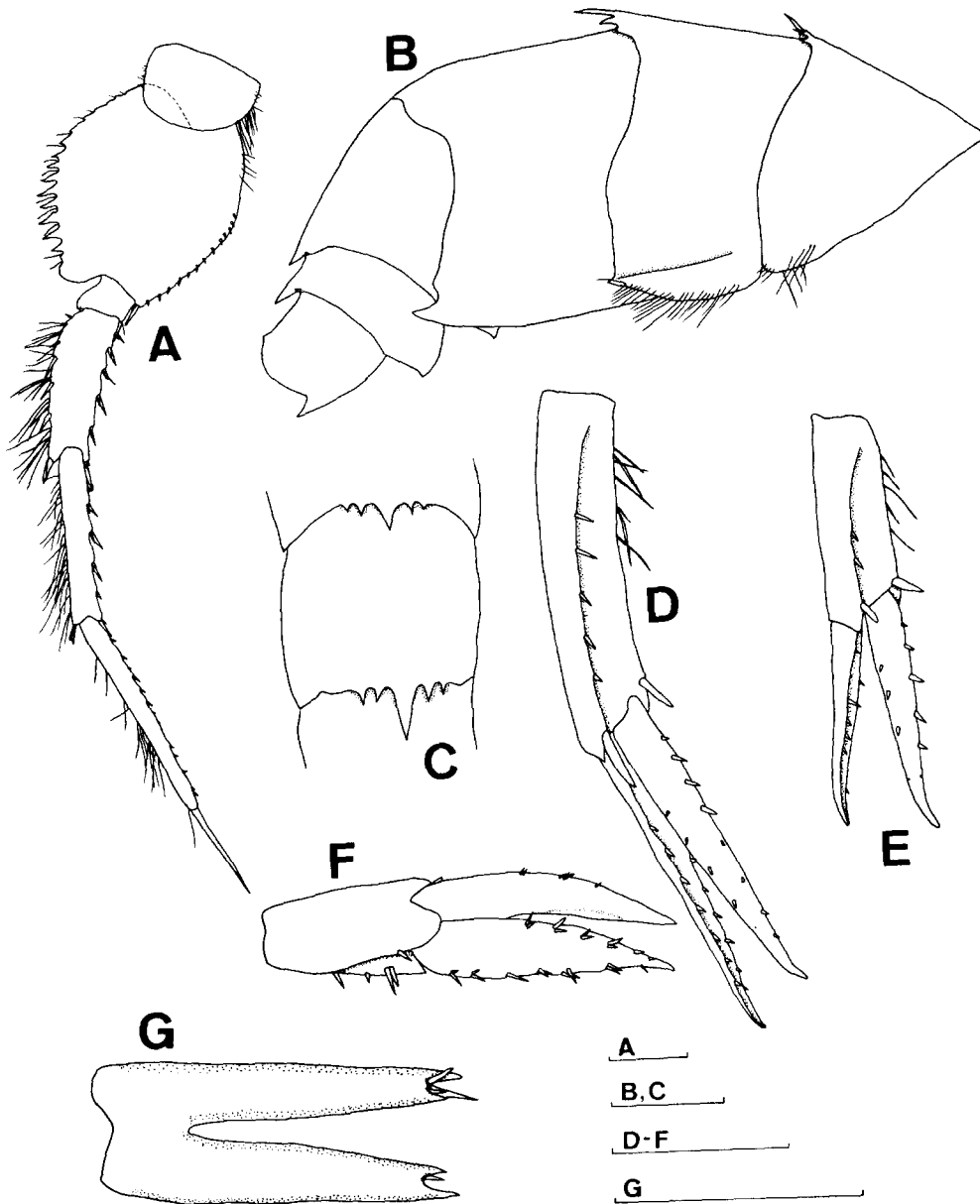
Pereopod 3 (Fig. 2C) slightly longer than pereopod 4 (Fig. 2D). In pereopods 3, 4, article 2 longer than articles 3, 4, 5 combined, dorsal and ventral margins covered with setae; article 4 rather expanded, dorsal and ventral margins covered with dense setae; article 5 shorter than article 4, ventral margin covered with setae; article 6 almost as long as article 4, ventral margin covered with setae; dactyl about 60% as long as article 6. Pereopod 5 (Fig. 2E) shorter than pereopod 6 (Fig. 2F). In pereopods 5, 6, article 2 with spines and setae along dorsal margin, ventral margin serrated along its full length; article 4 longer than article 5, dorsal and ventral margins covered with bundles of spine and setae and with one or two spines distally; dorsal margin of article 5 covered with four or five bundles of spines and long setae; article 6 almost as long as article 5, dorsal margin with tandem distribution of seven to nine spines, locking spines composed of two spines, ventral margin covered with long setae densely; dactyl curved, short.

