

On a new species of *Euryozius* Miers, 1886 (Crustacea: Decapoda: Brachyura: Pseudoziidae) from the Philippines, with notes on the taxonomy of the genus

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Abstract.—A new species of the rarely reported genus *Euryozius* Miers, 1886, is described from the Philippines and is distinguished from its congeners by carapace and ambulatory leg proportions, anterolateral margin armature, and form of the frontal margin. This new species, *Euryozius camachoi*, is only the third species of the genus reported from the Indo-Pacific, and the only one for which males are known. Two other Indo-Pacific congeners, *E. canorus* (Rathbun, 1911) and *E. danielae* Davie, 1992, are known only from type female specimens. The systematic position of *Euryozius* is discussed, and the genus is transferred to the Pseudoziidae Alcock, 1898. The Pseudoziidae is here recognized as a distinct family, separate from the Goneplacidae where it had been regarded as a subfamily.

The genus *Euryozius* Miers, 1886, currently contains five recognized species; three from the Atlantic, *E. bouvieri* (A. Milne-Edwards, 1869) (= *Ozius edwardsi* Barrois, 1888), *E. pagalu* Manning & Holthuis, 1981, *E. sanguineus* (Linnaeus, 1767) (= *Pseudozius mellissi* Miers, 1881); one from the Indian Ocean, *E. canorus* (Rathbun, 1911); and one from the Pacific, *E. danielae* Davie, 1992.

Recently, we had an opportunity to examine a series of relatively deep-water xanthoid crabs from Balicasag Island in the Philippines collected by commercial shell collectors. Several of these specimens proved to belong to a new species of *Euryozius*, described herein. The description of this new taxon and comparisons with congeners form the basis of the present paper. The systematic position of the genus *Euryozius* is also briefly discussed. The specimens examined are deposited in the University of San Carlos (USC), Cebu City, Cebu, Philippines; and the Zoological Ref-

erence Collection (ZRC), Raffles Museum of Biodiversity Research, National University of Singapore. The measurements are cited in the following order: cw (carapace width) $\times$ cl (carapace length). The abbreviations G1 and G2 are used for the male first and second pleopods respectively.

Euryozius Miers, 1886

Pseudozius (*Euryozius*) Miers, 1886:141 (type species: *Xantho bouvieri* A. Milne-Edwards, 1869, by monotypy; gender masculine)

Gardineria Rathbun, 1911:236 (type species: *Gardineria canora* Rathbun, 1911, by monotypy; gender feminine)

Euryozius.—Guinot, 1968:325; Manning & Holthuis, 1981:124.

Discussion.—*Pseudozius* (*Euryozius*) Miers, 1886, was established with *Xantho bouvieri* A. Milne-Edwards, 1869, from the Atlantic as type species. Two other Atlantic species are known, viz. *E. pagalu* Manning

& Holthuis, 1981, and *E. sanguineus* (Linnaeus, 1767). Rathbun (1911) described a new genus and species, *Gardineria canora* Rathbun, 1911, from the Indian Ocean, but *Gardineria* Rathbun, 1911, is now regarded as a junior synonym of *Euryozius* Miers, 1886 (Guinot 1971, Manning & Holthuis 1981, Crosnier in Serène 1984). Until the discovery of the new species described herein, no male specimen of any Indo-Pacific *Euryozius* species was known. *Euryozius canorus* and *E. danielae* were described from Providence Island in the Seychelles and Society Islands in French Polynesia respectively, both from female specimens. The characters of the male specimens of the new species described herein affirm that all species discussed above are congeneric.

The taxonomic position of *Euryozius* Miers, 1886, has been the subject of some debate. Although most authors (e.g., Manning & Holthuis 1981, Davie 1992, Crosnier in Serène 1984) regard it as a xanthoid crab, its precise position within the superfamily (sensu Guinot 1978) is uncertain. Guinot (1967:264, footnote) implied that *Gardineria* was close to *Pseudozius* Dana, 1851 (which she indicated was synonymous with *Euryozius*), and both were allied to *Carpilius* Desmarest, 1823. She (Guinot 1967), however, placed *Gardineria* in Xanthinae sensu stricto, but *Pseudozius* in Menippinae. Subsequently, Guinot (1968a:156) resurrected *Euryozius* as a valid genus and also referred it to the Menippinae. In a later development, Guinot (1968b:320, 325) decided that *Carpilius*, *Gardineria* and *Euryozius* should be placed in their own subfamily, the Carpiliinae, in the Xanthidae. Manning & Holthuis (1981:124), in a concise discussion of the history and systematic problems associated with this genus, left *Euryozius* in the Xanthidae sensu lato. With the redefinition of the Xanthoidea by Guinot (1978), all the above mentioned subfamilies were raised to family status. In the most recent discussion of *Euryozius*, the genus was regarded as incerta sedis by Crosnier (in Serène 1984:313).

