

Two Species of the Genus *Cumella* (Cumacea, Nannastacidae) from Korea

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ABSTRACT

Two species, *Cumella rigida* Gamô, 1963 and *Cumella sadoensis* Gamô, 1967, were based on the specimens collected from the shallow waters of the Yellow Sea and South Sea, Korea. They are newly recorded to Korean fauna. Of them, male of *C. sadoensis* is described for the first time.

Key words: Cumacea, *Cumella*, Korea

INTRODUCTION

We have worked on the taxonomy of the Korean cumaceans that collected from the shallow waters of the Yellow Sea and South Sea. As a result, two species, *Cumella rigida* Gamô, 1963 and *Cumella sadoensis* Gamô, 1967, turned out to be new to Korean cumacean fauna. The genus *Cumella* is belonging to the family Nannastacidae were composed of eighteen genera (Băcescu, 1992). Sixty-nine species in *Cumella* have been reported around world. Most of them are in the American and Indo-West Pacific tropical regions (Petrescu, 1997). While, just two species (*Cumella alveata* and *Cumella glaberata*) in Korean *Cumella* have been recorded (Lee and Lee, 1999). Now we add two *Cumella* species into Korean cumacean fauna in this paper. Of these new records, *C. sadoensis* was described originally only by female from the Japanese waters (Gamô, 1967b). The male of this species is described for the first time.

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MATERIALS AND METHODS

Specimens were collected mainly using a light-trap from the shallow waters of the Yellow Sea and South Sea in Korea from 1992 to 1999. The specimens were fixed in 70-80% ethanoll. The specimens were dissected in glycerol on Cobb's aluminium hole slide. Drawings and measurements were performed with the aid of a drawing tube. The SEM materials were dehydrated through a graded series of ethanoll (80%, 90%, 95%, 100%, 100%) for 20 minutes each, and then dried with HMDS (Hexamethyldisilazane) in 15 minutes. After coated with gold particle in high evaporator, the materials were examined in a Hitachi S-2500 scanning electron microscope operated at 20 kV. All examined specimens were deposited in the Department of Life Science, Dankook University.

DESCRIPTIONS

Order Cumacea Kröyer, 1846 올챙이새우 목

Family Nannastacidae Bate, 1866 꼬마올챙이새우 과

Genus *Cumella* Sars, 1865 옆올챙이새우 속

***Cumella rigida* Gamô, 1963 작은곰보옆올챙이새우 (신칭) (Figs. 1-4, 9-10)**

Cumella sp. Gamô, 1962, p. 197, figs. 32, 33; 1963a, p. 87.

Cumella rigida Gamô, 1963b, p. 53, figs. 16-18; 1967, p. 251; Băcescu, 1992, p. 225.

Material examined. 1 ♀, Anmyeondo Is., 19 Sep. 1992, B.J. Kang; 1 ♂, Daecheon Port (Boryeong-si), 27 Feb. 1993, B.J. Kang; 104 ♂♂, 2 ♀♀, Sabsido Is., 9 May 1993, B.J. Kang; 1 ♂, 1 ♀, Gyeokpo (Buan-gun), 23 May 1993, B.J. Kang; 10 ♂♂, 3 ♀♀, Dadaepo (Busan-si), 14 Mar. 1993, B.J. Kang; 3 ♂♂, Jindo Is., 24 July 1994, S.J. Song; 20 ♂♂, 1 ♀, Seongsanpo (Jejudo Is.), 7 May 1994, B.J. Kang; 6 ♂♂, Hongwon (Seocheon-gun), 27 May 1995, B.J. Kang; 60 ♂♂, 2 ♀♀, Wahyeon (Geojedo Is.), 27 June 1995, B.J. Kang; 84 ♂♂, 2 ♀♀, Jisepo (Geojedo Is.), 28 June 1995, B.J. Kang; 2 ♂♂, Baeksajang Beach (Anmyeondo Is.), 13 Sep. 1996, C.M. Lee; 100 ♂♂, Namchang (Wando Is.), 20 May 1998, C.M. Lee; 15 ♂♂, Soando Is., 24 May 1998, C.M. Lee; 6 ♂♂, 2 ♀♀, Changri (Ganwoldo Is.), 2 Aug. 1998, C.M. Lee; 18 ♂♂, Doripo (Muan-gun), 10 Oct. 1998, C.M. Lee; 6 ♂♂, Taepo (Geojedo Is.), 18 July 1999, Y.H. Kim.

Description. Adult male: Body length (Figs. 1A, 9A) about 1.6-1.7 mm, excluding uropods; surface (Fig. 9B) pitted, covered with numerous minute spiniform granules. Carapace (Figs. 1A, B) about 1/3 of body length, twice as long as its depth, 1.8 times as long as its width; shape nearly rectangular in dorsal view, shallowly depressed near both dorso-lateral sides of middle and rear portions; dorso-median carina (Figs. 1B, 9C) faintly marked, with 2 rows of serrations. Antennal notch shallowly concaved; antero-lateral margin rectangular, serrated. Pseudorostral lobes (Figs. 1A, B) serrated. Ocular lobe (Fig. 1B) broadly round, with 7 lenses. Thorax (Figs. 1A, B) slightly longer than 1/2 of carapace length, shorter than 1/5 of body length. First segment slightly shorter than second segment; third segment subequal to length of first and second segments combined; fourth segment slightly longer than third segment; fifth segment largest, slightly longer than fourth

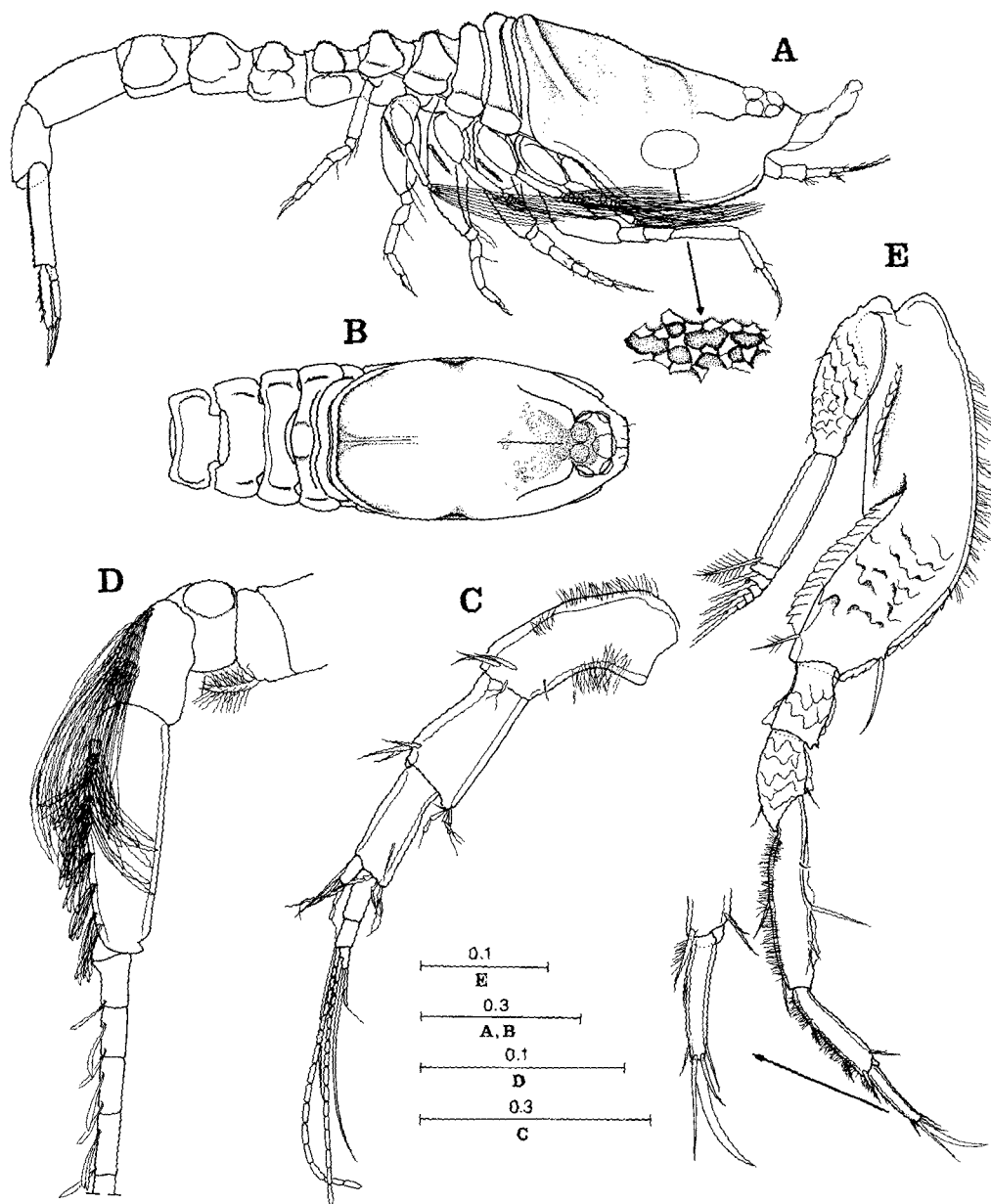


Fig. 1. *Cumella rigida* Gamô, male: A, habitus, lateral; B, cephalothorax, dorsal; C, antennule; D, antenna; E, first pereopod. Unit of scales in mm.

segment. Abdomen (Fig. 1A) about 0.9 times as long as cephalothorax. Fifth segment longest, about 0.75 times as long as third and fourth segments combined; sixth segment about 0.85 times as long as fifth segment.

