

A new species of the genus *Brachycarpus* (Decapoda, Caridea, Palaemonidae) from New Caledonia

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ABSTRACT

A new species of palaemonine shrimp, *Brachycarpus crosnieri*, from Uvea, Loyalty Islands, New Caledonia, is described and illustrated. The new species is readily distinguished from the two other species of the genus by the elongated carpus of its second pereopod. Both Indo-West Pacific species are now known from New Caledonian waters and the new species is also known from Madang, Papua-New Guinea.

RÉSUMÉ

Une nouvelle espèce du genre *Brachycarpus* (Decapoda, Caridea, Palaemonidae) de Nouvelle-Calédonie. *Brachycarpus crosnieri*, provenant d'Ouvéa, Îles Loyauté (Nouvelle-Calédonie), est décrite et illustrée. Cette nouvelle espèce se distingue facilement des deux autres espèces du genre par le carpe allongé du deuxième péréopode. Les deux espèces de l'Indo-Pacifique sont maintenant signalées de Nouvelle-Calédonie et la nouvelle espèce est également connue de Madang (Papouasie-Nouvelle-Guinée).

INTRODUCTION

The genus *Brachycarpus* was designated by Bate (1888) in the *Challenger* Report on the Macrura for his species *B. savignyi*. This species was subsequently synonymized by Kemp (1925) with the species originally described as *Palaemon biunguiculatus* by Lucas (1846), based on specimens from Oran and Bône, Algeria. Since then the species has been reported extensively from the warmer waters of the world. It is now sparsely recorded from most of the Indo-West Pacific region, from the Red Sea to Hawaii, most recently from Japan (Okuno & Osawa 1994), and more abundantly from the Eastern Pacific, Eastern and Western Atlantic and western Mediterranean Sea. A second species of the genus, *B. holthuisi*, was later reported from Brazilian waters (Fausto Filho 1966). The discovery of a second Indo-West Pacific species of this genus in New Caledonian waters, where *B. biunguiculatus* (Lucas, 1846) also occurs, is therefore of interest.

ABBREVIATIONS

MNHN Muséum national d'Histoire naturelle,
Paris;
CL postorbital carapace length.

***Brachycarpus crosnieri* n.sp.**
(Figs 1-4)

Rhynchocinetes sp. – Allen & Steene 1994: 148 (col. fig.).

Brachycarpus biunguiculatus – Bruce 1996: 4, 5 (partim).

MATERIAL EXAMINED. — **New Caledonia.** Loyalty Islands, Uvea, Passe de la Meurthe, 6-10 m, scuba, 16.XI.1991, coll. J. L. Menou: holotype, ovig. ♀ (MNHN Na.12855).

MEASUREMENTS. — Holotype ♀, postorbital carapace length, 9.0; carapace and rostrum, 18.0; total body length (approx.), 41.5; second pereopod, chela, 11.8; carpus, 8.2; merus, 7.8; length of ovum (advanced), 0.95 (in millimetres).

ETYMOLOGY. — It is a pleasure to dedicate this species to Dr Alain Crosnier in recognition of his great contribution, directly and indirectly, to knowledge

particularly of the carcinological fauna of the Indo-West Pacific region, and of his help and friendship over many years.

DISTRIBUTION. — Known only from the type locality, Uvea, Loyalty Islands, and Madang, Papua-New Guinea (Allen & Steene 1994).

DESCRIPTION

Small-sized palaemonid shrimp, of robust sub-cylindrical body form. Rostrum (Fig. 1A) well-developed, compressed, extending well beyond scaphocerite (Fig. 1B), subequal to carapace length, horizontal, slightly upturned distally; dorsal carina well-developed with seven acute dorsal teeth, first three situated on carapace, first at about 0.5 of carapace length, tip slender, elongate, with single small preterminal dorsal tooth, with sparse interdental median setae, ventral carina with three large acute teeth, distal tooth slightly in advance of antennular peduncle, distal ventral margin with submarginal setae. Carapace smooth, glabrous, antennal spine strong, marginal, hepatic spine smaller, at slightly lower level, at about 0.25 of carapace length; posterior orbital margin (Fig. 1C) marked by low ridge, without knob-like lower termination; pterygostomial angle not produced, bluntly obtuse.

