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THE STATUS OF *CRYPTOCHIRUS HONGKONGENSIS* SHEN, 1936 (BRACHYURA: CRYPTOCHIRIDAE)

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Abstract.—Morphological differences in the extent of the inner orbital angle, the length of the dactylus of the claw, and the shape of the abdomen are presented which support the removal of *Pseudocryptochirus viridis* Hiro from the synonymy of *Cryptochirus hongkongensis* Shen. This evidence also indicates that *C. hongkongensis* should be transferred to *Neotroglocarcinus* and considered a subjective senior synonym of *N. monodi* Fize and Serène.

In a short paper, Shen (1936) described two new species of the coral gall crab genus *Cryptochirus*. One of these, *C. granulatus*, was synonymized with *C. crescentus* Edmondson, 1925 [now *Opecarcinus crescentus*, see Kropp & Manning (1987)] by Utinomi (= Hiro, 1944), an action followed by all subsequent authors. The status of *C. granulatus* is under review and will be discussed in a subsequent manuscript on the genus *Opecarcinus* in the Indo-Pacific.

The second species described by Shen was *C. hongkongensis*. Utinomi (1944) transferred it to his genus *Pseudocryptochirus* as a subjective senior synonym of *P. viridis* Hiro, 1938, but erred by continuing to use the latter as the valid name for the taxon. This mistake was followed by Fize & Serène (1957), but corrected by Takeda & Tamura (1981). Both of the major works on Indo-West Pacific gall crabs published since Utinomi have upheld the synonymy (Fize & Serène 1957, Takeda & Tamura 1981). Both noted apparent discrepancies between Shen's account and the morphology of *P. viridis*, but neither disputed the synonymy of the two.

Here, I discuss the discrepancies mentioned by Fize and Serène and Takeda and Tamura and present additional evidence supporting the dissolution of the synonymy between *P. viridis* and *C. hongkongensis*. Furthermore, I argue that *C. hongkongensis* is a subjective senior synonym of *Troglocarcinus monodi* Fize & Serène (1955), the type species of *Neotroglocarcinus* Fize & Serène (1957).

Types

I have not been able to locate the holotype of *Cryptochirus hongkongensis* Shen, 1936. Contrary to the assertion of Fize & Serène (1957:59), it is probably not in the British Museum (Natural History), London (BMNH). Dr. Raymond B. Manning (Smithsonian Institution, Washington, D.C.), in 1984 and 1987, examined the gall crab collection in the British Museum and did not see any types for the species although he did find the holotype of *C. granulatus*. Shen (1936) did not report the disposition of the holotype of *C. hongkongensis*. Although relatively crude, his figures and description do provide enough information by which comparisons to other species can be made. The types for *Neotroglocarcinus monodi* (Fize & Serène, 1955) are also not available, however material identified by Serène is available from the BMNH and the Muséum National d'Histoire Naturelle, Paris (MNHN). Additional material examined was collected by the author in Micronesia (HAP and PHAP denote my collection numbers) and is deposited in the National Museum of Natural History,

Smithsonian Institution, Washington, D.C. (USNM).

A series of morphological features that were easily interpreted was selected from the figures and description of *C. hongkongensis* published by Shen (1936). This series was compared among the species in question. As the description of Shen's species is based on a male, only males were used in the comparisons. The results are presented below in the form of brief comparative diagnoses, based on males only, for each species. I have reproduced Shen's figures of *C. hongkongensis* and provided comparative figures of *P. viridis* and *N. monodi.* Abbreviations used in the text are: km, kilometers; m, meters; ov, ovigerous; P, pereopod. Size ranges of material examined are given in millimeters as carapace length (cl) × width.

At the first occurrence in the text of collection localities in the Caroline Islands, locality names are given as the new orthographic spelling (Motteler 1986) followed parenthetically by the former spelling.

