

## **Three Species of Cumaceans (Crustacea, Cumacea) from Korean Waters**

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### **ABSTRACT**

This study deals with the Korean cumaceans collected from the coast of the Yellow Sea and other Korean waters. Three species in two families (Lampropidae and Bodotriidae) are identified as new records for Korean fauna: *Hemilamprops californicus* Zimmer, 1936, *Bodotria parva* Calman, 1907 and *Iphinoe sagamiensis* Gamô, 1958. They are redescribed and figured in detail. The two genera, *Hemilamprops* and *Iphinoe*, are reported for the first time from Korea.

Key words: Redescription, *Hemilamprops*, *Bodotria*, *Iphinoe*, Cumacea, Korean waters.

### **INTRODUCTION**

The study on Korean cumaceans was first performed by Calman (1911). Since then, Kang and Lee (1995a, b, 1996) reported six species, including a new species and five new records, from Korean coasts. Furthermore, Lee and Lee (1997) reported two species in the southern coast of Korea. By these previous studies, until now 10 Korean cumacean species have been reported, which belongs to five genera (*Campylaspis*, *Diastylis*, *Dimorphostylis*, *Bodotria* and *Vaunthompsonia*) in three families.

As part of the continuous taxonomic studies on Korean cumaceans, we examined cumacean specimens collected from the Yellow Sea (from 1996 to 1997) and other Korean waters (from 1993 to 1996). Three species of them are turned out to be new records of Korean fauna: *Hemilamprops*

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*californicus* Zimmer, 1936, *Bodotria parva* Calman, 1907 and *Iphinoe sagamiensis* Gamô, 1958. In this paper, we redescribe them in detail with figures. Drawings and measurements were made with the aid of the drawing tube. All specimens examined are deposited in the Department of Biology, Dankook University.

## RESULTS

Order Cumacea Krøyer, 1846 올챙이새우 목

Family Lampropidae Sars, 1878 삼꼬리올챙이새우 과 (신칭)

Genus *Hemilamprops* Sars, 1883 가시삼꼬리올챙이새우 속 (신칭)

***Hemilamprops californicus* Zimmer**, 1936 한줄가시삼꼬리올챙이새우 (신칭) (Figs. 1-3)

*Hemilamprops* (?) *californica* Zimmer, 1936, p. 429, fig. 36.

*Lampropoides californicus*: Harada, 1959, p. 240, fig. 6.

*Hemilamprops californica*: Gamô, 1962, p. 199, fig. 36; 1963, p. 87; 1967b, p. 265; Given, 1964, p. 286, 287.

*Hemilamprops californiensis*: Lie, 1969, p. 21.

*Hemilamprops californicus*: Băcescu, 1988, p. 7.

**Material examined.** 1 ♂, Chisep'ô, Kôjedo Is., June 8, 1995, B.J. Kang; 10 ♂♂, 7 ♀♀, Samch'ök, Aug. 6, 1995, B.J. Kang; 1 ♂, 1 juv., Chôngja, Ulsan, Aug. 6, 1995, B.J. Kang; 15 ♂♂, 2 ♀♀, Nokdo Is., Poryöng, June 7, 1997, C.M. Lee.

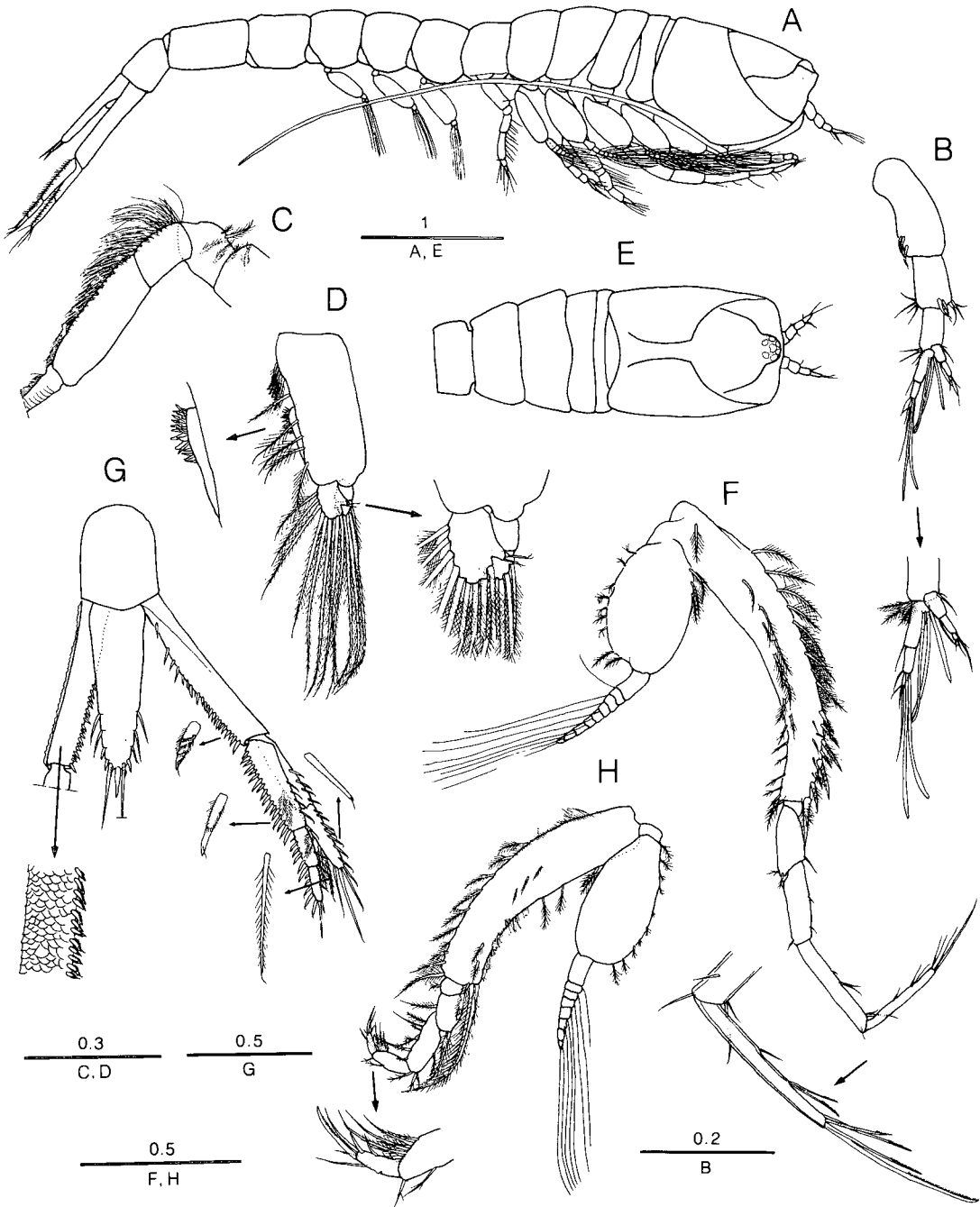
**Description. Adult male:** Body (Fig. 1A) about 5 mm long, excluding pseudorostrum, telson and uropods. Shape of carapace (Fig. 1E) almost rectangular in dorsal view. Carapace (Figs. 1A, E) about 1/5 of body length, about 1.2 times as long as its width and 1.36 times as long as its depth; with a pair of curved ridges on each side, approaching each other in the middle and subparallel in posterior half. Pseudorostral lobes (Fig. 1E) broadly truncated. Ocular lobe round, with 7 lenses.

All free thoracic somites (Figs. 1A, E) smooth, about 1.36 times as long as carapace and about 1/4.5 of body length. First somite very short; third somite largest, slightly longer than combined length of first and second somites; fourth somite slightly longer than fifth one. Abdomen (Fig. 1A) posteriorly narrowed, subequal to cephalothorax in length. Fifth somite longest. First to third somite each with a pair of pleopods. Sixth somite about 0.64 times as long as fifth one. Telson (Fig. 1G) about 1.5 times as long as sixth somite of abdomen, furnished with usually 4 lateral spines, and with 2 dorsal subterminal spines and 3 terminal spines. But other specimens with 3-5 lateral spines.

