

FIGURE 18.—*Paracerceis cohenae*, new species: a, pereopod 1; b, pereopod 7; c, pereopod 2; d, penis; e, pleopod 1; f, pleopod 2, ♂; g, pleopod 3; h, pleopod 4; i, pleopod 5.

dorsal and lateral conical tubercles; numerous smaller tubercles present, especially laterally; posterolateral margins curved, toothed; apex notched, with small median tooth, notch flanked by triangular toothed lobes.

Antenna 1, basal segment indurate, outer

(exposed) surface flattened, anteromedially rounded; segment 2 about  $\frac{1}{4}$  length and  $\frac{1}{2}$  width of basal segment; segment 3 slender, cylindrical, twice greatest length of segment 2; flagellum of 14 articles, 11 distal articles each bearing 1 or 2 aesthetascs. Antenna 2, segment 1 broadest; seg-

ments 2–5 cylindrical, increasing in length; flagellum of 15 setose articles. Mandibular palp 3-segmented, middle segment longest, bearing 8 mediobasal fringed spines; distal segment, outer margin convex, 13 fringed spines on inner distal margin, spines becoming longer distally. Left mandible, incisor with 3 subacute sclerotized cusps; lacinia mobilis bluntly dentate; 7 spines in spine row; molar broadly convex, with sclerotized, toothed outer margin; right mandible, incisor with 4 sclerotized cusps; lacinia mobilis with 3 sclerotized cusps; 8 spines in spine row. Maxilla 1 inner ramus with 4 elongate fringed setae; outer ramus with 6 strongly dentate distal spines. Maxilla 2, inner ramus with 7 fringed spines on mediobasal margin; both lobes of outer ramus each bearing 8 elongate curved spines. Maxillipedal endite with single coupling hook, 3 fringed spines on medial margin, mediobasal apex bearing strong tooth-like spine; outer distal margin bearing 8 fringed spines; palp 5-segmented, segments 2–4 with mediobasal setose lobes, segment 5 slender, setose. Pereopods increasing in length posteriorly. Pereopod 1 propodus, triangular carpus, and merus bearing fringed spines on posterior margins. Pereopod 2 with few sensory spines on posterior margins of propodus, carpus, and merus. Pereopod 7 with few spines on posterior margin; inner distal margin of carpus bearing 4 stout fringed spines. Penial processes on midventral sternite of pereonite 7 short, digitiform. Pleopod 1, basis with 3 retinacula; endopod roughly triangular; exopod broadening to truncate distal margin. Pleopod 2, endopod with rod-shaped copulatory stylet articulating slightly beyond midlength of medial margin; exopod as in pleopod 1. Pleopod 3, endopod triangular; exopod broadening to distal truncate margin, with obliquely transverse suture in distal  $\frac{1}{3}$ . Pleopod 4, both rami pleated, triangular. Pleopod 5, both rami pleated, less triangular than in pleopod 4, with 3 spinulose bosses. Uropod with peduncle and endopod fused; endopod distally rounded, not reaching pleotelsonic apex; exopod elongate, cylindrical, slightly bowed towards midline, becoming granular and setose distally, apically truncate, spinose.

*Female:* Head and pereon very similar to male. Clypeus lacking bulbous apex. Pleotelson with anterior half inflated, faintly tripartite, with strong conical spine at posterior end of each portion; apex shallowly notched, notch flanked by 2 low triangular lobes. Uropod with exopod flattened, slightly overreaching pleotelsonic apex, ending in distolateral tooth; endopod and peduncle fused, ramus flattened, distally rounded, slightly shorter than exopod.

REMARKS.—See "Remarks" section of *Paracerceis glynni*.

ETYMOLOGY.—The species is named for Anne Cohen, recently of the Smithsonian Institution, who collected all the material of this species at Carrie Bow Cay, Belize.

### *Paracerceis glynni*, new species

FIGURES 19, 20

MATERIAL EXAMINED.—*Holotype:* USNM 211248, ♂, TL 6.4 mm, coll. W.A. Starck, Jr.,  $\frac{1}{3}$  mi S of Alligator Light, Monroe County, Florida, 11 m.

*Paratypes:* USNM 122742, 3 ♀, TL 4.4, 5.0, 5.2 mm, coll. W.A. Starck, Jr.,  $\frac{1}{3}$  mi S of Alligator Light, Monroe County, Florida, 11 m. USNM 211249, ♂, TL 5.8 mm, sta H(81)-3, From *Halimeda* sp. on fore reef crest, 15.2 m. USNM 211250, ♂, TL 5.8 mm, sta K-142, from sponge *Aplysina fistularis* on fore reef slope, 11 m.

DESCRIPTION.—*Male:* Body dorsally strongly arched. Integument indurate, brittle, anteriorly sparsely setose, becoming densely setose posteriorly. Dorsolateral eyes well pigmented. Head smooth, with small rostral point separating bases of antenna 1, touching apex of clypeus. Clypeus apically subacute, divergent arms embracing labrum short, distally rounded. Pereonites 1–4 dorsally smooth. Pereonites 5–7 becoming progressively more tuberculate, tubercles becoming more acute posteriorly. Anterior 4 fused pleonites tuberculate. Pleotelson with numerous scattered small tubercles, anterior half inflated, posterior margin of inflated part marked by strong middorsal conical tubercle and smaller acutely

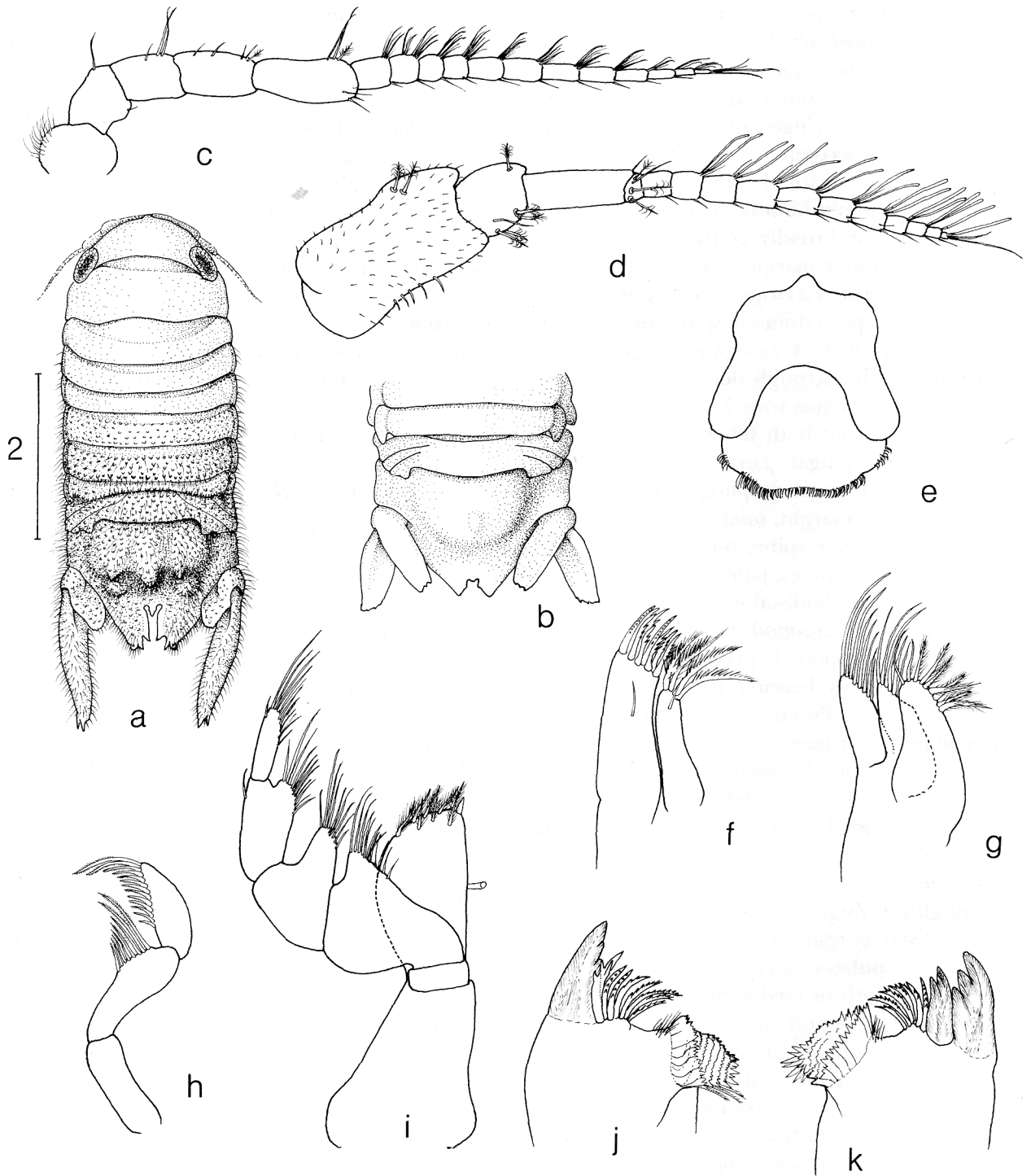


FIGURE 19.—*Paracerceis glynni*, new species: a, ♂, dorsal view; b, pleotelson, ♀, dorsal view; c, antenna 2; d, antenna 1; e, clypeus and labrum; f, maxilla 1; g, maxilla 2; h, mandibular palp; i, maxilliped; j, left mandible; k, right mandible.

