The Systematic Study of the Family Sphaeromatidae (Crustacea, Isopoda, Flabellifera) from Korea

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The Systematic Study of the Family Sphaeromatidae (Crustacea, Isopoda, Flabellifera) from Korea

Kim, Hoon Soo* · Kwon, Do Heon**

Previously ten species under seven genera of sphaeromatid isopods were recorded from Korea (Richardson, 1909; Kim and Choe, 1981; Choe and Kwon, 1982; Kim and Kwon, 1982, 1983; Yun, 1982): *Gnorimosphaeroma ovatum* (Gurjanova), *G. rayi* Hoestlandt, *G. latum* Nishimura, *Leptosphaeroma gottschei* Hilgendorf, *Dynamenella nipponica* (Nishimura), *Holotelson tuberculatus* Richardson, *Cymodoce japonica* Richardson, *C. acuta* Richardson, *Dynoides dentisinus* Shen and *Sphaeroma sieboldii* Dollfus. But they were fragmentary and mostly recorded merely in the collecting lists of local faunistic works.

In the course of the systematic studies on the Korean isopod crustaceans, we examined the sphaeromatid isopod specimens collected from 34 localities (Fig. 1) largely by ourselves during the period from 1968 to 1983, and deposited at the Department of Zoology, Seoul National University (SNU). Twelve species under six genera were identified and classified. Included are a new species, *Gnorimosphaeroma hoestlandti*, and two unrecorded species from Korea, *Gnorimosphaeroma chinense* (Tattersall) and *Dynoides brevispina* Bruce. Type specimens and the other specimens examined are deposited at the Department of Zoology, SUN.

Illustrations were prepared using a camera lucida or a drawing tube. Body measurements given are of the greatest length, exclusive of antennae and uropods, and the greatest width. Systematics were followed Iverson (1982) at subfamilial category.

SYSTEMATIC ACCOUNT

Order Isopoda

Suborder Flabellifera

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*** 이 논문은 1982년도 한국과학재단의 연구비 지원에 의한 "韓國産 甲殼類의 系統分類學的 硏究. Ⅰ. 蔓脚類, 等脚類, 十脚類"의 연구 결과의 일부임.

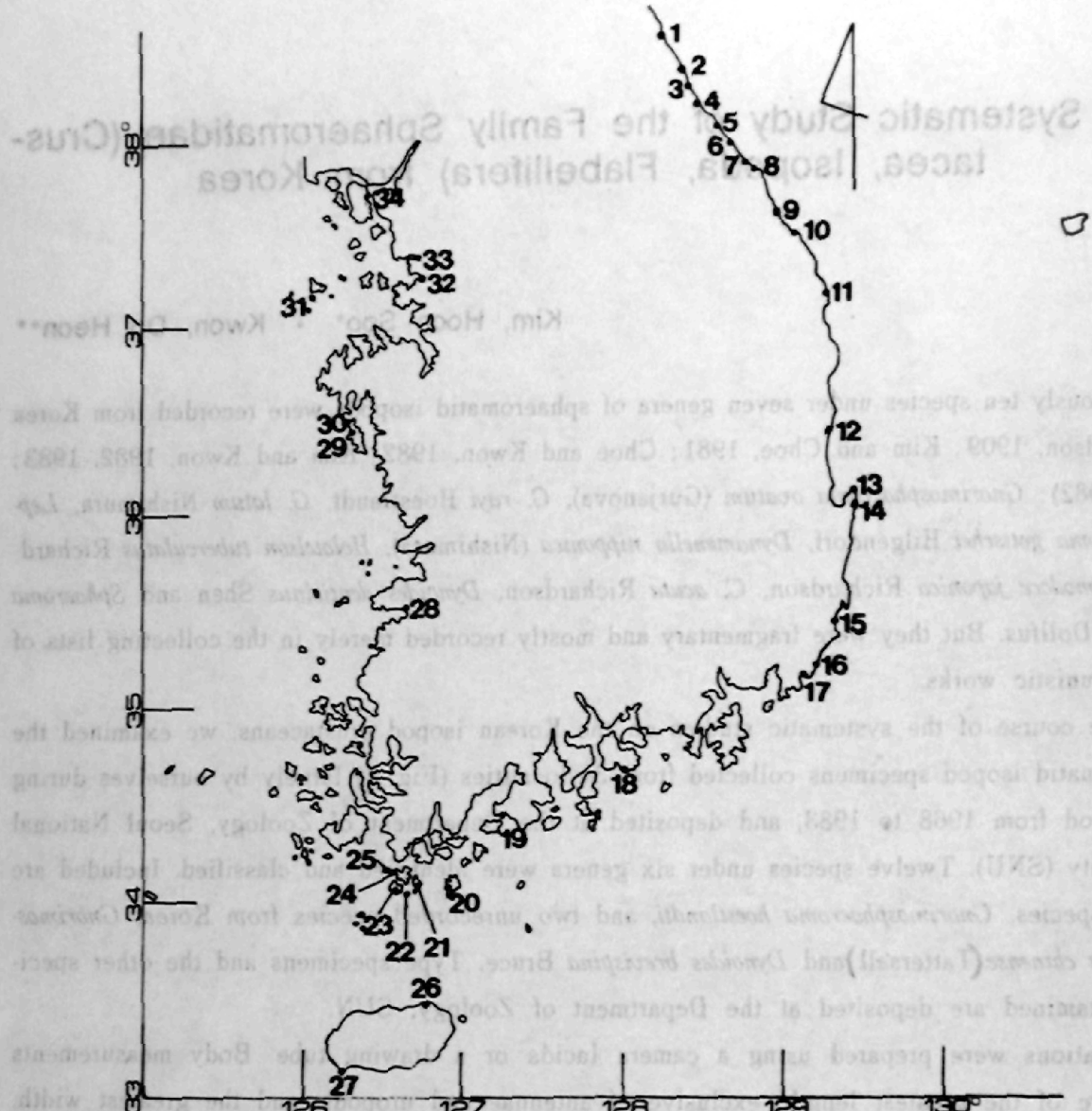

Fig. 1. A map showing the localities where the material was collected.

1. Kŏjin (巨 津) 2. Ayajin (我也津) 3. Sokch'o (束 草) 4. Yangyang (襄 陽) 5. Namae(南 涯) 6. Chumunjin (注文津) 7. Kangnŭng (江 陵) 8. Aninjin (安仁津) 9. Mukho (墨 湖) 10. Changho (莊 湖) 11. Chukpyŏn (竹 邊) 12. Kanggu (江 口) 13. Kuman (九 萬) 14. Kuryongp'o (九龍浦) 15. Naa-ri, Wŏlsŏng-gun (月城郡 羅兒里) 16. Kijang, Yangsan-gun (陽山郡 機張) 17. Pusan (釜 山) 18. Sangju-ri, Namhaedo I. (南海島 尙州里) 19. Noktong (鹿 洞) 20. Ch'ŏngsando I. (靑山島) 21. Soando I. (所安島) 22. Chajido I. (者只島) 23. Pogildo I. (甫吉島) 24. Maando I. (馬鞍島) 25. Nŏpto I. (苧 島) 26. Hamdŏk, Cheju I. (濟州島 咸德) 27. Mosŭlp'o, Cheju I. (濟州島 慕瑟浦) 28. Komso (곰 소) 29. Pangp'o, Anmyŏndo I. (安眠島 傍浦) 30. Ch'anggi-ri, Anmyŏndo I. (安眠島 倉基里) 31. Mungap-to I. (文甲島) 32. Panwŏl (半 月) 33. Sorae (蘇 來) 34. Sinjŏng-ri, Kanghwado I. (江華島 神井里)

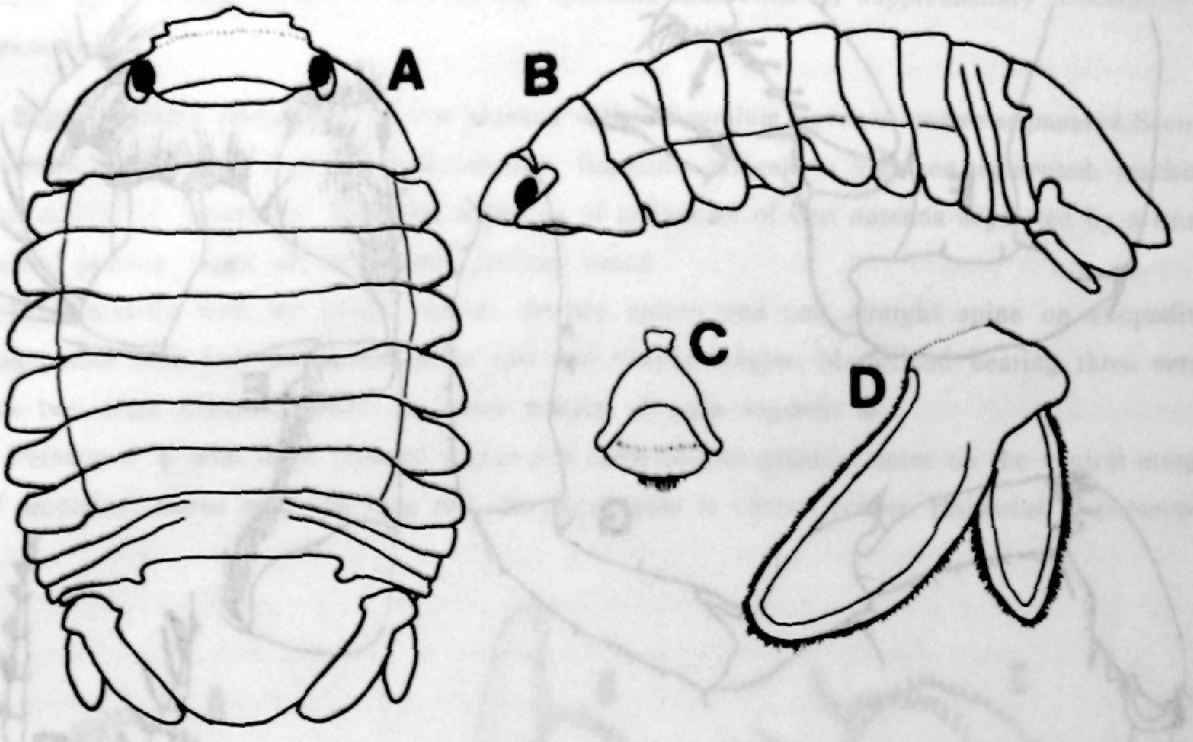

Fig. 2. *Gnorimosphaeroma ovatum* (Gurjanova), ♂: A, dorasal view; B, lateral view; C, epistome and upper lip; D, uropod. (A, B, X11; C, X29.4; D, X27.6)

