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TALITRIDAE (CRUSTACEA - AMPHIPODA) OF THE KOREAN COASTS

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ABSTRACT

Four species of the Talitridae, *Trinorchestia longiramus* n.sp., *Platorchestia crassicornis* (Derzhavin, 1937), *P. munmui* n.sp., and *P. pachypus* (Derzhavin, 1937) are described from the sandy or gravelly coasts of Korea, and their distribution is mapped. The taxonomic distinction between two confused species *P. crassicornis* and *P. platensis* (Krøyer, 1845) is restudied by comparison with material from northwestern Pacific and Atlantic coasts, some significant characters of the latter are illustrated, and the doubtful distribution of the latter in the Indo-Pacific region is discussed to some extent. A scanning electron microscope study reveals that the microstructure of the retinacula might be useful for the taxonomy of the group.

INTRODUCTION

On the northwestern Pacific coasts taxonomic studies on the Talitridae have been carried out intensively by several authors (Derzhavin, 1937; Iwasa, 1939; Bulycheva, 1957; Morino, 1972 & 1975). More recently Bousfield (1982) has reviewed the group in the North Pacific region and erected new genera based on more reliable characters such as mouthparts, pereopods, and surface ultrastructure. In Korea two species of the family (*Platorchestia crassicornis* as *P. platensis*, and *P. pachypus*) have been reported from Cheju Island by Kim & Kim (1987).

Since Derzhavin (1937) there have been many confused identifications of some members of the group, especially of *Trinorchestia trinitatis* (Derzhavin, 1937) and *Platorchestia crassicornis* (Derzhavin, 1937). Some earlier tax-

onomists recorded *T. trinitatis* as *Talorchestia brito* Stebbing, 1891 (Iwasa, 1939; Stephensen, 1945; Gurjanova, 1951; Bulycheva, 1957, as *Orchestoidea brito*), and almost all authors investigating the area identified *P. crassicornis* as *P. platensis* (Iwasa, 1939; Stephensen, 1945; Gurjanova, 1951: 807; Bulycheva, 1957; Morino, 1975; Kim & Kim, 1987) except Bousfield (1982).

In the present study 4 species in 2 genera of the family are described from the material collected on 51 intertidal and supralittoral sandy or gravelly coasts in Korea and 2 of them appear to be new species (*Trinorchestia longiramus* n.sp. and *Platorchestia munmui* n.sp.).

During the study I was able to compare the northwestern Pacific *P. crassicornis* with the Atlantic *P. platensis* and clear differences were found between them. Moreover, the earlier reports on the geographical distribution of *P.*

platensis in the Indo-Pacific are somewhat doubtful, because the descriptions of the species in the area had been illustrated in a very poor way and their gnathopods showed a different shape (see Stebbing, 1900; Chevreux, 1908; Chilton, 1921; Schellenberg, 1931).

In contrast with the Dogielinotidae (Jo, 1988), this group shows an interesting distribution in the Korean peninsula (fig. 1); the fre-

quent occurrence on the east coast (31.2%, 5 out of 16 localities on the west coast; 47.4%, 9 out of 19 localities on the south coast; 62.5%, 10 out of 16 localities on the east coast), which is characterized by high wave action, a small tidal range and a steep coastline. On the east coast *Trinorchestia longiramus* appears to be the only gammaridean amphipod which inhabits the sandy beaches of the north of Youngil Bay.

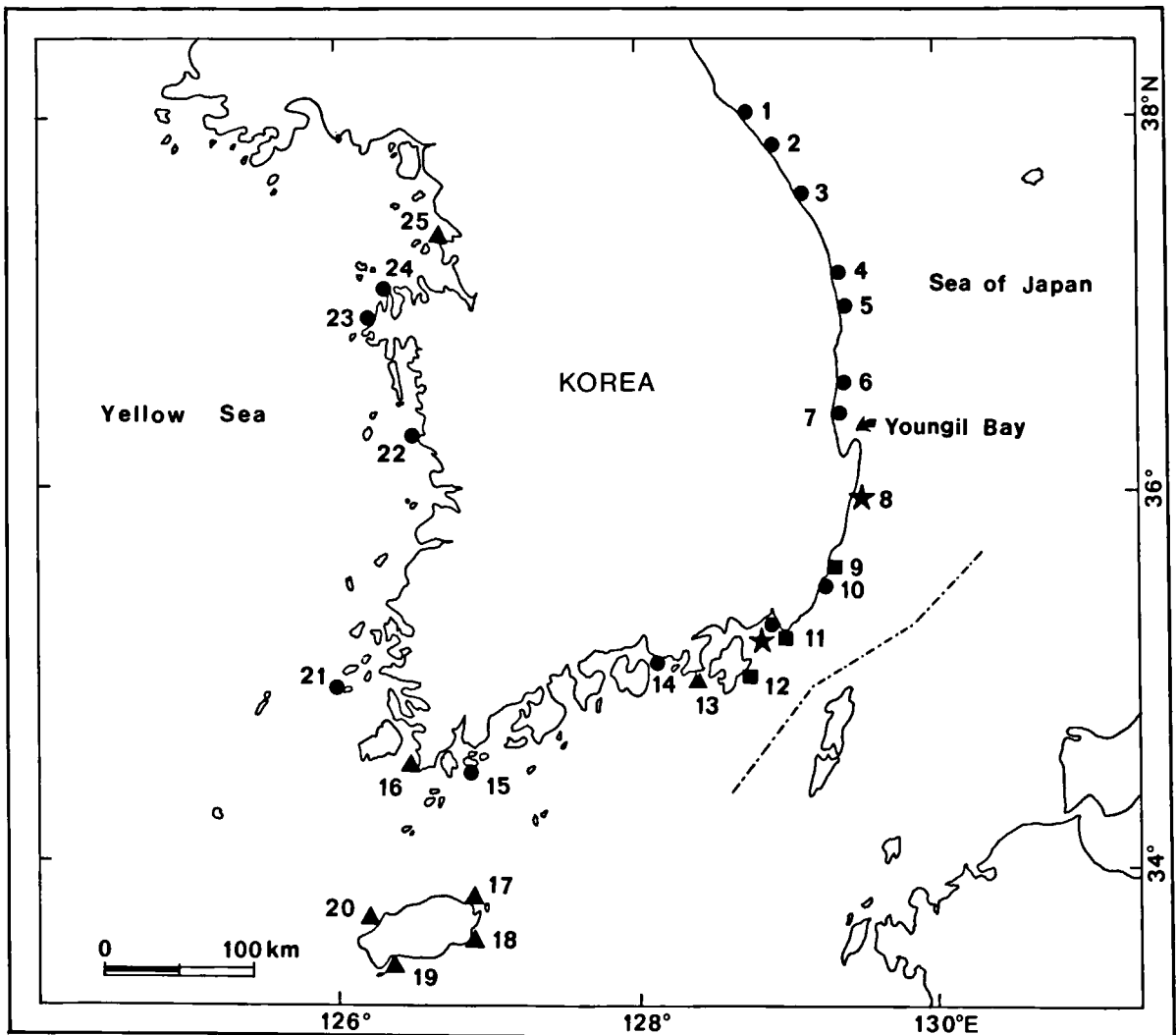


Fig. 1. Distribution of four species of Talitridae in Korea (●: *Trinorchestia longiramus*; ▲: *Platorchestia crassicornis*; ★: *P. munmui*; ■: *P. pachypus*). 1, Ingu; 2, Kyeongpodaeg; 3, Mangsang; 4, Jangho; 5, Bongpyeong; 6, Daejin; 7, Wolpo; 8, Daebon; 9, Ilkwang; 10, Gongsu; 11, Dadaepo; 12, Gujora; 13, Chungmu; 14, Samcheonpo; 15, Sinjido; 16, Songhori; 17, Sehwa; 18, Pyosun; 19, Hwasoon; 20, Hyeopjae; 21, Dochodo; 22, Chunjangdae; 23, Malipo; 24, Hakampo; 25, Masanpo.

TAXONOMIC PART

Superfamily TALITROIDEA Bulycheva, 1957

Family TALITRIDAE Bulycheva, 1957

Genus **Trinorchestia** Bousfield, 1982

Bulycheva, 1957: 130 (in part, as *Orchestoidea*); Bousfield, 1982: 41.

Diagnosis (italics amended from Bousfield, 1982). — Body smooth, *large size*. Rostrum not distinct, very blunt. Eyes large to very large. Antenna 1 short, not reaching end of peduncular segment 4 of antenna 2. Antenna 2 elongate, flagellum longer than peduncle. *Mandibular left lacinia 5- or 6-dentate*. Maxillipedal palp tall, *segment 4 fused or not fused with 3*.

Coxae 2-4 subquadrate, cuspidate posteriorly. Gnathopod 1, claw much exceeding palm, carpus and propodus with posterior tumescent lobe in male. Male gnathopod 2 powerfully subchelate, palm with notch near hinge, *merus with or without tumescent process*. Female gnathopod 2, basis expanded anteriorly, merus with posterior tumescent process. Pereiopods slender, *3 and 5-7 cuspidactylate*. Pereiopod 4 slightly smaller than 5, *segment 5 short*. Coxa 5 about 2/3 as deep as coxa 4. Pereiopods 5-7 similar in form, not sexually dimorphic, 6 and 7 much longer than 5.

Peduncle of pleopods with 2 retinacula, rami little reduced, outer ramus shorter than inner. Uropods 1-3, peduncle and rami armed with spines. *Uropod 2, both rami subequal or unequal in length*, terminal spines simple. Uropod 3, ramus longer than peduncle. Telson short, hardly emarginate at apex, with dorsal and apical spines. Coxal gills 2-5 short, sinuous, 6 elongate. *Oostegites on pereiopods 3-5, slender, with simple setae, lacking on gnathopod 2*.

Type-species: *Orchestoidea trinitatis* Derzhavin, 1937

KEY TO KNOWN SPECIES OF *TRINORCHESTIA*

1. Uropod 2, both rami subequal in length; pereiopod 4, dactylus simple, not overhang-

- ing the base of unguis
..... *T. trinitatis* (Derzhavin, 1937)
- Uropod 2, inner ramus longer than outer; pereiopod 4, dactylus with denticles, overhanging the base of unguis
..... *T. longiramus* n.sp.

***Trinorchestia longiramus* n.sp.**

(Figs. 2-4, 10a-c)

Talorchestia brito; non Stebbing, 1891; Stephensen, 1945: 65-69, figs. 22-23; Gurjanova, 1951: 809, fig. 563.

Material examined. — Prov. Kyeongbuk, Uljin-gun, Bongpyeong; 8 July 1986, 1 ♂ holotype (Zoological Museum Amsterdam, Amph. 108.388), 1 ♀ allotype (ZMA Amph. 108.389), 65 paratypes (ZMA Amph. 108.390), and 50 paratypes (Institute of Marine Sciences, Pusan). C. W. Ma coll.

Prov. Kangwon, Yangyang-gun, Ingu; 10 July 1986, 186 specimens. C. W. Ma coll.

Prov. Kangwon, Kangreung city, Kyeongpodae; 10 July 1986, 56 specimens. C. W. Ma coll.

Prov. Kangwon, Donghae city, Mangsang; 9 July 1986, 167 specimens. C. W. Ma coll.

Prov. Kangwon, Samcheok-gun, Jangho; 9 July 1986, 10 specimens. C. W. Ma coll.

Prov. Kyeongbuk, Youngduk-gun, Daejin; 8 July 1986, 153 specimens. C. W. Ma coll.

Prov. Kyeongbuk, Youngil-gun, Wolpo; 7 July 1986, 51 specimens. C. W. Ma coll.

Prov. Kyeongnam, Yangsan-gun, Gongsu; 17 July 1986, 118 specimens. Y. W. Jo & C. W. Ma coll.

Pusan, Dadaepo; 3 Nov. 1982, 7 specimens; 4 Mar. 1983, 2 specimens; 17 Apr. 1983, 16 specimens; 11 Oct. 1984, 14 specimens. Y. W. Jo & C. W. Ma coll.

Prov. Kyeongnam, Samcheonpo city, Namilda; 26 May 1986, 98 specimens. C. W. Ma coll.

Prov. Cheonnam, Wando-gun, Sinjido; 11 May 1986, 200 specimens. K. C. Yoo.

Prov. Cheonnam, Sinan-gun, Dochodo; 6 Oct. 1986, 4 specimens. Y. W. Jo coll.

Prov. Chungnam, Seocheon-gun, Chunjangdae; 9 May 1986, 6 specimens. Y. W. Jo coll.

Prov. Chungnam, Seosan-gun, Malipo; 21 Oct. 1986, 29 specimens. Y. W. Jo coll.

Prov. Chungnam, Seosan-gun, Hakampo; 19 Oct. 1986, 12 specimens. Y. W. Jo coll.; 28 June 1987, 3 specimens. H. J. Ko coll.

Description. — Body length (without antennae and telson): male up to 26.0 mm, female up to 25.5 mm. Male habitus as in fig. 2a.

