



## A new species of the rare caridean genus *Bresilia* Calman (Crustacea: Decapoda: Bresiliidae) from the Ryukyu Islands, Japan, representing a family new to the North Pacific marine fauna

TOMOYUKI KOMAI<sup>1</sup> & YUSUKE YAMADA<sup>2</sup>

<sup>1</sup>Natural History Museum and Institute, Chiba, 955-2 Aoba-cho, Chuo-ku, Chiba, 260-8682 Japan. E-mail: komai@chiba-muse.or.jp

<sup>2</sup>Ishikawa, Uruma, Okinawa, 904-1115 Japan

### Abstract

A new species of the rare caridean genus *Bresilia* Calman, 1896, *B. gibbosa*, is described and illustrated on the basis of one ovigerous female and one male specimens collected from a shallow water marine cave in Okinawa Island, Ryukyu Islands, Japan. The new species is morphologically similar to *B. antipodarum* Bruce, 1990, *B. briankensleyi* Bruce, 2005, *B. plumifera* Bruce, 1990 and *B. saldanhai* Calado, Chevaldonné & dos Santos, 2004 in the strongly produced third abdominal tergite, the presence of a long epistomal process, and the presence of an exopodal flagellum on the first maxilliped, but is easily distinguished from all these allied species by the possession of movable spines in the dorsal rostral series and the angular, instead of spinose, pterygostomial margin of the carapace. This new species is the first representative of Bresiliidae from the North Pacific Ocean.

**Key words:** Crustacea, Decapoda, Caridea, Bresiliidae, *Bresilia*, new species, Okinawa, marine cave

### Introduction

The genus *Bresilia* Calman, 1896 is one of the most rare taxa in the Caridea. Currently, six species are known from the world (Bruce 2005b; De Grave *et al.* 2009): *B. atlantica* Calman, 1896, known from off Ireland, Northeastern Atlantic, at depths of 1229–1372 m (type species of the genus) (Calman 1896; Kemp 1910; Komai & Segonzac 2003); *B. corsicana* Forest & Cals, 1977 from the western Mediterranean Sea at a depth of 450 m (Forest & Cals 1977); *B. antipodarum* Bruce, 1990 known from off eastern Tasmania and New Caledonia, at depth of 800 m (Bruce 1990a; 2004); *B. plumifera* Bruce, 1990 known only from off western Tasmania, at depth of 133 m (Bruce 1990b); *B. saldanhai* Calado, Chevaldonné and dos Santos, 2004 from a marine cave at a depth of 15 m, on the island of Madeira (Calado *et al.* 2004); and *B. briankensleyi* Bruce, 2005 from the Egyptian Red Sea at depths of 750–753 m (Bruce 2005a). In addition, Bruce (2004; 2005b) reported an undescribed species from shallow water off Zanzibar, noting that the whereabouts of the specimen was unknown. Calado *et al.* (2004) provided a review of the four species known at that time. Bruce (2005a, b) also gave an overview of the genus. In spite of the rather wide geographical distribution, no species of the genus is known from the North Pacific Ocean.

In this study, a new species of *Bresilia*, *B. gibbosa*, representing the first known species of the genus, as well as the family Bresiliidae, from the North Pacific Ocean, is described on the basis of one ovigerous female and one male specimens collected from a shallow water marine cave in Okinawa Island, Ryukyu Islands, Japan. *Bresilia gibbosa* n. sp. is morphologically similar to *B. antipodarum*, *B. briankensleyi*, *B. plumifera* and *B. saldanhai*. Characters differentiating these species are discussed. Possible heterogeneity of the genus is also briefly discussed.

## Material and methods

The type specimens were collected by the junior author (YY) during SCUBA diving, and preserved in 70% ethanol. They are deposited in the Natural History Museum and Institute, Chiba (CBM). For observation of details of surface structure, the specimens were stained with methylene blue solution. The postorbital carapace length (cl) is used as an indication of the size of specimens.

## Taxonomic account

### Genus *Bresilia* Calman, 1896

**Remarks.** The family Bresiliidae is presently composed of two genera, *Bresilia* (containing seven described species, including the new species described in this study) and *Encantada* Wicksten, 1989 (monotypic, including only *E. spinoculata* Wicksten, 1989 from the eastern Pacific). The six previously known species of *Bresilia* can be arranged in two groups based on the development of the epistomal process, the presence or absence of an exopodal flagellum on the first maxilliped and the structure of the third abdominal tergite. The first group, named here as *B. atlantica* group, is characterized by the lack of an epistomal process, the absence of an exopodal flagellum on the first maxilliped and the smooth, gently convex tergum of the third abdominal somite. Two species, *B. atlantica* and *B. corsicana*, are referred to this group. The second, *B. antipodarum* group, is characterized by the possession of an elongate epistomal process, the presence of an exopodal flagellum on the first maxilliped and the strongly produced, sometimes laterally compressed tergum of the third abdominal somite. This group contains four species, *B. antipodarum*, *B. briankensleyi*, *B. plumifera* and *B. saldanhai*. The new species described in this study is also referable to the *B. antipodarum* group. Bruce (2005b) suggested the possible taxonomic significance of the development of the epistomal process. It is remarkable that *E. spinoculata* shows similarity to the *B. antipodarum* group in the dorsally carinate third abdominal tergite and the presence of exopodal flagellum on the first maxilliped (Wicksten 1989; Bruce 1990a). Future study may eventually reveal that these two groups warrant full generic status.

