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NOTE ON A NEW SPECIES OF *BRESILIA* (CRUSTACEA: DECAPODA: BRESILIIDAE) FROM ZANZIBAR

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A new species of bresilliid shrimp from Zanzibar is described and illustrated. The single specimen described is incomplete, lacking all pereiopods. It can be readily distinguished from the six previously known species of the genus and a key is provided for their identification. The record is the first for the Indian Ocean and confirms the occurrence of the genus, usually found in deep sea depths, in shallow water. □ *Crustacea, Caridea, Bresiliidae, Bresilia sp. nov., Zanzibar, Indian Ocean*.

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Bresiliid shrimps are of particular interest due to the persistent uncertainty of their systematic relationships. The Bresiliidae has undergone numerous re-arrangements since its original designation by Calman in 1896. It seems unlikely that its status has been finally resolved. Recently Holthuis (1993) included in the Bresilioidea only a single family, the Bresiliidae, with eleven genera, of widely varying morphology, including several recent additions from deep sea hydrothermal vents. Others are commensals of shallow water coral reef Porifera. These 11 genera have been re-distributed by Martin & Davis (2001) in the Bresiliidae, Agostocarididae, Alvinocarididae, Disciadidae and Mirocarididae. Vereshchaka (1997) suggested synonymy of the Agostocarididae with the Bresiliidae. The Mirocarididae has been synonymized with the Alvinocarididae (Komai & Segonzac, 2003). Currently the Bresiliidae, Alvinocarididae and Disciadidae are recognized. *Pseudocheles* Chace & Brown has been placed in its own monogeneric family, Pseudochelidae (De Grave & Moosa, 2004).

The Bresiliidae may now contain only the single genus *Bresilia* (Calado, et al., 2004), (although the poorly known *Encantada* Wicksten should probably also be included). Its systematic relations with other carideans remain particularly obscure. The biology of these shrimps is similarly unclear. *Bresilia* was designated by Calman (1896) for a specimen of a species of small deep water shrimp collected off the west coast of Ireland, *Bresilia atlantica.* Three further specimens were described by Kemp (1910) and one noted by Komai & Segonzac (2003). There were no further Atlantic records of this genus until Calado et al. (2004) reported *Bresilia saldanhai,* from a marine cave at a depth of 15 m, on the island of Madeira, the first report of the genus from shallow water. *Bresilia corsicana* (Forest & Cals (1997) was reported from 450m off Corsica; *B. antipodarum*; from 800m off Tasmania (Bruce, 1990b) and 770-830m off New Caledonia (Bruce, 2004a); *B. plumifera* Bruce, 1990a, from 133m, also off Tasmania, and *B. briankensleyi* Bruce, 2004b, from 750-753m from the Red Sea.

Bresilia saldanhai is the best known species, represented by 12 specimens, *B. atlantica* is known from 5 specimens, while *B. antipodarum* is now known from 3. *Bresilia corsicana, B. plumifera* and *B. briankensleyi* are still known only from the holotype specimens, the latter two both damaged and incomplete. No specimens of *B. atlantica* have been collected since 1907, a remarkable length of time considering the amount of benthic research that has been carried out in the northeast Atlantic over the past century. Nothing is known of their biology.

Bruce (2004b) mentioned a further species from shallow water off Zanzibar, noting that the whereabouts of the unique specimen was unknown. This is still the case, but some drawings of the specimen that I originally prepared have been located. Bruce (2004b) stated that the specimen was collected from intertidal coral reef pools. This was erroneous, the true habitat being 26 m off the reef edge. The single Zanzibar specimen here reported provides a further indication that the genus is not confined to deep waters and represents the first occurrence of