Male: Eyes large, irregularly rounded or semi-

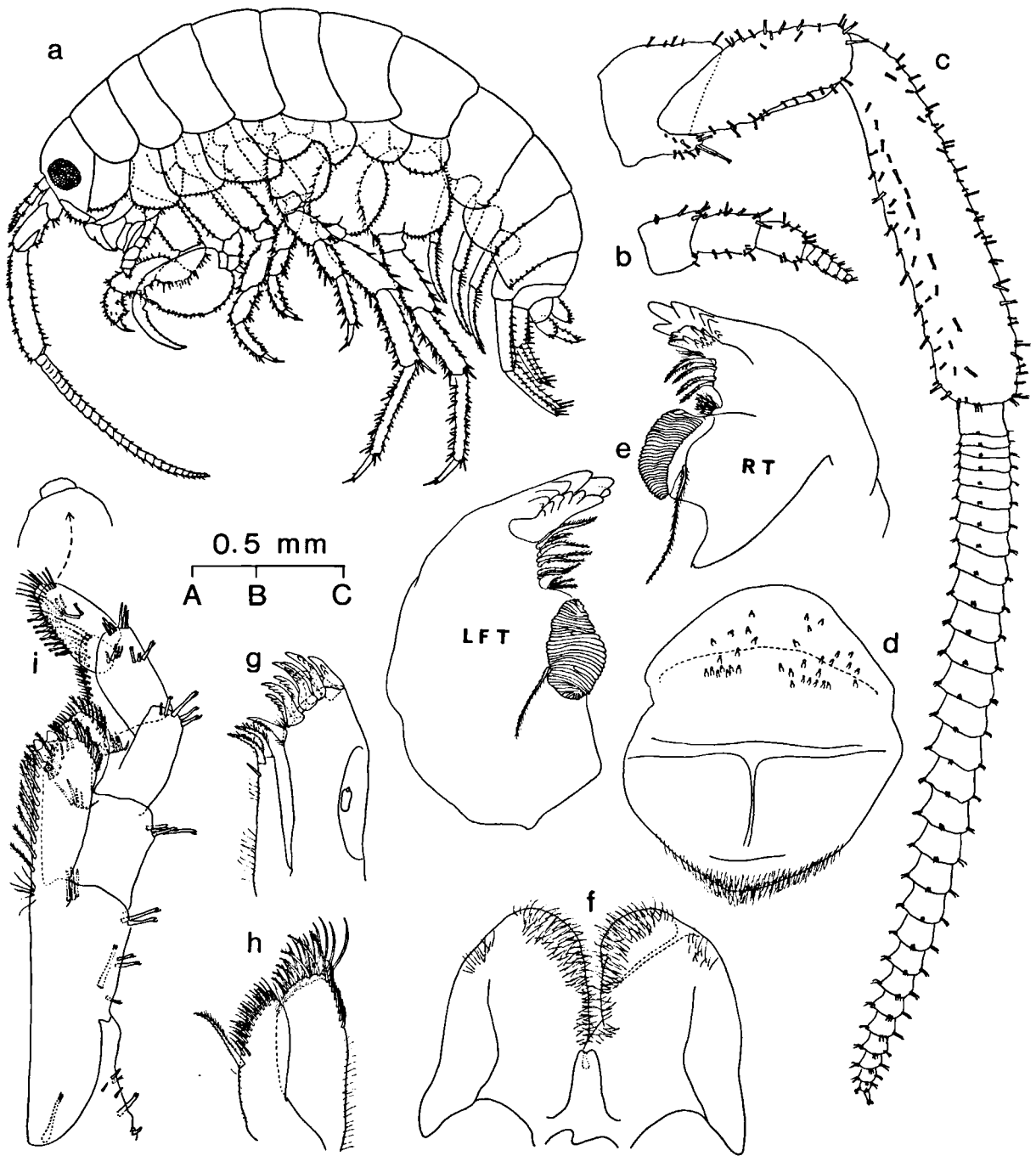


Fig. 2. *Trinorchestia longiramus* n.sp. (♂ holotype 22.0 mm from Bongpyeong). a, entire animal, from the left; b, antenna 1 (scale AB); c, antenna 2 (AB); d, upper lip (AC); e, mandibles (AC); f, lower lip (AC); g, maxilla 1 (AC); h, maxilla 2 (AC); i, maxilliped (AC). Each scale unit (AB, AC) represents 0.5 mm.

ovoid, eyes separated dorsally by their own diameter.

Antenna 1 (fig. 2b) short; length of flagellum subequal to peduncle segment 2, 6- to 7-segmented.

Antenna 2 (fig. 2c) more or less elongate, shorter or longer than body length; peduncle not very stout, segment 5 twice as long as 4; flagellum of 30-34 segments.

Upper lip (fig. 2d), epistome with numerous spine-like processes on the surface.

Mandibles (fig. 2e), left and right incisor with 7-8 teeth, the left lacinia mobilis 6-dentate, the most proximal tooth small (fig. 10a); the right lacinia bifid with teeth of different sizes.

Lower lip (fig. 2f) with minute inner lobes.

Maxilla 1 (fig. 2g), palp small, 2-segmented, distal segment minute; inner lobe with two plumose setae on apex and often one simple spine on inner margin; outer lobe with 9 spines, these spines bear from inner to outer side, 5, 4, 4, 4, 4, 2, and 2 median denticles, respectively.

Maxilla 2 (fig. 2h), outer lobe larger than inner, distolateral margin armed with 7-8 short, plumose setae.

Maxilliped (fig. 2i), inner margin of inner lobe with 10-12 plumose setae. Palp 4-segmented, 4th segment minute, masked by spines.

Coxa 1 (fig. 3a) acute anterodistally; coxae 2-4 (figs. 3b-d), posterior and distal margin armed with small spines; coxa 4 wider than 3.

Coxal gills on pereopods 2-5 (figs. 3b-e) short; that on pereopod 6 (fig. 3f) elongate, about twice as long as others.

Gnathopod 1 (fig. 3a) spinose; carpus about twice as long as propodus; propodus not narrowing distally; dactylus strong.

Gnathopod 2 (fig. 3b), palm spinose, slightly longer than posterior margin of propodus; dactylus with a small process near hinge. Merus usually with posterior tumescent process.

Pereopod 3 (fig. 3c) slender, longer than 4 pereopod or 5.

Pereopod 4 (fig. 3d) smaller than 5; dactylus apparently overhanging the base of unguis, with denticles (fig. 10b).

Pereopod 5 (fig. 3e), basis strongly expanded posteriorly, wider than long; segments 4 and 5 short, subequal in length.

Pereopod 6 (fig. 3f) longest; basis expanded posteriorly but longer than wide; segment 5 longer than 4; segment 6 much longer than that of pereopod 7.

Pereopod 7 (fig. 3g), basis quite expanded, as wide as long; segment 5 longer than 4 but shorter than 6.

Epimeral plates 1-3 (fig. 3h) with several spinules on posterior margin; posterodistal corners slightly pointed; plate 1 narrowing distally.

Pleopods (figs. 4f-h), peduncle armed with spines along the outer margin and spinules medially, peduncle 3 smaller than 1 or 2; retinacula (fig. 10c) 3-hooked, middle hook small. Rami 15- to 17-segmented, subequal to peduncle in length; inner ramus of pleopod 3 with 2-3 spines proximally.

Uropod 1 (fig. 3i), rami about 3/4 as long as peduncle, both with inner and outer marginal spines, terminal spines long.

Uropod 2 (fig. 3j), rami subequal to peduncle, with inner and outer marginal spines; inner ramus longer than outer.

Uropod 3 (fig. 3k), ramus about 1.3 times longer than peduncle, laterally compressed, with marginal and apical spines.

Telson (fig. 4i) wider than long, slightly emarginate at apex, with many dorsal and a few apical spines.

Female: Antennae 1 and 2 same as in male, not sexually dimorphic.

Gnathopod 1 (fig. 4a), propodus narrowing distally; carpus and propodus lacking posterior tumescent lobe.

Gnathopod 2 (fig. 4b), basis moderately expanded anteriorly; merus with long posterior tumescent lobe; lower part of carpus pointed in the proximal end; claw small, fitting the palm.

Oostegites on pereopods 3-5 (figs. 4c-e), lacking on gnathopod 2, sublinear, with simple setae; that of pereopod 5 spinose on the surface, anterior margin with spines and setules, posterior margin bare.

Remarks.—The present species closely

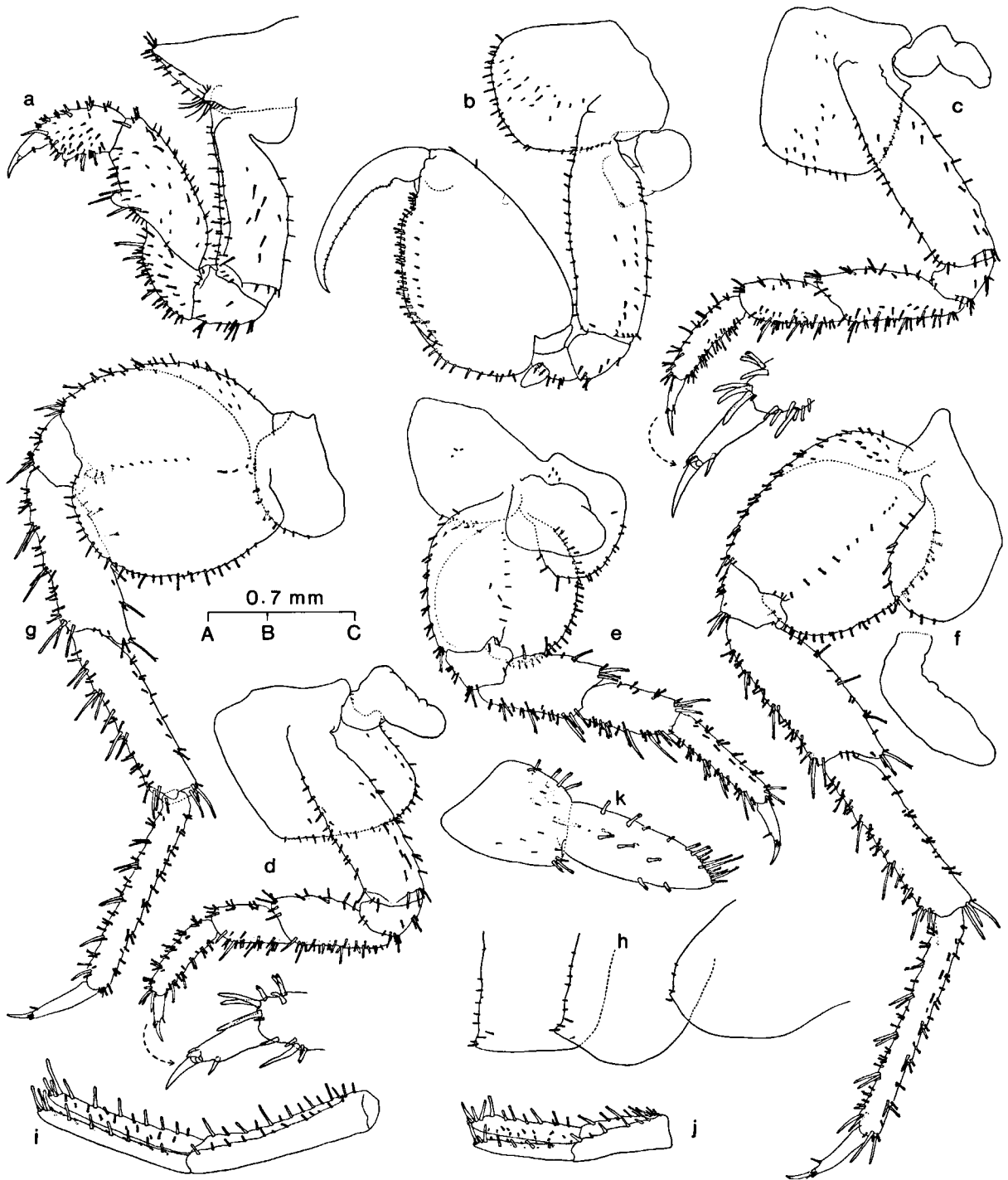


Fig. 3. *Trinorchestia longiramus* n.sp. (♂ holotype 22.0 mm from Bongpyeong). a, gnathopod 1 (scale AB); b, gnathopod 2 (AB); c, pereopod 3 (AB); d, pereopod 4 (AB); e, pereopod 5 (AB); f, pereopod 6 (AB); g, pereopod 7 (AB); h, epimeral plates 1 to 3 (AB); i, uropod 1 (AB); j, uropod 2 (AB); k, uropod 3 (AC). Each scale unit (AB, AC) represents 0.7 mm.

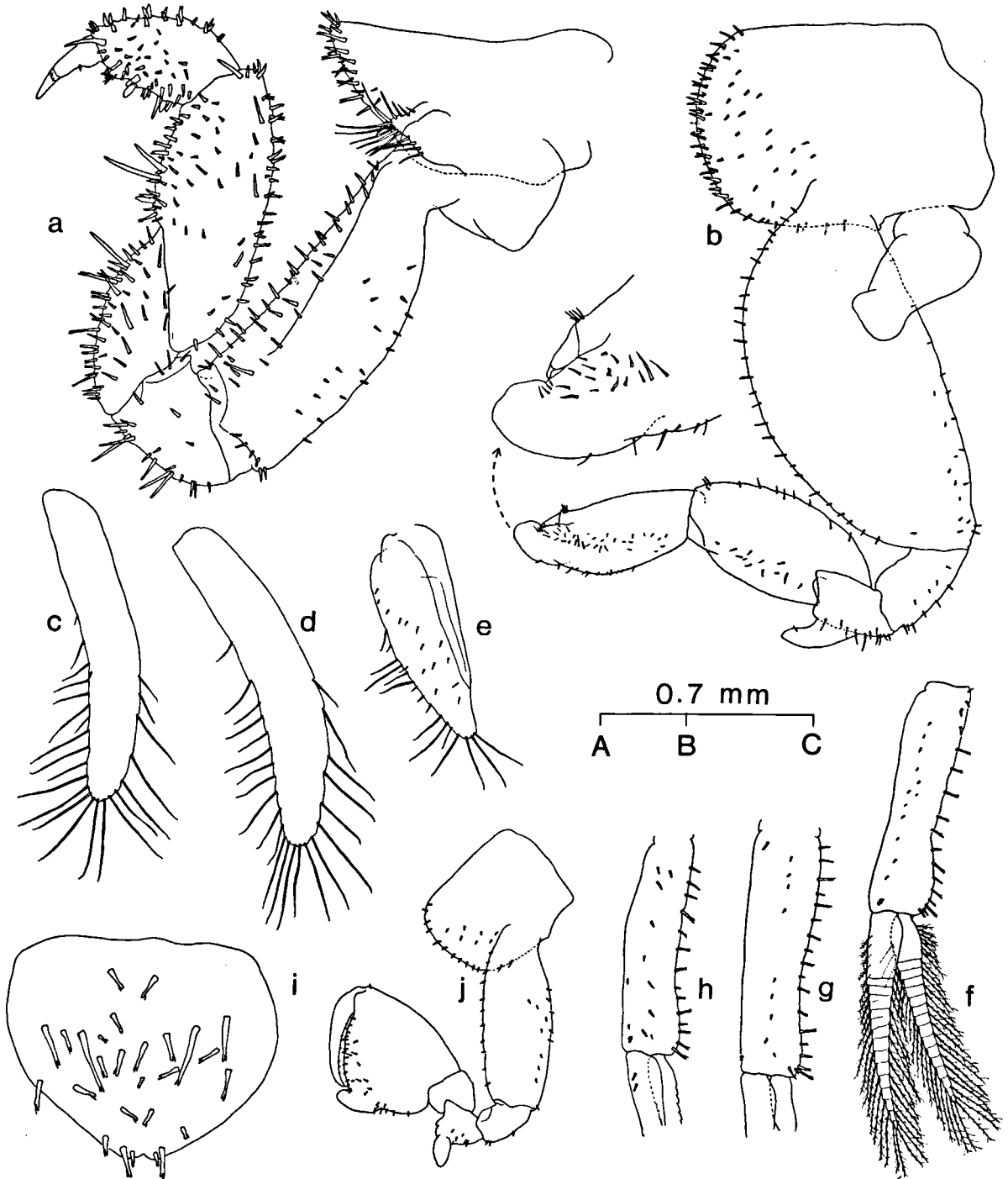


Fig. 4. *Trinorchestia longiramus* n.sp. (a-e, ♀ allotype 25.5 mm; f-i, ♂ holotype 22.0 mm; j, ♂ paratype 13.5 mm, from Bongpyeong). a, gnathopod 1 ♀ (scale AB); b, gnathopod 2 ♀ (AB); c, oostegite of pereopod 3 (AB); d, oostegite of pereopod 4 (AB); e, oostegite of pereopod 5 (AB); f, pleopod 1 ♂ (AB); g, peduncle of pleopod 2 ♂ (AB); h, peduncle of pleopod 3 ♂ (AB); i, telson ♂ (AC); j, gnathopod 2 ♂ (AB). Each scale unit (AB, AC) represents 0.7 mm.

resembles *T. trinitatis* (Derzhavin, 1937) from the Soviet coasts of the western Pacific and Japan. However, differences between two species are found in the rami of uropod 2 (inner ramus longer than outer in *T. longiramus* n.sp., subequal in *T. trinitatis*), the dactylus of pereopod 4 (distal end of dactylus overhanging the base of unguis in the former, lacking denticles in the latter), the lacinia mobilis of left mandible (6-dentate in the former, 5-dentate in the latter), and the palp of maxilliped (segment 4 minute in the former, absent in the latter).