Abdomen (Fig. 1D) smooth, glabrous; third segment not posterodorsally produced, pleura of first three segments large, broadly rounded, fourth and fifth (Fig. 1D) posteroventrally acute; sixth segment about 1.2 times longer than depth, posterolateral and posteroventral angles acute. Telson (Fig. 1H) about 1.5 times length of sixth segment, 2.5 times longer than anterior width, sides sublinear, posteriorly convergent, paired submedian setae anteriorly, with two pairs of subequal dorsal spines at 0.5 and 0.75 of telson length, spines about 0.08 of telson length, posterior margin (Fig. 3I) about 0.3 of maximal anterior width, angular, centrally rounded, with small acute median point, lateral spines small, intermediate spines long, slender, about 0.3 of telson length, two densely plumose submedian setae slightly shorter than intermediate spines, with smaller additional seta on right.

Antennule (Fig. 1F) with proximal segment about 1.25 times longer than wide, distolateral angle strongly produced with long acute lateral

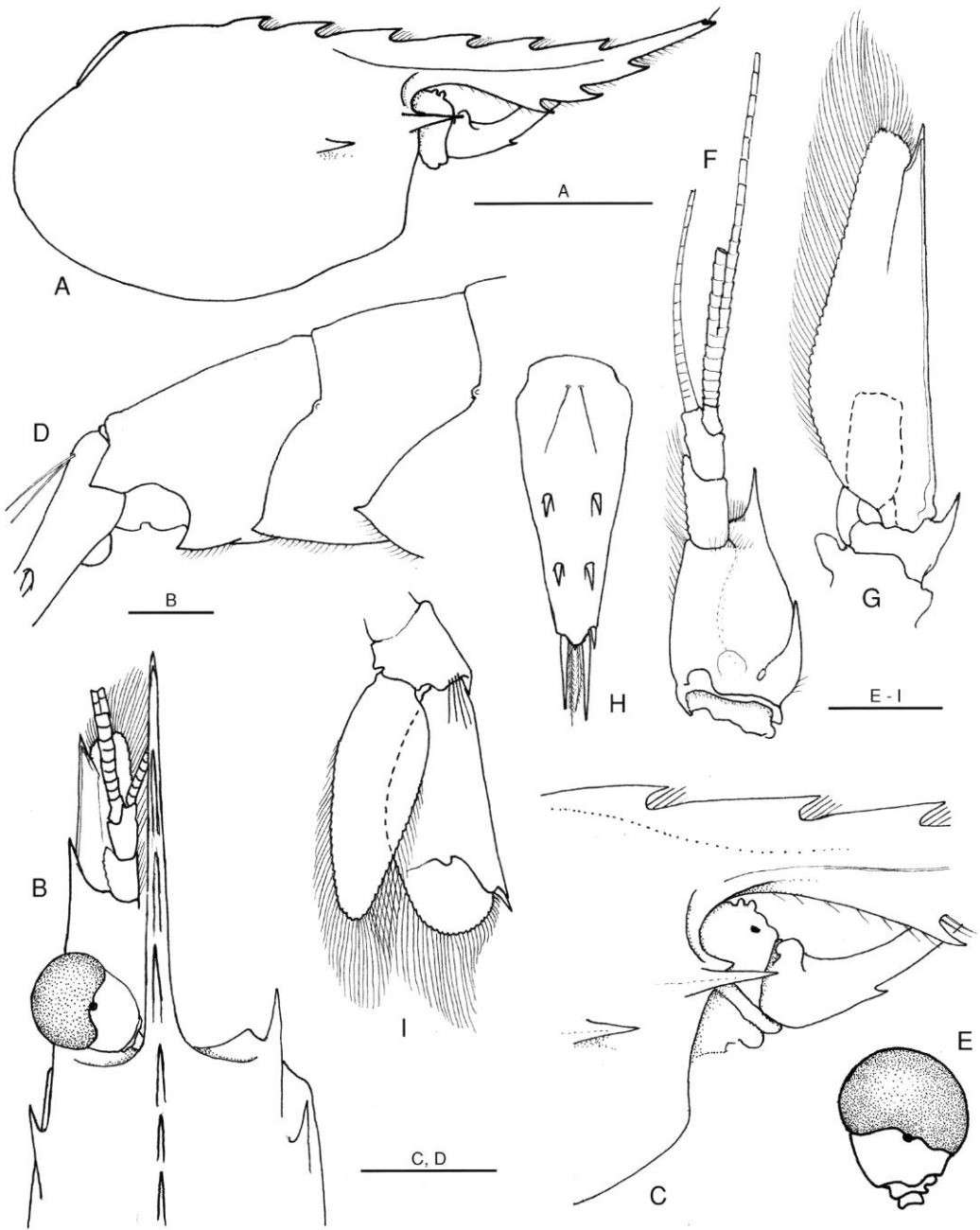


FIG. 1. — *Brachycarpus crosnieri* n.sp., holotype ♀, MNHN Na.12855; **A**, carapace and rostrum, lateral; **B**, anterior carapace and rostrum, left eye and antennal peduncles; **C**, orbital region of carapace, lateral; **D**, posterior abdominal segments, lateral; **E**, eye, right dorsal; **F**, antennule; **G**, antenna, right dorsal; **H**, telson, dorsal; **I**, uropod, right dorsal. Scale bars: **A**, 5 mm; **B-I**, 2 mm.

tooth exceeding medial margin of intermediate segment, medially convex, setose, lateral margin convex, with submarginal row of setae ventrally, medial margin less convex, setose, with well-developed acute ventromedial tooth on left side, absent on right, with large boss proximodorsally, statocyst normal, with small granular statolith, stylocerite short, acute, reaching