

The Marine Amphipod Crustaceans of Ulreung Island, Korea: Part III

Won Kim and Chang Bae Kim

Department of Molecular Biology, College of Natural Sciences,
Seoul National University, Seoul 151-742, Korea

This study on the four families (Leucothoidae, Melitidae, Pleustidae, and Stenothoidae) of gammaridean and the one family (Caprellidae) of caprellidean amphipods of Ulreung Island was based on the materials collected at eight localities in Ulreung Island. Ten species of six genera were identified. Of these, two (*Elasmopus koreanus*, and *Maera brevispina*) are new to science. Four species (*Leucothoe nagatai*, *L. spinicarpa*, *Parapleustes derzhavini*, and *Stenothoe valida*) are new records for Korean waters. Five species were described and six were illustrated.

KEY WORDS: Crustacea, Amphipoda, Ulreung Island, Korea

This study is the third part of a series of publication dealing with the species of marine amphipods from Ulreung Island. This study deals with the species in four families (Leucothoidae, Melitidae, Pleustidae, and Stenothoidae) of gammaridean and one family (Caprellidae) of caprellidean amphipods from Ulreung Island.

The historic review of studies on the marine amphipods from Korea and Ulreung Island were presented in the first part of this series (Kim and Kim, 1991). The keys to the suborders of Amphipoda and the families of Gammaridea from Ulreung Island were also provided in the first part of this series.

Materials and Methods

This study was based on the materials collected, during the period from July 1989 to August 1990, at eight localities in Ulreung Island (Fig. 1). Specimens were collected largely by formalin wash

method (Barnard, 1979). In the laboratory, the amphipods were sorted out under a high power stereoscopic microscope and preserved in 70% alcohol. All specimens collected from shallow subtidal zone were taken by scuba divers. In addition to materials mentioned above, many materials were obtained from fishing nets.

The body length was measured from the tip of rostrum to the base of the telson, along the dorsal margin of the body. The "Material Examined" section lists all specimens examined. The classification of superfamily and family levels was based on Bowman and Abele (1982). All materials examined are deposited in the Department of Molecular biology, Seoul National University.

Systematic Accounts

Superclass Crustacea Pennant, 1777
Class Malacostraca Latreille, 1806
Subclass Eumalacostraca Grobben, 1892
Superorder Peracarida Calman, 1904
Order Amphipoda Latreille, 1816
Suborder Gammaridea Latreille, 1803
Family Leucothoidae Dana, 1852
Genus *Leucothoe* Leach, 1814

The present study was supported in part by the Basic Science Research Institute program, Ministry of Education, 1989, ED89-43.

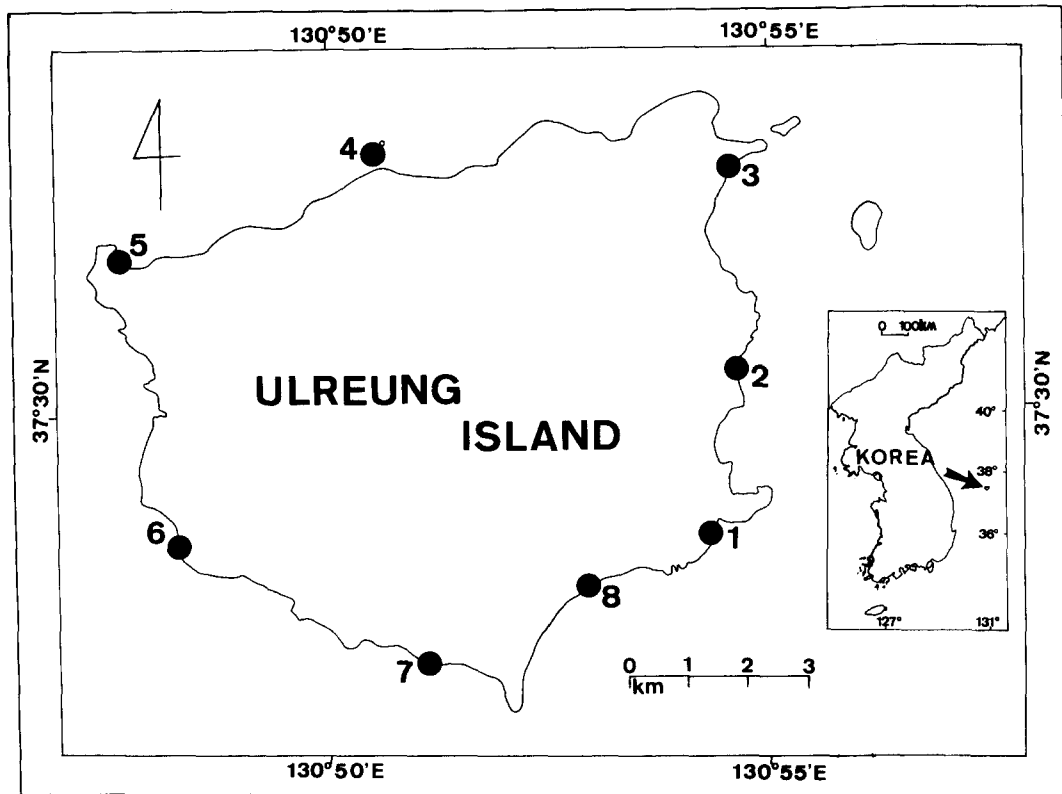


Fig. 1. The map showing the localities where the materials were collected. 1, Dodong(도동); 2, Naesujön(내수전); 3, Sömmok(섬목); 4, Hyölam(혈암); 5, Taepungch'wi(대풍취); 6, Kulam(굴암); 7, Tonggumi(통구미); 8, Sadong(사동).

Key to Species of *Leucothoe* from Ulreung Island

Dactyl of gnathopod 1 long *L. spinicarpa*

Dactyl of gnathopod 1 short *L. nagatai*

1. *Leucothoe nagatai* Ishimaru, 1985

(Figs. 2, 3)

Leucothoe nagatai Ishimaru, 1985, pp. 46-52, figs. 1, 2.

Leucothoe alata.-Nagata, 1965, pp. 158, 159, figs. 9, 10; Hirayama, 1985, pp. 172, 1973, figs. 166-169 [Not *Leucothoe alata* Barnard, 1959].

Material Examined.-2 ♂♂, Hyölam, July 14, 1989; 11 ♂♂, Tonggumi, July 12, 1989; 4 ♂♂, Taepungch'wi, July 15, 1989; 1 ♂, Sömmok, July 16, 1989.

Description of male.-Lateral cephalic lobe (Fig. 2A) broadly rounded, ventral margin of head truncated. Eye medium in size, yellowish in alcohol.

Antenna 1 stout, peduncular article 1 as long as articles 2, 3 combined, article 3 about 50% as long as article 2; flagellum longer than peduncular article 3, composed of six segments, and with aesthetascs ventrally; accessory flegellum absent. Antenna 2 slender, flegellum composed of four segments.

Left mandible (Fig. 2B) with incisor bearing eight blunt teeth and lacinia mobilis bearing seven blunt teeth, spine row composed of eight spines; right mandible with incisor bearing eight blunt teeth and without lacinia mobilis, spine row composed of nine spines; article 2 of mandibular palp with four setules, article 3 about 55% as long as article 2 and with two setae on apex. Inner plate of maxilla 1 (Fig. 2C) small, oval in shape, with

