

# Copepods (Crustacea) Associated with Marine Invertebrates from the Moluccas

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## ABSTRACT

Thirty new species consisting of 24 poecilostomatoid and six siphonostomatoid copepods are described as associates of marine invertebrates from the Moluccas. New taxa in the order Poecilostomatoida are *Amarda curvus* n. sp., *Anchimoligus gracilipes* n. sp., *A. partenuipes* n. sp., *A. parangensis* n. sp., *A. hastatus* n. sp., *Andrianellus papillipes* n. sp., *Exodontomoligus communis* n. gen. n. sp., *Jamescookina moluccensis* n. sp., *Odontomoligus flammeus* n. sp., *O. parvus* n. sp., *O. pavonus* n. sp., *Paranchimoligus parallelus* n. gen. n. sp., and *Scyphuliger karangmiensis* n. sp. in the family Anchimolgidae; *Enalcyonium circulatum* n. sp. and *E. ceramensis* n. sp. in the family Lamippidae; *Parastericola rimosus* n. gen. n. sp. in the family Lichomolgidae; *Pseudanthessius truncus* n. sp. and *P. planus* n. sp. in the family Pseudanthessiidae; *Acanthomoligus gomumuensis* n. sp., *A. dispadactylus* n. sp., *A. bandaensis* n. sp., *A. ambonensis* n. sp., *Kombia avitus* n. sp. and *Pionomoligus moluccensis* n. sp. in the family Rhynchomolgiae. New taxa in the order Siphonostomatoida are *Cryptopontius acutus* n. sp. in the family Artotrogidae; *Asteropontius fungicola* n. sp., *A. goniopora* n. sp., *Collocheres humesi* n. sp. and *C. amicus* n. sp. in the family Asterocheridae; and *Molucomes ovatus* n. gen. n. sp. in the family Stellicomitidae. Species new to the Moluccas and new host records are also included. Lists of 263 species of associated copepods known from the Moluccas and their 135 species of invertebrate hosts are provided.

**Key words:** Copepoda, Poecilostomatoida, Siphonostomatoida, new genera, new species, association, invertebrates, Moluccas

## INTRODUCTION

The Moluccas is the central region of the Malay Archipelago where is generally well known for its rich marine fauna. In April and May 1975, the late Dr. Arthur G. Humes made a trip to the Moluccas for collecting copepods associated with marine invertebrates (Fig. 1). He yielded 260 collections from this trip. This collecting trip was successful in consideration that his shore works of only three or four hours each at Gomumu Island (south of Obi), Parang Island (eastern Ceram), and Karamg Mie (eastern Halmahera) resulted in the discovery of 49 to 67 species of copepods from each location (Humes, 1994). Thereafter, he described more than 200 species of copepods collected from this region for 20 years until 1997, just two years before his passing in 1999. However, some of his collections were left unexamined and a selection of these was recently described by Kim (2005a, b; 2006). The present paper deals with the descriptions of the remaining copepod specimens, including the species new to the Moluccas and the new host records, as follows.

### Order Poecilostomatoida

#### Family Anchimolgidae

- Amarda curvus* n. sp. from the scleractinian coral *Goniastrea retiformis*.  
*Anchimoligus gracilipes* n. sp. from the scleractinian *Pavona danai*.  
*Anchimoligus partenuipes* n. sp. from the scleractinian *Pocillopora damicornis*.  
*Anchimoligus parangensis* n. sp. from the scleractinian *Hydnophora microconos*.  
*Anchimoligus hastatus* n. sp. from a scleractinian of *Fungia* sp.  
*Anchimoligus orectus* Humes from a scleractinian of *Fungia* sp.  
*Anchimoligus proxilipes* (Humes and Ho) from a scleractinian of *Porites* sp.  
*Andrianellus papillipes* n. sp. from the scleractinian *Platygyra ryukyuensis*.  
*Exodontomoligus communis* n. gen. n. sp. from the scleractinian *Alveopora mortenseni*.  
*Jamescookina moluccensis* n. sp. from the scleractinian *Echinopora lamellosa*.  
*Odontomoligus flammeus* n. sp. from a scleractinian of *Fungia* sp.

*Odontomolgus parvus* n. sp. from the scleractinian *Goniastrea retiformis*.

*Odontomolgus pavonus* n. sp. from the scleractinian *Pavona danai*.

*Paranchimolgus parallelus* n. gen. n. sp. from the scleractinian *Alveopora mortenseni*.

*Scyphuliger karangmiensis* n. sp. from the scleractinian *Acropora intermedia*.

#### Family Lamippidae

*Enalcyonium circulatum* n. sp. from a gorgonian of *Muricea* sp.

*Enalcyonium ceramensis* n. sp. from the gorgonian *Rumphella aggregata*.

#### Family Lichomolgidae

*Parastericola rimosus* n. gen. n. sp. from the sea star *Choriaster granulatus*.

#### Family Pseudanthessiidae

*Pseudanthessius truncus* n. sp. from the echinoid *Himerometra robustipinna*.

*Pseudanthessius planus* n. sp. from the echinoid *Himerometra robustipinna*.

#### Family Rhynchomolgidae

*Acanthomolgus gomumuensis* n. sp. from the alcyonacean *Dendronephthya grandiflora*.

*Acanthomolgus dispadactylus* n. sp. from the alcyonacean *Dendronephthya grandiflora*.

*Acanthomolgus bandaensis* n. sp. from an alcyonacean coral.

*Acanthomolgus ambonensis* n. sp. from the alcyonacean *Nephtea galbuloides*.

*Acanthomolgus longispinifer* (Humes and Ho) from an alcyonacean of *Dendronephthya*.

*Acanthomolgus exilipes* (Humes and Ho) from the alcyonacean *Dendronephthya grandiflora*.

*Doridicola patulus* (Humes) from the nudibranch *Phyllidia verrucosa*.

*Kombia avitus* n. sp. from a scleractinian of *Porites* sp.

*Pionomolgus moluccensis* n. sp. from the scleractinian *Echinopora lamellosa*.

#### Order Siphonostomatoida

##### Family Artotrogidae

*Cryptopontius acutus* n. sp. from the scleractinian *Hydnophora eyessa*.

##### Family Asterocheridae

*Asteropontius fungicola* n. sp. from a scleractinian of *Fungia* sp.

*Asteropontius goniopora* n. sp. from the scleractinian *Goniopora tenuidens*.

*Collocheres humesi* n. sp. from the crinoid *Comantheria briareus*.

*Collocheres amicus* n. sp. from the crinoid *Comantheria briareus*.

##### Family Stellicomitidae

*Molucomes ovatus* n. gen. n. sp. from the asteroid *Acanthaster planci*.

## MATERIALS AND METHODS

All copepod specimens studied in this work were collected by the late Dr. Arthur G. Humes from the Moluccas in 1975 (Fig. 1), mostly in the shallow water from the intertidal to 2-3 m depth but in some cases to the depth up to 25 m. Specimens have been preserved in ethanol.

In the description of species, the collection data, including scientific names of hosts are taken from Dr. Humes' collection notes. Lengths of copepod specimens were measured from the anterior apex to the caudal rami, excluding caudal setae. Before dissection, specimens were immersed in lactic acid for at least 10 minutes. Dissections were done using the reversed slide method. All figures were drawn with the aid of a drawing tube equipped on a light microscope (Nikon Labophot). Descriptions and illustrations of species are based on the dissected paratypes except for *Amarda curvus*, *Parastericola rimosus*, and *Pionomolgus moluccensis* where the allotype is also used. One of sexes (usually the female) is thoroughly described, and the opposite sex is briefly described chiefly on the basis of sexually dimorphic characters. In the armature formulae of legs, Roman numerals indicate spines, and Arabic numerals representing setae. Paragnath is not mentioned in the descriptions because of its low taxonomic value. Type specimens have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States.

