PROC. BIOL. SOC. WASH.
98(1), 1985, pp. 255–280

NEW SPECIES OF ISOPODA FROM THE FLORIDA MIDDLEGROUNDS (CRUSTACEA: PERACARIDA)

Allan Hooker

Abstract.—Six new species of isopods, five asellotes and one anthurid, are described from the Florida Middlegrounds in the northeastern Gulf of Mexico. One is described as a new genus, viz. *Mexicope kensleyi.* The other five species described are: *Pleurocope floridensis, Munnogonium wilsoni, Janira biunguicula, Gnathostenetrioides pugio,* and *Mesanthura hopkinsi.* The specimens were all collected from artificial habitats of mostly man-made materials.

Isopod crustaceans may be an important part of the macro-epifauna and macro-infauna of various marine habitats. The state of our knowledge of these links in the food-web of the macro- and megafauna of the western Atlantic, Caribbean, and Gulf of Mexico waters is generally limited to faunal checklists and inventories which usually deal with specific localities, e.g., Menzies and Frankenberg 1966, Hudson *et al.* 1970, Rouse 1970. There are also several regional reports and monographic accounts. Of these, the most comprehensive is that from Puerto Rico (Menzies and Glynn 1968).

As part of a survey of the biota of the Florida Middlegrounds, members of the Dauphin Island Sea Lab participated in an inventory of the area's epibenthic fauna between June 1978 and January 1981. A large majority of the diminutive asellote isopods of this study were collected in artificial habitats placed on and retrieved from a hermatypic coral reef at a depth of approximately 30 meters. Habitat placement and retrieval was accomplished by means of SCUBA. The anthurid species was found in vacuum samples collected by the submersible research vessel *Diaphus.*

The six new isopods are described and illustrated. Where practical, artificial dichotomous keys are presented.

Materials and Methods

All the specimens of this study were collected from the Florida Middlegrounds at 28°35′N, 84°16′W (see Fig. 1). A component of the West Florida shelf, 150 Km south of the north Florida coast and 160 km northwest of Tampa Bay, the Middlegrounds are influenced by the Caribbean-derived Loop Current, Florida Bay waters, and the West Florida Estuarine Gyre (Austin and Jones 1974). The area is characterised by coral reefs, projecting discontinuously from the bottom, not exceeding depths of 55 m (Jordan 1952). An abundant invertebrate community is supported by the area's reefs (Hopkins *et al.* 1977) among which are this study's isopods.

Nearly all the new species were obtained from artificial habitat cryptofaunal samples; however, selected sponges (especially *Agelas dispar*) and corals (especially *Madracis decactis*) played host to several of the collected specimens. *Agelas dispar* was found to host up to ten species of isopods, while *Madracis decactis* up to 14

Fig. 1. The Gulf of Mexico, showing the Florida Middlegrounds and other known reef locations (after Bright and Pequegnat 1974).

species (see Table 1). The unexpectedly large numbers of specimens found in the artificial habitats may be due to the extra effort expended in picking and sorting as against the same effort involved in picking and sorting naturally occurring samples.

Attempting to maximize internal heterogeneity, artificial habitats contained predetermined quantities of PVC tubing of two diameters, oyster shell, plastic straws, trawl netting, plastic swizzle sticks, fibreglass insulation, and plastic meshed "scrubbies," enclosed in vinyl-clad hardware cloth (1 cm × 1 cm mesh), structurally strengthened externally by a plastic milk case. Figure 2 is a cross-sectional view of such an artificial habitat.

Habitats were placed on the reef's rubble, and anchored by railroad iron sections. Habitat retrieval occurred at regular intervals corresponding to scientific cruises to the Middlegrounds. Retrieval consisted of enclosing the habitats in cloth bags, floating them to the surface by means of lift bags, and surface recovery. Both habitat placement and retrieval were accomplished by means of SCUBA.

On retrieval, intact individual habitats were fixed in 10% formalin, and transported to the laboratory. All the habitat substrates were rinsed over a 0.5 mm mesh sieve, the resulting animals and rubble stored in 70% anhydrous alcohol. The reef rubble found in nearly all the habitats was probably a result of habitat settling and storm-induced disturbance. No attempt was made to determine which of the internal microhabitat substrates was favored by the asellotes. The single

Table 1.—Distinguishing characters of Pleurocopidae, *Mexicope,* Abyssianiridae, *Janira,* and *J. biunguiculus.* Explanation of abbreviations: a, absent; am, ambulatory; b, biramous; c, covered; dil, dilated; e, expanded; ep, exposed; l, lacking; m, modified; n, non-expanded; nr, normal; ns, non-stalked; p, present; ps, parallel-sided; s, stalked; sag, sagittate; su, subchelate; u, uniramous; v, varied; ?, unknown or uncertain.

	Mexicope (unassigned)	*Pleurocope* (Pleurocopidae)	*Prethura* (Pleurocopidae)	*Santia* (Pleurocopidae)	Kuphomunna (Pleurocopidae)	*Abyssianira* (Abyssianiridae)	*Janira* (Janiridae)	*Janira biunguiculus*
Ant. I peduncular segments	2	2	2	1,2,3	2	4(?)	3,4	1
Ant. I flagellar articles	7	4	3	3,4,5	3	2(?)	v	5
Ant. I aesthetascs	p	p,l	l	1–3	1	?	0,2(?)	2
Ant. II peduncular segments	6	6	6	v	5	?	6	?
Ant. II flagellar articles	13	6,7	8	v	15	?	v	?
Ant. II aesthetascs	0	1	0	0	0	?	0	?
Ant. II peduncular scale	p	l	l	l	l	l	p	p
Length of Ant. I vs Ant. II	II>I	I>II	II>I	II>I	II>I	?	II>I	?(II>I)
Maxillipedal palp seg. 1–3	n	n	n	n	n	e	e	e
Maxilla I	b	u	b	b	b	b	b	b
Mandibular palp	l	l	l	p,l	l	p	p	p
Molar process	m	m	nr	nr	nr	nr	nr	nr
Eyes	p	p	p	p	p	a	p	p
Eye location	s	s	s	s	s	–	ns	ns
Uropods	b	b	m	b,u	b	b	b	b
Pereopod I	am	su	su	su	su	su	am,su	am
Claws on Prp. II–VII	2	1	2	2	2	2	3,2(?)	2
Epimera (dorsally)	1–7	2–3,5–6	0	0	5–7	1–7	1–7,2–7	1–7
Pleonal segments	2	1,2	2	1,2	1	2	2	2
Male Plp. I distally	ps	ps	ps	ps	dil	sag	v	ps
Male Plp. II	nr	nr	e	nr	nr	nr	nr	nr
Anus	c	ep	?	ep	ep	c	?	ep

species of anthurid was found in bottom vacuum samples provided by a minisubmersible research vessel.

Systematics

Infraorder Asellota
Family Pleurocopidae
Pleurocope floridensis, new species
Figs. 3, 4

Description.—Body broad, ovate, nearly twice longer than wide; broadest at pereonites 3 and 4. Dorsum covered with numerous minute tubercles. Cephalon about 1½ times wider than long, widest at eyestalk origin. Eyestalks projecting laterally nearly to spine of second pereonite, with 3 light-brown ommatidia; preocular lobes absent. Frontal margin slightly convex. Coxal plates dorsally visible on pereonites 2–3 and 4–7. Pereonites 2–4 subequal in length; slightly longer than subequal pereonites 1, 5–7; pereonites 5–7 narrower than preceding segments; coxal plates of pereonites 2, 3, 5 and 6 each with single lateral spine, tipped with 2 elongate simple setae. Pleotelson twice longer than broad, slightly raised at uropodal insertion, posteriorly tapering, elongate; 2 spines on each ventrolateral

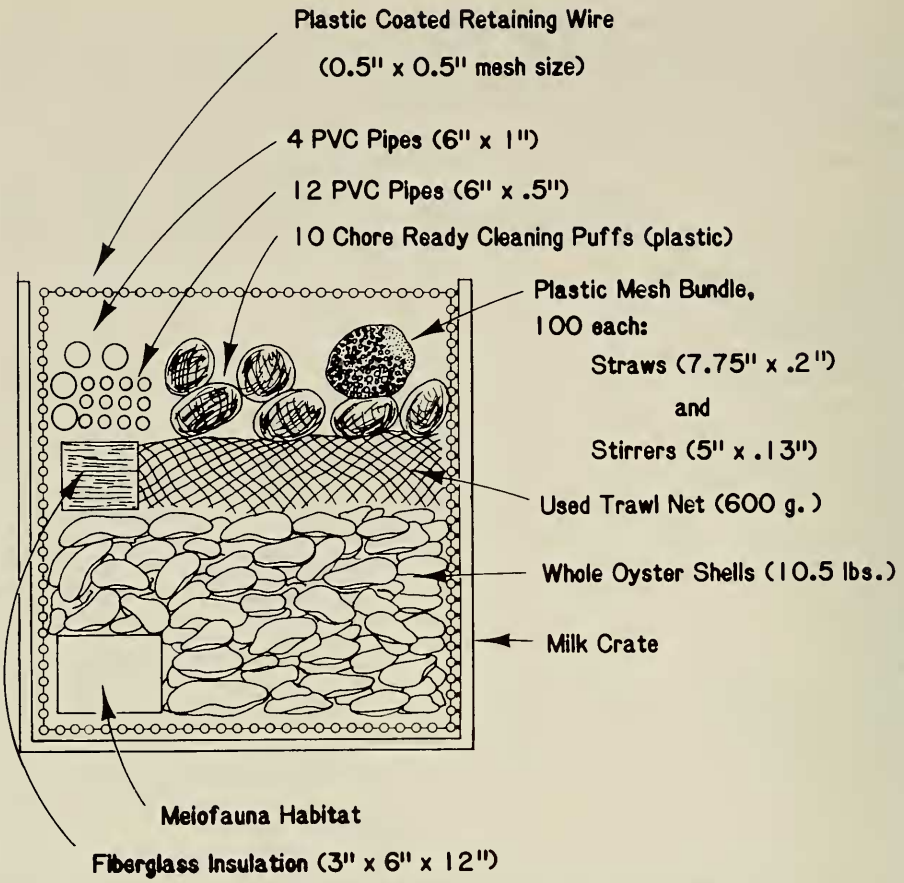

Fig. 2. Schematic cross-sectional view of artificial habitat utilized in the Florida Middlegrounds.

margin; 10–12 elongate articulate setae arising from each distal ventrolateral margin, several extending beyond pleotelsonic apex. No anterior pleonite visible.

Antennular peduncle 2-segmented, first segment slightly longer than second; flagellum of 4 articles, third longest, bearing 2 terminal aesthetascs; fourth article with 1 aesthetasc and elongate seta. Antenna reaching to midpoint of antennular flagellum, with 6-segmented peduncle, third segment strongly produced mesially, forming lobe tipped with row of 5 robust setae; fifth and sixth segments subequal in length, together equal to previous 4 segments together; flagellum half length of peduncle, of 6 articles, terminal article bearing 2 setae and 1 apical aesthetasc.

Mandible lacking palp; rudimentary lacinia mobilis on left mandible; molar process highly modified, conical, directed distally, incisor also modified, an elongate extension with several clefts.