Family SPHAEROMATIDAE

Subfamily CASSIDININAE

Genus *Gnorimosphaeroma* Menzies, 1954

Gnorimosphaeroma ovatum **(Gurjanova, 1933)**

(Figs. 2–4)

Exosphaeroma ovata Gurjanova, 1933, pp. 99~100, fig. 28; Shiino, 1957, pp. 178~182, figs. 10~11.

Exosphaeroma oregonensis: Tattersall, 1921, pp. 421~422, pl. 16, figs. 1~5; Shiino, 1944, pp. 12~15, figs. 10~11. (*non* Dana).

Gnorimosphaeroma ovata: Menzies, 1954, p. 7.

Gnorimosphaeroma ovatum: Kussakin, 1974, pp. 230~233, fig. 5; 1979, pp. 410~414, figs. 265~266; Kim and Kwon, 1983, p. 326, fig. 2a.

Material examined: 1 ♂, Osipch'ŏn Stream, Kanggu, Aug. 13, 1982, D. H. Kwon; 1 ♂, Ch'anggi-ri, Anmyŏndo I., May 22, 1982, D. H. Kwon; 53 ♂♂, 42 ♀♀, Sinjŏng-ri, Kanghwado I., May 6, 1982, D. H. Kwon.

The original description of this species (Gurjanova, 1933) is short and inadequately figured. Shiino(1957) redescribed this species in detail with fine illustrations, but his material was based on immature specimens (5.3mm×3.5mm) not having appendix masculina. Nevertheless, most of

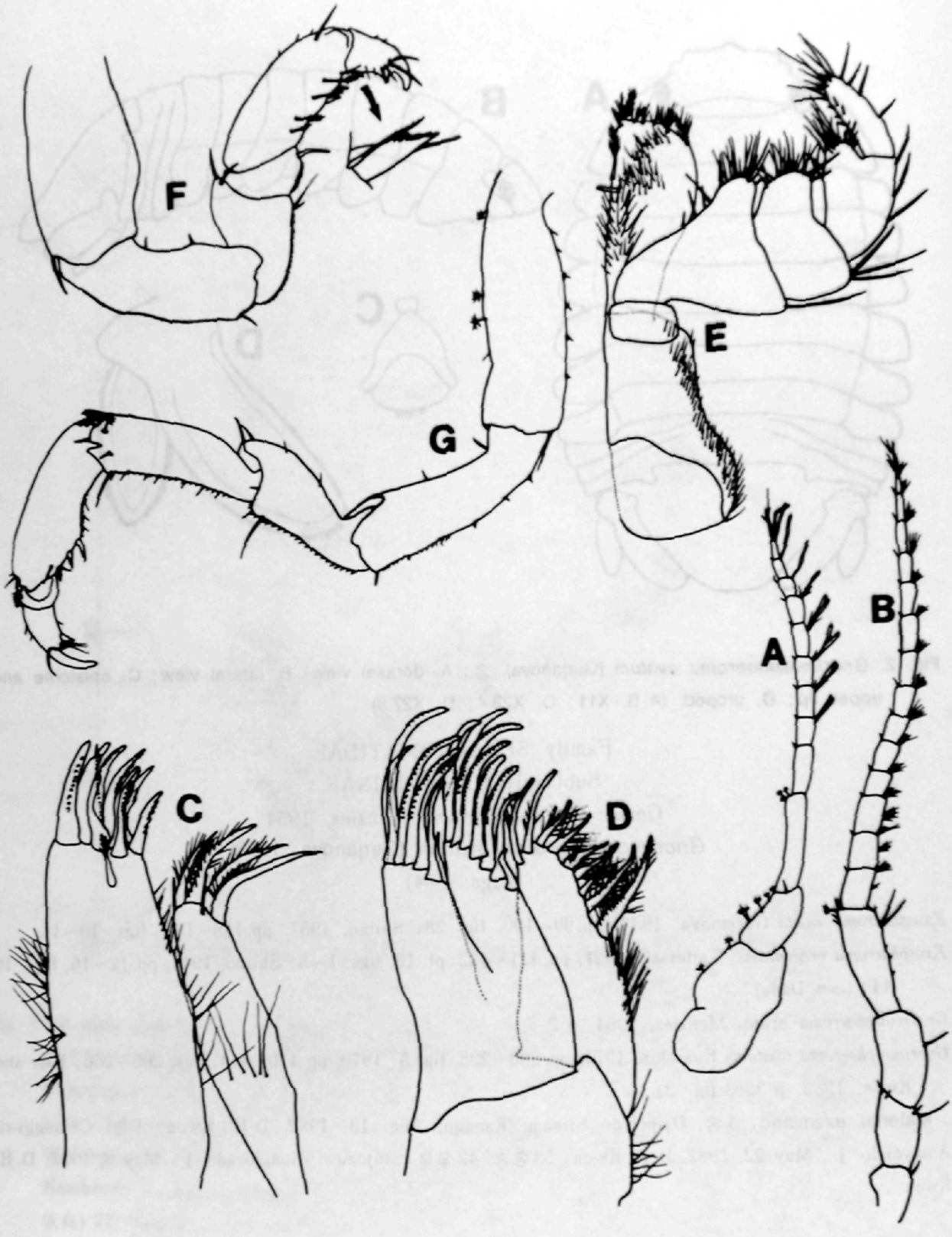

Fig. 3. *Gnorimosphaeroma ovatum* (Gurjanova), ♂ : A, first antenna; B, second antenna; C, first maxilla; D, second maxilla; E, maxilliped; F, peraeopod Ⅰ; G, peraeopod Ⅱ. (A, B, X37.8; C, D, X154; E, X86.3; F, G, X54)

II swollen in mature male and bearing three spines on ventral margin. Carpus and merus with one long seta each at ventral corner.

Appendix masculina of male pleopod 2 much longer than the endopod. Exopods of pleopods 3–5 partially or completely segmented; exopod of pleopod 3 inwardly produced. Exopod of uropod two thirds the length of endopod; exopod not reaching the hind margin of pleotelson. Margins of both rami dense with minute setae.

Female much smaller than the male, but sexual dimorphism not significant.

Remarks: *Gnorimosphaeroma ovatum* was sometimes synonymized with *G. rayi* Hoestlandt, 1969 (Kussakin, 1979; Yun, 1982). But *G. rayi* is more convex than *G. ovatum* and the former has truncated uropodal endopod. *G. ovatum* can tolerate extremely wide range of salinity from freshwater swamps or river (Shiino, 1957) to seashore (Gurjanova, 1933), while *G. rayi* lives only in sea water.

Tattersall (1921), with some doubt, referred his specimens from Whangpoo River (Huangpu River) and Tai Hu Lake, China, to *Exosphaeroma oregonensis*. Later Menzies (1954), in his revision of the genus *Exosphaeroma*, stated that *E. oregonensis* of Tattersall probably represented a new species of *Gnorimosphaeroma*. The length of mature male specimens (6mm) and the shape of whole animal and pleopods, together with the freshwater habitat, reveals that Tattersall's specimens might be referred to *G. ovatum*. Yun (1982) recorded *G. ovatum* from the south coast of Korea, but his description and figures represent the characteristic features of *G. rayi*.

Material was collected under stones from freshwater (Osipch'ŏn Stream), brackish water (Sinjŏng-ri, Kanghwado I.) and sea water (Ch'anggi-ri, Anmyŏndo I.)

Distribution: China, Korea, Japan and USSR.

Gnorimosphaeroma rayi Hoestlandt, 1969

(Fig. 5)

Gnorimosphaeroma rayi: Hoestlandt, 1973, pp. 380~390, figs. 20~26; 1975, pp. 31~45, figs. 1, 6~8, 10B (in part, Group I); Nunomura and Nishimura, 1976, pp. 23~24; Kim and Kwon, 1983, p. 326, fig. 2b.

Gnorimosphaeroma ovatum: Yun, 1982, pp. 17~21, figs. 10~11. (*non* Gurjanova).

