

Guide to the

MARINE ISOPOD
CRUSTACEANS

of the Caribbean



*Avian Kensley and
Marilyn Schaste*

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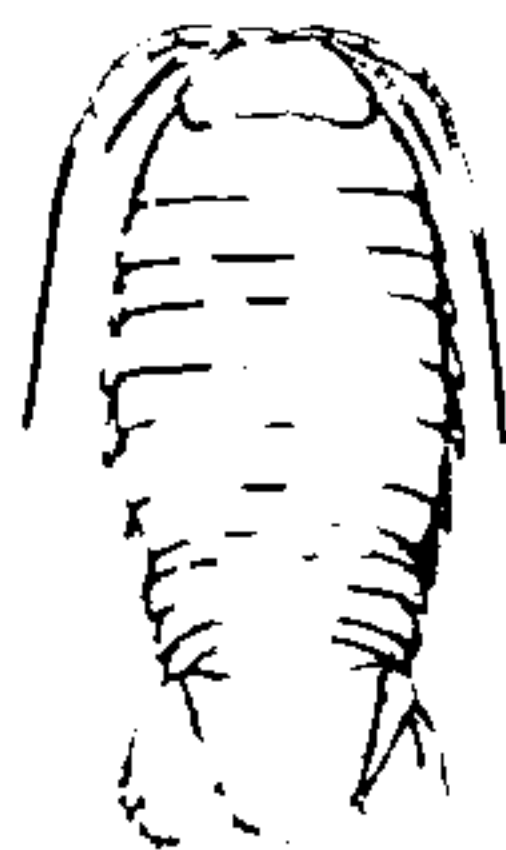
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*Brian Kensley and
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Introduction

The title of this work will no doubt raise several questions in many readers' minds: why the Caribbean? why not the Caribbean *and* the Gulf of Mexico? why only the marine isopods? just what is the "Caribbean area"? We hope that the answers to some of these (and other) questions will become apparent.

There are several works that already deal with the isopods of the Caribbean, as part of a wider treatment of North American isopods (e.g., Richardson, 1905; Schultz, 1969). Why then this "Isopods of the Caribbean"? As partial answer, the following: many new records of isopods from the Caribbean region (in its broadest sense) have appeared in scattered publications in the last few decades. The time has come to pull these together in a single work. The number of marine laboratories in the area has increased, with more and more students exploring especially the shallow marine environment. A single work on a relatively speciose and abundant group of invertebrates would be useful to such investigators, as they build up a comprehensive view of the biology of the region. Concepts of the taxonomy of several isopod groups have changed radically over the last few years; again, there is obvious utility in having these changes summarized in a single source. New species and records are continuously being found. Having a single baseline work decreases the time needed for investigating and establishing the validity of such records.

HISTORIC BACKGROUND

The history of isopod taxonomic research in the Caribbean really starts with a worldwide monographic work on the Cirolanidae by Hansen in 1890. Included here were about 12 species from the Danish West Indies, now the U.S. Virgin Islands. Since then a few major works on Caribbean isopods have appeared, such as Moore's report on the isopods of Puerto Rico (1901) and Menzies and Glynn's report on the same area (1968). Some areas have received considerable attention, such as the aforementioned Puerto Rico and, more recently, Belize. A list of 116 species of isopods from Cuba (including Oniscidea) has been published (Ortiz, Lalana, and Gomez, 1987). At the other extreme, there are no records from a number of localities, especially the

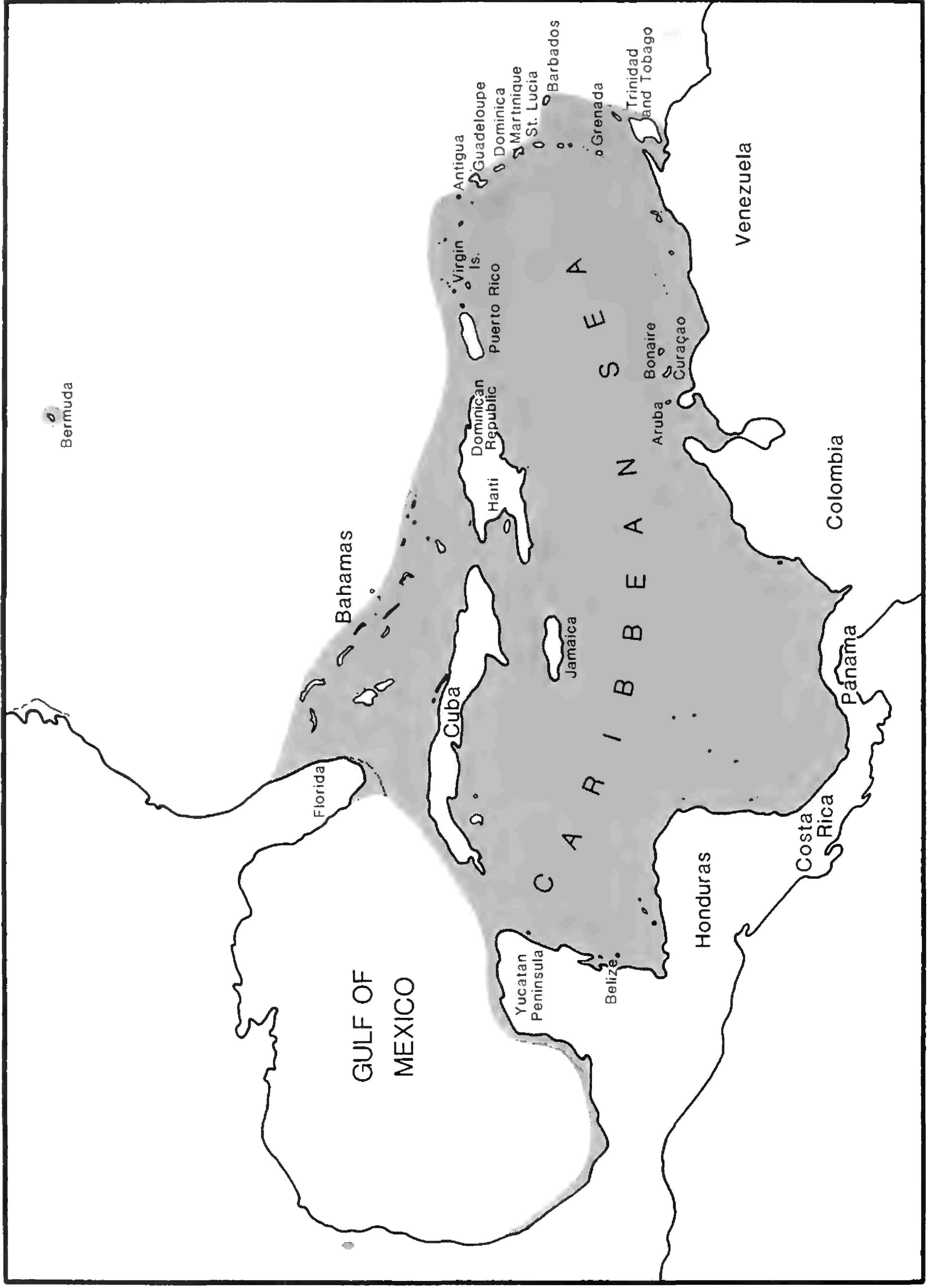


Figure 1. Map of area covered by this guide.

islands of the southeastern chain of the Lesser Antilles. In total there are about 40 publications, varying from descriptions of single species to longer works, that deal with isopods from the Caribbean. These publications will be encountered in the following guide, under the specific taxa.

GEOGRAPHIC AREA COVERED IN THIS GUIDE

The accompanying map (Figure 1) shows the area for which records are included in this guide.

While it may seem logical to include the Gulf of Mexico, and while there are several isopod species common to both areas, this has not been done. There are relatively few isopod records from the Gulf; undoubtedly a great deal of taxonomic work awaits the careful collector in this area. Also, from a zoogeographic point of view, separation of the Gulf may be justified.

Bermuda, on the other hand, situated in the northwestern Atlantic several hundred miles off the coast of the United States, is included. This island, although remote from the Caribbean, is swept by waters that earlier have passed through the Caribbean. Zoogeographically, the shallow-water Bermudan and Caribbean faunas have much in common.

While perhaps not strictly in the Caribbean Sea, the Bahamas and the Florida Keys are included here, their shallow-water marine faunas being overwhelmingly Caribbean in nature.

Turning to depths limits, within the area under discussion, species from the intertidal to 200 meters have been dealt with in some detail. This arbitrary cutoff depth was selected because most Caribbean isopod species inhabit relatively shallow depths. About 30 species have been recorded from below 200 meters in the Caribbean, many of these known only from the type material. A list of species of this very poorly known deeper fauna is included here. Without doubt, many species in the deeper waters of the Caribbean await discovery.

A fascinating group of isopods, while not strictly shallow-water marine forms, is included. These are the true cave forms, found mainly in the suborders Anthuridea and Flabellifera. Given the history of the Caribbean from the Quaternary to the present, it is not surprising that caves are common throughout the region. These caves may be well inland and contain only freshwater, but are more commonly anchialine, that is, having some (frequently subterranean) link to the sea. Less common, and of lesser interest from an isopod taxonomist's point of view, are the fully marine caves in direct communication with the sea or, indeed, under the surface of the sea itself.

ARRANGEMENT OF THE GUIDE AND HOW TO USE IT

A short introduction to the Crustacea Isopoda is provided, followed by a glossary of descriptive terms and morphological features used throughout the guide (see Figure 2).

Keys and diagnoses to the suborders and all lower taxa follow. For ease of usage, except in the keys, all taxa are presented in alphabetical order, regardless of their phylogenetic relationships.

Diagnoses are provided for all suborders, families, genera, and species. The only exceptions to this are in the suborders Epicaridea and Oniscidea. Within each suborder, a key to the families occurring in the Caribbean is provided. Similarly, within each family and genus, keys are provided to the relevant genera and species, respectively.

In whatever context, where an author and date appear, a reference to these is provided in the Literature Cited section. In some cases, reference is made to useful publications such as revisions of families or genera.

As this is not a textbook on the Isopoda, biological information is generally kept to a minimum. In the case of individual species, however, what little ecological information is available, is provided. For general texts on biology, internal anatomy, physiology, and reproduction, the reader is referred to works such as Kaestner (1967), Waterman (1960), Bliss (1982–1985), and Schram (1986).

Within each species discussion, a diagnosis is given, along with maximum (total) middorsal lengths for males and females, where known. The diagnoses are not exhaustive, but provide only the information needed to distinguish the species. Diagnoses thus vary in length from the statement of a single feature to a paragraph concerning several features, depending on the understanding and complexity of the taxonomy of the group. In the longer diagnoses, morphological features are dealt with in order from anterior to posterior on the animal's body. Records are given, rather than geographical distribution, as our knowledge of many species is woefully incomplete. These records are given in a roughly north-to-south order; records outside of the Caribbean region, as here defined, are given on a separate line. A few species not yet recorded from the Caribbean are included, in the strong likelihood that they will eventually be found here. The records include depth distribution information in meters, where known. Records were taken from published papers; in addition, the collections of the United States National Museum of Natural History, Smithsonian Institution, were scoured, and many unpublished records from this source are also included. In the "Remarks" section, ecological information such as substrate preferences is given. Hosts of parasitic species are given. Formal synonymies are not provided,

but nomenclatural comments are included in the few cases where a species may be known under a more commonly used name. Usually, a figure of the entire animal of each species is given. Diagnostic features are usually illustrated. Unless otherwise stated, all illustrations are original and by the authors, and were made from actual specimens.

Common and scientific names of fishes that are hosts to parasitic isopods are taken from the American Fisheries Society special publication no. 12 (Robins et al., 1980).

Finally, a word of warning. Difficulties may be experienced in using the keys, for which there may be any of several reasons: characters seen in the animal may not clearly conform to those in the key (in which case refer to the figures, as well as to good recent descriptions or diagnoses); your material may be a new record for the region; or you may have an undescribed species (in which case refer to more comprehensive treatments of the group).

ACKNOWLEDGMENTS

Much of the material covered in this work comes from the many collectors who have deposited specimens from several regions of the Caribbean in the collections of the National Museum of Natural History, Smithsonian Institution. Rather than risk the unwitting omission of a name, we thank all of these individuals collectively. Without their efforts, our knowledge of the Caribbean fauna would be the poorer.

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Glossary of Technical Terms

- AESTHETASC.** Thin-walled sensory seta usually found on flagellum of antennule
- AMBULATORY** (as applied to pereopods). Used for walking.
- ANCHIALINE.** An aqueous habitat near the sea; referring to saltwater or brackish pools fluctuating with the tides, but with no surface connection to the sea.
- ANGULATE.** Having an angle or an angular shape.
- ANTENNA.** Paired appendage of the third cephalon segment; sometimes referred to as antenna 2.
- ANTENNULE.** Paired appendage of the second cephalon segment; sometimes referred to as antenna 1.
- APICAL.** Relating to the apex or tip.
- APPENDAGE.** An articulated structure used for feeding, locomotion, sensory reception, e.g., mouthparts, antennae, pereopods, pleopods, uropods.
- ARTICLE.** A single section of an appendage, with an articulation at one or both ends.
- BASIS.** Article of appendage adjoining coxa proximally, and carrying endopod distally, i.e., article 2 of pereopod.
- BIARTICULATE.** Composed of two articles.
- BIDENTATE.** Having two teeth.
- BIFID.** Divided into two lobes or parts by a cleft.
- BILOBED.** Composed of two lobes.
- BIRAMOUS.** Composed of two rami or branches.
- BIUNGUICULATE.** Having two claws, as in a bifid dactylus.
- CARINA.** A keel, or an acute ridge.
- CARINATE.** Having one or more carinae or acute ridges.
- CARPOCHELATE.** Having a chela or pincerlike structure formed by the seventh (dactylus) and fifth (carpus) articles of an appendage.
- CARPUS.** Article 5 of pereopod.
- CEPHALON.** Anterior region of body or head; more correctly the cephalothorax in isopods, as the first pereonal segment is usually fused with the head.
- CHELA.** Distal pincerlike part of appendage, often formed by a mobile and an immobile finger.
- CHELATE.** Having a chela; modified to form a pincer.
- CLAVATE.** Club shaped; having one end thickened.
- CLYPEUS.** Platelike structure of cephalon, anterior to upper lip or labrum, sometimes fused with frontal lamina.
- CONGLOBATE.** Able to roll up into a ball, as in some sphaeromatid and oniscidean isopods.
- CONSPECIFIC.** Belonging to the same species.
- CONTIGUOUS.** Touching.

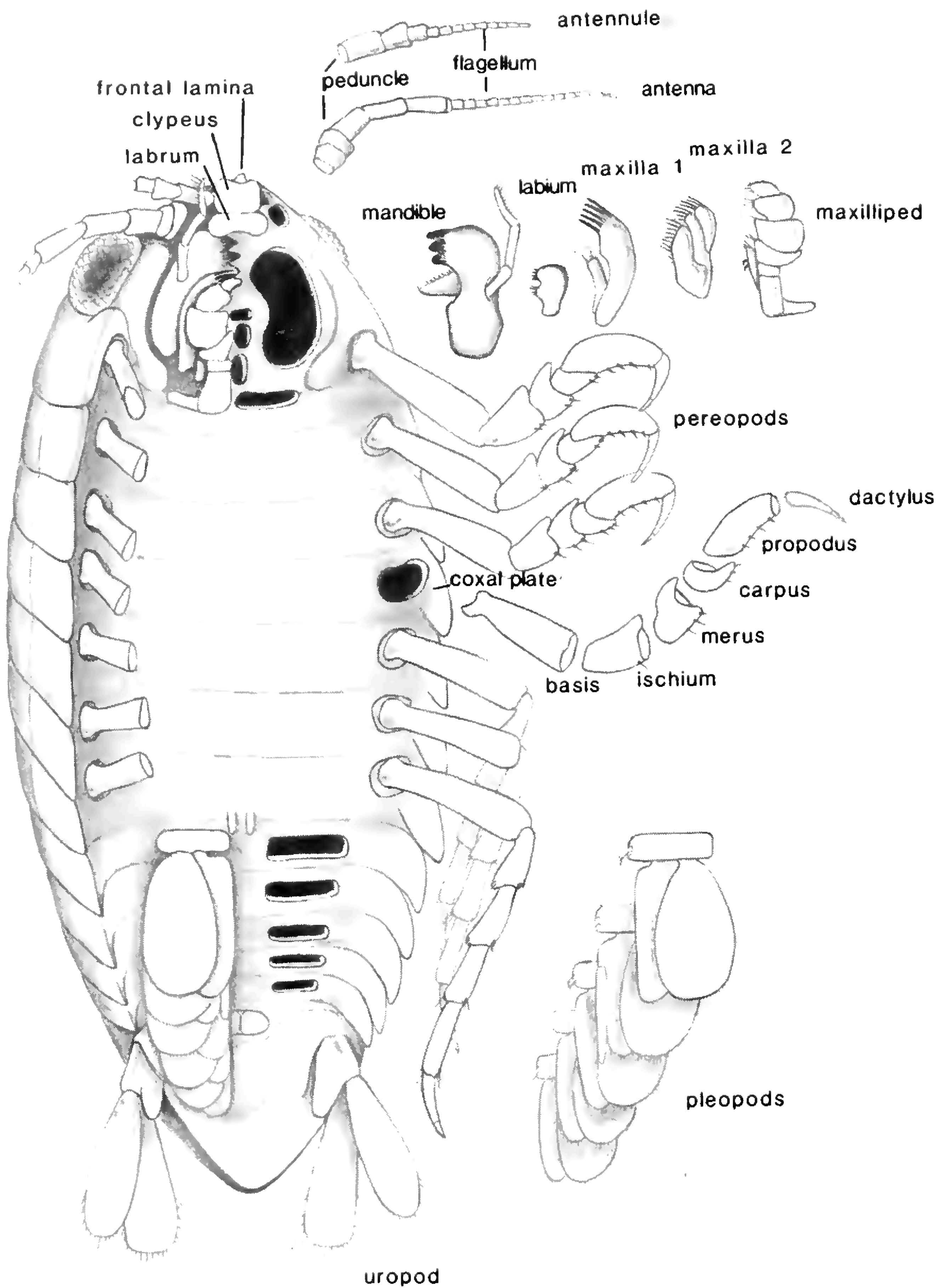


Figure 2. Schematic representation of an isopod illustrating morphological terms.

- COPULATORY STYLET.** Structure situated on endopod of pleopod 2 in males, used for transfer of spermatophore in some species; also referred to as appendix masculina.
- CORDATE.** Heart shaped in outline.
- COXA.** Basal article of an appendage, attached to sternite, sometimes expanded into a lateral coxal plate.
- CRENULATE.** Having a scalloped edge with rounded teeth, usually used to refer to the margin of a structure.
- DACTYLUS.** Terminal (7th) article of a pereopod or thoracic appendage.
- DENTATE.** Edged with teeth.
- DENTICLE.** A small tooth.
- DENTICULATE.** Having fine teeth.
- DIGITIFORM.** Fingerlike.
- DISTAL.** Situated away from the base or point of origin or attachment.
- ECDYSIS.** Molting of the integument.
- EMARGINATE.** Having the margin concave.
- ENDITE.** Medially directed lobe of coxa or basis of an appendage, especially the maxilliped.
- ENDOPOD.** Inner ramus of a biramous appendage.
- ENTIRE.** Complete; usually referring to the margin of a structure that is smooth.
- EPIMERON.** Lateral part of a somite.
- EPIPOD.** Lateral extension of a protopodite.
- EXCAVATE.** Hollowed out.
- EXOPOD.** Outer ramus of a paired appendage.
- FALGATE.** Sickle shaped; curved and tapering to a point.
- FLAGELLUM.** Distal part of antenna or antennule, usually multiarticulate, occasionally reduced to one or a few articles.
- FRONTAL LAMINA.** Platelike structure of the cephalon immediately anterior to, and sometimes fused with, clypeus.
- GENICULATE.** Bent at an abrupt angle, as in the body of many arcturid isopods.
- GRANULATE.** Having the appearance of bearing beadlike or grainlike protuberances; usually applied to the description of a surface.
- HIRSUTE.** Bearing hairs (elongate hairs in the case of most isopods).
- HYPOGEAN.** Underground.
- IMMERSED.** Sunken into, as with one structure into another.
- INCISOR.** Cutting process of the mandible, usually dentate, sometimes modified for piercing.
- INDURATE.** Hardened, usually by calcium carbonate or sclerotized protein.
- INTEGUMENT.** Outer covering, e.g., the exoskeleton.
- INTERSTITIAL.** Relating to interstices; living in the interstices of sand grains, gravel, or rubble.
- ISCHIUM.** Article 3 of pereopod.
- LABIUM.** Lower lip; usually consisting of a pair of lobes posterior to the mouth.
- LABRUM.** Unpaired projection anterior to mouth, attached to the clypeus; upper lip.
- LACINIA MOBILIS.** Small, usually toothed, process articulating at base of incisor in left or both mandibles.
- LAMELLAR.** In the shape or structure of a thin plate or lamella.

- LAMINA DENTATA. Serrate platelike structure in the mandible of anthurideans, formed by the fusion of spines of the spine-row.
- LANCEOLATE. Lance shaped; narrow and tapering to a point.
- LINGUIFORM. Tongue shaped.
- MANCA. Young of some peracaridean crustaceans (including isopods), lacking last thoracic appendage at time of release from broodpouch.
- MANDIBLE. First pair of mouthparts, functioning as jaws, often sclerotized.
- MARSUPIUM. Structure in which eggs are retained by female; the broodpouch.
- MAXILLA (1 and 2). Two sets of paired mouthpart appendages immediately posterior to mandible.
- MAXILLIPED. First paired appendage of the thorax; usually incorporated into the mouthparts.
- MEDIAN. At, near, or directed toward the middle or midline.
- MERUS. Article 4 of pereopod.
- METAMORPHOSED. Transformed; changed in appearance, structure, or function.
- MESIAL. Near or toward the middle or midline.
- MOLAR. Grinding, and sometimes piercing, structure of the mandible.
- MULTIARTICULATE. Composed of many articles.
- NATATORY. Adapted for swimming.
- OBSOLETE. Becoming vestigial, and losing original function.
- OMMATIDIA. Individual visual components of the compound eye.
- OOSTEGITE. Medially directed lamellar structure arising from coxa of pereopod in the female, forming part of the broodpouch or marsupium.
- OPERCULIFORM. In the form of a cover or lid.
- OVATE. Egg shaped or oval.
- PALM. Cutting edge of the propodus, often defined proximally by a spine, in a subchelate appendage.
- PALP. Articulated ramus consisting of one to three articles in mandible, of up to five articles in the maxilliped.
- PECTINATE. Having teeth like a comb.
- PEDUNCLE. Stalk or proximal part of an appendage, as in antennae.
- PENIAL RAMI. Paired submedian process on sternite 7 of male.
- PEREON. Middle or thoracic region of the body, consisting of seven segments or pereonites, first fused with cephalon in isopods.
- PEREONITE. Segment of the pereon.
- PEREOPOD. Paired appendage of the pereon, consisting of seven articles when unmodified.
- PILOSE. Covered with short hairs or setae.
- PLEON. Posterior or abdominal region of the body, primitively consisting of six segments or pleonites, and bearing paired pleopod and uropod appendages.
- PLEONITE. Segment of the pleon.
- PLEOPOD. Paired appendage of the pleon, five pairs being present in the primitive condition.
- PLEOTELSON. Structure resulting from the fusion of the telson and one or more pleonal segments.
- PLICATE. Pleated or folded.
- PRANIZA. Juvenile, immature stage of gnathiideans.
- PREHENSILE. Adapted for holding or clinging.

- PRODUCED. Extended or lengthened.
- PROPODUS. Article 6 of pereopod.
- PROTANDROUS. In hermaphroditic forms, becoming a functional male producing spermatozoa before becoming a functional female producing eggs.
- PROTOGYNOUS. In hermaphroditic forms, becoming a functional female producing eggs before becoming a functional male producing spermatozoa.
- PROTOPODITE. Proximal part of an appendage, consisting of the coxa and basis.
- PROXIMAL. Situated near the point of attachment.
- PYLOPOD. First pereopod of the Gnathiidea, modified to form part of the mouthparts.
- RAMUS. Branch of an appendage.
- RENIFORM. Kidney shaped.
- RETICULATE. Resembling or forming a network.
- RETINACULAE. Small hooks on an appendage, used to link the left and right members of a pair of appendages.
- ROSTRUM. Anterior middorsal projection of cephalon.
- SAGITTATE. Arrow shaped.
- SCLEROTIZED. Hardened, usually with chitin.
- SERRATE. Edged with toothlike projections as in a saw.
- SETIFEROUS. Bearing setae.
- SETOSE. Bearing setae.
- SINUATE. Having a wavy margin.
- SINUOUS. Having curves.
- SOMITE. Body segment, usually having a pair of appendages.
- SPATULATE. Shaped like a spatula.
- SPICATE. Shaped like a spike.
- SPINE-ROW. Row of spines situated between the incisor and molar processes of the mandible.
- SPINOSE. Bearing spines.
- STATOCYST. Small saclike sensory organ, often containing granules, used to indicate to the animal its orientation.
- STYGOBIONT. Cave organism.
- STYLIFORM. Having a long, slender, stiletlike shape.
- SUB-. A prefix indicating "almost" or "just less than," e.g., submarginal—almost on the margin.
- SUBCHELATE. Having a subchela, forming a pincerlike structure, especially by the dactylus folding back on the propodus.
- SUTURE. A line indicating an area of articulation, or of incomplete fusion.
- SYMPOD. Proximal part of an appendage, often formed by the fusion of the coxa and basis.
- TELSON. Terminal part of the body, usually bearing the anus.
- THORAX. Tagma or body region between the cephalon and the abdomen.
- TRACHEATE. Bearing tubular respiratory trachea (more correctly pseudotrachea) on pleopods, as in Oniscidea.
- TRICUSPID. Bearing three cusps or points.
- TRIDENTATE. Having three teeth.
- TRIFID. Divided into three parts or lobes.
- TRILOBED. Divided into three lobes.

TRISINUATE. Having three curves.

TRIUNGUICULATE. Bearing three claws, as in a trifid dactylus.

TRUNCATE. Having the appearance of having been abruptly cut off.

TUBERCULATE. Bearing knoblike or wartlike prominences or tubercles.

UNIARTICULATE. Composed of one article.

UNIRAMOUS. Having one ramus or branch.

UNIUNGUICULATE. Having a single claw, as in a dactylus.

UROPOD. Paired pleonal appendage of the last pleonite, usually situated at the base of the telson.

Marine Isopods of the Caribbean

Phylum Arthropoda

Superclass Crustacea Pennant, 1777

Class Malacostraca Latreille, 1806

Subclass Eumalacostraca Grobben, 1892

Superorder Peracarida Calman, 1904

Order Isopoda Latreille, 1817

DIAGNOSIS Body usually dorsoventrally depressed, occasionally subcylindrical, rarely bilaterally compressed. Carapace lacking. Antennules and antennae uniramous (scale on antenna in some asellotes may represent rudimentary second ramus). Eyes sessile (although situated on nonmobile stalks in some asellotes). Mouthparts consisting of one pair of mandibles, two pairs of maxillae, one pair of maxillipeds; latter appendages of first thoracic segment fused with cephalon. Mandible usually with palp consisting of one to three articles; incisor, lacinia mobilis, and molar usually present; lacinia mobilis often differing on left and right sides, sometimes absent from right mandible; molar variable. Maxilliped usually consisting of palp of no more than five articles, lamellar endite often with coupling hooks, lamellar epipod. Pereonites usually separate, although pereonite 1 sometimes fused with cephalon. Coxae of pereopods variously fused with, and forming expanded lateral processes of, pereonites. Pereopod 1 forming additional mouthpart (pylopod) only in Gnathiidea. Pereopods generally similar, ambulatory; pereopods 1–3 secondarily variously modified and becoming subchelate or prehensile; pereopods 4–7 occasionally modified, becoming natatory or prehensile. Pereopod 7 occasionally not developed (neotenous condition). Broodpouch or marsupium formed by varying number of oostegites attached ventrally and medially to coxae of pereopods; eggs held in anterior or posterior pockets or internal pouches in gnathiids and some sphaeromatids. Pleon consisting of six pleonites, free or variously fused, plus telson; if one or more pleonites fused with telson, resulting structure referred to as pleotelson.

Key to suborders of Isopoda

1. Parasitic on crustaceans; body of ♀ nearly always asymmetrical
 Epicaridea
 Free-living or parasitic on fishes; body of ♀ bilaterally symmetrical, or
 if parasitic, ♀ somewhat distorted 2
2. Body more or less bilaterally compressed Phreatoidea*
 Body more or less dorsoventrally depressed or subcylindrical 3
3. With six pereonites and five pairs of pereopods Gnathiidea
 With seven pereonites and six or seven pairs of pereopods 4
4. Body usually more than six times longer than wide, subcylindrical,
 uropods never operculiform 5
 Body usually less than six times longer than wide, usually
 dorsoventrally depressed; if subcylindrical, uropods operculiform .. 6
5. Uropodal exopod often folding dorsally over pleotelson; rarely
 interstitial forms Anthuridea p.16
 Uropods terminal, exopod lacking; minute interstitial forms
 Microcerberidea
6. Antennules minute; terrestrial forms, with pleopods tracheate
 Oniscidea
 Antennules rarely minute; aquatic forms, pleopods never tracheate .. 7
7. Uropods ventral, operculiform, covering pleopods Valvifera p.251
 Uropods never operculiform over pleopods 8
8. Uropods lateral or ventrolateral, forming tailfan with pleotelson;
 pleopods 1 and 2 rarely operculiform Flabellifera p.11
 Uropods terminal or subterminal; pleopods 1 and 2 variously
 operculiform Asellota p.7

* The suborder Phreatoidea contains freshwater forms, and has a Gondwanian distribution, primarily in the Southern Hemisphere.

Pleopods (on pleonites 1–5) biramous, lamellar, primarily for respiration; anterior pleopods occasionally operculiform. Pleopod 2 in male (and occa-

sionally also pleopod 1 in Oniscidea and Ascellota) with endopod bearing copulatory stylet. One pair of uropods on pleonite 6. Young leave broodpouch as manca, i.e., resembling adult but lacking pereopod 7; in Epicaridea, manca stage represented by epicaridium stage; latter transforms into microniscium and then cryptoniscium stage, before becoming adult.

Suborder Anthuridea Leach, 1814

DIAGNOSIS Body generally elongate and subcylindrical. Eyes absent in some genera. Antennular peduncle of three articles; antennal peduncle of five articles. Mandible with palp of one to three articles, or absent; body of mandible either styliform and lacking molar and lacinia mobilis, or with molar variously specialized or reduced, lacinia mobilis absent, and spine-row modified to form platelike lamina dentata. Maxilla 1 with inner ramus reduced, outer ramus slender. Maxilla 2 rudimentary. Maxilliped variable, with palp of one to five articles, endite present, modified, reduced, or absent. Pereonite 1 free. Pereopod 1, or pereopods 1–3 subchelate; pereopods 4–7 generally ambulatory. Pleonites 1–5 free or fused, pleonite 6 partly or completely fused with telson. Pleopods 1–5 similar, or pleopod 1 variously modified to form operculum. Uropodal exopod often folded dorsally over pleotelson. Pleotelson with pair of statocysts, with single statocyst, or lacking statocysts.

REMARKS Protogyny has been demonstrated in several species of Anthuridea. The order of development in these cases is: egg, manca (both in the broodpouch), immature subadult, ovigerous female, premale, male, with varying numbers of molts between each stage. At least one molt takes place between ovigerous female and premale, the latter being distinguished by the loss of the oostegites and by the elongation of, and acquisition of more flagellar articles in, the antennule. One or two molts take place between premale and sexually mature male, the latter being characterized by the possession of elongate antennular flagella bearing dense whorls of aesthetascs, a more setose and/or spinose pereopod 1, and sometimes by an elongation of the pleon and uropods. In some genera, the males have somewhat atrophied mouthparts, suggesting that they do not feed at this stage. As a result of this seemingly widespread protogyny, sex ratios are strongly biased toward females, and in several species males are not yet known.

The number of families in the suborder Anthuridea has not been settled. At present, three families are recognized. Doubtless, further families will be defined and the genera reshuffled.

Key to families of Anthuridea

1. Mouthparts adapted for piercing and sucking, together forming conelike structure Paranthuridae p64
 - Mouthparts adapted for cutting, lamina dentata and molar usually present 2
 2. Pereopod 1 subchelate, with propodus expanded; pleonites generally fused; if free, much shorter than wide Anthuridae ↓
 - Pereopods 1–3 subchelate, subsimilar; pleonites free, often as long as wide Hyssuridae p60
-

Family Anthuridae Leach, 1814

DIAGNOSIS Mouthparts adapted for cutting. Pereopod 1 usually markedly different from remaining pereopods, subchelate with propodus more or less inflated. Exopod of pleopod 1 operculiform, covering remaining pleopods. Pleonites 1–5 fused, with fusion marked ventrolaterally by short slits, occasionally with dorsal grooves marking lines of fusion, or free; if free, length of each pleonite much less than width. Pleotelson with pair of statocysts, or single medial statocyst, or lacking statocysts.

Key to genera of Anthuridae

1. Pleopod 1, both rami contributing to operculum 2
- Pleopod 1, only exopod operculiform 6
2. Antennal peduncle bearing serrate process *Licranthura* 43
- Antennal peduncle lacking any serrate process 3
3. Pleopod 1 in ♀, rami to some degree fused *Eisothistos* 38
- Pleopod 1 in ♀, rami free 4
4. Pereopods 1 and 2 subchelate, of similar size, propodi not noticeably inflated 5
- Pereopod 1 much larger and propodus more expanded, than pereopod 2 *Minyanthura*

- 5. Integument noticeably pitted; mandible on one side lacking molar, on other side with spicate molar *Apanthuroides* p. 26
- Integument not pitted; mandibles similar on both sides *Chalixanthura* p. 27
- 6. Telson with single statocyst *Anthomuda*
- Telson with two statocysts, or lacking statocysts 7
- 7. Pereopods 4–7, carpi roughly rectangular 8
- Pereopods 4–7, carpi triangular, with anterior margin considerably shorter than posterior margin 9
- 8. Maxillipedal palp of two articles *Haliophasma*
- Maxillipedal palp of three articles *Malacanthura*
- 9. Maxillipedal palp of one article; mandibular palp of one article
..... *Pendanthura* p. 56
- Maxillipedal palp of more than one article; mandibular palp of more than one article 10
- 10. Maxillipedal palp of two articles 11
- Maxillipedal palp of three articles 12
- 11. Mandibular palp of two articles *Cortezura* p. 29
- Mandibular palp of three articles *Cyathura* p. 31
- 12. Cephalon with midventral process at base of mouthparts .. *Skuphonura*
- Cephalon lacking midventral process 13
- 13. Pleon lacking dorsal grooves or lines indicating boundaries of fused pleonites; species-specific persistent dorsal pigment pattern usually present *Mesanthura*
- Pleon with dorsal grooves or lines indicating boundaries of fused pleonites; persistent pigment pattern lacking 14
- 14. Pleon with complete dorsal lines separating pleonites
1–5 *Apanthura* p. 25
- Pleon with incomplete dorsal line between pleonites 4 and 5
..... *Amakusanthura* } 17–19

Amakusanthura Nunomura, 1977

DIAGNOSIS Integument sometimes with pigment. Eyes present. Antennular flagellum of three articles. Antennal flagellum of two to four articles. Mandibular palp of three articles, terminal articles bearing distal spines. Max-

illipedal palp of three articles; endite small or absent. Pereopod 1, propodal palm with step or tubercle. Pereopods 4–7, carpus triangular. Pleonites short, pleonites 1–4 fused, boundaries demarked by complete dorsal folds, pleonites 4 and 5 separated only by lateral fold, not demarked dorsally; pleonite 6 dorsally demarked from telson. Pleopod 1 exopod operculiform. Uropodal exopod often notched or excavate distally. Pleotelson with two basal statocysts.

Key to species of *Amakusanthura*

1. Telson thickened, with raised area at midlength, widening and sloping posteroventrally; uropodal exopod distally shallowly excavate
 *magnifica*
 Telson dorsally flat, not thickened; uropodal exopod distinctly notched or barely excavate distally 2
 2. Integument pigmented; uropodal endopod length 1.5 times basal width
 *signata*
 Integument not pigmented 3
 3. Uropodal exopod distinctly notched 4
 Uropodal exopod, outer margin weakly excavate; mandibular palp article 3 bearing three spines *lathridia*
 4. Mandibular palp article 3 bearing three spines *significa*
 Mandibular palp article 3 bearing two spines *geminsula*
-

Amakusanthura geminsula (Kensley, 1982)

Figure 3A–E

DIAGNOSIS ♀: 8.1 mm. Shallow middorsal pit on pereonites 4–6, appearing chalky white in life. Antennular flagellum of three articles. Antennal flagellum of two articles. Mandibular palp article 3 bearing two spines. Maxilliped with short slender endite; terminal palp article set obliquely at outer distal angle of penultimate article. Pereopod 1, propodal palm with step; carpus distally a rounded lobe. Uropodal exopod with notch. Pleotelson tapering in posterior half to subtruncate apex. ♂: 4.8 mm. Eyes larger than ♀. Antennular flagellum of 8–9 articles. Pereopod 1, carpus with distal lobe

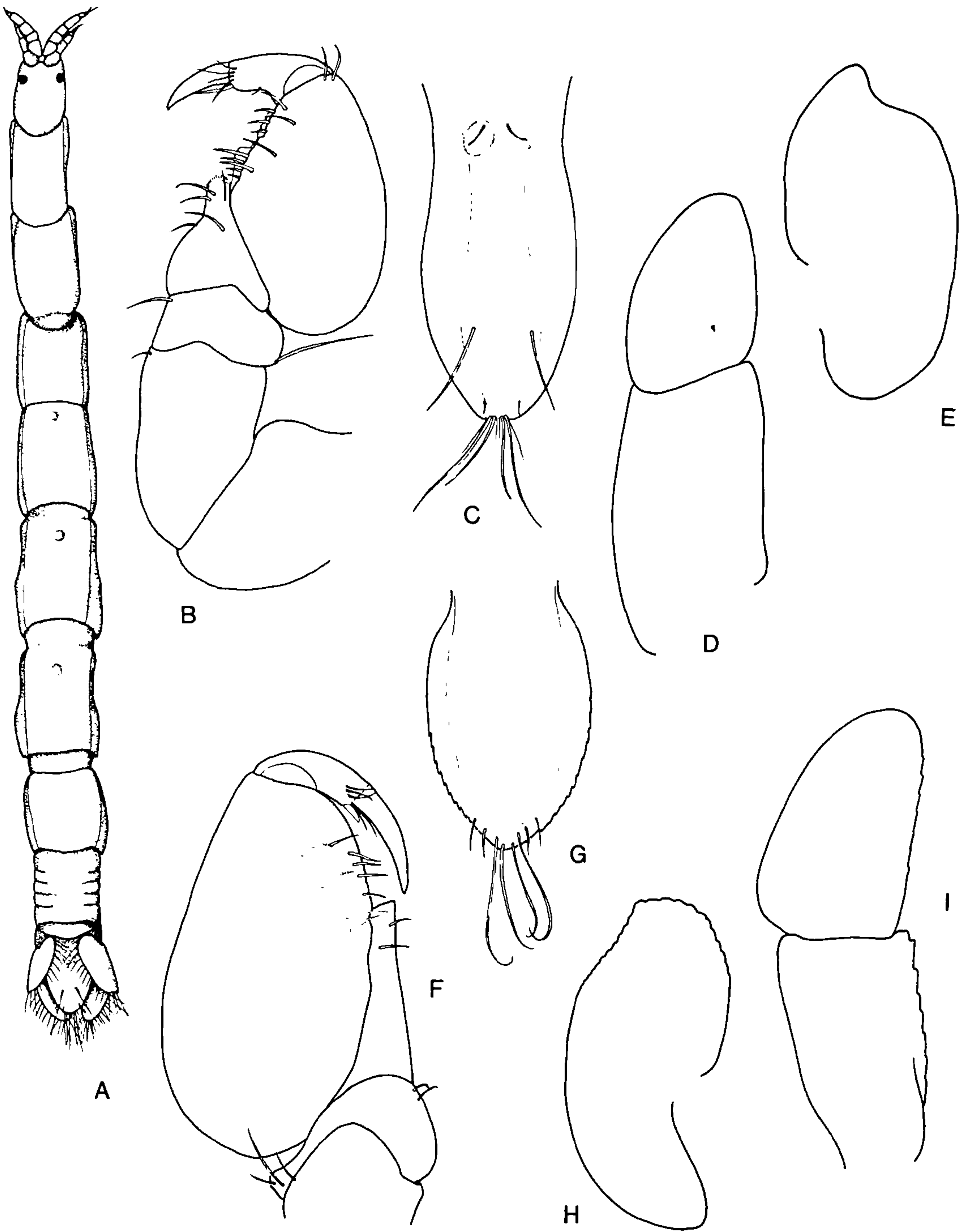


Figure 3. *Amakusanthura geminsula*: A, ♀; B, pereopod 1; C, telson; D, uropodal sympod and endopod; E, uropodal exopod. *Amakusanthura lathridia*: F, pereopod 1; G, telson; H, uropodal exopod; I, uropodal sympod and endopod.

narrowly rounded; propodal palm with rounded tubercle; irregular band of setae on mesial surface.

RECORDS Carrie Bow Cay and Twin Cays, Belize, intertidal to 1.5 m; Jamaica.

Amakusanthura lathridia (Wägele, 1982)

Figure 3F–I

DIAGNOSIS ♀ 2.7 mm. Antennular flagellum of three articles. Antennal flagellum of three articles. Mandibular palp article 3 bearing three spines. Maxilliped lacking endite. Pereopod 1, propodal palm with distal step; carpus with triangular posterodistal lobe. Uropodal exopod apically acute, outer margin slightly excavate, sinuate; endopod length slightly less than twice basal width. Pleotelson elliptical, widest at about midlength, margins weakly serrate.

RECORDS Cuba, interstitial beach sand just above water line.

Amakusanthura magnifica (Menzies and Frankenberg, 1966)

Figures 4, 5

DIAGNOSIS ♀: 13.9 mm. Maxilliped with short endite, terminal article of palp short, set obliquely at outer distal angle of penultimate article. Pereopod 1, propodal palm with strong tubercle; carpus with low distal sclerotized lobe. Uropodal exopod ovate, with shallow distal notch; endopod twice longer than wide. Pleotelson with posterior margin evenly rounded to subtruncate; dorsally with raised area at midlength, broadening and sloping

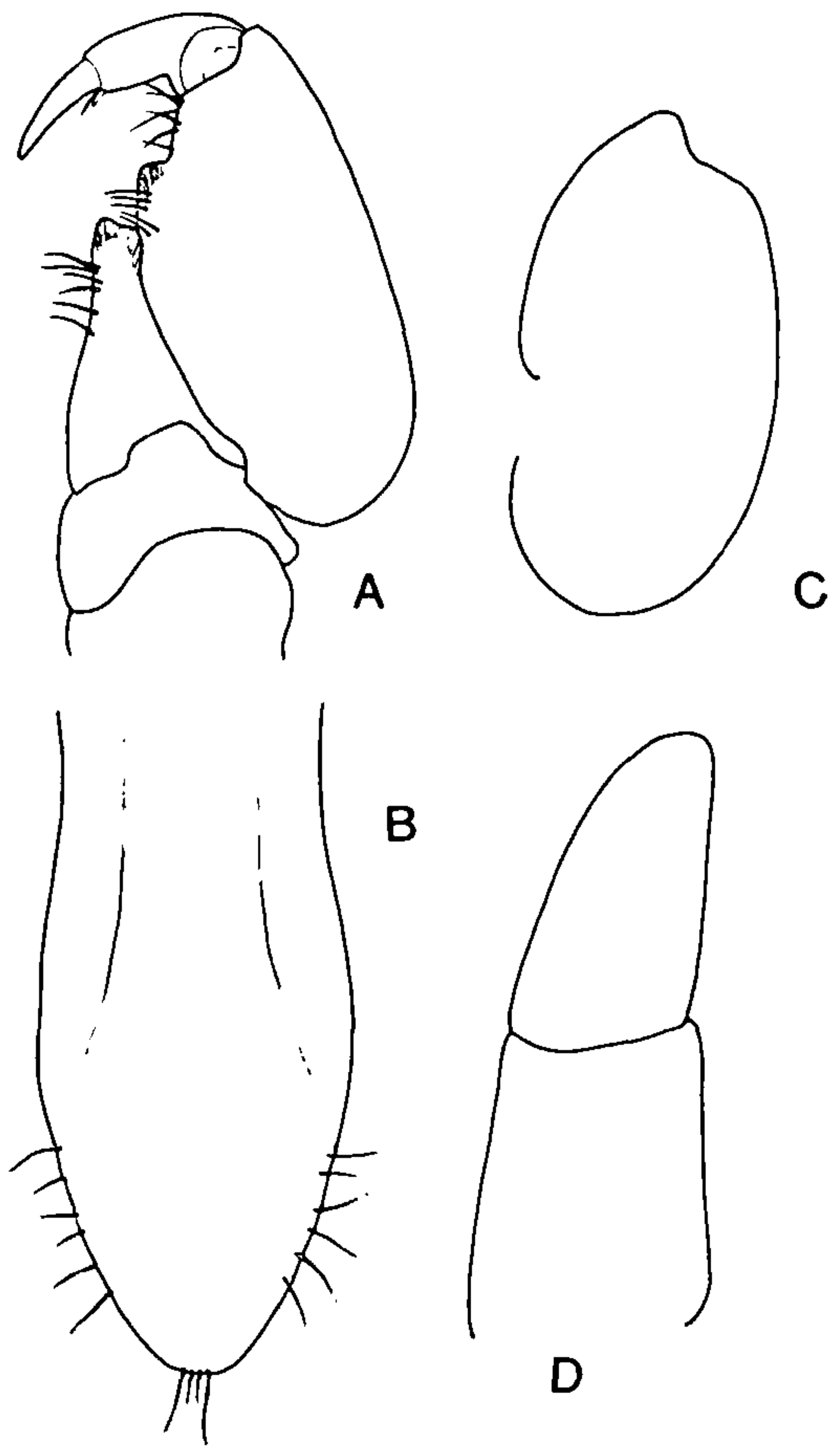


Figure 4. *Amakusanthura magnifica*: A, pereopod 1; B, telson; C, uropodal sympod and endopod (setae omitted); D, uropodal exopod (setae omitted)

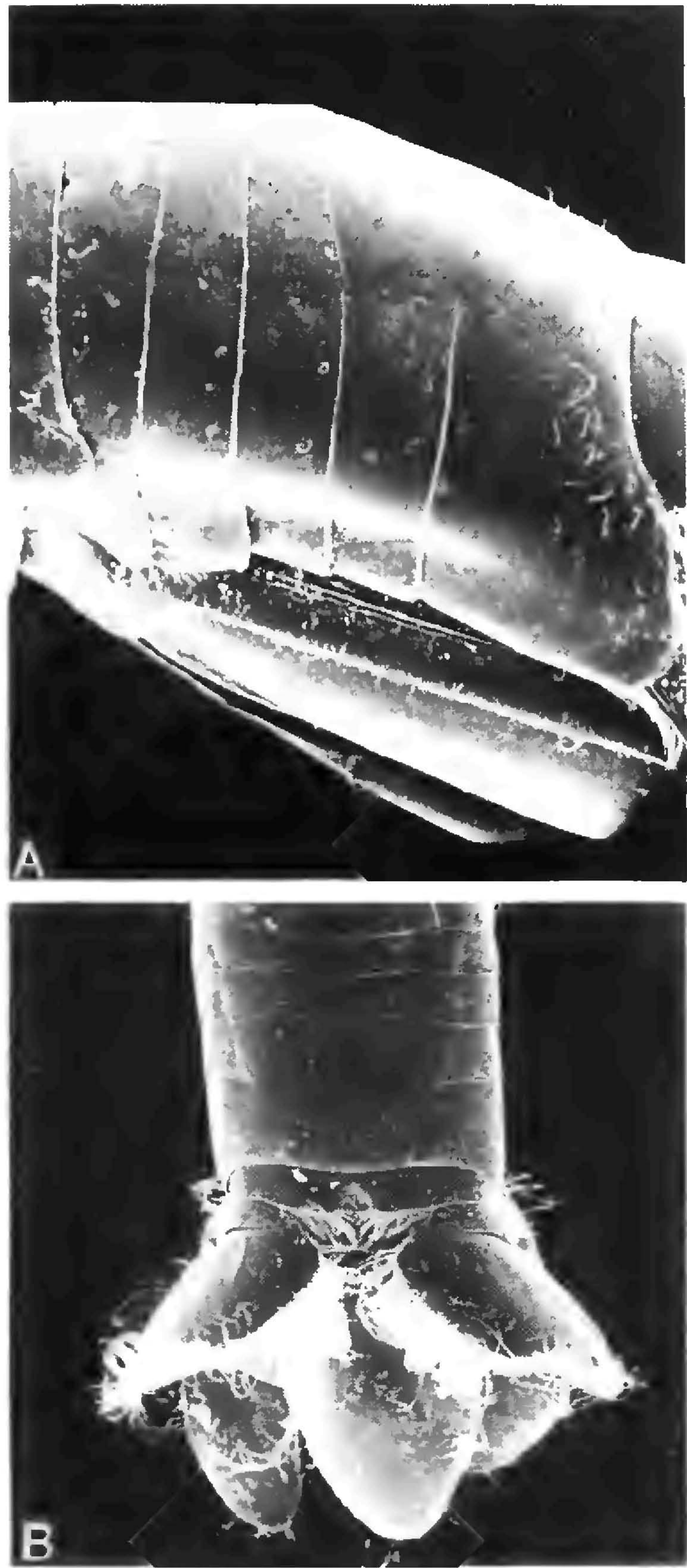


Figure 5. *Amakusanthura magnifica*: *A*, pleonites in lateral view; *B*, pleon in dorsal view.

away posteriorly. ♂: 10.3 mm. Antennular flagellum of 24 articles. Pereopod 1, carpus with sclerotized distal rounded lobe; propodal palm with strong sclerotized tubercle longer than in ♀; numerous setae on mesial surface. Pleopod 2, copulatory stylet of endopod not reaching beyond ramus.

RECORDS Off Georgia, 17–137 m; off Florida, 7–11 m; Cuba; Gulf of Mexico.

Amakusanthura signata (Menzies and Glynn, 1968)

Figure 6A–E

DIAGNOSIS ♀: 4.9 mm. Integument with strong patches of pigment on cephalon; pigment sparse on pereonites; two bars on pleonite 6. Antennular

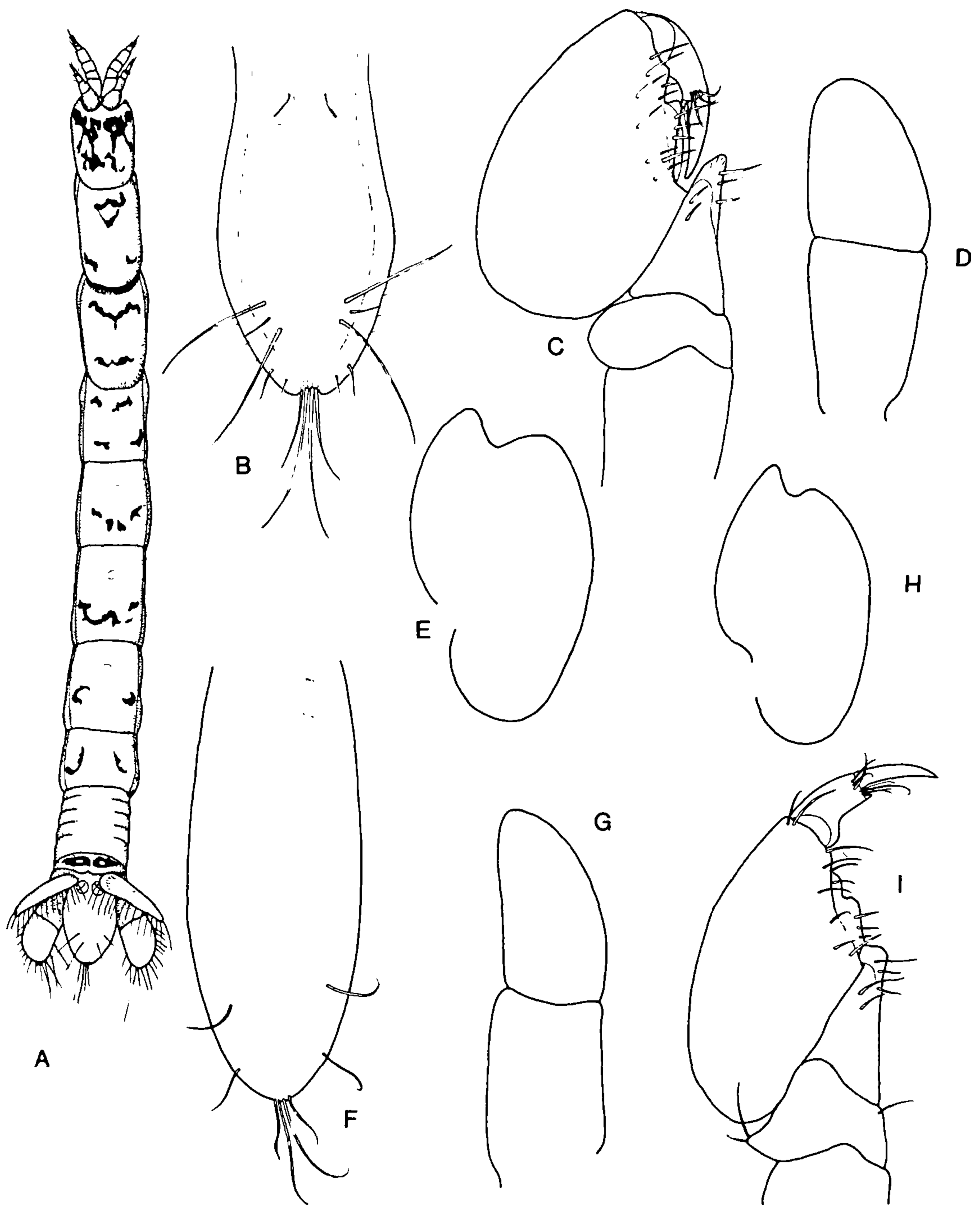


Figure 6. *Amakusanthura signata*: A, ♀; B, telson; C, pereopod 1; D, uropodal sympod and endopod; E, uropodal exopod. *Amakusanthura significa*: F, telson; G, uropodal sympod and endopod; H, uropodal exopod; I, pereopod 1.

flagellum of three articles. Antennal flagellum of three articles. Mandibular palp article 3 bearing three spines. Maxilliped with short endite not reaching base of palp article 2. Pereopod 1, carpus with strong subacute sclerotized lobe distally; propodal palm with transparent convex flange and step.

Uropodal exopod with strong distal notch; endopod length about 1.5 times basal width. Pleotelson widest in posterior half, tapering posteriorly to shallowly notched apex. ♂: 4.5 mm. Eyes larger than in ♀. Antennular flagellum of nine articles. Pereopod 1, carpus with strong distal lobe, propodal palm with step, convex transparent flange, and numerous setae on mesial surface. Pleopod 2, copulatory stylet of endopod reaching well beyond ramus.

RECORDS Cuba; Puerto Rico, intertidal to 1.5 m; Carrie Bow Cay, Belize, intertidal to 24 m.

Amakusanthura signifera (Paul and Menzies, 1971)

Figure 6F–I

DIAGNOSIS ♀ 5.0 mm. Antennular flagellum of three articles. Antennal flagellum of four or five articles. Mandibular palp article 3 bearing three spines. Maxilliped lacking endite. Pereopod 1, propodal palm with step; carpus distally rounded. Uropodal exopod ovate, with distal notch; endopod length slightly more than twice basal width. Telson elliptical, posterior margin narrowly rounded.

RECORDS Off Venezuela, 95 m.

Anthomuda Schultz, 1979

DIAGNOSIS Eyes present. Mandibular palp of three articles. Maxillipedal palp of four articles; endite reaching well beyond base of palp article 2. Pereopods 1 and 2 similar, subchelate. Pleonites 1–6 short, free; pleonite 6 dorsally demarked. Telson with single semiovate hollow representing statocyst.

Anthomuda stenotelson Schultz, 1979

Figure 7A

DIAGNOSIS ♀ 8.8 mm. Antennular flagellum of three or four articles. Antennal flagellum of six articles. Pereopods 1 and 2 similar, propodi somewhat inflated; pereopod 1, propodal palm straight, unarmed; pereopod 2 propodal palm with three sensory spines. Pereopods 4–7 with rectangular carpi. Pleonite 6 free, posterior margin broadly bilobed. Uropodal exopod elongate-elliptical, distally narrowly rounded; endopod length 2.5 times basal width, distally broadly rounded. Telson narrowly lanceolate, posteriorly narrowly rounded, with single open hollow statocyst.

RECORDS Off Bermuda, 90 m.

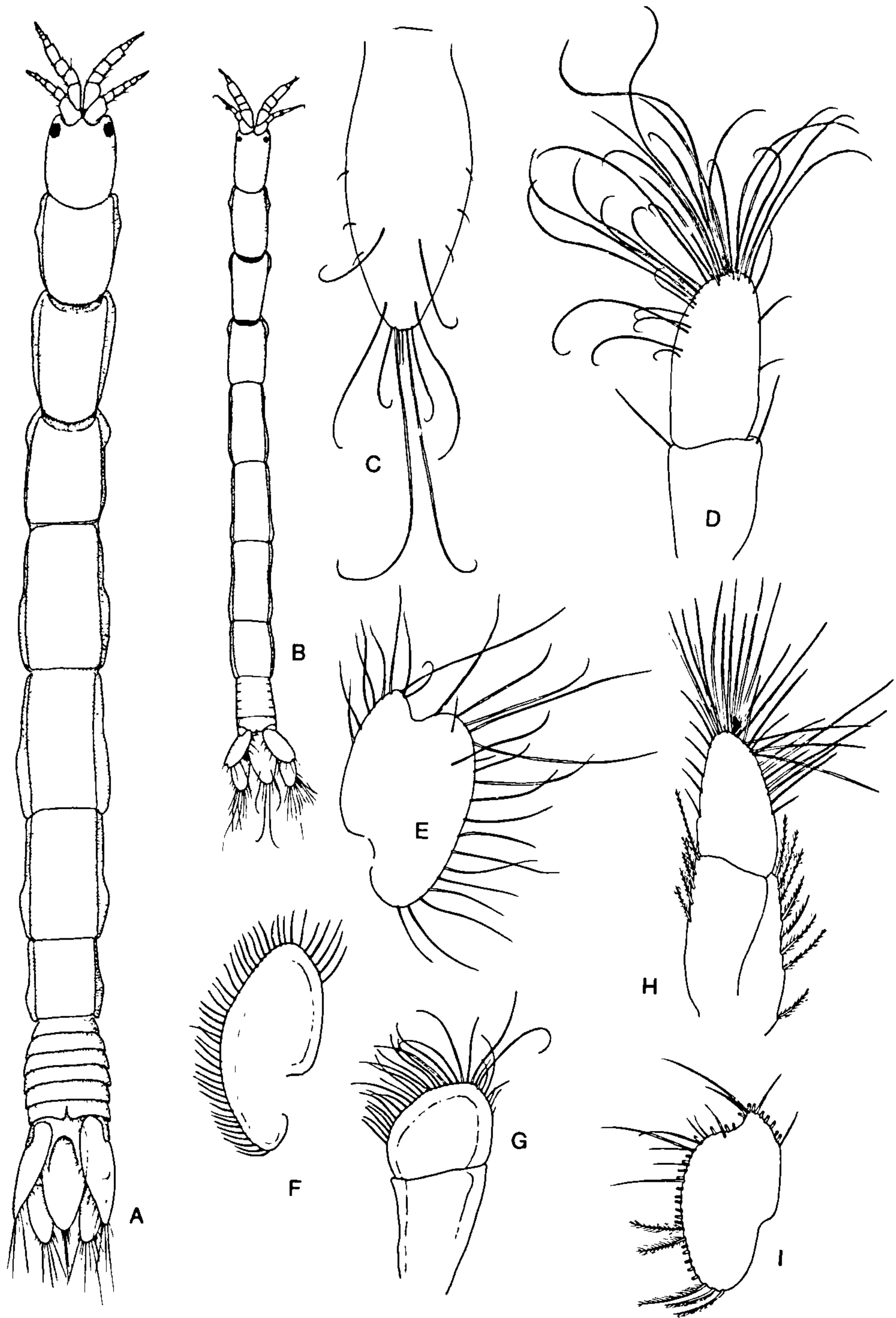


Figure 7. *Anthomuda stenotelson*: A, ♀. *Apanthura cracenta*: B, ♀; C, telson; D, uropodal endopod and sympod; E, uropodal exopod. *Apanthura crucis*: F, uropodal exopod; G, uropodal endopod and sympod. *Apanthura harringtoniensis* (from Wägele, 1981): H, uropodal endopod and sympod; I, uropodal exopod.

Apanthura Stebbing, 1900

DIAGNOSIS Integument sometimes pigmented. Eyes present. ♀: Antennular flagellum of three articles. Antennal flagellum of two to four articles. Mandibular palp of three articles, terminal article bearing distal spines. Maxillipedal palp of three articles; endite small, or lacking. Pereopod 1, propodal palm usually with step or tubercle; propodus inflated. Pereopods 4–7, carpus triangular. Pleonites 1–5 fused; pleonite 6 dorsally demarked. Pleopod 1, exopod operculiform. Uropodal exopod ovate, sometimes distally notched or excavate. Pleotelson with two basal statocysts. ♂ antennular flagellum of about 10 articles.

REMARKS Differentiation of species, especially if long preserved and the pigmentation is lost, depends on subtle features of the mandible, maxilliped, pereopods, and pleotelson.

Key to species of *Apanthura*

1. Uropodal exopod distally notched or excavate 2
 Uropodal exopod distally entire; uropodal endopod length subequal to width *crucis*
 2. Uropodal exopod distally notched; uropodal endopod length 2.4 times basal width *cracenta*
 Uropodal exopod faintly excavate or sinuate; uropodal endopod length about twice basal width *harringtoniensis*
-

Apanthura cracenta Kensley, 1984

Figure 7B–E

DIAGNOSIS ♀: 4.6 mm. Antennular flagellum of three articles. Antennal flagellum of two articles. Mandibular palp article 3 bearing four spines. Maxilliped with short rounded endite; terminal palp article set at oblique angle on, and less than half length of penultimate article. Pereopod 1, carpus triangular with acute sclerotized tip overlapping base of palm; propodal palm with rounded tubercle near midlength. Uropodal exopod deeply notched; endopod ovate, length $2\frac{1}{3}$ basal length. Pleotelson lanceolate. ♂: 3.8 mm. Antennular flagellum of six articles. Antennal flagellum of two articles. Pleopod 2, copulatory stylet of endopod reaching by half its length beyond ramus.

RECORDS Turks and Caicos Islands, 1 m; Carrie Bow Cay, Belize, intertidal on reef crest, 2 m.

Apanthura crucis (Barnard, 1925)

Figure 7F,G

DIAGNOSIS ♀: 5.9 mm. Antennular flagellum of four articles. Antennal flagellum of four articles. Mandibular palp article 3 with eight spines. Maxilliped lacking endite; terminal palp article more than half length of penultimate article. Pereopod 1, propodal palm with low rounded tubercle at midlength. Uropodal exopod ovate, outer margin evenly convex; endopod subcircular. Pleotelson anteriorly narrow, widest at midlength, posterior margin broadly rounded. ♂: 6.2 mm. Antennular flagellum of 12 or 13 articles. Antennal flagellum of four articles. Pereopod 1, propodal palm with low rounded tubercle; dense band of setae on mesial surface. Copulatory stylet on endopod of pleopod 2 reaching a third of its length beyond ramus.

RECORDS Turks and Caicos Islands, 1 m; St. Croix, U.S. Virgin Islands, 8 m.