### *Bresilia gibbosa* n. sp.

[new Japanese name: Manza-sekiyou-ebi]

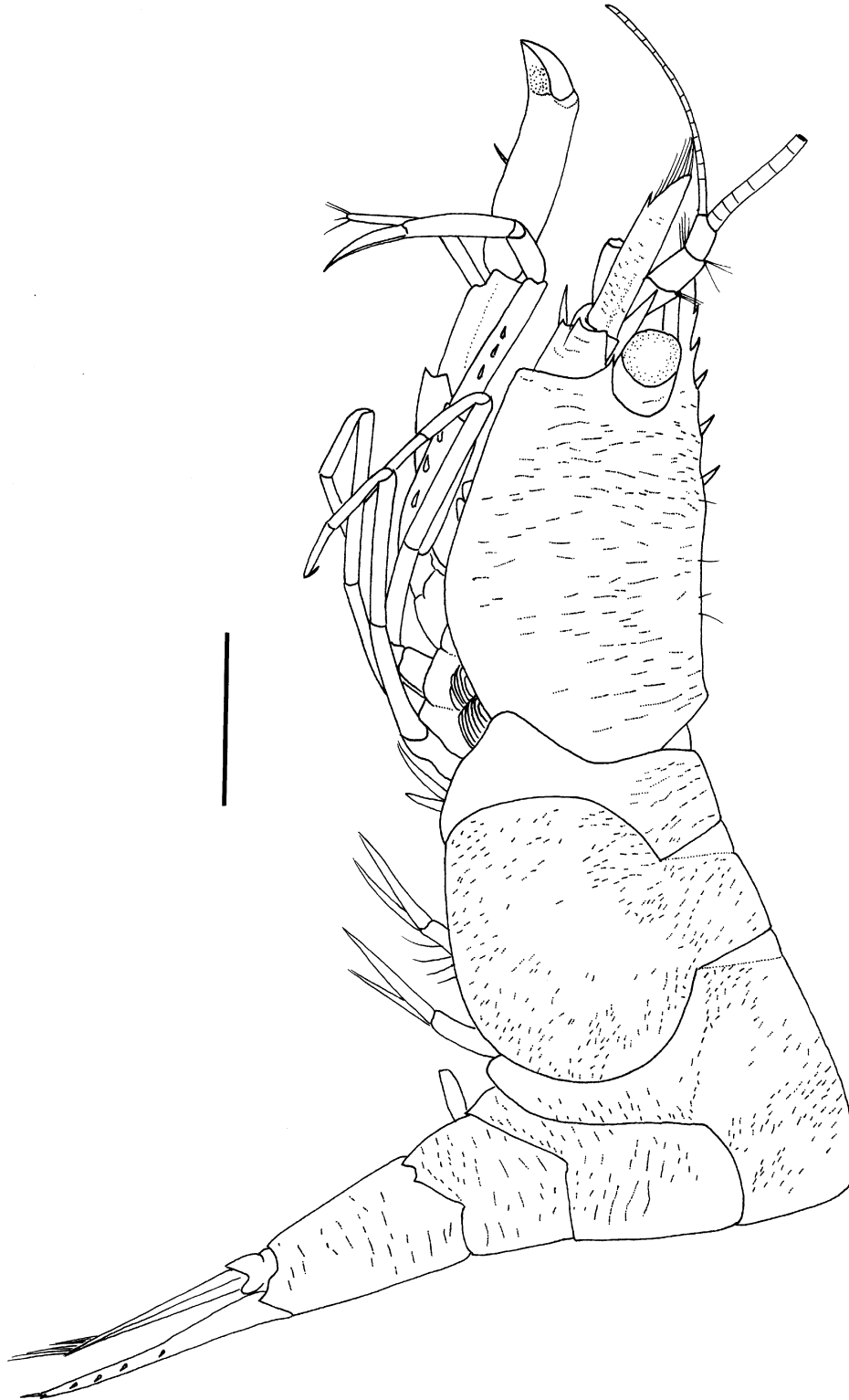
(Figs. 1–5)

**Material examined.** Holotype: ovigerous female (cl 1.6 mm), CBM-ZC 9868, Apo-gama Cave, Onna Village, Okinawa Island, Ryukyu Islands, 30 m, 28 January 2010, coll. Y. Yamada. Paratype: male (cl 1.3 mm), CBM-ZC 9869, same locality, 9 February 2010, coll. Y. Yamada.

**Diagnosis.** Body integument with numerous short to very short, transverse or obliquely transverse striae. Rostrum about 0.6 times as long as carapace, nearly straight or slightly curved dorsally, reaching distal margin of antennular peduncle; dorsal margin armed with 6 or 7 spines, including 2 on carapace, posterior 3 or 4 spines basally articulated, posteriormost spine located at about 0.2 of carapace length; ventral margin with 2 or 3 spines on distal 0.3. Carapace with pterygostomial margin angulate. Third abdominal tergite strongly produced, but not carinate. Fourth abdominal pleuron with small posteroventral spine, fifth pleuron with 2 posterolateral spines. Telson with 5 pairs of dorsolateral spines; posterior margin narrowly convex, with 2 unequal pairs of spines. Epistome with elongate, acute median process. Eye tapering distally, cornea narrower than eyestalk, distinctly faceted, lightly pigmented. Third segment of antennal peduncle without elongate seta. First maxilliped with well-developed exopodal flagellum. First pereopod with ischium bearing sharply pointed distoventral angle; palm with 1 spine at midlength of ventral margin, but without grooming setae. Second pereopod with tips of fingers bearing tuft of minute setae.