Peduncle of antennule (Fig. 1B) 3-segmented; first segment about 1.12 times as long as remaining segments together, with 3 setae on inner angle; third segment about 0.86 times as long as second one. Main flagellum 3-segmented; first segment with 3 short aesthetascs at proximal part; second segment with 2 subequal aesthetascs; third segment very short, with 3 distal setae (one long and the others short). Accessory flagellum 3-segmented, about 0.66 times as long as main flagellum.

Flagellum of antenna (Figs. 1A, C) long, not exceeding fifth segment of abdomen.

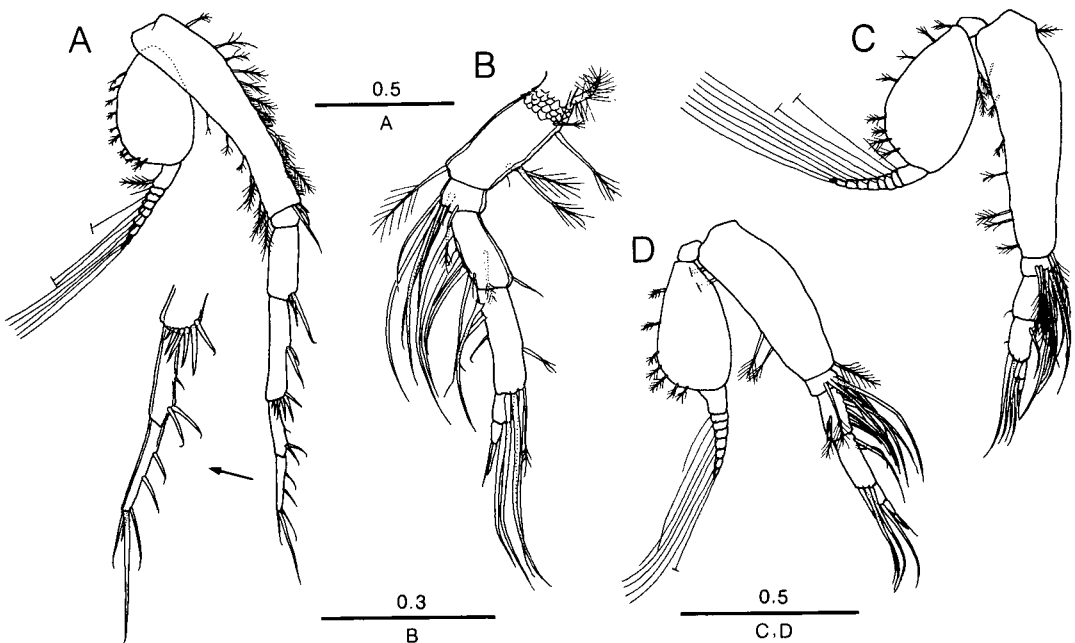
Basis of third maxilliped (Fig. 1H) about 1.52 times as long as remaining segments together, almost evenly broad; inner margin with about 10 plumose setae and numerous hairs; outer angle with 4 plumose setae (two long and the others very short); outer margin with 3 plumose setae and



**Fig. 1.** *Hemilamprops californicus* Zimmer, 1936, male: A, lateral view of body; B, antennule; C, antenna; D, first pleopod E, cephalothorax, dorsal; F, first pereopod; G, uropods, telson and last abdominal somite; H, third maxilliped. Unit of scales in mm.

numerous hairs; ventral surface with several plumose setae. Ischium slightly shorter than half of merus, with a plumose seta on inner margin. Merus about 0.71 times as long as carpus, with a plumose seta on inner margin and 2 plumose setae on outer angle. Carpus about 1.31 times as long as propodus, with 7 plumose setae on inner margin and 4 plumose seta on outer margin. Propodus about 1.76 times as long as dactylus, with 8 plumose setae on distal part of inner margin and 2 plumose seta on distal part of outer margin. Dactylus with 4 simple setae (two of them very short) on inner margin and 2 distal setae; longest seta about 1.46 times as long as propodus. Exopod well developed, with about 10 plumose setae on outer margin.

First peraeopod (Fig. 1F) robust. Basis subequal to remaining segments together in length, with 8 strong spiniform plumose setae distally on inner margin and 9 plumose setae proximally on inner margin. But other specimen with 6 spiniform plumose setae and 10 plumose setae. Ischium very short, with a plumose seta on inner margin. Merus about 0.74 times as long as carpus. Carpus about 0.75 times as long as propodus. Propodus 1.18 times as long as dactylus. Dactylus with 3 inner setae and 4 terminal setae. Second peraeopod (Fig. 2A) robust. Basis about 0.75 times as long as remaining segments together; inner margin with 9 plumose setae and numerous hairs; inner angle with 3 simple setae (one long and the others short); outer margin with 8 plumose setae and numerous hairs. Ischium about 0.27 times as long as merus. Merus about 0.71 times as long as carpus, with 3 simple setae (one long and the others short) on inner angle. Carpus about 1.81 times as long as propodus, with 2 simple setae on medial part of inner margin and 6 simple setae on inner angle. Propodus subequal to dactylus in length, with 3 simple setae on inner margin. Dactylus with 3 simple terminal setae (one of them very long) and 2 simple setae on inner margin. Basis of third



**Fig. 2.** *Hemilamprops californicus* Zimmer, 1936, male: A, second peraeopod; B, fifth peraeopod; C, third peraeopod; D, fourth peraeopod. Unit of scales in mm.

peraeopod (Fig. 2C) about 1.78 times as long as remaining segments together; exopod well developed, with about 8 plumose setae on outer margin. Basis of fourth peraeopod (Fig. 2D) about 1.13 times as long as remaining segments together; exopod well developed, with about 7 plumose setae on outer margin. Basis of fifth peraeopod (Fig. 2B) about 0.54 times as long as remaining segments together.

Basis of first pleopod (Fig. 1D) about 4.2 times as long as inner ramus, with 3 short proximal plumose setae and 5 plumose setae on inner margin; outer ramus 2-segmented, with 5 long plumose setae; inner ramus unsegmented, with 8 long plumose setae.

Peduncle of uropod (Fig. 1G) slightly longer than length of telson, with about 21 inner spines. But other specimens with 20-22 inner spines. Endopod of uropod 3-segmented, slightly longer than length of peduncle; first segment about 0.54 times as long as peduncle, with about 17 inner spines and 5 outer spines, But other specimens with 16-19 inner spines. Second segment about 0.39 times as long as first one, with about 6 inner and 2 outer spines. Third segment about 0.88 times as long as second one, with about 4 inner, 1 outer spine and 3 terminal spines. Exopod of uropod 2-segmented, about 0.88 times as long as first segment of endopod; first segment with 2 inner plumose setae and 4 outer spines; second segment with 4 inner plumose setae, 8 outer spines and 3 long terminal spines.

**Adult female:** Body (Fig. 3A) about 4.5 mm long, excluding pseudorostrum, telson and uropod. Shape of carapace (Fig. 3E) almost oval in dorsal view. Carapace (Figs. 2A, E) about 1/5 of body length, about 1.06 times as long as its width and 1.41 times as long as its depth. A pair of curved ridges furnished with on each side as in male. Pseudorostral lobes (Fig. 3E) broadly truncated. Ocular lobe round, with 8 lenses.

