

Two Species of the Family Bodotriidae (Crustacea, Malacostraca, Cumacea) from Korea

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Two species of bodotriid cumaceans, *Bodotria similis* Calman and *Vaunthompsonia cristata* Bate from Korea are redescribed.

KEY WORDS: Redescription, *Bodotria*, *Vaunthompsonia*, Bodotriidae, Cumacea, Korea

Since Calman's (1911) faunal report of the Cumacea from Korea, there was no study except authors' (Kang and Lee, 1995). In continuation of our taxonomic study on the Korean cumaceans, two species belonging to Bodotriidae are now reported.

The Bodotriidae is one of the 7 families in order Cumacea. The Bodotriidae is separated from others by the following characteristic features: (1) there is no free telson, (2) male has usually five pairs of pleopods, occasionally two (*Mancocuma*) or three (*Leptocuma*) pairs, (3) mandible is narrow at base, (4) endopod of uropod is unsegmented or 2-segmented (Day, 1975, 1978; Gamo, 1967).

Two species, *Bodotria similis* Calman and *Vaunthompsonia cristata* Bate, were collected from 11 localities (Fig. 1) during the period from 1993 to 1995 in Korean waters. They were new to Korean fauna. In this paper two species are redescribed. As a result, 7 cumacean species have been reported in Korean waters. Materials of the present study are deposited in the department of Biology, Dankook University. The collectors are referred when the specimens were not collected by authors.

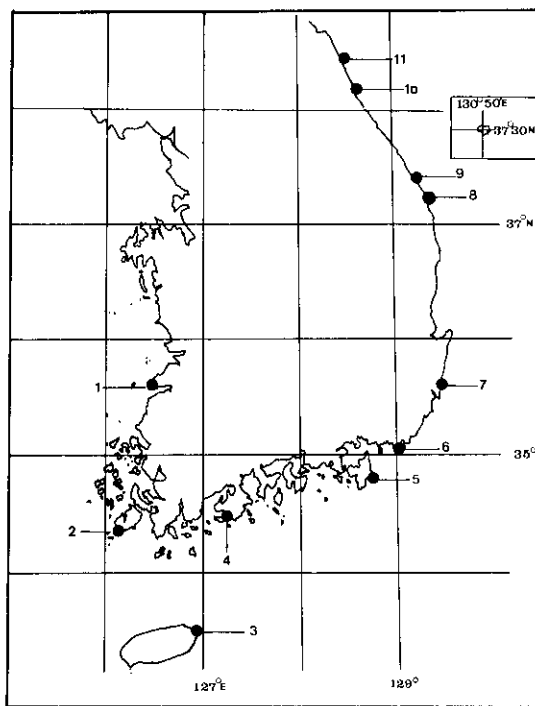


Fig. 1. Sampling localities. 1, Kyökp'o; 2, Sömang, Chindo Is.; 3, Söngsanp'o; 4, Kangdong, Kohüng; 5, Wahyün, Köjedo; 6, Tadaep'o; 7, Chöngja, Ulsan; 8, Imwön; 9, Samch'ök; 10, Sokch'o; 11, Köjin.

Results

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科 (신칭)

Subfamily Bodotriinae Hale, 1944 참올챙이새우 연하과 (신칭)

Bodotria similis Calman, 1907 한줄참올챙이새우 (신칭)

Bodotria similis Calman, 1907, p. 4, pl. 1, figs. 4-9; Gamo, 1962, p. 156, figs. 4-5; 1965, p. 532, fig. 691; 1967, p. 137.

Material examined. 8♂♂, Kyökp'o, 23 May 1993, I. H. Kim; 3♂♂, Sömang, Chindo, 23 July 1994; 3♂♂, Kangdong, Kohöng, 22 Dec. 1993; 1♂, 1♀, Wahyün, Köjedo, 28 June 1993; 1♂, Tadaep'o, 14 March 1993; 7♂♂, Chöngja, Ulsan, 5 Nov. 1994; 50♂♂, 15♀♀, Imwön, 5 Aug. 1994; 50♂♂, 25♀♀, Samch'ök, 6 Aug. 1994; 3♂♂, Sokch'o, 25 June 1993; 1♂, Köjin, 26 June 1993.

Description. Adult male: Body (Fig. 2A) about 3.9 mm long, excluding pseudorostrum and uropod. Carapace (Figs. 2A, B) slightly less than 1/4 of body length, nearly 1.5 times as long as its width; carapace width much more than its depth. Pseudorostral lobes broadly truncated. Dorsomedian and lateral carinae well marked. Antennal notch and antero-lateral angle prominent. Eye lobe darkish and subtriangular, and with 8 ocelli (Fig. 2B).

All free thoracic somites (Figs. 2A, B) about 1/5 of body length. First thoracic somite very short. Second somite about as long as fourth or fifth. Third somite shorter than second. Abdomen (Fig. 2A) rather plump and about 1.3 times of cephalothorax in length. From fifth thoracic to fourth abdominal somites with 2-6 tiny plumose setae on each postero-lateral border.

