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THE GALL CRABS (CRUSTACEA: DECAPODA: BRACHYURA: CRYPTOCHIRIDAE) OF THE RUMPHIUS EXPEDITIONS REVISITED, WITH DESCRIPTIONS OF THREE NEW SPECIES

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ABSTRACT. - Examination of the gall crab material collected on the Rumphius I and II expeditions revealed three undescribed species. *Fizesereneia latisella*, new species, is distinguished by having a hexagonal carapace with anterior concavities twice as wide as long and not completely separated by a median ridge. *Fizesereneia tholia*, new species, is distinguished by having a carapace with anterior concavities greater than half the length of the carapace and not completely divided by a median ridge. *Lithoscaptus prionotus*, new species, is distinguished by having the pterygostomial region not fused to the carapace and by having strikingly spinous anterolateral margins of the carapace interrupted by two notches. The remaining Rumphius specimens were examined and, if necessary, identifications were corrected to accommodate recent changes in the taxonomic structure of the family.

INTRODUCTION

The coral-dwelling gall crabs (Cryptochiridae) collected during the Rumphius I (1973) and II (1975) Expeditions have been listed in three publications. Serène *et al.* (1974) listed taxa found during Rumphius I, Serène *et al.* (1976) and Monod & Serène (1976) listed taxa found during Rumphius II, the latter in a note about parasitic, commensal, and inquiline taxa. Because all three publications provided only lists of taxa and considering the recent revisions within the family (e.g., Kropp, 1988a, 1988b, 1988c, 1989, 1990), it was of interest to re-examine the material on which the lists were based. A reasonable collection of the Rumphius material was made available for study by Dr. Alain Crosnier of the Muséum National D'Histoire Naturelle, Paris (MNHN), although not all specimens previously studied were represented in the collection. Among the Rumphius material were specimens belonging to undescribed species. For two of the undescribed taxa, supplementary material from collections made in Micronesia (see Kropp, 1990) was used.

In addition to the Rumphius material in the collection of the MNHN, material has been deposited in the National Museum of Natural History (USNM), Washington, D.C., the Bernice

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P. Bishop Museum (BPBM), Honolulu, Hawaii, the Natural History Museum of Los Angeles County (LACM), Los Angeles, California, and the Australian Museum (AM), Sydney, as listed in the material examined. Measurements are presented in millimeters (mm) as carapace length x carapace width. All Micronesian material was collected by the author and have collection numbers designated HAP and PHAP. Other abbreviations used are: MXP, maxilliped; P, pereopod; PLP, pleopod. Place names in Belau [Palau] follow orthography proposed by Motteler (1986). At the first occurrence of each new spelling, the former name is presented in brackets. Setal terminology generally follows that of Watling (1989). For proximally pappose setae, the irregularly-placed setules do not usually extend more than half the distance from the base to the tip of the seta.

Host and distribution records for all but the new species are listed in Takeda and Tamura (1986, Table 1). Host records for *Opecarcinus crescentus* are discussed in Kropp (1989).

TAXONOMY

FAMILY CRYPTOCHIRIDAE PAULSON, 1875

Fizesereneia heimi (Fize & Serène)

Troglocarcinus heimi Fize & Serène, 1956: 378; Kropp, 1988c: 262.
Troglocarcinus (Mussicola) heimi - Fize & Serène,1957: 111.
Troglocarcinus heimi - Monod & Serène, 1976: 26 [in part]; Serène *et al.*, 1976: 20 [in part].
Fizesereneia heimi - Kropp, 1990: 424.

Material examined. - 4 females (3 ovigerous), (5.2 x 4.2 mm to 6.6 x 5.4 mm), (MNHN B.12678), on *Symphyllia* sp., Banda (Volcan), Moluccas, 30.i.1975.

Remarks. - *Fizesereneia* was originally based on a misidentified type species (Kropp, 1988c; 1990). *Troglocarcinus heimi* was confirmed as the type species of *Fizesereneia* in the International Commission on Zoological Nomenclature Opinion 1591 (ICZN, 1990).

Hosts. - Mussidae. *Lobophyllia hemprichii* (Ehrenberg) [Kropp, unpublished]; *Symphyllia* sp.

Distribution. - Vietnam (Fize & Serène, 1957); Indonesia: Moluccas; Micronesia: Belau, Guam (Kropp, unpublished).

Fizesereneia latisella, new species
(Fig. 1, 2)

Troglocarcinus (Mussicola) heimi - Fize & Serène, 1957: 111, [in part, Pl. 18A; not *T. heimi* Fize & Serène].
Troglocarcinus heimi - Monod & Serène, 1976: 26 [in part]; Serène *et al.*, 1976: 20 [in part].
Fizesereneia heimi - Takeda & Tamura, 1980: 138; Takeda & Tamura, 1985: 105.

Material examined. — Holotype female (ovigerous), (4.5 x 4.4 mm), (USNM, PHAP 150), on *Lobophyllia hemprichii*, 2 m, patch reef in large bay facing Malakal Pass, NE coast, Ngeruktabel [Urukthapel] Is., Belau, 21.vii.1984.

Paratypes. - 1 female (ovigerous), (6.4 x 5.2 mm), (MNHN B.24773), on *Symphyllia* sp., Banda (Volcan), Moluccas, 30.i.1975. — 1 female (ovigerous), (4.8 x 4.6 mm), (USNM), Ngeruktabel Is., Belau, same collection data as holotype. — 1 female (ovigerous), (5.0 x 4.9 mm) (BPBM, PHAP 140), on *L. hemprichii*, 1 m, same location as holotype, 20.vii.1984; 1 male, (2.8 x 2.7 mm), same data. — 1 female, (4.1 x 3.9 mm), (LACM, PHAP 043), on *S. radians*; 2.5 m, patch reef, N coast, same data, 2.vii.1984. — 1 female (ovigerous), (5.6 x 5.4 mm), (AM, PHAP 119), on *L. hemprichii*, <1 m, fringing reef at rock island at Channel Pt., same data, 16.vii.1984. — 1 female (ovigerous), (5.4 x 5.3 mm), (AM, PHAP 173), on *L. hemprichii*, no depth, cove at W end of main rock island group, N shore, 22-23.vii.1984; 1 female (ovigerous), (5.0 x 4.9 mm), (LACM, PHAP 190), on *L. corymbosa*; same data; 1 male, (2.6 x 2.6 mm), same data; 1 female (ovigerous), (4.6 x 4.5 mm), (MNHN, PHAP 191), on *L. costata*, same data; 1 male, (3.4 x 3.2 mm), same data. — 2 females (ovigerous), (5.3 x 5.1 mm, 5.2 x 5.2 mm), (BPBM, PHAP 084, 086), on *Symphyllia radians*, *S.* cf. *valenciennesii*, 3 m, patch reef S of seawall near Micronesian Mariculture Demonstration Center (MMDC), Ngemelachel [Malakal] Is., 8.vii.1984. — 1 female, (3.9 x 3.8 mm), (AM, HAP 120), on *L. hemprichii*, 10 m, back side of main patch reef, Double Reef, Guam, 24.ii.1984. — 1 female (ovigerous), (5.3 x 5.0 mm), (MNHN, HAP 164), on *L. corymbosa*; 1 m, bay side of patch reef, Sasa Bay, 15.iii.1984; 1 female (ovigerous), (4.6 x 4.6 mm), (HAP 165), same data; 1 female, (5.0 x 4.9 mm), 1 male (figured), (4.3 x 3.8 mm), same data.