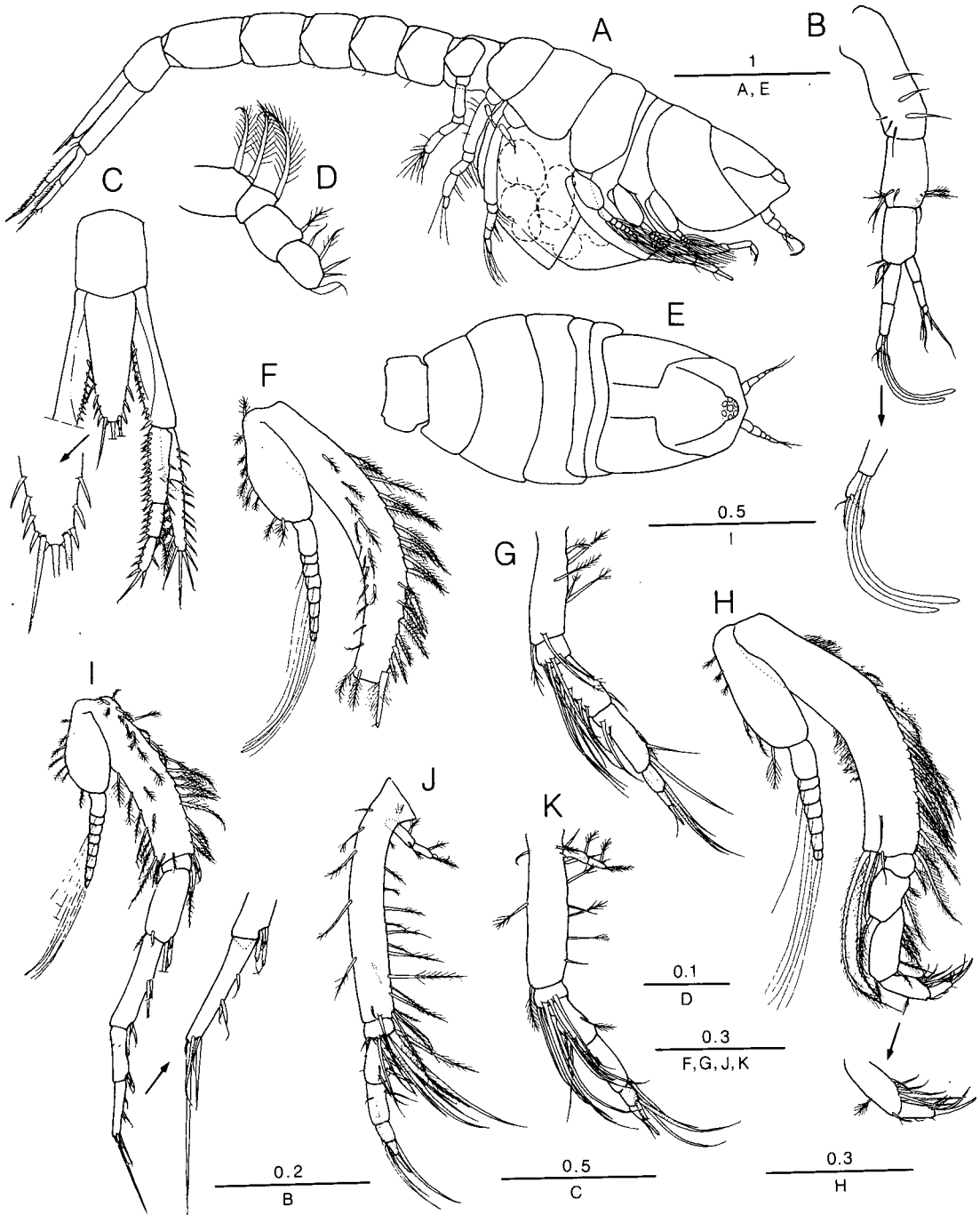
All free thoracic somites (Figs. 3A, E) smooth, about 1.62 times as long as carapace and about 1/3 of body length. First somite very short; third somite largest. Abdomen (Fig. 3A) narrowing posteriorly, slightly shorter than cephalothorax. Fifth somite longest. Sixth somite about 0.59 times as long as fifth one. Telson (Fig. 3C) about 1.44 times as long as sixth somite of abdomen, furnished with 3-4 lateral spines, and with 2 dorsal subterminal spines and 3 terminal spines.

Peduncle of antennule (Fig. 3B) 3-segmented; first segment about 1.07 times as long as remaining segments together, with 6 proximal setae; third segment about 0.86 times as long as second one. Main flagellum 3-segmented; second segment with 2 subequal aesthetascs; third segment very short, with 3 distal setae. Accessory flagellum 3-segmented, about 0.64 times as long as main flagellum.

Flagellum of antenna (Fig. 3D) 4-segmented.

Basis of third maxilliped (Fig. 3H) about 1.52 times as long as remaining segments together, almost evenly broad; inner margin with 15 plumose setae and numerous hairs; outer angle with 4 plumose setae; outer margin with numerous hairs on median part. Ischium slightly shorter than half of merus, with a plumose seta on inner margin. Merus about 0.77 times as long as carpus, with 2 plumose setae on inner margin and a plumose seta on outer angle. Carpus about 1.36 times as long as propodus, with 6 plumose setae on inner margin and a plumose seta on outer angle. Propodus about 1.84 times as long as dactylus. Exopod well developed, with 6 plumose setae on outer margin.

First peraeopod (Fig. 3F) robust; basis with 7 strong spiniform plumose setae distally on inner margin and about 10 plumose setae proximally on inner margin; ventral surface with several plumose setae. Second peraeopod (Fig. 3I) robust. Basis about 0.56 times as long as remaining segments



**Fig. 3.** *Hemilamprops californicus* Zimmer, 1936, female: A, lateral view of body; B, antennule; C, uropods, telson and last abdominal somite; D, antenna; E, cephalothorax, dorsal; F, basis of first pereopod; G, fifth pereopod; H, third maxilliped; I, second pereopod; J, third pereopod; K, fourth pereopod. Unit of scales in mm.

together; inner margin with about 12 plumose setae; inner angle with 3 simple setae; outer margin with 8 plumose setae; ventral surface with about 12 plumose setae. Ischium about 0.18 times as long as merus. Merus about 0.76 times as long as carpus, with 3 simple setae (one long and the others short) and a simple seta on distal margin. Carpus about 1.74 times as long as propodus, with 2 simple setae on medial part of inner margin and 6 simple setae on inner angle. Propodus subequal to dactylus in length, with 3 simple setae on inner margin. Dactylus with 5 simple terminal setae (one of them very long) and 3 simple setae on inner margin. Basis of third peraeopod (Fig. 3J) about 1.65 times as long as remaining segments together; exopod well developed, with 2-segmented rudimentary exopod. Basis of fourth peraeopod (Fig. 3K) slightly short than length of remaining segments together, with 2-segmented rudimentary exopod. Basis of fifth peraeopod (Fig. 3G) about 0.53 times as long as remaining segments together.

Peduncle of uropod (Fig. 3C) slightly longer than length of telson, with about 11 inner spines. Endopod of uropod 3-segmented, slightly longer than length of peduncle; first segment with about 14 inner spines and 4 outer spines; second segment with about 5 inner and 3 outer spines; third segment with 3 inner, 1 outer spine and 3 terminal spines. Exopod of uropod 2-segmented, about 0.7 times as long as first segment of endopod; first segment with 2 inner plumose setae and 4 outer spines; second segment with 4 inner plumose setae, 7 outer spines and 3 long terminal spines.

**Remarks:** This species was placed in a new genus *Lampropoides* which was established by Harada (1959) based on the following two characters: proportional length of segments of uropodal endopod and number of terminal or lateral spines of telson. However, Gamô (1962, 1967) did not agree to classification suggested by Harada, because he considered that differences of the above mentioned characters were inadequate to separate the new genus *Lampropoides* from the genus *Hemilamprops*. We followed Gamô's classification.

*Hemilamprops californicus* is similar to *Hemilamprops japonicus* Harada, 1959 in general appearance. However, *H. japonicus* has 2 curved ridges on each side of carapace, while *H. californicus* has a curved ridge. Additionally, *H. californicus* and *Hemilamprops pacificus* (Harada, 1959) have common feature that both species are furnished with a curved ridge on each side of carapace, but the latter is distinguished from the former in that the first segment of uropodal exopod is shorter than 1/2 of the first segment of uropodal exopod in length (in *H. californicus*, it is about 2/3).

Our specimens are well accorded with the previous descriptions of *H. californicus* by other authors (Zimmer, 1936; Harada, 1959; Gamô, 1962). But our female specimens differ from original description by Zimmer (1936) in some features. In Zimmer's female specimen, carapace is furnished with a pair of curved ridges on each side, which is connected with each other in the middle portion. Whereas Harada's (1959), Gamô's (1962) and our specimens are not connected and run subparallel near the posterior margin of the carapace. In addition, while the number of the lateral spines on the telson is furnished with 3 spines in Zimmer's and 5 spines in Gamô's, it shows variable (3, 4, or 5) in our specimens.