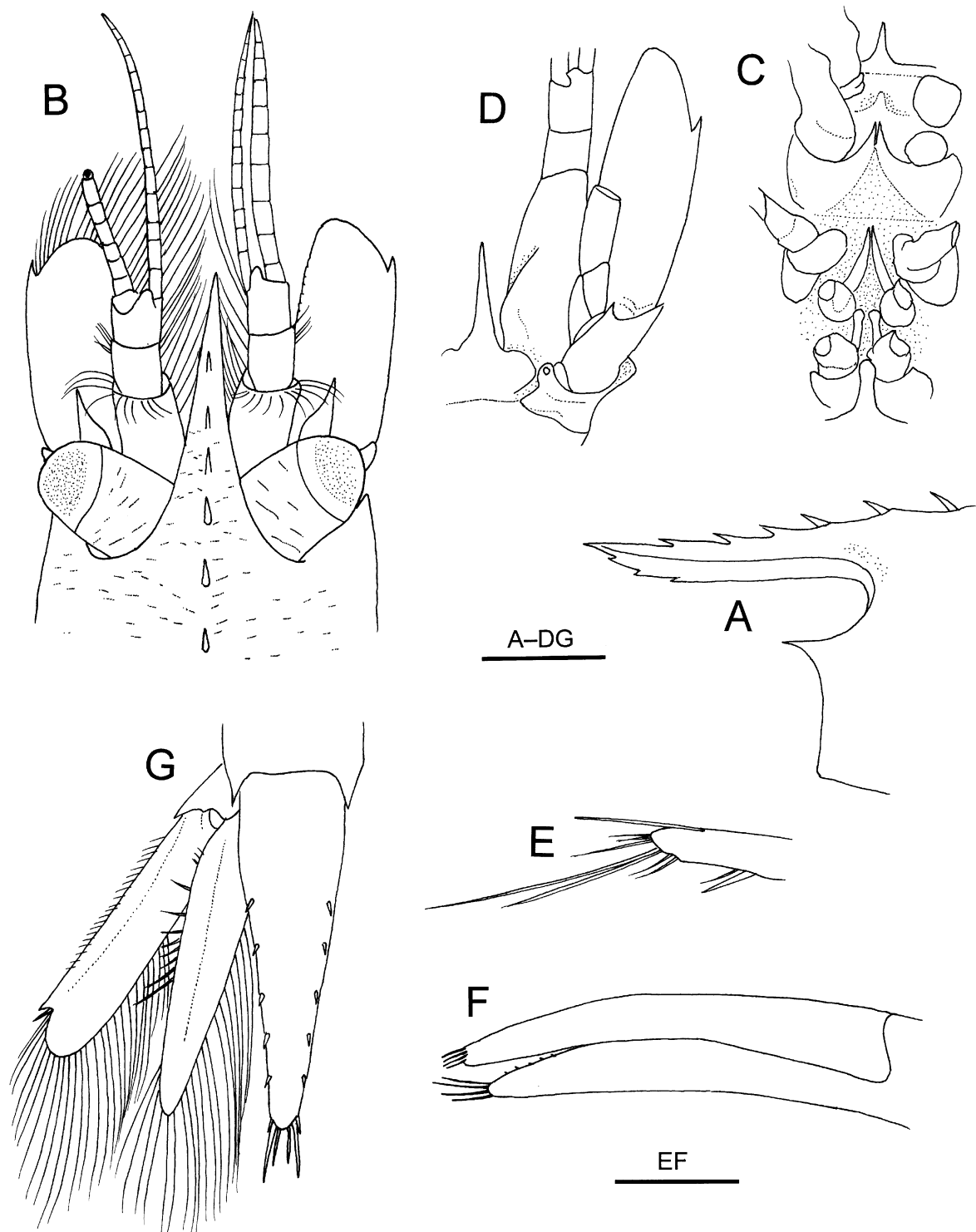
**Description.** *Female holotype.* Body (Fig. 1) moderately slender, generally subcylindrical; integument not firm. Rostrum (Fig. 2A, B) slender, slightly widened at base, about 0.6 of carapace length, directed forward,

nearly straight, reaching distal end of antennular peduncle; dorsal margin with 6 teeth, of them posterior 3 basally articulated, posteriormost one located at about 0.2 of carapace length; ventral margin linear, with 3 tiny teeth on distal 0.3; lateral carina sharp, merging into orbital margin. Carapace (Fig. 1) with numerous, scattered, short transverse striae on surfaces; dorsal surface rounded, straight in lateral view, with few setae medially; orbital margin evenly concave; antennal tooth moderately strong, acuminate (Fig. 2A); pterygostomial margin rectangular, without tooth (Fig. 2A).