Description. - Carapace about as long as wide; widest near posterior margin of concavities, about one-third carapace length. Posterior carapace with scattered granules decreasing in size posteriorly; with two shallow furrows flanking cardiac region; covered with distally-curved simple setae; lateral borders rounded, with longer pappose setae. Anterior carapace with concavities extending to about half carapace length, not completely divided by median longitudinal ridge; ridge extends to midlength of concavities, rounded, well-developed posteriorly, with many scattered spines, setae, most of ridge visible in lateral view; concavities gently sloping, fringed laterally and posteriorly with spines and setae, posterior margin not notched on each side of midline. Front without distinct orbits; external angle of carapace depressed, curving down toward eye; intraorbital margin of carapace sinuous, spinulate, setose.

Basal segment of antennule extends well beyond eye, dorsal surface smooth covered with setae, margins with 7 to 9 spines, distal angle oval (to pointed); only distal two-thirds visible in dorsal view; mesial lobe extends beyond carapace; smooth ventrally, without setae, inner margin broadly rounded. Eyestalks mostly exposed in dorsal view, with scattered setae, bearing inner distal spine, inner margin with mesial spine; cornea elliptical, inner ventral margin with spine distally.

Ischium of MXP-3 smooth, with few setae; surface flat; inner margin straight, finely denticulate, evenly lined with setae; outer margin slightly convex, finely denticulate, with few scattered setae; width of inner distal lobe about half that of ischium, rounded. Merus smooth; outer margin finely denticulate, with scattered setae; distal angle produced, about one quarter length of first palp segment.

Cheliped (P-1) smaller than P-2. Merus slightly compressed, length about 2.25 times height; with few scattered setae on anterior margin; smooth with granules distally on anterior margin. Carpus mostly smooth with few small rounded and conical tubercles, setae on anterior margin. Manus smooth, length about 3.2 times height, compressed, suboval in cross-section; total chela length about 1.9 times finger length; cutting margins of fingers entire, fixed finger about as wide as dactyl.

Length of P-2 merus about 1.8 times height; compressed, inner and outer surfaces concave, flaring distally; surfaces smooth; anterior margin not produced beyond carpal joint, with few

small tubercles, fringed with pappose setae; posterior margin with few tubercles distally, lined with pappose setae; distal margin irregularly tuberculate, posterodistal angle with bifid or single tooth. Carpus subtriangular in cross-section; outer surface smooth, with scattered short simple setae and few granules anterodistally; outer edge of anterior surface divided by median notch into two sections, 2-3 tubercles on proximal part, 7 tubercles on distal part; anterior surface convex, with many scattered conical tubercles, many simple setae; inner edge rounded, with few rounded tubercles; posterior margin rounded, with proximally-pappose setae. Propodus triangular in cross-section; with scattered proximally-pappose setae, setae larger and more numerous toward anterior surface; inner edge of anterior surface without tubercle, outer edge with 9 spines; posterior margin rounded, with some setae. Dactyl relatively straight, curving slightly at tip; subcircular in cross-section; with scattered setae; upper margin without spine or tubercle.

P-5 merus not compressed, subcircular in cross-section; length about 1.6 times height. Outer surface rounded, smooth, with few setae near margins. Posterior margin rounded, without tubercles, with few pappose setae; anterior margin rounded, entire, with scattered pappose setae. Carpus length about 2.3 times height; outer, inner surfaces rounded, smooth, with few scattered setae. Posterior margin rounded, entire; anterior margin rounded, with scattered simple and pappose setae of variable length, few tubercles distally. Propodus length about 2.8 times height, smooth with scattered pappose setae and small tubercles on anterior margin. Dactyl mostly straight, curving downward and inward towards tip, with scattered shorter simple setae, inner surface with few scattered setae; no tubercle dorsally; posterior margin with few regularly-spaced setae.

Male generally similar to, but smaller than female. Carapace widest near posterior margin of concavities, latter relatively shallow, lateral margins lined with sharp tubercles, ridge incomplete. Front elevated, slightly produced, internal orbital angle exceeding external orbital angle. Cheliped more robust than in female, tubercles anterodorsally on carpus. PLP-1 as figured.

Coloration. - White band posterior to intraorbital margin of carapace, dark greenish band posterior to white band; concavities mostly green, covered with green or blue-green spots of variable size. See Fize & Serène (1957: Pl. 18A) for a good watercolor portrayal of this species.

Etymology. - From the Latin "latus" for broad, in combination with "sella" for seat or saddle, with reference to the shape of the concavities on the anterior portion of the carapace.

Remarks. - *Fizesereneia latisella* is distinguished from *F. heimi* (Fize & Serène, 1956) and *F. stimpsoni* (Fize & Serène, 1956) by the incomplete separation of the anterior concavities of the carapace by a median ridge; a complete ridge is present in the latter two species. Color can be used to distinguish among the three species. The concavities are mostly green with green or blue-green spots in *F. latisella*, predominantly gray in *F. heimi* (Fize & Serène, 1957: Pl. 18B; Kropp, 1990), and off-white to gray with a network of red-brown lines in *F. stimpsoni* (Fize & Serène, 1957: Pl. 18E; Kropp, personal observation). The anterior concavities are incompletely separated by a median in two other species of *Fizesereneia*, *F. ishikawai* Takeda & Tamura, 1980 and *F. tholia*, new species. *Fizesereneia latisella*, in which the shape of the carapace is roughly hexagonal and widest near midlength, can be distinguished from *F. ishikawai*, in which the carapace is subquadrangular and widest anteriorly. Furthermore, the anterior concavities are deeper and more convex in *F. ishikawai* than in *F. latisella*. In *F. latisella* the concavities are almost twice as wide as long, whereas

