

Anthuridea (Crustacea: Isopoda) of Carrie Bow Cay, Belize

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ABSTRACT

Fourteen species of anthurid and paranthurid isopods from Carrie Bow Cay, Belize, are considered. These include two new genera, *Belizanthura* and *Minyanthura*, and seven new species, *Apanthura geminsula*, *Belizanthura imswe*, *Mesanthura fasciata*, *M. punctillata*, *M. reticulata*, *Minyanthura corallicola*, and *Paranthura caribbiensis*. These species are relatively abundant in shallow water (1.5 m or less) habitats such as coral rubble and coarse sandy sediments, but scant in deeper (6–24 m) sediments. Few species were observed in the entire range from the intertidal zone to depths of 40 m. Male anthurids found in the plankton show morphological adaptations suggesting that they had left their substrates for reproductive rather than feeding purposes.

Introduction

During January–February 1978 the author carried out two weeks of collecting at Carrie Bow Cay, Belize, from a variety of habitats, ranging from very shallow water to depths of about 40 m. Seventeen species of anthurids and paranthurids were collected (three represented by single specimens, and not treated in this paper). This is the highest number of anthuridean species taken in any single locality, and probably indicates that many species await discovery upon more careful investigation of different substrate and habitat types. This high number of species, and in some

cases, high numbers of specimens, is a strong indication of the important role the group often plays in shallow-water ecosystems. Very little is known of the biology, especially the feeding of these animals. It is hoped that future living specimen studies in the laboratory will provide such data.

Material is deposited in the National Museum of Natural History, Smithsonian Institution. In the accompanying figures a scale (in millimeters) is given only for the entire animal in dorsal view.

ACKNOWLEDGMENTS.—My thanks are due the following Smithsonian personnel: R. J. Larson for information and for specimens from horizontal plankton sampling, C. A. Child for help in collecting and sorting, J. N. Norris for algal identifications, A. C. Cohen for material collected, and F. D. Ferrari for making earlier Belize material available. I am very grateful to T. E. Bowman for reading the manuscript and for his many useful comments and criticisms.

Species List

Suborder ANTHURIDEA

Family ANTHURIDAE

Apanthura Stebbing

Apanthura geminsula, new species

Apanthura signata Menzies and Glynn

Apanthuroides Menzies and Glynn

Apanthuroides millae Menzies and Glynn

Belizanthura, new genus

Belizanthura imswe, new species

Mesanthura Barnard

Mesanthura fasciata, new species

Mesanthura paucidens Menzies and Glynn

Mesanthura pulchra Barnard

Mesanthura punctillata, new species

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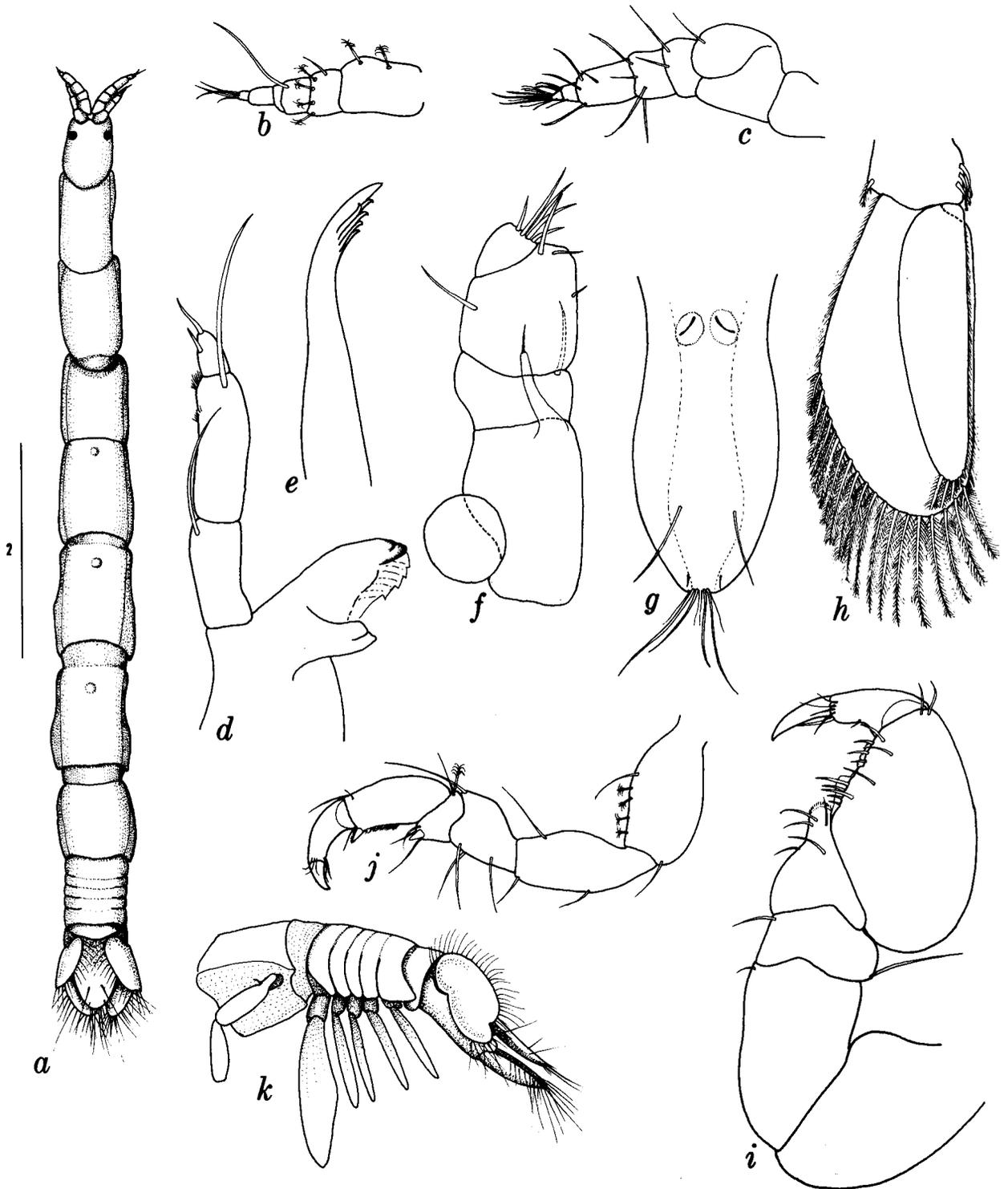


FIGURE 141.—*Apanthura geminsula*, new species, holotype, ♀: *a*, complete specimen; *b*, antennule; *c*, antenna; *d*, mandible; *e*, maxilla; *f*, maxilliped; *g*, telson; *h*, pleopod 1; *i*, pereopod 1; *j*, pereopod 7; *k*, pleon in lateral view.



FIGURE 142.—*Apanthura geminsula*, new species, ♂: *a*, cephalon; *b*, pereopod 1; *c*, mandible; *d*, pleopod 2.

Mesanthura reticulata, new species

Minyanthura, new genus

Minyanthura corallicola, new species

Pendanthura Menzies and Glynn

Pendanthura tanaiformis Menzies and Glynn

Family PARANTHURIDAE

Accalathura Barnard

Accalathura crenulata (Richardson)

Paranthura Bate and Westwood

Paranthura caribbiensis, new species

Paranthura infundibulata Richardson

Suborder ANTHURIDEA

Family ANTHURIDAE

Apanthura, Stebbing

Apanthura geminsula, new species

FIGURES 141, 142

DESCRIPTION OF FEMALE.—Body moderately indurate, semitranslucent when alive, lacking any

pigmentation. Cephalon with low triangular rostrum, not extending beyond anterolateral corners. Eyes dorsolateral. Body proportions: $C < 1 = 2 > 3 < 4 = 5 = 6 > 7$. Pereonites 4, 5, and 6 each with middorsal shallow pit. Pleonites 1–5 fused, but indicated ventrolaterally, with shallow dorsal grooves indicating lines of fusion; pleonite 6 free. Telson thin, hardly indurate, with hyaline border, widest at midlength, distodorsally slightly concave, with few distal setae; 2 large basal statocysts present.

Antennular peduncle 3-segmented, basal segment equal in length to 3 distal segments; flagellum of 3 articles. Antennal peduncle 5-segmented, second segment grooved to accommodate antennule; flagellum of 2 articles. Mandibular palp 3-segmented, terminal segment short, bearing 2 setae, middle segment longest, with elongate distal seta; incisor of 2 blunt cusps; lamina dentata with 4 marginal serrations; molar distally bluntly bilobed. Maxilla slender with one strong spine

TABLE 24.—Distribution and morphological comparison of four species of *Apanthura*

	<i>A. magnifica</i>	<i>A. signata</i>	<i>A. signifera</i>	<i>A. geminsula</i>
Distribution	Georgia to Florida	Puerto Rico; Belize	Venezuela	Belize
Pigment	absent	present	absent	absent
Dorsal pits	slight depression on pereonites 4-6	slight depression on pereonites 4-6	slight depression on pereonites 4-6	marked pits on pereonites 4-6
Antennular flagellum basal article ♀	elongate	short	elongate	short
Antennal flagellum articles	4	3	3	2
Maxillipedal endite	present	present	absent	present
Uropodal endite	notched	notched	unnotched	notched
Size ♀	8.5 mm	4.5 mm	5.0 mm	8.1 mm

and 5 smaller distally curved spines. Maxilliped 5-segmented, terminal segment situated on outer distal angle of fourth segment, with 5 setae; third segment narrowed, less than half length of fourth segment; slender endite on inner surface with single terminal seta. Pereopod 1 unguis almost half length of dactylus; propodal palm with few simple spines, rounded hyaline lobe at about midpoint: carpus triangular, distally narrowed. Pereopods 2 and 3 considerably smaller than pereopod 1. Posterior pereopods with propodus having strong posterodistal spine and several small fringed scales on posterior margin; carpus small, triangular, overriding propodus, with strong posterodistal spine. Pleopod 1 exopod operculiform, distal margin bearing several plumose setae; endopod slightly shorter and about half width of exopod, with few distal plumose setae. Uropodal exopod distally notched, extending to distal end of basis; endopod extending beyond telsonic apex, distally rounded, bearing numerous simple setae.

DESCRIPTION OF MALE.—Eyes considerably larger than those in female. Antennular flagellum of 8 or 9 articles, each bearing whorl of filiform aesthetascs. Mandibular palp as in female, but incisor, lamina dentata, and molar reduced to blunt nonsclerotised lobes. Pereopod 1 with hyaline process at about midpoint of propodal palm narrower than in female; numerous simple spines on medial margin; carpus with narrowly rounded hyaline posterodistal lobe. Pleopod 2 endopod

with cylindrical, apically narrowly rounded copulatory stylet extending beyond apices of rami.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble, coarse sediments, 0.2–1.5 m; Twin Cays, under mangroves, 0.2 m.

Holotype: ♀ (TL 8.1 mm), Twin Cays, USNM 171166.

Allotype: ♂ (TL 4.8 mm), Twin Cays, USNM 171167.

Paratypes: 3♂, 3♀, Twin Cays, USNM 171168.

Additional Material: 120♀, 3 sub♂, 7♂, 50 juveniles.

REMARKS.—Superficially the species of the genus *Apanthura* are all remarkably similar, but subtle differences are to be found in the mandibular palp spination-setation, telsonic shape, maxillipedal segment proportions, and in the structure of the first maxillipeds. *Apanthura magnifica* Menzies and Frankenberg (1966), *A. signata*, and *A. signifera* Paul and Menzies (1971) have been recorded either from the Caribbean or from adjoining areas, and are all figured as having pleonites 1–3 free, and pleonites 4 and 5 dorsally fused. Clearing specimens of *A. magnifica* and *A. geminsula* in lactic acid and Chlorazol Black shows that pleonites 1–5 are dorsally fused, but that pleonites 1–3 have a groove or fold over the dorsum which appears as an articulation. Careful examination of the type material of *A. signifera* and *A. signata* shows a similar fusion. The main distinguishing features of the four species of *Apanthura* discussed here are summarized in Table 24.

ETYMOLOGY.—The specific name *geminsula* is a Latinized form of Twin Cays, the locality where the species was abundant.

Apanthura signata Menzies and Glynn

FIGURE 143

Apanthura signata Menzies and Glynn, 1968:28, fig. 10.—Paul and Menzies, 1971:42.

DESCRIPTION OF FEMALE.—Body hardly indurate. Body proportions: $C < 1 = 2 > 3 < 4 < 5 > 6 > 7$. Pereonites 4, 5, and 6 with shallow middorsal depression. Pleonites 1–5 dorsally fused, laterally distinct; pleonite 6 free. Telson not indurate, gently convex dorsally with relatively broad hyaline border, widest at midpoint; with 2 proximal statocysts.

Antennular peduncle 3-segmented, basal segment slightly shorter than 2 distal segments together; flagellum of 3 articles, second article relatively elongate. Antennal peduncle 5-segmented, flagellum of 3 articles. Mandibular palp 3-segmented, terminal segment with 3 terminal setae, first and second segments each with single elongate seta; incisor of 3 blunt cusps, lamina dentata with 5 marginal serrations, molar blunt. Maxilliped 5-segmented, with thin-walled endite on inner surface. Pereopod 1 unguis almost half the length of dactylus; propodal palm with rounded distal lobe and convex hyaline flange, few simple setae; carpus triangular, posterodistal angle produced, narrowly rounded. Posterior pereopods with triangular carpus bearing strong posterodistal spine. Pleopod 1 exopod operculiform, endopod more than half as wide and almost as long as exopod. Uropodal exopod notched, extending beyond basis.

DESCRIPTION OF SUBMALE.—Eyes larger than in female, but not as large as in mature male. Antennular flagellum lacking filiform aesthetascs.

DESCRIPTION OF MALE.—Cephalon with eyes much larger than in female. Antennular flagellum of 9 articles bearing filiform aesthetascs. Mandible with palp as in female, but incisor, lamina dentata, and molar somewhat reduced. Pereopod 1 with propodal palm having low

rounded process at about midpoint, hyaline convex flange on inner surface shorter than in female, but with more setae than in female. Pleopod 2 endopod with cylindrical, distally rounded copulatory stylet extending well beyond rami.

COLOR NOTES.—Pigment pattern fairly regular, especially the dark band between eyes and narrow bands on anterior and posterior dorsal parts of pereonites, and on pleonite 6 in female. Pigmentation in male lacking regularity found in female; chromatophores scattered over dorsal and ventral surfaces.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble and coarse sediments, intertidal to 24 m: ~ 120♀, 2 sub♂, 7♂, 25 juveniles.

PREVIOUS RECORDS.—Puerto Rico.

Apanthuroides Menzies and Glynn

Apanthuroides millae Menzies and Glynn

FIGURES 144, 145

Apanthuroides millae Menzies and Glynn, 1968:30, fig. 11.

DESCRIPTION OF FEMALE.—Integument hardly indurate, with numerous pits on cephalon, pereon, pleon, and telson, and fine scales (seen with difficulty). Body proportions: $C < 1 > 2 = 3 = 4 = 5 > 6 > 7 < P$. Cephalon with short triangular rostrum not extending as far as anterolateral corners. Eyes dorsolateral. Pereonite 7 very short, one-third length of 6. Pleonites 1–5 fused, with shallow grooves indicating lines of fusion; pleonite 6 fused with telson. Latter proximally broad, distal two-thirds narrowed, apically rounded, with strong middorsal longitudinal ridge.