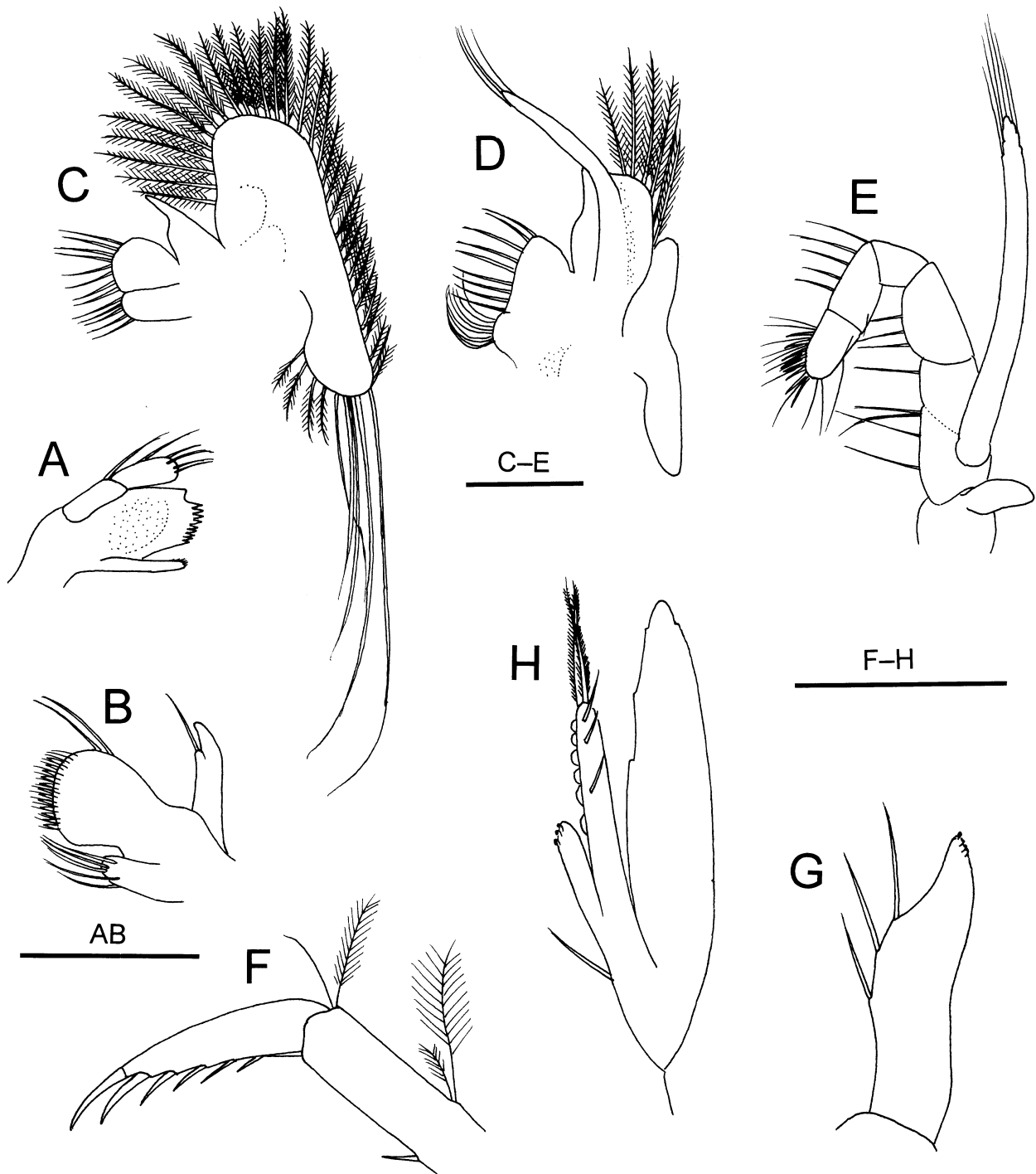


**FIGURE 1.** *Bresilia gibbosa* n. sp., holotype, ovigerous female (cl 1.6 mm), CBM-ZC 9868. Entire animal in lateral view. Scale bar: 1 mm.

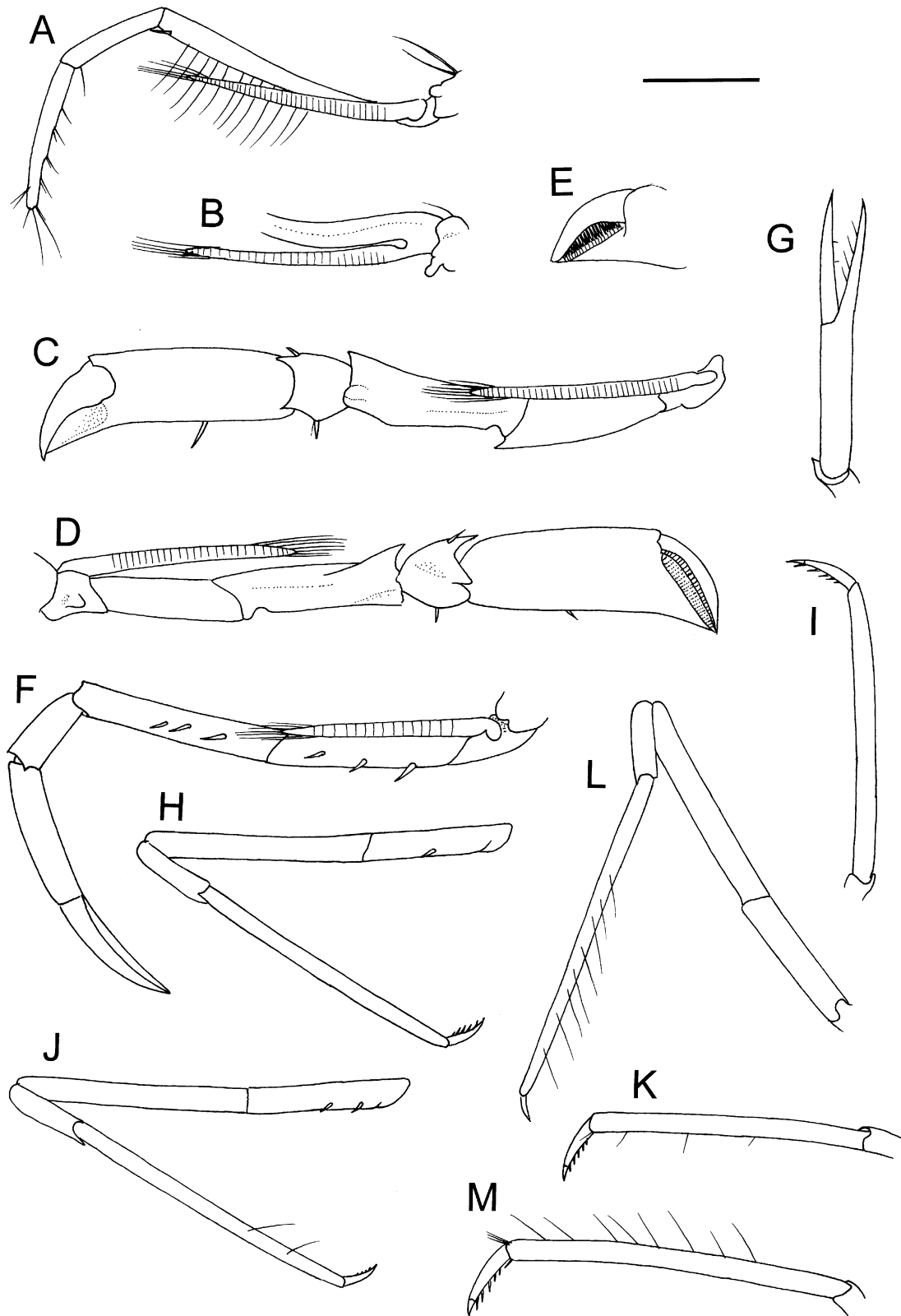
Thoracic sternum (Fig. 2C) very narrow; third sternite with sharp median tooth directed anteriorly; fourth sternite with short median carina; fifth sternite with submedian pair of small teeth; sixth and seventh each with pair of long, slender processes, those on sixth sternite acute, those on seventh terminally rounded; eighth with terminally blunt median process, slightly dilated and dorsoventrally flattened distally.



