

First Records of Three Crabs (Crustacea: Decapoda) from Korea

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ABSTRACT

Three crab species, *Macromedaeus orientalis*, *Eriphia smithi*, and *Ocypode cordimana*, from Jeju Island are recorded for the first time in Korea. *M. orientalis* was collected under the rocks by SCUBA diving in 20 m and at low tidal mark. However, *E. smithi* and *O. cordimana* were collected in crevices of the rock at low tidal mark and in a burrow of sand beach at supra tidal mark, respectively. At present, *E. smithi* is the only species of the genus represented in Korean waters. Including the new records in this study, the established brachyuran fauna in Korea now comprises 203 species.

Key words: Crabs, *Macromedaeus orientalis*, *Eriphia smithi*, *Ocypode cordimana*, Korea

INTRODUCTION

The List of Animals in Korea (Kim and Kim, 1997) contained 188 species of crabs. Recently, 12 species of crabs have been additionally reported, and they are one leucosiid, two majoid, two portunid, six xanthoid, and one grapsoid crabs (Ko and Takeda, 1999, 2000; Yang and Ko, 2000; Ko, 2002a; Lee and Kim, 2007; Lee and Ko, 2007). Thus, 200 species of crabs have been so far recorded from Korea. Among them, the xanthoid and ocypodoid crabs included 31 and 18 species, respectively.

Field work in various localities of Jeju Island has revealed the presence of two xanthoid and one ocypodoid crabs, *Macromedaeus orientalis* (Takeda et Miyake, 1969), *Eriphia smithi* MacLeay, 1838, and *Ocypode cordimana* Latreille, 1818, which have not been recorded in Korea. Therefore, these species are here redescribed.

Drawings were made with the aid of camera lucida. The abbreviation (cl) refers to carapace length from the front to the posterior dorsal margin of the carapace. In xanthoid crabs, the classification and the abbreviated terminology used for carapace regions generally follow those of Serène (1984). All the specimens are deposited in the second author's collection of Silla University, Busan.

SYSTEMATIC ACCOUNTS

Superfamily Xanthoidea MacLeay, 1838

Family Xanthidae MacLeay, 1838

Subfamily Xanthinae MacLeay, 1838

Genus *Macromedaeus* Ward, 1942

¹**Macromedaeus orientalis* (Takeda et Miyake, 1969)

(Figs. 1, 4)

Microcassiope orientalis Takeda et Miyake, 1969, p. 201, figs. 2, 3.

Macromedaeus orientalis: Yamaguchi et al., 1976, p. 37, fig. 2; Takeda, 1977, p. 84.

Not *Macromedaeus orientalis*: Ko, 2002b [zoea=*M. distinguendus* (De Haan, 1835)]

Material examined. 1♂ (cl 9.2 mm), Mosulpo (Jeju Is.), 9 June 2006 (H.S. Ko), by SCUBA diving in 20 m depth; 1♂ (cl 9.1 mm), Udo (Jeju Is.), 14 June 2007 (H.S. Ko), at low tidal mark.

Description. Carapace (Fig. 1A) transversely ovoid; ca. 1.5 times broader than long; slightly convex anteriorly and from side to side. Regions well defined, elevated, separated by strong furrows, with irregular transverse or oblique rows of strong bead-like granules; 1F and 2F clearly separated; 2M divided longitudinally over anterior one-thirds, inner lobe with long brush-like setae on anterior furrow, outer lobe broader; 1L to 5L not clearly separated; 5L with brush-like setae on anterior furrow; 6L distinct; 3M and 4M confused, posterolateral margins each with long brush-like setae; 1P and 2P not distinct, each posterior margin with granular