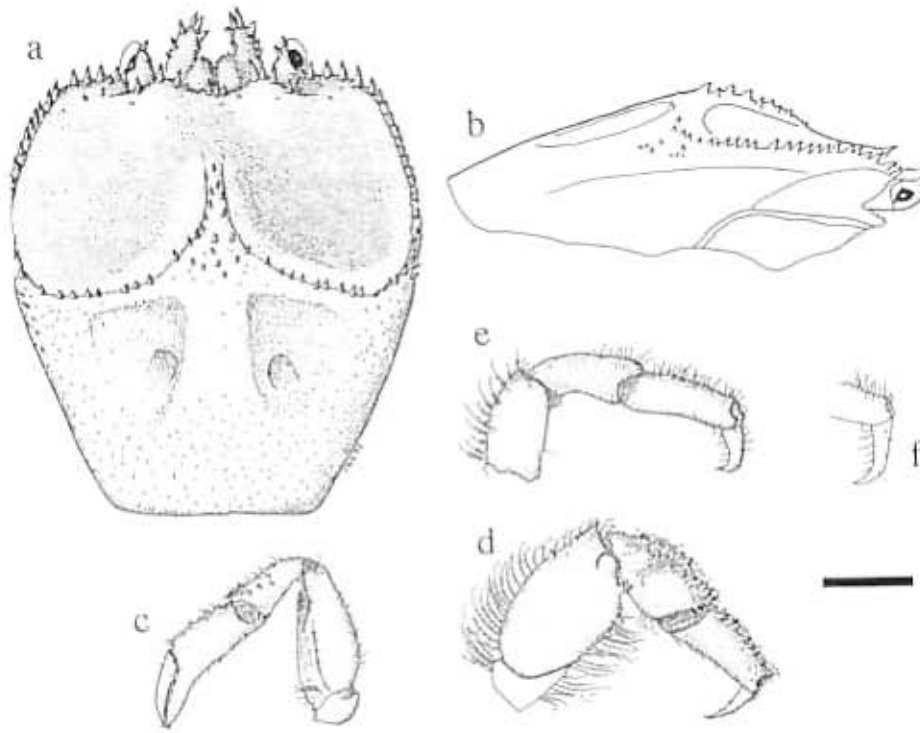

Fig. 1. *Fizesereneia latisella*, new species. Holotype (female): a, carapace (dorsal view); b, carapace (lateral view); c, right cheliped; d, right P-2; e, right P-5; f, right P-5 dactyl (slightly turned). Scale: a-f = 1 mm.

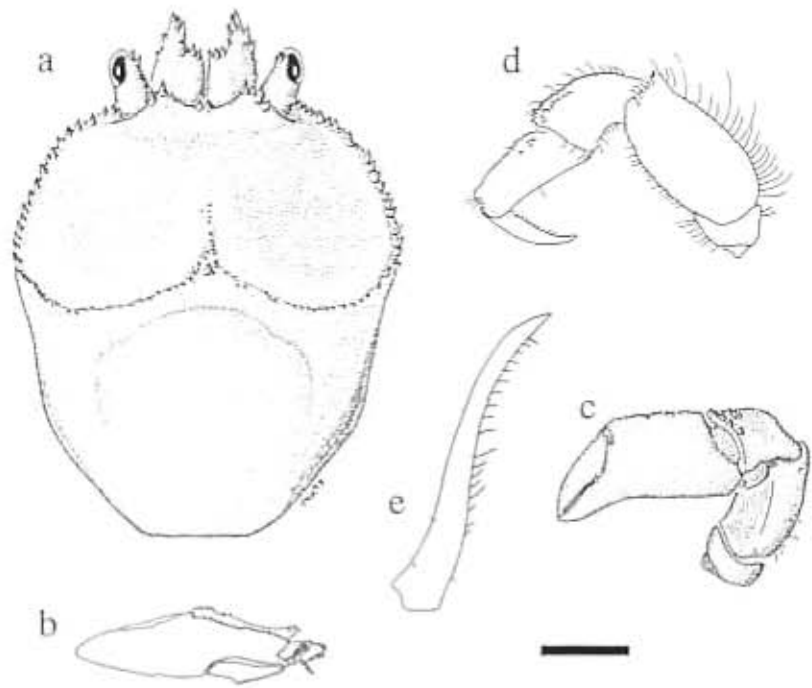

Fig. 2. *Fizesereneia latisella*, new species. Paratype (male, Guam): a, carapace (dorsal view); b, carapace (lateral view); c, left cheliped; d, right P-2; e, PLP-1. Scale: a, c, d = 1 mm; b = 0.5 mm; e = 2 mm.

they are about 1.5 times wider than long in *F. tholia*. Also, the posterior margin of the concavities is entire in *F. latisella*, but interrupted by submedian grooves in *F. tholia*; the ocular peduncles are exposed in the former, but concealed in the latter.

Hosts. - Mussidae: *Lobophyllia corymbosa* (Forskål), *L. costata* (Dana), *L. hemprichii*, *Symphyllia radians* Milne Edwards & Haime, *S.* cf. *valenciennesii* Milne Edwards & Haime. Additional hosts recorded by Fize & Serène (1957) and Takeda & Tamura (1980, 1985) are *S. nobilis* (Dana), *S. labyrinthica* Basset Smith, *S. agaricia* Milne Edwards & Haime, and *S. recta* (Dana).

Distribution. - Vietnam (Fize & Serène, 1957); Indonesia: Moluccas; Micronesia: Belau, Guam; Japan: Ryukyu Islands, Izu Islands (Hachijo Island).

Fizesereneia tholia, new species
(Fig. 3)

Troglocarcinus heimi - Serène *et al.*, 1974: 20.

Material examined. - Holotype - female (ovigerous), (8.3 x 7.2 mm), (MNHN B.12669), Moluccas, CB 302, 6.i.1973;

Description. - Carapace about 1.2 times as long as wide; widest at posterior margin of concavities. Posterior carapace with scattered granules decreasing in size posteriorly; with two irregular furrows flanking cardiac region; covered with distally-curved simple setae; lateral borders rounded, with longer pappose setae. Anterior carapace with concavities extending to about half carapace length, not completely divided by median longitudinal ridge; ridge not well-developed, without setae or spines, visible in lateral view; concavities steep sided posteriorly, more gently sloping anteriorly, fringed laterally and posteriorly with spines and setae, posterior margin notched on each side of midline. Front without distinct orbits; external angle of carapace not curving down toward eye; intraorbital margin of carapace sinuous, spinulate, setose.

Basal segment of antennule extends well beyond eye, dorsal surface smooth covered with setae, margins with 6 to 7 spines, distal angle rounded; only distal third visible in dorsal view, mesial lobe hidden in dorsal view; smooth ventrally, without setae, inner margin broadly rounded. Eyestalks mostly hidden in dorsal view, with scattered setae, bearing inner distal spine, inner margin with mesial spine; cornea elliptical, inner ventral margin with spine distally.