**Distribution:** Korea (East Sea), Japan (Sagami Bay), California.

Family Bodotriidae Scott, 1901 참올챙이새우 과

Genus *Bodotria* Goodsir, 1843 참올챙이새우 속

***Bodotria parva* Calman, 1907** 두줄참올챙이새우 (신칭) (Figs. 4-7)

*Bodotria parva* Calman, 1907, p. 18, figs. 16-18; Stebbing, 1913, p. 28; Harada, 1967, p. 238, fig. 7; Băcescu, 1988, p. 43.

*Bodotria chinensis* Lomakina, 1960, p. 96, fig. 3.

**Material examined.** 1 ♂, Tadaep'ŏ, Mar. 14, 1993, B.J. Kang; 49 ♂♂, 18 ♀♀, Sapsido Is., Poryŏng, May 9, 1993, B.J. Kang; 43 ♂♂, 68 ♀♀, Dŏkjŏkdo Is., Sep. 23-25, 1995, K.S. Lee; 5 ♀♀, Anmyŏndo Is., Sep. 14, 1996, C.M. Lee; 1 ♂, Much'angp'ŏ, July 14 1997, C.M. Lee; 3 ♂♂, 3 ♀♀, Taech'ŏn Port, Poryŏng, July 15, 1997, C.M. Lee.

**Description. Adult male:** Body (Fig. 4A) about 3.8 mm long, excluding pseudorostrum and uropods. Shape of carapace (Fig. 4D) almost subtriangular in dorsal view, with posterior part stouter than anterior part. Carapace (Figs. 4A, D) about 1/4 of body length, about 1.54 times as long as its width and 1.7 times as long as its depth; surface (Fig. 4B) covered with minute reticulated patterns furnished with a pair of dorso-lateral carinae (upper ridges) and a pair of lateral longitudinal ridges (lower ridges) on each side. Dorso-median carina well-marked over whole length of carapace. A pair of dorso-lateral carinae well-developed and connected with each other in dorsal portion. A pair of lateral longitudinal ridges somewhat curved, almost parallel to dorso-lateral carina and reached at posterior margin of carapace respectively. Antennal notch and antero-lateral angle (Fig. 3A) prominent. Pseudorostral lobes (Fig. 4A) broadly truncated and met in front of ocular lobe. Ocular lobe subtriangular, with 8 lenses.

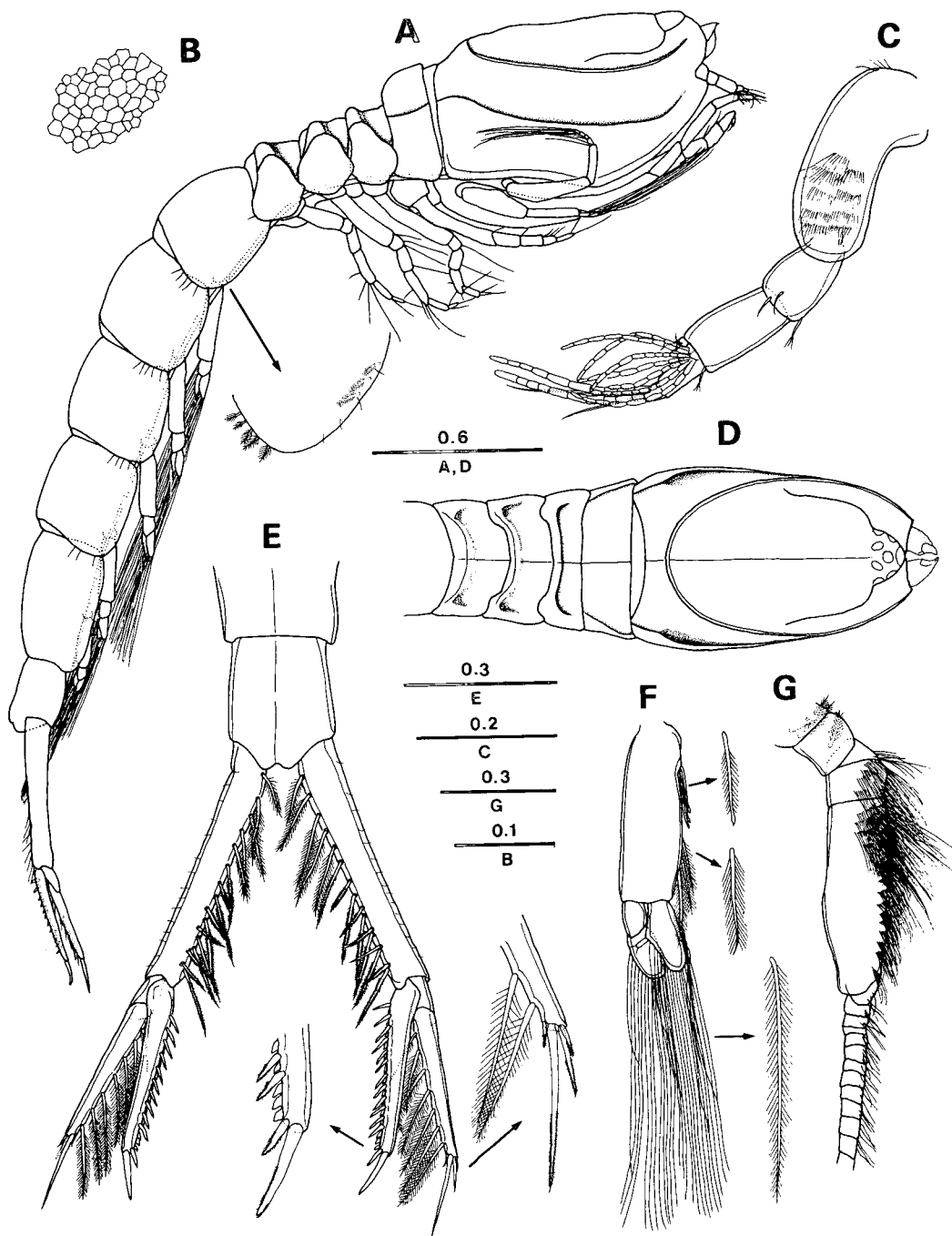
All free thoracic somites (Figs. 4A, D) about 0.78 times as long as carapace and about 1/5 of body length. Dorso-median carina elevated and dorso-lateral carina well-marked on all somites. First somite very short and only exposed as a narrow strip; second somite slightly larger than fourth one; fifth somite largest, slightly shorter than combined length of second and third somites. Abdomen (Fig. 4A) very plump and about 1.25 times as long as cephalothorax. Fifth somite longest. Sixth somite about 0.57 times as long as fifth one. First somite to fourth somites with 3-5 tiny plumose setae on posterior margin and 2-3 tiny plumose setae on ventral margin.

Antennular peduncle (Fig. 4C) 3-segmented; first segment about 1.27 times as long as remaining segments together, with several rows of numerous sensory hairs; third segment about 1.44 times as long as second one. Main flagellum 2-segmented; first segment with 7 short aesthetascs at proximal part; second segment with 2 subequal aesthetascs and 2 long distal setae. Accessory flagellum very minute.