Inner lobe of maxilla 1 rudimentary; outer lobe with 8 or 9 spines. Maxilla 2 biramous, inner ramus supporting 4 terminal setae; both lobes of outer ramus tipped with 2 setae. Maxilliped with narrow 5-segmented palp; epipodite distally rounded; broad endite with 2 coupling hooks, and setules fringing entire concave distal margin.

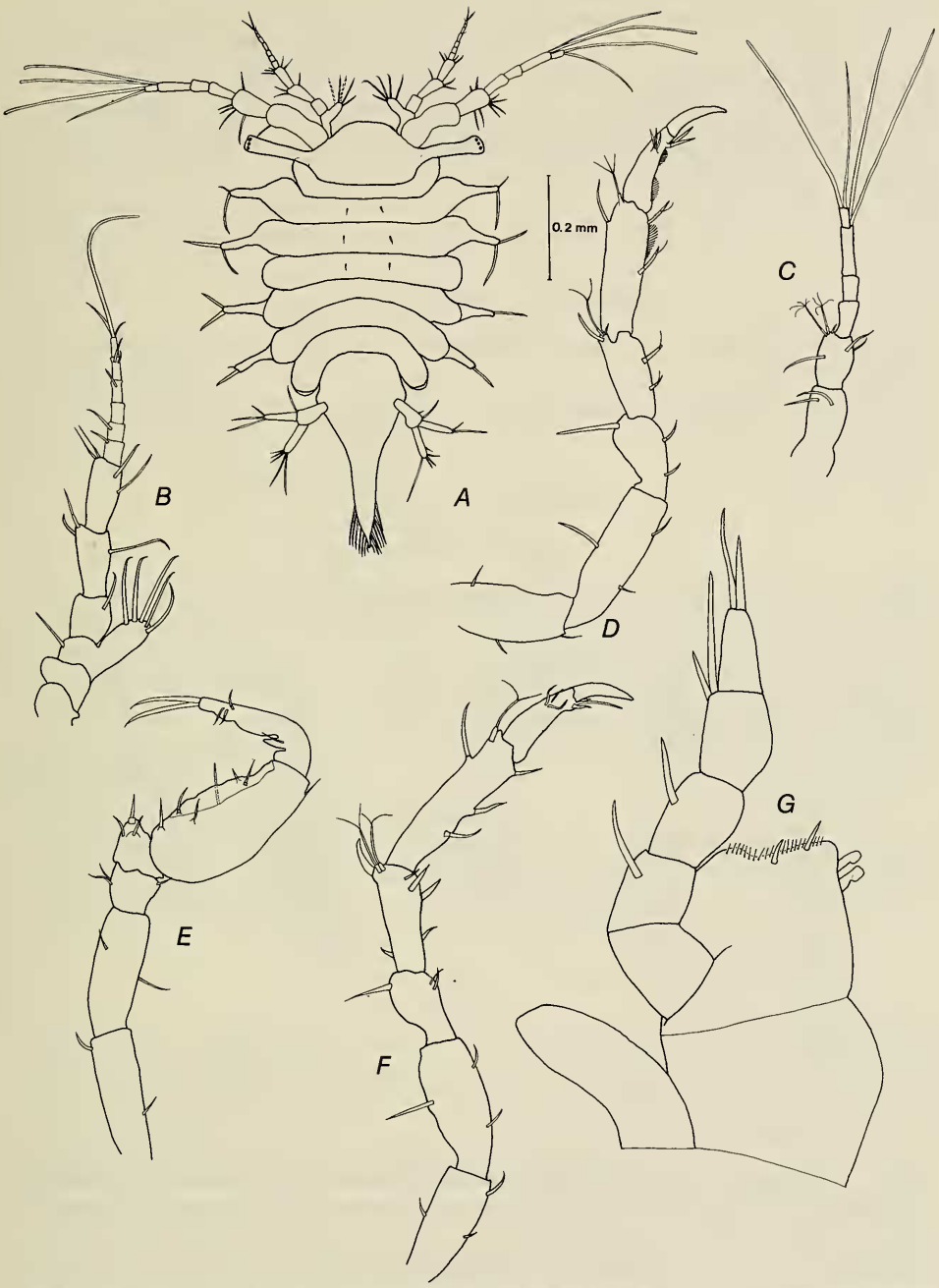

Fig. 3. *Pleurocope floridensis*: A, Holotype ♂, dorsal view; B, Antenna 2; C, Antenna 1; D, Pereopod 2; E, Pereopod 1; F, Pereopod 7; G, Maxilliped.

Pereopod 1 prehensile, dactyl with 2 elongate spines distally and lanceolate process on proximal inner margin; propod nearly oval; merus and carpus shortest segments, subequal in length. Dactyl of pereopod 2 with single claw, bearing setules on penultimate and ultimate articles.

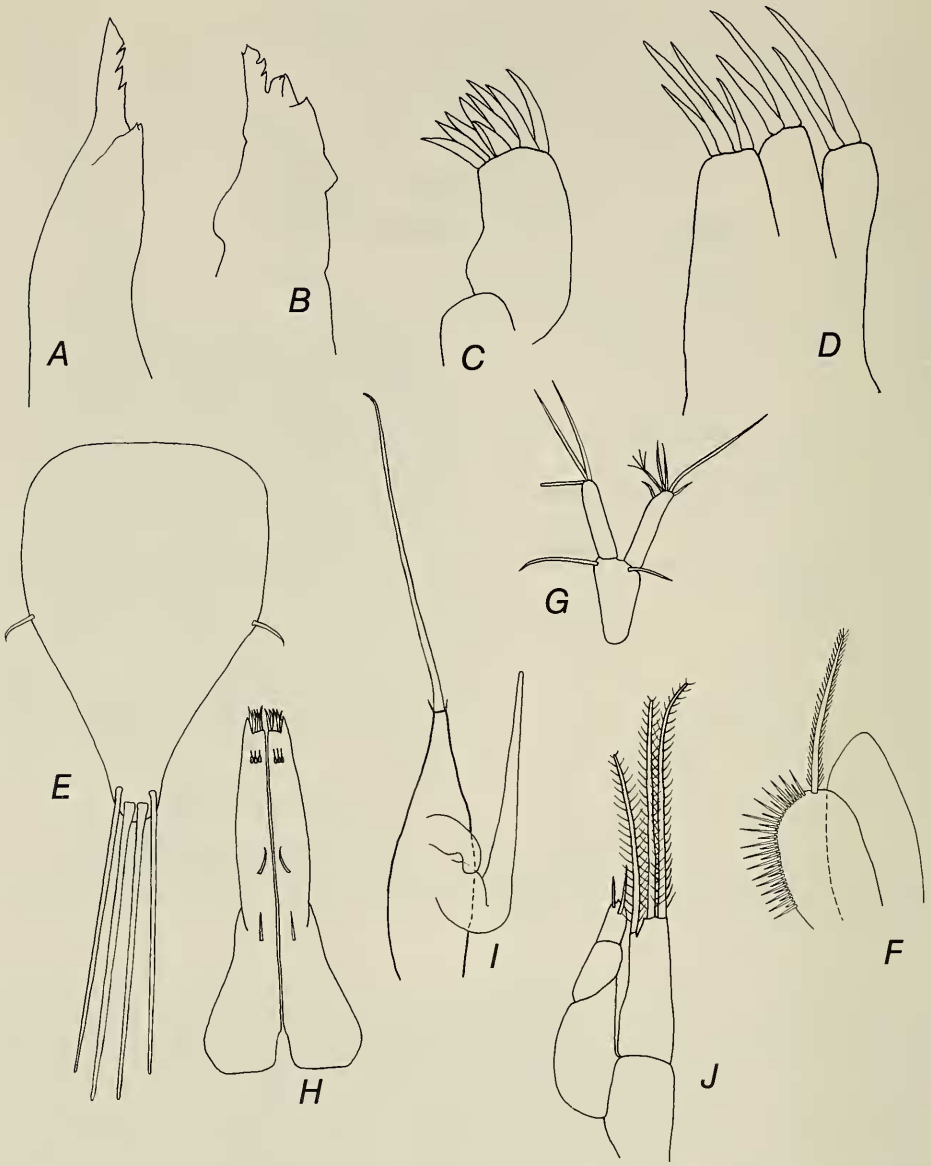

Fig. 4. *Pleurocope floridensis*: A, Right mandible; B, Left mandible; C, Maxilla 1; D, Maxilla 2; E, Operculum ♀; F, Pleopods 4 and 5 ♂; G, Uropod; H, Pleopod 1 ♂; I, Pleopod 2 ♂; J, Pleopod 3 ♂.

Uropods pedunculate, inserted dorsolaterally; peduncle expanded distally; lengths of peduncle, exopod, and endopod subequal. Rami of pleopod 1 fused proximally, elongate, widest proximally, with single spine on outer distal margin, apex bearing several setae. Pleopod 2 with long, slender endopod; exopod tapering distally, tipped with elongate spine. Endopod of pleopod 3 slightly longer than exopod, bearing 2 simple setae apically; outer branch tipped with 3 plumose setae.

Female: Body broader than male. Sexual dimorphism not apparent in gnathopod. Brood pouch of 3 pairs of oostegites.

Material.—Holotype male TL 1.15 mm, United States National Museum, catalog number 184943. Allotype female TL 0.96 mm, USNM 184944. Paratypes deposited in Dauphin Island Sea Lab Museum, catalog number 6183-1507.

Etymology.—The specific epithet *floridensis* refers to the locality where the asellote was collected.

Remarks.—See Remarks section for *Mexicope kensleyi.*

Key to the Species of *Pleurocope*

1. Dorsum with long setae; pleon of two segments; uropodal rami longer than peduncle ..... *P. dasyura*
– Dorsum without long setae; pleon of one segment; uropodal peduncle as long as rami ..... *floridensis*

Family Incertae Sedis

Mexicope, n. gen.

Diagnosis.—Eyes present; frontal margin of head straight; antennulae normal; scale present on antennal peduncle. Pleon 2-segmented, second segment as wide as long, with lateral serrations. Epimera spiniform, present on pereonites 1–7. Mandibular palp lacking; molar process conical, setiferous; maxillipedal palp 5-segmented, all segments subequally wide. Pereopod 1 ambulatory; all pereopodal dactyli biunguiculate. Uropoda elongate, biramous. Male pleopod 1 distally bilobed, both lobes setiferous.

Type-species.—*Mexicope kensleyi,* n. sp.

Etmyology.—The generic epithet *Mexicope* is a combination of the prefix *Mexi-*, indicating the Gulf of Mexico, and the suffix *-cope* derived from Pleurocopidae, the family to which *Mexicope* shows most similarities.

Mexicope kensleyi, new species
Figs. 5, 6

Description.—Female: Body nearly 3 times longer than wide, widest at pereonites 3 and 4. Head extending laterally, as wide as epimera of pereonite 1; preocular spines present; eyes dorsal, black, borne on small lobes. Pereonites 1–7 with spiniform coxae; coxae of pereonites 2–7 with recurved setae. Pleon with simple setae laterally and fringed setae apically; pleonite 1 free.

Antennule extending to proximal end of antennal peduncle segment 6; distal segment of 2-jointed peduncle with several plumose setae; flagellum of 7 articles, article 5–7 each with single terminal aesthetasc. Antenna heavily setose; peduncle 6-segmented, third segment with seta-bearing squama, fifth segment slightly longer than preceding 4 segments together; flagellum slightly longer than peduncle, first article longest, remaining 12 articles subequally long, together about twice length of first article.