Apanthura harringtoniensis Wägele, 1981

Figure 7H,I

DIAGNOSIS ♀ 6.0 mm. Antennular flagellum of four articles. Antennal flagellum of four articles. Mandibular palp article 3 bearing two spines. Maxillipedal endite short, not reaching base of palp article 2. Pereopod 1, propodal palm stepped; carpus distally bluntly triangular. Uropodal exopod apically acute, outer margin distally sinuate; endopod length about twice basal width. Pleotelson with posterolateral margins faintly denticulate; apex subtruncate and bearing several setae.

RECORDS Harrington Sound, Bermuda.

Apanthuroides Menzies and Glynn, 1968

DIAGNOSIS Eyes present. Mandibular palp of three articles; body of mandible anteriorly produced, molar absent on left side, present as narrow spikelike process on right. Maxillipedal palp of three articles; endite present, reaching palp article 2. Pereopod 1, propodus barely expanded, palm un-

armed. Pereonite 7 less than half length of pereonite 6. Pereopods 4–7, carpi with free anterior margin shorter than posterior margin. Pleonites 1–5 fused, 6 fused with telson. Pleopod 1, both rami forming operculum.

Apanthuroides millae Menzies and Glynn, 1968

Figure 8

DIAGNOSIS ♀: 4.5 mm. Integument with diffuse brown pigmentation and numerous shallow pits. Antennular flagellum of four articles. Antennal flagellum of seven articles. Pleotelson with strong middorsal ridge. ♂: 5.0 mm. Integumental pigment stronger than in ♀, in irregular brown patches. Eyes larger than in ♀. Antennular flagellum of six or seven articles. Antennal flagellum of seven articles. Pereopod 1, propodal palm armed with five fringed spines.

RECORDS Carrie Bow Cay, intertidal to 30 m; Puerto Rico, intertidal.

REMARKS The highly modified mandible probably indicates some specialized form of feeding, but this has yet to be discovered.

Chalixanthura Kensley, 1984

DIAGNOSIS Eyes present, enormously enlarged, especially ventrally in ♂, resulting in mouthpart reduction. Mandibular palp of three articles; molar small, lamina dentata, and incisor present. Mouthparts reduced in ♂. Pereopods 1–3 similar, propodi barely inflated. Pereopods 4–7, carpi triangular. Pleopod 1, exopod broader than endopod, operculiform, or both rami forming operculum. Pleopods 2–5, exopods biarticulate. Pleonites short, free, longer in ♂ than in ♀. Uropodal rami, margins moderately to strongly incised or serrate. Telsonic margin serrate posteriorly; statocysts lacking.

Key to species of *Chalixanthura*

1. Body pigmented; uropodal exopod deeply incised *scopulosa*
 - Body not pigmented; uropodal exopod weakly serrate *lewisi*
-

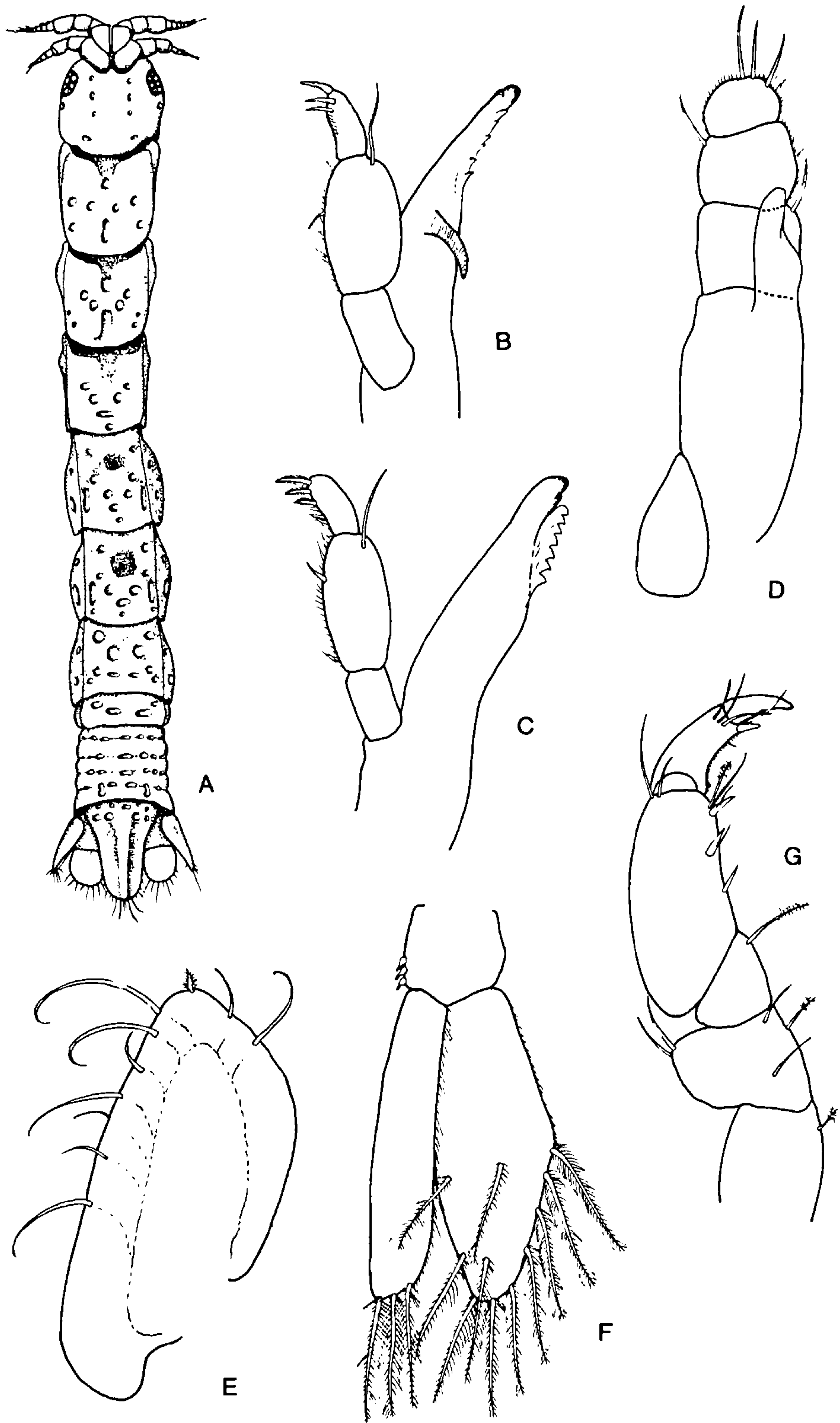


Figure 8. *Apanthuroides millae*: A, ♀; B, right mandible; C, left mandible; D, maxilliped; E, uropodal exopod; F, pleopod 1; G, pereopod 1.

Chalixanthura lewisi Kensley and Snelgrove, 1987

Figure 9A–D

DIAGNOSIS ♀: 3.1 mm. Integument lacking pigment. Antennular flagellum of three articles. Antennal flagellum of seven articles. Maxillipedal endite large, apically acute. Pereopod 1 propodus slightly expanded, palm with few (3) simple setae. Pereopod 7 propodus with two elongate anterodistal fringed spines. Uropodal and telsonic margins serrate. ♂: 2.2 mm. Antennular flagellum of 11 articles. Antennal flagellum of six articles. Maxilliped reduced, lacking endite. Pereopod 1, propodal palm with two spines plus seven spines on mesial surface. Pereopod 7 as in ♀.

RECORDS Barbados, in *Madracis mirabilis* coral, 9–15 m.

Chalixanthura scopulosa Kensley, 1984

Figure 9E–J

DIAGNOSIS ♀: 2.5 mm. Antennular flagellum of three articles. Antennal flagellum of seven articles. Maxillipedal endite short, not reaching base of palp article 4. Pereopod 1, propodal palm unarmed. Pereopod 7, propodus with single elongate anterodistal fringed spine. Uropodal exopod margin deeply incised; endopod ovate, margins serrate. Telson elongate-ovate, posterior margin serrate. ♂: 2.6 mm. Eyes considerably larger and with more ommatidia than in ♀. Antennular flagellum of seven articles. Antennal flagellum of four articles. Pereopod 1 propodal palm with three sensory spines. Uropodal exopod deeply incised.

RECORDS Carrie Bow Cay, Belize, 0.1 m.

Cortezura Schultz, 1977

DIAGNOSIS Eyes small, weakly pigmented. Antennular flagellum of two short articles. Antennal flagellum of single article. Mandibular palp of two articles. Maxillipedal palp of two articles, terminal article small; short endite present. Pereopod 1, propodus inflated. Pereopods 4–7 with carpus having anterior margin shorter than posterior. Pleonites 1–5 fused; pleonite 6 dorsally demarked. Pleopod 1, exopod operculiform. Pleotelson with two basal statocysts.

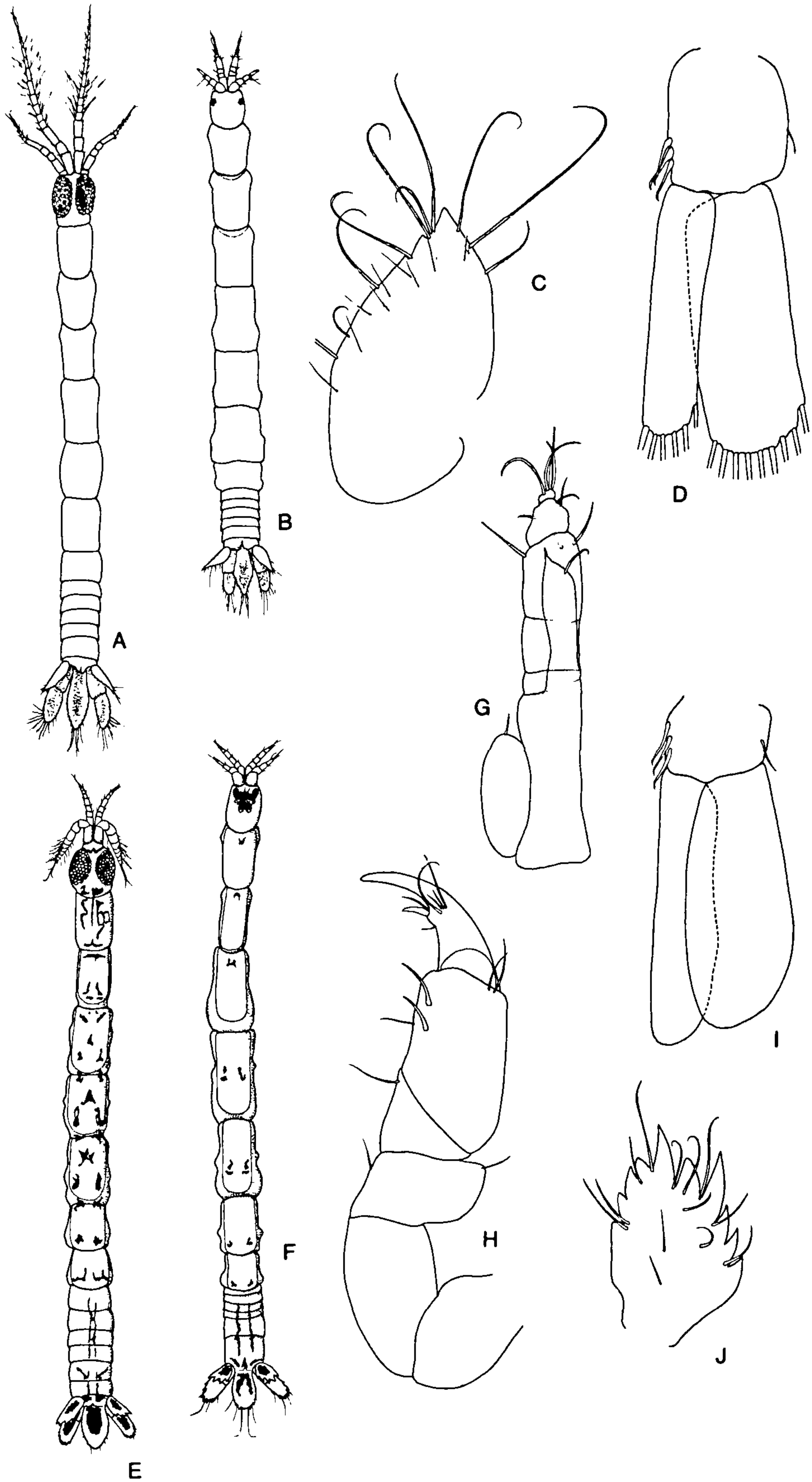


Figure 9. *Chalixanthura lewisi*: A, ♂; B, ♀; C, uropodal exopod; D, pleopod 1. *Chalixanthura scopulosa*: E, ♂; F, ♀; G, maxilliped; H, pereopod 1; I, pleopod 1; J, uropodal exopod.

Cortezura confixa (Kensley, 1978)

Figure 10

DIAGNOSIS ♀ 13.4 mm. Antennular peduncle articles 1 and 2 each with clump of ventrally directed setae. Antennal peduncle article 2 and antennular peduncle article 1 locked together. Mandibular palp of two articles, distal article twice length of proximal. Pereopod 1, propodus expanded, especially posteriorly; palm concave, with strong tubercle and irregular band of setae on mesial surface. Uropodal exopod ovate, apically rounded; endopod length 1.5 times greatest width. Telson ovate, posteriorly faintly narrowed, proximally thickened, with faint ridges diverging posteriorly.

RECORDS Cubagua Island, Venezuela, 4–10 m.

REMARKS This species was described under the generic name *Venezanthura* Kensley (1978). The only other known species of *Cortezura* is the type of the genus, *C. penascoensis* Schultz, 1977, from California.

Cyathura Norman and Stebbing, 1886

DIAGNOSIS Eyes present or absent. Antennular flagellum of one to three articles in ♀. Antennal flagellum of one to three articles. Mandibular palp of three articles. Maxillipedal palp of two articles; endite reduced or absent. Pereopod 1, propodus inflated. Pereopods 4–7, carpi triangular. Pleopod 1 exopod operculiform. Pleonites 1–5 short, fused; pleonite 6 fused with telson, sometimes dorsally demarked. Pleotelson with two basal statocysts.

Key to subgenera of *Cyathura*

1. Pleonite 6 not dorsally demarked from telson; articulation of uropodal exopod very short; exopod not adpressed to telson dorsally
 *Stygocyathura*
 - Pleonite 6 dorsally demarked from telson; articulation of uropodal exopod relatively elongate; exopod adpressed dorsally to telson
 *Cyathura*
-

Cyathura (Cyathura) Norman and Stebbing, 1886

DIAGNOSIS Integument usually strongly pilose or setose; eye and body pig-

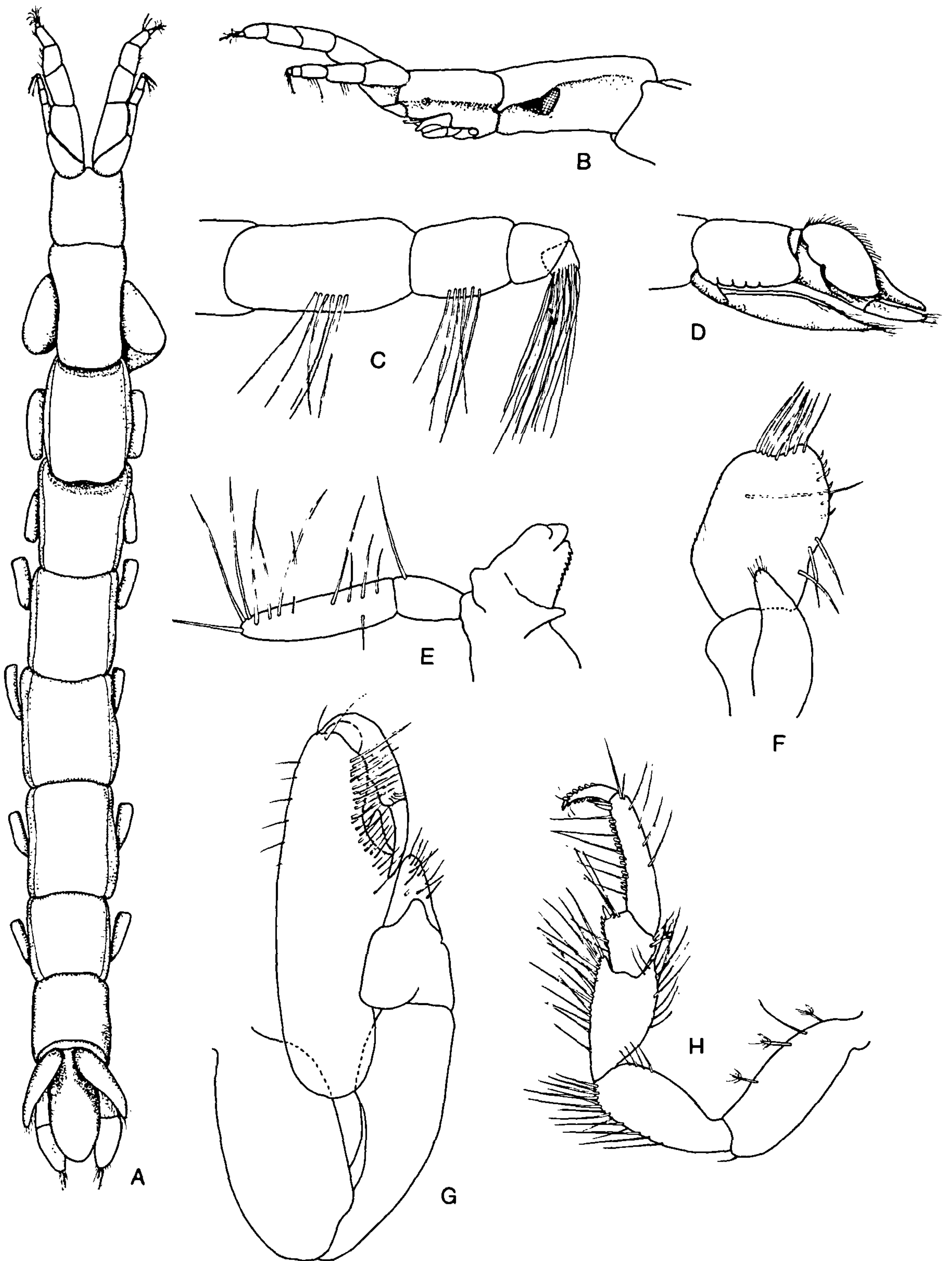


Figure 10. *Cortezura confixa*: A, ♀; B, cephalon and pereonite 1, lateral view (pereopod 1 removed); C, antennule; D, pleon, lateral view; E, mandible; F, maxilliped; G, pereopod 1; H, pereopod 7.

mentation usually present. Pereopod 1, propodal palm armed with tubercle. Pleopod 1, protopod with retinaculae. Uropodal exopod articulation relative elongate along lateral margin of sympod; exopod well developed, ovate. Pleonite 6 dorsally demarked from telson. Marine or estuarine forms.

Cyathura (Cyathura) cubana Negoescu, 1979

Figure 11A,B

DIAGNOSIS Ovigerous ♀: 7.0 mm. Antennular flagellum of two articles. Antennal flagellum of one article. Pereopod 1, propodal palm with rounded lobe in proximal half. Maxillipedal palp with distal article 0.34 times length of proximal article; small rounded endite present. Dorsal pigmentation consisting of irregular brown mottling. ♂: 5.5 mm. Antennular flagellum of four articles. Antennal flagellum of three articles. Pereopod 1, propodal palm with rounded lobe in proximal half. Copulatory stylet elongate-cylindrical, apically narrowed and flexed.

RECORDS Cuba, in mangroves, 2.5–7.0 m; Salt Creek, Belize, in mangroves, 1.5 m.

Cyathura (Stygocyathura) Botosaneanu and Stock, 1982

DIAGNOSIS Eye and body pigmentation absent. Body sparsely pilose or setose. Tendency toward elongation of some appendages, especially propodus of pereopods 2–7. Pereopod 1, propodal palm lacking strong tubercle. Pleopod 1, protopod lacking retinaculae. Pleonite 6 fused with telson, not dorsally demarked. Uropodal exopod with very short articulation on sympod, not adpressed dorsally to telson. Cave or hypogean forms.

REMARKS The ten species of *Stygocyathura* from the area covered in this work are morphologically very similar, with specific differences, although real, being very subtle. A dichotomous key would be cumbersome and require considerable dissection of mouthparts. The copulatory stylet of the male provides a valuable specific feature but males are not always available. Instead of a key, we have provided a list of species with their total lengths and localities (Table 1). Given the very restricted distribution of these cave species, material from localities not listed here should be treated as potentially undescribed, and the material compared with descriptions, especially those of Botosaneanu and Stock (1982).

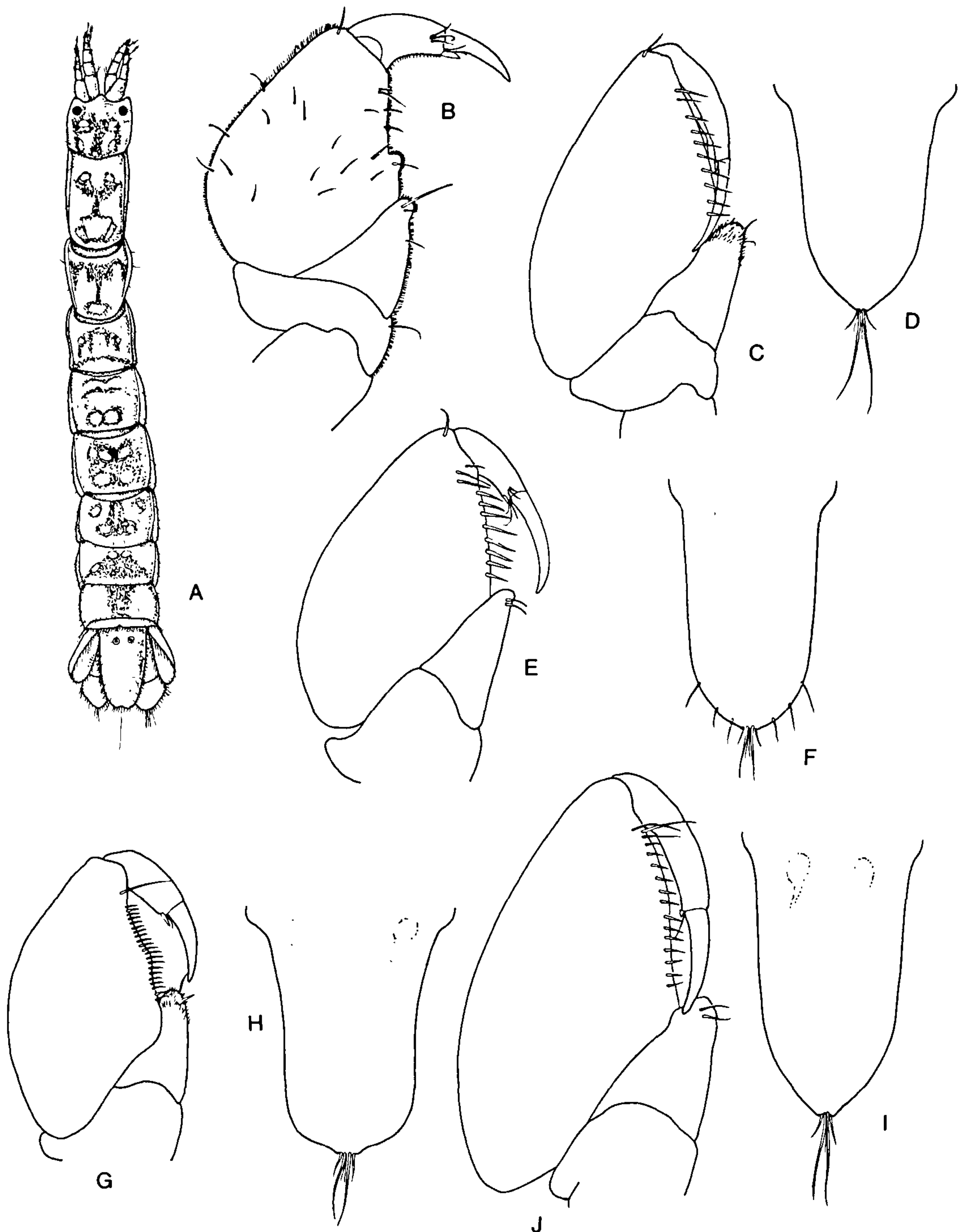


Figure 11. *Cyathura (Cyathura) cubana*: A, ♀; B, pereopod 1, ♀. *Cyathura (Stygocyathura) cuborientalis*: C, pereopod 1, ♀; D, telson. *Cyathura (Stygocyathura) curassavica*: E, pereopod 1, ♀; F, telson. *Cyathura (Stygocyathura) hummelincki*: G, pereopod 1, ♀; H, telson. *Cyathura (Stygocyathura) motasi*: I, telson; J, pereopod 1, ♀.

Cyathura (Stygocyathura) cuborientalis Botosaneanu and Stock, 1982
Figure 11C,D

DIAGNOSIS ♀ 6.8 mm. Pereopod 1, propodal palm straight, bearing about

TABLE 1. CARIBBEAN SPECIES OF *Cyathura (Stygocyathura)*, THEIR TOTAL LENGTHS (MM) AND LOCALITIES

<i>C. (S.) cuborientalis</i>	♀ 6.8	Cuba
<i>C. (S.) curassavica</i>	♂ 7.0, ♀ 9.2	Curaçao
<i>C. (S.) hummelincki</i>	♂ 4.75, ♀ 8.5	Aruba
<i>C. (S.) motasi</i>	♂ 6.8, ♀ 10.0	Haiti
<i>C. (S.) orghidani</i>	♀ 8.0	Cuba
<i>C. (S.) parapotamica</i>	ovig. ♀ 3.6, ♀ 4.1	Jamaica
<i>C. (S.) salpiscinalis</i>	♂ 5.6, ♀ 7.3	Haiti
<i>C. (S.) sbordonii</i>	♂, ♀ 9.0	Vera Cruz, Mexico
<i>C. (S.) specus</i>	♂ 18.0, ♀ 19.8	Cuba
<i>C. (S.) univam</i>	♀ 10.0	Venezuela

10 pectinate marginal spines; low triangular ridge present. Pleotelson evenly tapering to notched apex; angle of apex about 90°.

RECORDS Oriente Province, Cuba, interstitial in river alluvia.

Cyathura (Stygocyathura) curassavica Stork, 1940

Figures 11E,F; 12

DIAGNOSIS ♂ 7.0 mm, ♀ 9.2 mm. Pereopod 1, propodal palm gently convex, bearing about 10 pectinate spines. Pleotelsonic margins in anterior two-thirds subparallel, tapering gently to finely notched apex; angle of apex less than 90°.

RECORDS Curaçao, from pits and wells.

Cyathura (Stygocyathura) hummelincki Botosaneanu and Stock, 1982

Figure 11G,H

DIAGNOSIS ♂ 4.75 mm, ♀ 8.5 mm. Pereopod 1, propodal palm gently sinuate, bearing 11–23 marginal pectinate spines. Pleotelsonic margins faintly concave in midregion, posterior margin evenly convex, apex with slight notch.

RECORDS Aruba, in pits, wells, and temporary water sources.

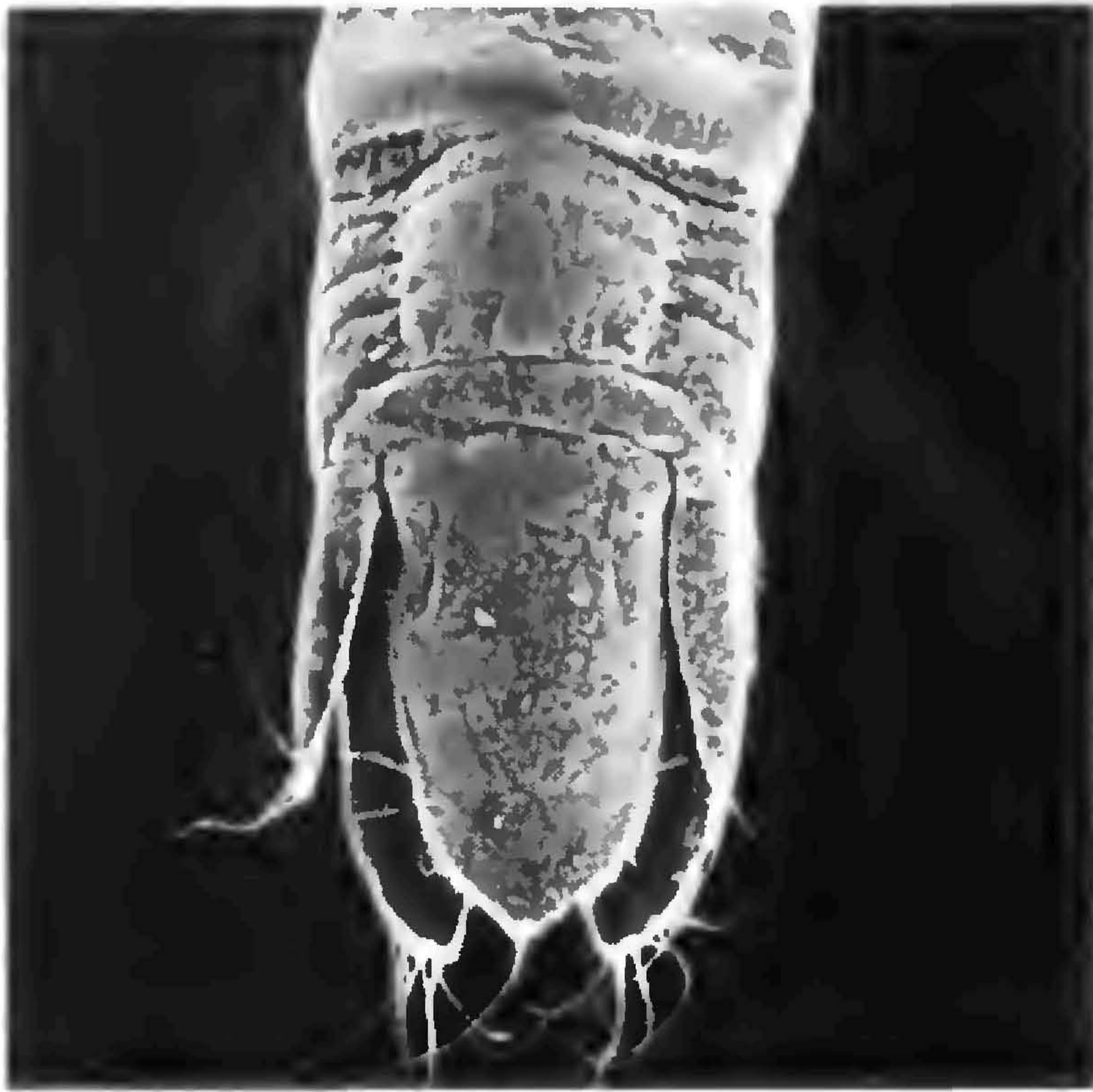


Figure 12. *Cyathura*
(*Stygocyathura*) *curassavica*:
pleon.

Cyathura (*Stygocyathura*) *motasi* Botosaneanu and Stock, 1982

Figure 11I,J

DIAGNOSIS ♂ 6.8 mm, ♀ 10.0 mm. Pereopod 1, propodal palm gently sinuate, bearing 11–18 marginal pectinate setae. Pleotelsonic margins tapering evenly to slightly notched apex; angle of apex less than 90°.

RECORDS Haiti, from wells.

Cyathura (*Stygocyathura*) *orghidani* Negoescu Vlădescu, 1983

Figure 13A,B

DIAGNOSIS ♀ 8.0 mm. Pereopod 1, propodal palm slightly convex, bearing about 11 marginal pectinate setae. Pleotelson, angle of apex obtuse, with small notch.

RECORDS Pinar del Río Province, Cuba, from freshwater lake in cave.

Cyathura (*Stygocyathura*) *parapotamica* Botosaneanu and Stock, 1982

Figure 13D,E

DIAGNOSIS ♀ 4.1 mm (ovig. ♀ 3.6 mm). Pereopod 1, propodal palm sinuate, bearing eight marginal pectinate setae. Pleotelson gently tapering to notched apex; angle of apex about 90°.

RECORDS Jamaica, from river alluvia.

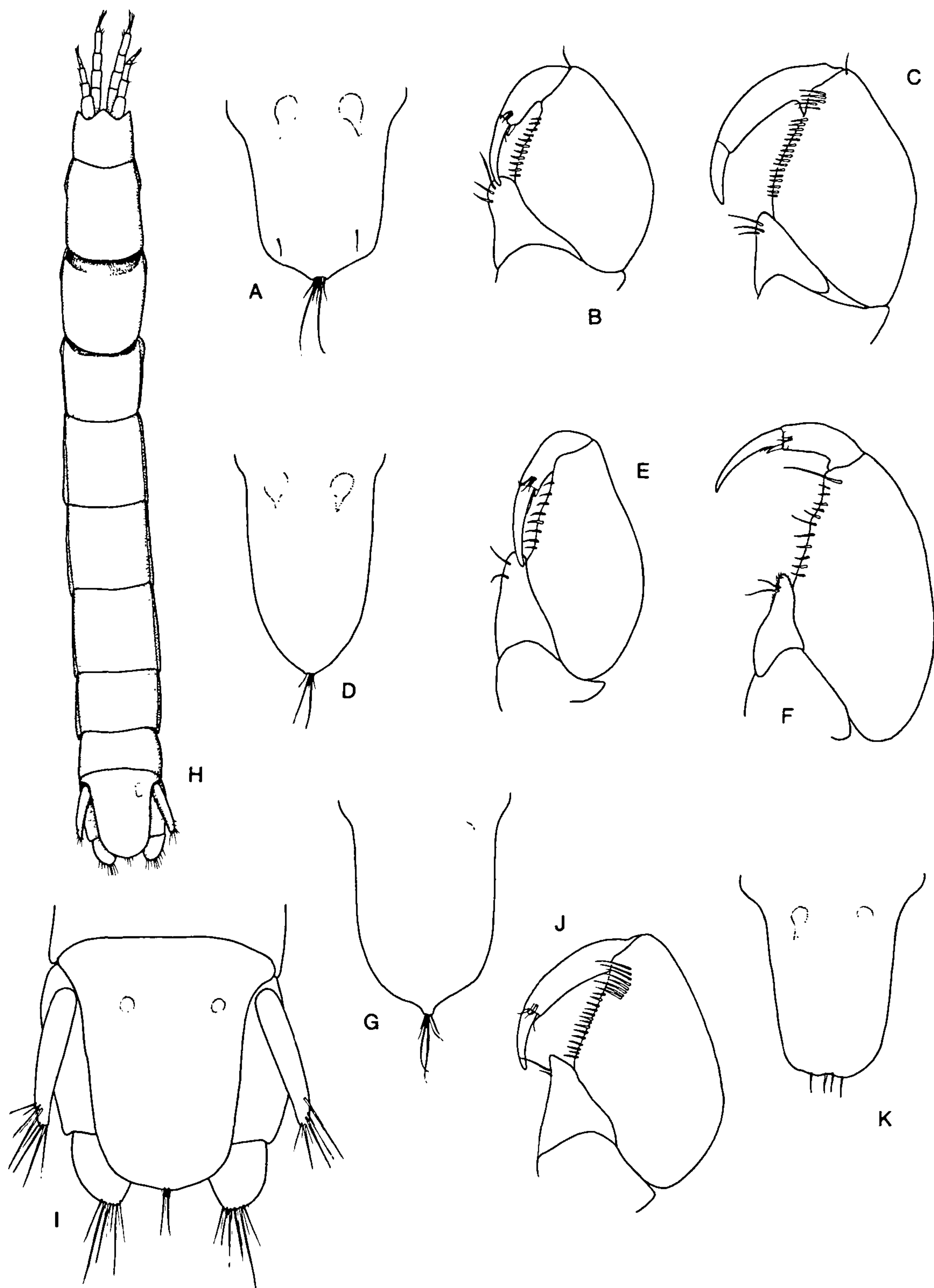


Figure 13. *Cyathura (Stygocyathura) orghidani* (from Negoescu, 1983): A, telson; B, pereopod 1, ♀. *Cyathura (Stygocyathura) sbordonii*: C, pereopod 1, ♀ (from Argano, 1971). *Cyathura (Stygocyathura) parapotamica*: D, telson; E, pereopod 1, ♀. *Cyathura (Stygocyathura) salpicinalis*: F, pereopod 1, ♀; G, telson. *Cyathura (Stygocyathura) specus*: H, ♀; I, telson and uropods; J, pereopod 1, ♀. *Cyathura (Stygocyathura) univam*: K, telson.

Cyathura (Stygocyathura) salpiscinalis Botosaneanu and Stock, 1982

Figure 13F,G

DIAGNOSIS ♂ 5.6 mm, ♀ 7.3 mm. Pereopod 1, propodal palm sinuate, bearing up to 15 marginal pectinate setae, and with distinct triangular ridge. Pleotelson gently tapering, with slight apical eminence.

RECORDS Haiti, from alluvia of lake.

Cyathura (Stygocyathura) sbordonii Argano, 1971

Figure 13C

DIAGNOSIS ♂ and ♀ 9.0 mm. Pereopod 1, propodal palm convex, bearing up to 16 marginal pectinate setae. Pleotelson with angle of apex obtuse.

RECORDS Vera Cruz, Mexico, from freshwater in cave.

Cyathura (Stygocyathura) specus Bowman, 1965

Figure 13H–J

DIAGNOSIS ♂ 18.0 mm, ♀ 19.8 mm. Pereopod 1, propodal palm almost straight, bearing up to 15 marginal pectinate setae. Pleotelson with angle of apex obtuse.

RECORDS Las Villas Province, Cuba, from freshwater lake in cave.

Cyathura (Stygocyathura) univam Botosaneanu, 1983

Figure 13K

DIAGNOSIS ♀ 10.0 mm. Pereopod 1, propodal palm gently convex, bearing 22 marginal pectinate setae. Pleotelson posteriorly broadly rounded, apex emarginate.

RECORDS Peninsula de Morocoy, Venezuela, from phreatic water in cave.

Eisothistos Haswell, 1884

DIAGNOSIS Mouthparts forwardly produced, tailfan spiny, indurate. Eyes present, larger and with more ommatodia in ♂ than in ♀. Pereonites sometimes elongate. Mandible with strong incisor, reduced lamina dentata, palp and molar lacking. Maxilliped lacking endite, palp slender, of three to five

articles. Pereopods 1–3 not subchelate, propodi relatively elongate, minimally expanded. Pleopod 1 ♀, rami fused, together forming operculum; ♂ rami separate. Pleonites free, short, longer in ♂ than in ♀. Telson lacking statocysts.

REMARKS Wägele (1979) first recorded species of *Eisothistos* preying on serpulid polychaete worms in their tubes.

The genus contains about 12 species in the Pacific, Indian Ocean, Caribbean, Antarctic, and Mediterranean.

Key to species of *Eisothistos*

- 1. ♀ telson with middorsal spines; ♂ pereopod 1 propodal palm with 19 or 20 spines *teri*
 - ♀ telson lacking middorsal spines; ♂ pereopod 1 propodal palm with 11 spines *petrensis*
-

Eisothistos petrensis Kensley, 1984

Figure 14A–E

DIAGNOSIS ♀: 4.0 mm. Antennular flagellum of six articles. Antennal flagellum of six articles. Telson posteriorly faintly bilobed, margin strongly serrate; faint anterior middorsal ridge; middorsally unarmed. Pereopod 1, propodal palm unarmed. Pleopod 1 rami fused for 1/12 of length. ♂: 2.0 mm. Antennular flagellum of eight articles. Antennal flagellum of six articles. Pereopod 1 propodal palm with 11 fringed spines. Telson narrower than in ♀, with middorsal ridge running almost entire length.

RECORDS Carrie Bow Cay, Belize, 0.1–36 m; Looe Key, Florida, 5–6 m; Turks and Caicos Islands, 1.0 m; St. Thomas, U.S. Virgin Islands, 7–10 m.

Eisothistos teri Kensley and Snelgrove, 1987

Figure 14F–H

DIAGNOSIS ♀: 3.2 mm. Basal antennular peduncle article bearing triangular apically rounded laminate process; flagellum of seven articles. Antennal flagellum of six articles. Mandible with biserrate lamina dentata. Pereopod 1 propodal palm unarmed. Pleopod 1 rami fused for 3/4 of length. Uropodal exopod with one or two strong slightly recurved spines on dorsal surface.

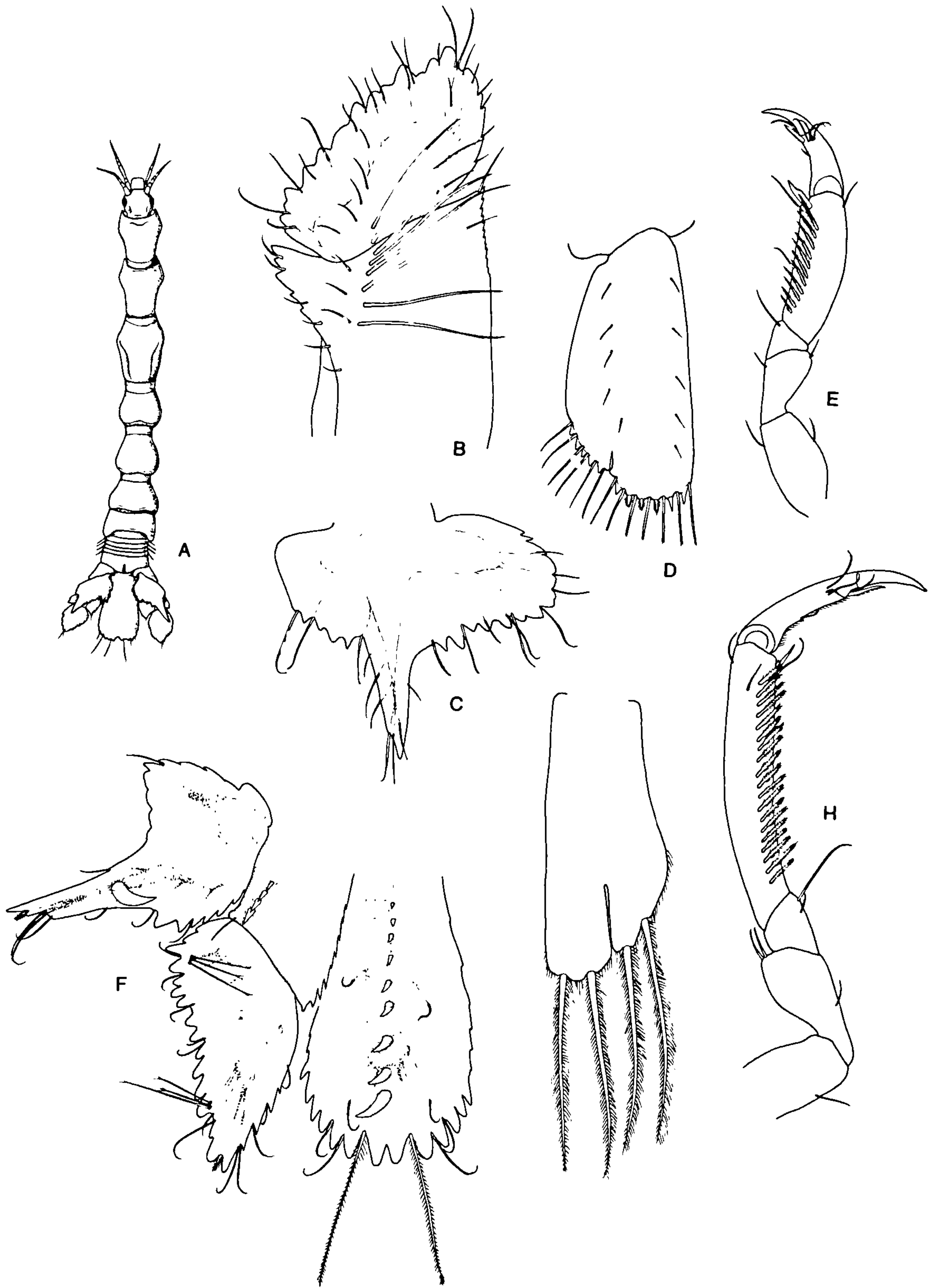


Figure 14. *Eisothistos petrensis*: A, ♀; B, uropodal sympod and endopod; C, uropodal exopod; D, pleopod 1; E, pereopod 1, ♂. *Eisothistos teri*: F, telson and uropod; G, pleopod 1; H, pereopod 1, ♂.

Telson with eight or nine slightly recurved middorsal teeth becoming longer posteriorly. ♂: 2.0 mm. Antennular flagellum of eight articles. Antennal

flagellum of six articles. Pereopod 1 propodal palm with 19 or 20 fringed spines. Uropodal exopod lacking dorsal teeth. Telson lacking middorsal teeth; posterior margin incised into 12 acute or narrowly rounded teeth.

RECORDS Barbados, in *Madracis mirabilis* coral, 9–15 m.

Haliophasma Haswell, 1881

DIAGNOSIS Eyes present. Integument often indurate, with scattered pitting. Antennular flagellum usually of two articles. Antennal flagellum of 4–7 articles. Mandibular palp of three articles. Maxillipedal palp of two articles, article 2 smaller than article 1. Pereopod 1, propodus expanded. Pereopods 4–7, carpi roughly rectangular. Pleopod 1 exopod operculiform. Pleonites 1–5 short, fused; pleonite 6 usually demarked from telson. Latter with two basal statocysts. ♂ often with more elongate form than ♀. Antennular flagellum multiarticulate. Eyes larger.

Key to species of *Haliophasma*

- 1. Telson posteriorly narrowly rounded; dactylus of pereopod 1 dentate
..... *valeriae*
 - Telson posteriorly broadly rounded; dactylus of pereopod 1 entire
..... *curri*
-

Haliophasma curri Paul and Menzies, 1971

Figure 15A–C

DIAGNOSIS ♀ 7.0 mm. Antennular flagellum of three articles. Antennal flagellum of five articles. Mandibular palp article 3 with five spines. Maxillipedal palp, terminal article small, set obliquely at distolateral angle of article 1. Pereopod 1, carpus triangular, posterodistal margin crenulate, distally rounded; propodal palm crenulate, with low rounded proximal lobe. Pleonite 6 dorsally demarked, narrow, with middorsal point in posterior margin. Uropodal exopod elongate, outer margin sinuate, dentate; endopod ovate, distally narrowed, length twice greatest width, outer margin dentate. Telson parallel sided, posterior margin broadly rounded.

RECORDS Off Venezuela, 95 m; Culebra Island, Bay of Panama, intertidal.

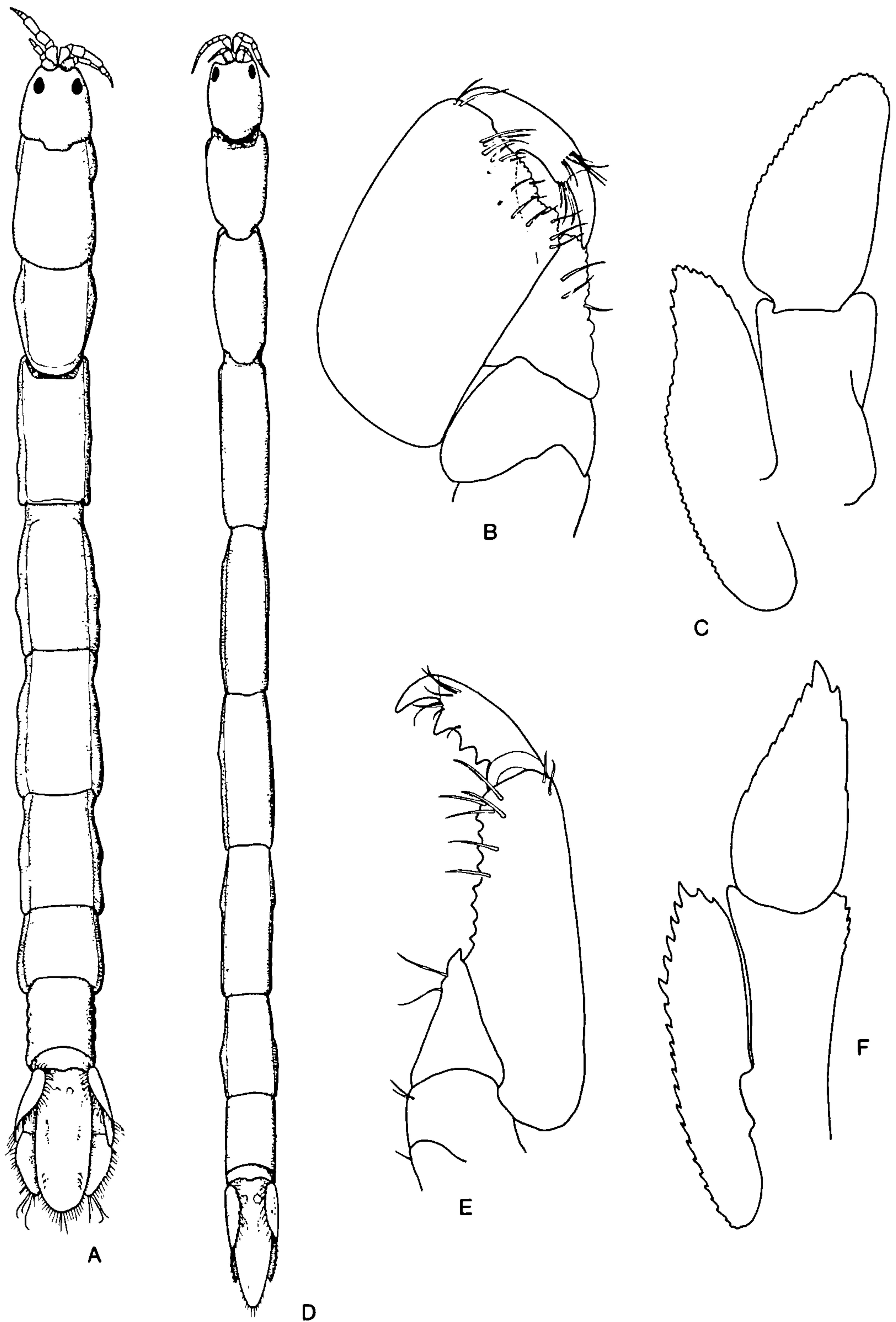


Figure 15. *Haliophasma curri*: A, ♀; B, pereopod 1; C, uropod. *Haliophasma valeriae*: D, ♀; E, pereopod 1; F, uropod.

Haliophasma valeriae Paul and Menzies, 1971

Figure 15D–F

DIAGNOSIS ♀ 6.5 mm. Body long and slender. Antennular flagellum of

three articles. Antennal flagellum of six articles. Mandibular palp article 3 with four spines. Pereopod 1, carpus triangular, tipped with acute tooth; propodus elongate, palm with about seven teeth, five fringed spines on mesial surface; unguis of dactylus strongly flexed; margin of dactylus with three strong triangular teeth. Uropodal exopod elongate, apically acute, margins serrate; endopod length little more than twice greatest width, outer margin serrate, apex acute. Telson elongate-elliptical, apically narrowly rounded; strong middorsal longitudinal rounded ridge running almost entire length.

RECORDS Off Venezuela, 95 m.

REMARKS Wägele (1981) made this species the type of his new genus *Nemanthura*, based primarily on the elongate form of the body and appendages. *Haliophasma irmae* Paul and Menzies, 1971, from the same locality as the above species, is probably the same species.

Licranthura Kensley and Schotte, 1987

DIAGNOSIS Serrate process on antennal peduncle article 3. Mandibular palp of three articles; molar lacking. Maxillipedal endite short. Pereopod 1 larger than pereopods 2 and 3. Pereopods 4–7, carpi triangular. Pleonites short, free. Pleopod 1, both rami forming operculum. Pleotelson lacking statocysts.

Licranthura amyle Kensley and Schotte, 1987

Figure 16

DIAGNOSIS ♀ 3.8 mm. Eyes small, pigmented. Antennular flagellum of three articles. Antennal peduncle article 3 with lamellar expanded process, serrate on mesial margin; flagellum of six articles. Maxillipedal palp of five articles; very short endite. Pereopod 1, propodal palm unarmed. Uropodal and telsonic margins serrate.

RECORDS Carrie Bow Cay, Belize, 0–25 m, in coral rubble.

Malacanthura Barnard, 1925

DIAGNOSIS Eyes present. Mandibular palp of three articles. Maxillipedal palp of three articles, terminal article usually broadly ovate. Pereopod 1, propodus expanded. Pereopods 4–7 with carpi roughly rectangular. Pleopod

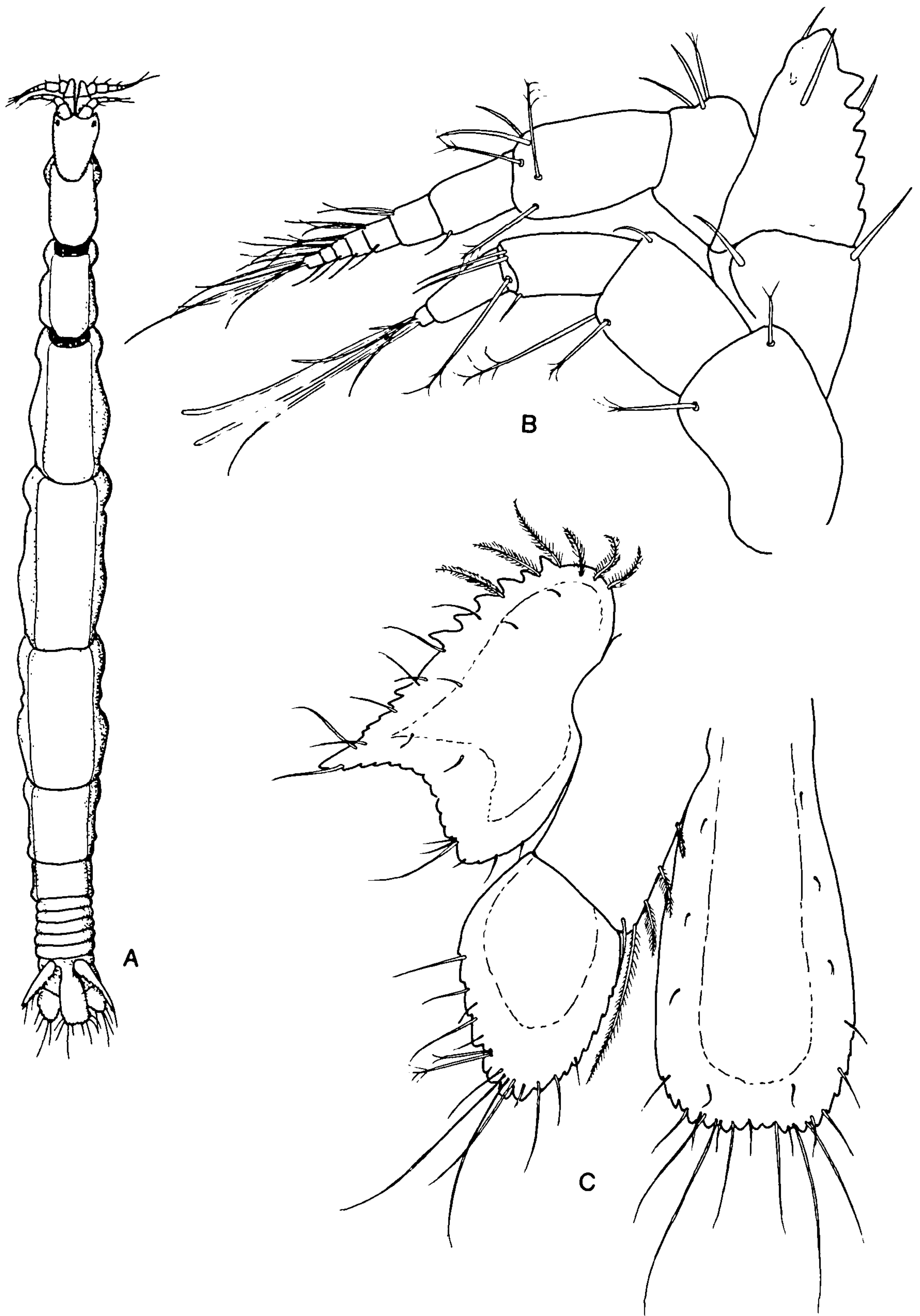


Figure 16. *Licranthura amyle*: A, ♀; B, antennule and antenna; C, telson and uropod.

1, exopod operculiform. Pleonites 1–5 short, fused; pleonite 6 dorsally demarcated. Pleotelson with two basal statocysts.

Malacanthura caribbica Paul and Menzies, 1971

Figure 17

DIAGNOSIS ♀ 27.1 mm. Integument moderately indurate. Antennular flagellum of seven articles. Antennal flagellum of four articles. Mandibular palp, article 3 with comb of 11 spines. Maxillipedal palp, terminal article broadly ovate, penultimate article with row of seven spines on mesial margin. Pereopod 1 propodus expanded, palm straight, with few spines on mesial margin. Uropodal exopod barely reaching base of endopod, narrow, apically acute, outer margin sinuate, serrate; endopod set obliquely on sympod, margin serrate, apically acute. Telson lanceolate, apically narrowly rounded, with strong longitudinal middorsal carina.

RECORDS Off Venezuela, 95 m; off Colombia, 42–44 m.

REMARKS *Malacanthura cumanensis* Paul and Menzies, 1971, described from the same locality as *M. caribbica*, was shown to be the latter species (Kensley, 1980).

Mesanthura Barnard, 1914

DIAGNOSIS ♀: Dorsal integument with (usually) species-specific pigment pattern; pigment persistent in alcohol. Mandibular palp of three articles, terminal article with row of spines, number of which specific for species. Maxilliped with endite either very reduced or absent; palp of three articles, with terminal article usually about half length of penultimate article, suture transverse. Pereopod 1, propodus expanded, palm often with step. Pereopods 2 and 3, propodi not expanded. Pereopods 4–7, carpi roughly triangular, with anterior margin shorter than posterior margin. Pleonites 1–5 fused, pleonite 6 dorsally demarked. Pleopod 1, exopod operculiform. Telson with two basal statocysts. ♂: Eyes larger than in ♀. Antennular flagellum of seldom more than 10 articles bearing numerous aesthetascs. Mouthparts, especially body of mandible, reduced. Pereopod 1, propodus bearing dense band of spines on mesial surface near palm. Pigment pattern more diffuse than in ♀, extending onto ventral surface.

REMARKS *Mesanthura* is a relatively large genus of about 30 species, recorded from most tropical and temperate seas, in shallow habitats. The males of few species have been recorded; by themselves, males are difficult to identify as the dorsal pigment pattern characteristic of the female breaks down and spreads onto the ventrum.

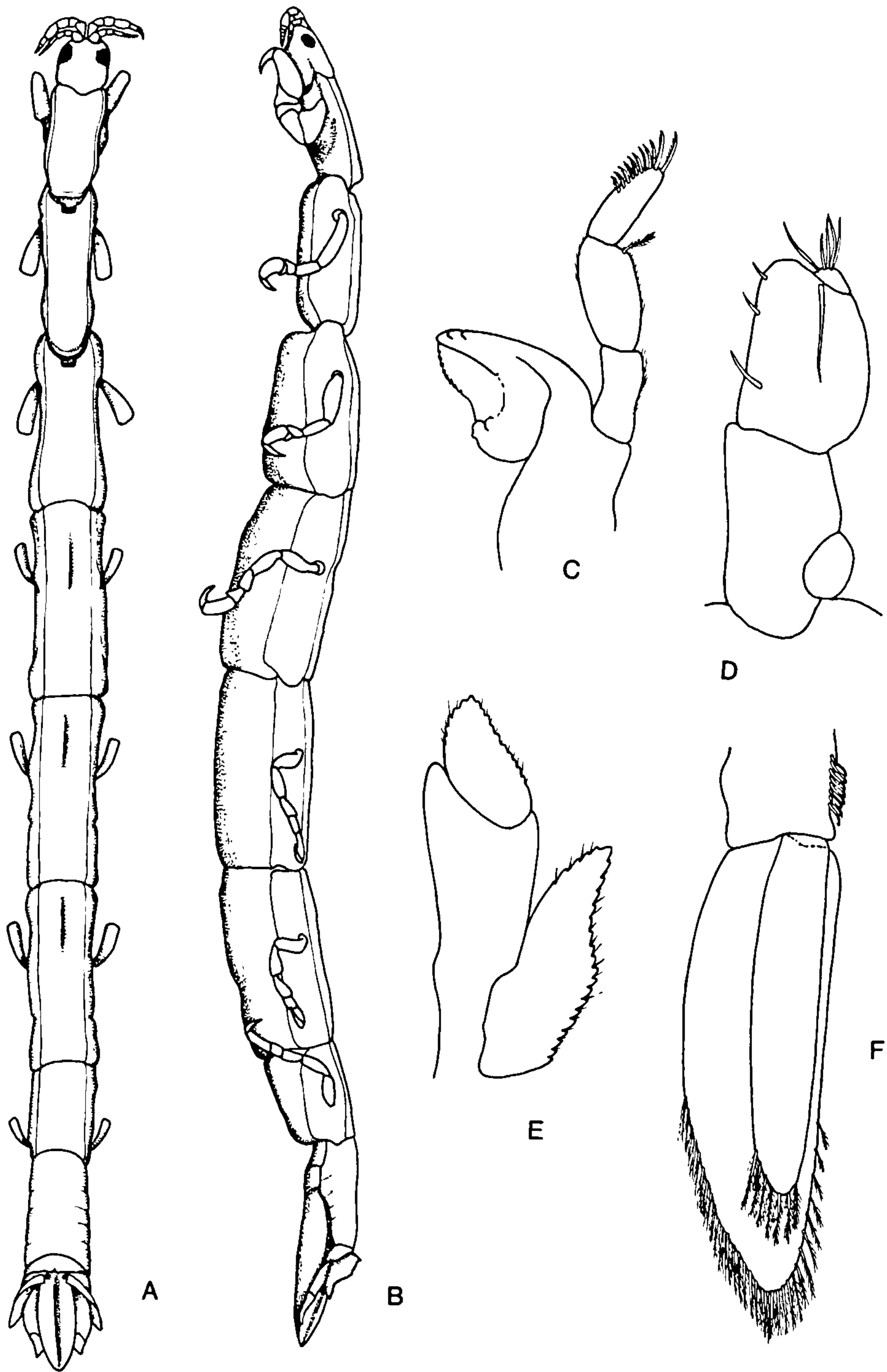


Figure 17. *Malacanthura caribbica*: A, ♀; B, ♀, lateral view; C, mandible; D, maxilliped; E, uropod; F, pleopod 1.

Key to species of *Mesanthura* (♀ only)

1. Pigment in tiny evenly scattered chromatophores over body; cephalon with solid patch of pigment; mandibular palp article 3 with seven spines *punctillata*
 Pigment not evenly scattered over body 2
2. Pereonites 4 and 5 with patch of pigment, sometimes with unpigmented area in middle of patch 3
 Pereonites 4 and 5 lacking fairly solid patch of pigment 6
3. Pereonites 4 and 5 lacking unpigmented area in pigment patch; five transverse lines on pigment on pleon; mandibular palp article 3 with six spines *paucidens*
 Pereonites 4 and 5 with unpigmented area in pigment patch; pleon lacking transverse pigment lines 4
4. Pigment in obvious double longitudinal bands on pereon and pleon; mandibular palp article 3 with nine spines *bivittata*
 Pigment not in obvious double bands 5
5. Unpigmented area in middle of pigment patch of pereonites 1–3; mandibular palp article 3 with 10 spines *pulchra*
 No unpigmented area in middle of pigment of pereonites 1–3; mandibular palp article 3 with eight spines *loensis*
6. Pigment of pereon in fine reticulate lines; mandibular palp article 3 with six spines *reticulata*
 Pigment of pereon not in fine reticulate lines; mandibular palp article 3 with four spines 7
7. Pigment in more or less complete rings on pereonites 1–6 *hopkinsi*
 Pigment in strong transverse posterior bars on pereonites 4–7 .. *fasciata*

Mesanthura bivittata Kensley, 1987a

Figures 18A, 20A–D

DIAGNOSIS ♂ 5.2 mm, ovigerous ♀ 7.8 mm. Pigment in obvious double longitudinal bands on pereon and pleon. Mandibular palp article 3 with nine spines. Maxilliped lacking endite. Pereopod 1, propodal palm with rounded lobe.