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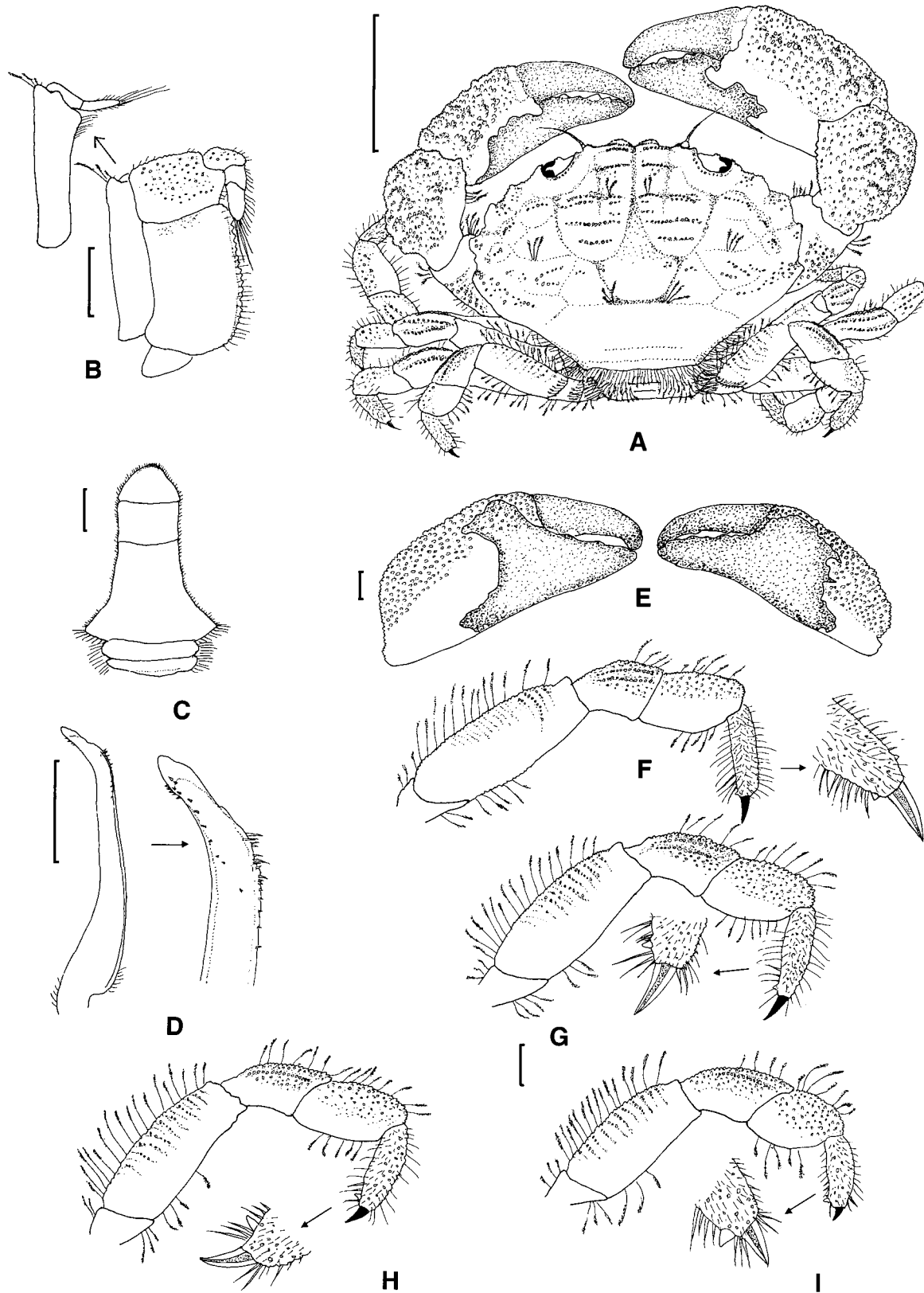


Fig. 1. *Macromedaeus orientalis*, male. A, dorsal view; B, third maxilliped; C, abdomen; D, first gonopod and enlargement of tip; E, chelipeds, frontal view; F-I, first to fourth ambulatory legs, enlargement of tip. Scale bars=5 mm (A), 1 mm (B-I).