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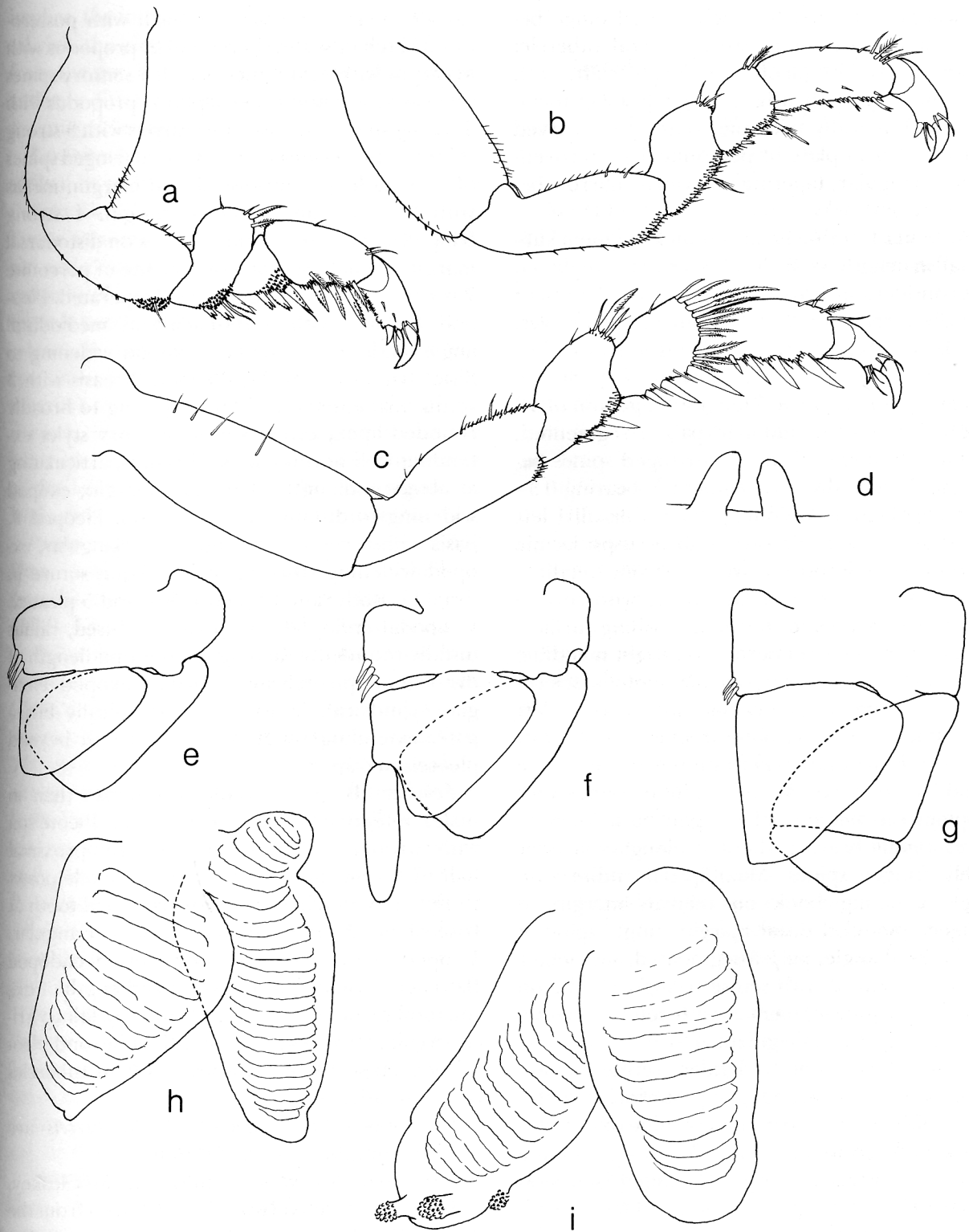


FIGURE 20.—*Paracerceis glynni*, new species: a, pereopod 1; b, pereopod 2; c, pereopod 7; d, penis; e, pleopod 1; f, pleopod 2; g, pleopod 3; h, pleopod 4; i, pleopod 5.



conical lateral tubercle; low rounded bulge beneath and posterior to strong lateral tubercle; posterior half of pleotelson deeply cleft, with small median tooth at base of notch, lobes forming notch apically tricuspid, outer cusp curved dorsally. Coxal plate of pereonite 1 posteroventrally triangular, tapering anteriorly, narrow beneath eye.

Antenna 1, setose basal peduncle segment subequal in length to 2 distal segments combined but considerably broader; segment 2  $\frac{2}{3}$  length of narrower segment 3; flagellum of 12 articles, articles 3–10 each with 2 aesthetascs, articles 11–12 with single aesthetasc. Antenna 2, peduncle 5-segmented, segment 5 longest; flagellum of 12 setose articles. Mandibular palp 3-segmented, segment 2 longest, bearing 8 fringed spines becoming longer distally; segment 3 bearing 13–14 fringed spines becoming longer distally; left mandible, incisor sclerotized, of 3 cusps; lacinia mobilis not sclerotized, with 3 strong teeth; 7 spines in spine row; molar broad, with several distally toothed plates forming crushing surface, with longer spines on periphery. Right mandible with tridentate incisor; lacinia mobilis sclerotized; 7 spines in spine row; molar as in left mandible. Maxilla 1, outer ramus bearing 7–9 dentate distal spines; inner ramus with 4 elongate distal fringed setae. Maxilla 2, inner ramus with 9 spines on mediodistal margin; both lobes of outer ramus bearing about 8 elongate slender finely fringed spines. Maxillipedal endite with single coupling hook on median margin, 8 fringed spines on distal margin, single spine at mediodistal angle; palp 5-segmented, segment 1 short, segment 2 with setose triangular lobe on median margin, segment 3 with setose lobe becoming digitiform, segment 4 with setose lobe very short, segment 5 slender, terete, setose. Pereopods becoming longer posteriorly. Pereopod 1 with unguis and accessory spine of dactylus sclerotized; propodus with 3 strong dentate spines on posterior margin, 3 fringed spines on outer surface; triangular carpus, and merus with 3 strong dentate spines on posterior margin;

carpus, merus, and ischium each with posterodistal patch of scales. Pereopod 2, propodus with 4, carpus with 3, and merus with 1 sensory spines on posterior margin. Pereopod 7, propodus with 4 strong spines on posterior; carpus with 3 strong spines on posterior margin, several fringed spines of varying length on distodorsal margin; merus with 3 spines on posterior margin, 1 strong fringed spine and 2 slender spines on distodorsal margin. Penial processes on sternite of pereonite 7 relatively short and blunt, well separated. Pleopod 1, basis with 3 retinacula at mediodistal angle; endopod triangular; exopod widening to distal truncate margin. Pleopod 2, basis with 3 retinacula; endopod distally tapering to broadly rounded apex, cylindrical copulatory stylet extending well beyond apex of ramus, articulating at about midlength of median margin; exopod widening to distal truncate margin. Pleopod 3, basis with 3 retinacula; endopod triangular; exopod widening distally, with oblique suture in distal  $\frac{1}{3}$ . Both rami of pleopods 4 and 5 pleated. Uropodal endopod and peduncle fused, ramus distally rounded, reaching to about midlength of distolateral pleotelsonic margin; exopod elongate-cylindrical, faintly sinuous, apically bicusate, extending by about  $\frac{1}{2}$  its length beyond pleotelsonic apex.

*Female:* Body markedly less setose than in male, integument not tuberculate. Pleotelson with strongly inflated hemispherical proximal half with very faint indication of tubercle posteriorly; apex notched, with low rounded tooth at base of notch; lobes flanking notch triangular. Uropodal endopod and peduncle fused; endopod flattened, reaching just beyond midlength of distolateral pleotelsonic margin, apically faintly tri-tuberculate; exopod just extending beyond pleotelsonic apex, flattened, with few faint tubercles mediodistally.

REMARKS.—Four species of *Paracerceis* are known from the western Atlantic.

*Paracerceis tomentosa* Schultz and McCloskey, 1967, was described from three females from the North Carolina coast. As the specific epithet

implies, the integument is densely setose. In dorsal view the pleotelsonic apex is entire, differing from the notched female pleotelson of *P. glynni*, and very different from the notched and strongly sculptured female pleotelson of *P. cohenae*.

*Paracerceis nuttingi* (Boone, 1921), was described from Barbados and since recorded from Puerto Rico (Menzies and Glynn, 1968:55, 113). Boone's material consisted only of females. Menzies and Glynn record an immature male with an incipient pleotelsonic notch. Although the pleotelsonic notch of *P. nuttingi* resembles that of *P. cohenae*, Boone's species has a nonsculptured pereon and pleon, whereas *P. cohenae* is strongly tuberculate. The notch in the female of *P. glynni* is much deeper than in *P. nuttingi*, whereas the latter species can also be separated by the length of the lobes of the maxillipedal palp segments. In *P. glynni*, these lobes are very much shorter.