## DESCRIPTIONS

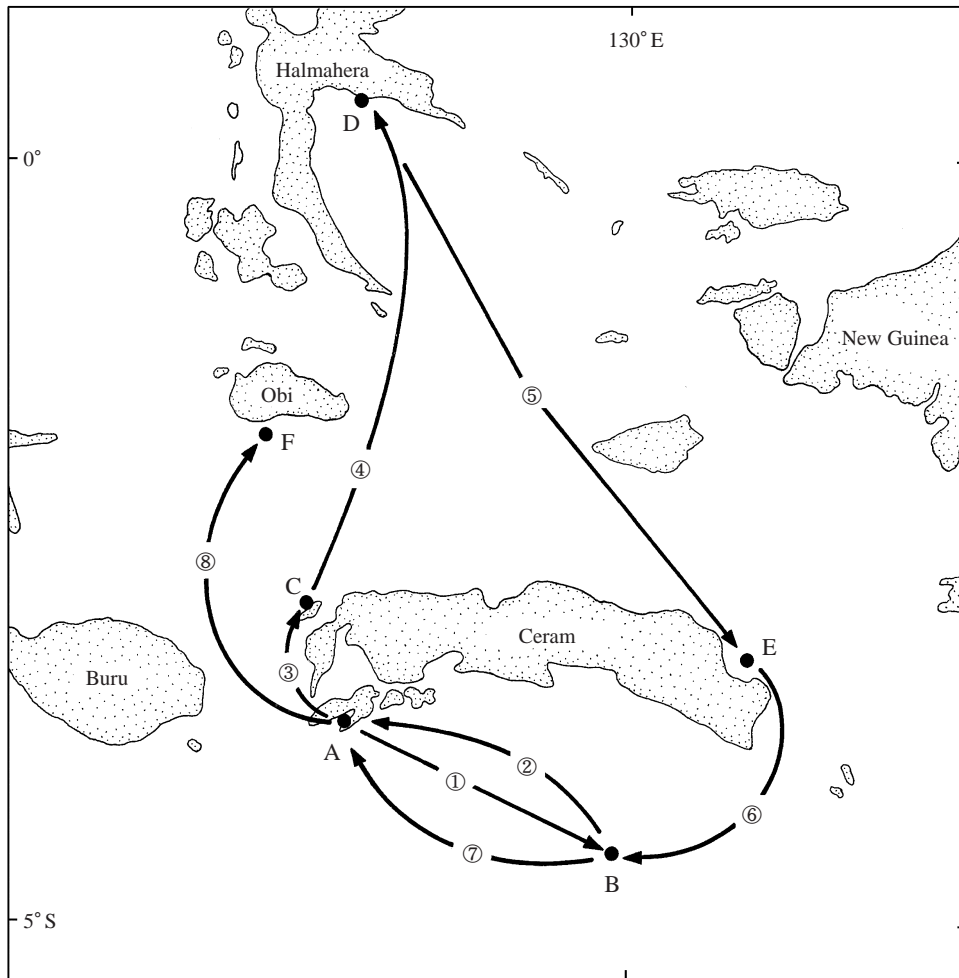
Order Poecilostomatoida Thorell, 1859

Family Anchinoligidae Humes and Boxshall, 1996

Genus *Amarda* Humes and Stock, 1972

*Amarda curvus* n. sp. (Figs. 2, 3)

*Material examined.* One ♀, 3 ♂♂ from the scleractinian coral *Goniastrea retiformis* (Lamarck), depth 2 m, Parang



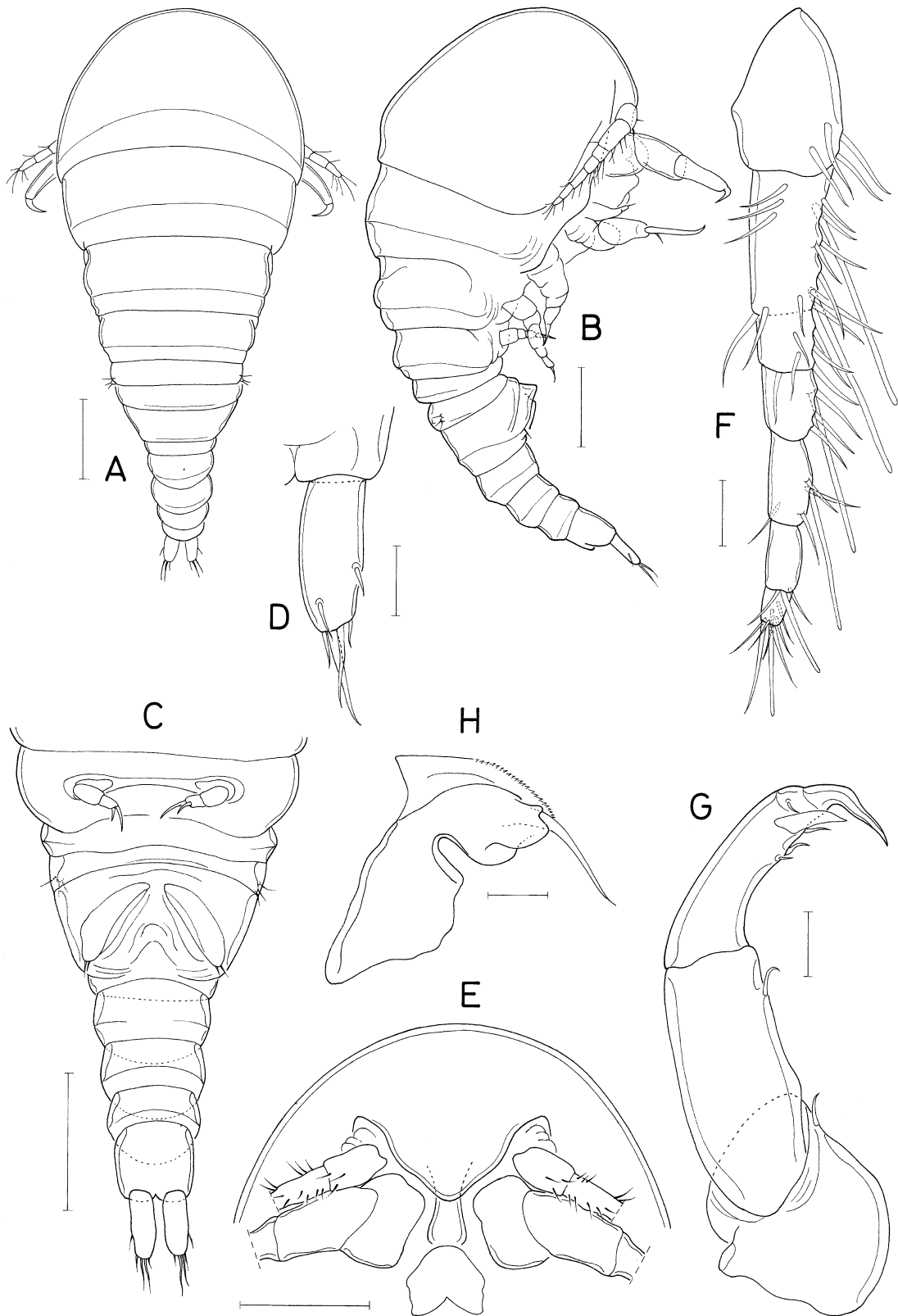
**Fig. 1.** The route of the collecting trip to the Moluccas made by Dr. Arthur G. Humes in 1975. A, Natsepa, Ambon ( $3^{\circ} 37'05''\text{S}$ ,  $128^{\circ} 17'00''\text{E}$ ); B, Banda Islands ( $4^{\circ} 32'05''\text{S}$ ,  $129^{\circ} 52'30''\text{E}$ ;  $4^{\circ} 31'45''\text{S}$ ,  $129^{\circ} 51'55''\text{E}$ ;  $4^{\circ} 32'12''\text{S}$ ,  $129^{\circ} 53'40''\text{E}$ ;  $4^{\circ} 31'45''\text{S}$ ,  $129^{\circ} 53'35''\text{E}$ ;  $4^{\circ} 31'55''\text{S}$ ,  $129^{\circ} 52'12''\text{E}$ ;  $4^{\circ} 31'45''\text{S}$ ,  $129^{\circ} 53'35''\text{E}$ ); C, Marsegoe Island, western Ceram ( $2^{\circ} 59'30''\text{S}$ ,  $128^{\circ} 03'30''\text{E}$ ); D, Karang Mie, in Weda Bay, Halmahera ( $00^{\circ} 20'07''\text{N}$ ,  $128^{\circ} 25'10''\text{E}$  and  $128^{\circ} 25'00''\text{E}$ ); E, Parang Island, eastern Ceram ( $3^{\circ} 17'00''\text{S}$ ,  $130^{\circ} 44'48''\text{E}$ ); F, Gomumu Island, south of Obi ( $1^{\circ} 50'00''\text{S}$ ,  $127^{\circ} 30'54''\text{E}$ ). Numerals (1-8) in circles indicate the course of the trip.