Antennule (Fig. 1C): Peduncle composed of 3 articles; first article about $\frac{4}{5}$ length of remaining articles combined, with numerous hairs proximally, a sensory seta, 3 simple setae, a hair-like seta

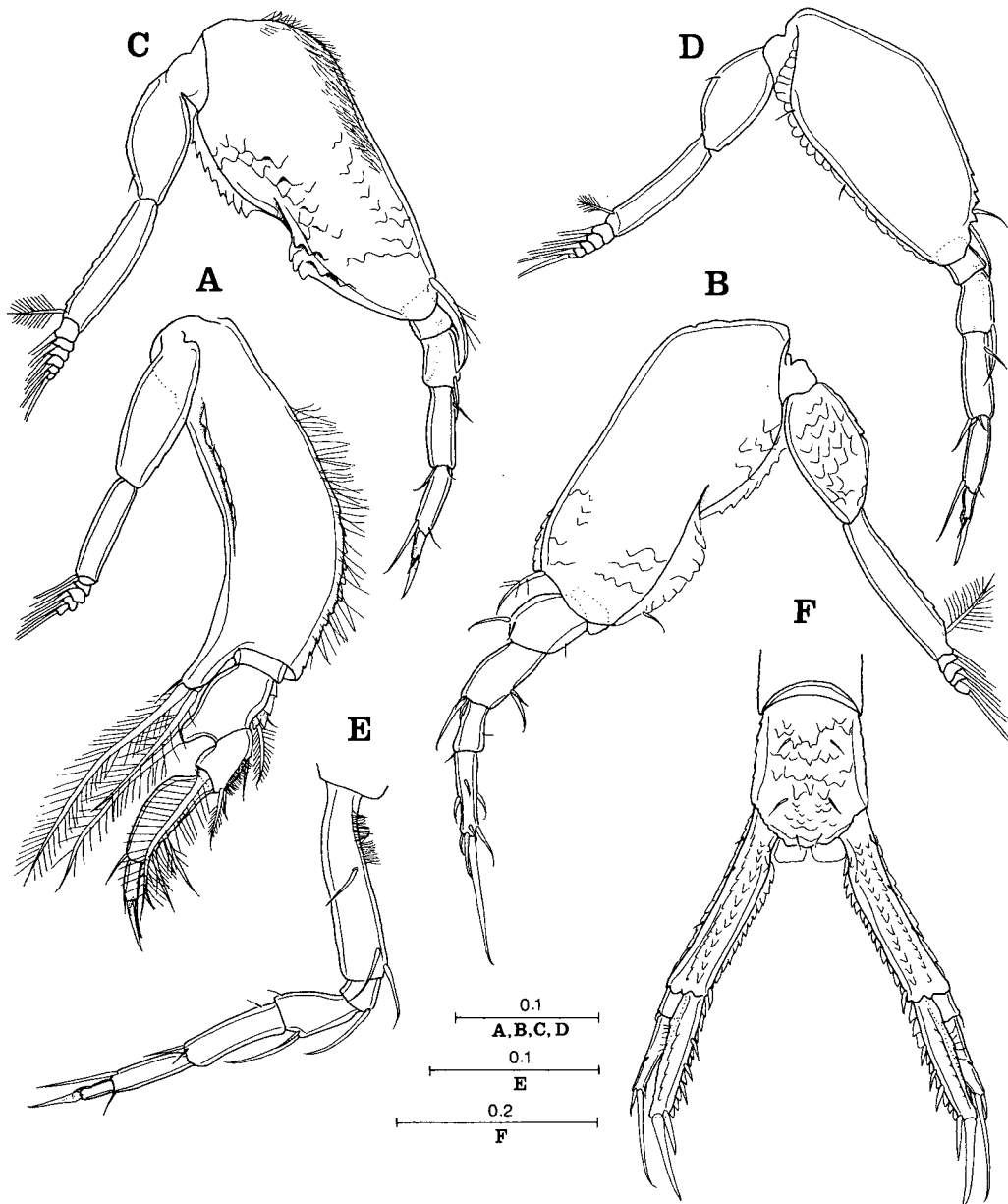


Fig. 2. *Cumella rigida* Gamô, male: A, third maxilliped; B, second pereopod; C, third pereopod; D, fourth pereopod; E, fifth pereopod; F, uropods and last abdominal segment, dorsal. Unit of scales in mm.

distally on surface; second article about 0.65 times as long as first article, with 3 sensory distal setae on inner corner; outer margin with 3 simple distal setae; third article slightly shorter than second article, with a simple submedial seta, 3 sensory distal setae. Main flagellum composed of 3 articles; second article slightly longer than 1/2 of first article, with a aesthetascs, a long simple seta; third article very minute, with a aesthetascs, a sensory seta, a simple seta. Accessory flagellum not

articulated, slightly longer than 1/2 of first article of main flagellum; outer margin with a simple seta; terminal end with a sensory seta, 2 simple setae.

Antenna (Figs. 1A, D) short, not exceeding first abdominal segment. Peduncle composed of 5 articles; second article with a plumose seta on inner margin.

Maxilliped 3 (Fig. 2A): Basis about 1.25 times as long as remaining articles combined; inner margin serrated, with numerous hairs; outer corner inflated, reaching to about 1/2 of merus, with 2 long plumose setae, a short simple seta. Ischium very short. Merus longer than carpus, with a simple seta, a plumose seta on serrated inner margin; outer corner somewhat inflated, with a long plumose seta. Carpus about 1/2 of propodus, with numerous hairs, 2 simple setae, a plumose seta on inner margin; outer margin a long plumose terminal seta. Propodus about 2.8 times as long as dactylus, with 3 plumose setae on inner margin; outer corner with a simple distal seta. Dactylus with a simple outer seta, 3 simple terminal setae, a terminal spine; terminal spine slightly longer than propodus. Exopod well developed.

First pereopod (Fig. 1E): Basis about 0.9 times as long as remaining articles combined, with a simple distal seta, numerous hairs on inner margin; outer margin with 2 rows of hyaline flattened teeth, a plumose distal seta. Ischium equal to merus in length. Merus slightly longer than 1/3 of carpus, with a simple seta on inner and outer margins. Carpus about 1.6 times as long as propodus, with 3 simple setae (medial seta long) on inner margin; outer margin with numerous hairs, a simple distal seta, a plumose medial seta. Propodus about 1.5 times as long as dactylus, with 2 simple distal setae on inner corner; outer margin with numerous hairs, 3 plumose setae. Dactylus with 3 simple setae on surface, 2 simple terminal setae and a terminal spine.

Second pereopod (Fig. 2B): Basis about 1.5 times as long as remaining articles combined, with a plumose distal seta, serrated near inner corner; outer margin with 2 rows of hyaline flattened teeth, a simple distal seta. Ischium very short. Merus slightly shorter than carpus, with 2 simple setae on inner margin (one very short). Carpus about 1.6 times as long as propodus, with 3 simple setae on inner corner; outer margin with 2 simple setae. Propodus slightly longer than 1/2 of dactylus. Dactylus with 5 simple setae on surface; terminal end with 3 simple setae (one of them long).

Third pereopod (Fig. 2C): Basis about 1.5 times as long as remaining articles combined, with 2 rows of hyaline flattened teeth; outer margin with numerous hairs proximally, a plumose distal seta.

Fourth pereopod (Fig. 2D): Basis about 1.1 times as long as remaining articles combined.

Fifth pereopod (Fig. 2E): Basis about 0.6 times as long as remaining articles combined.

Uropod (Fig. 2F): Peduncle about 1.2 times as long as last abdominal segment, with 2 rows of spines on dorsal surface; outer margin serrated faintly, with 3 hair-like setae; inner margin serrated strongly, with a distal spine. Endopod not articulated, about 0.7 times as long as peduncle, with a row of spines on dorsal surface; inner margin serrated, with 3 spines; outer margin serrated, several sensory hairs near middle portion; terminal end with 2 strong spines. Exopod composed of 2 articles, about 0.8 times as long as endopod; first article slightly longer than 1/3 of second article, with a hair-like seta on outer corner; second article with a hair-like inner seta, a hair-like outer seta, 2 terminal setae.