Antennule (Fig. 2F) 3-segmented; first segment slightly longer than combined length of second and third; third segment somewhat longer than second, with 2-segmented main flagellum and minute accessory flagellum. Flagellum of antenna (Fig. 2G) long, extending beyond last abdominal somite.

Labium (Fig. 3I) divided 2 lobes, subtriangular form, and with tuft of hairs on inner borders. Right mandible (Fig. 3J) with 11 spines and left mandible (Fig. 3K) with 10 spines. Both mandibles boat-shaped. First maxilla (Fig. 3G) with 2 filaments on palp. Second maxilla (Fig. 3H)

formed subrectangle, with a row of spines and hairs on distal portion. Branchial apparatus of first maxilliped (Fig. 3D) with 15 lobules. Second maxilliped (Fig. 3E) with long plumose setae on inner border. Basis of third maxilliped (Fig. 2C) about 2.4 times of remaining distal segments.

Basis of first peraeopod (Fig. 2D) about 1.6 times as long as remaining distal segments, with 5 spines on middle of inner edge. Carpus about twice as long as merus, with 1 long seta and many hairs on inner border; carpus width about 1/3 of its length. Basis and ischium of second peraeopod (Fig. 2E) fused and shorter than 1.4 times of remaining distal segment. Carpus with 5 strong spines on distal end. Dactylus about twice as long as propodus, with 4 terminal spines; each spine unequal in length and longest spine about 1.5 times of dactylus length. Basis of third peraeopod (Fig. 3A) nearly as long as remaining distal segments, with 1 long plumose seta on distal end. Basis of fourth peraeopod (Fig. 3B) nearly 0.73 times as long as remaining distal segments. Basis of fifth peraeopod (Fig. 3C) nearly 0.57 times as long as remaining distal segments. Outer ramus of second pleopod (Fig. 3F) 2-segmented and inner ramus unsegmented. Both rami with long plumose setae.

Peduncle of uropod (Fig. 2H) somewhat longer than twice of last abdominal somite, with 10 plumose setae and 11 long spines on inner border. Endopod of uropod slightly longer than half of peduncle, with 11 spines on serrated inner border 2 terminal spines on distal end. Exopod of uropod 2-segmented, slightly longer than endopod, with 6 plumose setae on inner border 2 short spines and 1 long spine on distal end.

Ovigerous female: Body (Fig. 4A) about 2.7 mm long, excluding pseudorostrum and uropod. Integument calcified and covered finely reticulated patterns (Fig. 4C). Carapace (Figs. 4A, B) slightly longer than 1/4 of body length; carapace length nearly 1.17 times as long as its width; carapace width about 1.4 times as wide as its depth. Lateral carinae well marked on both sides of carapace. Antennal notch concave triangularly, and antero-lateral angle prominent and acute.

All free thoracic somites (Figs. 4A, B) slightly shorter than carapace length, with well marked

