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COMMENTS ON TAXONOMY OF THE GENUS *ORTHOTHERES* SAKAI, 1969 (CRUSTACEA, BRACHYURA, PINNOTHERIDAE)

Ernesto Campos

ABSTRACT

Several mistakes in the species assigned to the genus *Orthotheres* are discussed. *Pinnotheres barbatus* Desbonne, 1867, and *Fabia unguifalcula* Glassell, 1936, are included within *Orthotheres*, and *O. rathbunae* Schmitt, 1973, is reassigned to *Pinnotheres*. The generic status of *P. laevis* Bürger, 1895, and *P. longipes* Bürger, 1895, is analyzed and these species are retained to *Pinnotheres*. A complete diagnosis of the genus *Orthotheres* is given.

According to Schmitt, et al. (1973), the genus *Orthotheres* Sakai, 1969, is formed by six species. A taxonomic analysis revealed that *O. rathbunae* Schmitt, 1973, *O. laevis* Bürger, 1895, and *O. longipes* (Bürger, 1895), should be included in *Pinnotheres* Bosc, 1801–1802, and only *O. strombus* (Rathbun, 1905), *O. serrei* (Rathbun, 1909), and *O. turboe* Sakai, 1969, remained unquestionably within the former genus. Additionally two other species, *Pinnotheres barbatus* Desbonne, 1867, and *Fabia unguifalcula* Glassell, 1936, are also placed in *Orthotheres*.

MATERIAL AND METHODS

Taxonomic analysis of the species of *Orthotheres* is based primarily on the original descriptions and figures. Two female topotypes of *O.* (ex. *Fabia*) *unguifalcula*, housed in the Smithsonian Institution, and several species of *Fabia* and *Pinnotheres* included in the Collection of Invertebrates, Escuela Superior de Ciencias, Universidad Autónoma de Baja California, were examined by me. Original drawings were done using a camera lucida.

RESULTS AND DISCUSSION

Orthotheres Sakai, 1969

Diagnosis.—Carapace of the female appreciably broader than long, subrectangular, or transversely elliptical; the front is deflexed. Outer maxilliped obliquely placed, ischium indistinguishably fused with the merus; palpus three articles, inserted end to end, carpus longer than propodus and dactylus together, this last article very small, about twice as long as wide, its length fits more than two times in the propodus. The anterior three pairs of walking legs generally subequal in length, the last pair always more slender and shorter than the preceding ones. The dactylus of all pairs is uniformly short and hooked at the tip.

Type Species.—By the original designation *Orthotheres turboe* Sakai, 1969.

Distribution.—West Atlantic (Florida, U.S.A., and West Indies); East Pacific (Gulf of California, Mexico); Indo-West Pacific (Yoron Island, Amani Group, Japan, and Palau Islands) (Schmitt et al., 1973; this work).

Hosts.—In the stomach of Mollusca: Gastropoda: *Turbo, Strombus, Pleuroploca, Cittarium* (Schmitt et al., 1973).

Orthotheres barbatus (Desbonne, 1867)

Pinnotheres barbata Desbonne, 1867: 44.
Pinnotheres barbatus, Rathbun, 1918: 88–89, pl. 19, figs. 8–11, text-fig. 44a–b. Rathbun, 1933: 82. Schmitt, McCain, and Davidson, 1973: 2, 39. Manning and Holthuis, 1981: 183–184. Gore, 1986: 147, table 1.
Orthotheres barbatus, Sakai, 1969: 244, 275 (generic assignment). Schmitt, 1973: 27 (within synonymy of *O. rathbunae* Schmitt).

Type Locality.—"La Guadeloupe" (Desbonne, 1867).

Distribution and Host.—Virgin Islands; French West Indies; in the stomach of *Cittarium pica* (Linnaeus) (Schmitt et al., 1973).

Remarks.—After the description of *Orthotheres* Sakai, 1969, this author included the following American species in the new genus, *P. serrei* Rathbun, *P. strombi* Rathbun, and *P. barbatus* Desbonne (not Rathbun). Schmitt (1973) found that *P. barbatus* Bürger, 1895 is a homonym of *P. barbatus* Desbonne, 1867, and because the two names are primary homonyms, he renamed the Bürger species as *O. rathbunae* Schmitt. This action was correct but the placement of this species within *Orthotheres,* instead of the Desbonne's species, was unjustified (see below). Because the morphological characteristics and microhabitat recorded for *P. barbatus* Desbonne, agree with the diagnosis of *Orthotheres* (Desbonne, 1867; Rathbun, 1918), it is evident that the American species cited by Sakai as *P. barbatus* Rathbun, is Desbonne's species. Therefore, the correct name for this pea crab is *Orthotheres barbatus* (Desbonne, 1867).