Table 1. Morphological differences between *Macromedaeus orientalis* and *M. distinguendus*

| | <i>M. orientalis</i> | <i>M. distinguendus</i> |
|---|--|--|
| Bathymetric range | To 40 m | Intertidal region |
| Carapace length | Less than 10 mm | More than 10 mm |
| Front of carapace | Moderately projecting, double-rimmed, with median V-shaped notch (Fig. 4A) | Slightly projecting, straight, divided into two lobes by small notch (Fig. 4C) |
| Color of fixed finger of cheliped in male | Extending ventrally more than 1/2 length of palm (Fig. 4B) | Extending ventrally less than 1/2 length of palm (Fig. 4C, D) |
| Outer margin of carpus of ambulatory leg | Not lobulate (Fig. 4A, B) | Lobulate (Fig. 4C, D) |
| Subterminal spine of ambulatory leg | Present | Absent |

rim; posterolateral margin oblique, more or less straight. Front ca. 0.24 times carapace width; moderately projecting, double-rimmed, with median V-shaped notch, border with row of strong granules; pre-orbital granular projection. Anterolateral margins regularly convex; with four teeth behind exorbital angle; teeth subequal, triangular, bluntly pointed; the second and third teeth larger; the greatest carapace width across the third pair.

Third maxilliped (Fig. 1B). Ischium subrectangular, length ca. 1.5 times breadth; bearing setae on inner margin, distal surface minutely granulate. Surface of merus and carpus covered with strong granules.

Chelipeds (Figs. 1A, E). Noticeably unequal, robust; minor cheliped of similar form but more slender. Merus short and broad, outer surface granulate. Carpus with strong granulated tooth at inner angle; upper and outer surfaces granular, armed with several granulated tubercles. Outer surface of palm coarsely granular, with several granulated tubercles; towards inner surface granules gradually smaller and smaller; black color of fixed finger extending over at middle of inner border on palm. Fingers black colored, bluntly pointed, recurved; cutting margins of both fingers with molariform teeth of different size.

Ambulatory legs (Figs. 1A, F-I). Medium length; compressed; relatively stout; fourth pair shortest. All segments more or less granular, with long brush-like setae marginally except inner margin of carpus. Carpus with more or less granulated ridge on outer margin; row of granules forming crest on outer surface. Dactylus slender, straight, and flattened; covering with short, thick setae; terminating in acute chitinous spine; with subterminal spine on inner margin, fourth one largest.

Male abdomen (Fig. 1C). Relatively narrow; segments 3 to 5 fused; Segment 3 widest. Segment 6 ca. 1.3 times wider than long; telson length ca. 0.6 times width, rounded. Surface smooth.

Gonopods (Fig. 1D). G1 relatively long, slender, curved,

tip bluntly pointed; large, stout setae on inner margin reducing to small conical setae over distal third; small conical setae on outer margin subdistally.

Color. Dorsal carapace, chelipeds, and ambulatory legs reddish brown.

Habitat. Inhabits under stones from low tidal mark to 40 m in depth (Takeda, 1977).

Remarks. Two species are currently known in the genus *Macromedaeus* from Korea: *M. orientalis* and *M. distinguendus*. *Macromedaeus orientalis* is quite similar to *M. distinguendus*. However the former species can be easily distinguished from the latter, as shown in Table 1.

Distribution. Japan (type locality: Fukuoka Prefecture), Korea.

Family Menippidae Ortmann, 1893

Subfamily Eriphiinae Alcock, 1898

Genus *Eriphia* Latreille, 1817

¹**Eriphia smithi* MacLeay, 1838 (Figs. 2, 5)

Eriphia smithii MacLeay, 1838, p. 60; Takeda, 1982, p. 184, fig. 544.

Eriphia sebana smithii: Stimpson, 1907, p. 72; Guinot, 1964, p. 89; Sakai, 1935, p. 71.

Eriphia smithi: Sakai, 1976, p. 478, pl. 172, fig. 3; Miyake, 1983, p. 131, pl. 44, fig. 3; Serène, 1984, p. 311, pl. XLVII, figs. 236, 237; Dai and Yang, 1991, p. 357, pl. 47, fig. 174.

Material examined. 1 ♂ (cl 32.4 mm), 1 ♀ (cl 28.2 mm), Seongsanpo (Jejudo Is.), 21 August 2006 (H.S. Ko).