*Paracerceis edithae* Boone, 1930, was described from Haiti and has since been redescribed on material from Puerto Rico and Haiti (Glynn, 1972). This distinctive species has been collected in Belize in depths of 11–23 m, taken on four occasions only in association with sponges. Glynn's statement (1972:146) concerning *P. edithae* replacing *P. caudata* can thus be qualified. The male pleotelsonic apex of *P. edithae*, with its strong median tooth and broad lateral lobes, immediately separates it from the shallower dentate notch of *P. cohenae* and the very deep notch of *P. glynni*. The pleotelsonic apex of the female *P. edithae*, shown as almost entire, or faintly trilobed in the Belize specimens, again differs from the broadly notched condition in *P. cohenae* and the much deeper notch of *P. glynni*.

*Paracerceis caudata* (Say), the most widespread *Paracerceis* species in the Caribbean, with its bowed uropodal exopod and dentate pleotelsonic notch in the male, and truncate pleotelsonic apex in the female, is easily separated from the two species described herein.

**ETYMOLOGY.**—The species is named for Dr. Peter W. Glynn, in recognition for his many valuable contributions to isopod systematics.

## Family CIROLANIDAE

### Genus *Metacirolana* Nierstrasz, 1931

#### *Metacirolana agaricicola*, new species

FIGURES 21, 22

**MATERIAL EXAMINED.**—*Holotype*: USNM 211259, ♂, TL 2.6 mm, sta H(81)-32, from *Porites* sp. coral on spur and groove, outer reef slope, 9.1 m.

*Paratypes*: USNM 211260, 2 ovig ♀, TL 2.0–2.1 mm, 2 ♀, TL 2.0 mm, sta K-35, rubble and coarse sediment on outer reef slope, 20 m. USNM 211261, ♂, TL 2.0 mm, 1 ovig ♀, TL 2.0 mm, 5 ♀, TL 1.8–2.1 mm, 2 juvs, sta H(81)-17, on *Agaricia* sp. coral on fore reef, 15.2 m.

*Additional Material*: USNM 211262, ♂, 7 ♀, sta H(81)-13, H(81)-15, H(81)-16, H(81)-42, on *Agaricia* sp. coral on fore reef, 1–15.2 m.

**DESCRIPTION.**—*Male*: Integument dorsally with scattered red-brown chromatophores on head, pleotelson, and uropods. Pereonites and pleonites with relatively dense transverse broken bands of chromatophores. Body dorsally arched, slightly more than twice longer than wide, widest at pereonite 6. Head with large dorsolateral eyes; fairly strong rostral point; frontal lamina anteriorly convex, tapering to point between bases of antenna 2; clypeus broadly triangular, projecting ventrally. Coxal plates becoming more acutely produced posterodistally. Pereonite 1 slightly longer middorsally than remaining subequal pereonites. Epimeron of pleonite 1 shorter than that of pleonite 2, overlapped by coxal plate of pereonite 7. Hind margin of pleonite 5 broadly trilobed; faint submedian furrows demarking lobes. Telson wider than long, basally broad, straight lateral margins tapering to broadly triangular posterior margin, latter dentate, with fine plumose setae alternating with teeth.

Antenna 1, basal peduncle segment broader with slightly shorter than segment 2; segment 3 narrower and 1/3 length of segment 2; flagellum of 7 articles, 2 basal articles with cluster of about

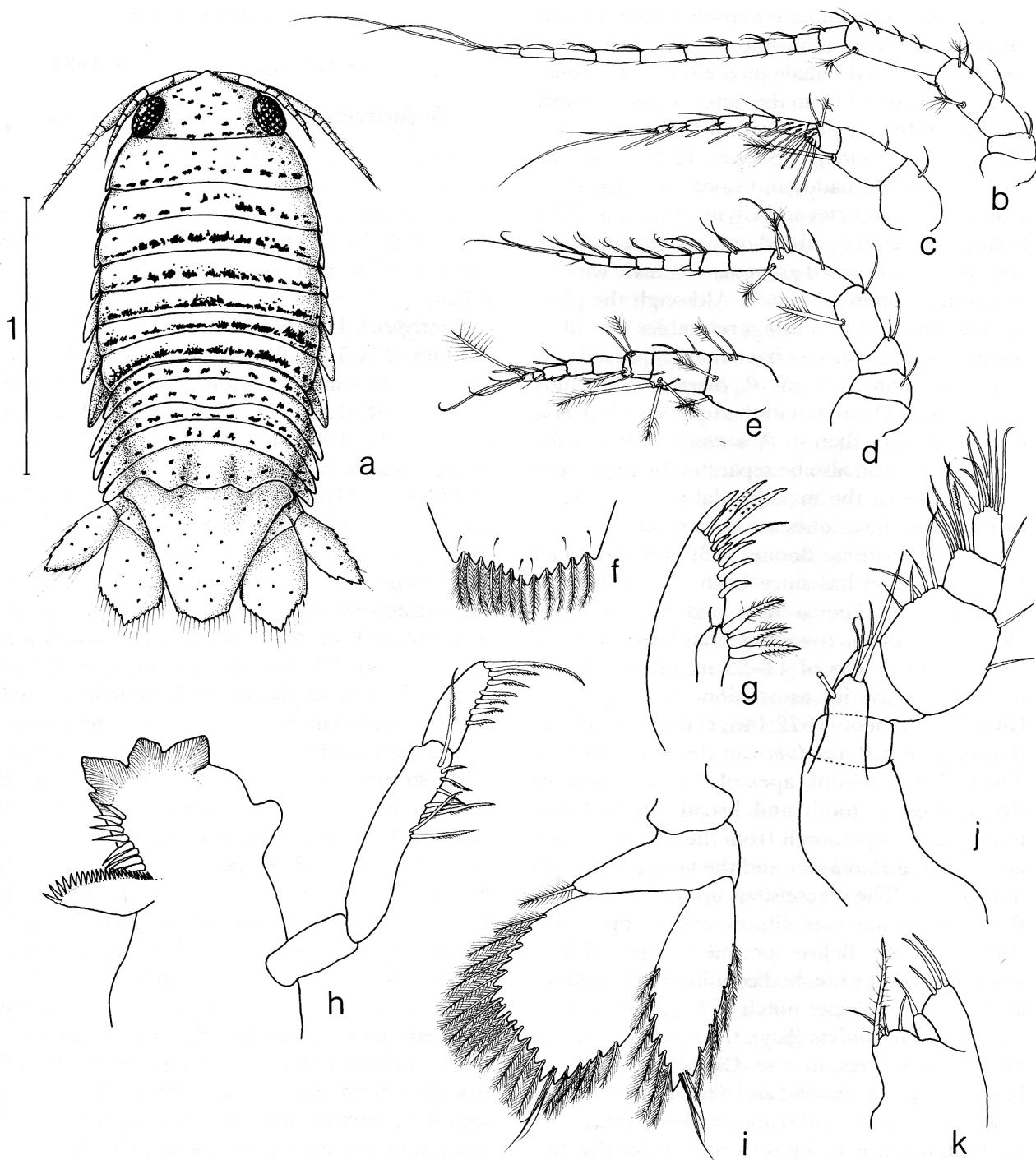


FIGURE 21.—*Metacirolana agaricola*, new species: a, ♀, dorsal view; b, antenna 2, ♂; c, antenna 1, ♂; d, antenna 2, ♀; e, antenna 1, ♀; f, pleotelsonic apex; g, maxilla 1; h, mandible; i, uropod; j, maxilliped; k, maxilla 2.

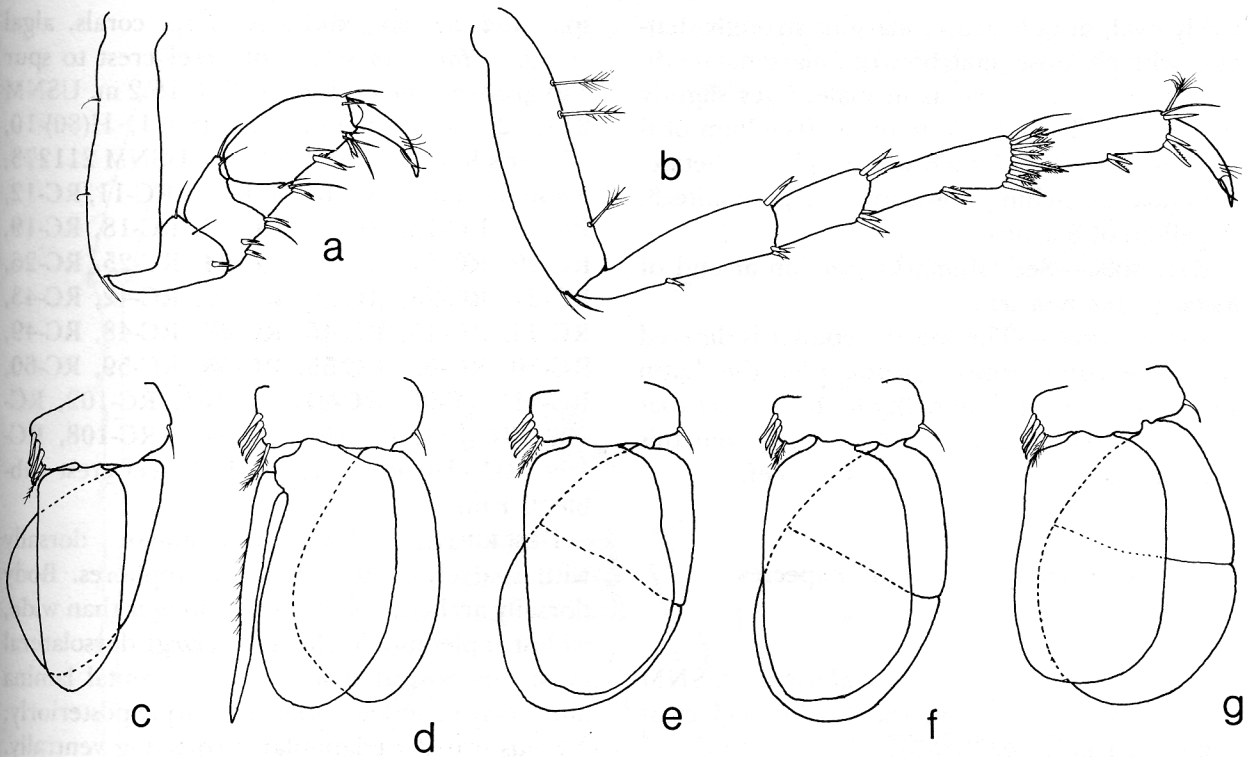


FIGURE 22.—*Metacirolana agaricicola*, new species: a, pereopod 1; b, pereopod 7; c, pleopod 1; d, pleopod 2, ♂; e, pleopod 3; f, pleopod 4; g, pleopod 5.