to about 0.5 of segment length; intermediate segment dorsal length about 0.45 of proximal segment length, 1.5 times longer than wide, medially setose, obliquely articulated with distal segment; distal segment subequal to dorsal length of intermediate segment, 2.0 times longer than central width; upper flagellum biramous, proximal nine segments fused, shorter ramus incomplete, with numerous groups of aesthetascs on all except first two segments, longer ramus slender, incomplete, lower flagellum slender, incomplete.

Antenna (Fig. 1G) with basicerite with large acute lateral tooth; carpocerite short, reaching to about 0.33 of scaphocerite length, twice as long as wide, flagellum well-developed, slender, filiform, incomplete; scaphocerite far exceeding antennular peduncle, about 3.4 times longer than wide, greatest width at about 0.3 of length, at level of distal carpocerite, lamella produced, bluntly angular, slightly exceeded by strong distolateral tooth, lateral margin straight.

Eye (Fig. 1E) with large globular wellpigmented cornea, diameter about 0.24 of CL, with small dorsal marginal ocellus; stalk short, broad, twice as wide as long, length about 0.3 of corneal diameter.

Ophthalmic segment (Fig. 1C) with two small median tubercles; median pigment spot distinct. Epistome with median anterior carina, without beak.

Mandible (right) (Fig. 2A) robust, with well-developed slender 3-segmented palp (Fig. 3A), distal segments subequal, about 1.4 times proximal segment length; incisor process short, broad, with three stout teeth distally, cutting edge confluent with molar process; molar process stout, with four blunt teeth. Maxillula (Fig. 2B) with short stout bilobed palp (Fig. 3B), upper lobe slender, sparsely setose, lower lobe stouter, with distoventral tubercle bearing two small spinules (Fig. 3C); upper lacinia slender, distally