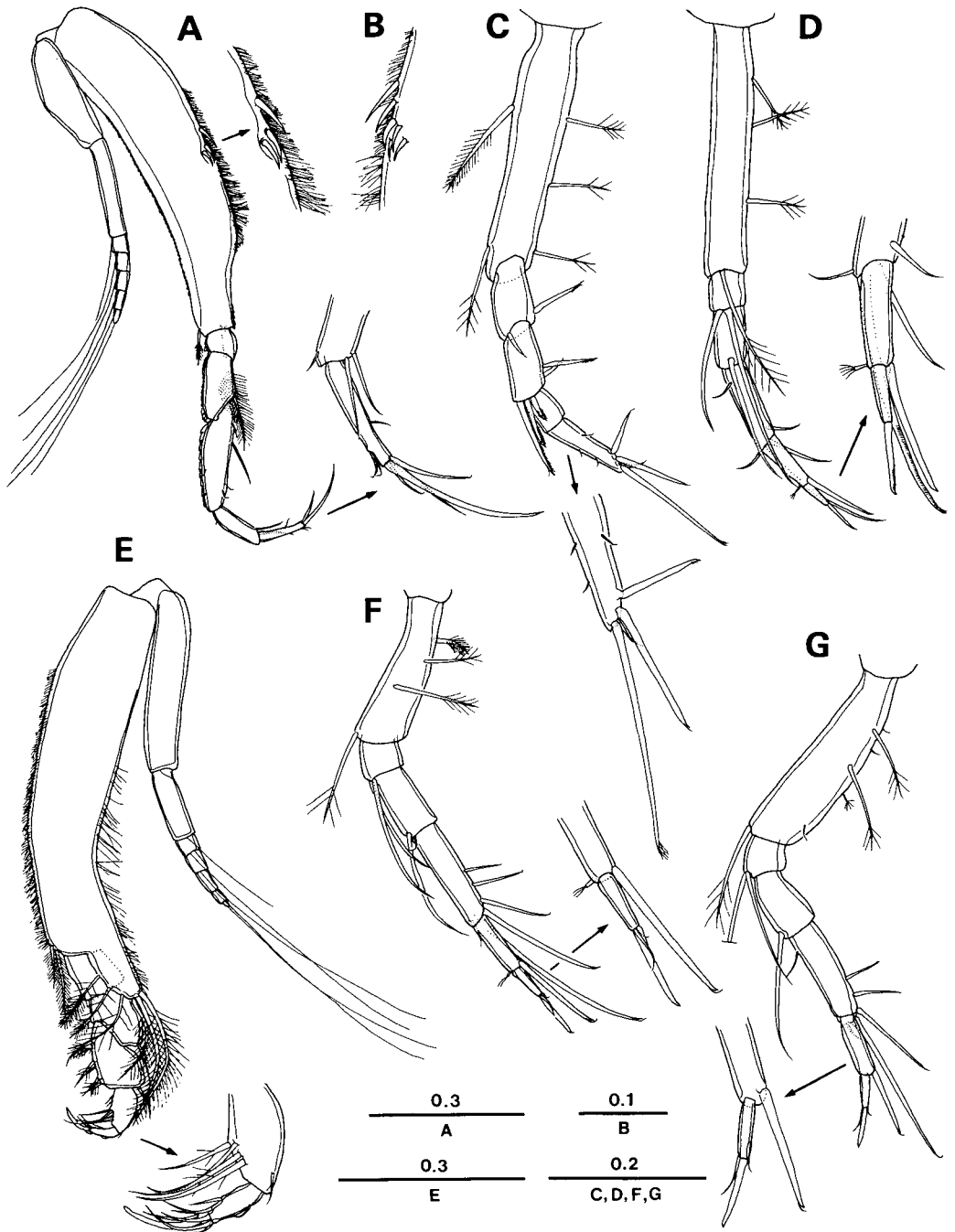
Flagellum of antenna (Fig. 4G) very long, extending beyond last abdominal somite; its peduncle 5-segmented, with 3 plumose setae and many rows of numerous sensory hairs.

Basis of third maxilliped (Fig. 5E) about 1.72 times as long as remaining distal segments together and with numerous hairs on inner and outer margins. Outer angle of basis very inflated, reaching to about 1/3 of merus and with 6 plumose setae; inner angle with 2 plumose setae. Ischium slightly shorter than merus. Merus subequal to carpus and with a plumose seta each on inner and outer angles. Carpus with 6 plumose setae on inner margin and a plumose seta on outer angle. Propodus slightly shorter than carpus. Dactylus about 0.63 times as long as propodus, with 8 setae and a distal





**Fig. 4.** *Bodotria parva* Calman, 1907, male: A, lateral view of body; B, integument of carapace; C, antennule; D, cephalothorax, dorsal; E, uropods and last abdominal somite, dorsal; F, first pleopod; G, antenna. Unit of scales in mm.



**Fig. 5.** *Bodotria parva* Calman, 1907, male: A, first pereopod (left); B, medial part of first pereopod (right); C, second pereopod; D, third pereopod; E, third maxilliped; F, fifth pereopod; G, fourth pereopod. Unit of scales in mm.

spine; distal spine about 1.22 times as long as propodus.

Basis of first pereopod (Figs. 5A, B) about 1.29 times as long as remaining distal segments together, with 3 (in left) and 6 (in right) spines and numerous hairs medially on inner margin; its distal margin with a short plumose seta and a long plumose seta. But other specimens with 2-3 and 4-6 spines respectively. Ischium subequal to half of merus. Carpus about 1.75 times as long as merus. Propodus slightly longer than half of carpus, with a short seta on outer margin and 2 long distal setae. Dactylus about 0.92 times as long as propodus, with 2 outer setae, inner setae and 4 distal setae (one of them very long); longest about 1.53 times as long as propodus.

Basis and ischium of second pereopod (Fig. 5C) fused and subequal to remaining segments together, with 5 plumose setae. Merus subequal to carpus. Dactylus about 2.12 times as long as propodus, with 3 large spines and a small spine on distal end. Basis of third pereopod (Fig. 5D) about 0.9 times as long as remaining segments together. Basis of fourth pereopod (Fig. 5G) about 0.68 times as long as remaining segments together. Basis of fifth pereopod (Fig. 5F) about 0.5 times as long as remaining segments together.

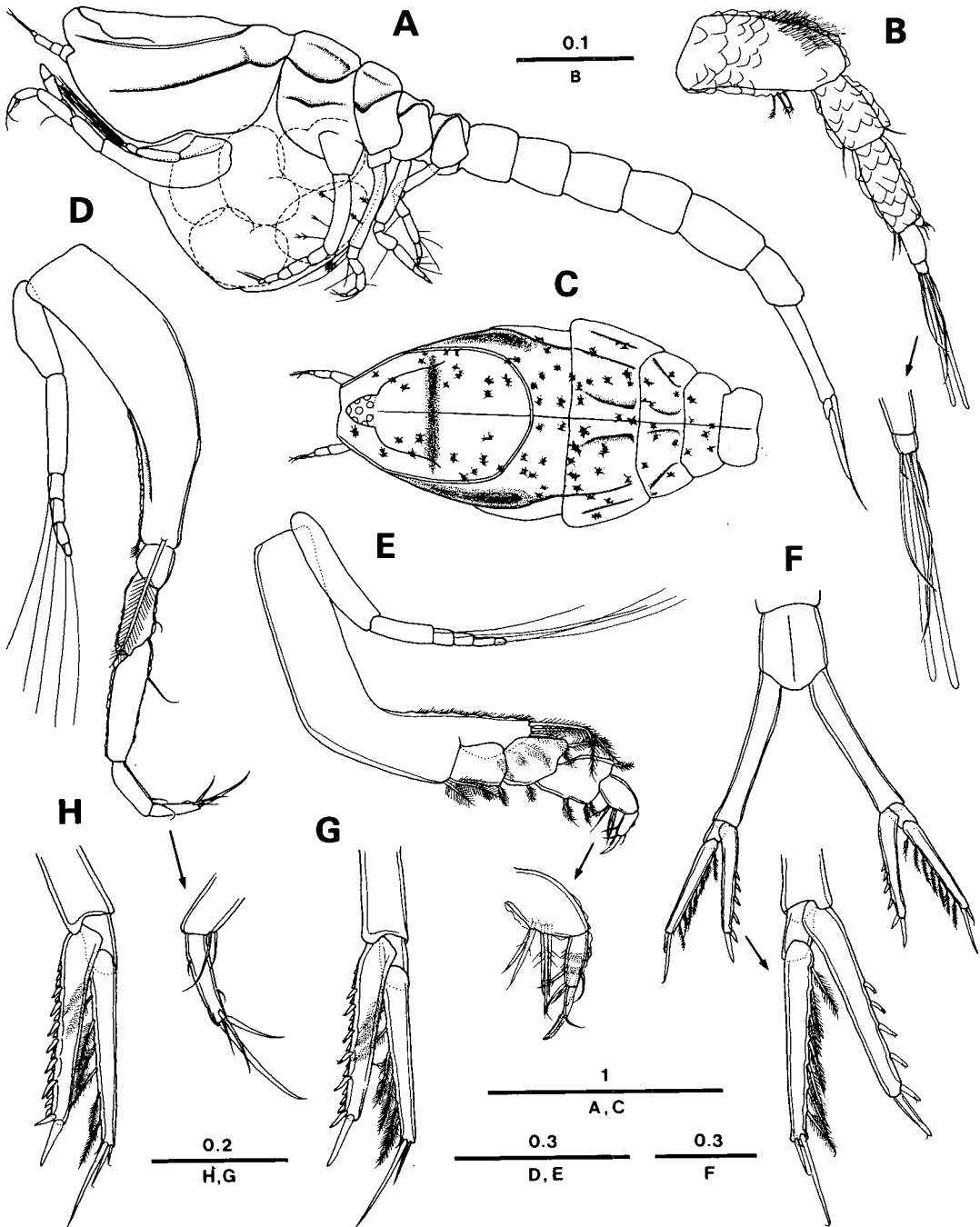
Basis of first pleopod (Fig. 4F) about 2.24 times as long as outer ramus, with 3 plumose setae (with round end) and 3 plumose setae on inner margin; outer ramus 2-segmented; inner ramus unsegmented; both rami with numerous long plumose setae.