Pinnotheres rathbunae (Schmitt, 1973)

Pinnotheres barbatus Bürger, 1895: 369–370, pl.9, fig. 8, pl. 10, fig. 8. Tesch, 1918: 248, 253. Silas and Alagarswami, 1967: 1196, 1216. Schmitt, McCain, and Davidson, 1973: 2, 27 (within synonymy of *O. rathbunae* Schmitt).
Orthotheres rathbunae Schmitt, 1973: 27.

Type Locality.—Aibukit (Philippine Islands) (Schmitt, 1973).

Distribution and Host.—Known only from the type locality; in *Donax* sp. (Schmitt, 1973).

Remarks.—According to Bürger (1895), *P. barbatus* (=*O. rathbunae* Schmitt, 1973), possesses the carapace orbicular, slightly broader than long, and the dactylus of the outer maxilliped is inserted on the inner margin of the propodus (Fig. 1A). These features disagree with the definition of *Orthotheres,* but fit within *Pinnotheres.* Because the primary homonymy between the Desbonne's and the Bürger's species, Schmitt (1973) was correct in renaming this last taxa, but according to the above data, it should be known as *Pinnotheres rathbunae* (Schmitt, 1973).

Pinnotheres laevis Bürger, 1895

Pinnotheres laevis Bürger, 1895: 380, pl. 9, fig. 25, pl. 10, fig. 24. Tesch, 1918: 249, 255. Miyake, 1939: 221, 241. Silas and Alagarswami, 1967: 1201, 1216.
? *Orthotheres laevis,* Sakai, 1969: 275. Schmitt, McCain, and Davidson, 1973: 26 (tentative generic assignment).

Type Locality.—Palaos-Ins (Palau Island) (Schmitt et al., 1973).

Distribution and Host.—Known only from the type locality; in *Coralliophaga* sp.

Remarks.—See next section.

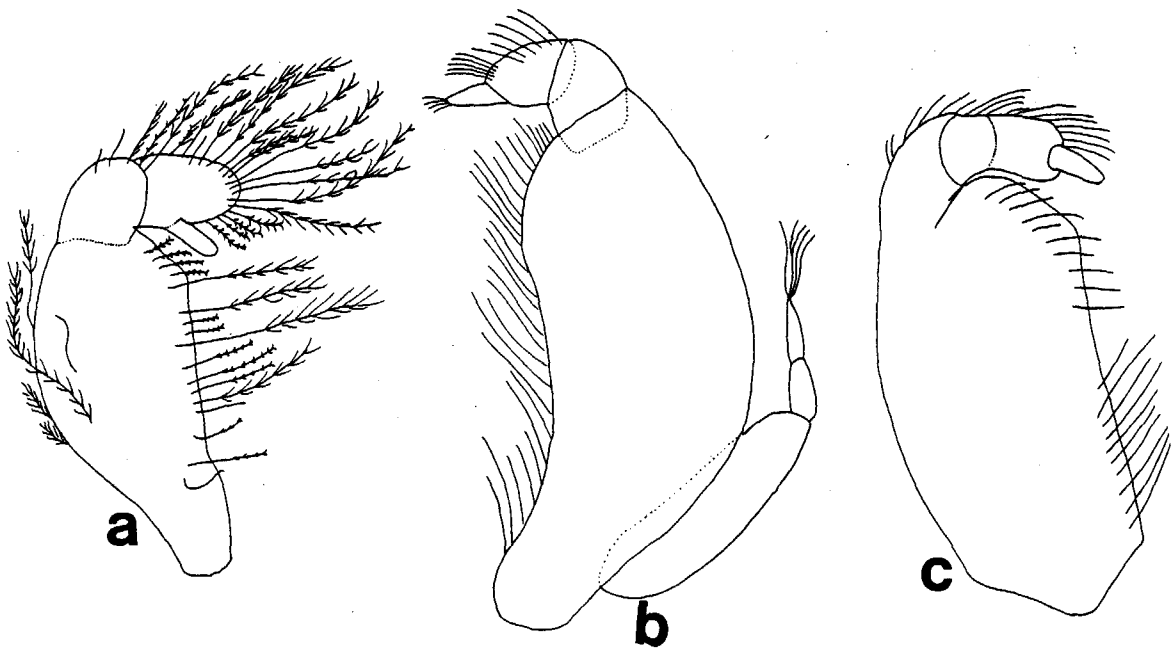

Figure 1. Outer maxilliped of *Pinnotheres* species. A, *P. rathbunae* (=*P. barbatus* Bürger); B, *P. laevis*; C, *P. longipes* (from Bürger, 1895).