Adult female: Body length (Figs. 3A, 10C) about 1.8–1.9 mm, excluding uropods; surface (Fig. 10B) same as in male. Carapace (Figs. 3A, B, 10A) slightly longer than 1/3 of body length, about

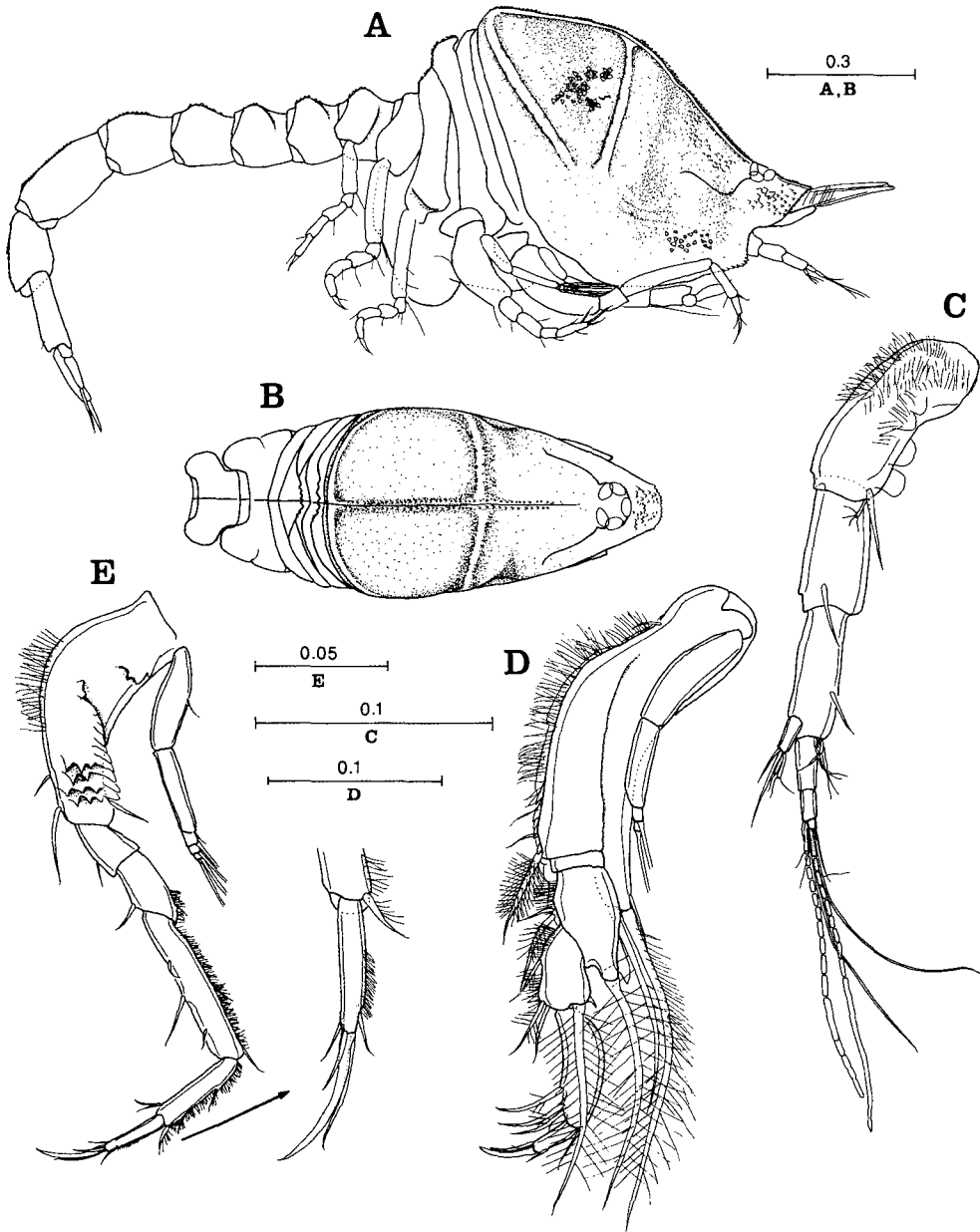


Fig. 3. *Cumella rigida* Gamô, female: A, habitus, lateral; B, cephalothorax, dorsal; C, antennule; D, third maxilliped; E, first pereopod. Unit of scales in mm.

1.5 times as long as its depth, 1.9 times as long as its width; shape nearly triangular in dorsal view, prominently depressed on both lateral sides of middle and rear portions; dorso-median carina (Figs. 3B, 10G) bearing 2 rows of serrations well marked. Antennal notch shallowly concaved; antero-lateral margin rectangular, serrated. Pseudorostral lobes (Figs. 3A, B) serrated. Ocular lobe (Fig. 3B) broadly round, with 5 lenses. Thorax (Figs. 3A, B) slightly shorter than $1/2$ of carapace length, $1/5$

of body length. First segment slightly shorter than second segment; third segment slightly shorter than first and second segment; fourth and fifth segments equal to each other in length. Abdomen (Fig. 3A) about 0.8 times as long as cephalothorax. Fifth segment longest, about 0.8 times as long as third and fourth segments combined; sixth segment about 0.75 times as long as fifth segment.

Antennule (Fig. 3C): Peduncle composed of 3 articles; first article about $\frac{4}{5}$ length of remaining articles combined, with numerous hairs, 4 round processes on surface, a sensory hair, a simple seta on inner distal margin; second article about 0.55 times as long as first article, with a simple distal seta; third article slightly longer than second article, with a simple submedial seta, 3 sensory distal setae on inner margin. Main flagellum composed of 3 articles; second article slightly longer than $\frac{1}{2}$ of first article, with a aesthetascs, 2 simple setae (one long, the other short); third article very minute, with a aesthetascs, 2 simple setae (one long, the other short). Accessory flagellum not articulated, slightly shorter than first article of main flagellum; terminal end with a sensory seta, 3 simple setae.

Third maxilliped (Fig. 3D): Basis subequal to length of remaining articles combined, with numerous hairs on serrated inner margin, a plumose distal seta, a simple distal seta on inner corner; outer corner inflated, reaching to about $\frac{1}{3}$ of merus, with 2 plumose setae, a short simple seta. Ischium very short. Merus longer than carpus; outer corner somewhat inflated, with a long plumose seta, a spine; inner margin with numerous hairs, a plumose seta, a simple seta. Carpus about 0.65 times as long as propodus, with 2 plumose setae, a simple seta, numerous hairs on inner margin; outer corner with a long plumose seta, a spine. Propodus about 2.7 times as long as dactylus, with 3 plumose setae on inner margin. Dactylus with a simple outer seta, 2 simple terminal seta, a terminal spine; terminal spine slightly longer than propodus. Exopod well developed.

First pereopod (Fig. 3E): Basis about 0.55 times as long as remaining articles combined, with 2 simple distal setae, numerous hairs on inner margin; outer margin with 2 rows of hyaline flattened teeth, a simple distal seta. Ischium about 0.7 times as long as merus. Merus slightly longer than $\frac{1}{3}$ of carpus, with a simple seta on inner margin; outer margin with a hair-like seta. Carpus about 1.8 times as long as propodus, with 3 simple setae (medial seta long) on inner margin; outer margin with numerous hairs, a simple distal seta, a plumose medial seta. Propodus about 1.4 times as long as dactylus, with 2 simple distal setae on inner corner; outer margin with numerous hairs, 3 plumose setae. Dactylus with 2 simple setae on surface, 2 simple terminal setae, a terminal spine.

Second pereopod (Fig. 4A): Basis about 0.7 times as long as remaining articles combined, with a plumose distal seta on inner margin; outer margin with a row of hyaline flattened teeth and a simple distal seta. Ischium very short. Merus about 0.7 times as long as carpus, with a simple distal seta on inner margin; outer margin with 2 simple distal setae. Carpus about 1.6 times as long as propodus, with 2 simple setae on inner margin; outer corner with 2 simple setae. Propodus about $\frac{1}{2}$ of dactylus. Dactylus with 5 simple setae on surface; terminal end with 3 simple setae (one of them long).

Third pereopod (Fig. 4B): Basis about 1.1 times as long as remaining articles combined, with 4 simple distal setae on inner margin; outer corner with a plumose seta.

Fourth pereopod (Fig. 4C): Basis about 0.9 times as long as remaining articles combined.

Fifth pereopod (Fig. 4D): Basis about 0.55 times as long as remaining articles combined.