The retention of *Euryozius* in Xanthidae, Carpiliidae or Eriphiidae (a senior name for Menippidae sensu Guinot 1978, fide Ng 1988) is not feasible. All members of the Xanthidae (sensu Guinot 1978, Serène 1984) have male abdominal segments 3 to 5 completely fused, slender G1s and a short G2 that is less than a quarter the length of the G1; characters very different from what is known for *Euryozius*. Adult members of Carpiliidae have male abdominal segments 3 and 4 fused and immovable, and the G2 is as long as or longer than the G1. Neither can *Euryozius* be accommodated in Eriphiidae as all its members have a G2 which is at least as long as the G1.

Euryozius is certainly close to *Pseudozius*. In addition to their very similar carapace appearance (smooth, ovate, with ill-defined regions), members of both genera have all seven male abdominal segments (including telson) freely articulating; the G1s relatively slender, gently sinuous, relatively simple, with stiff, short spines lining the distal half; and a G2 which is 0.2 to 0.3 times the length of the G1. There is, however, little doubt that *Euryozius* and *Pseudozius* are distinct genera, the prominent stridulatory crest of the proximal part of the anterolateral margin of *Euryozius* being very diagnostic.

Ng & Wang (1994) resurrected the Pseudoziinae Alcock, 1898, for *Pseudozius*, and they also suggested that the genus *Flindersoplax* Davie, 1989, should also be referred to this subfamily. They tentatively referred Pseudoziinae to the Goneplacidae. Considering the number of shared characters between *Euryozius* and *Pseudozius*, it therefore seems logical to also refer the former, as well as *Flindersoplax*, to the Pseudoziinae as well.

The placement of the Pseudoziinae in the Goneplacidae is, however, very unsatisfactory, its members very different from the taxa now in the Goneplacidae (Ng et al. 2001:32, 33). In the form of the male abdomen, G1 and G2 structures, pseudoziines are clearly not closely related to the other

subfamilies now included in the Goneplacidae (Goneplacinae, Euryplacinae, Carcinoplacinae, Chasmocarcininae and Troglolacinae). One subfamily, Pseudorhombiliinae, which has traditionally been placed in the Goneplacidae (see Guinot 1971), was recently recognized as a distinct family (Hendrickx 1996). On the same rationale, the unique suite of characters possessed by *Pseudozius*, *Flindersoplax* and *Euryozius* as noted above indicate that it is best to regard Pseudoziinae as a distinct family as well. In fact, Crosnier (in Serène 1984:301) had commented that the late Raoul Serène planned to establish a new family, Pseudoziidae, for *Pseudozius*, but his untimely death had prevented this.

Ng et al. (2001:33) commented that with "... regards to the Planopilumninae, the type species of the type genus, *Planopilumnus spongiosus* (Nobili, 1905), is actually not a pilumnid at all but closer to goneplacids like the Pseudoziinae instead. The genus *Planopilumnus* as currently understood, is heterogeneous." The genus *Planopilumnus* sensu stricto and the Planopilumninae Serène, 1984, should also be transferred to the Pseudoziidae. As the carapace and pereopod structures of *Planopilumnus* sensu stricto, and *Pseudozius*, *Flindersoplax* and *Euryozius*, are very different, it seems best to recognise two subfamilies within the Pseudoziidae for now. In addition, the aberrant genus *Platychelonion* Crosnier & Guinot, 1969 (type species *Platychelonion plannissimum* Crosnier & Guinot, 1969), whose familial classification is currently uncertain (Crosnier & Guinot 1969:726, 729, 730), should also be transferred to the Pseudoziidae as defined here. The male abdomen of *Platychelonion* (all segments freely articulating), a G1 that has numerous short spines on the side, and a short G2 (ca. 0.3–0.4 times total length of G1), are all pseudoziid characters. The general form of *Platychelonion* actually resembles *Flindersoplax*, although its carapace is superficially similar to *Planopilumnus*. *Pla-*

tychelonion is here referred to the Pseudoziinae.

