

A SECOND SPECIES OF *BRESILIA*, *B. PLUMIFERA* SP. NOV.,
NEW TO THE AUSTRALIAN FAUNA
(CRUSTACEA: DECAPODA: BRESILIIDAE)

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ABSTRACT

A new species of *Bresilia*, *B. plumifera* (Crustacea: Decapoda: Bresiliidae), is described and illustrated, increasing to four the number of species now known in this genus. The single specimen, the smallest in the genus (total length about 6 mm), was collected from the western Tasman Sea, at only 133 m, the most shallow depth from which this deep-sea genus has been recorded.

KEYWORDS: Crustacea, Decapoda, Bresiliidae, *Bresilia*, new species, Tasman Sea.

INTRODUCTION

The small genus *Bresilia* was first described by Calman (1896) from a single specimen collected off Ireland at 1372 m depth. Some ninety years passed before a further specimen of this genus was reported, when Forest and Cals (1977) described *B. corsicana*, again based on a single specimen from the western Mediterranean Sea, at a depth of 450 m. Recently, *B. antipodarum* has been recorded from off eastern Tasmania, at 800 m, by Bruce (1990). The discovery of a single specimen of another species of *Bresilia* in eastern Australian waters increases the size of the genus from three to four species, with two in the northern hemisphere and two at nearly the opposite pole of the southern hemisphere. All species are still known only from the single holotype specimens. All are very small shrimps and doubtless are easily overlooked in trawl or dredge catches.

Carapace length refers to the postorbital carapace length. Type material is deposited with the Australian Museum, Sydney (AM).

SYSTEMATICS

Genus *Bresilia* Calman
***Bresilia plumifera* sp. nov.**
(Figs 1-4)

Type material. HOLOTYPE - AM P40086: 1 female, Taupo Sea Mount, western Tasman

Sea, 33° 14.21'S., 56° 10.68'E, 133 m, sled, 2 May 1989, coll. J.K. Lowry *et al.* F.R.V. *Franklin*, stn. FRO589-7.

Description. A small-sized, slenderly built shrimp, of generally subcylindrical body form, lacking parts of antennae, second to fifth pereopods, parts of pleopods, with distal caudal fan damaged.

Carapace slightly compressed, smooth; rostrum well developed, acute, about 0.3 of carapace length, straight, slightly shorter than proximal segment of antennular peduncle, dorsal carina distinct, shallow, with 4 small acute teeth, first tooth on carapace proximal to posterior orbital margin, second tooth over posterior orbital margin, distal teeth at about 0.4 and 0.8 of rostral length; ventral carina distinct, shallow, ventral border convex, unarmed, non-setose; lateral carinae distinct, broadened posteriorly, expanded to form orbital rim; inferior orbital angle acute, anterior margin of branchiostegite deeply convex, pterygostomial angle acutely produced; supraorbital, hepatic, and antennal spines absent.

Abdomen smooth; third segment strongly produced posterodorsally; sixth segment about 2.2 times length of fifth, 2.0 times longer than deep, compressed, posterolateral angle produced; acute, posteroventral angle small, subacute; pleura of first three segments expanded, broadly rounded; fourth posteriorly produced, rounded; fifth angular, with small posteroventral tooth. Caudal fan damaged,