Pinnotheres longipes Bürger, 1895

Pinnotheres longipes Bürger, 1895: 379, 380, pl. 9, fig. 31, pl. 10, fig. 22. Tesch, 1918: 249, 255. Silas and Alagarswami, 1967: 1201, 1216.

? *Orthotheres longipes,* Sakai, 1969: 275. Schmitt, McCain, and Davidson, 1973: 27 (Tentative generic assignment).

Type Locality.—Aibukit (Philippine Islands) (Schmitt et al., 1973).

Distribution.—Known only from the type locality; host unknown.

Remarks.—Both *P. laevis* and *P. longipes* were tentatively included within *Orthotheres,* because the dactylus of the outer maxilliped is inserted at the "end" of the propodus. A comparison between these species and *Orthotheres* spp. showed that this appendage is very different, both in shape and relative length of the palp's articles (Fig. 1B, C, and 3A). Furthermore, unlike *Orthotheres,* the female's carapace of these species are not appreciably broader than long, and the dactylus of the walking legs are not uniformly very short and sharply hooked (Bürger, 1895). These features allow me to conclude that both pinnotherid crabs are indeed species of the overdefined genus *Pinnotheres,* and their tentative inclusion within *Orthotheres* is now rejected. These species are related with the Indo Pacific species, *P. glaber* Bürger, 1895, and *P. impresus* Bürger, 1895, and with *P. angelicus* Lockington, 1877, from the northeast Pacific (Bürger, 1895; Glassell, 1935).

Orthotheres unguifalcula (Glassell, 1936)

Fabia unguifalcula Glassell, 1936: 298, 299, Pl. 21, fig. 2; Schmitt, McCain, and Davidson, 1973: 26.

Type Locality.—Punta (Puerto) Peñasco (Rocky Point), Sonora, Mexico.

Material Examined.—Two females, type locality, 4 February 1937, S. A. Glassell, coll.

Distribution.—Known only from the type locality.