Mandible lacking palp, with conical setiferous molar process; left mandible with quadridentate lacinia, quadridentate incisor molar process, row of 1 simple and 6 dentate spines. Maxilla 1 inner ramus short, outer ramus with 11 spines. Maxilla

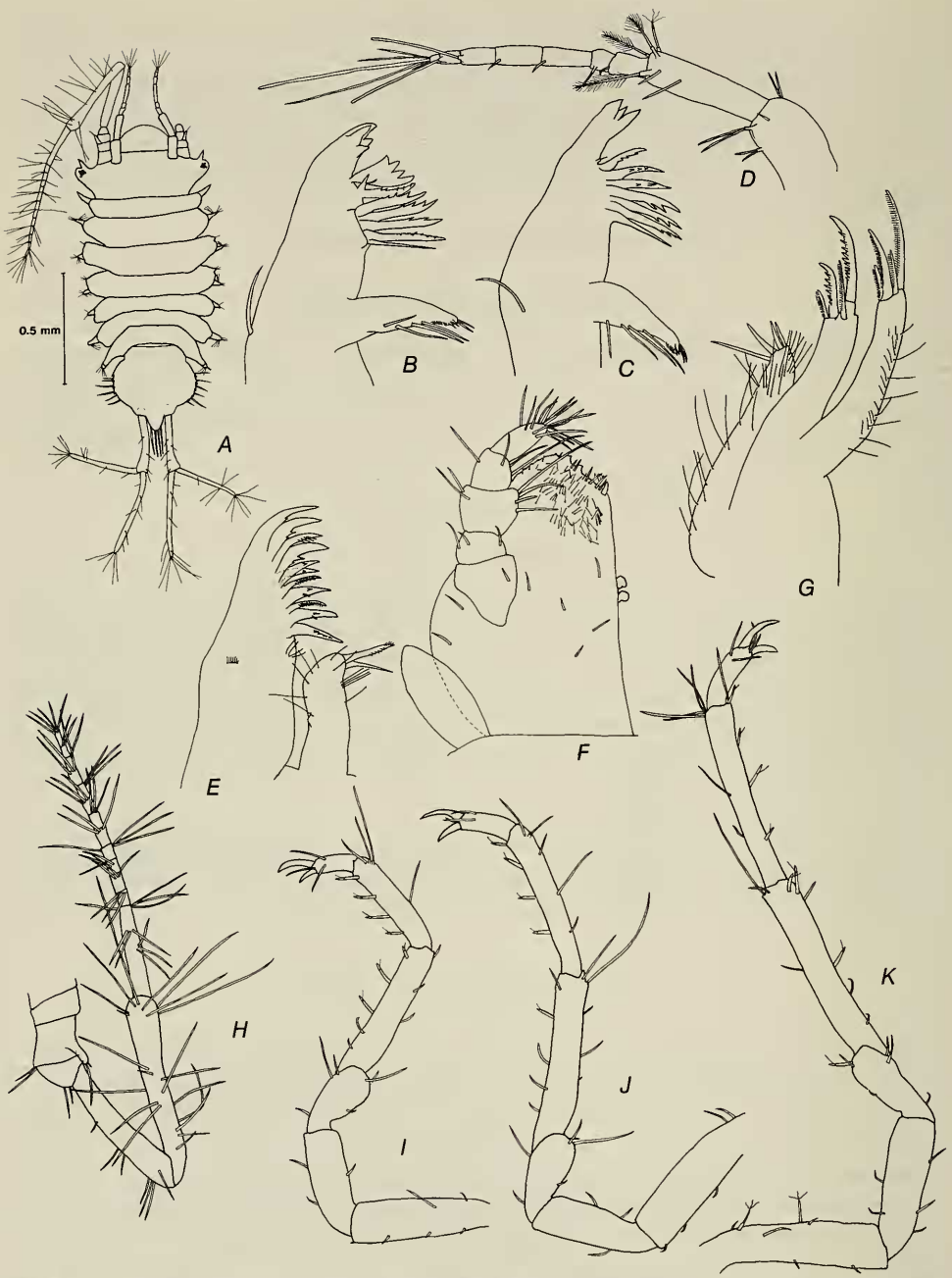

Fig. 5. *Mexicope kensleyi*: A, Holotype ♀, dorsal view; B, Left mandible; C, Right mandible; D, Antenna 1; E, Maxilla 1; F, Maxilliped; G, Maxilla 2; H, Antenna 2; I, Pereopod 1; J, Pereopod 2; K, Pereopod 7.

2, inner ramus supporting 4 spines distally, inner lobe of outer ramus with 2 dentate spines and 2 fringed setae terminally, outer lobe with 4 fringed setae.

Maxilliped with 5-segmented palp, segments subequally wide, terminal segment

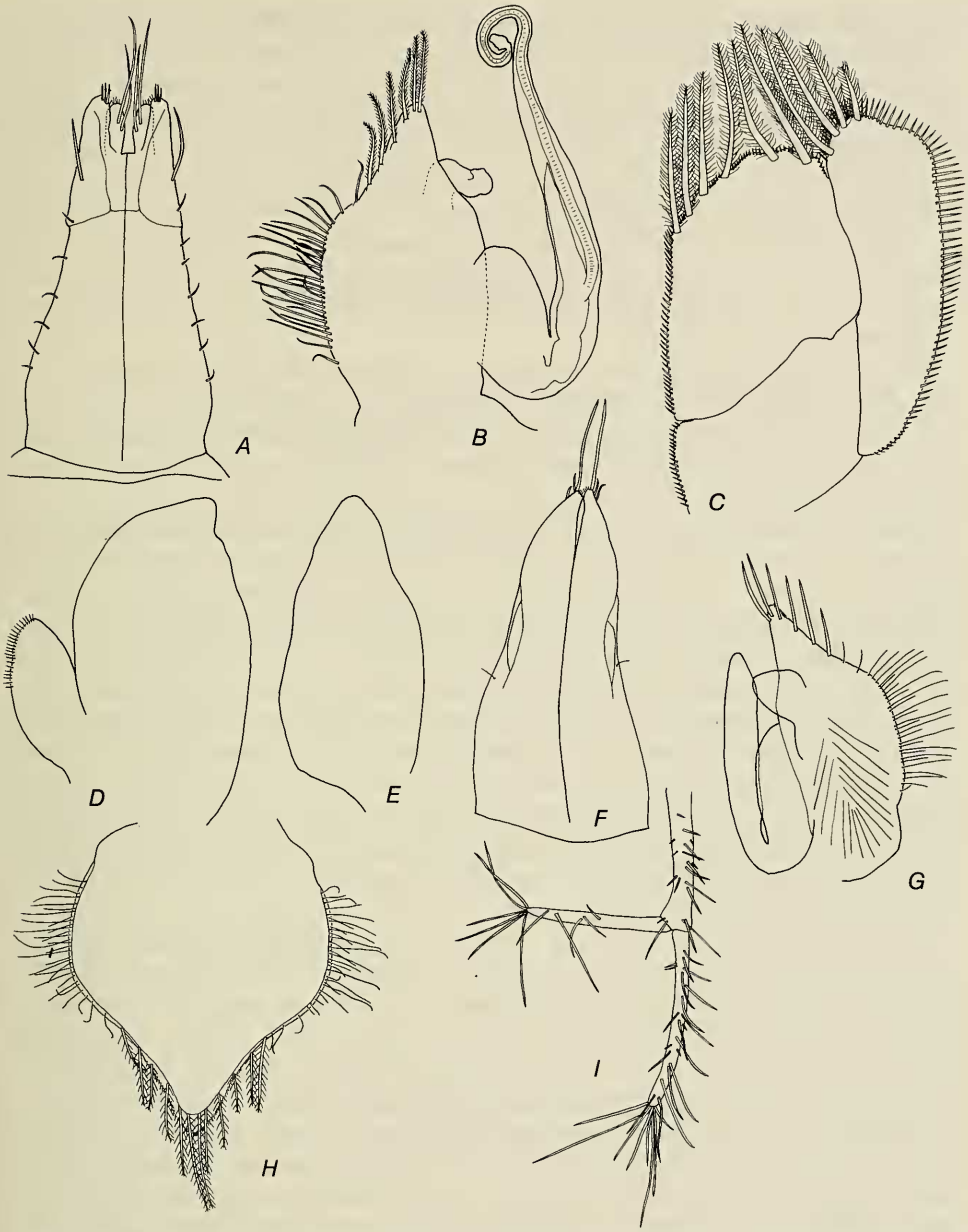

Fig. 6. *Mexicope kensleyi*: A, Pleopod 1 ♂; B, Pleopod 2 ♂; C, Pleopod 3 ♂; D, Pleopod 4 ♂; E, Pleopod 5 ♂; F, Pleopod 1, immature ♂; G, Pleopod 2, immature ♂; H, Operculum ♀; I, Uropod.

bearing several setae distally. Endite broad, outer margin rounded; inner margin with 2 coupling hooks prominent tooth distally; bearing numerous setules on distal third. Epipodite small, narrowly rounded apically.

Pereopod 1 ambulatory; subequally long basis and propodus longest segments; merus bulbous; dactyl with 2 claws. Pereopod 2 with biunguiculate dactyl, carpus, and propodus equally long. Pereopod 7 longest, similar to pereopod 2.

Uropoda elongate, setiferous, biramous, peduncle and exopod subequal in length, endopod slightly longer.

Operculum as broad as long; distal half of lateral margin somewhat excavate, proximal half bearing numerous narrow setae; 12 prominent feather setae along distal subacute margin.

Male: Pleopod 1 rami fused proximally, bearing several short setae and single elongate seta laterally; bilobed distally, outer lobe with 3 setae and several setules terminally; inner lobe bearing several setules apically and 2 elongate setae medially. Pleopod 2 sympod with alternating long and short setae along outer margin, 6 plumose setae on outer distal third; endopod coiled distally, with flared stylet, exceeding length of sympod.

Material.—Holotype female TL 2.95 mm, USNM 184940. Allotype male TL 1.66 mm, USNM 184941. Paratypes DISL Museum 6183-1506.

Etymology.—The specific name *kensleyi* is for Brian Kensley, of the National Museum of Natural History (Smithsonian Institution), for the assistance and guidance he has given me.

Remarks (Pleurocope floridensis and *Mexicope kensleyi).*—Consistently challenging to taxonomists, the genus *Pleurocope* has undergone five different family assignments since its inception by Walker in 1901. Describing *P. dasyura* from the Mediterranean Sea, Walker (1901) placed his genus in the family Munnidae. Wolff (1962:64) reassigned *Pleurocope* to the family Dendrotionidae with hesitancy and noted its exceptional characters in the family diagnosis. Facilitated by several fresh specimens of *P. dasyura,* Fresi and Schieke (1972) re-evaluated *Pleurocope,* and felt it necessary to erect a new family, Pleurocopidae. Wilson (1980) argued that the cephalic appendages Fresi and Schieke (1972) cite as basis for the erection of Pleurocopidae are ". . . specializations not of familial significance . . ." and placed *Pleurocope* in the family Antiadidae. Finally, recent efforts (Kensley, 1982) to rectify nomenclatural and priority problems will place the genus in the family Pleurocopidae.