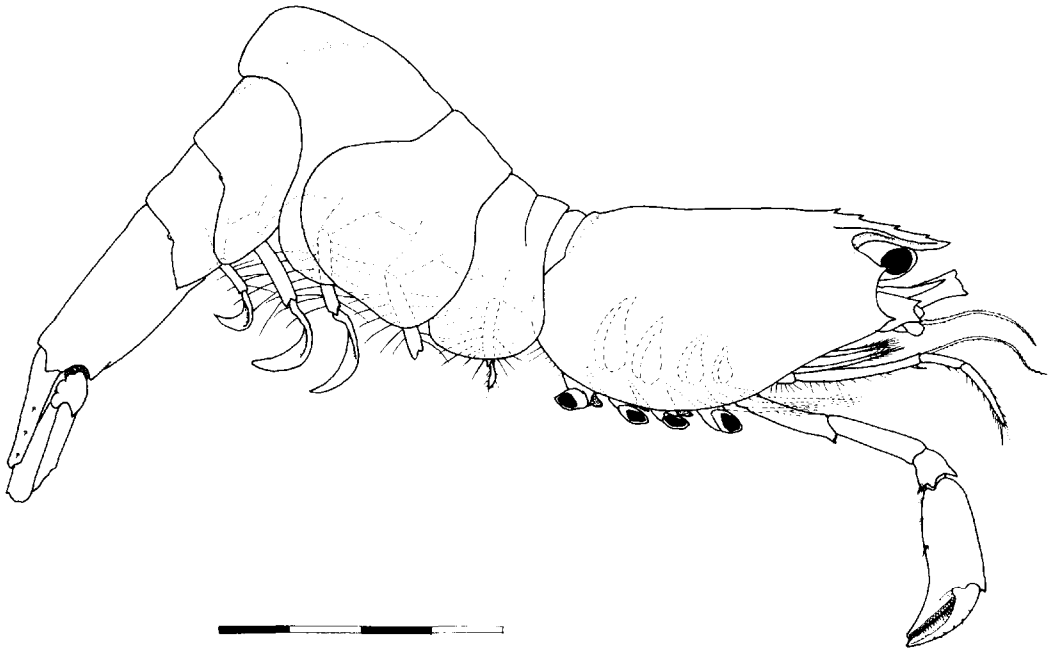


Fig. 1. *Bresilia plumifera* sp. nov., female holotype, Tasman Sea. Scale divisions in 0.5mm.

lacking distal telson and distal rami of uropods. Uropod with distolateral angle of protopodite acute.

Eye with rounded, pigmented cornea, obliquely hemispherical; stalk subcylindrical, slightly inflated proximally, without dorsal tooth.

Antennule with proximal segment of peduncle broad, about 1.3 times longer than wide, stylocerite broad, acute, not reaching distal margin of segment, medial border setose, with small ventral tooth; statocyst obsolete; distal segments and flagella lacking.

Antenna with basicerite robust, with small distal dorsolateral tooth, larger ventrolateral tooth and strong ventral medial tooth; ischio-cerite bearing elongate plumose setae, merocerite normal; scaphocerites and flagella lacking.

Epistome with long slender, forwardly directed acute median process.

Mandible with feeble corpus; palp well developed, 2-segmented, proximal segment subcylindrical, distal segment suboval, flattened, with numerous short plumose or serrulate spiniform setae; molar process feeble, slender, slightly expanded and compressed distally, with numerous slender acute marginal teeth; incisor process broad, anterior margin with distinct knob-like process disto-

dorsally, cutting edge with 10 acute teeth, anteriormost tooth largest. Maxillula with slender, curved palp, with 2 unequal, pre-terminal setae; upper lacinia broad, with 12 stout, dentate marginal spines, largest ventrally, with submarginal row of 11 more slender serrulate spines and proximal row of 6 slender serrulate spines, dorsal and ventral margins with setulose setae; lower lacinia slender, with 5 long stout serrulate spines distally, setulose setae ventrally. Maxilla with elongate tapering palp, distal half subcylindrical, styloform, with few short proximomedial setae; basal endite bilobed, distal lobe subcircular, proximal lobe more elongate, both sparsely setose, with long finely setulose setae; coxal endite simple, similarly setose, with scaphognathite well developed, about 4.3 times longer than wide, posterior lobe narrow, with elongate posterior marginal setae, anterior lobe large, broad, 2.0 times longer than broad, rounded. First maxilliped with small simple palp, with about 6 plumose setae distomedially; basal endite small, broad, sparsely setose medially, coxal endite similar, smaller, exopod with small, narrow caridean lobe, with sparse stout plumose marginal setae, flagellum slender, with several short plumose setae distally; epipod bilobed, elongate, narrow. Second maxilliped with endopod stout, dac-

tylar segment terminal, about 1.6 times longer than wide, distally rounded, with numerous long serrulate marginal spines, oblique transverse row of similar submarginal spines; propod about 2.0 times dactyl length, 2.5 times

longer than wide, sparsely setose; carpus short, unarmed; ischiomerus 2.2 times longer than wide, 1.2 times longer than propod, sparsely setose medially; basis subequal to ischiomerus length, exopod with long slender