Pseudocryptochirus viridis Hiro, 1938
Figs. 1a–c, 2a–d

Material.—Viet Nam: Nhatrang (12°14′N, 109°12′E), Rocher Noir, Rte. 1643, on *Turbinaria* sp., 1 ♀ (ov), 1 ♂, BMNH. Guam: Toguan Bay (13°17′N, 144°39′E), reef front south of river channel, 6 m, 27 May 1984, HAP 229, on *T. stellulata* (Lamarck, 1816), 1 ♀ (ov), 1 ♂; USNM; Cocos Lagoon (13°14′N, 144°39′E), southwest corner of lagoon just inside barrier reef, 1 m, 6 Mar, 3 Oct 1984, HAP 155, 272, on *Turbinaria stellulata,* 3 ♀ (2 ov), 1 ♂, USNM. Belau (Palau): Ngeruktabel (Urukthapel) Is. (07°15′N, 134°24′E), north shore, west end of rock islands, 2 m, 22 Jul 1984, PHAP 166, on *T. reniformis* Bernard, 1896, 2 ♀ (ov), USNM. Same locality: 2 m, 23 Jul 1984, PHAP 193, 199, on *T.* cf. *patula* (Dana, 1846), *T. reniformis,* 3 ♀ (2 ov), USNM. Pohnpei (Ponape): Main lagoon, inside barrier reef about 1.6 km north of Main Passage (07°00′N, 158°13′E), 2 m, 14 Nov 1984, PHAP 244, on *T.* cf. *mesenterina* (Lamarck, 1816), 1 ♀ (ov), 2 ♂, USNM. Ant Atoll (06°47′N, 147°58′E), reef front off Imwinyap Is., 100 m west of pass, 8 m, 17 Nov 1984, PHAP 284, on *T. reniformis,* 1 ♀, 1 ♂, USNM.

Size ranges.—Females, 1.8 × 1.6 to 3.3 × 2.8; smallest ovigerous female, 1.8 × 1.6; males, 1.6 × 1.3 to 2.1 × 1.8.

Diagnosis.—Anterior third of carapace slightly depressed, not sharply set off from posterior carapace, latter lacking grooves or depressions; internal orbital angle greatly exceeding anterolateral angle of carapace. Basal segment of antennule with mesial margin straight, dorsal surface with longitudinal row of spines near mesial margin. Width of abdominal somite 6 about ½ that of somite 3. Dactylus of cheliped (P-1) longer than dorsal margin of palm, latter with spines along entire length. Propodus of P-3 about 1.4 times longer than high, dorsal margin with tubercles. Gonopod tapering sharply, mesial and lateral margins with plumose setae originating just proximal to midlength.

Neotroglocarcinus monodi
(Fize & Serène, 1955)
Figs. 1g–i, 2i–l

Material.—Viet Nam: Nhatrang, Rte. 1590, on *T. peltata* (Esper, 1797), 1 ♀ (ov), 1 ♂, MNHN. Bai Miew, 11 Apr 1956, Rte. 1637, on *T. peltata,* 1 ♂, BMNH. Rocher Noir, 8 May 1956, Rte. 1643, on *T. peltata,* 1 ♀ (ov), BMNH.

Size ranges.—Females, 3.2 × 2.7 to 4.6 × 4.1; smallest ovigerous female, 3.2 × 2.7; males, 3.2 × 2.9 to 3.8 × 3.4.

Diagnosis.—Anterior third of carapace markedly depressed, sharply set off from posterior carapace, latter with series of shallow, longitudinal depressions; internal orbital angle slightly exceeding anterolateral angle of carapace. Basal segment of anten-

nule with mesial margin convex, dorsal surface with scattered tubercles, lacking longitudinal row of spines near mesial margin. Width of abdominal somite 6 about ¾ that of somite 3. Dactylus of P-1 shorter than dorsal margin of palm, latter with few tubercles proximally. Propodus of P-3 about 1.8 times longer than high, dorsal margin entire. Gonopod not tapering sharply, mesial and lateral margins with plumose setae originating at about midlength.

Cryptochirus hongkongensis Shen (1936)
Figs. 1d–f, 2e–h

From Shen (1936).

Size.—Male, 2.3 × 2.0.

Diagnosis.—Anterior third of carapace markedly depressed, sharply set off from posterior carapace, surface of latter uncertain; internal orbital angle slightly exceeding anterolateral angle of carapace. Basal segment of antennule with mesial margin convex, dorsal surface with scattered tubercles, lacking longitudinal row of spines near mesial margin. Width of abdominal somite 6 about ¾ that of somite 3. Dactylus of P-1 shorter than dorsal margin of palm, latter with few tubercles proximally. Propodus of P-3 about 1.7 times longer than high, dorsal margin entire. Gonopod tapering sharply, mesial and lateral margins with simple setae originating near or distal to midlength.

Discussion

From the above comparisons and the figures provided, it is clear that *C. hongkongensis* is quite different from *P. viridis,* and further, that *C. hongkongensis* strongly resembles *N. monodi.* These relationships are most strongly supported by features such as the relative extent of the internal orbital angle compared to the anterolateral angle of the carapace, the relative demarcation between the anterior and posterior parts of the carapace, the relative length of the dactylus of the P-1, and the shape of the abdomen as indicated by the relative widths of somite 3 and 6.