truncate, with three pairs of short spines distally, and three single spines proximoventrally; lower lacinia short, tapering distally, with numerous spiniform setae distally. Maxilla (Fig. 2C) with sparsely setose tapering palp, basal endite elongate, bilobed, upper lobe longer and stouter than lower, both with simple setae distally; coxal endite obsolete, medial margin feebly convex, non-setose; scaphognathite broad, about 2.2 times longer than wide, posterior lobe large, rounded, about 0.3 of length, anterior lobe distally narrow, medial margin concave. First maxilliped (Fig. 2D) with slender tapering, sparsely setose, dorsomedially concave palp; basal endite large, 1.5 times longer than wide, medial margin with numerous long fine setae; coxal endite medially bicarinate, dorsal carina setose distally, ventral carina setose proximally; exopod well-developed, with long flagellum with numerous plumose setae distally, caridean lobe large; epipod large, deeply bilobed. Second maxilliped (Fig. 2E) with dactylar segment narrow, medial margin with dense fringe of spiniform setae, propodal segment broad, rounded distally, anterior margin with long spines dorsally, long setae ventrally; carpus and ischiomerus normal; basis stout, feebly concave ventromedially, exopod well-developed, with long flagellum with small lateral lamella proximally, with numerous plumose setae distally; coxa strongly produced medially, bicarinate, ventral carina setose, with large simple epipod laterally, bearing well-developed podobranch. Third maxilliped (Fig. 2F) robust, exceeding carpocerite by 0.4 of penultimate segment, ischiomerus fully fused to basis, twisted, distolaterally expanded, dorsal and ventral borders with numerous spiniform setae, exopod well developed, with long flagellum with numerous plumose setae distally; penultimate segment 4.5 times longer than wide, about 0.5 of combined ischiomerus-basis segment length, dorsal and ventral margins with long spiniform setae medially; terminal segment about 0.6 of penultimate segment length, 5.0 times longer than proximal width, tapering distally, with short stout terminal spine, with about twelve transverse rows of short spines dorsally, ventral border more feebly spinulate; coxa with small setose ventromedial process, small oval epipod laterally, with two small

arthrobranchs (smaller upper arthrobranch lost from Fig. 2F).

Fourth thoracic sternite with a small slender, very sharp median process; fifth with transverse lamina with small median notch; posterior sternites unarmed. Abdominal sternites unarmed, fifth with feeble median carina.

First pereopod (Fig. 3D) slender, exceeding scaphocerite by 0.2 of carpus; chela (Fig. 3E) with palm subcylindrical, slightly compressed, about 2.3 times longer than central depth, fingers long, slender, with strongly hooked tips, about 1.75 times palm length, with sharp cutting edges throughout length, without teeth; carpus subequal to chela length, about 8.5 times longer than distal width, tapering proximally; merus subcylindrical, subequal to carpus length, with few sparse setae; ischium about 0.5 of merus length, ventrally carinate, with numerous short setae; basis and coxa normal, slender, basis with long

setae distoventrally, coxa with rounded distoventral process, fringed with short setae.

Second pereopods well-developed, subequal, similar (see photograph, Allen & Steene 1994). Holotype specimen with only one detached second pereopod preserved (Fig. 3F). Chela (Fig. 3G) about 1.3 times CL, palm smooth, subcylindrical, slightly compressed and tapering distally, about 3.6 times longer than deep, fingers (Fig. 3H) long, slender, sparsely setose, about 10.0 times longer than proximal depth, 1.1 times palm length, with strongly hooked tips, dactylus with two very small teeth at 0.25 of length, opposing single similar tooth on fixed finger, anterior cutting edges sharp, entire; carpus subequal to CL, 8.0 times longer than distal width, 1.65 times palm length, distally slightly expanded, unarmed; merus about 0.9 of carpus length, 9.0 times longer than width, unarmed; ischium 0.5 of carpus length, 5.0 times longer than distal