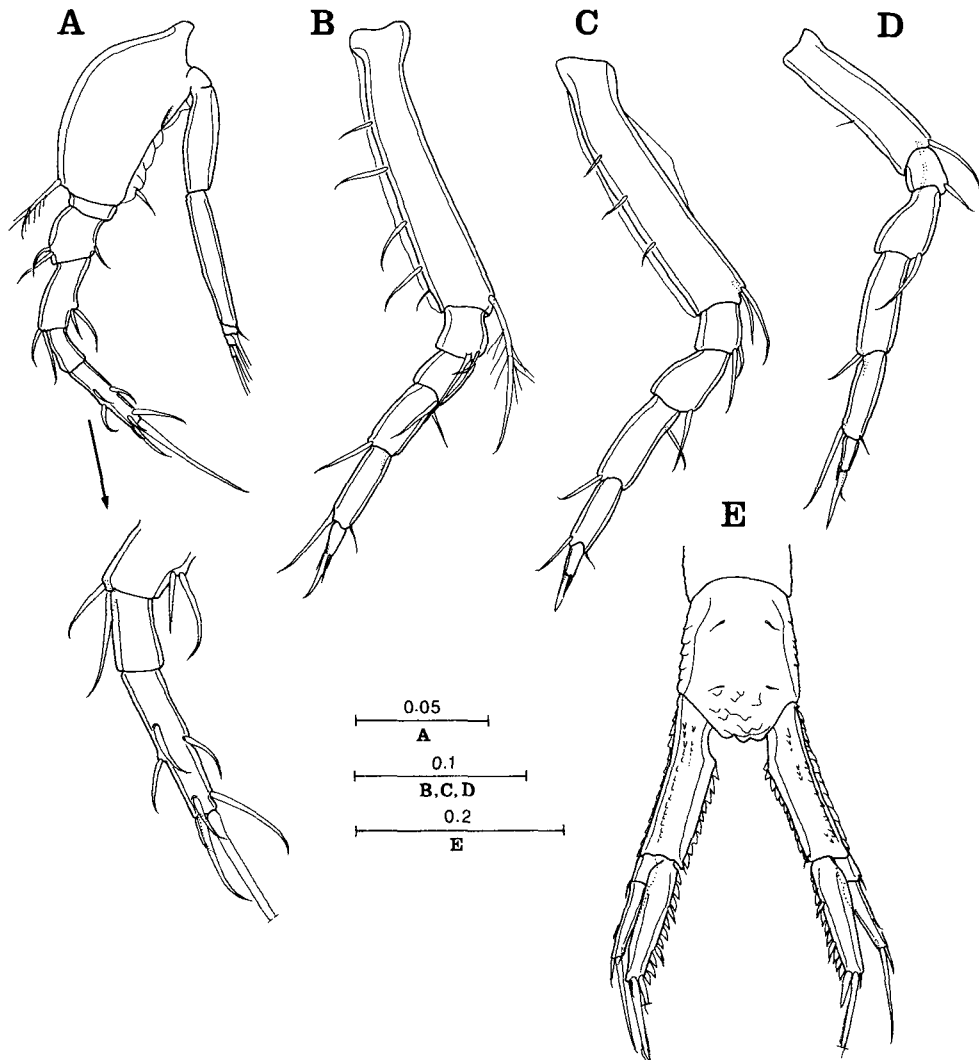


Fig. 4. *Cumella rigida* Gamô, female: A, second pereopod; B, third pereopod; C, fourth pereopod; D, fifth pereopod; E, uropods and last abdominal segment, dorsal. Unit of scales in mm.

Uropod (Fig. 4E): Peduncle a little shorter than last abdominal segment in length, serrated on inner and outer margins, with a row of spines on dorsal surface; inner margin with a hair-like seta distally. Endopod not articulated, about 0.8 times as long as peduncle; inner margin serrated, with 2 inner spines; terminal end with a hair-like seta, 2 strong spines. Exopod composed of 2 articles, about 0.8 times as long as endopod; first article slightly longer than 1/3 of second article, with a hair-like seta on outer corner; second article with a hair-like inner seta, a hair-like outer seta, 2 terminal setae.

Remarks. Our specimens are well accorded with the original description (Gamô, 1963b). However, a few differences are found between our specimens and type specimen: (1) according to

Gamô's description the uropodal peduncle of male is about 1.5 times as long as the last abdominal segment, while it is about 1.2 times as long as the last abdominal segment in our male specimens; (2) in our male specimens the carpus of the first pereopod has numerous hairs and a medial plumose seta, while Gamô's is absent.

This species have important features such as carapace surface that is pitted (not refer to Gamô's description) and covered with numerous minute spiniform granules, and uropodal peduncle bearing two rows of spines on dorsal surface. Also, this specice is distinguished from other congeners in having the short antenna which is not exceeding first abdominal segment. The shape and pattern of sculptures of carapace surface seem to be characteristics of species within the genus *Cumella*.

This species is similar to *Cumella sadoensis* Gamô, 1967 in having carapace that is pitted. However, *C. rigida* is easily distinguished from *C. sadoensis* by following features: (1) the shape of the carapace surface (in *C. rigida* it is covered with numerous minute spiniform granules, while it is corvered numerous large alveolate sculptures in *C. sadoensis*), (2) the ratio of the uropodal peduncle and last abdominal segment in male (in *C. rigida* the uropodal peduncle is about 1.2 times as long as the last abdominal segment, while it is about 1.7 times in *C. sadoensis*), and (3) the length of the antenna in male (in *C. rigida* the antenna reaches to first abdominal segment while it reaches to fifth abdominal segment in *C. sadoensis*). In addition, the carapace of *C. sadoensis* is raised dorsally near middle portion, but it is not in *C. rigida*.

Distribution. Korea (Yellow Sea and South Sea), Japan (Kii Peninsula).

***Cumella sadoensis* Gamô, 1967 큰곰보옆올챙이새우 (신칭) (Figs. 5-10)**

Cumella sp. (2) Gamô, 1967a, p. 27, fig. 14.

Cumella sadoensis Gamô, 1967b, p. 252, figs. 13, 14; Băcescu, 1992, p. 225.

Material examined. 19 ♂♂, Dadaepo (Busan-si), 14 Mar. 1993, B.J. Kang; 14 ♂♂, Seongsanpo (Jejudo Is.), 7 May 1994, B.J. Kang; 1 ♂, Hongwon (Seocheon-gun), 27 May 1995, B.J. Kang; 38 ♂♂, 2 ♀♀, Wahyeon (Geojedo Is.), 27 June 1995, B.J. Kang; 1 ♂, Baeksajang Beach (Anmyeondo Is.), 13 Sep. 1996, C.M. Lee; 2 ♂♂, Hakampo (Taeaeon-gun), 25 June 1998, C.M. Lee; 5 ♂♂, Namchang (Wando Is.), 20 May 1998, C.M. Lee; 40 ♂♂, Cheongsando Is. (Wando-gun), 20-22 May 1998, K.S. Lee and C.M. Lee; 10 ♂♂, 2 ♀♀, Bijindo Is. (Tongyeong-si), 9 July 1998, C.M. Lee; 1 ♀, Chubongdo Is. (Tongyeong-si), 10 July 1998, C.M. Lee; 1 ♂, Taepo (Geojedo Is.), 18 July 1999, Y.H. Kim.

Description. Adult male: Body length (Figs. 5A, 9D) about 2.5 mm, excluding uropods; surface (Figs. 5A, C, 9E) pitted, covered with numerous large alveolate sculptures. Carapace (Figs. 5A, B) slightly longer than 1/3 of body length, about 1.8 times as long as its depth, 1.9 times as long as its width; shape nearly rectangular in dorsal view, shallowly depressed on both lateral sides of middle portion; dorso-median carina (Figs. 5B, 9F) bearing 2 rows of serrations well marked, raised dorsally near middle portion. Antennal notch shallowly concaved; antero-lateral margin rectangular, serrated. Pseudorostral lobes (Figs. 5A, B) serrated. Ocular lobe (Fig. 5B) broadly round, with 7 lenses. Thorax (Figs. 5A, B) about 1/2 of carapace length, shorter than 1/5 of body length. First segment slightly shorter than second segment; third segment subequal to length of first and second segments combined; fourth segment slightly longer than third segment; fifth segment largest, slightly longer than fourth segment. Abdomen (Fig. 5A) about 0.9 times as long as

