

Coral-inhabiting Crabs of the Family Hapalocarcinidae from Japan

X. Collections from Hachijo Island in the Izu Islands

By

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Abstract Nine species of hapalocarcinid crabs were recorded from Hachijo Island, the Izu Islands. They are *Cryptochirus coralliodytes* HELLER, *C. trii* FIZE et SERÈNE, *Favicora japonica* TAKEDA et TAMURA, *Pseudocryptochirus hongkongensis* (SHEN), *Hiroia krempfi* (FIZE et SERÈNE), *H. boissoni* (FIZE et SERÈNE), *Fizesereneia heimi* (FIZE et SERÈNE), *F. stimpsoni* (FIZE et SERÈNE) and *Neotroglocarcinus monodi* (FIZE et SERÈNE). Most of them extended the geographical ranges, and the male of *Favicola japonica* was discovered.

Hachijo Island is situated at lat. 33°05'N and long. 139°50'E, in the south of the Kuroshio Current. The island is surrounded by rocky shore, without typical coral reef, but the reef-building corals are commonly found in shallow waters around the island. Many colonies of these corals are associated with crabs of the Hapalocarcinidae.

In May, 1980 and May, 1983, the junior author took the chances to visit Hachijo Island to collect the hapalocarcinid crabs. Otherwise, a small collection of crabs was sent to us for identification by Mr. Kônosuke TAKAHASHI of the Hachijo Branch, Tokyo Fisheries Experiment Station. The specimens at our disposal were referred to nine species of six genera, viz., *Cryptochirus coralliodytes* HELLER, *C. trii* FIZE et SERÈNE, *Favicora japonica* TAKEDA et TAMURA, *Pseudocryptochirus hongkongensis* (SHEN), *Hiroia krempfi* (FIZE et SERÈNE), *H. boissoni* (FIZE et SERÈNE), *Fizesereneia heimi* (FIZE et SERÈNE), *F. stimpsoni* (FIZE et SERÈNE) and *Neotroglocarcinus monodi* (FIZE et SERÈNE).

Although all the species were already recorded from southern Japan in the previous parts of the present serial reports, it is remarkable that most of the species extended their geographical ranges, and the male of *Favicola japonica* was discovered for the first time, and that the male of *Hiroia krempfi* was newly recorded from Japanese waters. The specimens dealt herewith are now preserved in the National Science Museum, Tokyo (NSMT).

Before going further, we wish to express our gratitude to Mr. K. TAKAHASHI who kindly placed the interesting specimens at our disposal for study. The junior authors'

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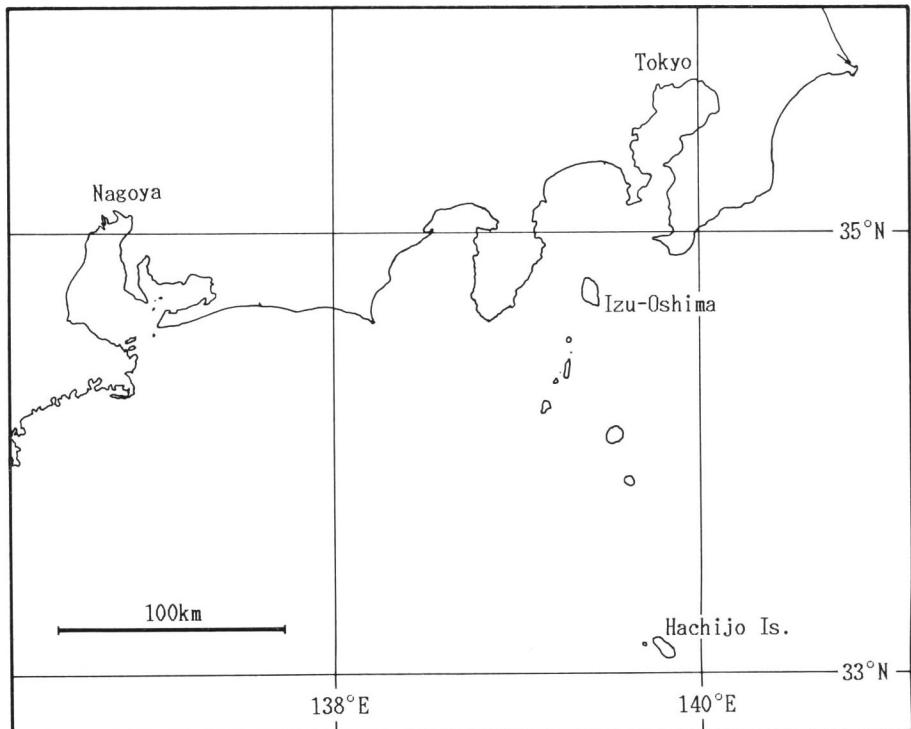


Fig. 1. A map showing the location of Hachijo Island.

cordial thanks are due to Dr. Ryôsuke ISHIKAWA of Tokyo Metropolitan University for his continuous encouragement throughout the series of this study.