Pereopod 7 (Fig. 3A) longer than pereopod 6. Article 2 expanded, ovoid in shape; dorsal margin with setae on proximal part and with a series of 13 spines from middle to distal part, with two spines distally; first half of ventral margin serrated, second half deeply dentated as nine strong teeth, ventral margin round distally. Article 4 shorter than article 5; dorsal margin with five bundles of spines, with three spines distally; ventral margin with seven spines and setae, with one strong spine distally. Article 5 shorter than article 6; dorsal margin with five bundles of spines, with two spines distally; ventral margin with setae only, with two spines distally. Dorsal margin of article 6 with 14 small spines; ventral margin with long setae only. Dactyl styliform, long, about 46% as long as article 6.

Peduncle of uropod 1 (Fig. 3D) longer than rami, with one strong spine on each distal end of inner and outer margins of dorsal surface, dorsal surface with five moderate spines on outer margin and with setae on inner margin only; rami equal in length, inner and outer margins of dorsal surface of each ramus with a row of spines. Peduncle of uropod 2 (Fig. 3E) almost as long as outer ramus, with one strong spine on each distal end of



**Fig. 2.** *Liljeborgia huanghaensis*, new species, holotype male. A, left gnathopod 1; B, right gnathopod 2; C, right pereopod 3; D, right pereopod 4; E, right pereopod 5; F, right pereopod 6. Bars = 1 mm.



**Fig. 3.** *Liljeborgia hwanghaensis*, new species, holotype male. A, right pereopod 7; B, lateral view of pleonites 1-3 and urosome; C, dorsal view of pleonites 1, 2; D, left uropod 1; E, left uropod 2; F, right uropod 3; G, dorsal view of telson. Bars = 1 mm.

inner and outer margins of dorsal surface, dorsal surface with two moderate spines on outer margin and with setae on inner margin only; inner ramus slightly longer than outer ramus, inner and outer margins of dorsal surface of each ramus with a row of spines. Peduncle of uropod 3 (Fig. 3F) shorter than rami, inner and outer margins of dorsal surface with spines; rami equal in length, inner ramus with spines on inner and outer margins of dorsal surface, outer ramus with spines on outer margin of dorsal surface only.

Telson (Fig. 3G) with apices deeply clefted, outer point of each apex 1.5 times as long as inner one; each lobe with three spines on notch of apex.

Pleonites 1-2 (Fig. 3B, C) with five dorsal teeth, of which middle tooth enlarged. Pleonal epimeron 1 narrow, posteroventral corner round, ventral submargin with several setae. Posteroventral corner of pleonal epimeron 2 with prominent tooth, with lateral ridge, ventral margin and submargin covered with setae densely. Pleonite 3 (Fig. 3B) without dorsal tooth. Posteroventral corner of pleonal epimeron 3 directing backward, situated above corner. Each of urosomites 1-2 (Fig. 3B) with one strong dorsal tooth.

Habitat.—Water depth: 8m; muddy-sand bottom.

Remarks.—The dorsal tooth formula of pleonites 1-3 and urosomites 1-2 is very important in keying out among the species in the genus *Liljeborgia*. The present species can be easily distinguished from other species in the genus *Liljeborgia* by the dorsal tooth formula of pleonites 1-3 and urosomites 1-2 (5-5-0-1-1) except for *Liljeborgia dubia* (Haswell, 1880)(see Barnard, 1962). This new species is readily distinguished from *Liljeborgia dubia*, reported from Tasmania, Australia, New Zealand, by the following characteristics: (1) *L. dubia* has deeply concave palm in the male gnathopod 2, while in the present species the palm in the male gnathopod 2 is convex. (2) The second half of anterior margin of article 2 of

pereopod 7 of *L. dubia* is deeply concave, while in this new species that part is convex. (3) The teeth in the posterior margin of article 2 of pereopod 7 of *L. dubia* are not prominent, while in the present species those teeth are very stout. (4) The outer point of each apex of telson of *L. dubia* is almost three times as long as inner point, while in this new species outer point is 1.5 times as long as inner one.

Etymology.—The specific name *hwanghaensis* is based on hwanghae (the Korean name of Yellow Sea) where the type locality is located.

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### 한국해산 *Liljeborgia* 속 옆새우류의 1신종

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황해에서 채집된 옆새우류 1종을 *Liljeborgia hwanghaensis*라고 명명하고 기재한다. 이 신종과 최근연종인 *Liljeborgia dubia* (Haswell, 1880)와의 형태적 차이점을 밝혔다.