Antennular peduncle 3-segmented, basal segment broad, equal in length to 2 distal segments plus 2 basal flagellar article; flagellum of 4 articles, two distal articles each with single aesthetasc. Antennal peduncle 5-segmented, second segment grooved to accommodate antennule; flagellum of 7 articles. Mandibular palp 3-segmented, middle segment broadest and longest, terminal segment with 3 distal finely fringed spines; incisor of 2 blunt cusps, narrow lamina dentata with 6 or 7

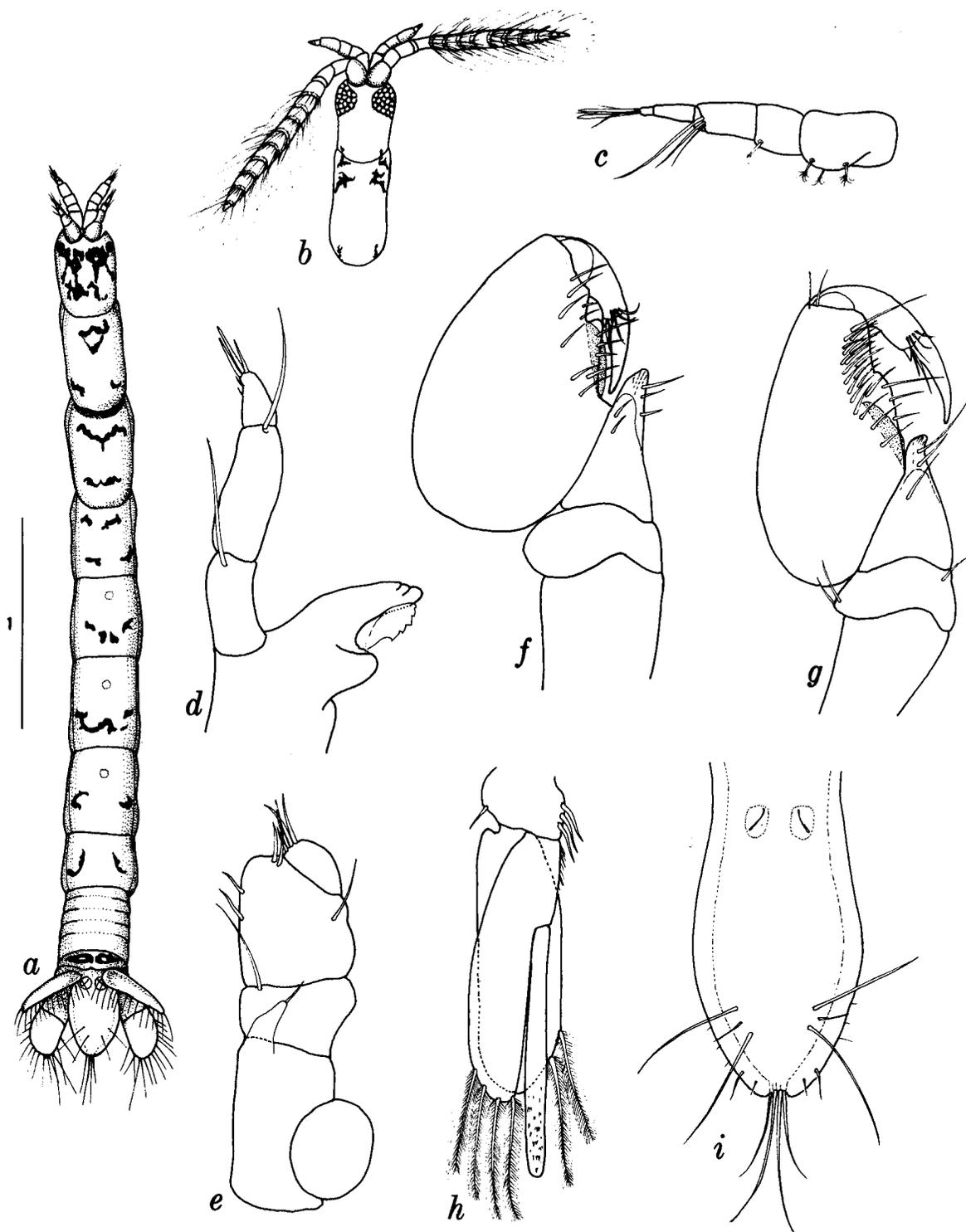


FIGURE 143.—*Apanthura signata* Menzies and Glynn: *a*, complete specimen, ♀; *b*, cephalon, ♂; *c*, antennule ♀; *d*, mandible; *e*, maxilliped; *f*, pereopod 1, ♀; *g*, pereopod 1, ♂; *h*, pereopod 2, ♂; *i*, telson.

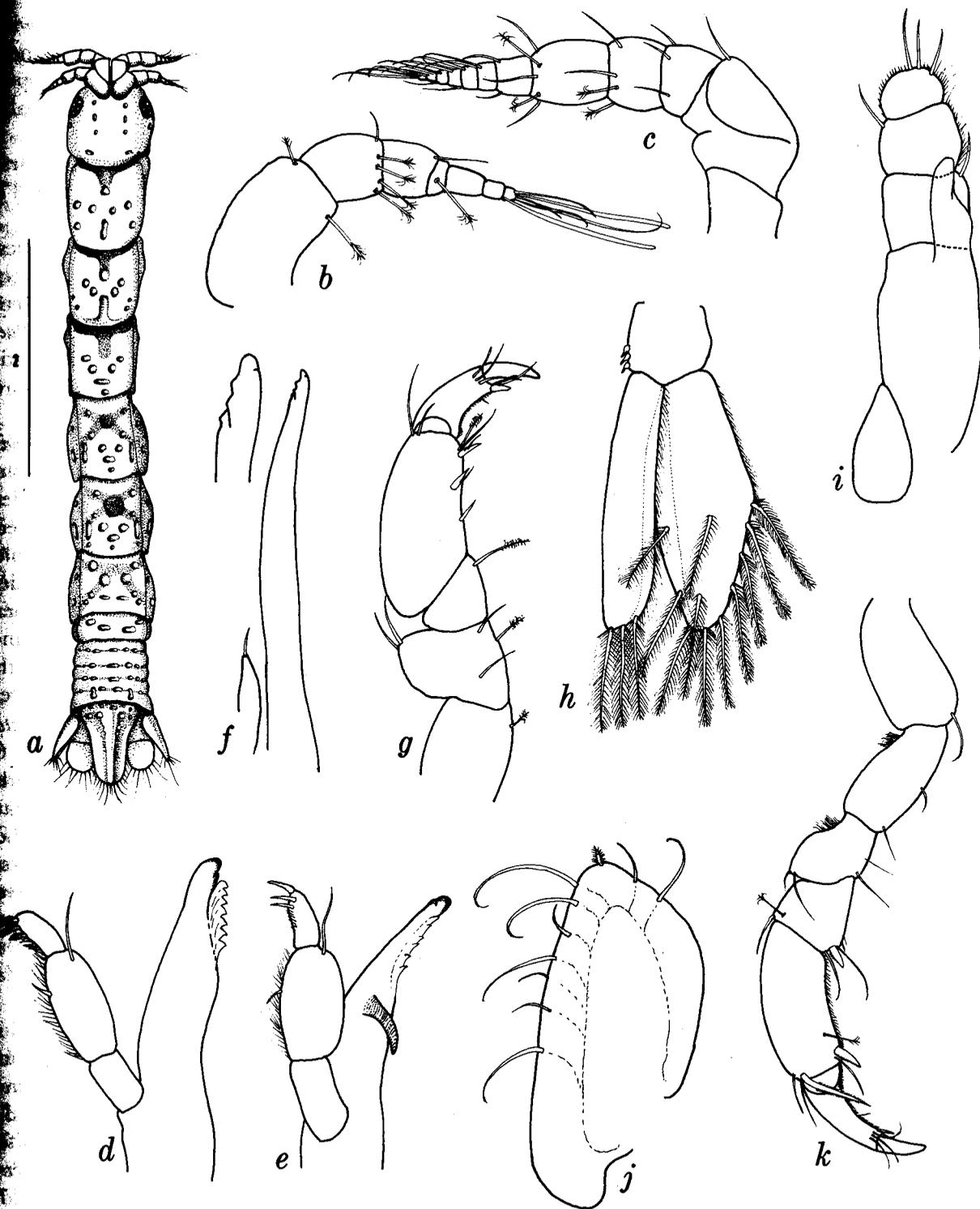


FIGURE 144.—*Apanthuroides millae* Menzies and Glynn, holotype, ♀: *a*, complete specimen; *b*, antennule; *c*, antenna; *d*, left mandible; *e*, right mandible; *f*, maxilla; *g*, pereopod 1; *h*, pleopod 1; *i*, maxilliped; *j*, uropodal exopod; *k*, pereopod 6.

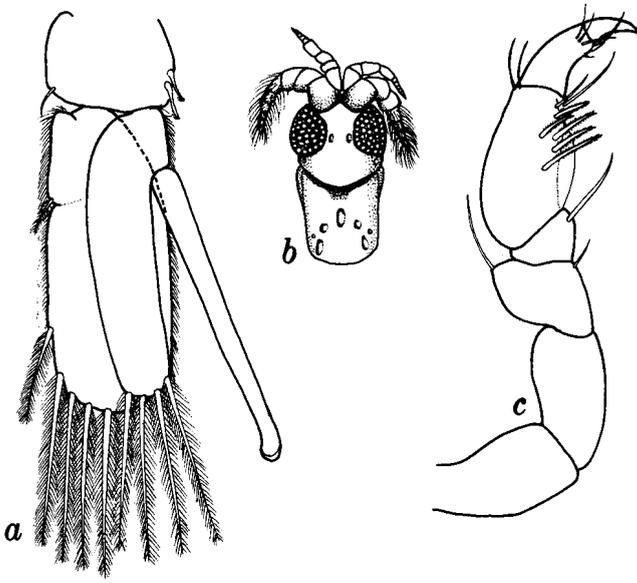


FIGURE 145.—*Apanthuroides millae* Menzies and Glynn, ♂: a, pleopod 2; b, cephalon; c, pereopod 1.

serrations; molar of right mandible elongate, slender, finely ridged, absent on left mandible. Maxilla elongate, slender, apically with 3 or 4 broadened cusps, no spines distinguishable. Maxilliped 5-segmented, terminal segment semicircular, setose, second segment elongate, with well-developed thin-walled endite on inner face. Pereopod 1 not markedly larger than following pereopods; unguis one-third length of dactylus, with short basal spine; propodus not very broad, palm straight, with 3 spines. Posterior pereopods, propodus with 2 distal finely-fringed spines; carpus slightly underriding propodus, anterior margin somewhat shorter than posterior margin; latter with strong posterodistal spine. Pereopod 7 absent. Pleopod 1 exopod twice width and subequal in length to endopod, rami overlapping slightly, together forming opercular surface closing off branchial chamber. Uropodal exopod extending well beyond basis, twice as long as wide, distally rounded, margin entire, sparsely setose; endopod almost circular, sparsely setose.

DESCRIPTION OF MALE.—Integument somewhat less pitted than in female. Eyes enlarged. Antennular flagellum with 6 or 7 articles bearing

filiform aesthetascs. Propodus of pereopod 1 with thin convex flange along palm, latter with 5 finely fringed spines in distal half. Pleopod 2 endopod with cylindrical copulatory stylet, apically rounded.

MATERIAL EXAMINED.—Carrie Bow Cay, coarse sediments, 6–24 m: 3♀ (TL 2.3–2.8 mm), 1♂ (TL 2.8 mm), USNM 171154.

REMARKS.—The type material of this species, consisting of two males from Puerto Rico, agrees well with the male of the present material. Menzies and Glynn (1968), in describing *A. millae*, neither figured nor mentioned the characteristically pitted integument, neither did they figure the unusual mandible.

Several features of this species agree with *Natalanthura foveolata* Kensley, 1978a, described from the southwest Indian Ocean. These similarities include the pitted integument, the 5-segmented maxilliped with endite, the elongate mandible with a slender molar present only on one side, pleopod 1 with the exopod and endopod together forming an operculum over the branchial chamber, and pleonites 1–5 fused, pleonite 6 fused with the telson. (With regard to the latter feature, Kensley (1978a) described the pleon of *N. foveolata* as having pleonites 1–3 free, 4 and 5 fused, 6 fused with the telson. Clearing of a specimen with lactic acid and Chlorazol Black has shown that pleonites 1–5 are completely fused, as in the present species). The aforementioned features, especially the unique mandibular structure, leave no doubt that *Natalanthura* should be regarded as a junior synonym of *Apanthuroides*.

Belizanthura, new genus

DIAGNOSIS.—Eyes present. Antennal flagellum of 7 articles. Mandibular palp 3-segmented; incisor, lamina dentata, and molar reduced in ♂, normal in ♀. Maxilliped 7-segmented with endite in ♀; 5-segmented and lacking endite in ♂. Pereopods 1–3 similar, subchelate. Pereopods 4–7 with triangular carpus underriding propodus. Pleopod 1 not operculiform. Pleonites 1–6 free. Telson lacking statocysts.

TABLE 25.—Comparison of anthurid genera possessing a seven-segmented maxilliped

Character	<i>Neohyssura</i>	<i>Ocsanthura</i>	<i>Minyanthura</i>	<i>Belizanthura</i>
Eyes	absent	absent	present	present
♂ mouthparts	?	similar to ♀	similar to ♀	very reduced
Carpus of pereopods 4-7	triangular	rectangular	rectangular	triangular
Pleopod 1	non-operculiform	non-operculiform	operculiform	non-operculiform
Pleonites	1-5 free, 6 fused with telson	1-6 free	1-5 fused, 6 fused with telson	1-6 free
Telson	spiniform	flattened	flattened	flattened
Statocysts	?	2	2	absent

TYPE-SPECIES.—*Belizanthura imswe*, new species.

ETYMOLOGY.—The generic name is derived from the country of Belize, plus *anthura*, the suffix often used for anthurid genera.

REMARKS.—A 7-segmented maxilliped as in the female of *Belizanthura* also occurs in *Neohyssura* Amar (1952), *Ocsanthura* Kensley (1978b), and *Minyanthura*, new genus. The features separating these genera are summarized in Table 25.

Belizanthura imswe, new species

FIGURES 146, 147

DESCRIPTION OF FEMALE.—Body very slender, semi-transparent when alive, integument thin, not indurate. Body proportions: $C > 1 < 2 = 3 < 4 = 5 > 6 > 7$. Cephalon with low triangular rostrum, tiny dorsal eyes. Pleonites free, 1-5 subequal, 6 with notch in posterodorsal margin. Telson widest at midlength, tapering to rounded setose apex, lateral margins distally with 7 or 8 shallow serrations; statocysts absent.

Antennular peduncle 3-segmented, flagellum of 4 articles, terminal article tiny. Antennal peduncle 5-segmented; flagellum of 7 articles. Mandibular palp 3-segmented, middle segment twice length of first, third segment bearing 3 distal fringed setae; incisor of 3 cusps; lamina dentata with 4 serrations and several tiny spinules; molar bluntly rounded. Maxilla with one large and 4 small distal spines. Maxilliped 7-segmented, terminal segment small, with 3 setae; third segment short; endite reaching to distal margin of fourth

segment, thin-walled, with single terminal seta. Pereopods 1-3 similar, unguis half length of dactylus; propodal palm very slightly sinuous, with few scattered setae; carpus triangular, with posterodistal point. Posterior pereopods with unguis about one-quarter length of dactylus, propodus with 3 posterodistal sensory spines; carpus almost triangular, with short free anterior margin. Pleopod 1 not operculiform, subequal to following pleopods. Uropodal exopod pyriform, basally broad, outer margin with 4 or 5 serrations, distally rounded, setose; endopod longer than basis, extending slightly beyond telson, distally rounded, setose.