Peduncle of uropod (Fig. 4E) strong, about 1.93 times as long as last abdominal segment; its inner margin with 5 plumose setae proximally, 11 pectinated setae distally. Endopod of uropod unsegmented, serrated on inner margin, about 2/3 of length of peduncle and with about 10-12 inner spines and 2 terminal spines. Exopod of uropod 2-segmented, subequal to endopod in length; first segment about 1/4 of length of second one; second segment furnished with 7 inner plumose setae and 4 terminal spines (one long and the others short).

**Adult female:** Body (Fig. 6A) about 3.58 mm long, excluding pseudorostrum and uropod. Shape of carapace (Fig. 6C) oval in dorsal view. Carapace (Figs. 6A, C) about 1/3.5 of body length, about 1.17 times as long as its width and 1.77 times as long as its depth; with a pair of dorso-lateral carinae (upper ridges) and a pair of lateral longitudinal ridges (lower ridges) on each side. Dorso-median carina well-marked over whole length of carapace. A pair of dorso-lateral carinae well-developed and connected with each other in dorsal portion. A pair of lateral longitudinal ridges somewhat curved, almost parallel to dorso-lateral carina and reached at posterior margin of carapace respectively. Antennal notch and antero-lateral angle (Fig. 6A) prominent. Pseudorostral lobes (Fig. 6C) broadly truncated, with 8 lenses.

All free thoracic somites (Figs. 6A, C) about 0.81 times as long as carapace and about 1/4.5 of body length. Dorso-median carina elevated and dorso-lateral carina well-marked on all somites. First somite concealed; second somite largest, slightly shorter than combined length of third and fourth somites and with 2 lateral ridges; third somites with a lateral ridge; fifth somite slightly longer than third and fourth one. Abdomen (Fig. 6A) about 0.9 times as long as cephalothorax. Fifth somite longest. Sixth somite about 0.69 times as long as fifth one.

Antennular peduncle (Fig. 6B) 3-segmented; first segment subequal to remaining segments together, with numerous sensory hairs on outer margin; third segment about 1.26 times as long as second one. Main flagellum 2-segmented; second segment with 2 subequal aesthetascs and a short, 2 long distal setae. Accessory flagellum very minute.



**Fig. 6.** *Bodotria parva* Calman, 1907; female: A, lateral view of body; B, antennule; C, cephalothorax, dorsal; D, first pereopod; E, third maxilliped; F, uropods and last abdominal somite, dorsal; G, H, uropodal endopod and exopod of other specimens. Unit of scales in mm.

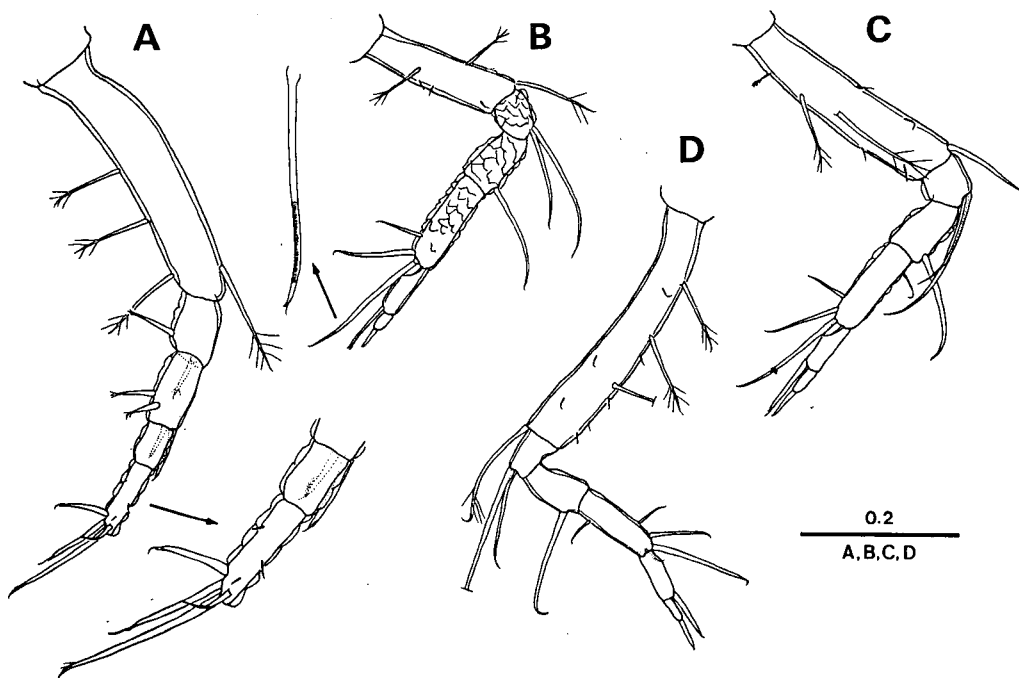
Basis of third maxilliped (Fig. 6E) about 1.42 times as long as remaining distal segments together. Outer angle of basis very inflated, reaching to about 1/2 of merus and with 6 plumose setae; inner angle with 2 plumose setae. Ischium subequal to merus and carpus respectively. Propodus slightly shorter than carpus. Dactylus about 0.57 times as long as propodus.

Basis of first peraeopod (Fig. 6D) slightly shorter than remaining distal segments together, with a short plumose seta and a long plumose seta on distal margin. Ischium subequal to half of merus. Carpus about 1.22 times as long as merus. Propodus about 0.72 times as long as carpus. Dactylus about 0.9 times as long as propodus.

Basis and ischium of second peraeopod (Fig. 7A) fused and subequal to remaining segments together, with 4 plumose setae. Basis of third peraeopod (Fig. 7D) subequal to remaining segments together. Basis of fourth peraeopod (Fig. 7C) about 0.78 times as long as remaining segments together. Basis of fifth peraeopod (Fig. 7B) about 0.52 times as long as remaining segments together.

Peduncle of uropod (Figs. 6F, G, H) strong, about 1.93 times as long as last abdominal segment. Endopod of uropod unsegmented, about 2/3 of length of peduncle and with 4 inner spines and 2 terminal spines. But other spines with 4-6 inner spines. Exopod of uropod 2-segmented, slightly longer than length of endopod; second segment furnished with 7 inner plumose setae and 4 terminal spines (one long and the others short).

**Remarks.** This species is similar to *Bodotria ozolinshi* Tzareva and Vassilenko, 1993 from sea of Japan. Both species have common feature such as the similar carapace bearing two pairs of ridges



**Fig. 7.** *Bodotria parva* Calman, 1907, female: A, second peraeopod; B, fifth peraeopod; C, third peraeopod; D, fourth peraeopod. Unit of scales in mm.

(upper and lower) on each side. However, in the adult female of *B. ozolinshi* carapace bear another a pair of short ridges and lower ridges do not reach at the posterior of the carapace, while the short ridges do not appear and the lower ridges reach in *Bodotria parva*. In addition, while the inner margin of uropodal endopod is furnished 4 spines in the adult male of *Bodotria ozolinshi*, that of *Bodotria parva* is furnished about 10-12 ones.