Stephensen (1945) recorded this species under the name of *Talorchestia brito* Stebbing from Kurile Islands. Later, Morino (1972) and Bousfield (1982) synonymized Stephensen's animal with *Orchestoidea trinitatis* and *Trinorchestia trinitatis*, respectively. However, from the longer inner ramus of uropod 2 and denticulated dactylus of pereopod 4 (see Stephensen, 1945, figs. 22-23), it is clear that his animal belongs to the present species. And specimens from the Abasiri sandy beach of Hokkaido, Japan (sent to the author by Dr. Morino) agree well with the new species.

Morphological variation of the species is noticeable by instar and region. Male preadults show a quite different shape of gnathopod 2 (fig. 4j), especially in carpus and propodus. Another distinctive variation can be seen in antenna 2. Several male specimens from Sinjido and Dadaepo have an elongate antenna 2 and sometimes its length is greater than that of the body. In such case, it is observed that the merus of gnathopod 2 does not have a posterior tumescent lobe probably indicating that is an older or larger animal.

Etymology.—The specific name, *longiramus*, refers to the inner ramus of uropod 2 which is longer than outer ramus.

Distribution and ecology.—This sandhopper occurs both on exposed and sheltered sandy beaches in the Korean peninsula (fig. 1). In contrast with the dogielinotid genus *Haustorioides*, the present animal is commonly distributed along the eastern coast of the country where *Haustorioides* does not occur. Among

the intertidal gammaridean amphipods of the east coast, this species is considered to be unique for the sandy beaches of the north of Youngil Bay. No specimens were collected in Cheju Island. Outside Korea, the species was collected in Etorofu Island of the Kuriles, U.S.S.R. and on Abasiri beach, Japan.

Ecologically this species seems to have almost the same habits and behavior as *T. trinitatis*; essentially nocturnal, occurring around HWS (High Water of Springtide) on the beach (see Morino, 1972).

No ovigerous females were found during our study. But in May 1986 a number of small juveniles were collected at Sinjido and Namildae suggesting they hatched in April.

Genus *Platorchestia* Bousfield, 1982

Bousfield, 1982: 26.

Diagnosis (italics amended from Bousfield, 1982).—Body smooth, medium size, semi-fossorial. Rostrum very blunt. Eyes medium. Antenna 1 short, hardly exceeding end of peduncle segment 4 of antenna 2. Antenna 2 about 1/3 as long as body, sexually dimorphic. *Mandibular left lacinia 5- to 6-dentate*. Maxillipedal palp relatively short and broad, segment 4 minute, masked by spines.

Coxae 2-4 shallow or moderately deep, cusped posteriorly. Male gnathopod 1 subchelate, *claw shorter or longer than palm*, carpus and propodus with posterior tumescent lobe, both segments widening distally. Female gnathopod 1, palm much shorter than claw, carpus and propodus lacking posterior lobe. Male gnathopod 2 less spinose, powerfully subchelate. Female gnathopod 2, basis expanded anteroproximally, *merus, carpus, and propodus with feebly-tumescent lobe posteriorly, that on merus rudimentary*. Pereiopods 3-7 cuspidactylate, segment 5 of pereopod 4 often very short. Coxa 5, anterior lobe as deep as coxa 4. Pereiopod 7 usually (and pereopod 6 often) sexually dimorphic, segments 4 and 5 widened in male.

Pleopods normal, rami 8- to 10-segmented, peduncle with 2 retinacula. Uropod 1, rami shorter than peduncle, inner ramus with inner

and outer marginal spines, margin of outer ramus nearly bare, terminal spines long. Uropod 2, rami shorter than peduncle, outer ramus with outer marginal spines only, lacking inner marginal spines. Uropod 3, peduncle broad, ramus shorter than peduncle, with dorsal and apical spines. Telson slightly but distinctly emarginate, with dorsal and apical spines on distal half only. Coxal gills reduced on pereopods 3-5, 2 and 6 long. Oostegites on pereopods 2-5, elongate-ovate, marginal setae long, simple-tipped.

Type-species: *Orchestia platensis* Krøyer, 1845

KEY TO THE KNOWN SPECIES OF *PLATORCHESTIA**

1. Male gnathopod 1, claw distinctly or slightly shorter than total palm, distal end of dactylus with scale-like denticle(s) anteromarginally; male pereopod 7, segment 5 shorter than segment 6, equal to or broader than segment 4; pleopods 1 and 2, peduncle lacking outer distomarginal spines 2
 - Male gnathopod 1, claw slightly longer than total palm, dactylus lacking denticle; male pereopod 7, segment 5 subequal to segment 6 in length, narrower than segment 4; pleopods 1 and 2, peduncle with outer distomarginal spines *P. crassicornis* (Derzhavin, 1937)
2. Male gnathopod 1, claw slightly shorter than total palm; male gnathopod 2, palmar notch nearer posterior angle; male pereopod 7, width of segment 5 subequal to segment 4; mandibular left lacinia usually 6-dentate 3
 - Male gnathopod 1, claw distinctly shorter than total palm; male gnathopod 2, palm sinuous, without notch; male pereopod 7,

* Bousfield (1982) includes 3 more species of the genus with a questionmark. But *P. chathamensis* Bousfield, 1982 is hard to place since the male is unknown (only a single female being recorded), and the remaining two species, *Talorchestia zachsi* Derzhavin, 1937 and *Orchestia japonica* (Tattersall, 1922) are considered to deviate from the diagnosis of the genus.

- segment 5 much broader than segment 4; mandibular left lacinia 5-dentate *P. pachypus* (Derzhavin, 1937)
- 3. Body very slender, especially coxae 2-4 extremely shallow; pereopod 4, segment 5 very short, width nearly equal to anterior length; pereopod 6, anterodistal corner of hind lobe of coxa without distal process; oostegite of pereopod 5, anterior and posterior margins with about the same number of setae *P. munmui* n.sp.
 - Body not very slender, coxae 2-4 as broad as deep; pereopod 4, segment 5 not so short, width less than 2/3 anterior length; pereopod 6, anterodistal corner of hind lobe of coxa with distal process; oostegite on pereopod 5, posterior margin with a few setae distally ... *P. platensis* (Krøyer, 1845)

***Platorchestia crassicornis* (Derzhavin, 1937)**
(Figs. 5-7, 9a,c,e, 10d-e)

Talorchestia crassicornis Derzhavin, 1937: 90-91, 108-109, pl. 3-1; Gurjanova, 1951: 812, fig. 566.
Orchestia platensis; non Krøyer, 1845; Iwasa, 1939: 257-261, figs. 1-3, pl. 9; Stephensen, 1945: 57-59, figs. 15-16; Gurjanova, 1951: 807-808, fig. 562; Bulycheva, 1957: 159-162, figs. 57a-b; Morino, 1975: 172-175, figs. 1-3.
Platorchestia crassicornis (Derzhavin); Bousfield, 1982: 26.
Platorchestia platensis; non Krøyer, 1845; Kim & Kim, 1987: 18-19, fig. 16A-G.

Material examined.—Prov. Kyeongki, Hwasung-gun, Masanpo; 23 May 1986, 64 specimens (ZMA Amph. 108.391) and 64 specimens (IMS, Pusan). Y. W. Jo coll.
Prov. Cheonnam, Haenam-gun, Songho-ri; 8 Aug. 1986, 132 specimens. C. W. Ma coll.
Prov. Cheju, Bukcheju-gun, Hyeopjae; 8 Aug. 1986, 160 specimens. Y. W. Jo & M. Y. Hong coll.
Prov. Cheju, Bukcheju-gun, Sehwa; 7 Aug. 1986, 369 specimens. Y. W. Jo & M. Y. Hong coll.
Prov. Cheju, Namcheju-gun, Pyosun; 9 Aug. 1986, 189 specimens. Y. W. Jo & M. Y. Hong coll.
Prov. Cheju, Namcheju-gun, Hwasoon; 8 Aug. 1986, 5 specimens. Y. W. Jo & M. Y. Hong coll.
Prov. Kyeongnam, Chungmu city, Buksin-dong; 28 Apr. 1987, 1 ♂, 1 ovigerous ♀ and 1 ♀. C. W. Ma coll.

Description.—Body length up to 13.5 mm in male, 14.0 mm in female.

Male: Body stout, not very slender. Eyes (fig. 5a) of medium size, vertically subovoid.

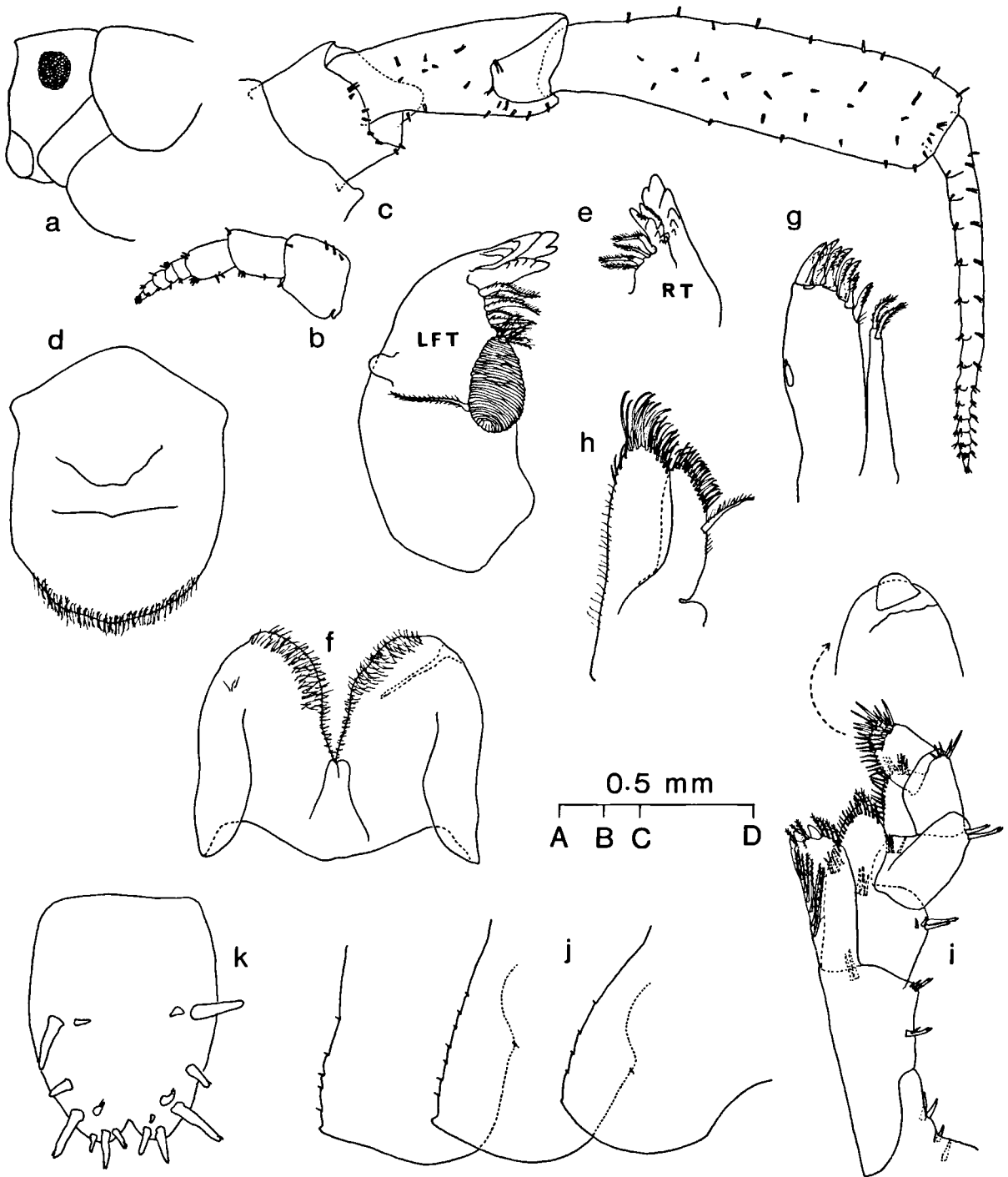


Fig. 5. *Platorchestia crassicornis* (Derzhavin, 1937) (♂ 12.5 mm from Masanpo). a, head (scale AB); b, antenna 1 (AC); c, antenna 2 (AC); d, upper lip (AD); e, mandibles (AD); f, lower lip (AD); g, maxilla 1 (AD); h, maxilla 2 (AD); i, maxilliped (AD); j, epimeral plates 1 to 3 (AC); k, telson (AD). Each scale unit (AB, AC, AD) represents 0.5 mm.

Antenna 1 (fig. 5b) short, not reaching end of peduncle segment 4 of antenna 2; peduncular segments narrowing distally; flagellum short, 5-segmented.

Antenna 2 (fig. 5c) about one third as long as body; peduncle strongly incrassate; flagellum 14-segmented, shorter than peduncle segment 5 in large animal.

Upper lip and lower lip (figs. 5d,f) of the usual structure, lower lip with small inner lobes.

Mandibles (fig. 5e), left and right incisor with 6 teeth; left lacinia mobilis 5- or 6-dentate, most proximal (6th) tooth small; right lacinia bifid with teeth of various sizes.