Ischium of MXP-3 granular near outer margin, otherwise smooth, with few setae; inner surface concave mesially; inner margin straight, finely denticulate, evenly lined with setae; outer margin slightly convex, finely denticulate, with few scattered setae; width of inner distal lobe half that of ischium, rounded. Merus smooth except for few granules near outer margin; outer margin finely denticulate, lined with setae; distal angle well-produced, almost half length of first palp segment.

Cheliped (P-1) smaller than P-2. Merus slightly compressed, length about 1.8 times height; with few scattered setae on anterior margin; smooth with granules on upper and lower margins. Carpus smooth with few granules, setae distally on anterior margin. Manus smooth, length about 3.3 times height, compressed, suboval in cross-section; total chela length about 1.5 times finger length; cutting margins of fingers entire, fixed finger slightly wider than dactyl.

Length of P-2 merus about 1.8 times height; compressed, inner and outer surfaces concave, flaring distally; surfaces smooth; anterior margin produced beyond carpal joint, with 4 conical tubercles, fringed with pappose setae; posterior margin with few tubercles, lined with pappose setae; distal margin irregularly tuberculate, posterodistal angle with rounded tubercles. Carpus subtriangular in cross-section; outer surface smooth, with many short simple setae and few granules anterodistally; outer edge without median notch, lined with 8 spines, few tubercles, and proximally-pappose setae; anterior surface flat, with proximal row of 6 spines near outer edge, many scattered simple setae; inner edge angular, with 4 spines; posterior margin rounded, lined with proximally-pappose setae. Propodus triangular in cross-section; all surfaces smooth, covered with proximally-pappose setae; anterior surface slightly concave; inner edge of anterior surface with 1 spine and 2 tubercles, outer edge with 6 spines; posterior margin rounded, with some setae. Dactyl relatively straight, curving slightly at tip; subcircular in cross-section; with scattered setae; upper margin with proximal spine.

P-5 merus not compressed, subcircular in cross-section; length about 1.7 times height. Outer surface rounded, smooth, with few setae near margins. Posterior margin rounded, with 2 rounded tubercles at distal angle, with few pappose setae; anterior margin rounded, entire, lined with pappose setae. Carpus length about 2.8 times height; outer, inner surfaces rounded, smooth, without setae. Posterior margin rounded, without tubercles, with few pappose setae at distal margin; anterior margin rounded, lined with simple and pappose setae of variable length, few tubercles distally. Propodus length about 3.3 times height, smooth with scattered squarish tubercles; anterior margin lined with pappose setae. Dactyl mostly

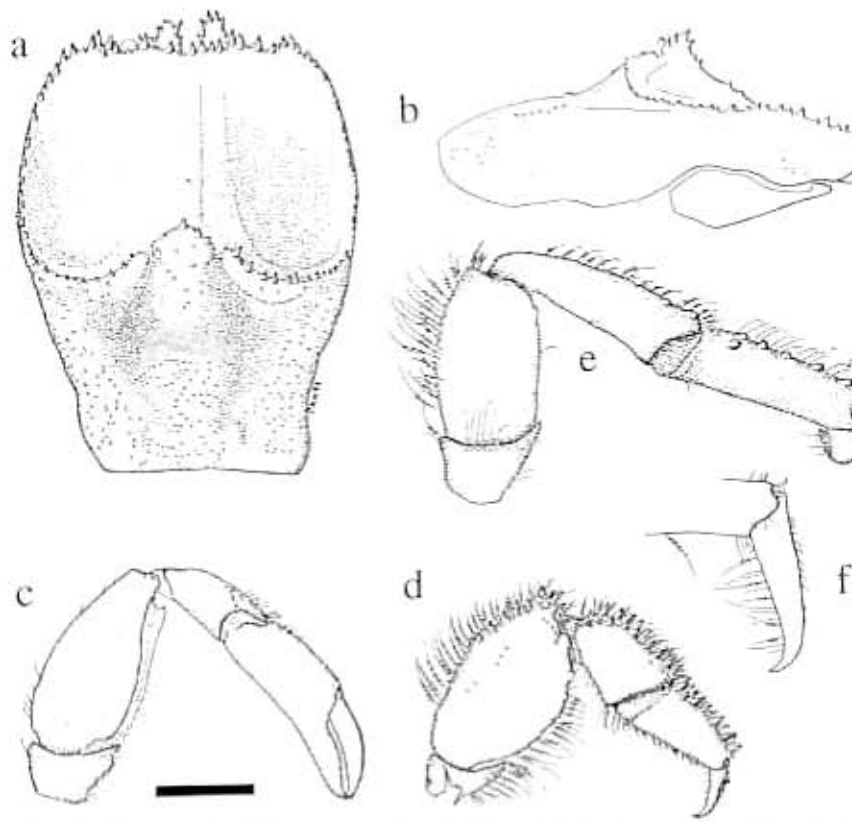

Fig. 3. *Fizesereneia tholia*, new species. Holotype (female): a, carapace (dorsal view); b, carapace (lateral view); c, right cheliped; d, right P-2; e, right P-5; f, right P-5 dactyl (slightly turned). Scale: a, b, d = 0.5 mm; e, f = 1 mm; c = 1.1 mm.

straight, curving downward and inward towards tip, with scattered shorter simple setae, having longer setae on inner surface; no tubercle dorsally; posterior margin lined with setae.

Male unknown.

Coloration. - Coloration of the living crab was not recorded.

Etymology. - From the Greek "tholia" for a comical hat with a broad brim, a noun in apposition, referring to the manner in which the "brim" of the carapace covers most of the eyestalk in this species.

Remarks. - Among the Rumphius I material that I have examined, this is the only specimen that could have been referred to as *Troglocarcinus heimi*. However, there is no indication in the list of gall crabs collected during Rumphius I (Serène *et al.*, 1974) of the number of specimens collected. I cannot exclude the possibility that there may have been other specimens referrable to one or both of the previous two species of *Fizesereneia*.

The new species can be distinguished from *F. heimi* and *F. stimpsoni* by having the anterior concavities of the carapace incompletely divided by a median ridge; the concavities are completely divided in the latter two species. *F. tholia* can be separated from *F. latisella* as discussed for that species. *Fizesereneia tholia* seems most similar to *F. ishikawai*, but can be distinguished from that species by having concavities whose length is greater than half the total length of the carapace and whose posterior margin is interrupted by submedian grooves. The length of the concavities is less than half that of the carapace and the posterior margin is not interrupted in *F. ishikawai*.

Hosts. - The host was not recorded.