DESCRIPTION OF MALE.—Antennular flagellum of 8 articles, each with whorl of filiform aesthetascs. Eyes enormously enlarged, almost meeting middorsally and midventrally, with just sufficient space between to accommodate mandibular palps; remainder of mandible reduced to short nonmasticatory segment. Maxillae absent. Maxilliped 5-segmented, only terminal segment bearing 3 setae; endite absent. Pereopod 1 unguis about one-third length of dactylus; propodal palm straight, armed with about 8 short, fringed spines; carpus triangular, with apical fringed spine and short, acute process. Pereopod 2 propodus slightly shorter than pereopod 1, palm armed with 3 strong ventrodorsal sensory spines. Posterior pereopods as in female. Pleopod 1 basis with 2 slender retinaculae, exopod and endopod subequal in length, broadly rounded distally both bearing elongate plumose setae. Pleopod 2 basis

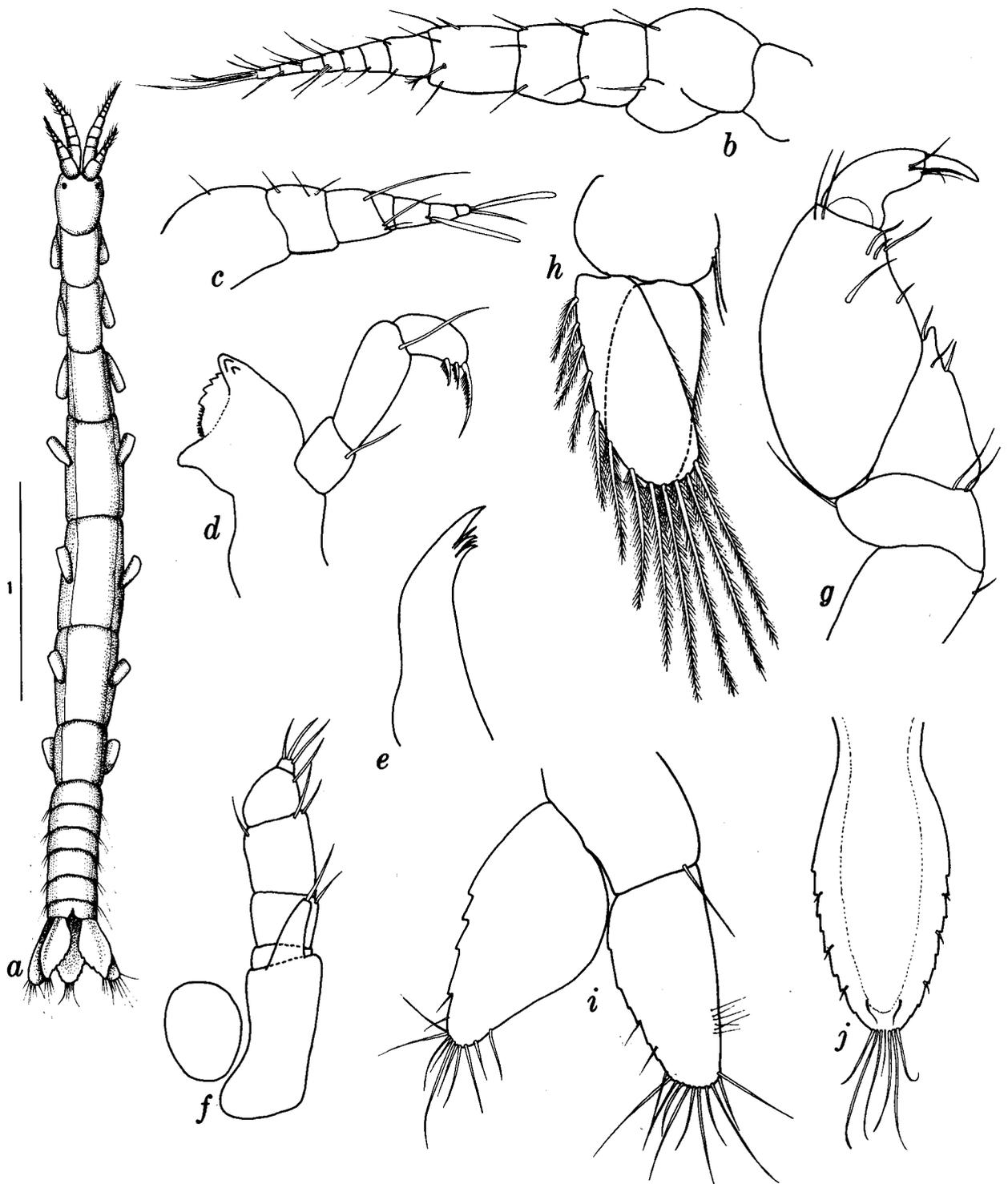


FIGURE 146.—*Belizanthura imswe*, new species, holotype, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, mandible; *e*, maxilla; *f*, maxilliped; *g*, pereopod 1; *h*, pleopod 1; *i*, uropod; *j*, telson.

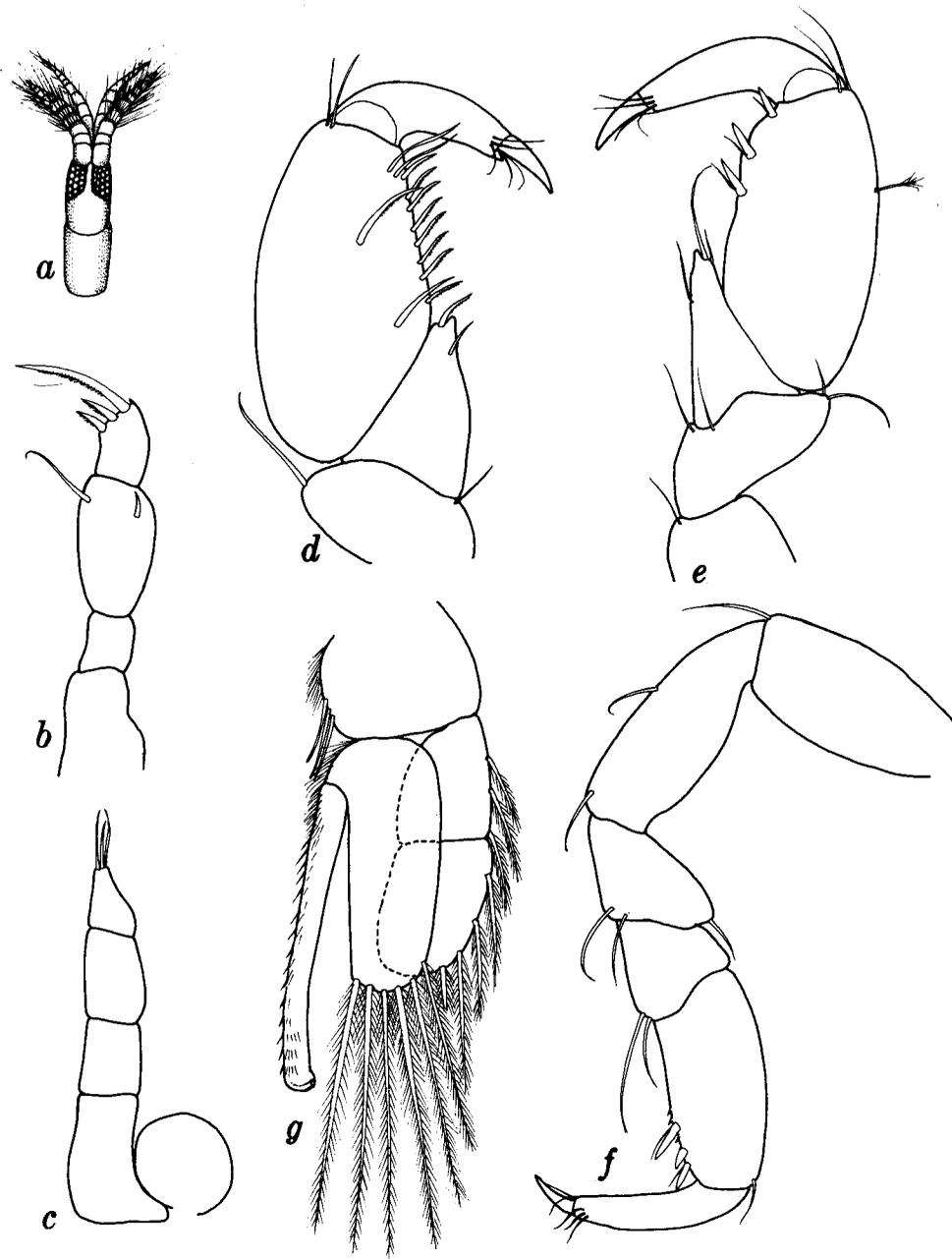


FIGURE 147.—*Belizanthura imswe*, new species, ♂: *a*, cephalon; *b*, mandible; *c*, maxilliped; *d*, pereopod 1; *e*, pereopod 2; *f*, pereopod 7; *g*, pleopod 2.

with 3 retinaculae; endopod bearing stout, apically rounded copulatory stylet extending well beyond ramus; exopod with distinct transverse suture at midlength.

MATERIAL EXAMINED.—Carrie Bow Cay, coral

rubble and shallow coarse sediments, 0.1–0.3 m; Twin Cays, in algal mat under mangroves, 0.1–0.3 m.

Holotype: ♀ (TL 3.4 mm), Twin Cays, USNM 171172.

Allotype: ♂ (TL 2.5 mm), USNM 171173.

Paratypes: 4♀ (TL 3.0–3.7 mm), 4♂ (TL 2.3 mm–2.7 mm), Twin Cays, USNM 171174.

Additional Material: 27♀, 2♂.

ETYMOLOGY.—The specific name is the acronym for “Investigations of Marine Shallow Water Ecosystems.”

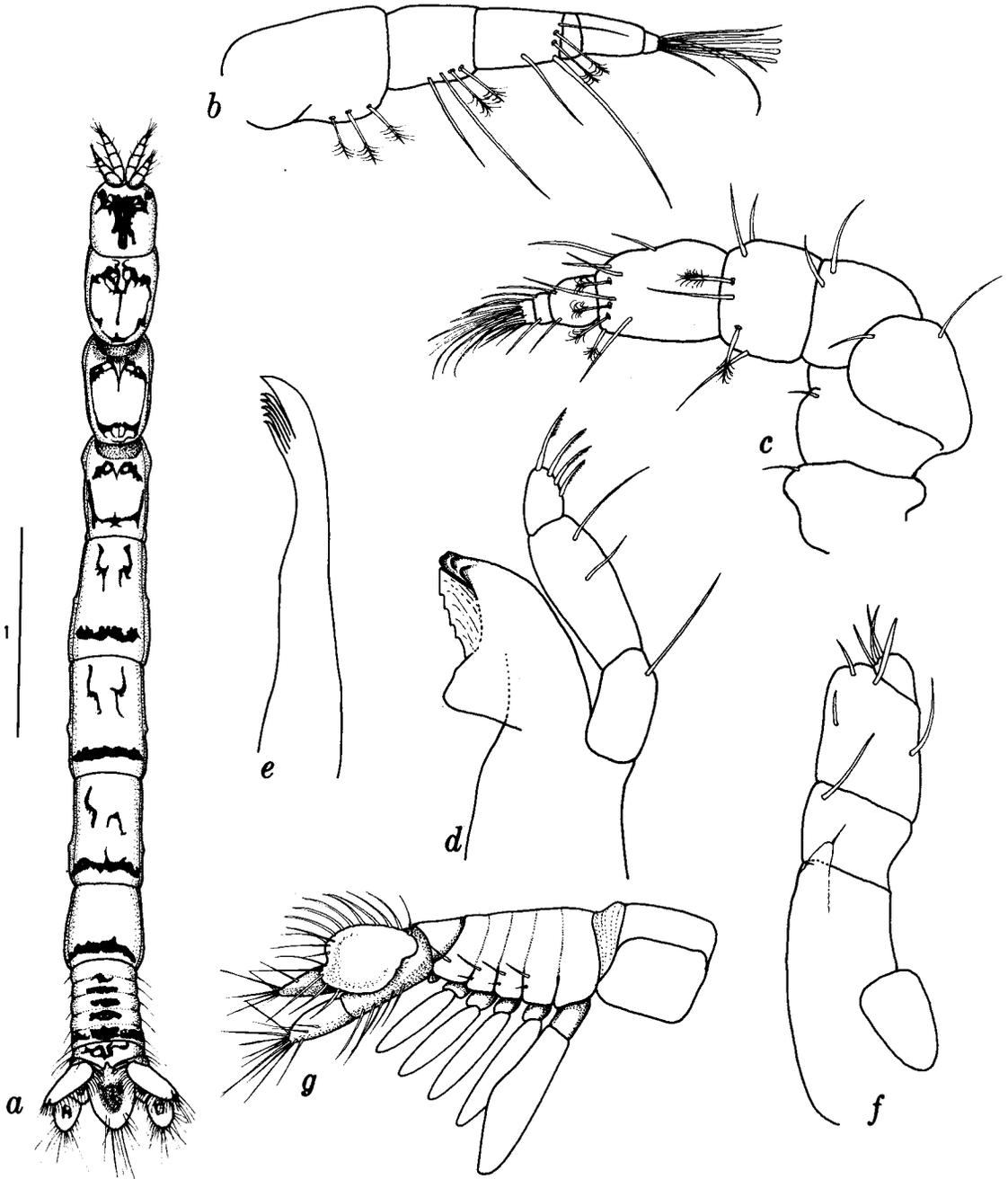


FIGURE 148.—*Mesanthura fasciata* new species, holotype, ♀: a, complete specimen; b, antennule; c, antenna; d, mandible; e, maxilla; f, maxilliped; g, pleon in lateral view.

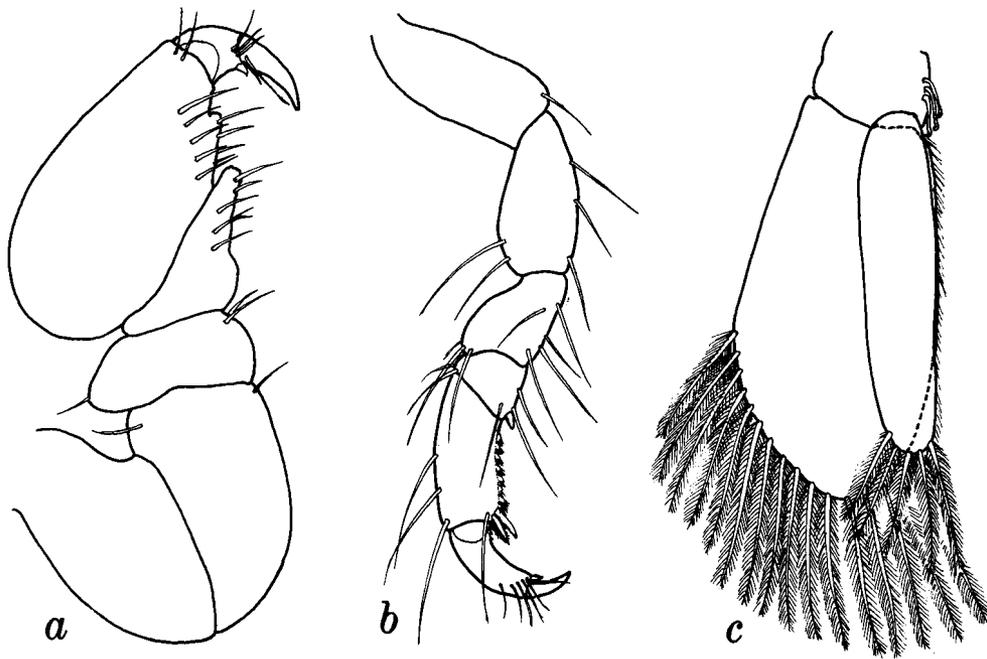


FIGURE 149.—*Mesanthura fasciata* new species, ♂: *a*, pereopod 1; *b*, pereopod 7; *c*, pleopod 1.