Our specimens are well accorded with the previous descriptions of *Bodotria parva* Calman, 1907 by other authors (Calman, 1907; Lomakina, 1960; Harada, 1967). Some of our specimens show several individual variations: (1) the peduncle of uropod is furnished with 4, 5 or 6 inner spines in some females; (2) the basis of left first peraeopod is furnished with 2-3 spines and that of right first peraeopod is furnished with 4-6 ones in some males; (3) a pair of lateral longitudinal ridges are not reached at posterior margin of carapace in some males.

**Distribution:** Korea (Yellow and South Sea), China, Japan

*Genus Iphinoe* Bate, 1856 긴허리올챙이새우 속

**Iphinoe sagamiensis** Gamô, 1958 이쁜긴허리올챙이새우 (신칭) (Figs. 8-9)

*Iphinoe sagamiensis* Gamô, 1958, pp. 385, 388, fig. 2; 1960, p. 118, pl. 59, fig. 3; 1962, p. 166, fig. 9; 1963, pp. 80, 86, pl. 14, fig. 15; 1965, p. 533, fig. 695; 1967a, p. 138; Băcescu, 1988, p. 89.

**Material examined.** 1 ♂, Sömang, Chindo Is., July 23, 1994, K.S. Lee; 1 ♂, Nokdo Is., Poryöng, June 7, 1997, C.M. Lee; 1 ♂, Taech'ön Port, Poryöng, July 4, 1997, C.M. Lee.

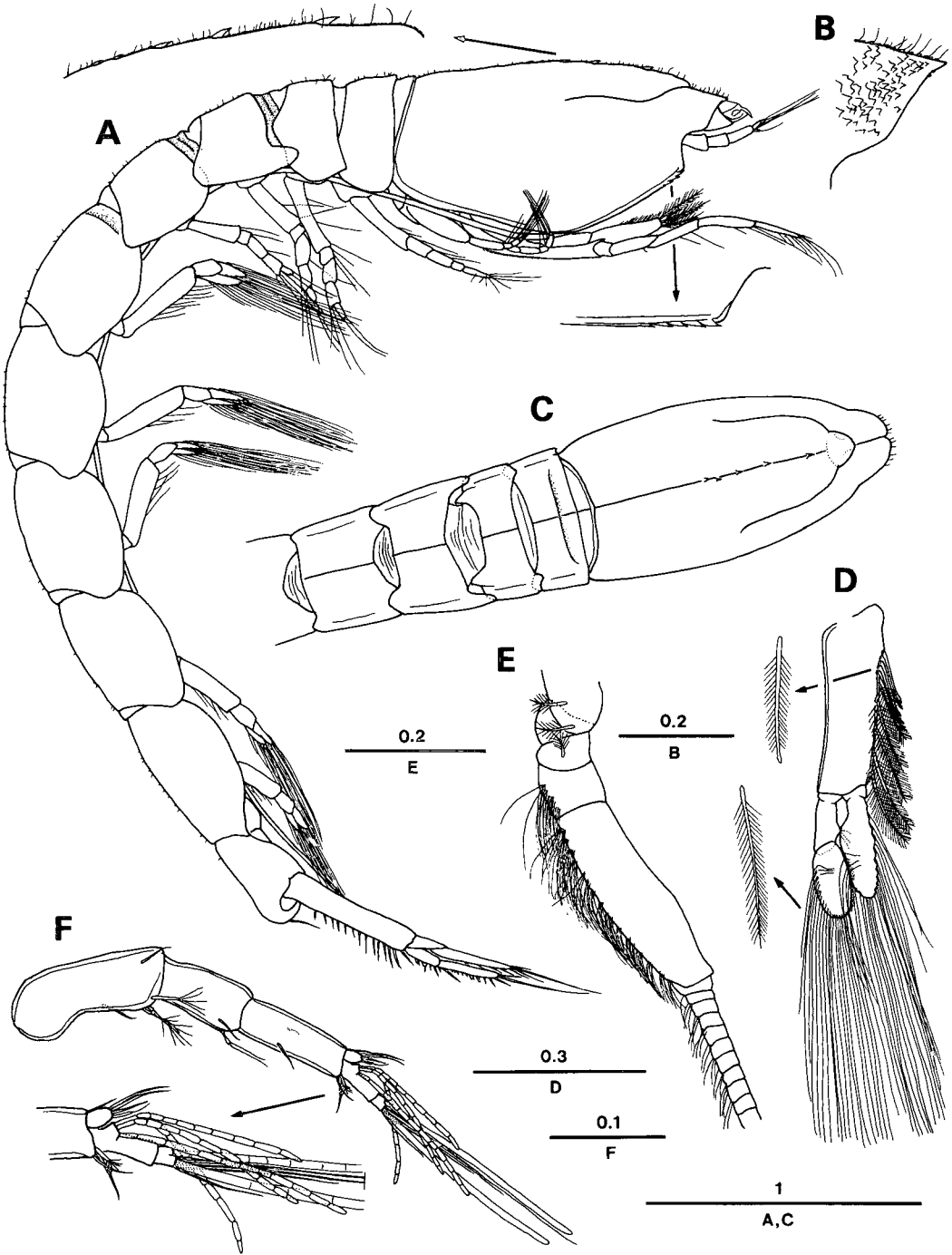
**Description. Adult male:** Body (Fig. 8A) about 5.3 mm long, excluding pseudorostrum and uropods; its surface rough (Figs. 8A, B), with numerous short hairs. Carapace (Figs. 8A, C) about 1/5 of body length, about twice as long as its width and 1.88 times as long as its depth; its shape almost subtriangular in dorsal view. Dorso-median carina well-marked over whole length of carapace. Dorso-medial part of carapace furnished with a forwardly directed tooth on anterior half and about 4 spaced minute teeth on posterior half of frontal lobe. But other specimen with 7 spaced minute teeth. Antero-lateral angle (Fig. 8A) prominent; its apex rounded; its outer margin furnished with about 5 teeth. Pseudorostral lobes (Figs. 8B, C) about 1/9 of carapace length. Ocular lobe prominent.

All free thoracic somites (Figs. 8A, C) about subequal to carapace in length and about 1/5 of body length. Dorso-median carina well-marked on all somites. First somite very short; second and third somite subequal in length and shorter than fourth somite; fifth somite largest. Abdomen (Fig. 8A) very plump and about 1.2 times as long as cephalothorax. Fifth somite longest. Sixth somite about 0.67 times as long as fifth somite.