?*Exosphaeroma oregonensis*: Thielemann, 1910, pp. 51~53, figs. 41~47. (*non* Dana).

Material examined: 1 ♂, 18(17 ovi.) ♀♀, Kŏjin, May 19, 1980, D.H. Kwon; 1 ♀, Ayajin, June 2, 1981, D.H. Kwon; 9 ♂♂, 49 ♀♀, Aninjin, May 18, 1980, D.H. Kwon; 3 ♂♂, 22(ovi.) ♀♀, Mukho, May 20, 1980, D.H. Kwon; 6 ♀♀, Naa-ri, Wŏlsŏng-gun, Nov. 4, 1979, D.H. Kwon; 1 ♂, 18 ♀♀, Hamdŏk, Cheju I., July 18, 1979, D.H. Kwon; 2(ovi.) ♀♀, Pangp'o, Anmyŏndo I., May 21, 1982, D.H. Kwon; 1(ovi.) ♀, Ch'anggi-ri, Anmyŏndo I., May 22, 1982, D.H. Kwon.

Remarks: *G. rayi* closely resembles *G. ovatum*, but is easily distinguished from the latter in the following features: (1) body more convex and larger (males up to 11mm in length), (2) first antenna with flagellum twelve to fourteen-segmented, second antenna with flagellum fourteen-segmented, (3) maxillipedal palp segments 2–4 with two, three and two setae respectively at

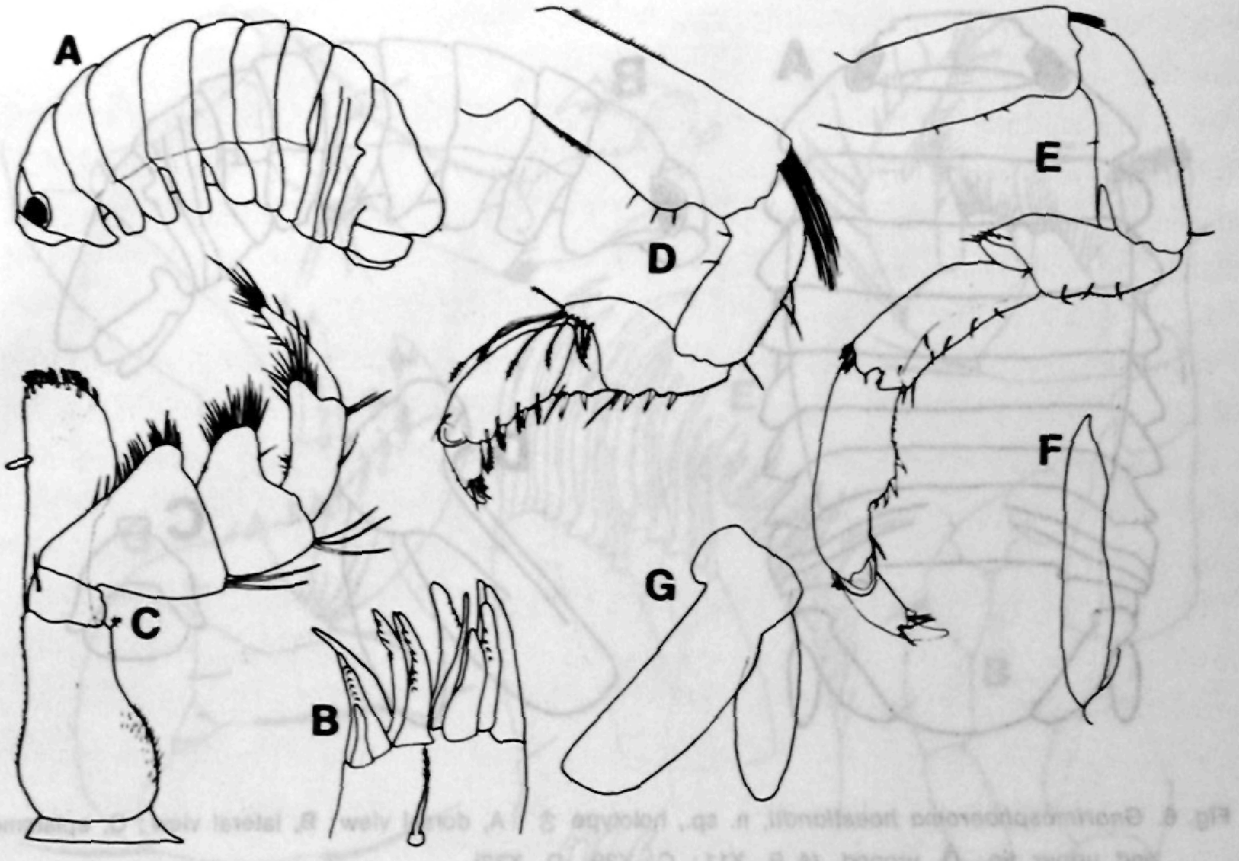

Fig. 5. *Gnorimosphaeroma rayi* Hoestlandt, ♂ : A, dorsolateral view; B, exopodite of first maxilla; C, maxilliped; D, peraeopod Ⅰ; E. peraeopod Ⅱ; F, appendix masculina; G, uropod. (A, X5; B, X167; C, X51.9; D, E, X32.4; F, X22.7; G, X13.9)

outer-distal corner, (4) peraeopod I with basis bearing six to eight setae at ventral corner; merus bearing four spines and one setae on ventral margin and about eight plumose setae at dorsal corner, (5) peraeopod Ⅱ with swollen propodus bearing four spines on ventral margin; merus bearing five short setae at dorsal corner and (6) uropodal exopod three fourths the length of endopod; apex of endopod truncate; margins of both rami rarely setose.

G. rayi commonly occurs under stones from shallow waters in Korea. *G. rayi* from California was supposed to introduced from the Northwest Pacific, presumably from Japan along with the implantation of Japanese oyster (*Crassostrea gigas* Thunberg) in the Tomales Bay (Hoestlandt, 1975).

Distribution: Korea, Japan and Tomales Bay, California.

Gnorimosphaeroma hoestlandti, nov. sp.

(Figs. 6–8)

Gnorimosphaeroma rayi: Hoestlandt, 1975, pp. 39–43, fig. 9. (in part, Group Ⅱ).

Holotype: 1 ♂, Mukho, May 20, 1980, D. H. Kwon.

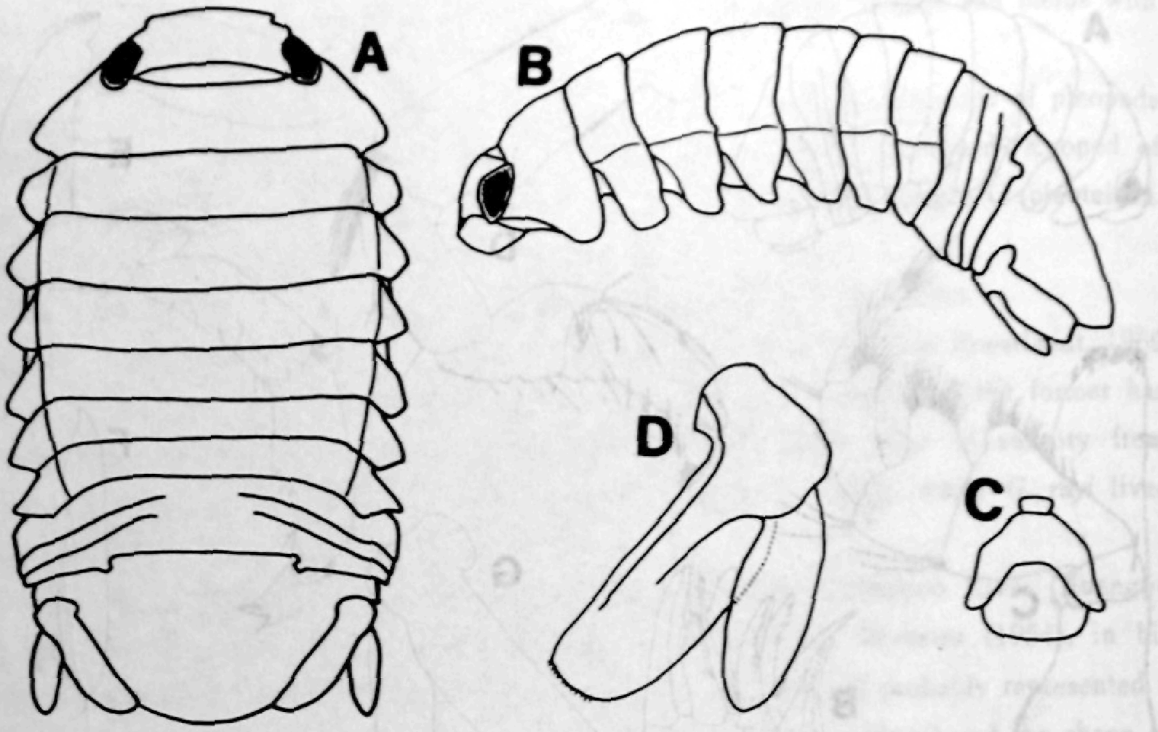

Fig. 6. *Gnorimosphaeroma hoestlandti*, n. sp., holotype ♂ : A, dorsal view; B, lateral view; C, epistome and upper lip; D, uropod. (A, B, X11; C, X29; D, X32)

Paratypes: 15 ♂♂, 41(31 ovi.) ♀♀, collected with the holotype; 51 ♂♂, 50 ♀♀, Ayajin, June 11, 1981, D.H. Kwon; 1 ♂, Changsa-dong, Sokch'o, Aug. 10, 1981, D.H. Kwon; 3 ♂♂, 11 ♀♀, Tongmyŏng-dong, Sokch'o, May 19, 1980, D.H. Kwon; 73 specimens, Yangyang, Aug. 4, 1979, D.H. Kwon; 3 ♂♂, 9 ♀♀, Mukho, Sep. 29, 1981, H.S. Kim; 4 ♀♀, Naa-ri, Wŏlsŏng-gun, Nov. 4, 1979, D.H. Kwon; 1 juvenile, Mungapto I., Aug. 4, 1982, D.H. Kwon.