Distribution. - Known only from the type location.

Fungicola utinomi (Fize & Serène)

Troglocarcinus utinomi Fize & Serène, 1956: 377.
Troglocarcinus (*Fungicola*) *utinomi* - Fize & Serène, 1957: 124.
Fungicola utinomii - Serène, 1966: 396 [unjustified emendation]; Serène *et al.*, 1974: 20; Monod & Serène, 1976: 26.
Pseudocryptochirus ishigakiensis Takeda & Tamura, 1979: 188.
Hiroia ishigakiensis - Takeda & Tamura, 1981: 20.

Material examined. - 2 males, 1 damaged, (3.9 x 2.9 mm), (MNHN B.12666), no host listed, Moluccas, CB 308, 11.i.1973; 6 females (3 ovigerous), (4.7 x 3.9 mm to 7.3 x 5.5 mm), same data.

Remarks. - The specimens are as has been described for the species.

Hapalocarcinus marsupialis Stimpson

Hapalocarcinus marsupialis Stimpson, 1859: 412; Serène *et al.*, 1974: 20; Monod & Serène, 1976: 26; Serène *et al.*, 1976: 20; Takeda and Tamura, 1986: 61.
Cryptochirus marsupialis - Taylor, 1971: 100.

Material examined. - 5 females, (too distorted to measure), (MNHN B.12668), no host listed (piece of *Seriatopora* in jar), Moluccas, CB 306, 11.i.1973.

Remarks. - Though the specimens examined are somewhat distorted, some differences from "typical" examples of the species were noticed. All had a tooth on the cutting edge of the dactyl of the cheliped; none had a spine on the mesial surface of the merus. The basal segments of the antennule in the smaller specimens were somewhat produced and pointed.

Lithoscaptus helleri (Fize & Serène)

Troglocarcinus (*Favicola*) *helleri* Fize & Serène, 1957: 93.
Favicola helleri - Serène, 1966: 397; Takeda & Tamura, 1981: 46, Text-fig. 2.
? *Cryptochirus coraliodytes* [sic] - Monod & Serène, 1976: 26.
Cryptochirus coralliodytes - Serène *et al*., 1976: 20 [not *Cryptochirus coralliodytes* Heller].
Lithoscaptus helleri - Kropp, 1990: 431.

Material examined. - 1 female (ovigerous), (4.8 x 3.4 mm), (MNHN B.12680), no host listed, Banda (volcan), Moluccas, 30.i.1975.

Remarks. - The label accompanying this specimen reads "*Cryptochirus coralliodytes* R. Serène det." Although the specimen is not in very good condition, the carapace sculpture, the first maxilliped, and the epistome match those of *L. helleri*. There are no other specimens in the Rumphius II material that I have examined that are referrable to either *C. coralliodytes* Heller, 1861 or *L. paradoxus* Milne Edwards, 1862. Confusion over the identity of the latter two species was clarified by Kropp (1988b).

Lithoscaptus prionotus, new species
(Fig. 4, 5)

Cryptochirus trispinosus Fize & Serène, 1957: 176 [nomen nudum].
Cryptochirus grandis Takeda & Tamura, 1983: 2, fig. 1c [in part, one male only].

Material examined. - Holotype – female - (7.6 x 5.2 mm), (USNM, PHAP 179), on *Oulophyllia aspera*; 1 m, off S side of rock island bordering cove at W end of main rock island group, N shore, Ngeruktabel Is., Belau, 23.vii.1984.

Paratypes. - 1 female, (3.9 x 2.7 mm), (MNHN B.12676), host not recorded, Exp. Rumphius I, Sta. 1, Indonesia, 19.i.1973 — 1 female, (3.7 x 2.4 mm), (BPBM, PHAP 179), same data as holotype. — 1 female, (3.8 x 2.6 mm), (USNM, PHAP 162), on *O. aspera*; 1.5 m, cove at W end of main rock island group, N shore, Ngeruktabel Is., 22.vii.1984; 1 female, (5.4 x 3.4 mm), same data; 1 male, (2.2 x 1.6 mm), (MNHN, PHAP 186), on *Favia favus*; 23.vii.1984. — 1 male, (3.0 x 1.8 mm), (LACM, HAP 235), on *O. crispa*; 14m, reef front of Univ. Guam Marine Lab, Pago Bay, Guam, 31.viii.1984. — 1 female, (4.6 x 2.8 mm), (LACM, HAP 279), on *O. crispa*; 15 m, reef front off E coast of island, Cocos Island, 3.x.1984. 1 female, (4.6 x 3.1 mm), (AM, HAP 285), same data. — 1 female, (3.2 x 2.4 mm), (BPBM, HAP 473), on *Favia favus*, 1.5 m, Double Reef, 16.vi.1986.

Description. - Carapace convex in both directions, about 1.5 times longer than wide, widest at midlength, narrows anteriorly. Anterior portion slopes from midlength toward front, mid line bearing row of prominent spines, smaller spines flank central row and near lateral margins; with two prominent smooth longitudinal valleys, anterolateral margins with prominent spines, margins divided by 2 notches. Intraorbital margin of carapace concave, setose, with conspicuous medial spine; external orbital angle extending slightly beyond internal, both

orbital angles marked with prominent spine; orbit broadly V-shaped, granular. Posterior carapace convex, with scattered round tubercles, cardiac region marked by two smooth longitudinal furrows, posterolateral margins rounded. Carapace bearing setae on entire surface. Pterygostomial region not fused to carapace.

Basal segment of antennule extends well beyond eye, smooth with scattered setae dorsally, margins with 8 to 9 spines, distal apex marked with prominent spine; shape in dorsal view pointed (excluding apical spine); ventrally bearing scattered granules, no setae, subtriangular in shape; outer margins subequal, inner margin straight, edge rounded.

Eyestalks fully exposed dorsally, with scattered setae, bearing prominent inner distal spine, 2 smaller mesial spines; smooth ventrally; cornea margin with spine or tubercle distally; eyestalk length about 2.25 times cornea length.