Island, eastern Ceram ( $3^{\circ} 17'00''\text{S}$ ,  $130^{\circ} 44'48''\text{E}$ ), collected by A.G. Humes, 23 May 1975. Holotype ( $\sigma$ : USNM 1081613), allotype ( $\text{f}$ : USNM 1081615, maxilla, maxilliped, and exopod of leg 1 of left side dissected out), and paratype ( $\sigma$ : USNM 1081616) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype ( $\sigma$ ) is kept in the collection of the author.

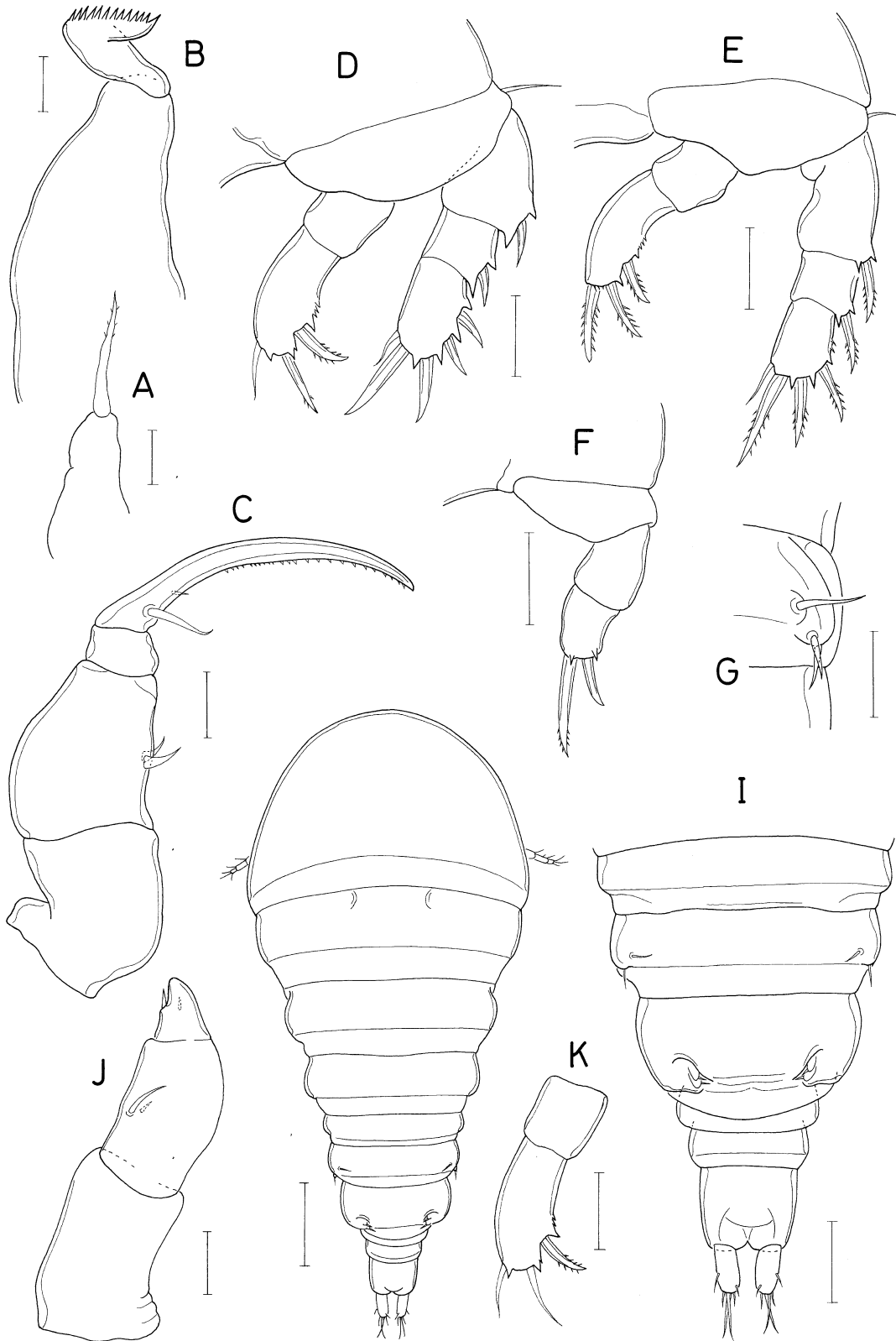
*Male.* Body (Fig. 2A, B) moderately broad, arched ventrally, and evenly tapering in dorsal and ventral views, with no clear division between prosome and urosome. Body length of dissected specimen  $793\ \mu\text{m}$ . Cephalosome delimited from first pedigerous somite. Third and fourth pedigerous somites short (Fig. 2C). Urosome 6-segmented. Fifth

pedigerous somite very short, confluent with its preceding and following somites. Genital somite tapering,  $79 \times 146\ \mu\text{m}$ . Four abdominal somites  $38 \times 85$ ,  $38 \times 77$ ,  $29 \times 67$ , and  $52 \times 58\ \mu\text{m}$  from anterior to posterior. Caudal ramus (Fig. 2D)  $44 \times 18\ \mu\text{m}$  (ratio 2.44 : 1). All caudal setae naked, longest terminal one  $32\ \mu\text{m}$ .

Rostrum broad, strongly tapering, with posterior ridge extending to labrum (Fig. 2E). Antennule (Fig. 2F)  $189\ \mu\text{m}$  long, tapering, 7-segmented, but second and third segments incompletely divided. Armature formula: 4, (13+2 aesthetascs plus 6), 3+1 aesthetasc, 4+ aesthetasc, 2+aesthetasc, and 7+aesthetasc. Antenna (Fig. 2G) tapering and 3-segmented. Coxobasis (first segment) as long as wide, with small inner distal seta. First endopodal segment (second



**Fig. 2.** *Amarda curvus* n. sp., male. A, habitus, dorsal; B, habitus, lateral; C, urosome, ventral; D, right caudal ramus, dorsal; E, rostral area, ventral; F, antennule; G, antenna; H, mandible. A-C, E, 0.1 mm; F-H, 0.02 mm.



**Fig. 3.** *Amarda curvus* n. sp. Male: A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 3. G, leg 5. Female: H, habitus, dorsal; I, urosome, dorsal; J, maxilliped. Scales: A, B, 0.01 mm; C-G, J, 0.02 mm; H, 0.1 mm; I, 0.05 mm.

segment) longest, with inner seta. Second endopodal segment (third segment) about  $62 \times 27 \mu\text{m}$ , with 4 small, scalpel-like setae. Terminal claw small and strongly curved proximally.