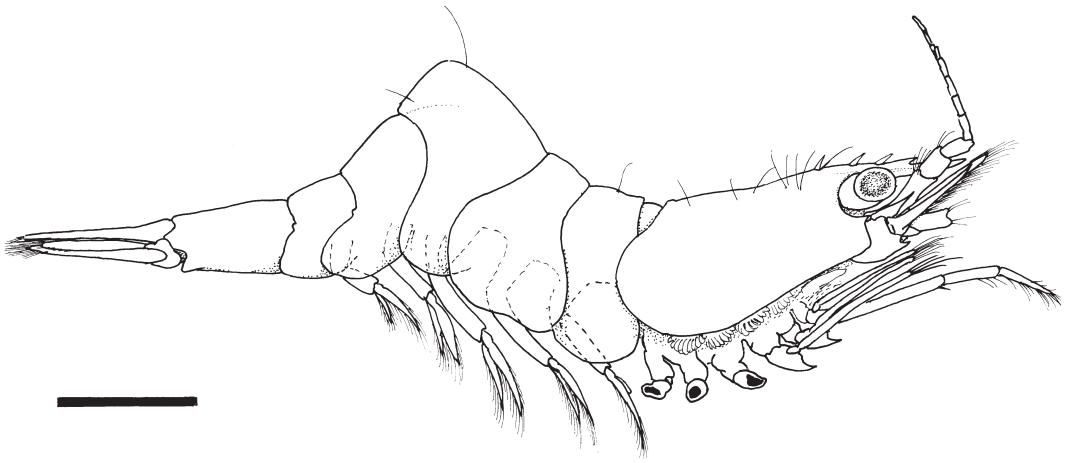

FIG. 1.*Bresilia* sp., ♂, Mnemba Island. Scale bar = 1.0mm.

this genus in the Indian Ocean and in a coral reef biotope. The annotated drawings indicate that the specimen does not belong to any of the described species, but, as a full description and a holotype specimen can not be provided, it is not formally provided with a name.

CL indicates the post-orbital carapace length.

Bresilia sp.
(Figs 1-3)

MATERIAL. 1♂, CL 1.25 mm, Mnemba Island, off NE Unguja, Zanzibar, reef edge, 26 m, 25 September 1995, coll. N.L. Bruce.

DESCRIPTION. Very small, slender, subcylindrical, caridean (Fig. 1). Rostrum (Fig. 2A) slender, about 5.0 times longer than proximal depth, about 0.7 of CL, straight, horizontal, acute, reaching to about distal end of intermediate segment of antennular peduncle, dorsal carina well developed, extending onto anterior carapace, with 5 teeth, first tooth distinctly postorbital, articulate, spiniform, second and third teeth similar, two smaller distal teeth acute, non-articulate; lateral carinae distinct; ventral margin sublinear, non-setose, two small acute teeth, situated close together, below fourth and fifth dorsal teeth. First dorsal rostral tooth with single slender seta immediately anteriorly. Carapace smooth, mainly glabrous, dorsal surface with 2 pairs of simple submedian gastric setae, sparse simple setae posteriorly, orbit feebly developed, inferior orbital angle not observed, antennal spine small, acute, pterygostomial angle bluntly rectangular. . Abdomen smooth, first tergite with median dorsal seta, third tergite strongly produced posteriorly, angular, with sparse submedian setae, pleura of first four segments broadly rounded, fifth bluntly angular, sixth segment about 0.75 of CL, 0.57 times longer than anterior depth, tapering slightly posteriorly, posterolateral and posteroventral angles small, acute. Telson about 0.85 of CL, with 2 pairs of small dorsal spines. Epistome (Fig. 2B) with long slender median process. Antennule without special features, distinctly exceeding rostrum, upper flagellum biramous with proximal 5 segments fused, lower ramus short. Antenna with basicerite with well developed ventrolateral tooth, carpocerite short, reaching to about half of scaphocerite length, scaphocerite well developed, lamina well exceeding rostrum, about 2.7 times longer than wide, with small distolateral tooth at about 0.8 of lateral margin length, lateral margin sublinear. Eye with well developed pigmented globular cornea, cornea about 0.2 of CL, stalk stout, width about 1.5 times corneal diameter. Mouthparts not examined. Third maxilliped endopod long and slender, basis with well developed plumose exopod. Pereiopods all missing, coxae without epipods, bases of first and second pereiopods with well developed plumose exopods; pereiopods 1-4 with pleurobranch. Fifth thoracic sternite with large acute broad median tooth, sixth and seventh each with pair of long slender submedian teeth, eighth with long tapering blunt median process. Pleopods and uropods without special features; second pleopod endopod with appendix masculina.