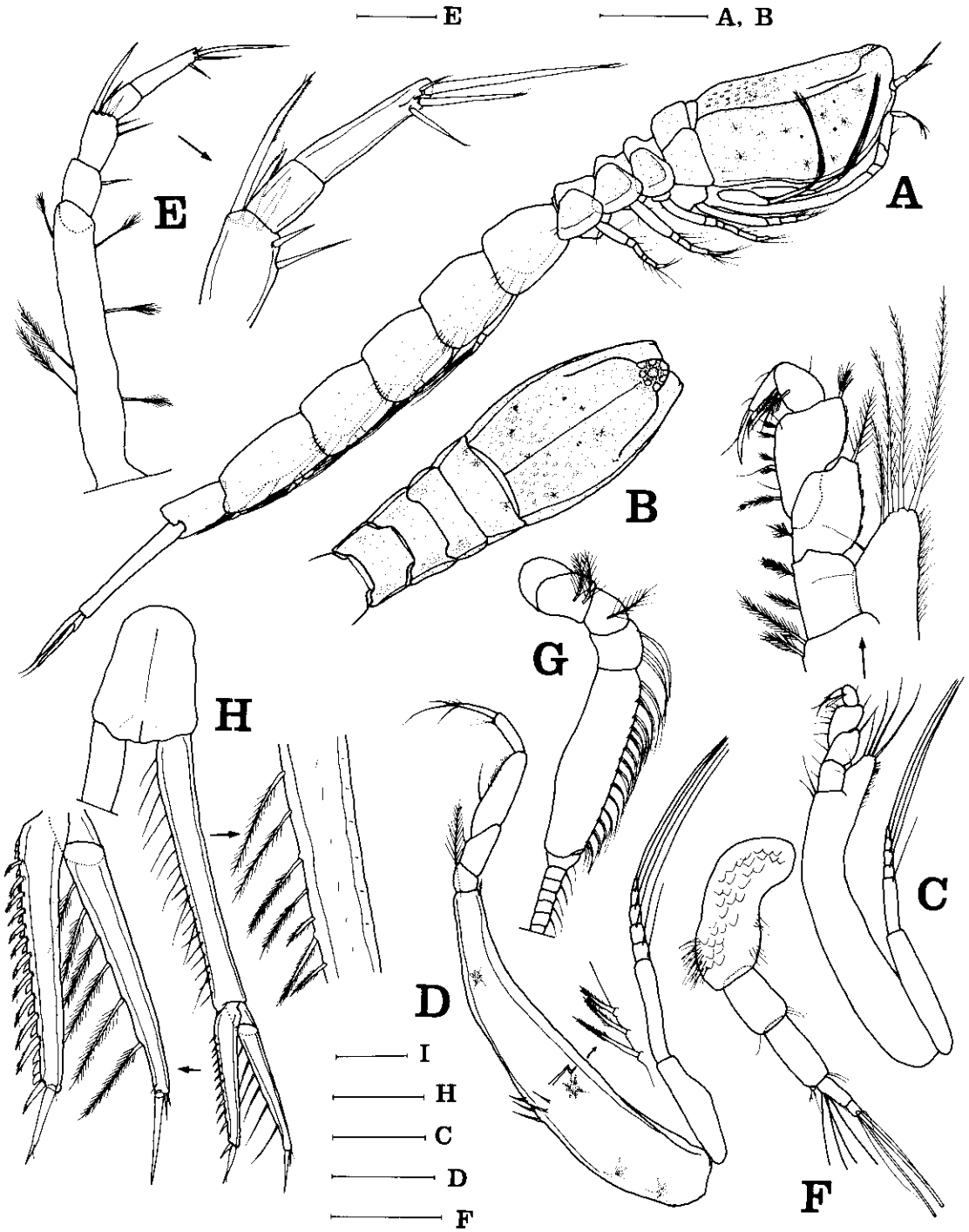


Fig. 2. *Bodotria similis* Calman, 1907, Male: A, lateral view; B, cephalothorax, dorsal; C, third maxilliped; D, first peraeopod; E, second peraeopod; F, antennule; G, antenna; H, uropod, telson and last abdominal somite. Scales: A, B = 0.5 mm; C, D, F = 0.1 mm.