**FIGURE 2.** *Bresilia gibbosa* n. sp., holotype, ovigerous female (cl 1.6 mm), CBM-ZC 9868. A, rostrum and anterior part of carapace, lateral view; B, rostrum, anterior part of carapace and cephalic appendages, dorsal view (setae partially omitted; distal part of outer flagellum of left antennule broken off); C, third to eighth thoracic sternites, ventral view (left pereopods and right fourth and fifth pereopods removed); D, epistome and left antennae, ventral view (setae and antennular flagella omitted; antennal flagellum missing); E, close up of distal part of ultimate segment of third maxilliped, lateral view; F, close up of fingers of second pereopod, lateral view; G, telson and left uropod, dorsal view. Scale bars: 0.5 mm for A–D, G; 0.25 mm for E, F.



**FIGURE 3.** *Bresilia gibbosa* n. sp. A–E, holotype, ovigerous female (cl 1.6 mm), CBM-ZC 9868; F–H, paratype, male (cl 1.3 mm), CBM-ZC 9869. Left appendages. A, mandible, inner view; B, maxillule, outer view; C, maxilla, outer view (proximal endite broken off); D, first maxilliped, outer view; E, second maxilliped, outer view; F, dactylus and distal part of propodus of third pereopod, lateral view; G, endopod of first pleopod, dorsal view; H, endopod and appendices internal and masculina of second pleopod, ventral view (setae on endopod omitted). Scale bars: 0.25 mm.



**FIGURE 4.** *Bresilia gibbosa* n. sp., holotype, ovigerous female (cl 1.6 mm), CBM-ZC 9868. Left appendages. A, third maxilliped, lateral view; B, same, proximal part of antepenultimate segment of endopod and exopod, dorsal view; C, first pereopod, lateral view; D, same, dorsomesial view; E, same, fingers, ventrolateral view; F, second pereopod, lateral view; G, same, chela, extensor view; H, third pereopod, lateral view; I, same, propodus and dactylus, lateral view; J, fourth pereopod, lateral view; K, same, propodus and dactylus, lateral view; L, fifth pereopod, lateral view; M, same, propodus and dactylus, lateral view. Scale bar: 0.5 mm.

Abdomen (Fig. 1) also with covering of short to very short, transverse or obliquely transverse striae; terga all rounded dorsally, but third tergite strongly produced posterodorsally, angular in lateral view; few setae on third tergite (setae missing). Pleura of anterior three somites broadly rounded, fourth pleuron with small, sharp posteroventral tooth, fifth pleuron with 2 small teeth posterolaterally. Sixth somite tapering posteriorly in lateral view, about 0.6 times as long as carapace, 1.8 times longer than fifth somite, and 1.3 times longer than proximal height; posterolateral process terminating in acute tooth; posteroventral tooth very small. Telson (Fig. 2G) about 1.5 times longer than sixth somite, tapering distally to narrowly convex posterior margin; dorsal surface nearly flat, with 6 pairs of lateral spines including 1 pair at posterolateral angle; posterior margin with 2 pairs of long, unequal spines (mesial pair shorter than lateral pair).

Epistome (Fig. 2D) with very long, slender median process, visible even in lateral view.

Eye (Fig. 2B) stout, weakly tapering to cornea; cornea small, well-faceted, but devoid of dark pigmentation; eyestalk with scattered transverse striae.

Antennular peduncle (Fig. 2B, D) reaching distal 0.2 of antennal scale. First segment with fringe of stiff setae directed dorsally or laterally; ventral surface slightly thickened mesially, unarmed; stylocerite terminating in sharp tooth, reaching distal margin of first segment. Distal two segments cylindrical, combined length shorter than first segment; third segment slightly shorter than second segment. Outer flagellum uniramous, consisting of about 10 articles, subequal in length to peduncle; inner flagellum subequal in length to outer flagellum, more slender.

Antennal peduncle (Fig. 2D) with stout basicerite bearing small ventrolateral and ventrodorsal teeth. Third segment without prominent plumose seta. Carpocerite (fifth segment) cylindrical, reaching midlength of antennal scale. Antennal scale (Fig. 2B, D) elongate oval, about 0.6 times as long as carapace, about 1.8 times longer than wide; dorsal surface with scattered very short transverse striae; lateral margin slightly convex, terminating in small, acute distolateral spine; distal lamella strongly produced, far overreaching distolateral spine. Flagellum shorter than body (missing at time of examination).