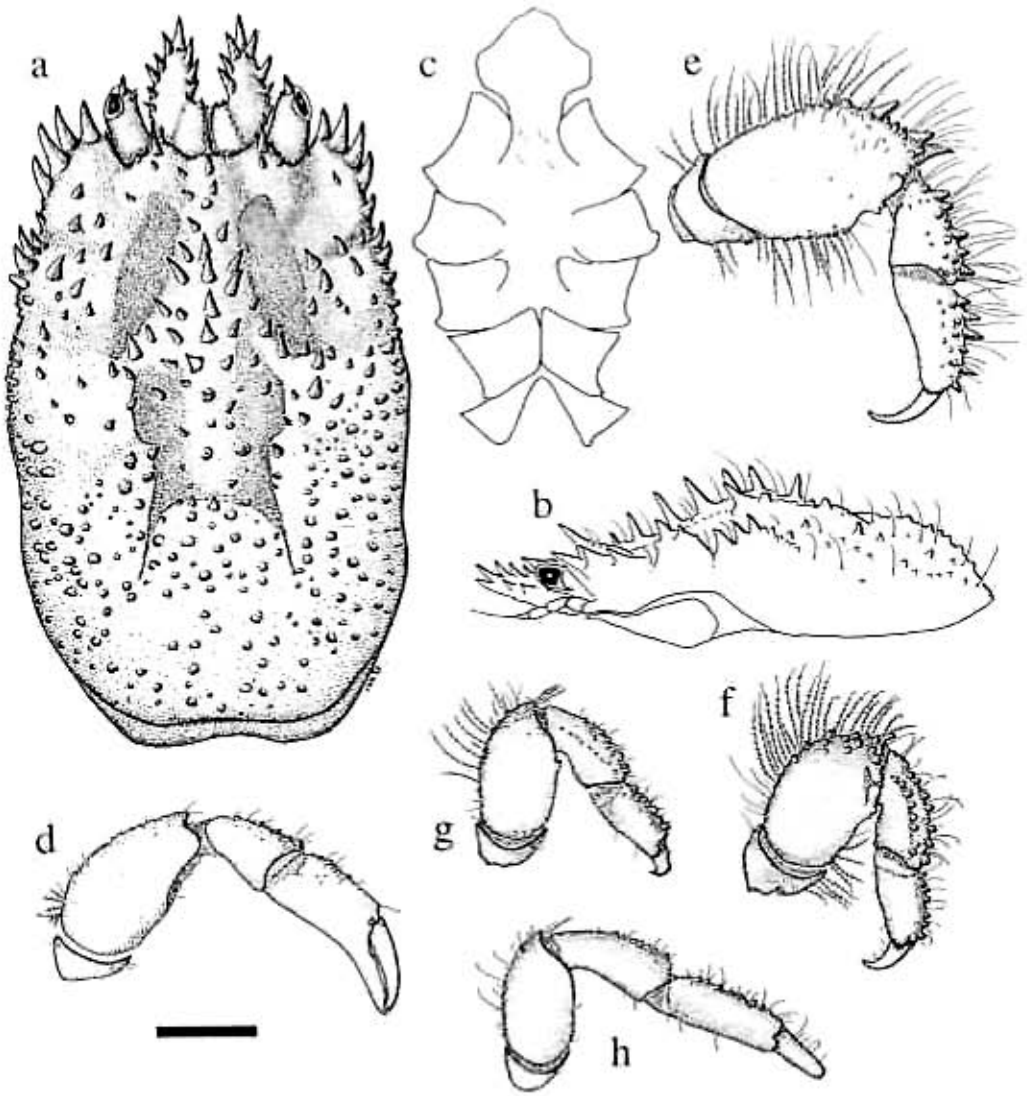

Fig. 4. *Lithoscaptus prionotus*, new species. Holotype (female): a, carapace (dorsal view); b, carapace (lateral view); c, thoracic sternites; d, right cheliped; e-h, right P-2 to right P-5; Scale: a, e-h = 1 mm; b = 1.1 mm.

Ischium of MXP-3 about 1.2 times longer than wide, surface granular except near inner margin, latter entire, slightly convex, bearing scattered setae; outer margin granular, bearing pappose setae (~6); exopod about 0.5 times length of outer margin of ischium, with pappose setae (~12-13) on outer margin. Merus granulate toward outer margin, latter finely denticulate, bearing setae along entire length, distal angle produced, pointed. Palp segments bearing few setae along outer margins.

Cheliped (P-1) slightly shorter than first walking leg (P-2). Merus compressed, length about 1.7 times height; inner surface concave, with setae near posterior margin; outer surface smooth, with few fine striae proximally near anterior margin, latter smooth proximally and with fine, widely-spaced serrations distally; bearing clump of pappose setae proximally and distally; posterior margin entire. Carpus smooth, but with tubercles at anterior margin and on upper half of outer surface; anterior margin with few setae. Manus length about 1.4 times height, smooth, but with tubercles proximally on anterior margin and granules proximally near anterior margin. Cutting edges of fingers with low tooth proximally, without setae, dactyl length about 0.5 times total chela length, having locking mechanism with manus.

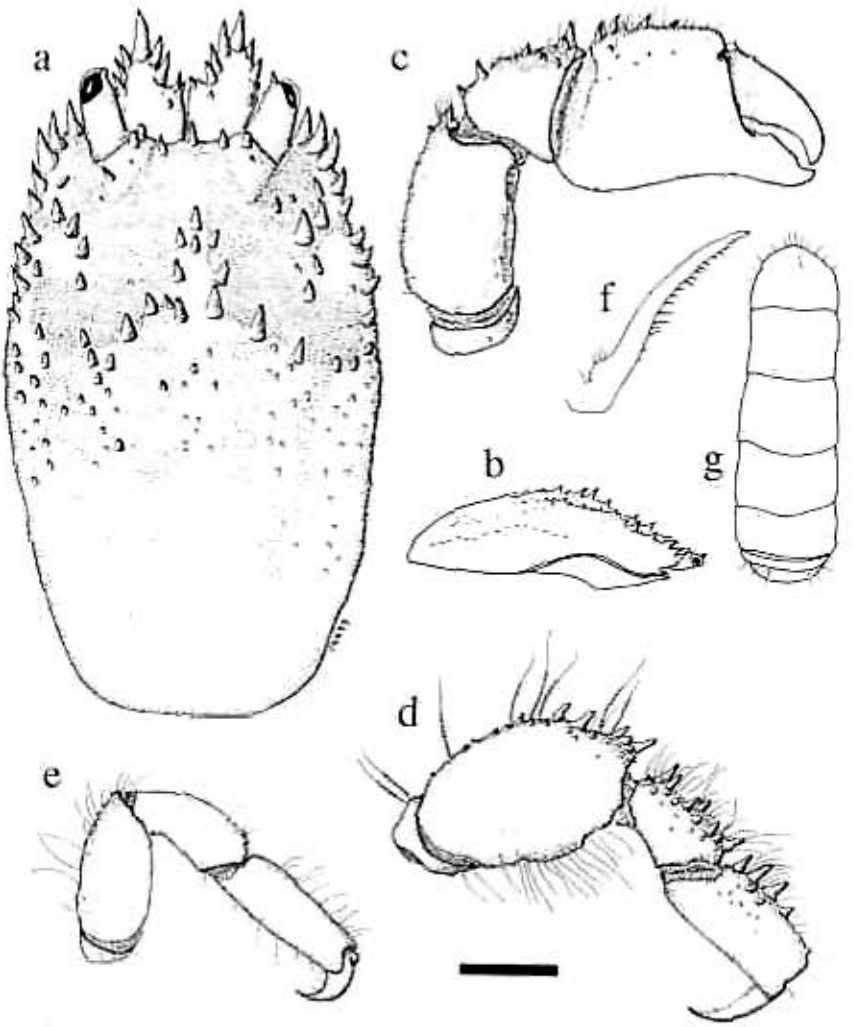

Fig. 5. *Lithoscaptus prionotus*, new species. Paratype (male, Belau): a, carapace (dorsal view); b, carapace (lateral view); c, right cheliped; d, right P-2; e, right P-5; f, abdomen; g, PLP-1. Scale: a, c-f = 1 mm; b, 0.5 mm.