After comparing *Pleurocope* and the other pleurocopid genera, *Kuphomunna* Barnard, 1914, *Santia* Sivertsen and Holthuis, 1980 (=*Antias* Richardson, 1906), and *Prethura* Kensley, 1982, the heterogeneity of this family becomes immediately apparent. Kensley (1982), citing the diverse nature of the family's constituent genera, is admittedly hesitant in grouping this foursome, which he believes need to be studied in greater detail in order to establish taxonomic relationships.

Pleurocope floridensis can be distinguished from *P. dasyura* Walker by its single segmented pleon, short dorsal setae, and subequally long uropodal peduncle and rami. A third member of the genus is presently being described by Wilson and Carter (Wilson, pers. comm.). *P. floridensis* differs from it by possessing only five robust setae along the mesial margin of the second antenna's third segment.

The new monotypic genus, *Mexicope,* also offers taxonomic difficulties. Its unique combination of diagnostic attributes does not fit readily into any existing family. Both Wilson (pers. comm.) and Kensley (pers. comm.) feel *Mexicope* is most closely related to the family Pleurocopidae, even though it shares several characters with the Janiridae. The new genus, however, differs significantly from its pleurocopid allies by possessing peduncular scales on its antennae, a conical setiferous molar process, and an ambulatory first pereopod. *Mexicope* can also be distinguished from the janirids by its nonexpanded maxillipedal palp segments

1–3, absence of a mandibular palp, modified molar process, and stalked eyes. Table 2 compares the distinguishing characters of *Mexicope,* the genera of Pleurocopidae, and the genus *Janira.*

Because of this overlapping of familial features and because of the present vagueness of family and generic diagnoses of the Janiridae and Pleurocopidae, *Mexicope* is not assigned a familial position.

Family Paramunnidae

Munnogonium wilsoni, new species
Figs. 7, 8

Description.—Male: Body pear-shaped, widest at pereonite 3, nearly twice longer than wide. Frontal margin of head broadly rounded; black eyes on short lateral projections; coxal plates dorsally visible on pereonites 2–7. Pleotelson as long as broad, laterally dentate to point of uropodal insertion, posteriorly rounded.

Antennular peduncle 2-segmented, second segment expanded distally; first and fourth articles of flagellum subequally long, latter bearing single elongate aesthetasc and several setae apically.

Third segment of antennal peduncle elongate, with seta-bearing scale; sixth peduncular segment slightly longer than fifth segment, with several setae distally. Flagellum of 6 or 7 segments, each article slightly shorter than the preceding one.

Mandibles with strong, truncate molar process; palp reduced to glabrous scale; left mandible with 4-toothed incisor, lacinia mobilis trifid, 4 elongate simple setae; incisor of right mandible 5-toothed, spine row of 2 serrate setae and 3 simple setae. Inner ramus of maxilla 1 with 1 plumose and 3 elongate simple setae; 8 terminal spines on outer ramus, single spine arising from body of outer ramus. Maxilla 2, inner ramus broad, bearing several elongate simple setae and 1 feather seta along distal margin, with several rows of setules of distal half; inner lobe of outer ramus with 3 elongate simple setae terminally, outer lobe carrying 1 feather seta and 2 elongate simple setae.

Maxillipedal epipodite extending to first palp segment; palp 5-segmented, joints 1–3 expanded; endite setose along distal margin, 2 coupling hooks along inner margin.

Pereopod 1 subchelate; dactyl with terminal and accessory claws; carpus with 2 prominent sensory spines inferiorly; basis longest article, subequal in length to ischium and merus together. Single claw on dactyl of pereopod uni-unguiculate; basis and ischium subequally long.

Uropodal protopod not visible dorsally; endopod twice longer than exopod, both rami apically setose.

Pleopod 1 sagittate, lateral corners cleft, supporting setae of varying lengths. Pelopod 2 laterally fringed with several elongate setae; endopod distally thin, elongate.

Female: Slightly broader than male; operculum distally narrowing to rounded apex, bearing several slender setae along convex lateral margins. Ovigerous paratype with 9 eggs in brood pouch.

Material.—Holotype male, TL 0.86 mm, USNM 184946. Allotype female, TL 0.98 mm, USNM 184947. Paratypes, DISL Museum 6183-1509.

Etymology.—The specific name is in honor of George Wilson, University of

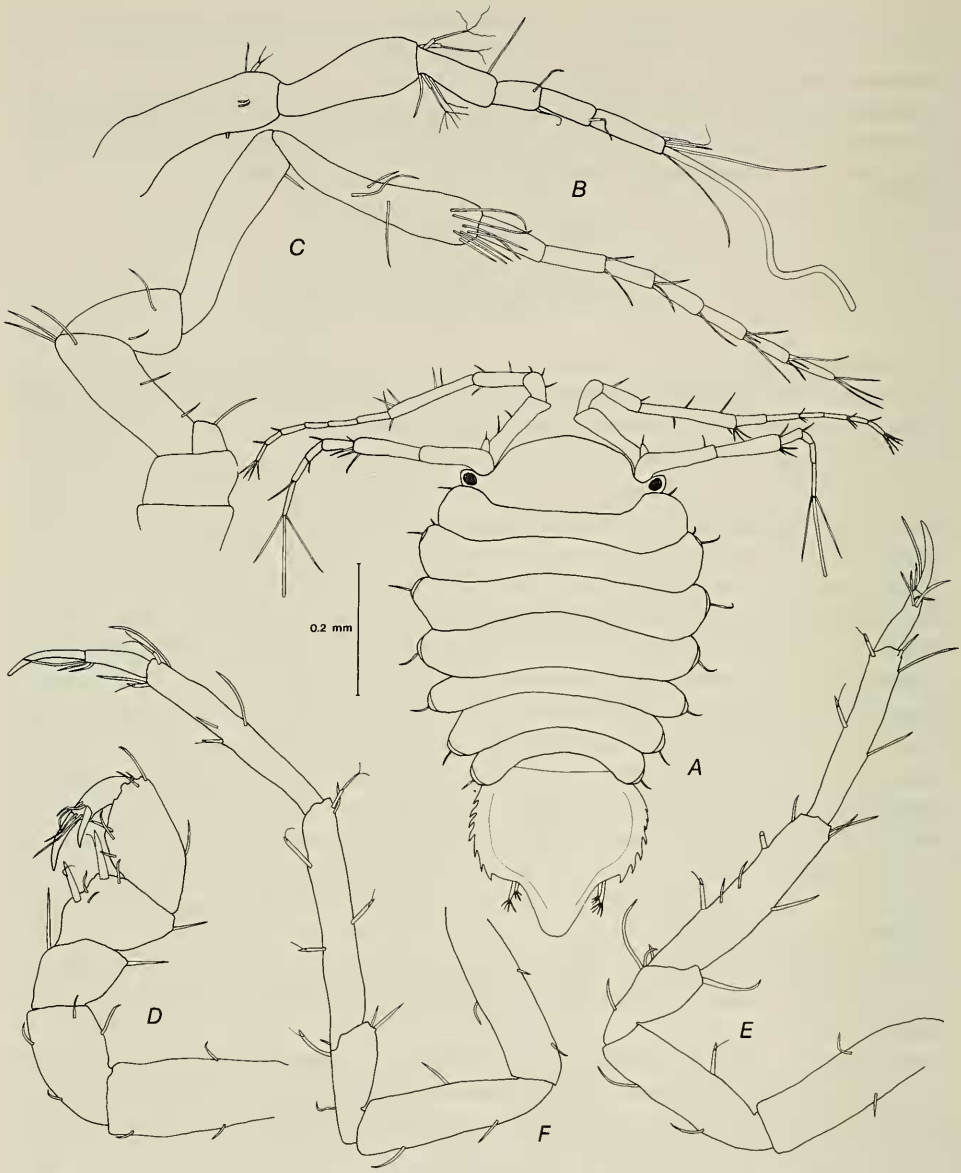

Fig. 7. *Munnogonium wilsoni*: A, Holotype ♂, dorsal view; B, Antenna 1; C, Antenna 2; D, Pereopod 1; E, Pereopod 2; F, Pereopod 7.

California at San Diego, who has recently helped to rectify paramunnid-munnid inconsistencies, and has helped me immeasurably.

Remarks.—A new genus and species, *Munnogonium waldronense,* was instituted by George and Stromberg (1968) after collecting what was thought to be a previously undescribed asellote from the San Juan Archipelago, Washington. Although justified in their erection of a new genus, the asellote was not, in fact, a new species. Menzies and Barnard (1959) had described the same species, placing

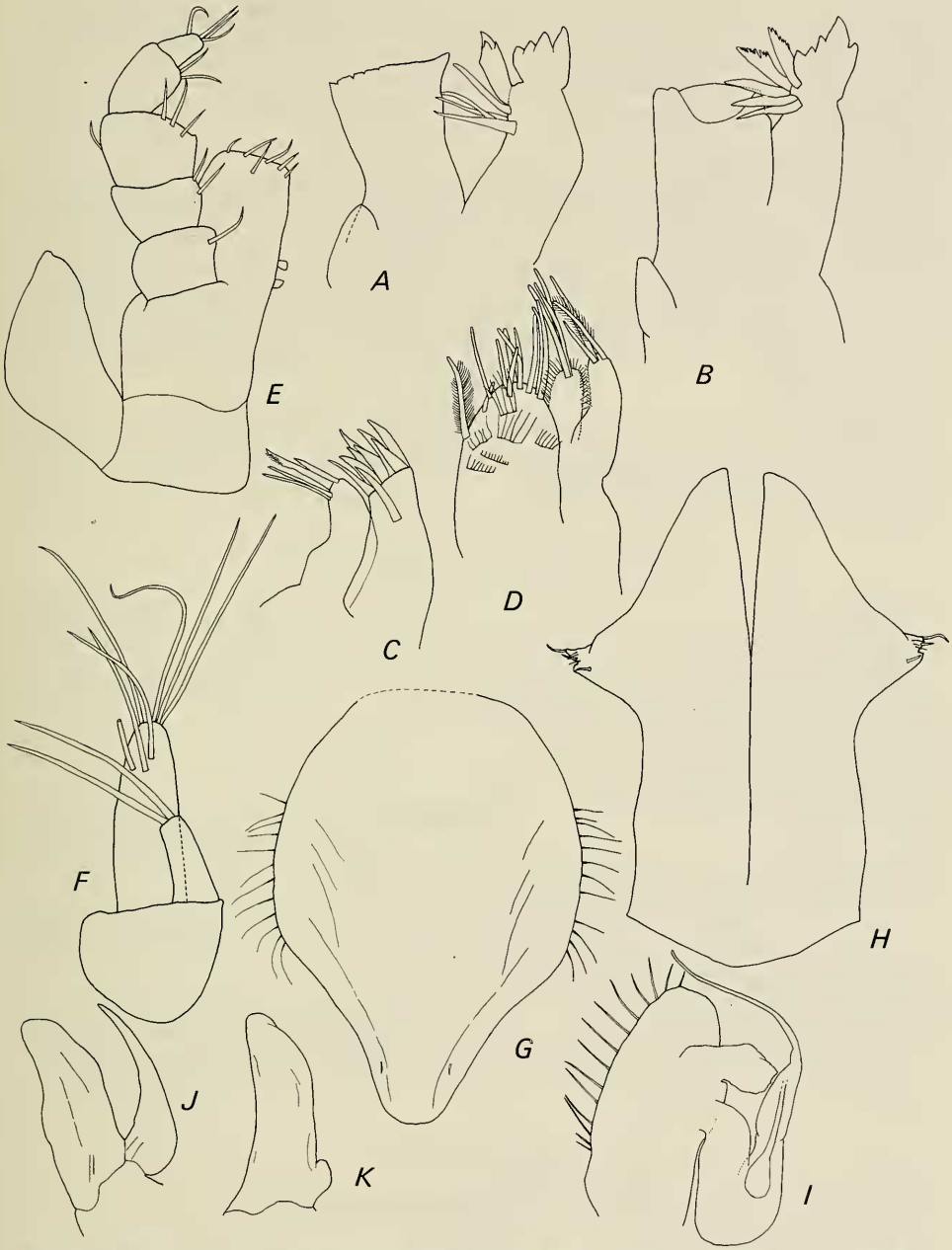

Fig. 8. *Munnogonium wilsoni*: A, Left mandible; B, Right mandible; C, Maxilla 1; D, Maxilla 2; E, Maxilliped; F, Uropod; G, Operculum ♀; H, Pleopod 1 ♂; I, Pleopod 2 ♂; J, Pleopod 3 ♂; K, Pleopod 4 ♂.