Labrum with tapering posterior lobes (Fig. 2E). Mandible (Fig. 2H) with deep and narrow proximal notch. Inner margin bilobed and unarmed. Convex side with angular, wing-like expansion followed by minute denticles. Distal lash slender and smooth. Maxillule (Fig. 3A) characteristically armed with 1 apical seta. Maxilla (Fig. 3B) 2-segmented. Syncoxa (first segment) large and unarmed. Basis (second segment) strongly reflexed and unarmed; its distal lash stout, with row of spinules on distal margin. Maxilliped (Fig. 3C) consisting of 3 segments and terminal claw. Syncoxa (first segment) unarmed. Basis (second segment) tapering, with 2 naked setae near middle of inner margin. Short endopod (third segment) unarmed. Claw  $97 \mu\text{m}$ , with denticles along distal half of concave margin and 2 very unequal proximal setae.

Legs 1 and 2 (Fig. 3D, E) with 3-segmented exopod and 2-segmented endopod. Leg 3 (Fig. 3F) 2-segmented exopod, without endopod and no seta on basis. All these legs without inner coxal seta. Leg 4 absent. Armature formula of legs 1-3 as follows:

- Leg 1: coxa 0-0; basis 1-0; exp. I-0; I-0; III,I,I;  
           enp. 0-0; I,I,1  
 Leg 2: coxa 0-0; basis 1-0; exp. I-0; I-0; II,I,1;  
           enp. 0-0; I,II  
 Leg 3: coxa 0-0; basis 0-0; exp. 0-0; II;  
           enp. lacking

Leg 5 (Fig. 3G) consisting of small lobe bearing 3 setae (one of them on proximal part of lobe), without free segment. Leg 6 represented by 2 small setae on genital flap (Fig. 2C).

*Female.* Body (Fig. 3H) almost identical in shape to that of male but slightly broader. Body length of dissected specimen  $743 \mu\text{m}$ . Urosome 5-segmented (Fig. 3I). Genital double-somite much wider than long,  $130 \times 80 \mu\text{m}$ . Genital areas located dorsally. First and second free abdominal somites  $177$  and  $147 \mu\text{m}$  long, respectively. Anal somite  $100 \times 120 \mu\text{m}$ . Caudal ramus  $57 \times 30 \mu\text{m}$  (ratio 1.90 : 1). Egg sac not seen.

Rostrum as in male. Antennule as in male but lacking aesthetascs on second and fourth segments. Antenna, labrum, mandible, maxillule and maxilla as in male. Maxilliped (Fig. 3J) 3-segmented. Syncoxa unarmed. Basis slightly shorter than syncoxa and armed with 2 unequal setae (each  $10$  and  $2 \mu\text{m}$ ). Endopod strongly tapering, blunt, incompletely divided from basis, with 2 small setae.

Legs 1-3 as in male, but second endopodal segment of

leg 1 armed with spine and 2 setae (formula I,2). Leg 5 represented by 2 small setae (Fig. 3I). Leg 6 represented by 2 small setae in genital area.

*Etymology.* The specific name *curvus* (the Latin meaning "bent") alludes to the ventrally arched body of the species.

*Remarks.* *Amarida curvus* n. sp. is closely allied to *A. goniastreae* Humes, 1985, which is known from the same host species and geographical area. These species share the similar body size and identical armature (two spines) on the second exopodal segment of leg 3. They are differentiated from each other by the following ways:

In *A. goniastreae* (as well as in other two congeners *A. cultrata* and *A. compta*, both described by Humes and Stock, 1973) the second endopodal segment of leg 1 is not sexually dimorphic, bearing one spine and two setae (I,2) in both genders, whereas bearing two spines and one seta (I,I,1) occurring in the male of *A. curvus*. According to Humes (1985a), the maxillule of *A. goniastreae* is armed with four elements, as in *A. cultrata*. This armature state contrasts with the presence of a single large seta on the same appendage of *A. curvus*. The second and third pedigerous somites of *A. goniastreae* bear posterolateral epimera which are absent in *A. curvus*. The caudal ramus of *A. goniastreae* is more slender,  $44 \times 14 \mu\text{m}$  (ratio 3.14 : 1) in the female, in contrast to  $57 \times 30 \mu\text{m}$  (ratio 1.90 : 1) in the female of *A. curvus*. The female leg 5 of *A. goniastreae* consists of seta on the fifth pedigerous somite and two setae on a small lobe, a condition different from that of *A. curvus* whose female leg 5 consists of only two small setae. Finally, the basis of male maxilliped of *A. goniastreae* is not expanded proximally, unlike in *A. curvus*.

Genus *Anchimolgus* Humes and Stock, 1972

***Anchimolgus gracilipes* n. sp. (Figs. 4-6)**

*Material examined.* Ten ♀♀, 4♂♂ from the scleractinian coral *Pavona danai* (Milne Edwards and Haime), depth 2 m, Natsepa, Ambon ( $3^{\circ} 27'01''\text{S}$ ,  $128^{\circ} 17'00''\text{E}$ ), collected by A.G. Humes, 11 May 1975. Holotype (♀: USNM 1081618), allotype (♂: USNM 1081619), and paratypes (7♀♀, 2♂♂: USNM 1081620) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2♀♀, 1♂♂) are kept in the collection of the author.

*Female.* Body (Fig. 4A) narrow. Mean body length  $1.33$  mm ( $1.26$ - $1.43$  mm) based on 7 specimens. Body length of dissected specimen  $1.39$  mm. Greatest width  $494 \mu\text{m}$ . Prosome  $772 \mu\text{m}$  long. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 4B) 5-segmented. Fifth pedigerous somite  $187 \mu\text{m}$  wide. Genital double-somite  $215 \mu\text{m}$  long, consisting of

distinctly expanded anterior part and narrower posterior part; anterolateral corners of anterior expansion slightly angular; width across anterior expansion 167  $\mu\text{m}$ ; width across narrower posterior part 100  $\mu\text{m}$ . Genital areas located dorsally. Three free abdominal somites 73  $\times$  92, 52  $\times$  83, and 81  $\times$  81  $\mu\text{m}$  respectively, from anterior to posterior. Caudal rami (Fig. 4C) straight backward and parallel, 130  $\times$  33  $\mu\text{m}$  (ratio of length to width 3.94 : 1), with fine spinules on posterior margin and 6 caudal setae. Outer lateral seta smooth, located at distal 0.3 length of outer margin. Two median terminal setae fringed with membrane on distal half of both margins. Outer distal seta and outer one of 2 median terminal seta plumose along inner margin.

Rostrum broad, with rounded posterior apex (Fig. 4D). Antennule (Fig. 4E) slender, 427  $\mu\text{m}$  long, 7-segmented; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Largest seta on first segment 129  $\mu\text{m}$  long, significantly larger than other 3. Antenna (Fig. 4F) slender and 4-segmented. Coxobasis about 88  $\mu\text{m}$  long, with inner distal seta. First endopodal segment 148  $\mu\text{m}$  long, with small inner seta on distal 1/3. Second endopodal segment 70  $\times$  16  $\mu\text{m}$ , with minute inner distal seta. Third endopodal segment small, 17  $\mu\text{m}$  long, less than 1/4 length of third segment and unarmed. Terminal claw small, 37  $\mu\text{m}$  long.

Labrum (Fig. 5A) with wide posteromedian incision and membrane along posterior margin of lobes. Mandible (Fig. 5B) with deep proximal notch. Inner margin distinctly bilobed, with spinules. Convex side with row of minute spinules. Distal lash elongated, with serrate margins. Maxillule (Fig. 5C) armed with subdistal setiform element and 3 terminal plumose setae. Maxilla (Fig. 5D) with unarmed syncoxa. Basis with 2 setae, inner one distally expanded, foliaceous, with minute spinules along margins. Distal lash relatively short; its inner and outer margins serrated, with 7 or 8 serrations along outer (distal) margin and 2-4 serrations along inner (proximal) margin. Maxilliped (Fig. 5E) 3-segmented. Syncoxa longest but unarmed. Basis with 2 unequal setae (23 and 6  $\mu\text{m}$  long, respectively). Small endopod with seta, 2 spiniform processes, and row of minute spinules along outer margin.