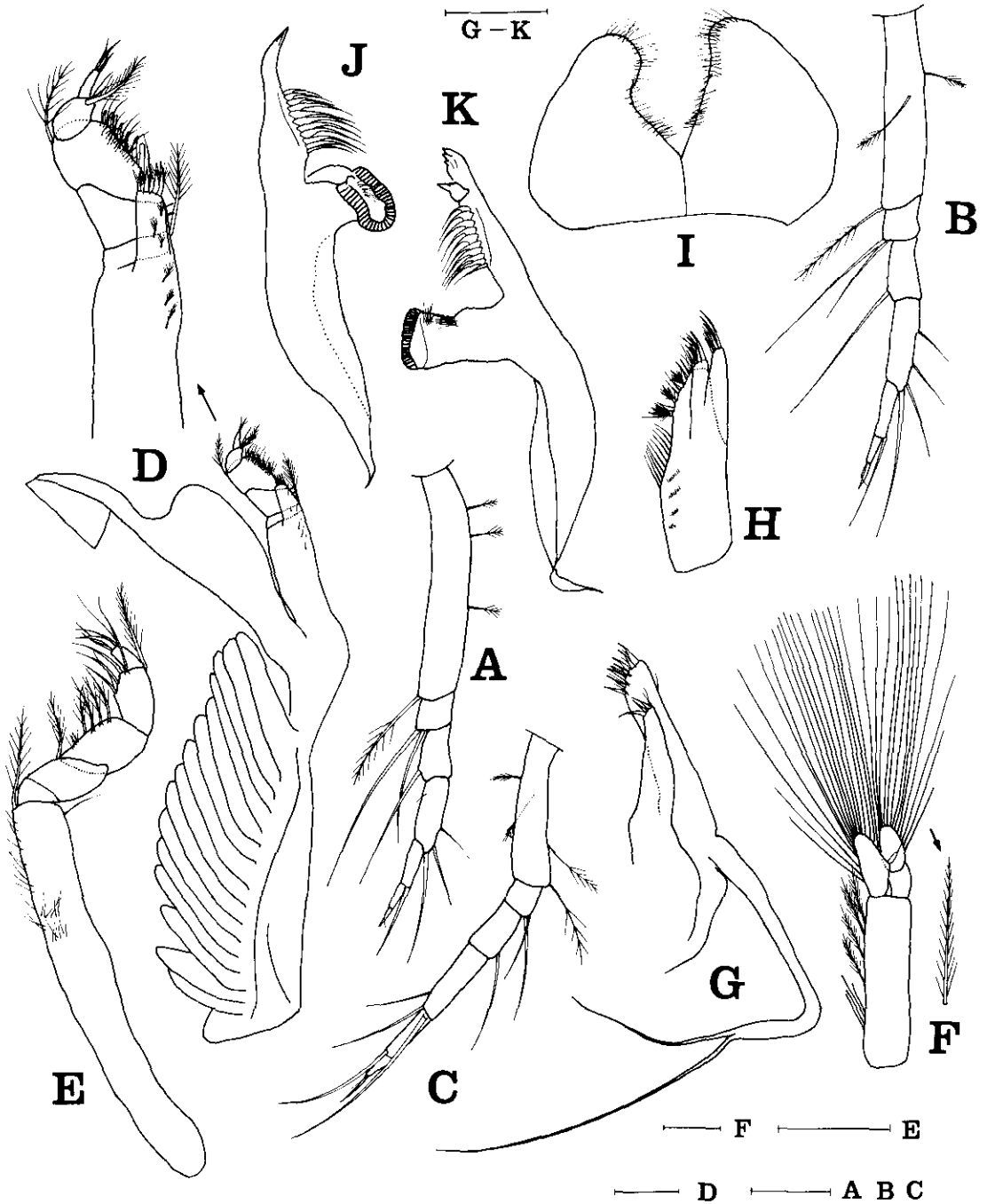


Fig. 3. *Bodotria similis* Calman, 1907, Male: A, third peraeopod; B, fourth peraeopod; C, fifth peraeopod; D, first maxilliped; E, second maxilliped; F, second pleopod; G, first maxilla; H, second maxilla; I, labium; J, right mandible; K, left mandible. Scales: 0.1 mm for all.