Genus *Cryptochirus* HELLER, 1861

Cryptochirus coralliodytes HELLER, 1861

(Pl. 1, figs. A, B)

Cryptochirus coralliodytes [sic] HELLER, 1861a, p. 19.

Cryptochirus coralliodytes: HELLER, 1861b, p. 370, pl. 4 (33–39); HIRO, 1937, pp. 140–143, 147, 150–153, figs. 5, 6, pls. 4 (2, 3), 6 (7–9); UTINOMI, 1944, pp. 697–729, figs. 5 (B), 6 (A), 7 (A, D), 9, 11 (A, B), 12 (A), 13 (A), 15 (A, E), 16 (A, B), pls. 3 (5, 6), 4 (1, 2); FIZE & SERÈNE, 1957, p. 31, figs. 4, 5 (A, E), pls. 1 (3–6), 2 (1–3), 10 (A), 14 (A–H); SERÈNE, 1962, p. 31, figs. 1 (f), 2 (f), 3, 4 (a–c), (H, h, L); SAKAI, 1976, p. 684, pl. 235 (4); TAKEDA & TAMURA, 1980c, p. 48, pl. 2 [lit.]; 1983, p. 1; MIYAKE, 1983, p. 191, pl. 64 (2).

Material examined. Senjôjiki; 1 ovig. ♀ (NSMT-Cr 8983 — 4.3 × 6.8 mm), 2 ♀♀ (NSMT-Cr 8984–1, 8986 — 5.3 × 7.1, 2.5 × 3.7 mm), 1 ♂ (NSMT-Cr 8984–2 — 2.5 × 3.6 mm); May 2, 1980. Kaminato; 1 ovig. ♀ (NSMT-Cr 8982–1 — 5.4 × 7.4 mm), 1 ♀ (NSMT-Cr 8982–2 — 6.0 × 7.6 mm); Sept. 27, 1981. Shinminato;

1 ♀ (NSMT-Cr 8985 — 4.4×6.0 mm); Aug. 15, 1981. The specimens with same stem number are those obtained from one coral block.

Host. Many species of the Faviidae [Kikumeishi-ka] and *Merulina laxa* DANA [Eda-sazanami-sango] of the Merulinidae [Sazanamisango-ka] are known as host corals. The specimens dealt herewith were collected from some unidentified species of the Faviidae.

Distribution. This species is widely distributed in the range of whole Indo-West Pacific waters. It is very common in southern Japan, ranging from Sagami Bay to the Ryukyu Islands.

Cryptochirus trii FIZE et SERÈNE, 1955

(Pl. 1, figs. C, D)

Cryptochirus tri [sic] FIZE & SERÈNE, 1955b, p. 397, fig. 1 (B); 1957, p. 48, figs. 5 (H), 8, 9, pls. 1 (10, 11), 2 (7-10), 10 (B, C).

Cryptochirus trii: TAKEDA & TAMURA, 1980c, p. 51, fig. 2, pl. 4.

Material examined. Yaene; 2 ♀♀ (NSMT-Cr 8994, 8995-1 — 3.6×5.1 , 2.6×3.8 mm), 1 ♂ (NSMT-Cr 8995-2 — 1.7×2.4 mm); May 3, 1980. Sokodo; 1 young ♀ (NSMT-Cr 8996 — 1.2×2.0 mm); May 7, 1983.

Host. The host corals are *Echinopora lamellosa* (ESPER) [Ryukyu-kikka] and *E. gemmacea* LAMARCK of the Faviidae. The specimens dealt herewith were also collected from *E. lamellosa*.

Distribution. Nhatrang, Viet-Nam, and the Ryukyu and Ogasawara Islands.

Genus *Favicola* FIZE et SERÈNE, 1957

Favicola japonica TAKEDA et TAMURA, 1981

(Fig. 2; Pl. 2, figs. A, B)

Favicola japonica TAKEDA & TAMURA, 1981a, p. 47, fig. 3, pl. 2 (C, D).