Legs 1-3 with 3-segmented exopod and endopod (Fig. 5F, G). Leg 4 (Fig. 5I) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 and inner coxal seta of leg 4 small and naked. Second endopodal segment of leg 4 50  $\times$  18  $\mu\text{m}$ , its 2 terminal spines 53 and 35  $\mu\text{m}$ . Armature formula of legs 1-4 as follows:

Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,5

Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,3

Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,2

Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. 0-1; II

Free segment (Fig. 5J) of leg 5 very slender 143  $\times$  17  $\mu\text{m}$  (ratio 8.41 : 1), slightly curved proximally, with minute spinules on outer side and 2 terminal setae of 49 and 63  $\mu\text{m}$ . Leg 6 represented by 2 minute setae in genital area (Fig. 4B).

*Male.* Body (Fig. 6A) similar to that of female. Mean body length 1.12 mm (1.08-1.15 mm) based on 4 specimens. Body length of dissected specimen 1.13 mm. Greatest width 323  $\mu\text{m}$ . Cephalothorax with incomplete, rudimentary dorsal line between original cephalosome and first pedigerous somite. Urosome (Fig. 6B) 6-segmented. Fifth pedigerous somite 125  $\mu\text{m}$  wide. Genital somite 219  $\times$  170  $\mu\text{m}$ . Four abdominal somites 42  $\times$  62, 44  $\times$  60, 31  $\times$  58, and 48  $\times$  65  $\mu\text{m}$ , respectively. Caudal ramus 85  $\times$  31  $\mu\text{m}$ .

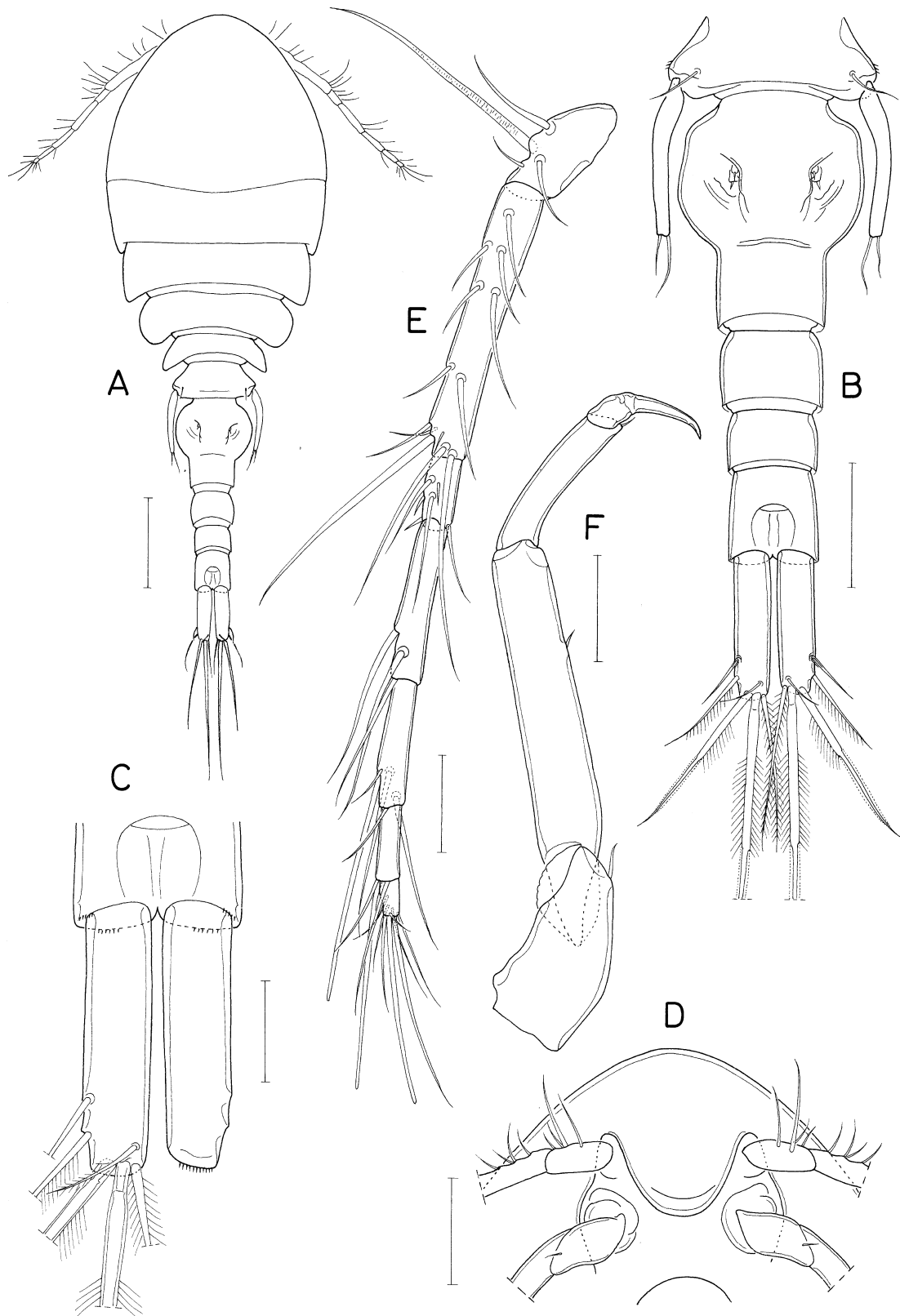
Rostrum as in female. Antennule with 3 additional aesthetascs: 2 on second and 1 on fourth segments. Antenna (Fig. 6C) with scales on inner side of first endopodal segment proximal to inner seta. Second endopodal segment with 3 distal setae.

Labrum, mandible, maxillule, and maxilla as in female. Maxilliped (Fig. 6D) consisting of 3 segments and terminal claw. Syncoxa and endopod unarmed. Basis with 2 inner setae and 2 or 3 rows of spinules on inner margin. Terminal claw 202  $\mu\text{m}$  long, weakly and evenly curved, with 2 proximal setae of unequal sizes.

Legs 1-4 as in female, except for third endopodal segment of leg 1 (Fig. 6E) bearing 2 spines and 4 setae (formula II,4). Free segment of leg 5 (Fig. 6F) distinctly shorter than that of female, 46  $\times$  11  $\mu\text{m}$ ; its 2 terminal setae 37 and 31  $\mu\text{m}$ . Leg 6 represented by 2 small setae on posterior corners of genital flap (Fig. 6B).