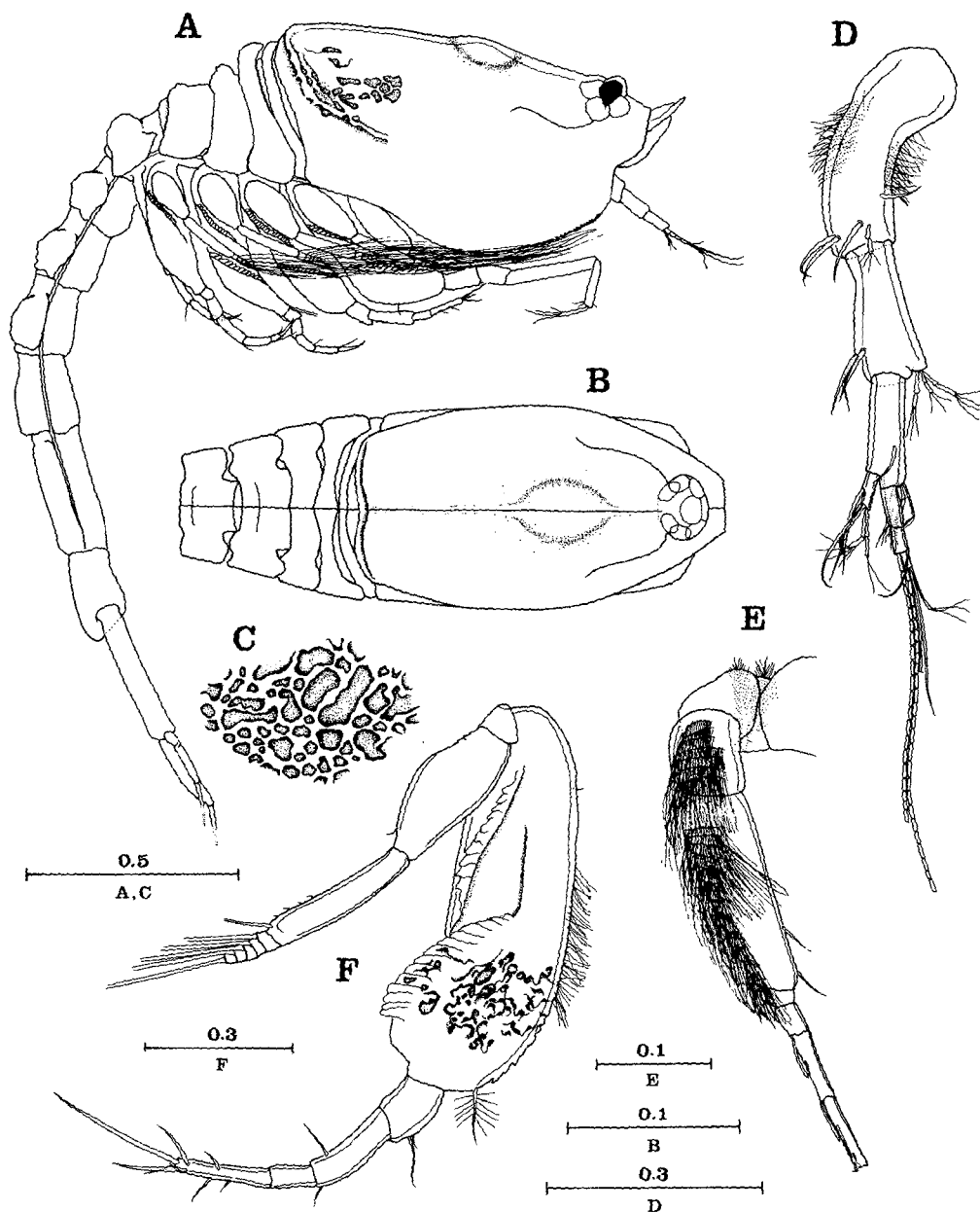


Fig. 5. *Cumella sadoensis* Gamô, male: A, habitus, lateral; B, cephalothorax, dorsal; C, carapace surface, lateral; D, antennule; E, antenna; F, second pereopod. Unit of scales in mm.

cephalothorax. Fifth segment longest, about 0.8 times as long as third and fourth segments combined; sixth segment about 0.7 times as long as fifth segment.

Antennule (Fig. 5D): Peduncle composed of 3 articles; first article about 4/5 length of remaining articles combined, with numerous hairs on medial surface, a sensory distal seta, 3 simple distal setae; second article about 0.6 times as long as first article, with 3 sensory distal setae on inner

corner; outer margin with 3 simple distal setae; third article slightly shorter than second article, with a simple submedial seta, 3 sensory distal setae on inner margin. Main flagellum composed of 3 articles; second article slightly shorter than $2/3$ of first article, with a aesthetascs, 2 simple setae (one long, the other short); third article very minute, with a aesthetascs, a sensory seta, a simple seta. Accessory flagellum not articulated, slightly shorter than first article of main flagellum; outer margin with a simple seta; terminal end with 2 sensory setae, 2 simple setae.

Antenna (Figs. 5A, E) long, not exceeding fifth abdominal segment. Peduncle composed of 5 articles; second article with 2 plumose setae; fifth article 2 sensory setae on inner margin.

Maxilliped 3 (Fig. 6A): Basis about 1.6 times as long as remaining articles combined; inner margin serrated, with numerous hairs, 2 plumose setae at distal portion; outer corner inflated, reaching to about $1/2$ of merus, with 2 long plumose setae, a simple seta. Ischium very short. Merus longer than carpus, a simple seta inner margin; outer corner somewhat inflated, with a long plumose seta. Carpus about 0.7 times as long as propodus, with numerous hairs, 2 simple setae on inner margin; outer margin with a spine, a long plumose terminal seta. Propodus about 2.3 times as long as dactylus, with 3 plumose setae on inner margin. Dactylus with a simple outer seta, a simple terminal seta, a terminal spine; terminal spine slightly longer than propodus. Exopod well developed.

First peraeopod (Fig. 6B): Basis about 0.9 times as long as remaining articles combined, with a simple distal seta on inner margin; outer margin with 2 rows of hyaline flattened teeth, a plumose distal seta. Ischium about 0.8 times as long as merus. Merus slightly longer than $1/3$ of carpus, with a simple seta on inner margin. Carpus about 2.2 times as long as propodus, with 3 simple setae (medial seta long); outer margin with numerous hairs, a simple distal seta, 2 plumose medial setae. Propodus about 1.2 times as long as dactylus, with 2 simple distal setae on inner corner; outer margin with numerous hairs, 3 plumose setae. Dactylus with 4 simple setae on surface, 2 simple terminal setae, a terminal spine.

Second peraeopod (Fig. 5F): Basis about 1.4 times as long as remaining articles combined, with a plumose distal seta, numerous hairs on inner margin; outer margin with 2 rows of hyaline flattened teeth. Ischium very short. Merus about 0.6 times as long as carpus, with 2 simple setae on inner margin (one very short). Carpus about 2.1 times as long as propodus, with a simple seta on inner corner; outer margin with a simple seta. Propodus about $1/2$ of dactylus. Dactylus with 5 simple setae on surface; terminal end with 3 simple setae (one of them long).

Third peraeopod (Fig. 6C): Basis about 1.8 times as long as remaining articles combined, with 2 rows of hyaline flattened teeth, 2 simple distal setae on outer margin; outer corner with a plumose seta.

Fourth peraeopod (Fig. 6D): Basis about 1.4 times as long as remaining articles combined.

Fifth peraeopod (Fig. 6E): Basis about 0.65 times as long as remaining articles combined.

Uropod (Fig. 6F): Peduncle about 1.7 times as long as last abdominal segment in length, serrated on inner and outer margins; inner margin with a hair-like medial seta, 2-3 inner spines. Endopod not articulated, about 0.5 times as long as peduncle; inner margin serrated, with 2 spines; outer margin several sensory hairs; terminal end with a hair-like seta, 2 strong spines. Exopod composed of 2 articles, about 0.7 times as long as endopod; first article slightly shorter than $1/3$ of second article, with a hair-like seta on outer corner; second article with a hair-like inner seta, a hair-like