Material examined. Kaminato; 2 ovig. ♀♀ (NSMT-Cr 8997-1, 2 — 2.8×4.1 , 2.1×3.3 mm), 1 ♀ (NSMT-Cr 8997-3 — 2.1×3.3 mm), 1 ♂ (NSMT-Cr 8997-4 — 1.8×2.8 mm); Sept. 27, 1981.

Description of Male. Smaller than female. Carapace suboval, much longer than broad and weakly convergent posteriorly; dorsum moderately convex as a whole in both directions and covered with minute granules and sparse setae; anterior part of gastric region Λ-shaped and slightly convex dorsally.

Chelipeds stout; height of palm nearly as long as movable finger and longer than its upper border; movable finger with a small tooth at proximal part of cutting edge; immovable finger with an indistinct blunt tooth at middle part. Abdomen elongate and composed of seven segments, two proximal segments being visible in dorsal view. First pleopod rather slender and fringed with sparse longish setae at its external surface.

Host. The known host coral is *Goniastrea* sp. of the Faviidae. The specimens

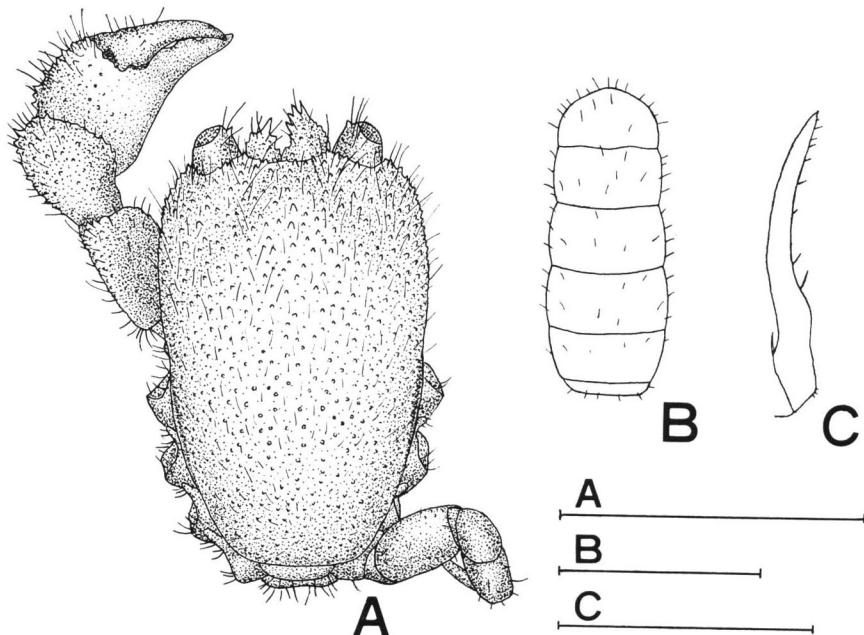


Fig. 2. *Favicola japonica* TAKEDA et TAMURA, ♂, NSMT-Cr 8997-4. — A, entire animal; B, distal six segments of abdomen; C, left first pleopod in abdominal view. Scale for A=2 mm, scales for B and C=1 mm.

from Hachijo Island were obtained from *Leptastrea* sp. of the same family.

Distribution. Originally described from the Ryukyu and Ogasawara Islands.

Genus *Pseudocryptochirus* HIRO, 1938

Pseudocryptochirus hongkongensis (SHEN, 1936)

(Pl. 2, figs. C, D)

Cryptochirus hongkongensis SHEN, 1936, p. 23, pl. 1.

Pseudocryptochirus viridis HIRO, 1938, p. 150; UTINOMI, 1944, p. 689, figs. 1-3, 5 (C), 6 (C), 7 (B, E), 11 (C-F), 12 (B), 14 (C), 15 (B, F), 16 (E, F), pls. 4 (3-6), 5 (1, 2); SERÈNE, 1966, p. 396 (in list); SAKAI, 1976, p. 685, fig. 375.

Troglocarcinus (Troglocarcinus) viridis: FIZE & SERÈNE, 1957, p. 58, figs. 11 (A, B), 12 (A), pls. 3 (1-3), 5 (1), 11 (D).

Pseudocryptochirus hongkongensis: TAKEDA & TAMURA, 1981b, p. 15, pl. 1.