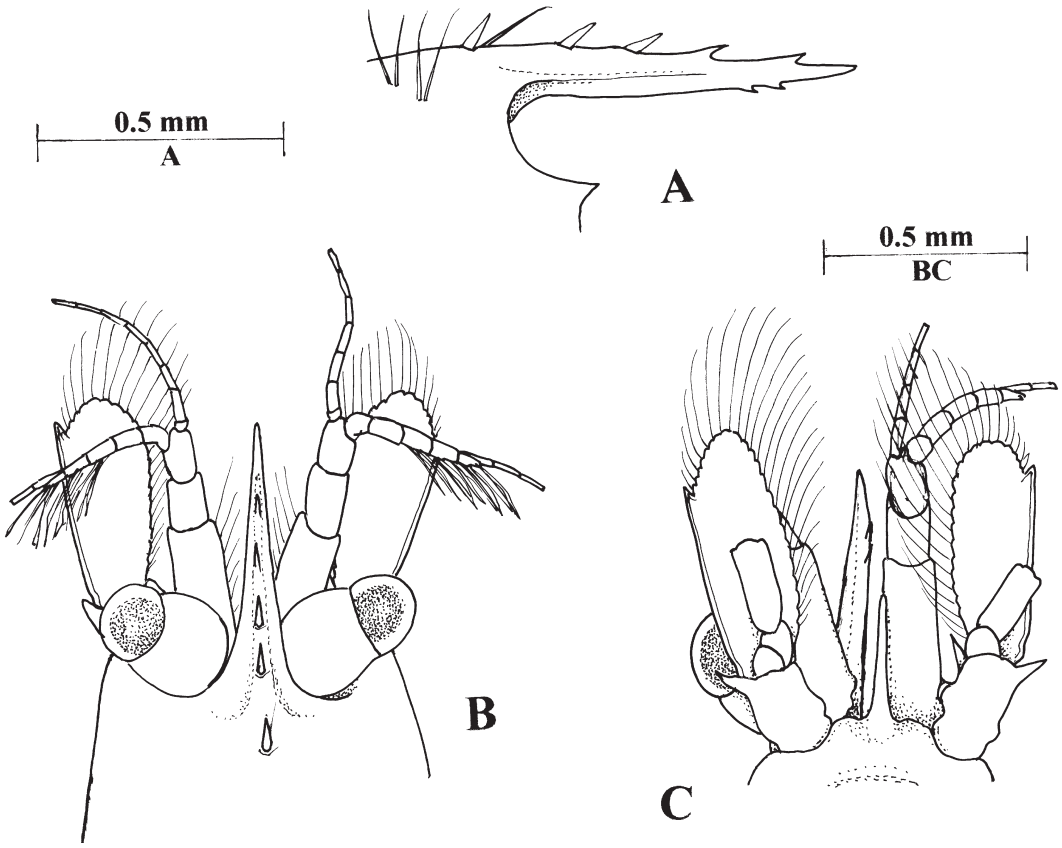

FIG. 2. *Bresilia* sp., ♂, Mnemba Island. A, rostrum. B, anterior carapace, eyes and antennal peduncles, dorsal. C, epistomal region, ventral.

SYSTEMATIC POSITION. This species may be distinguished from all other known species by its rostral dentition, 5/2, with the three articulated posterior teeth. In its incomplete state, it would be premature to assess its closest relationships. The sparse setation of the dorsal carapace and abdomen may be a further autapomorphic character but it is possible that similar setae may have been lost in the few other known specimens of this genus. This factor would not have occurred in the case of the several hand-collected specimens of *B. saldanhai* (Calado et al., 2004).

REMARKS. Although incomplete, the single specimen of *Bresilia* sp. emphasises the general morphological homogeneity of the species of *Bresilia.*

The original drawings of this specimen bear annotations suggesting re-examination of the pterygostomial angle and the posteroventral angles of the fourth and fifth pleura. This suggests that these might possibly have been acute, but probably not markedly so. Also noted was the presence of two pairs of small dorsal telson spines, but these were not shown on the drawing.