Length of merus of P-2 about 1.6 times height, compressed, inner and outer surfaces concave, smooth; inner surface with 2 spines, rounded tubercles along anterodistal margin; anterior margin convex, denticulate proximally, with prominent conical tubercles distally, with many proximally pappose setae along most of length and simple setae distally; posterior margin convex, with blunt tubercles, pappose setae, posterodistal angle with 2 tubercles. Carpus subtriangular in cross-section; anterior surface flat, sloping mesially, with spines, tubercles, and some simple setae; inner surface granular, with setae anteriorly; outer surface flat, smooth, with larger granules and some tubercles at anterior margin, without setae. Propodus about 2.2 times longer than high; outer surface flat, smooth posteriorly, with tubercles anteriorly and spines at anterior margin, with setae at anterior margin; inner surface smooth, with many setae on upper half and few on lower half. Dactyl entire, with few simple setae.

P-3 smaller than P-2; merus length 1.6 times height; outer surface flat, smooth except for tubercles on upper distal corner; inner surface convex, smooth, with few pappose setae on posterior margin; anterior margin convex, lined with pappose setae, with tubercles on distal third, latter curves sharply downward; posterior margin relatively straight, entire; posterodistal angle with 1 tubercle. Carpus quadrangular in cross-section; inner surface flat, smooth; outer surface with row of tubercles at upper third mark; anterior margin with row of tubercles and few setae. Propodus shorter than carpus; compressed; outer surface mostly smooth, with rounded tubercles anteriorly and few setae; inner surface smooth, with few setae. Dactyl distally curved, entire; tip not spooned.

P-4 slightly smaller than P-3; merus length 1.8 times height. Outer surface relatively flat, smooth, with rounded tubercles on anterodistal angle; inner surface convex, smooth, having few setae; posterior margin with 1 larger, 1 smaller tubercle distally; anterior margin convex, with few pappose setae, with "serrate" tubercles on distal half; carpus length 2.3 times height; outer, inner surfaces convex, smooth, with few setae; posterior margin entire; anterior surface flat, sloping laterally, lined on each margin with rounded tubercles, with few simple setae. Propodus length 2.1 times height; outer surface relatively flat, smooth, with few simple setae; inner surface slightly convex, smooth, with few setae; posterior margin entire, with few setae; anterior margin convex with scattered round and blunt tubercles, with scattered setae. Dactyl with 2 proximal rounded tubercles dorsally, with scattered simple setae.

P-5 more slender, longer than P-4; merus not compressed, length 1.9 times height; outer, inner surfaces convex, smooth, without setae; posterior margin rounded, entire; anterior margin rounded, convex, having few rounded tubercles distally. Carpus length 3.2 times height; outer, inner surfaces slightly rounded, smooth, without setae; posterior margin rounded, entire, having few setae; anterior margin rounded, with rounded tubercles on distal half, with few simple setae. Propodus length 3.0 times height; outer, inner surfaces rounded, smooth, outer with scattered simple setae, inner having few pappose setae. Dactyl smooth, rounded, with many simple setae on inner surface, posterior margin.

Male smaller than, but generally similar in form to female. Carapace similar, but with fewer granules posteriorly; wider, smoother furrows anteriorly. Chelipeds more robust than in female. PLP-1 as figured.

Coloration. - Carapace of female off-white, finely interlaced with light green periphally, anterior depressions amber or opaque with 2-3 amber spots; posterior with two medial amber lines separated by an off-white band. Eyestalks off-white with amber wedge dorsally, red

stripes laterally; cornea dark red proximally, mostly white distally or all white. Basal segment of antennule white; palp clear, covered with white markings. Ventrum opaque; MXP-3, P-1, and P-2 with scattered white chromatophores and red dots. Male similar to female; opaque areas tinted amber, filled with orange and black dots. Eyestalk mostly white, corneas red and white. Ventrum opaque; MXP-3 with black spots and red dots. P-1 through P-5 off-white with scattered irregular red spots giving overall pink hue.

Etymology. - From the Greek "prionotos" for jagged or serrated, with reference to the appearance created by the prominent spines on the lateral margins of the carapace.

Remarks. - The vial containing the Rumphius paratype contains a label that reads "*Favicola sukarnoi* sp nov ?" therefore, it is not known how this specimen was listed in Serène *et al.* (1976). I have not been able to examine the male paratype of *Cryptochirus grandis*, but the male depicted in Figure 1C of Takeda and Tamura, 1983 strongly resembles the male of *L. prionotus*. The general shape and spinulation of the carapace coupled with the interruption of the anterolateral margin by two notches support the conclusion that the male figured by Takeda and Tamura should be referred to *L. prionotus*. *Lithoscaptus prionotus* can be distinguished from all other species in the genus *Lithoscaptus* by having the pterygostomial region not fused to the carapace. The placement of the new species in the genus *Lithoscaptus* calls into question the validity of the fusion of the pterygostomial region to the carapace as one of the characteristics of the genus. It is likely that, after further study, the character might be redefined, or that this species might be removed to a new genus.

Hosts. - Faviidae. In Belau, *L. prionotus* occurred on *Oulophyllia aspera* (Quelch); in Guam, on *O. crispa* (Lamarck). Veron *et al.* (1977) synonymized the two coral species, however it is possible that the two forms are distinct (R. H. Randall, University of Guam, personal communication, 1984). For this reason, I have used the two host names. In Belau and Guam, *L. prionotus* also was collected on *Favia favus* (Forskål). In Japan, Takeda & Tamura (1983) found a male *L. prionotus* on *Platygyra gigantea* (Yabe & Sugiyama).

Distribution. - Indonesia: Moluccas; Micronesia: Belau, Guam; Japan: Kushimoto.