Material examined. Yaene; 4 ovig. ♀♀ (NSMT-Cr 8998-1, 2, 8999, 9000-1 — $2.5 \times 3.2 \sim 2.0 \times 2.5$ mm), 2 ♀♀ (NSMT-Cr 9001, 9002 — 2.2×2.6 , 1.9×2.4 mm), 2 ♂♂ (NSMT-Cr 9000-2, 3 — 2.1×2.6 , 1.9×2.5 mm); May 3, 4, 1980.

Host. Eight species of the family Dendrophylliidae [Kisango-ka], viz., *Turbinaria contorta* BERNARD [Nejire-suribachi-sango], *T. pustulosa* BERNARD [Hime-suribachi-

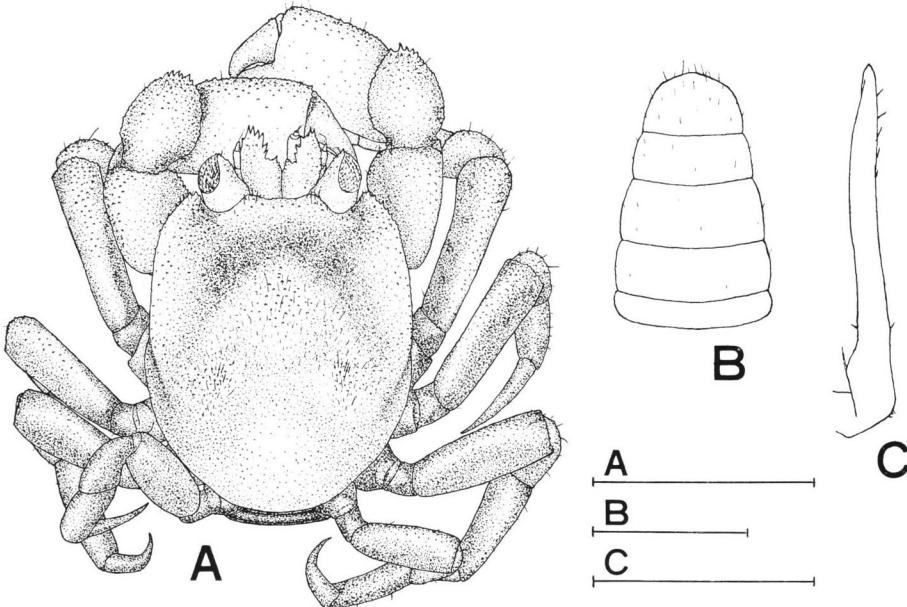


Fig. 3. *Hiroia krempfi* (FIZE et SERÈNE), ♂ NSMT-Cr 9003-3. — A, entire animal; B, distal five segments of abdomen. C, left first pleopod in abdominal view. Scale for A=2 mm, scales for B and C=1 mm.

sango], *T. edwardsi* BERNARD, *T. mollis* BERNARD, *T. crater* (PALLAS), *T. veluta* BERNARD, *T. agaricia* BERNARD and *T. danae* BERNARD, are recorded as host corals. The specimens dealt herewith were also collected from some *Turbinaria* species.

Distribution. Tanabe Bay, Central Japan and the Ryukyu Islands; Taiwan; Hongkong; Viet-Nam; the Marshall Islands; Indonesia.

Genus *Hiroia* TAKEDA et TAMURA, 1981

Hiroia krempfi (FIZE et SERÈNE, 1955)

(Fig. 3; Pl. 2, figs. E, F)

Troglocarcinus krempfi FIZE & SERÈNE, 1955a, p. 378, fig. 2 (G).

Troglocarcinus (Troglocarcinus) krempfi: FIZE & SERÈNE, 1957, p. 79, figs. 11 (F), 18, 19, 20 (E, F), pls. 3 (8-10), 5 (3), 12 (A), 15 (E, F).

Pseudocryptochirus krempfi: SERÈNE, 1966, p. 396 (in list).

Hiroia krempfi: TAKEDA & TAMURA, 1981b, p. 20, fig. 2, pl. 3.

Material examined. Yaene; 1 ovig. ♀ (NSMT-Cr 9003-1 — 3.2×4.8 mm), 2 ♀♀ (NSMT-Cr 9003-2, 9004 — 4.1×6.9, 2.4×3.1 mm), 1 ♂ (NSMT-Cr 9003-3 — 2.4×2.9 mm); May 3, 4, 1980.