Mesanthura, Barnard

Mesanthura fasciata, new species

FIGURES 148, 149

DESCRIPTION OF FEMALE.—Integument not indurate. Body proportions: $C < 1 < 2 = 3 < 4 = 5 > 6 > 7$. Cephalon with low rostrum, not extending beyond anterolateral corners; eyes dorsolateral. Pereonites 2 and 3 each with anterodorsal hollowed area. Pleonites 1–5 fused, indicated laterally, and with dorsal grooves marking fusion lines; pleonite 6 free, with middorsal notch in posterior margin. Telson dorsally slightly convex, distal margin rounded.

Antennular peduncle 3-segmented, flagellum 3-segmented, distal segment one-quarter length of second segment, with 3 aesthetascs. Antennal peduncle 5-segmented, second segment grooved to accommodate antennule; flagellum 3-articulate. Mandibular palp 3-segmented, third segment one-third length of second, with 4 finely fringed spines; incisor of 3 cusps; lamina dentata with 4 serrations; molar bluntly rounded. Maxilla with 1 strong spine and 5 smaller distally curved

spines. Maxilliped 5-segmented, terminal segment small, set obliquely at outer distal angle of fourth segment; tiny thin-walled endite present at base of third segment. Pereopod 1 dactylus with small spine at base of unguis; propodal palm with rounded lobe at about midlength; 5 simple setae on inner face of propodus; carpus triangular, distally somewhat produced and rounded. Pereopods 2–7 similar; posterior pereopods with triangular carpus bearing short posterodistal spine, underriding propodus; latter with 2 serrate posterodistal spines; posterior margin bearing tiny fringed spines. Pleopod 1 exopod operculiform, extending somewhat beyond endopod; both rami with distal plumose setae; basis with 3 retinaculae. Uropodal exopod with strong distal notch, fringed with plumose setae, extending beyond base of endopod; latter oval, extending slightly beyond telson apex.

COLOR NOTES.—Red-brown pigment pattern constant, characterized by irregular patch on cephalon, delicate reticulation on pereonites 1–3; thin anterior submedian lines and posterior solid transverse bars on pereonites 4–7; pleon with 5 short transverse bars on fused pleonites 1–5,

pleonite 6 with fine middorsal tracery; patches of pigment on telson and uropodal bases and endopods.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble and coarse sediments, intertidal to 24 m.

Holotype: ♀ (TL 4.5 mm), Carrie Bow Cay, USNM 171162.

Paratypes: 6♀ (TL 3.7–4.5 mm), USNM 171163.

Additional Material: 28♀, 25 juveniles.

REMARKS.—On the basis of the color pattern, the present species bears some resemblance to *M. occidentalis* Menzies and Barnard, 1959, from southern California, especially in the delicate tracery on pereonites 1–3. The Californian species, however, lacks the strong posterior pigment bars on pereonites 4–7 and the 5 shorter bars on the pleon. The 2 species can further be separated on the form of the maxilliped.

ETYMOLOGY.—The specific name, derived from the Latin *fasciata* (striped), refers to the transverse bands of pigment on the posterior pereonites and on the pleon.

Mesanthura paucidens Menzies and Glynn

FIGURES 150, 151

Mesanthura paucidens Menzies and Glynn, 1968:27, fig. 9A–G.

DESCRIPTION OF FEMALE.—Anterolateral lobes of cephalon rounded, not extending beyond rostrum. Cephalon with marked dorsolateral ridge; midventral margin posterior to maxilliped evenly convex. Pereon and pleon not indurate. Pleonites 1–5 fused, sutures barely discernible along ventrolateral margin; pleonite 6 free, with narrow middorsal notch in posterior margin. Telson dorsally gently convex, distal margin evenly rounded.

Antennular peduncle 3-segmented, distal segment very short, flagellum of 3 articles, terminal article bearing several setae and 2 aesthetascs. Antennal peduncle 5-segmented, second segment grooved to accommodate antennule; flagellum of 3 (?4) short setose articles. Mandibular palp 3-segmented, terminal segment shortest and narrowest, with 6 stout spines; incisor of 3 blunt cusps, linked to somewhat reduced and rounded

molar by 6-serrate lamina dentata. Maxilla slender, with 6 terminal spines. Maxilliped 5-segmented, second segment with reduced endite on inner face. Pereopod 1 unguis half length of dactylus; propodal palm finely crenulate, with small convex transparent process at midpoint bearing simple setae. Pereopod 2 unguis one-third length of dactylus; propodus cylindrical, with strong serrate distoventral spine; carpus triangular. Pereopods 5–7 with carpus and propodus each with distoventral spine. Pleopod 1 exopod operculiform, about 3 times width of endopod; basis with 4 retinaculæ. Uropodal exopod (Figure 150e) distally sinuous rather than notched.

DESCRIPTION OF MALE.—Eyes larger than in female. Antennular flagellum of 7 articles, each with whorl of filiform aesthetascs. Pereopod 1 with lobe at about midpoint of propodal palm, inner surface of propodus with many finely serrate spines. Pleopod 2 copulatory stylet cylindrical, extending beyond rami, distally spinulose, apically rounded and slightly sclerotised.

COLOR NOTES.—Female with roughly rectangular dorsal patches of chromatophores on cephalon and pereonites. Pleon with 5 laterally linked transverse bars. Telson and uropodal endopod and basis with proximal chromatophores. Male with pigmentation of pereon heavier and less defined than in female, but with 5 pleonal bars as in female.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble and shallow sediments: 25♀ (TL 6.6 mm), 1♂ (TL 6.4 mm), 9 juveniles. Twin Cays, under mangroves: 1♀.

PREVIOUS RECORDS.—Puerto Rico.

REMARKS.—The palm of pereopod 1 has a definite rounded process at midlength, but as this is transparent, it may have been overlooked and therefore not figured by Menzies and Glynn (1968). The presence of a small maxillipedal endite is unusual in *Mesanthura*, but may be related to the relatively small body size, and the almost interstitial habit. The fact that the holotype is only about one-third the length of the present mature male and females may account for the omissions in the original description.

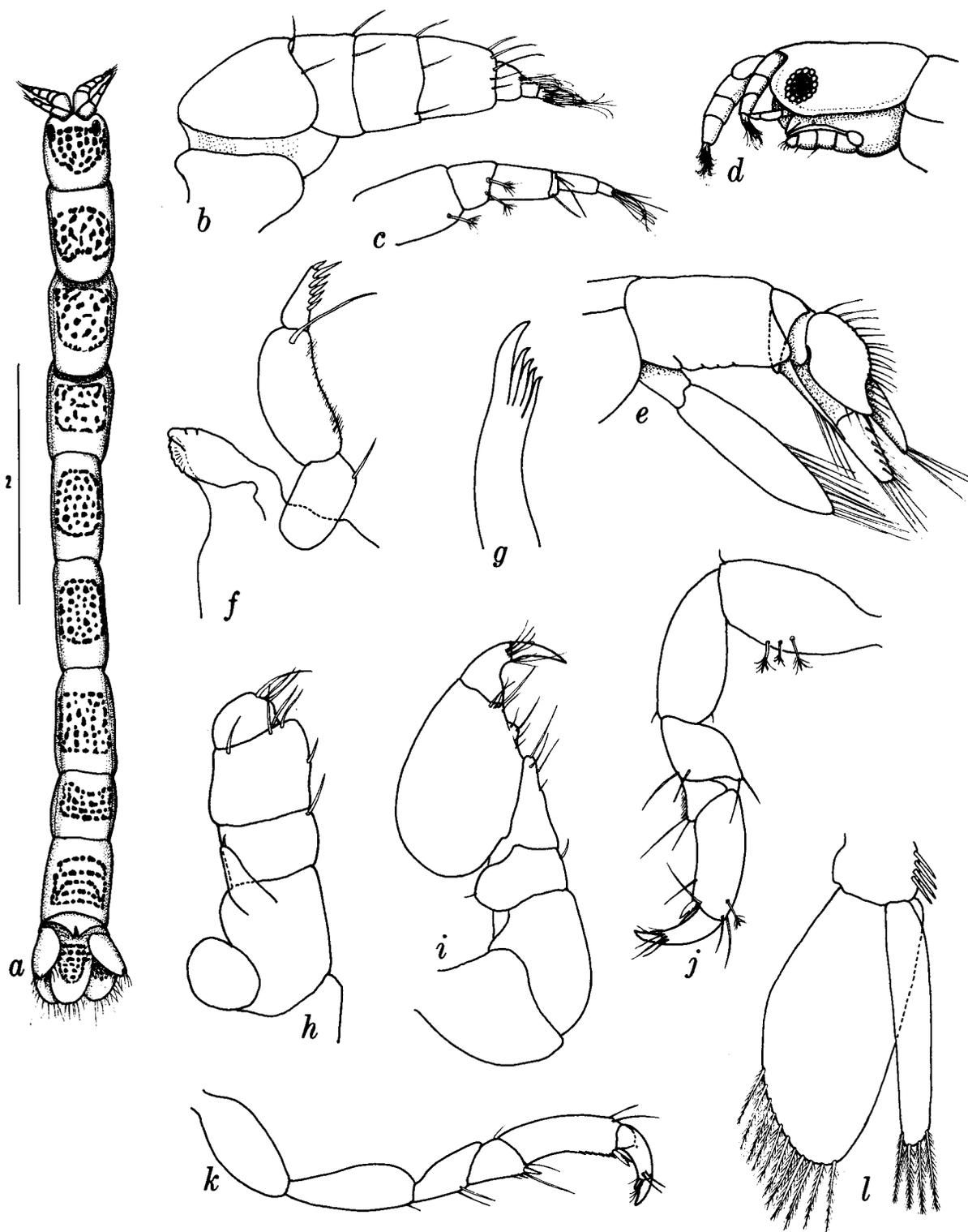


FIGURE 150.—*Mesanthura paucidens* Menzies and Glynn, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, cephalon in lateral view; *e*, pleon in lateral view; *f*, mandible; *g*, maxilla; *h*, maxilliped; *i*, pereopod 1; *j*, pereopod 2; *k*, pereopod 7; *l*, pleopod 1.

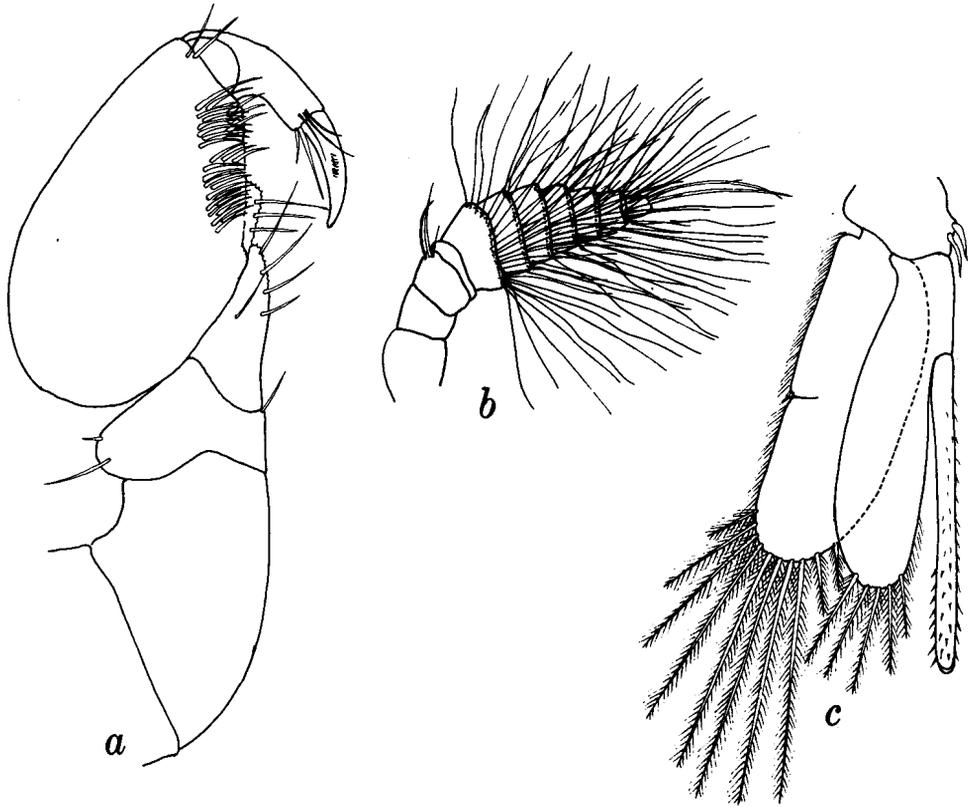


FIGURE 151.—*Mesanthura paucidens* Menzies and Glynn, ♂: *a*, pereopod 1; *b*, antennule; *c*, pleopod 2.

Mesanthura pulchra Barnard

FIGURES 152, 153

Mesanthura pulchra Barnard, 1925:145, fig. 9e.—Schultz, 1969:109, fig. 151.

Mesanthura decorata Menzies and Glynn, 1968:26, fig. 8A-I.

DESCRIPTION OF FEMALE.—Cephalon with rostrum reaching as far forward as anterolateral angles. Body proportions: $C < 1 = 2 > 3 < 4 = 5 = 6 > 7$. Anterior 5 fused pleonites equal in length to pereonite 7; individual pleonites indicated by very short ventrolateral incisions; pleonite 6 free, with middorsal slit in posterior margin. Telson broadly rounded distally.

Antennular peduncle 3-segmented, basal segment longest and broadest, flagellum of 3 articles. Antennal peduncle 5-segmented, second segment broadest, hollowed dorsally to accommodate antennule; flagellum of 3 short articles. Mandibular palp 3-segmented, middle segment longest, distal

segment shortest, with row of 10 spines; incisor of 4 rounded cusps, linked to blunt rounded molar by lamina dentata having 5 serrations. Maxilla slender, with 5 or 6 distal spines. Lower lip bilobed, ending in narrowly rounded process, with fine lateral setae. Maxilliped 5-segmented, second segment longest; third segment slightly narrower than fourth; latter with 4 short setae on median margin; distal segment triangular, with 2 stout, fringed setae and few simple setae. Pereopod 1 unguis one-third length of dactylus; propodal palm with rounded process at about midpoint bearing row of 6 setae, remainder of propodus and carpus with few scattered setae. Pereopod 2 unguis one-quarter length of dactylus; propodus with distoventral spine and few setae; carpus very short, triangular. Pereopods 5-7, propodus with distoventral simple spine plus fringed spine and several short spinules; carpus triangular, under-riding propodus, with distoventral simple spine.