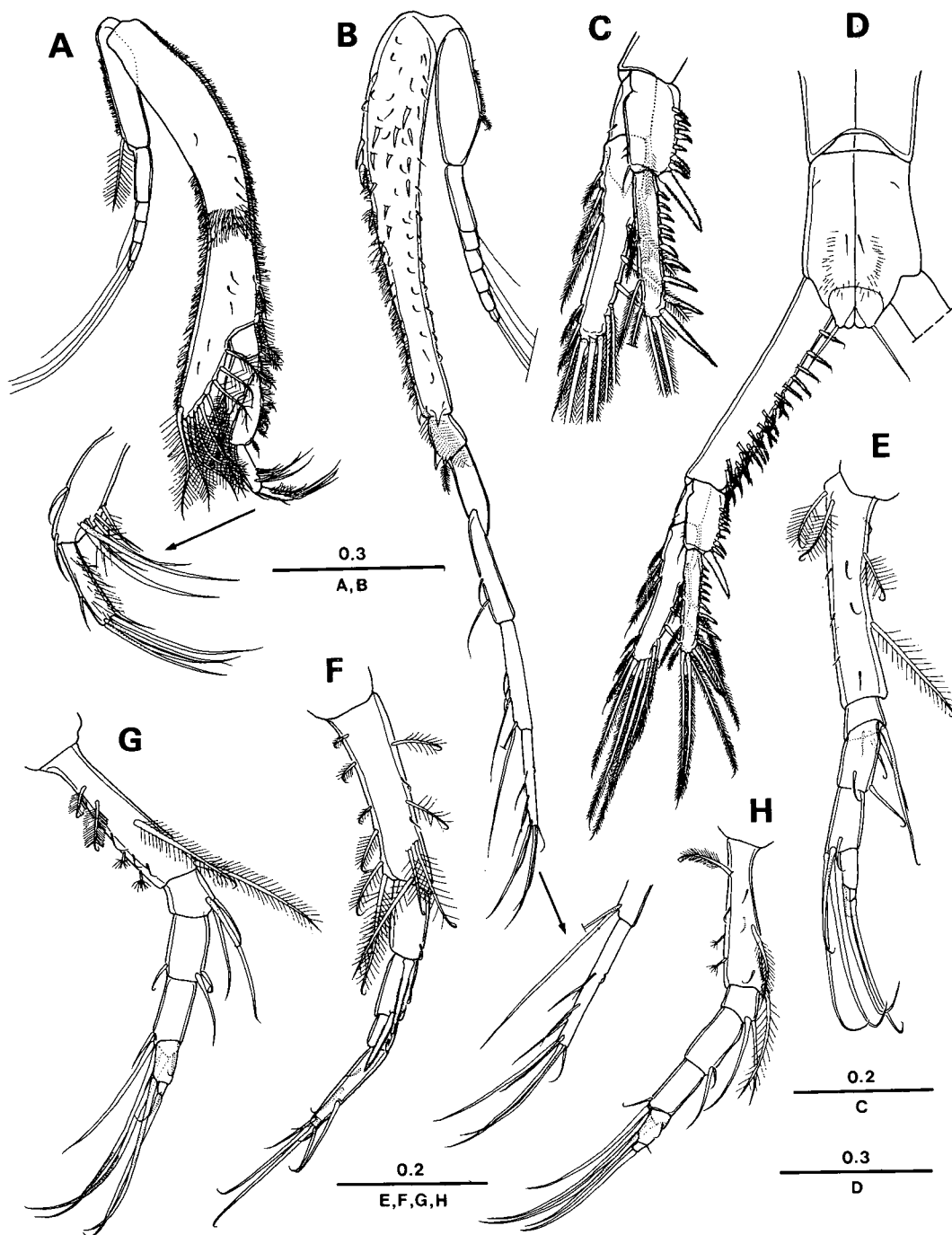
Antennular peduncle (Fig. 8F) 3-segmented; first segment about 0.8 times as long as remaining segments together, with 3 sensory setae and 2 simple setae on distal margin; third segment about 1.28 times as long as second one. Main flagellum 2-segmented; first segment with 4 short aesthetascs at proximal part; second segment with 2 subequal aesthetascs and 2 distal long setae. Accessory flagellum very minute.

Flagellum of antenna (Fig. 8E) very long, extending beyond last abdominal somite; its peduncle 5-segmented, with 3 plumose setae and many rows of numerous sensory hairs.

Basis of third maxilliped (Fig. 9A) about 1.64 times as long as remaining segments together, with numerous hairs on inner and outer margins and 3 rows of numerous hairs on middle part. Outer



**Fig. 8.** *Iphinoe sagamiensis* Gamô, 1958, male: A, lateral view of body; B, pseudostràl lobe, lateral; C, cephalothorax, dorsal; D, first pleopod; E, antenna; F, antennule. Unit of scales in mm.



**Fig. 9.** *Iphinoe sagamiensis* Gamô, 1958, male: A, third maxilliped; B, first pereopod; C, exopod and endopod of uropod, dorsal; D, uropods and last abdominal somite, dorsal; E, third pereopod; F, second pereopod; G, fourth pereopod; H, fifth pereopod. Unit of scales in mm.



angle of basis very inflated, reaching to merus and with 9 plumose setae; inner angle with 2 plumose setae. Ischium slightly shorter than merus, with 2 plumose setae on inner angle. Merus about 1.64 times as long as carpus; its outer angle inflated, reaching to about 1/2 of carpus and with 3 plumose setae; inner angle with 2 plumose setae. Carpus with 5 plumose setae on inner margin and a plumose seta on outer angle. Propodus about 0.8 times as long as carpus. Dactylus about 0.7 times as long as propodus, with numerous hairs, 2 short setae and 4 long setae.

Basis of first peraeopod (Fig. 9B) about 0.93 times as long as remaining segments together, numerous hairs inner margin; its surface with 14 (right first peraeopod) or 17 (left first peraeopod) spines, numerous short setae; its distal margin with a plumose seta and several teeth. Ischium slightly shorter than half of merus, with a short plumose seta and several teeth. Carpus slightly longer than propodus. Dactylus about 0.91 times as long as propodus.

Basis and ischium of second peraeopod (Fig. 9F) fused and about 0.68 times as long as remaining segments together, with 11 plumose setae. Merus about 1.34 times as long as carpus; merus and carpus with a large spine on distal margin respectively. Dactylus about 3.18 times as long as propodus. Basis of third peraeopod (Fig. 9E) subequal to remaining segments together. Basis of fourth peraeopod (Fig. 9G) about 0.78 times as long as remaining distal segments. Basis of fifth peraeopod (Fig. 9H) about 0.72 times as long as remaining distal segments.

Basis of first pleopod (Fig. 8D) about 1.41 times as long as outer ramus, with 4 short plumose setae (with round end) and 5 short plumose setae on inner margin; outer ramus 2-segmented; inner ramus unsegmented; both rami with numerous long plumose setae.

Peduncle of uropod (Fig. 9D) strong, about 1.3 times as long as last abdominal segment, with 26 pectinated spines on inner margin. Endopod of uropod 2-segmented; first segment about 0.3 times as long as peduncle, with 8 inner pectinated spines; second segment 1.52 times as long as first one, with about 10-12 inner pectinated spines, 2 long terminal plumose setae and 4 outer plumose setae. Exopod of uropod 2-segmented; first segment about 0.2 times as long as peduncle, with a inner plumose seta on distal margin; second segment 3.14 times as long as first one, with about 6-8 inner plumose setae, 3 long terminal plumose setae and 6 outer plumose setae.

**Remarks.** This species closely resembles *Iphinoe tenera* Lomakina, 1960 from China. Both species have common feature such as the similar carapace form. But, this species differs from *Iphinoe tenera* in having antero-lateral angle of carapace furnished with several teeth in male. Also, the number and shape of spine furnished in uropod reveal several differences between the two as follows: (1) In *Iphinoe tenera*, the peduncle of uropod is furnished with about 16 spines and 11 plumose setae on the inner margin, while in *Iphinoe sagamiensis*, it is furnished with only about 26 pectinated spines on the inner margin (not furnished with any plumose setae); (2) in *Iphinoe sagamiensis*, the endopod of uropod has more numeral pectinated spines on the inner margin than that of *Iphinoe tenera* (in *Iphinoe sagamiensis*, the first segment of endopod is furnished with about 8 inner pectinated spines and the second segment is furnished with about 10-12 inner pectinated spines, while in *Iphinoe tenera*, the first and second segments is furnished with 5 and 7 ones respectively).

Our specimens are well accorded with the original description of *Iphinoe sagamiensis* by Gamô (1958, 1960) from Japanese waters. However, a few differences are found between ours and Gamô's male specimens. Our specimens are furnished with 5-8 teeth on the outer margin of the antero-lateral angle, while in Gamô's specimen is furnished with 6 ones. In addition, Gamô's male

specimens bear more numeral pectinated spines on the inner margin of the endopod (the first and second segments is furnished with 10 and 16 ones respectively) than ours. Maybe, the number of uropodal spines seems to be variable.

**Distribution:** Korea (Yellow Sea), Japan (Sagami Bay, Kii Peninsula, Amakusa).

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### 한국산 올챙이새우류(갑각 상강, 올챙이새우 목)의 3미기록종

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#### 요 약

1996년부터 1997년 사이에 서해 연안에서 집중적으로 채집된 올챙이새우류와 그 이전에 다른 연안에서도 채집되어 보관 중이던 올챙이새우류를 동정한 결과 Lampropidae 과와 Bodotriidae 과에 속하는 3 한국미기록종이 확인되어 보고한다: *Hemilamprops californicus* Zimmer, 1936, *Bodotria parva* Calman, 1907, *Iphinoe sagamiensis* Gamô, 1958. 이 중에서 *Hemilamprops* 속과 *Iphinoe* 속은 국내에서 처음으로 보고된다.