RECORDS Twin Cays, Belize, under red mangroves, 1–2 m.

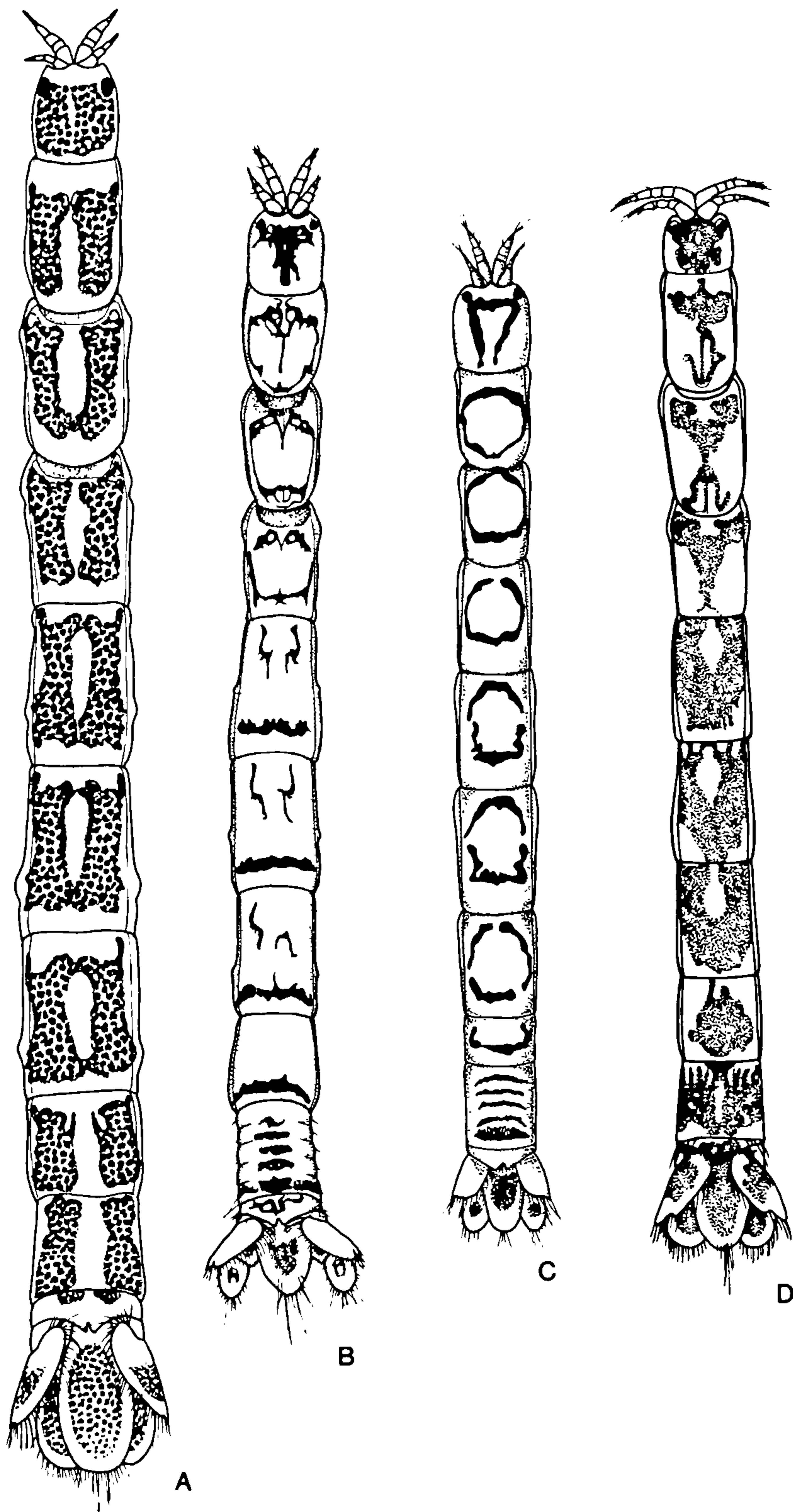


Figure 18. A, *Mesanthura bivittata*; B, *Mesanthura fasciata*; C, *Mesanthura hopkinsi*; D, *Mesanthura loensis*.

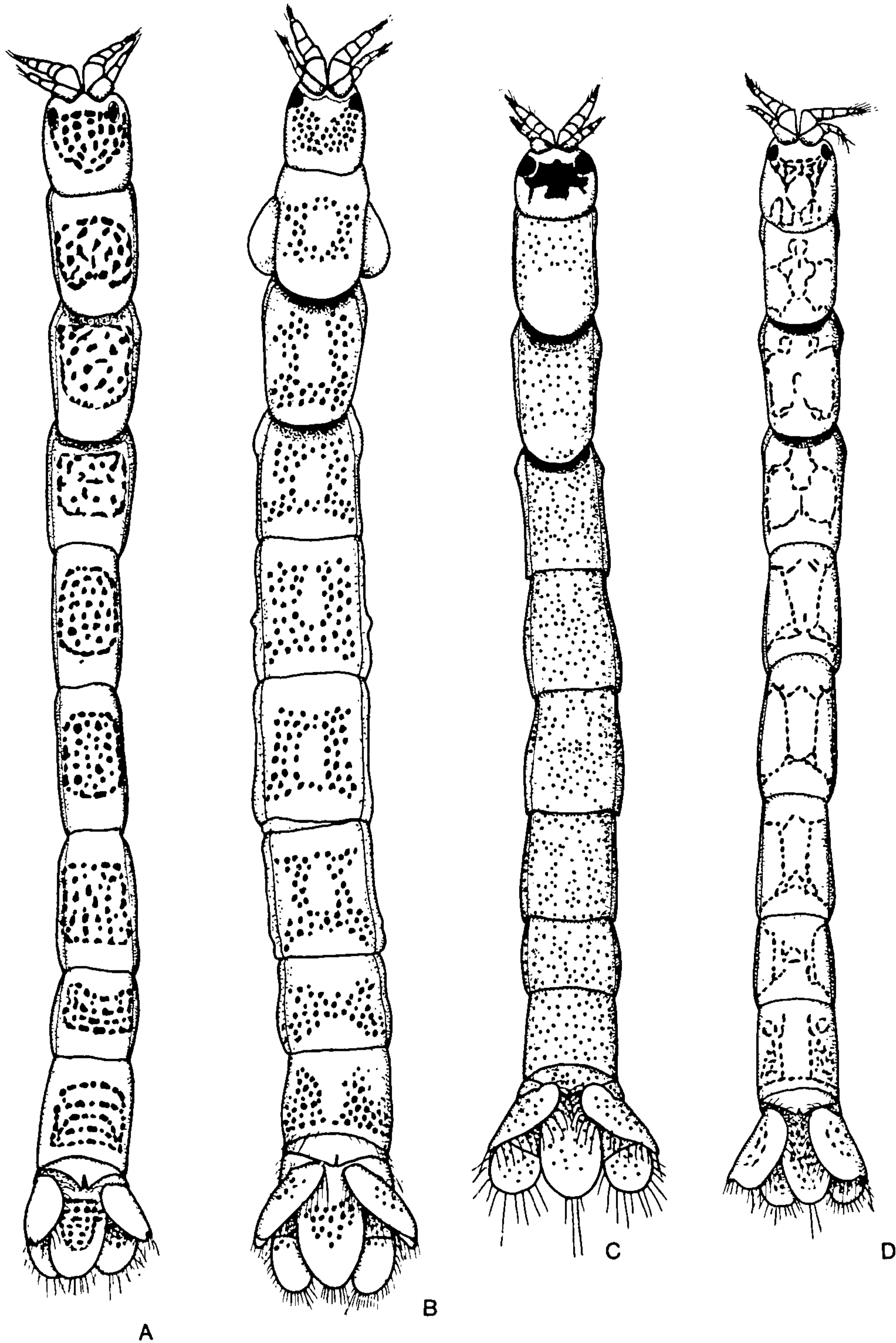


Figure 19. A, *Mesanthura paucidens*; B, *Mesanthura pulchra*; C, *Mesanthura punctillata*; D, *Mesanthura reticulata*.

Mesanthura fasciata Kensley, 1982

Figures 18B, 20E-H

DIAGNOSIS ♀ 4.5 mm. Pigment in triangular patch on head, open irregular rings on peronites 1-3; peronites 4-7 with strong transverse posterior bar;

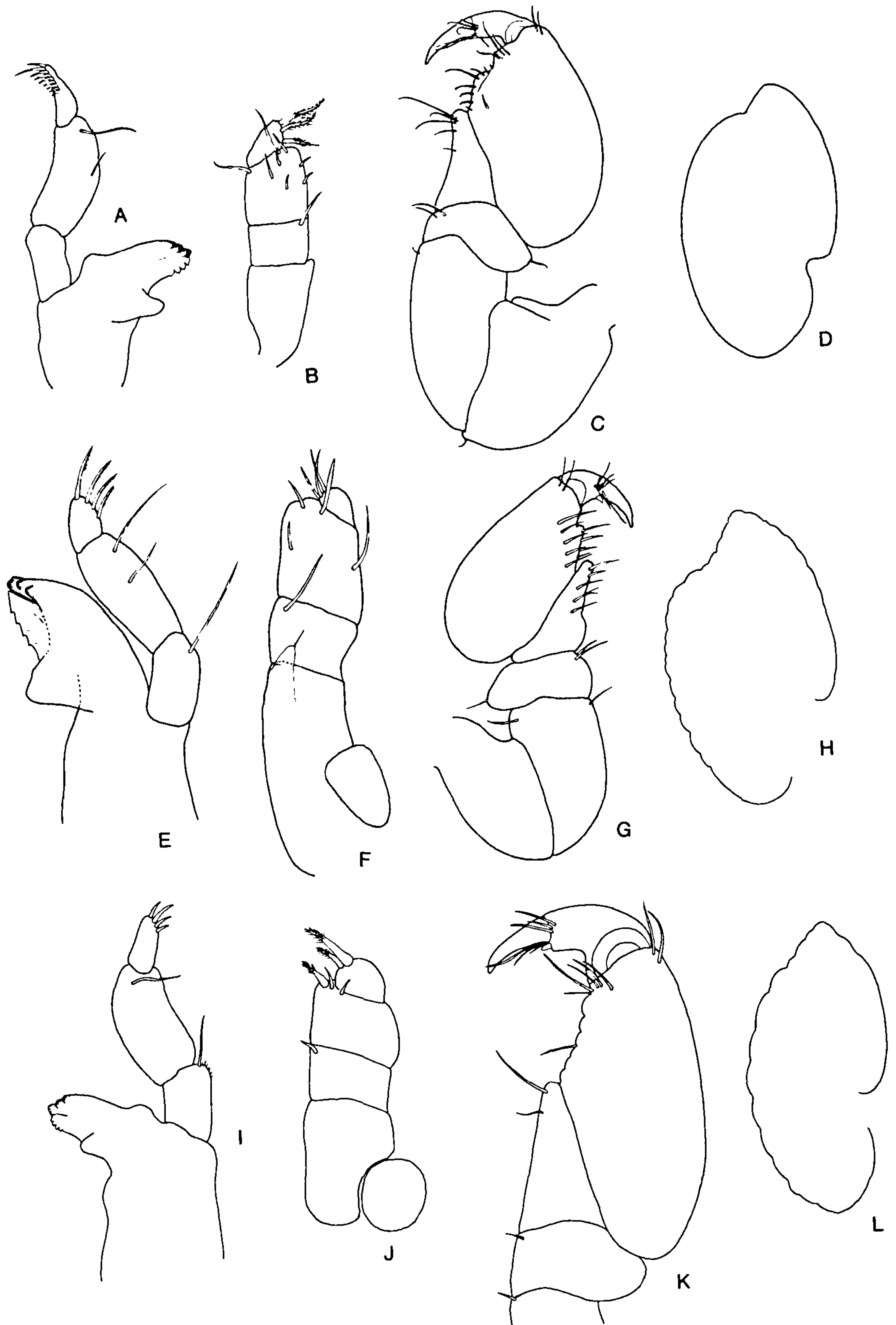


Figure 20. *Mesanthura bivittata*: A, mandible; B, maxilliped; C, pereopod 1; D, uropodal exopod. *Mesanthura fasciata*: E, mandible; F, maxilliped; G, pereopod 1; H, uropodal exopod. *Mesanthura hopkinsi*: I, mandible; J, maxilliped; K, pereopod 1; L, uropodal exopod.

five bars on pleon. Mandibular palp article 3 with four spines. Maxilliped with very reduced endite. Pereopod 1, propodal palm with step.

RECORDS Looe Key, Florida, 5–6 m; Cozumel, Mexico; Jamaica; Carrie Bow Cay, Belize, 0.2–6 m.

Mesanthura hopkinsi Hooker, 1985

Figures 18C, 20I–L

DIAGNOSIS ♀ 2.4 mm. Pigment in triangle on cephalon; in irregular rings on pereonites 1–6; four transverse bars on pleon. Mandibular palp article 3 with four spines. Maxilliped lacking endite. Pereopod 1, palm of propodus lacking step.

RECORDS Looe Key, Florida, 0.5 m; Florida Middlegrounds, Gulf of Mexico, 55 m.

Mesanthura looensis Kensley and Schotte, 1987

Figures 18D, 21A–D

DIAGNOSIS ♀ 10.0 mm. Pigment in solid patches on cephalon, pereonites, pleon, uropods and telson; pereonites 4–6 with open central area in patch. Mandibular palp article 3 with eight spines. Maxilliped lacking endite. Pereopod 1, propodal palm with step.

RECORDS Looe Key, Florida, 1 m.

Mesanthura paucidens Menzies and Glynn, 1968

Figures 19A, 21E–I

DIAGNOSIS ♀: 6.6 mm. Pigment in roughly rectangular to ovate patches on cephalon and pereonites; in five transverse lines connected laterally on pleon. Mandibular palp article 3 with six spines. Maxilliped with short narrow endite. Pereopod 1 propodal palm with step. ♂: 6.4 mm. Antennular flagellum of seven articles. Pigment more diffuse than in ♀ but retaining five pleonal bars.

RECORDS Looe Key, Florida, 5–6 m; Carrie Bow Cay, Belize, 15.2 m; Puerto Rico, intertidal; Jamaica.

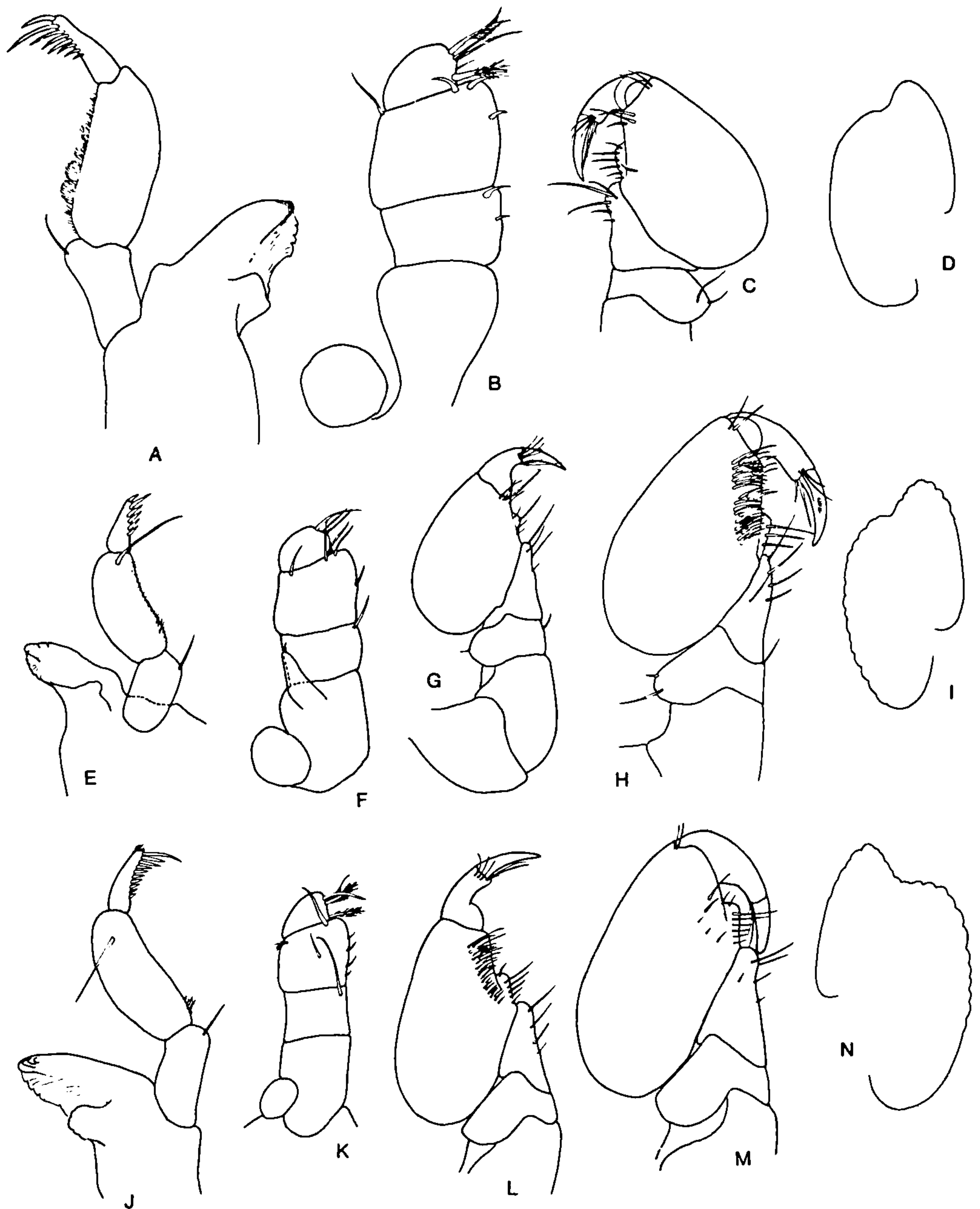


Figure 21. *Mesanthura loensis*: A, mandible; B, maxilliped; C, pereopod 1; D, uropodal exopod. *Mesanthura paucidens*: E, mandible; F, maxilliped; G, pereopod 1, ♀; H, pereopod 1, ♂; I, uropodal exopod. *Mesanthura pulchra*: J, mandible; K, maxilliped; L, pereopod 1, ♂; M, pereopod 1, ♀; N, uropodal exopod.

Mesanthura pulchra Barnard, 1925

Figures 19B, 21J–N

DIAGNOSIS ♀: 9.3 mm. Pigment pattern in roughly rectangular patches on cephalon and pereonites 1–6, with open oval middorsal area in patch. Mandibular palp article 3 with 10 spines. Maxilliped lacking endite. Pereopod 1, propodal palm with step. ♂: 5.4 mm. Antennular flagellum of eight articles.

RECORDS Egmont Key, Florida, 18.3–36.6 m; Looe Key, Florida, 0.5–12 m; Dry Tortugas; Turks and Caicos Islands, 1 m; Puerto Rico, intertidal to 1.5 m; Carrie Bow Cay, Belize, intertidal to 1.5 m; St. Thomas and St. John's, U.S. Virgin Islands; Cozumel, Mexico.

REMARKS Menzies and Glynn (1968) recorded this species as *M. decorata* from Puerto Rico, while Menzies and Kruczynski (1983) recorded it as *M. floridensis*.

Mesanthura punctillata Kensley, 1982

Figures 19C, 22A–F

DIAGNOSIS ♀: 6.4 mm. Pigment in solid patch between eyes, rest of pigment on pereon and pleon with chromatophores scattered, diffuse, not in any regular pattern. Mandibular palp article 3 with seven spines. Maxilliped lacking endite; terminal palp article semicircular. Pereopod 1 propodal palm with step. ♂: 4.5 mm. Antennular flagellum of 10 articles.

RECORDS Turks and Caicos Islands, 1 m; Carrie Bow Cay, 0.2–20 m.

Mesanthura reticulata Kensley, 1982

Figures 19D, 22G–J

DIAGNOSIS ♀ 6.1 mm. Dorsal pigment pattern a network of chromatophores arranged in fine lines. Mandibular palp article 3 with six spines. Maxilliped lacking endite. Pereopod 1 propodal palm with step.

RECORDS Carrie Bow Cay, 10–24 m.

Minyanthura Kensley, 1982

DIAGNOSIS Mandible lacking molar and palp. Maxillipedal palp of five articles; large apically acute endite present. Pereopods 4–7, carpi rectangular. Pleopod 1, both rami forming operculum. Pleonites 1–5 fused; pleonite 6 fused with telson, not dorsally demarked. Telson with two basal statocysts.

Minyanthura corallicola Kensley, 1982

Figure 23

DIAGNOSIS ♀: 1.7 mm. Antennular flagellum of one article. Antennal

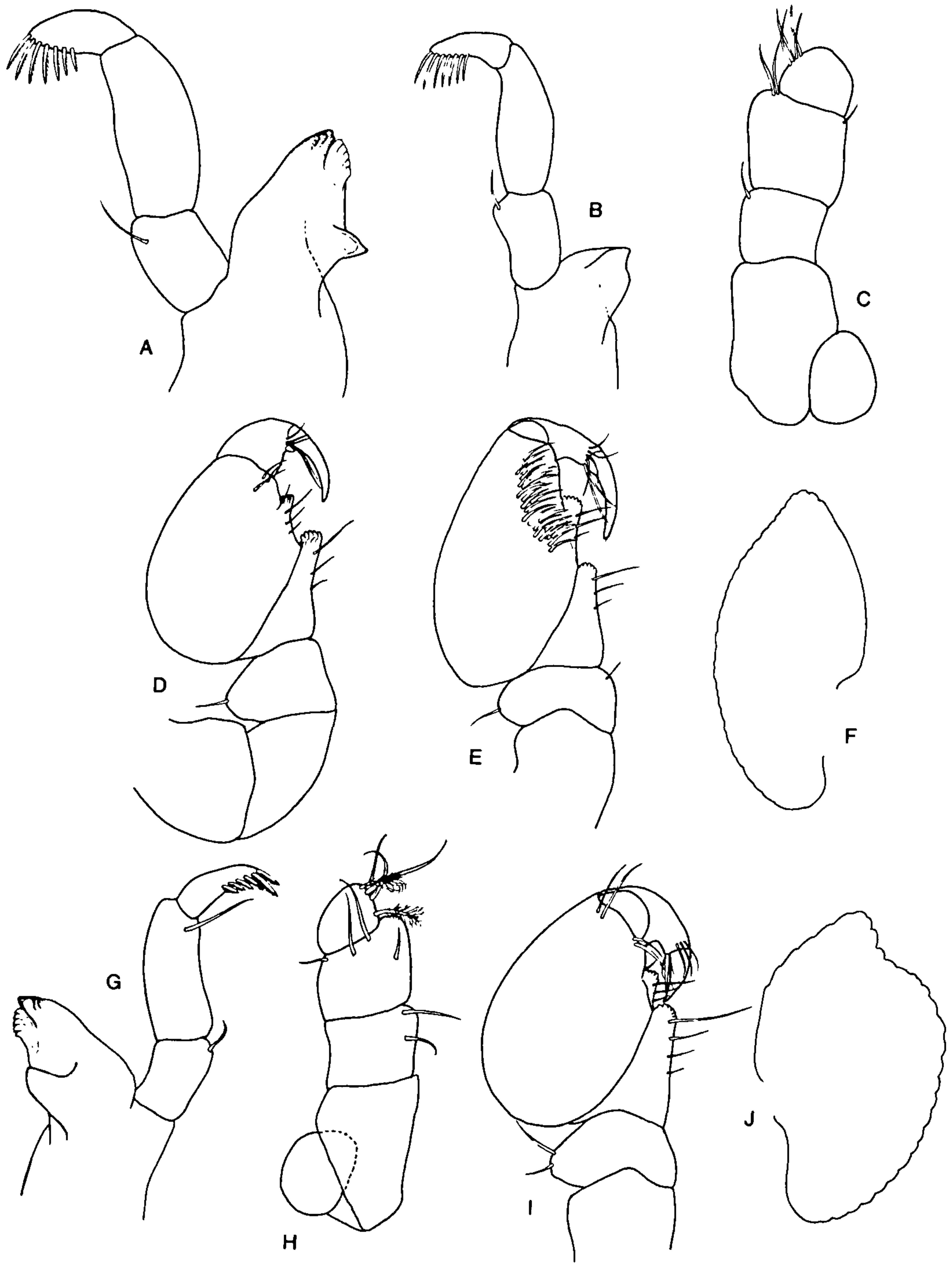


Figure 22. *Mesanthura punctillata*: A, mandible, ♀; B, mandible ♂; C, maxilliped; D, pereopod 1, ♀; E, pereopod 1, ♂; F, uropodal exopod. *Mesanthura reticulata*: G, mandible; H, maxilliped; I, pereopod 1; J, uropodal exopod.

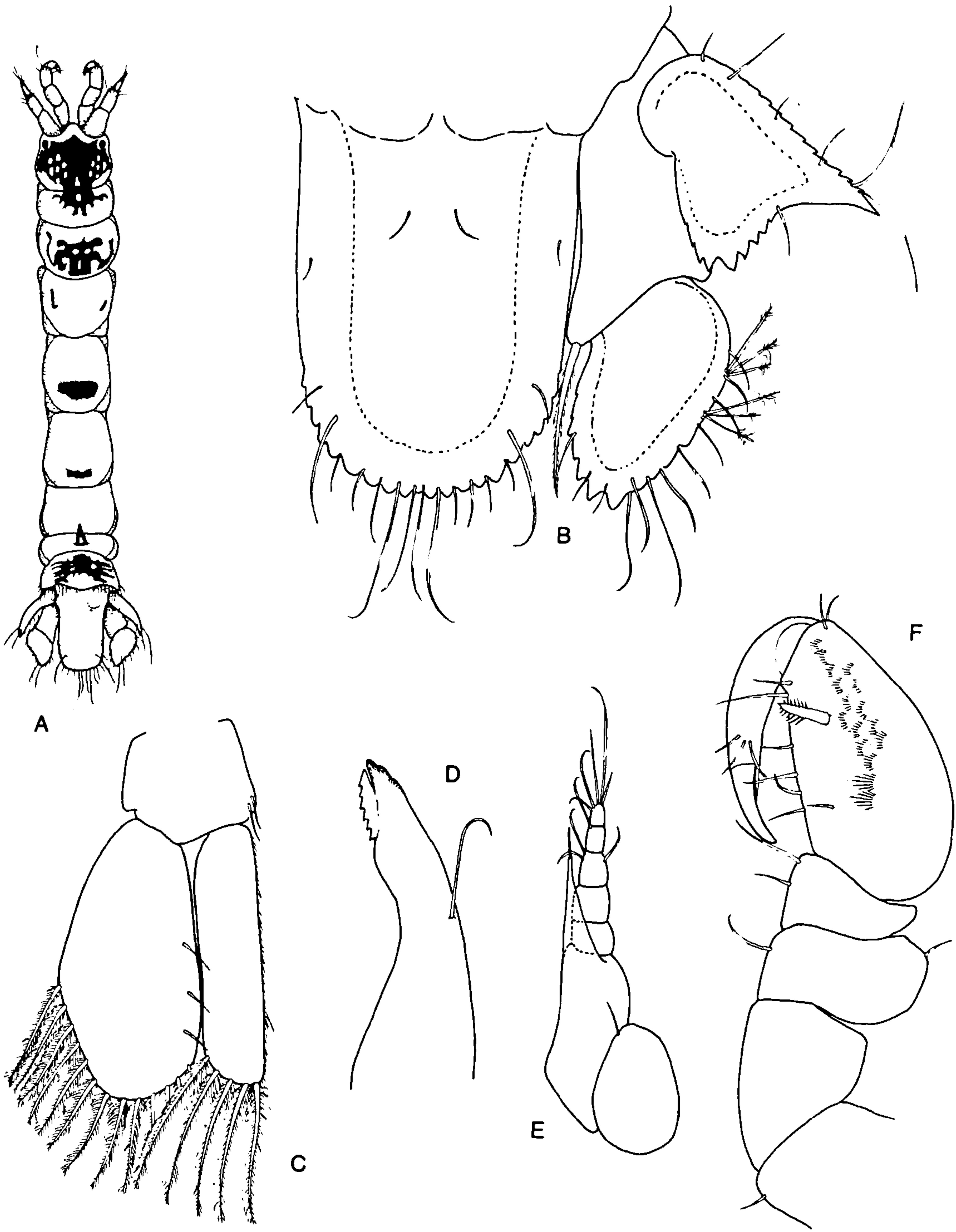


Figure 23. *Minyanthura corallicola*: A, ♀; B, telson and uropod; C, pleopod 1; D, mandible; E, maxilliped; F, pereopod 1.

flagellum of four articles. Pereopod 1, propodus somewhat inflated. Uropodal rami and posterior telsonic margin serrate. ♂: 1.3 mm. Eyes larger than in ♀. Antennular flagellum of three articles. Antennal flagellum of two articles.

RECORDS Carrie Bow Cay, Belize, 6–24 m; Barbados, 9–15 m; Jamaica.

Pendantthura Menzies and Glynn, 1968

DIAGNOSIS ♀: Integument with some red-brown dorsal pigmentation. Eyes small, pigmented. Antennular flagellum of two articles. Antennal flagellum of one article. Mandibular palp of single reduced article; incisor, molar, and lamina dentata present. Maxillipedal palp of single broad article; small triangular endite present. Pereopod 1, propodus expanded. Pereopods 4–7, carpi short, triangular, lacking free anterior margin. Pleonites 1–5 very short, fused, 6 fused with telson. Pleopod 1, exopod operculiform. Telson basally broad, with two statocysts at about midlength. ♂: Antennular peduncle of four articles. Antennal flagellum of one article. Pereopod 1, propodus with dense clump of spines on mesial surface. Eyes only slightly larger than in ♀.

REMARKS The genus comprises three species, two from the Caribbean and one from the Pacific, all of which have been taken from shallow coral reefs.

Key to species of *Pendantthura*

1. Dorsal pigmentation over entire body; pereopod 1, propodal palm with rounded lobe *tanaiformis*
 Dorsal pigmentation on cephalon, pereonite 2, and pleon; pereopod 1, propodal palm lacking rounded lobe *hendleri*
-

Pendantthura hendleri Kensley, 1984

Figure 24A–E

DIAGNOSIS ♀: 3.3 mm. Dorsal pigmentation limited to cephalon, pereonite 2, and very short pleon. Reduced mandibular palp with two setae. Pereopod 1, propodus expanded, palm gently convex, lacking rounded lobe, with four spines on mesial surface near palmar margin. ♂: 2.8 mm. Pigmentation as in ♀. Pereopod 1, propodal palm gently convex, lacking rounded lobe.

RECORDS Carrie Bow Cay, Belize, 9–23 m; Twin Cays, Belize, 0–2 m; Panama, 30 m.

Pendantthura tanaiformis Menzies and Glynn, 1968

Figure 24F–H

DIAGNOSIS Ovigerous ♀: 2.9 mm. Dorsal pigmentation a dense red-brown

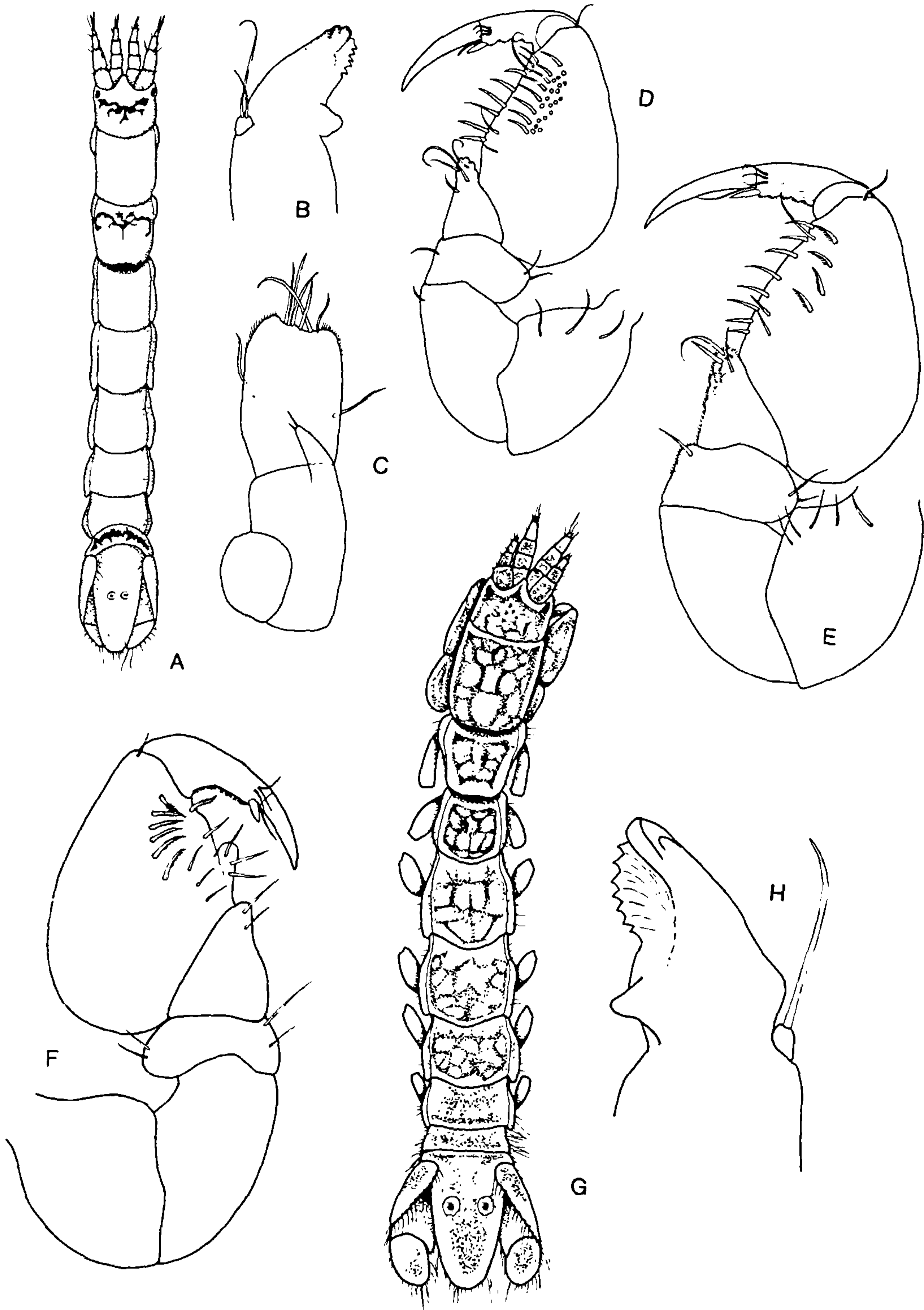


Figure 24. *Pendantura hendleri*: A, ♀; B, mandible; C, maxilliped; D, pereopod 1, ♂; E, pereopod 1, ♀. *Pendantura tanaiiformis*: F, pereopod 1, ♀; G, ♀; H, mandible.

reticulation over entire dorsum. Mandibular palp with one seta. Pereopod 1, propodus expanded, palm with rounded lobe, mesial surface with six spines near palmar margin. ♂: 2.8 mm. Pigmentation as in ♀. Propodal palm with rounded lobe.

RECORDS Bermuda; Carrie Bow Cay, Belize, intertidal to 1 m; Puerto Rico, intertidal; Cozumel, Mexico.

REMARKS Kensley (1984) characterized this common species of the intertidal of the reef crest as stress-tolerant, breeding throughout the year.

Skuphonura Barnard, 1925

DIAGNOSIS Antennal flagellum of single article. Cephalon with midventral toothlike process at base of mouthparts. Mandibular palp of three articles. Maxillipedal palp of three articles; endite lacking. Pereopod 1, propodus expanded. Pereopods 4–7, carpi triangular. Pleopod 1, exopod operculiform. Pleonites 1–5 fused; pleonite 6 dorsally demarked. Pleotelson with two basal statocysts.

Skuphonura laticeps Barnard, 1925

Figure 25

DIAGNOSIS ♂ 6.0 mm. Cephalon wider anteriorly than posteriorly, with anterolateral lobes extending well beyond rostrum. Antennular flagellum of two articles. Pereonite 1 with strong midventral forwardly directed tooth. Pereopod 1, carpus with posterodistal angle produced into triangular lobe; propodus expanded, palmar margin proximally convex, numerous setae on mesial surface. Pleopod 2, copulatory stylet of endopod reaching beyond rami. Pleonite 6 dorsally demarked, posterior margin middorsally incised. Uropodal exopod ovate, with distal notch; endopod length slightly more than basal width. Pleotelson widest at midlength, posteriorly narrowly rounded, with broadly rounded longitudinal raised area.

RECORDS St. Thomas, U.S. Virgin Islands, 8–40 m.

Family Hyssuridae Wägele, 1981

DIAGNOSIS Maxillipedal palp usually of five articles; endite present. Pereopods 1–3 subsimilar, often all three pairs subchelate. Pleopod 1 similar to

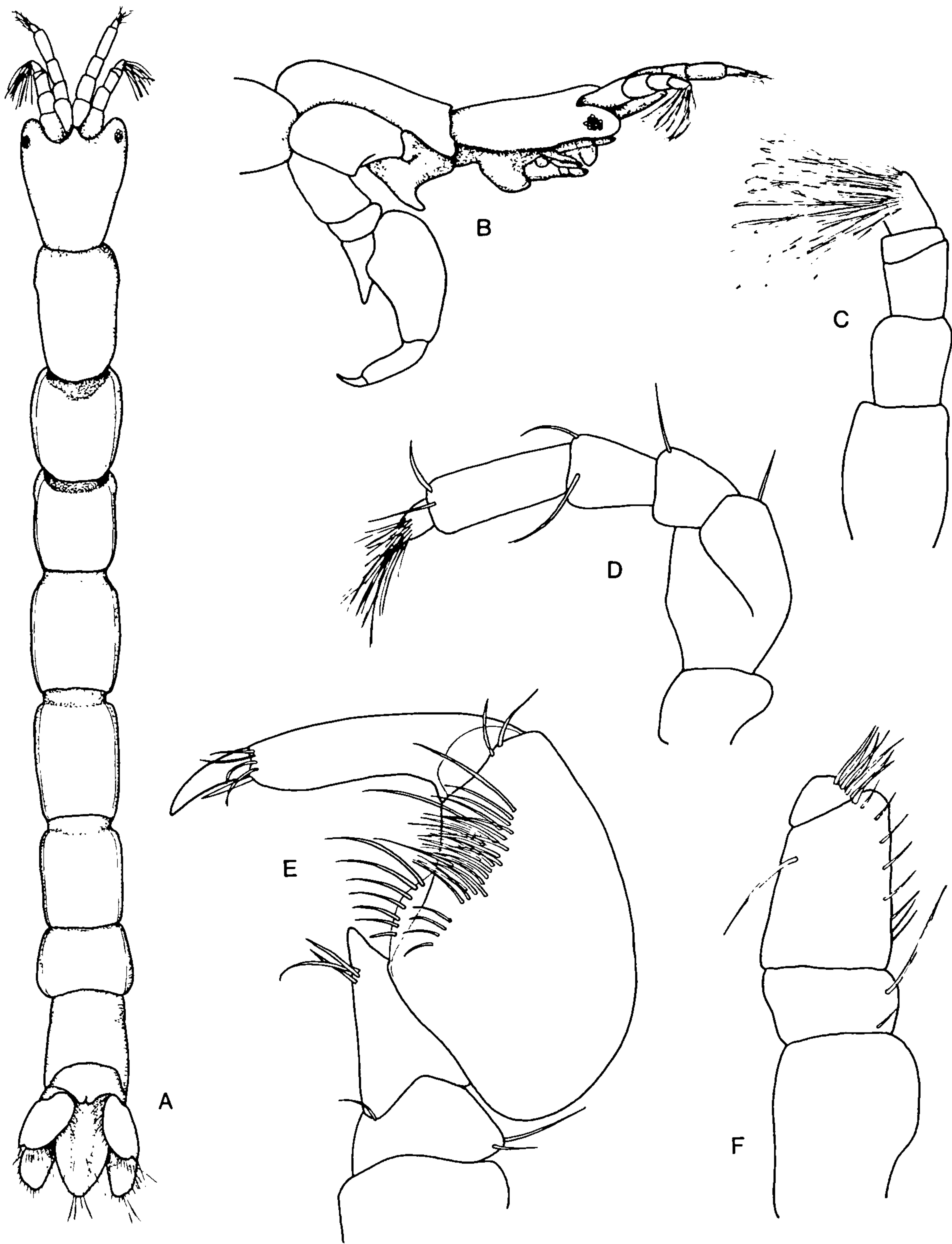


Figure 25. *Skuphonura laticeps*: A, ♂; B, cephalon and pereonite 1, lateral view; C, antennule, ♂; D, pereopod 1, ♂; E, antenna; F, maxilliped.

following pleopods, not operculiform. Pleonites 1–5 freely articulating, relatively elongate. Pleotelson lacking statocysts.

Key to genera of Hyssuridae

1. Pleotelson not covered by uropodal exopods; maxillipedal rami basally free *Kupellonura*
 Pleotelson covered completely by uropodal exopods; maxillipedal rami basally fused *Xenanthura*
-

Kupellonura Barnard, 1925

DIAGNOSIS Mandibular palp of three articles. Maxillipedal palp of five articles; large endite present. Pereopods 1–3 similar, propodi somewhat expanded. Pereopods 4–7, carpi triangular. Pleonites 1–5 elongate, free, subequal. Pleopods 1–5 similar.

Kupellonura imswe (Kensley, 1982)

Figures 26, 27

DIAGNOSIS ♀: 3.4 mm. Eyes present. Antennular flagellum of four articles. Antennal flagellum of seven articles. Maxillipedal endite reaching to base of article 3. Pereopods 1–3 similar; pereopod 1, carpus posterodistally acute; propodus expanded, palm straight, unarmed; carpus triangular, free anterior margin shorter than posterior. Pleonite 6 with middorsal incision in posterior margin. Uropodal exopod, outer margin serrate, distally narrowly rounded; endopod length twice greatest width. Telson widest at midlength, posterolateral margin serrate, apically broadly rounded. ♂: 2.7 mm. Eyes larger than in ♀. Mouthparts reduced. Pereopod 1, propodal palm armed with row of eight fringed spines.

RECORDS Carrie Bow Cay, Twin Cays, Glover's Reef, Belize, 0–6.0 m; Montego Bay, Jamaica, 1 m.

Xenanthura Barnard, 1925

DIAGNOSIS Mandibular palp of single article. Maxillipedal rami fused; articulations of palp articles obscure. Pereopods 1–3 similar. Pereopods 4–7, carpi triangular.

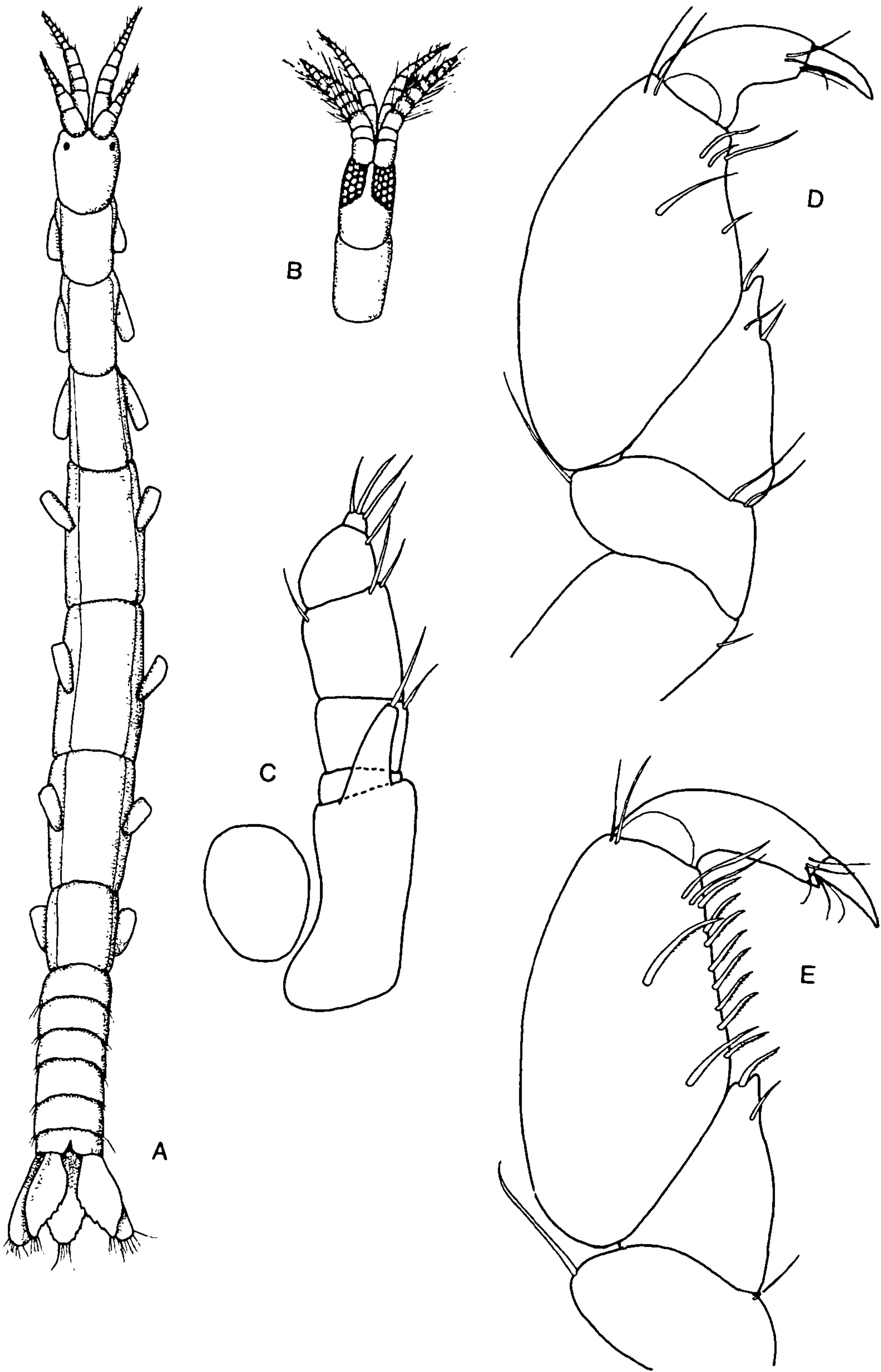


Figure 26. *Kupellonura imswe*: A, ♀; B, cephalon and pereonite 1, ♂; C, maxilliped; D, pereopod 1, ♀; E, pereopod 1, ♂.

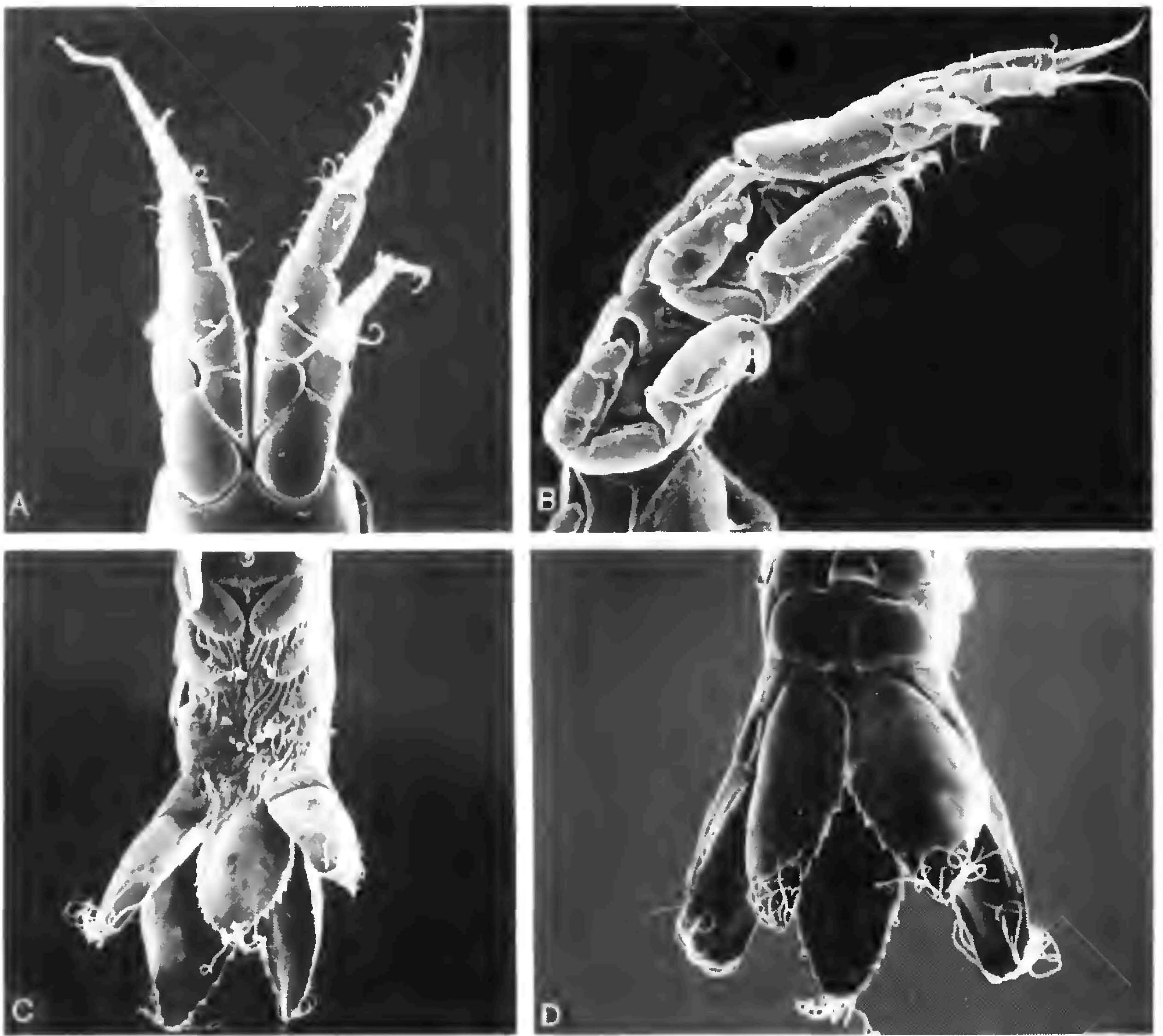


Figure 27. *Kupellonura imswe*: A, ♀ cephalon, dorsal view; B, posterior pleon, dorsal view; C, pleon, ventral view; D, cephalon and pereonites 1 and 2, lateral view.

Xenanthura brevitelson Barnard, 1925

Figure 28

DIAGNOSIS ♀: 4.0 mm. Ommatidia of eyes in longitudinal row of three or four groups. Antennular flagellum of three articles. Antennal flagellum of three articles. Mandibular palp of single short article bearing single seta. Maxillipedal rami basally fused, palp of three or four obscurely separated articles. Pereopods 1–3 similar, carpus of pereopod 2 triangular, with strong triangular projecting lobe posterodistally; propodi expanded, palm incised into several rounded lobes. Uropodal exopods circular, overlapping dorsally and covering telson; endopod projecting beyond exopods ventrally, mesial margin with step, distally rounded. Telson shorter than uropodal exopod, posterior margin truncate to faintly concave. ♂: 3.5 mm. Antennular flagellum of seven articles.

RECORDS Off Georgia, 20–145 m; off Florida, 8–10 m; Turks and Caicos Islands, 1 m; St. Thomas, U.S. Virgin Islands, 50–60 m; Gulf of Mexico.

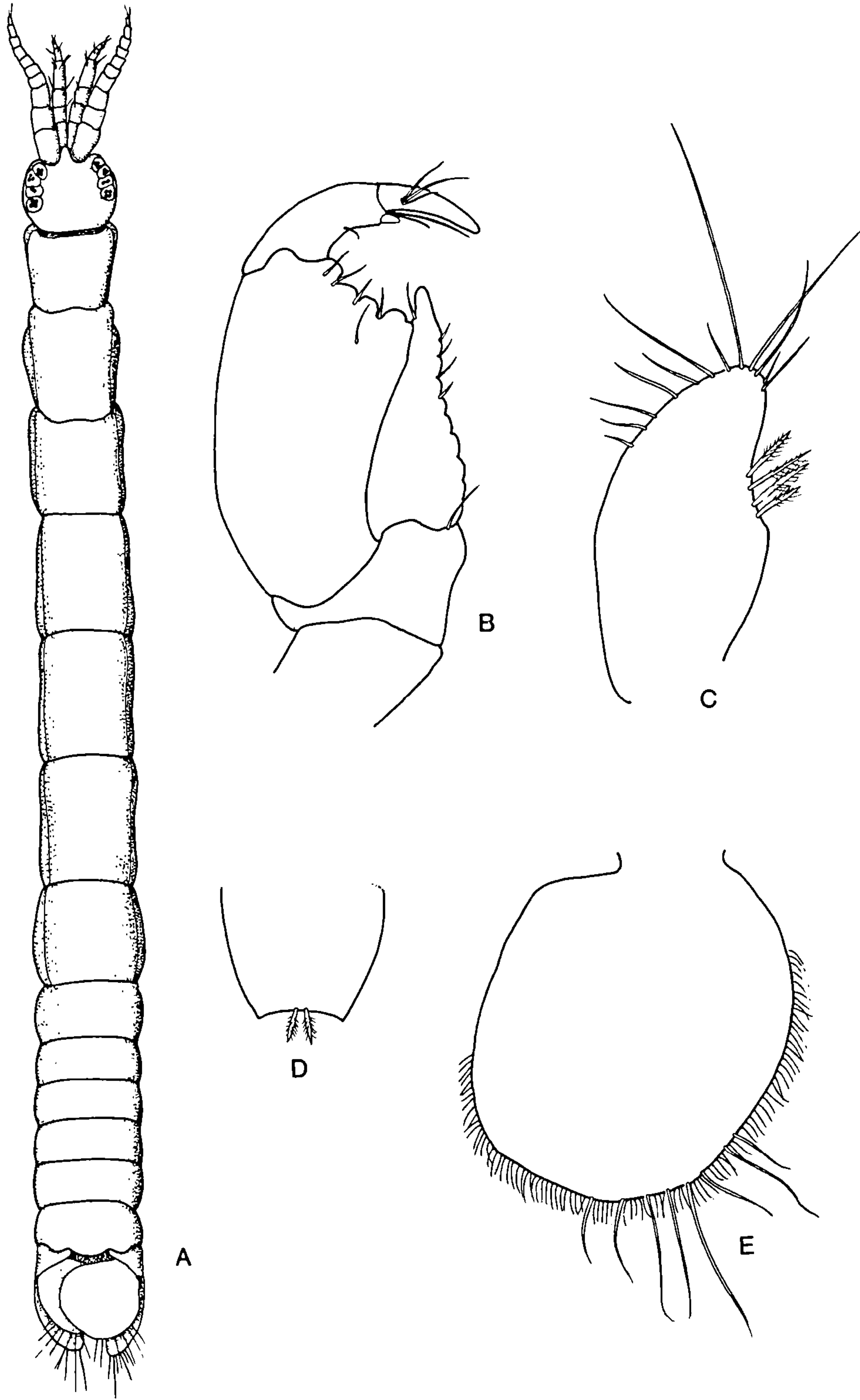


Figure 28. *Xenanthura brevitelson*: A, ♀; B, pereopod 1; C, uropodal endopod; D, telson; E, uropodal exopod.

Family Paranthuridae Menzies and Glynn, 1968

DIAGNOSIS Mouthparts together forming somewhat elongate cone adapted for piercing and sucking. Mandible with styliform incisor, lacking lamina dentata and molar. Maxilla slender, styliform, distally serrate. Maxilliped elongate; number of palp articles usually reduced. Pereopod 1, or pereopods 1–3 subchelate. Pleopod 1 exopod operculiform. Pleonites short, free or fused. Pleotelson with single basal statocyst, or lacking statocyst.

Key to genera of Paranthuridae

1. Pereopod 7 lacking in adult 2
 Pereopod 7 present in adult 3
 2. Eyes present *Colanthura*
 Eyes absent *Curassanthura*
 3. Antennular and antennal flagellum of more than 10
 articles *Accalathura*
 Antennular and antennal flagella with fewer than 10 articles 4
 4. Antennal flagellum a single (rarely two or 3) flattened article;
 maxillipedal palp of one or two articles *Paranthura*
 Antennal flagellum of seven articles; maxillipedal palp of three articles
 *Virganthura*
-

Accalathura Barnard, 1925

DIAGNOSIS Eyes present. Antennular and antennal flagella multiarticulate, each of more than 10 articles. Mandibular palp of three articles. Maxillipedal

Key to species of *Accalathura*

1. Uropodal exopod elongate-narrow; endopod length twice basal width
 *crenulata*
 Uropodal exopod ovate, apically subacute; endopod length 1.5 times
 basal width *setosa*
-

palp of two articles, endite almost reaching end of palp. Pereopod 1 subchelate, propodus inflated, larger than pereopods 2 and 3. Pereopods 4–7, carpi with anterior and posterior margin subequal. Pleonites free, short. Pleopod 1, exopod operculiform. Telson with single statocyst.

Accalathura crenulata (Richardson, 1901)

Figure 29A–D

DIAGNOSIS ♀: 16.0 mm. Antennular flagellum of about 26 articles. Antennal flagellum of about 18 articles. Uropodal exopod narrow, parallel sided. Telson apically subacute. ♂: 15.0 mm. Pleopod 2, copulatory stylet of endopod apically acute, with subapical “heel.”

RECORDS Off North Carolina, 30 m; off Georgia, 20 m; Cuba; Puerto Rico, intertidal; Cozumel, Mexico; Carrie Bow Cay, Twin Cays, Belize, intertidal to 6 m; west coast of Florida, Gulf of Mexico, 55 m.

Accalathura setosa Kensley, 1984

Figure 29E–H

DIAGNOSIS ♀: 8.5 mm. Antennular flagellum of 11 articles. Antennal flagellum of 13 articles. Uropodal rami, margins closely setose; exopod ovate, outer margin sinuate, apex subacute; endopod ovate, length 1.25 times greatest width. Telson apically rounded. ♂: 7.0 mm. Pleopod 2, copulatory stylet of endopod apically strongly bifid.

RECORDS Carrie Bow Cay, Belize, intertidal to 0.5 m.

Colanthura Richardson, 1902

DIAGNOSIS Integument with minute squamae. Mandible lacking palp. Maxillipedal palp articles fused except for minute terminal article. Pereopod 1 subchelate, propodus expanded. Pereopods 2 and 3 subchelate but smaller than pereopod 1. Pereopods 4–6, carpi rectangular. Pereonite 7 very short, pereopod 7 lacking. Pleotelson lacking statocyst.

Colanthura tenuis Richardson, 1902

Figure 30A–C

DIAGNOSIS ♀: 3.5 mm. Eyes present. Integument diffusely brown in color. Antennular flagellum of four articles. Antennal flagellum of single article.

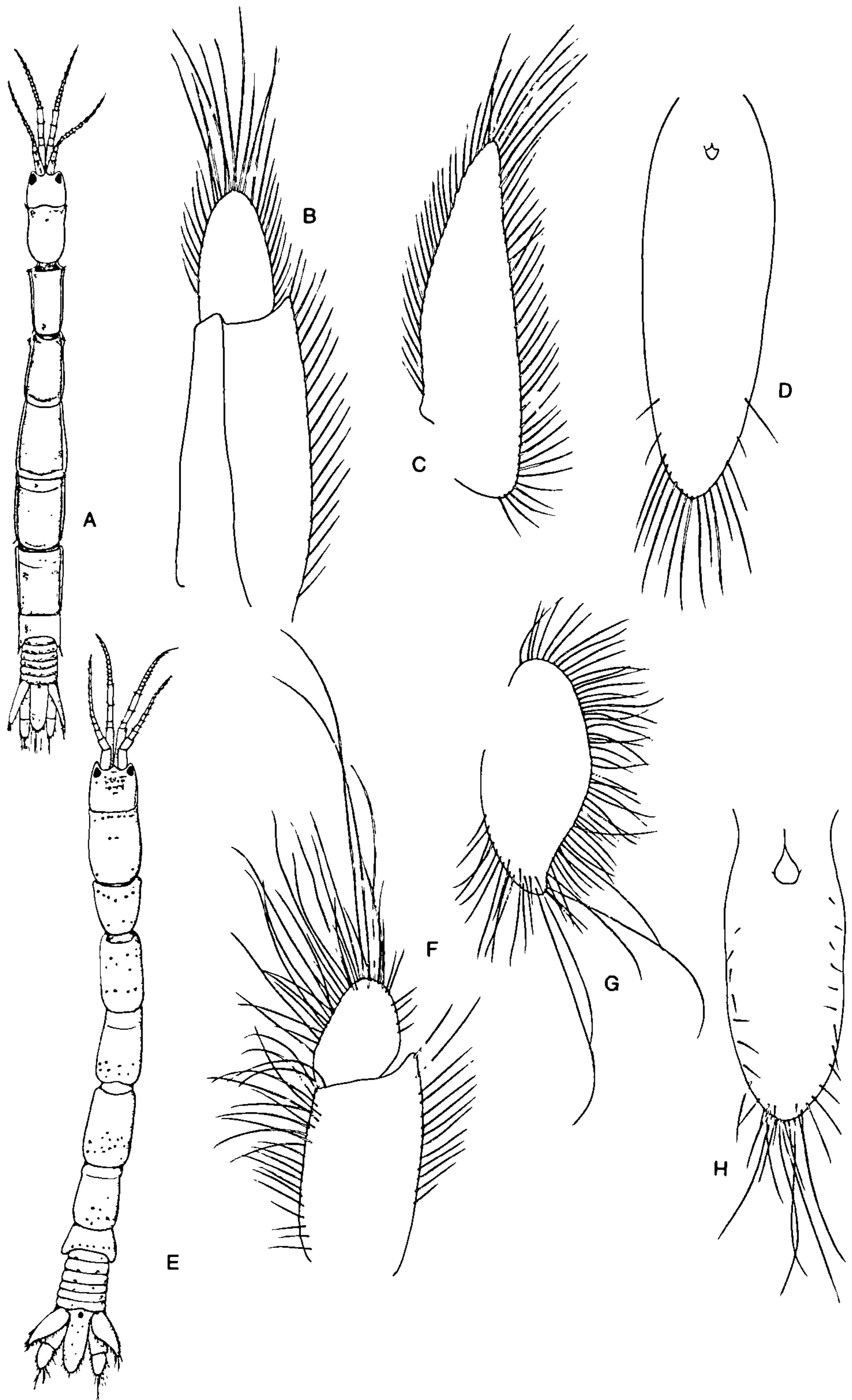


Figure 29. *Accalathura crenulata*: A, ♀; B, uropodal sympod and endopod; C, uropodal exopod; D, telson. *Accalathura setosa*: E, ♀; F, uropodal sympod and endopod; G, uropodal exopod; H, telson.

Pereopod 1, propodus with mesial surface bearing proximal row of six spines. Pleonites 1–5 short, fused, boundaries marked dorsally by folds. Telson posteriorly broadly rounded. ♂: 3.5 mm. Antennular flagellum of five articles.

RECORDS Bermuda, intertidal to 0.5 m.

Curassanthura Kensley, 1981

DIAGNOSIS Eyes lacking. Mandibular palp of three articles. Maxillipedal palp of five articles; short endite present. Pereopod 1 subchelate. Pereopods 2–6 similar, carpi rectangular. Pereopod 7 lacking. Pleonites 1–5 free; pleonite 6 dorsally demarked. Pleopod 1, exopod operculiform. Pleotelson with single statocyst. Interstitial littoral forms.

REMARKS Three species of this interstitial genus are known, two from the Caribbean, and one from the upper sublittoral gravels of a lava tunnel on Lanzarote, Canary Islands.