Mandible (Fig. 3A) with broad incisor process bearing 9 closely set, acute teeth on mesial margin and 1 somewhat remote tooth at distomesial angle; molar process very slender, extending as far as incisor process, bearing row of microscopically minute setae distally; palp broad, 2-articulated, proximal article with 1 seta at outer angle; distal article subequal in length to proximal article, with several stiff setae on roundly truncate terminal margin. Maxillule (Fig. 3B) with moderately stout, short proximal endite bearing stiff setae distally; distal endite broadly oval, with double row of spiniform setae on mesial margin partially obscured by longer stiff setae; endopod divided in two unequal lobes terminally, mesial lobe very short, bearing apical bristle, lateral lobe elongate. Maxilla (Fig. 3C) with broad distal endite; proximal endite lost during dissection; endopod broad basally, but abruptly tapering distally at midlength, curved mesially; scaphognathite moderately broad, anterior lobe broadly rounded, posterior lobe rounded, not particularly elongate, bearing some greatly elongate setae posteriorly. First maxilliped (Fig. 3D) with endites apparently fused; endopod moderately slender, rather abruptly tapering distally at about midlength, reaching base of exopod; exopod with moderately broad caridean lobe and well-developed flagellum; epipod large, faintly bilobed. Second maxilliped (Fig. 3E) with endopod sub-pediform; coxa with small epipod lacking podobranch; basis and ischium incompletely fused (suture still discernible); merus with convex mesial margin; carpus short, but not cup-like; propodus with stiff setae on mesial margin; articulation between propodus and dactylus transverse, not oblique; dactylus subequal in length to propodus, rounded terminally, bearing short stiff setae distomesially. Third maxilliped (Fig. 4A) slender, reaching distal margin of antennal scale, consisting of 4 segments; coxa with small, papilla-like epipod (Fig. 4B); antepenultimate segment longest, sinuously curved in dorsal view, with 1 slender spiniform seta near ventrolateral angle; ultimate segment about 1.3 times longer than penultimate segment, slightly tapering distally to blunt tip, with sparse tufts of stiff setae and 2 long subterminal setae on ventral (flexor) margin (Fig. 2E); exopod flagellum-like, falling short of distal margin of antepenultimate segment, bearing terminal tuft of setae.

First pereopod (Figs. 1, 4C–E) overreaching antennal scale by about half length of chela; articulation between basis and ischium distinct; ischium widened distally, distoventral angle produced, terminating in small tooth; merus slightly widened distally, dorsodistal margin produced in strong tooth, ventral margin with

distinct notch proximally adjacent to articulation to ischium; carpus short, cup-like, dorsal surface with 1 subterminal spine, ventral surface with 1 spine located at midlength, dorsodistal and ventrolateral distal angles produced in strong teeth, distomesial margin with 1 prominent triangular process; chela about 0.8 times as long as carapace; palm oval in cross section, slightly increasing in depth distally, armed with 1 long spine at midlength of ventral margin; fingers somewhat deflexed, forming deep concavity on outer side (Fig. 4E), terminating in acute tips; cutting edge of fixed finger bordered by thin chitinous plate; inner side of chitinous plate with fossae to accommodate chitinous spines on cutting edge of dactylus; dactylus curving, about 0.6 times as long as palm, cutting edge pectinate with row of small chitinous spines; exopod flagellum-like, overreaching distal margin of ischium. Second pereopod (Fig. 4F, G) slender, overreaching antennal scale by half length of chela; ischium with 3 spines on lateral face; merus subequal in length to ischium, with row of 3 spines on lateral surface; carpus about 0.4 times as long as chela, with tiny distolateral spine; chela slightly arcuate in lateral view; fixed finger very slightly deflexed in extensor view, with sparse microscopically minute spinules on cutting edge, tipped by tuft of minute setae (Fig. 2F); dactylus slightly shorter than palm, tapering to acute tip, slightly curving in lateral view, tipped by tuft of minute setae, cutting edge with row of microscopically minute spinules (Fig. 2F); exopod flagellum-like, reaching to distal margin of ischium, with terminal tuft of setae. Third to fifth pereopods lacking exopod. Third pereopod (Fig. 4H, I) falling short of distal margin of antennal scale; ischium with 1 spine on lateral surface at midlength; merus longer than ischium, unarmed; carpus about 0.3 times as long as propodus; propodus with few setae and few spinules on flexor margin (distalmost one located at distal margin); dactylus slightly curving, 0.25 times as long as propodus, terminating in sharp unguis, bearing 5 accessory spinules over entire length of flexor margin. Fourth pereopod (Fig. 4J, K) with ischium bearing 2 spines on lateral surface, otherwise similar to third pereopod. Fifth pereopod (Fig. 4L, M) with ischium unarmed; propodus with row of long setae on dorsal (extensor) margin.

**TABLE 1.** *Bresilia gibbosa* n. sp. Gill formula. r: rudimentary.

Thoracic somites	1	2	3	4	5	6	7	8
	Maxillipeds			Pereopods				
Appendages	1	2	3	1	2	3	4	5
Pleurobranchs	0	0	0	1	1	1	1	0
Arthrobranchs	0	0	0	0	0	0	0	0
Podobranchs	0	0	0	0	0	0	0	0
Epipods	1	1	r	0	0	0	0	0
Exopods	1	1	1	1	1	0	0	0

Gill formula summarized in Table 1. Pleurobranch on seventh thoracic somite very large, but other pleurobranchs greatly diminishing in size anteriorly.

Pleopods without distinctive feature. Uropod (Fig. 2G) falling short of tip of telson; endopod slender, tapering distally, with row of stiff setae directed laterally on lateral margin anterior to midlength; exopod slightly shorter than endopod, not tapering distally, bearing sharp posterolateral spine and 1 slender spine just mesial to posterolateral spine, distal lamella rounded; protopod sharply pointed posterolaterally.