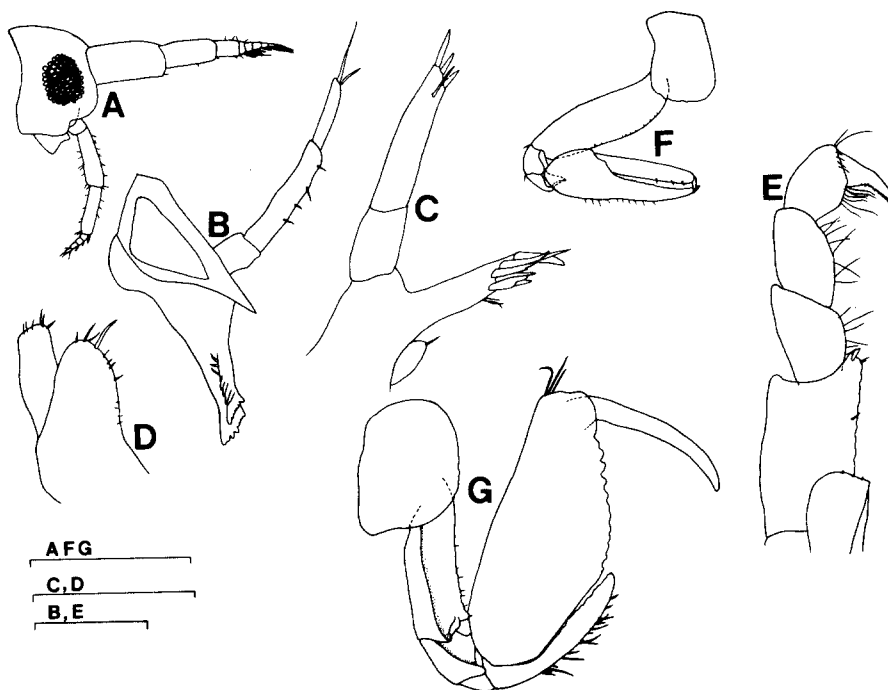


Fig. 2. *Leucothoe nagatai* Ishimaru, 1985, male, body length 8 mm: A, head and antennae; B, left mandible; C, right maxilla 1; D, left maxilla 2; E, left maxilliped; F, right gnathopod 1; G, right gnathopod 2. Scale bars: A, F, G = 1 mm; B-E = 0.5 mm.

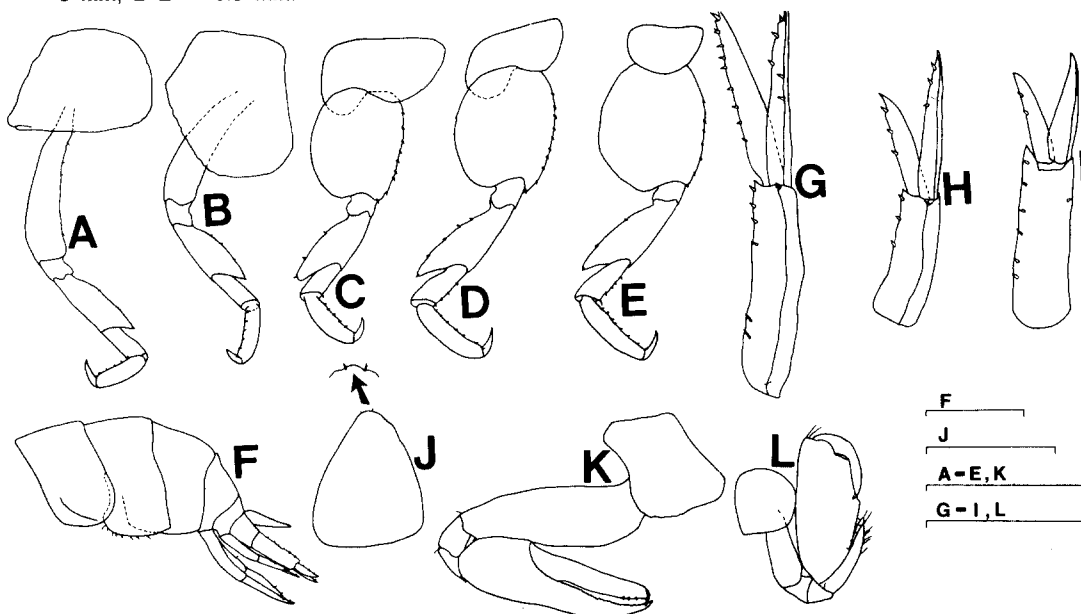


Fig. 3. *Leucothoe nagatai* Ishimaru, 1985, male, body length 8 mm: A, right pereopod 3; B, right pereopod 4; C, right pereopod 5; D, right pereopod 6; E, right pereopod 7; F, lateral view of left pleonites, urosomites, uropods, and telson; G, right uropod 1; H, right uropod 2; I, right uropod 3; J, dorsal view of telson. Male, body length 9 mm: K, right gnathopod 1. Male, body length 3 mm: L, right gnathopod 2. Scale bars: A-F, J, K = 1 mm; G-I, L = 0.5 mm.

one seta on apex; outer plate with two rows of spines composed of three bifid spines and four simple spines on apex and apex terminated with small tooth proximally; palp biarticulate, article 1 small, article 2 tapering toward distal part and with three teeth on apex and one seta subapical margin. Inner plate of maxilla 2 (Fig. 2D) broader than outer plate, lined with setae along apical and subapical margins; outer plate with setae on apex. Inner plate of maxilliped (Fig. 2E) with three spines on apex; outer plate not broadly expanded, with one stout spine on inner apical margin and with inner margin denticulated; article 3 of palp not produced dorsodistally, article 4 slightly longer than article 3.

Posterior margin of coxa of gnathopod 1 (Fig. 2F) concave, anterior margin slightly concave, ventral margin convex and undulating; article 2 laterally flattened, proximal part of article 2 more expanded than distal part; article 5 slightly longer than article 2, produced part of article 5 slightly longer than article 6, not narrowing, as wide as article 6, tapering toward distal part, upcurved at distal part, dorsal margin of produced part weakly crenulated, and ventral margin lined with setae; article 6 not expanded, weakly tapering toward distal part, with three to five small spines on subventral margin; dactyl short, about 10% as long as article 6.

Article 2 of gnathopod 2 (Fig. 2G) with inner dorsal margin weakly crenulated and setose; distal lobe of article 5 slightly overreaching to palmar angle of article 6, outer dorsal margin of lobe crenulated, ventral margin lined with setae; article 6 dilatant toward distal part, palm oblique, crenulated irregularly along palmar margin, palm about same as long as ventral margin of article 6; dactyl fitting palm.

Pereopods 3, 4 (Figs. 3A, B) similar. Article 2 of pereopod 3 longer than that of pereopod 4. In pereopods 3, 4, dorsal margin of article 4 not strongly produced distally, dorsal margin of article 4 with two or three small spines and one small spine distally; ventral margin of article 6 with one row of spines composed of six small spines.

Pereopods 5-7 (Figs. 3C-E) succeedingly longer. In pereopods 5-7, article 2 oval in shape, dorsal margin of article 2 lined with seven to nine small spines; ventral margin of article 4 strongly

produced; dorsal margin of article 5 with one or four or five small spines; dorsal margin of article 6 with six to eight small spines.

Peduncle of uropod 1 (Fig. 3G) almost same as long as rami, outer dorsal margin lined with small spines and inner dorsal margin with one small spine distally; rami almost equal in length, outer ramus lined with small spines on outer margin and inner ramus with spines on inner and outer margins. Uropod 2 (Fig. 3H) overreaching to distal end of peduncle of uropod 3; peduncle slightly shorter than inner ramus, with outer dorsal margin with small spines and inner dorsal margin with one small spine distally; outer ramus about 75% as long as inner ramus; each ramus with small spines on outer margin. peduncle of uropod 3 (Fig. 3I) strongly elongated, inner dorsal margin with small spines and produced distally; inner ramus about 65% as long as peduncle.

Telson (Fig. 3J) narrowing toward distal part, about 1.27 times as long as wide, with two notches on apex and each notches with one setule.

Pleonal epimeron 1 (Fig. 3F) with lateral ridge, posteroventral corner convexly rounded. Ventral margin of pleonal epimeron 2 lined with setae, posteroventral corner quadrate in shape. Pleonal epimeron 3 broad, posteroventral corner rounded.

Remarks.—The present specimens well agree with the description of *Leucothoe nagatai* Ishimaru, 1985 except for the shape of anterior margin of coxa 1 (the present specimens: slightly concave; type specimens: strongly concave) and the ratio of length and width of telson (the present specimens: 1.27 times; type specimens: 1.8 times) and the longer produced part of article 5 of gnathopod 1, and the slightly shorter lobe of article 5 of gnathopod 2. However, Nagata (1965)'s figures of gnathopods 1, 2 and telson of this species well fit to the shapes of gnathopods 1, 2 and telson of the present specimens.

The shape of anterior margin of coxa 1 depicted by Hirayama (1985) also agrees with the shapes of those of the present specimens. Therefore, those character differences mentioned above are variations which appear among populations of this species.