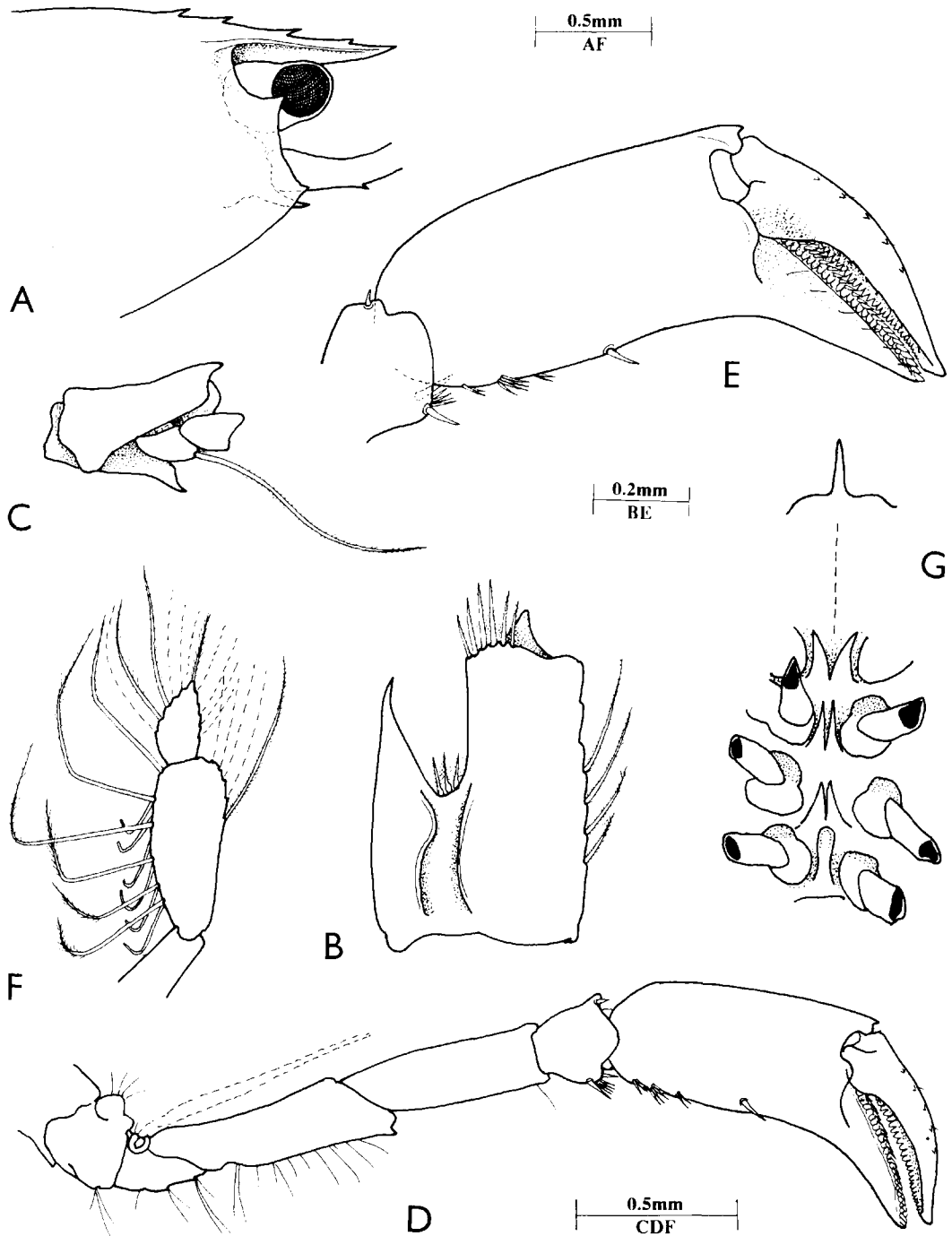


Fig. 2. *Bresilia plumifera* sp. nov., female holotype. A. anterior carapace, rostrum and eye, right antennae removed, epistome and epistomal spine indicated by dashed line. B. antennule, proximal segment of peduncle. C. basicerite, ventrolateral aspect. D. first pereiopod. E. same, chela. F. first pleopod. G. fifth to eighth thoracic sternites; above, epistomal spine.