Measurements: Holotype male, body length 7.6mm, width 4.2mm.

Description of holotype male: Body ovate; lateral margins subpararelle, dorsal surface smooth. Coxal plates distinct on peraeonites Ⅱ–Ⅶ; coxal plates on peraeonites Ⅲ and Ⅳ tapering laterally, while in *G. rayi* only the coxal plate on peraeonite Ⅳ more or less tapering. Two pairs of imcomplete suture lines on pleon with anterior one more approximating the midline.

First antenna with flagellum thirteen-segmented, reaching the hind marigin of peraeonite Ⅰ. Second antenna with flagellum twelve-segmented, exceeding a little beyond the hind margin of peraeonite Ⅱ.

Mandibular palp three-segmented; segment 1 setose, segment 2 bearing fifteen plumose setae and segment 3 bearing twenty plumose setae. First maxilla with thirteen spines, several of which are dentate, and an accessary plumose seta on exopodite; endopodite with four pectinated

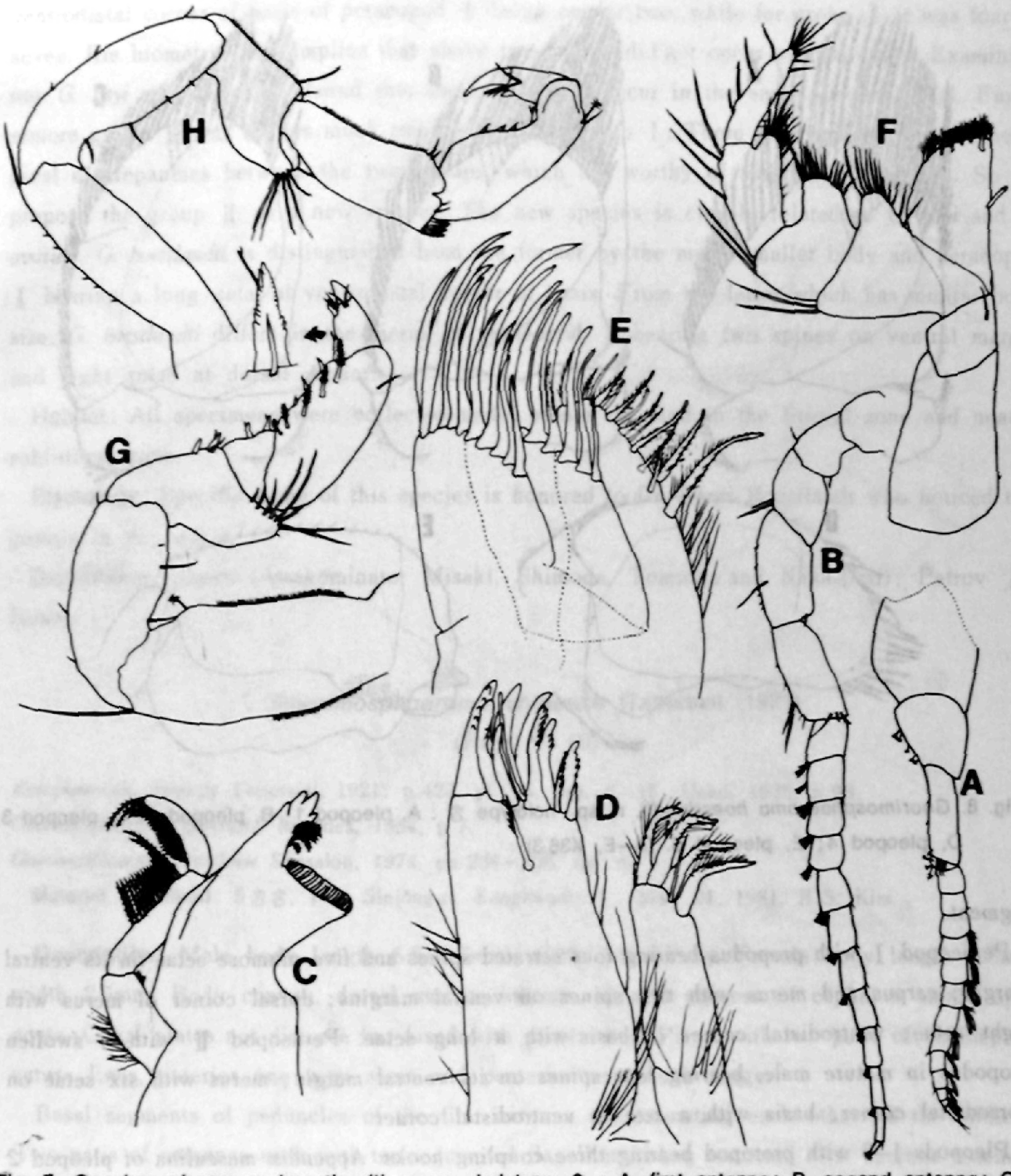

Fig. 7. *Gnorimosphaeroma hoestlandti*, n. sp., holotype ♂ : A, first antenna; B, second antenna; C, mandible; D, first maxilla; E, second maxilla; F, maxilliped; G, peraeopod Ⅰ; H, peraeopod Ⅱ. (A, B, X41.5; C, X59.2; D, E, X167; F, X74; G, H, X51.9)

and two simple setae. Second maxilla with exopodite bearing eleven curved spines on outer lobe and ten curved spines on inner lobe; endopodite with fifteen setae, eleven of which are setulose. Maxilliped with a coupling hook; palp segments 2 and 3 with two setae on outer-distal corner of each segment, segments 4 and 5 with four setae on outer margin of each

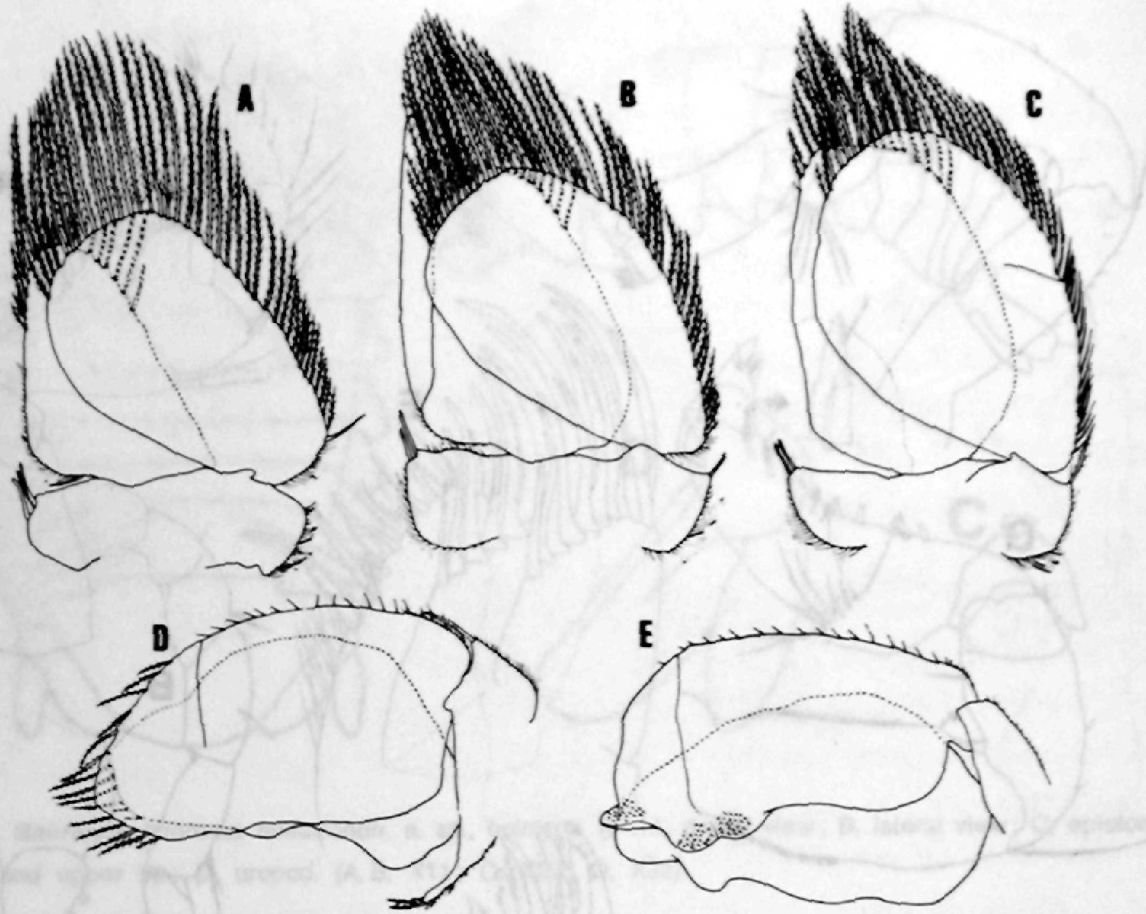

Fig. 8. *Gnorimosphaeroma hoestlandti*, n. sp., holotype ♂ : A, pleopod 1; B, pleopod 2; C, pleopod 3; D, pleopod 4; E, pleopod 5. (A—E, X36.3)

segment.