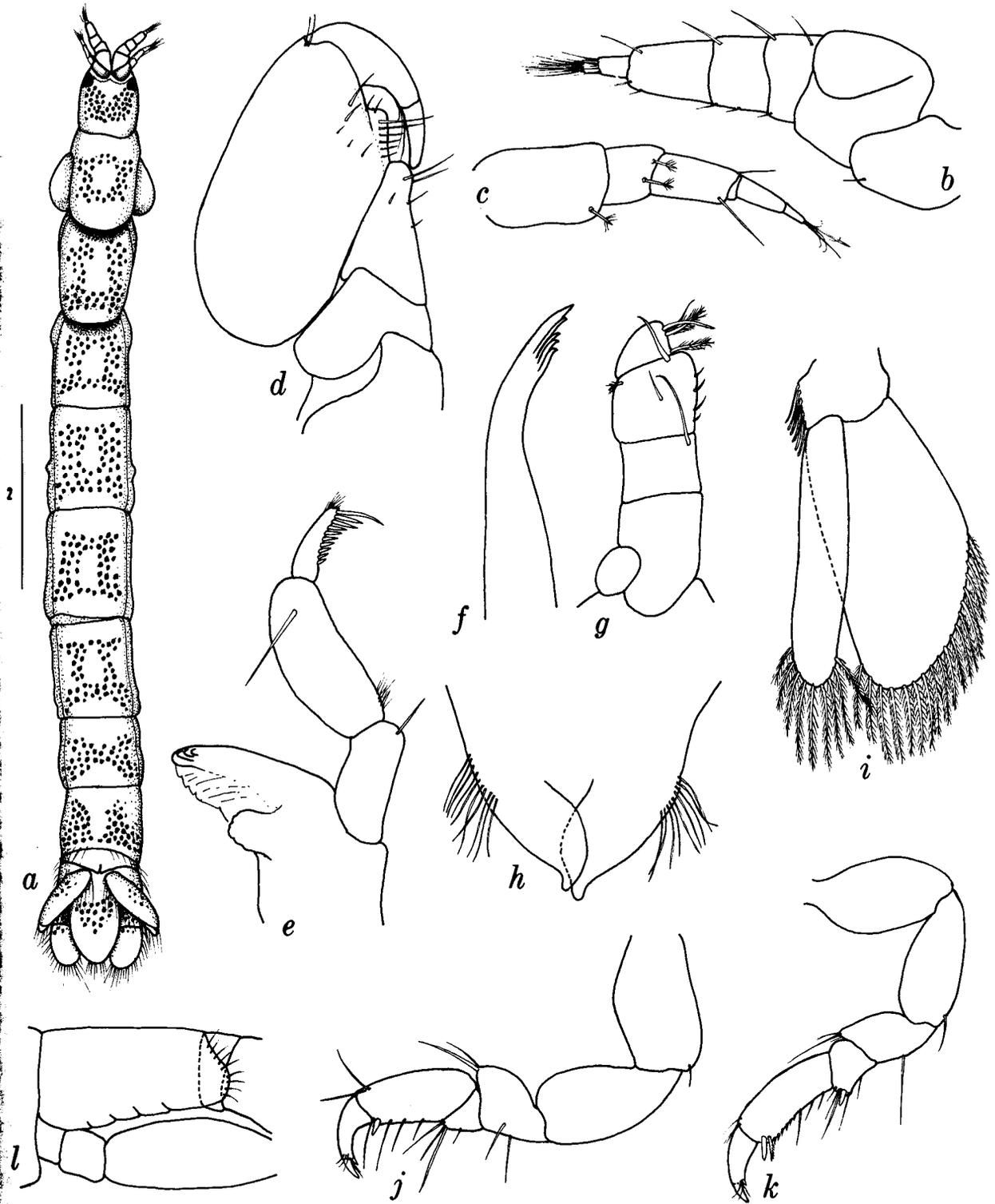


FIGURE 152.—*Mesanthura pulchra* Barnard, ♀: a, complete specimen; b, antenna; c, antennule; d, pereopod 1; e, mandible; f, maxilla; g, maxilliped; h, lower lip; i, pleopod 1; j, pereopod 2; k, pereopod 7; l, pleon in lateral view.

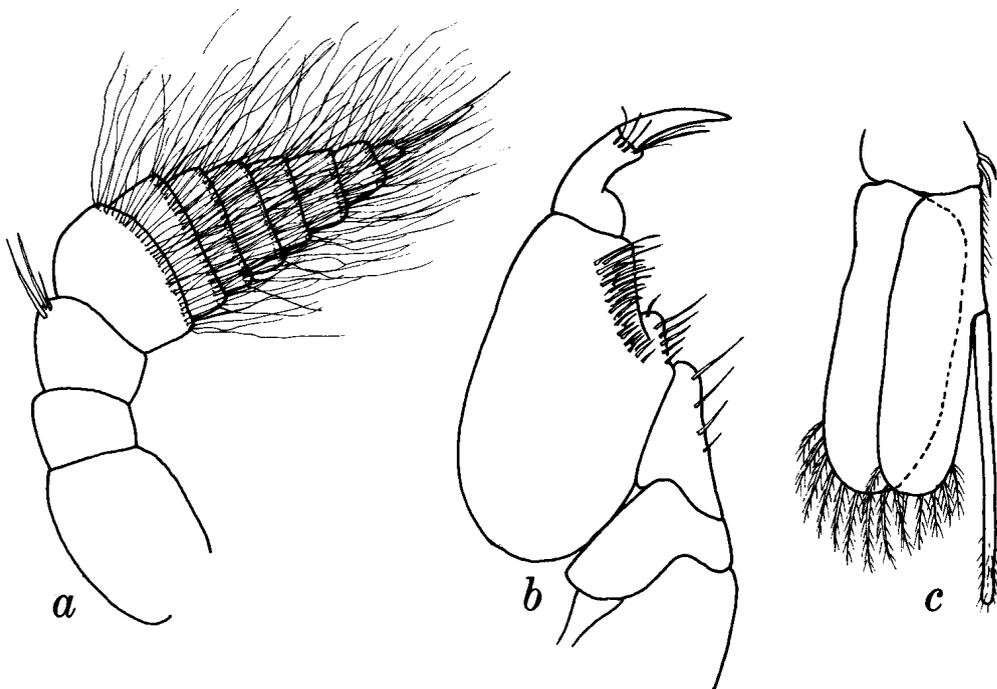


FIGURE 153.—*Mesanthura pulchra* Barnard, ♂: *a*, antennule; *b*, pereopod 1; *c*, pleopod 2.

Pleopod 1 exopod operculiform, 3 times width of endopod, with numerous plumose setae on distal margin; endopod with 9 plumose setae on distal margin; basis with 6 retinaculae. Uropods typical of genus.

DESCRIPTION OF MALE.—Antennule with 3-segmented peduncle, flagellum of 7 articles, each bearing whorl of filiform aesthetascs. Pereopod 1 similar to female, but with unguis half length of dactylus, propodus with dense band of spines on inner face of palm. Pleopod 2 copulatory stylet of endopod simple, cylindrical, extending well beyond rami.

COLOR PATTERN.—Broad band of chromatophores on cephalon posterior to eyes; hollow, roughly rectangular dorsal patch on pereonites 1–6, pereonite 7 and pleon with pigment band laterally broad, narrowed middorsally. Scattering of chromatophores on telson and uropods.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble and shallow sediments: 12♀ (TL 9.3 mm), 4 juveniles.

PREVIOUS RECORDS.—St. Thomas and St. John,

U.S. Virgin Islands; Puerto Rico; Dry Tortugas, Florida.

TYPE MATERIAL.—Barnard's type series from the Copenhagen Museum consists of 2♂ and 1 ovigerous ♀ syntypes, St. Thomas and St. John, 10–18 fathoms (18–33 m); ovigerous ♀ lectotype (TL 6.5 mm); 2♂ (TL 5.4 mm, 4.7 mm) paralectotypes.

REMARKS.—Although Barnard described this species in 1925, examination of the 3 type specimens still reveals the pigment pattern quite clearly. Menzies and Glynn (1968) based their species *M. decorata* on differences in the pigment patterns but made no comparison of appendages. Comparison of the Carrie Bow Cay material and that from the Dry Tortugas, Barnard's types, and Menzies and Glynn's types shows that despite slight differences (for example, in the presence or absence of a clear area on the cephalon), the basic pigment pattern is the same. Comparison of the appendages, especially the first pereopods in both the male and female shows no differences in the 4 groups of specimens available. Schultz's figure

(1969, fig. 151) misrepresents the pigment pattern.

· *Mesanthura punctillata*, new species

FIGURES 154, 155

DESCRIPTION OF FEMALE.—Integument moderately indurate. Cephalon with large dorsolateral eyes, low triangular rostrum extending slightly beyond anterolateral corners. Body proportions: $C < 1 = 2 > 3 < 4 = 5 > 6 > 7$. Pleonites 1–5 fused, only pleonite 1 indicated laterally; pleonite 6 free, with middorsal slit in posterior margin. Telson broadly rounded distally. Antennular peduncle 3-segmented, flagellum of 3 articles. Antennal flagellum 3-articulate. Mandibular palp 3-segmented, middle segment twice length of distal segment, latter armed with 7 finely fringed spines; incisor with 3 cusps; lamina dentata with 5 blunt marginal serrations; molar acute, slightly sclerotised. Maxilla with 1 strong and 4 smaller spines. Maxilliped 5-segmented, distal segment semicircular, with 4 setae; penultimate segment with 2 medial distal setae. Pereopod 1 unguis half length of dactylus, with tiny spine at base; propodus proximally broad, palm with hyaline serrate lobe at midlength; carpus narrowly triangular, distal rounded part bearing 5 serrations. Posterior pereopods with short triangular carpus underriding propodus; posterior margin of propodus bearing short, fringed scales; posterodistal corner with 1 simple and one serrate spine. Pleopod 1 exopod operculiform, about 3 times wider than endopod; both rami with distal plumose setae; basis with 4 retinaculae. Uropodal exopod with outer sinuous margin, but not notched; endopod almost circular.

DESCRIPTION OF SUBMALE.—Antennular flagellum elongate and swollen, but lacking aesthetascs. Pereopod 1 as in female. Pleopod 2 not yet differentiated.

DESCRIPTION OF MALE.—Eyes larger than in female, extending dorsally and ventrally. Antennule with flagellum of 10 articles bearing whorls of filiform aesthetascs. Mandible with palp as in

female; incisor and lamina dentata reduced and not sclerotised; molar absent. Pereopod 1 as in female but with dense band of simple spines on inner face of propodus. Pleopod 2 endopod with copulatory stylet extending well beyond rami, apically rounded.

COLOR NOTES.—Female with pigment pattern consisting of almost solid red-brown bar between eyes and extending in lobes posteriorly; pereon, pleon, telson, and uropods bearing scattered and separate pigment spots. (When chromatophores are expanded, pigment pattern is still scattered and does not become reticulate.) Male with chromatophores scattered dorsally and ventrally over entire body, denser than in female and with no discernible pattern.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble, coarse sediments, intertidal to 12 m.

Holotype: Ovigerous ♀ (TL 6.4 mm), Carrie Bow Cay, USNM 171157.

Allotype: ♂ (TL 4.5 mm), Carrie Bow Cay, USNM 171158.

Paratypes: ♂ (TL 4.5 mm), Carrie Bow Cay, USNM 171159; 3♀ (TL 5.7 mm, 5.2 mm, 5.2 mm), Carrie Bow Cay, USNM 171160.

Additional Specimens: 5♀, 2 sub♂, 8 juveniles.

REMARKS.—The distinctive pigment pattern distinguishes this species from its congeners from the same area. Other differences may be seen in the number of mandibular palp spines, shape of the uropodal exopod, the degree of lateral indication of the fusion of pleonites 1–5, and the armature of the first pereopod.

ETYMOLOGY.—The specific name *punctillata*, derived from the Latin word for small spots, refers to the overall scattered spots of pigment.

Mesanthura reticulata, new species

FIGURE 156

DESCRIPTION OF FEMALE.—Integument hardly indurate. Body proportions: $C = 1 < 2 = 3 = 4 < 5 > 6 > 7$. Cephalon with dorsolateral eyes; tiny triangular rostrum. Pleonites 1–5 fused; 6 free, with middorsal notch in posterior margin.

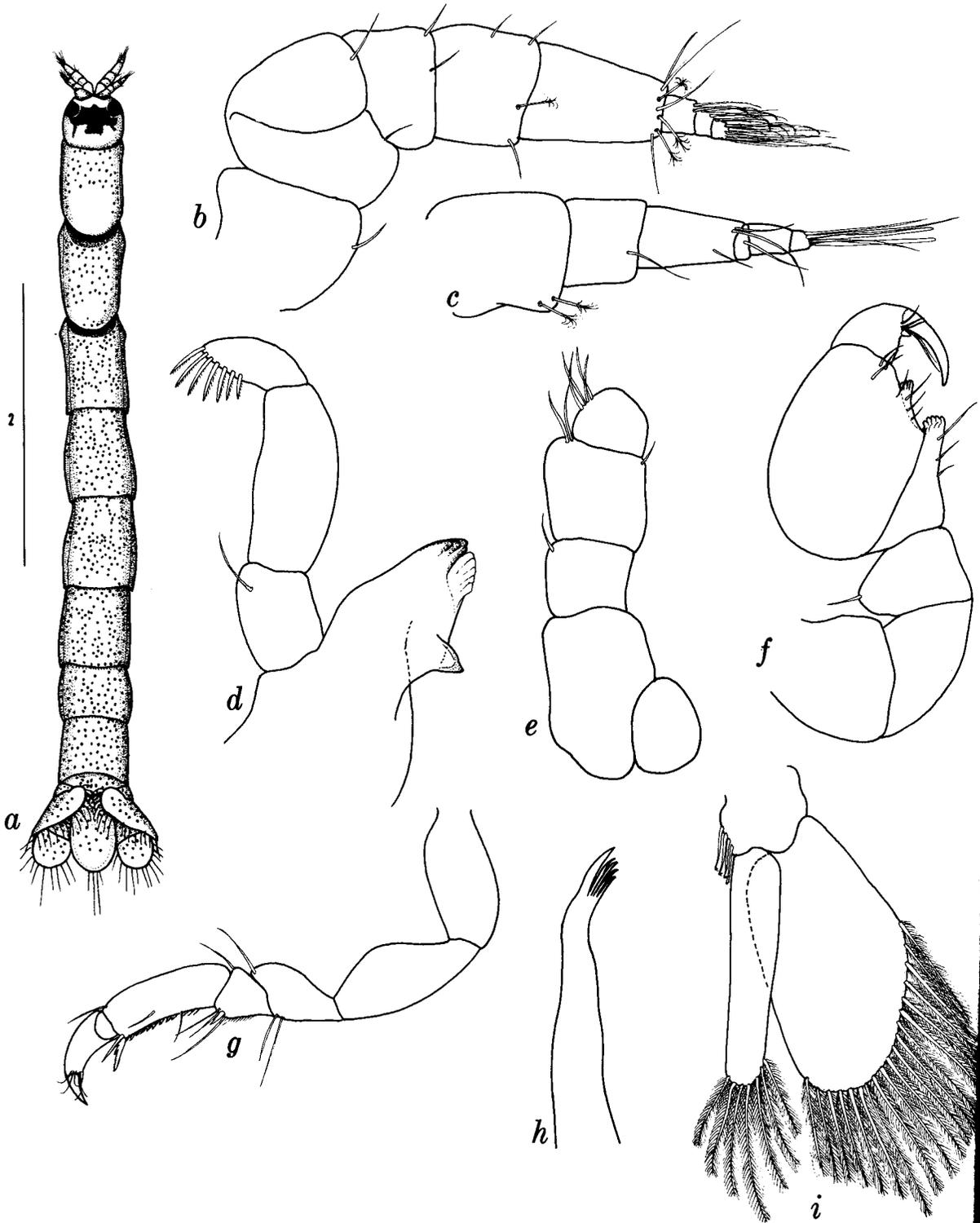


FIGURE 154.—*Mesanthura punctillata* new species, holotype, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, mandible; *e*, maxilliped; *f*, pereopod 1; *g*, pereopod 7; *h*, maxilla; *i*, pleopod 1.