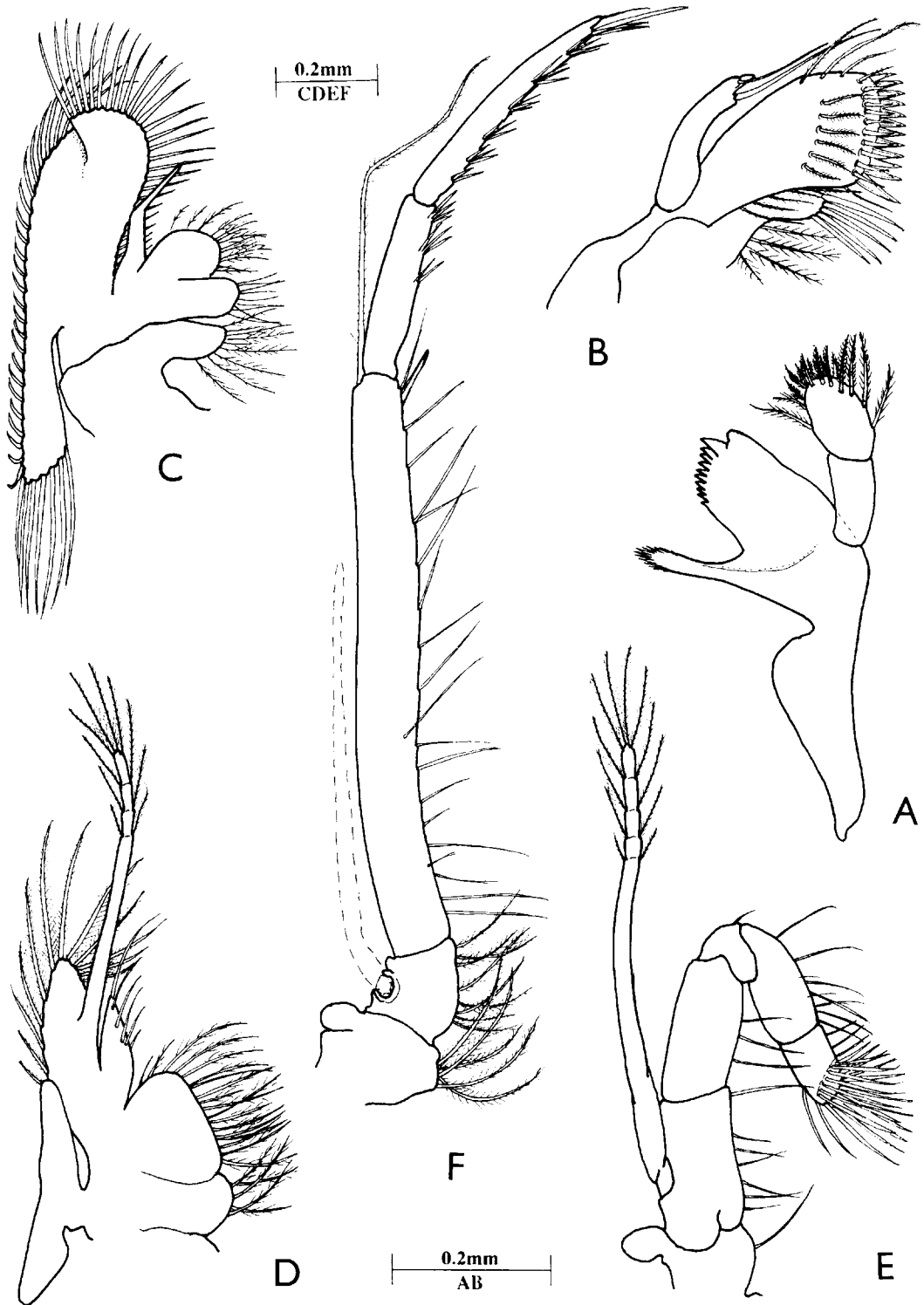


Fig. 3. *Bresilia plumifera* sp. nov., female holotype. A, mandible. B, maxillula. C, maxilla. D, first maxilliped. E, second maxilliped. F, third maxilliped.

flagellum with numerous short plumose setae distally; coxa medially rounded, with single seta, with reduced rounded epipod laterally. Third maxilliped with long slender endopod, exceeding proximal segment of antennular peduncle by length of distal segment; antepenultimate segment about 9.0 times longer than central width, tapering feebly distally, sparsely setose medially, with single elongate plumose seta at distodorsal angle, penultimate segment 0.3 of proximal segment length, 4.3 times longer than proximal width, feebly tapering distally, with 3 transverse rows of short serrulate spines along distal half of ventral border; terminal segment slender, tapering, about 9.0 times longer than proximal width, with stout subterminal distal spine, 0.4 of segment length, with 7 transverse rows of serrulate spines on ventral margin; basis distinct from ischiomere, short, with slender plumose setae medially, exopod well developed, flagellum (lacking on right) slender, with short plumose setae distally, reaching to about 0.65 of ischiomere length; coxa robust, with 5 long plumose setae medially, small globular epipod dorsolaterally.