Description of Male. Smaller than female. Carapace longer than broad, and its posterior half semicircular in outline; dorsum seemingly almost smooth, but gastric

region, median parts of branchial regions and marginal part of anterior half of carapace sparsely covered with minute granules and short setae; gastric region convex dorsally, being separated from front-orbital border, hepatic region and anterior parts of branchial regions by a wide depression; median parts of branchial regions also convex dorsally; posterior part of gastric region, cardio-intestinal region and posterior parts of branchial region indistinctly separated. Both chelipeds equal in size and comparatively stouter than those of female; upper border of palm nearly as long as its height; movable finger as long as upper border of palm and armed with a small tooth at proximal part of cutting edge; immovable finger with an indistinct blunt tooth at middle part. Abdomen suboval and composed of seven segments, and proximal three segments exposed to dorsal view. First pleopod rather slender and straight, bearing fringed with sparse setae at its external surface.

Host. *Merulina laxa* DANA [Eda-sazanami-sango] of the Merulinidae, *Hydrophora microconos* (LAMARCK) [Ryukyu-ibo-sango] and *H. rigida* (DANA) of the Faviidae are recorded as host corals. The specimens from Hachijo Island were obtained from *H. exesa* (PALLAS) [Ibo-sango].

Color. The color pattern was observed on a female (NSMT-Cr 9003-1) and a male (NSMT-Cr 9003-3). The basic color of the carapace is semitransparent gray, with dense green chromatophores except for the cardio-intestinal region; the front border and the inner side of the eyestalk are fringed with white; the gastric region is white, and each posterolateral corner is extended backward as a white stripe along the cardio-intestinal region to the posterior end of each lateral border; the median part and surroundings of the gastric region are sparsely covered with brown pigments.

Distribution. Known from Nhatrang, Viet-Nam, and the Yaeyama Group in the Ryukyu Islands.

Hiroia boissoni (FIZE et SERÈNE, 1955)

(Pl. 3, fig. A)

Troglocarcinus boissoni FIZE & SERÈNE, 1955a, p. 376, fig. 1 (D); MIYAKE, 1983, p. 192, pl. 64 (5).

Troglocarcinus (Troglocarcinus) boissoni: FIZE & SERÈNE, 1957, p. 69, figs. 11 (E), 13-15, 20 (A, B), pls. 4 (1, 2), 5 (4), 12 (C), 16 (A-D).

Hiroia boissoni: TAKEDA & TAMURA, 1983, p. 7, fig. 3, pl. 3.

Material examined. Yaene; 1 ovig. ♀ (NSMT-Cr 9005 — 4.1×6.2 mm); May 3, 1980. Kaminato; 1 ovig. ♀ (NSMT-Cr 9006-1 — 3.6×5.3 mm), 1 ♀ (NSMT-Cr 9006-2 — 3.2×4.5 mm); Sept. 23, 1981.

Host. *Echinophyllia aspera* (ELLIS et SOLANDER) [Kikka-sango] and *Oxypora lacera* VERRILL [Togehana-sango] of the Pectinidae [Umibara-ka], *Merulina ampliata* (ELLIS et SOLANDER) [Sazanami-sango] and *M. vaughani* VAN DER HORST of the Merulinidae are recorded as host corals. The specimens dealt herewith were also obtained from *E. aspera* and *Oxypora* sp.

Distribution. Known from Nhatrang, Viet-Nam, and Kushimoto, Central Japan.

Genus *Fizesereneia* TAKEDA et TAMURA, 1980*Fizesereneia heimi* (FIZE et SERÈNE, 1955)

(Pl. 3, figs. B, C)

Troglocarcinus heimi FIZE & SERÈNE, 1955a, p. 378, fig. 2 (H); SERÈNE, 1966, pp. 396, 398.*Troglocarcinus (Mussicola) heimi*: FIZE & SERÈNE, 1957, p. 111, figs. 29, 30, 31 (A, B), pls. 5 (13), 7 (1, 2), 12 (E-G), 18 (A-D).*Fizesereneia heimi*: TAKEDA & TAMURA, 1980a, p. 138, figs. 1, 2, 3 (A, B), 4; MIYAKE, 1983, p. 192, pl. 64 (4).