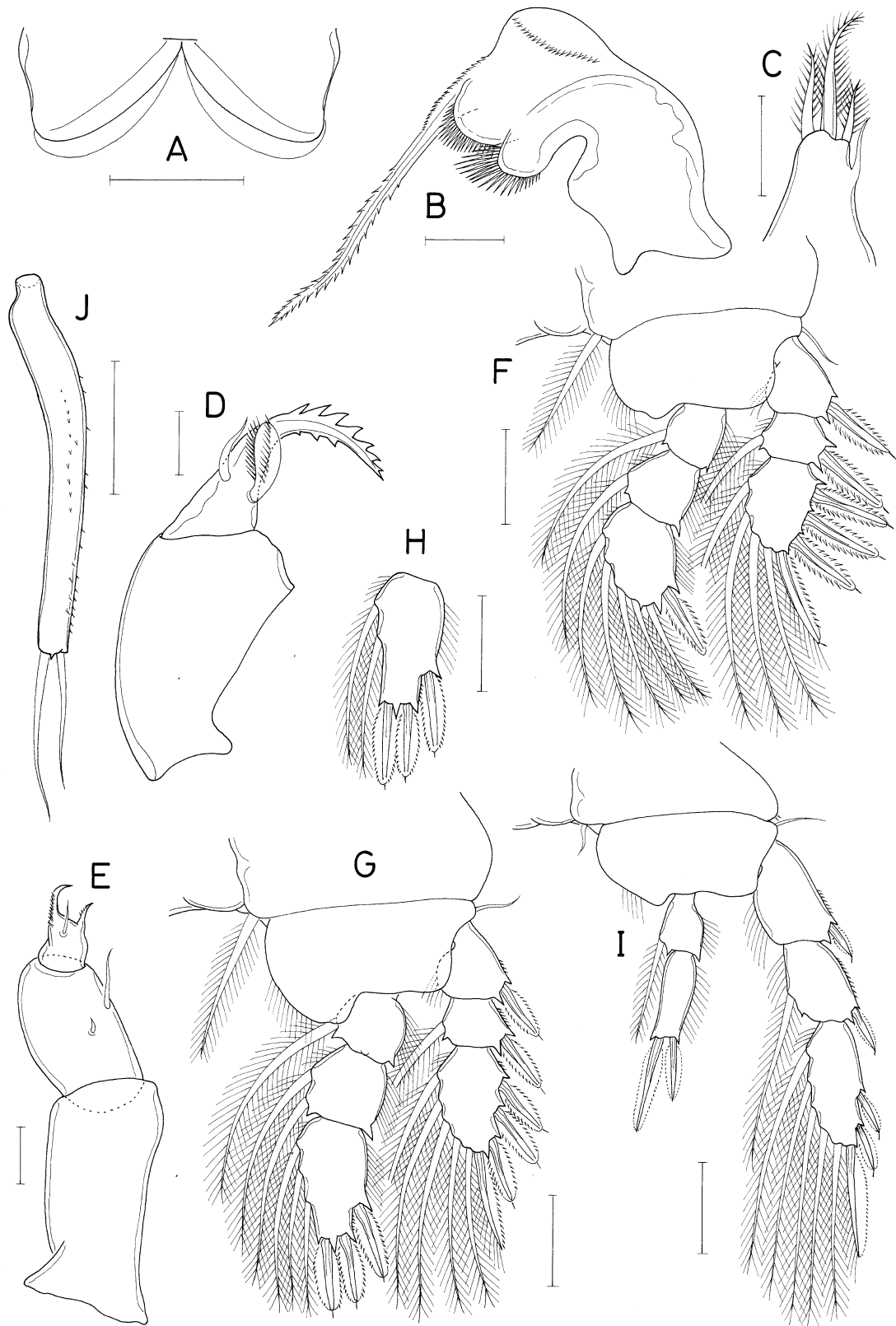
*Etymology.* The specific name *gracilipes* is derived from Latin *gracilis* (=slender) and *pes* (=foot) and refers to the slender free segment of female leg 5.

*Remarks.* This species has a unique feature within the genus that the third endopodal segment of the antenna is very short, only one-fourth as long as the second endopodal segment. No species of *Anchimolgus* has been recorded to have such a short third endopodal segment of the antenna. *Anchimolgus punctilis* Humes, 1978, and *A. gratus* Humes, 1996, have a similar antenna, but the shortness of the third endopodal segment in these species does not approach to that of *A. gracilipes*. Another characteristic feature of *A. gracilipes* is the elongated free segment of female leg 5, which is more than eight times as long as wide, a feature that separable *A. gracilipes* from all congeners.

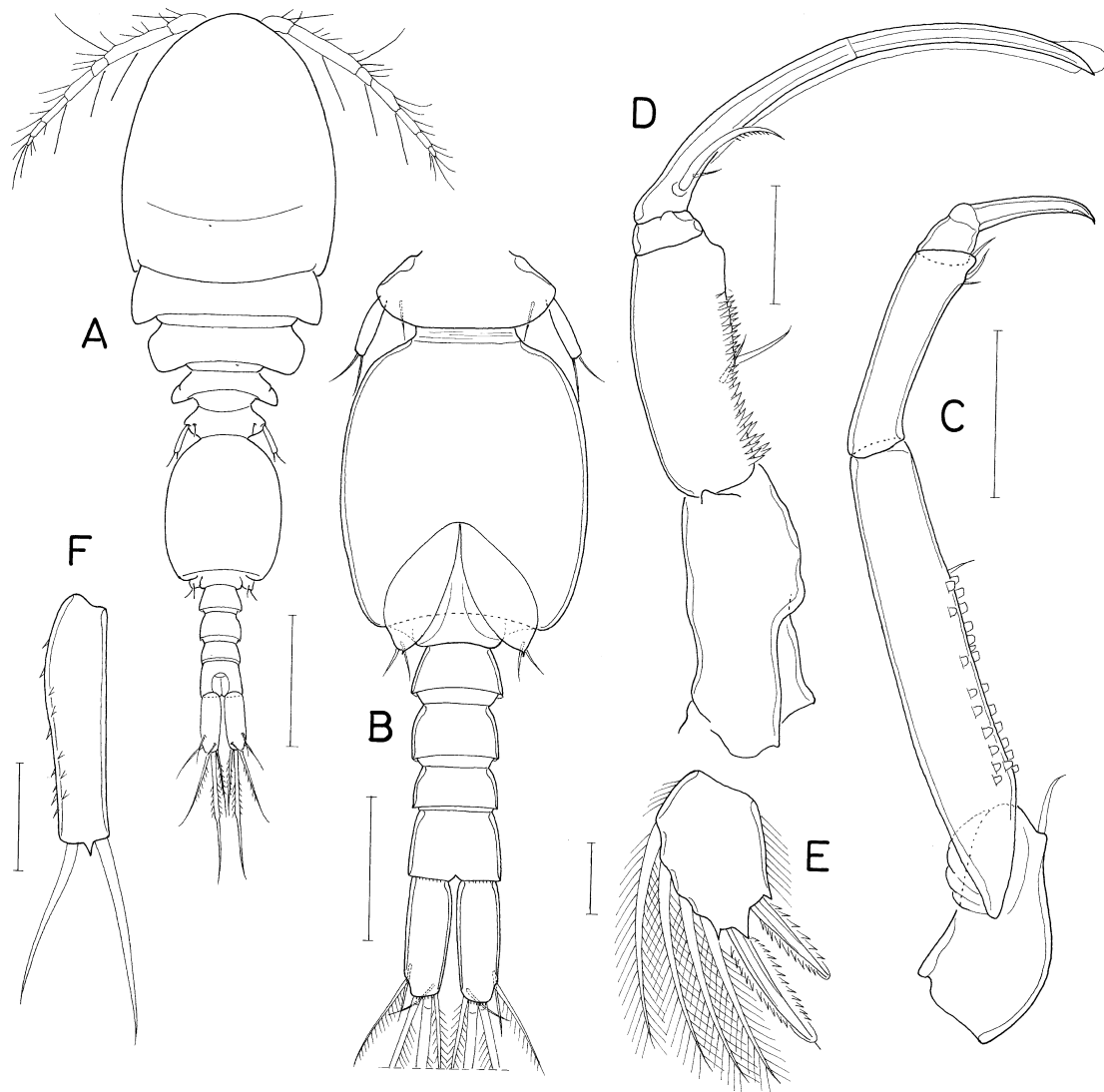


**Fig. 4.** *Anchimolgus gracilipes* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule; F, antenna. Scales: A, 0.2 mm; B, D, 0.1 mm; C, D, F, 0.05 mm.





**Fig. 5.** *Anchimolgus gracilipes* n. sp., female. A, labrum; B, mandible; C, maxillule; D, maxilla; E, maxilliped; F, leg 1; G, leg 2; H, third endopodal segment of leg 3; I, leg 4; J, free segment of leg 5. Scales: A, F-J, 0.05 mm; B-E, 0.02 mm.



**Fig. 6.** *Anchimolgus gracilipes* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, maxilliped; E, third endopodal segment of leg 1; F, free segment of leg 5. Scales: A, 0.2 mm; B, 0.1 mm; C, D, 0.05 mm; E, F, 0.02 mm.