Thoracic sternites narrow, first to fourth unarmed, fifth with submedian pair of large divergent triangular teeth, sixth and seventh with slender pairs of acute subparallel teeth, eighth with blunt median process, feebly dilated and flattened distoventrally.

First pereopod present on right side only, well developed, exceeding basicerite by carpus and chela; chela about 0.6 of carapace length, palm oval in section, smooth, about 2.0 times longer than central width, increasing slightly in width distally, distodorsal margin with small acute tooth, proximal ventral margin with three transverse rows of short serrulate spines with single larger stout simple spine at 0.5 of ventral border length; fingers strongly deflexed; dactyl about 0.75 of palm length, slightly exceeding fixed finger, with slightly upturned blunt tip, about 3.5 times longer than proximal depth, deeply concave laterally, dorsal margin convex, carinate, with 5 small acute denticles, ventromedial margin concave, with 9 small spinules, ventrolateral margin straight, strongly dentate, with about 40 strongly compressed teeth, largest centrally, decreasing strongly in size distally; fixed finger about 2.0 times longer than proximal width, deeply concave dorsolaterally, taper-

ing strongly distally, cutting edge straight, with series of deep fossae laterally for reception of dactylar teeth, medially with a row of stout simple spines, about 35, becoming shorter, stouter distally, extending to tip of fixed finger; carpus short, stout, as wide distally as long, slightly expanded, excavate distally, with small dorsal lobe with single short stout simple spine, rounded lateral lobe, small ventral lobe with strong simple medial and lateral spines, separated by four slender serrulate spines; merus about 0.8 of palm length, 3.4 times longer than central depth, unarmed; ischium obliquely articulated with merus, subequal to palm length, 3.5 times longer than distal width, tapering feebly ventrally, distoventral angle produced, with small acute tooth, ventral border sparsely setose; basis short, stout, without special features, exopod well developed, flagellum (lacking on right) slender, reaching to proximal merus, with numerous plumose setae distally; coxa normal, with rounded dorsolateral protuberance (epipod?).

Second of fifth pereopods lacking; well developed exopod on basis of second pereopod, (lacking on right) shorter than first pereopod exopod; posterior pereopods without exopods.

Pleurobranchs present on first four pereopods only, decreasing strongly in size anteriorly.

Pleopods damaged: first pleopod with basipodite 1.75 times longer than wide, with 6 elongate distally plumose setae medially, with inner row of 6 ovigerous setae; exopod lacking; endopod small, about 0.45 of basipodite length, tapering distally, with about 10-12 plumose marginal setae. Second pleopod lacking exopod and endopod. Posterior pleopods without special features, all lacking endopods.

Measurements (mm). Total length (approx.), 6.0 +; carapace and rostrum, 2.5; carapace, 1.8; first pereopod chela, 1.2.

Associated fauna. One small badly damaged hippolytid shrimp, unidentifiable at genus level.

Etymology. From *pluma*, Latin, a feather, and *fero*, Latin, to carry or bear.

Systematic Position. *Bresilia plumifera* is most closely related to the only other Australian species of the genus, *B. antipodarum* Bruce, which it particularly resembles in the presence of the postero-dorsally produced third abdominal segment, a feature not found