it in the genus *Austrosignum* Hodgson, 1910, naming it *A. tillerae.* Discovering the conspecificity of *M. waldronense* and *A. tillerae,* Bowman and Schultz (1974) reviewed *Munnogonium,* comparing it to *Munna* Krøyer, 1838, *Pleurogonium* Sars, 1864, and *Austrosignum.* They found *Munnogonium* most closely related

to *Austrosignum,* but differing from its generic allies in the absence of a mandibular palp, ". . . character of generic value . . ." (Bowman and Schultz 1974). By transferring *A. tillerae* (and all other previously described *Austrosignum* species lacking mandibular palps) to *Munnogonium* and applying the law of priority, the type-species became *M. tillerae* (Menzies and Barnard, 1959).

Based on the position of the anus, shape of the male first pleopod, and proportions of the third antennal segment, Wilson (1980) transferred *Munnogonium* and several other genera from the family Munnidae to the resurrected family Pleurogonidae Wilson, 1980. Holthuis (pers. comm.), however, correctly indicates that the law of priority dictates the family name Paramunnidae Vanhoffen, 1914, takes precedence over Pleurogoniidae Nordenstam, 1933, if the genera *Pleurogonium* Sars, 1899, and *Paramunna* Sars, 1866, are considered to belong to the same family.

Munnogonium wilsoni can be distinguished from all its congeners by the presence of coxal plates on pereonites 2–7, and the unique combination of antennal peduncular scales and short eyestalks.

Key to the Species of *Munnogonium*

1. Eyes not visible dorsally, lacking ocular peduncles ..... *M. erratum* Schultz, 1964
– Eyes visible dorsally, borne on short or long peduncles 2
2. Pereonites 3 and 4 laterally notched ..... *M. subtilis* Kensley, 1976*
– Pereonites 3 and 4 not laterally notched 3
3. Lateral pleonal margin non-serrate 4
– Lateral pleonal margin serrate 5
4. Eyes borne on elongate peduncles; antennule of 6 articles ..... *M. grande* Hodgson, 1910
– Eyes borne on short stalks; antennule of 7 articles ..... *M. globifrons* Menzies, 1962
5. Antenna without peduncular scale *M. tillerae* (Menzies and Barnard, 1959)
– Antenna with peduncular scale 6
6. Eyes borne on elongate peduncles; male antenna with peduncular segment 3 suboval, swollen ..... *M. maltinii* Schiecke and Fresi, 1972
– Eyes borne on short stalks; coxal plates dorsally visible on pereonites 2–7 ..... *M. wilsoni,* n. sp.

Family Janiridae

Janira biunguicula, new species
Figs. 9, 10

Description.—Body about 3 times longer than wide, widest at pereonite 4. Cephalon wider than long, projecting strongly at anterolateral corners; prominent frontal margin slightly concave distally. Eyes of 3 ommatidia, brown, dorsolateral. Pereonites 1–4 bearing bilobed coxal plates; pereonites 5–7 with single epimera; lateral margins of pereonites 1–3 directed anteriorly. Pleon 2-segmented, pleonite 1 inconspicuous; pleotelson shield-shaped, as wide as long.

* Based on single ovigerous female.

Fig. 9. *Janira biunguicula*: A, Holotype ♂, dorsal view; B, Antenna 1; C, Maxilliped; D, Maxilla 2; E, Maxilla 1; F, Right mandible; G, Left mandible.

Antennule with 2-segmented peduncle; flagellum of 4 articles, terminal article elongate, with 2 aesthetascs. Antenna broken at scale-bearing peduncular segment.

Mandibular palp 3-segmented, second segment bearing 2 prominent forked setae; strong molar process carrying 2 setae; scale present near base of molar

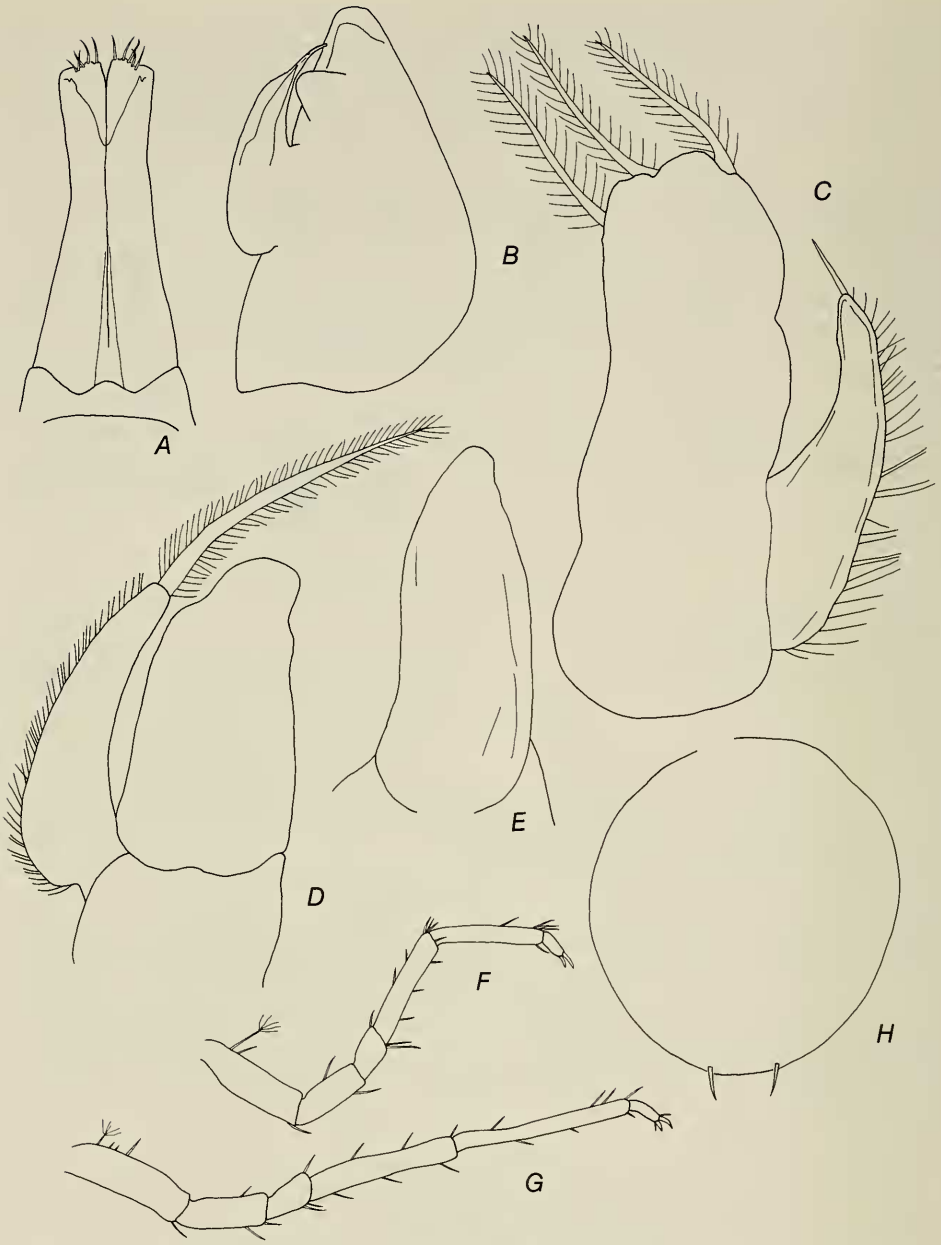

Fig. 10. *Janira biunguicula*: A, Pleopod 1 ♂; B, Pleopod 2 ♂; C, Pleopod 3 ♂; D, Pleopod 4 ♂; E, Pleopod 5 ♂; F, Pereopod 1; G, Pereopod 2; H, Operculum ♀.

process; 6 dentate spines in spine row; lacinia mobilis of left mandible with 5 teeth incisor 5-toothed; incisor of right mandible with 6 teeth.

Outer ramus of maxilla 1 with 6 plumose setae, 1 simple and 5 dentate spines on distal margin; inner ramus bearing several simple setae. Maxilla 2, inner ramus bearing numerous setae; inner lobe of outer ramus with elongate setae, outer lobe

tipped with 4 elongate setae. Maxillipedal epipodite broad, distally subtriangular, apically narrowly rounded; palp 5-segmented, segments 1–3, and especially segment 2 wider than segments 4 and 5; endite bearing several fringed setae-spines distally; 2 retinaculae on inner margin.

Pereopod 1 ambulatory; dactyl shortest segment, biunguiculate; basis, propod, and carpus subequally long. Pereopod 2 with 2 claws on dactyl; carpus longest segment, slightly longer than propod; pereopod 7 shortest, dactyl biunguiculate.

Pleopod 1, rami elongate, tapering for proximal two-thirds of length, distal margin of rami slightly concave, with 4 or 5 stout setae; outer margin of pleopod 2 rounded, sympodal apex rounded, slightly longer than basally robust endopod. Endopod of pleopod 3 bearing 3 strong feather setae terminally; exopodal outer margin setose, spine present distally; exopod of pleopod 4 with prominent feather seta.

Uropod pedunculate, biramous; endopod twice length of exopod, nearly twice as wide.

Female: Broader than male; operculum nearly circular, with 2 setae distally.

Material.—Holotype male, TL 1.19 mm, USNM 184937. Allotype female, TL 1.08 mm, USNM 184938. Paratypes, DISL Museum 6183-1508.

Etymology.—The specific name *biunguicula* refers to the two dactylar claws present on all seven pereopods.

Remarks.—No other asellote family has demonstrated the heterogeneity of genera nor repeatedly presented taxonomic problems as has the Janiridae. Disregarding possible synonymies, Wolff (1962) listed 35 genera, and when combined with more recent generic designations, the number stands close to 40. Many of these genera are monotypic, casting doubt on their validity, in regard to characters traditionally considered generically diagnostic. Two major problems have contributed to the present taxonomic tangle. First, the family diagnosis is very broad, often serving as a catch-all for non-related genera. The disparate nature of janirid genera is exemplified by juxtaposing *Caecianiropsis* Menzies and Pettit, 1956, *Vermectias* Silvertsen and Holthuis, 1980, *Katianira* Hansen, 1916, *Carpias* Richardson, 1902, and *Neojaera* Nordenstam, 1933. Second, as Wilson (pers. comm.) suggests, no one really knows what a janirid is. Only three recurring morphological traits have been found among the janirids: uropods with a peduncle, a scale present on the antennal peduncle (not true for *Iais* Bovallius, 1887), and expanded maxillipedal palp segments 1–3.