Ishimaru (1985) described the shape of apex of telson as a sexual variation (male: with round apex; female: with two apical notches on apex).

However, all the present male specimens have telsons bearing two apical notches. The figures of Nagata and Hirayama show two apical notches of telson in the male specimens. Therefore, this variation certainly is not intersexual variation. But, the male specimens bearing round apex of telson were not observed in our materials.

Habitat.—Commensal with two species of sponge, *Geodia* sp. and *Cliona celata* Grant, 1826.

Type Locality.—Misaki, Kanagawa Prefecture (35°09'N, 139°38'E), Japan.

Distribution.—Korea, Japan.

2. *Leucothoe spinicarpa* (Abildgaard, 1789) (Figs. 4, 5)

Gammarus spinicarpus Abildgaard, 1789, pp. 66, 67, pl. 119, figs. 1-4 (cited from Sars, 1895).

Leucothoe spinicarpa.—Sars, 1895, pp. 283, 284, pls. 100, 101, fig. 1; Stebbing, 1906, pp. 165, 166; Chevreux and Fage, 1925, pp. 122, 123, fig. 118; Gurjanova, 1951, pp. 486-488, fig. 319; Barnard, 1962b, p. 132, figs. 7A, B, C; Bousfield, 1973, p. 93, pl. 18, fig. 1; Krapp-Schickel, 1975, pp. 95, 96, pls. 1, 2; Lincoln, 1979, p. 174, figs. 77a-e; Ledoyer, 1986, pp. 676, 677, fig. 260.

Material Examined.—6 ♀♀ (3 ovig.), Hyölam, July 14, 1989.

Description of female.—Eye (Fig. 4A) oval in shape, yellowish in alcohol.

Antenna 1 almost same as long as antenna 2; peduncular article 1 almost same as long as article 2, with one minute and sharp tooth ventrodistally; peduncular article 3 about 27% as long as article 2; flagellum composed of 10 segments. Antenna 2 slender, flagellum compact, composed of eight segments.

Left mandible (Fig. 4C) with incisor bearing seven blunt teeth, lacinia mobilis armed with nine blunt teeth, spine row composed of 15 spines; right mandible (Fig. 4D) with incisor bearing seven blunt teeth, lacinia mobilis inconspicuous, spine row composed of 12 spines; mandibular palp tri-articulate, article 2 with several long setae, article 3 about 41% as long as article 2 and with two setae on apex. Inner plate of maxilla 1 (Fig. 4E) oval in shape, with one seta on apex; outer plate with two rows of spines composed of five bifid spines and one stout spine and one simple spine;

palp bi-articulate, article 2 with four spines on apex. Inner plate of maxilla 2 (Fig. 4F) broader than outer plate, lined with setae on apical margin to inner margin; outer plate with thick setae on apex and short setae on outer margin. Inner plate of maxilliped (fig. 4G) with two small spines on apex; outer plate with slightly expanded outer margin, with one stout spine on inner distal end.

Anterior margin of coxa of gnathopod 1 (Fig. 5E) strongly concave, roundly produced distally, posterior margin concave; article 2 not expanded, dorsal and ventral margins lined with setae; distal lobe of article 5 slender, tapering toward distal part, upcurved at distal end; article 6 slightly shorter than distal lobe of article 5, slightly narrowing toward distal part, with eight setae on subventral margin; dactyl long, about 50% as long as article 6.

Coxa of gnathopod 2 (Fig. 5F) quadrate in shape; ventral lobe of article 5 slightly overreaching to palmar angle, distal end of ventral lobe crenulated; article 6 dilatant toward distal part, palm crenulated on proximal part; dactyl fitting palm.

Pereopods 3, 4 (Figs. 4H: 5A) similar. Anterior margin of coxa of pereopod 4 not concave. In pereopods 3, 4, ventral margin of article 6 lined with seven or nine small spines. Pereopods 5-7 (Figs. 5B-D) succeedingly longer. Medial part of ventral margin of article 2 of pereopod 7 expanded. In pereopods 5-7, ventral margin of article 4 not strongly produced distally, dorsal margin of article 6 lined with nine or 12 small spines.

Peduncle of uropod 1 (Fig. 5H) almost same as long as inner ramus; inner ramus slightly longer than outer ramus. Peduncle of uropod 2 (Fig. 5I) about 80% as long as inner ramus; outer ramus about 67% as long as inner ramus. Peduncle of uropod 3 (Fig. 5J) about 1.37 times as long as inner ramus, inner ramus slightly longer than outer ramus.

Telson (Fig. 5K) about 3.4 times as long as wide, with two notches on apex, each notch with one setule.

Posteroventral corner of pleonal epimeron 1 (Fig. 5G) rounded. Pleonal epimeron 2 with lateral ridge, posteroventral corner produced, ventral margin lined with several setae. Pleonal epimeron 3 quadrate in shape, posteroventral corner slightly

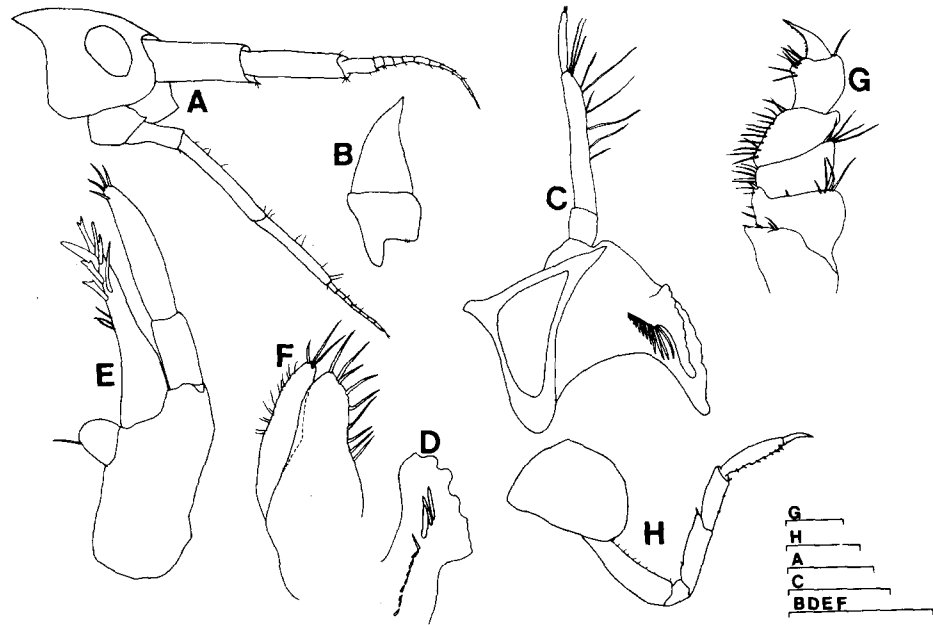


Fig. 4. *Leucothoe spincarpa* (Abildgaard, 1789), ovigerous female, body length 8.8 mm: A, head and antennae; B, upper lip; C, left mandible; D, distal part of right mandible; E, right maxilla 1; F, left maxilla 2; G, right maxilliped; H, right pereopod 3. Scale bars = 0.5 mm.