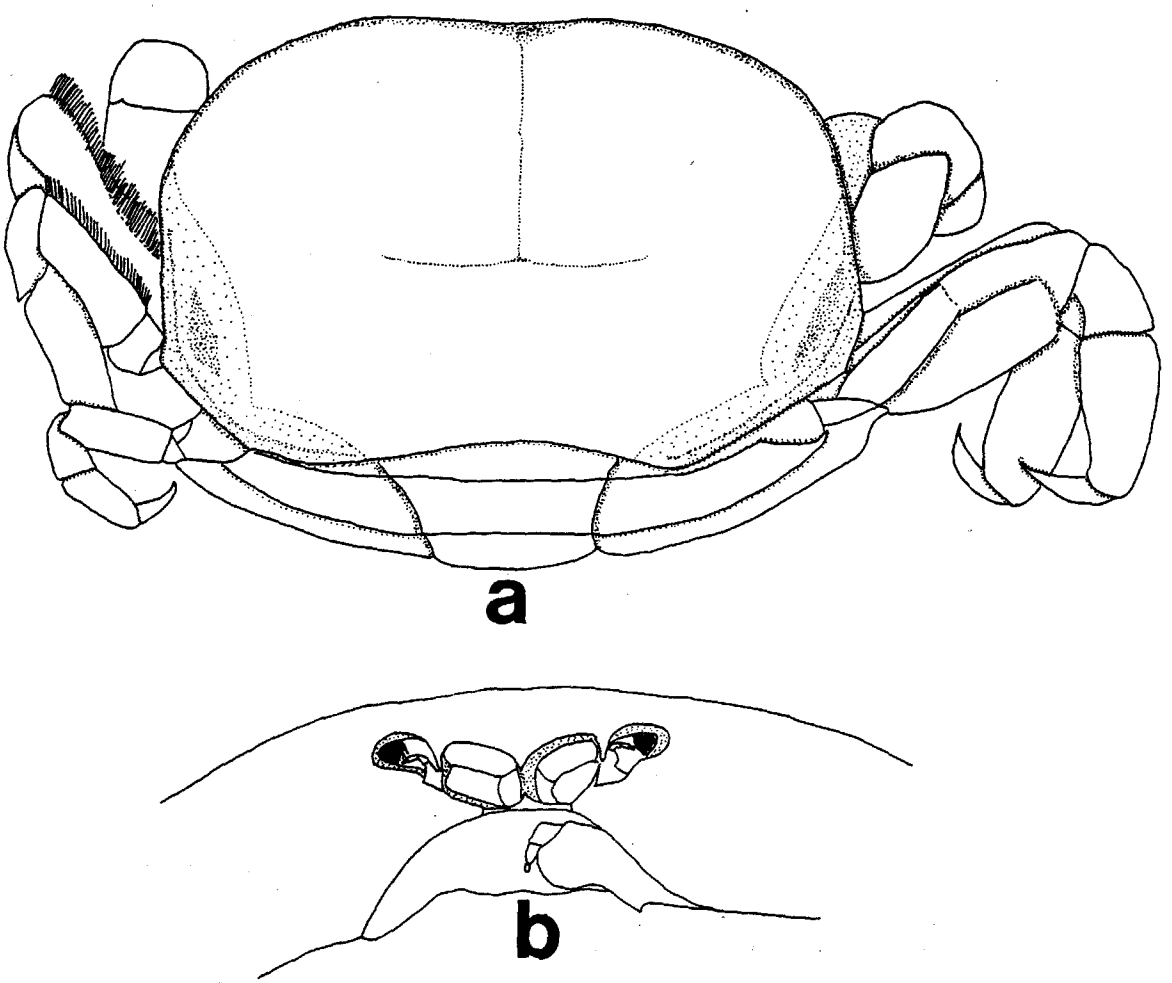

Figure 2. *Orthotheres unguifalcula,* female from Puerto Peñasco, Sonora: A, Dorsal view; B, Frontal view.

Description of the Female.—Carapace subrectangular, soft, from 1.25 to 1.6 times broader than long, anterolateral corners rounded, posterior margin sinuous, dorsal surface thin, transluced (Fig. 2A); frontal region deflexed, defined by an inconspicuous sulcus, other regions ill defined; cardiac and intestinal regions with longitudinal strias.

Outer maxilliped obliquely placed (Fig. 2B), ischium and merus fused, crescentic, palpus three articles, inserted end to end; carpus longer than propodus and dactylus together, this last article smaller than preceding one (Fig. 3A).

Chelipeds symmetrical, stout; merus short, not extending far past sides of carapace; carpus long, wide, rounded dorsally, inner proximal margin tomentose; chela stout, heavy, thick, smooth (Fig. 3B, C), reticulate for transparency, ventral margin sinuous; pollex deflexed with upturned, sharp-pointed tip, cutting edge triangular, with a medial tooth and proximal denticles; dactylus as long as pollex, falcate, sharp-pointed tip. Tips of fingers crossing.

Each pair of walking legs equal, the first pair differ from the others, in that the upper crest of the merus, the anterior lower margin of the carpus and propodus are margined with tomentum. Relative length of the walking legs 2, 3, 1, 4 in order decrescent. The fourth pair shorter and thin. Dactylus sickle-like, shorter than the preceding articles, 1 and 2 subequal, 4 shorter.

Abdomen circular (Fig. 3D), covers the sternum and reaches to middle of the buccal cavity, segment IV wider and larger (modified after Glassell, 1936).