Maxilla 1 (fig. 5g), palp 2-segmented, distal segment minute; outer lobe, number of median denticles on the spines from inner to outer side, 4, 4, 4, 4, 4, 4, 4, 2, and 2, respectively.

Maxilla 2 (fig. 5h), distolateral margin of outer lobe with 4-5 short setae.

Maxilliped (fig. 5i), inner margin of the inner lobe with 7-8 plumose setae.

Coxa 1 (fig. 6a) narrowing distally, setose posteriorly. Coxae 2-4 (figs. 6b-d) moderately deep, with spinules on posterior and distal margins.

Coxal gill on gnathopod 2 (fig. 6b) slender and long; those on pereopods 3-5 (figs. 6c-e) reduced; on pereopod 6 (fig. 6f) large.

Gnathopod 1 (fig. 6a) spinose, claw slightly longer than palm, anterior margin of dactylus simple, not overhanging the base of unguis (fig. 9a); carpus, posterodistal lobe narrow, anterior margin 1.5 times as long as that of propodus.

Gnathopod 2 (fig. 6b), palm with 2 strong processes, anterior one larger than posterior, palmar notch more or less central (fig. 9c); propodus, posterior margin with several spines distally.

Pereopods 3-7 (figs. 6c-g), unguis relatively long, slender. Pereopod 4, dactylus pinched behind. Pereopod 5, anterior and hind lobes of coxa spinose posterodistally; basis moderately widened. Pereopods 6 and 7 subequal in size. Pereopod 7, segment 5 as long as segment 6, not strongly incrassate.

Epimeral plates 1-3 (fig. 5j), posterior

margin weakly serrulate, with several spinules; posterodistal corner of plate 1 hardly pointed.

Pleopods, retinacula (fig. 10d) 2-hooked, inner margin smooth, not serrate (but see fig. 10e, serrate inner margin in specimen from Hyeopjae). Pleopod 1 (fig. 7h), outer margin of peduncle poorly spinose, only proximal and distal margin with 2 spines each. Pleopods 2 and 3 (figs. 7i, j), peduncle densely spinose (more than 10 spines along the outer margin), including a small distal spine on the outer margin.

Uropod 1 (fig. 7k), rami about 2/3 as long as peduncle; inner ramus spinose on the inner and outer margins; outer ramus with 2 subapical and 2 apical spines (fig. 9e).

Uropod 2 (fig. 7-l), inner ramus with inner and outer marginal spines; outer ramus lacking inner marginal spines, with a few outer marginal spines only.

Uropod 3 (fig. 7m), peduncle and ramus with bifid spines posteriorly; ramus 2/3 as long as peduncle.

Telson (fig. 5k), each lobe with 3 apical and 5 dorsolateral spines.

Female: Antennae 1 and 2 (figs 7a,b) much shorter and slenderer than in male; antenna 2, peduncle not stout, flagellum 14-segmented.

Gnathopod 1 (fig. 7c), basis with a sub-marginal spine row anteriorly; propodus narrowing distally, with very short palm; claw greatly exceeding palm, dactylus with a single spinule on posterior margin, anterior margin smooth, lacking denticle.

Gnathopod 2 (fig. 7d), basis strongly expanded anteriorly; carpus slightly longer than propodus.

Pereopod 7 similar to that of male, not sexually dimorphic.

Oostegites (figs. 7d-g) elongate, with simple and long marginal setae; that on pereopod 5 widest and shortest, with a few spinules on anterior margin.

Remarks.—In the footsteps of Iwasa (1939) many workers in the northwestern Pacific have ascribed this species to *Platorchestia platensis* (Krøyer, 1845) (Stephensen, 1945; Gurjanova,

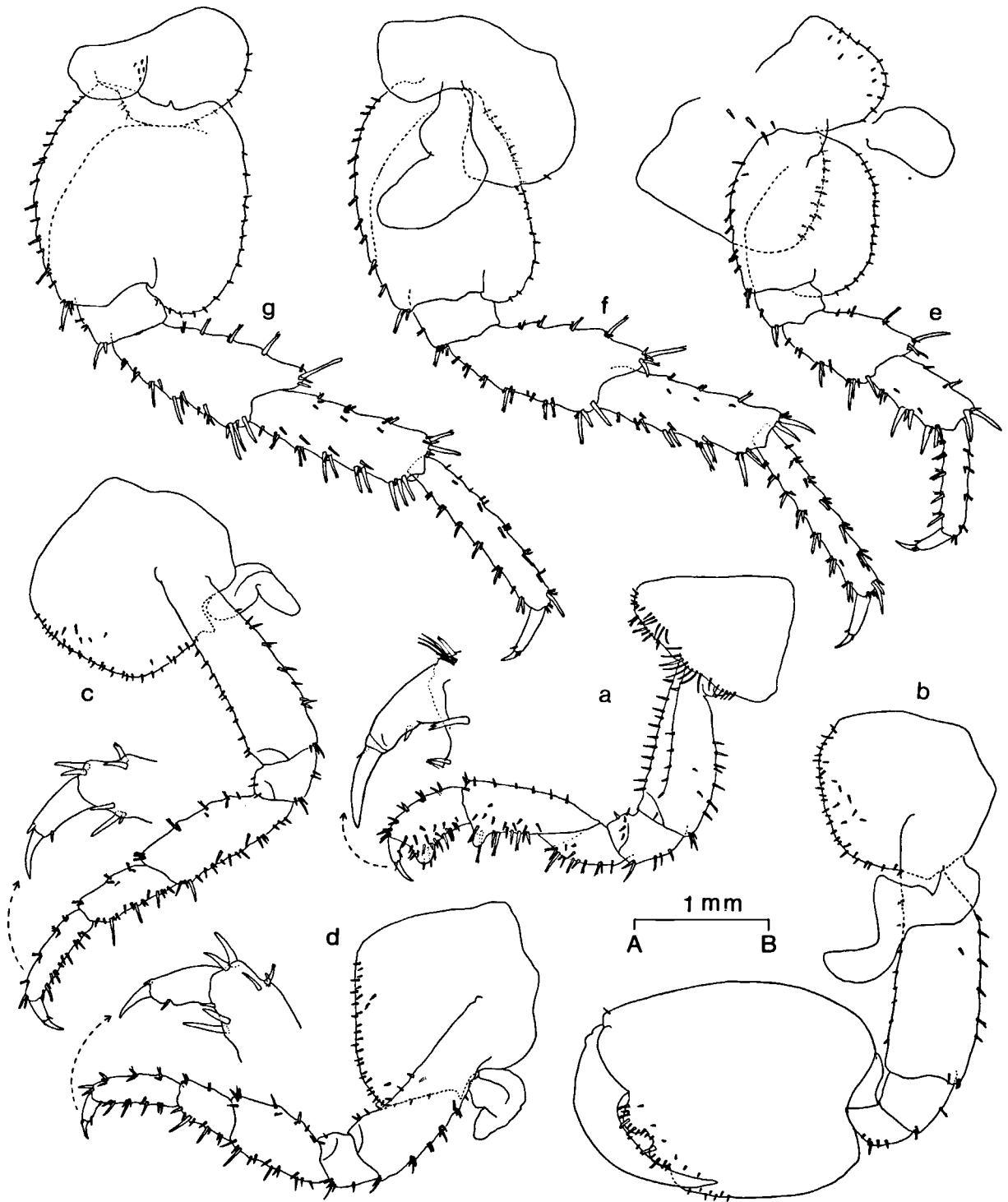


Fig. 6. *Platorchestia crassicornis* (Derzhavin, 1937) (♂ 12.5 mm from Masanpo). a, gnathopod 1; b, gnathopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pereopod 6; g, pereopod 7. Scales: all AB (= 1 mm).

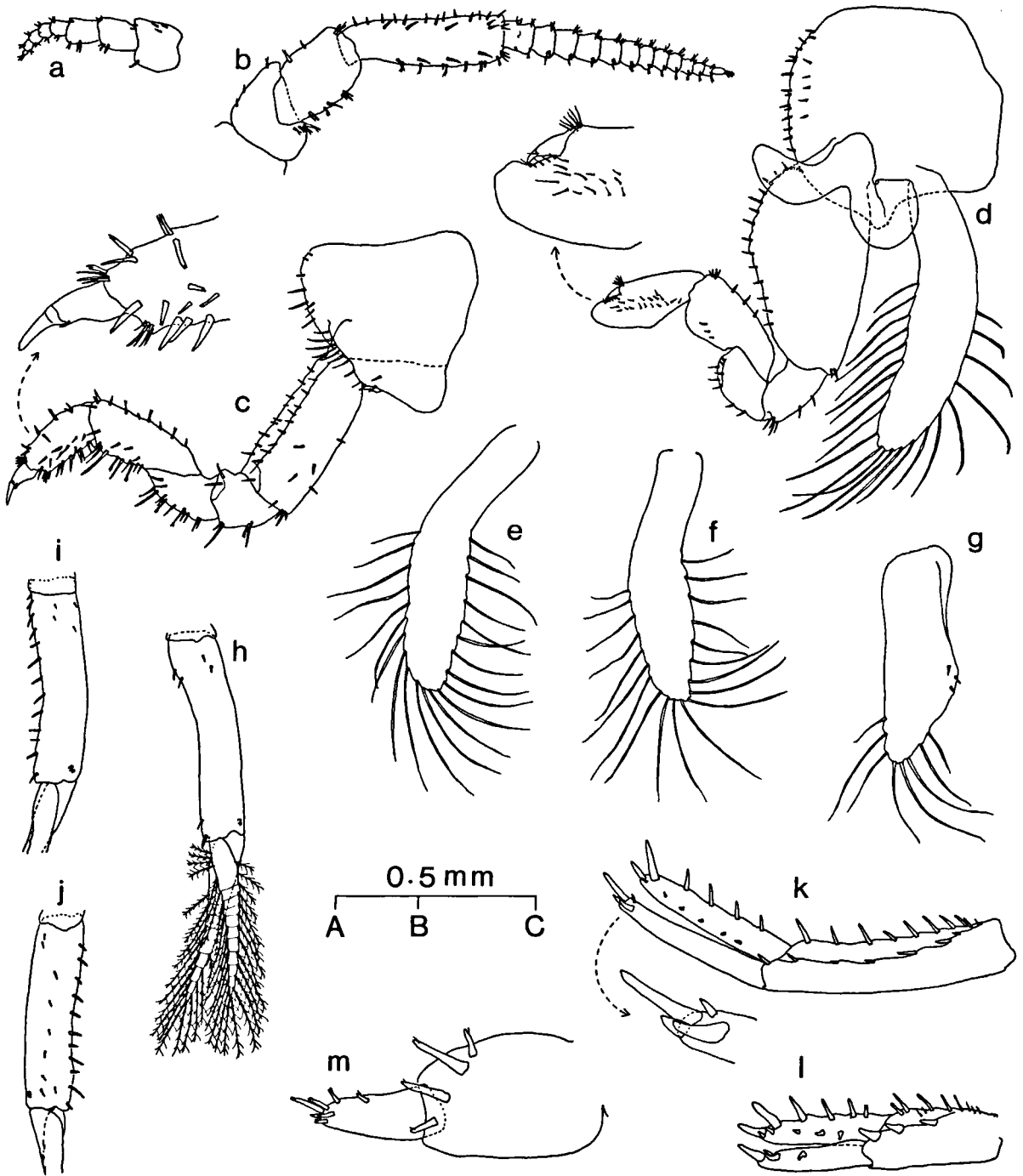


Fig. 7. *Platorchestia crassicornis* (Derzhavin, 1937) (a-g, ♀ 13.0 mm; h-m, ♂ 12.5 mm, from Masanpo). a, antenna 1 ♀ (scale AB); b, antenna 2 ♀ (AB); c, gnathopod 1 ♀ (AB); d, gnathopod 2 with oostegite (AB); e, oostegite of pereopod 3 (AB); f, oostegite of pereopod 4 (AB); g, oostegite of pereopod 5 (AB); h, pleopod 1 ♂ (AB); i, peduncle of pleopod 2 ♂ (AB); j, peduncle of pleopod 3 ♂ (AB); k, uropod 1 ♂ (AB); l, uropod 2 ♂ (AB); m, uropod 3 ♂ (AC). Each scale unit (AB, AC) represents 0.5 mm.

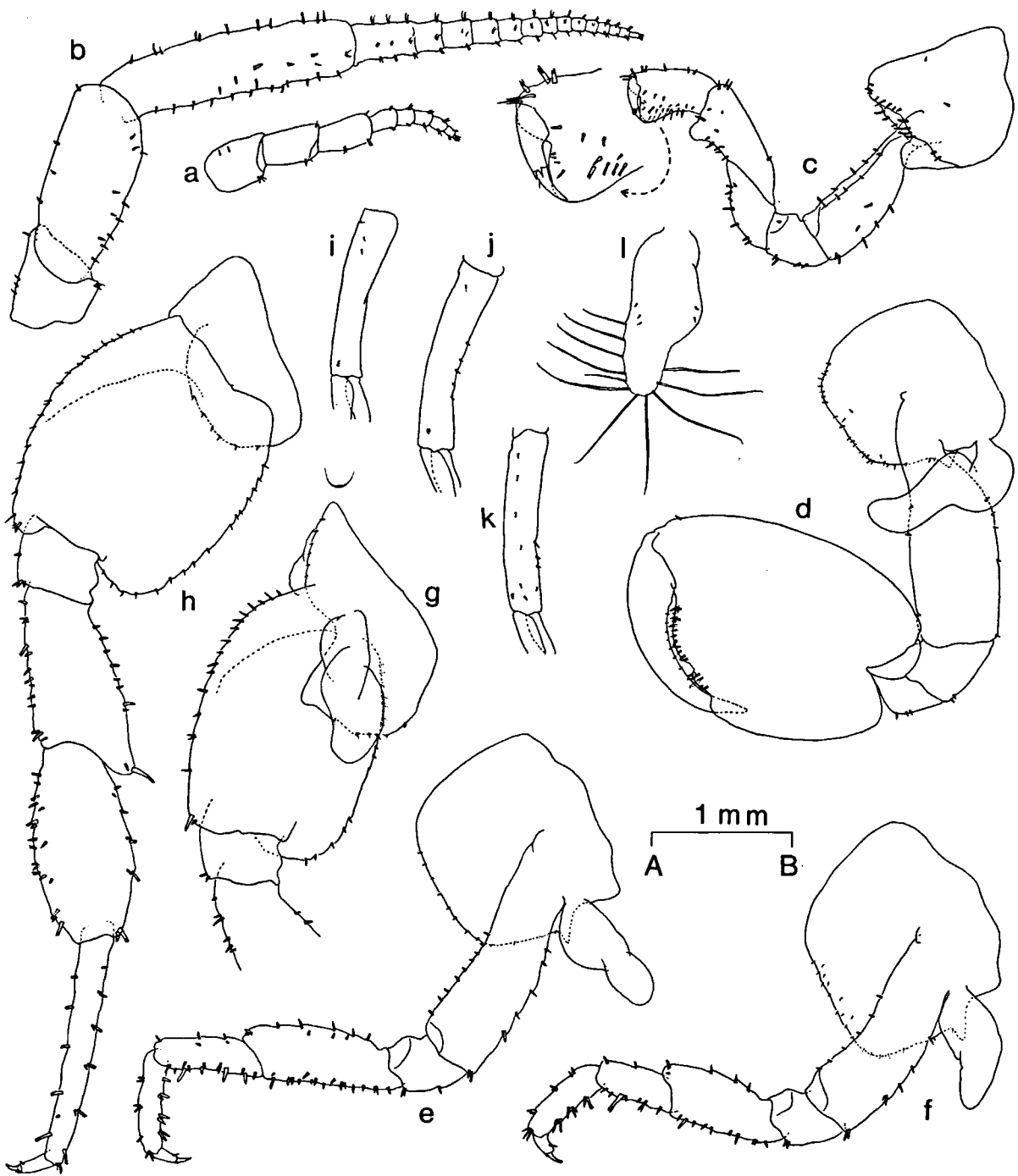


Fig. 8. *Platorchestia platensis* (Krøyer, 1845) (a-k, ♂ 14.5 mm; l, ♀ 14.0 mm, from Møns Klint, Denmark, 9 Aug. 1952, J. H. Stock coll.). a, antenna 1 ♂; b, antenna 2 ♂; c, gnathopod 1 ♂; d, gnathopod 2 ♂; e, pereopod 3 ♂; f, pereopod 4 ♂; g, pereopod 6 ♂; h, pereopod 7 ♂; i, peduncle of pleopod 1 ♂; j, peduncle of pleopod 2 ♂; k, peduncle of pleopod 3 ♂; l, oostegite of pereopod 5 ♀. Scales: all AB (= 0.5 mm).