Eggs about 0.4 mm in diameter (about 0.25 of carapace length); number not precisely counted, but about 20.

*Male paratype.* Generally similar to female holotype. Rostrum with 7 teeth on dorsal margin including 2 on carapace, posterior 4 basally articulated; ventral margin with 3 small teeth. Dactyli of third to fifth pereopods each with 5 accessory spinules as in holotype (Fig. 3F). Endopod of first pleopod (Fig. 3G) tapering distally to rather slender distal part; lateral margin strongly sinuous, with 3 simple stiff setae at around midlength; mesial margin also sinuous, with few adhesive hooks distally. Second pleopod with endopod (Fig. 3H) bearing sparse setae marginally; appendix masculina distinctly longer than appendix interna, bearing 2 setulose elongate setae apically and 3 simple spiniform setae directed outward on distal half of dorsal surface; 1 spiniform seta proximal to base of appendices interna and masculina.





**FIGURE 5.** *Bresilia gibbosa* n. sp., underwater photographs in situ, showing living animals. A, holotype, ovigerous female (cl 1.6 mm), CBM-ZC 9868; B, paratype, male (cl 1.3 mm), CBM-ZC 9869. Photography by Y. Yamada.

**TABLE 2.** Comparison among five species of the *Bresilia antipodarum* group.

Characters/species	<i>B. gibossa</i> n. sp.	<i>B. antipodarum</i>	<i>B. briankensleyi</i>	<i>B. plumifera</i>	<i>B. saldanhai</i>
Rostrum					
Extension	reaching distal margin of antennular peduncle	reaching nearly to distal margin of first segment of antennular peduncle	reaching nearly to distal end of antennular peduncle	not reaching distal margin of first segment of antennular peduncle	reaching to distal margin of second segment of antennular peduncle
Armature on dorsal margin	with 6 or 7 teeth, posterior 3 or 4 basally articulated, 2 on carapace	with 9 small teeth, all fixed, none on carapace	8 small teeth, all fixed, none on carapace	4 small teeth, all fixed, 1 on carapace	10-13 small teeth, all fixed, 1 on carapace
Pterygostromial angle of carapace	angular	with sharp tooth	with sharp tooth	with sharp tooth	with sharp tooth
Abdomen					
Third tergite	non-carinate	carinate	carinate	carinate	non-carinate
Fourth pleuron	with posteroventral tooth	with posteroventral tooth	rounded	rounded	with posteroventral tooth
Fifth pleuron	with 2 teeth posteriorly	with posteroventral tooth	with posteroventral tooth	with posteroventral tooth	with 2 teeth posteriorly
Telson posterior margin	narrowly convex	angulate	no information	no information	truncate
Antennal peduncle	third segment without elongate plumose seta	third segment without elongate plumose seta	third segment without elongate plumose seta	third segment with elongate plumose seta	third segment with elongate plumose seta
Third maxilliped	without elongate seta at dorsodistal margin of antepenultimate segment	no information	no information	with elongate plumose seta at dorsodistal margin of antepenultimate segment	without elongate seta at dorsodistal margin of antepenultimate segment
First pereopod					
Ischium	terminating in acute tooth distoventrally	terminating in acute tooth distoventrally	no information	terminating in acute tooth distoventrally	rounded, non-produced at distoventral margin
Ventral surface of palm	with only 1 long movable spine located at midlength	with 3 transverse rows of grooming setae	no information	with 3 transverse rows of grooming setae and 1 movable spine at midlength	with 2 transverse rows of grooming setae and 1 movable spine located distal to midlength
Distribution	Okinawa Island, Ryukyus	Tasman Sea, Australia and New Caledonia	Egyptian Red Sea	Tasman Sea, Australia	Madeira, northeast Atlantic
Depth range	30 m	770–830 m	750–753 m	133 m	15 m

**Color in life.** See Fig. 5. Body whitish or transparent; cephalothorax reddish or orangish ventrally; third abdominal tergite with white patch and reddish brown spot laterally. Cornea of eye light yellowish gray. Antennular flagellum whitish. Antennal also whitish; flagellum generally brown, with narrow white bands. Pereopods generally transparent, but chela of first pereopod generally whitish; bases of third to fifth pereopods with tinge of reddish brown. Eggs yellow.

**Size.** Ovigerous female cl 1.6 mm; male cl 1.3 mm.

**Distribution.** Known only from Okinawa Island, Ryukyu Islands, Japan; found in marine cave at depth of 30 m.

**Ecology.** The two specimens were collected at about 5 m from the entrance of the cave. They were found under rocks on a substrate consisting mainly of coral rubble. When disturbed, the shrimp moved forward slowly. The holotype moved its first pereopods horizontally during brief observation in situ, although the function is unknown. Other fauna found in the same habitat included *Acanthanas* sp. (Caridea: Alpheidae), *Calaxius* sp. (Axiidea: Axiidae), *Pylopaguropsis fimbriata* McLaughlin and Haig, 1989 and *P. speciosa* McLaughlin and Haig, 1989 (Anomura: Paguridae). It is unclear if the new species is endemic to cave environment, but the small cornea on the distally tapering eyestalk and the lack of dark pigments may be suggestive that the new species prefers aphotic environment.