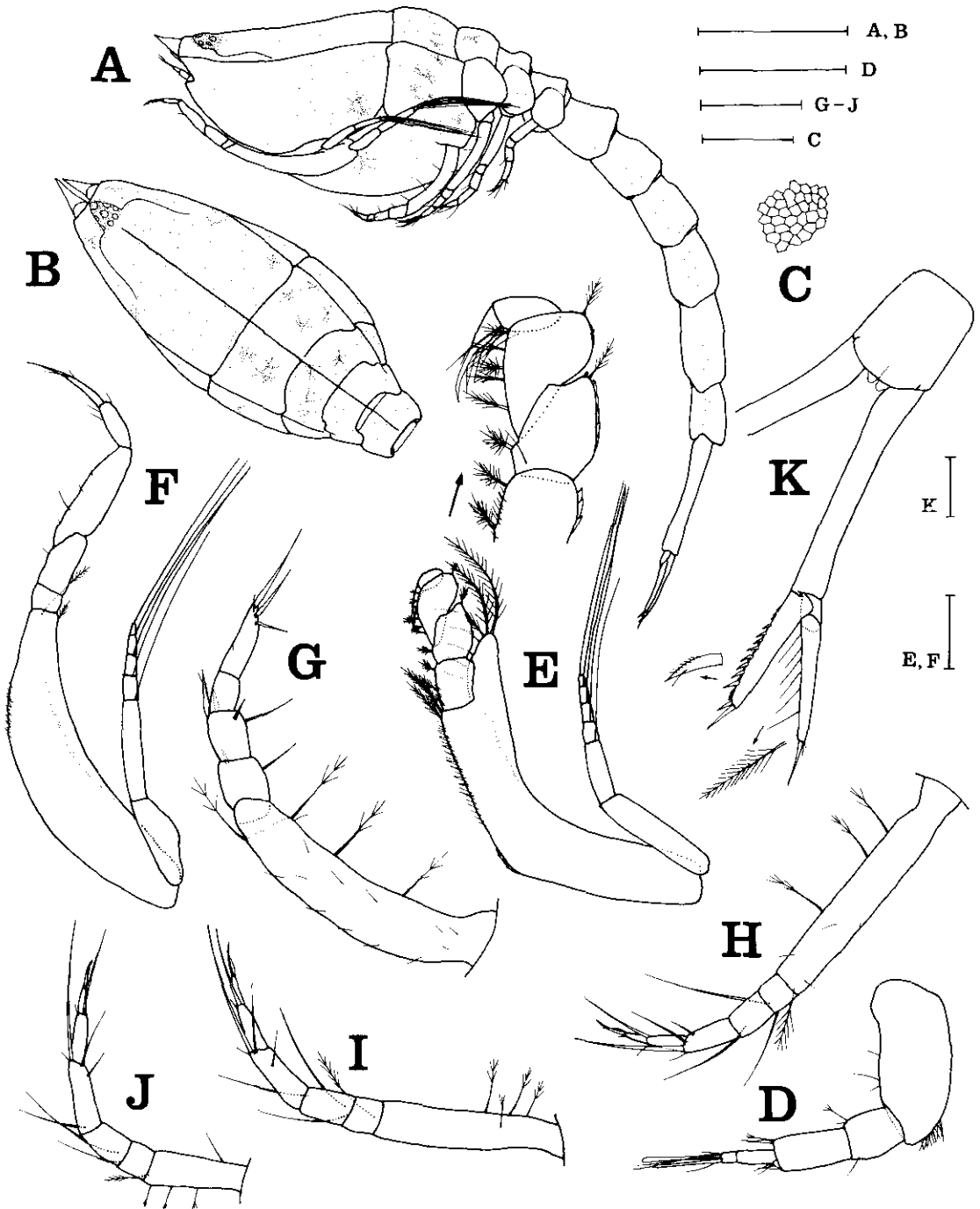


Fig. 4. *Bodotria similis* Calman, 1907, Female: A, lateral view; B, cephalothorax, dorsal; C, Integument of carapace, D, antennule; E, third maxilliped; F-J, first to fifth pereopod. Scales: A, B = 0.5 mm; remainders = 0.1 mm.

lateral and dorso-median carinae. First somite concealed. Second somite larger than others, about as long as third and fourth combined length. Dorso-median portion elevated somewhat on fourth and fifth somites. All abdominal somites (Fig. 4A) shorter than cephalothora. First two somites elevated dorso-median portion. Fifth somite longer than others.

First segment of peduncle of antennule (Fig. 4D) longer than remaining distal 2 segments. Main flagellum 2-segmented and with 2 aesthetascs. Accessory flagellum very minute.

Basis of third maxilliped (Fig. 4E) shorter than twice length of remaining distal segments and serrated on middle margin of inner border. External angle of basis developed long process, reaching level about 1/2 of merus and with 7 plumose setae. Ischium slightly longer than merus. Merus somewhat expanded externally. Carpus slightly longer than merus. Dactylus about 0.65 times as long as propodus.

Basis of first pereopod (Fig. 4F) about 1.25 times as long as remaining distal segments. Ischium shorter than half of merus. Carpus nearly 1.75 times as long as merus. Propodus shorter than half of carpus. Dactylus shorter than propodus. Ischium of second pereopod (Fig. 4G) indistinct. Basis much longer than remaining distal segments.

Basis of third pereopod (Fig. 4H) about 1.35 times as long as remaining distal segments. Basis of fourth pereopod (Fig. 4I) about 0.8 times as long as remaining distal segments. Basis of fifth pereopod (Fig. 4J) shorter than half of remaining distal segments,

Peduncle of uropod (Fig. 4K) slender, about twice as long as last abdominal segment. Endopod of uropod unsegmented, slightly longer than 1/2 of peduncle, and with 8 spines on serrated inner border 2 spines on distal end. Exopod of uropod 2-segmented, somewhat longer than endopod, with 6 plumous hairs on inner border, 2 spines and 1 long spine on distal end.

Remarks: Our specimens resemble closely *Bodotria scorpioides* (Montaru, 1840) in general appearance. But our specimens differ from *B. scorpioides* in the fact that *B. scorpioides* has 2-segmented endopod of the uropod while our

specimens have unsegmented endopod.

Our specimens are well accorded with the previous description of *B. similis* by other authors. But some characteristic features, possibly due to the geographical variations, were found in Korean materials. Calman (1907) described *B. similis* on the basis of the specimens collected from Gulf of Siam. According to Calman's (1907) description, his species has distinct ridge below lateral keel on the side of carapace in adult male and no distinct ridge is found in female. However, Gamo's (1962) species, based on the specimens collected from Tanabe Bay, has less apparent ridge below lateral carina (keel) in adult male and no ridge in female. Gamo remarked that the difference between the specimens from Gulf of Siam and those from Tanabe Bay may be due to geographical variations. In our specimens these ridges are, however, absent and some specimens have a minute furrow instead of such ridge in both sexes.

Some of our specimens show the individual variations. Lateral carina is distinct on the side of carapace and thoracic somite in most specimens, but it is less distinct in some of young female with undeveloped marsupium.

In adult male of Calman's specimen, the basis of the first pereopod was slightly longer than the length of remaining distal segments. On the other hand, in that of Gamo's specimen the basis of the first pereopod was slightly longer than 1.5 times of the remaining distal segments as like in that of our specimens. In Calman's specimen, both rami of the uropod are 2/3 as long as the peduncle, but in Gamo's specimen the endopod of uropod was longer than 1/2 of the peduncle. In our specimens the endopod of uropod is about 0.54 times as long as the peduncle as like in that of Japanese.

However, some differences between our and Gamo's specimen were also found. Our specimens appear that the basis of third maxilliped is provided with 7 plumose setae on the external angle in female and 6 plumose setae in male, whereas Gamo described the basis of third maxilliped with 8 plumose setae only in female. On the dorsal surface of the carapace there are somewhat conspicuous pitting patterns in Gamo's specimen, but some of our specimens bear rather obscure patterns.

There is a similarity of the dorso-median risings on the fourth, fifth thoracic somites and the first two abdominal somites in female between Japanese and our specimen. It seems that our and Japanese specimens are the same species with sharing important characters constantly. But it will be necessary to reexamine the relation between Calman's and our specimen henceforth.