10 aesthetascs, remaining articles each with single aesthetasc. Antenna 2 reaching posteriorly to pereonite 4; 5 peduncle segments becoming progressively longer distally; flagellum of 10 articles, terminal article with 2 elongate setae. Mandibular palp, segments 1 and 3 subequal in length, each half length of segment 2; latter with 8 distal fringed spines; segment 3 with 7 distal fringed spines; incisor of 3 large and 1 small sclerotized cusps; spine row with 8 spines. Maxilla 1, inner ramus with 3 stout fringed setae; outer ramus with 11 distal spines. Maxilla 2, inner ramus with 4 mediobasal spines, innermost longest and fringed; inner lobe of outer ramus reduced, with 1 terminal spine; outer lobe with 3 terminal spines. Maxillipedal endite reaching midlength of palp segment 2, with 2 distal setae, and coupling hook on medial margin; palp segment 3 broadest and longest. Pereopod 1 short; propodus somewhat expanded, with 2 clusters of spines

on posterior margin; carpus triangular, with single posterodistal spine cluster; merus with 2 spine clusters on posterior margin. Pereopods becoming more elongate posteriorly; pereopod 7, propodus subequal in length to carpus, with 2 pairs of spines on posterior margin; carpus with 2 spines on posterior margin, distal margin bearing several fringed spines. Pleopod 1, basis with 3 retinacula; endopod parallel-sided, distally broadly rounded; exopod distally expanded, distal margin oblique-truncate. Pleopod 2, endopod elongate-oval, with copulatory stylet articulating at base, just reaching beyond ramus; exopod broadly oval. Pleopods 3–5 with endopods oval-rectangular, exopods broadly oval, with transverse suture at about midlength. Uropodal protopod produced into triangular lobe, not reaching midlength of endopod; latter distally expanded, distal margin strongly dentate, angled, with plumose setae between marginal teeth; exopod nar-

rowly oval, distally acute, margins strongly dentate, with plumose setae between marginal teeth.

*Female:* Body form as in male. Eyes slightly smaller than in male. Antenna 1, flagellum of 6 articles, articles 3–5 each with single aesthetasc. Antenna 2 reaching posteriorly to pereonite 3; flagellum of 8 articles.

REMARKS.—See "Remarks" section at end of *Metacirolana menziesi*.

ETYMOLOGY.—The specific epithet is derived from the coral genus *Agaricia* plus the Latin suffix *-cola* (to dwell) and alludes to the fact that almost all the specimens were taken from this coral living on the Carrie Bow Cay reef.

### *Metacirolana halia*, new species

FIGURES 23, 24

MATERIAL EXAMINED.—*Holotype:* USNM 211263, ♂, TL 2.9 mm, sta RC-30, reef crest rubble, 0.1 m.

*Allotype:* USNM 211264, ovig ♀, TL 2.7 mm, sta RC-30, reef crest rubble, 0.1 m.

*Paratypes:* USNM 211265, 5 ♂, TL 2.8–2.9 mm, 3 ovig ♀, TL 2.1–2.5 mm, 23 ♀, TL 2.1–2.6 mm, 9 juvs, sta RC-22, reef crest rubble, 0.1 m. USNM 211266, 4 ♂, TL 2.4–2.9 mm, 3 ovig ♀, TL 2.5–2.7 mm, 19 ♀, TL 2.4–2.8 mm, 12 juvs, sta RC-30, reef crest rubble, 0.1 m.

*Additional Material:* USNM 211267, ~100 specimens, sta CBC-2.5.74-2, CBC-2.5.74-3, CBC-4.5.74-3, CBC-7.5.74-1, from rubble on fore reef slope, 0.5 m. USNM 211268, ~180 specimens, sta K-3, K-6, K-35, K-36, K-55, K-56, K-62, K-65, K-98, K-105, K-106, K-107, K-132, K-134, K-135, K-137, K-139, K-145, from reef crest rubble, on algal clumps (*Caulerpa racemosa*, *C. verticillata*, *Halimeda* sp.), coarse sediment and rubble, fore reef, 0–23 m. USNM 211269, ~100 specimens, sta H(81)-8, H(81)-9, H(81)-11, H(81)-12, H(81)-13, H(81)-15, H(81)-17, H(81)-19, H(81)-20, H(81)-27, H(81)-28, H(81)-29, H(81)-30, H(81)-32, H(81)-33, H(81)-34, H(81)-35, H(81)-36, H(81)-37, H(81)-38, H(81)-39, H(81)-40, H(81)-41, H(81)-42, H(81)-48, H(81)-53, H(81)-54, H(81)-55, H(81)-57, from *Agaricia*

sp., *Madracis* sp., and *Porites* sp. corals, algal clumps (*Halimeda* sp.), from reef crest to spur and groove zone on fore reef, 0–15.2 m. USNM 211272, 2 specimens, sta H(80)-1, H(80)-10, Glover's Reef, Belize, 12–21 m. USNM 211273, ~600 specimens, sta RC-6, RC-7, RC-11, RC-12, RC-13, RC-15, RC-16, RC-17, RC-18, RC-19, RC-20, RC-21, RC-23, RC-24, RC-25, RC-26, RC-27, RC-28, RC-29, RC-41, RC-42, RC-43, RC-44, RC-45, RC-46, RC-47, RC-48, RC-49, RC-50, RC-52, RC-55, RC-58, RC-59, RC-60, RC-71, RC-96, RC-97, RC-101, RC-102, RC-103, RC-104, RC-106, RC-107, RC-108, RC-109, RC-110, RC-111, RC-117, reef crest rubble, 0.1 m.

DESCRIPTION.—*Male:* Integument dorsally with sparsely scattered chromatophores. Body dorsally arched, about 3 times longer than wide, widest at pleonite 5. Head with large dorsolateral eyes; tiny rostral point present; frontal lamina anteriorly rounded, tapering sharply posteriorly; clypeus broadly triangular, projecting ventrally. Pereonite 1 longer than remaining subequal pereonites. Coxal plates: pereonite 1 anteroventrally rounded, posteroventrally acute, pereonites 2–6 becoming posteroventrally produced and acute, pereonite 7 coxal plate slightly shorter than that of pereonite 6 in lateral view. Pleonites 1–5 free, subequal in middorsal length, occasionally with tiny denticles on hind margins. Telson tapering to truncate posterior margin armed with 8 stout spines and intervening plumose setae.

Antenna 1 reaching posteriorly to pereonite 5; 2 basal peduncle segment broad, segment 2 longer than segment 1; segment 3 about 1/3 length and much narrower than segment 2; flagellum of 14 articles, 2 basal articles bearing 4 rows of aesthetascs. Antenna 2 reaching posteriorly to pereonite 7, 3 basal peduncle segments subequal in length, segment 4 1/3 longer than segment 3; segment 5 about twice length of 4, narrower; flagellum of 11 articles, terminal article with 2 elongate setae. Mandibular palp 3-segmented, segment 2 about twice length of segment 1, bearing 12 fringed spines distally; segment 3 about half length of segment 2, with 9 spines increasing in length distally; incisor with 3