Key to species of *Curassanthura*

1. Telson with posterior fourth abruptly narrowed; uropodal exopod length 4.5 times greatest width *bermudensis*
 Telson tapering, but posterior fourth not abruptly narrowed; uropodal exopod length 2.5 times greatest width *halma*
-

Curassanthura bermudensis Wägele, 1985

Figure 30G,H

DIAGNOSIS ♀ 3.0 mm. Pereopod 1 propodal length 2.5 times proximal width, palm with proximal strongly recurved hooklike tooth. Uropodal exopod slender, parallel sided, 4.5 times longer than greatest width. Telson constricted in posterior fourth.

RECORDS Church Cave, Bermuda, in shore sediments.

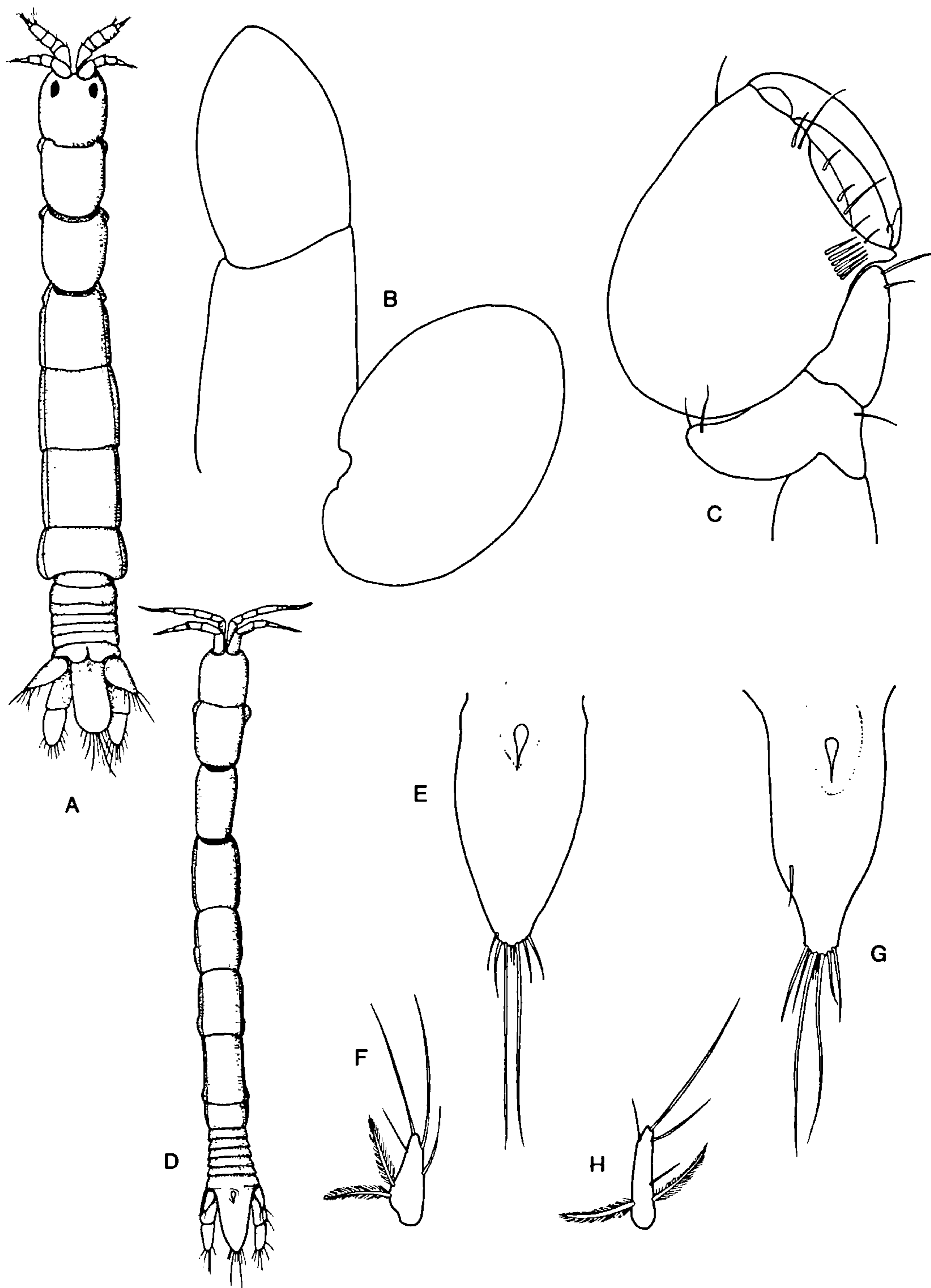


Figure 30. *Colanthura tenuis*: A, ♀; B, uropod; C, pereopod 1. *Curassanthura halma*: D, ♀; E, telson; F, uropodal exopod. *Curassanthura bermudensis*: G, telson; H, uropodal exopod (from Wägele, 1985).

Curassanthura halma Kensley, 1981

Figure 30D–F

DIAGNOSIS ♀ 2.3 mm. Pereopod 1, propodal length about 1.7 times proximal width, palm with eight fringed spines and basal tridentate lobe. Uropo-

dal exopod triangular, length 2.5 times greatest width, shorter than sympod. Telson tapering but not abruptly narrowed in posterior fourth.

RECORDS Curaçao, in shore sediments 1.5 m above tide line; Bonaire, in shore sediments above tide line.

Paranthura Bate and Westwood, 1868

DIAGNOSIS Eyes present. Antennular flagellum shorter than peduncle. Antennal flagellum usually of single flattened setose article. Mandibular palp of three articles, article 3 with comb of spines. Maxillipedal palp of one or two articles; endite small to absent. Pereopod 1, propodus inflated, larger than that of pereopods 2 and 3. Pereopods 4–7, carpi rectangular. Pleonites short, more or less distinct. Pleopod 1, exopod operculiform. Telson lacking statocyst.

REMARKS This is the largest of the paranthurid genera, with over 50 names in the literature. Many of these are poorly described. Species of *Paranthura* are common in the shallow waters of the temperate and tropical seas.

Key to species of *Paranthura*

- 1. Telson posteriorly truncate; uropodal exopod rectangular, margins serrate *infundibulata*
 Telson posteriorly rounded; uropodal exopod ovate, margins entire .. 2
- 2. Uropodal endopod longer than wide 3
 Uropodal endopod as long as wide *antillensis*
- 3. Uropodal exopod elongate-elliptical; telson parallel sided for half length *floridensis*
 Uropodal exopod ovate, outer margin sinuate; telson evenly elliptical *barnardi*

Paranthura antillensis Barnard, 1925

Figure 31A–F

DIAGNOSIS ♀ 5.1 mm. Antennular flagellum of four articles. Mandibular palp, article 3 with five spines. Maxillipedal palp of single article three times longer than basal width; short endite present. Pereopod 1, propodus ex-

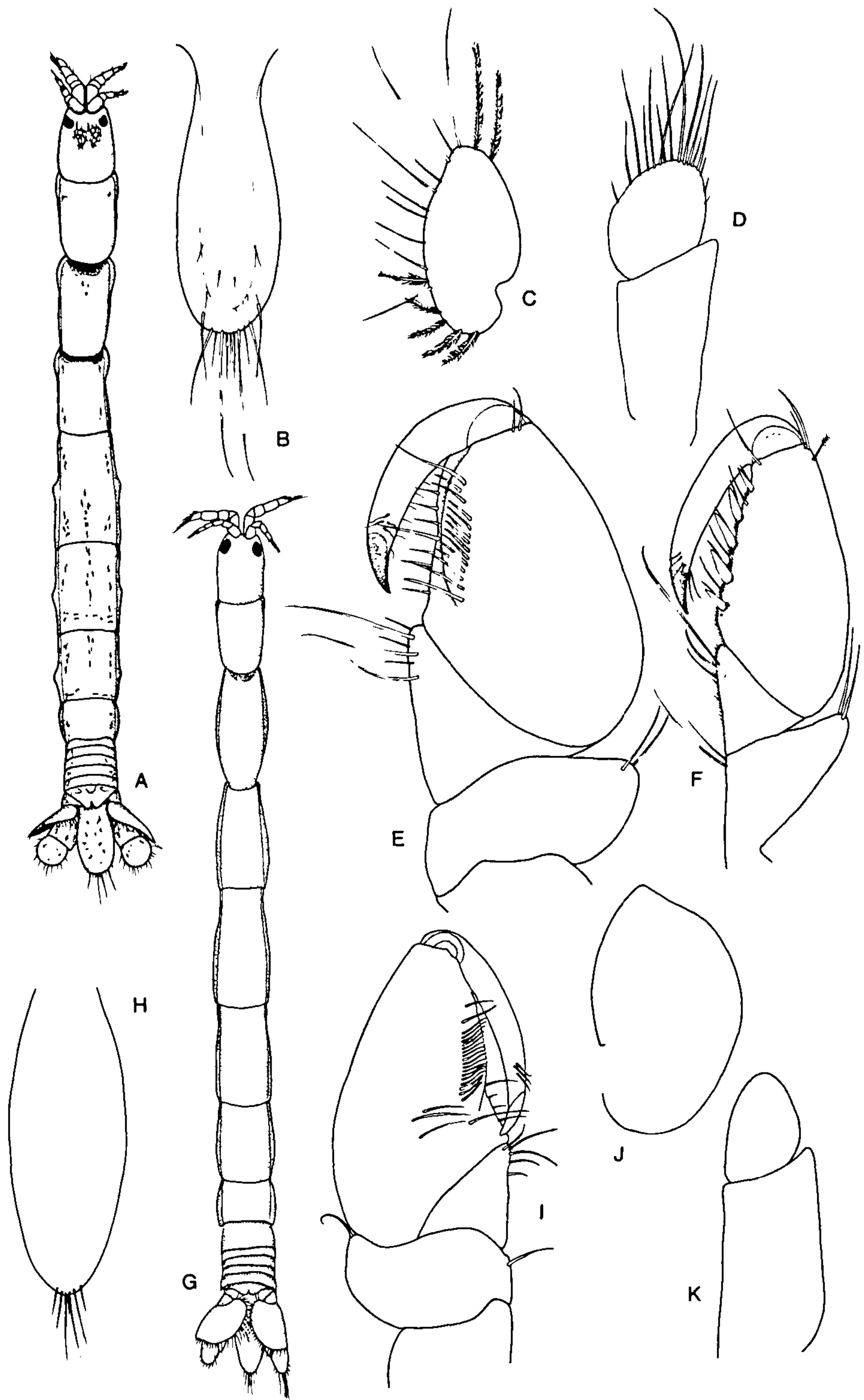


Figure 31. *Paranthura antillensis*: A, ♀; B, telson; C, uropodal exopod; D, uropodal sympod and endopod; E, pereopod 1, ♀; F, pereopod 2, ♀. *Paranthura barnardi*: G, ♀; H, telson; I, pereopod 1, ♀; J, uropodal exopod; K, uropodal sympod and endopod.

panded, palm bearing row of setae, mesial surface near palmar margin with convex flange and row of about 10 spines. Pereopod 2, propodal palm with five stout sensory setae. Pleonite 6 free, posterior margin bilobed. Uropodal exopod ovate, outer margin sinuous; endopod almost circular, as wide as long. Telson posteriorly rounded.

RECORDS St. Johns, St. James, U.S. Virgin Islands, 32 m; Carrie Bow Cay, Belize, intertidal to 1.5 m.

Paranthura barnardi Paul and Menzies, 1971

Figure 31G–K

DIAGNOSIS ♀ 6.0 mm. Mandibular palp article 3 with eight spines. Maxillipedal palp of single article, length four times basal width. Pereopod 1, propodal palm concave, with convex flange and row of about 17 spines on mesial surface. Uropodal exopod broadly ovate, apically subacute; endopod ovate, length about 1.5 times basal width. Telson evenly elliptical, apex evenly rounded.

RECORDS Off Venezuela, 95 m.

Paranthura floridensis Menzies and Kruczynski, 1983

Figure 32A–E

DIAGNOSIS ♀ 6.3 mm. Integument with sparse irregular pigmentation. Mandibular palp article 3 with eight spines. Maxillipedal palp of single article, length 3.5 times basal width. Pereopod 1, propodal palm with transparent flange and row of 10 setae on mesial surface. Uropodal exopod elongate-elliptical; endopod ovate, length 1.5 times greatest width. Telson posteriorly broadly rounded, parallel sided for about half its length.

RECORDS Off Sanibel Island, Florida, Gulf of Mexico, 73 m.

Paranthura infundibulata Richardson, 1902

Figure 32F–J

DIAGNOSIS ♀ 8.2 mm, ♂ 6.0 mm. Integument with red-brown pigmentation; broad irregular patch between eyes running onto bases of antennules; pereonites 1 and 2 with anterior patches, remainder of pereonites with posterior patches; strong patch on uropodal exopod, endopod, and telson. Mandibular palp article 3 with 11 or 12 spines. Maxillipedal palp of single article,

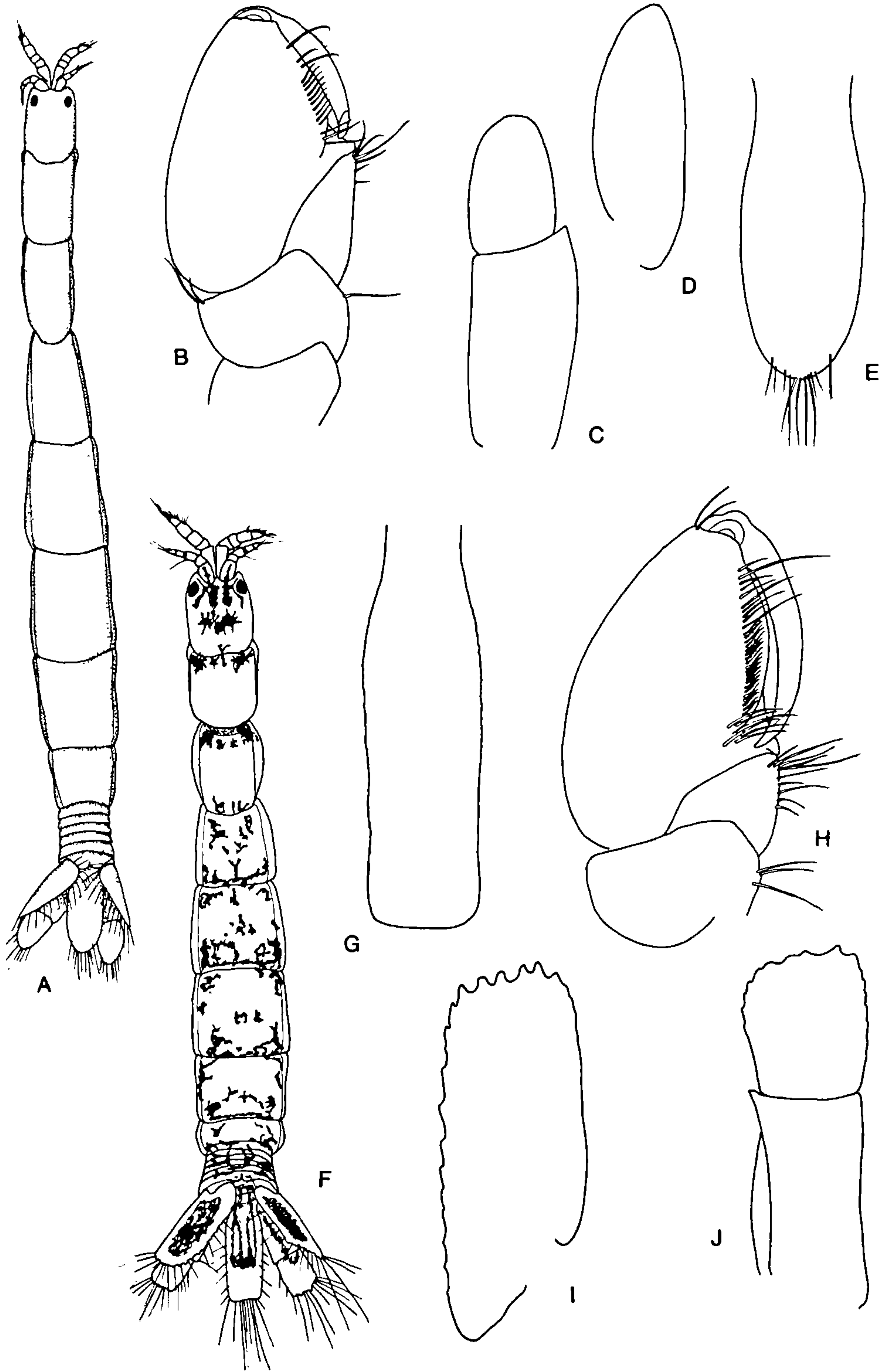


Figure 32. *Paranthura floridaensis*: A, ♀; B, pereopod 1, ♀; C, uropodal sympod and endopod; D, uropodal exopod; E, telson. *Paranthura infundibulata*: F, ♀; G, telson; H, pereopod 1, ♀; I, uropodal exopod; J, uropodal sympod and endopod.

length 2.5 times basal width. Pereopod 1, propodus with convex flange and row of more than 20 setae. Uropodal exopod elongate-rectangular, mesial and distal margins serrate; endopod roughly square, margins serrate. Telson parallel sided, posterior margin truncate.

RECORDS Bermuda, 11–12 m; Carrie Bow Cay, Belize, intertidal to 1 m; Cozumel, Mexico; Venezuela.

Virganthura Kensley, 1987b

DIAGNOSIS Eyes present. Mandibular palp of three articles. Maxillipedal palp of three articles; endite present. Pereopods 1–3 subchelate, pereopod 1 larger than pereopods 2 and 3; pereopods 4–7, carpi rectangular. Pleopod 1, exopod operculiform. Pleonites 1–5 short, distinct; pleonite 6 dorsally demarcated. Telson with single statocyst.

Virganthura crassa (Barnard, 1925)

Figure 33

DIAGNOSIS ♀ 6.8 mm. Antennular flagellum of three articles. Antennal flagellum of seven articles. Maxillipedal endite reaching distal margin of first palp article. Pereopod 1, propodal palm slightly concave, bearing seven spines. Uropodal exopod ovate, outer margin sinuate; endopod distally rounded, articulating obliquely on sympod.

RECORDS U.S. Virgin Islands, 30 m.

Suborder Asellota Latreille, 1803

DIAGNOSIS Antennules uniramous. Antennae uniramous, with scale in some families. Mandible usually with palp, but palp lacking in some groups. Pereopod 1 usually subchelate, sexually dimorphic in some groups. Coxae small, sometimes not all visible in dorsal view. Pleon seldom of more than two free pleonites plus pleotelson. Pleopod 1 absent in ♀. One pair of pleopods in ♀, and one or two pairs of pleopods in ♂ forming operculum over remaining respiratory pleopods. Pleopod 2 in ♂ usually adapted for copulation. Uropods usually pedunculate, but peduncle may be reduced, biramous or uniramous, terminal or subterminal.

REMARKS The suborder Asellota is usually divided into four superfamilies, based on pleopodal arrangement. The great majority of families, however,

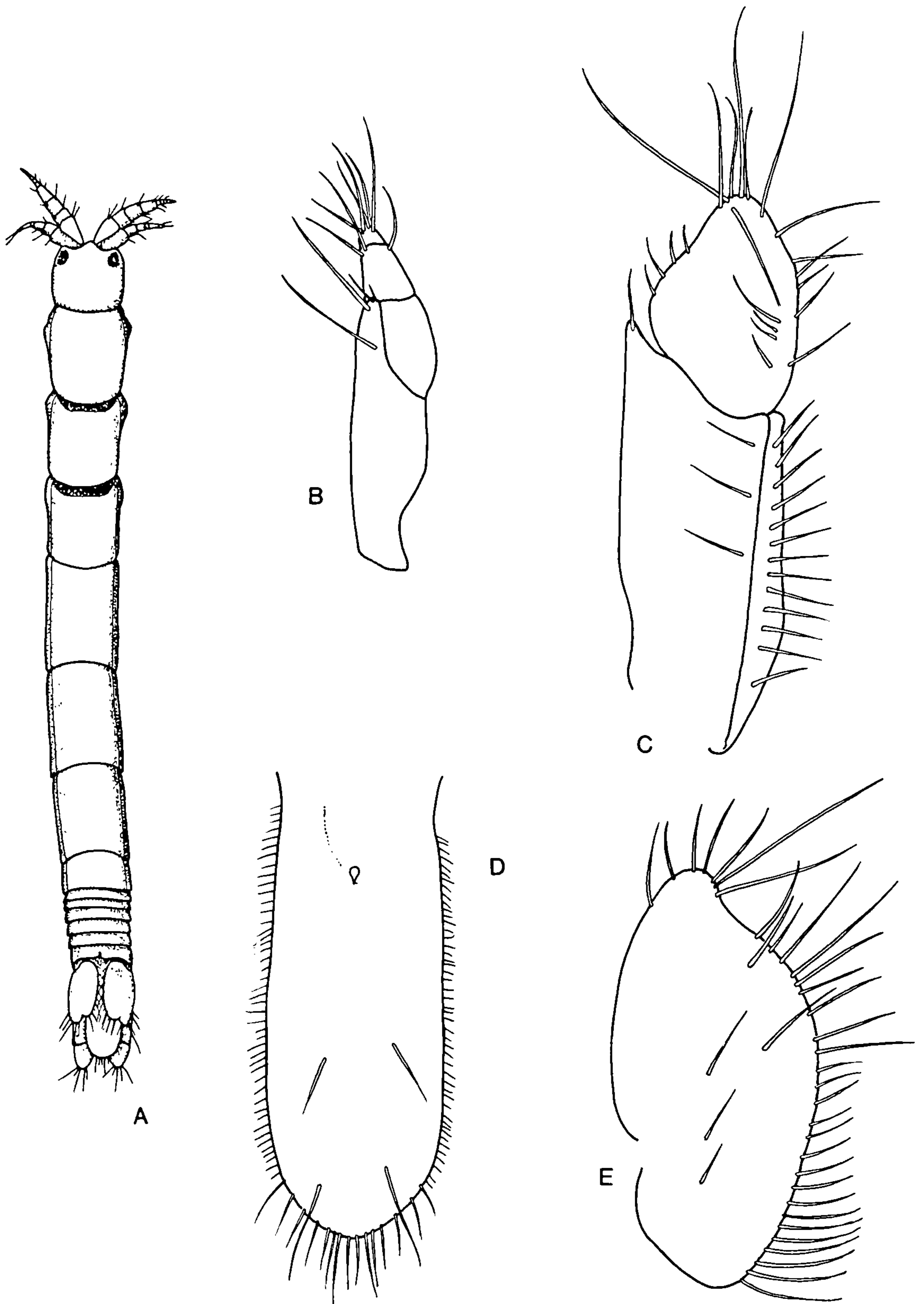


Figure 33. *Virganthura crassa*: A, ♀; B, maxilliped; C, uropodal endopod and sympod; D, telson; E, uropodal exopod.

belong to the superfamily Janiroidea, considered to be the most advanced. In place of a key to the four superfamilies, the chart shown in Figure 34 illustrates diagrammatically the arrangement of the pleopods in these groups.

Superfamily Aselloidea Rafinesque-Schmaltz, 1815

DIAGNOSIS ♂: Pleopod 1, peduncles separate, rami uniarticulate; pleopod 2 having biarticulate exopod and copulatory endopod; pleopod 3 biramous, opercular. ♀: Pleopod 1 absent; pleopod 2 absent, or of single article; pleopod 3 biramous, opercular.

Family Atlantasellidae Sket, 1979

DIAGNOSIS Body resembling that of a sphaeromatid isopod. Pleon consisting of two free pleonites plus pleotelson. ♂: Pleopod 1 of two articles; pleopod 2 with sympod, small exopod, and uniarticulate copulatory endopod. ♀: Pleopods 1 and 2 absent; pleopod 3 operculate but rami not fused.

Atlantasellus Sket, 1979

DIAGNOSIS Eyes lacking. Antennule flattened, short and broad. Antenna elongate, peduncle of four (?five) articles, flagellum of four articles. Mandibular palp of three articles; with incisor and lacinia, molar replaced by brushlike process. Maxillipedal palp of five articles of similar width and broad endite. Pereopod 1 subchelate; pereopods 2–7 ambulatory, slender, dactyli biunguiculate. Uropods uniarticulate, vestigial.

Atlantasellus cavernicolus Sket, 1979

Figure 35

DIAGNOSIS ♂ 1.1 mm. Cephalon with strong triangular rostrum, equal to pereonites 1–3 combined in middorsal length. Pleotelson basally broad, tapering to trilobed posterior margin, uropods inserted in incisions between median and lateral lobes.

RECORDS Walsingham Cave, Bermuda.

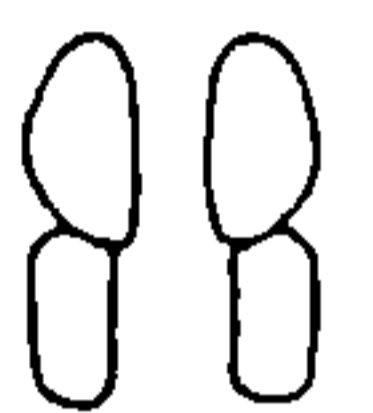
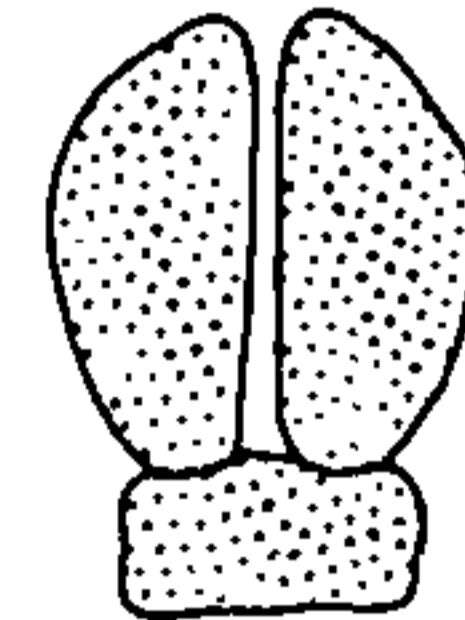
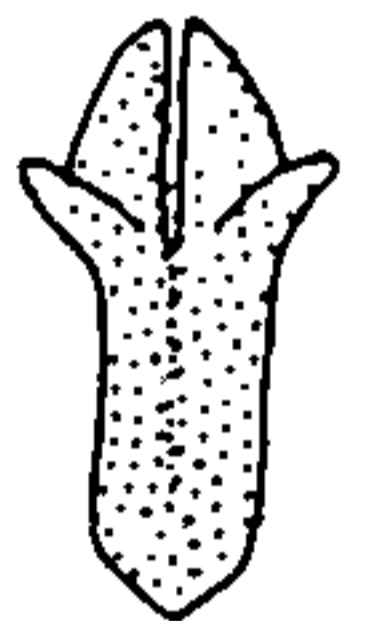
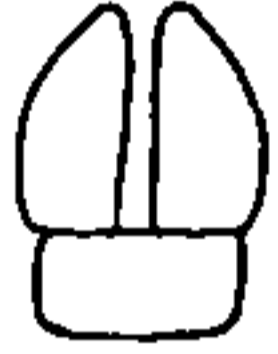
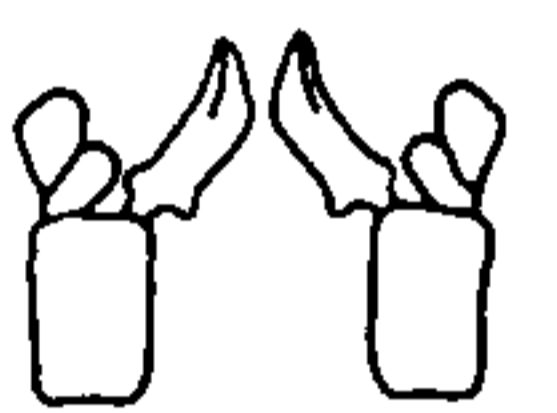

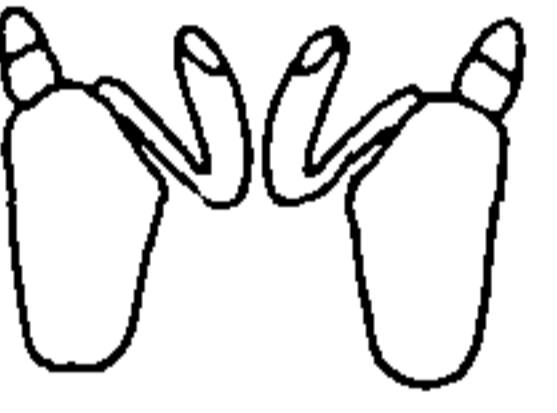
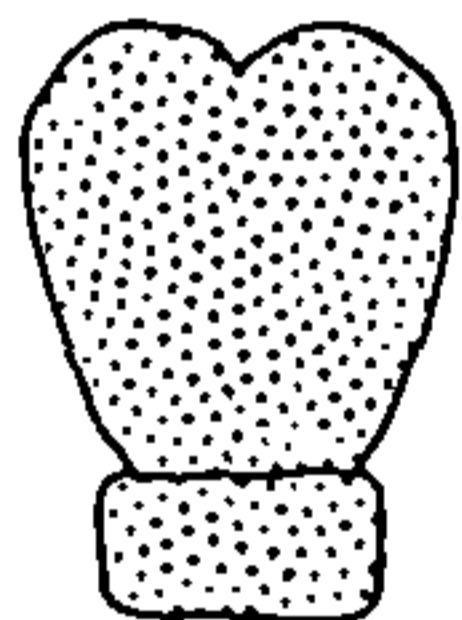
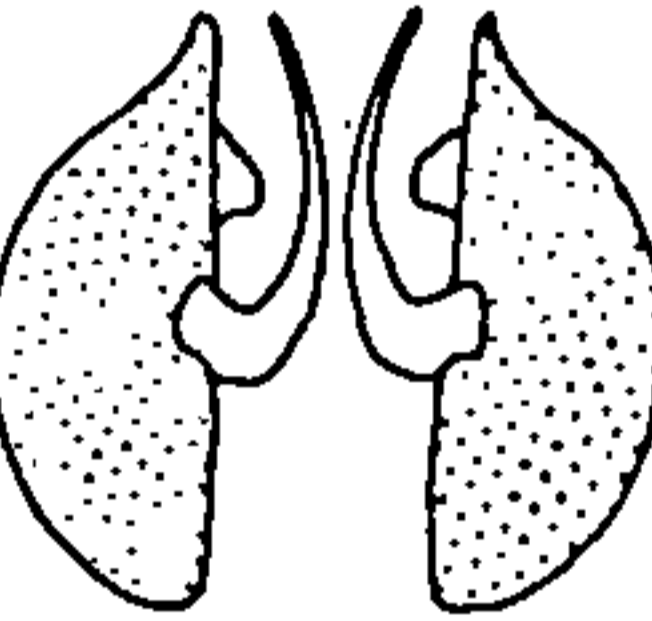
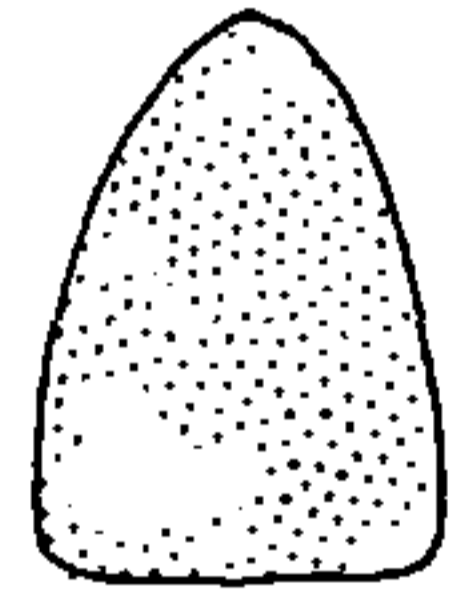


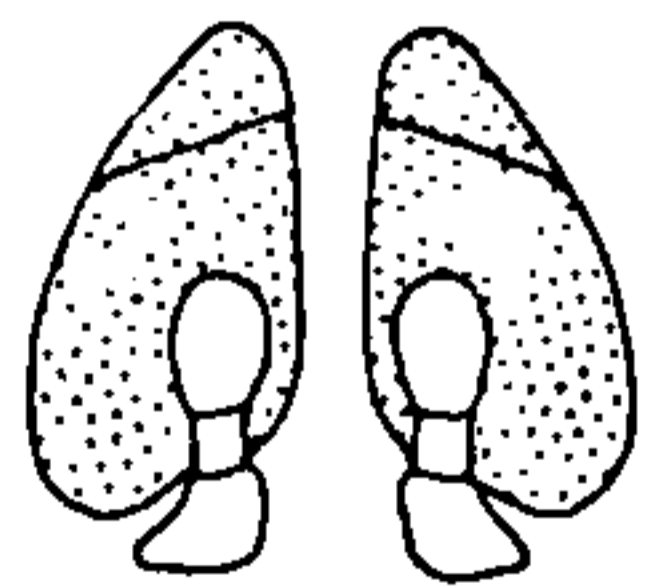
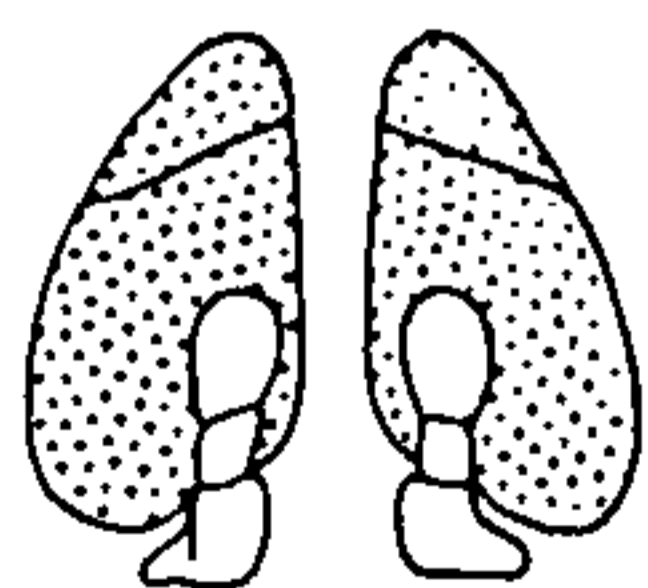
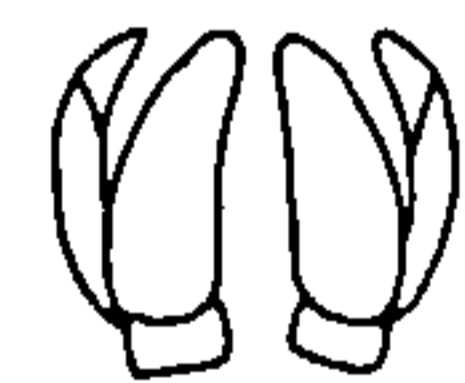
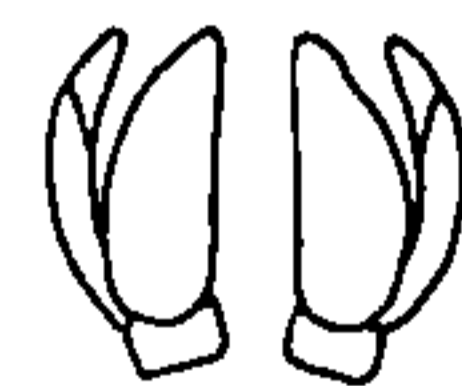
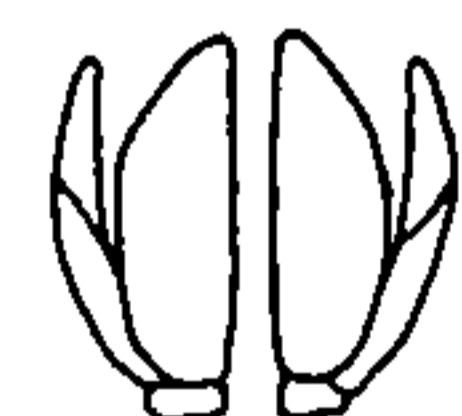
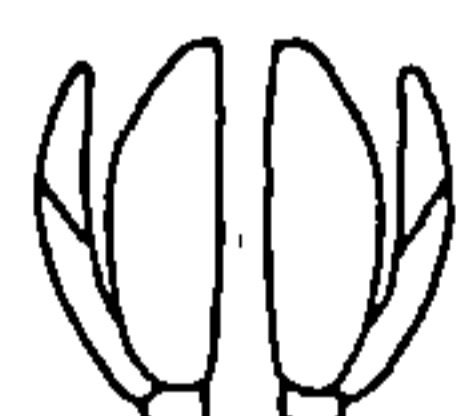
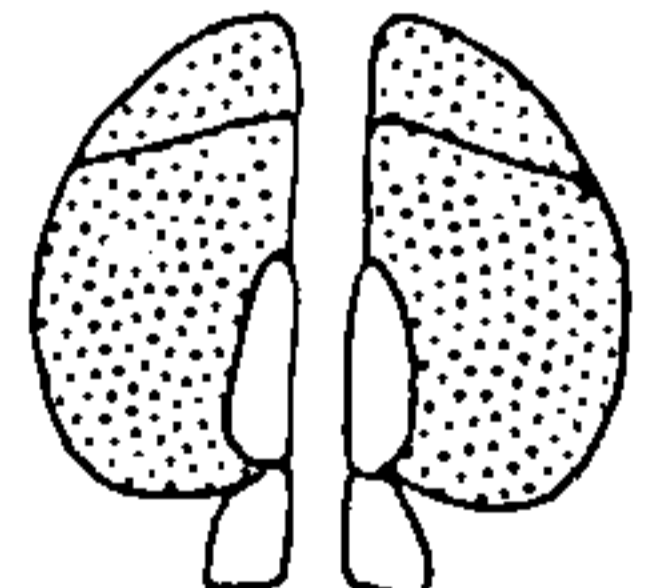
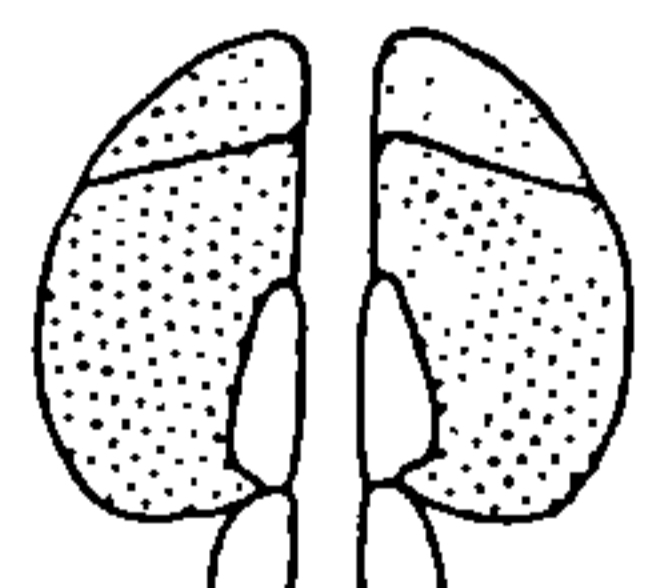
	ASELLOIDEA		GNATHOSTENETROIDOIDEA		JANIROIDEA		STENETRIOIDEA	
	♂	♀	♂	♀	♂	♀	♂	♀
PLEOPOD 1		—		—		—		—
PLEOPOD 2		— or 						
PLEOPOD 3								

Figure 34. Comparison of pleopods 1–3 in the four superfamilies of the suborder Asellota.

Superfamily Gnathostenetroidoidea Kussakin, 1967

DIAGNOSIS ♂: Pleopod 1 peduncles fused, uniarticulate rami separate, opercular; pleopod 2 small, with biarticulate exopod and copulatory endopod; pleopod 3, broad endopod biarticulate, exopod slender, uniarticulate. ♀: Pleopod 1 absent; pleopod 2 rami fused to form operculum; pleopod 3 as in ♂.

Family Gnathostenetroididae Kussakin, 1967

DIAGNOSIS Uropods with short sympod, rami relatively well developed. ♂: Pleopod 1, protopodites short, fused, rami separate, together forming operculum covering remaining pleopods. Pleopod 2, separate, much smaller than pleopod 1. Pleopod 3, exopod elongate, slender; endopod uniarticulate, broad. ♀: Pleopod 2, rami fused to form operculum covering remaining pleopods.

Key to genera of Gnathostenetroididae

1. Eyes absent. Rostrum anteriorly rounded/truncate *Neostenetroides*
Eyes present. Rostrum anteriorly bilobed *Gnathostenetroides*
-

Gnathostenetroides Amar, 1957

DIAGNOSIS Eyes present. Rostrum well developed, anteriorly bilobed. Pereonite 1, especially in ♂, larger than following pereopods. Pleon having one very short free pleonite. Pleotelson with lateral margins subparallel, ending in strong tooth posteriorly; posterolateral margins sinuous, rounded. Mandible in ♂ with strong projection arising proximolateral to incisor, visible dorsally; in ♀, projection short, not visible dorsally.

Gnathostenetroides pugio Hooker, 1985

Figure 36A–C

DIAGNOSIS ♂ 3.2 mm, ♀ 1.6 mm. Eyes of five ommatidia each. ♂: Pereopod 1, merus with anterior margin strongly produced into narrow triangular process; propodus broad, palm demarked by strong denticulate spine and

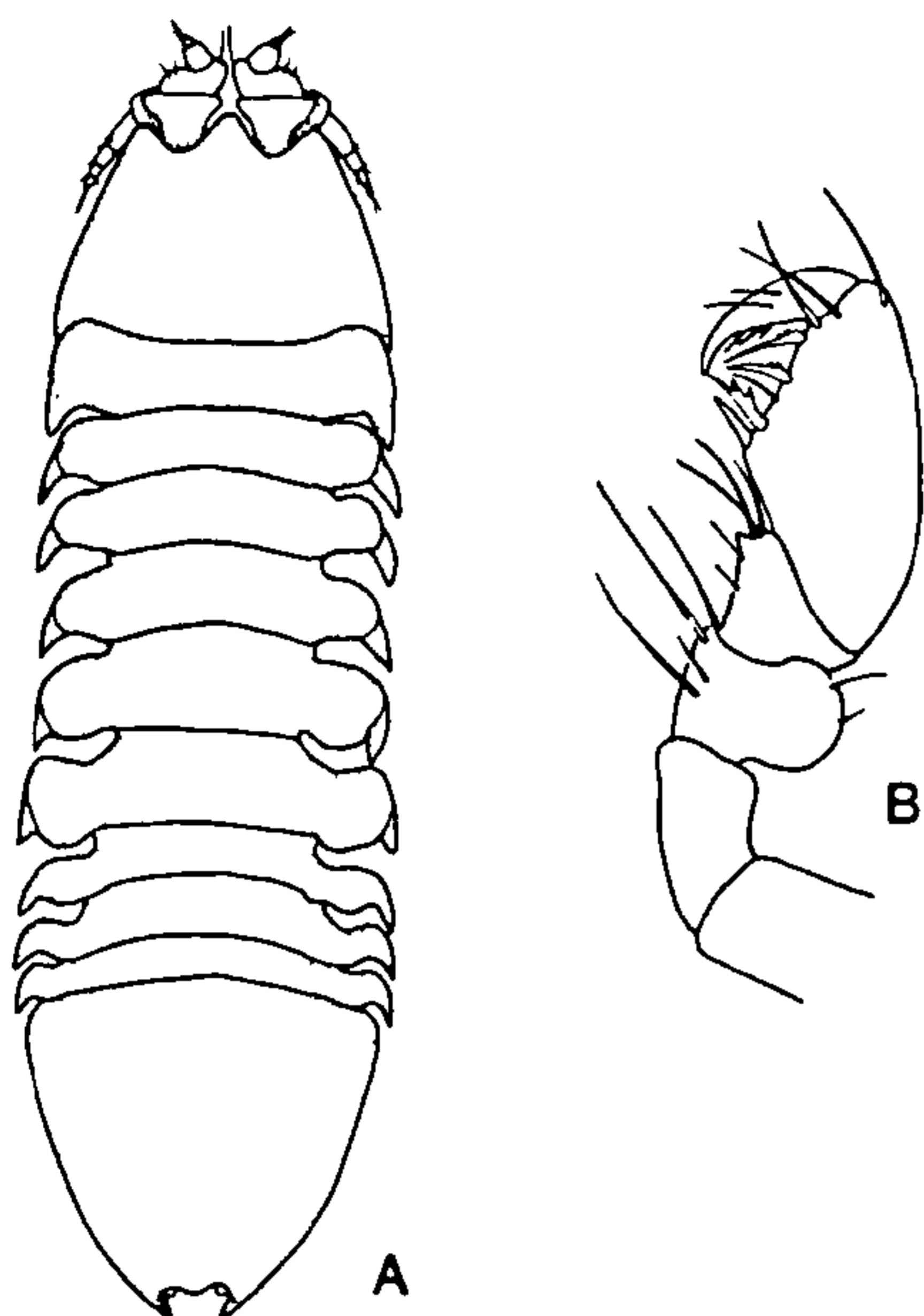


Figure 35. *Atlantasellus cavernicolus*: A, ♀; B, pereopod 1. (From Sket, 1979).

bearing row of nine more slender spines, posterior margin setose. ♀: Operculum with distal incision acute.

RECORDS Florida Middlegrounds, Gulf of Mexico, 55 m.

REMARKS The type of the genus, and only other species known, *G. laodicense* Amar, 1957, was recorded from the Mediterranean Sea. This species is included here, as several of the species first recorded from the Florida Middlegrounds (Hooker, 1985) have since been recorded from the Caribbean.

Neostenetroides Carpenter and Magniez, 1982

DIAGNOSIS Pleonites 1 and 2 very short. Operculum of ♀ subcircular. Pleopod 2 in ♂ with elongate protopodite, copulatory organ prolonged by hyaline tonguelike structure. Pleopod 4, exopod ovate, wider than endopod.

Neostenetroides stocki Carpenter and Magniez, 1982

Figure 36D,E

DIAGNOSIS ♂ 1.46 mm, ♀ 1.87 mm. Eyes absent. Rostrum well developed, anteriorly rounded/truncate. Pleotelson wider than long, lateral margins entire, posterior margin regularly convex. Pereopod 1, propodus elongate, widening distally, palm poorly demarked, with few spines; dactylus stout, overlapping palm. Uropods unknown.

RECORDS San Salvador, Bahamas, from Dixon Hill Lighthouse Cave.

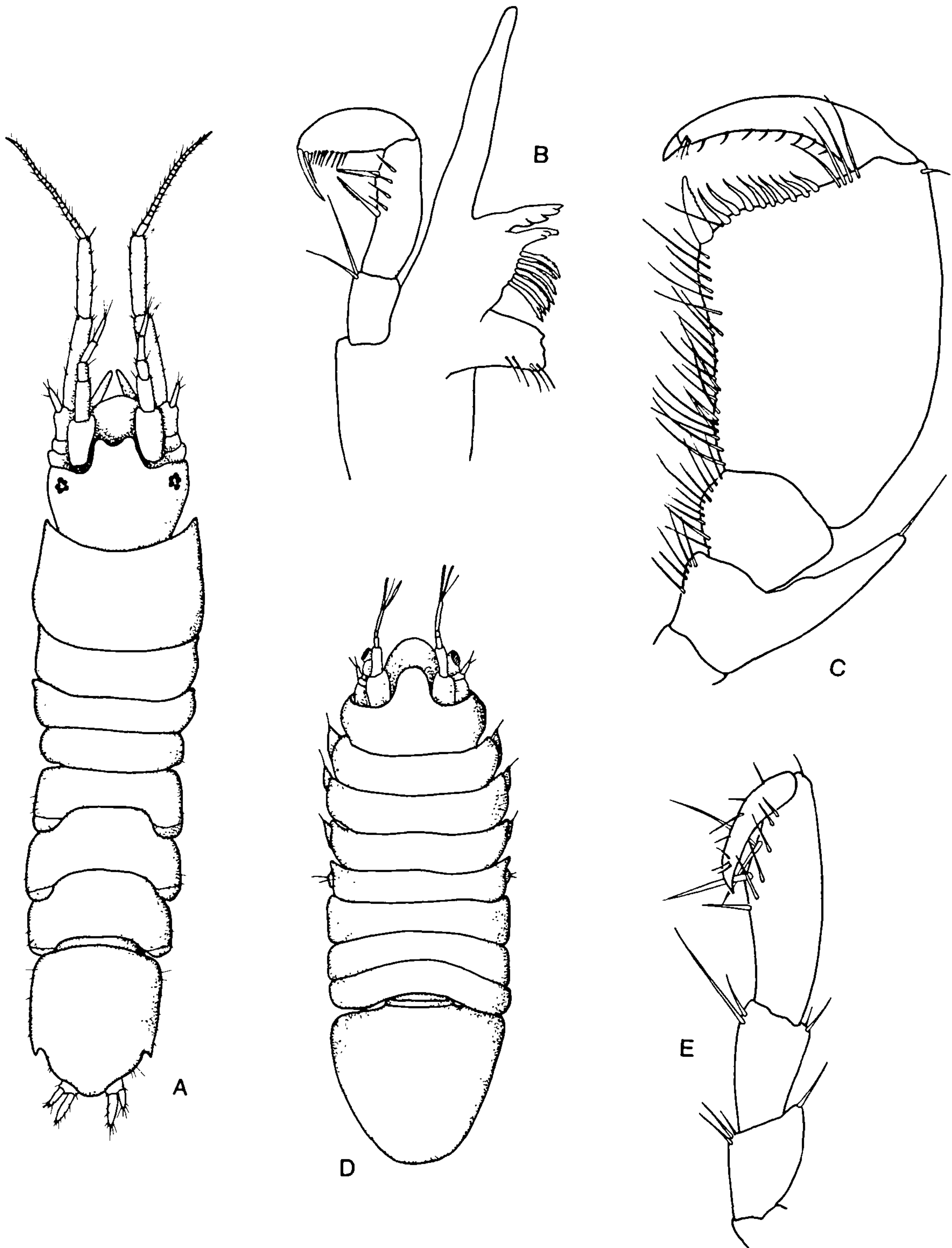


Figure 36. *Gnathostenetroides pugio*: A, ♂; B, mandible; C, pereopod 1. *Neostenetroides stocki* (from Carpenter and Magniez, 1982): D, ♀; E, pereopod 1.

Superfamily Janiroidea Sars, 1899

DIAGNOSIS ♂: Pleopod 1 with elongate peduncle, occasionally fused; pleopod 2 with short exopod and copulatory usually elongate endopod, pleopods 1 and 2 together forming operculum; pleopod 3 endopod uniarticu-

late, exopod biarticulate. ♀: Pleopod 1 absent; pleopod 2, rami fused to form operculum; pleopod 3 as in ♂.

Key to families of Janiroidea

1. Eyes (if present) on lateral processes of cephalon 2
 Eyes dorsolateral on cephalon, not on lateral processes 6
 2. Uropods with large, easily visible sympod and rami 3
 Uropods with sympod minute or absent, rami short 5
 3. Pleon posteriorly markedly produced; some pereonites produced
 laterally into fingerlike processes *Pleurocopidae*
 Pleon posteriorly rounded, barely produced; pereonites not laterally
 produced into prominent fingerlike processes 4
 4. Pereopod 1 subchelate *Santiidae*
 Pereopod 1 ambulatory, biunguiculate *Mexicope*
 5. Pleopod 1 ♂ distally sagittate; anus covered by pleopod 1 ♂, or
 pleopod 2 ♀ *Paramunnidae*
 Pleopod 1 ♂ distally truncate; anus exposed *Munnidae*
 6. Uropodal rami minute, smaller than squat sympod *Joeropsidae*
 Uropodal rami elongate, sympod variable, generally elongate 7
 7. Eyes lacking; pereopods all similar, ambulatory *Microparasellidae*
 Eyes usually present; pereopod 1 prehensile, subchelate, pereopods
 2–7 ambulatory *Janiridae*
-

Family Incertae Sedis

Mexicope Hooker, 1985

DIAGNOSIS Eyes on short lateral lobes of cephalon. Scale present on antennal peduncle. Coxae short, visible in dorsal view on pereonites 2–7. Pereonites laterally acute, not markedly produced. Pereopod 1 ambulatory, dactylus biunguiculate. Pleon consisting of one short pleonite plus broad pleotelson. Uropods large, with elongate peduncle, endopod, and exopod.

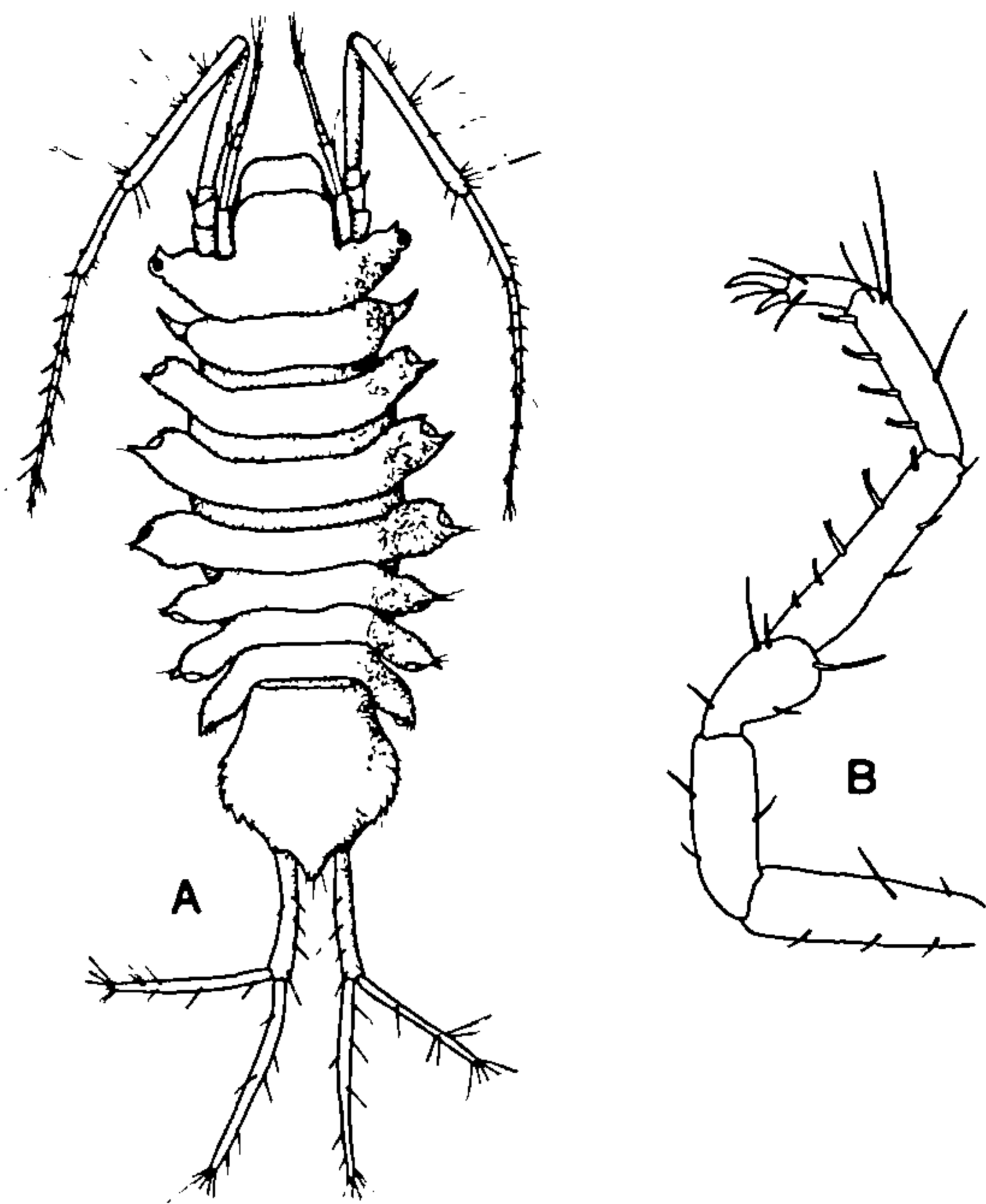


Figure 37. *Mexicope kensleyi*: A, ♀; B, pereopod 1.

REMARKS The inability to place *Mexicope* in a family reflects the fact that the arrangement of the families and genera of the Janiroidea is still unsettled. While having affinities with the Pleurocopidae and the Janiridae, placement in either of these would require redefinition of both families, making the Janiridae even more of a hodgepodge of phylogenetically unrelated genera.

Mexicope kensleyi Hooker, 1985

Figure 37

DIAGNOSIS ♂ 1.7 mm, ♀ 2.9 mm. Antennae slightly longer than body. Pereonites and pleon laterally finely serrate. Pleotelsonic lobe between uropodal bases narrowly rounded, barely produced.

RECORDS Turks and Caicos Islands, 1 m; Florida Middlegrounds, Gulf of Mexico, 30 m.

Family Janiridae Sars, 1899

DIAGNOSIS Antennae longer than antennules. Mandibles with palp and well-developed molar. Maxilliped with articles 1–3 at least as wide as endite, markedly broader than articles 4 and 5. Pereopod 1 prehensile, subchelate, sexually dimorphic, larger in ♂ than in ♀. Pereopods 2–7 ambulatory, dactyli biunguiculate. Coxae visible at least on three posterior pereonites. Pleon

consisting of single free pleonite (often very narrow, short and inconspicuous) plus pleotelson. Uropods with well-developed sympod; usually biramous.

Carpias Richardson, 1902

DIAGNOSIS Cephalon with dorsolateral eyes, lacking rostrum. Coxae visible dorsally on pereonites 1–7. Pleon with one short pleonite lacking free lateral margins, plus broad pleotelson. Antennules and antennae well developed, latter with scale. Articles 2 and 3 of maxillipedal palp expanded. Pereopod 1 sexually dimorphic, often relatively enormous and/or elongate in male, carpochele, carpus expanded, propodus variously armed or expanded, dac-

Key to species of *Carpias* (based on pereopod 1 of mature ♂)

1. Propodus distally acute 2
 Propodus distally broad 4
 2. Propodus apically acute, with proximal tooth *minutus*
 Propodus lacking teeth 3
 3. Carpus with two strong distal teeth; propodus (when chela closed)
 reaching to merus *algicola*
 Carpus with two strong and one small teeth; propodus (when chela
 closed) reaching proximal half of carpus *serricaudus*
 4. Propodus with distinct teeth 5
 Propodus lacking distinct teeth 6
 5. Carpus distally with broadly rounded area; merus elongate-slender,
 length about four times greater than width *bermudensis*
 Carpus lacking broadly rounded area; merus short, broader than long
 *punctatus*
 6. Carpus with two distal teeth; dactylus minute *triton*
 Carpus with three distal teeth; dactylus small, but not obsolete 7
 7. Propodus distally truncate; carpus with middle tooth of palm distally
 faintly bilobed *brachydactylus*
 Propodus distally faintly bilobed; carpus with middle tooth of palm
 distally narrowly rounded *harrietae*
-

tylus reduced or rudimentary, bearing two claws (biunguiculate). Pereopods 2–7 similar, ambulatory, dactylus with three claws (triunguiculate). Uropods often longer than pleotelson, with relatively elongate sympod and rami.

REMARKS This genus has been, and continues to be, a source of taxonomic problems. Several authors (e.g., Pires, 1980) have separated the species into the genera *Carpias* and *Bagatus*; others (e.g., Bowman and Morris, 1979) have synonymized them. In part, this uncertainty reflects the general uncertainty of the state of taxonomy in the family Janiridae. In this work, the genus *Carpias* is used to contain all the species described under the names *Carpias* and *Bagatus*.

While these tiny asellotes are frequently extremely abundant in certain habitats (e.g., in reef-crest algal turfs; Kensley, 1983), difficulty is experienced in identifying specimens other than mature males. The first pereopod of the mature male is the feature best used for species separation, but variation with maturity and geographic locality have not been investigated. With more detailed work, some species will undoubtedly be synonymized.

Carpias algicola (Miller, 1941)

Figure 38A,B

DIAGNOSIS ♂ 2.9 mm, ovigerous ♀ 2.0 mm. Frontal margin straight. Pereopod 1 in ♂, carpus distally not much broader than proximally, with two teeth. Propodus reaching back to merus in mature male. Pleopod 1 in ♂, rami with outer lobe distally acute but not produced. Uropod longer than pleotelson. Pigment in scattered red-brown chromatophores.

RECORDS Looe Key, Florida, 1–1.5 m; Yucatan, Mexico; Carrie Bow Cay, Belize, 0–2 m; Puerto Rico; Jamaica; Venezuela.

Indo-west Pacific.

Carpias bermudensis Richardson, 1902

Figure 38C,D

DIAGNOSIS ♂ 2.7 mm. Frontal margin straight. Pereopod 1 in adult ♂ almost 1.6 times body length; carpus distally broadened, with rounded posterior area, palm with tooth at outer distal angle, larger tooth at midlength followed by deep notch; propodus with two teeth on flexor margin, widening to truncate distal margin. Pleopod 1 ♂, outer distal lobe narrowly acute, somewhat produced. Operculum of ♀ with distal margin emarginate.

RECORDS Bermuda; eastern and southern coasts of Florida, 1.5–15 m.

Carpias brachydactylus Pires, 1982

Figure 38E

DIAGNOSIS ♂ 1.6 mm. Pereopod 1 ♂, carpus distally between two and three times wider than proximal width, with strong triangular outer tooth defining palm, middle tooth apically faintly bifid, inner tooth rounded; propodus widening to distal truncate margin, overreaching carpal palm by short distance, with very low tubercle at about midlength of flexor margin. Pleopod 1 ♂, outer distal lobe slightly produced, rounded. Operculum of ♀ wider than long, distal margin broadly emarginate.

RECORDS Puerto Rico, 1.5 m.

Carpias harrietae Pires, 1981

Figure 38F,G

DIAGNOSIS ♂ 2.3 mm. Closely resembling *C. brachydactylus*. Pereopod 1 ♂, carpus with posterodistal area somewhat expanded, with strong tooth defining outer margin of palm, middle tooth rounded, inner tooth distally faintly bifid; propodus widening to shallowly bilobed distal margin. Pleopod 1 ♂, inner distal lobe rounded, outer lobe narrowly acute. Operculum of ♀ with mediodistal margin gently concave. Uropod about twice length of pleotelson.

RECORDS Biscayne Bay, Florida, intertidal to 2 m.

Carpias minutus (Richardson, 1902)

Figure 39A

DIAGNOSIS ♂ 1.9 mm, ovigerous ♀ 1.8 mm. Pereopod 1 ♂, carpus distally widening, palm defined by strong triangular tooth, two inner teeth of palm separated by rounded notch; propodus with strong proximal tooth on flexor margin, distally produced into small triangular lobe below dactylus. Pleopod 1 ♂, outer distal lobe narrowly triangular and produced well beyond inner lobe. Uropod subequal to pleotelson in length.

RECORDS Bermuda, on *Sargassum*.