Peraeopod Ⅰ with propodus bearing four serrated spines and five plumose setae on its ventral margin; carpus and merus with two spines on ventral margins; dorsal corner of merus with eight setae; ventrodistal corner of basis with a long setae. Peraeopod Ⅱ with a swollen propodus in mature male, bearing four spines on its ventral margin; merus with six setae on dorsodistal corner; basis with a seta at ventrodistal corner.

Pleopods 1–3 with protopod bearing three coupling hooks. Appendix masculina of pleopod 2 elongate, much longer than the endopod; distal half covered with numerous minute spinules. Pleopods 3–5 with exopod partially or completely segmented. Exopod of pleopod 3 slightly produced inwardly. Uropod with exopod three fourths the length of endopod; posterior apex of endopod truncate, not reaching the hind margin of pleotelson.

Remarks: Hoestlandt (1975) divided *Gnorimosphaeroma rayi* into two groups, group Ⅰ and group Ⅱ. His group Ⅰ had the same morphological characters with those originally described from Tomales Bay, California. Group Ⅱ was characterized by the number of setae at the

ventrodistal corner of basis of peraeopod Ⅰ being one or two, while for group Ⅰ it was four to seven. His biometric data implies that above two groups did not occur sympatrically. Examining our *G. rayi* specimens, we found that the two groups occur in the same specimen vial. Furthermore group Ⅱ was always much smaller than the group Ⅰ. There are considerable morphological discrepancies between the two groups, which are worthy of two distinct species. So we propose the group Ⅱ as a new species. The new species is closely related to *G. rayi* and *G. ovatum*. *G. hoestlandti* is distinguished from the former by the much smaller body and peraeopod Ⅰ bearing a long seta at ventrodistal corner of basis. From the latter which has similar body size, *G. hoestlandti* differs in the merus of peraeopod Ⅰ bearing two spines on ventral margin and eight setae at dorsal corner.

Habitat: All specimens were collected under stones on sand in the littoral zone and nearby sublittoral zone.

Etymology: Specific name of this species is honored to Dr. Henri Hoestlandt who noticed two groups in *G. rayi*.

Distribution: Japan (Awakominato, Misaki, Shimoda, Tomioka and Naka-Umi); Petrov Ⅰ.; Hawaii.

Gnorimosphaeroma chinense (Tattersall, 1921)

(Figs. 9~10)

Exosphaeroma chinensis Tattersall, 1921, p. 423, pl. 16, figs. 6~15; Ueno, 1935, p. 90.

Gnorimosphaeroma chinensis: Menzies, 1954, p. 7.

Gnorimosphaeroma kurilense Kussakin, 1974, pp. 234~236, fig. 6.

Material examined: 5♂♂, 1♀, Sinjŏng-ri, Kanghwado Ⅰ., Mar. 21, 1981, H.S. Kim.

Description: Male body length 6.3–6.7mm, width 3.4–3.9mm. Female body length 4.8mm, width 2.5mm. Body convex, dorsal surface smooth. Rostral process of cephalon small, apex acute. Coxal plates not distince but fused with peraeonites. Pleon with two pairs of imcomplete suture lines, anterior one very short and posterior one much longer.

Basal segments of peduncles of the first antenna approximating each other on the midline. Two paris of antennae each with ten-segmented flagellum; when retracted, first antenna reaching the hind margin of peraeonite Ⅰ, whilst second antenna exceeding a little beyond the hind margin of peraeonite Ⅱ.

First maxilla with exopodite bearing ten stout spines, some are dentate, without accessory plumose setae; endopodite with three pectinated setae. Second maxilla with exopodite bearing three curved spines on outer lobe and four curved spines on inner lobe; endopodite with six pectinated setae of which innermost one largest. Maxillipedal palp five-segmented; segment 1 square, segments 2 and 3 without any setae on outer margin, segment 4 bearing a long setae at

the outer-distal corner; outer margins of segments 4 and 5 fringed with minute setae; segment 4 not elongated as in *G. noblei*.

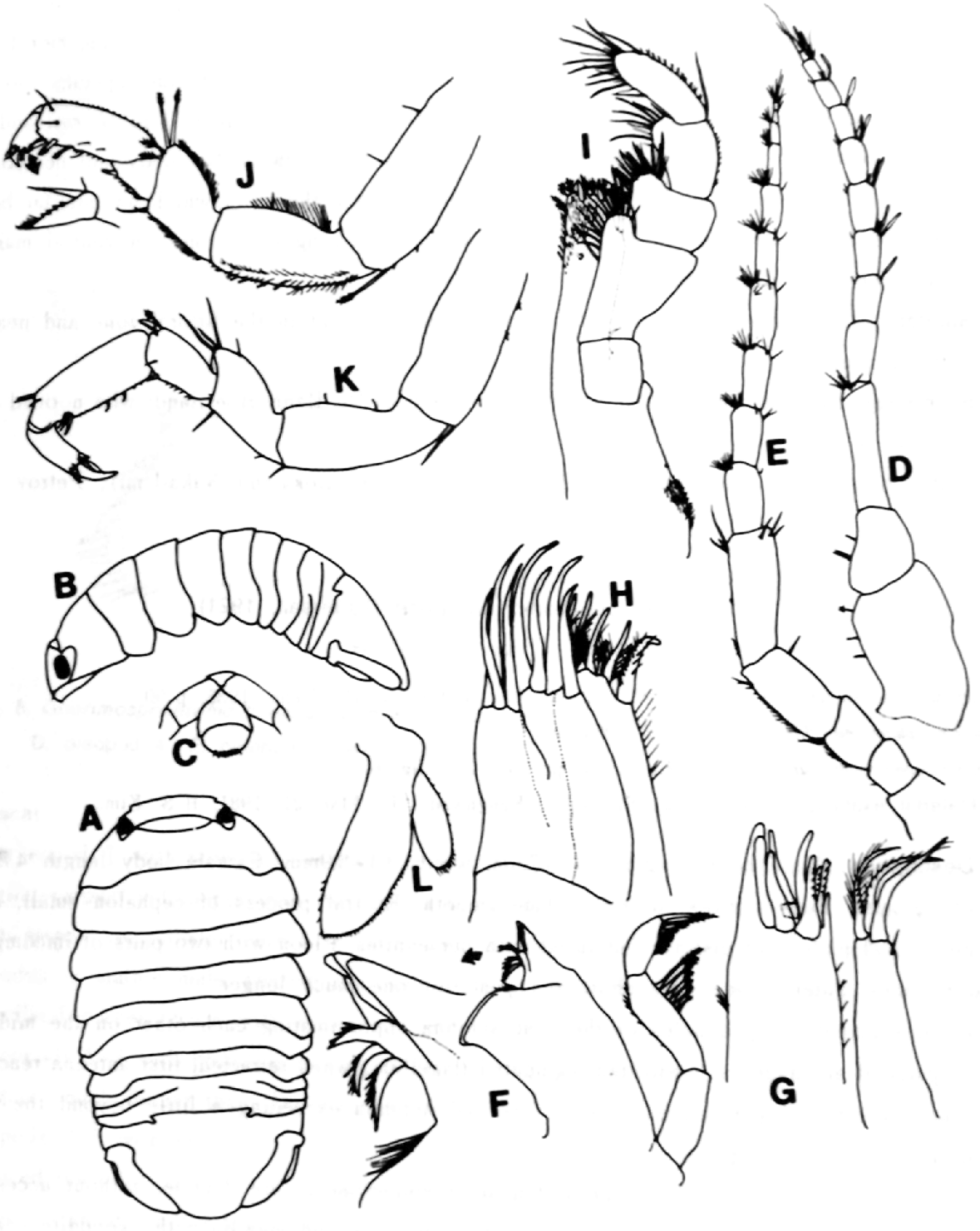

Fig. 9. *Gnorimosphaeroma chinense* (Tattersall), ♂: A, dorsal view; B, lateral view; C, epistome and upper lip; D, first antenna; E, second antenna; F, mandible; G, first maxilla; H, second maxilla; I, maxilliped; J, peraeopod Ⅰ; K, peraeopod Ⅱ; L, uropod. (A, B, X9; C, L, X22; D, E, J, K, X46.2; F, X46.2; F, X74; G, H, X192; Ⅰ, X92.4)

Peraeopod Ⅰ with propodus bearing a spine and two plumose setae on the ventral margin; carpus with one spine at ventral corner; merus with four plumose setae on dorsal corner; dorsoventral margins of merus and ischium dense with minute setae; ventral corner of basis with one plumose seta. Peraeopod Ⅱ with propodus not swollen.

Appendix masculina of male pleopod 2 broad with round apex. Pleopods 3 and 4 with exopods partially segmented. Endopod of pleopod 4 and both rami of pleopod 5 without any marginal plumose setae. Uropodal exopod a half as long as the endopod, width a half as broad as the endopod; posterior apex of endopod acutely produced.