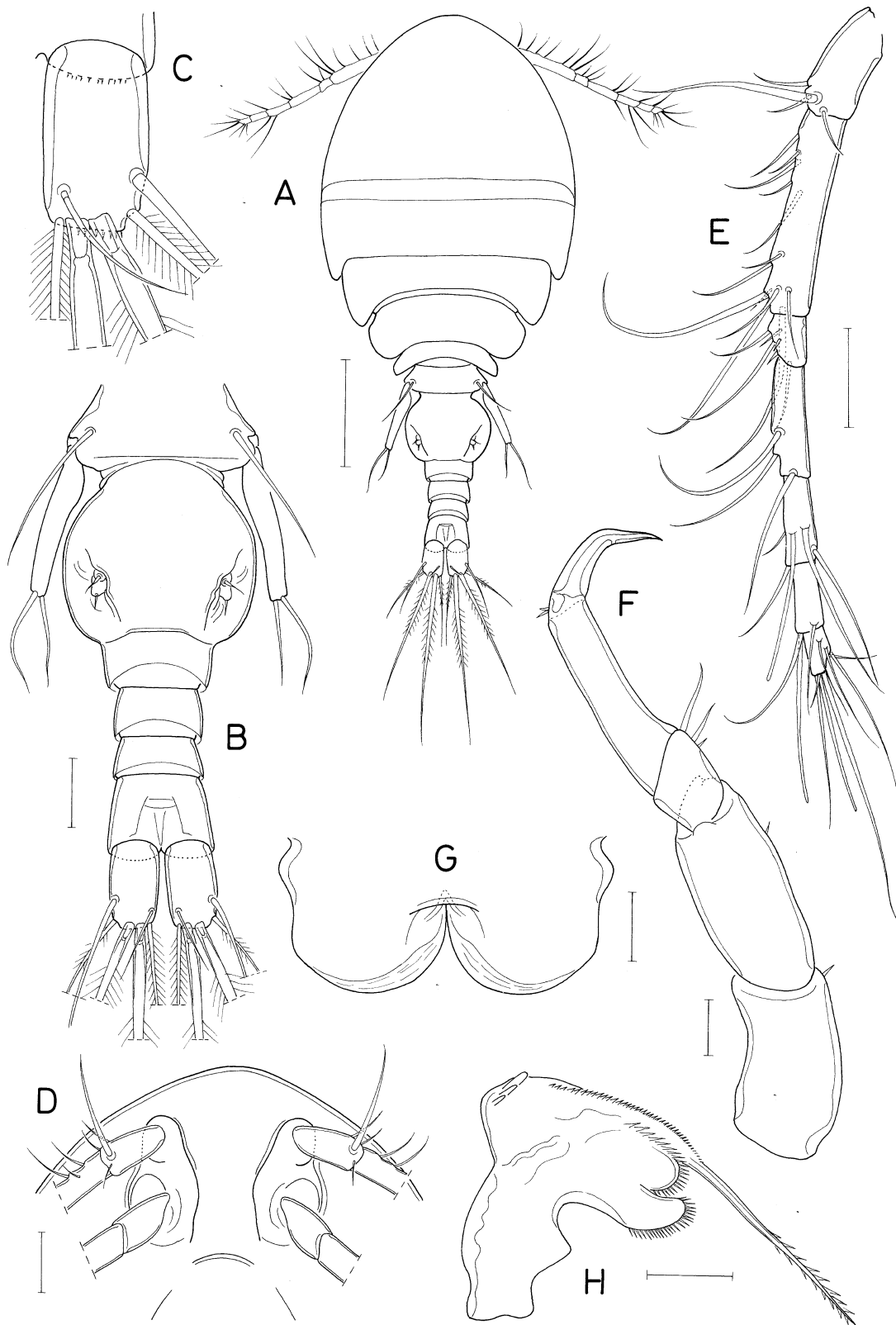
It is notable that *A. gracilipes* is superficially very similar to *Paramolgus setellus* Humes, 1992, a member of the family Rhynchomolgidae, in the body form and the shape of the antenna.

***Anchimolgus partenuipes* n. sp. (Figs. 7-9)**

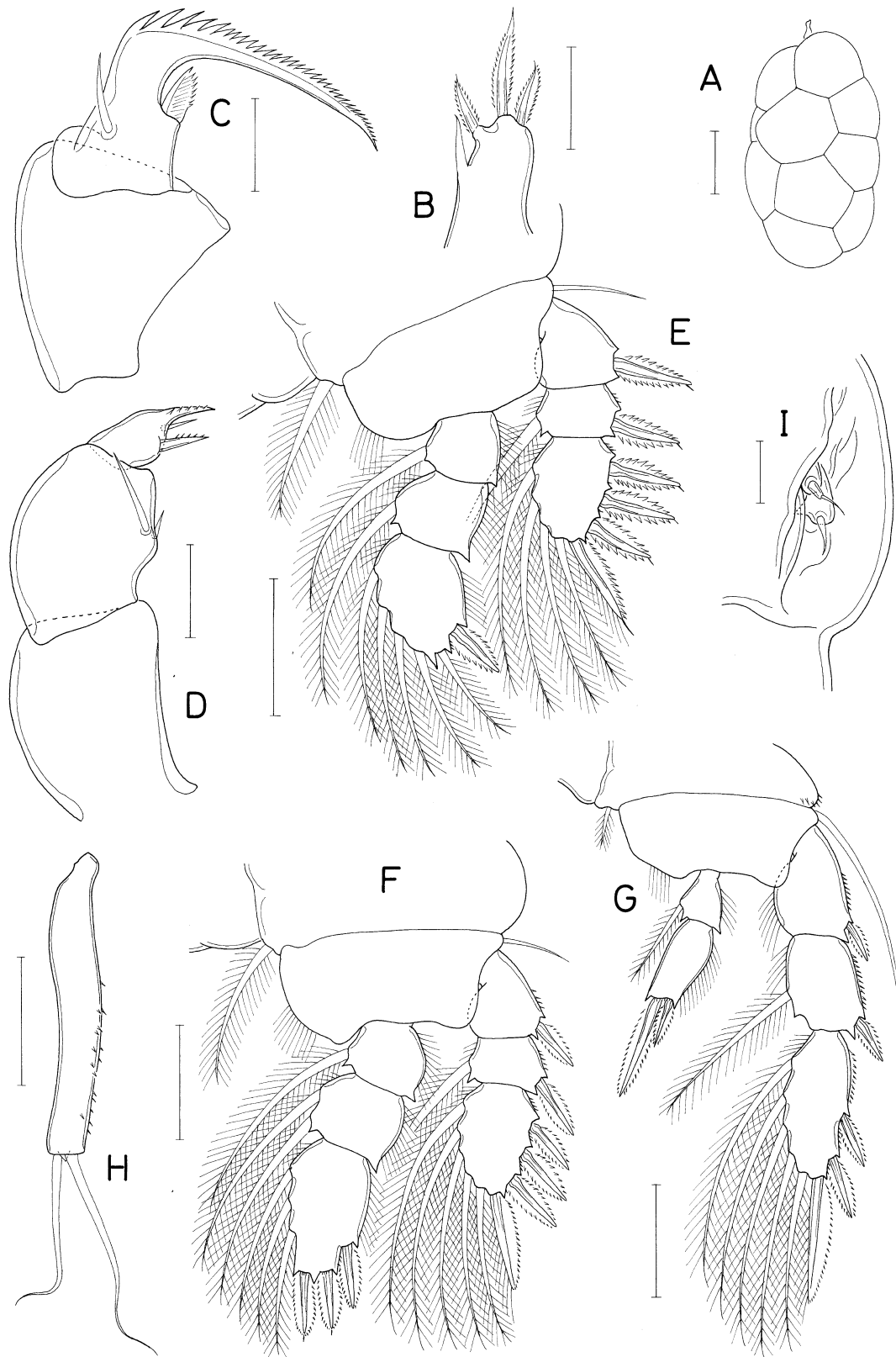
**Material examined.** Twelve ♀♀, 27 ♂♂ from the scleractinian coral *Pocillopora damicornis* (Linnaeus), depth 3 m, Naira, Banda Islands (4° 35'45''S, 129° 53'35''E), collected by A.G. Humes, 8 May 1975. Holotype (♀: USNM 1081624), allotype (♂: USNM 1081625), and paratypes (9 ♀♀, 25 ♂♂: USNM 1081626) have been depo-

sited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2 ♀♀, 1 ♂) are retained in the collection of the author.