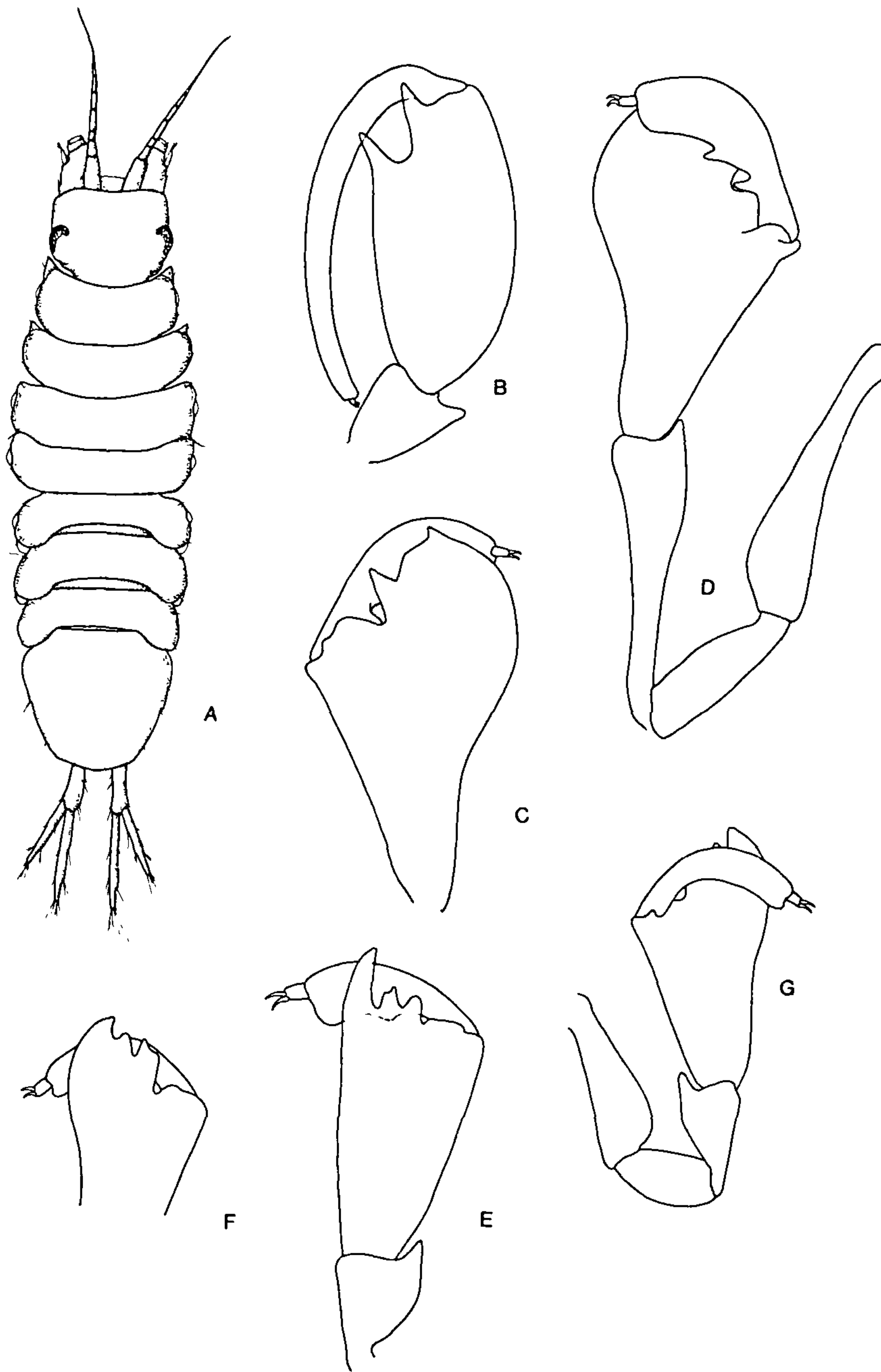


Figure 38. *Carpias algicola*: A, ♀; B, pereopod 1, ♂. *Carpias bermudensis*: C, D, pereopod 1, ♂. *Carpias brachydactylus*: E, pereopod 1, ♂. *Carpias harrietae*: F, G, pereopod 1, ♂.

Carpias punctatus (Kensley, 1984)

Figure 39 B,C

DIAGNOSIS ♂ 2.2 mm, ♀ 2.8 mm. Dorsal integument with patchy reticulate pattern of large dark brown chromatophores. Frontal margin faintly convex.

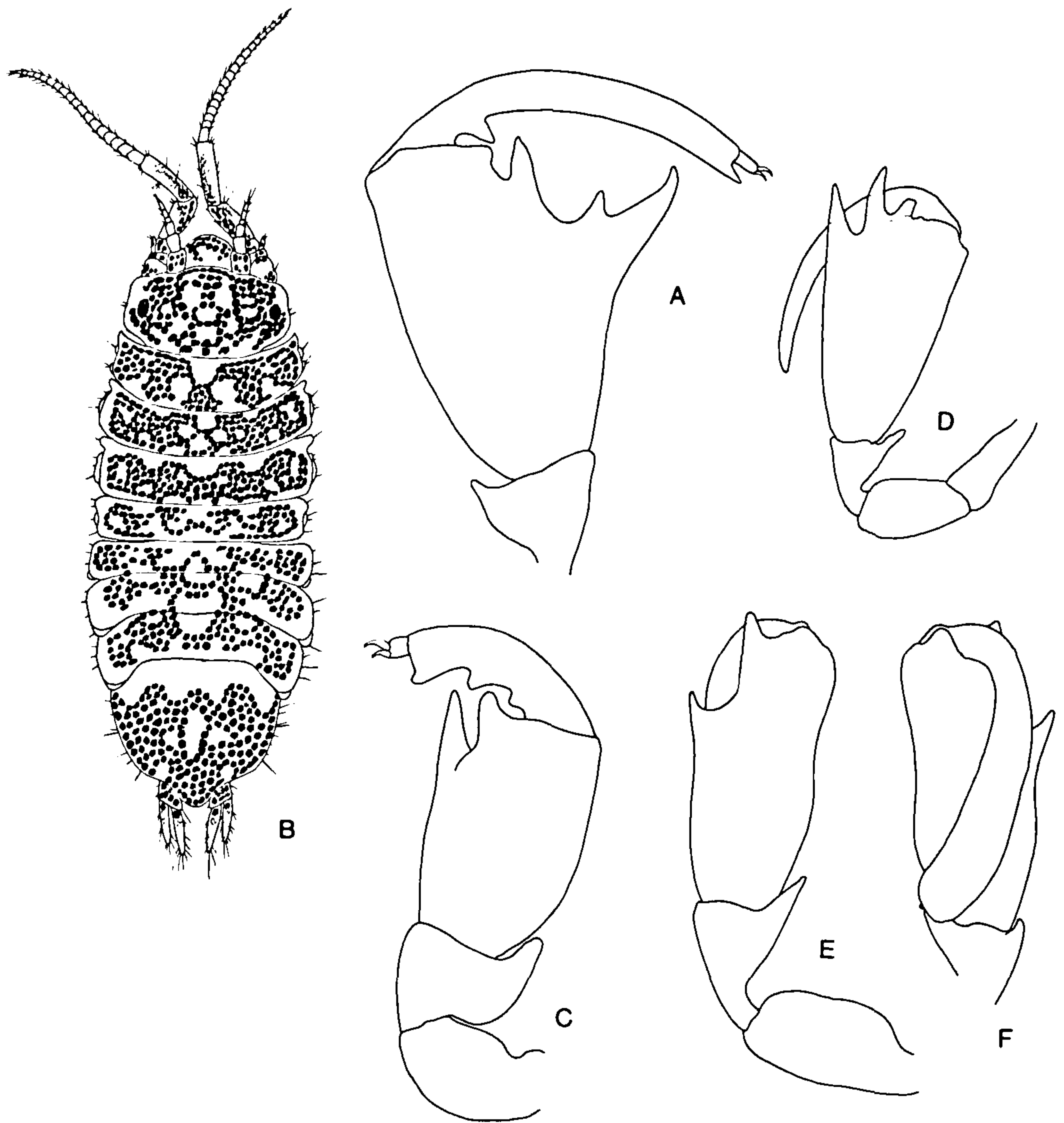


Figure 39. *Carpias minutus*: A, pereopod 1, ♂. *Carpias punctatus*: B, ♂; C, pereopod 1, ♂. *Carpias serricaudus*: D, pereopod 1, ♂. *Carpias triton*: E, F, pereopod 1, ♂.

Pereopod 1 ♂, distal two-thirds parallel sided, with strong acute tooth defining palm, and second rounded tooth; propodus with three lobe-teeth on flexor surface, overreaching carpus by a third of its length. Pleopod 1 ♂, outer distal lobe narrowly triangular, reaching well beyond inner lobe. Operculum of ♀ with distal margin shallowly concave. Uropod half length of pleotelson; latter with posterior margin a broadly rounded lobe between uropodal bases.

RECORDS Carrie Bow Cay, Belize, intertidal to 15.2 m.

Carpias serricaudus Menzies and Glynn, 1968

Figure 39D

DIAGNOSIS ♂ 1.6 mm, ♀ 1.5 mm. Pereopod 1 ♂, palm of carpus with two strong outer teeth and one short inner tooth; propodus reaching back to proximal half of carpus, tapering distally; dactylus obsolete. Pleopod 1 ♂, outer distal lobe acute, reaching well beyond inner lobe. Pleotelsonic margins very faintly serrate. Uropod about 0.7 times length of pleotelson.

RECORDS Turks and Caicos Islands, 1 m; Puerto Rico, intertidal to 1.5 m.

Carpias triton Pires, 1982

Figure 39E,F

DIAGNOSIS ♂ 2.3 mm. Very similar to *C. algicola*. Pereopod 1 ♂, carpus with two strong basally broad distal teeth; propodus extending back to merus in adult ♂, widening to broadly rounded distal margin; dactylus minute. Pleopod 1 ♂, outer distal lobe narrowly acute, reaching well beyond inner rounded lobe. Uropod about 1.5 times pleotelson length.

RECORDS Carrie Bow Cay, Belize, intertidal reef crest.

Family Joeropsidae Nordenstam, 1933

DIAGNOSIS Cephalon free, with distinct rostrum. Molar process of mandible reduced. Maxillipedal palp articles all of similar width. Antenna short, peduncle dilated, flagellum reduced. Pereonites similar, wider than long. Pereopods similar, biunguiculate. Uropods having short squat sympod and very reduced rami; inserted into submedian posterior notches of pleotelson.

Joeropsis Koehler, 1885

DIAGNOSIS Dorsolateral eyes present. Antennule, basal article widest and longest, often with transparent distal dentition. Antenna, peduncular articles 3–5 somewhat dilated, article 2 often with fringe of transparent scales; flagellum of about six articles, together shorter than peduncle article 5. Pereonites similar, generally subequal in length and width. Pleotelson of single shield-shaped segment. Uropodal sympod usually with mesiodistal angle acute; rami reduced.

Key to species of *Joeropsis*

1. Lateral margins of cephalon serrate; rostrum triangular *personatus*
 Lateral margins of cephalon entire; rostrum not triangular 2
 2. Body glabrous; strong band of pigment on cephalon and pereonite 4
 *bifasciatus*
 Body setose; pigment in reticulation over entire body 3
 3. Rostrum evenly convex; outer uropodal ramus longer than inner
 *rathbunae*
 Rostrum anteriorly shallowly notched; outer uropodal ramus shorter
 than inner *coralicola*
-

Joeropsis bifasciatus Kensley, 1984

Figure 40A–F

DIAGNOSIS ♂ 2.5 mm, ♀ 2.4 mm. Body glabrous. Lateral margins of cephalon entire. Rostrum semicircular, with marginal flange of transparent teeth. Antennal flagellum of eight articles. Lateral margins of pleotelson serrate. Apex of ♀ operculum blunt. Broad band of pigment on cephalon between eyes and almost reaching posterior margin; broad band of pigment on pereonite 4.

RECORDS Carrie Bow Cay, Belize, 1–6 m, often on *Agaricia* sp. and *Porites* sp. corals, and *Halimeda* sp. alga; Anguilla.

Joeropsis coralicola Schultz and McCloskey, 1967

Figure 40G

DIAGNOSIS ♂ 2.0 mm, ovigerous ♀ 1.9 mm. Body setose. Lateral margins of cephalon entire. Rostrum anteriorly notched. Antennal flagellum of five articles. Lateral margins of pleotelson serrate. Apex of ♀ operculum acute. Outer uropodal ramus shorter than inner. Pigment spread as reticulation over entire body.

RECORDS Off North Carolina, on coral *Oculina arbuscula*; Florida Middlegrounds, Gulf of Mexico, from sponge *Agelas* sp. and coral *Madracis* sp., 25–33 m.

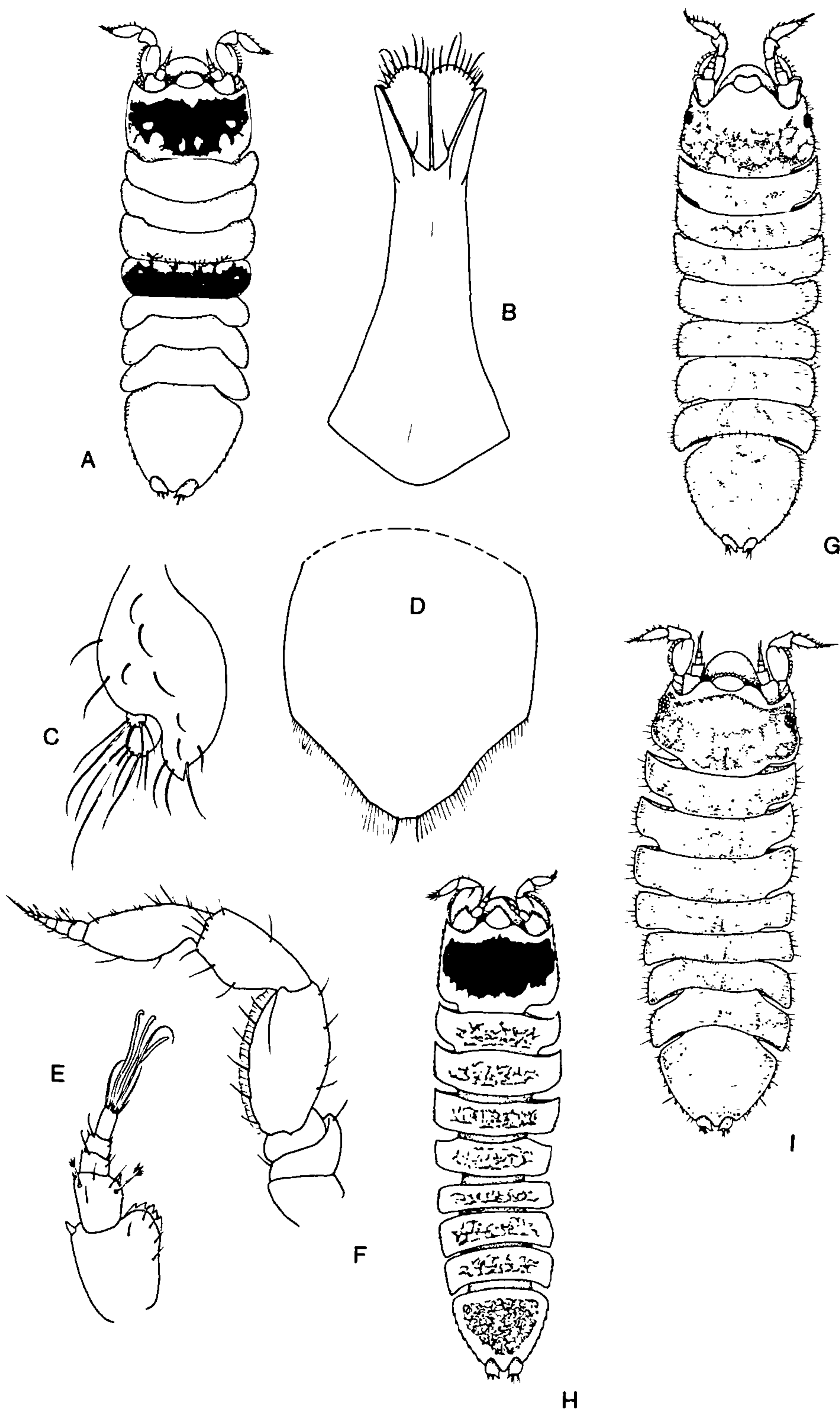


Figure 40. *Joeropsis bifasciatus*: A, ♂; B, pleopod 1, ♂; C, uropod; D, operculum, ♀; E, antennule; F, antenna. *Joeropsis coralicola*: G, ♂. *Joeropsis personatus*: H, ♂. *Joeropsis rathbunae*: I, ♂.

Joeropsis personatus Kensley, 1984

Figure 40H

DIAGNOSIS ♂ 2.2 mm, ♀ 2.0 mm. Body glabrous. Lateral margin of cephalon serrate. Rostrum triangular. Lateral margins of pleotelson serrate. Antennal flagellum of five articles. Apex of ♀ operculum acute. Outer uropodal ramus shorter than inner. Strong band of pigment on cephalon; rest of body with paler reticulation of pigment.

RECORDS Carrie Bow Cay, Belize, on *Porites* sp. and *Madracis* sp. corals, and on *Halimeda* sp. alga, 1–20 m.

Joeropsis rathbunae Richardson, 1902

Figure 40I

DIAGNOSIS ♂ 1.9 mm, ovigerous ♀ 1.6 mm. Body setose overall. Lateral margins of cephalon entire. Rostrum evenly convex with flange of transparent teeth. Antennal flagellum of three articles. Lateral margins of pleotelson serrate. Apex of ♀ operculum acute. Outer uropodal ramus longer than inner. Pigment in reticulation over entire body.

RECORDS Bermuda; Florida Keys; Turks and Caicos Islands; Puerto Rico; Gulf of Mexico; intertidal to 36 m.

Family Microparasellidae Karaman, 1933a

DIAGNOSIS Eyes lacking. Antennule much shorter than antenna. Antenna with scale. Pereopods all similar, with biunguiculate dactyli. Pleon of one free pleonite plus pleotelson. Uropods with well-developed sympod and rami.

Key to genera of Microparasellidae

1. ♂, pleopod 1 narrow, not overlapping external part of pleopod 2;
maxillipedal palp of five articles *Microcharon*
 - ♂, pleopod 1 broad, almost completely covering pleopod 2;
maxillipedal palp of four articles, terminal article ending in pointed
process *Angliera*
-

REMARKS All the members of this family are tiny (usually less than 2 mm), and most are interstitial in habit, being found in marine, brackish, and freshwater environments.

Angliera Chappuis and Delamare Deboutteville, 1955

DIAGNOSIS Mandibular palp with two proximal articles inflated, terminal article, slender hooklike, articles lacking setae and spines. Maxillipedal palp of four articles, articles 1 and 3 elongate, article 2 short, article 4 with terminal acute process. Pleopod 1 in ♂ forming broad lamella.

Angliera psamathus Kensley, 1984

Figure 41A–D

DIAGNOSIS ♂ 1.0 mm, ♀ 1.0 mm. Maxillipedal endite with seven setae on distal margin. Posterior four pairs of pereopods with claw on dactylus dorsal to unguis. Uropodal endopod subequal in length to sympod.

RECORDS Carrie Bow Cay, Belize, interstitial in intertidal sand bank.

REMARKS Two other species of *Angliera* have been recorded from the Caribbean area: *A. dubitans* Stock, 1977, from Bonaire, and *A. racovitzai* Coineau and Botosaneanu, 1973, from Cuba. The reader should refer to the original descriptions to distinguish the species, as differences are extremely subtle.

Microcharon Karaman, 1934

DIAGNOSIS Mandibular palp of three articles, two distal articles bearing spines and/or setae. Maxillipedal palp of five articles, articles 1, 2 and 3 expanded. ♂, pleopod 1 narrow, elongate, not obscuring pleopod 2.

REMARKS More than 20 species of *Microcharon* have been described worldwide. The genus is unusual in that the species have been found in true marine environments, in brackish habitats such as wells, and inland in freshwater.

Microcharon sabulum Kensley, 1984

Figure 41E–H

DIAGNOSIS ♂ 1.4 mm, ♀ 1.5 mm. Antennule of five articles. Inner ramus of maxilla 2 with pectinate spine. Pereopodal dactyli short, biunguiculate. En-

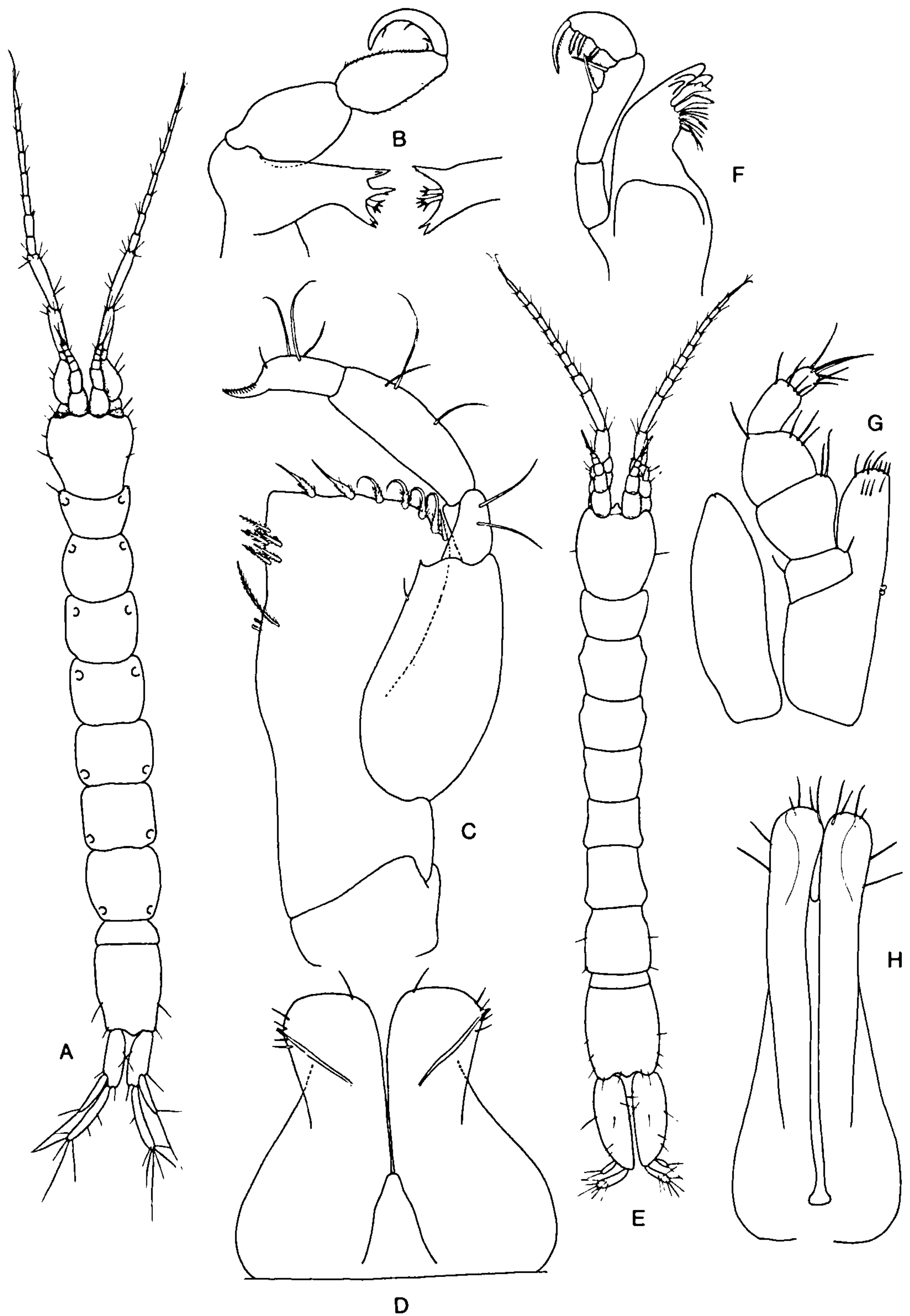


Figure 41. *Angliera psamathus*: A, ♂; B, right, and part of left, mandible; C, maxilliped; D, pleopod 1, ♂. *Microcharon sabulum*: E, ♂; F, mandible; G, maxilliped; H, pleopod 1, ♂.

dopod of pleopod 3 with three distal plumose setae. Uropodal sympod stout, longer than rami.

RECORDS Carrie Bow Cay, Belize, interstitial in intertidal sand bank.

REMARKS Two other species of *Microcharon* have been described from the Caribbean area: *M. phreaticus* Coineau and Botosaneanu, 1973, from interstitial freshwater on Cuba, and *M. herrerae* Stock, 1977, from freshwater wells on Bonaire. The reader should refer to the original descriptions to distinguish these species.

Family Munnidae Sars, 1899

DIAGNOSIS Body ovate. Cephalon and all pereonites free; pleon narrower than rest of body, longer than broad. Eyes on lateral processes of cephalon. Mandible with molar and incisor present; palp present or absent. Maxillipedal palp articles 2 and 3 broader than remaining articles. Pereopod 1 prehensile; pereopods 2–7 ambulatory. Uropods tiny, without sympod. Anus exposed, not covered by pleopods.

REMARKS Poore (1984) has provided the most useful and recent survey of the genera, and especially of *Munna*.

Key to genera of Munnidae

1. Mandibular palp present; pereopod 1 enormous in ♂, as compared with ♀ *Munna*
 - Mandibular palp absent; pereopod 1 not sexually dimorphic *Uromunna*
-

Munna Krøyer, 1839

DIAGNOSIS Body dorsally with numerous setae and/or articulating spines. Antennular flagellum with two distal articles each with single aesthetasc, terminal article minute. Mandibular molar strong, subcylindrical, distally truncate, with accessory setae; palp reaching beyond incisor, article 2 with few serrate spines. Pereopod 1 sexually dimorphic; pereopods 2–7 not (or barely) sexually dimorphic, dactyli with accessory claw. Pleopod 3, article 2 of exopod reaching well beyond endopod.

Munna petronastes Kensley, 1984

Figure 42A–D

DIAGNOSIS ♂ 1.1 mm, ♀ 1.0 mm. Pereopod 1 in ♂ enormously enlarged, carpochelate. Pleopod 1 in ♂ with distolateral angles projecting, acute. Body with anterodorsal U-shaped pigment band, and two converging bands on posterior pereon.

RECORDS Carrie Bow Cay, Belize, intertidal to 2 m, usually on corals.

Uromunna Menzies, 1962c

DIAGNOSIS Body with few if any dorsal setae, without articulating spines. Terminal antennular flagellar article not minute, bearing single aesthetasc. Mandibular molar strong, cylindrical, distally truncate, lacking accessory setae; palp present or absent. Pereopod 1 not sexually dimorphic, small. Pereopod 2 (rarely 2–7) sexually dimorphic, carpi and propodi broader in ♂ than in ♀. Pleopod 3, article 2 of exopod not reaching beyond endopod.

Key to species of *Uromunna*

1. Larger uropodal ramus parallel sided, about 3.5 times longer than basal width; inner uropodal ramus tiny, obscured by pleotelsonic margin *reynoldsi*
 - Larger uropodal ramus tapering, about 1.5–2.0 times longer than basal width; inner uropodal ramus smaller than outer, but visible beyond pleotelsonic margin *caribea*
-

Uromunna caribea (Carvacho, 1977)

Figure 42E,F

DIAGNOSIS ♂ 1.5 mm, ♀ 1.5 mm. Propodus of pereopod 1 1.5–2 times longer than wide. Operculum of ♀ distally truncate. Shorter uropodal ramus visible beyond pleotelsonic margin, with single seta. Pigmentation in reticulation on cephalon and pereon; with six marginal patches on pleon.

RECORDS Turks and Caicos Islands, 1 m; Canal de la Belle Plaine, Guadeloupe, in water of 25‰.

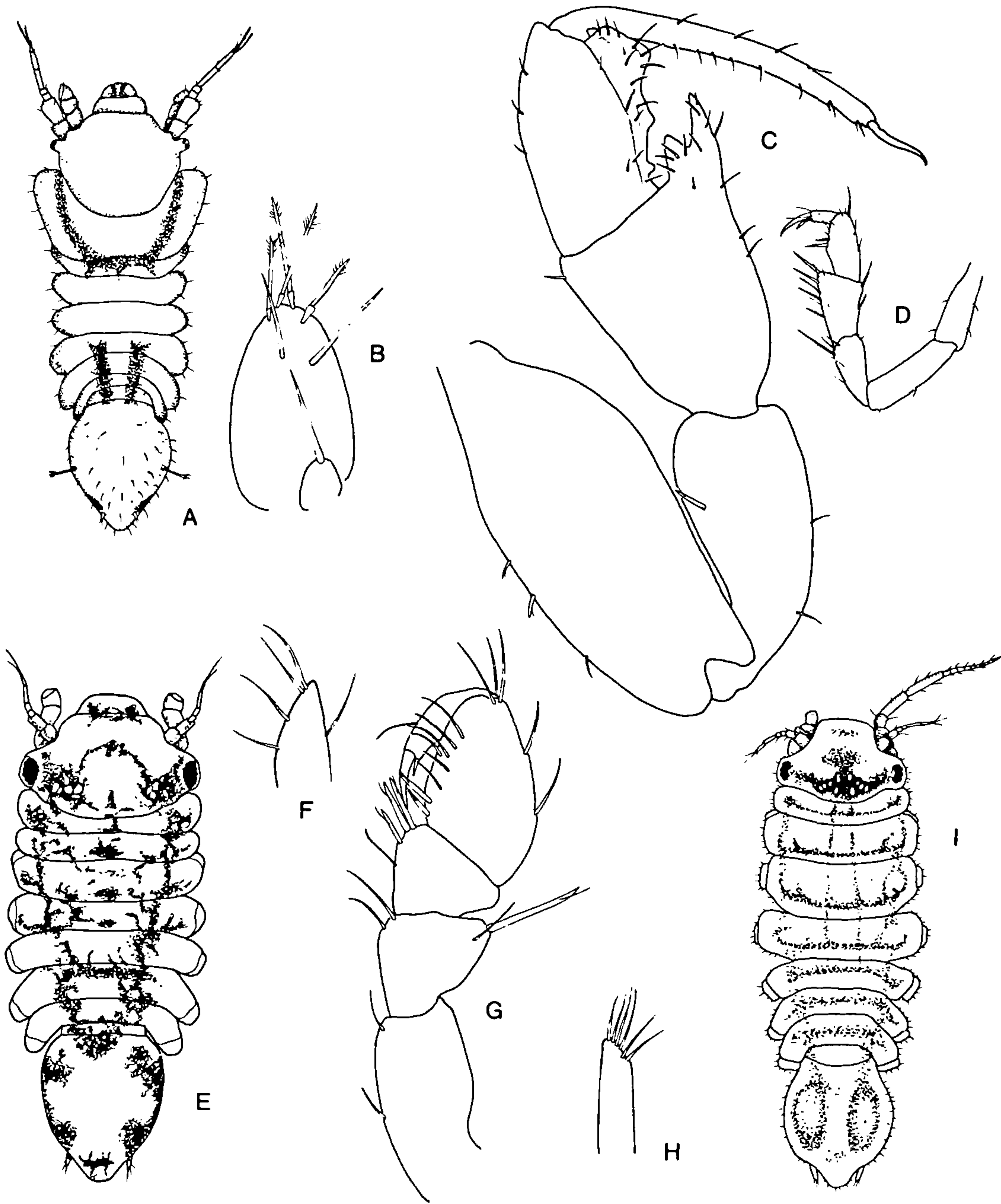


Figure 42. *Munna petronastes*: A, ♂; B, uropod; C, pereopod 1, ♂; D, pereopod 1 ♀ (C and D same scale). *Uromunna caribea*: E, ♂; F, larger uropodal ramus. *Uromunna reynoldsi*: G, pereopod 1, ♂; H, larger uropodal ramus; I, ♂.

Uromunna reynoldsi Frankenberg and Menzies, 1966

Figure 42G–I

DIAGNOSIS ♂ 1.5 mm, ♀ 1.6 mm. Propodus of pereopod 1 two or three times longer than wide. Operculum of ♀ distally rounded. Shorter uropodal ramus obscured by pleotelsonic margin, with single seta. Pigmentation a

broad patch between eyes on cephalon, lateral bands on pereon, and anterior and lateral patches on pleon.

RECORDS Sapelo Island, Georgia, in tidal saltmarsh creek; Lake Ponchartrain, Louisiana; Atlantic and Pacific locks of Panama Canal.

Family Paramunnidae Vanhöffen, 1914

DIAGNOSIS Body broad, ovate, often with laterally produced tergal or epimeral plates. Cephalon recessed into pereonite 1. Eyes, if present, on lateral projections of cephalon. Antennule short, usually of six articles, with single terminal aesthetasc. Antenna never longer than body. Mandibular palp present or absent. Pereopod 1 prehensile; pereopods 2–7 ambulatory. Pleopod 1 ♂ distally sagittate. Uropods with sympod minute or absent; rami tiny. Anus covered by pleopods.

Munnogonium George and Strömberg, 1968

DIAGNOSIS Eyes present on short lateral processes of cephalon. Antennal peduncular scale present. Coxal plates visible on pereonites 2–7.

Munnogonium wilsoni Hooker, 1985

Figure 43A,B

DIAGNOSIS ♂ 0.86 mm, ♀ 0.98 mm. Frontal margin of cephalon broadly rounded. Mandibular palp absent. Uropodal endopod twice length of exopod. Lateral margins of pleotelson to uropodal insertion serrate, posterior margin between uropodal insertions tapering to rounded apex.

RECORDS Florida Middlegrounds, Gulf of Mexico, 55 m.

Family Pleurocopidae Fresi and Schiecke, 1972

DIAGNOSIS Cephalon broader than long. Eyes (or at least ocular peduncles) present. Mandible with or without palp; molar truncate. Maxillipedal palp articles narrow, less than half width of endite. At least coxae of pereonites 5–7 dorsally visible. Pereopods 2–7 uni- or biunguiculate. Pleopod 1 in ♂ not sagittate. Uropod pedunculate, inserted laterally or slightly dorso- or ventrolaterally on pleotelson; biramous, or with one ramus fused with sympod.

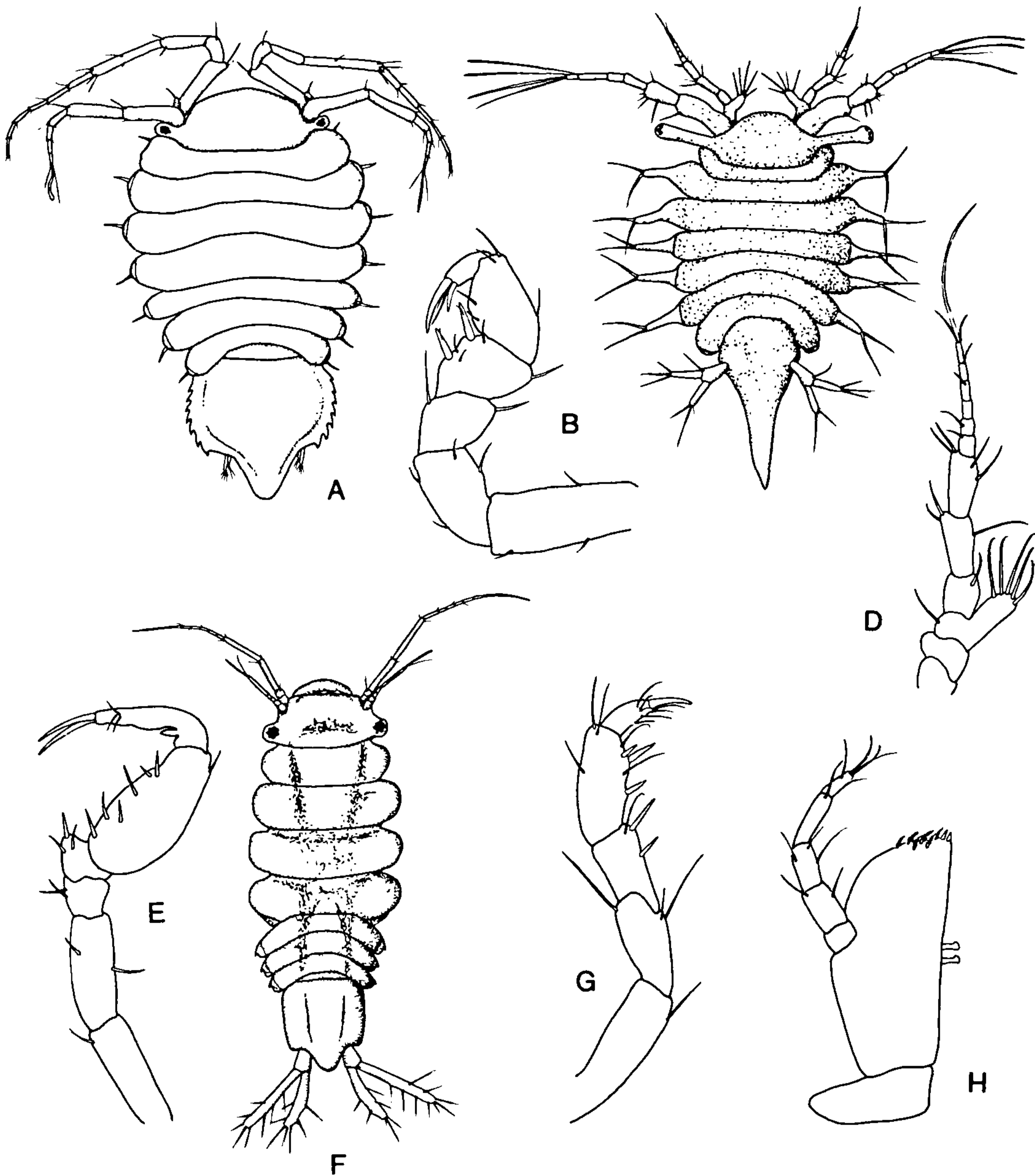


Figure 43. *Munnogonium wilsoni*: A, ♀; B, pereopod 1, ♂. *Pleurocope floridensis*: C, ♂; D, antennule ♂; E, pereopod 1 ♂. *Santia milleri*: F, ♂; G, pereopod 1, ♂; H, maxilliped.

Pleurocope Walker, 1901

DIAGNOSIS Eyes present on lateral peduncle. Antennular peduncle of two articles; flagellum of four articles. Antennal peduncle of five (six) articles, scale lacking; flagellum of six or seven articles. Mandibular palp lacking. Pereopod 1 subchelate. Pereopods 2–7 uniunguiculate.



Figure 44. *Pleurocope floridensis*: adult in dorsal view.

Pleurocope floridensis Hooker, 1985

Figure 43C–E, 44

DIAGNOSIS ♂ 1.15 mm, ♀ 0.96 mm. Body ovate, tapering posteriorly. Integument very finely tuberculate. Mesiodistal lobe on antennal peduncle article 3 bearing five distal setae. Pereon lacking long dorsal setae. Pereopod 1 subchelate, but almost carpochelate. Pleon consisting of single segment, posteriorly narrowly tapered and produced. Uropodal rami as long as sympod.

RECORDS Turks and Caicos Islands, 1 m; Carrie Bow Cay, Belize, 3–10 m; Florida Middlegrounds, Gulf of Mexico, 55 m.

Family Santiidae Wilson, 1987

DIAGNOSIS Antennular flagellum with at most, three articles, antennular scale sometimes present. Pereopod 1 prehensile. Pereopods 2–7, dactyli biunguiculate. Coxae visible at least on pereonites 5–7. Pleon consisting of single short pleonite plus pleotelson. Uropods pedunculate, biramous, inserted dorsally or laterally. (One species of *Santia* possesses a uniramous uropod.)

Santia Sivertsen and Holthuis, 1980

DIAGNOSIS Cephalon about twice wider than long. Eyes present. Antennular peduncle of three articles. Pereonites laterally rounded, sometimes bearing short lateral spines.

Santia milleri (Menzies and Glynn, 1968)

Figure 43F–H

DIAGNOSIS ♂ and ♀ 1.0 mm. Eye on short lateral process of cephalon. Mandibular palp of three articles. Maxillipedal palp articles all of similar width. Pereopod 1 barely subchelate. Uropod with sympod well developed, rami prominent, well developed.

RECORDS Carrie Bow Cay, Belize, intertidal to 30 m; Puerto Rico, 1.5 m; San Salvador, Bahamas, 6 m; Turks and Caicos Islands, 1 m; Anguilla; Jamaica; Cozumel, Mexico; Gulf of Mexico.

Brazil, 1–6 m.

Superfamily Stenetrioidea Hansen, 1905a

DIAGNOSIS ♂: Pleopod 1 small, peduncles fused, rami separate, uniarticulate; pleopod 2 small, copulatory; pleopod 3 biramous, opercular. ♀: Pleopod 1 absent; pleopod 2 rami and peduncle fused to form operculum; pleopod 3 as in ♂.

Family Stenetriidae Hansen, 1905a

DIAGNOSIS ♂: Pereopod 1 frequently much bigger than in ♀, with distinctive lobes and teeth. Pleopods 1 and 2 reduced; pleopod 1 protopodite short, fused, rami separate. Pleopod 2, endopod elongate, flexed, exopod short. Pleopod 3 exopod basally broad, distally narrowed; endopod broad, biarticulate. ♀: Pleopod 2, rami fused, short, covering base of pleopod 3. Uropod with short sympod, rami relatively well developed, styliform, of single article.

Key to genera of Stenetriidae

1. Rostrum narrowly triangular, spikelike; two free, very short pleonites anterior to pleotelson *Stenobermuda*
 - Rostrum short, basally broad, anteriorly truncate or broadly rounded; two or three very short free pleonites anterior to pleotelson
..... *Stenetrium*
-

Stenetrium Haswell, 1881

DIAGNOSIS Eyes present. Cephalon broader than long. Rostrum short, basally broad, anteriorly truncate or rounded. Pereonites 1–4 with anterolateral projections; pereonites 5–7 projecting posteriorly. Pleotelson with sharp tooth anterior to small lateral notch.

REMARKS If fresh material is not available, and color pattern is lost in preservation, mature male material is needed as identification is based on the structure of male pereopod 1.

Key to species of *Stenetrium*

1. Eyes of few (not more than 10) ommatidia, not reniform 2
 Eyes of many ommatidia, reniform 3
 2. Eyes of four ommatidia; ♂ pereopod 1 small, propodus not unusually broad *minocule*
 Eyes of more than four ommatidia; ♂ pereopod 1, propodus broad, with wide palm *patulipalma*
 3. Pleotelsonic margins serrate 4
 Pleotelsonic margins entire 5
 4. Rostrum convex, with fine marginal teeth; pereopod 1 ♂, propodal palm with three straight teeth *bowmani*
 Rostrum truncate; pereopod 1 ♂, propodal palm with two teeth, outer tooth elongate, curved *serratum*
 5. Pereopod 1 ♂, carpus produced, apically acute *stebbingi*
 Pereopod 1 ♂, carpus produced, apically rounded *spathulicarpus*
-

Stenetrium bowmani Kensley, 1984

Figure 45

DIAGNOSIS ♂ 5.0 mm, ♀ 5.2 mm. Rostrum convex, with tiny marginal teeth. Lateral lobes of cephalon acute, margins serrate. Color pattern in small scattered red-brown chromatophores; irregular unpigmented patches on cephalon, pereonite 4, and pleon; chalky-white bands on antennae and uropods. ♂: Pereopod 1 propodus broad, palm with three teeth, outermost

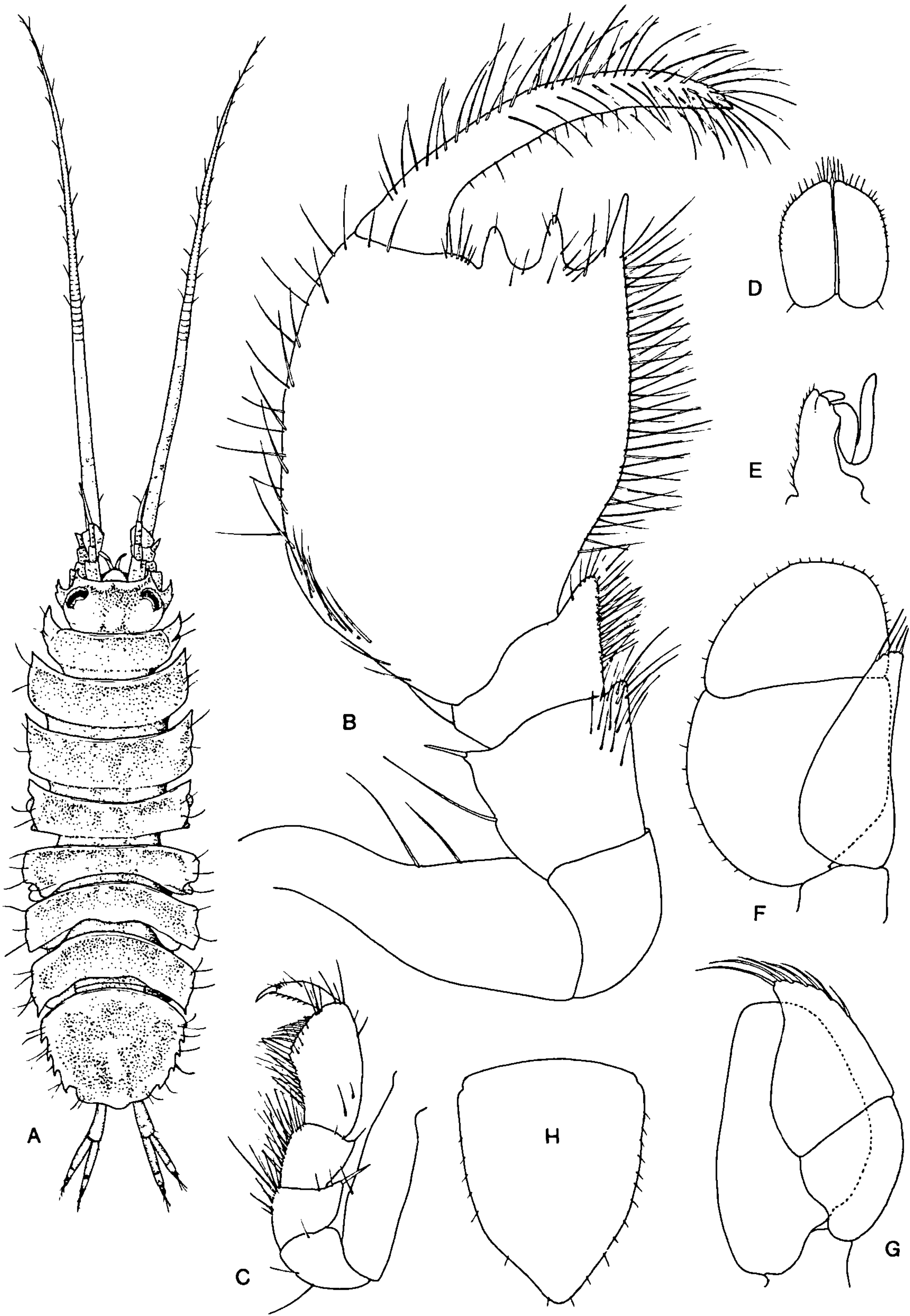


Figure 45. *Stenetrium bowmani*: A, ♂; B, pereopod 1, ♂; C, pereopod 1, ♀; D, pleopod 1, ♂; E, pleopod 2, ♂; F, pleopod 3; G, pleopod 4; H, operculum, ♀.

longest, slender. ♀: Pereopod 1 propodus with strong denticulate spine demarking palm, latter straight, with row of about seven slender spines.

RECORDS Cozumel, Mexico; Carrie Bow Cay, Belize, 0.5–15.2 m, on algae and corals in reefcrest, and spur and groove zone of reef.

Stenetrium minocule Menzies and Glynn, 1968

Figure 46A–C

DIAGNOSIS ♂ 2.8 mm, ♀ 3.7 mm. Eye of four ommatidia. Anterolateral lobes of cephalon blunt, barely produced. Rostrum poorly defined, truncate. ♂: Pereopod 1, carpus produced posterodistally into broadly rounded lobe; propodus broad, palm demarked by strong spine, with six low rounded teeth. ♀: Pereopod 1 propodus little broadened, palm demarked by strong denticulate spine, bearing several more spines.

RECORDS Puerto Rico, intertidal to 3 m; Carrie Bow Cay, Belize, intertidal to 36 m, from rubble, algal turfs, and seagrass.

Stenetrium patulipalma Kensley, 1984

Figure 46D,E

DIAGNOSIS ♂ 2.0 mm, ♀ 2.7 mm. Eyes of about 10 ommatidia in cluster. Rostrum poorly defined, truncate. Two basal articles of maxillipedal palp not enlarged. ♂: Pereopod 1 unknown. ♀: Pereopod 1 broadening to palm, and bearing row of about 12 small fringed spines. Color pattern: entire body with red-brown reticulation, dark transverse bars anteriorly on cephalon, pereonites 2 and 3, posteriorly on pereonites 4–7.

RECORDS Carrie Bow Cay, Belize, 9.1–27.4 m; Barbados; Jamaica.

Stenetrium serratum Hansen, 1904

Figure 46F–H

DIAGNOSIS ♂ 4.0 mm, ovigerous ♀ 4.9 mm. Rostrum truncate. Pereonites 1–5 with acute anterolateral angles. Pleotelsonic lateral margins with five teeth. ♂: Pereopod 1, propodus broad, palm with three teeth, outermost elongate, curved; dactylus reaching well beyond outermost palmar tooth. ♀: Pereopod 1, propodus much smaller than in ♂, palm bearing series of about nine fringed spines. Color: tiny red-brown chromatophores arranged in re-

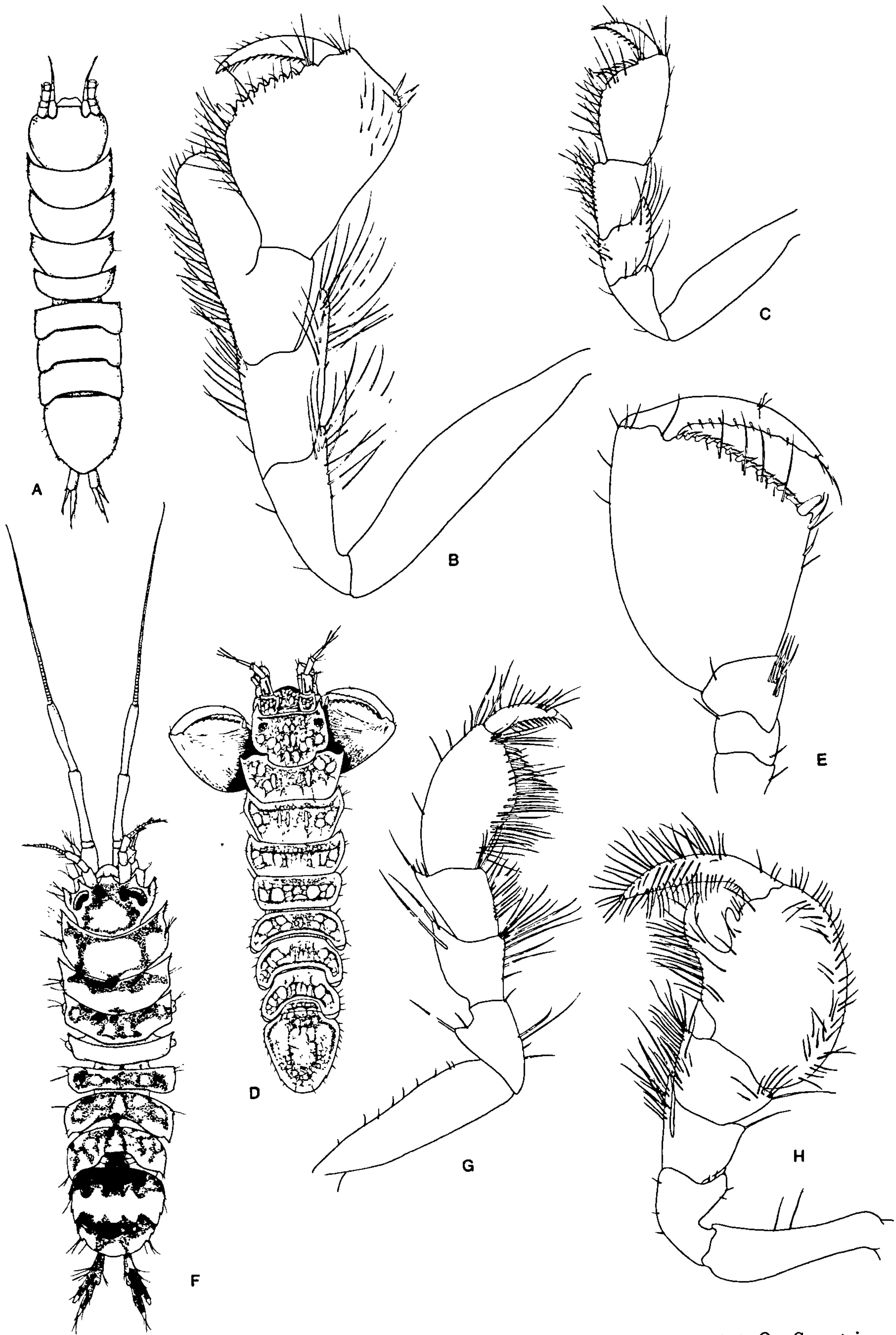


Figure 46. *Stenetrium minocule*: A, ♂; B, pereopod 1 ♂; C, pereopod 1 ♀. *Stenetrium patulipalma*: D, ♀; E, pereopod 1 ♀. *Stenetrium serratum*: F, ♂; G, pereopod 1 ♀; H, pereopod 1 ♂.

ticulate bands; distinctive open patches on cephalon and pereonite 1; pleon with two broad transverse bands.

RECORDS Looe Key, Florida, 0.5–6 m; Turks and Caicos Islands, 1 m; Jamaica; Puerto Rico, intertidal to 3 m; St. Thomas, U.S. Virgin Islands; Carrie Bow Cay, Belize, intertidal to 15 m.

Stenetrium spathulicarpus Kensley, 1984

Figure 47A–C

DIAGNOSIS ♂ 4.1 mm, ♀ 4.1 mm. Rostrum truncate. ♂: Pereopod 1, merus and ischium each with setose fingerlike anterodistal projection; carpus with large spatulate and setose lobe almost reaching level of palm; propodal palm with large outer tooth and four or five low rounded teeth, broad band of setae near anterior margin; dactylus reaching slightly beyond palm, with band of setae along anterior margin. ♀: Propodal palm straight, with row of slender spines; band of setae in similar position as in ♂. Color: pigment in ill-defined and scattered reticulation; strong band on cephalon between eyes.

RECORDS Carrie Bow Cay, Belize, intertidal to 36 m; Puerto Rico, intertidal.

Stenetrium stebbingi Richardson, 1902

Figure 47 D–H

DIAGNOSIS ♂ 4.8 mm, ovigerous ♀ 4.1 mm. Rostrum truncate. Ommatidia of eye more bunched than in *S. spathulicarpus*. ♂: Pereopod 1 variable according to maturity; carpus produced posterodistally into narrowly triangular, apically acute lobe; propodal palm poorly defined, with group of two to four teeth near dactylar articulation. ♀: Pereopod 1, palm straight, defined by strong outer tooth and bearing row of six or seven low rounded tubercles. Color: irregular reticulation of red-brown pigment, no strong band between eyes.

RECORDS Bermuda, 0.5–4 m; Florida Keys, 18.3 m; Bahamas, 5 m; Turks and Caicos Islands, 1 m; Cuba; Jamaica; U.S. Virgin Islands, 50 m; Carrie Bow Cay, Belize, 0.5–36 m; Gulf of Mexico.

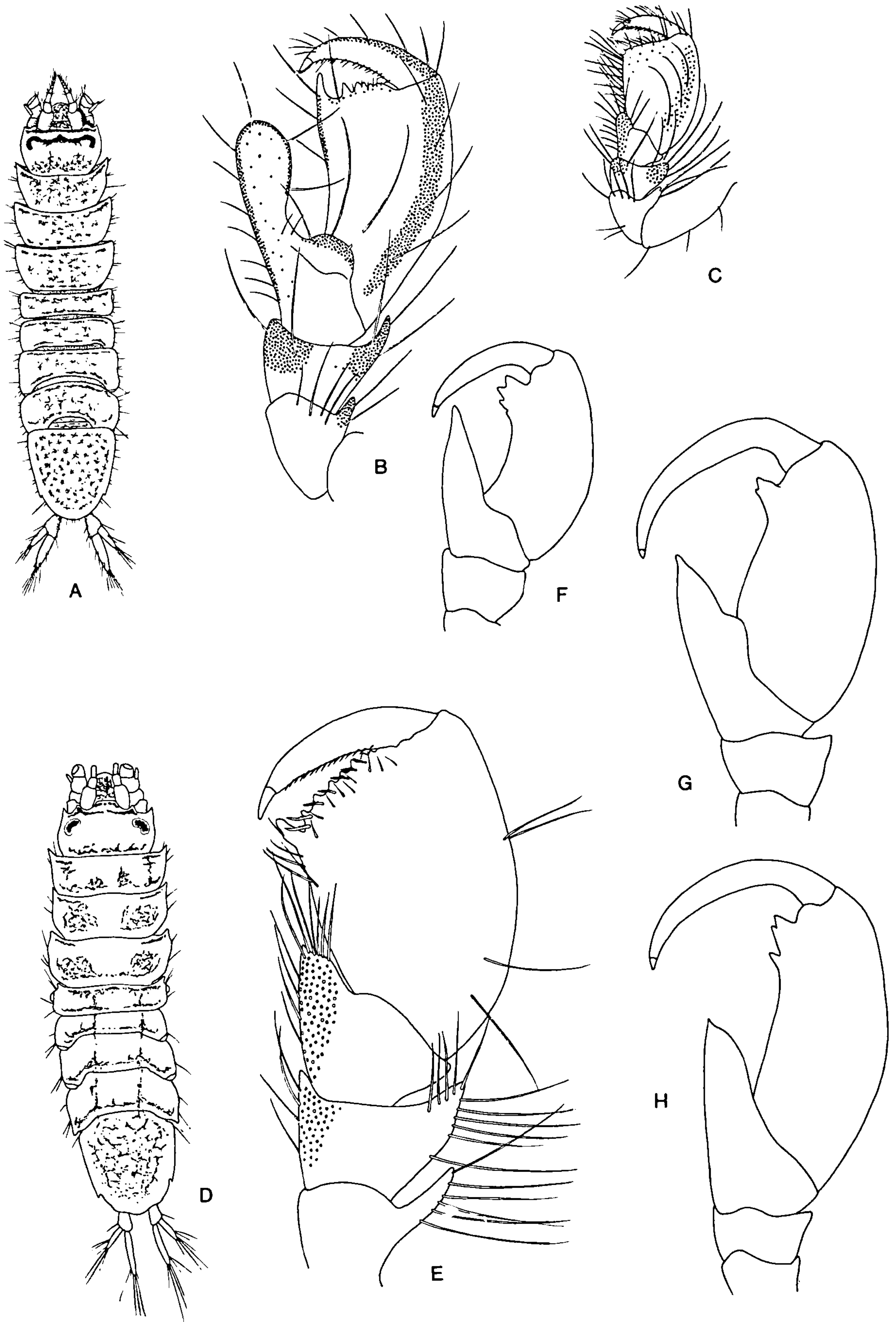


Figure 47. *Stenetrium spathulicarpus*: A, ♂; B, pereopod 1, ♂, many setae removed; C, pereopod 1, ♀. *Stenetrium stebbingi*: D, ♂; E, pereopod 1, ♀; F, G, H, variation in pereopod 1, ♂.

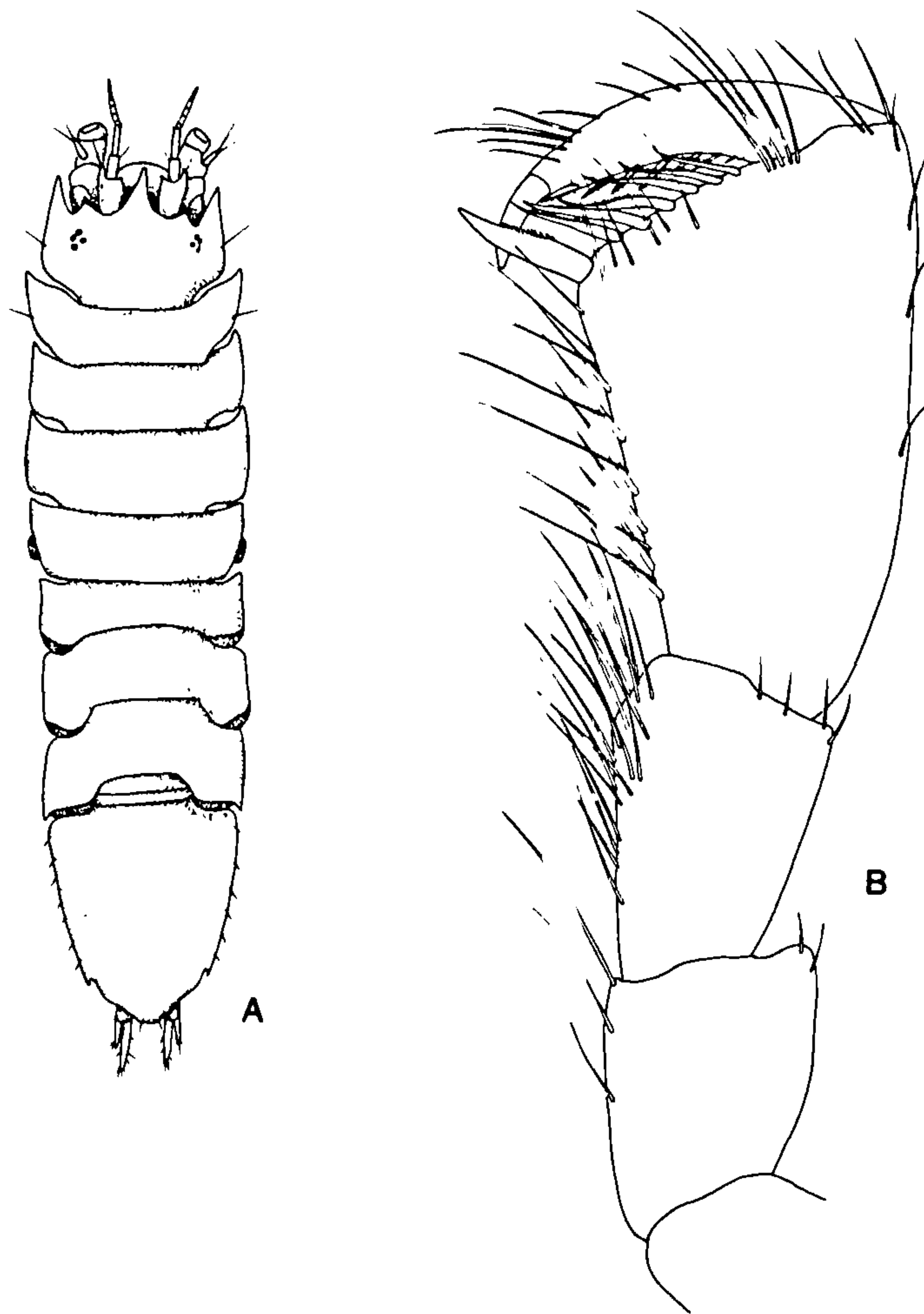


Figure 48. *Stenobermuda acutirostrata*: A, ♀; B, pereopod 1, ♀.

Stenobermuda Schultz, 1979

DIAGNOSIS Eyes of few ommatidia; rostrum narrow-based, elongate and spikelike. Pleon consisting of two free pleonites plus pleotelson, with posterolateral notch marked by tooth.

Stenobermuda acutirostrata Schultz, 1979

Figure 48

DIAGNOSIS ♂ 4.8 mm. Eyes having five ommatidia. Spikelike rostrum reaching well beyond anterolateral angles of cephalon. Pereopod 1, propodus longer than wide, palm straight, bearing eight fringed spines, posterior margin with six spines and several setae.

RECORDS Off Bermuda, 90 m; Turks and Caicos, 1 m.

Suborder Epicaridea Latreille, 1831

DIAGNOSIS Predominantly ectoparasites of marine crustaceans, feeding on blood. Eyes sessile, usually present in ♂, often reduced or lost in ♀. Antennae and antennules reduced; mouthparts reduced, forming a suctorial cone containing pair of piercing stylets formed from modified mandibles. Maxillae 1 and 2 reduced or lost. All mouthparts may be lost, and replaced by proboscis. ♂ small and isopodlike. ♀ undergo considerable distortion or reduction, often to unsegmented sacs of eggs in some forms. Ostegites usually retained. Two larval mancalike stages, epicaridium and cryptoniscium (Figure 49), characteristic of entire suborder.

REMARKS The epicarideans are ectoparasites of other crustaceans, with the juveniles often using copepods as intermediate hosts. Sexual dimorphism is marked, the males being symmetrical with unambiguous segmentation, and considerably smaller than the often highly distorted females. In these, body segmentation is often obscured, with body segments often expanded on one side and reduced and compressed on the other. The marsupium of the ovigerous female, except in the *Crytoniscidae* and *Entoniscidae*, is made up of broadly lamellar oostegites, is relatively enormous and often obscures the rest of the body structure.