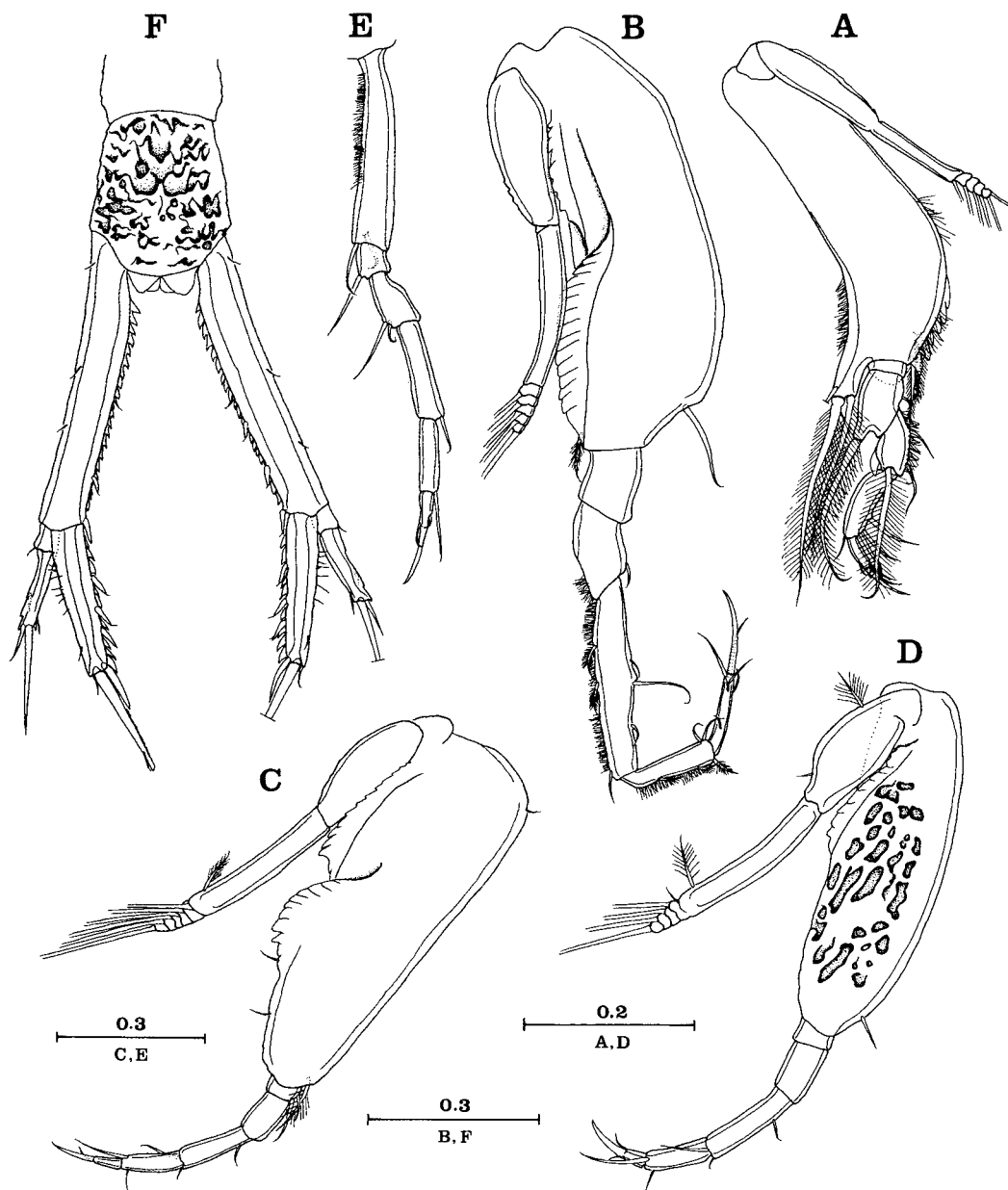


Fig. 6. *Cumella sadoensis* Gamô, male: A, third maxilliped; B, first pereopod; C, third pereopod; D, fourth pereopod; E, fifth pereopod; F, uropods and last abdominal segment, dorsal. Unit of scales in mm.

outer seta, 2 terminal setae.

Adult female: Body length (Figs. 7A, 10D) about 1.7-1.8 mm, excluding uropods; surface (Figs. 7A, 10F) same as in male. Carapace (Figs. 7A, B, 10E) slightly longer than 2/5 of body length, about 1.6 times as long as its depth, 1.7 times as long as its width; shape nearly triangular in dorsal view, prominently depressed on both lateral sides of middle and rear portions; dorso-median carina

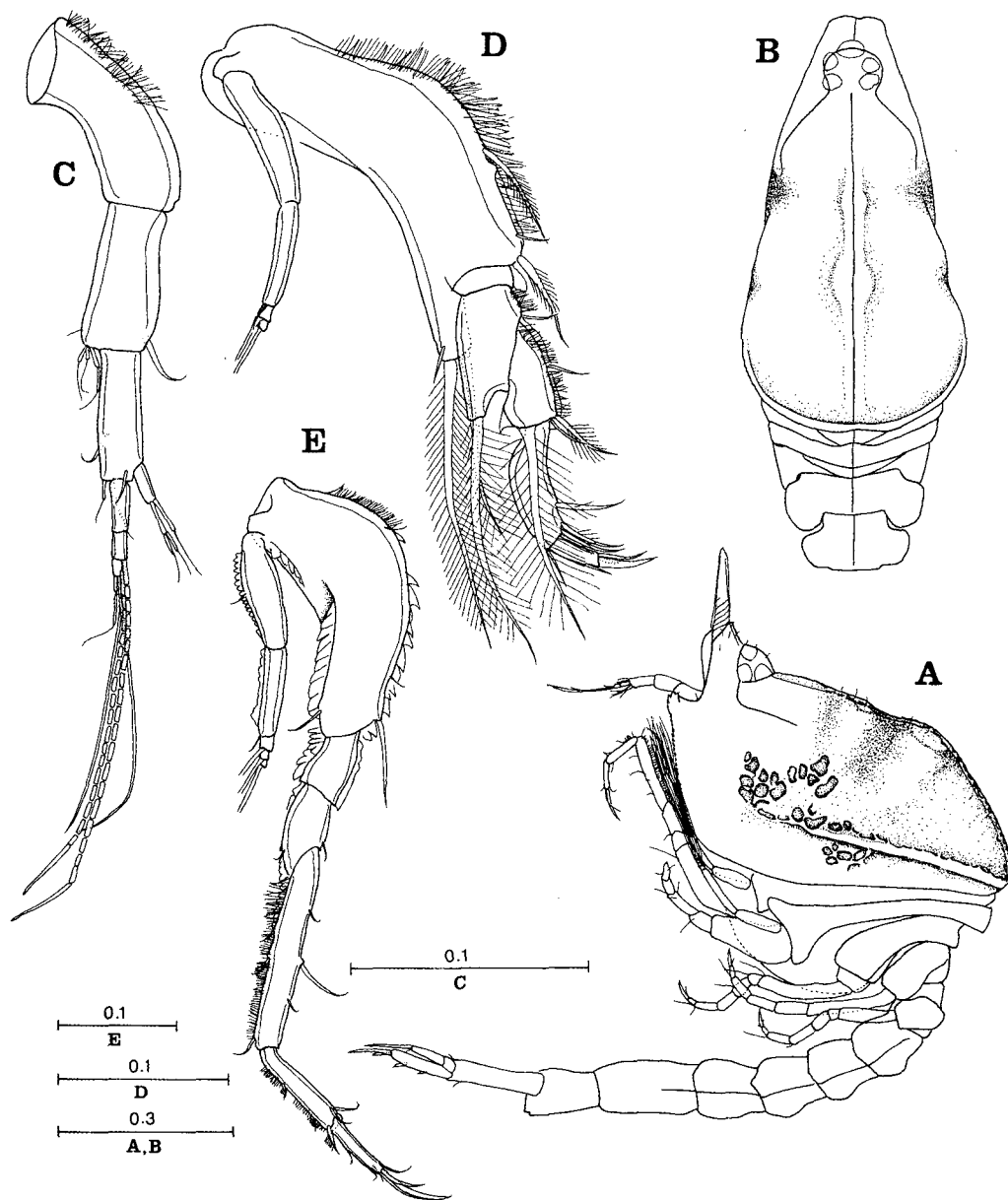


Fig. 7. *Cumella sadoensis* Gamô, female: A, habitus, lateral; B, cephalothorax, dorsal; C, antennule; D, third maxilliped; ; E, first pereopod. Unit of scales in mm.

(Figs. 7B, 10H) bearing 2 rows of serrations well marked, raised dorsally near middle and rear portions. Antennal notch prominently concaved; antero-lateral margin triangular, furnished with several serrations. Pseudorostral lobes (Figs. 7A, B) serrated. Ocular lobe (Fig. 7B) broadly round, with 5 lenses. Thorax (Figs. 7A, B) slightly longer than $1/3$ of carapace length, shorter than $1/5$ of body length. First and second segments subequal to each other in length; third segment slightly

shorter than length of first and second segments combined; fourth segment slightly longer than third segment; fifth segment largest, slightly longer than fourth segment. Abdomen (Fig. 7A) about 0.85 times as long as cephalothorax. Fifth segment longest, about 0.8 times as long as third and fourth segments combined; sixth segment about 0.8 times as long as fifth segment.

Antennule (Fig. 7C): Peduncle composed of 3 articles; first article about $\frac{3}{5}$ length of remaining articles combined, with numerous hairs on outer margin; second article about 0.85 times as long as first article, with 3 sensory distal setae on inner corner; outer margin with a simple distal seta; third article slightly shorter than second article, with a simple submedial seta; distal end 3 sensory setae. Main flagellum composed of 3 articles; second article about $\frac{1}{2}$ of first article, with a aesthetascs, a simple long setae; third article very minute, with a aesthetascs, a sensory seta, a simple long seta. Accessory flagellum not articulate, slightly shorter than first article of main flagellum, with 2 sensory setae.