Description. Carapace (Fig. 2A) transversely ovoid, ca. 1.38 times broader than long; granular over half of surface anteriorly; with minute setae; convex anteriorly; slightly convex at both sides of postero-branchial regions. Regions not distinct; 1F, 2F, 1M and 2M fused, lateral margins of 2M distinct, 3M and 4M not distinct; lateral hepatic and branchial regions indistinct, 1L, 3L, 4L and 5L not clearly separated;

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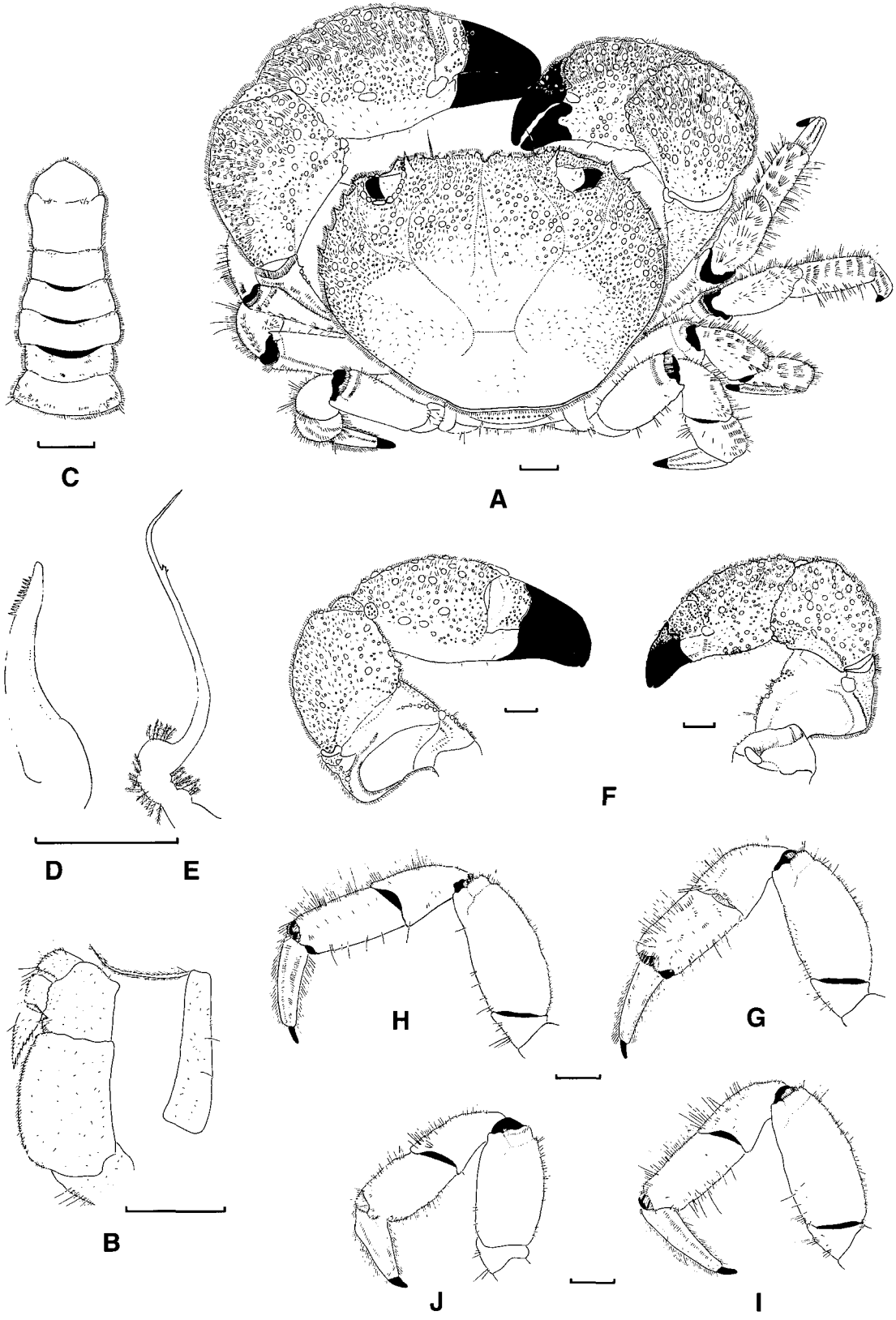


Fig. 2. *Eriphia smithi*, male. A, dorsal view; B, third maxilliped; C, abdomen; D, first gonopod; E, second gonopod; F, chelipeds, dorsal view; G-J, first to fourth ambulatory legs. Scale bars=5 mm (A-J).