Material examined. Shinminato; 1 ovig. ♀ (NSMT-Cr 9007-1 — 8.1 × 9.1 mm), 1 ♂ (NSMT-Cr 9007-2 — 5.0 × 5.4 mm); Oct. 31, 1981, 2 ♀♀ (NSMT-Cr 9008-1, 2 — 7.4 × 8.9, 6.3 × 7.0 mm); Aug. 15, 1981.

Host. The host corals are *Lobophyllia hemprichii* (EHRENBURG), *L. corymbosa* (FORSKÅL), *L. costata* (DANA) [Hanagata-sango], *Sympyllia nobilis* (DANA), *S. labyrinthica* BASSET SMITH, *S. agaricia* M. EDWARDS et HAIME and *S. recta* (DANA) [Togedainô-sango] of the Mussidae [Ô-togesango-ka]. The specimens from Hachijo Island were also obtained from an unidentified species of *Lobophyllia*.

Distribution. Known from Nhatrang, Viet-Nam, the Yaeyama Group in the Ryukyu Islands, and Kushimoto, Central Japan.

Fizesereneia stimpsoni (FIZE et SERÈNE, 1955)

(Pl. 3, fig. D)

Troglocarcinus stimpsoni FIZE & SERÈNE, 1955b, p. 380, fig. 1 (C).*Troglocarcinus (Mussicola) stimpsoni*: FIZE & SERÈNE, 1957, p. 116, fig. 31 (E), pls. 5 (14), 7 (3, 4), 12 (D), 18 (E-H).*Fizesereneia stimpsoni*: MIYAKE, 1983, p. 191, pl. 64 (3); TAKEDA & TAMURA, 1983, p. 9, fig. 4, pl. 4.

Material examined. Yaene; 1 ovig. ♀ (NSMT-Cr 9009 — 3.2 × 4.3 mm), 2 ♀♀ (NSMT-Cr 9010, 9011 — 4.1 × 6.0, 3.3 × 4.8 mm); May 2 and 3, 1980.

Host. *Acanthastrea echinata* (DANA), *A. hemprichii* [Ô-toge-kikumeishi] and *A. sp.* of the Mussidae are recorded as host corals. The specimens from Hachijo Island were also obtained from an unidentified species of the same genus.

Distribution. Known from Nhatrang, Viet-Nam, and Kushimoto, Central Japan.

Genus *Neotroglocarcinus* FIZE et SERÈNE, 1957*Neotroglocarcinus monodi* (FIZE et SERÈNE, 1955)

(Pl. 3, fig. E)

Troglocarcinus monodi FIZE & SERÈNE, 1955, p. 375, fig. 1 (B).*Neotroglocarcinus monodi*: FIZE & SERÈNE, 1957, p. 137, figs. 36-39 (A), pls. 9 (1-3, 9), 11 (F), 17 (F, G); TAKEDA & TAMURA, 1980b, p. 148, figs. 1, 2.

Material examined. Yaene; 2 ovig. ♀♀ (NSMT-Cr 9015-1, 9016-1 — 3.7 × 4.3,

3.2×3.7 mm), 2 ♀♀ (NSMT-Cr 9017, 9016-2 — 4.2×4.6 , 3.3×3.8 mm), 4 young ♀♀ (NSMT-Cr 9015-2, 9016-3 ~ 5 — $1.9 \times 2.3 \sim 1.5 \times 1.8$ mm); May 3, 1980.

Host. *Turbinaria peltata* (ESPER) [Ô-suribachi-sango], *T. nidifera* BERNARD and *T.* sp. are recorded as host corals. The specimens from Hachijo Island were also obtained from some unidentified species of the same genus. This species were sometimes collected from same coral block as *Pseudocryptochirus hongkongensis*.

Distribution. Known from Viet-Nam, Singapore, and the Yaeyama Group in the Ryukyu Islands.

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Explanation of Plate 1-3

Plate 1

Figs. A, B. *Cryptochirus coralliodytes* HELLER —— A, ♀ (NSMT-Cr 8982-2). Breadth 6.0 mm, length 7.6 mm B, ♂ (NSMT-Cr 8984-2). Breadth 2.5 mm, length 3.6 mm.

Figs. C, D. *Cryptochirus trii* FIZE et SERÈNE —— C, ♀ (NSMT-Cr 8994). Breadth 3.6 mm, length 5.1 mm. B, ♂ (NSMT-Cr 8995-2). Breadth 1.7 mm, length 2.4 mm.