Maxilliped 3 (Fig. 7D): Basis about 1.1 times as long as remaining articles combined; inner margin with numerous hairs, 2 plumose setae, a simple seta; outer corner inflated, reaching to about $\frac{1}{2}$ of merus, with 2 long plumose setae. Ischium very short. Merus longer than carpus, with a simple seta on inner margin; outer corner somewhat inflated, with a long plumose seta. Carpus about 0.6 times as long as propodus, with numerous hairs, 2 simple setae, a plumose seta on inner margin; outer margin with a spine, a long plumose terminal seta. Propodus about 2.5 times as long as dactylus, with 3 plumose setae on inner margin. Dactylus with a simple outer seta, 2 simple terminal seta, a terminal spine; terminal spine slightly longer than propodus. Exopod well developed.

First peraeopod (Fig. 7E): Basis about 0.55 times as long as remaining articles combined; inner margin serrated, with 4 simple hair-like setae, a simple distal seta, numerous hairs proximally; outer margin with 2 rows of hyaline flattened teeth, a simple distal seta. Ischium about 0.9 times as long as merus. Merus slightly longer than $\frac{1}{3}$ of carpus, a simple seta on inner and outer margins. Carpus about 1.9 times as long as propodus, with 3 simple setae (medial seta long); outer margin with numerous hairs, a simple distal seta, 2 plumose medial setae. Propodus about 1.5 times as long as dactylus, with 2 simple distal setae on inner corner; outer margin with numerous hairs, 3 plumose setae. Dactylus with 4 simple setae on surface, 2 simple terminal setae, a terminal spine.

Second peraeopod (Fig. 8A): Basis about 0.7 times as long as remaining articles combined, with 4 simple setae, a plumose distal seta on inner margin; outer margin with a row of hyaline flattened teeth, 3 simple setae. Ischium very short, with a simple seta on inner margin. Merus about 0.65 times as long as carpus, with a simple seta on inner and outer margins. Carpus about 1.9 times as long as propodus, with 2 simple setae on inner corner; outer margin with 2 simple setae. Propodus about $\frac{1}{2}$ of dactylus, with 2 hair-like setae. Dactylus with 5 simple setae on surface; terminal end with 3 simple setae (one of them long).

Third peraeopod (Fig. 8B): Basis about 1.2 times as long as remaining articles combined.

Fourth peraeopod (Fig. 8C): Basis about 0.9 times as long as remaining articles combined.

Fifth peraeopod (Fig. 8D): Basis about 0.65 times as long as remaining articles combined.

Uropod (Fig. 8E): Peduncle subequal to last abdominal segment length, serrated on inner margin, with 3 hair-like spines. Endopod not articulated, about 0.8 times as long as peduncle, with 6-7 hair-like setae on surface; inner margin serrated, with 2 spines; terminal end with a hair-like seta,

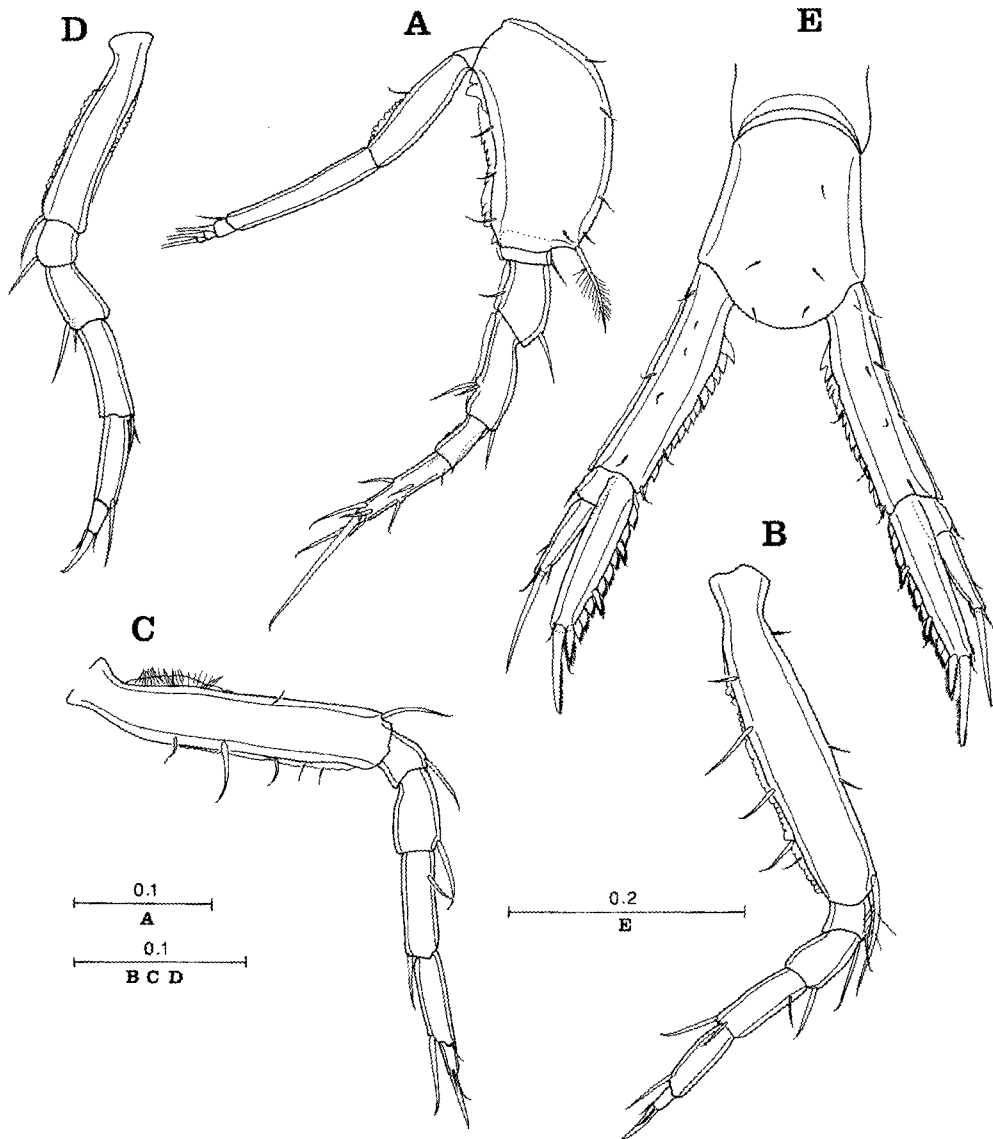


Fig. 8. *Cumella sadoensis* Gamô, female: A, second pereopod; B, third pereopod; C, fourth pereopod; D, fifth pereopod; E, uropods and last abdominal somite, dorsal. Unit of scales in mm.

2 strong spines. Exopod composed of 2 articles, about 0.65 times as long as endopod; first article slightly shorter than 1/2 of second article, with a hair-like seta on outer corner; second article with a hair-like seta on inner and outer margins; terminal end with 2 terminal setae.

Remarks. This species was originally described only by one female specimen from the Japanese waters (Gamô, 1967b), therefore its male was not known until now. Fortunately, we collected many males and several females specimens of *Cumella sadoensis* from Korean waters. This species has almost same carapace form that is pitted, covered with numerous large alveolate sculptures and