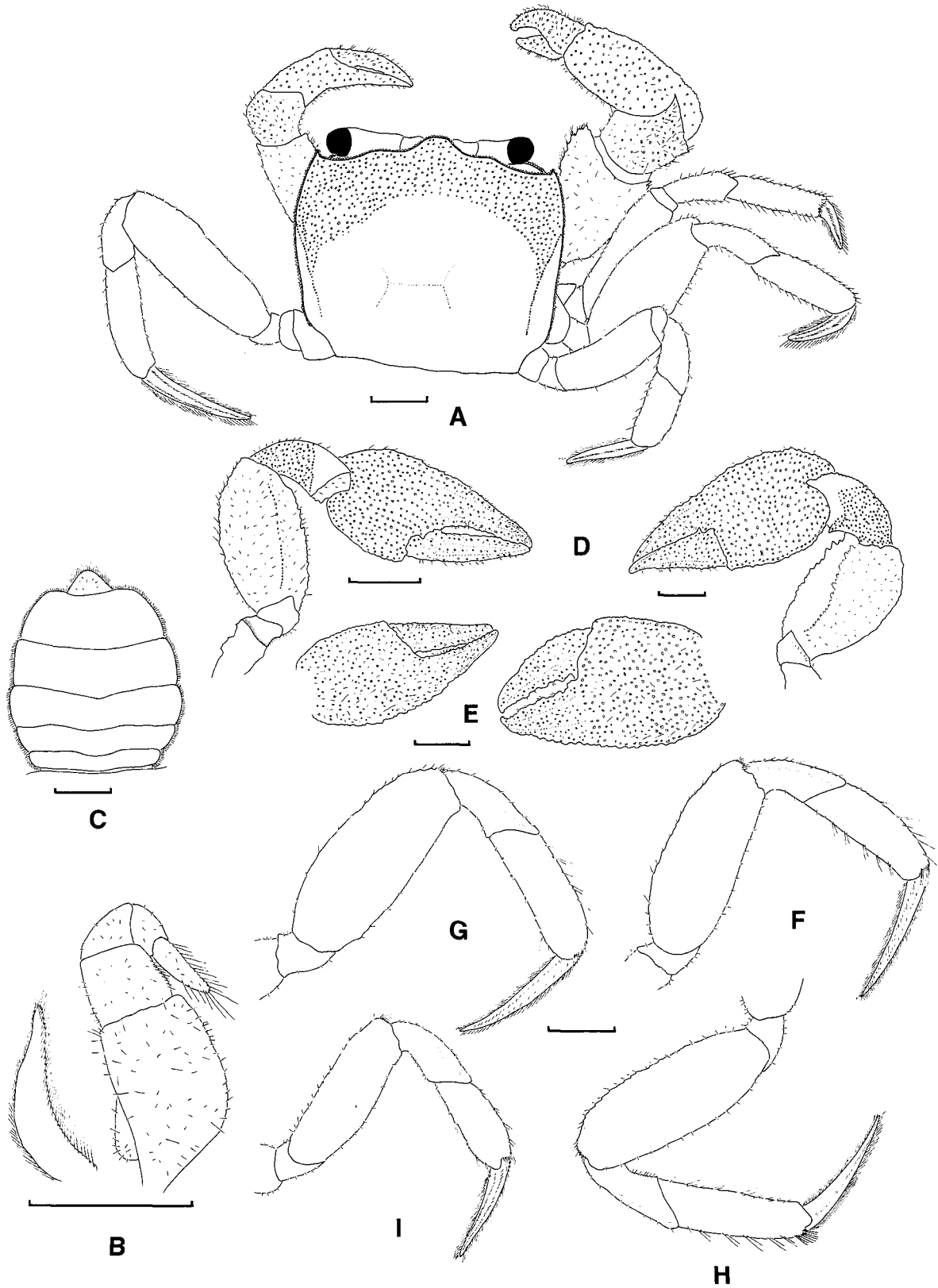


Fig. 3. *Ocypode cordimana*, female. A, dorsal view; B, third maxilliped; C, abdomen; D, chelipeds, dorsal view; E, chelipeds, ventral view; F-I, first to fourth ambulatory legs. Scale bars=5 mm (A-I).