Plate 2

Figs. A, B. *Favicola japonica* TAKEDA et TAMURA —— A, ovig. ♀ (NSMT-Cr 8997-1). Breadth 2.8 mm, length 4.1 mm. B, ♂ (NSMT-Cr 8997-4). Breadth 1.8 mm, length 2.8 mm.

Figs. C, D. *Pseudocryptochirus hongkongensis* (SHEN) —— C, ovig. ♀ (NSMT-Cr 8999). Breadth 2.5 mm, length 3.1 mm. D, ♂ (NSMT-Cr 9000-2). Breadth 2.1 mm, length 2.6 mm.

Figs. E, F. *Hiroia krempfi* (FIZE et SERÈNE) —— E, ovig. ♀ (NSMT-Cr 9003-1). Breadth 3.2 mm, length 4.8 mm. F, ♂ (NSMT-Cr 9003-3). Breadth 2.4 mm, length 2.9 mm.

Plate 3

Fig. A. *Hiroia boissoni* (FIZE et SERÈNE) —— Ovig. ♀ (NSMT-Cr 9005). Breadth 4.1 mm, length 6.2 mm.

Figs. B, C. *Fizesereneia heimi* (FIZE et SERÈNE) —— B, ovig. ♀ (NSMT-Cr 9007-1). Breadth 8.1 mm, length 9.1 mm. C, ♂ (NSMT-Cr 9007-2). Breadth 5.0 mm, length 5.4 mm.

Fig. D. *Fizesereneia stimpsoni* (FIZE et SERÈNE) —— Ovig. ♀ (NSMT-Cr 9009). Breadth 3.2 mm, length 4.3 mm.

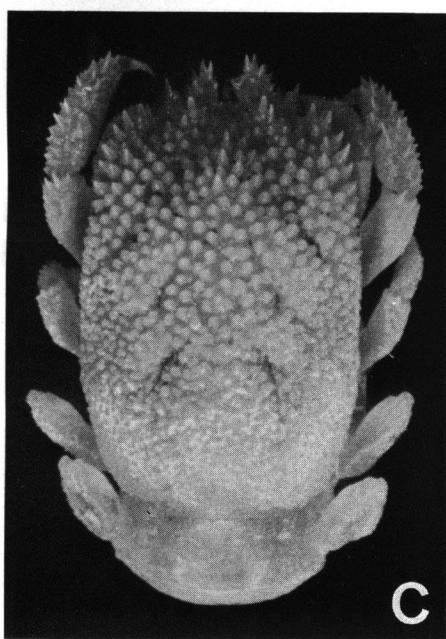
Fig. E. *Neotroglocarcinus monodi* (FIZE et SERÈNE) —— Ovig. ♀ (NSMT-Cr 9016-3). Breadth 3.2 mm, length 3.7 mm.