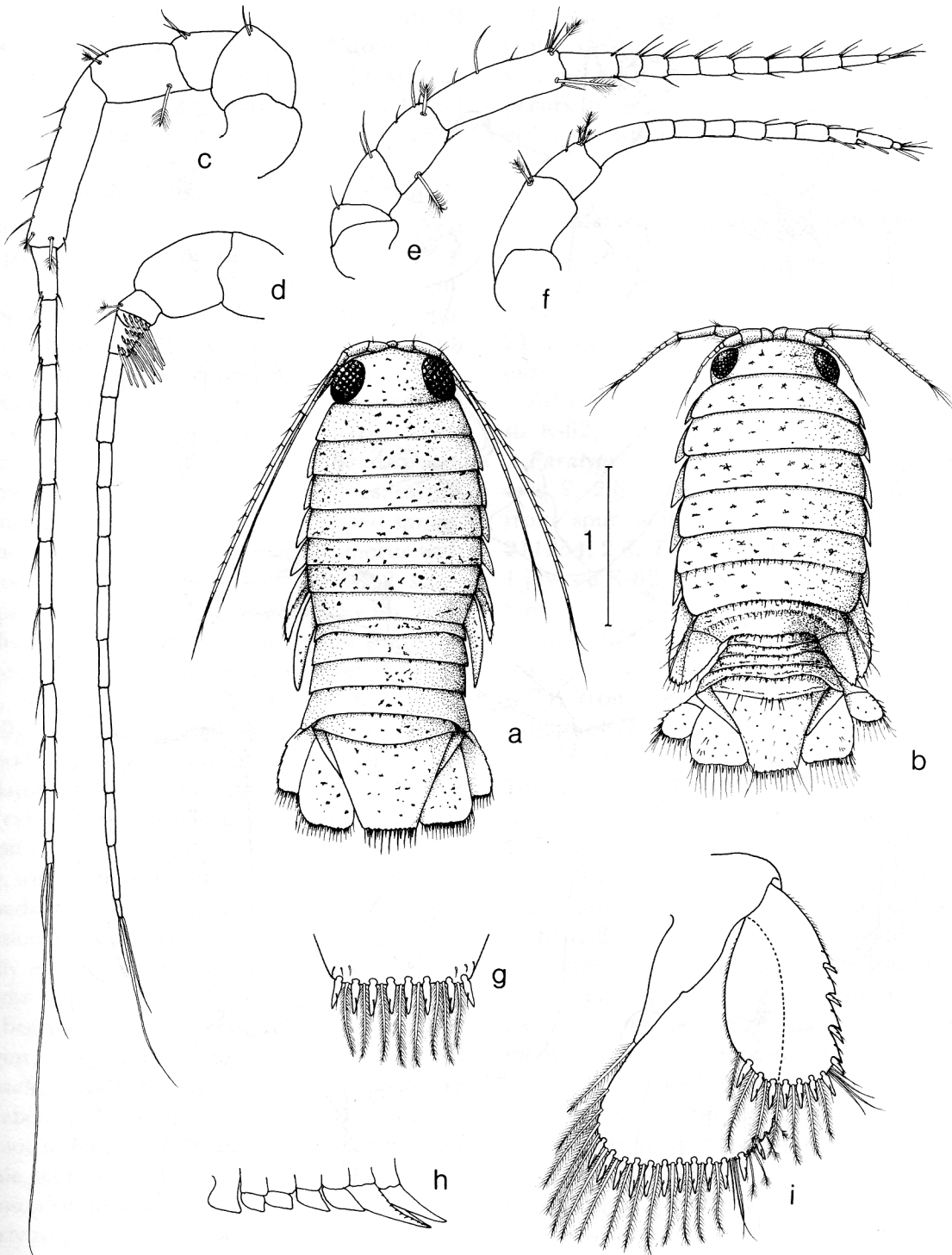


FIGURE 23.—*Metacirolana halia*, new species: a, ♂, dorsal view; b, ♀, dorsal view; c, antenna 2, ♂; d, antenna 1, ♂; e, antenna 2, ♀; f, antenna 1, ♀; g, pleotelsonic apex; h, coxal plates, lateral view; i, uropod.



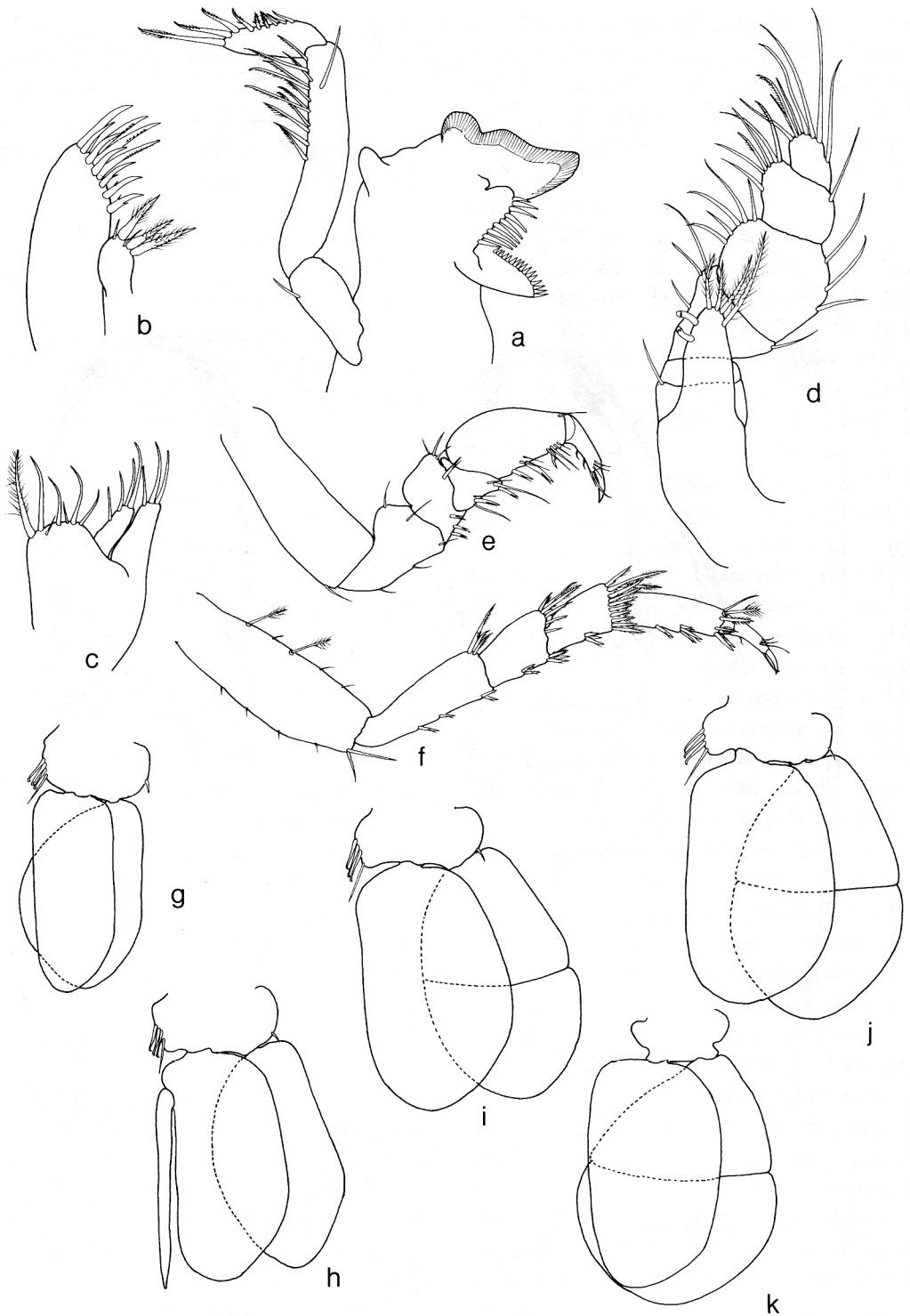


FIGURE 24.—*Metacirolana halia*, new species: *a*, mandible; *b*, maxilla 1; *c*, maxilla 2; *d*, maxilliped; *e*, pereopod 1; *f*, pereopod 7; *g*, pleopod 1; *h*, pleopod 2, ♂; *i*, pleopod 3; *j*, pleopod 4; *k*, pleopod 5.



strongly sclerotized cusps; spine row with 9 spines. Maxilla 1, inner ramus with 3 stout setae; outer ramus with 10 distal spines. Maxilla 2, inner ramus with 5 elongate spines on broad distal margin, innermost spine longest, fringed; inner lobe of outer ramus with 4 spines, outer lobe with 3 spines. Maxillipedal endite with 2 coupling hooks on median margin, and 4 fringed setae palp with segment 3 longest and broadest, 3 distal segments setose on mediodistal margin. Pereopod 1, dactylus with strong unguis; propodus proximally expanded, posterior margin with 3 sensory spines; carpus triangular, with 2 sensory spines on posterior margin; merus with 3 short sensory spines on posterior margin. Pereopod 7, propodus with 4 distal fringed spines, posterior margin with 2 clumps of spines; carpus with distal band of about 11–12 fringed spines, 2 spine clumps on posterior margin; merus with anterodistal clump of fringed spines, 2 spine clumps on posterior margin; ischium with 3 anterodistal fringed spines, 3 spines on posterior margin. Pleopod 1, endopod narrower than exopod, parallel-sided for  $\frac{2}{3}$  of length, distally broadly rounded; exopod ovate, distally broad. Pleopod 2, endopod and exopod equally broad copulatory stylet articulating near base of endopod, cylindrical, apically tapered, just reaching beyond ramus. Pleopods 3–5, endopods broadly ovate, with transverse suture at about midlength. Uropodal basis produced into acutely triangular lobe along medial margin of endopod; endopod distally expanded, bearing 12 stout spines and plumose setae; exopod ovate, outer margin serrate, bearing 11 stout spines on outer and distal margins, plus plumose setae.

*Female*: Body markedly setose in posterior half, about twice longer than wide. Dorsolateral eyes not so large as in male. Pleon shorter than in male, more setose, with tiny scattered denticles on posterior margins. Antenna 1 reaching posteriorly to pereonite 1, flagellum of 10 articles, single aesthetasc on articles 7–9. Antenna 2 reaching posteriorly to pereonite 2, flagellum of 10 articles.

**REMARKS.**—See “Remarks” section at end of *Metacirrolana menziesi*.

**ETYMOLOGY.**—The specific epithet is derived from the Greek *halis* (abundance, crowds, swarms) and refers to the fact that the species occurs in large numbers in a variety of habitats at Carrie Bow Cay.