The problems of systematics within the Janiridae are brought to light by *Janira biunguicula,* which falls into the same systematic category as many other newly described janirids, while all related genera (or perhaps, more appropriately, 'forms') can be precluded by their generic diagnoses. *Janira*'s most closely related genera, *Ianiropsis* Sars, 1899, and *Janiralata* Menzies, 1951, can both be discounted by their distally dilate first male pleopods, *Ianiropsis* by its elongate, prehensile first male pereopod, and *Janiralata* by its subchelate first pereopod in both sexes.

The dorsal display and arrangement of epimera, and the distally non-dilate male pleopod 1 of *J. biunguicula* agree with the *Janira* diagnosis; however, the type-genus, *Janira maculosa* Leach, 1814, differs from *J. biunguicula* in two important aspects: *J. maculosa* possesses triunguiculate dactyli, whereas *J. biunguicula* has biunguiculate dactyli, and pereopod 1 of *J. maculosa* is prehensile, while that of *J. biunguicula* is ambulatory.

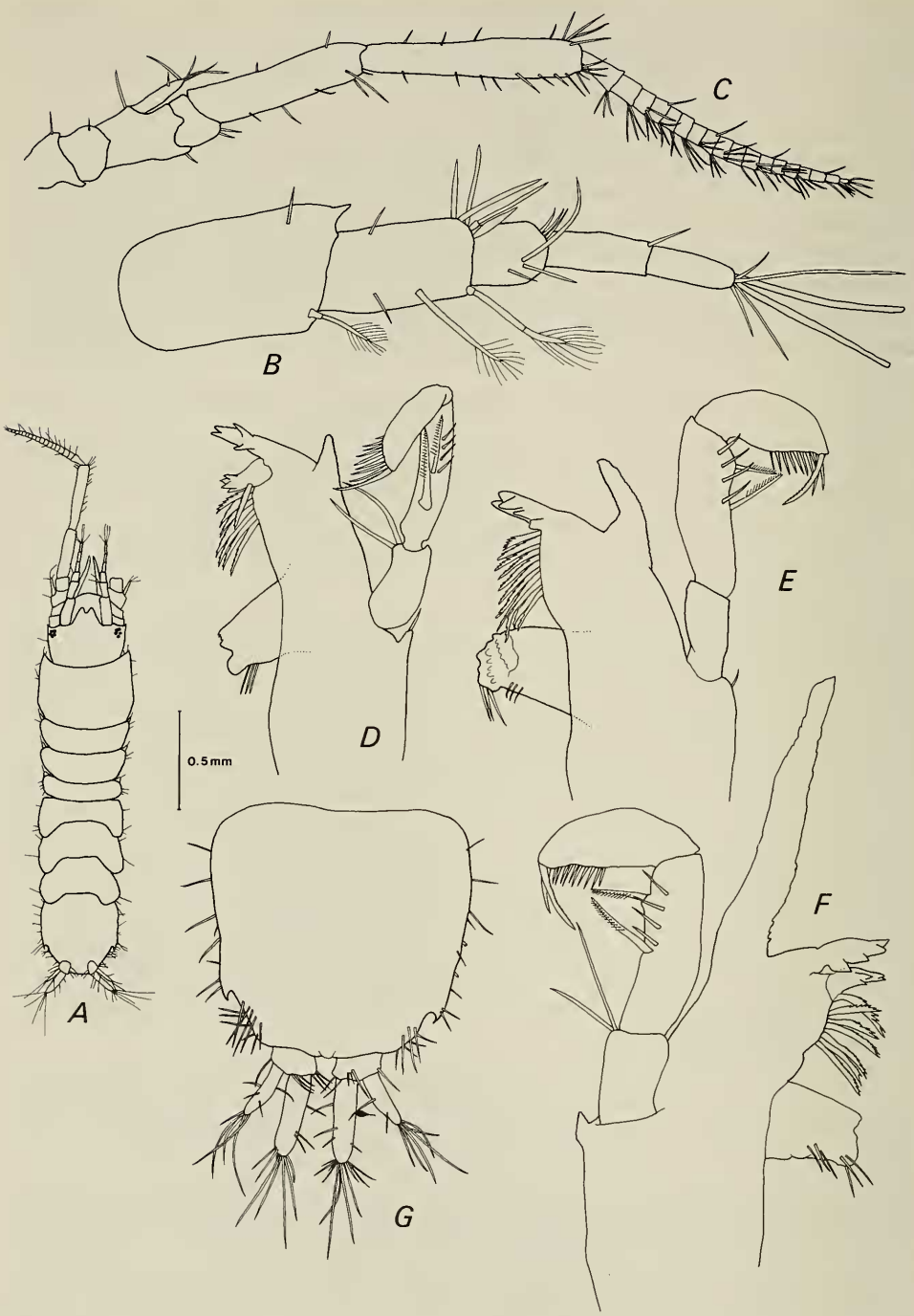

Fig. 11. *Gnathostenetrioides pugio*: A, Holotype ♂, dorsal view; B, Antenna 1; C, Antenna 2; D, Left mandible ♀; E, Right mandible, immature ♂; F, Left mandible, mature ♂; G, Pleotelson and uropods.

These differences may characterize a new genus, but *J. biunguicula* has been placed in *Janira* for two reasons. First for the aforementioned characters it shares with the generic diagnosis, and second, the Janiridae by sheer number of dissimilar genera, should not be burdened by yet another genus that may not be valid and which would only serve further to confuse the situation. Table 2 compares the distinguishing features of *J. maculosa* and *J. biunguicula.*

That the Janiridae require an intensive study to resolve the present complexity is obvious. Schultz (1976) suggests that the number of dactylar claws may be of generic or higher significance. Unfortunately, not all janirid descriptions contain claw number information. Wolff (1962) has found *J. alta* Stimpson, 1853, with three claws rather than two as mentioned by Stimpson, and suspects both *J. japonica* Richardson, 1908, and *J. tristani* Beddard, 1886, are also triunguiculate, contrary to their original descriptions.

Superfamily Parastenetrioidea

Family Parastenetriidae

Gnathostenetrioides pugio, new species

Figs. 11–13

Description.—Male: Body elongate, parallel-sided. Cephalon length and width nearly equal; frontal margin projecting between antennulae, concave anteriorly; mandibular prolongation extending to midpoint of antennular flagellum; eyes dorsal, of 5 light-brown ommatidia. Pereonite 1 longest; pereonites 2–4 with seta-bearing coxae; pereonites 5–7 slightly produced posterolaterally. Pleotelson as wide as long, with lateral spines anterior to uropodal insertion, free pleonal segment lacking.

Peduncle of antennule 3-segmented, first segment broadest, as long as following 2 segments together; flagellum of 2 articles, 2 subequally long aesthetascs on terminal article, aesthetascs nearly as long as flagellum. Antennal peduncle of 6 segments, third segment bearing setiferous squama, segment 5 as long as segments 1–4 together, segment 6 longest; flagellum of 18 setose articles.

Mandibular palp 3-segmented, second segment with 2 fringed setae and 4 shorter simple setae, terminal segment with serrate seta distally; armed with elongate, slightly crenulate projection distolaterally, bearing truncate setiferous molar process; incisors with cusps; lacinia mobilis of left mandible bearing 4 teeth and single serrate seta. Outer ramus of maxilla 1 bearing 10 serrate spines distally; inner ramus slender, carrying several elongate simple setae terminally. Second maxilla, outer lobe of outer ramus with 4 elongate simple setae and 1 short simple seta. Maxillipedal endite narrow, with 3 coupling hooks, mediodistal margins setose; palp segment 2 widest, expanded distally; epipodite extending to third palp, apically subacute.

Merus of pereopod 1 with seta-bearing projecting corner; propod, merus, and carpus setiferous posteriorly; propod with seta-bearing tooth and several combed, curved spines along palmar edge; dactyl bearing several pectinate curved spines and short terminal claw. Pereopod 2 with subequally long merus and carpus; dactyl shortest joint, bearing 2 claws. Basis of pereopod 7 nearly oval, longest joint; dactyl shortest segment, biunguiculate.

Pleopod 1 large; sympods nearly 3 times broader than long; rami separate, non-

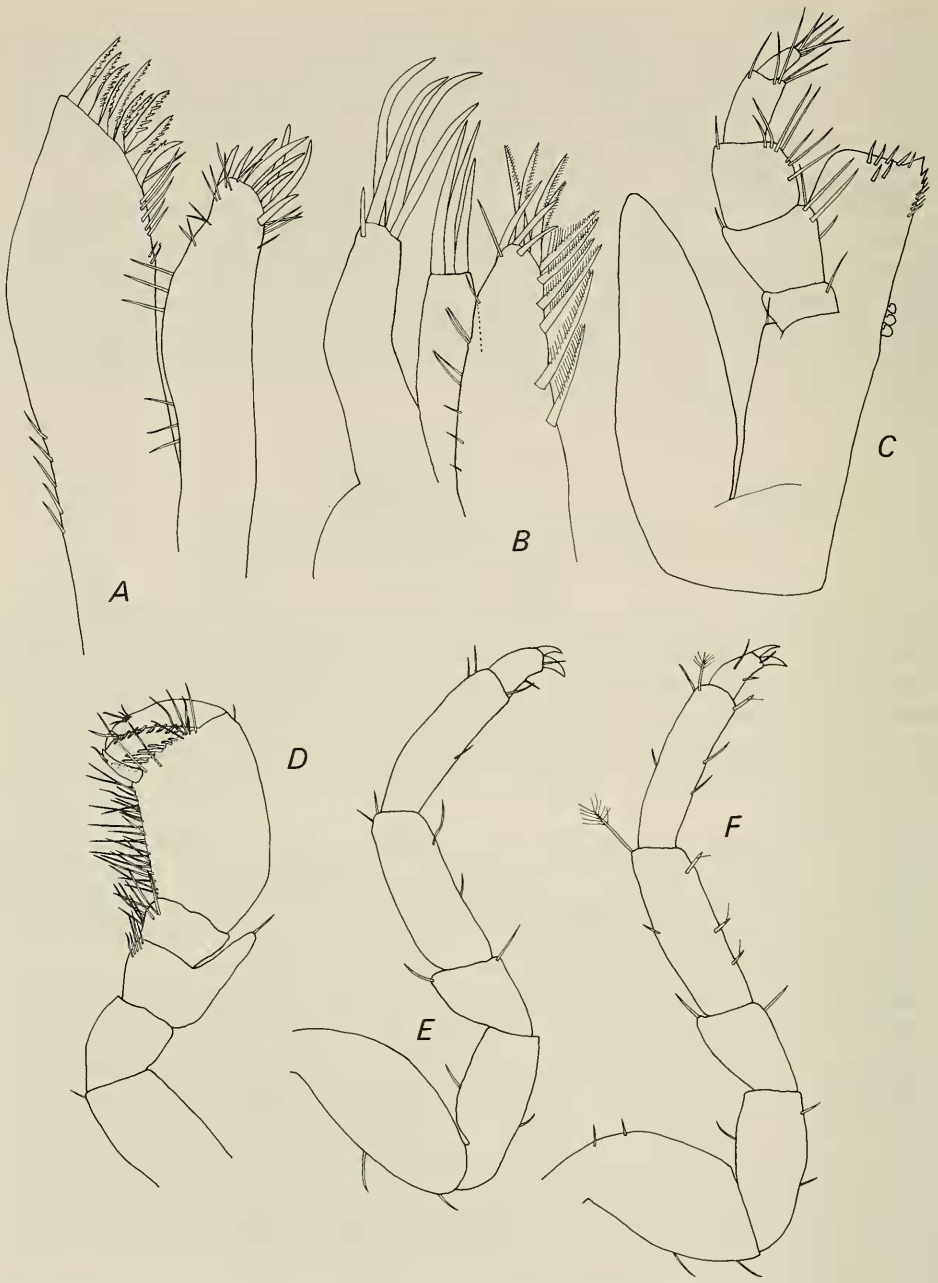

Fig. 12. *Gnathostenetrioides pugio*: A, Maxilla 1; B, Maxilla 2; C, Maxilliped; D, Pereopod 1 ♂; E, Pereopod 2; F, Pereopod 7.

overlapping, bearing numerous setae distally. Endopod of pleopod 2 2-segmented, second joint truncate distally, slightly expanded medially; 2-segmented, second joint truncate distally, slightly expanded medially; 2-segmented exopod, pleopod 3 exopod of 2 joints, endopod with 2 plumose setae terminally.