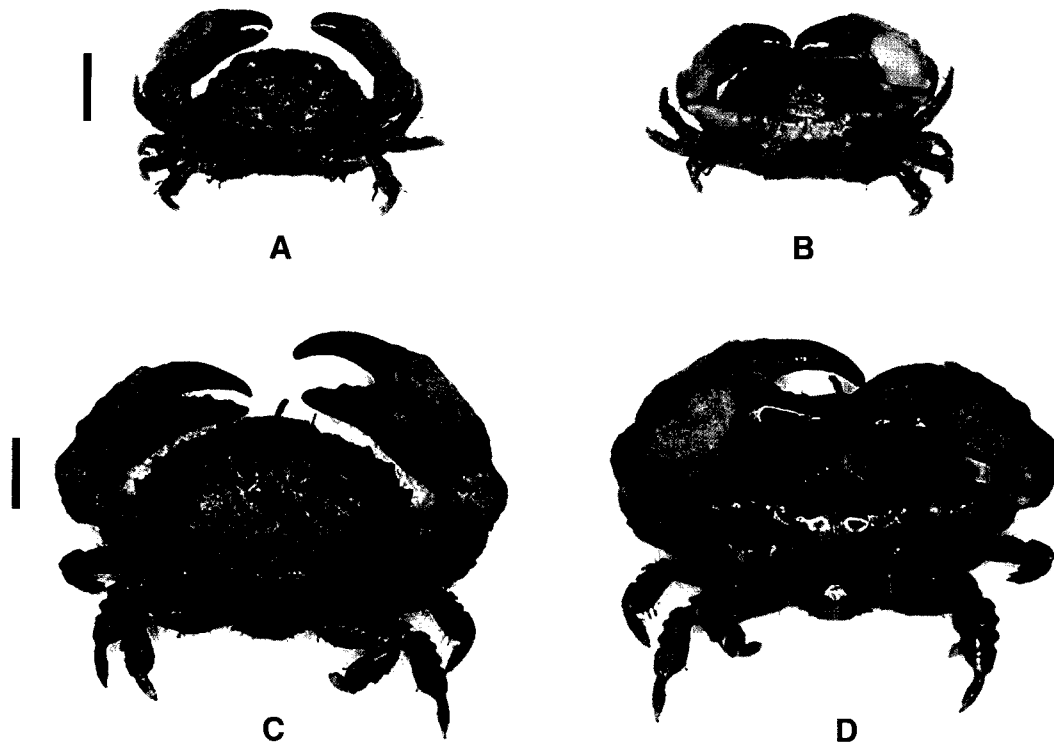


Fig. 4. A, B, *Macromedaeus orientalis*, male, dorsal and ventral views; C, D, *Macromedaeus distinguendus* (cl 17.1 mm, from Gadeokdo Island, Busan), male, dorsal and ventral views. Scale bars=5 mm (A-D).



Fig. 5. *Eriphia smithi*, female. Scale bar=10 mm.

2L more or less separated, posterolateral margins of 2L markedly convergent; anterior margin of 1P with H-shaped depression. Front ca. 0.45 times carapace width; border denticulate, with median V-shaped notch extending more or less backwards; with pre-orbital spinal projection. Antero-lateral margin with 5-6 spines behind exorbital angle, gradually decreasing in size backwards.

Third maxilliped (Fig. 2B). Surface covered with small setae; ischium subrectangular, length ca. 1.5 times breadth, bearing setae on inner margin.

Chelipeds (Fig. 2F). Noticeably unequal, left largest and

stoutest. Merus short and broad, covered with setae on outer surface. Carpus and palm bearing strong granules and setae dorsally. Fingers black and tan colored, bluntly pointed, recurved.

Ambulatory legs (Figs. 2A, G-J). Medium length; compressed, relatively stout, covered with short setae; first 3 pairs subequal, last pair the shortest.

Male abdomen (Fig. 2C). Relatively narrow, 7 segmented; segments 1 and 3 the widest; segment 6 the longest, posterolateral margins slightly convex; telson broadly rounded.