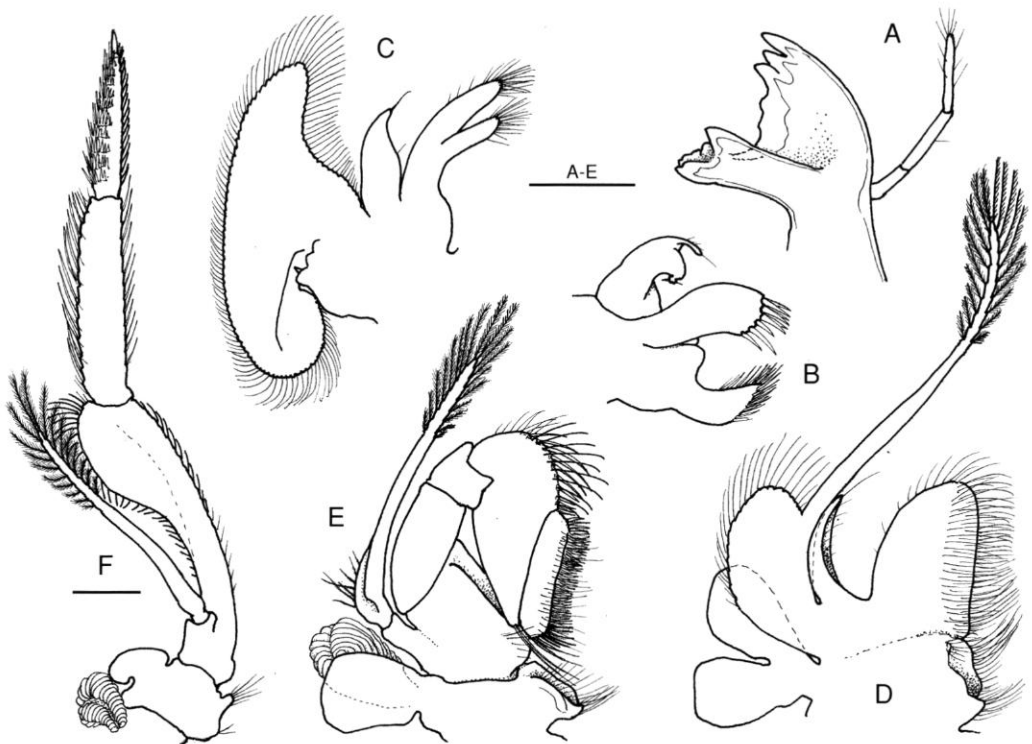


FIG. 2. — *Brachycarpus crosnieri* n.sp., holotype ♀, MNHN Na.12855, right mouthparts, ventral; A, mandible; B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped, lateral. Scale bars: 1 mm.