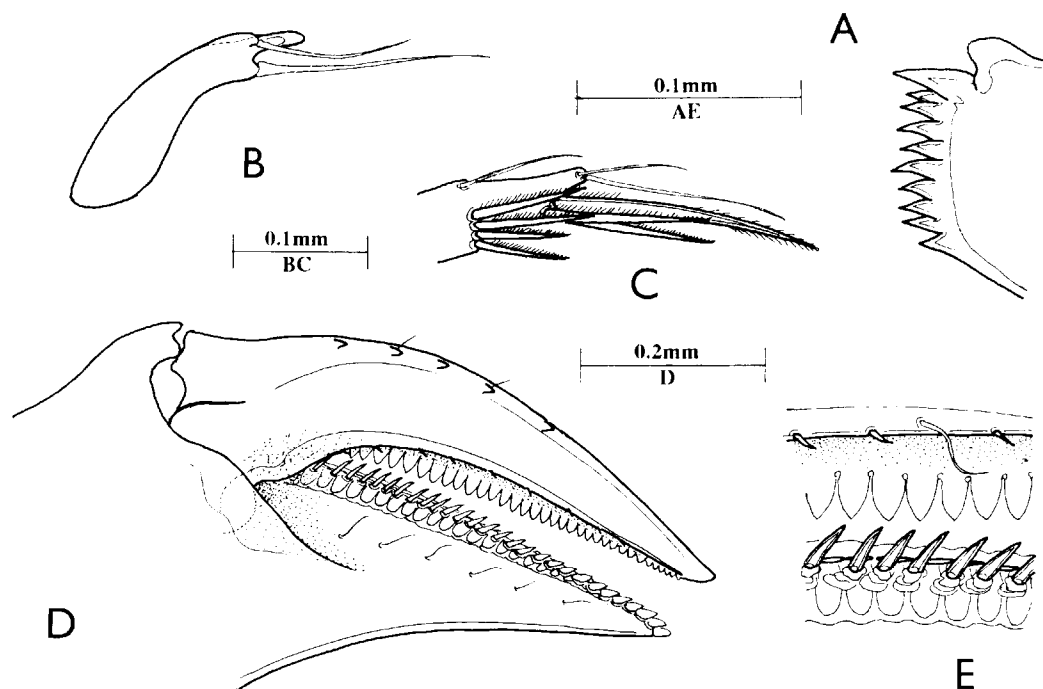


Fig. 4. *Bresilia plumifera* sp. nov., female holotype. A, mandible, incisor process. B, maxillula, palp. C, third maxilliped, tip of distal segment of endopod. D, first pereiopod, chela, fingers. E, same, detail of cutting edges.

in the two other species of the genus. *Bresilia plumifera* may be distinguished from *B. antipodarum* by the presence of only four dorsal rostral teeth, with the ventral border of the rostrum unarmed, whereas the latter has nine dorsal rostral teeth and a small ventral tooth. The rostrum is also much shorter in *B. plumifera*, much less than half the carapace length, whereas it is well over half in *B. antipodarum*. *Bresilia antipodarum* also has the antennal tooth and pterygostomial angle more acutely produced than in *B. plumifera* and the posterodorsal enlargement of the third abdominal segment is larger and more compressed. In *B. plumifera* the proximal segment of the antennular peduncle is much broader than in *B. antipodarum*, with the stylocerite stouter, not reaching the level of the distal end of the segment. The mouth parts of the two species are essentially similar, but in *B. plumifera*, the incisor process of the mandible is much broader and more strongly dentate, the molar process more strongly provided with simple teeth and the distal segment of the palp with serrulate spiniform setae; the upper lacinia of the maxillula is also much more strongly dentate. The first pereiopods of the two species are remarkably similar, but *B. antipodarum*

lacks the ventral palmar spine present in *B. plumifera*, and the small distodorsal palmar tooth. Also lacking is the distoventral tooth on the ischium. In *B. plumifera* the dorsal margin of the dactylus is carinate, with five small acute teeth, whereas in *B. antipodarum*, this surface is rounded and unarmed.

The features of *B. plumifera* that are without parallel in other species of *Bresilia* so far described, are the medial epistomal process and the long plumose setae on the ischiocerite and the distal antepenultimate segment of the endopod of the third maxilliped.

Both Australian species of *Bresilia* are characterized by the presence of a distinct flagellum on the exopod of the first maxilliped, a character in which they also resemble *Encantada*, and of a distinct posterodorsal carina on the third abdominal segment, features not present in the northern hemisphere species. It is possible that they should be considered as generically distinct, but this is best postponed until such time as intact specimens are available.