Remarks: Tattersall (1921) originally described this species from Whangpoo River (Huangpu River), China. Later Ueno (1933, 1935) recorded this species from the lakes in the Itutup Ⅰ., Kurile Islands and southern Sakhalin. They were collected form both freshwater and brackish water. Although Tattersall described only the shapes of pleopods 3–5 with figures of them and

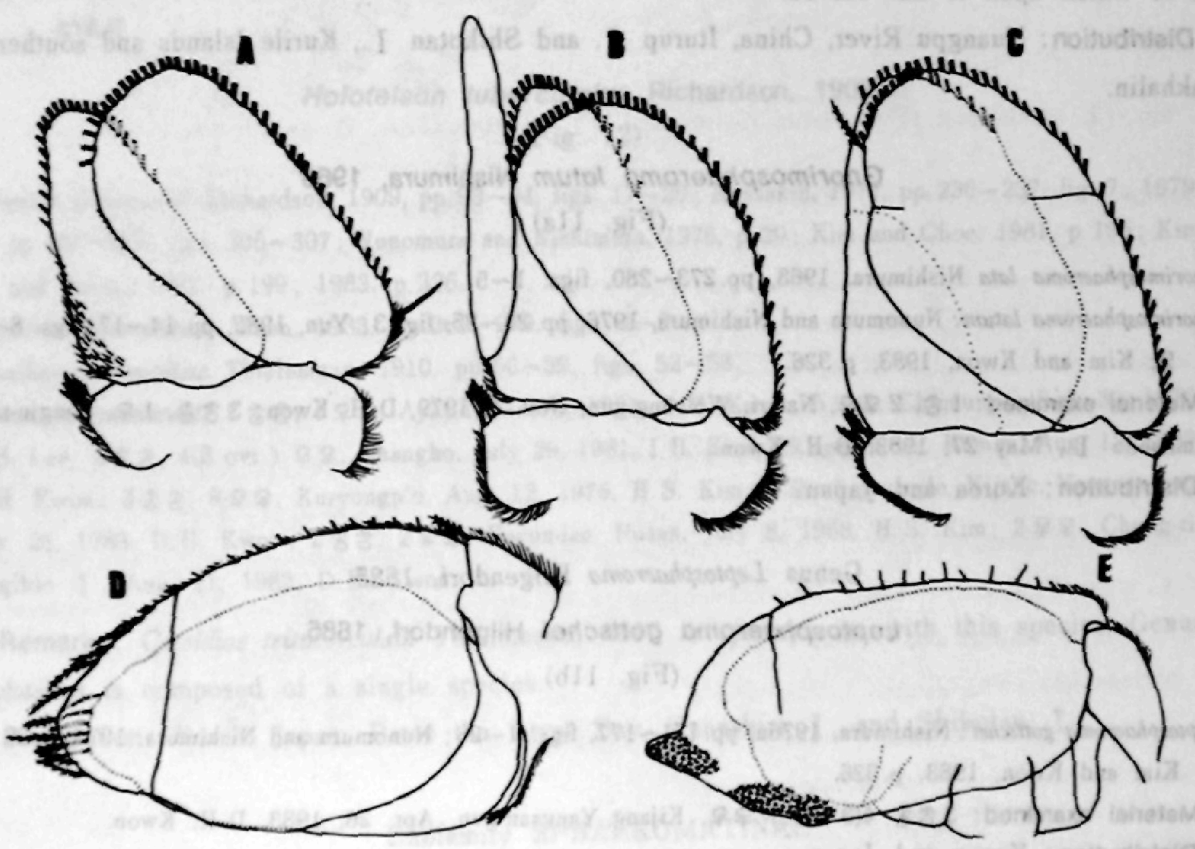

Fig. 10. *Gnorimosphaeroma chinense* (Tattersall), ♂ : A, pleopod 1; B, pleopod 2; C, pleopod 3; D, pleopod 4; E, pleopod 5. (A–E, X43.2). Most of the marginal plumose setae on pleopods 1–3 omitted.

several other appendages, they agree well with those of our specimens.

Kussakin (1979) described a new species, *G. kurilense*, from Shikotan, Kurile Islands. *G. kurilense* is distinguished from *G. chinense* by the freshwater or slightly salty habitat. He stated that *G. chinense* was a marine species, but the type locality of *G. chinense* (edge of Whangpoo River, between Shanghai and Wu Sung, China) and another collecting locality (Whangpoo River, about 10 miles below Shanghai) were freshwater but under the influence of tide. The present specimens were collected from brackish water at the depth of about 7m in the vicinity of the mouth of Han River. The figures of *G. kurilense* given by Kussakin (1979) are so similar with our *G. chinense* specimens that we can't find any considerable difference between the two species. It is our opinion that *G. kurilense* is a junior synonym of *G. chinense*.

G. chinense closely resembles *G. noblei* Menzies, 1954 in the approximation of the basal segments of peduncles of first antenna, the configuration of pleonal suture lines and the setation of pleopods. G. chinense differs from *G. noblei* by the much larger body (*G. noblei*, 2.9mm in male, 2.0mm in female), not elongated maxillipedal palp segment 4 and short appendix masculina of which apex is not curved.

Distribution: Huangpu River, China, Iturup I. and Shikotan I., Kurile Islands and southern Sakhalin.

Gnorimosphaeroma latum Nishimura, 1968

(Fig. 11a)

Gnorimosphaeroma lata Nishimura, 1968, pp. 273~280, figs. 1~5.

Gnorimosphaeroma latum: Nunomura and Nishimura, 1976, pp. 24~25, fig. 3; Yun, 1982, pp. 14~17, figs. 8~9; Kim and Kwon, 1983, p. 326.

Material examined: 1 ♂, 2 ♀♀, Naa-ri, Wŏlsŏng-gun, Nov. 4, 1979, D.H. Kwon; 3 ♂♂, 1 ♀, Sangju-ri, Namhaedo I., May 27, 1983, D.H. Kwon.

Distribution: Korea and Japan.

Genus *Leptosphaeroma* Hilgendorf, 1885

Leptosphaeroma gottschei Hilgendorf, 1885.

(Fig. 11b)

Leptosphaeroma gottschei: Nishimura, 1976a, pp. 171~177, figs. 1~26; Nunomura and Nishimura, 1976, p. 25; Kim and Kwon, 1983, p. 326.

Material examined: 3 ♂♂ 4(3 ovi.) ♀♀, Kijang, Yangsan-gun, Apr. 26, 1983, D.H. Kwon.

Distribution: Korea and Japan.

Subfamily DYNAMENINAE

Genus *Holotelson* Richardson, 1909

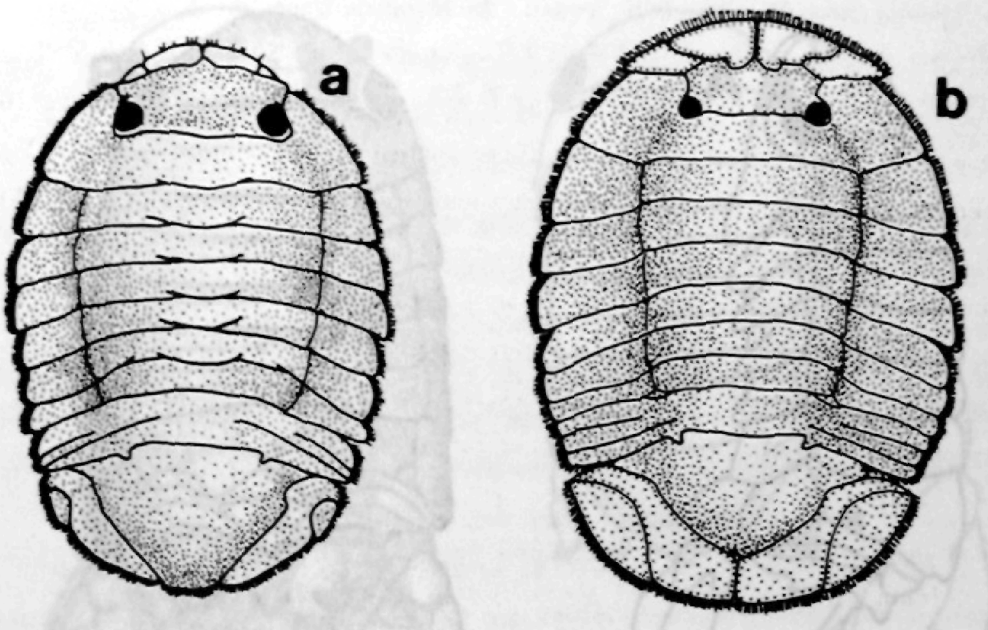

Fig. 11. a, *Gnorimosphaeroma latum* Nishimura; b, *Leptosphaeroma gottschei* Hilgendorf. (a, X25.6; b, X12.4)

Holotelson tuberculatus Richardson, 1909

(Fig. 12)

Holotelson tuberculatus Richardson, 1909, pp. 93~94, figs. 17~20; Kussakin, 1974, pp. 236~237, fig. 7; 1979, pp. 457~460, figs. 305~307; Nunomura and Nishimura, 1976, p. 20; Kim and Choe, 1981, p. 195; Kim and Kwon, 1982, p. 199; 1983, p. 326.

Holotelson tuberculatum: Shen, 1933, pp. 269~279, figs. 1~9.