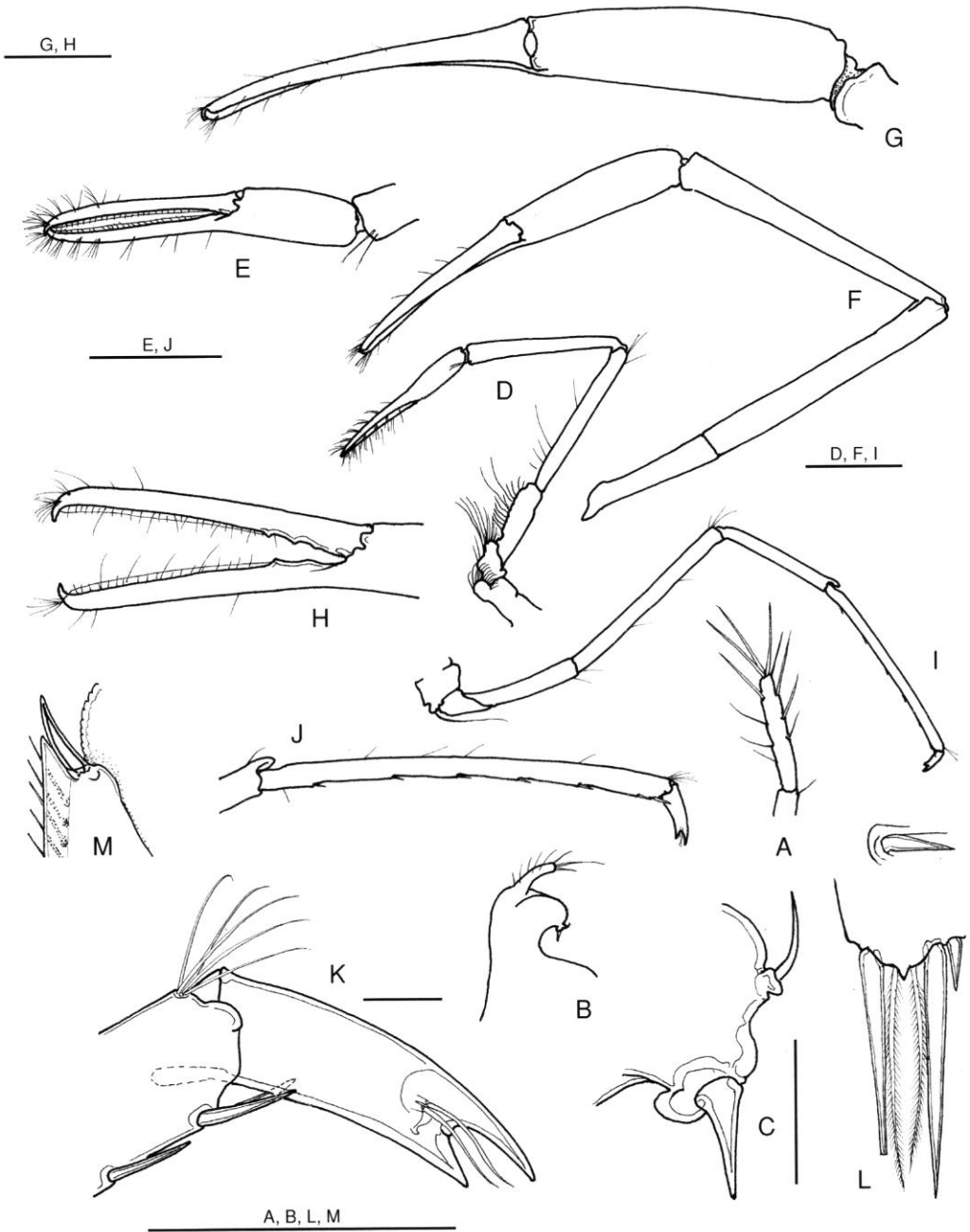


FIG. 3. — *Brachycarpus crosnieri* n.sp., holotype ♀, MNHN Na.12855; **A**, mandible, distal segment of palp; **B**, maxillula, palp; **C**, same, distal end of lower lobe; **D**, first pereopod; **E**, same, chela; **F**, second pereopod; **G**, same, chela; **H**, same, fingers; **I**, third pereopod; **J**, same, first pereopod and dactyl; **K**, same, distal propod and dactyl; **L**, posterior telson spines, dorsal spine inset above; **M**, uropod, distolateral right exopod. Scale bars: A, B, G, H, L, M, 2 mm; C, 0.1 mm; D, F, I, 3 mm; E, J, K, 0.2 mm.



FIG. 4. — *Brachycarpus crosnieri* n.sp., holotype ♀, Uvea, New Caledonia, MNHN Na.12855. Photo by J.-L. Menou.

width, tapering proximally, unarmed. Basis and coxa without special features.

Third pereopod (Fig. 3I) slender, exceeding scaphocerite by half propod length; propod equal to 0.62 of CL; dactyl (Fig. 3K) with unguis fused to corpus, unguis not cornified, about 2.7 times longer than basal width, 0.33 of dorsal corpus length, corpus compressed, about 2.8 times longer than deep, dorsal and ventral margins subparallel, with paired setae distolaterally, dorsal border devoid of setae, ventral margin with stout acute distal accessory tooth, about 0.5 of unguis length; propod (Fig. 3J) about 6.5 times dactyl length, 21 times longer than central depth, sparsely setose, with paired distoventral spines, about 0.4 of dactylar corpus length, six evenly spaced similar ventral spines; carpus about 0.6 of propod length, unarmed; merus subequal to propod length, about 12 times longer than central depth, unarmed; ischium slightly shorter than carpus, unarmed; basis and coxa normal, coxa with small ventral process with single long seta. Fourth pereopod similar, propod about 0.65 of CL. Fifth pereopod similar, with propod 0.76

of CL, without transverse rows of cleaning setae distally.

Pleopods without special features.