Distribution: Korea, Trivandrum, Andaman Sea, Gulf of Siam, Vietnam, Formosa, Japan (Omai Zaki).

Subfamily Vaunthompsoniinae Hale, 1944 배불뚝올챙이새우亞科 (신칭)

Vaunthompsonia cristata Bate, 1858 민배불뚝올챙이새우 (신칭)

Vaunthompsonia cristata: Calman, 1907, p. 29; Stebbing, 1913, p. 13, figs. 5-7; Fage, 1945, p. 176; 1951, p. 24, figs. 17, 18; Jones 1960, p. 171; 1976, p. 16, fig. 4; Gamo, 1962, p. 154, figs. 1, 2; 1965, p. 532, fig. 688; 1967, p. 144; Day, 1975, p. 202.

Material examined. 4♂♂, Sömang, Chindo Is., 23 July 1994, I. S. Seo; 17♂♂, Söngsanp'o, 7 May 1994.

Description. Adult male: Body (Fig. 5A) about 4.3 mm long, excluding pseudorostrum and uropod. Carapace (Figs. 5A, B) smooth, without lateral ridge, slightly less than 1/4 of total length of body, and 1.5 times as long as its width; carapace length less than its depth. Antero-lateral border of carapace serrated strongly. Pseudorostral lobes short and truncated in front of ocular lobe. Ocular lobe rounded, with 9 ocelli and bear a pair of spinules on frontal border (Fig. 5A, B).

All free thoracic somites (Figs. 5A, B) nearly as long as carapace. First somite covered by second and exposed dorsal portion. Pleural plate of second to fifth somites somewhat expanded. Width of second somite slightly wider than carapace and remaining 3 somites decreased in width gradually. Carapace, thoracic somites and abdomen with reticulated pattern in postero-dorsal portion. From third thoracic to fourth abdominal somites with a row of minute setae on each postero-dorsal border. From second to fourth thoracic somites with 2-3 tiny plumose setae on each antero-lateral border. From fourth thoracic to

fourth abdominal somites with 5-6 tiny plumose setae on each postero-lateral border. Abdomen (Fig. 5A) quite plump and half as long as body. Last abdominal somite with teeth on posterior border.

Antennule (Fig. 5D) 3-segmented; first segment slightly shorter than distal 2 segments; second segment somewhat longer than third. Main flagellum 2-segmented and accessory flagellum minute. Flagellum of antenna (Fig. 5E) reaching about second abdominal somite.

Labium (Fig. 6J) divided 2 lobes, semicircular form, with stubby setae on front edge of each lobes. Left and right mandibles (Figs. 6K, L) normally boat-shaped, with a row of spines between pars incisiva and molar process. First maxilla (Fig. 6I) with 2 filaments on palp. Second maxilla (Fig. 6H) subtriangular, with many spines and setae on inner border. Branchial apparatus of first maxilliped (Fig. 6E) with 5 lobules and 1 accessory lobule. Second maxilliped (Fig. 6F) with long plumose setae on each segments. Basis of third maxilliped (Fig. 6G) serrated strongly on inner border, nearly 0.9 times as long as remaining distal segments.

Basis of first peraeopod (Fig. 5F) with short plumose hairs on inner border, and 3 spines on distal end. Length of basis shorter than 3/4 of remaining distal segments. Carpus about 0.8 times as long as propodus and slightly longer than dactylus. Second peraeopod (Fig. 5G) about 0.7 times as long as first. Basis shorter than remaining distal segments and with 3 spines distal end. Ischium distinct and very short. Merus and carpus with several long spines on distal end respectively. Dactylus more than 3 times of propodus in length, with 7 short spines on median borders, and with 5 spines, 1 long spine and 2 minute spines on distal end. Basis of third peraeopod (Fig. 6A) about 1.5 times as long as remaining distal segments. Fourth peraeopod similar to third in form but basis of fourth peraeopod shorter than that of third. Basis of fourth peraeopod (Fig. 6B) about 0.8 times as long as remaining distal segments. Basis of fifth peraeopod (Fig. 6C) slightly shorter than half of remaining distal segments. Outer ramus of second pleopod (Fig. 6D) 2-segmented.