***Metacirrolana menziesi*, new species**

FIGURES 25, 26

**MATERIAL EXAMINED.**—*Holotype*: USNM 211251, ♂, TL 2.3 mm, sta K-74, rubble from outer reef slope, 18 m.

*Allotype*: USNM 211252, ovig ♀, TL 2.1 mm, sta K-62, rubble from outer reef slope, 5–8 m.

*Paratypes*: USNM 211253, ♂, TL 2.2 mm, 5 ovig ♀, 2.0–2.4 mm, 2 ♀, sta AC-509, rubble from spur and groove zone, 14 m. USNM 211254, 2 ♂, TL 2.0 mm, 5 ♀, TL 2.0–2.2 mm, 1 juv, sta K-62, rubble from outer reef slope, 5–8 m.

*Additional Material*: USNM 211255, 1 ♂, 6 ovig ♀, 13 ♀, 2 juvs, sta K-4, K-65, K-70, K-73, K-74, from rubble on fore reef slope; from clumps of *Halimeda* sp. on fore reef, 0.5–30 m. USNM 211256, 8 ♀, 12 juvs, sta H(80)-11, H(80)-16, H(80)-22, H(80)-32, H(80)-41, rubble from fore reef, 27–36 m. USNM 211257, ♀, sta H(83)-1, reef drop-off, 128 m. USNM 211258, 6 ♀, 2 juvs, sta RC-20, reef crest rubble, 0.1 m.

**DESCRIPTION.**—*Male*: Body dorsally strongly arched,  $2\frac{1}{2}$  times longer than wide, widest at pereonite 6. Integument with scattered red-brown chromatophores on head, pereon, and pleon. Under very high magnification, integument of head and pereon with very fine transverse striae. Head with large dorsolateral eyes; fairly strong rostral point; frontal lamina anteriorly convex, tapering to point between bases of antenna 2. Clypeus broadly triangular, projecting ventrally. Coxal plates 1–4 with posteroventral corners more or less right angled; 5–7 produced posteriorly, acute. Pereonite 1 about twice length of pereonite 2; pereonites 2–7 subequal in middorsal length. Sideplate of pleonite 1 overlapped by coxal plate of pereonite 7; sideplate of pleonite 5 overlapped by that of pleonite

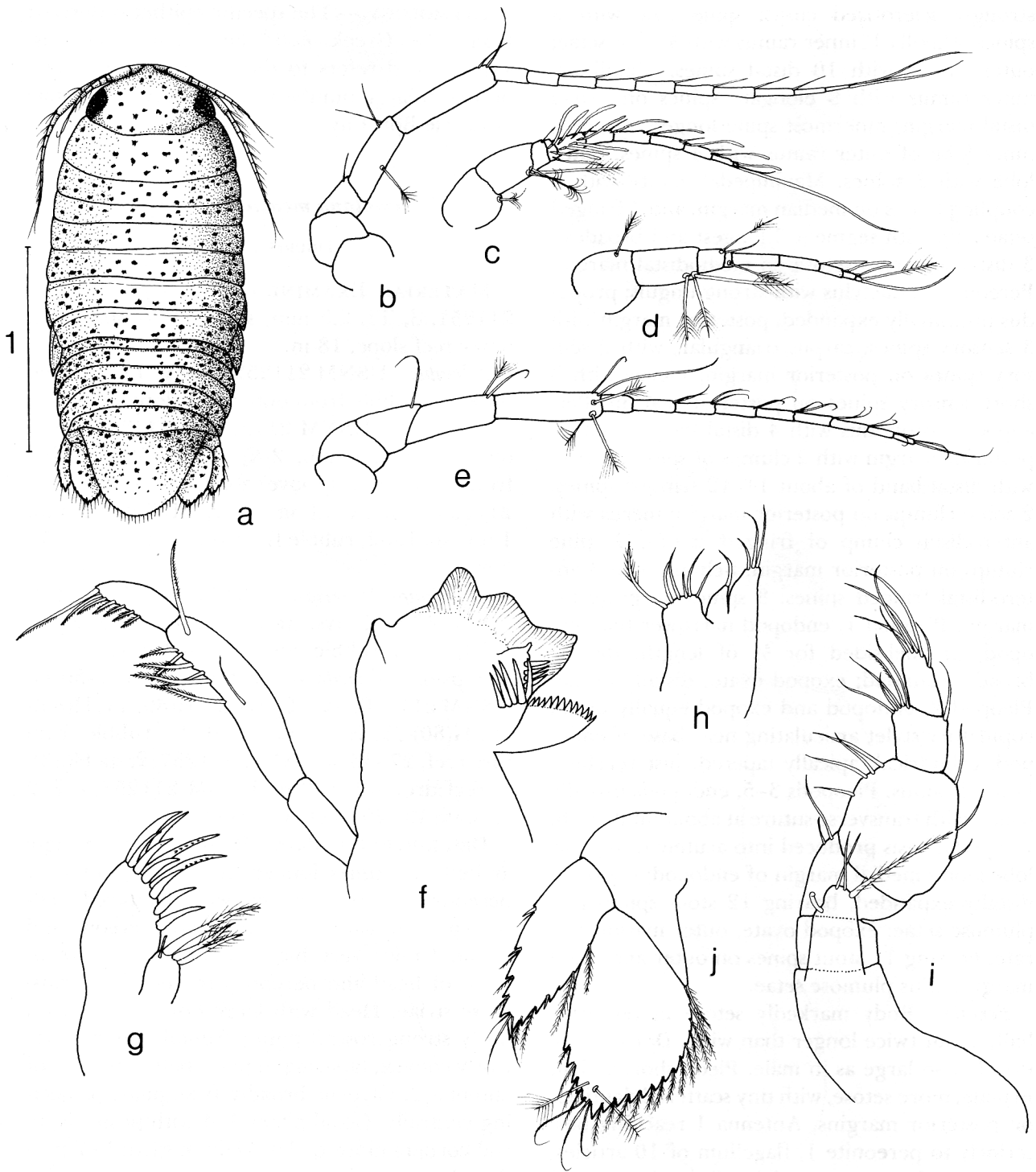


FIGURE 25.—*Metacirolana menziesi*, new species: a, ♀, dorsal view; b, antenna 2, ♂; c, antenna 1, ♂; d, antenna 1, ♀; e, antenna 2, ♀; f, mandible; g, maxilla 1; h, maxilla 2; i, maxilliped; j, uropod.

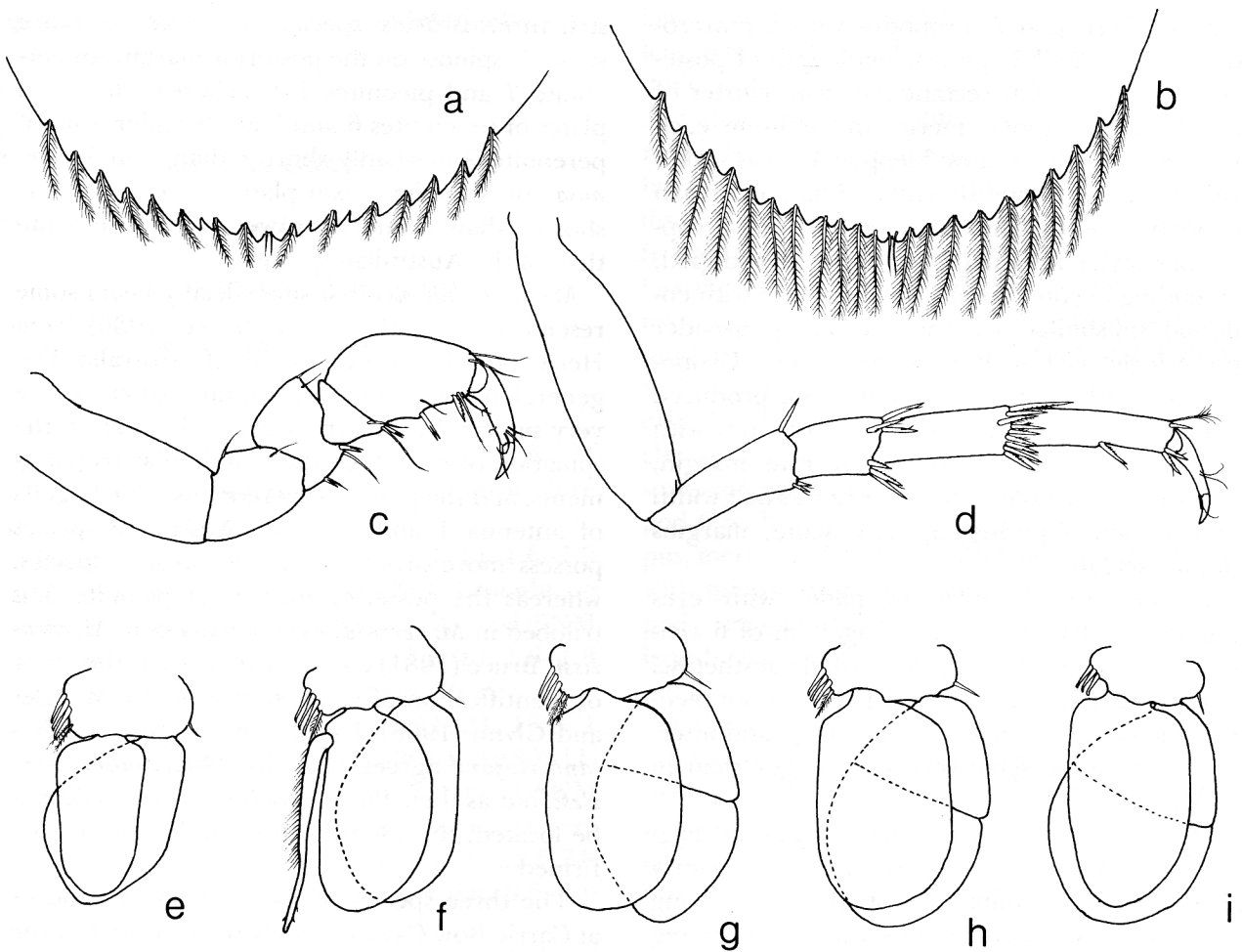


FIGURE 26.—*Metacirolana menziesi*, new species: a, pleotelsonic apex, ♂; b, pleotelsonic apex, ♀; c, pereopod 1; d, pereopod 7; e, pleopod 1; f, pleopod 2, ♂; g, pleopod 3; h, pleopod 4; i, pleopod 5.