1951; Bulycheva, 1957; Morino, 1975; Kim & Kim, 1987) except Bousfield (1982). During this study the author had occasion to examine some Atlantic specimens of *P. platensis* from Møns Klint and Tirsbaek (Denmark), Normert in North Holland (the Netherlands), and western Florida (U.S.A.), deposited in ZMA. Close comparison showed that several clear morphological differences existed between the northwestern Pacific *P. crassicornis* and the Atlantic *P. platensis*. The latter has less incrassate peduncle of male antenna 2 (fig. 8b); weakly spinose pereopods; an anteromarginally denticulated dactylus of gnathopod 1 (figs. 8c; 9b); rather even processes on the palm and a palmar notch nearer to the posterior angle in male gnathopod 2 (figs. 8d; 9d); fewer posterior setae on oostegite of pereopod 5 (fig. 8-1); segment 5 of male pereopod 7 as wide as segment 4 and shorter than segment 6 (fig. 8h); the peduncle of pleopods 1 and 2 lacking distomarginal spines (figs. 8i, j).

In his key, Bousfield (1982) points out that *P. crassicornis*, contrary to *P. platensis*, has an elongate carpus of gnathopod 1 (anterior margin about 1.5 times as long as propodus) and an outer ramus of uropod 1 with a single marginal (subapical) spine. In this study, however, both species share the same characters in those aspects (see figs. 6a, 8c; figs. 9e-f).

From *P. pachypus* this species differs in having a longer claw of male gnathopod 1, strong processes and a notch on the palm of male gnathopod 2, a sublinear segment 5 of pereopod 7, and distomarginal spines on the peduncle of pleopods 1 and 2. In female gnathopod 1, the dactylus has a single spine posteriorly and lacks an anteromarginal denticle in this species but *P. pachypus* has two spines and denticles on the dactylus.

Morphological variations among the instars are visible in antenna 2 and gnathopod 2 of the male. However, a widened segment 5 of male pereopod 7 (as in Morino, 1975: 173, fig. 2L) was not observed in the present study (see Derzhavin, 1937; Iwasa, 1939; Bulycheva, 1957; Kim & Kim, 1987). Strong sexual dimorphism can be seen in antenna 2, gnathopods 1 and 2.

Specimens from the sandy beaches of Cheju Island hardly differ from those of other localities of the country, except for some minor differences, for instance, a less stout peduncle of antenna 2, a higher number of spines (12-13) on the telson lobes, and a longer segment 6 of pereopod 7. However, the microstructure of the retinacula (fig. 10e) shows quite a different shape from that of Masanpo (fig. 10d), viz., that of a marginally serrate hook. More detailed studies are required to evaluate the taxonomic value of retinacular microstructure.

Distribution and ecology.—The species has been recorded from the northwestern Pacific, including Soviet coasts, Japan, and Korea.

In contrast, *P. platensis* seems to be restricted to both sides of the Atlantic (Rio de la Plata, north-west of Montevideo: Krøyer, 1845; North American Atlantic coast from Florida to Newfoundland: Bousfield, 1973; Mediterranean: Chevreux & Fage, 1925; Britain: Lincoln, 1979; Denmark and Sweden: Dahl, 1946; Norway: Teigsmark, 1981; Germany: Schellenberg, 1942; Netherlands: Stock, 1950). Previous reports of *P. platensis* from Chilka Lake, India (Chilton, 1921), Hawaii (Stebbing, 1900), Gambier Islands, South Pacific (Chevreux, 1908), and Bali, Indonesia (Schellenberg, 1931) are doubtful because those animals are different from the Atlantic material in shape of palm of male gnathopod 2, in having a short claw of male gnathopod 1, and slender segments 4 and 5 of male pereopod 7.

In Korea, the present species is distributed along the west and south coasts, including Cheju Island. At Masanpo it was collected under a heap of fishing nets on a pebbly coarse sandy beach several metres above HWS. And a few specimens were obtained under the stones at Chungmu. In Cheju Island, on the other hand, it was collected on fine sand, showing fossorial behaviour.

Ovigerous females were found in April 1987 at Chungmu and in May 1986 at Masanpo. A female from Masanpo (B.L. 12.5 mm) carries 14 eggs, egg size 0.48 × 0.62 mm.

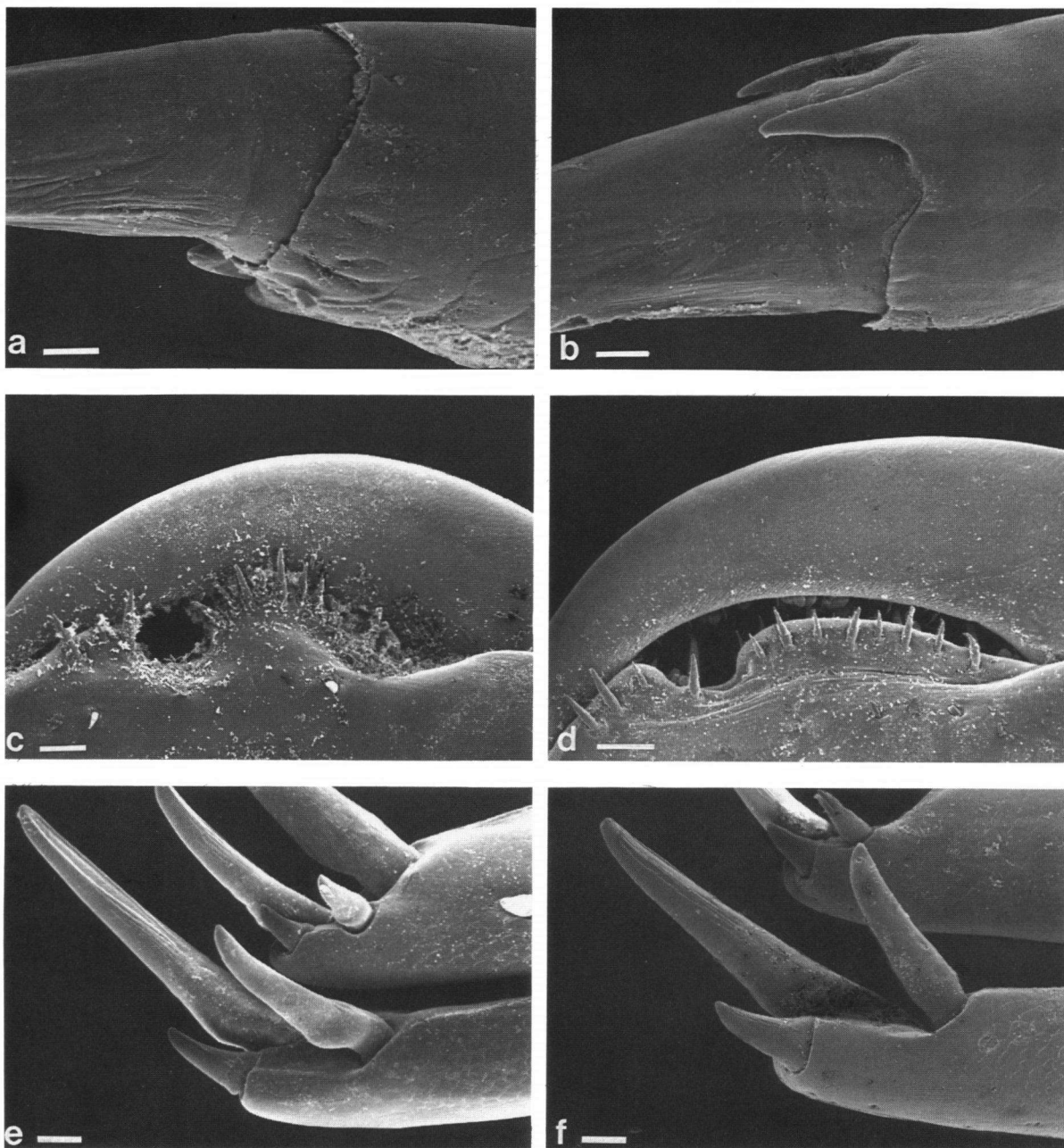


Fig. 9. *Platorchestia crassicornis* (Derzhavin, 1937) [a, c, e: ♂ 13.5 mm, from Masanpo, Korea and *P. platensis* (Krøyer, 1845) [b, d, f: ♂ 15.0 mm, from Tirsbaek, Denmark, 2 Aug. 1952, J. H. Stock coll.]. a & b, dactylus of gnathopod 1 (scale bars = 10 μm); c & d, palm of gnathopod 2 (scale bars = 80 μm); e & f, distal part of outer ramus of uropod 1 (scale bars = 30 μm).

***Platorchestia munmui* n.sp.**
(Figs. 11-13, 10f)

Material examined.—Prov. Kyenongbuk, Wolsung-gun, Daebon; 25 May 1986, 1♂ holotype (ZMA Amph.

108.392), 1 ovigerous ♀ allotype (ZMA Amph. 108.393), 20 paratypes (ZMA Amph. 108.394), and 34 paratypes (IMS, Pusan). Y. W. Jo & M. Y. Hong coll.

Pusan, Dadaepo; 23 Apr. 1983, 3♂♂ and 2♀♀. Y. W. Jo coll.

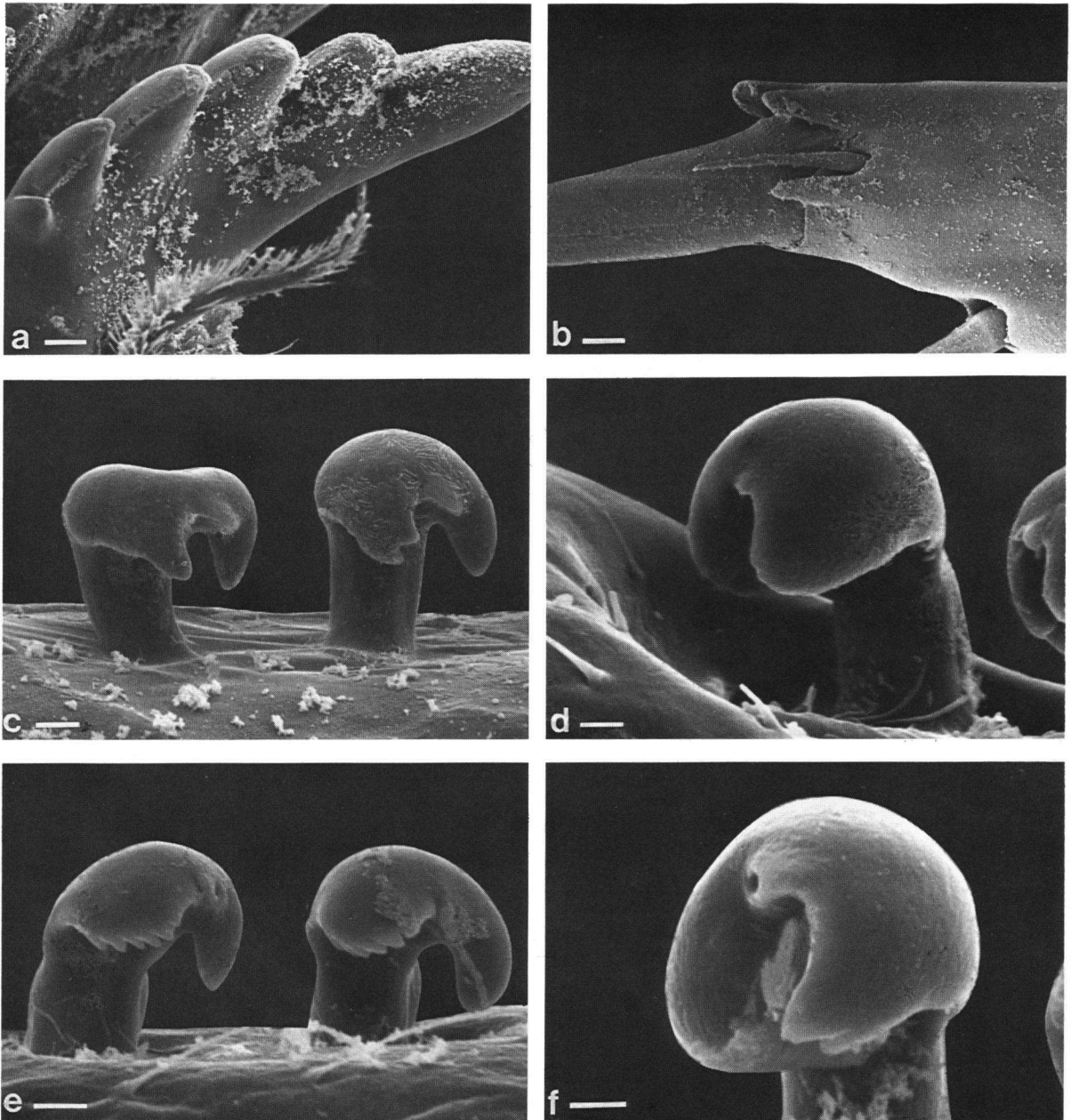


Fig. 10. *Trinorchestia longiramus* n.sp. [a, c: ♂ 21.0 mm; b: ♀ 25.5 mm, from Bongpyeong], *Platorchestia crassicornis* (Derzhavin, 1937) [d: ♂ 13.5 mm from Masanpo; e: ♂ 13.5 mm from Hyeopjae], and *P. munmui* n.sp. [f: ♀ 13.2 mm from Daebon]. a, lacinia mobilis of left mandible (scale bar = 15 μ m); b, dactylus of pereopod 4 (scale bar = 20 μ m); c, retinacula of pleopod 3 (scale bar = 4 μ m); d, retinacula of pleopod 2 (scale bar = 2 μ m); e, retinacula of pleopod 1 (scale bar = 3 μ m); f, retinacula of pleopod 1 (scale bar = 2 μ m).