Peduncle of uropod (Fig. 5C) shorter than last

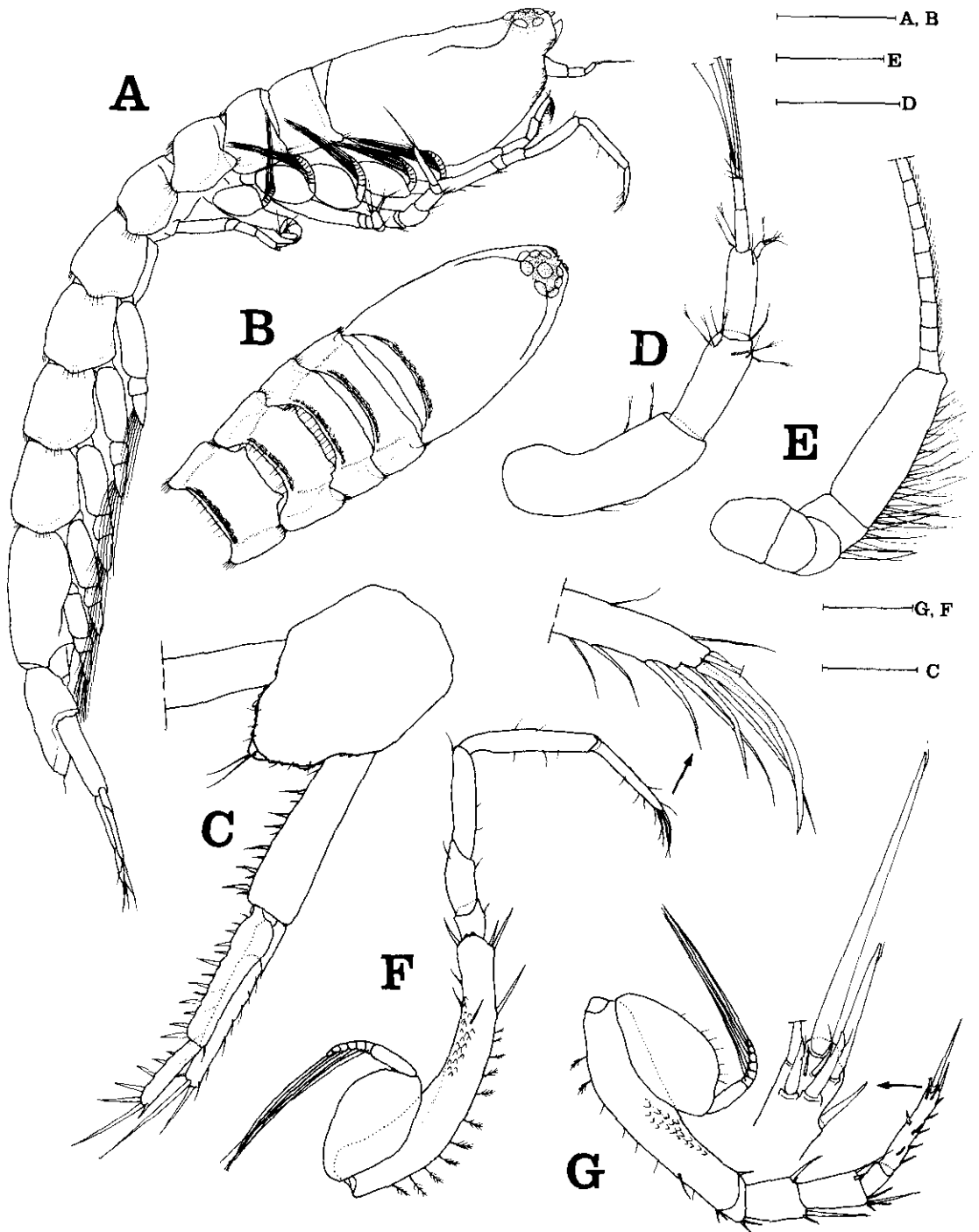


Fig. 5. *Vaunthompsonia cristata* Bate, 1858, Male: A, lateral view; B, cephalothorax, dorsal; C, telsonic (last abdominal) somite and uropod; D, antennule; E, antenna; F, first pereopod; G, second pereopod. Scales: A, B = 0.5 mm; C, E-G = 0.2 mm; D = 0.1 mm.