Crustacean hosts of the epicarideans are found in four classes: Ostracoda, Copepoda, Cirripedia, and Malacostraca, and in nine orders of the Malacostraca: Leptostraca, Stomatopoda, Mysidacea, Cumacea, Tanaidacea, Isopoda, Amphipoda, Euphausiacea, and Decapoda. The Epicaridea have been divided into two superfamilies, the Bopyroidea, containing families Bopyridae, Dajidae, and Entoniscidae, and the Cryptoniscoidea, containing the *Crytoniscidae*.

In the Bopyridae (Figure 50), the often asymmetrical adult female shows some segmentation. Seven pereopods may be present only on one side, their number being variable on the other. This is largest of the epicaridean families, containing over 400 species (Markham, 1974). Ten subfamilies have been recognized: the monotypic Entophilinae parasitizes galatheid crabs; six subfamilies, the Argeiinae, Bopyrinae, Bopyrophryxinae, Ioninae, Pseudioninae, and Orbioninae are all branchial parasites of decapod crustaceans; two subfamilies are abdominal parasites, the Phyllodurinae on callianassid mud-shrimps, and the Athelginae on hermit crabs; the Hemiarthrinae are known from the dorsal and ventral abdominal surfaces, and from the branchial chamber of caridean shrimps.

The Dajidae are ectoparasites pelagic mysidaceans, euphausiaceans, and decapod caridean shrimps. Adult females are often found unattached in plankton and pelagic samples. When attached, dajids are found on the

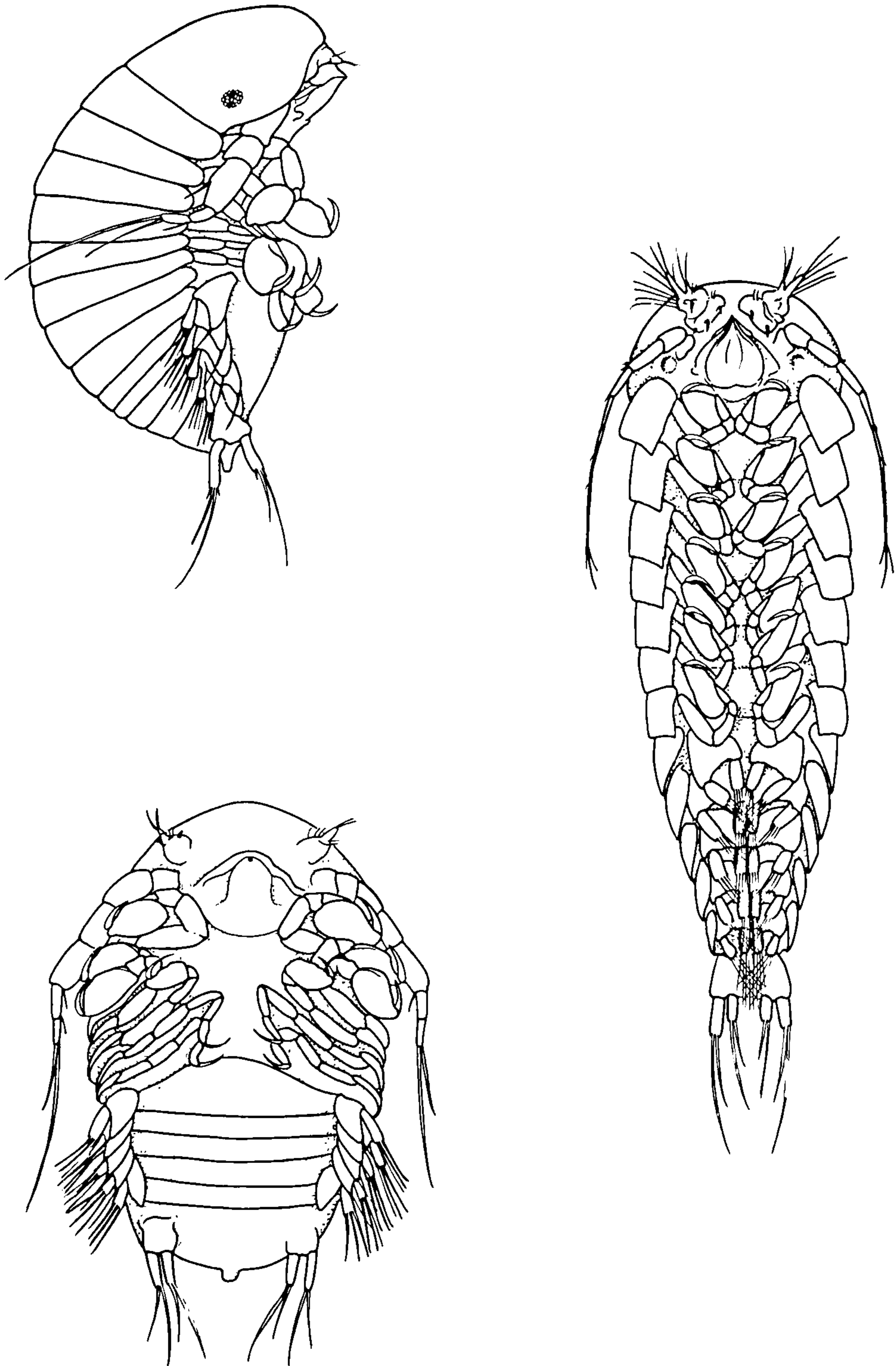


Figure 49. *A*, epicaridium larva, lateral view; *B*, epicaridium larva, ventral view; *C*, cryptoniscium larva, ventral view (from Bonnier, 1900).

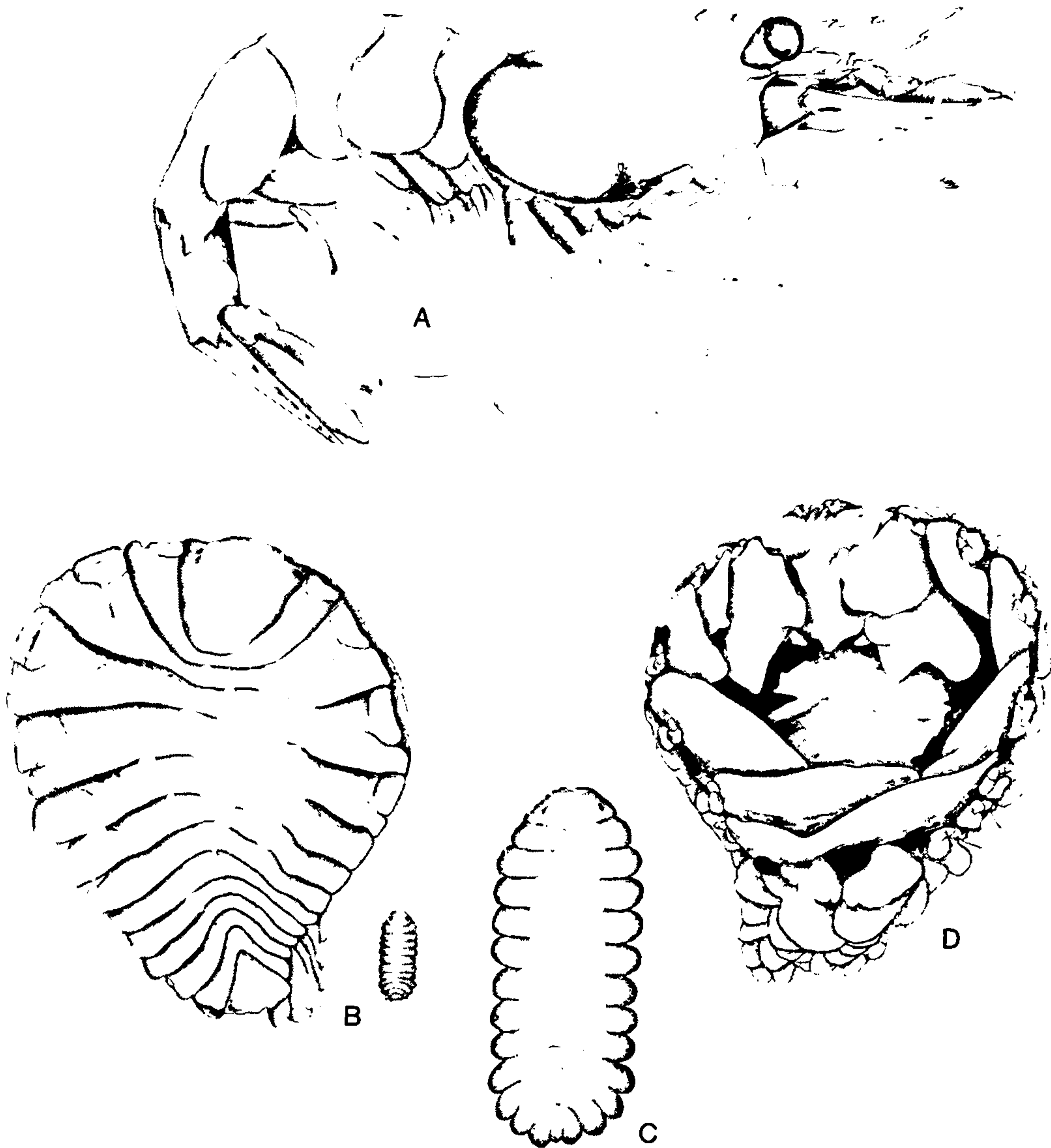


Figure 50. *A*, caridean shrimp with bopyrid parasite in branchial chamber. *Probopyrus pandalicola*: *B*, ♀ and ♂ in dorsal view, same scale; *C*, ♂ enlarged; *D*, ♀, ventral view, eggs removed from marsupium.

cephalothorax of the host, attached dorsally to the carapace, ventrally and laterally in the gill chambers and on the pereopods, or in the brood chambers.

The Entoniscidae are internal parasites of decapod crustaceans, being found in the visceral cavity, with the parasite's head in the position of the host's gonads or hepatopancreas. Veillet (1945) demonstrated that a pore to the host's branchial chamber connecting the parasite to the exterior is present only in hosts with mature parasites, to facilitate the release of epicaridium larvae.

The Cryptoniscidae are protandrous hermaphrodites. The female is

TABLE 2. CARIBBEAN EPICARIDEAN ISOPODS, THEIR HOSTS AND LOCALITIES

<i>Achelion occidentalis</i> Hartnoll, 1966	<i>Synalpheus pectiniger</i> Coutière
<i>Microphrys bicornutus</i> (Latreille)	North Carolina to Florida; Bahamas;
<i>Stenorhynchus seticornis</i> (Herbst)	Hispaniola; Jamaica; Bonaire;
Jamaica	Curaçao; Belize; Gulf of Mexico
<i>Aporobopyrina anomala</i> Markham, 1973	<i>Balanopleon tortuganus</i> Markham, 1973
<i>Munida valida</i> Smith	<i>Munida simplex</i> Benedict
Florida Keys; off Colombia; Gulf	Tortuga Island
of Mexico	<i>Bopyrella harmopleon</i> Bowman, 1956
<i>Aporobopyrus curtatus</i> (Richardson,	<i>Synalpheus brevicarpus</i> (Herrick)
1904)	<i>Synalpheus fritzmuelleri</i> Coutière
<i>Petrochirus diogenes</i> (Linnaeus)	<i>Synalpheus hemphilli</i> Coutière
<i>Petrolisthes armatus</i> (Gibbes)	<i>Synalpheus minus</i> Say
<i>Petrolisthes galathinus</i> (Bosc)	Venezuela; Brazil
<i>Petrolisthes marginatus</i> Stimpson	<i>Bopyrina abbreviata</i> Richardson, 1904
<i>Porcellana sayana</i> (Leach)	<i>Hippolyte curacaoensis</i> Schmitt
Florida Keys; U.S. Virgin Islands;	<i>Hippolyte pleuracanthus</i> (Stimpson)
North Carolina	<i>Hippolyte zostericola</i> (Smith)
<i>Argeia atlantica</i> Markham, 1977	North Carolina to Florida; Belize;
<i>Sclerocrangon jacqueti</i> (A. Milne	West Indies; Gulf of Mexico
Edwards)	<i>Bopyrinella thorii</i> (Richardson, 1904)
Bahamas; Newfoundland	<i>Thor floridanus</i> Kingsley
<i>Astalione cruciaria</i> Markham, 1975b	Florida; Curaçao; Yucatan
<i>Clastotoechus vanderhorsti</i> (Schmitt)	Peninsula, Mexico
U.S. Virgin Islands	<i>Bopyrione synalphei</i> Bourdon and
<i>Asymmetrione clibanarii</i> Markham,	Markham, 1980
1975d	<i>Synalpheus goodei</i> Coutière
<i>Clibanarius tricolor</i> (Gibbes)	<i>Synalpheus bousfieldi</i> Chace
Florida; Bahamas; Ascension	<i>Synalpheus brevicarpus</i> (Herrick)
Island	<i>Synalpheus pectiniger</i> Coutière
<i>Asymmetrione desultor</i> Markham, 1975d	Florida; Haiti; Curaçao; Gulf of
<i>Pagurus bonairensis</i> Schmitt	Mexico
<i>Pagurus longicarpus</i> Say	<i>Bopyrissa wolffi</i> Markham, 1978
<i>Pagurus provenzanoi</i> Forest and de	<i>Clibanarius tricolor</i> (Gibbes)
Saint Laurent	<i>Clibanarius vittatus</i> (Bosc)
<i>Pylopagurus</i> sp.	Bermuda; North Carolina to Florida;
North Carolina; Florida Keys;	Bahamas; Puerto Rico; Gulf of
Curaçao; Bonaire	Mexico
<i>Azygopleon schmitti</i> (Pearse, 1932)	<i>Cabirops</i> sp.
<i>Synalpheus brooksi</i> Coutière	<i>Synsynella deformans</i> Hay
<i>Synalpheus hemphilli</i> Coutière	Bermuda
<i>Synalpheus longicarpus</i> Coutière	<i>Cancricepon choprae</i> (Nierstrasz and
<i>Synalpheus mcclendoni</i> Coutière	Brender à Brandis, 1925)

- Domecia acanthophora* (Desbonne and Schramm)
Domecia hispida Eydoux and Souleyet
Eriphia gonagra (Fabricius)
Hexapanopeus angustifrons (Benedict and Rathbun)
Micropanope barbadensis Rathbun
Neopanope packardii (Kingsley)
Neopanope texana sayi (Smith)
Panopeus herbstii H. Milne Edwards
Panoplax depressa Stimpson
Paraliomera dispar (Stimpson)
Rithropanopeus harrisii (Gould)
 Carolinas to Florida; Bermuda; Curaçao; Gulf of Mexico
Cancrion carolinus Pearse and Walker, 1939
Panopeus herbstii H. Milne Edwards
 North Carolina; Bahamas
Dactylokepon caribaeus Markham, 1975c
Iliacantha liodactyla Rathbun
Iliacantha subglobosa Stimpson
 Dominican Republic; Costa Rica–Panama
Dicropleon periclimenis Markham, 1972a
Periclimenes americanus Kingsley
 St. Lucia Island
Diplophryxus sp. (see Markham, 1985)
Alpheus formosus Gibbes
 Georgia; Florida; Yucatan, Mexico
Eophrinx subcaudalis (Hay, 1917)
Synalpheus brooksi Coutière
Synalpheus goodei Coutière
Synalpheus hemphilli Coutière
Synalpheus longicarpus (Herrick)
Synalpheus mcclendoni Coutière
Synalpheus pandionis Coutière
Synalpheus pectiniger Coutière
 North Carolina to Florida; Yucatan Peninsula, Mexico; Belize; Hispaniola; Curaçao
Gigantione mortenseni Adkison, 1984b
Dromidia antillensis Stimpson
Hypoconcha sabulosa (Herbst)
Hypoconcha spinosissima Rathbun
 Florida; Haiti; Yucatan, Mexico; U.S. Virgin Islands; Gulf of Mexico
Hemiarthrus synalpheii (Pearse, 1950)
Synalpheus fritzmuelleri Coutière
Synalpheus hemphilli Coutière
Synalpheus longicarpus (Herrick)
 North Carolina to Florida; Haiti; Gulf of Mexico
Leidya bimini Pearse, 1951
Cyclograpsus interger (H. Milne Edwards)
Pachygrapsus transversus (Gibbes)
Sesarma ricordi H. Milne Edwards
 Bermuda; Florida Keys; Bahamas; U.S. Virgin Islands; Jamaica; Panama
Leidya distorta (Leidy, 1855)
Uca pugilator (Bosc)
Uca spp.
 New Jersey to Florida; Guadeloupe; Trinidad
Loki circumsaltanus Markham, 1972a
Thor floridanus Kingsley
Thor manningi Chace
 Southern Florida; U.S. Virgin Islands; Belize
Metaphrixus carolii Nierstrasz and Brender à Brandis, 1931
Hippolyte pleuracanthus Stimpson
 Southern Florida; U.S. Virgin Islands
Munidion cubense Bourdon, 1972
Munida flinti Benedict
Munida stimpsoni A. Milne Edwards
 Cuba; Venezuela
Munidion irritans Boone, 1927
Munida irrasa A. Milne Edwards
 Florida Keys; Belize

(continued)

TABLE 2. (Continued)

<i>Munidion longipedis</i> Markham, 1975a	<i>Parathelges piriformis</i> Markham, 1972b
<i>Munida longipes</i> A. Milne Edwards	<i>Paguristes oxyophthalmus</i> Holthuis
<i>Munida schroederi</i> Chace	<i>Pagurus brevidactylus</i> (Stimpson)
East coast of Florida; Florida	<i>Pagurus provenzanoi</i> Forest and de
Keys; Cuba; Gulf of Mexico	Saint Laurent
<i>Parabopyrella lata</i> (Nierstrasz and	Bermuda; Bahamas; Colombia
Brender à Brandis, 1929)	<i>Parathelges tumidipes</i> Markham, 1972b
<i>Alpheus normanni</i> Kingsley;	<i>Allodardanus bredini</i> Haig and
<i>Upogebia affinis</i> (Say)	Provenzano
Florida; U.S. Virgin Islands;	<i>Dardanus fucosus</i> Biffar and
Brazil	Provenzano
<i>Parabopyrella mortenseni</i> (Nierstrasz	Bermuda; Jamaica
and Brender à Brandis, 1929)	<i>Pleurocrypta floridana</i> Markham, 1974
<i>Lysmata rathbunae</i> Chace	<i>Galathea rostrata</i> A. Milne Edwards
<i>Lysmata wurdemanni</i> (Gibbes)	Alligator Reef, Florida
Florida; U.S. Virgin Islands;	<i>Pleurocryptella fimbriata</i> Markham,
Venezuela	1973
<i>Parabopyrella richardsonae</i> (Nierstrasz	<i>Munida constricta</i> A. Milne Edwards
and Brender à Brandis, 1929)	<i>Munida miles</i> A. Milne Edwards
<i>Alpheus formosus</i> Gibbes	Western Caribbean; Cuba
<i>Alpheus heterochaelis</i> (Say)	<i>Probopyria alpei</i> (Richardson, 1900a)
U.S. Virgin Islands; Gulf of	<i>Alpheus armillatus</i> H. Milne Edwards
Mexico	<i>Alpheus heterochaelis</i> Say
<i>Parabopyrella thomasi</i> (Nierstrasz and	<i>Alpheus normanni</i> Kingsley
Brender à Brandis, 1929)	<i>Alpheus viridari</i> (Armstrong)
<i>Tozeuma carolinense</i> Kingsley	North Carolina to Florida; Antilles;
U.S. Virgin Islands	Brazil; Gulf of Mexico
<i>Parapagurion imbricata</i> Markham, 1978	<i>Probopyrinella latreuticola</i> (Gissler, 1882)
<i>Paguristes tortugae</i> Schmitt	<i>Latreutes fucorum</i> (Fabricius)
<i>Parapagurus</i> sp.	Bermuda; Sargasso Sea to Azores;
Cuba; Colombia	North Carolina to Florida;
<i>Parathelges foliatus</i> Markham, 1972b	Bahamas; Antilles; Gulf of
<i>Clibanarius vittatus</i> (Bosc)	Mexico
<i>Pagurus brevidactylus</i> (Stimpson)	<i>Probopyrus pandalicola</i> (Packard, 1879)
Barbados; Curaçao; Trinidad	<i>Macrobrachium acanthurus</i> (Wiegmann)
<i>Parathelges occidentalis</i> Markham,	<i>Macrobrachium amazonicum</i> (Heller)
1972b	<i>Macrobrachium bonelli</i> (Nobili)
<i>Clibanarius tricolor</i> (Gibbes)	<i>Macrobrachium carcinus</i> (Linnaeus)
<i>Iridopagurus</i> sp.	<i>Macrobrachium faustinum</i> (de Saussure)
<i>Pylopagurus corallinus</i> (Benedict)	<i>Macrobrachium ohione</i> (Smith)
North Carolina; Florida Keys;	<i>Macrobrachium olfersii</i> (Wiegmann)
Bahamas; Venezuela	<i>Macrobrachium surinamicum</i> Holthuis

- Palaemon northropi* (Rankin)
Palaemon pandaliformis (Stimpson)
Palaemonetes exilipes Stimpson
Palaemonetes intermedius Holthuis
Palaemonetes kadiakensis Rathbun
Palaemonetes paludosus (Gibbes)
Palaemonetes pugio Holthuis
Palaemonetes vulgaris (Say)
Periclimenes americanus (Kingsley)
 New Hampshire to Florida;
 Caribbean to Brazil; Pacific
 Panama
Pseudasymmetrione sp. (see Adkison
 and Heard, 1978)
Iridopagurus iris (A. Milne
 Edwards)
 Venezuela
Pseudione affinis (Sars, 1882)
Pandalus annulicornis Leach
Pandalus bonnierii Caullery
Pandalus leptorhynchus Kinahan
Pandalus montagui Leach
Plesionika antiquai Zariquiey
Plesionika edwardsi (Brandt)
Plesionika ensis (A. Milne Edwards)
Plesionika heterocarpus (Costa)
Plesionika martia (A. Milne
 Edwards)
 Bermuda; Northeastern Atlantic;
 South Africa; Java
Schizobopyrina urocaridis (Richardson,
 1904)
Periclimenes longicaudatus (Stimpson)
Pontonia margarita Smith
 North Carolina to Florida; Belize;
 Gulf of Mexico
Stegias clibanarii Richardson, 1904
Clibanarius tricolor (Gibbes)
 Bermuda
Stegophryxus hyptius Thompson, 1902
Iridopagurus sp.
Pagurus annulipes (Stimpson)
Pagurus bonairensis Schmitt
Pagurus brevidactylus (Stimpson)
Pagurus longicarpus Say
Pagurus provenzanoi Forest and de
 Saint Laurent
 Massachusetts to Florida; Curaçao
Synalpheion giardi Coutière, 1908
Synalpheus longicarpus Herrick
 Yucatan, Mexico
Synsynella choprae (Pearse, 1932)
Synalpheus brooksi Coutière
Synalpheus longicarpus (Herrick)
Synalpheus minus (Say)
Synalpheus pandionis Coutière
 Bermuda; North Carolina to Florida;
 Bahamas; Haiti; U.S. Virgin
 Islands; Gulf of Mexico
Synsynella deformans Hay, 1917
Synalpheus brooksi Coutière
Synalpheus longicarpus (Herrick)
Synalpheus pectiniger Coutière
 Bermuda; Carolinas to West Indies;
 Gulf of Mexico
Urobopyrus processae Richardson,
 1904
Ambidexter symmetricus Manning and
 Chace
Processa acutirostris Nouvel and
 Holthuis
Processa canaliculata Leach
Processa edulis (Risso)
Processa fimbriata Manning and Chace
Processa tenuipes Manning and Chace
 Caribbean; Gulf of Mexico; Brazil;
 Mediterranean; Eastern Atlantic
-

reduced to a simple or lobed sac, generally without appendages. The brood-pouch is formed by invagination of the ventral body wall. The eggs are released by the bursting of the sac. Cryptoniscids have been recorded as parasites of ostracods, cirripedes, mysidaceans, amphipods, isopods, and cumaceans. The majority feed on blood, but the females of some forms have been reported to be egg predators.

Given the highly variable morphology of the epicarideans, and the necessity of examining large series of specimens, keys are not provided and species are not treated individually here. As there is a degree of genus- and species-specificity for the hosts, Table 2 is provided to give a clue to the possible identity of a specimen. The student is then advised to consult one of the detailed works on the group. The most useful single work on the speciose Bopyridae for the area covered here is Markham (1985).

Suborder Flabellifera Sars, 1882

DIAGNOSIS Eyes usually well developed, reduced or absent in cave forms. Antennules and antennae uniramous; antennal peduncle of five or six articles. Mandible usually strong, adapted for cutting and grinding, occasionally for piercing; lacinia mobilis, spine-row, and molar usually present, although latter sometimes reduced; usually with triarticulate palp. Maxilla 1 biramous, sometimes adapted for piercing; maxilla 2 biramous, outer ramus

Key to families of Flabellifera

1. Pleon consisting of four or five free pleonites plus pleotelson 3
 Pleon consisting of not more than three free pleonites plus
 pleotelson 2
2. Pleon consisting of one or two free pleonites plus pleotelson; body
 usually dorsally strongly convex; pleopods subequal
 Sphaeromatidae
 Pleon consisting of three free pleonites plus pleotelson; body strongly
 depressed; pleopods 1–3 small, natatory, pleopods 4 and 5 large and
 broadly ovate Serolidae
3. Uropodal rami flattened, generally not reduced 4
 Uropodal rami reduced, exopod often hooklike Limnoriidae

4. Pereopods 4–7 prehensile, with dactyli longer than propodi; antennae reduced, with no clear distinction between peduncle and flagellum Cymothoidae
 Pereopods 4–7 ambulatory, with dactyli shorter than propodi; antennae normal, peduncle and flagellum clearly distinguished 5
5. Maxilliped bearing distal recurved hooks; pereopods 1–3 strongly prehensile Aegidae
 Maxilliped lacking distal recurved hooks; pereopods 1–3 ambulatory or at most weakly prehensile 6
6. Maxilliped lacking, or with very reduced endite; maxilla 1 a strongly falcate hook Corallanidae
 Maxilliped with strong endite; maxilla 1 not strongly falcate 7
7. Mandibular incisor distally narrowed, lacinia lacking; maxilla 1 slender and elongate, with 3–5 distal hooked spines Tridentellidae
 Mandibular incisor distally broad, cusped; maxilla 1 relatively broad, with several distal spines and setae Cirolanidae
-

usually consisting of two lobes. Pereopods generally ambulatory, sometimes prehensile; pereopods 1 and 2 subchelate only in Serolidae, ancinine Sphaeromatidae, and some Cirolanidae; posterior pereopods sometimes secondarily natatory in some cirolanids. Pleon consisting of as many as five free pleonites plus pleotelson, but pleonites variously fused in several families. Five pairs of pleopods usually present. Uropods lateral, usually forming tailfan with pleotelson.

REMARKS This suborder contains a large group of diverse families, largely held together by primitive features such as the tailfan structure. Future work will undoubtedly show the Flabellifera to be an artificial polyphyletic group.

Family Aegidae Leach, 1815

DIAGNOSIS Dorsal integument usually unornamented. Coxae distinct on pereonites 2–7. Eyes usually present, large, often almost, or complete contiguous. Mandible lacking lacinia mobilis, spine-row, and molar. Maxilla 1 slender, with apical spines. Maxilla 2 with two terminal unequal lobes bearing apical spines. Maxillipedal palp of two, three, or five articles. Pereopods 1–3 prehensile, with dactyli strongly curved; pereopods 4–7 ambulatory.

Pleopods biramous, bearing plumose marginal setae. Uropods forming tail-fan with pleotelson. Pleon of four or five free pleonites plus pleotelson.

REMARKS Although these large isopods (up to 60 mm) are often referred to as fish parasites, Brusca (1983) prefers the term "carnivorous scavengers and micropredators," as they attach to fish hosts infrequently and only long enough to feed. When feeding, they engorge themselves on the host's blood. Aegids show almost no host- (or rather prey-) specificity, being opportunistic feeders, and are most frequently captured by bottom trawls on the ocean bed. In ovigerous females, the maxillipedal articles become expanded and, along with the anterior oostegites, cover the buccal field, thereby making feeding impossible.

Key to genera and subgenera of Aegidae

1. Maxillipedal palp of two or three articles; frontal lamina small, narrow
 *Rocinela*
 Maxillipedal palp of five articles; frontal lamina large, broad 2
 2. Antennular peduncle articles 1 and 2 expanded; cephalon lacking true rostrum, not completely separating antennular bases *Aega* (*Aega*)
 Antennular peduncle articles 1 and 2 not expanded; cephalon with true rostrum completely separating antennular bases . . . *Aega* (*Rhamphion*)
-

Aega Leach, 1815

DIAGNOSIS Eyes large, contiguous or separate. Cephalon with or without true rostrum. Frontal lamina broad, separating bases of antennae. Mandibular palp article 2 elongate. Maxilla 1 bearing strong apical and subapical spines. Maxilla 2 of two usually unequal lobes bearing stout spines. Maxillipedal palp of four or five articles, terminal article often small, with setae or recurved spines; article 4 with stout recurved spines; endite small, seldom reaching beyond palp article 2. Pleon not much narrower than pereon.

REMARKS Brusca (1983) published a useful account of the genus *Aega* in the Eastern Pacific.

Key to species of *Aega (Aega)*

1. Eyes contiguous *deshaysiana*
Eyes separate *ecarinata*
-

Key to species of *Aega (Rhamphion)*

1. Posterior margin of pleotelson distinctly dentate *dentata*
Posterior margin of pleotelson at most faintly crenulate *tenuipes*
-

Aega (Aega) deshaysiana (H. Milne Edwards, 1840)

Figure 51A

DIAGNOSIS ♀ 18.0 mm. Eyes large, contiguous. Cephalon with frontal margin acute to subacute. Frontal lamina large, shield shaped. Antennular peduncle articles 1 and 2 not expanded; flagellum of more than 15 articles. Uropodal endopod with deep notch in lateral (outer) margin. Pleotelson with basal width subequal to middorsal length, triangular, lateral margins faintly to markedly convex, tapering to narrowly rounded to subacute apex.

RECORDS Cuba; Yucatan Peninsula, Mexico; Gulf of Mexico. Azores; Cape Verde Islands; Tristan da Cunha; Mediterranean; St. Paul and Amsterdam Islands; Seychelles; east coast of South Africa; Philippines; Japan; Hawaii; northeast Australia; Tasmania; Cocos Islands; Costa Rica.

REMARKS This species is more familiarly known in the Caribbean region as *Aega antillensis* Schioedte and Meinert, 1879.

Aega (Aega) ecarinata Richardson, 1898

Figure 51B

DIAGNOSIS ♀ 21.0 mm. Eyes well separated. Articles 1 and 2 of antennular peduncle expanded. Propodus of pereopod 3 with posterodistal lobe. Uropo-

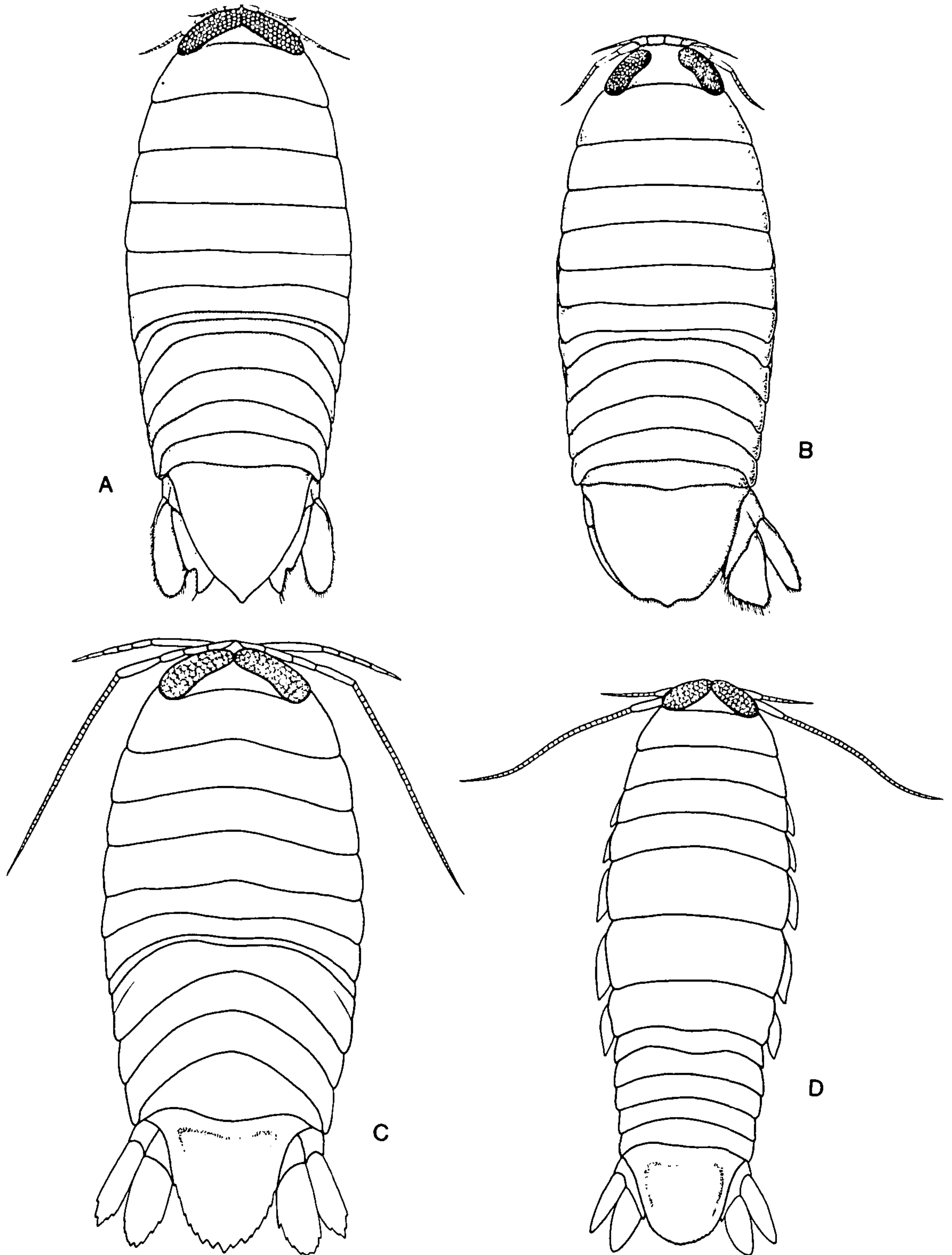


Figure 51. A, *Aega (Aega) deshayesiana*; B, *Aega (Aega) ecarinata*; C, *Aega (Rhamphion) dentata*; D, *Aega (Rhamphion) tenuipes*.

dal exopod narrower than endopod; latter distally truncate, lacking marginal notch. Pleotelson dorsally smooth, with posterior margin broadly trilobed.

RECORDS Bahamas, 776 m; Puerto Rico; Gulf of Mexico, 176 m.

Aega (Rhamphion) dentata Schioedte and Meinert, 1879

Figure 51C

DIAGNOSIS ♀ 7.5 mm. Eyes large, just contiguous in midline. Frontal lamina distally acute. Uropodal exopod shorter than and half width of endopod; latter with lateral margin entire. Pleotelson with two obscure dorsal depressions anteriorly; posterior margin crenulate with seven teeth.

RECORDS Cuba.

Aega (Rhamphion) tenuipes Schioedte and Meinert, 1879

Figure 51D

DIAGNOSIS ♀ 11.5 mm. Eyes large, contiguous. Frontal lamina distally broadly rounded. Uropodal exopod shorter and narrower than endopod; latter with entire lateral margin. Pleotelson dorsally smooth; posterior margin evenly and broadly convex, obscurely crenulate.

RECORDS Cuba.

Rocinela Leach, 1818

DIAGNOSIS Cephalon with short rostrum sometimes covering antennular bases. Eyes well developed. Frontal lamina small, often indistinct. Mandibular palp of three articles, article 1 elongate. Maxillipedal palp of two or three articles. Pereopods 1–3 usually with spine-bearing expanded lobe on posterior margin of propodi.

Key to species of *Rocinela*

1. Eyes contiguous *oculata*
 Eyes not contiguous 2
 2. Cephalon produced anteriorly into broadly rounded rostrum .. *cubensis*
 Cephalon lacking obvious broadly rounded rostrum 3
 3. Eyes well separated, cephalon anteriorly broadly triangular *signata*
 Eyes barely separate, cephalon anteriorly narrowly triangular *insularis*
-

Rocinela cubensis Richardson, 1898

Figure 52A

DIAGNOSIS ♂ 16 mm. Cephalon with two small tubercles between well-separated eyes; rostrum broadly rounded, extending anteriorly, very obvious. Flagellum of antenna with about 15 articles. Propodi of pereopods 1–3 with two spines. Pleotelson basally wider than middorsal length, lateral margins convex, apex rounded.

RECORDS Off Cuba, 290 m.

Rocinela insularis Schioedte and Meinert, 1879

Figure 52B

DIAGNOSIS Ovigerous ♀ 24.5 mm. Eyes medially barely separated but not contiguous. Flagellum of antenna of more than 12 articles. Propodus of pereopods 1–3 with two to four spines on posterior lobe. Uropodal endopod barely reaching beyond pleotelsonic apex. Pleotelson basally slightly wider than middorsal length, lateral margins convex, apex rounded.

RECORDS Florida Keys; West Indies; between Mississippi delta and west coast of Florida, Gulf of Mexico; 550 m.

Rocinela oculata Harger, 1883

Figure 52C

DIAGNOSIS ♀ 21.0 mm. Eyes contiguous. Cephalon with rostrum truncate in dorsal view. Antennal flagellum with 12 articles. Propodi of pereopods 1–3 with six to eight spines on lobed posterior margin. Pleotelson with basal width subequal to middorsal length; posterior margin broadly rounded.

RECORDS Off Georgia; Gulf Stream off Florida, 360–400 m; Puerto Rico, 84 m; Gulf of Mexico, 380–750 m.

New South Wales, Queensland, Australia, 450–630 m.

Rocinela signata Schioedte and Meinert, 1879

Figure 52D

DIAGNOSIS Ovigerous ♀ 13.0–15.0 mm. Cephalon anteriorly broadly triangular, produced over bases of antennules. Eyes widely separate. Flagellum of antenna with 10 or 11 articles. Pereopods 1–3, propodi unarmed or with

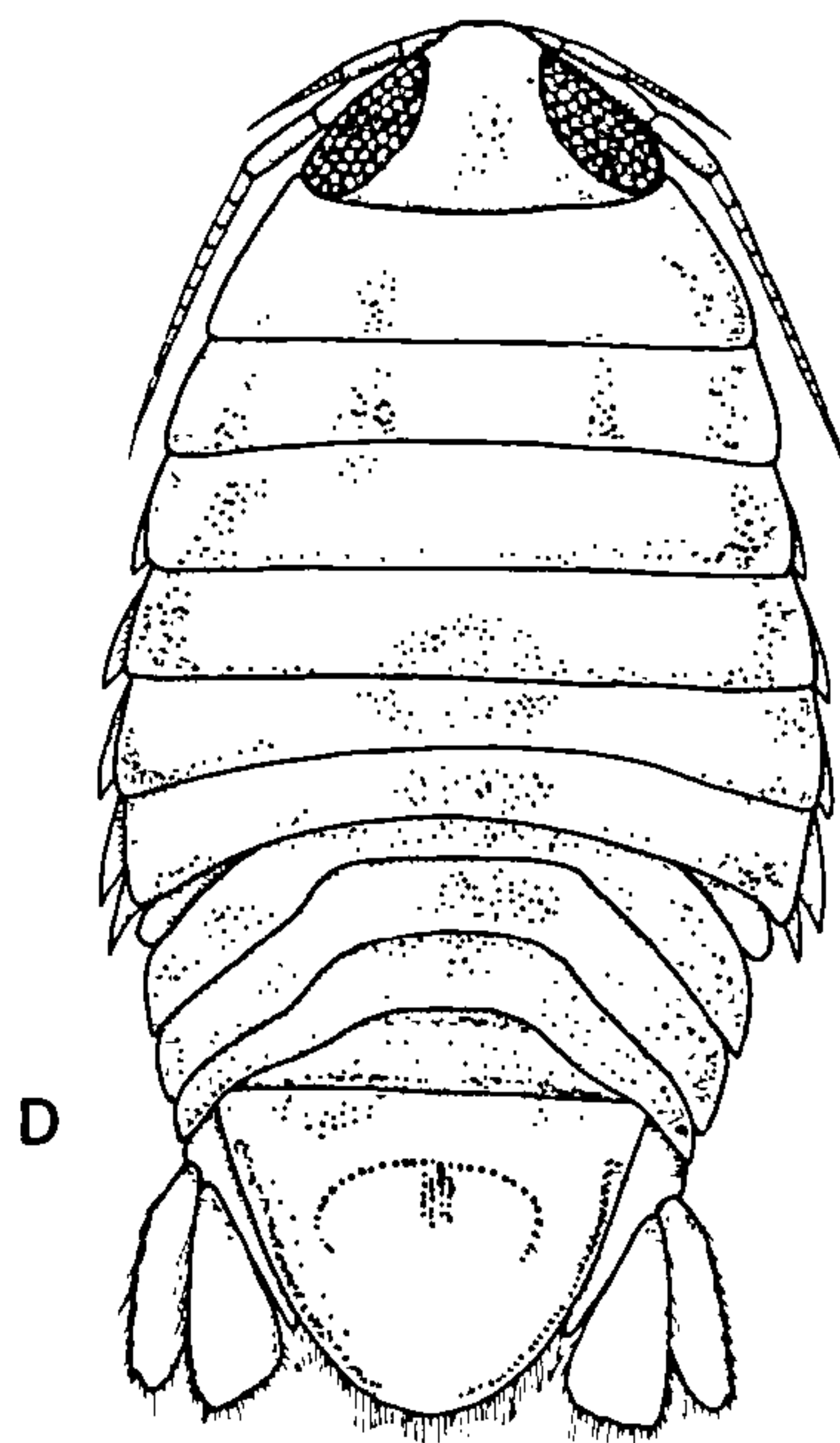
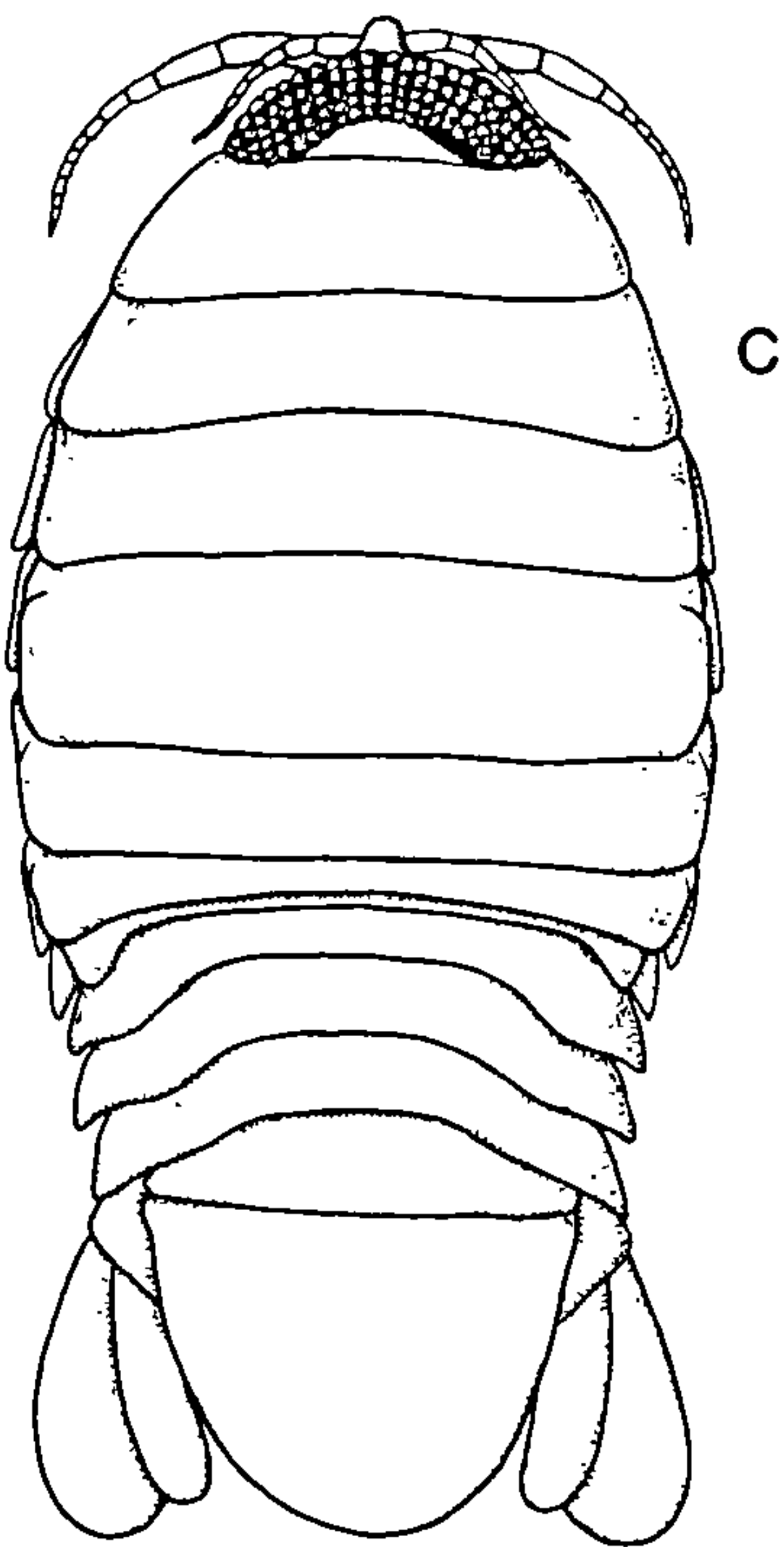
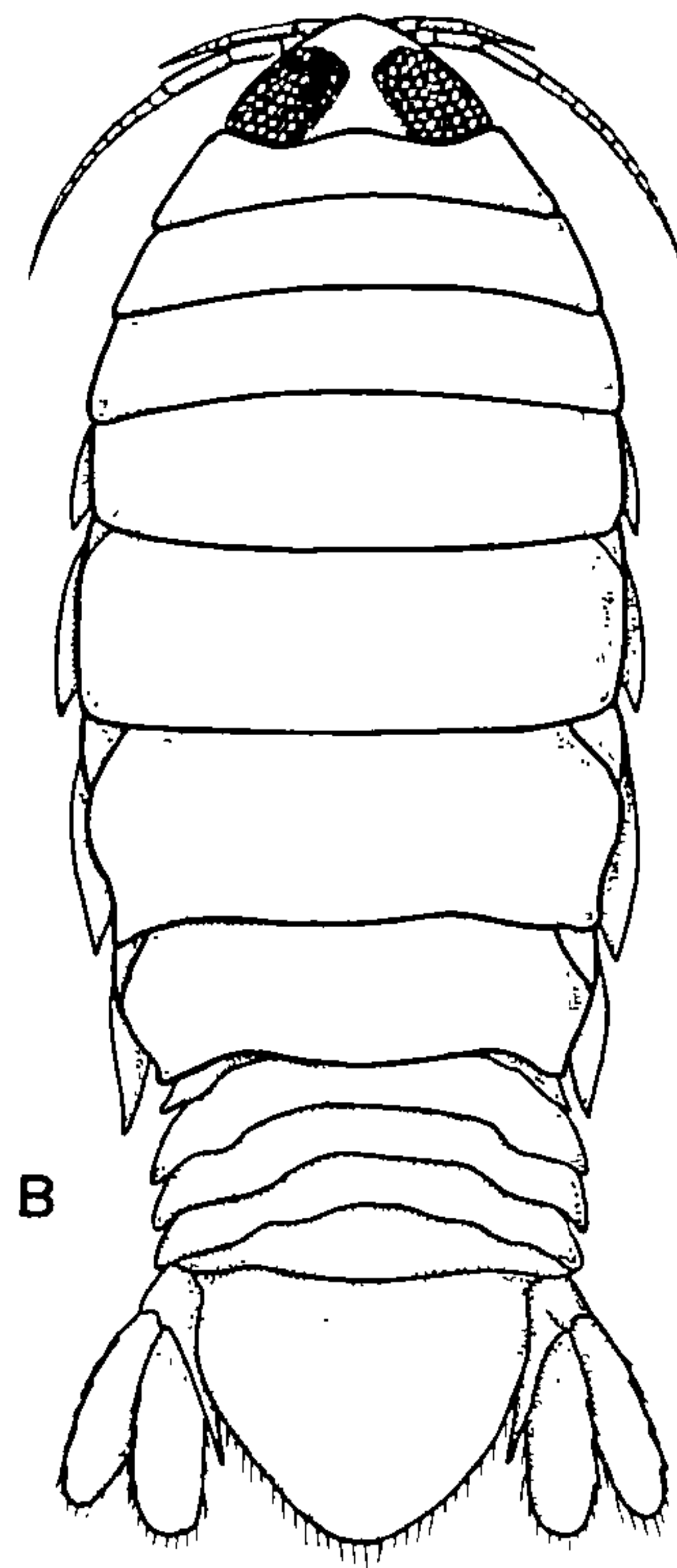
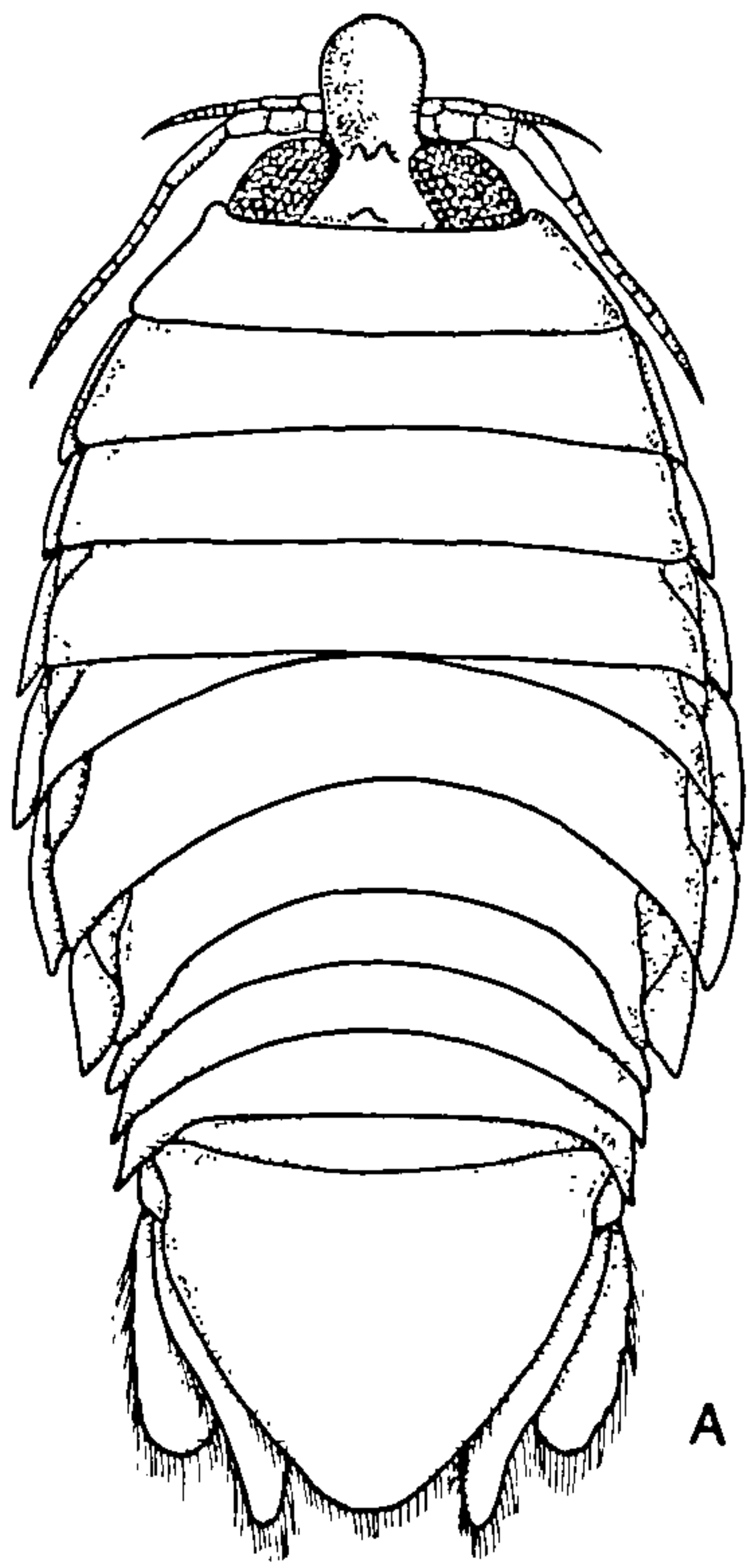


Figure 52. A, *Rocinela cubensis*; B, *Rocinela insularis*; C, *Rocinela oculata*; D, *Rocinela signata*.

single spine on posterior margin. Pleotelson with posterior margin evenly and broadly rounded; usually with inverted W-shaped band of pigment.

RECORDS Florida Keys, shallow infratidal–4 m; Tortugas, from gills of jewfish *Epinephelus itajara*, mutton snapper *Lutjanus analis*; U.S. Virgin Islands, on mutton snapper *Lutjanus analis*, on yellowfin grouper *Mycteroperca venenosa*; Bahamas, on sheepshead *Archosargus probatocephalus*, on mutton snapper *Lutjanus analis*, on blackfin snapper *Lutjanus buccanella*, on queen triggerfish *Balistes vetula*, on saucereye porgy *Calamus calamus*; Jamaica, on French grunt *Haemulon flavolineatum*, hogfish *Lachnolaimus maximus*, on parrotfish *Sparisoma viride*; Haiti; Yucatan Peninsula, Mexico, 60–93 m, on gills of tiger shark *Galeocerdo cuvieri*; Puerto Rico, in gill slits of southern stingray *Dasyatis americana*, in gill slits of nurse shark *Ginglymostoma cirratum*; Jamaica; Carrie Bow Cay and Blue Ground Range, Belize, 0.5–2 m, on jolthead porgy *Calamus bajonado* and sheepshead porgy *Calamus penna*, on peacock flounder *Bothus lunatus*, on queen triggerfish *Balistes vetula*, on *Caranx* sp., on barracuda *Sphyraena barracuda*, on hogfish *Lachnolaimus maximus*, on mutton snapper *Lutjanus analis*; Venezuela, on *Orthopristis ruber*, on *Haemulon steindachneri*; Surinam, on gills of sheepshead porgy *Calamus penna*; Gulf of Mexico off Florida, shallow infratidal–55 m, on red grouper *Epinephelus morio*, on *Lutjanus blackfordi*, on black grouper *Mycteroperca bonaci*, on clearnose skate *Raja eglanteria*.

Pacific records: Southern California and Gulf of California; Socorro Island; Panama; Costa Rica.

REMARKS While often taken from fish hosts (sometimes in the gill chamber), this species is equally frequently found freelifing in shallow water over sand and coral rubble. The species will also attach itself to humans, inflicting a sharp bite as it tries to feed.

Family Cirolanidae Dana, 1852

DIAGNOSIS Eyes when present, relatively small, lateral. Frontal lamina present. Mandible with tridentate incisor, lacinia mobilis, blade- or sawlike molar, and palp. Maxillipedal palp of five articles, endite present. Coxal plates present on pereonites 2–7, distinctly separated by suture from tergite. Pereopods generally ambulatory, although anterior three pairs prehensile in some genera, and posterior four pairs natatory in some genera. Pleon of five free pleonites plus pleotelson in most genera; pleonite 5 with free lateral margins or overlapped by pleonite 4. Pleopods membranous, lacking ridges or folds. Uropods situated at anterolateral angles of pleotelson, freely articulating, both rami well developed, mobile.

REMARKS Of the many recent publications on the cirolanids, the most comprehensive is that of Bruce (1986) on the cirolanids of Australia. Botosaneanu, Bruce, and Notenboom (1986) tabulate all the known troglobitic cirolanids of the world.

Key to subfamilies of Cirolanidae

- 1. Clypeus projecting; pleonite 5 with free lateral margins (except in *Xylolana*) Eurydicinae
 Clypeus flattened, not projecting; pleonite 5 lacking free lateral margin, overlapped by pleonite 4 2
- 2. Pereopods 1–3 with ischium and merus not anterodistally produced; antennal peduncular articles 4 and 5 subequal; secondary unguis present on pereopodal dactyli Cirolaninae
 Pereopods 1–3 with ischium and merus anterodistally produced; antennal peduncular articles 3 and 4 subequal; no secondary unguis on pereopodal dactyli Conilerinae

Subfamily Cirolaninae Dana, 1852

DIAGNOSIS Frontal lamina short, flat. Clypeus flattened, not projecting. Antennal peduncular articles 4 and 5 subequal, longer than articles 1–3. Pereopods with secondary unguis on dactyli. Penes reduced or absent. Pleonite 5 always overlapped by pleonite 4. Pleopod 2 in ♂ with copulatory stylet articulating basally.

Key to genera of Cirolaninae

- 1. Pleopods having accessory branchial filaments *Bathynomus*
 Pleopods lacking accessory branchial filaments 2
- 2. Pleopod 1 operculiform 7
 Pleopod 1 not operculiform 3
- 3. Pleopods 3–5, endopods lacking, or with very few, marginal setae ... 4
 Only endopod of pleopod 5 lacking marginal setae *Cirolana*

(continued)

Key to genera of Cirolaninae (*Continued*)

-
4. Merus of pereopod 1 posterodistally produced; merus of pereopods 2 and 3 anterodistally produced *Bahalana*
 Meri of pereopods 1–3 not markedly produced 5
5. Animal able to conglobate *Creaseriella*
 Animal unable to conglobate 6
6. Mandibular palp directed anteriorly *Anopsilana*
 Mandibular palp directed posteriorly *Haptolana*
7. Pleopod 1, exopod longer and broader than endopod *Oncilorpheus*
 Pleopod 1, endopod longer and broader than exopod *Calyptolana*
-

Anopsilana Paulian and Delamare Deboutteville, 1956

DIAGNOSIS Body unable to conglobate. Eyes present or absent. Frontal lamina well developed, as long as broad, or longer than broad, anteriorly

Key to species of *Anopsilana*

1. Estuarine-brackish water species; integument pigmented when alive 2
 Cave species; lacking integumental pigment 3
2. Frontal lamina distally rounded, projecting *browni*
 Frontal lamina distally acute, not projecting *jonesi*
3. Posterior margin of pleotelson with 10 or more spines 4
 Posterior margin of pleotelson with less than 10 spines 5
4. Posterior margin of pleotelson with 10 spines; found in cave on Cuba
 *cubensis*
 Posterior margin of pleotelson with 10–12 spines; found in cave on
 Haiti
 *acanthura*
5. Posterior margin of pleotelson with eight spines; found in cave on
 Grand Cayman *crenata*
 Posterior margin of pleotelson with four spines; found in cave on Haiti
 *radicicola*
-

somewhat expanded. Antennular peduncle of two articles. Maxillipedal endite with two coupling hooks. Pereopod 1 prehensile, pereopods 2–3 weakly prehensile, pereopods 4–7 ambulatory. Pleopod 2 ♂, copulatory stylet articulating at base of endopod. Pleopods 3–5, exopods biarticulate, endopods lacking marginal setae. Uropodal sympod produced along mesial margin of endopod.

Anopsilana acanthura (Notenboom, 1981)

(was Haitilana)

Figure 53A,B

DIAGNOSIS ♂ 7.0 mm. Lacking eyes and integumental pigment. Frontal lamina anteriorly rounded. Posterior margin of pleotelson with 10–12 spines.

RECORDS Well at Marigot, Haiti.

Anopsilana browni (Van Name, 1936)

Figure 53C,D

DIAGNOSIS ♂ 11.1 mm, ♀ 10.0 mm. Eyes well developed, pigmented. Dorsal integument strongly pigmented with red-brown chromatophores. Frontal lamina as wide as long, anteriorly rounded. Cephalon with two fused mid-dorsal tubercles near posterior margin. Pereonites and pleonites each with row of tubercles near posterior margin. Pleotelson triangular, with scattered dorsal tubercles, apex rounded, with eight spines.

RECORDS River in Santa Clara Province, Cuba (freshwater); Sittee River and Salt Creek, Stann Creek District, Belize (brackish water).

Golfo de Nicoya, Pacific Costa Rica, in red mangroves.

Anopsilana crenata Bowman and Franz, 1982

Figure 53E,F

DIAGNOSIS ♂ 6.2 mm. Lacking eyes and integumental pigmentation. Frontal lamina longer than wide, anteriorly rounded. Posterior margin of pleotelson with eight spines.

RECORDS West Bay Cave, Grand Cayman Island.

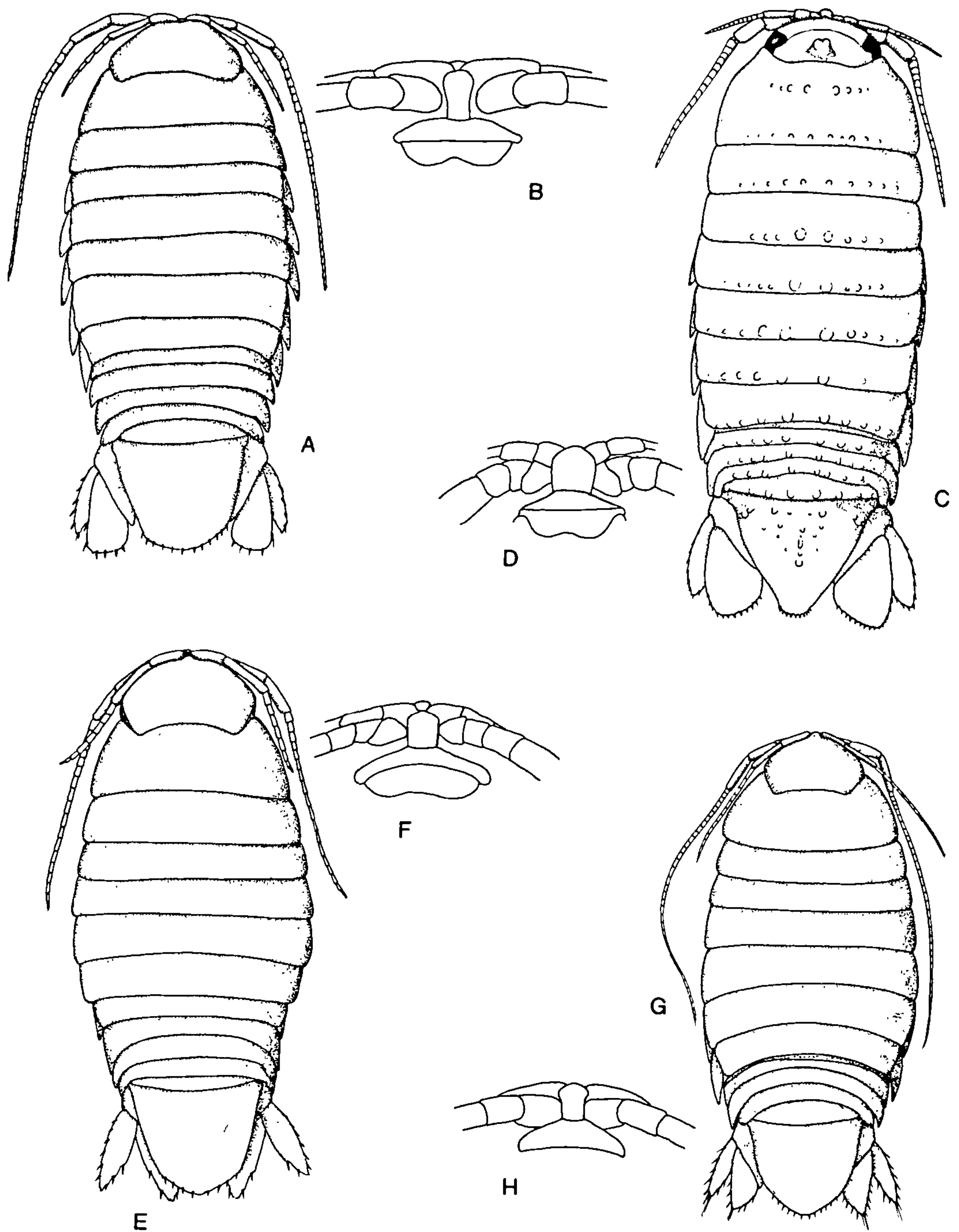


Figure 53. *Anopsilana acanthura*: A, ♀; B, anterior cephalon. *Anopsilana browni*: C, ♀; D, anterior cephalon. *Anopsilana crenata*: E, ♀; F, anterior cephalon. *Anopsilana cubensis*: G, ♀; H, anterior cephalon.