Uropod (Fig. 1I) with protopod distolaterally acute (?), slightly damaged), with several long simple setae distodorsally; exopod about 2.5 times longer than central width, lateral margin straight, submarginally setose ventrally, distally with small acute tooth, with large mobile spine medially (Fig. 3M); endopod subequal to exopod length, about 2.7 times longer than maximal width.

General coloration (Fig. 4) a uniform light reddish, including rostrum, antennal peduncles and flagella, and pereopods, with conspicuous darker reddish bands transversely across each abdominal segment posteriorly, paler anteriorly, caudal fan uniform (see Allen & Steene 1994).

SYSTEMATIC POSITION

Brachycarpus crosnieri closely resembles and is closely related to both the other species of the genus, *B. biunguiculatus* (Lucas) and *B. holthuisi* Fausto Filho. It can be readily distinguished from

both by the much more elongate carpus of the second pereopods, which is particularly short in *B. biunguiculatus*, hence the generic name.

The postorbital carina is simple in both *B. holthuisi* and *B. crosnieri*, but is provided with a very characteristic abruptly rounded lower end in *B. biunguiculatus* (Fig. 5).

The mandibular palp is well-developed in both Indo-West Pacific species, but is remarkably reduced in the Brazilian species, which also has the fourth pleuron bluntly angled, whereas it is acutely produced in both other species. The mouthparts of *B. crosnieri* closely resemble those of *B. biunguiculatus* as illustrated by Schmitt (1939).

FIG. 5. — *Brachycarpus biunguiculatus* (Lucas), ♀, CL 10 mm, Latham Island, Zanzibar. Anterior carapace, orbital region. Scale bar: 2 mm.



KEY TO THE SPECIES OF *Brachycarpus* BATE

1. Second pereopod carpus long and slender, *ca.* 1.6 times palm length (rostrum far exceeding antennular peduncle and scaphocerite); rostral dentition 3 + 4/3 *B. crosnieri* n.sp.

— Second pereopod carpus shorter, not exceeding palm length (rostrum not exceeding antennular peduncle and scaphocerite) 2

2. Second pereopod carpus distinctly shorter than palm length; dorsal telson spines subdorsal; rostral dentition 2-3 + 5-4/3-4 *B. biunguiculatus* (Lucas)

— Second pereopod carpus subequal to palm length; dorsal telson spines lateral; rostral dentition 2+6/2-3 *B. holthuisi* Fausto Filho

REMARKS

At present the subfamily Palaemoninae contains only seventeen genera and, of these, *Brachycarpus* is the only one to possess biunguiculate dactyls on the adult ambulatory pereopods. In contrast, the numerous genera of the subfamily Pontoniinae have the majority, which are generally commensally associated with other marine invertebrates, provided with biunguiculate or even more ornate dactyls on these appendages. These are presumably related to their commensal life-style. There is no indication of a commensal

life-style in the case of *Brachycarpus* species, or of any other member of the Palaemoninae, and most of the Pontoniinae with simple dactyls are probably free-living micropredators or browsers. However, *B. biunguiculatus* has been reported from high energy situations, *i.e.*, reef front surge channels (Holthuis 1953; pers. obs.). No other palaemonine shrimps occur in these habitats. In these situations stout biunguiculate ambulatory dactyls would be of considerable use in maintaining station when exposed to forceful, rapidly changing conditions of water flow. Other palae-

monine shrimps are generally found in less violent or even static waters, where such a feature would be redundant.

In addition to its morphological characters, *B. crosnieri* may also be distinguished from *B. biunguiculatus* by its colour pattern in life, with conspicuous transverse red bars across the abdominal terga, which are not present in the latter species (Okuno & Osawa 1994; Bruce 1996), and apparently also absent from *B. holthuisi*, which is described as uniformly coloured (Fausto Filho 1966).

Brachycarpus biunguiculatus has also been reported from Uvea, Loyalty Islands, from the North Pleiades Islands, also collected by J.-L. Menou (Bruce 1996): the precise habitats of both species were not recorded. The present specimen was overlooked during the examination of some *B. biunguiculatus* specimens, so it is possible that some reports in the literature of that species may refer to specimens of *B. crosnieri*.

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