4; posterior margin of pleonite 5 faintly sinuous. Pleotelson considerably broader than long, posterior margin evenly convex, with about 20 fine teeth interspersed with short plumose setae.

Antenna 1, 2 basal peduncle segments subequal; segment 3 short; flagellum of 8 articles, articles 1 and 2 with several aesthetascs, articles 3–7 each with single aesthetasc. Antenna 2 reaching posteriorly to pereonite 3; peduncle segments 1–3 short, subequal in length; segments 4 and 5 cylindrical; segment 4 about  $\frac{2}{3}$  length of segment 5; flagellum of 10 setose articles. Mandibular palp 3-segmented, segment 2 with 7 fringed spines distally; segment 3  $\frac{2}{3}$  length of segment

2, with 7 distal fringed spines; incisor of 3 broad cusps, spine row with 9 stout spines. Maxilla 1, inner ramus with 3 stout fringed setae; outer ramus with 10 distal spines, some faintly dentate. Maxilla 2, inner ramus with 6 mediobasal spines; inner lobe of outer ramus with single terminal spine, outer lobe with 3 spines. Maxillipedal endite with single coupling hook, 1 fringed and 2 simple distal setae; palp segment 3 broadest and longest. Pereopod 1 shorter than following legs; propodus somewhat expanded, with 1 serrate and 1 sensory spine on posterior margin; carpus short, triangular, with 1 posterodistal sensory spine; merus with 2 sensory spines on posterior

margin. Pereopod 7, propodus with 2 posterodistal spines, and 1 spine at midlength of posterior margin; carpus rectangular, with cluster of distal fringed spines; merus and ischium each with several distal spines. Pleopod 1, basis with 3 retinaculæ; endopod shorter and narrower than exopod; latter distally expanded. Pleopod 2, copulatory stylet articulating at base of endopod, extending beyond ramus. Pleopods 3–5 with endopod subsimilar, exopods becoming broader posteriorly, each with transverse suture. Uropodal basis with narrowly triangular lobe produced along medial margin of inner ramus; latter with broadly rounded mediobasal serrate margin, outer margin less convex; outer ramus half width of endopod, tapering, apically acute, margins distally serrate.

*Female*: Very similar to male, with eyes slightly smaller. Antenna 1, flagellum of 6 articles, 3 distal articles each with single aesthetasc. Antenna 2, flagellum of 9 articles. Posterior pleotelsonic margin with 22–24 serrations and intervening plumose setae relatively longer than in male.

**REMARKS.**—The genus *Metacirolana*, as diagnosed by Bruce (1981), possesses an anteriorly dilated frontal lamina, a triangular projecting clypeus, a maxillipedal endite with one coupling hook, and a 5-segmented pleon, with pleonite 5 not overlapped by pleonite 4.

The three species of *Metacirolana* described above agree with the diagnosis in the frontal lamina and clypeus structure. *Metacirolana halia*, however, possesses two coupling hooks on the maxillipedal endite, and pleonite 5 is overlapped by pleonite 4. *Metacirolana agaricicola* agrees in all points of the diagnosis. In *M. menziesi* pleonite 4 overlaps pleonite 5. In spite of the shortcoming of the generic diagnosis, these three species do seem to form a natural group, all possessing a very similar frontal lamina and projecting clypeus, perhaps the most important features of the genus.

*Metacirolana halia* bears a striking resemblance to *M. spinosa* Bruce, 1980, described from Queensland, Australia, especially in the tail-fan

structure. Bruce's species, however, is more strongly spinose on the posterior margins of pereonite 7 and pleonites 1–5, whereas the coxal plates of pereonites 6 and 7 are broader, that of pereonite 7 markedly shorter than 6 in *M. spinosa*. In *M. halia*, coxal plate 7 is only slightly shorter than 6 and narrower and more acute than in the Australian species.

*Metacirolana menziesi* superficially bears some resemblance to *M. serrata* (Bruce, 1980) from Heron Island, Great Barrier Reef, Australia. The general body shape and tail-fan structure are very similar, but differences may be seen in the spination of maxilla 2, the mandibular palp segments, and the posterior pereopods. The flagella of antenna 1 and 2 in the Australian species possess more articles than the present species, whereas the posterior margin of pleonite 5 is trilobed in *M. serrata*, evenly convex in *M. menziesi*. Bruce (1981) correctly points out the error of identification of *Cirolana mayana* by Menzies and Glynn (1968). In fact, their figure of *Cirolana mayana* agrees well with *Metacirolana menziesi*, but as their Puerto Rico material could not be located, this identification could not be confirmed.

The three species of *Metacirolana* that occur at Carrie Bow Cay may easily be separated by the morphological features given in the following tabulation.

	<i>M. agaricicola</i>	<i>M. halia</i>	<i>M. menziesi</i>
Posterior pleotelsonic margin	triangular, dentate	truncate, spinose	convex, dentate
Antenna 2 ♂	reaching pereonite 4	reaching pereonite 7	reaching pereonite 3
Uropodal endopod	distally angular	distally truncate	distally angular
Uropodal exopod	distally acute	distally rounded	distally acute
Pleonite 5, posterior margin	trilobed	convex	faintly convex

**ETYMOLOGY.**—This species is named for the

late Dr. Robert J. Menzies, indefatigable isopod worker.

### Suborder GNATHIIDEA

### Family GNATHIIDAE

### Genus *Gnathia* Leach, 1813

### *Gnathia rathi*, new species

FIGURE 27

**MATERIAL EXAMINED.**—*Holotype*: USNM 211328, ♂, TL 1.6 mm, sta H(80)-11, from fore reef slope, 27.4 m.

*Paratypes*: USNM 211329, 13 ♂, TL 1.6–1.9 mm, 3 ♀, 1.8–2.2 mm, sta H(83)-1, brought up by fishing line, off reef drop-off, 128 m. USNM 211330, 14 ♂, TL 1.6–1.9 mm, 2 ♀, TL 1.6–1.8 mm, sta H(80)-22, fore reef slope, 36 m.

*Additional Material*: USNM 211331, 18 ♂, 1 ovig ♀, 1 ♀, 2 praniza, sta H(80)-4, H(80)-11, H(80)-18, fore reef slope, 1–27.2 m. USNM 211332, 2 ♂, sta K-101, rubble from fore reef slope, 25 m. USNM 211333, 3 ♂, sta CBC.2.5.74-2, CBC.4.5.74-3, rubble from reef flat, 0.5–1.0 m.

**DESCRIPTION.**—*Male*: Integument of head and pereonites 1–3 indurate, finely granular. Head with anterior margin barely convex, with lateral conical tubercle medial to mandible; anterolateral corner bluntly triangular; anteromedial part of head hollowed, posteromedial part convex; lateral eyes well pigmented. Pereonite 1 short, lacking free lateral margins. Pereonite 2 slightly shorter than pereonite 3. Pereonites 4–6 broad, poorly defined; pereonite 7 very short, hidden beneath posterior margin of pereonite 6. Pleonites subequal in length. Telson triangular, slightly longer than basal width, lateral margins proximally shallowly serrate, sinuous.

Antenna 1, peduncle segment 3 equal in length to 2 basal segments together; flagellum of 4 articles, penultimate article with 1 aesthetasc, terminal article with 2 aesthetascs. Antenna 2, 3

basal peduncle segments short, segment 4  $\frac{2}{3}$  length of segment 5; flagellum of 6 articles. Mandible with subacute apex, cutting edge barely crenulate, outer margin with strong convex ridge. Maxilliped of 5 segments, basal segment broad, semicircular, with triangular lobe at inner distal corner; 4 distal segments bearing finely fringed setae. Pylopod with broad basal segment bearing finely fringed setae on convex medial margin; distal ovate segment very small, margins setulose. Pereopod 1, dactylus with strong unguis and tiny accessory spine; propodus with 2 spines on posterior margin; carpus with 2 conical tubercles on posterior margin; merus and ischium with scattered tubercles on posterior surface. Pereopod 6 with posterior margins of propodus, carpus, merus, and ischium with fringed scales; basis with spinose tubercles on anterior surface. Uropodal exopod narrower than but subequal in length to endopod; both rami bearing elongate seta.