Euryozius camachoi, new species

Figs. 1–3

Material examined.—Holotype: male, 24.3 × 15.8 mm, USC 2002.02, Balicasag Island, Panglao, Bohol, Visayas, Philippines, in tangle nets, 200–300 m, coll. local shell fishermen, Dec 2000. Paratypes: 1 male, 25.6 × 16.4 mm, 1 female, 20.7 × 13.0 mm, ZRC 2001.334, same data as holotype; 1 dried male, 23.5 × 14.8 mm, ZRC 2001.342, Balicasag Island, Panglao, Bohol, Visayas, Philippines, in tangle nets, 200–300 m, coll. local shell dealer, Dec 2001; 1 female, 25.0 × 15.8 mm, ZRC 2001.2325, Balicasag Island, Panglao, Bohol, Visayas, Philippines, in tangle nets, 200–300 m, coll. local shell fishermen, 28 Nov 2001.

Description of holotype.—Carapace transversely ovate, 1.53 times broader than long; regions barely defined, grooves separating epigastric regions not clearly discernible; H-shaped gastric grooves separating cardiac and gastric regions very shallow, just discernible (Fig. 1a, b); dorsal surface of carapace glabrous; frontal and anterolateral regions and areas immediately adjacent to them pitted and/or gently rugose, rest of surface with scattered small pits, smooth; postorbital and epigastric regions barely discernible as slightly inflated areas, without discernible cristae or granules (Fig. 1b). Front bilobed, slightly produced anteriorly, margin extends well beyond level of orbits, slightly deflexed downwards; each lobe gently convex, margin somewhat uneven with small, irregularly arranged granules, with a low ridge just behind it; lobes separated from each other by shallow but distinct V-shaped cleft (Figs. 1b, 2a). Supraorbital margin uneven, lined with scattered small granules of unequal sizes, with 2 small but just discernible clefts (Figs. 1b, 2a, b). Infraorbital margin lined with small and large rounded granules,