Description.—Maximum body length 13.2 mm in male, 12.3 mm in female. Male habitus as in fig. 11a.

Male: Body slender, especially pereionial somites very shallow. Eyes rounded sub-quadrangle, medium-sized.

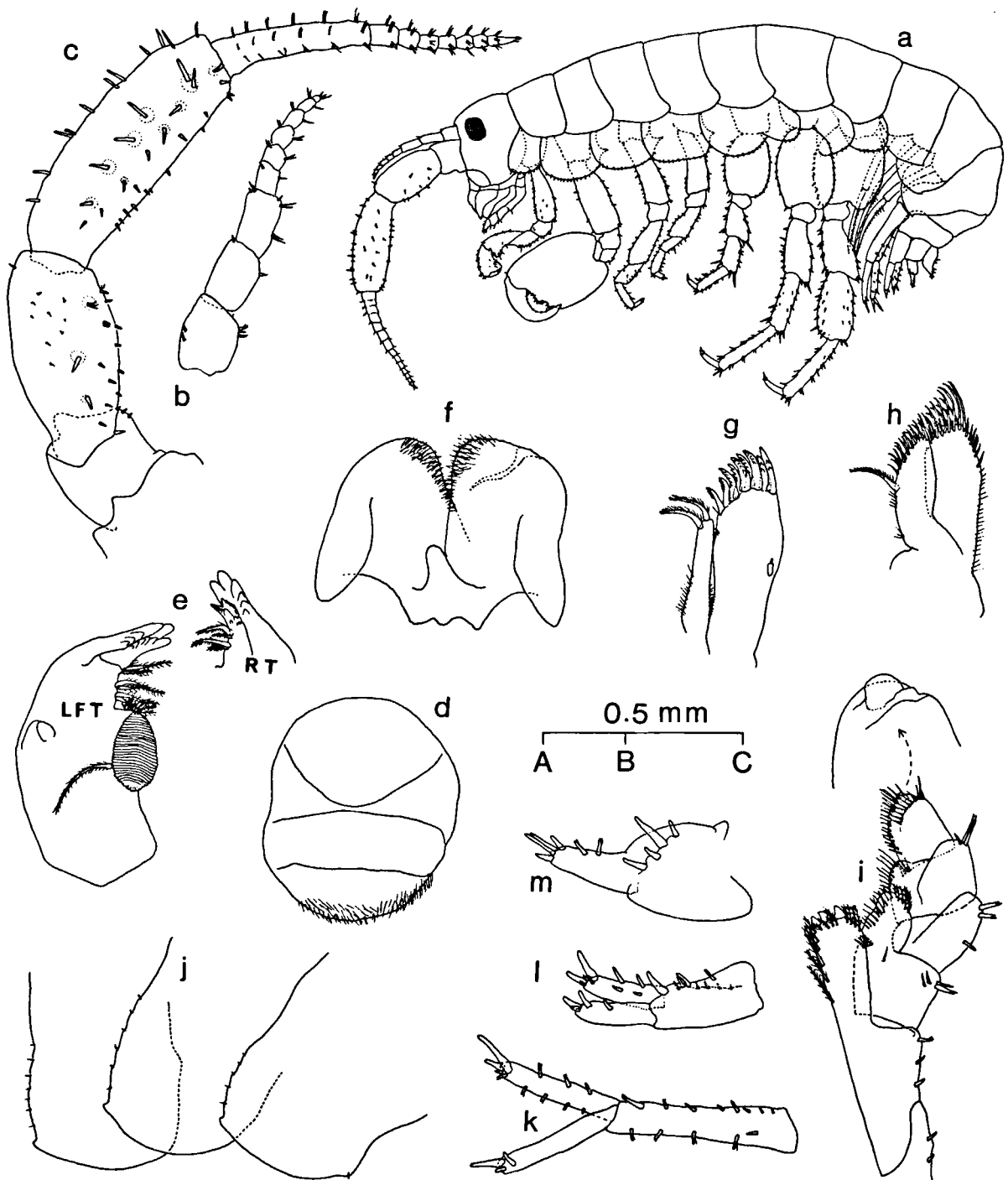


Fig. 11. *Platorchestia munmui* n.sp. (♂ holotype 13.2 mm from Daebon). a, entire animal, from the left; b, antenna 1 (scale AB); c, antenna 2 (AB); d, upper lip (AC); e, mandibles (AC); f, lower lip (AC); g, maxilla 1 (AC); h, maxilla 2 (AC); i, maxilliped (AC); j, epimeral plates 1 to 3 (AB); k, uropod 1 (AB); l, uropod 2 (AB); m, uropod 3 (AC). Each scale unit (AB, AC) represents 0.5 mm.

Antenna 1 (fig. 11b) slender, almost reaching end of peduncle segment 4 of antenna 2; peduncular segments subequal; flagellum relatively long, 6-segmented.

Antenna 2 (fig. 11c) longer than 1/3 of body length; peduncle strongly incrassate, segment 5 shorter than flagellum; flagellum 14-segmented.

Upper and lower lips (figs. 11d,f) of the usual structure, inner lobes of lower lip very small.

Mandibles (fig. 11e), left incisor with 5-6 teeth, lacinia mobilis 6-dentate; right incisor with 6 teeth, lacinia mobilis bifid with fine teeth along the rami and with large teeth on the base.

Maxilla 1 (fig. 11g), proximal half of inner lobe marginally setose; outer lobe, number of median denticles on the spines, 4, 5, 5, 4, 5, 4, 5, 2, and 2 from inner to outer side, respectively.

Maxilla 2 (fig. 11h), outer lobe much wider than inner, distal outer margin with 7-8 short, simple setae.

Maxilliped (fig. 11i), inner margin of inner lobe with 6-7 plumose setae; palp relatively short and wide, in particular segment 2.

Coxae 2-4 (figs. 12b-d) very shallow, much wider than deep, sharply cuspidate posteriorly.

Coxal gill on gnathopod 2 (fig. 12b) long and slender, very large on pereopod 6 (fig. 12f).

Gnathopod 1 (fig. 12a) little spinose; claw a little shorter than total palm, distal end of dactylus with a denticle anteromarginally; posterodistal lobe of carpus broad.

Gnathopod 2 (fig. 12b) strongly subchelate; palmar notch nearer posterior angle, processes rather even; claw markedly curved, stout.

Pereopods 3-5 (figs. 12c-e), unguis short and stout. Pereopod 4, segment 5 short, width about equal to anterior length. Pereopod 6 (fig. 12f), anterodistal margin of hind lobe of coxa rounded, lacking distal process. Pereopod 7 (fig. 12g), segment 5 incrassate, as wide as segment 4, distinctly shorter than segment 6.

Epimeral plates 1-3 (fig. 11j), posterior margin weakly serrulate with 5-7 spinules; posterodistal corners with small process.

Pleopods (figs. 13i-k), rami 8- to 9-segmented, a little shorter than peduncle; outer

margin of peduncle of pleopod 1 bare; peduncle of pleopod 2 with several outer marginal spines, but lacking distomarginal spines; peduncle of pleopod 3 with dorsal and marginal spines. Retinacula (fig. 10f) with 1 pore in the middle.

Uropod 1 (fig. 11k), rami 2/3 as long as peduncle; inner ramus armed with inner and outer marginal spines; outer ramus with 1 or 2 subapical and 2 apical spines.

Uropod 2 (fig. 11-l), rami 2/3 as long as peduncle; outer ramus with 2 marginal and 2 apical spines.

Uropod 3 (fig. 11m), ramus 3/4 as long as peduncle.

Telson (fig. 13-1) longer than wide, each lobe with 3 apical and 5 dorsal spines.

Female: Antennae 1 and 2 (figs. 13a,b) much shorter and slenderer than in male; antenna 2, length of peduncle subequal to flagellum; flagellum 12-segmented.

Gnathopod 1 (fig. 13c), propodus sublinear in form, not narrowing distally; claw strongly exceeding palm, dactylus with a single spinule posteriorly, anterior margin with a denticle as in male gnathopod 1.

Gnathopod 2 (fig. 13d), coxal plate wider than deep; basis strongly expanded anteriorly; carpus slightly longer than propodus.

Pereopod 7 (fig. 13e) slender; segment 5 not incrassate, narrower than segment 4 and shorter than segment 6.

Oostegites (figs. 13d, f-h) elongate, that on pereopod 5 with several spinules on mid-ventral, and both anterior and posterior margins with 5-6 setae on distal half.

Remarks.—The new species is closely related to *P. platensis*. Similarities include the denticulated dactylus of gnathopod 1, shape of pereopod 7, spination of peduncle of pleopods 1 and 2, and weakly spinose appendages. The present species is, however, discriminated from *P. platensis* by the shape of the hind lobe of coxa 6 (lacking distal process on anterodistal corner), the very short segment 5 of pereopod 4 (width nearly equal to anterior length), equal number of setae both on the anterior and posterior

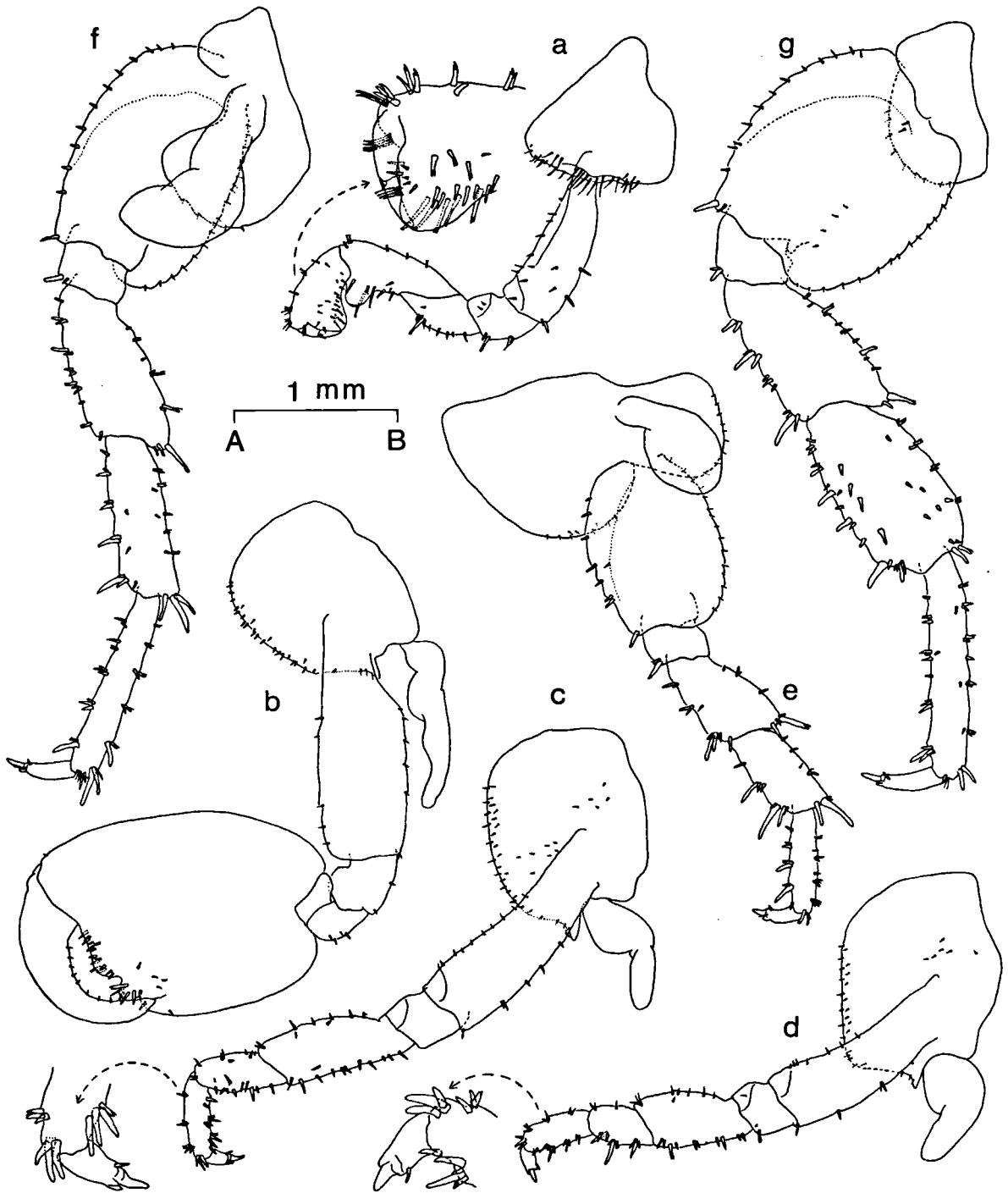


Fig. 12. *Platorchestia munmui* n.sp. (♂ holotype 13.2 mm from Daebon). a, gnathopod 1; b, gnathopod 2; c, pereopod 3; d, pereopod 4; e, pereopod 5; f, pereopod 6; g, pereopod 7. Scales: all AB (= 1 mm).