The epistomal process, first described in *B. antipodarum,* has now also been reported in *B. plumifera, B. saldanhai* and *B. briankensleyi.* It appears likely that it is a generic character, without parallel in the Caridea. It was not reported in the original description of the genus and attempts to locate and re-examine the type material in the collections of the Dublin Natural History Museum have been unsuccessful (pers. com., Julia Sigwart, 19 November 2004). The original description and partial re-descriptions of *Encantada spinoculata* (Wicksten, 1989 ; Bruce, 1990) did not report on the presence or absence of

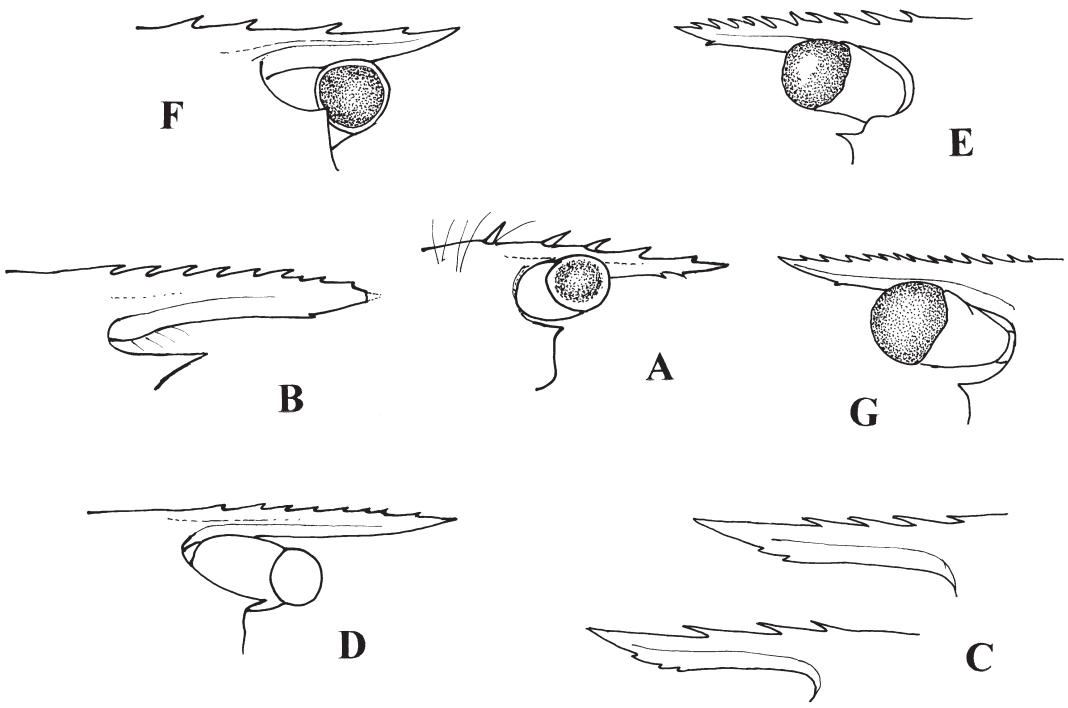

FIG. 3.*Bresilia* species, rostra, not to scale. A, *Bresilia* sp., Mnemba Island. B, *Bresilia antipodarum* Bruce (redrawn after Bruce, 1990). C, *Bresilia atlanticum* Calman, (redrawn after Calman, 1896). D, *Bresilia briankensleyi* Bruce, (redrawn after Bruce, 2004b). E, *Bresilia corsicana* Forest & Cals, (redrawn after Forest, & Cals, 1977). F, *Bresilia plumifera* Bruce, (redrawn after Bruce, 1990a). G,. *Bresilia saldanhai* Calado et al. (redrawn after Calado et al., 2004).

an epistomal process. Its presence in *Encantada spinoculata* has now been confirmed, in which "it's neither as long, nor as robust as the example you have given me. It looks to be about half the length and much more delicate than the one you've illustrated (i.e., *Bresilia* sp., Fig. 2C)" (pers.com., R. Van Syoc, 21 September 2005). Its presence in *Encantada* further supports the inclusion of that genus in the Bresiliidae.