Anopsilana cubensis (Hay, 1903)

Figure 53G,H

DIAGNOSIS ♀ 7.0 mm. Lacking eyes and integumental pigmentation. Frontal lamina longer than wide, anteriorly expanded, rounded. Posterior margin of pleotelson with 10 spines.

RECORDS Caves in provinces of Pinar del Río, La Habana, Matanzas, and on Isla de Pinos, Cuba.

Anopsilana jonesi Kensley, 1987

Figure 54A–D

DIAGNOSIS ♂ 7.2 mm, ovigerous ♀ 5.9 mm. Eyes well developed and pigmented. Dorsal integument strongly pigmented with almost solid central area on pereonites 1–7. ♂ cephalon with three low tubercles near posterior margin; pereonite 1 with four to six low tubercles. ♀ lacking tubercles on cephalon or pereonite 1. Pereonites 2–7 with low submedian longitudinal ridges near posterior margin. Frontal lamina narrow, pentagonal, anteriorly acute, not projecting. Posterior margin of pleotelson with 9 or 10 spines.

RECORDS Salt Creek, and Sittee River, Stann Creek District, Belize, in estuarine mangroves.

Anopsilana radicolica (Notenboom, 1981)

Figure 54E,F

DIAGNOSIS ♂ 6.3 mm, ♀ 6.5 mm. Lacking eyes and integumental pigmentation. Frontal lamina longer than wide, anteriorly expanded and rounded. Posterior margin of pleotelson with four spines.

RECORDS Source Débarasse, a spring near Jérémie, Haiti.

Bahalana Carpenter, 1981

DIAGNOSIS Eyes lacking. Frontal lamina basally triangular, anteriorly narrowed into poorly developed carina. Pereopods 1–3 prehensile, dactyli and propodi relatively elongate; pereopod 1 carpus small, almost concealed; merus with strong posterodistal extension almost reaching dactylar base and armed with spines. Pereopods 2 and 3, meri with elongate anterodistal extension, meri and carpi with shorter posterodistal extensions. Pereopods 4–7 slender, ambulatory. Pleopod 2 in ♂ with copulatory stylet articulating basally on endopod. Pleopods 3–5, exopods biarticulate, endopods with few distal marginal setae, or lacking setae. Pleonite 5 with free lateral margin, hardly overlapped by pleonite 4.

Key to species of *Bahalana*

1. Pleopods 3–4, endopods lacking setae; maxillipedal endite with one coupling hook *cardiopus*
 Pleopods 3–4, endopods with few setae; maxillipedal endite with one or two coupling hooks 2
 2. Antennular peduncle, article 3 longest; maxillipedal endite with two coupling hooks *geracei*
 Antennular peduncle, article 2 longest; maxillipedal endite with one coupling hook *mayana*
-

Bahalana cardiopus Notenboom, 1981

Figure 55A,B

DIAGNOSIS ♀ 10.0 mm. Maxillipedal endite with single coupling hook. Pereopod 1, meral projection bearing five distal spines. Pleopods 3–5, endopods lacking marginal setae. Uropodal exopod half width of endopod, four spines on outer margin.

RECORDS Mount Misery Cave, Mayaguana Island, Bahamas.

Bahalana geracei Carpenter, 1981

Figure 55C–G

DIAGNOSIS ♀ 15.0 mm, ♂ 8 mm. Maxillipedal endite with two coupling hooks. Pereopod 1, meral projection bearing seven distal spines. Pleopods 3–5, endopods with 9–13 distal marginal setae; pleopod 5 endopod with four distal setae. Uropodal endopod bearing few spines at outer distal margin, margin not serrate, lacking distinct apex; exopod half width of endopod, with four spines on outer margin.

RECORDS Lighthouse Cave, San Salvador Island, Bahamas.

Bahalana mayana Bowman, 1987

Figure 55H

DIAGNOSIS ♀ 8.4 mm, ♂ 10.0 mm. Clypeus acutely pointed. Antennular peduncle, article 2 longest. Maxillipedal endite with one coupling hook. Per-

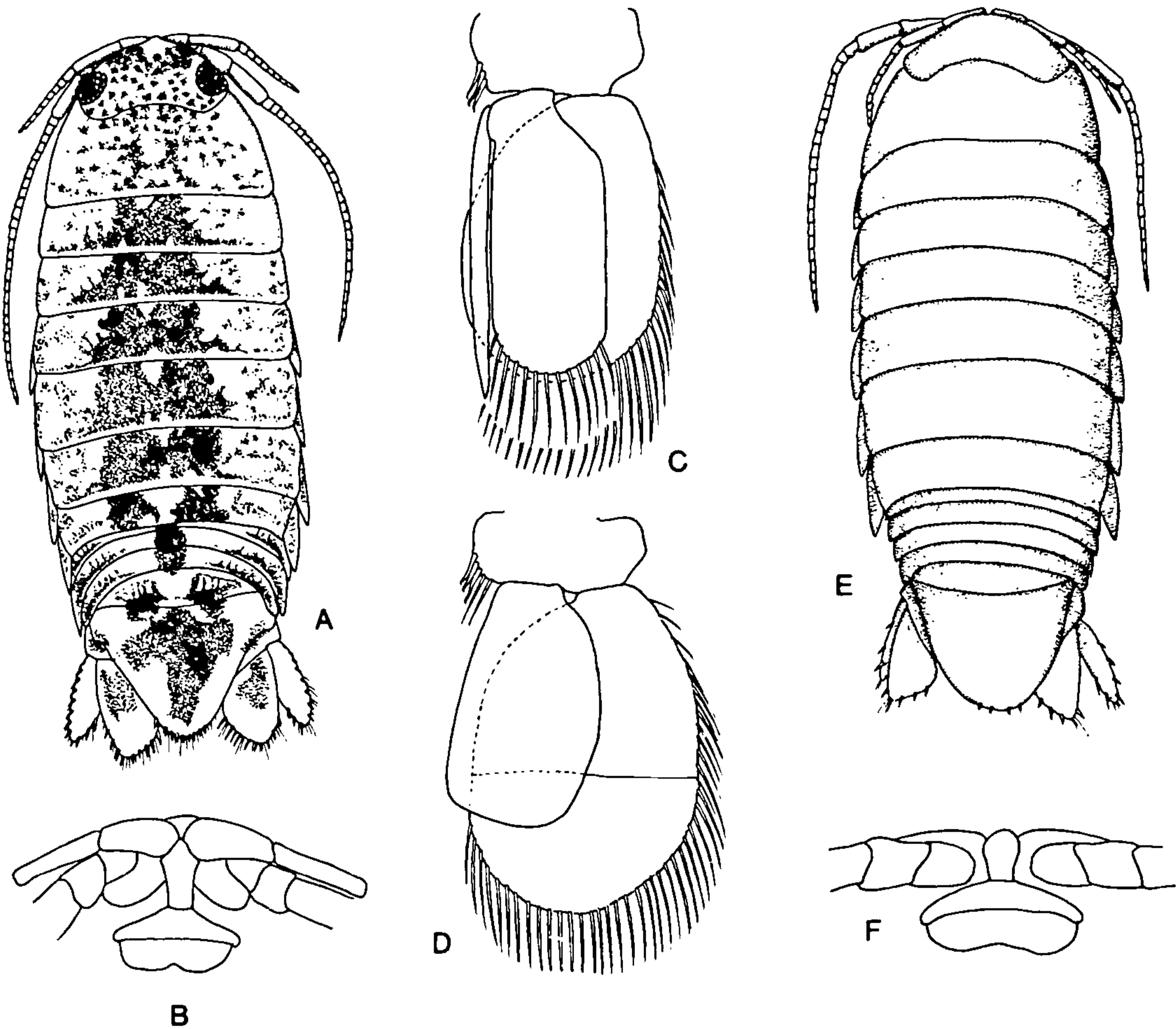


Figure 54. *Anopsilana jonesi*: A, ♂; B, anterior cephalon; C, pleopod 2, ♂; D, pleopod 3. *Anopsilana raditicola*: E, ♂; F, anterior cephalon.

eopod 1, meral projection rudimentary. Pleopods 3–4, endopods with few marginal setae, pleopod 5 lacking marginal setae. Uropodal exopod narrow, $\frac{1}{3}$ width of endopod; endopod with distal margin slightly concave.

RECORDS Anchialine caves on Cozumel Island and at Tulum, Yucatan Peninsula, Mexico.

Bathynomus A. Milne Edwards, 1879

DIAGNOSIS Frontal lamina triangular; clypeus projecting anteriorly. Antennal peduncle with articles 3 and 4 subequal, article 5 longest. Maxillipedal endite with four to seven coupling hooks. Pereopods 1–3 with anterodistal margins of ischia and meri produced. Pleopods with all rami bearing marginal setae; endopods bearing accessory gills at bases. Posterior margin of pleotelson dentate.

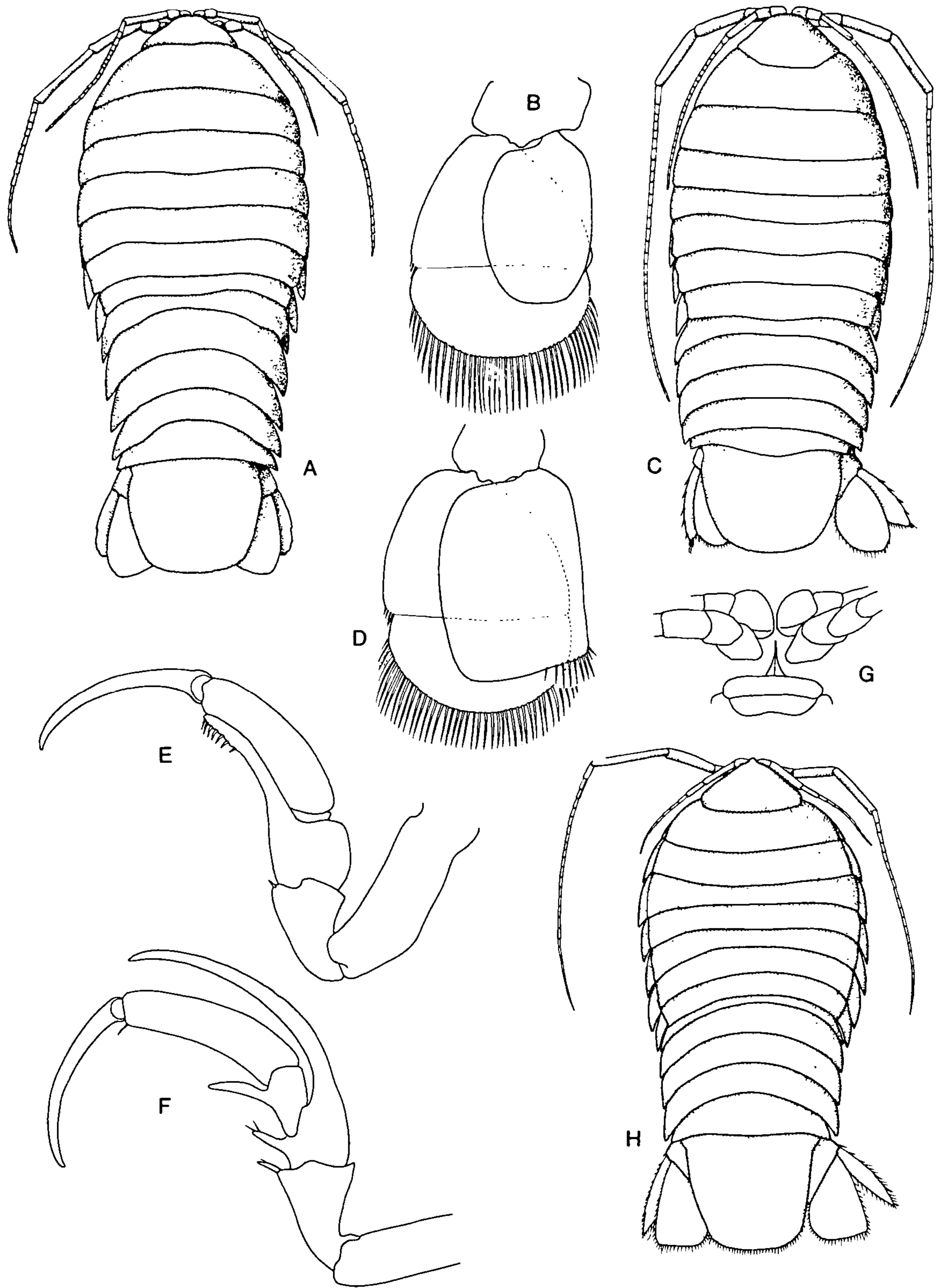


Figure 55. *Bahalana cardiopus*: A, ♀; B, pleopod 3. *Bahalana geracei*: C, ♀; D, pleopod 3; E, pereopod 1; F, pereopod 2; G, anterior cephalon. *Bahalana mayana*: H, ♀.

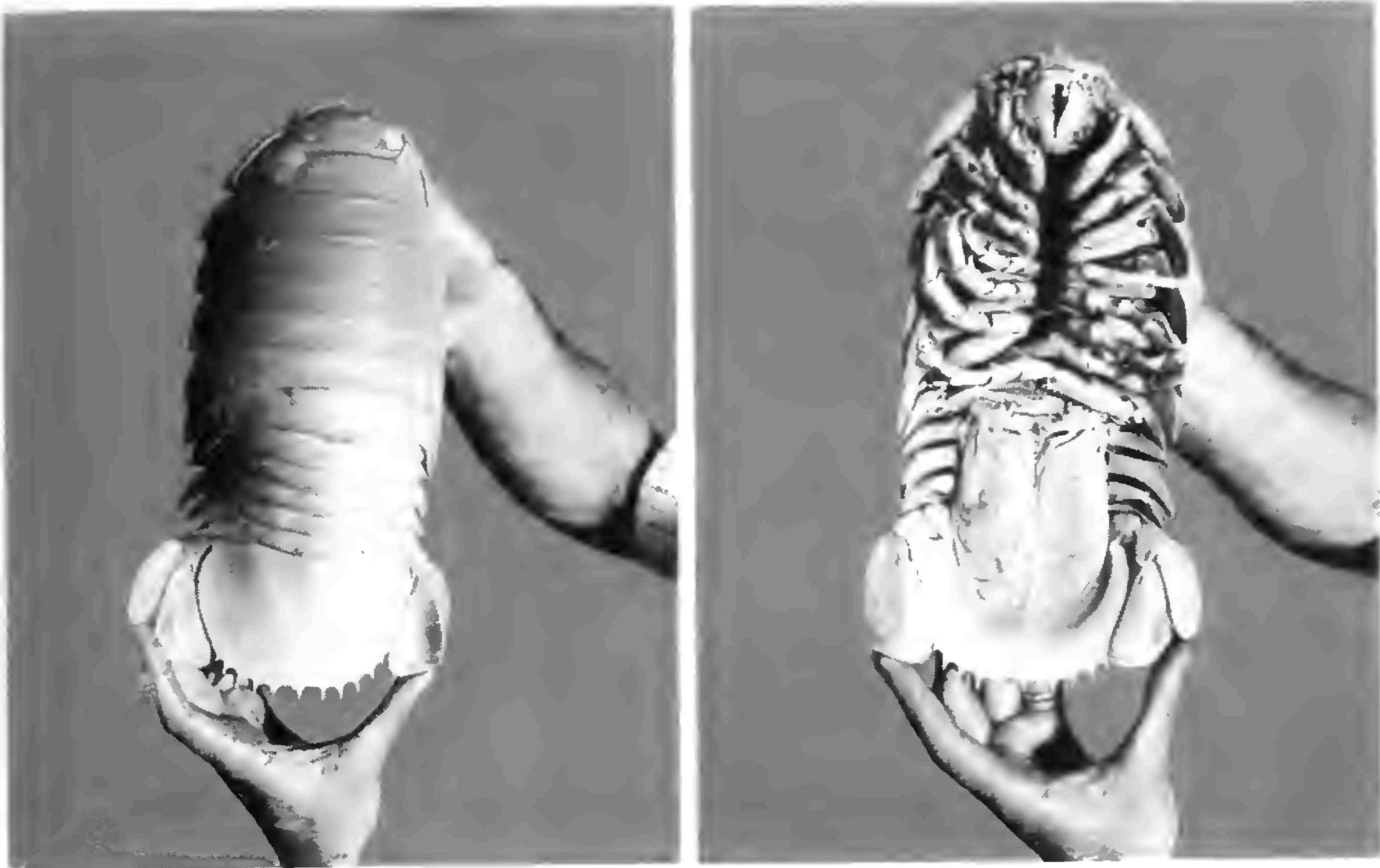


Figure 56. *Bathynomus giganteus*.

Bathynomus giganteus A. Milne Edwards, 1879

Figure 56

DIAGNOSIS Up to 280 mm. Large pigmented eyes present, not visible dorsally. Antennule with small exopod distally on peduncular article 3. Pleopods with marginal setae on all rami; pleonites 3 and 4 with epimera produced posteriorly. Posterior margin of pleotelson with median tooth and five or six teeth on each side.

RECORDS Gulf of Mexico; Caribbean; Bahamas; Florida Keys; 360–2300 m.

REMARKS Gut-content analysis of these deep-water giants has shown them to be scavengers, commonly feeding on dead fish, cephalopods, crabs, and polychaete worms.

Calyptolana Bruce, 1985

DIAGNOSIS All pereopods ambulatory; each dactylus with secondary unguis. Pleopod 1 operculate, longer than following pleopods. All pleopodal rami except endopod of pleopod 5 with marginal setae.

Calyptolana hancocki Bruce, 1985

Figure 57

DIAGNOSIS ♀ 3.0 mm. Body dorsally strongly convex. Cephalon with small rostrum curving ventrally to meet frontal lamina; latter pentagonal. Eyes small, well pigmented. Coxae of pereonites barely produced. Pleonite 5 lacking free lateral margins. Pleotelson with broadly rounded posterior margin. Uropodal sympod produced along mesial margin of endopod; exopod slightly less than half length of endopod; latter distally rounded.

RECORDS Dominican Republic; Aruba Island, Netherlands Antilles, 43.2 m.

Cirolana Leach, 1818

DIAGNOSIS Frontal lamina usually twice as long as wide, not projecting; clypeus flat. Mandible with strong incisor, dentate molar, palp of three articles. Pereopods all ambulatory. Pleon consisting of five free pleonites plus pleotelson, pleonite 5 overlapped laterally by pleonite 4. All pleopodal rami

Key to species of *Cirolana*

1. Pleotelson posteriorly very broad to subtruncate 2
 Pleotelson posteriorly narrowed 4
 2. Uropodal endopod broad, distally rounded, lacking marginal spines
 *obtruncata*
 Uropodal endopod broad, distal margin having apical tooth or
 angle 3
 3. Posterior margin of pleotelson bearing spines; uropodal endopod not
 dentate *minuta*
 Posterior margin of pleotelson faintly crenulate, lacking spines;
 uropodal endopod strongly dentate *crenulitelson*
 4. Uropodal endopod evenly tapering to acute apex; uropodal exopod
 length about four times greatest width *albidoida*
 Uropodal endopod, outer margin convex; uropodal exopod length less
 than four times greatest width *parva*
-

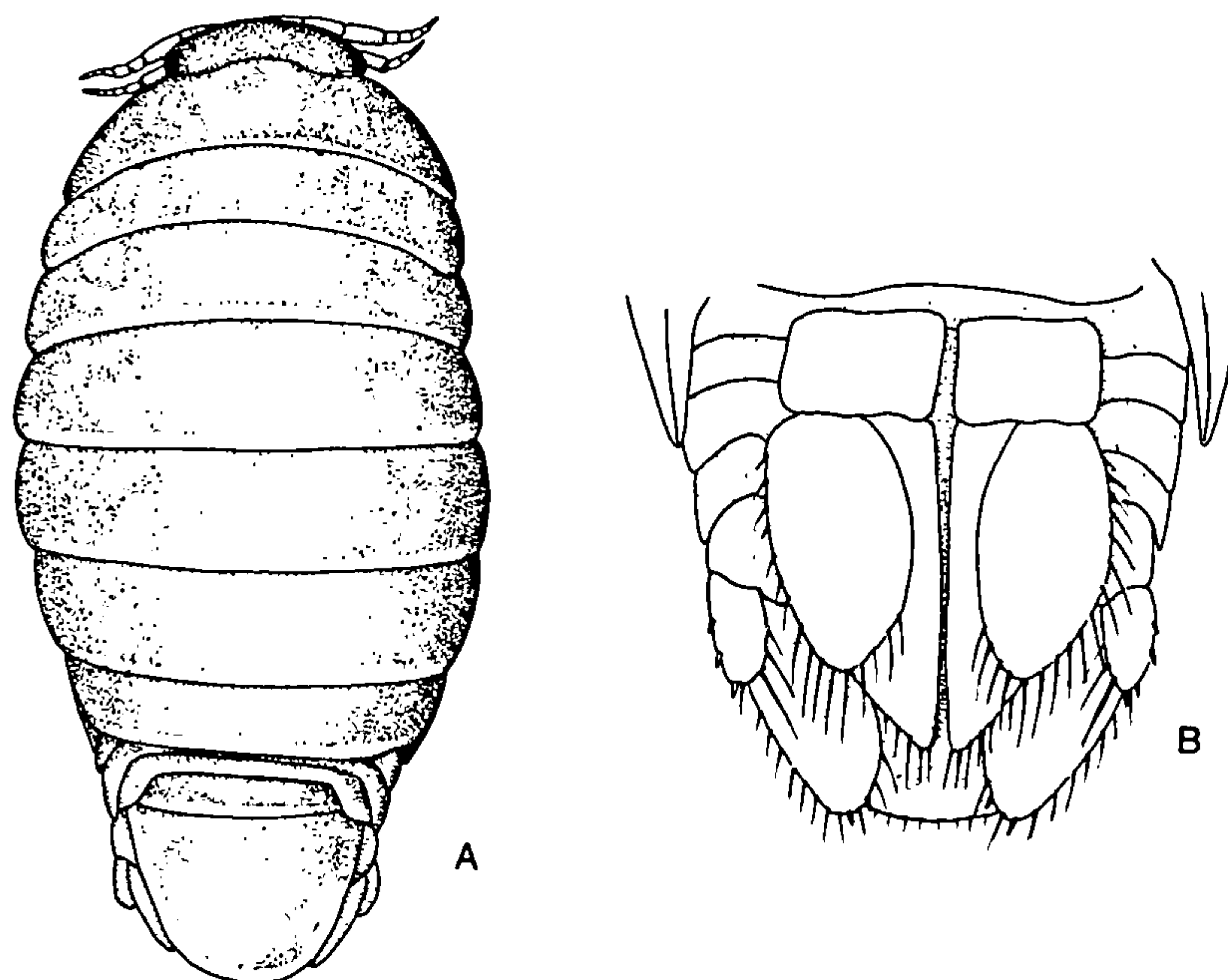


Figure 57. *Calyptolana hancocki*: A, ♀; B, ventral pleon.

bearing marginal setae except endopod of pleopod 5. Copulatory stylet on endopod of ♂ pleopod 2 inserted proximally.

Cirolana albidoida Kensley and Schotte, 1987

Figure 58A–C

DIAGNOSIS ♂ 7.8 mm. Integument sparsely pitted. Antenna reaching posteriorly to pereonite 3. Uropodal endopod triangular, evenly tapering, margins serrate; exopod length about four times greatest width, apically acute. Pleopod 1 ♂, endopod markedly narrowed in distal half. Pleopod 2 ♂, copulatory stylet reaching beyond rami by about half its length. Pleotelson with sides gently convex, tapering to rounded posterior margin bearing eight spines and three or four small serrations anterior to first spine.

RECORDS Off Lucaya, Grand Bahama, 180–220 m.

Cirolana crenulitelson Kensley and Schotte, 1987

Figure 58D–F

DIAGNOSIS ♂ 7.0 mm, ♀ 7.0 mm. Antenna reaching posteriorly to anterior of pereonite 3. Pleopod 2 ♂, copulatory stylet reaching by $\frac{1}{5}$ its length be-

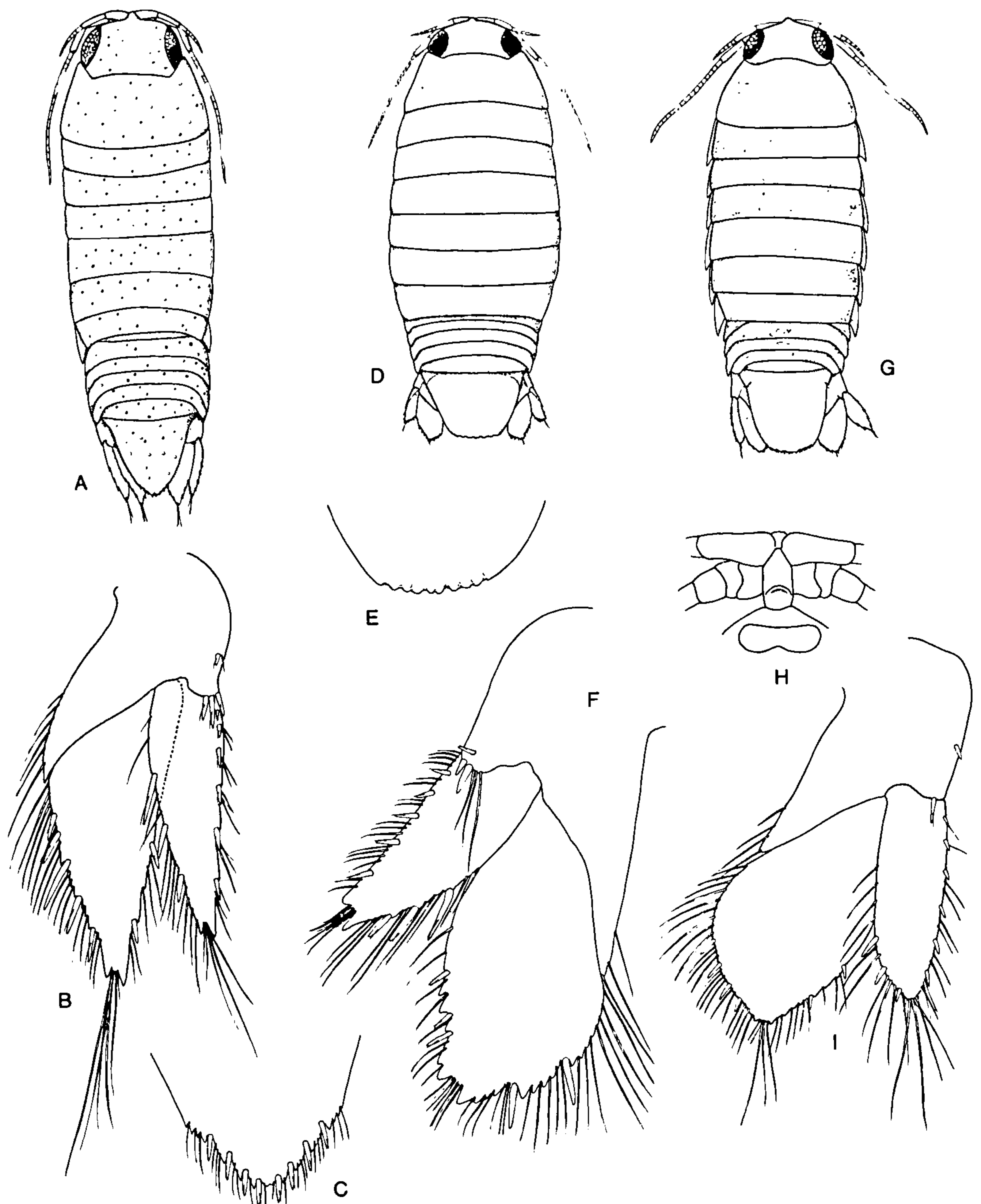


Figure 58. *Cirolana albidoida*: A, ♂; B, uropod; C, pleotelsonic apex. *Cirolana crenulitelson*: D, ♀; E, pleotelsonic apex; F, uropod. *Cirolana minuta*: G, ♂; H, anterior cephalon; I, uropod.

yond rami. Uropodal endopod with mesial margin broadly convex, serrate, apically acute; exopod about 2.5 times longer than wide, mesial margin weakly convex, apically acute. Posterior margin of pleotelson truncate, faintly crenulate, lacking spines.

RECORDS Carrie Bow Cay, Belize, 36 m.

Cirolana minuta Hansen, 1890

Figure 58G–I

DIAGNOSIS ♂ 8.9 mm, ♀ 5.0 mm. Antenna reaching posteriorly to pereonite 3. Pleopod 2 ♂, copulatory stylet reaching by about $\frac{1}{6}$ of its length beyond rami. Uropodal endopod, mesial margin broadly convex, with apical angle of about 90° ; exopod about three times longer than wide, parallel sided for proximal two-thirds, with marginal spines, apically narrowly rounded. Pleotelson with posterior margin subtruncate to broadly rounded, with about eight marginal spines.

RECORDS St. Thomas, U.S. Virgin Islands; Tobago; 180–220 m.

Cirolana obtruncata Richardson, 1901

Figure 59A,B

DIAGNOSIS ♂ 11.3 mm, ♀ 11.0 mm. Antenna reaching posteriorly to middle of pereonite 3. Pleopod 2 ♂, copulatory stylet just reaching to distal margin of rami. Uropodal endopod distally broadly rounded, margin with rounded teeth; exopod 2.5 times longer than wide, margin with rounded teeth, apically obscurely subacute. Posterior margin of pleotelson subtruncate, with about eight spines.

RECORDS Jamaica; Puerto Rico; Cozumel, Mexico; Gulf of Mexico.

Cirolana parva Hansen, 1890

Figures 59C–E, 60

DIAGNOSIS ♂ 6.9 mm, ♀ 7.9 mm. Cephalon with furrow between eyes having middorsal posterior deflection. Antenna reaching posteriorly to pereonite 4. Pleopod 1 ♂, endopod narrowed in distal third. Pleopod 2 ♂, copulatory stylet reaching by $\frac{1}{4}$ its length beyond rami. Uropodal endopod with mesial margin convex, apically acute; exopod 2.5 times longer than wide, apically acute. Pleotelson evenly tapering to angled posterior margin, with seven or eight spines.

RECORDS North and South Carolina; Turks and Caicos Islands; St. Thomas and St. Croix, U.S. Virgin Islands; Andros Island, Bahamas; Puerto Rico; Jamaica; Florida Keys; Dry Tortugas; Barbados; Carrie Bow Cay, Belize; Cozumel, Mexico; Panama; Gulf of Mexico; intertidal to 55 m.

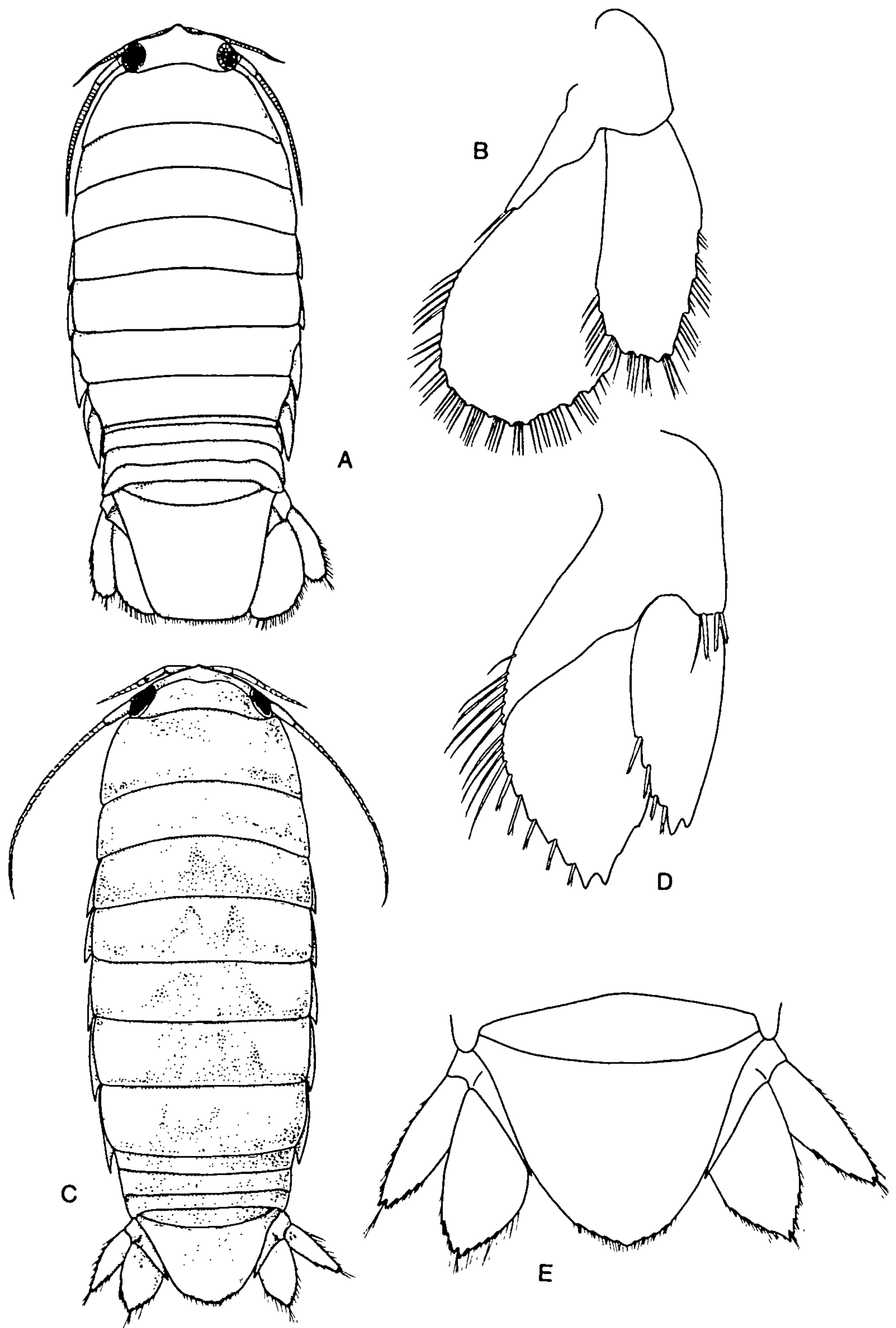


Figure 59. *Cirolana obtruncata*: A, ♀; B, uropod. *Cirolana parva*: C, ♀; D, uropod; E, pleotelson and uropods.

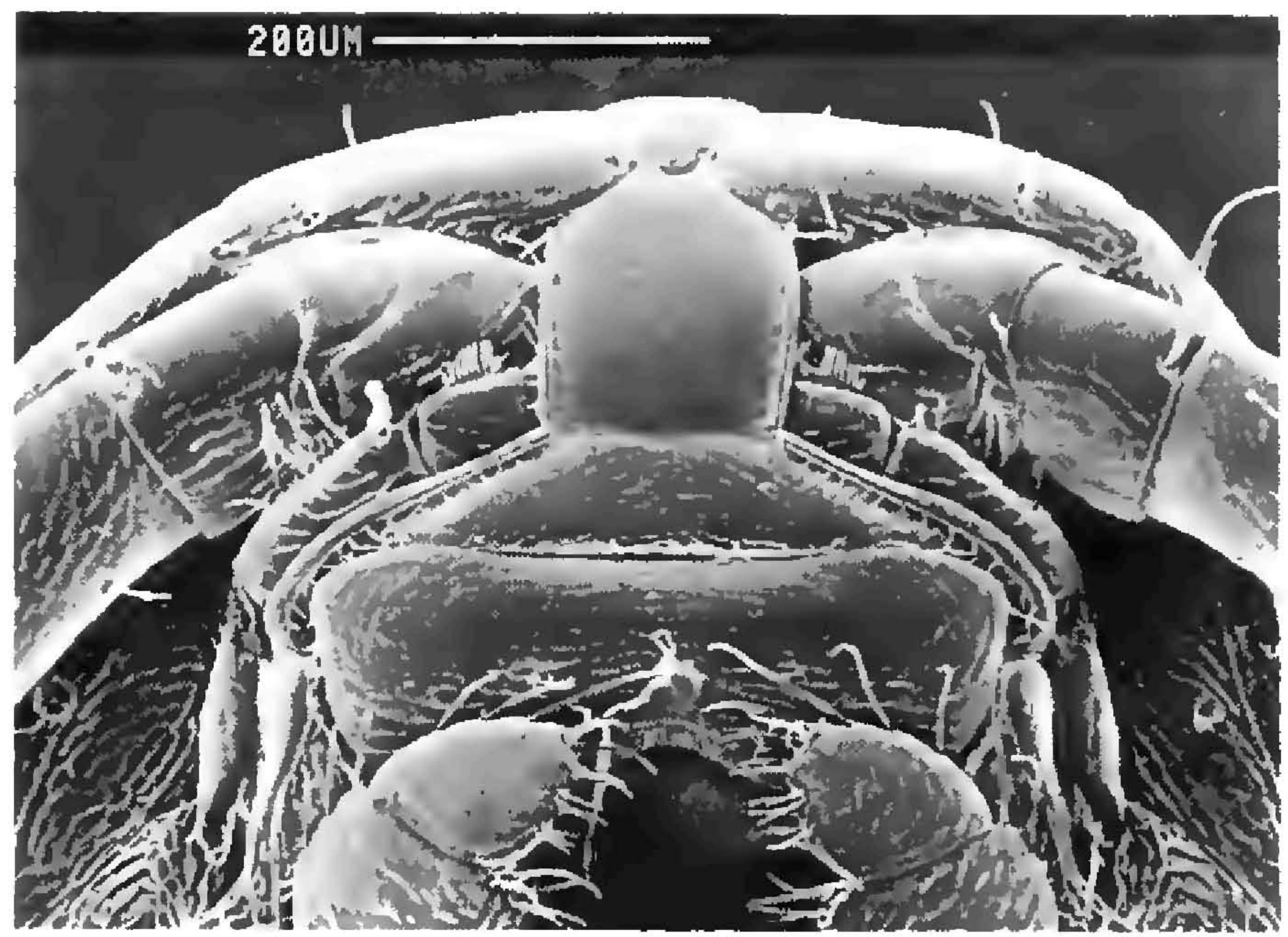


Figure 60. *Cirolana parva*, anteroventral cephalon.

Creaseriella Rioja, 1953

DIAGNOSIS Antennular peduncle of two articles (articles 1 and 2 fused). Antennal peduncle of five articles. Pereopods all ambulatory. Penial rami fused to form short stout process. Pleopod 2 in ♂ with copulatory stylet inserted at base of endopod. Pleopods 3–5, endopods lacking marginal setae. Pleonite 5 lacking free lateral margins.

Creaseriella anops (Creaser, 1936)

Figure 61A,B

DIAGNOSIS ♂ 15.5 mm. Animal able to conglobate. Eyes lacking. Frontal lamina pentagonal, longer than wide, with transverse ridge at widest point. Maxillipedal endite with four or five coupling hooks. Pleotelson wider than long, posterior margin very broadly rounded and finely crenulate. Both uropodal rami distally rounded, margins bearing spines and setae, sympod produced along mesial margin of endopod.

RECORDS Several caves and cenotes on the Yucatan Peninsula, Mexico.

Haptolana Bowman, 1966

DIAGNOSIS Mandibular palp directed posteriorly. Antennular peduncle of two articles, basal article expanded. Pereopods all prehensile, with dactyli closing in propodal groove. Pleopods 3–5, exopods with partial suture and marginal setae; endopods undivided, lacking marginal setae. Pleonite 4 overlapping pleonite 5 laterally.

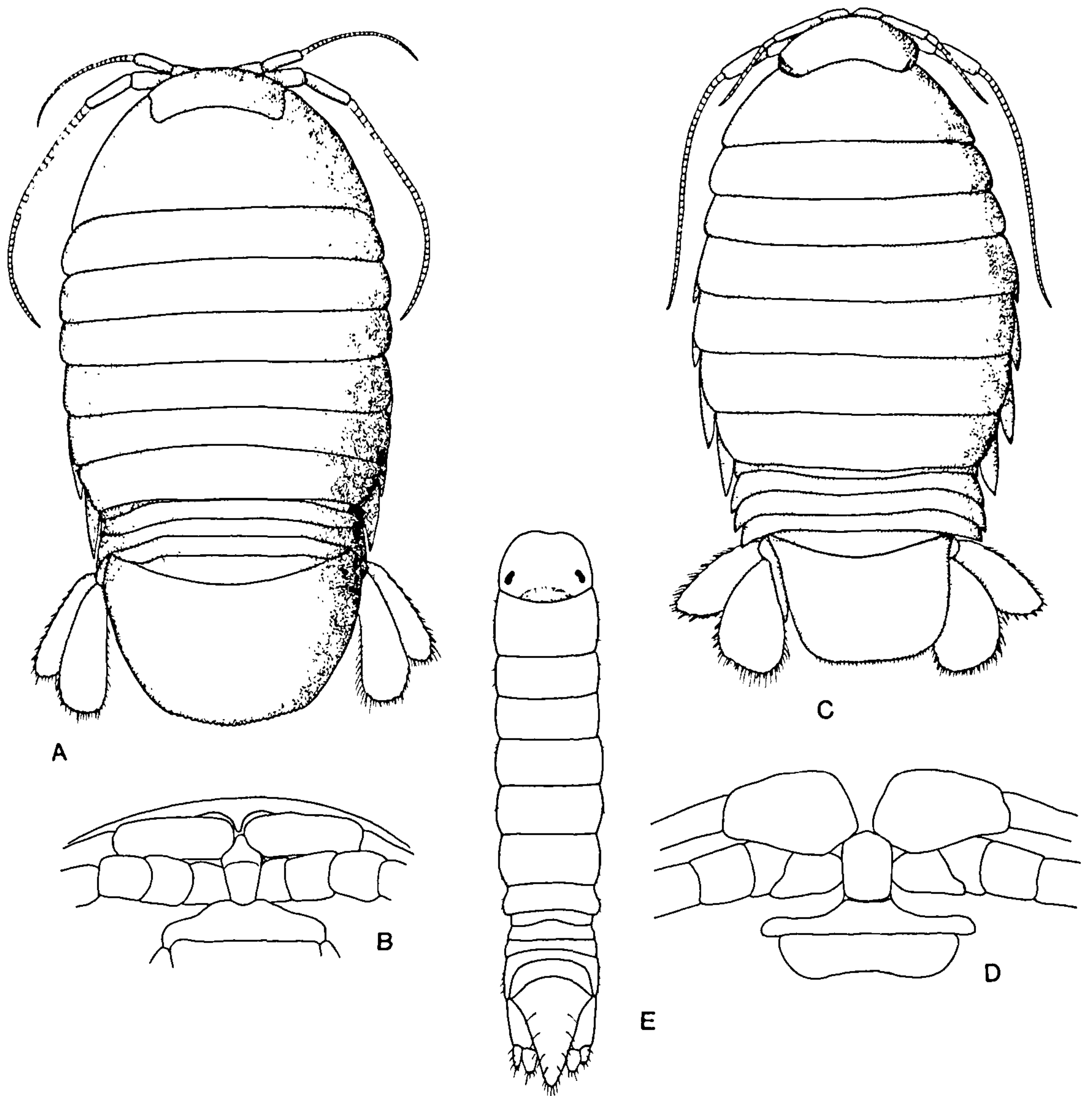


Figure 61. *Creaseriella anops*: A, adult; B, frontal lamina. *Haptolana trichostoma*: C, adult; D, frontal lamina. *Oncilorpheus stebbingi*: E, juvenile (from Paul and Menzies, 1971).

Haptolana trichostoma Bowman, 1966

Figure 61C,D

DIAGNOSIS ♂ 13.8 mm. Eyes lacking. Frontal lamina broad, pentagonal, with anterior angle very broad. Pleotelson wider than long, roughly rectangular, posterior margin faintly crenulate, with spine between and setae on crenulations. Uropodal endopod distally broad, exopod distally narrowly rounded, $\frac{2}{3}$ width of endopod, both rami with marginal setae and spines.

RECORDS Cave in Camaguey Province, Cuba.

REMARKS A second species of *Haptolana*, *H. somala* Messina and Chelazzi, has been described from northern Somalia in Africa.

Oncilorpheus Paul and Menzies, 1971

DIAGNOSIS Frontal lamina projecting ventrally. Pleopod 1, exopod indurate, opercular; endopod membranous, less than half width of exopod. Uropodal sympod longer than rami, slightly produced along mesial margin of endopod; rami inserted subapically.

Oncilorpheus stebbingi Paul and Menzies, 1971

Figure 61E

DIAGNOSIS ♀ 11.0 mm. Body narrow, about five times longer than wide. Pleotelson triangular, bearing faint middorsal longitudinal ridge, apex narrowly rounded.

RECORDS Off Venezuela, 73 m.

Subfamily Conilerinae, new name

DIAGNOSIS Clypeus flattened. Frontal lamina flat, narrow. Antennal peduncular articles 3 and 4 subequal. Pereopods 1–3, ischium and merus produced anterodistally. Pereopods lacking secondary unguis on dactyli. Natatory setae present on pereopods 4–7.

REMARKS In a discussion of the Cirolanidae, Botosaneanu, Bruce, and Notenboom (1986:412) refer to the subfamilies Eurydicinae and Cirolaninae but place the Conilera group under the heading “Unnamed Subfamily.” For consistency, the Conilera group is here recognized as a subfamily.

Key to genera of Conilerinae

1. Uropodal endopod with distal notch; pereopods 4–7 natatory, ischium, merus, and carpus flattened *Politolana*
- Uropodal endopod lacking distal notch; pereopods 4–7 with basis flattened and expanded, bearing natatory setae *Natatolana*

Natatolana Bruce, 1981

DIAGNOSIS Frontal lamina narrow; clypeus flat. Pereopods 1–3 bearing long setae. Pleopod 2 ♂, copulatory stylet articulating basally on endopod.

Natatolana gracilis (Hansen, 1890)

Figure 62

DIAGNOSIS ♂ 8.0 mm. Antennule short, not reaching distal end of antennal peduncle. Antenna reaching posteriorly to pereonite 4. Pleopod 2, copulatory stylet of endopod cylindrical, bowed, distally rounded. Pleotelson with obtuse apex, with slight transverse indentation near anterior margin.

RECORDS Probably St. Thomas, U.S. Virgin Islands; off Sombrero Light, Florida, 100–120 m.

Northern Brazil, 7–85 m.

REMARKS Hansen (1890) indicated some uncertainty about the exact type locality, but thought it likely to have been St. Thomas. Koenig (1972) recorded this species from several localities off northern Brazil, but did not illustrate her material.

Politolana Bruce, 1981

DIAGNOSIS Frontal lamina slender, flattened; clypeus flattened. Antennal peduncular articles 3–5 subequal. Pereopods 1–3 with ischium and merus anterodistally produced. Pereopods 4–7 with ischium, merus, and carpus flattened. ♂ pleopod 2 with copulatory stylet inserted basally on endopod. Endopod of pleopod 5 lacking marginal setae. Pleonite 5 overlapped laterally by pleonite 4. Uropodal endopod with distal emargination; exopod slender, elongate; sympod produced along mesial margin of endopod.

Key to species of *Politolana*

1. Uropodal endopod broad distal to emargination, margin obliquely truncate; coxae of pereonites 2–6 with impressed line *impressa*
 Uropodal endopod distal to emargination somewhat narrowed, margin evenly convex; coxae of pereonites lacking impressed line *polita*
-

Politolana impressa (Harger, 1883)

Figure 63A,B

DIAGNOSIS ♂ and ♀ up to 27 mm. Frontal lamina slightly expanded anteriorly. Coxae of pereonites 2–6 with impressed oblique line. Uropodal endo-

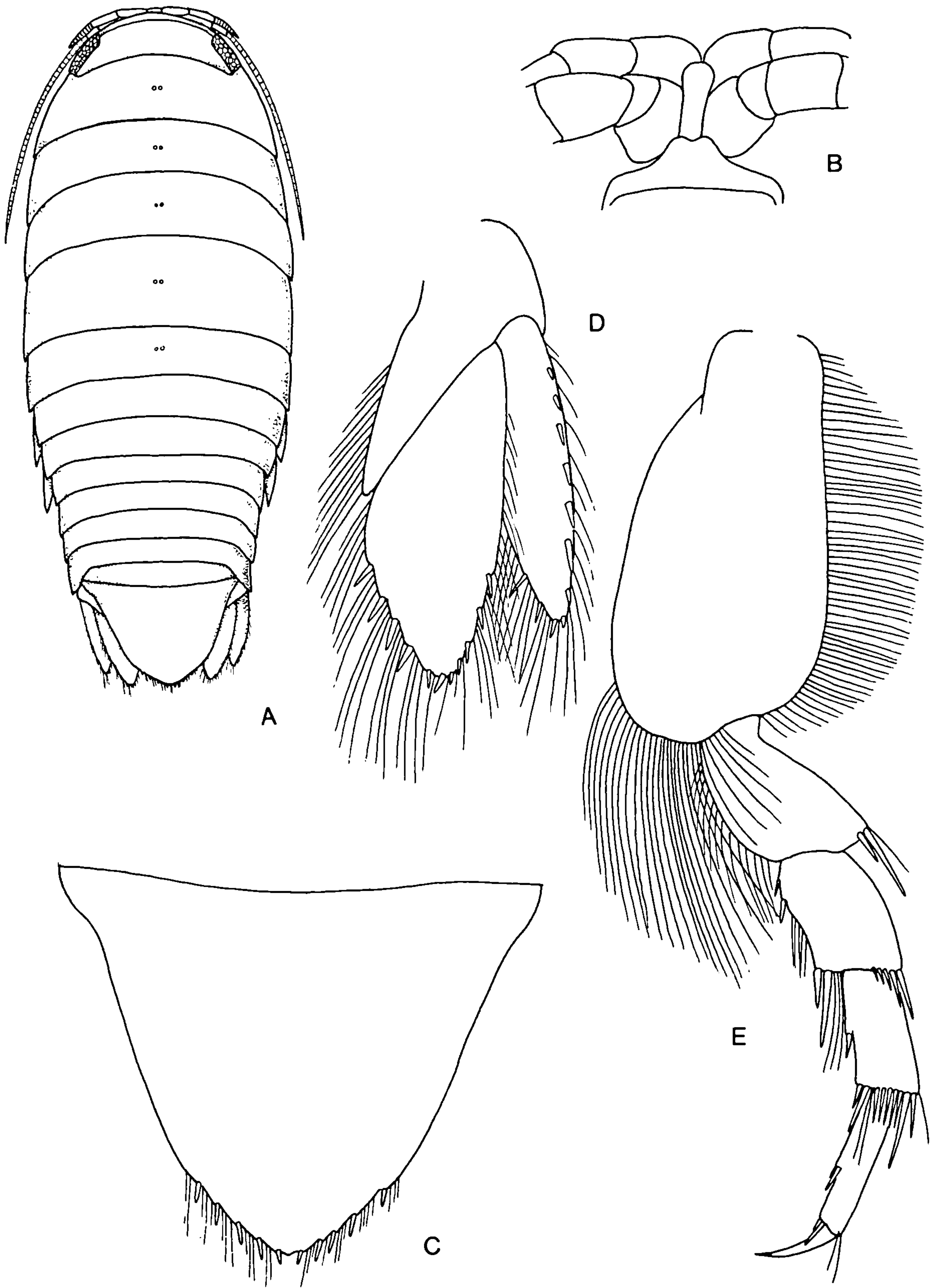


Figure 62. *Natatolana gracilis*: A, ♀; B, frontal lamina; C, pleotelson; D, uropod; E, pereopod 7.

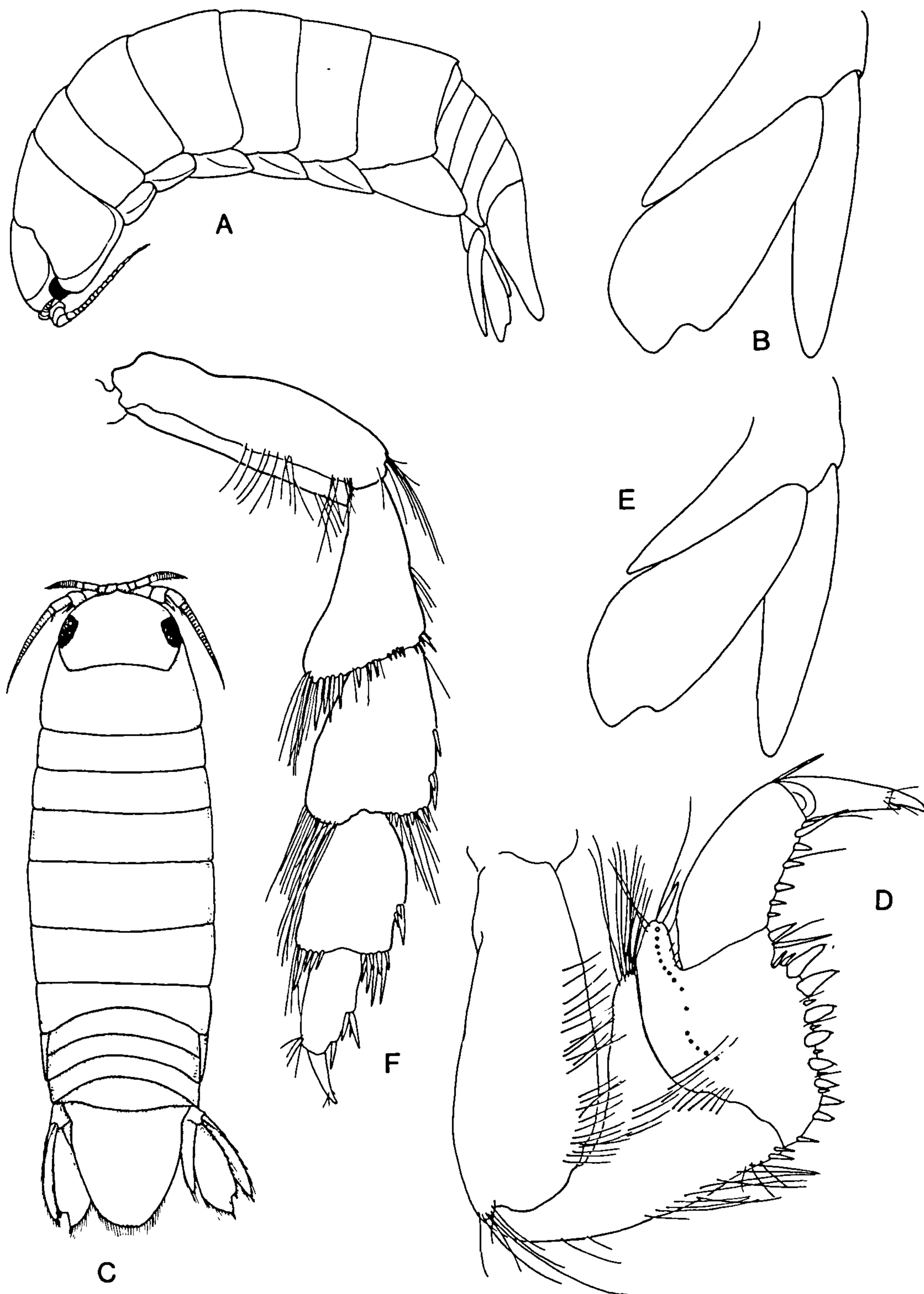


Figure 63. *Politolana impressa*: A, ♂, lateral view; B, uropod, (setae and spines omitted). *Politolana polita*: C, ♂; D, pereopod 1; E, uropod, setae and spines omitted; F, pereopod 1.

pod broad distal to emargination, margin subtruncate. Pleotelson posteriorly broadly rounded.

RECORDS Massachusetts to Palm Beach, Florida, 32–650 m.

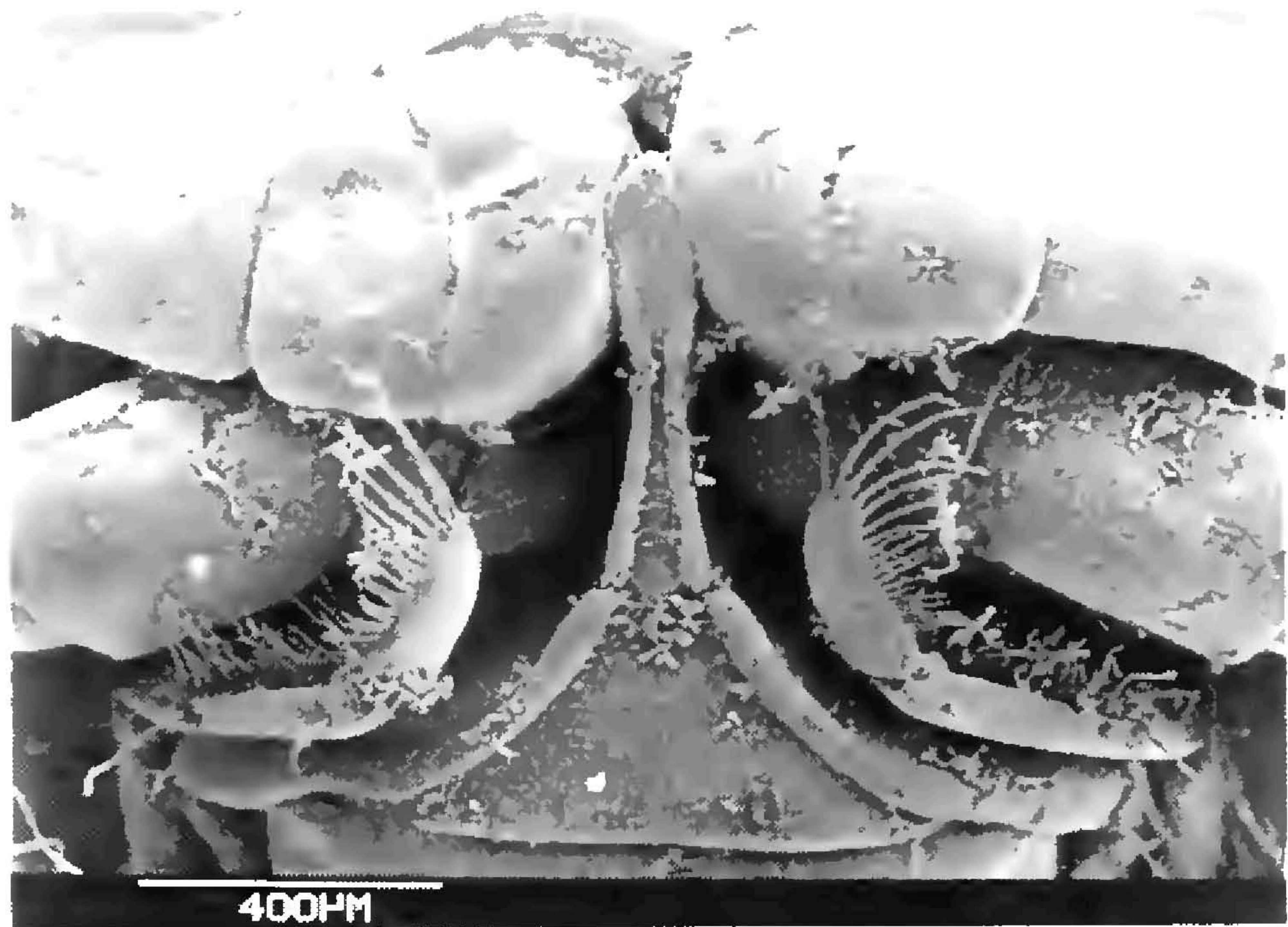


Figure 64. *Politolana polita*, anteroventral cephalon.

Politolana polita (Stimpson, 1853)

Figures 63C–F, 64

DIAGNOSIS ♂ 27.0 mm, ♀ 29.0 mm. Antennule barely reaching distal end of antennal peduncle. Frontal lamina basally slender, anteriorly expanded, just visible in dorsal view. Coxae lacking impressed oblique line. Uropodal endopod distal to emargination narrowed, margin convex. Pleotelson posteriorly broadly rounded.

RECORDS Bay of Fundy, Canada, to Florida Keys, 2–600 m; Gulf of Mexico.

Subfamily Eurydicinae Stebbing, 1905

DIAGNOSIS Clypeus projecting. Pleonite 5 with free lateral margins (except in *Xylolana*). Penes prominent. Pleopod 2 of ♂ with copulatory stylet articulating subbasally, medially, or subapically.

Key to genera of Eurydicinae

- 1. Uropodal sympod not produced along mesial margin of endopod
Eurydice
 - Uropodal sympod produced along mesial margin of endopod 2
 - 2. Rostrum prominent, fused with frontal lamina, separating antennal bases 5
 - Rostrum not prominent 3
- (continued)

Key to genera of Eurydicinae (*Continued*)

3. Pleon of five free pleonites plus pleotelson 4
 Pleon of three free pleonites plus pleotelson *Colopisthus*
4. Endopods of pleopods 3–5 lacking marginal setae, or with no more than three marginal setae; copulatory stylet of endopod of pleopod 2 in ♂ articulating subterminally *Arubolana*
 Marginal setae lacking only on endopod of pleopod 5; copulatory stylet of pleopod 2 endopod in ♂ articulating basally *Metacirolana*
5. Clypeus conical; uropodal endopod lacking notch in outer distal margin *Xylolana*
 Clypeus flattened; uropodal endopod with notch in outer distal margin *Excirolana*
-

Arubolana Botosaneanu and Stock, 1979

DIAGNOSIS Animal not able to conglobate. Blind, or with very small eyes. Anterior margin of frontal lamina broad. Antennular peduncle of three articles. Maxillipedal palp of four articles (articles 2 and 3 fused). Maxilla 2 reduced, endite unarmed, exopod with few marginal setae. Pereopods 1 and 2 and sometimes pereopod 3 prehensile; pereopods 4–7 ambulatory. Pleopods 1 and 2, rami undivided. Pleopod 2 ♂ with copulatory stylet articulating subterminally on endopod. Pleopods 3–5, exopods biarticulate; endopods lacking marginal setae, or with few setae on endopods of 3 and 4; pleopod 5 exopod with marginal setae interrupted.

Key to species of *Arubolana*

1. Eyes present, small *parvioculata*
 Eyes absent 2
2. Pleotelson posteriorly rounded; rostrum not distinct in dorsal view *aruboides*
 Pleotelson posteriorly subtruncate; rostrum distinct in dorsal view *imula*
-

Arubolana aruboides (Bowman and Iliffe, 1983)

Figure 65A–C

DIAGNOSIS ♂ 3.9 mm, ♀ 4.1 mm. Body about three times longer than wide. Eyes absent. Antennular peduncle article 3 longer than articles 1 and 2 together. Antenna reaching posteriorly to pereonite 6 or 7. Frontal lamina visible in dorsal view between antennal bases, anteriorly rounded and only slightly wider than proximally, with distally flared ridge on ventral (exposed) surface. Pleotelson as long as basal width, evenly narrowing to broadly rounded posterior margin, latter with few small serrations and setae. Uropodal exopod four times longer than wide; endopod length about twice basal width, distally obliquely truncate, with elongate setae on inner margin.

RECORDS Church Cave and Wonderland Cave, Bermuda.

Arubolana imula Botosaneanu and Stock, 1979

Figure 65D

DIAGNOSIS ♂ and ♀ 6.25 mm. Body 2.3 times longer than wide. Eyes absent. Antenna reaching posteriorly to pereonite 4 or 5. Rostrum distinct, anteriorly truncate, separating antennal bases, fused with rectangular frontal lamina ventrally. Pleotelson basally slightly wider than long, posterior margin broadly rounded to subtruncate, with irregular crenulations or faint teeth. Uropodal exopod apically acute, reaching to about midlength of endopod; latter distally broad, with slight tooth at distolateral angle.

RECORDS Mangel Cora Tunnel, Aruba.