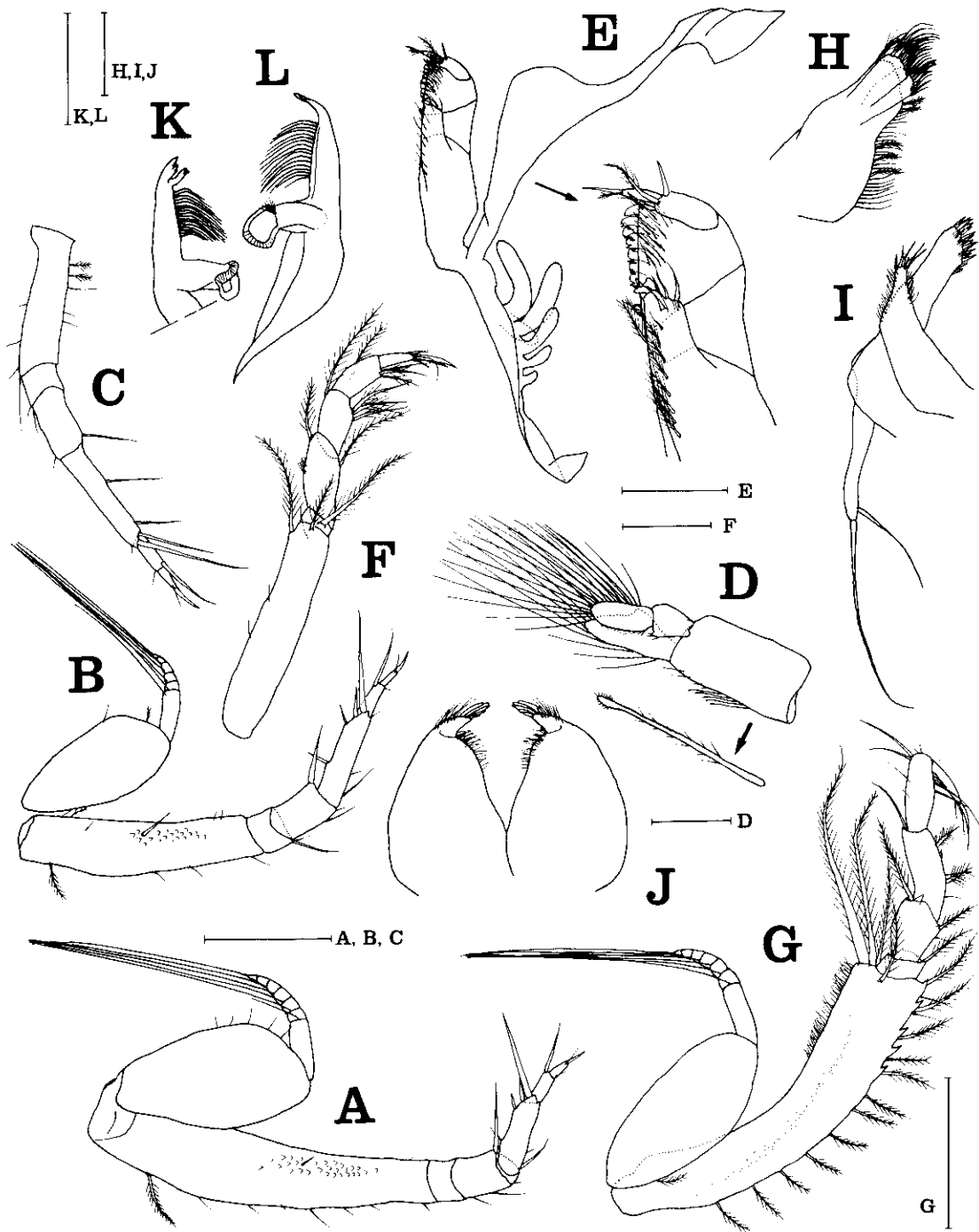


Fig. 6. *Vaunthompsonia cristata* Bate, 1858, Male: A-C, third to fifth peraeopod; D, second pleopod; E-G, first to third maxilliped; H, second maxilla; I, first maxilla; J, labium; K, left mandible; L, right mandible. Scales: F = 0.1 mm; remainders = 0.2 mm.

abdominal somite, with 12 spines on inner border. Endopod 2-segmented and much longer than peduncular segment; proximal segment shorter than twice length of distal one, with 1 spine on outer border, 13 spines on inner border; distal segment with 4 spines on inner border and 3 distal spines, of which middle one much longer than distal segment. Exopod 2-segmented and much shorter than endopod; distal segment with 7 spines on outer border, 5 spines on inner border and 2 end spines, of which longest one longer than 2/3 length of distal segment; proximal segment slightly shorter than 1/3 length of distal one.

Remarks: The present species exhibits variation. The teeth on the last abdominal somite are variable in size.

Our specimens differ from Stebbing's (1913) in some characters. In our specimens the peduncle of uropod is much shorter than the telsonic somite and the second segment of uropodal endopod is a little longer than half of the first. Whereas the peduncle of uropod is as long as the telsonic somite and second segment of the endopod of uropod is 2/3 length of the first as described by Stebbing (1913).

In our specimens the ischium of the second peraeopod is distinct as in Stebbing (1913), which is absent in Sars (1879, cited from Stebbing, 1913), and invisible in Gamo (1962). Our specimen showed another difference in the spine at the second segment of the first antennal peduncle: while 3 and 1 spines appeared in Sars' drawings and Zimmer's (1952, cited from Jones, 1960) specimen, respectively, no spine appeared in ours and Gamo did not mention about it.

According to the general features of Gamo's drawing (he did not describe it), our specimens are very similar to his specimen. But the discrepancy between Stebbing's and our specimens invokes us to reexamine the both specimens henceforth.

Distribution: Korea, Southern Japan (Kii Peninsula, Amakusa), South China Sea, British Isles, West coast of France, Atlantic coast of Morocco, Mediterranean,

Acknowledgements

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한국産 침울챙이새우목(갑각上綱, 연갑綱, 울챙이새우목)의 2 미기록종
강범준·이경숙(단국대학교 자연과학대학 생물학과)

1993년 3월부터 1995년 6월까지 한국 연안에서 채집된 울챙이새우류, *Bodotria similis*와 *Vaunthompsonia cristata*, 2종의 한국미기록종을 보고한다.