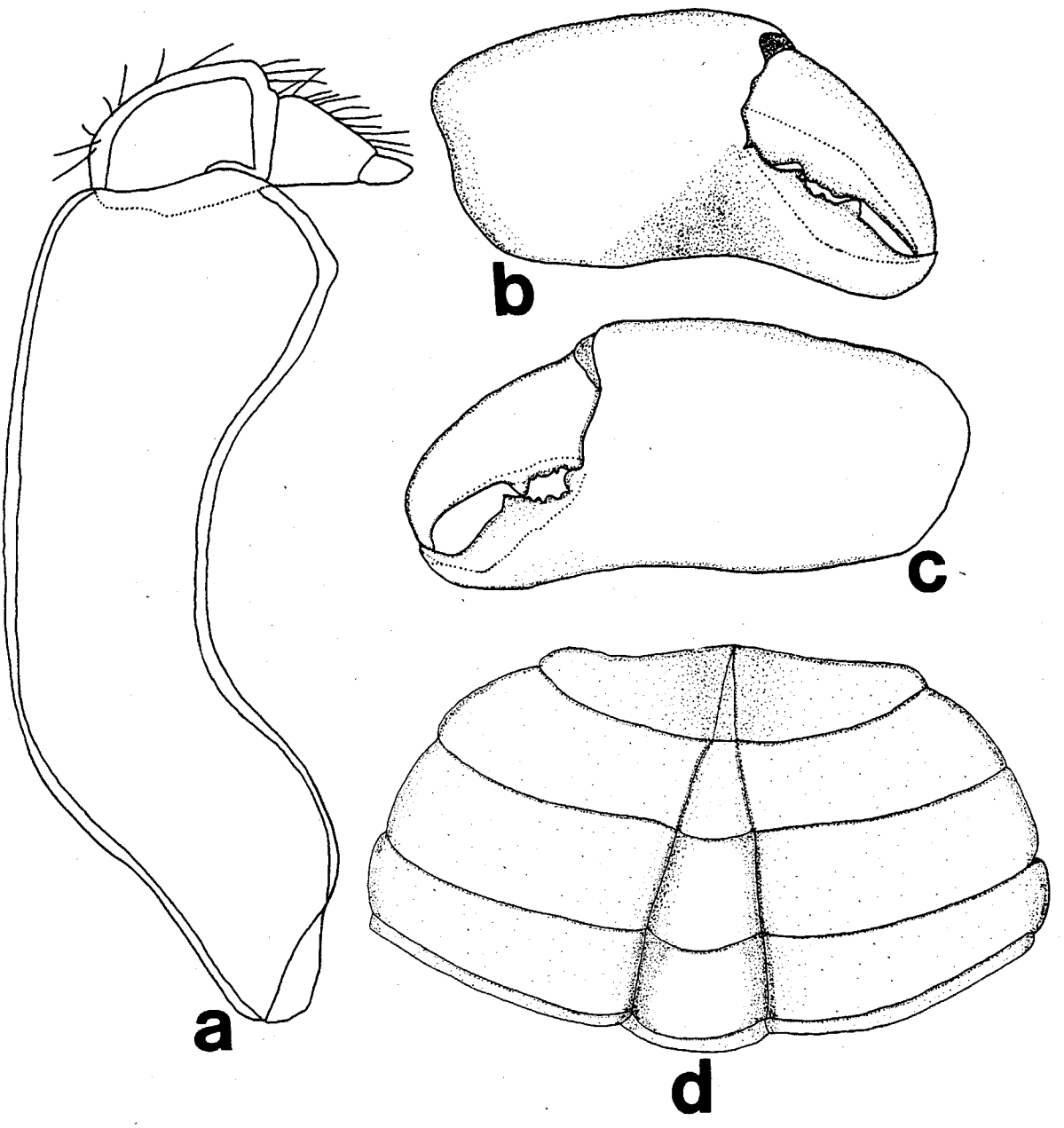

Figure 3. *Orthotheres unguifalcula,* female from Puerto Peñasco, Sonora: A, Outer maxilliped; B, Chela, dorsal view; C, Chela, ventral view; D, Abdomen.

Remarks.—Because the apparent similarity in the palp of the outer maxilliped, Glassell (1936) pointed out that *O.* (ex. *Fabia*) *unguifalcula* is allied to *F. granti* Glassell, 1933. He cited for these species the palpus of two articles which is only real for this last species.

O. unguifalcula is closely related with the West-Atlantic species, *O. serrei* (Rathbun), and *O. strombi* (Rathbun) (Rathbun, 1918). Because our knowledge on morphology of these species is very incipient, and their segregation can be difficult, additional specimens and work on this topic is necessary for these, and all species of *Orthotheres.*

Apparently the common microhabitat of *Orthotheres* is the stomach of gastropods, e.g., *Strombus, Turbo* (Sakai, 1969). According to Glassell (1936) the host for *O. unguifalcula* was not determined, but he recorded for the female topotypes

that were collected "on the ambulacral groove of starfish." I consider that this needs confirmation.

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ADDRESS: *Escuela Superior de Ciencias, Universidad Autónoma de Baja California, Apartado Postal 2300, Ensenada, Baja California, México.*