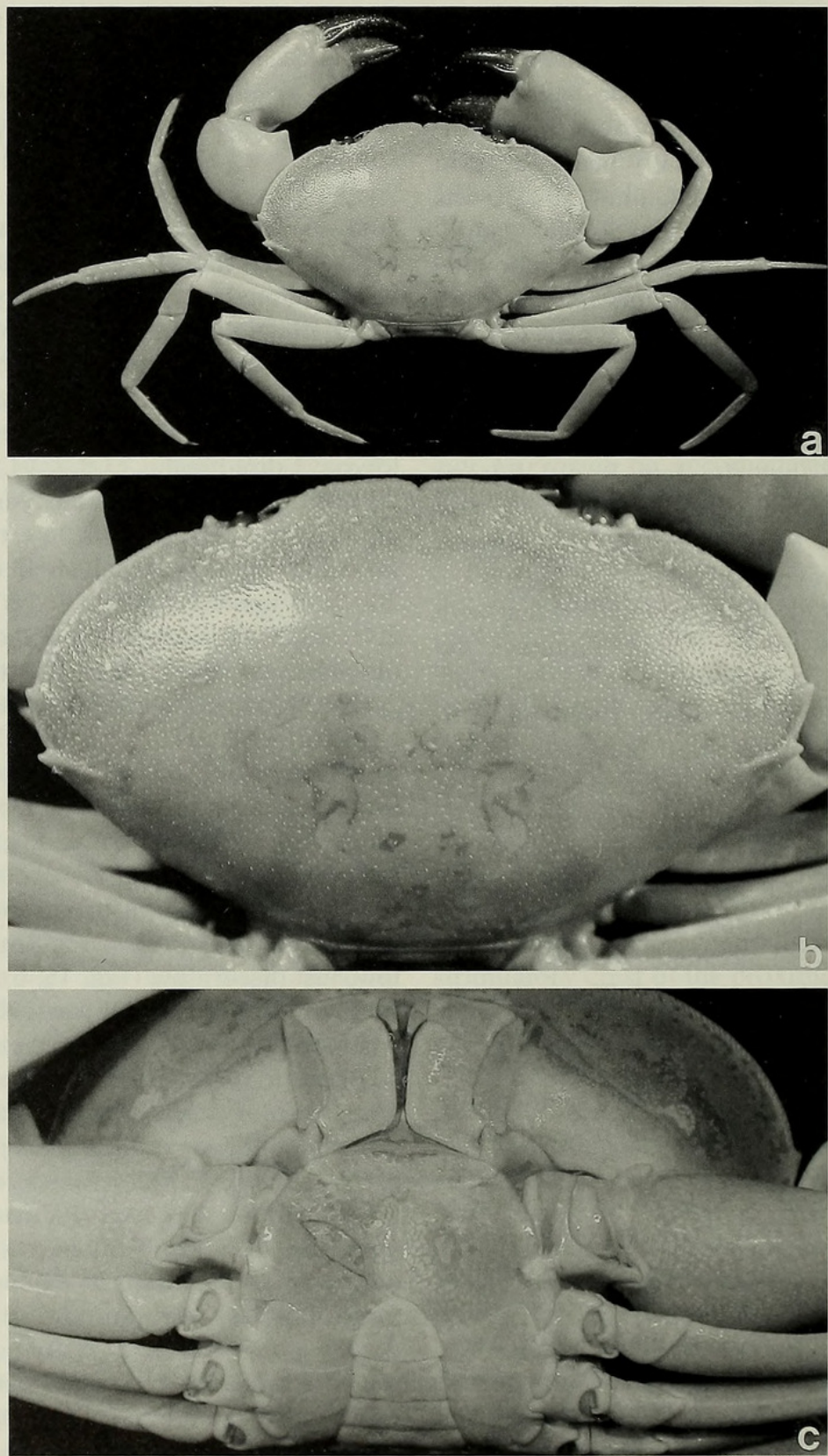


Fig. 1. *Euryozius camachoi*, new species. Paratype male, 25.6 × 16.4 mm, ZRC 2001.334. a, overall view; b, carapace; c, anterior part of thoracic sternum.