Cassidias trituberculata Thielemann, 1910, pp. 56~59, figs. 52~58.

Material examined: 2 ♂♂, 4 ♀♂, Ayajin, June 2, 1981, D. H. Kwon; 5 ♀♀, Chumunjin, Sep. 30, 1976, K. S. Lee; 2 ♂♂, 4(2 ovi.) ♀♀, Changho, July 29, 1981, I. H. Kim; 29 specimens, Kuman, Aug. 12, 1982, D. H. Kwon; 3 ♂♂, 9 ♀♀, Kuryongp'o, Aug. 12, 1976, H. S. Kim; 1 ♀, 1 juvenile, Kijang, Yangsan-gun, Apr. 26, 1983, D. H. Kwon; 2 ♂♂, 2 ♀♀, Haeundae, Pusan, July 8, 1968, H. S. Kim; 2 ♀♀, Chung-ri, Pogildo I., Aug. 21, 1982, D. H. Kwon.

Remarks: *Cassidias trituberculata* Thielemann, 1910 is synonymous with this species. Genus *Holotelson* is composed of a single species.

Distribution: Korea, Japan, Peter the Great Bay, Kunashiri I. and Shikotan I..

Subfamily SPHAEROMATINAE

Genus *Cymodoce* Leach, 1814

Cymodoce japonica Richardson, 1907.

(Fig. 12c–d)

Cymodocea japonica Richardson, 1907, pp. 7~8, fig. 11.

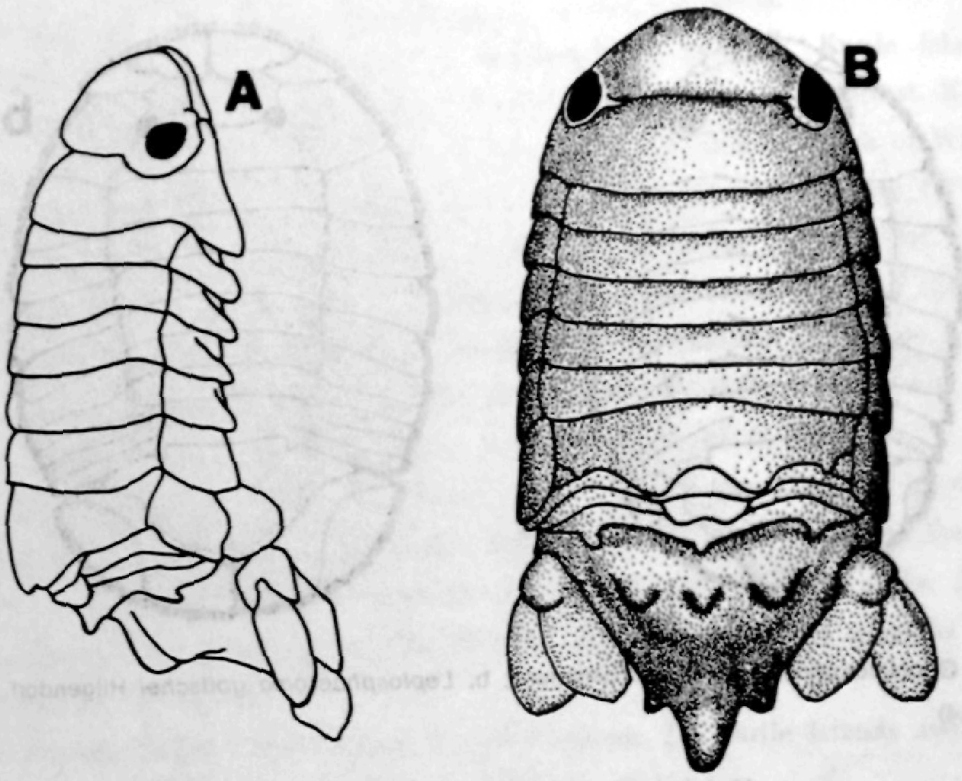

Fig. 12. *Holotelson tuberculatus* Richardson, ♂: A, lateral view; B, dorsal view. (A, B, X8.6)

Cymodoce japonica: Richardson, 1909, p. 92; Thielemann, 1910, pp. 53~56, figs. 48~51; Shiino, 1944, pp. 8~12, figs. 7~9; 1957, pp. 172~178, figs. 7~9; Hatch, 1947, pp. 214~215, pl. 13, figs. 150~151; Nunomura and Nishimura, 1976, p. 20; Yun, 1982, pp. 2~6, figs. 2~3.

Cymodocea affinis Richardson, 1907, pp. 11~12, fig. 15.

Cymodoce acuta: Kussakin, 1974, pp. 237~238, fig. 8; 1979, pp. 430~432, figs. 280~281. (*non* Richardson).

Material examined: 4 ♀♀, Mip'o, Pusan, May 1, 1981, H.S. Kim; 1 ♂, Mip'o, Pusan (from gill net), Apr. 26, 1983. D.H. Kwon; 10 ♀♀, Ch'ŏngsando Ⅰ., Aug. 20, 1982, D.H. Kwon; 2 ♀♀, Soando Ⅰ., Aug. 23, 1982, D.H. Kwon.

Remarks: Kussakin (1974, 1979) erroneously regarded *Cymodoce japonica* as a junior synonym of *C. acuta* Richardson, 1904. Above two species are clearly distinct species. *Cymodoce japonica* is often found among sea weeds and in oyster or mussel cultivation farms (Yun, 1982).

Distribution: Philippine, Korea, Japan, Peter the Great Bay, Port Arther and Washington, U.S.A.. *C. japonica* from Washington was supposed to have introduced from Japan (Hatch, 1947). Intertidal to 864 fathoms.

Cymodoce acuta Richardson, 1904

(Fig. 13a-b)

Cymodocea acuta Richardson, 1904, pp. 38~39, figs. 8~10.

Cymodoce acuta: Thielemann, 1910, p. 56; Kim and Kwon, 1983, p. 326.

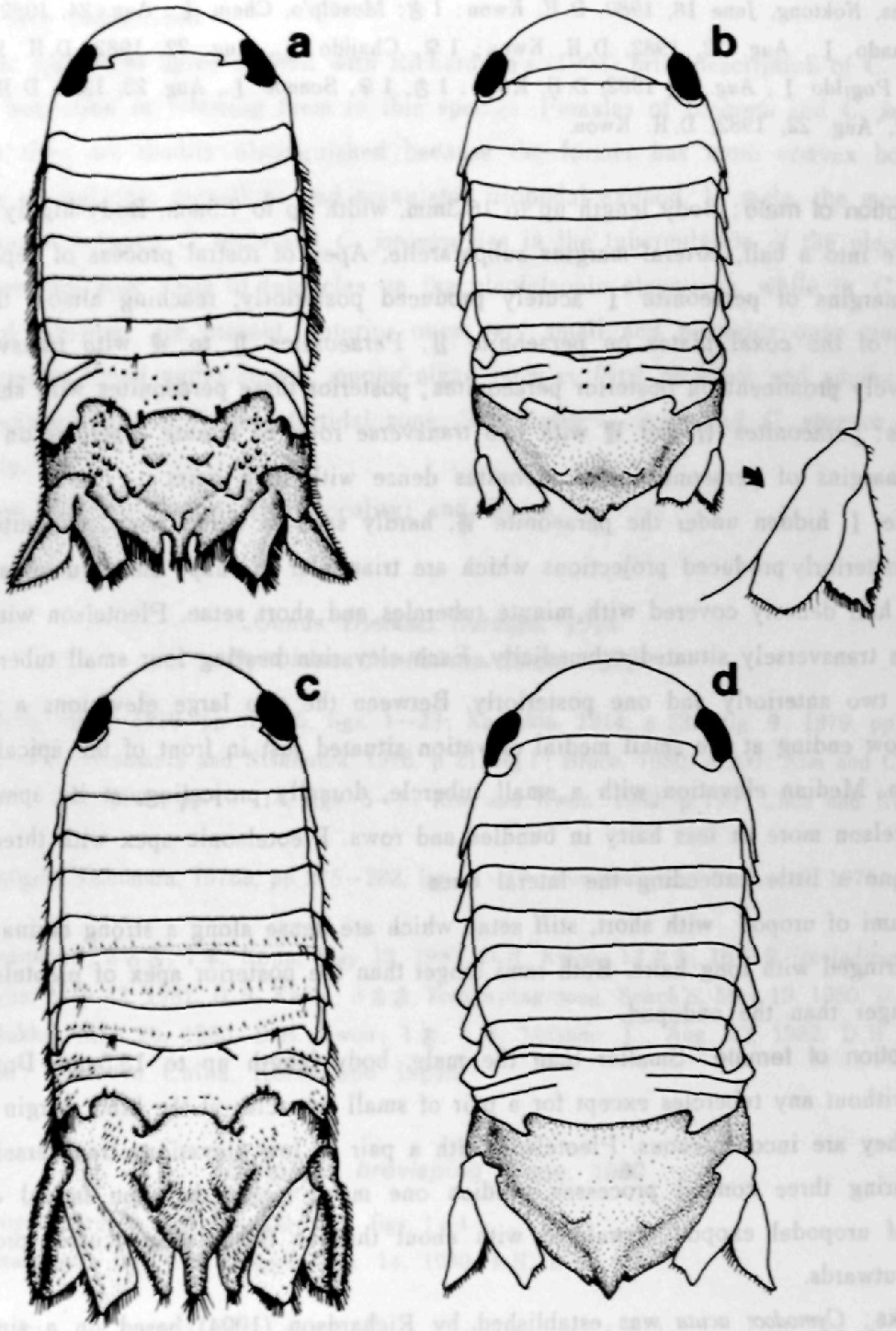

Fig. 13. a, b, *Cymodoce acuta* Richardson: a, male, dorsal view; b, female, dorsal view. c, d, *Cymodoce japonica* Richardson: c, male, dorsal view; d, female, dorsal view. (a, c, X4.6; b, d, X6.8)