Arubolana parvioculata Notenboom, 1984

Figure 65E,F

DIAGNOSIS ♂ 2.8 mm, ♀ 2.9 mm. Body 3.3 times longer than wide. Cephalon with tiny pigmented eyes. Antenna reaching posteriorly to pereonite 5. Frontal lamina projecting, dorsally visible. Pleotelson basally wider than long, tapering to broadly rounded/subtruncate posterior margin bearing about six low teeth. Uropodal exopod distally acute, almost three times longer than basal width; endopod distally serrate, apically acute.

RECORDS Interstitial water near Discovery Bay, Jamaica.

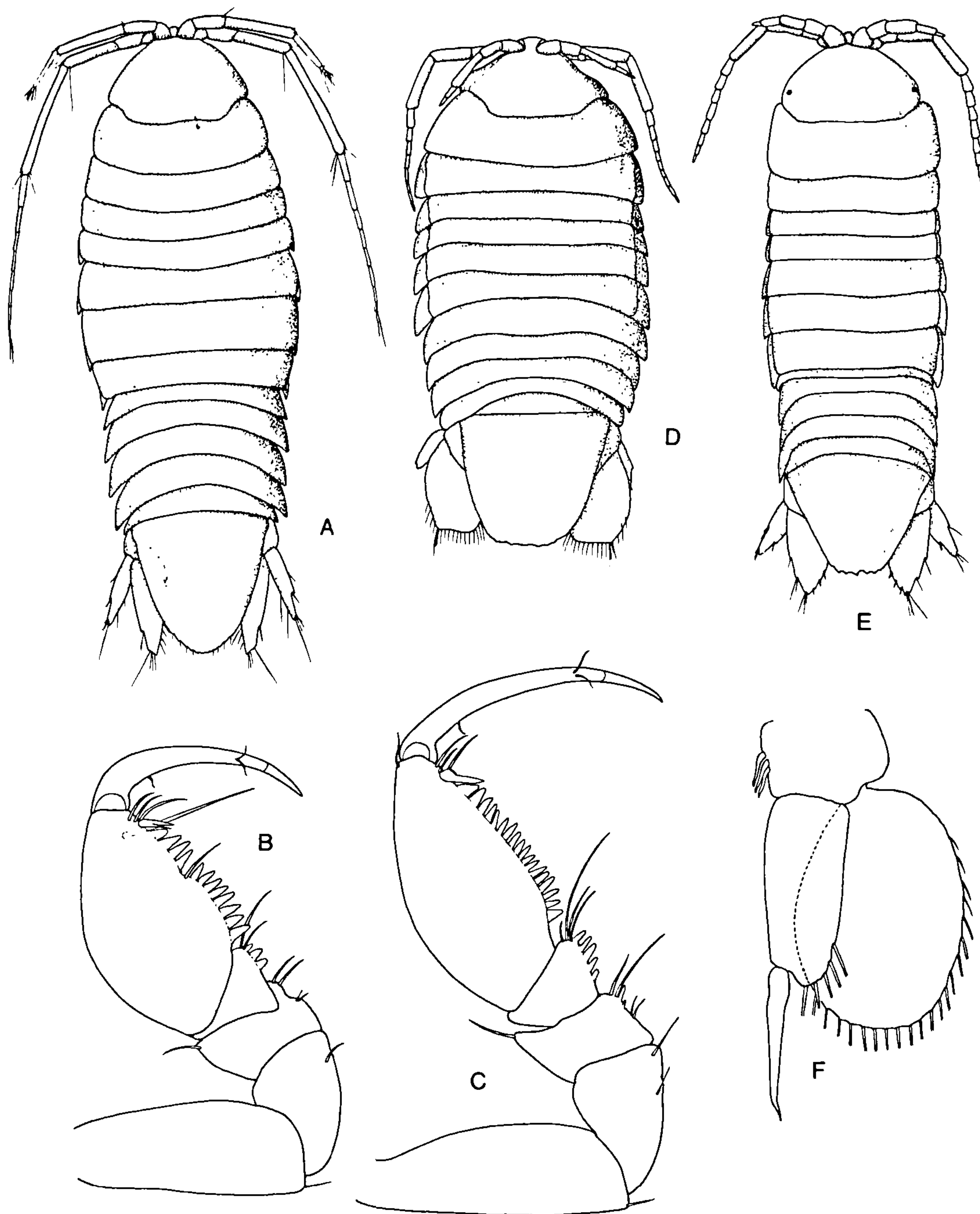


Figure 65. *Arubolana aruboides*: A, ♂; B, pereopod 1; C, pereopod 2. *Arubolana imula*: D, ♀. *Arubolana parvioculata*: E, ♂; F, pleopod 2, ♂.

Colopisthus Richardson, 1902

DIAGNOSIS Cephalon broader than long, becoming triangular between antennal bases. Pleon consisting of three short free pleonites (often obscured beneath pereonite 7), plus triangular pleotelson.

Colopisthus parvus Richardson, 1902

Figure 66A

DIAGNOSIS ♀ 3.6 mm. Eyes large, well pigmented. Frontal lamina proximally narrow, anteriorly widened to truncate distal margin. Antennules and antennae short, latter reaching posteriorly to pereonite 1. Pleotelson with strong middorsal ridge.

RECORDS Bermuda; Puerto Rico, intertidal rocks and algae.

Eurydice Leach, 1815

DIAGNOSIS Antennular peduncle article 2 at right angle to article 1. Antennal peduncle of four articles. Frontal lamina usually slender; clypeus usually a ventrally directed triangular blade. Maxillipedal endite reduced, lacking coupling hooks. ♂ pleopod 2 with copulatory stylet articulating at mid-length. Pleopod 5, endopod lacking marginal setae. Pleonite 5 with free lateral margins, not overlapped by pleonite 4. Uropodal sympod not produced along medial margin of endopod.

Key to species of *Eurydice*

- 1. Frontal lamina distally truncate to faintly bilobed 2
 Frontal lamina lanceolate, distally acute *personata*
 - 2. Posterior margin of pleotelson between notches rounded, with four
 moderate spines *convexa*
 Posterior margin of pleotelson between notches almost straight, with
 four very short spines and several elongate setae *piperata*
-

Eurydice convexa Richardson, 1900

Figures 66B–E, 67A,B

DIAGNOSIS ♂ 6.1 mm, ♀ 6.1 mm. Frontal lamina slender, anteriorly widening slightly and becoming truncate to faintly bilobed. Posterior margin of pleotelson between lateral notches convex, with four spines and few setae between serrations; spines between three and four times longer than wide. ♂: Plicate process on antennal flagellar articles about 1/5 length of article. Pleopod 2 with copulatory stylet distally blunt, reaching well beyond rami.

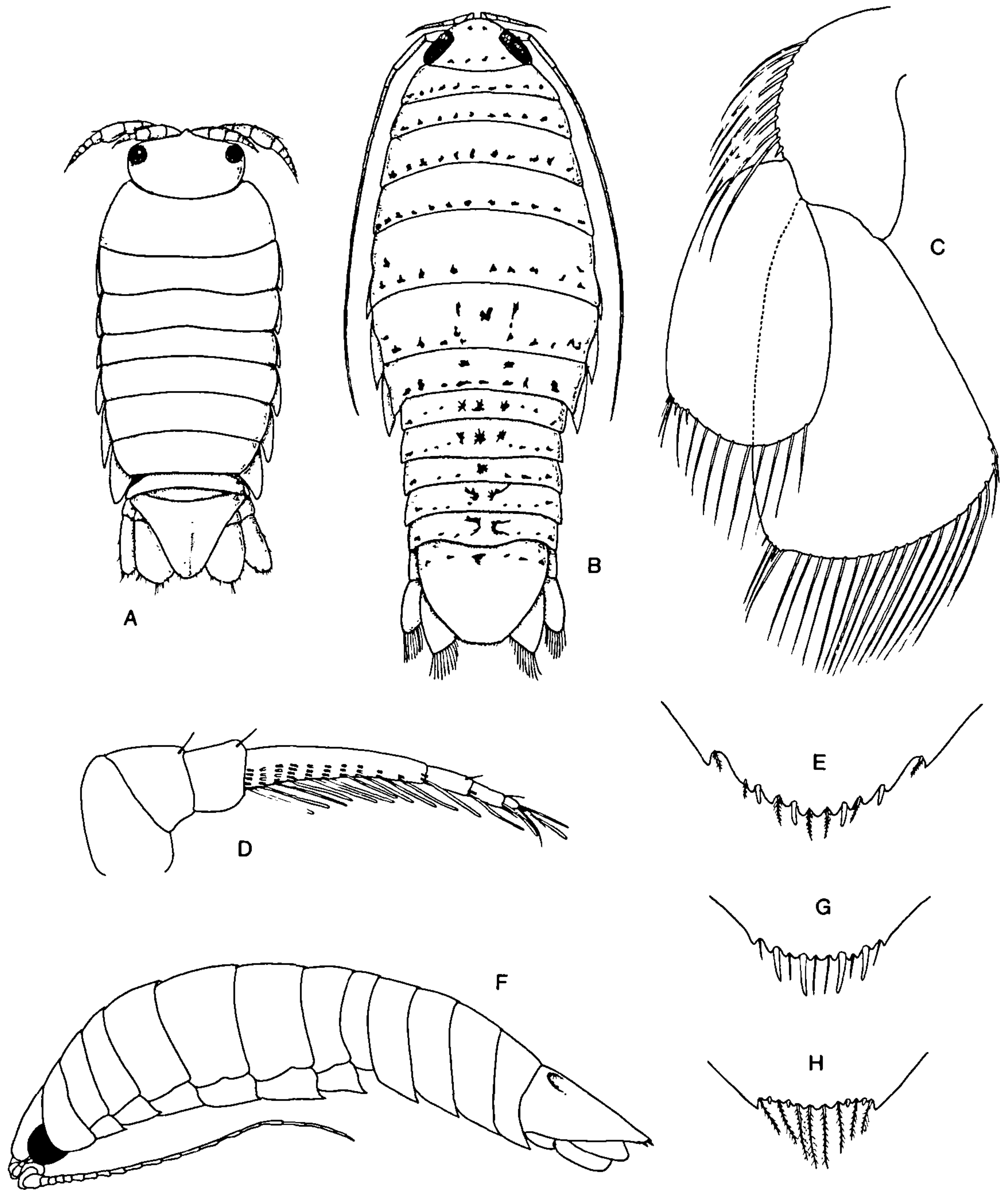


Figure 66. *Colopisthus parvus*: A, ♀. *Eurydice convexa*: B, ♂; C, uropod; D, antennule; E, pleotelsonic apex. *Eurydice personata*: F, ♂, lateral view; G, pleotelsonic apex. *Eurydice piperata*: H, pleotelsonic apex.

RECORDS South Carolina to Florida Keys; Bahamas; Gulf of Mexico and Caribbean.

REMARKS Whether *E. convexa* and *E. littoralis* are conspecific needs further investigation. Differences can be detected in the male plicate organs of the antennae, and in the mandibular palp spination, but range of variation in

these features is still unknown. It seems unlikely that the species recorded as *E. littoralis* by Moreira (1972) from Brazil is the same species.

Eurydice personata Kensley, 1987a

Figures 66F,G; 67C

DIAGNOSIS ♂ 6.0 mm, ovigerous ♀ 5.1–6.4 mm. Frontal lamina slender, lanceolate, anteriorly acute. Posterior margin between notches faintly convex, with four relatively elongate spines (inner pair five or six times longer than wide) and few setae between dentitions. ♂: Plicate organ on antennal flagellar articles half length of article. Pleopod 2, copulatory stylet on endopod clavate, barely reaching beyond ramus.

RECORDS Bermuda; off Georgia, 18–27 m; off South Carolina, 34 m; off Miami, Florida; Puerto Rico, 13–17 m; Bahamas, 1–2 m and surface plankton tow; Haiti; Cuba; Venezuela.

REMARKS This recently discovered species has masqueraded under the names of *E. convexa* and *E. littoralis* for some time, which may explain some of the inconsistencies in the literature, especially in variation in the pleotelsonic apex.

Eurydice piperata Menzies and Frankenberg, 1966

Figure 66H

DIAGNOSIS ♂ 4.0 mm, ♀ 4.5 mm. Frontal lamina slender, widening anteriorly to become slightly bilobed. Posterior margin of pleotelson between notches straight to faintly convex, with four spines barely twice longer than wide, and several much longer setae between dentition. ♂: Plicate organ on antennal flagellar articles about 1/6 length of article but situated subdistally. Pleopod 2, copulatory stylet clavate, reaching well beyond ramus.

RECORDS Georgia to Florida, Gulf of Mexico, 37–150 m.

Exciorolana Richardson, 1912a

DIAGNOSIS Cephalon with prominent rostrum separating antennular bases; fused with flattened frontal lamina. Clypeus with short, broadly triangular blade projecting anteroventrally. Antennal peduncle with four or five articles. Maxillipedal endite with single coupling hook. Pleopods 3–5, endopods

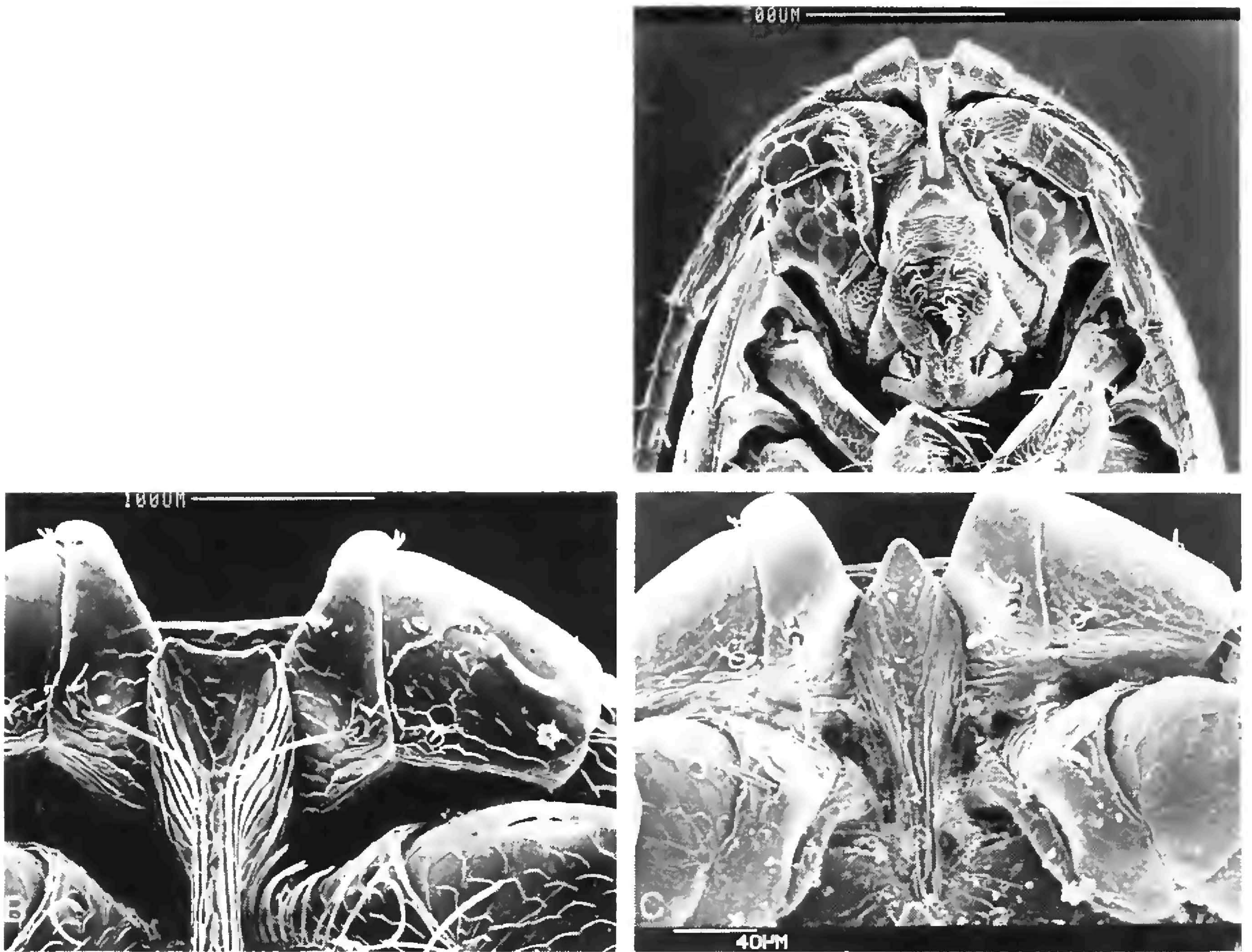


Figure 67. *Eurydice convexa*: A, anteroventral cephalon; B, frontal lamina. *Eurydice personata*: C, frontal lamina.

lacking marginal setae. Pleonite 5 with free lateral margins, not overlapped by pleonite 4. Uropodal sympod produced along mesial margin of endopod.

Key to species of *Excirolana*

1. Pleotelson with two anterior hollows clearly joined by impressed line; uropodal endopod about half length of exopod *braziliensis*
 Pleotelson with two anterior hollows not connected by impressed line; uropodal endopod about two-thirds length of exopod *mayana*

Excirolana braziliensis Richardson, 1912a

Figures 68A–C, 69A–C

DIAGNOSIS ♂ 6.0 mm, ♀ 7.5 mm. Frontal lamina very slender between antennal bases, widening anteriorly into rounded structure between anten-

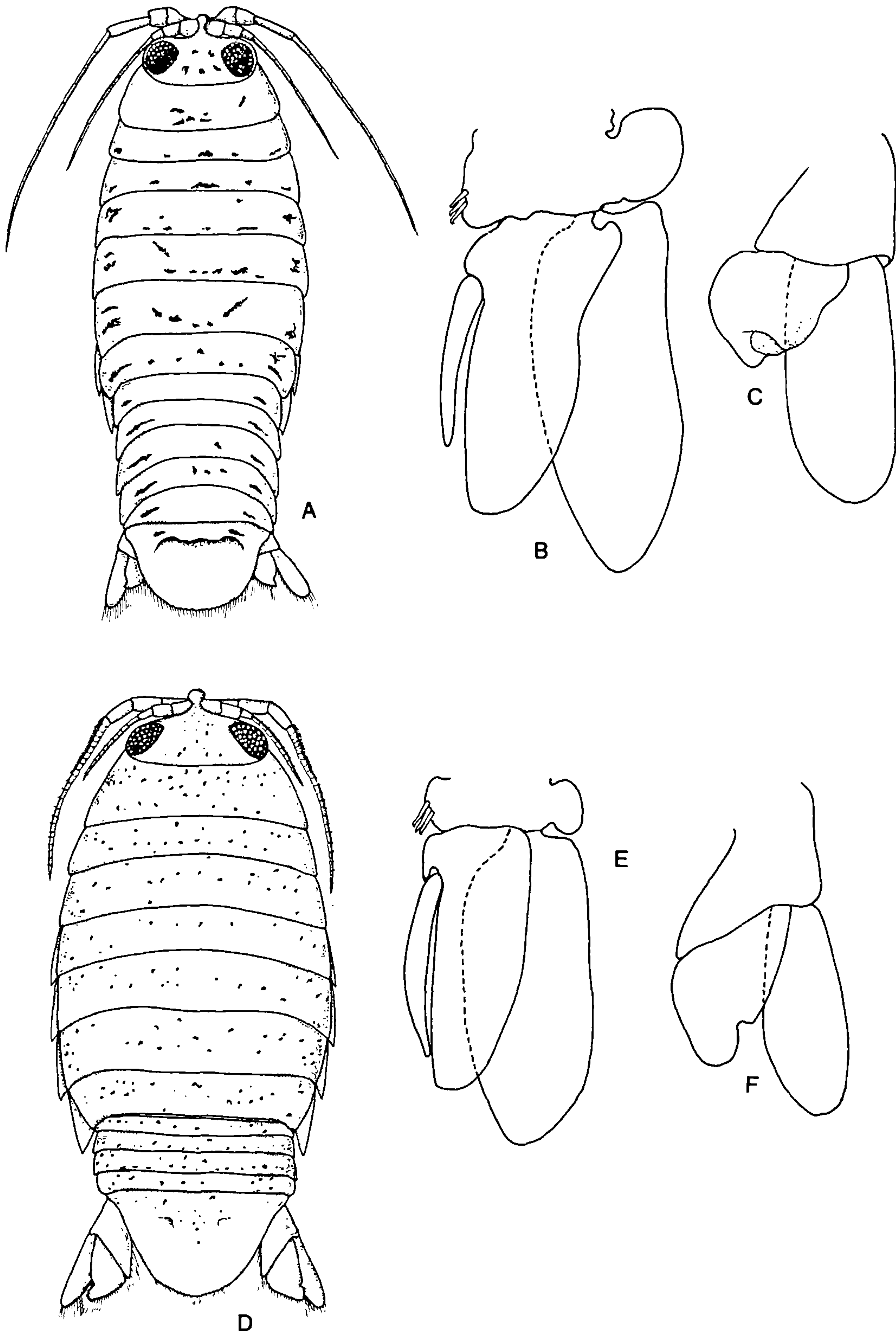


Figure 68. *Excirolana braziliensis*: A, ♂; B, pleopod 2 ♂; C, uropod, (setae and spines omitted). *Excirolana mayana*: D, ♀; E, pleopod 2 ♂; F, uropod, setae and spines omitted.

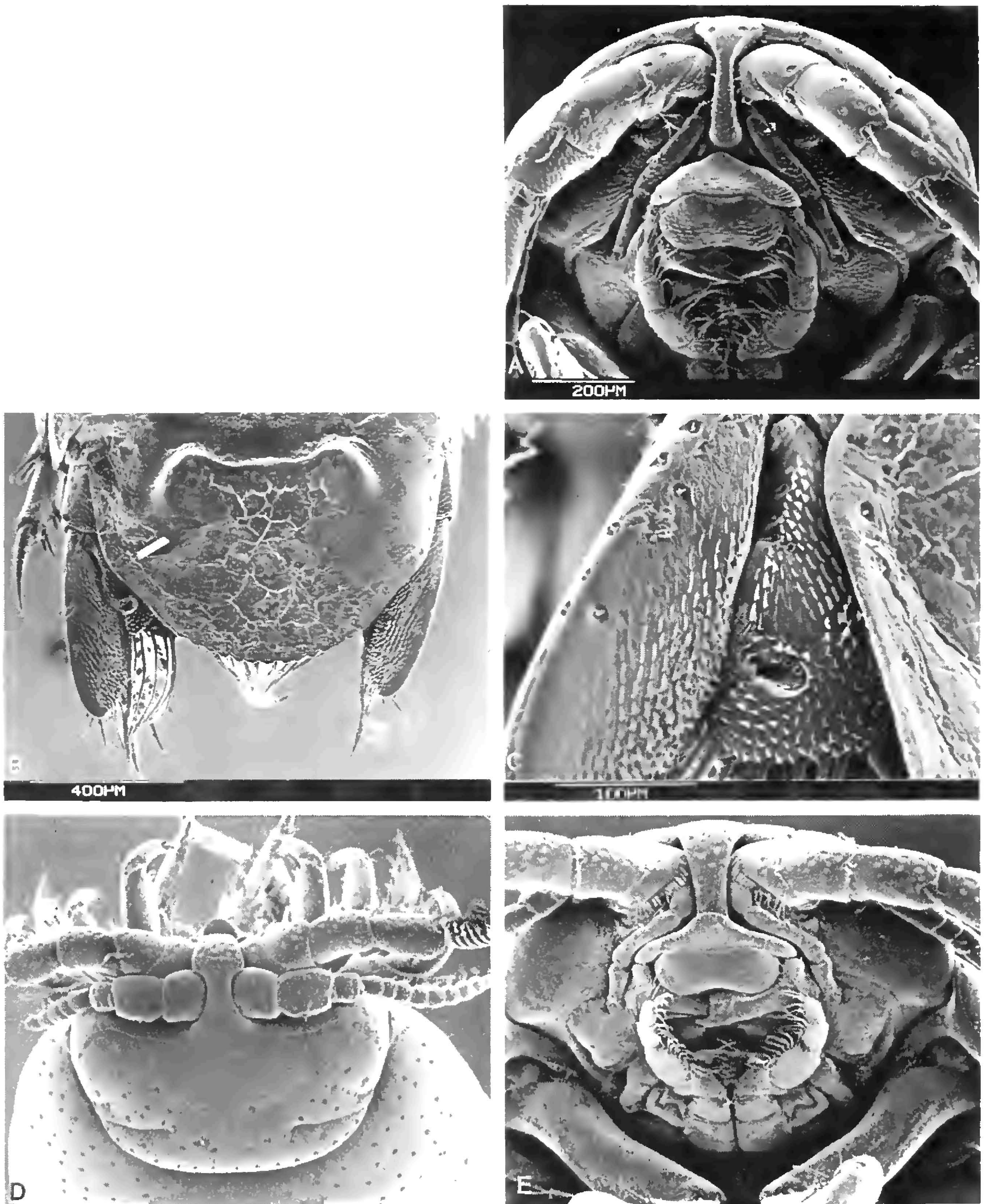


Figure 69. *Exciorolana braziliensis*: A, anteroventral cephalon; B, pleotelson; C, uropodal endopod. *Exciorolana mayana*: D, anterodorsal cephalon; E, anteroventral cephalon.

nular bases, joined to rostrum by very slim isthmus. Clypeus distally subacute. Uropodal endopod about half length of exopod. Pleotelson with two lateral hollows defined and connected by clear impressed line; posterior margin evenly convex, bearing numerous plumose setae.

RECORDS Caribbean to Brazil; common in the intertidal of sandy beaches; Gulf of Mexico.

Gulf of California to Chile.

REMARKS Glynn et al. (1975) produced a thorough study of the taxonomy, zonation, and distribution of this Pan-American species.

Excirolana mayana (Ives, 1891)

Figures 68D–F, 69D,E

DIAGNOSIS ♂ 8.2 mm, ♀ 10.0 mm. Frontal lamina between antennal bases about half anterior width. Clypeus anteriorly rounded. Uropodal endopod about 2/3 length of exopod. Pleotelson with two faint lateral hollows in anterior half, not connected by impressed line.

RECORDS Florida to Venezuela, intertidal.

Metacirolana Nierstrasz, 1931

DIAGNOSIS Frontal lamina anteriorly dilated, free, projecting; clypeus triangular, projecting ventrally. Maxillipedal endite with one coupling hook. Pleon with five free segments, pleonite 5 not overlapped laterally by pleonite 4. Eyes often larger, and antennular flagellum of more articles in ♂ than in ♀.

Key to species of *Metacirolana*

1. Telson posteriorly truncate *halia*
 Telson posteriorly rounded or angulate 2
 2. Posterior margin of telson an obtuse angle *agaricicola*
 Telson posteriorly rounded 3
 3. Posterior margin of telson narrowly rounded; uropodal rami, margins strongly dentate *menziesi*
 Posterior margin of telson broadly rounded; uropodal rami, margins obscurely dentate *sphaeromiformis*
-

Metacirolana agaricicola Kensley, 1984

Figure 70A–C

DIAGNOSIS ♂ 2.6 mm, ovigerous ♀ 2.1 mm. Antennular flagellum of six or seven articles. Antennal flagellum of 10 articles. Posterior margin of telson finely dentate, with broadly obtuse median point. Uropodal exopod about half width of endopod, margins dentate, apically acute; endopod, margins dentate, distally angled, apically acute.

RECORDS Carrie Bow Cay, Belize, 1–20 m, in coral on reef slope, and spur and groove zone.

Metacirolana halia Kensley, 1984

Figure 70D–F

DIAGNOSIS ♂ 2.9 mm, ovigerous ♀ 2.7 mm. Antennular flagellum of 10 articles in ♀, 14 in ♂. Antennal flagellum of 10 articles in ♀, 11 in ♂. Posterior margin of telson truncate, bearing about eight sensory spines. Uropodal exopod distally broadly rounded, more than half distal width of endopod, outer margin dentate, with about 11 sensory spines; endopod distally broad, margin straight, bearing about 12 sensory spines.

RECORDS Carrie Bow Cay, Glover's Reef, Belize; intertidal to 23 m; Turks and Caicos Islands, 1 m; Bahamas; Jamaica; Cozumel, Mexico.

Metacirolana menziesi Kensley, 1984

Figure 71A,B

DIAGNOSIS ♂ 2.3 mm, ovigerous ♀ 2.4 mm. Antennular flagellum of six articles in ♀, eight in ♂. Antennal flagellum of nine articles in ♀, 10 in ♂. Posterior margin of telson broadly rounded, finely dentate. Uropodal exopod half width of endopod, margins dentate, apically acute; endopod, margins dentate, apically acute.

RECORDS Carrie Bow Cay, Belize, intertidal to 30 m, usually in coral rubble.

Metacirolana sphaeromiformis (Hansen, 1890)

Figure 71C,D

DIAGNOSIS ♂ 2.5 mm, ♀ 3.2 mm. Antennular flagellum of three articles. Antennal flagellum of eight articles. Posterior margin of telson narrowly

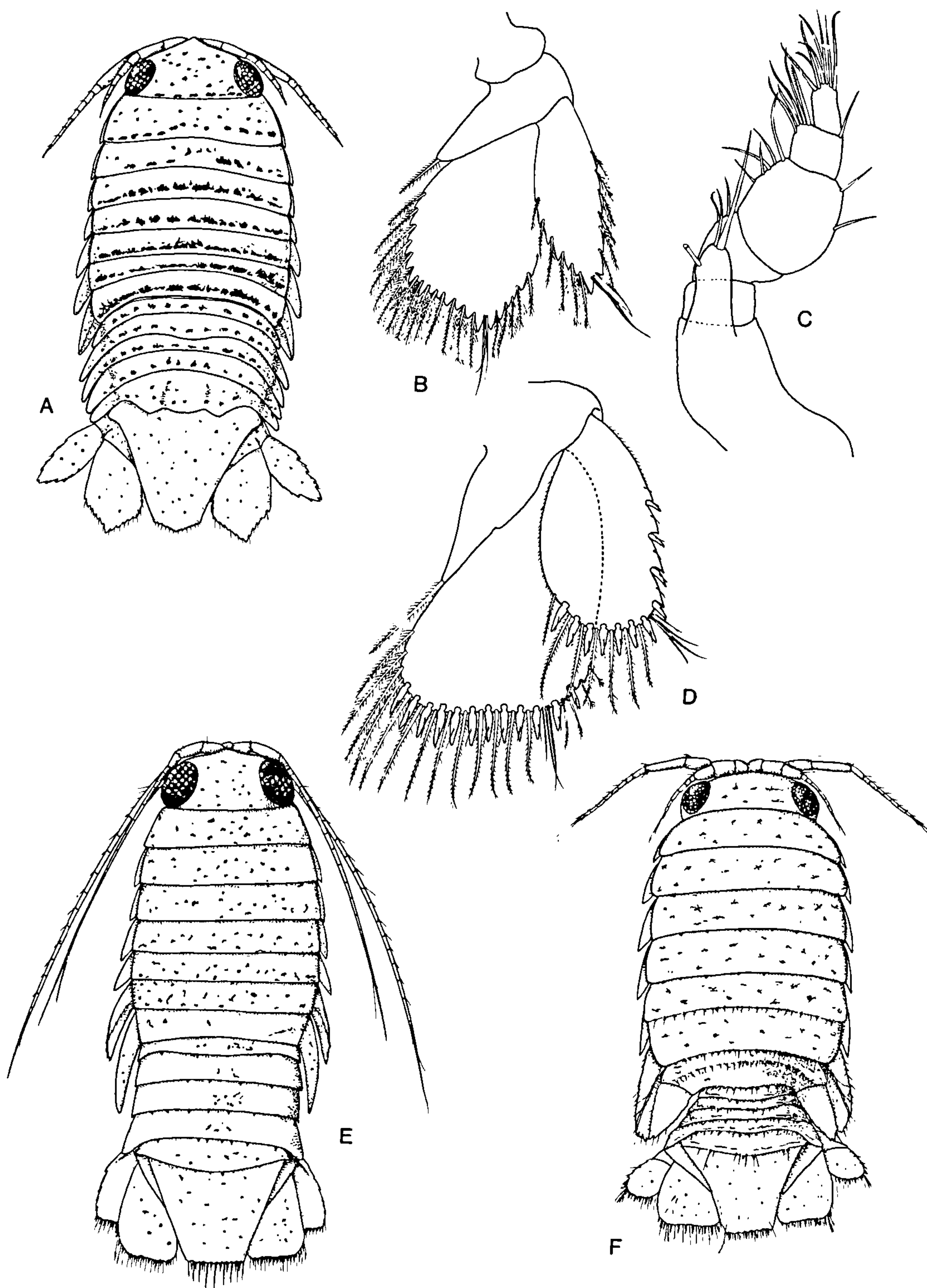


Figure 70. *Metacirolana agaricicola*: A, ♀; B, uropod; C, maxilliped. *Metacirolana halia*: D, uropod; E, ♂; F, ♀.

rounded, obscurely dentate. Telson with low rounded middorsal ridge and pair of lateral ridges. Uropodal exopod more than half width of endopod, margin dentate; exopod distally broadened, margin dentate, with few sensory spines.

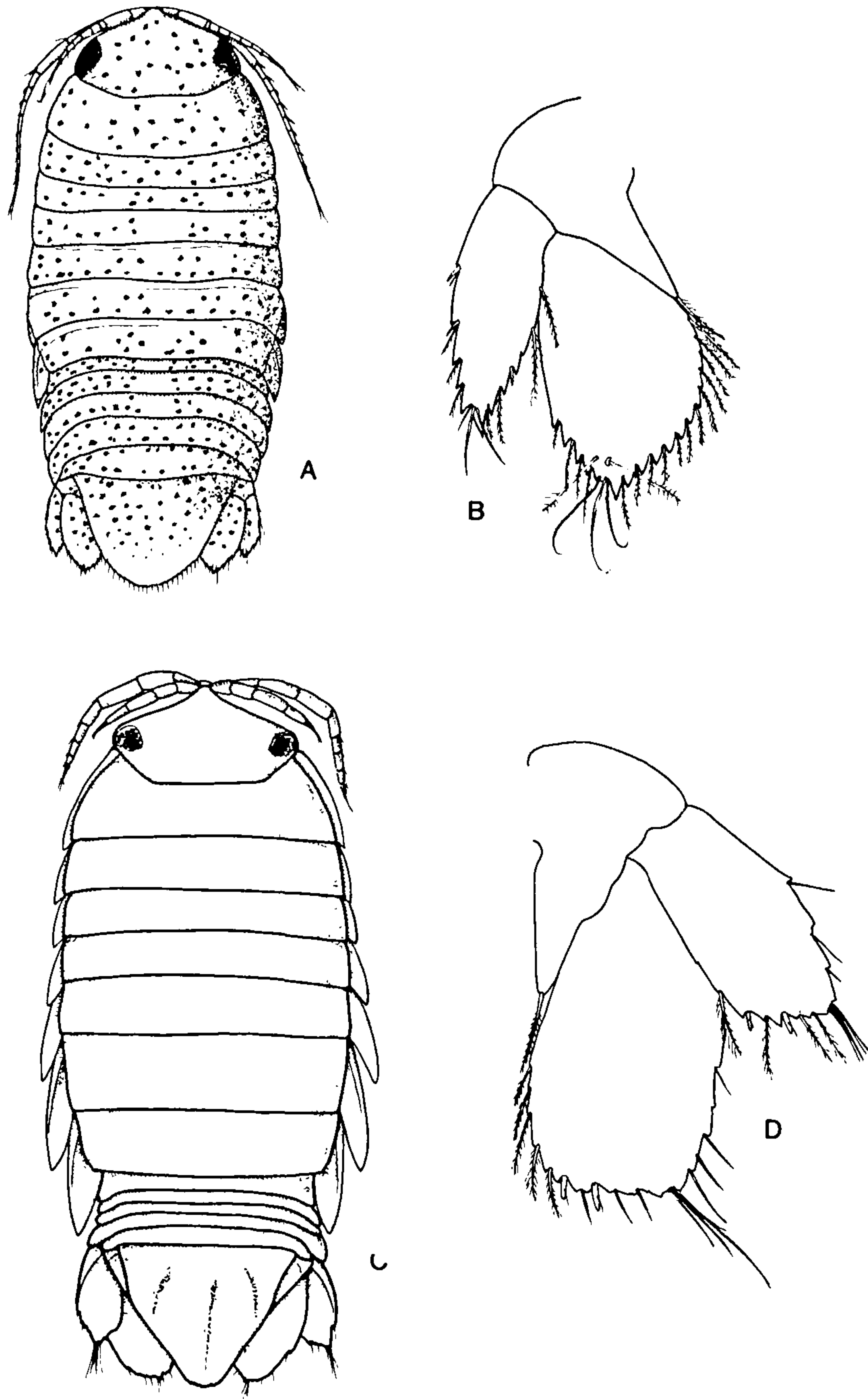


Figure 71. *Metacirolana menziesi*: A, ♀; B, uropod. *Metacirolana sphaeromiformis*: C, ♀; D, uropod.

RECORDS Looe Key, Florida, intertidal reef crest; Turks and Caicos Islands, 1 m; St. Thomas, U.S. Virgin Islands.

Xylolana Kensley, 1987a

DIAGNOSIS Frontal lamina and rostrum fused, broad, separating antennular bases. Clypeus conical, projecting. Maxillipedal endite reduced, lacking

coupling hooks; palp of five articles. Copulatory stylet in ♂ articulating in distal half of mesial margin of pleopod 2 endopod. Pleopods 3–5, exopods biarticulate; endopods lacking marginal setae. Pleonite 5 lacking free lateral margins, overlapped by pleonite 4. Uropodal sympod produced along mesial margin of endopod.

Xylolana radiccicola Kensley, 1987a

Figure 72

DIAGNOSIS ♂ 2.6 mm, ♀ 3.3 mm. Body about four times longer than greatest width. Uropodal exopod about $\frac{2}{3}$ width of endopod, bearing single short subapical spine; both uropodal rami distally rounded. Pleotelson with lateral margins subparallel, with poorly defined middorsal longitudinal ridge.

RECORDS Twin Cays, Belize, in dead red mangrove roots, 1 m.

Family Corallanidae Hansen, 1890

DIAGNOSIS Outer ramus of maxilla 1 apex with single strong falcate spine, with single strong spine with one or more smaller hooked spines at base, or with two large recurved spines, occasionally with one to three smaller spines between them. Maxillipedal endite reduced or lacking.

Key to genera of Corallanidae

1. Maxilla 1 with single strong falcate spine 2
 Maxilla 1 with two large falcate spines *Alcirona*
 2. Maxilla 2, distal article slender-elongate; article 2 of maxillipedal palp longest *Nalicora*
 Maxilla 2 distally bluntly bilobed; article 3 of maxillipedal palp longest *Excorallana*
-

Alcirona Hansen, 1890

DIAGNOSIS Antennular peduncle of two articles. Mandible lacking molar. Maxilla 1 having two large recurved spines, with one or more smaller spines between these. Maxilla 2 a simple rounded lobe. Maxilliped lacking endite. Posterior half of body hirsute.

Key to species of *Alcirona*

1. Golden-brown setae starting dorsally on pereonite 3; pereopod 1, dactylus having several elongate spines *insularis*
 - Golden-brown setae starting dorsally on pereonites 5 or 6; pereopod 1, dactylus having accessory spine only *krebsii*
-

Alcirona insularis Hansen, 1890

Figure 73A

DIAGNOSIS ♂ and ♀, 5.0 mm. Posterior half of body, especially in ♂, bearing stiff golden-brown setae, these beginning as posterior row on pereonite 3, and becoming dense on posterior pereonites, pleonites and pleotelson. Pereopods 1–3, dactylus strongly falcate, having distal unguis equal in length to rest of article, and with three or four strong teeth on posterior margin. Apex of pleotelson rounded, bearing six short marginal spines in addition to setae.

RECORDS Looe Key, Florida, 0.5–6 m; St. Thomas, U.S. Virgin Islands, 40–46 m; Puerto Rico, from intertidal coral rubble and from gills of nurse shark *Ginglymostoma sirratum*; St. Lucia, from coral rubble.

Alcirona krebsii Hansen, 1890

Figure 73B–D

DIAGNOSIS ♂ 10 mm, ovigerous ♀ 15.5 mm. Posterior half of body, especially in ♂ bearing stiff golden-brown setae, these beginning in posterior row on pereonites 5 or 6, becoming dense on posterior pereonites, pleonites, uropods, and pleotelson. Pereopod 1, dactylus strongly falcate, with unguis equal in length to rest of article, and with one strong tooth and several low tubercles on posterior margin. Apex of pleotelson rounded, bearing six short spines in addition to setae.

RECORDS Bermuda, in sponges; Florida Keys; Quintana Roo, Yucatan Peninsula; St. Thomas, U.S. Virgin Islands; Venezuela.

REMARKS A single 8-mm ♂ specimen of *Alcirona* from Panama Bay (Pacific) has the characteristic pereopod 1 of *A. krebsii*, but has the rows of stiff setae beginning on about pereonite 3. The possibility that *A. krebsii* is another amphi-Panamic species needs to be investigated.

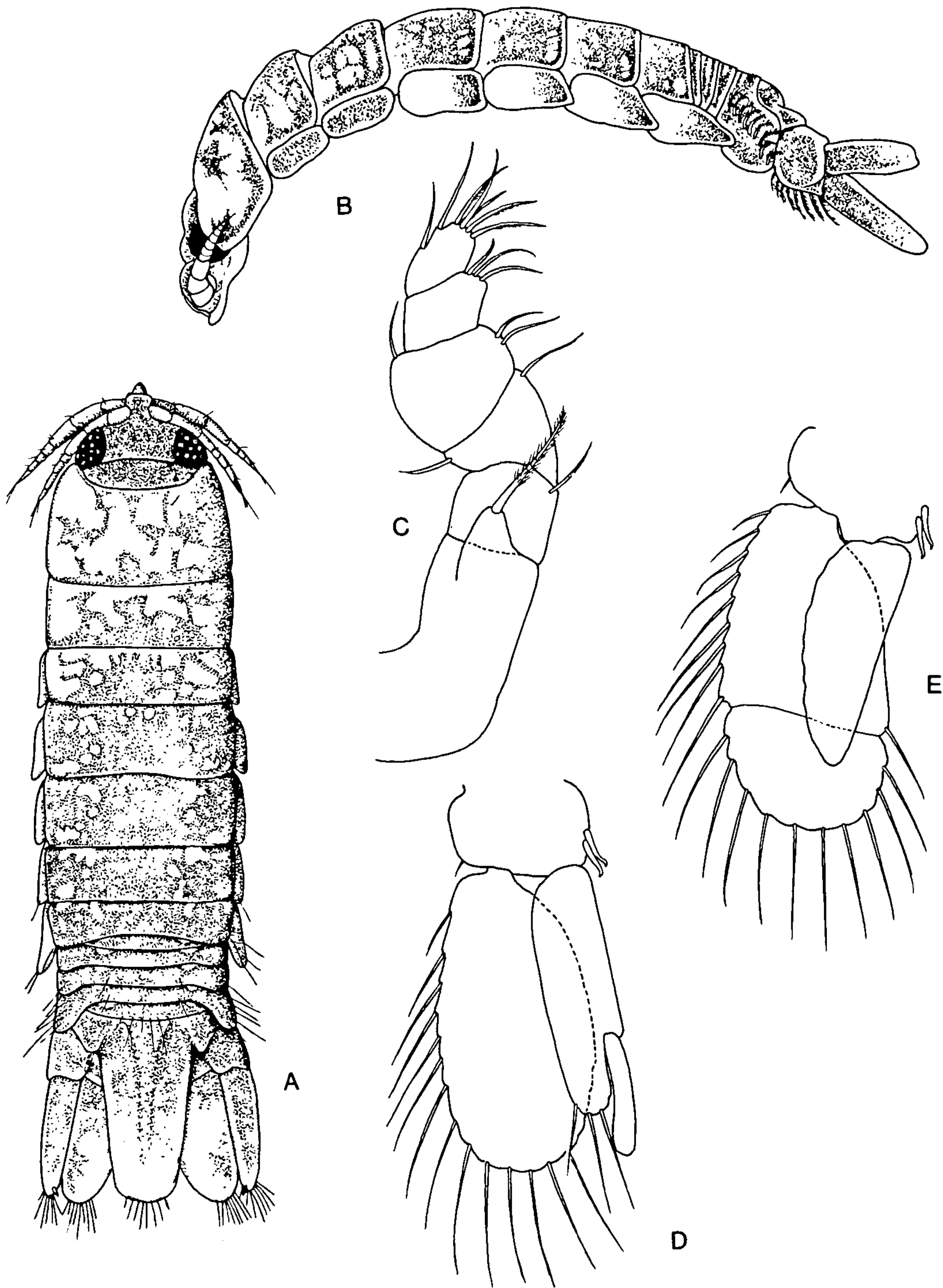


Figure 72. *Xylolana radicicola*: A, B, ♂; C, maxilliped; D, pleopod 2 ♂; E, pleopod 3.

Excorallana Stebbing, 1904

DIAGNOSIS Eyes well developed and pigmented, sometimes contiguous or nearly so. Maxilla 1, outer ramus a single falcate spine. Maxillipedal palp of five articles; endite reduced or absent. Pereopods 1–3 subprehensile or pre-

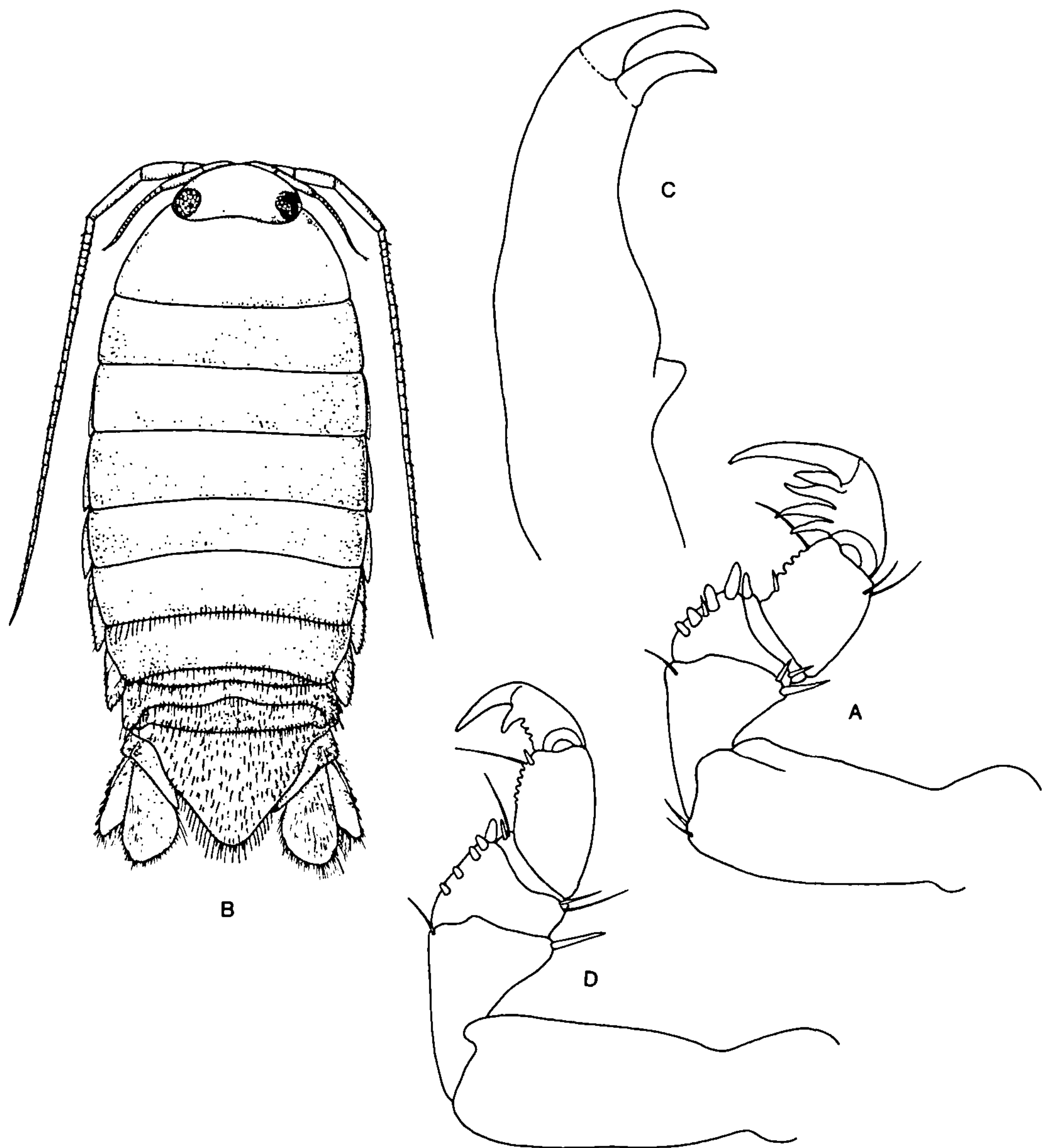


Figure 73. *Alcirona insularis*: A, pereopod 1. *Alcirona krebsi*: B, ♂; C, maxilla 1; D, pereopod 1.

hensile, pereopods 4–7 ambulatory. All rami of pleopods bearing marginal setae. Pleotelson often with characteristic spination and tuberculation; lateral margins often with incision.

REMARKS *Excorallana subtilis* (Hansen, 1890) was described from St. Thomas, U.S. Virgin Islands, based on a specimen undergoing ecdysis; the true identity of this species remains uncertain.

In the key, two species have been included which are not illustrated. These are *E. mexicana* Richardson, 1905, from the Gulf of Mexico, and *E. delaneyi*

Stone and Heard, 1989, from the northeastern Gulf of Mexico. The latter species, particularly, could conceivably be encountered in the Florida Keys.

Delaney (1984) provides a useful review of the genus *Excorallana*, and of the distribution of the species.

Key to species of *Excorallana*

1. Eyes contiguous 2
 Eyes well separated 4
 2. Apex of pleotelson with deep slit *fissicauda*
 Apex of pleotelson entire 3
 3. Pleotelson with lateral incision *oculata*
 Pleotelson lacking lateral incision *warmingii*
 4. Pleotelson with lateral incision 6
 Pleotelson lacking lateral incision 5
 5. Frontal lamina linguiform, anteriorly rounded *berbicensis*
 Frontal lamina posteriorly with faintly concave margins, anteriorly
 subacute *delaneyi*
 6. Frontal lamina strongly grooved for entire length 7
 Frontal lamina with ventral surface flat 8
 7. Pleotelson with medial row of small tubercles flanked by row of larger
 tubercles in posterior half *mexicana*
 Pleotelson lacking rows of tubercles in posterior half *antillensis*
 8. Frontal lamina distinctly bell shaped; ♂ cephalon with two pairs of
 tubercles and antennular bases not tuberculate *quadricornis*
 Frontal lamina, and ♂ cephalon and antennules not as above 9
 9. Frontal lamina anteriorly broadly rounded, length 1.5 or less times
 basal width; ♂ cephalon with two pairs of tubercles and basal
 antennular article each with tubercle *sexticornis*
 Frontal lamina anteriorly narrowly rounded, length about twice basal
 width; ♂ cephalon with three tubercles, tubercles lacking on
 antennular bases *tricornis tricornis*
-

Excorallana antillensis (Hansen, 1890) = *E. antillensis* (Hansen, 1890)

Figure 74A–D

DIAGNOSIS ♂ 11.0 mm, ovigerous ♀ 15.0 mm. Cephalon unornamented. Eyes well separated. Frontal lamina parallel sided, length twice basal width, anteriorly broadly rounded. Pleonites 2–4, posterolateral margins tuberculate, middorsal posterior margin excavate with strong middorsal tubercle; pleonite 5 with strongest tubercles submedian, posterior margin not excavate. Pleotelson with low middorsal ridge, strong basal tubercles; lateral incisions present; two submedian patches of spines; apex narrowly rounded.

RECORDS Florida Keys; St. Thomas, U.S. Virgin Islands; Puerto Rico; Quintana Roo, Mexico; Carrie Bow Cay, Belize, 5–18 m.

Excorallana berbicensis Boone, 1918

Figure 74E,F

DIAGNOSIS ♂ 9.9 mm, ♀ 12.0 mm. Eyes well separated. Frontal lamina about twice longer than wide, posteriorly parallel sided, widening anteriorly to broadly rounded apex. Subadult ♂ cephalon unornamented except for pair of very low tubercles mesial to eyes. Posterior margins of pleonites 3–5 very faintly tuberculate. Pleotelson with submedian pair of low tubercles basally; lacking lateral incisions; apex rounded.

RECORDS Guyana; French Guiana; Guadeloupe.

Excorallana fissicauda (Hansen, 1890)

DIAGNOSIS 11 mm. Cephalon unornamented. Eyes contiguous. Frontal lamina unknown. Pleonite 5 with three strong mesial, and several smaller lateral tubercles on posterior margin. Pleotelson with two strong submedian basal tubercles; lateral incision lacking; posterior margin with deep open incision.

RECORDS St. Thomas, U.S. Virgin Islands.

REMARKS This species was described from a single specimen, and has not been recorded since. After examining the holotype, Paul Delaney (in litt.) suspects that the terminal incision of the pleotelson may be the result of an injury.

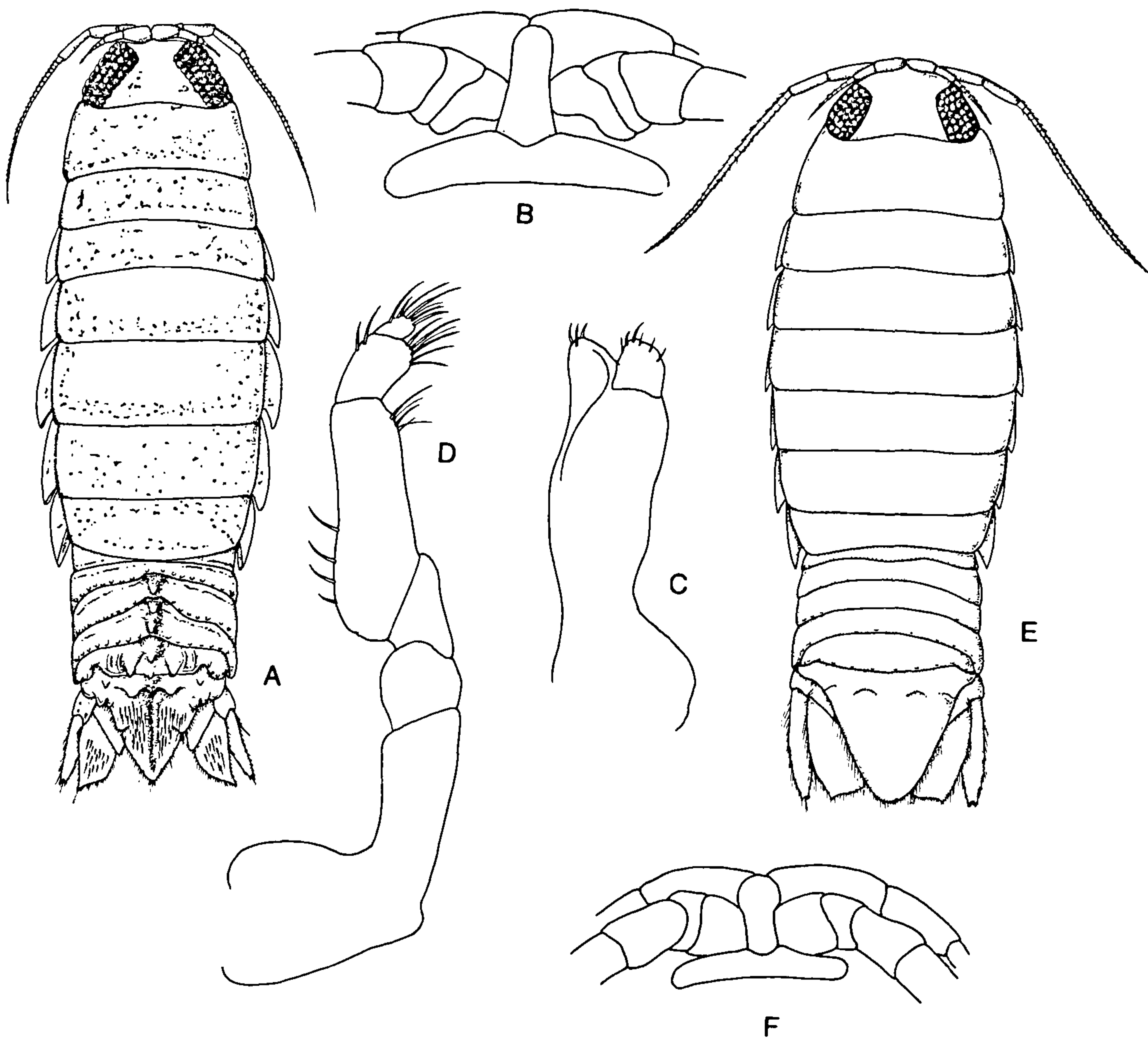


Figure 74. *Excorallana antillensis*: A, ♂; B, frontal lamina; C, maxilla 2; D, maxilliped. *Excorallana berbicensis*: E, ♂; F, frontal lamina.

Excorallana oculata (Hansen, 1890)

Figure 75A,B

DIAGNOSIS ♂ 6.9 mm, ♀ 8.5 mm. Eyes contiguous. Cephalon unornamented. Frontal lamina slender, linguiform, widest posteriorly. Pleonites 3–5 each with slightly hollowed middorsal area containing strong flattened tubercle; pleonite 5 with two strong flanking tubercles; pleotelson basally with low median ridge and two strong submedian tubercles; short strong spines in two roughly triangular submedian patches; lateral incisions present; apex narrowly rounded.

RECORDS Bahamas; Cuba, Puerto Rico, 40 m; Barbados. Brazil.

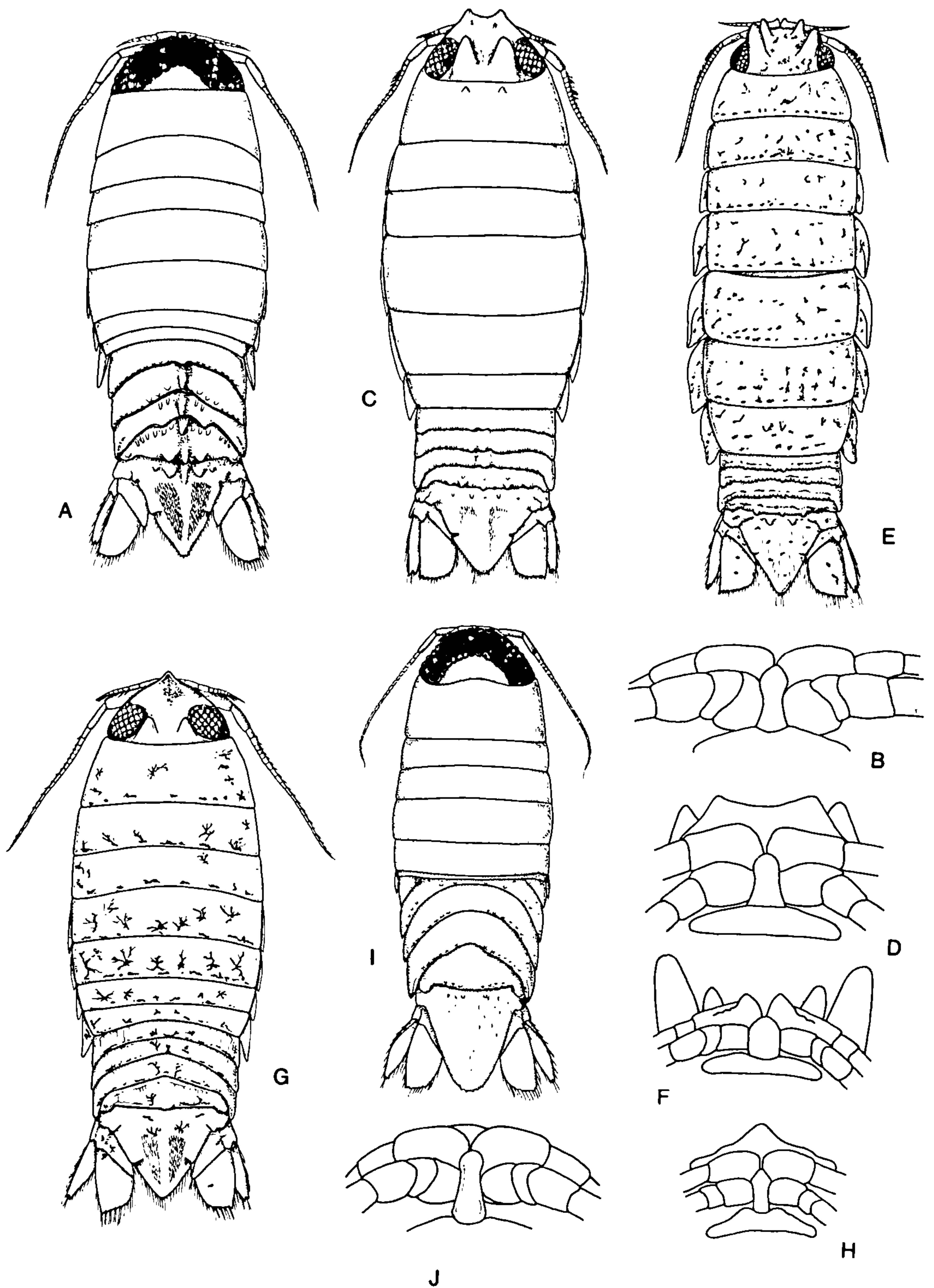


Figure 75. *Excorallana oculata*: A, ♂; B, frontal lamina. *Excorallana quadricornis*: C, ♂; D, frontal lamina. *Excorallana sexticornis*: E, ♂; F, frontal lamina. *Excorallana tricornis tricornis*: G, ♂; H, frontal lamina. *Excorallana warmingi*: I, ♂; J, frontal lamina.

Excorallana quadricornis (Hansen, 1890)

Figures 75C,D; 76A–C

DIAGNOSIS ♂ 13.2 mm, ♀ 12.1 mm. Eyes well separated. Cephalon in ♂ with two pairs of tubercles, anterior pair connected by low rounded ridge, posterior pair situated mesial to eyes. Frontal lamina bell shaped, broadest posteriorly. Pereonite 1 with submedian pair of low tubercles. Posterior margin of pereonite 7 and pleonites faintly tuberculate. Pleotelson with two submedian raised areas bearing short spines; lateral margins with incision; few low tubercles basally.

RECORDS Bermuda; St. Thomas, U.S. Virgin Islands; Jamaica, intertidal in grassflats and between mangrove roots; Martinique; Belize; Venezuela.

Excorallana sexticornis (Richardson, 1901)

Figures 75E,F; 76D–F

DIAGNOSIS ♂ 7.9 mm, ovigerous ♀ 6.9–8.3 mm. Eyes well separated. Basal antennular peduncular article in ♂ with short anterodorsally directed tubercle. Cephalon with two pairs of prominent tubercles, anterior pair shorter than posterior pair, latter situated mesial to eyes. Frontal lamina, length less than twice width, sides parallel to faintly converging anteriorly, apically broadly rounded. Posterior margins of pleonites 2–5 with low rounded tubercles, those near middorsal line largest. Pleotelson with two basal submedian tubercles, numerous scattered dorsal spines, lateral margins with incision, apex narrowly rounded.

RECORDS Key West, Florida; Cuba; Puerto Rico; Twin Cays, Belize, shallow infratidal from dead mangrove wood.

Excorallana tricornis tricornis (Hansen, 1890)

Figures 75G,H; 77

DIAGNOSIS ♂ 8.2 mm, ♀ 9.9 mm. Basal antennular article narrow, not dilated. Cephalon in ♂ with one median and two dorsal “horns.” Eyes large, well separated. Frontal lamina between two and three times longer than basal width, sides subparallel, anteriorly rounded to subacute. Pereon smooth. Margins of lateral incision of pleotelson separated by gap; anterior margin of incision lined with short spines; scattered short spines on dorsum of telson, but especially concentrated in two submedian patches. Uropodal exopod, length 2.3–2.5 times width; apical notch nearly symmetrical.