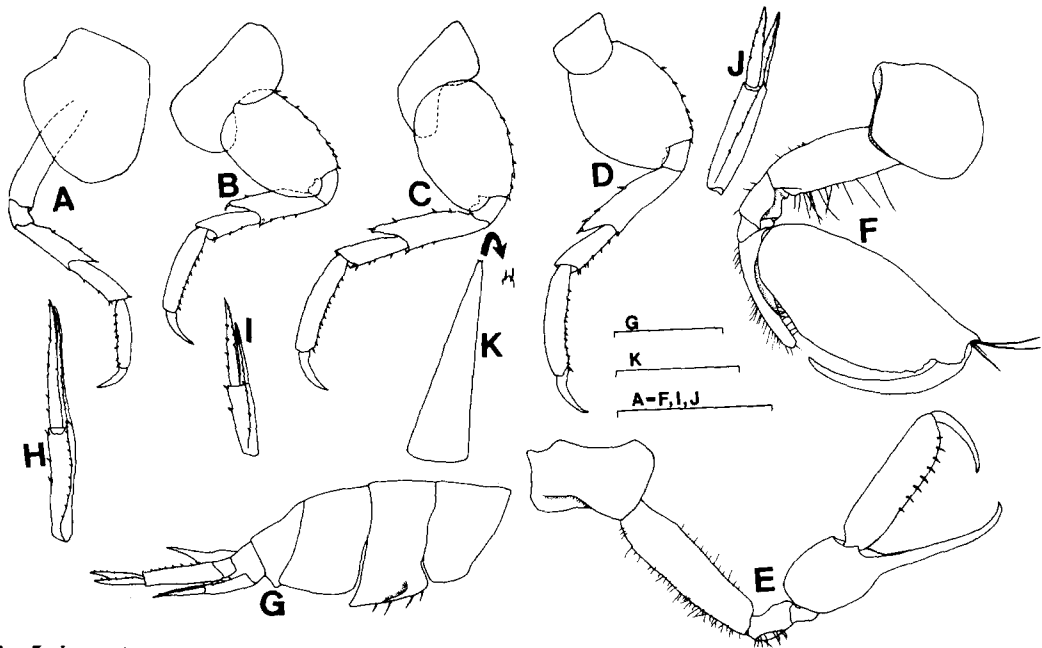


Fig. 5. *Leucothoe spincarpa* (Abildgaard, 1789), ovigerous female, body length 8.8 mm: A, right pereopod 4; B, right pereopod 5; C, right pereopod 6; D, right pereopod 7; E, right gnathopod 1; F, right gnathopod 2; G, lateral view of right pleonites, urosomites, uropods 2, 3, and telson; H, right uropod 1; I, right uropod 2; J, right uropod 3; K, dorsal view of telson. Scale bars = 1 mm.

produced.

Type Locality.—Denmark.

Distribution.—Cosmopolitan.

Family Melitidae Bousfield, 1973

Key to Genera of Melitidae from Ulreung Island

- The article 3 of mandibular palp falcate
 *Elasmopus*
 The article 3 of mandibular palp not falcate
 *Maera*

Genus *Elasmopus* Costa, 1853

3. *Elasmopus koreanus*, new species (Figs. 6, 7)

Material Examined.—Holotype: ♂, body length: 12.9 mm, Sadong, July 17, 1989. Paratypes: 3 ♂♂, Taepungch'wi, July 15, 1989; 1 ♂, Sömmok, July 16, 1989.

Description of holotype male.—Eye (Fig. 6A) circular and black. Antennae with normal setosity. Antenna 1 with 24 segmented primary flagellum; accessory flagellum composed of one long and one rudimentary terminal segment.

Article 3 of mandibular palp (Fig. 6B) deeply falcate.

Coxa of gnathopod 1 (Fig. 6C) produced anteriorly with round margin, ventral margin with five long setae and several short setae; article 6 slightly longer than article 5. Article 6 of gnathopod 2 (Fig. 6D) bearing hump with three spines near dactylar hinge, ventral part of this hump sharply produced distally; palm long, sparsely setose, and with one blunt tooth on the middle part and defined by one broad tooth and one short tooth; ventral margin of article 6 shorter than palm and densely setose, those setae not elongated; dactyl relatively stout.

The locking spines of pereopods 3, 4 (Figs. 7A, B) ordinary and inner margins of dactyls smooth. Article 2 of pereopods 5-7 (Figs. 7C-E) without long setae on ventral margin; locking spines of pereopods 5-7 ordinary and inner margins of dactyls smooth.

Pleonal epimera 1, 2 (Fig. 6F) with two short spines on ventral margins. Posterior margin of

pleonal epimeron 3 rounded convexly and with several short setae; posteroventral corner quadrately rounded; ventral margin with six short spines.

Inner ramus of uropod 3 (Fig. 7H) about 79% as long as outer ramus and with one spine on inner margin. Telson (Fig. 7I) with round apices producing medially; each lateral sinus broad, shallow and bearing three unequal spines.

Remarks.—The present species is closely related to *Elasmopus mutatus* Barnard, 1962 (see Barnard, 1962a), reported from California, in many morphological characters. But, this new species is distinguished from *E. mutatus* in the following characteristics: (1) The antennae of the present species bear less setae than those of *E. mutatus* have; (2) The defining tooth of palm of male gnathopod 2 of the present species has no spines, while in *E. mutatus*, the defining tooth has spines; (3) The ventral part of article 6 of male gnathopod 2 of *E. mutatus* is covered with the more setae than that of the present species is; (4) The inner ramus of uropod 3 of *E. mutatus* is slenderer than that of the present species.

Etymology.—The specific name *koreanus* is from the Republic of Korea, to which type locality of the present species belongs.

Genus *Maera* Leach, 1814

Key to Species of *Maera* from Ulreung Island

- Dactyls of pereopods lacking accessory claws
 *M. brevispina*
 Dactyls of pereopods bearing accessory claws
 *M. pacifica*

4. *Maera pacifica* Schellenberg, 1938

Maera pacifica Schellenberg, 1938, pp. 42-45, figs. 19, 20; Barnard, 1970, pp. 150, 151, fig. 92; Griffiths, 1976, pp. 25, 26, fig. 8; Ledoyer, 1982, pp. 534, 536, 538, figs. 201-203; Myers, 1985, pp. 112, 115, 116, figs. 89, 90; Kim and Kim, 1987, pp. 11, 12, fig. 10.

Material Examined.—1 ♂, 2 ♀♀, Kulam, July 11, 1989; 5 ♂♂, 3 ♀♀, Sömmok, July 16, 1989; 22 specimens, Hyölam, July 14, 1989; 5 ♂♂, 4 ♀♀

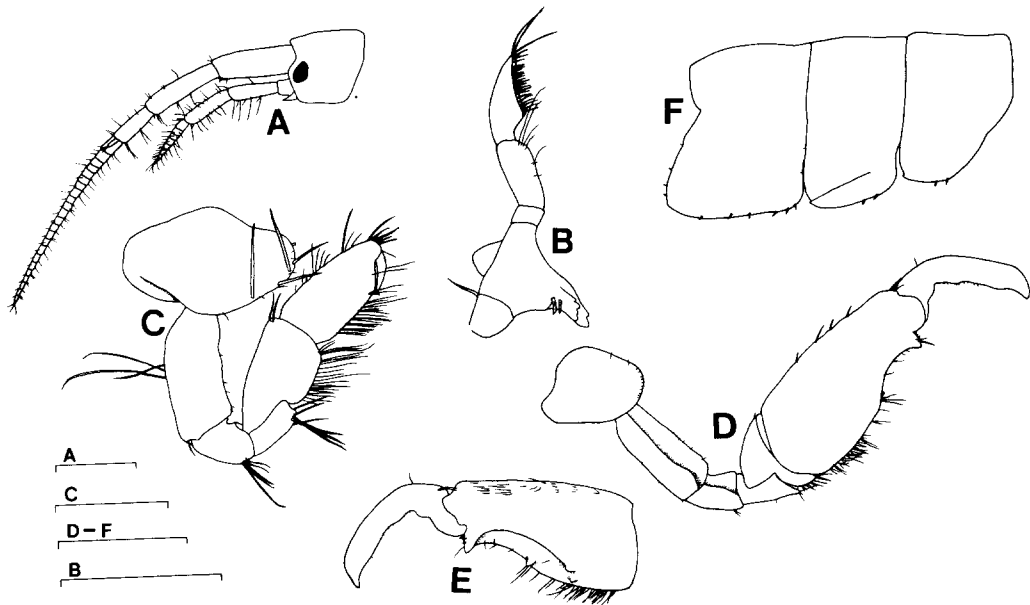


Fig. 6. *Elasmopus koreanus*, new species, holoctypic male, body length 12.9 mm: A, head and antennae; B, left mandible; C, right gnathopod 1; D, outer view of right gnathopod 2; E, inner view of article 6 and dactyl of right gnathopod 2; F, lateral view of right pleonal epimera 1-3. Scale bars: A, D-F = 1 mm; B, C = 0.5 mm.