**Remarks.** *Bresilia gibbosa* **sp. nov.** is readily distinguished from other four species of the *B. antipodarum* group in the posterior three or four spines on the dorsal rostral series being movable and the angular pterygostomial angle of the carapace. In other four species, the dorsal rostral spines are all fixed; and the pterygostomial angle terminates in an acute tooth. Other differentiating characters are summarized in Table 2. Furthermore, *Bresilia gibbosa* is very similar to *Bresilia* sp. reported by Bruce (2005b), particularly in having three spines of the rostral dorsal series and an angulated pterygostomial margin of the carapace. Nevertheless, the present two specimens differs from the specimen reported by Bruce (2005b) in the lack of prominent setae on the dorsum of the carapace and abdomen, spinose pleura of the fourth and fifth somites and the possession of six pairs of dorsolateral spines on the telson, instead of two pairs. Nevertheless, Bruce (2005b) noted that his original drawings bore annotations suggesting re-examination of the pterygostomial angle and the posteroventral angles of the fourth and fifth abdominal pleura. It is difficult to further comment on the identity between the present specimens and the specimen reported by Bruce (2005b), because the whereabouts of Bruce's specimen remains unknown.

The present new species has characteristic transverse striae on the body integument, but this character is not known in other species of *Bresilia*. Nevertheless, without staining, the transverse striae will be easily overlooked. It needs to be verified if the transverse striae are really absent in other congeneric species.

Previously, *Bresilia* was considered to be a deep-water genus, but the recent studies (Bruce 1990b; Calado et al. 2004) have shown that the genus occurs in rather various environments: *Bresilia plumifera* was collected at sublittoral zone (133 m deep); *B. saldanhai* and the present new species occur in shallow water caves. *Bresilia* sp. of Bruce (2005b) was recorded at a reef edge of 27 m depth, although the habitat was not clearly indicated. There is little doubt that the genus is more widespread than we have suspected. One of the reasons of the rareness of the genus may be due to the small size and the free but cryptic habitats. The two specimens of the present new species were found to live under rocks, where collection is possible only by SCUBA divers. As mentioned above, this new species is the first species of Bresiliidae to be known from the North Pacific Ocean. It is clearly suggested that the cryptic macrobenthos fauna in shallow reefs in the tropics remains insufficiently sampled. There is no doubt that cooperation with skilful divers provides opportunities to better understand the diversity and ecology of the cryptic fauna.

**Etymology.** From the Latin *gibbosus* (= hump-backed) in reference to the strongly produced third abdominal tergite.

## Acknowledgments

We deeply thank Mr. Naoki Shirakawa (Naha, Okinawa) for his help and assist in the field and Dr. Alexander J. Bruce (Queensland Museum) and two anonymous reviewers for reviewing the manuscript.

## References

- Bruce, A. J. (1990a) Two deep-sea shrimps new to the Australian fauna, *Psathyrocaris hawaiiensis* Rathbun (Pasiphaeidae) and *Bresilia antipodarum*, sp. nov. (Bresiliidae), with remarks on *Encantada spinoculata* Wicksten (Bresiliidae). *Invertebrate Taxonomy*, 4, 847–866.

- Bruce, A. J. (1990b) A second species of *Bresilia*, *B. plumifera* sp. nov., new to the Australian fauna (Crustacea: Decapoda: Bresiliidae). *The Beagle*, 7, 1–8.
- Bruce, A. J. (2004) *Bresilia antipodarum* Bruce, 1990 (Crustacea: Decapoda: Bresiliidae), a new record from New Caledonian waters. *Cahiers de Biologie Marine*, 45, 365–372.
- Bruce, A. J. (2005a) Bresiliid shrimps from the Red Sea (Crustacea: Decapoda: Caridea) with description of a new species. *Proceedings of the Biological Society of Washington*, 118, 176–182.
- Bruce, A. J. (2005b) Note on a new species of *Bresilia* (Crustacea: Decapoda: Bresiliidae) from Zanzibar. *Memoirs of the Queensland Museum*, 51, 385–390.
- Calado, R., Chevardonné, P. & dos Santos, A. (2004) A new species of the deep-sea genus *Bresilia* (Crustacea: Decapoda: Bresiliidae) discovered from a shallow-water cave in Madeira. *Journal of the Marine Biological Association of the United Kingdom*, 84, 191–199.
- Calman, W. T. (1896) On deep-sea Crustacea from the SouthWest of Ireland. *Transactions of the Royal Irish Academy*, 31, 1–22.
- De Grave, S., Pentcheff, N. D., Ahyong, S. T., Chan, T.-Y., Crandall, K. A., Dworschak, P., Felder, D. L., Feldmann, R. M., Fransen, C. H. J. M., Goulding, L. Y. D., Lemaitre, R., Low, M. L., Martin, J. W., Ng, P. K. L., Schweitzer, C. E., Tan, S. H. & Wetzer, R. 2009. A classification of living and fossil genera of decapod crustaceans. *Raffles Bulletin Zoology*, Supplement 21, 1–109.
- Forest, J. & Cals, P. (1977) Une deuxième espèce du genre *Bresilia* Calman, *B. corsicana* sp. nov. Comparaison avec *B. atlantica* Calman (Crustacea Decapoda Bresiliidae). *Bulletin du Muséum National d'Histoire Naturelle*, 3e Série (Zoologie), 453, 549–565.
- Kemp, S. (1910) The Decapoda Natantia of the coasts of Ireland. *Scientific Investigation of the Fisheries Branch, Ireland*, 1908, 3–190.
- Komai, T. & Segonzac, M. (2003) Review of the hydrothermal vent shrimp genus *Mirocaris*, redescription of *M. fortunata* and reassessment of the taxonomic status of the family Alvinocarididae (Crustacea: Decapoda: Caridea). *Cahiers de Biologie Marine*, 44, 199–215.
- Wicksten, M. K. (1989) *Encantada spinocolata*, new genus and species of shrimp from the Galapagos Islands (Caridea: Bresiliidae). *Journal of Crustacean Biology*, 9, 667–671.