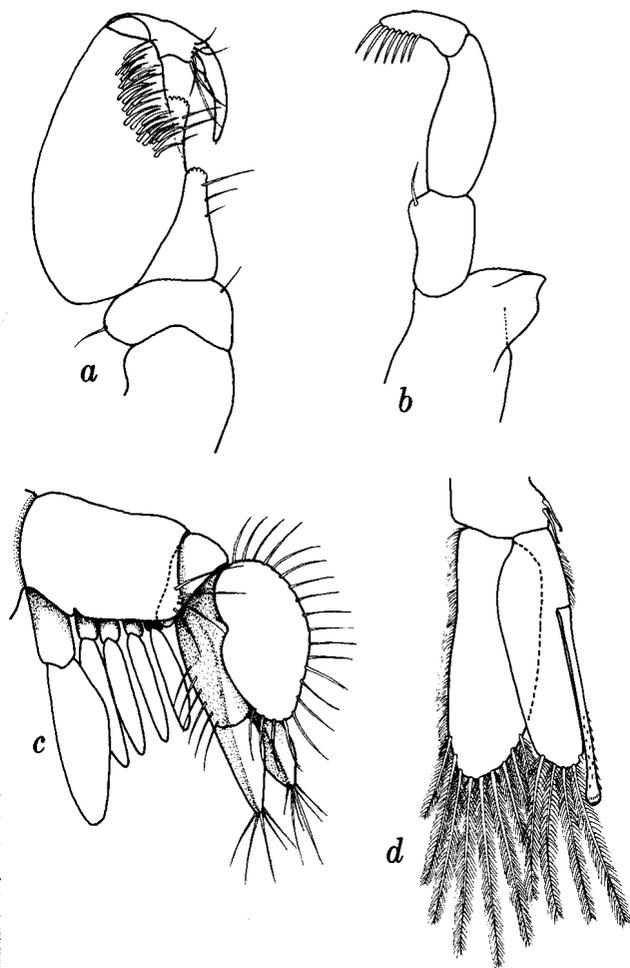


FIGURE 155.—*Mesanthura punctillata* new species, ♂: a, pereopod 1; b, mandible; c, pleon in lateral view; d, pleopod 2.

Telson dorsally flattened, distal margin evenly rounded.

Basal antennular peduncle segment broader than, but equal in length to, 2 distal segments; flagellum of 3 articles. Antennal flagellum of 3 articles. Mandibular palp, distal segment with 6 finely serrate spines; incisor with 3 acute cusps; lamina dentata with 5 marginal serrations; molar thumb-like, blunt. Maxilla with 1 strong and 4 slender distal spines. Maxilliped 5-segmented, lacking endite. Pereopod 1 unguis about one-third length of dactylus, propodus broad, palm with hyaline toothed lobe at midlength; carpus triangular, distal rounded part with about 6 serrations. Posterior pereopods with propodus bear-

ing 3 strong posterodistal sensory spines; several spinules on posterior margin; carpus with short anterior margin, underriding propodus, with single sensory spine at anterodistal corner. Pleopod 1 exopod operculiform, 3 times width and subequal in length to endopod, both rami with distal plumose setae; basis with 5 retinaculae. Uropodal exopod ovate, outer margin sinuous, extending slightly beyond distal end of basis, fringed with plumose setae.

COLOR NOTES.—Red-brown chromatophores form reticulate pattern on dorsal surface of cephalon, pereon, and pleon. Scattered chromatophores on telson and uropods.

MATERIAL EXAMINED.—Carrie Bow Cay, coarse sediment, 24 m.

Holotype: ♀ (TL 6.1 mm), Carrie Bow Cay, USNM 171161.

REMARKS.—*Mesanthura reticulata* somewhat resembles *M. punctillata* in having scattered chromatophores with a concentration of pigment on the cephalon between the eyes, as well as in the shape of the maxilliped and first pereopod of the female. *Mesanthura punctillata*, however, does not have a notched uropodal exopod, the third mandibular palp segment has 7 more slender spines, rather than the 6 found in *M. reticulata*, and the body proportions of the 2 species also differ. Although only 1 specimen of this species was collected, the pigment pattern is distinctive enough to warrant the formation of a new species.

ETYMOLOGY.—The specific name derives from the reticulate dorsal pigment pattern.

Minyanthura, new genus

DIAGNOSIS.—Antennular flagellum of 1 article; antennal flagellum of 4 articles. Mandible lacking palp and molar process. Maxilliped 7-segmented, bearing endite. Pleonites 1–5 fused; pleonite 6 fused with telson. Telson with 2 basal statocysts. Pleopod 1, exopod and endopod together forming operculum over branchial chamber. Carpus of pereopods 4–7, rectangular, not underriding propodus.

TYPE-SPECIES.—*Minyanthura corallicola*, new species.

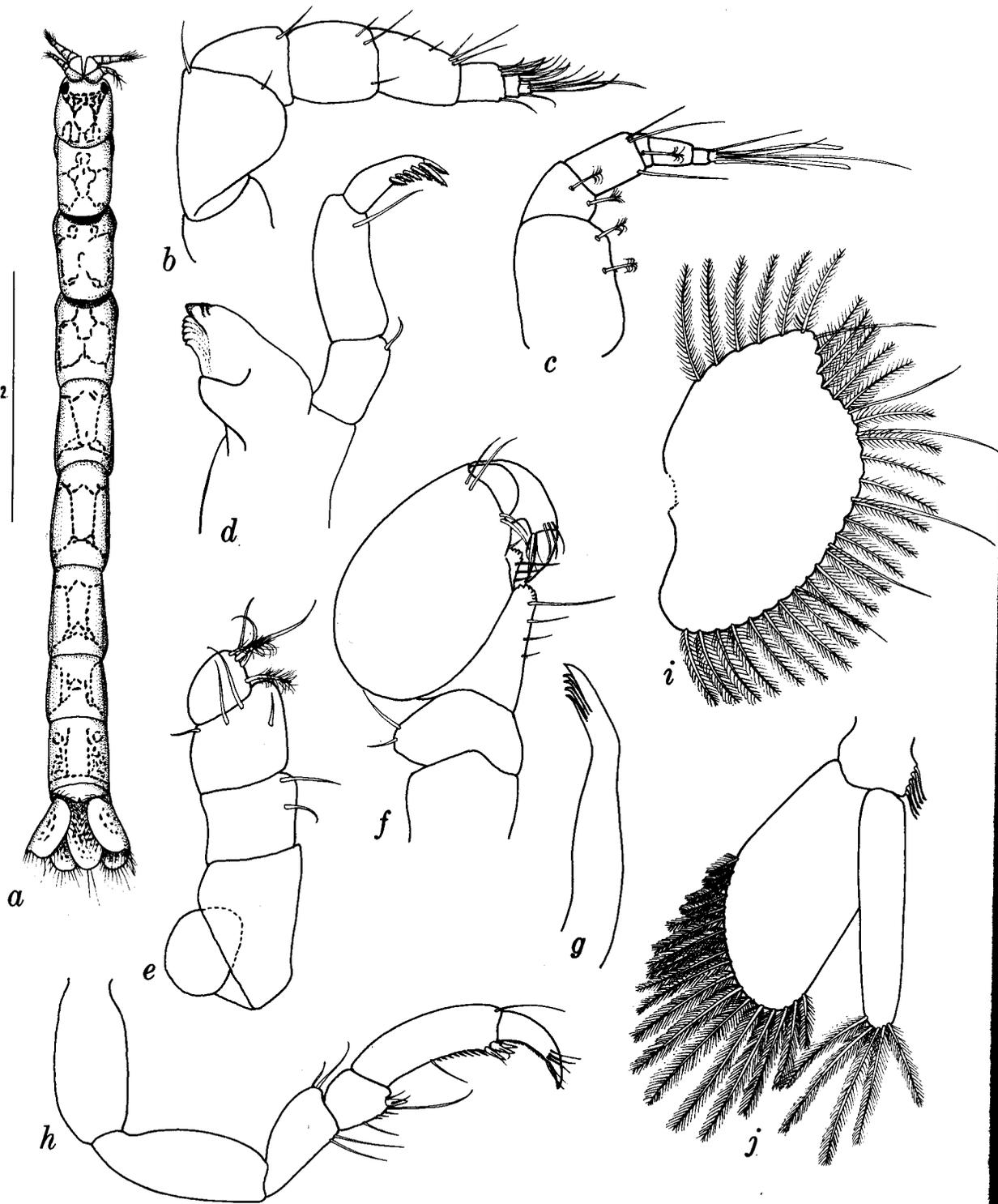


FIGURE 156.—*Mesanthura reticulata* new species, holotype, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, mandible; *e*, maxilliped; *f*, pereopod 1; *g*, maxilla; *h*, pereopod 7; *i*, uropodal exopod; *j*, pleopod 1.

ETYMOLOGY.—The generic name is derived from the Greek *minus* (tiny), and *anthura*, the suffix used for many anthurid genera.

REMARKS.—Three anthurid genera, *Belizanthura*, *Ocsanthura*, and *Neohyssura*, possess a 7-segmented maxilliped with an endite. All 3 genera, however, possess nonoperculiform first pleopods and pleonites 1–5 free, and *Ocsanthura* and *Neohyssura* have a short triangular carpus on the posterior 3 pairs of pereopods, which underrides the propodus. The present specimens (assigned herein to *Minyanthura corallicola*), with pleonites 1–5 fused, and pleonite 6 fused with the telson, and operculiform pleopod 1, and a rectangular carpus on the posterior pereopods, obviously cannot be members of any of the above-mentioned genera. Table 25 summarizes these differences.

Minyanthura corallicola, new species

FIGURES 157, 158

DESCRIPTION OF FEMALE.—Integument not indurate. Body proportions: $C > 1 < 2 < 3 < 4 = 5 > 6 > 7$. Cephalon with broadly rounded rostrum extending beyond anterolateral corners; eyes dorsolateral. Pereonite 7 very short. Pleon only slightly longer than pereonite 7; pleonites 1–5 fused, only indicated ventrolaterally; posterior margin of pleonite 5 with row of plumose setae; pleonite 6 fused with telson. Telson broad, distal margin crenulate, broadly rounded or truncate, with few setae; gently convex, longitudinal mid-dorsal ridge present; broad hyaline margin; 2 large basal statocysts.

Antennular peduncle 3-segmented, basal segment as long as rest of appendage, segments 3 and 4 equal in length, and half width of second segment; flagellum reduced to single very short setose article. Antennal peduncle 5-segmented, second segment curved ventrally, subequal in length to segments 3 and 4; flagellum of 4 articles, basal article longer than 3 distal articles together. Mandible with palp represented by single simple seta; incisor of 3 cusps, lamina dentata narrow, with 6 marginal serrations; molar absent. Maxilla with single stout spine and 5 shorter hooked spines. Maxilliped 7-segmented, 5 distal segments together shorter than second segment; thin-

walled endite tipped with single seta, which reaches base of terminal palp segment. Pereopod 1 unguis one-third length of dactylus; propodus with straight unarmed palm, with single stout serrate spine and irregular row of fine combs of setules on inner face. Pereopod 2 similar to pereopod 1. Posterior pereopods propodus with 2 distal serrate spines; ventral margin with row of setule-combs; carpus rectangular, not underriding propodus. Pleopod 1 exopod and endopod lying side by side, subequal in length, together forming operculum over branchial chamber; exopod broadening distally, almost 3 times wider than endopod; both rami with distal plumose setae. Uropodal basis with row of plumose setae on outer margin: exopod widening distally, outer distal angle produced into acutely triangular lobe; inner distal angle rounded and dentate; endopod oval, distal margin serrate, endopod and exopod with broad hyaline border.

DESCRIPTION OF MALE.—Body proportions as in female. Eyes larger than in female. Antennular peduncle 3-segmented, flagellum of 2 articles with single terminal aesthetasc. Pereopod 1 as in female. Pleopod 2 endopod with copulatory stylet formed by club-shaped extension of distal end of ramus.

COLOR NOTES.—Female, cephalon with broad dark-red-brown band between and posterior to eyes, with lateral unpigmented spots, centrally continuous with pattern on pereonite 1; latter with anterodorsal branching patch; pereonite 2 with dark medio-dorsal ramifying pattern; pereonite 3 with 2 slender lateral bars; pereonite 4 with broad posterodorsal rectangle; pereonite 5 with slender posterodorsal rectangle; tiny wedge between pereonites 6 and 7; pleon with solid middorsal patch with lateral extensions. Male, pigment pattern less defined than in female, with scattered ventral patches.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble, 6–24 m.

Holotype: larvigerous ♀ (TL 1.7 mm), Carrie Bow Cay, USNM 171169 (2 larvae in brood pouch, with pigment pattern developed).

Allotype: ♂ (TL 1.3 mm), Carrie Bow Cay, USNM 171170.

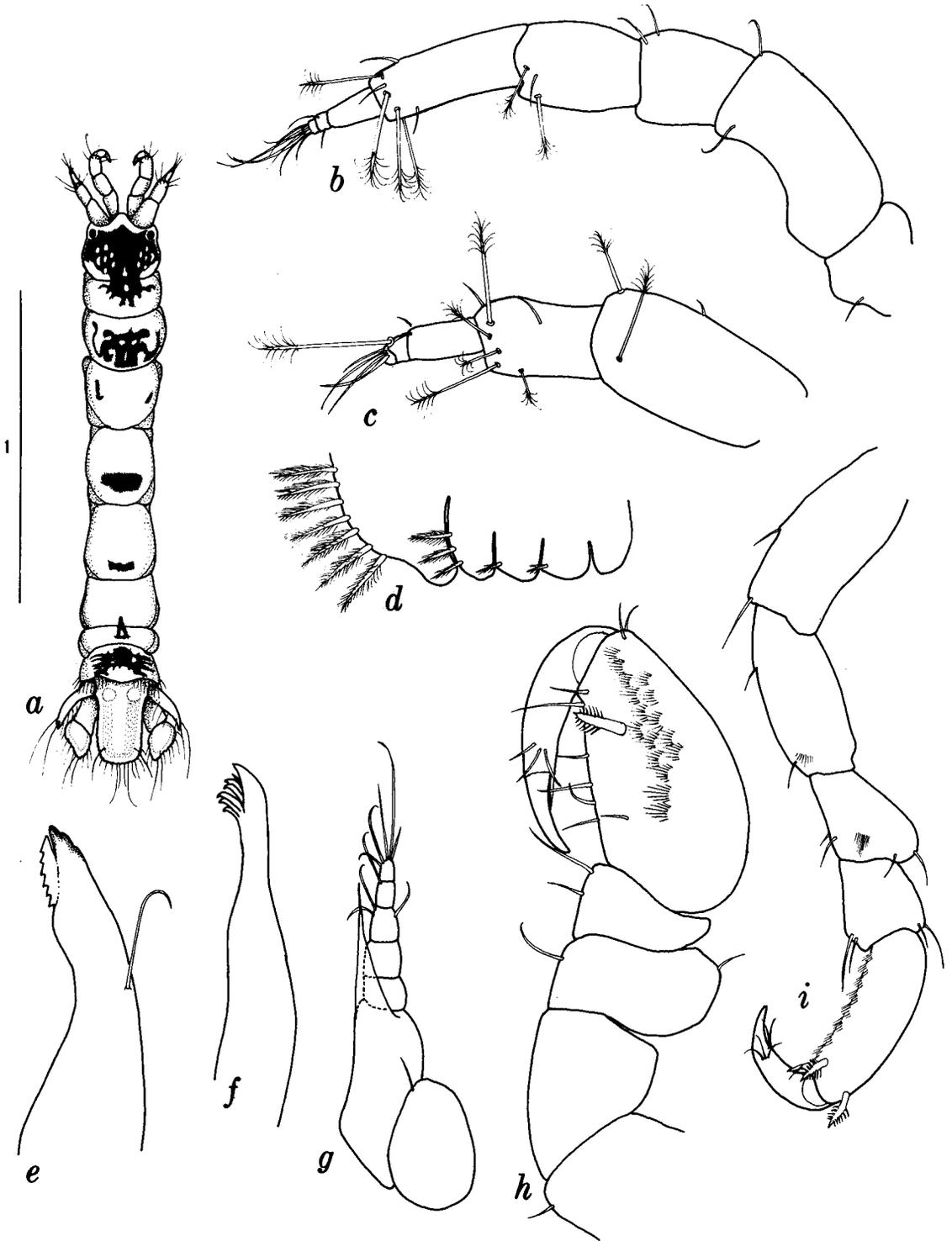


FIGURE 157.—*Minyanthura corallicola* new species, holotype, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, lateral margin of anterior pleon; *e*, mandible; *f*, maxilla; *g*, maxilliped; *h*, pereopod 1; *i*, pereopod 6.