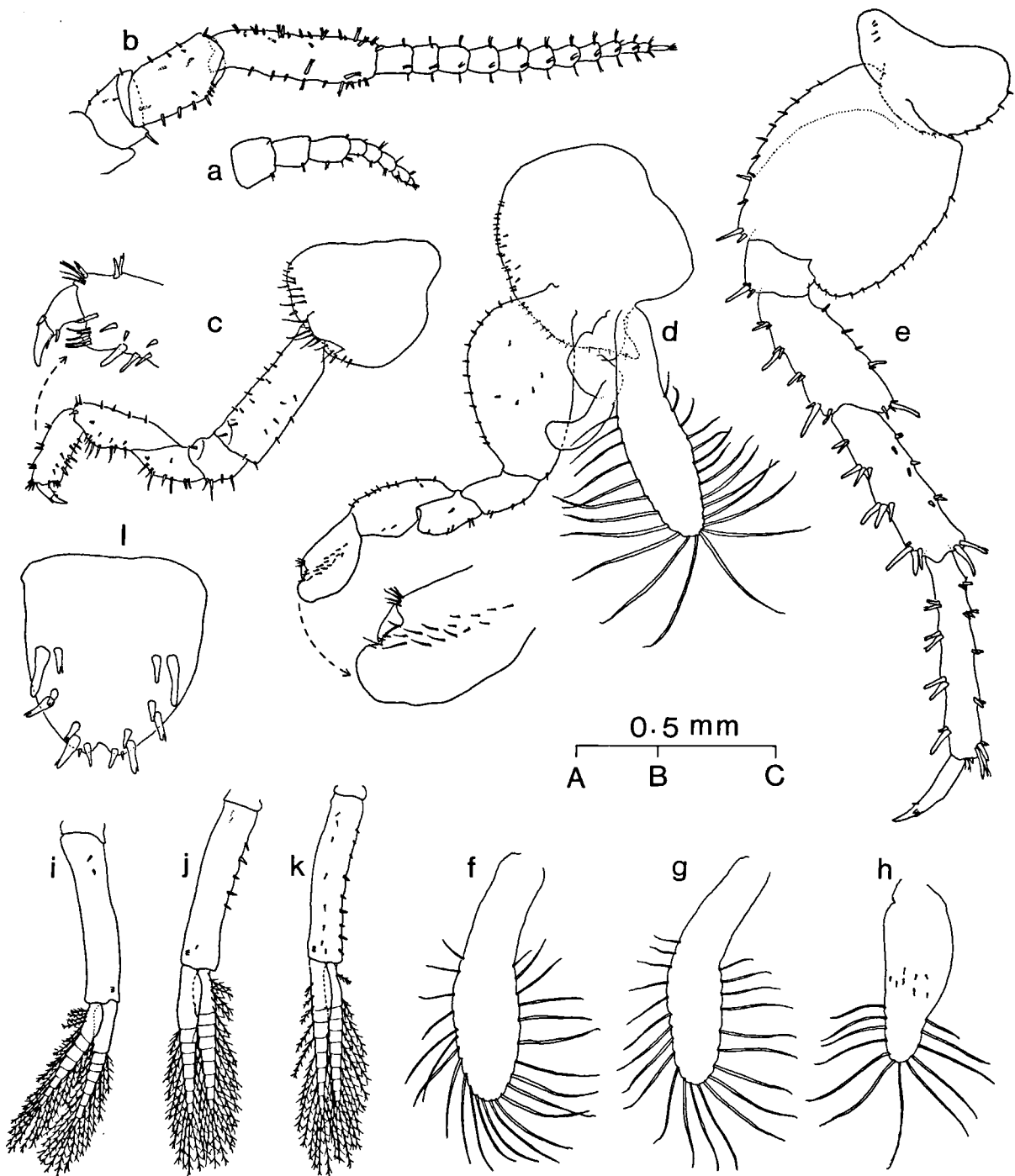


Fig. 13. *Platorchestia munmui* n.sp. (a-h, ♀ allotype 12.3 mm; i-l, ♂ holotype 13.2 mm, from Daebon). a, antenna 1 ♀ (scale AB); b, antenna 2 ♀ (AB); c, gnathopod 1 ♀ (AB); d, gnathopod 2 with oostegite (AB); e, pereiopod 7 ♀ (AB); f, oostegite of pereopod 3 (AB); g, oostegite of pereopod 4 (AB); h, oostegite of pereopod 5 (AB); i, pleopod 1 ♂ (AB); j, pleopod 2 ♂ (AB); k, pleopod 3 ♂ (AB); l, telson ♂ (AC). Each scale unit (AB, AC) represents 0.5 mm.

margin of oostegite of pereopod 5, and very slender body form, especially the shallow coxae 2-4.

From *P. crassicornis* the species differs in having a denticulated dactylus in gnathopod 1, the even processes on the palm of male gnathopod 2, the shape of male pereopod 7 (segment 5 as wide as segment 4 and shorter than segment 6 in the new species), the short and blunt claw of pereopods 3-5, lacking distomarginal spines on the peduncle of pleopods 1 and 2, and the very slender body form.

This species can be distinguished from *P. pachypus* by the length of the claw of male gnathopod 1, the shape of the palm of male gnathopod 2, the width of segment 5 of male pereopod 7, and the 6-dentate left mandibular lacinia. Identification of female specimens of these two species is more difficult than that of males. But the new species has a less emarginate posterior margin of epimeral plate 3 and a single posterior spine on the dactylus of female gnathopod 1.

Morphological variations are rather strong depending on instar and sex. These phenomena are most common in antenna 2, gnathopod 2, and pereopod 7, becoming incrassate in older and larger animals, especially males.

Etymology.—The specific name, *munmui*, is proposed because the type-locality Daebon is a historical place where Munmu the Great's underwater tomb is situated. The type-material was collected just around the royal tomb.

Distribution and ecology.—This species occurs on the southern part of the east coast. At Daebon it was collected among stranded *Sargassum* heaps at the HWS drift line; the substrate was gravelly coarse sand. At Dadaepo sandy beach the animals were found amongst stranded algae.

Ovigerous females were found in May 1986 at type-locality Daebon, with a small number of eggs. The allotype (B.L. 12.3 mm) carries 6 eggs, sized 0.52 × 0.63 mm.

***Platorchestia pachypus* (Derzhavin, 1937) (Figs. 14-16)**

Talorchestia pachypus Derzhavin, 1937: 91-92, 109, pls. 2-3, 3-2; Gurjanova, 1951: 812-813, fig. 567; Bulycheva, 1957: 146, fig. 52a-c.

Orchestia platensis japonica; non Tattersall, 1922*; Iwasa, 1939: 261-263, figs. 4-6, pl. 10 (in part); Stephensen, 1945: 59-60, fig. 17.

Orchestia pachypus (Derzhavin): Morino, 1975: 175-180, figs. 4-7.

Platorchestia pachypus (Derzhavin); Bousfield, 1982: 26; Kim & Kim, 1987: 19-20, fig. 16H-I.

Material examined.—Pusan, Dadaepo; 23 Apr. 1983, 15 specimens (ZMA Amph. 108.395), and 14 specimens (IMS, Pusan). Y. W. Jo coll.

Prov. Kyeongnam, Yangsan-gun, Ilkwang; 8 Dec. 1984, 51 specimens. Y. W. Jo coll.

Prov. Kyeongnam, Geoje-gun, Gujora; 20 Apr. 1986, 1 ♀. C. W. Ma coll.

Description.—Body length up to 15.0 mm in male, 12.4 mm in female.

Male: Body slender. Eyes (fig. 14a) medium-sized.

Antenna 1 (fig. 14b) a little exceeding end of peduncle segment 4 of antenna 2, of about the same length as peduncle segment 5 of antenna 2; flagellum 6-segmented.

Antenna 2 (fig. 14c) slightly shorter than half the length of body; peduncle strongly incrassate, peduncle segment 5 slightly shorter than flagellum; flagellum 14-segmented.

Upper and lower lips (figs. 14d,f) of the usual structure, epistome of upper lip with a number of spinules on the surface.

Mandibles (fig. 14e), both incisors 6-dentate; the left lacinia mobilis 5-dentate; the right lacinia bifid with numerous teeth.

Maxilla 1 (fig. 14g), spines of outer lobe with 6, 5, 3, 3, 3, 4, 3, 3, and 3 median denticles, from inner to outer side, respectively.

Maxilla 2 (fig. 14h), outer lobe a little wider

* *Orchestia japonica* (Tattersall, 1922) is a terrestrial species from a freshwater lake shore in Japan, which is different from *P. pachypus*. According to Morino (pers. comm.), Iwasa's concept (1939) of *Orchestia platensis japonica* (Tattersall) comprises two species; *P. pachypus* and *O. japonica*.

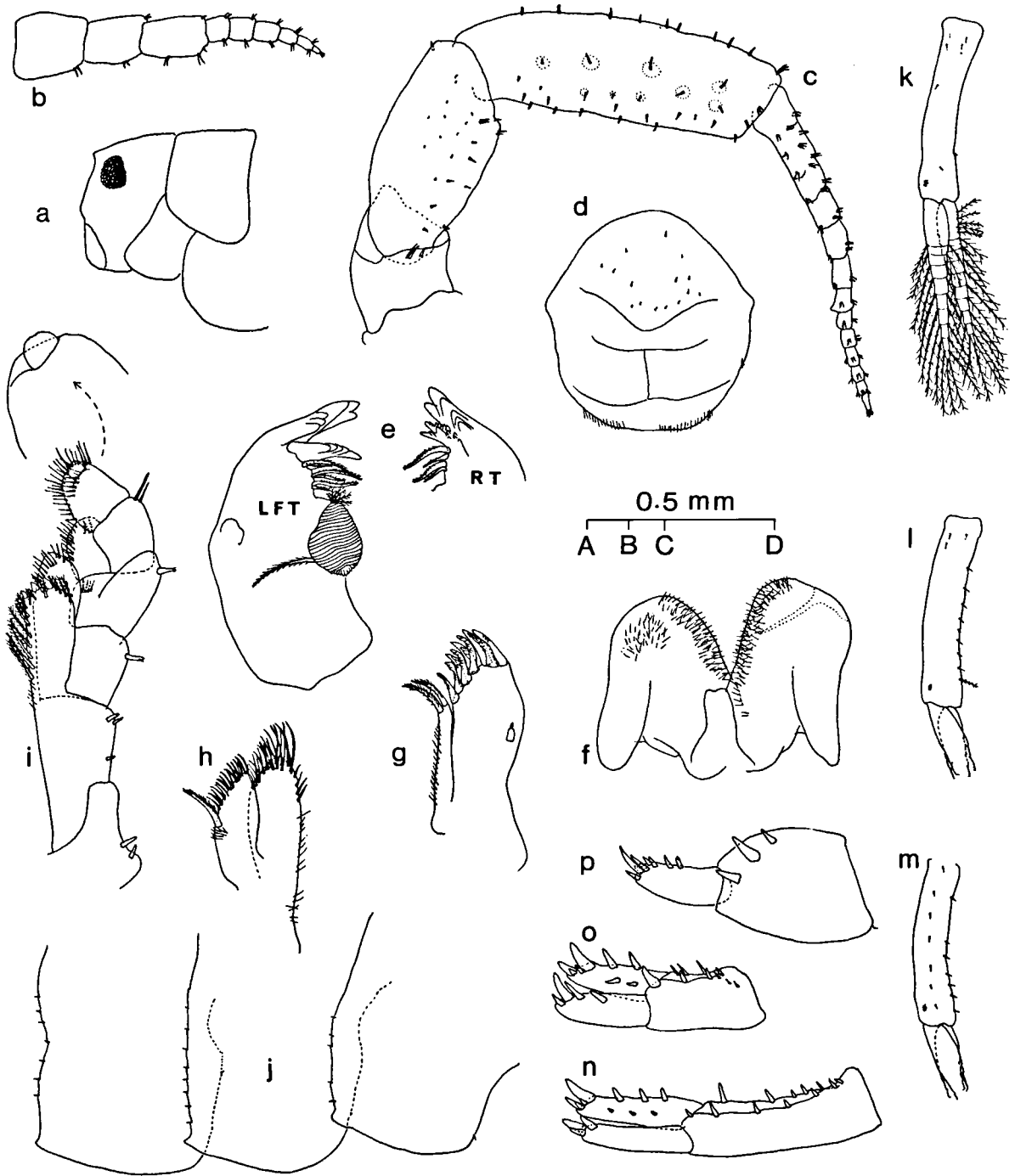


Fig. 14. *Platorchestia pachypus* (Derzhavin, 1937) (σ 15.0 mm from Dadaepo). a, head (scale AB); b, antenna 1 (AC); c, antenna 2 (AC); d, upper lip (AD); e, mandibles (AD); f, lower lip (AD); g, maxilla 1 (AD); h, maxilla 2 (AD); i, maxilliped (AD); j, epimeral plates 1 to 3 (AC); k, pleopod 1 (AC); l, peduncle of pleopod 2 (AC); m, peduncle of pleopod 3 (AC); n, uropod 1 (AC); o, uropod 2 (AC); p, uropod 3 (AD). Each scale unit (AB, AC, AD) represents 0.5 mm.

than inner lobe, distal outer margin with 4-5 short setae.

Maxilliped (fig. 14i), inner margin of inner lobe with 8-9 plumose setae.

Coxa 1 (fig. 15a) not narrowing distally. Coxae 2-4 (figs. 15b-d) moderately shallow, wider than deep.

Coxal gills (figs. 15b-f): on gnathopod 2 slender, on pereopods 5 and 6 broad.

Gnathopod 1 (fig. 15a) little spinose; claw much shorter than total palm, covering only true palm, anterior margin of dactylus denticulated, overhanging the base of unguis.

Gnathopod 2 (fig. 15b), propodus wide and stout, palm sinuous; central part of claw straight, not curved.

Pereopods 3-7 (figs. 15c-g) relatively poorly spinose, spines small or robust; dactylus short and stout, unguis blunt. Pereiopod 6 shorter than 7, basis moderately expanded. Pereiopod 7, segment 4 widened distally; segment 5 remarkably broad, much broader than segment 4; segment 6 longer than segment 5.

Epimeral plates 1-3 (fig. 14j), posterior margin weakly serrulate with several spinules; plate 3 moderately emarginate posteriorly.

Pleopods (figs. 14k-m), outer margin of peduncle of pleopod 1 scarcely spinose; peduncle of pleopods 2 and 3 with several spines marginally. All peduncles lacking distal spine on the outer margin. Outer margin of peduncle of pleopod 2 often with a plumose seta.

Uropod 1 (fig. 14n), peduncle about 1.7 times as long as rami; outer ramus with 1 subapical and 2 apical spines.

Uropod 2 (fig. 14-o) stout, peduncle slightly longer than rami; outer ramus with 2 marginal and 2 apical spines.

Uropod 3 (fig. 14p), ramus about 3/5 as long as peduncle, with short posterior and apical spines.

Telson (fig. 15h) longer than wide, slightly notched, with short and stout spines.

Female: Antennae 1 and 2 (figs. 16a,b) shorter and more slender than in male. Antenna 2, flagellum 14-segmented.