Material examined: 1 ♂, Kangnŭng, June 30, 1980, I.H. Kim; 9 ♂♂, 9 ♀♀, Changho, Aug. 16, 1982, D.H. Kwon; 1 ♂, 3 ♀♀, Chukpyŏn, Aug. 15, 1982, D.H. Kwon; 2 ♀♀, Kanggu, Aug. 13, 1982, D.H. Kwon; 2 ♂♂, 4 ♀♀, Kuryongp'o, Aug. 10, 1982, D.H. Kwon; 1 ♀, Mip'o, Pusan, May 1, 1981, H.S. Kim;

2 juveniles, Noktong, June 18, 1980, D.H. Kwon; 1 ♂, Mosŭlp'o, Cheju I., Aug. 24, 1982, B.L. Choe; 1 ♀, Maando I., Aug. 22, 1982, D.H. Kwon; 1 ♀, Chajido I., Aug. 22, 1982, D.H. Kwon; 2 ♀♀, Chung-ri, Pogildo I., Aug. 21, 1982, D.H. Kwon; 1 ♂, 1 ♀, Soando I., Aug. 23, 1982, D.H. Kwon; 1 ♀, Nŏpto I., Aug. 22, 1982, D.H. Kwon.

Description of male: Body length up to 16.3mm, width up to 7.5mm. Body highly convex and contractile into a ball, larteral margins subpararelle. Apex of rostral process of cephalon acute. Lateral margins of peraeonite I acutely produced posteriorly, reaching almost the posterior extremity of the coxal plates on peraeonite II. Peraeonites II to VII with transverse ridges, progressively prominent on posterior peraeonites; posterior three peraeonites with short setae on the ridges; peraeonites VI and VII with two transverse rows of minute tubercles on each ridge. Lateral margins of peraeonites and pleonites dense with long hairs.

Pleonite I hidden under the peraeonite VII, hardly seen in dorsal view. Pleonite II with a pair of posteriorly produced projections which are triangular in shape and situated submedially; posterior half densely covered with minute tubercles and short setae. Pleotelson with two large elevations transversely situated submedially. Each elevation bearing four small tubercles, one at its apex, two anteriorly and one posteriorly. Between the two large elevations a longitudinal deep furrow ending at the small medial elevation situated just in front of the apical notches of pleotelson. Median elevation with a small tubercle, dorsally projecting, at its apex. Pleonites and pleotelson more or less hairy in bundles and rows. Pleotelsonic apex with three processes, median one a little exceeding the lateral ones.

Both rami of uropod with short, stiff setae which are dense along a strong carina of exopod; margins fringed with long hairs. Both rami longer than the posterior apex of pleotelson, exopod much longer than the endopod.

Description of female: Smaller than the male, body length up to 13.5mm. Dorsal surface smooth without any tubercles except for a pair of small tubercles at the hind margin of pleonite II, but they are inconspicuous. Pleotelson with a pair of low elevations transversely situated; apex bearing three conical processes, median one much larger than the lateral ones. Inner margin of uropodal exopod crenulated with about thirteen teeth, apex acutely produced and curved outwards.

Remarks: *Cymodoce acuta* was established by Richardson (1904) based on a single female specimen. No male specimen having been found thereafter, this species was often synonymized with *C. japonica* Richardson, 1907 (Kussakin, 1974, 1979; Yun, 1982). Thielemann (1910), without examining the specimen, believed that *C. acuta* might be a defect female specimen of *C. japonica*, as he stated "Da indessen Miss Richardson nur ein einziges, vielleicht defektes Exemplar der neuen Form zur Verfügung stand, ..., daß es sich bei diesem um ein ♀ von *Cymodoce japonica* Richardson handeln könnte". *C. acuta* was rediscovered by us (Kim and Kwon,

1983) and here redescribed.

Our female specimens agree so well with Richardson's (1904) brief description of *C. acuta* that we had no hesitation in referring them to this species. Females of *C. acuta* and *C. japonica* are similar, but they are readily distinguished because the former has more convex body, more conspicuous pleotelsonic elevations and crenulated uropodal exopod. In male, the most conspicuous difference between *C. acuta* and *C. japonica* lies in the tuberculation of the pleotelson. In *C. acuta*, there are four pairs of tubercles on the pleotelsonic elevations, while in *C. japonica*, two pairs of tubercles are present, anterior ones very small and posterior ones much larger.

This species is found under stones, among algae such as *Ulva perforata* and among the roots of *Phyllospadix* or *Zostera*. From intertidal zone. Sometimes *C. acuta* and *C. japonica* are found sympatrically.

Distribution: Enoura, Japan (type locality) and Korea.

Genus *Dynoides* Barnard, 1914

Dynoides dentisinus Shen, 1929

Dynoides dentisinus Shen, 1929, pp. 67~75, figs. 1~23; Kussakin, 1914, p. 238, fig. 9; 1979, pp. 433~436, figs. 282~284; Nunomura and Nishimura, 1976, p. 21, fig. 1; Bruce, 1980, p. 200; Kim and Choe, 1981, p. 195, 197; Yun, 1982, pp. 10~14, figs. 6~7; Kim and Kwon, 1982, p. 199; Choe and Kwon, 1982, p. 258.

Dynoidella conchicola Nishimura, 1976b, pp. 275~282, figs. 1~19; Nunomura and Nishimura, 1976, pp. 22~23, fig. 2.

Material examined: 2 ♂♂, 1 ♀, Kŏjin, May 19, 1980, D. H. Kwon; 12 ♂♂, 16 ♀♀ (including ovigerous females), Ayajin, May 22, 1981, D. H. Kwon; 3 ♂♂, Tongmyŏng-dong, Sokch'o, May 19, 1980, D. H. Kwon; 1 ♂, 1 ♀, Mukho, May 20, 1980, D. H. Kwon; 1 ♂, 1 ♀, Maando I., Aug. 22, 1982, D. H. Kwon.

Distribution: Northern China, Korea and Japan.

Dynoides brevispina Bruce, 1980

Dynoides brevispina Bruce, 1980, pp. 200~205, figs. 1~4.

Material examined: 1 ♂, 1 ♀, Namae, Sep. 14, 1980, I. H. Kim.

Remarks: There are slight differences between the present female specimen and the original description (Bruce, 1980). A female specimen is about 2.9mm in length, much smaller than the Japanese specimens (up to 4mm, Bruce, 1980) but carries eggs. Uropod of female with endopod fringed with compact setae on the posterior half of outer margin; exopod fringed with compact setae on outer margin, hind margin crenulated. Bruce stated the pleotelson of female to be smooth with few setae, but the present specimen has pleotelson covered with numerous tubercles each bears a relatively long seta on it. The present material was collected under stones from

intertidal zone.

Distribution: Previously recorded only from the type locality, Kyushu, Japan.

Genus *Sphaeroma* Latreille, 1802

***Sphaeroma sieboldii* Dollfus, 1889**

Sphaeroma sieboldii: Richardson, 1909, p. 91; Thielemann, 1910, p. 51; Shiino, 1944, pp. 1~5, figs. 1~3; 1957, pp. 161~167, figs. 1~3; Kim and Kwon, 1983, p. 326.

Material examined: 6 ♂♂, 1 ♀, Pangp'o, Anmyŏndo I., Apr. 24, 1979, I. H. Kim; 1 ♀, Komso, Apr. 5, 1983, D. H. Kwon; 2 ♂♂, Panwŏl, July 2, 1980, W. Kim.

Remarks: This species is active borer of stones and dwells in the hole. Found among oysters or in the hole of stones on mud flats. Shiino (1944, 1957) mentioned the boring habits of this species.

Distribution: Korea and Japan.

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=국문초록=

韓國産 잔벌레科 (甲殼上綱, 等脚目, 有扇亞目)의 系統分類學的 硏究

金 熏 洙* · 權 道 憙**

韓國産 等脚類의 系統分類學的 硏究의 일환으로 1968年 부터 1983年 사이에 南韓의 34개소에서 채집되어 서울大學校 自然科學大學 動物學科 標本室에 보관되어 있는 잔벌레科 等脚類를 同定·分類한 결과 3亞科 6屬 12種이 밝혀졌다. 이 중에는 *Gnorimosphaeroma hoestlandti*, n. sp. 의 1新種과 *Gnorimosphaeroma chinense* (Tattersall)과 *Dynoides brevispina* Bruce의 2韓國未記錄種이 포함되어 있다. 한편 *Cassidias trituberculata* Thielemann, 1910과 *Gnorimosphaeroma kurilense* Kussakin, 1974는 각각 *Holotelson tuberculatus* Richardson, 1909와 *Gnorimosphaeroma chinense* (Tattersall, 1921)의 下位同物異名으로 思料된다. 이로써 韓國産 잔벌레科 等脚類는 모두 3亞科 7屬 13種이 된다.

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