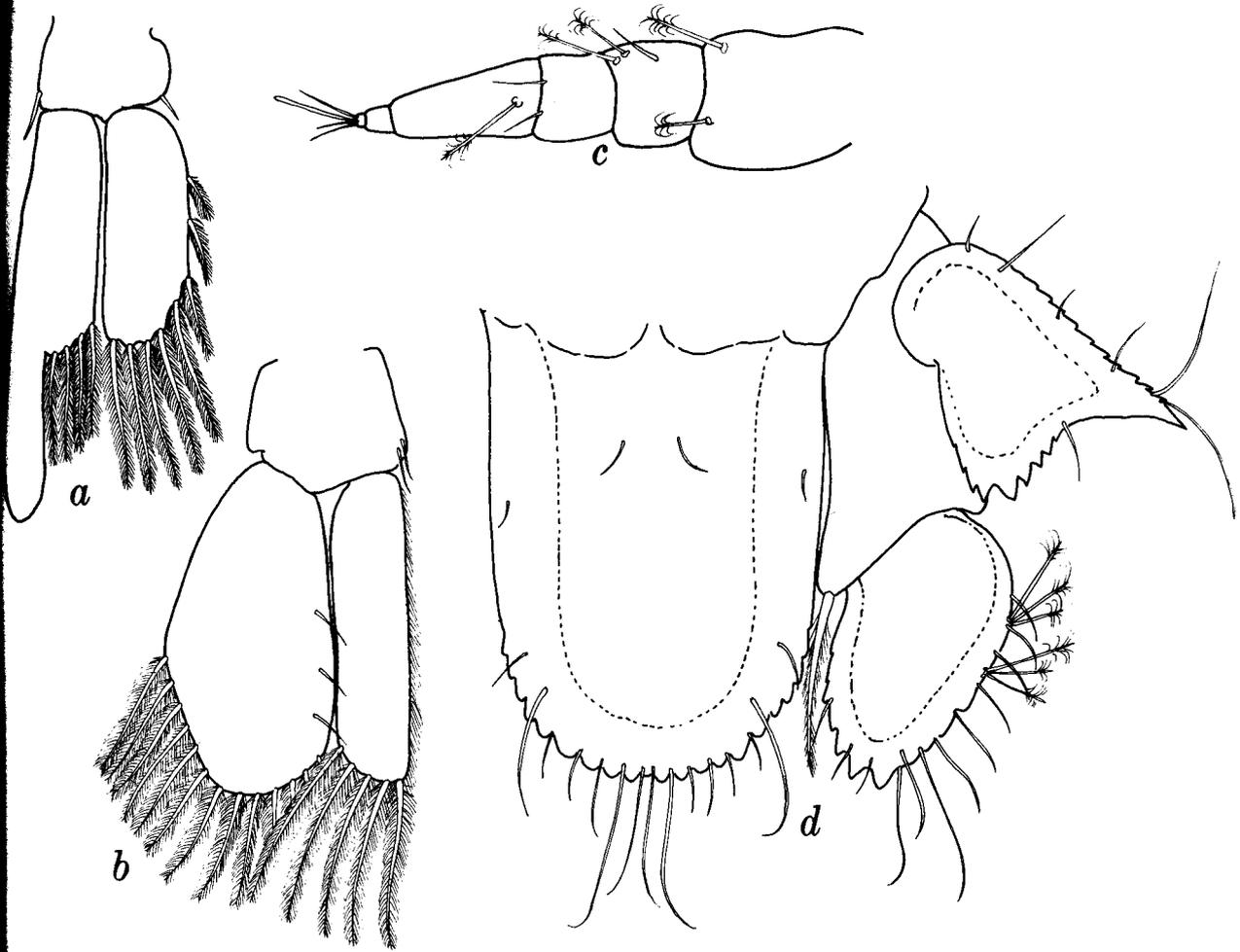


FIGURE 158.—*Minyanthura corallicola* new species, ♂: a, pleopod 2; b, pleopod 1; c, antennule; d, telson and uropod.

Paratypes: 4♀ (TL 1.5–1.8 mm), Carrie Bow Cay, USNM 171171.

ETYMOLOGY.—The specific name *corallicola* which means coral-dwelling, is used because all the specimens were removed from coral rubble.

***Pendantura*, Menzies and Glynn**

***Pendantura tanaiformis* Menzies and Glynn**

FIGURES 159, 160

Pendantura tanaiformis Menzies and Glynn, 1968:32, fig. 12A–I.

DESCRIPTION OF FEMALE.—Integument moderately indurate. Cephalon half length of pereonite

1, with rostrum extending beyond anterolateral corners; eyes present in bases of anterolateral lobes. Body proportions: $C < 1 > 2 = 3 < 4 = 5 > 6 > 7 > P$. Brood pouch formed by 3 pairs oostegites on pereonites 3–5. Pleon very reduced, one-third length of pereonite 7; pleonites indicated only on ventrolateral margins by very short sutures. Telson dorsally flattened, distal margin broadly rounded, pair of statocysts situated at about midlength.

Antennular peduncle 3-segmented, basal segment longest and broadest, distal segment with reduced flagellum of 2 short articles, plus seta-bearing papilla; peduncle armed with large pinnate setae, each articulating on distinct slightly

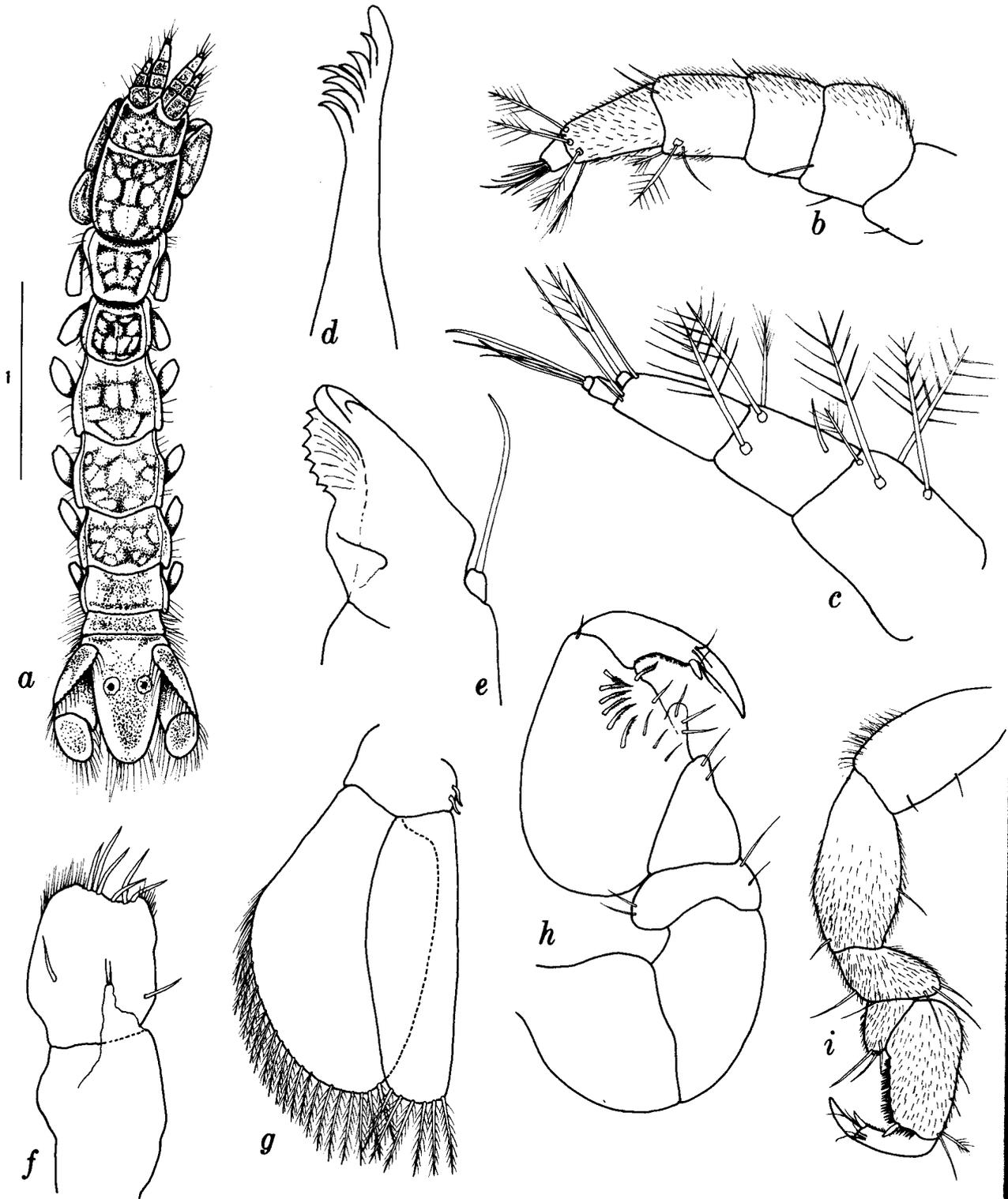


FIGURE 159.—*Pendantura tanaiformis* Menzies and Glynn, ♀: *a*, complete specimen; *b*, antenna; *c*, antennule; *d*, maxilla; *e*, mandible; *f*, maxilliped; *g*, pleopod 1; *h*, pereopod 1; *i*, pereopod 7.

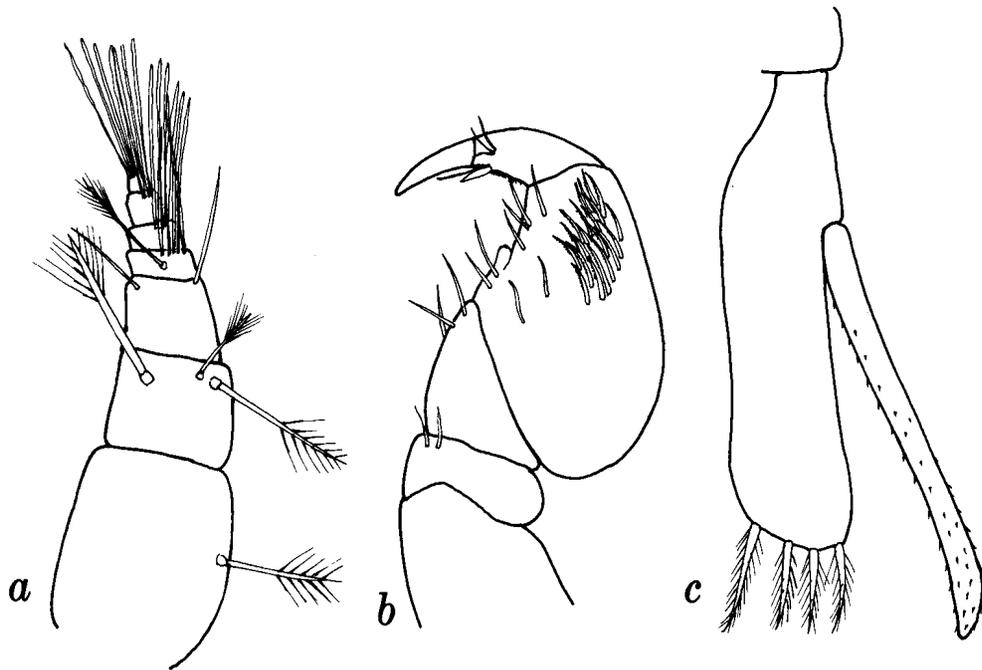


FIGURE 160.—*Pendanthura tanaiformis* Menzies and Glynn, ♂: *a*, antennule; *b*, pereopod 1; *c*, pleopod 2 endopod.

broader base. Antennal peduncle 5-segmented, segments with minute setules; flagellum reduced to single short article. Mandibular palp reduced to small papilla bearing single seta; incisor of 3 rounded, slightly sclerotised cusps; molar reduced; lamina dentata plate with 7 marginal serrations. Maxilla slender, with 8 distal curved spines, terminal spine strongest. Maxilliped 3-segmented, terminal segment with several distal simple setae; thin-walled endite present on inner face, with 2 fine distal setae. Pereopod 1 unguis almost half length of dactylus, ventral margin of latter with fine spinules, strong supplementary spine at base of unguis; propodus with 6 serrate spines on inner face, rounded, very thin transparent lobe on palm with few simple setae. Pereopods 2-7 similar, propodus with posterior margin with crenulations bearing clusters of short spinules and with strong serrate posterodistal spine; carpus short, triangular, underriding propodus; propodus, carpus, merus, and ischium bearing numerous short fine setules. Pleopod 1 exopod operculiform, with numerous laterodistal plumose setae;

endopod half width of exopod, with 6 distal plumose setae; basis with 2 retinaculae. Uropodal exopod distally narrowly rounded, outer (dorsal) margin crenate, with numerous plumose setae, reaching slightly beyond basis; endopod ovoid, bearing plumose and elongate simple setae.

DESCRIPTION OF MALE.—Antennular peduncle 3-segmented, flagellum of 4 articles, each with cluster of aesthetascs. Pereopod 1 propodus with dense cluster of curved serrate spines on inner surface, palm with rounded transparent lobe at about midlength. Copulatory stylet of pleopod 2 endopod attached at about proximal third, cylindrical, longer than ramus, apically narrowly rounded, with minute scattered spinules.

COLOR NOTES.—Strong reticulate red-brown pigmentation dorsally on cephalon, pereonites, antennae and first pereopods, becoming diffuse on pleon, telson and uropods. The young are released from the brood pouch fully pigmented.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble: 37 ovigerous ♀, 82♀, 45♂, 4 juveniles.

PREVIOUS RECORDS.—Puerto Rico.

REMARKS.—This is the second record of this unusual genus and species, and the first record of the male. It was thought useful to supplement Menzies and Glynn's description and to figure most of the appendages. A few features require further comment. Menzies and Glynn (1968) described the mandibular palp as being reduced to 2 setae. In fact, the palp may be regarded as 1-segmented, this seta-bearing segment being reduced to a small papilla. Menzies and Glynn mentioned the possible existence of a second flagellar ramus of a single article, on the antennule. More likely, this apparent segment is the slightly enlarged articulated base of one of the large specialized pinnate setae.

Family PARANTHURIDAE

Accalathura, Barnard

Accalathura crenulata (Richardson)

Calathura crenulata Richardson, 1901:509, figs. 1-4; 1905:74, figs. 58-61.

Accalathura crenulata.—Barnard, 1925:147, pl. 4: fig. 18.—Nierstrasz, 1941:242.—Menzies and Glynn, 1968:33, fig. 13A-H.—Schultz, 1969:96, fig. 128.

MATERIAL EXAMINED.—Carrie Bow Cay, intertidal to 12 m, sediments, 9♀, 3♂, 9 juveniles; Twin Cays, under mangroves, 1♀.

PREVIOUS RECORDS.—Bahamas; Puerto Rico; Yucatan, 40 m; Brazil; Cape Verde Is.

Paranthura, Bate and Westwood

Paranthura caribbiensis, new species

FIGURES 161, 162

DESCRIPTION OF FEMALE.—Integument not indurate, with sparse scattered chromatophores. Cephalon with patch of chromatophores between dorsolateral eyes; tiny, triangular rostrum, not extending beyond anterolateral corners. Body proportions: C < 1 < 2 > 3 < 4 > 5 > 6 > 7. Pleonites 1-5 free, subequal; pleonite 6 with bilobed posterodorsal margin. Telson dorsally flat,

basally constricted, distal margin evenly rounded, with few setae.