Some evidence is equivocal. Setation on the dorsal margins of the walking legs (Fig. 2) allies *C. hongkongensis* more closely to *P. viridis* than to *T. monodi.* However, I have noticed that setation can be variable within gall crab species. Also, setules on walking leg setae are often difficult to see and may have been missed by Shen. The gonopod figured by Shen is problematic. It tapers, as does the gonopod of *P. viridis.* Yet, the setation differs between the two, both in type (plumose in *P. viridis,* simple in *C. hongkongensis*) and position of origin (proximal to midlength in *P. viridis,* midlength or just distal in *C. hongkongensis*). Shen may have erred in figuring the gonopod. Shen's figures and descriptions of the mouthparts and antenna of *C. hongkongensis* are too general to be of use in resolving the affinities of each taxon.

The evidence presented by Utinomi (1944) for synonymizing *P. viridis* with *C. hongkongensis* is weak. He noted (p. 702) the antennule of "*hongkongensis* seems akin to *viridis*" and (p. 703) the third maxilliped of *hongkongensis* "shows close similarity to that of *viridis.*" He further argued (p. 725) that the probable identity of the two was supported by "distributional evidences that both forms have been recorded together from neighboring seas."

Fize & Serène (1957:142) noted in particular the differences in the relative extent of the internal orbital angle and the relative length of the dactylus of the P-1 among the three taxa that I have mentioned. However, they did not ally *C. hongkongensis* with *T. monodi,* stating that Shen described the carapace as having "petites épines," a feature they attribute to *P. viridis,* not *T. monodi.* This is not true. Shen (p. 23) describes the carapace as "finely granulate," not as having spinules.

Takeda & Tamura (1981:16) noted the same two discrepancies mentioned above and the relative demarcation between the