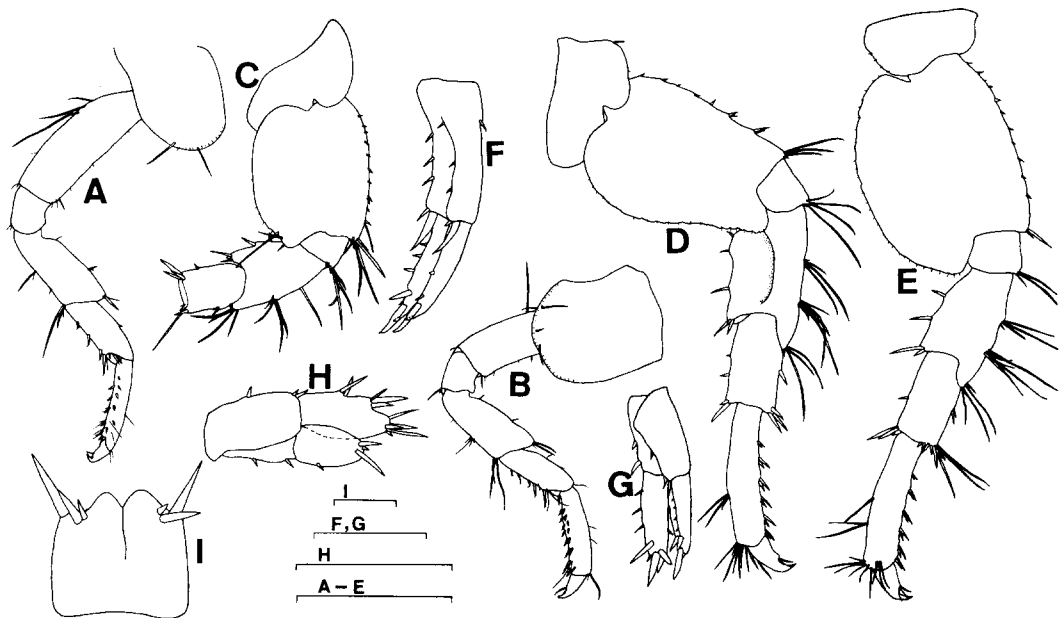


Fig. 7. *Elasmopus koreanus*, new species, holoctypic male, body length 12.9 mm: A, right pereopod 3; B, right pereopod 4; C, right pereopod 5 (articles 6, 7 were broken); D, right pereopod 6; E, right pereopod 7; F, right uropod 1; G, right uropod 2; H, right uropod 3; I, dorsal view of telson. Scale bars: A-E = 1 mm; F-H = 0.5 mm; I = 0.1 mm.

♀, Taepungch'wi, July 15, 1989; 2 ♂♂, Naesujön, July 12, 1989.

Type Locality.—Hawaiian Islands.

Distribution.—Korea (Cheju Is. and Ulreung Is.), Southern Polynesia, Micronesia, Hawaiian Islands, South Africa.

5. *Maera brevispina*, new species

(Figs. 8, 9)

Material Examined.—Holotype: ♀, body length: 12.5 mm, Kulam, July 17, 1989. Paratypes: 11 specimens, collection details same as holotype; 3 ♀♀, Taepungch'wi, July 15, 1989; 10 ♀♀, Naesujön, July 12, 1989; 5 ♀♀, Tonggumi, July 12, 1989.

Description of holotype female.—Lateral cephalic lobe (Fig. 8A) rounded, not produced; anteroventral corner of head with obsolescent sharp cusp. Eye circular and black. Article 1 of antenna 1 with three elongated spines on subventral margin; peduncle longer than primary flagellum; accessory flagellum composed of eight segments. Antenna 2 moderately setose; flagellum longer than peduncular article 5.

Article 3 of mandibular palp (Figs. 8B, C) about same as long as article 2.

Coxa of gnathopod 1 (Fig. 8D) moderately produced anteriorly; article 4 with one cusp on dorsal margin distally; article 6 oval-rectangular in shape, palm oblique and convex, shorter than ventral margin of article 6. Gnathopod 2 (Figs. 8E, F) large; article 2 without long setae on dorsal margin, dorsal margin of article 2 with one sharply pointed part near jointed part with article 3; article 3 with one lobe on dorsal margin distally; ventral margin of article 4 sharply produced distally; article 5 short, with long tumid lobe; article 6 large, subrectangular, slightly expanded distally; palm slightly oblique, with hump near dactylar hinge and with shallow sinus and small hump just proximally, and remainder of palmar margin slightly concave, and defined by two teeth companioning one spine; ventral part of article 6 longer than palmar margin and lined with setae sparsely; dactyl fitting palm, bearing slightly protuberant part fit to sinus on the palmar margin.

Each dactyl of pereopods 3-7 (Figs. 8G-K; 9A) with distal constrictions bearing sharp defining cor-

ners, and armed with one seta but nail without accessory tooth.

Each ventral margin of pleonal epimera 1, 2 (Fig. 9B) with two spines. Each posteroventral corner of pleonal epimera 2, 3 with one sharp tooth. Posterior margin of pleonal epimeron 3 slightly convex and ventral margin with five spines.

Rami of uropod 3 (Fig. 9E) flat, narrow, apically truncated and spinose, inner and outer rami almost same in length. Telson (Fig. 9F) short, each lobe broad and deeply notched apically, with one long spine on notched part, that spine shorter than the length of telson, and lobule on medial part of apex of telson lobe broader than lobule on lateral part.

Male.—Similar to female.

Remarks.—The present species is the most closely related to *Maera vigota* Barnard, 1969, reported from California, in many morphological characters. But, the present species differs from *M. vigota* in the detailed shape of palm of gnathopod 2 and the length of spine of lobe of telson (in the present species, the spine is shorter than length of telson, while in *M. vigota* the spine is as long as telson) and the setosity of antennae and posterior part of article 6 of gnathopod 2 (the antennae and posterior part of article 6 of gnathopod 2 of the present species have less setae than those of *M. vigota* have).

Etymology.—The Latin *brevispina* [brevis (short) + spina (spine)] refers to the short spines on each lobe of telson compared with those of the most similar species *M. vigota*.

Family Pleustidae Buchholz, 1874

Genus *Parapleustes* Buchholz, 1874

6. *Parapleustes derzhavini* (Gurjanova, 1938) (Figs. 10, 11)

Neopleustes derzhavini Gurjanova, 1938, pp. 317, 318, fig. 31; 1951, p. 645, fig. 442.

Parapleustes derzhavini.—Barnard and Given, 1960, p. 40; Ishimaru, 1984, pp. 417-425, figs. 10-16.

Parapleustes derzhavini makiki Barnard, 1970, pp. 227-230, figs. 151, 152.

Material Examined.—10 ♀♀ (ovig.), Tonggumi, July 12, 1989; 1 ♂, 2 ♀♀, Taepungch'wi, July

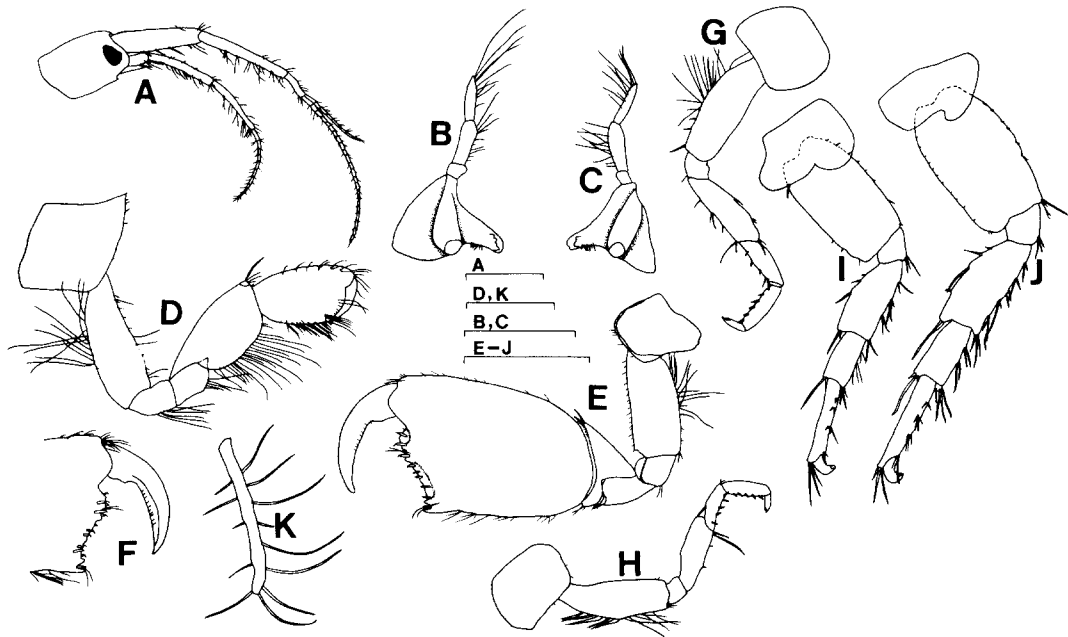


Fig. 8. *Maera brevispina*, new species, holotype male, body length 12.5 mm: A, head and antennae; B, left mandible; C, right mandible; D, right gnathopod 1; E, outer view of left gnathopod 2; F, inner view of palm and dactyl of left gnathopod 2; G, right pereopod 3; H, right pereopod 4; I, right pereopod 5; J, right pereopod 6; K, oostegite of pereopod 6. Scale bars: A, E-J = 1 mm; B-D, K = 0.5 mm.