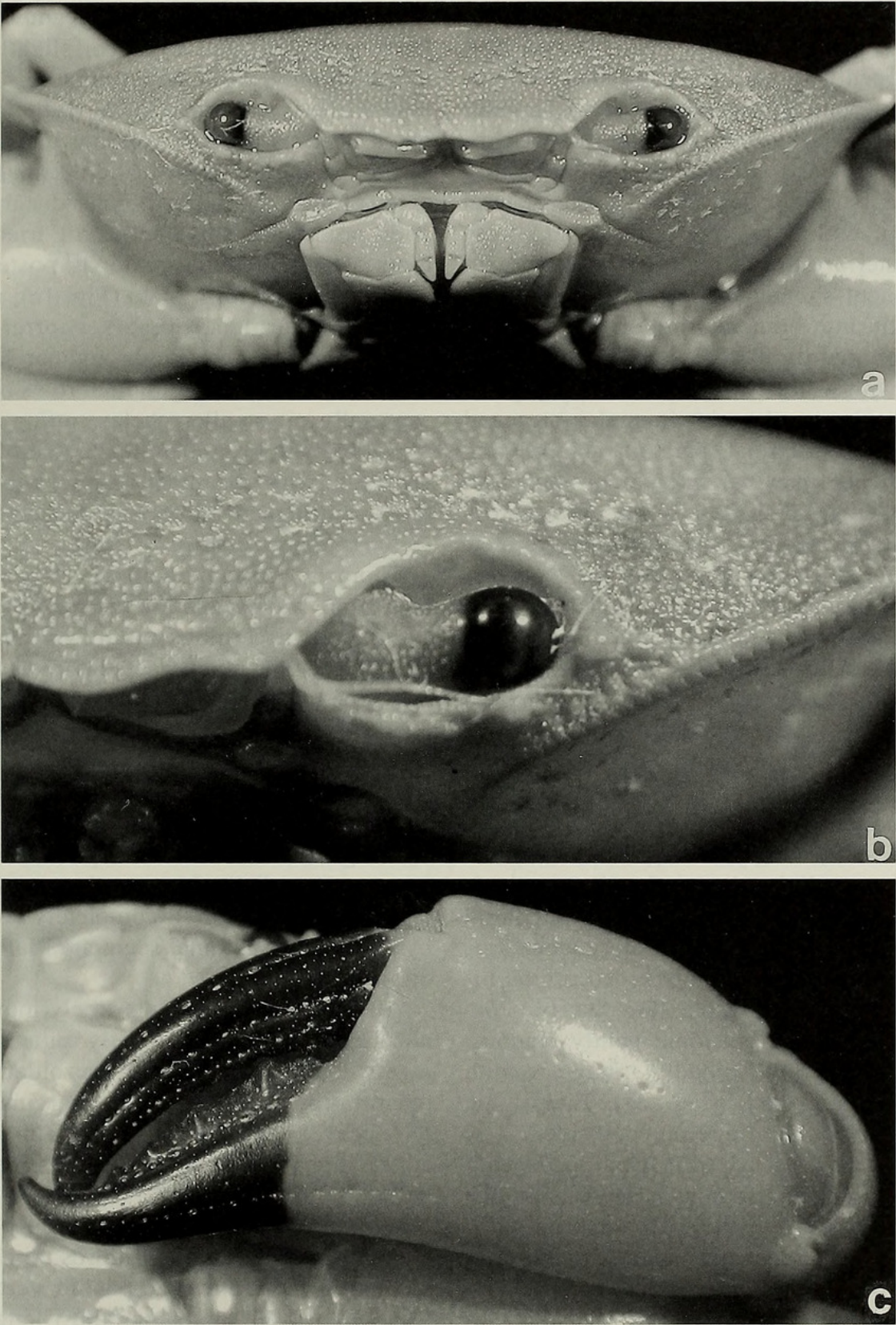


Fig. 2. *Euryozius camachoi*, new species. Paratype male, 25.6 × 16.4 mm, ZRC 2001.334. a, front end of carapace, showing antennules, antennae and third maxillipeds; b, left orbit and stridulatory anterolateral margin; c, left chela.

without spines or teeth (Fig. 2a, b). Orbits transversely ovate; eyes small, cornea well developed (Fig. 2a, b). External orbital angle represented by small, acutely triangular granuliform tooth; anterolateral margin convex, clearly demarcated from gently convex, strongly converging posterolateral margin; with 2 relatively low, sharp teeth on posterior third of margin, last tooth with prominent submedian ridge which extends partially into branchial region (Figs. 1a, b, 2a, b); margin before anterolateral teeth lined with well developed stridulatory granules, each granule subrectangular, arranged obliquely; proximal part of anterolateral margin not meeting external orbital tooth but curving downwards below orbit, across suborbital region, stopping just before pterygostomial region (Fig. 2a, b). Posterior margin of carapace gently convex (Fig. 1a, b). Suborbital and sub-branchial regions covered with scattered, unevenly shaped granules, gently rugose; suborbital region with inner surface, behind stridulatory anterolateral margin, gently depressed (Fig. 2a). Pterygostomial region gently rugose. Antennules folding transversely, antennular fossae subrectangular (Fig. 2a). Antennal flagellum well developed, flagellum extending just beyond outer edge of orbit; basal segment rectangular, with subsequent articles lodged into relatively broad orbital hiatus but freely movable (Fig. 2a, b). Posterior margin of epistome gently sinuous, median lobe low, broadly triangular with small median cleft (Fig. 2a). Endostome with low oblique ridge on each side.

Outer surfaces of third maxilliped punctate; ischium subrectangular, median oblique sulcus barely discernible; merus subquadrate, anteroexternal angle auriculiform; carpus rounded, subpediform (Figs. 2a, 1c, 3b); exopod relatively stout, reaching anterior edge of merus, with rounded subdistal tooth on inner margin, flagellum long (Fig. 3b).

Ambulatory legs relatively long, slender, surfaces smooth, unarmed except for subdistal dorsal margin which may have a low

tooth or angle (Fig. 1a). Second ambulatory leg longest. Dactylus styliform, slightly flattened laterally, without spines or stiff setae.