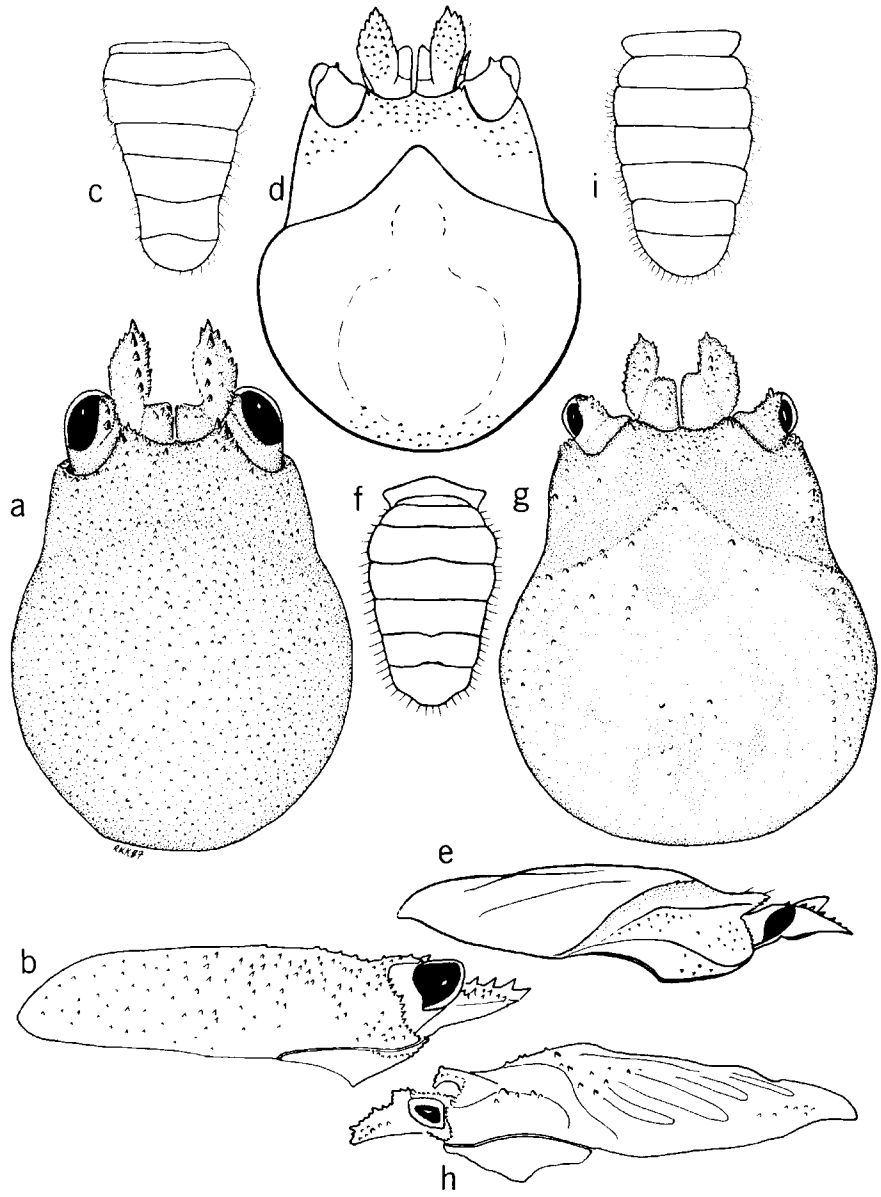

Fig. 1. Dorsal, lateral views of carapace, and abdomen: a–c, *Pseudocryptochirus viridis*, Pohnpei, USNM, cl = 1.9 mm; d–f, *Cryptochirus hongkongensis*, from Shen (1936), cl = 2.3 mm; g–i, *Neotroglocarcinus monodi*, Viet Nam, MNHN B-18762, cl = 3.8 mm. All males. Not to scale.

anterior and posterior carapace regions. They declared that these differences are "too small" to warrant separation of the two species; I disagree. Differences of the magnitude presented here are enough to separate species of gall crabs.

The evidence presented here supports the restoration of *Pseudocryptochirus viridis* Hiro to valid status. This evidence further indicates that *Cryptochirus hongkongensis* Shen is a subjective senior syyonym of *Troglocarcinus monodi* Fize & Serène, the

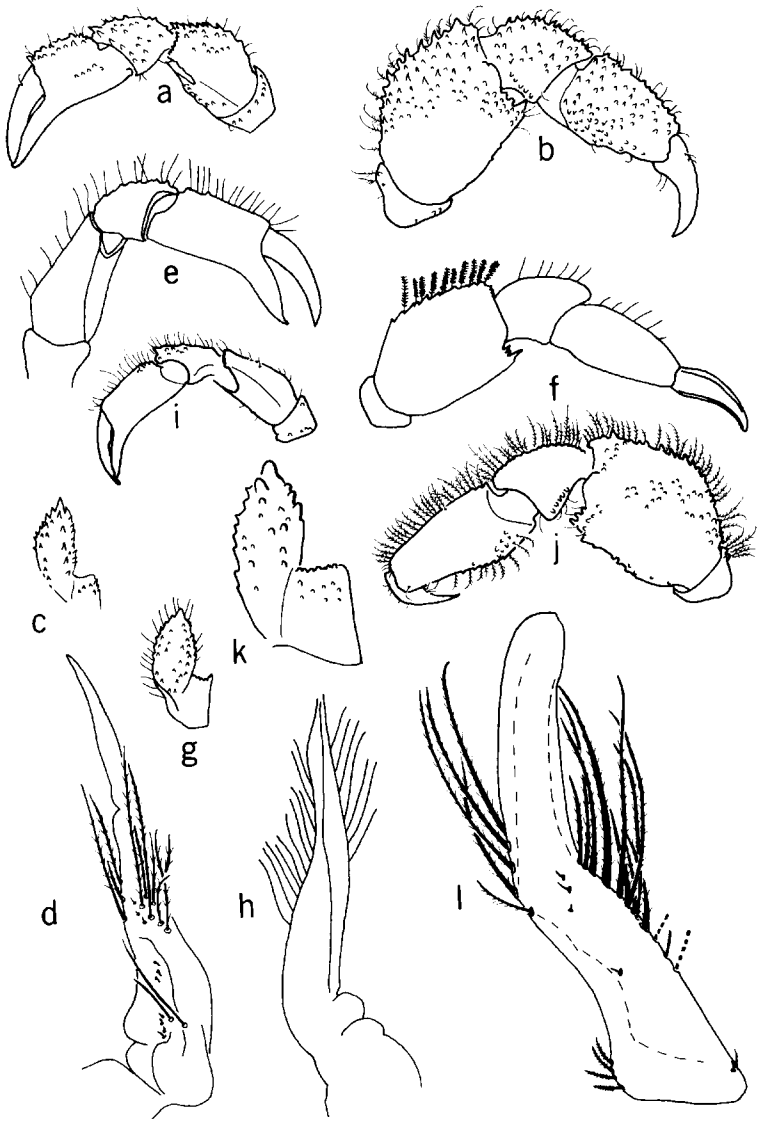

Fig. 2. Pereopods 1 and 3, antennule, and gonpod: a–d, *Pseudocryptochirus viridis,* USNM; e–h, *Cryptochirus hongkongensis,* from Shen (1936); i–l, *Neotroglocarcinus monodi,* MNHN B-18762. All males. Not to scale.

type species of *Neotroglocarcinus* Fize & Serène. Shen's species should now be known as *Neotroglocarcinus hongkongensis* (Shen).

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