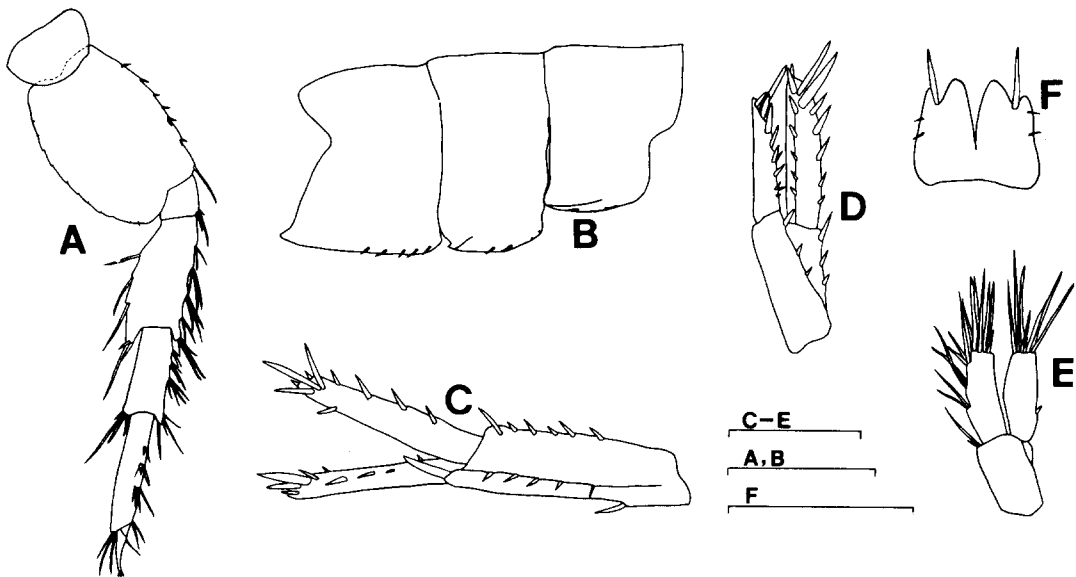


Fig. 9. *Maera brevispina*, new species, holotype male, body length 12.5 mm: A, right pereopod 7; B, lateral view of right pleonal epimera 1-3; C, right uropod 1; D, right uropod 2; E, right uropod 3; F, dorsal view of telson. Scale bars: A, B = 1 mm; C-F = 0.5 mm.

15, 1989; 1 ♂, 3 ♀♀, Naesujön, July 12, 1989.

Description of female.—Rostrum (Fig. 10A) small, lateral cephalic lobe produced roundly, anteroventral corner of head with sharp cusp. Eye circular, a black core surrounded by clear ommatidia.

Peduncle of antenna 1 reaching to middle part of peduncular article 5 of antenna 2.

Incisor of left mandible (Fig. 10B) with six teeth and lacinia mobilis armed with eight teeth; spine row with nine spines; molar nontrititative and lacking spines; palp large, article 2 covered with a row of simple setae along posterior margin, article 3 slightly falcate, armed with pectinate spines along posterior margin and apex. Inner plate of maxilla 1 (Fig. 10E) small, with one plumose seta on apex; outer plate armed with eight serrate spines; article 2 of palp covered with setae and with three simple spines on apex.

Coxa of gnathopod 1 (Figs. 10G, H) with one notch on dorsal margin distally; article 2 not strongly setose dorsally; article 5 long, with thick lobe; palm oblique, with one obtuse cusp on middle part and one set of three spines and defined by one set of two spines. Coxa of gnathopod 2 (Figs. 10I, J) with one notch on dorsal margin distally; article 4 produced sharply; article 5 with thin lobe; palm oblique, with one obtuse cusp on middle part and one set of four spines and defined by one set of three spines; posterior part of article 6 with one spine near jointed point with palm.

Article 2 of pereopods 5-7 (Figs. 11C-E) oval-rectangular in shape; articles 4-6 slender, article 4 produced nearly halfway along article 5.

Posteroventral corners of pleonal epimera 1-3 (Fig. 11H) with sharp cusp; ventral margins of pleonal epimera 1-3 without spines.

Uropods 1-3 (Figs. 11I-K) with increasingly shortened outer ramus. Inner ramus of uropod 3 about two times as long as peduncle; outer ramus about 75% as long as inner ramus.

Telson (Fig. 11L) long, about 70% as broad as long, linguiform in shape, apex rounded, with small, obtuse lateral notch bearing setule on each side.

Oostegite (Fig. 11F) suboval in shape, anterior margin lined with setae densely, but posterior margin sparsely setose.

Eggs (Fig. 11G) suboval in shape; longer dia-

meter: 0.4 mm. In the case of ovigerous state, females bear six eggs on each her brood pouch.

Male.—Similar to female.

Remarks.—The present specimens differ from the Japanese and Hawaiian populations in the following points: (1) The dorsal margins of article 2 of female gnathopod 1 of the present specimens have less setae than those of other populations have; (2) The ventral margins of pleonal epimera 1-3 of the present specimens have no spines, while in the other populations, those parts bear spines. But, in our opinion, these differences are considered as variations.

Type Locality.—Petrov Island.

Distribution.—Korea, Japan, Pacific coasts of U.S.S.R., Hawaiian islands.

Family Stenothoidae Boeck, 1871

Genus *Stenothoe* Dana, 1852

7. *Stenothoe valida* Dana, 1853

(Fig. 12)

Stenothoe validus Dana, 1853, pp. 63, fig. 1.

Stenothoe valida.—Stebbing, 1906, p. 194; Chevreux and Fage, 1925, pp. 137, 138, fig. 137; Krapp-Schickel, 1976, p. 27, figs. 19-21; Ledoyer, 1986, pp. 975, 977, fig. 385; Hirayama, 1988, pp. 52-55, figs. 275-278.

Material Examined.—1 ♂, 37 ♀♀, Hyölam, July 14, 1989; 3 ♀♀ (ovig.), Tonggumi, July 12, 1989; 10 specimens, Taepungch'wi, July 15, 1989.

Type Locality.—Rio de Janeiro.

Distribution.—Cosmopolitan.