Chelipeds asymmetrical, right larger; outer surfaces of merus, carpus and chelae smooth or at most with scattered small pits; carpus longer than broad, inner distal angle with prominent sublamelliform triangular tooth which gradually extends posteriorly as a low lamelliform plate (Fig. 1a); merus smooth, unarmed. Fingers shorter than palm, pigmented black throughout length, outer surface with longitudinal rows of pits, especially on smaller chela; cutting edges of pollex with prominent teeth, that of larger chela with prominent large sub-basal tooth; cutting edges of dactylus with low teeth or unarmed (Fig. 2c).

Thoracic sternum relatively broad, surface gently rugose; suture between sternites 1 and 2 not discernible; suture between sternites 2 and 3 distinct; deep suture and well developed transverse ridge between sternites 3 and 4 distinct marginally, medially discernible as shallow groove; sternite 4 broad, with distinct but shallow longitudinal groove which extends into abdominal cavity (Fig. 1c, 3a); all subsequent sternites separated medially by prominent longitudinal groove; sternite 8 completely covered by last male abdominal segment. Male gonopore coxal.

All abdominal segments freely movable, not fused, smooth or gently pitted; segments 3–5 increasingly trapezoidal, segment 6 subrectangular, lateral margins gently concave; telson semicircular, with lateral edges slightly produced laterally (Figs. 1c, 3d).

G1 long, relatively slender, gently sinuous, margins of distal two-thirds with short spines, tip subtruncate, opening vertically (Fig. 3d, e). G2 about one-third length of G1, with spatuloid process, distal segment relatively short (Fig. 3f).

Variation.—The carapace width to length proportions of the four paratypes are 1.56 and 1.59 (male specimens), and 1.58 and 1.59 (female specimens), but other than