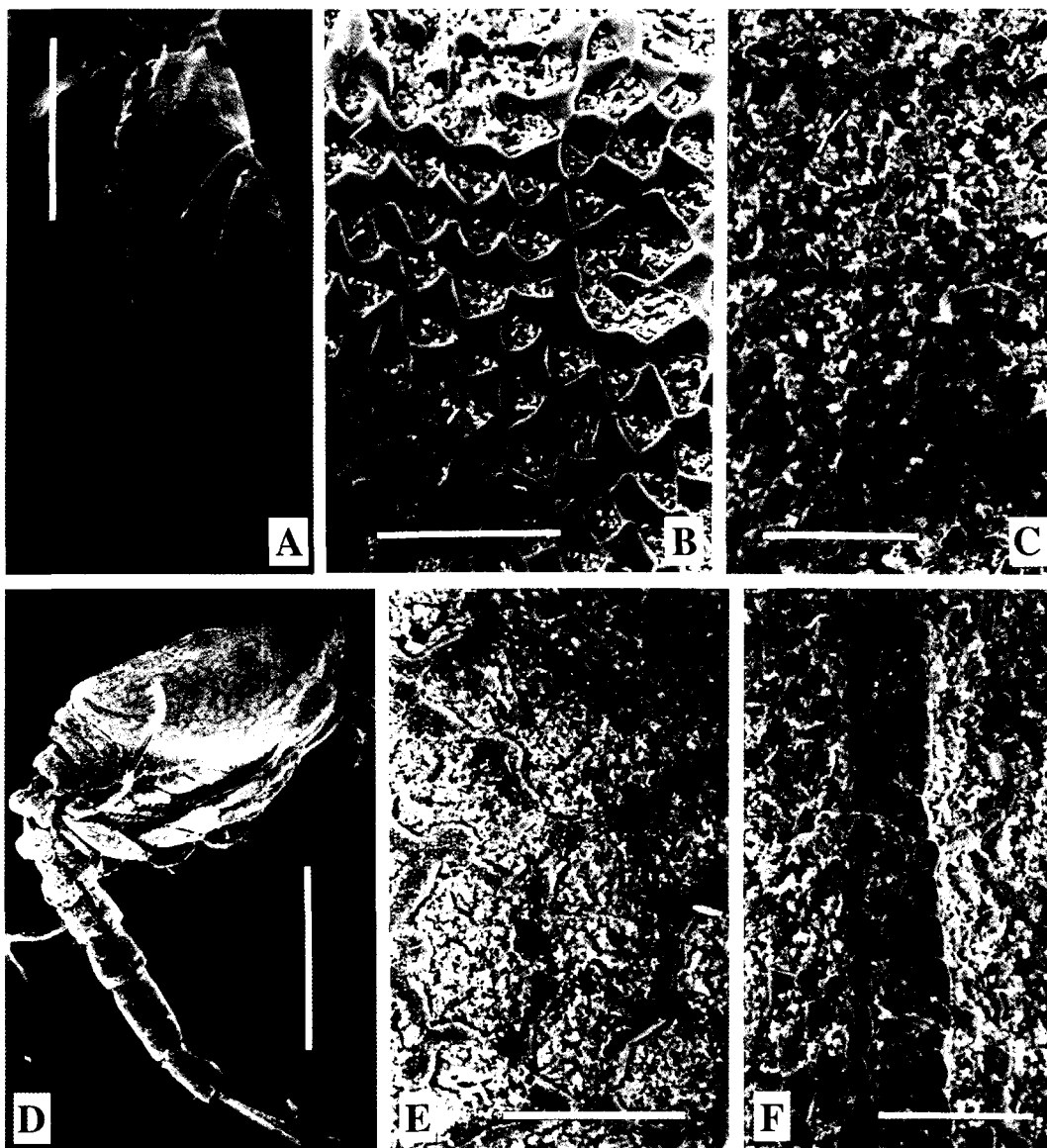


Fig. 9. *Cumella rigida* Gamô, male: A, habitus, lateral view; B, lateral surface, carapace; C, dorsal surface, carapace. *Cumella sadoensis* Gamô, male: D, habitus, lateral view; E, lateral surface, carapace; F, dorsal surface, carapace. Scales: A, D = 0.5 mm; B, C, E, F = 0.05 mm.

raised dorsally near middle portion in both sexes.

Our female specimens are well accorded with the original description by Gamô, 1963. However, a few differences are found between our specimens and type specimen: (1) according to Gamô's description the antero-lateral corner of carapace is round form, while it is finished with several serrations in our specimens; (2) in our specimens the basis of the first pereopod is furnished with

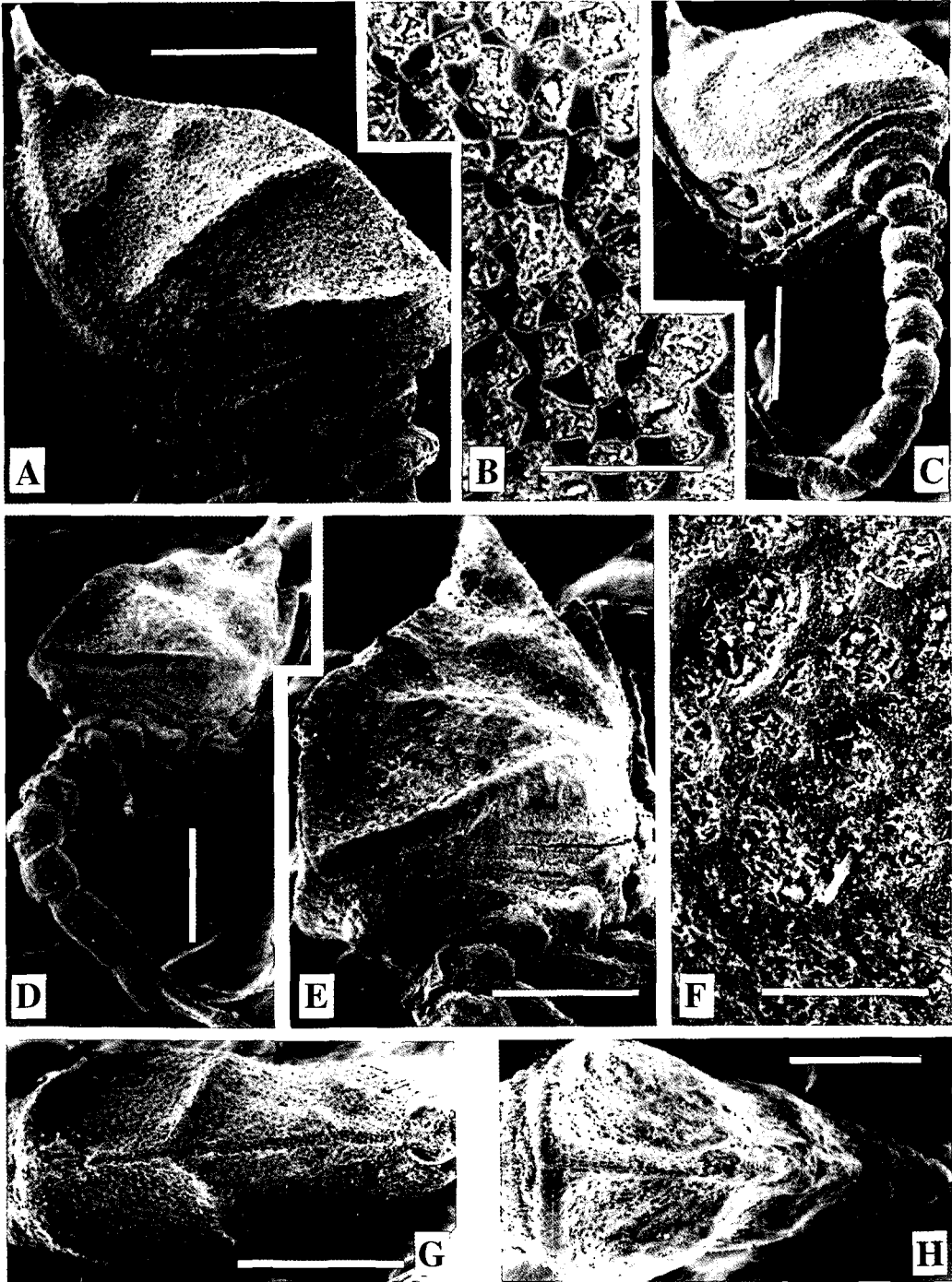


Fig. 10. *Cumella rigida* Gamô, female: A, cephalothorax, lateral view; B, lateral surface, carapace; C, habitus, lateral view; G, carapace, dorsal view. *Cumella sadoensis* Gamô, female: D, habitus, lateral view; E, cephalothorax, lateral view; F, lateral surface, carapace; H, carapace, dorsal view. Scales: A, C, D, G = 0.3 mm; B, F = 0.05 mm; E, H = 0.2 mm.

several serrations on the inner margin, while Gamô's is absent; (3) in Gamô's specimens the uropodal peduncle of male is a little the longer than the last abdominal segment in length, while it almost equal to the one in our specimens.

The female of *C. sadoensis* closely resembles *C. morion* Watling and McCann, 1997. But, the shape of the carapace surface greatly differ each other. The carapace surface of *C. sadoensis* is covered with numerous large alveolate sculptures, while in *C. morion* it is covered rarely with small alveolate sculptures. Also, in *C. morion* the dorsal portions of the abdomen segments 1-4 bear a pair of projections, while there is no one in *C. sadoensis*.

Distribution. Korea (Yellow Sea and South Sea), Japan (Sado Is.).

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한국산 옆올챙이속(올챙이새우목, 꼬마올챙이새우과)의 2미기록종

이 창 목 · 이 경 숙
(단국대학교 생물학과)

요 약

1992년부터 1999년 사이에 황해와 남해연안의 여러 지점에서 채집된 올챙이새우류를 동정한 결과, 옆올챙이새우속의 2 한국미기록종 *Cumella rigida* Gamø, 1963 그리고 *Cumella sadoensis* Gamø, 1967이 확인되어 보고한다. 이들 중, *C. sadoensis*의 수컷에 관한 기재는 학계에 처음으로 보고되어 진다.