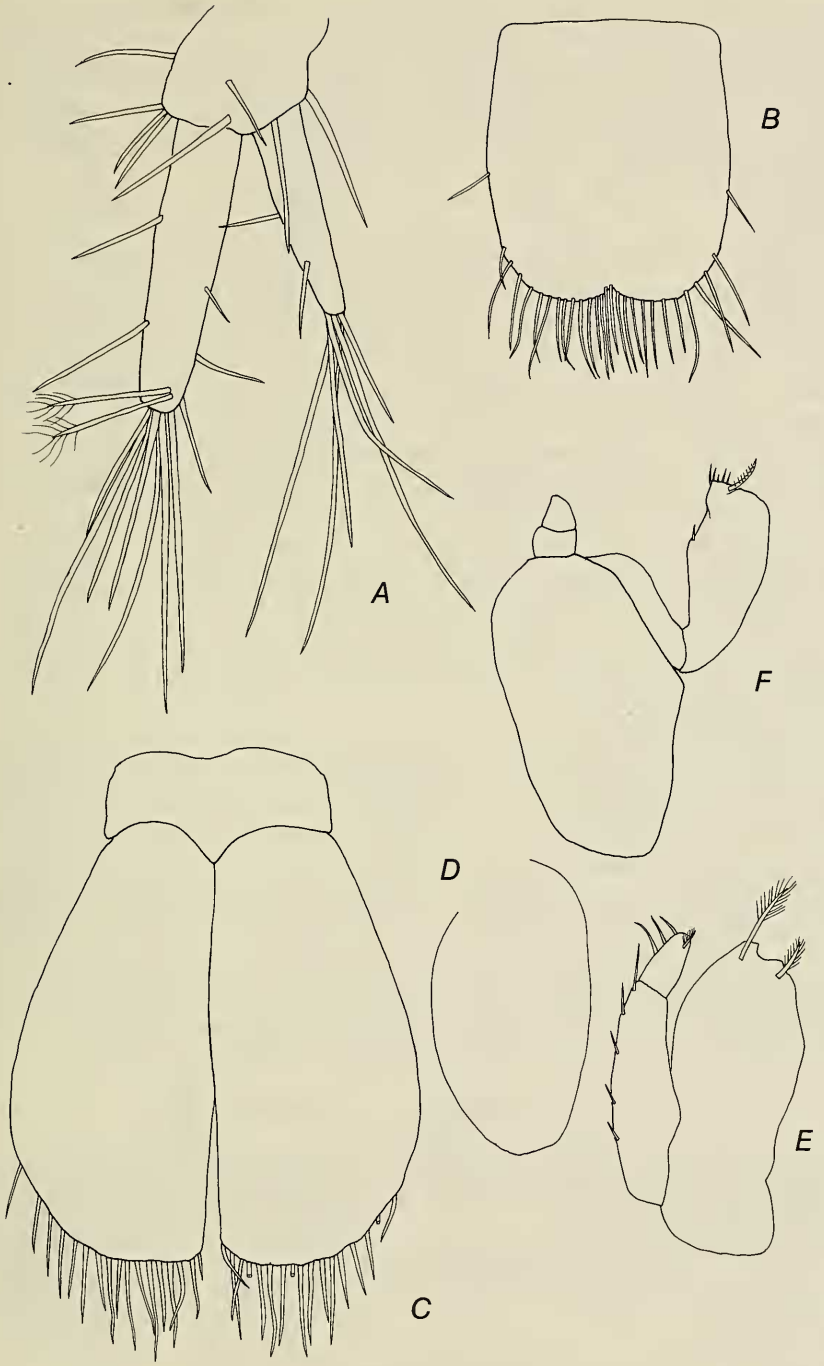

Fig. 13. *Gnathostenetrioides pugio*: A, Uropod; B, Operculum ♀; C, Pleopod 1 ♂; D, Pleopod 4 ♂; E, Pleopod 3 ♂; F, Pleopod 2 ♂.

Uropod pedunculate; inner ramus longer and broader than outer ramus, both carrying numerous elongate setae terminally.

Female: Similar to male, fewer setae on inner margin of pereopod 1 merus, carpus, and propodus; operculum with mesiodistal margin acutely cleft.

Material.—Holotype male TL 3.20 mm, USNM 184934. Allotype female TL 1.60 mm, USNM 184935.

Etymology.—The Latin *pugio* refers to the dagger-like process on the male mandible.

Remarks.—Describing a new asellote from the Mediterranean Sea, Amar (1957) found it necessary to designate a fourth subtribe, Parastenetrioidea, a new family, Parastenetriidae, and a new genus, *Gnathostenetrioides* to accommodate the unusual features of the new species *G. laodicense.* Amar felt the pleopodal structure, his basis for erecting a new subtribe, to be intermediate in form between the pleopodal morpohlogy of the subtribes Stenetrioidea Hansen, 1905, and Paraselloidea Hansen, 1905. Based upon features other than pleopods, *Gnathostenetrioides* is clearly more closely related to Stenetrioidea than to Paraselloidea. The parastenetrioideans and stenetrioideans have probably descended from a common ancestor with pleopodal differences evolving into the present dichotomy.

Besides diagnostic pleopods, *Gnathostenetrioides* also bears anomalous mandibular prolongations; an elongate, tusk-like protuberance in the male; a shorter, acute process in the female. The use of these remarkable processes is unknown, but they may be involved in mating behavior, which could account for their marked sexual dimorphism.

Unlike the stenetrioideans, the two parastenetrioidean species do not demonstrate marked sexual dimorphism in their subchelate first pereopod. Male parastenetrioidean gnathopods are, however, more hirsute on the inner margins of the merus, carpus, and propodus than in their female counterparts.

Only the second recorded species of the subtribe, *G. pugio* differs from its congener, *G. laodicense* by the absence of setae along the lateral margin of pleopod 1, an inner margin length of pleopod 1 less than twice the length of the palmar margin, and the female's acute opercular mesiodistal incision. The close similarity between the two species is not totally surprising; the related stenetrioidean genus, *Stenetrium* Haswell, 1881, also demonstrates conservatism with regard to interspecific differences among its approximately 40 members.

Key to the species of *Gnathostenetrioides*

1. Pereopod 1 propodus bearing several setae on outer lateral margin, inner margin greater than twice the length of the palmar margin; female operculum incision rounded ..... *G. laodicense* Amar, 1957
– Pereopod 1 propodus lacking outer lateral margin setae, inner margin less than twice the length of the palmar margin; female operculum distal incision acute ..... *pugio,* n. sp.

Family Anthuridae

Mesanthura hopkinsi, new species
Figs. 14, 15

Description.—Female: Body proportions: C = 1 < 2 > 3 < 4 = 5 > 6 > 7. Pigmentation pattern of cephalon dorsum triangular, originating anteriorly between

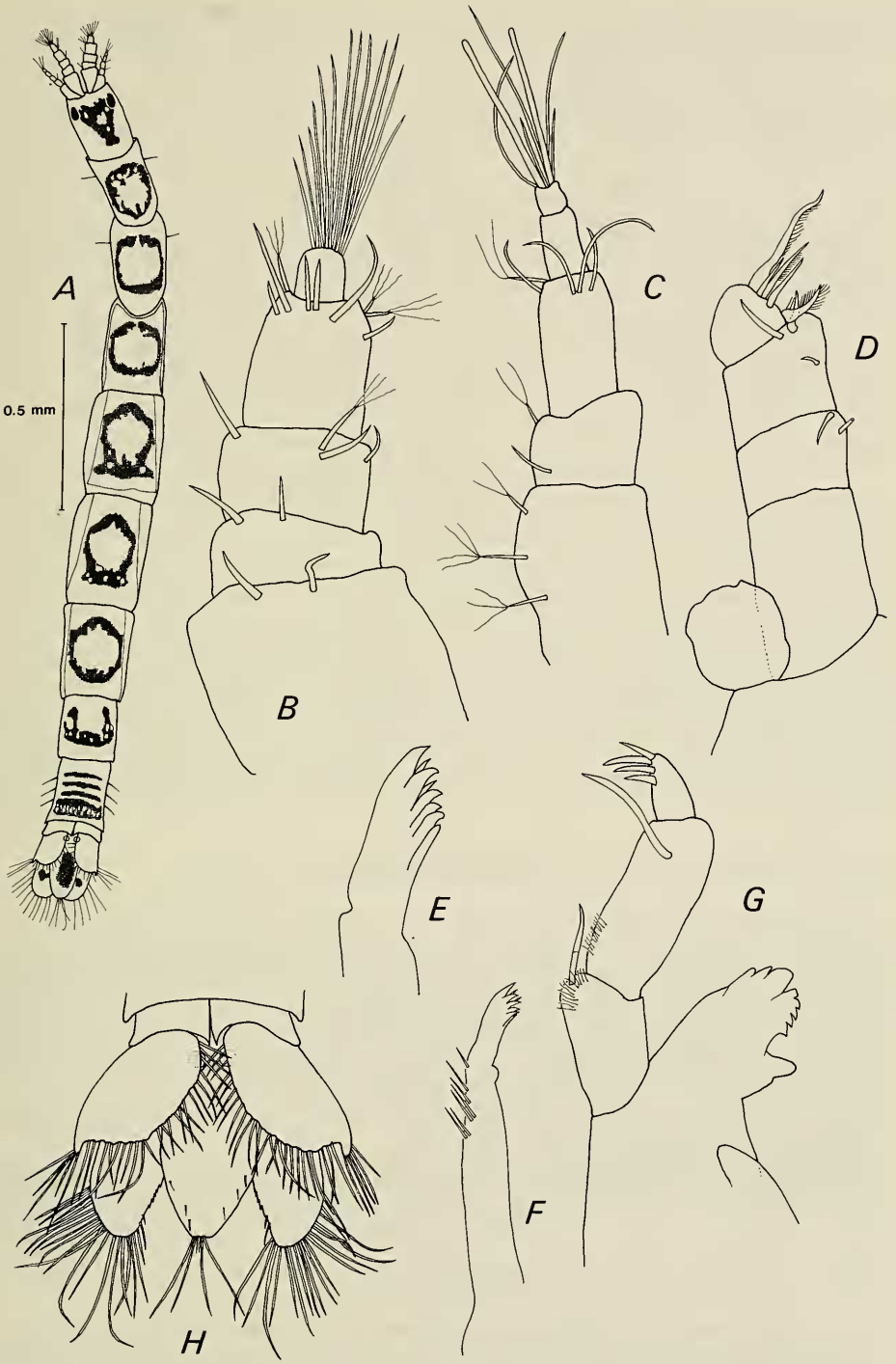

Fig. 14. *Mesanthura hopkinsi*: A, Holotype ♀, dorsal view; B, Antenna 2; C, Antenna 1; D, Maxilliped; E, Maxilla, apex enlarged; F, Maxilla; G, Mandible.