Gnathopod 1 (fig. 16c) more spinose than in

male; distal margin of coxa blunt; claw greatly exceeding palm, dactylus with 2 spinules posteriorly, anterior margin with a denticle.

Gnathopod 2 (fig. 16d), basis strongly expanded anteriorly; carpus longer than propodus.

Pereiopod 7 (fig. 16e), segments 4 and 5 slender, not incrassate; segment 6 longer than segment 5; claw thin and sharp.

Oostegites on gnathopod 2 to pereiopod 4 (figs. 16f-h) elongate, cucumber-shaped, with simple setae; that on pereiopod 5 (fig. 16i) short, with several spinules.

Remarks.—The present species agrees well with the Japanese specimen which has been sent to the author by Dr. Morino. But there are some differences in telson shape between Derzhavin's original description and the Korean material. He figured and described: "telson cleft nearly to the centre, with a single subapical and 2 apical spinules on each lobe," whilst the Korean specimens have slightly notched telson (about 1/8 of telson length) and 5 subapical and 3 apical spines on each lobe. It is presumed that Derzhavin's description is not correct because Bulycheva's Russian material (1957) shows the same telson shape as in the present specimens.

For the differences between this species and *P. crassicornis* or *P. munmui* see the remarks under both.

The animals are variable morphologically according to sex and instar. Sexual dimorphisms are noticeable in antenna 2, gnathopods 1 and 2, and pereopods 6 and 7. For the successive change of male characters see Morino (1975).

Distribution and ecology.—The species is found in southern part of the east coast and eastern part of the south coast in Korea. At Dadaepo and Ilkwang the animals live among stranded algae around the HWS drift line, where the substratum is coarse sand to shingle. Kim & Kim (1987) obtained the species under stones in Cheju Island.

Outside Korea, this species was recorded from the Soviet coasts of the NW Pacific and Japan.

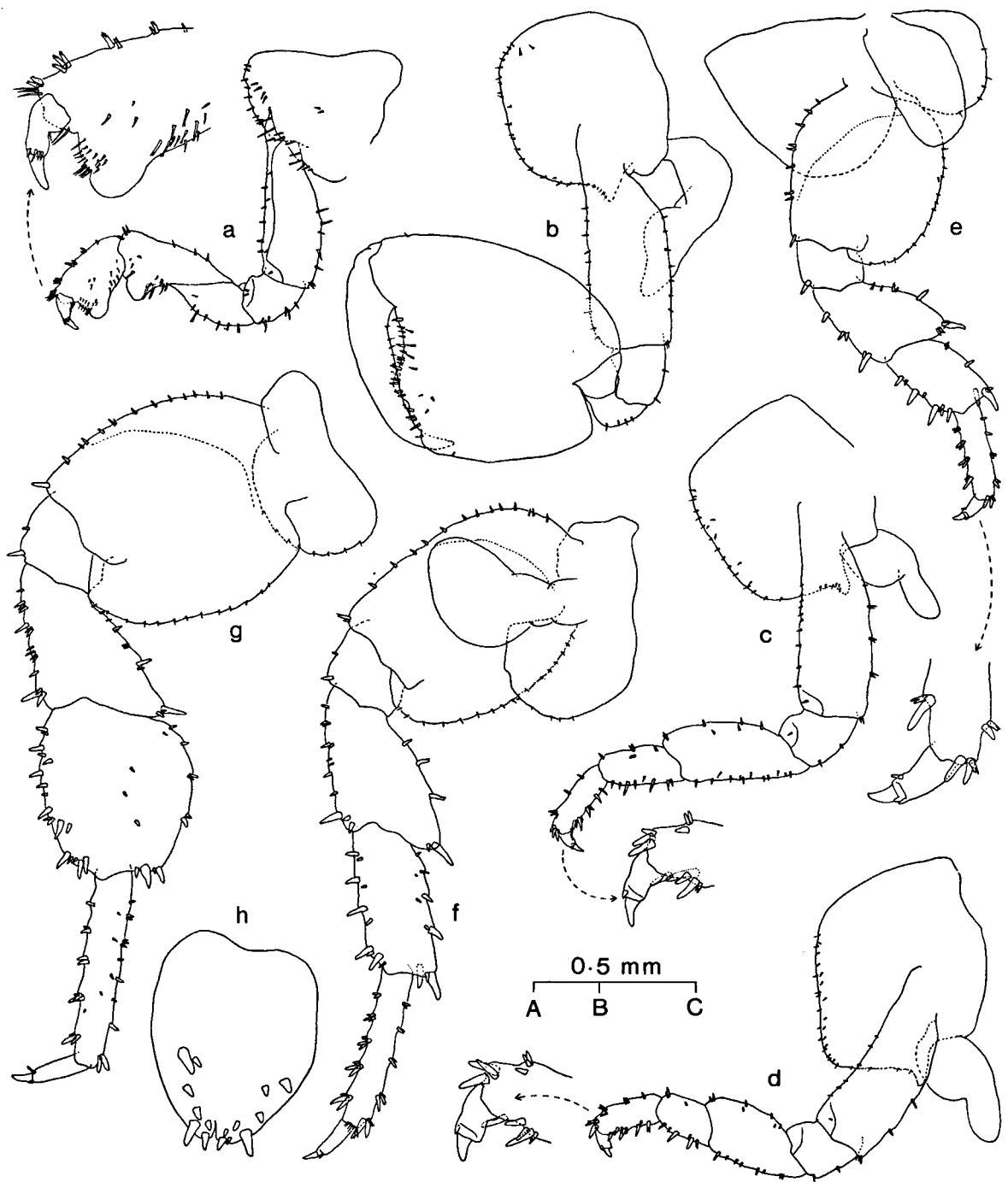


Fig. 15. *Platorchestia pachypus* (Derzhavin, 1937) (σ 15.0 mm from Dadaepo). a, gnathopod 1 (scale AB); b, gnathopod 2 (AB); c, pereopod 3 (AB); d, pereopod 4 (AB); e, pereopod 5 (AB); f, pereopod 6 (AB); g, pereopod 7 (AB); h, telson (AC). Each scale unit (AB, AC) represents 0.5 mm.

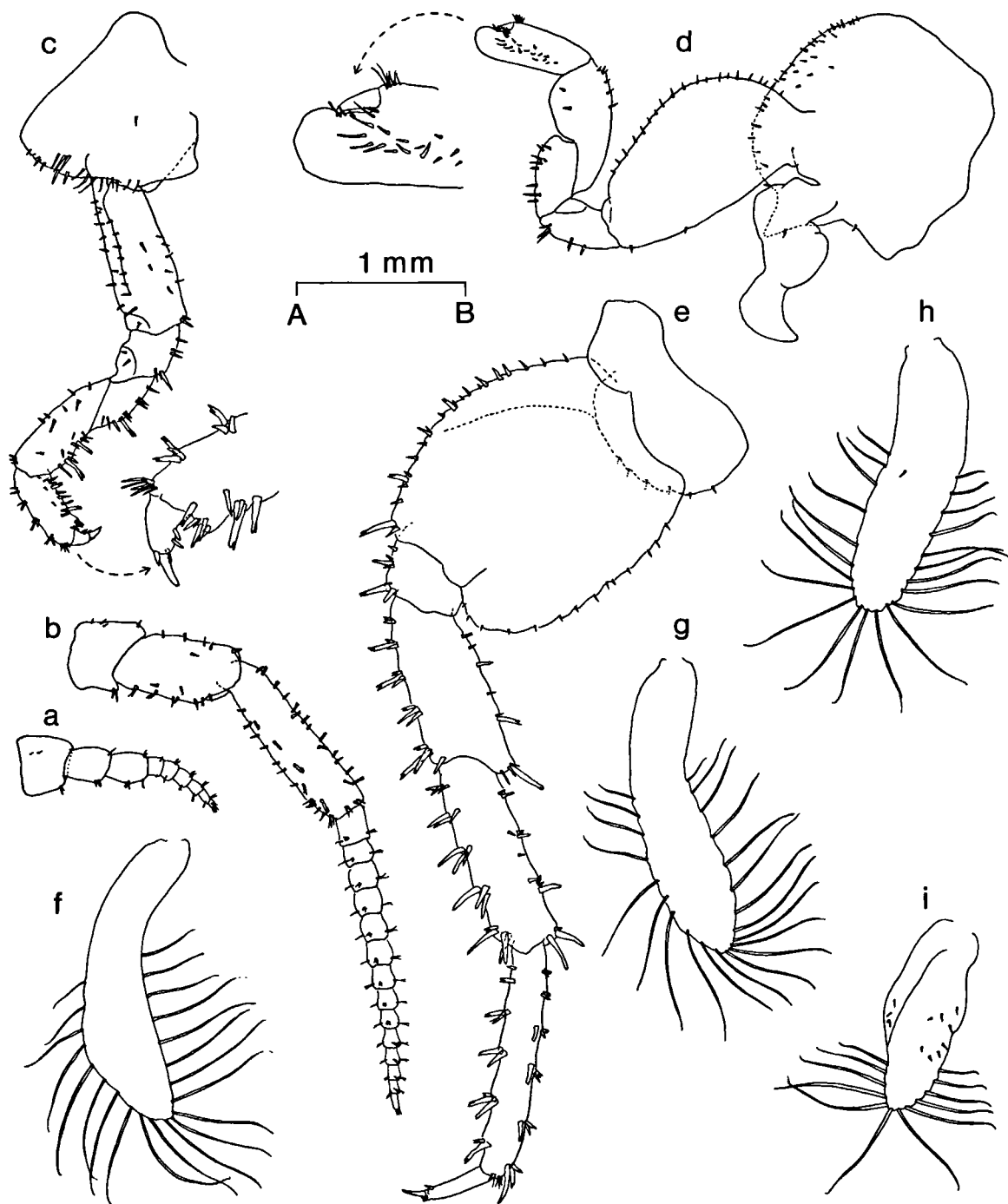


Fig. 16. *Platorchestia pachypus* (Derzhavin, 1937) (♀ 12.4 mm from Dadaepo). a, antenna 1; b, antenna 2; c, gnathopod 1; d, gnathopod 2; e, pereopod 7; f, oostegite of gnathopod 2; g, oostegite of pereopod 3; h, oostegite of pereopod 4; i, oostegite of pereopod 5. Scales: all AB (= 0.5 mm).

Ovigerous females were found in April 1983 at Dadaepo. A female (B.L. 12.4 mm) carries 11 eggs, egg size 0.47 × 0.60 mm.

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REFERENCES

- BOUSFIELD, E. L., 1973. Shallow-water gammaridean Amphipoda of New England: 1-312. Cornell Univ. Press (Ithaca and London).
- , 1982. The amphipod superfamily Talitroidea in the northeastern Pacific region. 1. Family Talitridae: Systematics and distributional ecology. Natl. Mus. nat. Sci. (Ottawa), Publ. biol. Oceanogr., 11: 1-73.
- BULYCHEVA, A. I., 1957. The sand fleas of the USSR and adjacent waters (Amphipoda-Talitroidea). Keys to the Fauna of the USSR, Zool. Inst. Acad. Sci. USSR, 65: 1-185 [in Russian].
- CHEVREUX, E., 1908. Amphipodes recueillis dans les possessions françaises de l'Océanie par M. le Dr Seurat, directeur du Laboratoire de Recherches Biologiques de Rikitea (îles Gambier) 1902-1904. Mém. Soc. Zool. France, 20: 470-527.
- CHEVREUX, E. & L. FAGE, 1925. Amphipodes. Faune de France, 9: 1-488.
- CHILTON, C., 1921. Fauna of the Chilka Lake: Amphipoda. Mem. Indian Mus., 5: 521-558.
- DAHL, E., 1946. The Amphipoda of the Sound. Part 1, Terrestrial Amphipoda. Undersökningar över Öresund 29. Lunds Univ. Årsskr., (n. F.) Avd. 2, 42(6): 1-53.
- DERZHAVIN, A. N., 1937. Talitridae of the Soviet coast of the Japan Sea. Issledov. Morej SSSR, 23: 87-112 [in Russian with English summary].
- GURJANOVA, E. F., 1951. Gammarids of the seas of the USSR and adjacent waters (Amphipoda-Gammaridea). Keys to the Fauna of the USSR, Zool. Inst. Acad. Sci. USSR, 41: 1-1092 [in Russian].
- IWASA, M., 1939. Japanese Talitridae. J. Fac. Sci. Hokkaido imp. Univ., (6) Zool., 6(4): 255-296.
- JO, Y. W., 1988. Taxonomic studies on Dogielinotidae (Crustacea-Amphipoda) from the Korean coasts. Bijdr. Dierk., 58(1): 25-46.
- KIM, H. S. & C. B. KIM, 1987. Marine gammaridean Amphipoda (Crustacea) of Cheju Island and its adjacent waters, Korea. Korean J. syst. Zool., 3(1): 1-23.
- KRØYER, H., 1845. Karcinologiske bidrag, Fortsøttelse. Naturh. Tidsskr. (2), 1: 283-345, 403, 453-638.
- LINCOLN, R. J., 1979. British marine Amphipoda: Gammaridea: 1-658. (British Museum (Natural History), London).
- MORINO, H., 1972. Studies on the Talitridae (Amphipoda-Crustacea) in Japan. I. Taxonomy of Talorchestia and Orchestoidea. Publ. Seto mar. biol. Lab., 21(1): 43-65.
- , 1975. Studies on the Talitridae (Amphipoda-Crustacea) in Japan. II. Taxonomy of seashore Orchestia, with notes on the habitats of Japanese seashore talitrids. Publ. Seto mar. biol. Lab., 22(1/4): 171-193.
- SHELLENBERG, A., 1931. Amphipoden der Sunda-Expeditionen Thienemann und Rensch. Arch. Hydrobiol., Suppl. 8: 493-511.
- , 1942. Die Tierwelt Deutschlands. Krebstiere oder Crustacea: IV, Flohkrebse oder Amphipoda. Tierwelt Dtl., 40: 1-252.
- STEBBING, T. R. R., 1900. Crustacea Amphipoda. Fauna Hawaiiensis, 2(5): 527-530.
- STEPHENSON, K., 1945 (not 1944). Some Japanese amphipods. Vidensk. Medd. Dansk naturh. Foren., 108: 25-88.
- TATTERSALL, W. M., 1922. Amphipoda with notes on additional species of Isopoda. Zoological Results of a tour in the Far East. Mem. Asiatic Soc. Bengal, 6: 435-459.
- TEIGSMARK, G., 1981. Orchestia platensis (Talitridae), an amphipod new to the Norwegian fauna. Sarsia, 66: 165.

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