Suborder Caprellidea Leach, 1814

Family Caprellidae White, 1847

Genus *Caprella* Lamarck, 1801

Key to Species of *Caprella* from Ulreung Island

1. Pereonites 2-5 with many spines on the dorsal and ventral sides *C. acanthogaster*
- Pereonites 2-5 without spines 2
2. Article 2 of gnathopod 2 shorter than pereonite 2 *C. penantis*
- Article 2 of gnathopod 2 almost equal to pereonite 2 in length *C. scaura*

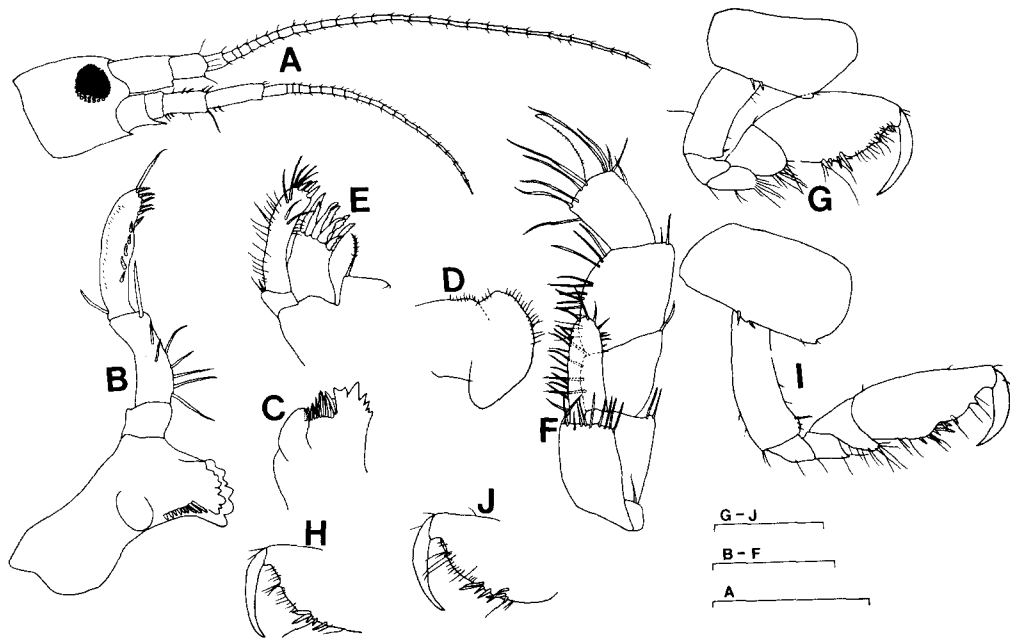


Fig. 10. *Parapleustes derzhavini* (Gurjanova, 1938), ovigerous female, body length 7 mm: A, head and antennae; B, left mandible; C, distal part of right mandible; D, right part of lower lip; E, left maxilla 1; F, right maxilliped; G, outer view of right gnathopod 1; H, inner view of palm and dactyl of right gnathopod 1; I, outer view of right gnathopod 2; J, inner view of palm and dactyl of right gnathopod 2. Scale bars: A = 1 mm; B-J = 0.5 mm.

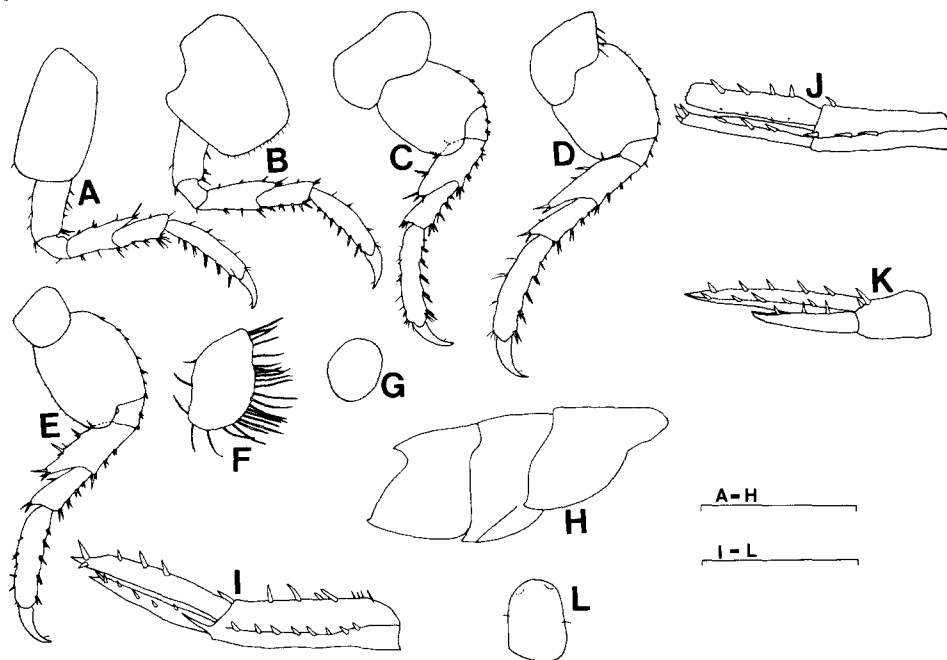


Fig. 11. *Parapleustes derzhavini* (Gurjanova, 1938), ovigerous female, body length 7 mm: A, right pereopod 3; B, right pereopod 4; C, right pereopod 5; D, right pereopod 6; E, right pereopod 7; F, oostegite of pereopod 4; G, egg; H, right pleonites 1-3; I, right uropod 1; J, right uropod 2; K, right uropod 3; L, dorsal view of telson. Scale bars: A-H = 1 mm; I-L = 0.5 mm.

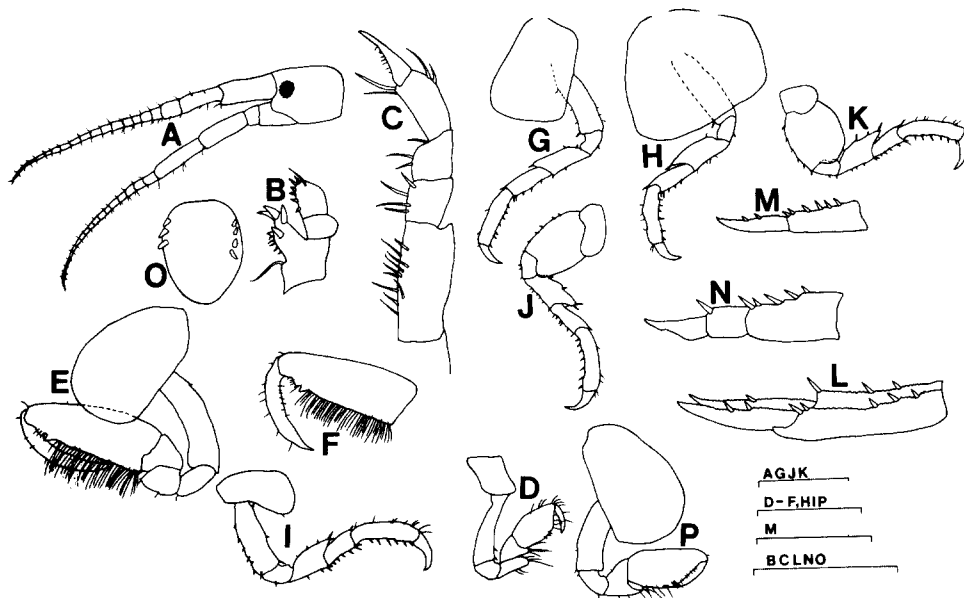


Fig. 12. *Stenothoe valida* Dana, 1853. male, body length 4 mm: A, head and antennae; B, right maxilla 1; C, right maxilliped (inner plate was broken); D, right gnathopod 1; E, outer view of left gnathopod 2; F, articles 6, 7 of left gnathopod 2; G, left pereopod 3; H, left pereopod 4; I, left pereopod 5; J, left pereopod 6; K, left pereopod 7; L, right uropod 1; M, right uropod 2; N, right uropod 3; O, dorsal view of telson. Female, body length 4.6 mm: P, right gnathopod 2. Scale bars: A, D-K, P = 0.5 mm; B, C, L, N, O = 0.25 mm.

8. *Caprella acanthogaster* Mayer, 1890

Caprella acanthogaster.—Kim and Lee, 1978, pp. 2, 3, fig. 2.

Material Examined.—18 ♂♂, 1 ♀, Hyölam, July 14, 1989.

Distribution.—Korea, Pacific coasts of U.S.S.R., Japan.

9. *Caprella penantis* Leach, 1814

Caprella penantis.—Kim and Lee, 1975, p.120, fig. 8.

Material Examined.—81 ♂♂, 9 ♀♀, Hyölam, July 14, 1989; 4 ♂♂, 3 ♀♀, Sömmok, July 16, 1989; 14 ♂♂, 10 ♀♀, Sadong, July 17, 1989; 1 ♂, 1 ♀, Dodong, July 17, 1989.

Distribution.—Korea, Japan, Atlantic coast, South Africa.

10. *Caprella scaura* Templeton, 1836

Caprella scaura.—Kim and Lee, 1975, pp. 121,

122, fig. 10.

Material Examined.—20 ♂♂, 10 ♀♀, Tonggumi, July 12, 1989.