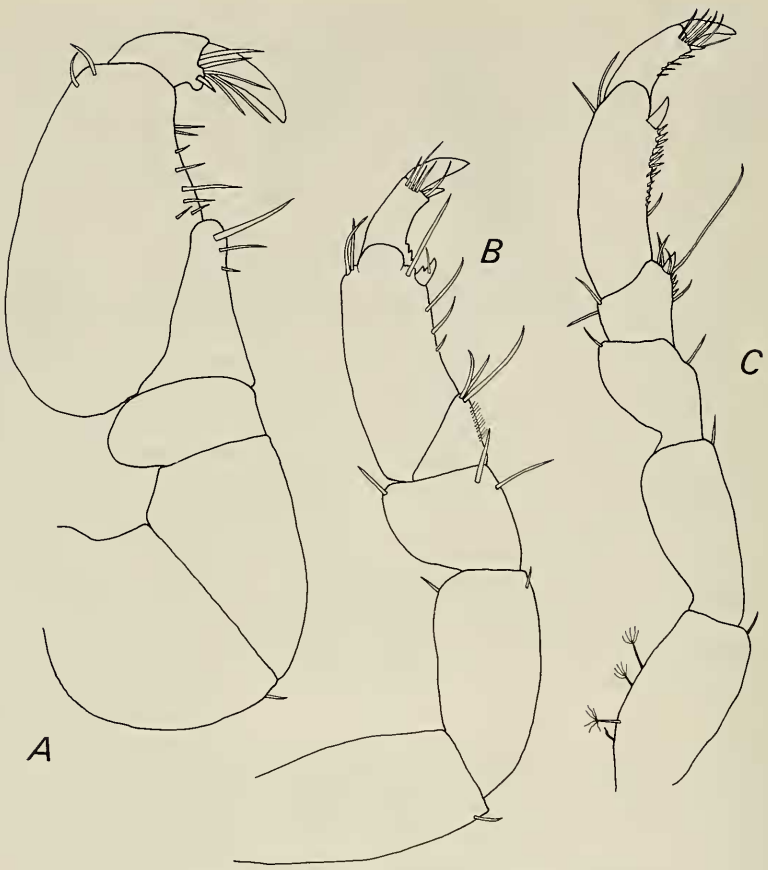

Fig. 15. *Mesanthura hopkinsi*: A, Pereopod 1; B, Pereopod 2; C, Pereopod 7.

black eyes. Pereonites 1–6 with non-pigmented central area surrounded by pigment in varying near-circular patterns; pereonite 7 with a U-shaped pigment. Telson with chromatophores, bearing 4 elongate setae distally. Pleonites 1–5 fused.

Antennular flagellum 2-jointed, terminal article with several setae and 2 aesthetascs; peduncle of 3 segments, second segment shortest.

Antennal peduncle 5-segmented, segments 1 and 2 wider than long, flagellum uniarticulate, bearing numerous apical setae.

Mandibular palp 3-segmented, setae-bearing distal segment shortest; second segment longest, carrying elongate setae distally; molar of 1 lobe; incisor of 3 cusps; lamina dentata with 5 serrations. Maxilla slender, with 8 spines distally. Maxilliped 5-segmented, terminal segment set obliquely on penultimate segment, with 2 simple setae, 2 fringed setae/spines and 1plumose seta/spine.

Unguis of pereopod 1 slightly longer than dactyl; dactyl with spine-bearing ventrolateral lobe, broadly rounded proximally; carpus rounded distally; merus with convex outer margin. Dactyl of pereopod 2 slightly longer than unguis, with strong ventrodistal spine; propodus with distal seta-bearing tooth; carpus triangular, with 3 simple setae and row of setules on inner margin. Carpus of pereopods

4–7 with anterior margin shorter than posterior margin. Propod of pereopod 7 with row of robust setae along posterior margin, longest article slightly longer than the basis.

Uropodal exopod heavily setose medially, notched apically, lacking pigment; endopod pigmented, rounded distal margin heavily setose, inner margin serrate.

Male: Unknown.

Material.—Holotype female TL 2.43 mm, USNM 184949.

Etymology.—In honor of Thomas S. Hopkins, Dauphin Island Sea Lab, who provided all the specimens of this study, and for his patience and understanding.

Remarks.—Species of the anthurid genus *Mesanthura* Barnard, 1914, are by definition, distinguished by the persistent chromatophoric pigmentation patterns displayed dorsally. The species-specific patterns vary widely in chromatophoric density, arrangement and location. One species, *M. protei* Kensley, 1980, (Kensley and Poore 1982) exhibits polychromatism, with three documented patterns and possibly more. Multiple intraspecific patterns would appear to be the exception since no other polychromatic members of this genus are known.

Mesanthura paucidens Menzies and Glynn, 1968, and *M. pulchra* Barnard, 1925, are also found in the waters off Florida. *Mesanthura hopkinsi* can be distinguished from these congeners by its pigmentation pattern, particularly that of the cephalon and pleon. *Mesanthura hopkinsi*'s cephalic pigment is triangular, whereas *M. paucidens*'s is a transverse band located just behind the eyes, and *M. pulchra* is a wide scattering nearly covering the entire head. *Mesanthura hopkinsi*'s pleonal pigmentation consists of three, laterally independent transverse bands on the first three pleonal segments, and a fourth, wide, transverse band on pleonal segments four and five, whereas *M. pauciden*'s is five, laterally connected, transverse bands and *M. pulchra*'s is a nondescript, broad scattering of chromatophores.

Acknowledgments

I would like to express thanks to members of my graduate committee, Dr. Thomas Hopkins, University of Alabama; Dr. Brian Kensley, National Museum of Natural History; and Dr. Joseph Scheiring, University of Alabama, for all their guidance, assistance, and time. George Wilson, University of California at San Diego, provided expertise, insights, and encouragement. Richard Heard, Gulf Coast Research Laboratory, and David Camp, Florida Department of Natural Resources, also assisted in the taxonomic organization of the manuscript. Dawn Dardeau has my thanks and praise for her expert sorting. Finally, the entire faculty, staff, support personnel and graduate student body at Dauphin Island Sea Lab warrant thanks in appreciation for all their efforts. Funding was provided by BLM Contract AA550-CT7-34 to Dr. Thomas Hopkins.

Literature Cited

Amar, R. 1957. *Gnathostenetrioides laodicense nov. gen., nov. sp.* type nouveau d'Asellota et classification des Isopodes Asellotes.—Bulletin de l'Institut Océanographique 1100:1–10.

Austin, H. W., and M. L. Jones. 1974. Seasonal variations of physical oceanographic parameters of the Florida Middlegrounds and their relation to zooplankton biomass on the West Florida Shelf.—Florida Scientist 37:5–16.

Bowman, T. E., and G. A. Schultz. 1974. The isopod crustacean genus *Munnogonium* George and

Stromberg, 1968 (Munnidae, Asellota).—Proceedings of the Biological Society of Washington 87:265–272.

Bright, T. J., and L. H. Pequegnat. 1974. Biota of the West Florida Garden Bank. Gulf Publications Co.: Houston, Texas. 453 pp.

Fresi, E., and U. Schiecke. 1972. *Pleurocope dasyura* Walker, 1901 and the Pleurocopidae, new family (Isopoda, Asellota).—Crustaceana, supplement 3:207–213.

George, R. Y., and J. O. Stromberg. 1968. Some new species and new records of marine isopods from San Juan Archipelago, Washington, U.S.A.—Crustaceana 14:226–230.

Hopkins, T. S., D. R. Blizzard, S. A. Brawley, S. A. Erie, D. E. Grimm, D. K. Gilbert, P. G. Johnson, E. H. Livingston, C. H. Lutz, J. K. Shaw, and B. B. Shaw. 1977. A preliminary characterization of the biotic components of composite strip transects on the Florida Middlegrounds, Northeastern Gulf of Mexico. University of Miami, Proceedings of the Third International Coral Reef Symposium, pp. 31–37.

Hudson, J. H., D. M. Allen, and J. Costello. 1970. The flora and fauna of a basin in Central Florida Bay.—U.S. Fish and Wildlife Service, Special Scientific Report 64, 14 pp.

Jordan, G. F. 1952. Reef formation in the Gulf of Mexico off Apalachicola Bay, Florida.—Bulletin of the Geological Society of America 63:741–744.

Kensley, B. 1982. *Prethura hutchingsae,* new genus, new species, an asellote isopod from the Great Barrier Reef, Australia (Crustacea: Isopoda: Pleurocopidae).—Journal of Crustacean Biology 2: 255–260.

———, and G. C. B. Poore. 1982. Anthurids from the Houtman Abrolhos Islands, Western Australia (Crustacea: Isopoda: Anthuridae).—Proceedings of the Biological Society of Washington 95: 625–636.

Menzies, R. J., and J. L. Barnard. 1959. Marine Isopoda on coastal shelf bottoms of Southern California: systematics and ecology.—Pacific Naturalist 1:1–35.

———, and D. Frankenberg. 1966. Handbook on the Common Marine Isopod Crustacea of Georgia. University of Georgia Press: Athens, Georgia. 93 pp., 27 figs., 4 pls.

———, and R. W. Glynn. 1968. The common marine isopod Crustacea of Puerto Rico.—Studies on the Fauna of Curaçao and Other Caribbean Islands 27:1–33.

Rouse, W. L. 1969 (1970). Littoral crustaceans from southwest Florida.—Quarterly Journal of the Florida Academy of Science 32:127–152.

Schultz, G. A. 1976. Species of Asellotes (Isopoda: Paraselloidea) from Anvers Island, Antarctica.—Antarctic Research Series 26:1–35.

Walker, A. O. 1901. Contributions to the malacostracan fauna of the Mediterranean.—Journal of the Linnean Society of London (Zoology) 28:290–307.

Wilson, G. D. 1980. New insights into the colonization of the deep sea: systematics and zoogeography of the Munnidae and the Pleurocopidae comb. nov. (Isopoda, Janiridae).—Journal of Natural History 14:215–236.

Wolff, T. 1962. The systematics and biology of bathyal and abyssal Isopoda Asellota.—Galathea Report 6:1–320.

Department of Environmental Regulation, Southwest District, 7601 Highway 301 North, Tampa, Florida 33610.