DISCUSSION

The posterior thoracic sternites of *Bresilia plumifera* show a great similarity to those of *B.*

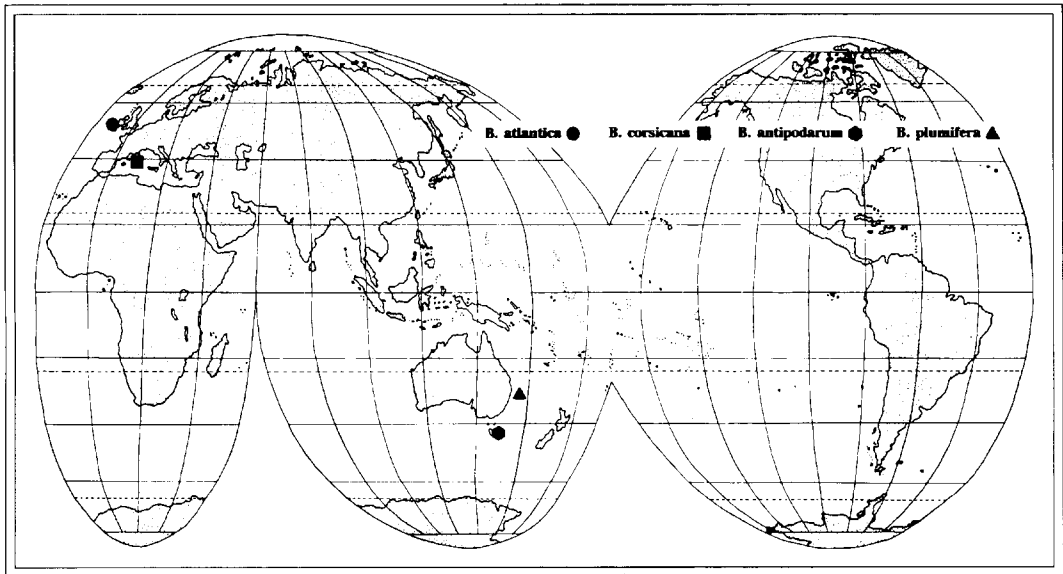


Fig. 5. The distribution of the species of *Bresilia* Calman.

corsicana (Forest and Cals 1977: fig. 20). Forest and Cals (1977) noted that the interpretation of these processes presented difficulties, and this applies equally to *B. plumifera*, at only half the size of *B. corsicana*, and cannot be elucidated further without destroying the unique specimen.

The function of the plumose setae on the antennular ischiocerite and the endopod of the third maxilliped, which probably functions as a complex in association with the median epistomal process, is not readily apparent. Apparently unique to *B. plumifera*, it seems unlikely that these setae would have been overlooked, particularly in the detailed study by Forest and Cals (1977), but it is possible that they could have been lost during capture of the specimens. This could not have happened in the case of the epistomal process.

The four species of the genus *Bresilia* are known only from the holotype specimens, incomplete in the case of *B. antipodarum* and *B. plumifera*. All are small shrimps, with *B. atlantica* the largest, with a total body length of 27 mm and *B. plumifera* the smallest, with a length of about 6 mm. Their small size probably contributes to the paucity of records of these species. Their zoogeography is clearly incompletely known (Fig. 5) and their bathymetric range is now known to extend from 1375 m to 133 m. *Bresilia antipodarum* is also known from the Tasman Sea, off Cape

Freycinet, eastern Tasmania (Bruce 1990). Most of the bresiliiform species of the Bresiliidae are deep-water species and the only other species so far reported from shallow waters is *Encantada spinoculata* Wicksten (1989) from 55-92 m depth.

The four species of *Bresilia* may be distinguished by the following key:

1. Third abdominal segment posterodorsally produced; first maxilliped endopod with flagellum 2
 Third abdominal segment not posterodorsally produced; first maxilliped endopod without flagellum 3
2. First pereiopod with posteroventral angle unarmed; posterodorsal process of third abdominal segment compressed; rostrum with nine dorsal and one ventral tooth
 *B. antipodarum* Bruce
 First pereiopod with posteroventral angle dentate, dactyl dorsally carinate, dentate; posterodorsal process of third abdominal segment not strongly compressed; rostrum with four dorsal teeth, ventrally unarmed
 *B. plumifera* sp. nov.
3. Posterior margin of telson truncate, with 6-7 pairs of spines *B. atlantica* Calman
 Posterior margin of telson with median notch, with four pairs of spines and four submedian spinules
 *B. corsicana* Forest and Cals

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