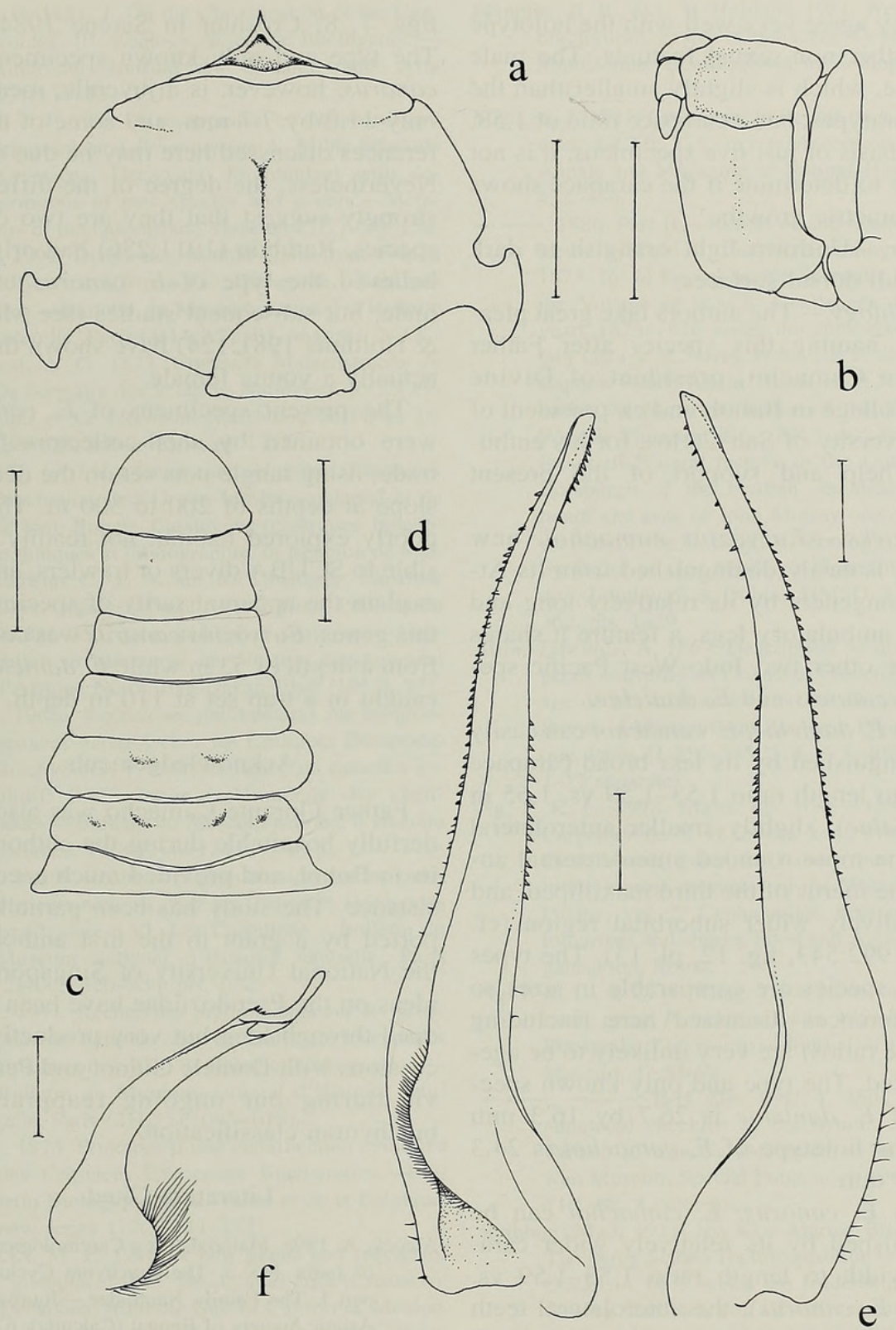


Fig. 3. *Euryozius camachoi*, new species. Paratype male, 25.6 × 16.4 mm, ZRC 2001.334. a, anterior part of thoracic sternum; b, outer view of left third maxilliped; c, abdomen; d, dorsal view of left G1; e, ventral view of left G1; f, dorsal view of left G2. Scales equal 5.0 mm (a–c), and 0.5 mm (d–f).

this, they agree very well with the holotype in all other non-sexual features. The male holotype, which is slightly smaller than the male paratypes, has a carapace ratio of 1.53. On the basis of just five specimens, it is not possible to determine if the carapace shows any allometric growth.

Color.—Uniform light orangish to dark red on all dorsal surfaces.

Etymology.—The authors take great pleasure in naming this species after Father Florante Camacho, president of Divine Word College in Bohol, and ex-president of the University of San Carlos, for his enthusiastic help and support of the present study.

Remarks.—*Euryozius camachoi*, new species, is easily distinguished from its Atlantic congeners by its relatively long and slender ambulatory legs, a feature it shares with the other two Indo-West Pacific species, *E. canorus* and *E. danielae*.

From *E. danielae*, *E. camachoi* can easily be distinguished by its less broad carapace (width to length ratio 1.53–1.59 vs. 1.65 in *E. danielae*), slightly smaller anterolateral teeth, the more rounded anteroexternal angle of the merus of the third maxilliped, and the relatively wider suborbital region (cf. Davie 1992:543, fig. 12, pl. 13). The types of both species are comparable in sizes so the differences discussed here (including carapace ratios) are very unlikely to be age-associated. The type and only known specimen of *E. danielae* is 26.7 by 16.3 mm while the holotype of *E. camachoi* is 24.3 by 15.8 mm.

From *E. canorus*, *E. camachoi* can be distinguished by its relatively wider carapace (width to length ratio 1.53–1.59 vs. 1.45 in *E. canorus*), the anterolateral teeth being more prominent (vs. very low in *E. canorus*), the proportionately longer and more slender ambulatory legs, the frontal margin being less distinctly deflexed downwards with the median cleft separating the lobes distinct (vs. just discernible), and the completely pigmented cheliped fingers (vs. only distally) (cf. Rathbun 1911:182, pl. 19,

figs. 7, 8; Crosnier in Serène 1984:48A). The type and only known specimen of *E. canorus*, however, is a juvenile, measuring only 11.2 by 7.7 mm, and some of the differences discussed here may be due to size. Nevertheless, the degree of the differences strongly suggest that they are two distinct species. Rathbun (1911:236) had originally believed the type of *E. canorus* to be a male, but subsequent studies (see Manning & Holthuis 1981:124) have shown that it is actually a young female.

The present specimens of *E. camachoi* were obtained by shell-collectors for the trade, using tangle nets set on the deep reef slope at depths of 200 to 300 m. This is a poorly explored habitat, not readily accessible to SCUBA divers or trawlers, and may explain the apparent rarity of specimens of this genus. *Euryozius canorus* was collected from a depth of 53 m while *E. danielae* was caught in a trap set at 110 m depth.

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