It was also not described in the original description of *B. corsicana.* This specimen is now in very poor condition and the presence or absence of the epistomal process can not be ascertained (Xinzheng Li, pers. com., 2 Nov. 2004). The specimen of *B. atlantica* noted by Komai & Segonzac (2003) is in a similar state (Xinzheng Li, pers. com., 2 Nov. 2004). The collection locality of this specimen is obscure but it was collected on 12 September 1901, from 1225-1262m depth, similar to the type material (1372m, Calman, 1896). The epistomal process has been confirmed in *B. antipodarum, B. plumifera, B. briankensleyi, B. saldanhai* and the present *Bresilia* sp.

Specimens of *Bresilia* seem particularly prone to the loss of pereiopods. The second to fifth pereiopods of *B. plumifera* are unknown, as are all pereiopods of *B. briankensleyi* and *Bresilia* sp. The holotype of *B. antipodarum* also lacked ambulatory pereiopods, but these have now been described (Bruce, 2004). The following key may facilitate the identification of pereiopod-free specimens, but in all cases careful comparison with the available descriptions should be made and confirmatory characters should be sought. The genus *Bresila* is clearly widespread, occurring in the Northeast Atlantic and western Mediterranean, the Red Sea, western Indian Ocean and western Pacific Ocean, over a wide bathymetric range, so that the collection of further new species of the genus must be considered likely.

With the re-assessment of the position of *Encantada,* the Bresilioidea now appears as follows:

Bresiliidae Calman, 1896
Bresilia Calman. 1896; *Encantada* Wicksten, 1989

Disciadidae Rathbun, 1902
Discias Rathbun, 1902; *Lucaya* Chace, 1939; *Tridiscias* Kensley, 1983

Agostocarididae Hart & Manning, 1986
Agostocaris Hart & Manning, 1986

Alvinocarididae Christoffersen, 1986
Alvinocaris Williams & Chace, 1982; *Rimicaris* Williams & Rona, 1986; *Chorocaris* Martin & Hessler, 1990; *Opaepele* Williams & Dobbs, 1995; *Mirocaria* Vereshchaka, 1997

Pseudochelidae De Grave & Moosa, 2004
Pseudocheles Chace & Brown, 1978

Incertae sedis
Kirnasia Burukovsky, 1988

A KEY FOR THE PROVISIONAL IDENTIFICATION OF *BRESILIA* SPECIES, BASED ON ROSTRAL CHARACTERS (Fig. 2)

1. Rostral dentition 5/2, first tooth postorbital, first three teeth articulated (carapace and first and third abdominal tergites with sparse slender setae dorsally; third tergite produced, angular, fifth pleuron unarmed, telson with 2 pairs of dorsal telson spines) . . . . . *Bresilia* sp.
   Rostrum without articulated teeth (carapace and abdomen glabrous) 2
2. Rostrum without postorbital teeth (third abdominal tergite dorsally produced, angular 3
   Rostrum with postorbital teeth 4
3. Rostrum slender, 0.77 of postorbital carapace length, dentition 8/0 (telson unknown) . . . . . *B. briankensleyi* Bruce, 2004
   Rostrum deeper, 0.66 of postorbital carapace length, dentition 9/1 (telson with 4 pairs of dorsal spines) . . . . . *B. antipodarum* Bruce, 1990b
4. Rostrum short, 0.31 of postorbital carapace length, first tooth markedly postorbital, second tooth slightly postorbital, dentition 4/0 (third abdominal tergite dorsally produced, angular, telson with 3+ (?) pairs of dorsal spines) . . . . . *B. plumifera* Bruce, 1990a
   Rostrum longer, first tooth slightly postorbital, ventral rostral teeth present, (third abdominal tergite dorsally gibbous) 5
5. Rostrum 0.52 of postorbital carapace length, elevated, rostral dentition 3-4/2-3 (7 pairs of dorsal telson spines) . . . . . *B. atlantica* Calman, 1896
   Rostrum with more than five dorsal rostral teeth, horizontal, not elevated, single ventral tooth only . . . 6
6. Rostrum 0.64 of postorbital carapace length, rostral dentition 10/1 (5 pairs of dorsal telson spines) . . . . . *Bresilia corsicana* Forest and Cals, 1997
   Rostrum 0.55 of postorbital carapace length, rostral dentition 10-13/1-2 (6-7 pairs of dorsal telson spines) . . . . . *Bresilia saldanhai* Calado et al., 2004

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