Distribution.—Cosmopolitan.

Acknowledgements

We thank Dr. Chung Ja Sim, Department of Biology, Han Nam University, for the identification of the sponges commensal with leucothoid amphipods.

References

- Barnard, J. L., 1959. Estuarine Amphipoda, *In*: Ecology of Amphipoda and Polychaeta of Newport Bay, California (Barnard, J. L., and D. J. Reish, eds.). *Allan Hancock Found. Publ., Occ. Pap.* **21**: 13-69.
- Barnard, J. L., 1962a. Benthic marine Amphipoda of southern California: Families Tironidae to Gammaridae. *Pacific Nat.* **3**: 73-115, figs. 1-23.
- Barnard, J. L., 1962b. Benthic marine Amphipoda of

- southern California: Families Amphilochidae, Leucothoidae, Stenothoidae, Argissidae, Hyalidae. *Pacific Nat.* **3**: 116-163, figs. 1-23.
- Barnard, J. L., 1969. Gammaridean Amphipoda of the rocky intertidal of California: Monterey Bay to La Jolla. *Bull. U.S. Nat. Mus.* **258**: 1-230, figs. 1-65.
- Barnard, J. L., 1970. Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. *Smith. Contrib. Zool.* **34**: I-IV + 1-286, figs. 1-180.
- Barnard, J. L., 1979. Littoral gammaridean Amphipoda from the Gulf of California and the Galapagos Islands. *Smith. Contrib. Zool.* **271**: I-VI + 1-149, figs. 1-74.
- Barnard, J. L. and R. R. Given, 1960. Common pleustid amphipods of southern California, with a projected revision of the family. *Pacific Nat.* **1**: 37-48, figs. 1-6.
- Bousfield, E. L., 1973. Shallow-water gammaridean Amphipoda of New England. Cornell Univ. Press. Ithaca & London, 312 pp, pls. 1-69.
- Bowman, T. E. and L. G. Abele. 1982. Systematics, the fossil record, and biogeography, In: *The Biology of Crustacea* (Abele, L. G., ed.). Academic Press, New York, Vol. 1, pp. 1-27.
- Chevreaux, E. and L. Fage, 1925. Amphipodes. *Faune de France* **9**: 1-488, figs. 1-438.
- Dana, J. D., 1853. Crustacea, Part II. *U.S. Expl. Exped.* **14**: 689-1618, atlas of 96 pls.
- Griffiths, C. L., 1976. Some new and notable Amphipoda from southern Africa. *Ann. S. Afr. Mus.* **72**: 11-35.
- Gurjanova, E., 1938. Amphipoda, Gammaroidea of Siakhu Bay and Sudzukhe Bay (Japan Sea). *Rep. Japan Sea Hydrobiol. Exped. of Zool. Inst. of the Acad. Sci. USSR, 1934*, **1**: 2241-2404, figs. 1-59.
- Gurjanova, E., 1951. *Bokoplavy morej SSSR i sopredel'nykh vod* (Amphipoda-Gammaridea). *Opred. po Faune SSSR, Akad. Nauk SSSR* **41**: 1-1029, figs. 1-705.
- Hirayama, A., 1985. Taxonomic studies on the shallow water gammaridean Amphipoda of west Kyushu, Japan. V. Leucothoidae, Liljeborgiidae, Lysianassidae (*Prachynella*, *Aristias*, *Waldeckia*, *Ensayara*, *Lepidepcreum*, *Hippomedon* and *Anonyx*). *Publ. Seto Mar. Biol. Lab.* **30**: 167-212.
- Hirayama, A., 1988. Taxonomic studies on the shallow water gammaridean Amphipoda of west Kyushu, Japan. VIII. Pleustidae, Podoceridae, Priscomilitaridae, Stenothoidae, Synopidae, and Urothoidae. *Publ. Seto Mar. Biol. Lab.* **33**: 39-77.
- Ishimaru, S., 1984. Taxonomic studies of the family Pleustidae (Crustacea, Amphipoda, Gammaridea) from coastal waters of northern Japan. I. The genus *Parapleustes*. *J. Fac. Sci. Hokkaido Univ. ser. 6, Zool.* **23**: 403-453, figs. 1-32.
- Ishimaru, S., 1985. A new species of the genus *Leucothoe* (Amphipoda, Gammaridea, Leucothoidae) from Japan. *Proc. Jap. Soc. Syst. Zool.* **30**: 46-52.
- Kim, H. S. and C. B. Kim, 1987. Marine gammaridean Amphipoda (Crustacea) of Cheju Island and its adjacent waters, Korea. *Korean J. Syst. Zool.* **3**: 1-23.
- Kim, H. S. and K. S. Lee, 1975. Faunal studies on the genus *Caprella* (Crustacea: Amphipoda, Caprellidae) in Korea. *Korean J. Zool.* **18**: 115-126.
- Kim, H. S. and K. S. Lee, 1978. Systematic study of Amphipoda (Crustacea) in Korea III. Four unrecorded caprellids (Caprellidae) from Korea. *Korean J. Zool.* **21**: 1-7.
- Kim, W. and C. B. Kim, 1991. The marine amphipod crustaceans of Ulreung Island, Korea: Part I. *Korean J. Zool.* **34**: 232-252.
- Krapp-Schickel, G., 1975. Revision of Mediterranean *Leucothoe* species (Crustacea, Amphipoda). *Boll. Mus. Civ. St. Nat. Verona* **2**: 91-118, pls. 1-15.
- Krapp-Schickel, G., 1976. Die gattung *Stenothoe* (Crustacea, Amphipoda) im Mittelmeer. *Bijdr. Dierk.* **46**: 1-34.
- Ledoyer, M., 1982. Crustaces Amphipodes Gammariens. Familles des Acanthonotozomatidae a Gammaridae. *Faune de Madagascar* **59**: 1-598. Editions du C.N.R.S. Paris.
- Ledoyer, M., 1986. Crustaces Amphipodes gammariens. Familles des Haustoriidae a Vitjazianidae. *Faune de Madagascar* **59**: 599-1112. Editions du C.N.R.S. Paris.
- Lincoln, R. J., 1979. British marine Amphipoda: Gammaridea. British Museum (Nat. Hist.), London, 658 pp, 280 figs.
- Myers, A. A., 1985. Shallow-water, coral reef and mangrove Amphipoda (Gammaridea) of Fiji. *Records of the Australian Museum, Suppl.* **5**: 1-143.
- Nagata, K., 1965. Studies on marine gammaridean Amphipoda of the Seto Inland Sea. Part I. *Publ. Seto Mar. Biol. Lab.* **13**: 131-170, figs. 1-15.
- Sars, G. O., 1890-1895. Amphipoda: An account of the Crustacea of Norway with short descriptions and figures of all the species, vol. 1, pp. viii + 1-711, 240 pls, 8 suppl. pls. Alb. Cammaermeyers, Christiania and Copenhagen.
- Schellenberg, A., 1938. Litorale Amphipoden des tropischen Pazifiks. *Kungl. Svenska Vetenskapakad. Handl.*, ser. 3, **16**: 1-105, figs. 1-48.
- Stebbing, T. R. R., 1906. Amphipoda I: Gammaridae. *Das Tierreich* **21**: 1-806, figs. 1-127.

(Accepted May 4, 1991)

울릉도 해역의 단각류(갑각류) III

김 원 · 김창배(서울대학교 자연과학대학 분자생물학과)

울릉도의 해양 단각류상을 조사하기 위하여 조사기간인 1989년 7월부터 1990년 8월 사이에 울릉도 해안의 8개 지소에서 채집한 단각류 표본들 중에서 열새우 아목의 4과(Leucothoidae, Melitidae, Pleustidae, Stenothoidae)에 속하는 것들과 카프렐라 아목의 1과(Caprellidae)에 속하는 것들을 동정한 결과 6속, 10종의 목록이 얻어졌다. 이 중에서 2종(*Elasmopus koreanus*, *Meara brevispina*)은 신종이었고, 다음의 4종(*Leucothoe nagatai*, *L. spinicarpa*, *Parapleustes derzhavini*, *Stenothoe valida*)은 한국미기록 종이였다. 5종을 기재하고 6종의 그림을 작성하였다.