Neotroglocarcinus hongkongensis (Shen)

Cryptochirus hongkongensis Shen, 1936: 23.
Troglocarcinus monodi Fize & Serène, 1956: 375.
Neotroglocarcinus monodi - Fize & Serène, 1957: 137.
Pseudocryptochirus hongkongensis - Takeda & Tamura, 1981: 15.
Neotroglocarcinus hongkongensis - Kropp, 1988a: 870.

Material examined. - 1 female, (2.1 x 1.8 mm), (MNHN B.12677), on *Turbinaria*; Banda (volcan), Moluccas, 30.i.1975; 2 males, (1.8 x 1.5 mm, 2.4 x 2.0 mm), same data.

Remarks. - I identified one of the specimens in the vial containing these crabs as *Pseudocryptochirus viridis* and have listed it under that species.

Opecarcinus crescentus (Edmondson)

Cryptochirus crescentus Edmondson, 1925: 33
Pseudocryptochirus crescentus - Utinomi, 1944: 701; Serène *et al.*, 1974: 20; Monod & Serène, 1976: 26.
Opecarcinus crescentus - Kropp & Manning, 1987:9; Kropp, 1989: 99 [detailed synonymy].

Material examined. - 3 males, (2.2 x 1.8 mm to 2.5 x 2.1 mm), no host listed, CB 307, Moluccas, 11.i.1973; 2 females (1 ovigerous), (2.3 x 2.0 mm, 2.9 x 2.6 mm), (MNHN B.12667), same data.

Remarks. - The carapace of the Rumphius specimens is much spinier than the holotype (see Kropp, 1989), but otherwise the material fits the description of the species.

Pseudocryptochirus viridis Hiro

Pseudocryptochirus viridis Hiro, 1938: 150; Kropp, 1988a: 867; Kropp, 1990: 439.

Material examined. - 6 females, (1.8 x 1.6 mm to 2.6 x 2.3 mm), (MNHN B.12672), on *Turbinaria*; Banda Neira, Moluccas, 31.i.1975; . — 1 female, (1.9 x 1.7 mm), (MNHN B.12677), on *Turbinaria*, Banda (volcan), 30.i.1975.

Remarks. - The specimens examined are not in good condition, but do fit the description of the species. The female, MNHN B.12677, was found in a vial labeled "*Neotroglocarcinus* sp." along with specimens identified as *N. hongkongensis*.

Pseudohapalocarcinus ransoni Fize & Serène

Pseudohapalocarcinus ransoni Fize & Serène, 1956: 378; Monod & Serène, 1976: 26; Serène *et al.*, 1976: 20.

Material examined. - 4 females (1 parasitized by bopyrid isopod), (1.7 x 1.7 mm to 2.6 x 2.8 mm), (MNHN B.12674), on *Pavona lactuca* [det. R. Serène], Banda Neira, Moluccas, 29.i.1975.

Remarks. - Three of the females are preovigerous as indicated by a well-developed, but tightly folded abdominal pouch. These females are considerably spinier than the other, presumably older non-ovigerous female. Also, in these three, the basal segment of the antennules is more pronounced than in older individuals.

Utinomiella dimorpha (Henderson)

Cryptochirus dimorphus Henderson, 1906: 214.
? *Cryptochirus* sp. - Monod & Serène, 1976: 26; ? Serène *et al.*, 1976: 20.
Pseudocryptochirus kahe McCain & Coles, 1979: 81.
Utinomia dimorpha - Takeda & Tamura, 1981: 23.
Utinomiella dimorpha - Kropp & Takeda, 1988: 29; Kropp, 1990: 443.

Material examined. - 1 male, (1.4 x 1.0 mm), (MNHN B.12679), on *Pocillopora*; Gorong Island, Moluccas, 25.i.1975; 2 females (1 ovigerous), (2.7 x 1.9 mm to 3.0 x 2.2 mm), same data.

Remarks. - The label in the container holding these specimens reads "*Cryptochirus* sp." These specimens fit the description of *U. dimorpha* well. The male occupied the abdominal pouch of the ovigerous female.

Incertae Sedis

? *Lithoscaptus* sp.

Pseudocryptochirus boissoni - Monod & Serène, 1976: 26; Serène *et al.*, 1976: 20 [not *Xynomaia boissoni* (Fize & Serène)].

Material examined. - 1 female, (2.0 x 1.4 mm), (MNHN B.12675), on *Echinophyllia*; Moluccas, 25.i.1975.

Remarks. - *Troglocarcinus boissoni* Fize & Serène, 1956, was recently placed in the genus *Xynomaia* by Kropp (1990). One of the distinguishing features of that genus is the presence of a mesial spine on the second segment of the antenna. The Rumphius specimen does not have such a spine and therefore can not be assigned to Fize & Serène's species. Because the specimen is not in good condition and is missing several appendages, it can not be identified to species.

Lithoscaptus ? *nami* (Fize & Serène)

Favicola minutum - Serène *et al.*, 1976: 20 [not *Pelycomaia minuta* (Edmondson)].

Material examined. - 2 females (pre-ovigerous), (2.0 x 1.4 mm, 2.1 x 1.4 mm), (MNHN B.12673), on *Goniastrea*; St. Lili Island, Moluccas, 23.i.1975.

Remarks. - The two specimens are small, immature females; both lacking fully developed pleopods. The anterior portion of the carapace in these specimens has a slight depression, but do not have the distinctive, well-formed concavities that are characteristic of Edmondson's species.

DISCUSSION

The following list summarizes the present status of gall crab taxa previously reported as found by the Rumphius expeditions.

Previous Record	Present Status
Rumphius I	
Cryptochirus coralliodytes	no material available
Cryptochirus, new species ?	? *Lithoscaptus prionotus*
Previous Record	Present Status
Fungicola fagei	no material available
Fungicola utinomii	*F. utinomi*
Hapalocarcinus marsupialis	*H. marsupialis*
Pseudocryptochirus viridis	no material available
Troglocarcinus heimi	*Fizesereneia tholia*
Rumphius II	
Cryptochirus coralliodytes	*Lithoscaptus helleri*
? *Cryptochirus* sp.	*Utinomiella dimorpha*
Favicola minutum	*Lithoscaptus ? nami*
Fungicola fagei	no material available
Fungicola utinomii	no material available
Hapalocarcinus marsupialis	no material available
Neotroglocarcinus sp.	*N. hongkongensis*; *Pseudocryptochirus viridis*
Pseudocryptochirus boissoni?	Lithoscaptus sp.
Pseudocryptochirus crescentus	no material available
Pseudocryptochirus viridis	*P. viridis*
Pseudohapalocarcinus ransoni	*P. ransoni*
Troglocarcinus heimi	*Fizesereneia heimi*; *F. latisella*

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