Antennular peduncle 3-segmented, basal segment wider than and subequal in length to 2 distal segments; flagellum of 4 articles bearing aesthetascs. Antennal flagellum of single flattened triangular article. Mandibular palp 3-segmented, second segment two and one-half times length of basal segment, third segment with 4 stout fringed spines. Maxilla slender, with 8 distal serrations. Maxilliped 3-segmented, with short endite at base of third segment. Pereopod 1 unguis about one-third length of dactylus; propodus proximally broad, with convex flange and row of 12-14 spines on inner face. Pereopods 2 and 3 similar, subchelate, smaller than pereopod 1; propodal palm armed with 5 sensory spines. Pereopods 4-7 ambulatory, propodus with 2 posterior sensory spines; carpus rectangular, with 2 posterior sensory spines. Pleopod 1 exopod operculiform, four times wider and slightly longer than endopod, both rami with distal plumose setae; basis with 4 retinaculae. Uropodal endopod subcircular; exopod oval, outer margin slightly sinuous, extending beyond endopod base.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble, shallow sediments, and under mangroves.

Holotype: Larvigerous ♀ (TL 4.5 mm), Carrie Bow Cay, USNM 171164 (8 larvae in brood pouch).

Paratype: Ovigerous ♀ (TL 4.5 mm), Carrie Bow Cay, USNM 171165.

Additional Material: 10♀, 4 juveniles.

REMARKS.—This small species of *Paranthura* is easily distinguished from the larger *P. infundibulata*, which also occurs at Carrie Bow Cay, by the serrate and curved telson in the latter species. *Paranthura barnardi* Paul and Menzies, 1971, recorded from Venezuela, is more similar to *P. caribbiensis* in both size and structure. These 2 species can be separated on the uropodal structure (broadly ovate and crenulate in *P. barnardi*, narrowly ovate/sinuous, and entire in *P. caribbiensis*), the telson, which is distally more rounded in *P. caribbiensis*, the presence of a small maxillipedal endite in this species (absent in *P. barnardi*), the

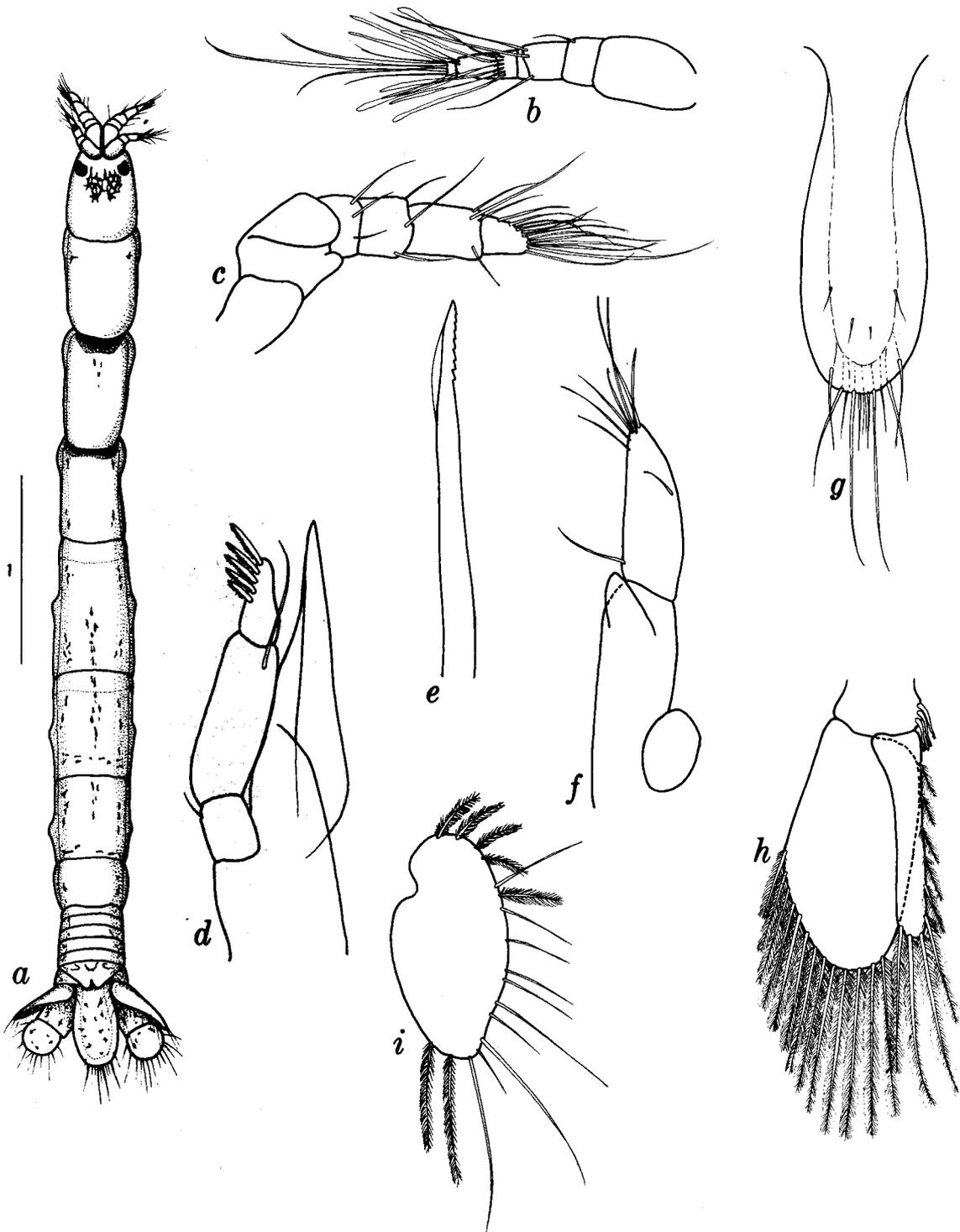


FIGURE 161.—*Paranthura caribbiensis* new species, holotype, ♀: *a*, complete specimen; *b*, antennule; *c*, antenna; *d*, mandible; *e*, maxilla; *f*, maxilliped; *g*, telson; *h*, pleopod 1; *i*, uropodal exopod.

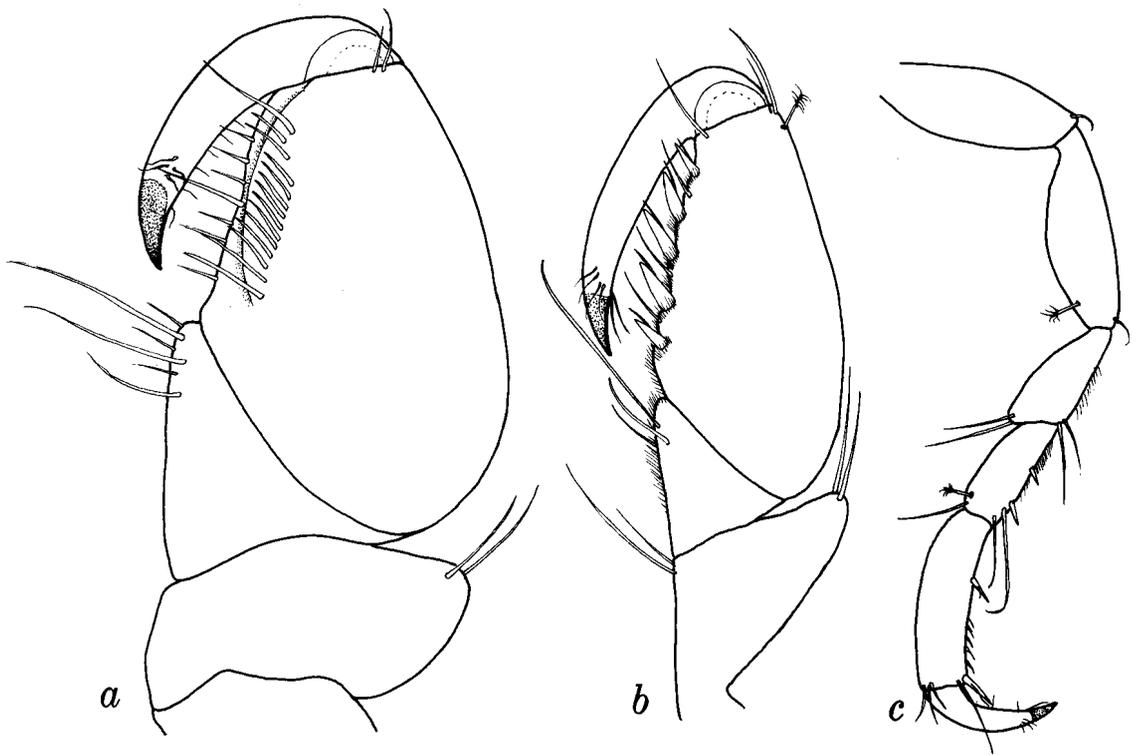


FIGURE 162.—*Paranthura caribbiensis* new species, ♀: *a*, pereopod 1; *b*, pereopod 2; *c*, pereopod 7.

relative proportions of the antennular flagellar articles, and the number of spines on the terminal segment of the mandibular palp (5 in *P. caribbiensis*, 8 in *P. barnardi*). The patch of chromatophores between the eyes in the present species is also a distinctive feature.

ETYMOLOGY.—The specific name is derived from the Caribbean Sea in which Carrie Bow Cay is situated.

Paranthura infundibulata Richardson

Paranthura infundibulata Richardson, 1902:284, figs. 15–20; 1905:76, fig. 62.—Barnard, 1925:155.—Menzies and Glynn, 1968:11.—Schultz, 1969:95, fig. 126.—Camp, Whiting, and Martin, 1977:16.

Paranthura verrillii Richardson, 1902:286, figs. 21, 22; 1905:77, fig. 63.—Barnard, 1925:155. Menzies and Glynn, 1968:11.

MATERIAL EXAMINED.—Carrie Bow Cay, coral rubble: 2♀, 1♂, 12 juveniles.

PREVIOUS RECORDS.—Bermuda; Florida.

Discussion

MICROHABITATS.—The five microhabitats that were sampled for anthuridean isopods in and around Carrie Bow Cay ranged in depth from the intertidal zone to about 24 meters. A general description of the location is presented in Rützler and Macintyre (herein: 9). Although quantitative sampling was not done, about 5 liters of sediment, plant material, and/or rubble was collected at each station, and subjective measures of anthuridean abundance (Table 26) are given in addition to the comments on these microhabitats and their fauna that follow.

1. Coral rubble and algae atop the reef, east side of island. Because much of the reef top is in very shallow water (intertidal to 30 cm) this area is subject to considerable wave action and turbulence under windy or stormy conditions, and to local warming under calm conditions. This environment—with the numerous crevices provided by the Corallinacea-encrusted pieces of coral—shelters a rich population of cryptic ani-

TABLE 26.—Distribution of anthuridean species at Carrie Bow Cay and vicinity by substrate and depth (A = abundant, > 20 specimens; FC = fairly common, 5–19 specimens; P = present, < 5 specimens)

Species	Coral rubble 0–1.5 m	Coarse sediments 0–1.5 m	Algal mat under mangroves 0–1.5 m	Coarse sediments 6–12 m	Coarse sediments 24 m
<i>Accalathura crenulata</i>	–	FC	P	P	–
<i>Apanthura geminsula</i>	A	A	A	–	–
<i>A. signata</i>	P	A	–	–	P
<i>Apanthuroides millae</i>	–	–	–	P	P
<i>Belizanthura imswe</i>	P	P	A	–	–
<i>Mesanthura fasciata</i>	A	A	–	P	P
<i>M. paucidens</i>	FC	A	P	–	–
<i>M. pulchra</i>	FC	P	–	–	–
<i>M. punctillata</i>	FC	P	–	P	–
<i>M. reticulata</i>	–	–	–	–	P
<i>Minyanthura corallicola</i>	–	–	–	P	P
<i>Paranthura caribbiensis</i>	FC	P	P	–	–
<i>P. infundibulata</i>	FC	–	–	–	–
<i>Pendantthura tanaiiformis</i>	A	–	–	–	–

mals, including isopods, amphipods, small mollusks, polychaetes, sipunculans, and pycnogonids. Ten species of anthurideans were collected here, several of which also occurred in coarse sediments of weed beds and at the bases of patch corals. *Pendantthura tanaiiformis* and *Paranthura infundibulata* were found only in the coral rubble, the former in great numbers. The dark wine-red pigmentation of both species, which live in the tiny holes in the Corallinacea-encrusted coral fragments, probably has a protective function. Probably also connected with this overriding red coloration of the coral rubble is the fact that 8 of the 10 species occurring here have some degree of integumental pigmentation.

2. Coarse white sandy sediments in shallow water. These sediments were taken from *Thalassia* weed beds, *Syringodium* weed beds, or from the sandy patches between patch reefs at a depth of 1.5 m or less. These sites are in protected areas with little wave action, either in the lagoonal area west of the island, or in the shallows between the main reef and the island. Eight species of anthurideans were common to these habitats and to the coral rubble area atop the reef, with *Mesanthura*

fasciata, *M. paucidens*, and *Apanthura geminsula* being fairly common to abundant in both habitats.

3. Shallow water sediments and algae at bases of mangroves. This habitat is characterized by calm water in the shade of the mangrove trees, with high accumulations of organic debris, especially mangrove leaves and rootlets, and *Thalassia* leaves. In the several large samples taken under the mangroves, three of the five species of anthurideans collected occurred only rarely, whereas *Belizanthura imswe* and *Apanthura geminsula* were abundant, especially in the dense carpet of *Caulerpa verticillata* J. Agardh growing in less than 15 cm of water between the mangrove trunks and roots. Although *Belizanthura* was taken rarely from other living plants, it is abundant only in the *Caulerpa verticillata*. This algal mat, with its high organic debris content, and with a complex web of fine algal species (including *Cladophora* sp., *Centroceras* sp., *Ceramium* sp., blue-green algae and diatoms), which floats above the *Caulerpa* at high-tide and sinks onto the *Caulerpa* at low-tide, harbors a rich fauna, including many asellote and gnathiid isopods, amphipods, a high diversity of pycnogonids (C. A. Child, pers. comm.), poly-

chaetes, nematodes, cumaceans, leptostracans, and small mollusks, especially the bivalved gastropod *Berthelinia*.

4. Coarse sediments and rubble from the channel between Carrie Bow Cay and South Water Cay. This area is somewhat protected from wave action, but subject to the scouring action of water moving through the channel at a depth of 6 to 12 m. Five species of anthurideans were collected here, none of which appeared to be abundant.

5. Sand trough at base of coral and gorgonian-covered slope. Only two species, *Apanthura signata* and *Mesanthura fasciata* were collected from this area (~24 m depth) and from the intertidal zone. Both were abundant only in the very shallow sediments. Interestingly, *Minyanthura corallicola* resembles *Pendanthura tanaiformis* both in overall size and in having a very short anterior pleonal area. Both species seem to live in crevices in coral rubble, for which a reduction of the body length may be an advantage.

GENERAL OBSERVATIONS.—Only male anthurids were taken in the horizontal plankton samples, in shallow water over the reefs suggesting that the

males leave the substrate in search of females. The development of enlarged eyes, filiform aesthetascs of the antennular flagella, and pigmentation over the entire body (rather than confined to the dorsum in female *Mesanthura* spp., for example) are probably adaptations for this reproduction-centered activity. It is unlikely that feeding is a reason for this increased activity, considering the reduction of mouthparts seen in the males of *Belizanthura imswae*, *Apanthura geminsula*, and *Mesanthura punctillata*.

The genus *Mesanthura*, represented here by five species (plus single specimens of two additional species not dealt with in this report) shows very successful radiation into several of the microhabitats mentioned above. Four of these five species co-occur in the coral rubble environments, as well as in the coarse sediments from shallow water. Closer investigation will probably reveal distinctive feeding preferences, and even behavioral differences (considering the distinctive and constant dorsal pigmentation of each species), which would account for this apparent overlap of several species of the same genus.

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