Gonopods (Figs. 2D, E). G1 median length, stout, outer margin with slightly produced, broad, tapering distally, tip bluntly pointed; small conical spines on subdistal inner margin. G2 long, slender, evenly curved; tip short, recurved, sharply pointed.

Color. Dorsal carapace, chelipeds, and ambulatory legs dark purple. Eyes red.

Habitat. Inhabits crevices of the rocky beach near low tidal mark.

Remarks. Serène (1984) reported that three species assigned the genus *Eriphia* existed in the Indian Ocean: *E. scabricula* Dana, 1852, *E. sebana* (Shaw et Nodder, 1803), and *E. smithi*. Among them, *E. smithi* is immediately distinguished from other two species by the dorsally granulated cheliped



Fig. 6. *Ocypode cordimana*, female. Scale bar=5 mm.

(Takeda, 1982). The present species coincides well with Serène and Takeda's ones. Its presence in Korean waters extends its range northward into the Pacific.

Distribution. Japan, Hawaii, Red Sea, South Africa (Sakai, 1976), China (Dai and Yang, 1991), Korea.

Superfamily Ocypodoidea Rafinesque, 1815
 Family Ocypodidae Rafinesque, 1815
 Subfamily Ocypodinae Rafinesque, 1815
 Genus *Ocypode* Weber, 1795

¹**Ocypode cordimana* Latreille, 1818 (Figs. 3, 6)

Ocypode cordimana Latreille, 1818, p. 198; Miyake, 1983, p. 161, pl. 54, fig. 1; Wada, 1995, p. 413, pl. 117, fig. 2.

Ocypode cordimana Desmarest, 1825, p. 121, pl. 58, fig. 230; Sakai, 1976, p. 599, pl. 206, fig. 4; Takeda, 1982, p. 206, fig. 611; Dai and Yang, 1991, p. 455, fig. 230, pl. 58.

Ocypode cordimanus: Sakai, 2004, p. 1195.

Material examined. 2 ♀ (cl 19.2, 20.1 mm), Mosulpo (Jejudo Is.), 15 June 2007 (H.S. Ko).

Description. Carapace (Fig. 3A) quadrangular; ca. 1.2 times broader than long; half of surface covered with small granules anteriorly; slightly convex anteriorly; with straight lateral margin. Regions ill defined; border between gastric and cardiac regions with H-shaped depression. Front narrow; orbits broad, occupying whole anterior margin of carapace. Eyestalks long, not extending beyond cornea, without horn; outerorbital tooth acute, directed inward.

Third maxilliped (Fig. 3B). Merus ca. 1.5 times longer than wide; exopod slender, concealed; palp articulating near distolateral angle of merus.

Chelipeds (Figs. 3A, D, E) unequal; carpus and palm gran-

ular; palm of large cheliped without stridulation organ on inner surface; fingers pointed.

Ambulatory legs (Figs. 3A, F-I) relatively slender, more or less fringed on anterior and posterior margins; carpus of each leg with row of tubercles on outer surface; fourth pair the shortest.

Female abdomen (Fig. 3C) 5 segmented; telson triangular. **Color.** Dorsal carapace and ambulatory legs pale brownish gray. Cheliped bright ivory.

Habitat. Inhabits in deep burrows of the sand beach near supratidal mark.

Remarks. In Hamo sand beach of Mosulpo, two species of the *Ocypode* were collected: *O. cordimana* and *O. stimpsoni* Ortmann, 1897. They agreed well with Sakai (1976)'s key: *O. cordimana* was without the stridulating organ on the inner surface of the palm of the large cheliped and with the outer orbital tooth directed inward, whereas *O. stimpsoni* was with the stridulating organ and with the outer orbital tooth directed forwards. In sand beach, the authors found these two species living in somewhat different habitats. The former occupied supratidal region near to grassy area. In contrast, the latter occupied further down the habitat of the former species.

Distribution. Japan, Red Sea, South Africa, Tahiti (Sakai, 1976), China, India (Dai and Yang, 1991), Papua New Guinea (Sakai, 2004), Australia (Poore, 2004), Korea.

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