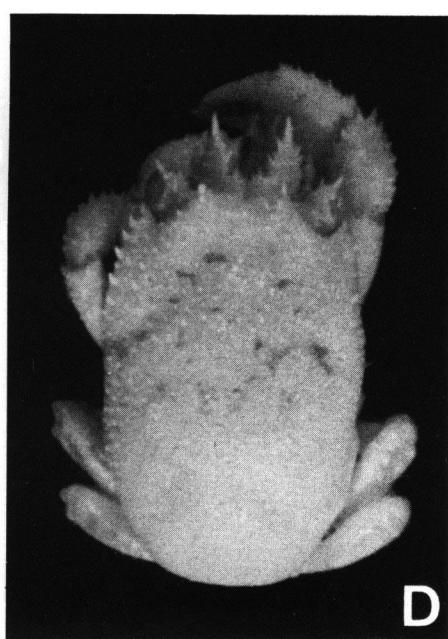
A



B



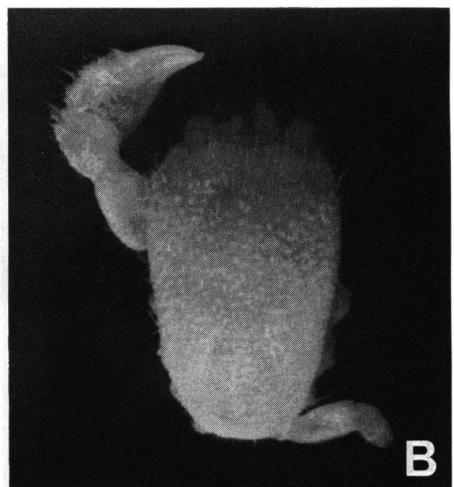
C



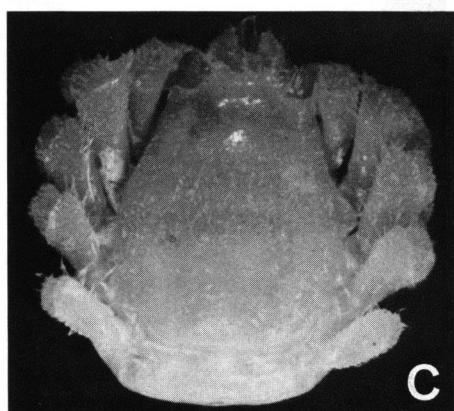
D



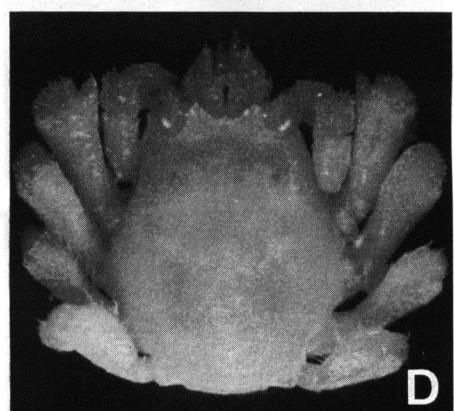
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B



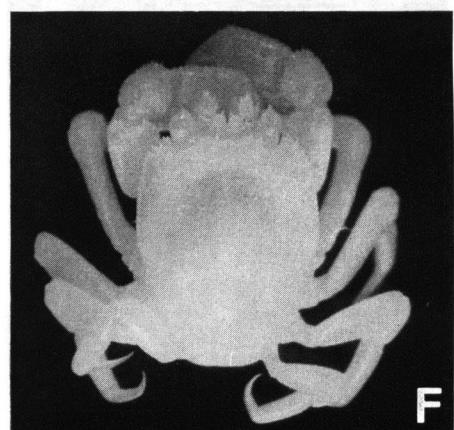
C



D



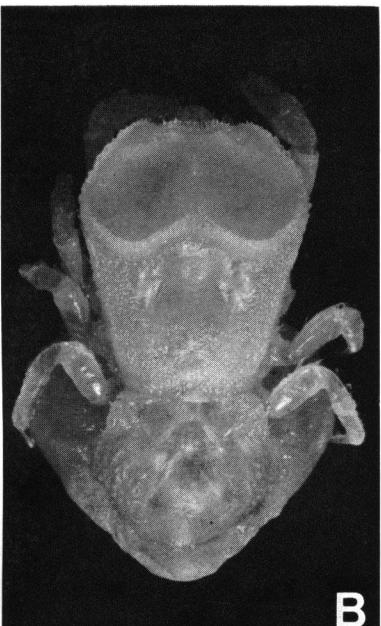
E



F



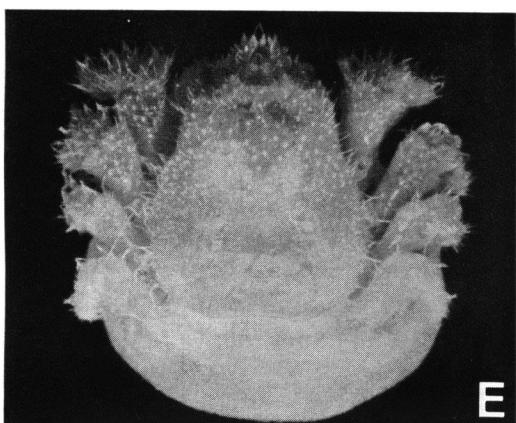
A



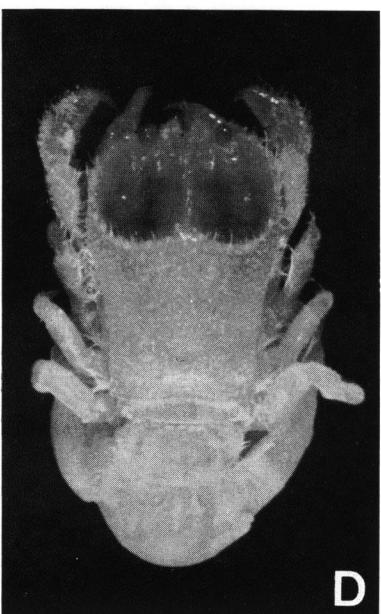
B



C



E



D