*Female*: Typical of genus.

**REMARKS.**—Three species of *Gnathia* have been recorded from the Caribbean. The commonest, *G. puertoricensis* Menzies and Glynn, was collected along with *G. rathi* at several stations at Carrie Bow Cay. The earlier species has a tiny rostral point flanked by a subacute tubercle, giving the frontal margin a tridentate appearance. The outer ridge of the mandible is not so robust as in *G. rathi*, and the cutting margin is more strongly dentate. The strongly granulate anterior integument of *G. rathi* is not seen in the earlier species.

*Gnathia beethoveni* Paul and Menzies, from Venezuela, has a median notch and two lateral tubercles on the frontal margin of the head, a mandible with a dentate cutting edge, and lacks integumental granulations.

*Gnathia triospathiona* Boone, from the Gulf Stream off Florida, is a much larger species (♂ TL 8.8 mm) than *G. rathi*, lacks integumental granulations, and has a produced frontal margin.

**ETYMOLOGY.**—The species is named for Tony Rath, as a small token of appreciation for his assistance as station manager at Carrie Bow Cay.

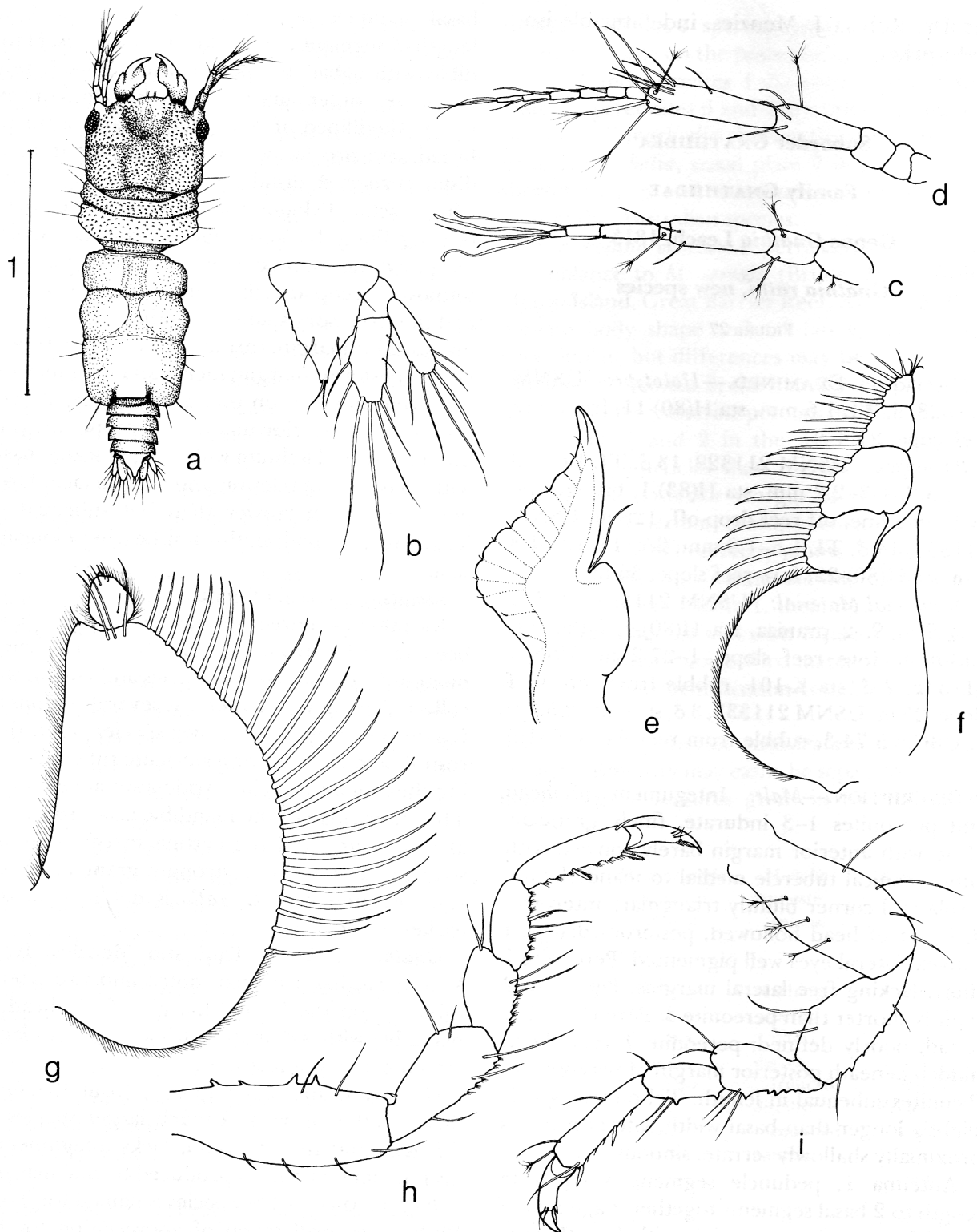


FIGURE 27.—*Gnathia rathi*, new species: *a*, ♂, dorsal view; *b*, pleotelson and uropod; *c*, antenna 1; *d*, antenna 2; *e*, mandible; *f*, maxilliped; *g*, pylopod; *h*, pereopod 6; *i*, pereopod 1.



## Suborder VALVIFERA

## Family ARCTURIDAE

Genus *Astacilla* Cordiner, 1793*Astacilla regina*, new species

FIGURES 28, 29

**MATERIAL EXAMINED.**—*Holotype*: USNM 211334, ♂, TL 6.5 mm, sta H(80)-22, fore reef slope, 36 m.

*Allotype*: USNM 211335, ovig ♀, TL 7.1 mm, sta H(80)-41, fore reef slope, 36 m.

*Paratypes*: USNM 211336, 2 ♂, TL 5.9–6.5 mm, 9 juvs, TL 3.1–4.6 mm, sta H(80)-4, H(80)-11, H(80)-22, fore reef slope, 27.4–36 m.

**DESCRIPTION.**—*Male*: Body elongate-cylindrical, geniculate between pereonites 4 and 5. Integument tuberculate. Head with anterior margin evenly concave; anterolateral lobes well produced, rounded in lateral view, with small conical tubercle anterodorsally; dorsolateral eyes large, well pigmented, subcircular; pair of submedian conical tubercles above eye, second large posterior pair; ventral margin of head not concealing mouthparts. Pereonite 1 fused with head, line of fusion marked by slit in ventral margin; middorsal tubercle near posterior margin; large lateral tubercle present. Pereonites 2 and 3 subequal, each with small middorsal tubercle, several smaller lateral tubercles. Pereonite 4, 8 times longer than wide, cylindrical, with strong conical middorsal tubercle just anterior to midlength, smaller middorsal tubercle near posterior margin; several small scattered tubercles. Pereonites 5–7 decreasing in length posteriorly, each with middorsal conical tubercle. Pleotelson with 2 anterior fused pleonites very weakly indicated, with anterior middorsal tubercle, well-marked lateral "shoulder"; apex subacute.

Antenna 1, basal peduncle segment with distodorsal conical tubercle, about twice width and 1.5 times length of segment 2; segment 3 slightly narrower and longer than segment 2; flagellum of single article, subequal in length to peduncle, with row of 10 ventral aesthetascs. Antenna 2, 2

basal peduncle segments relatively short, segment 2 with 2 distal tubercles; segments 3–5 elongate-cylindrical, segment 4 almost twice length of segment 3; segment 5 subequal to segment 4; flagellum of 2 articles. Mandible with tricuspid incisor, dentate lacinia mobilis; 2 spines in spine row; broadly truncate molar with strong marginal teeth. Maxilla 1, inner ramus with 3 distal fringed setae; outer ramus with 10 stout distal spines, some with dentate margins. Maxilla 2, inner ramus with 6 fringed setae on mediolateral margin, several slender setae on outer distal margin; both lobes of outer ramus bearing 3 elongate distally pectinate spines. Maxillipedal endite distally broad, with 1 coupling hook, 4 fringed setae on mediolateral margin; palp of 5 segments, 4 distal segments setose on medial margins; strong conical spine on endite body near origin of palp. Pereopod 1 shorter than pereopods 2–4; carpus longest segment, bearing 6 distally bipectinate spines on posterior margin, plus several simple setae on medial surface; propodus with simple setae on posterior margin plus several ranks of fringed spines on medial surface; dactylus with terminal fringed spine and several less-robust setae on anterior and posterior margins. Pereopods 2–4 similar, lacking dactylus, with propodi, carpi, and meri slender, cylindrical, bearing elongate setae on posterior margins. Pereopods 5–7 prehensile, robust, becoming progressively shorter posteriorly. Penis slightly longer than basis of pleopod 1, distally bilobed. Pleopod 1 basis with 3 retinacula; rami of equal length, exopod with notch in proximal half, and 3 elongate setae. Pleopod 2, copulatory stylet articulating on inner margin of endopod near base, reaching by half its length beyond rami, distally trifid, with 2 slender elongate lobes shielded basally by third acute process. Uropod with outer ramus triangular, margins setulose; inner ramus half length and  $\frac{1}{3}$  basal width of outer ramus, with 2 elongate distal setae.

*Female*: Integument relatively more tuberculate than in male. Head and pereonites 1–3 similar to male; pereonite 4 only slightly longer than greatest anterior width; coxal plate with 2 marginal tubercles, segment tapering poste-