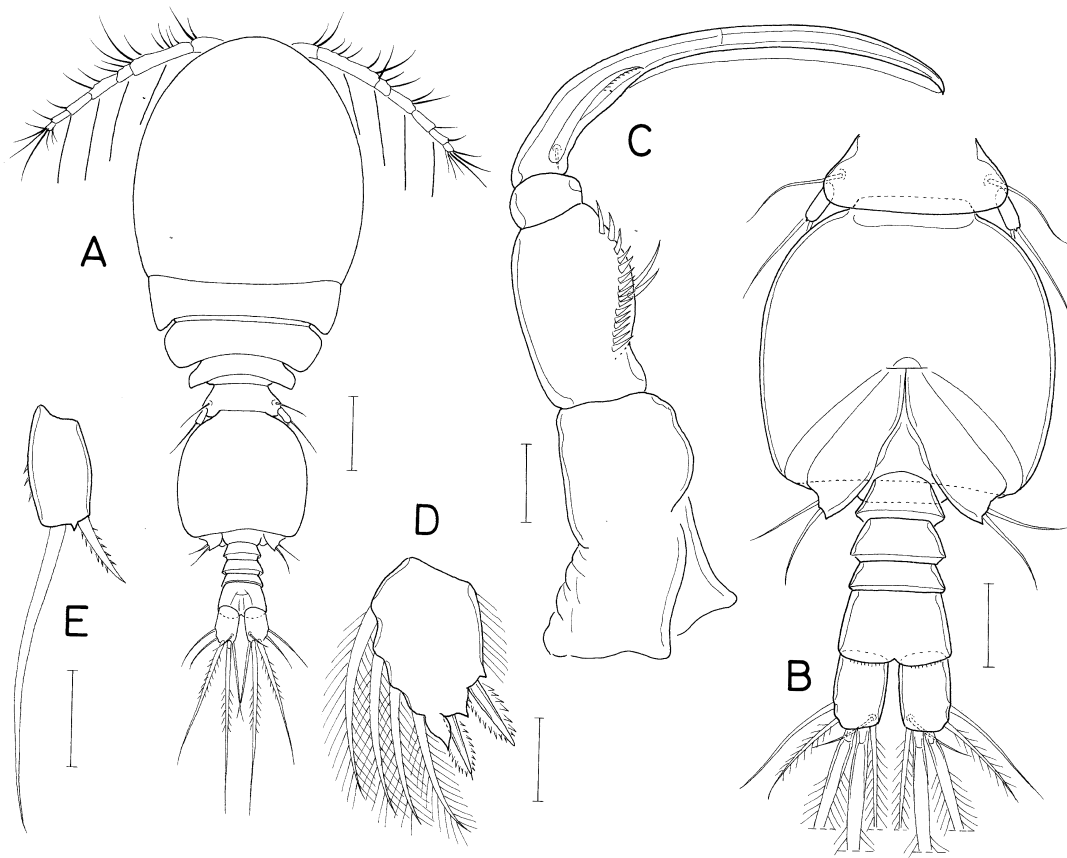
**Female.** Body (Fig. 7A) with broad prosome and narrow urosome. Mean body length 1.02 mm (0.93-1.13 mm) based on 10 specimens. Body length of one of dissected specimens 1.00 mm. Greatest width 421 µm. Prosome oval and 604 µm long. Cephalothorax with faint dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 7B) 5-segmented. Fifth pedigerous somite 137 µm wide. Genital double-somite 156 µm long, with roundly expanded anterior part and short narrower posterior part.



**Fig. 7.** *Anchimolgus partenuipes* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, labrum; H, mandible. Scales: A, 0.2 mm; B, D, 0.1 mm; C, F-H, 0.02 mm; E, 0.05 mm.



**Fig. 8.** *Anchimoligus partenuipes* n. sp., female. A, egg sac; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, leg 4; H, free segment of leg 5; I, right genital area. Scales: A, 0.1 mm; B-D, I, 0.02 mm; E-H, 0.05 mm.



**Fig. 9.** *Anchimolgus partenuipes* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, maxilliped; D, third endopodal segment of leg 1; E, free segment of leg 5. Scales: A, 0.1 mm; B, 0.05 mm; C-E, 0.02 mm.

Width 138  $\mu\text{m}$  across anterior expansion and 79  $\mu\text{m}$  across narrower posterior part. Three free abdominal somites 35  $\times$  65, 27  $\times$  64, and 54  $\times$  75  $\mu\text{m}$ , respectively. Caudal ramus (Fig. 7C) stocky, 68  $\times$  38  $\mu\text{m}$  (ratio 1.79 : 1), with 6 setae, longest one 333  $\mu\text{m}$ ; inner dorsal and outer lateral setae naked, other setae plumose. Egg sac (Fig. 8A) oval, 383  $\times$  221  $\mu\text{m}$ , containing of 12 or 13 eggs; each egg 125  $\mu\text{m}$  in diameter.

Rostrum as broad ridge extending to labrum (Fig. 7D), without posterior apex. Antennule (Fig. 7E) 341  $\mu\text{m}$  long, slender, 7-segmented; armature formula 4, 13, 6, 3, 4+1 aesthetasc, 2+1 aesthetasc, and 7+1 aesthetasc. All setae naked. Largest seta on first segment 96  $\mu\text{m}$  long. Aesthetascs relatively small and confluent with setae. Antenna (Fig. 7F) 4-segmented, gradually narrowed distally. Coxobasis and first endopodal segment 68 and 67  $\mu\text{m}$ , each armed with minute inner seta. Second endopodal segment 25  $\mu\text{m}$  long with 3 unequal setae. Third endopodal segment much longer than third segment, 70  $\times$  24  $\mu\text{m}$ , with 2 minute outer distal setae. Terminal claw 45  $\mu\text{m}$  long, strongly curved, with sharply pointed tip.

Labrum (Fig. 7G) with broad posterior lobes. Mandible (Fig. 7H) with distinct proximal notch. Inner margin distinctly bilobed; proximal lobe projected. Convex side with 3 small digitiform processes. Distal lash very thin and elongated, with spinules on both margins in distal half. Maxillule (Fig. 8B) armed with subdistal setiform process and 3 terminal foliaceous setae. Maxilla (Fig. 8C) with unarmed syncoxa. Basis with 2 setae: anterior seta naked; inner seta foliaceous. Distal lash forming right angle from segment, elongate, with serrate distal margin. Maxilliped (Fig. 8D) 3-segmented. Syncoxa unarmed. Basis with 2 very unequal inner setae, 18 and 6  $\mu\text{m}$ . Endopod with spine and setae and terminated as spiniform process bearing several spinules.

Legs 1-3 with 3-segmented exopod and endopod (Fig. 8E, F). Leg 4 (Fig. 8G) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 naked; this seta in legs 3 and 4 large. Second endopodal segment of leg 4 38  $\times$  19  $\mu\text{m}$ ; 2 terminal spines 46 and 22  $\mu\text{m}$ , respectively, inner one more than twice as long as outer one. Armature formula of legs 1-4 as in preceding species.

Free segment of leg 5 (Fig. 8H) slender, 118  $\times$  18  $\mu\text{m}$

(ratio 6.56 : 1), with minute spinules on distal half of outer margin; 2 terminal setae 94 and 70  $\mu\text{m}$ . Leg 6 (Fig. 8I) represented by 2 seta, anterior one proximally thickened.

*Male.* Body (Fig. 9A) similar to that of female. Body length of dissected specimen 835  $\mu\text{m}$ . Cephalothorax without dorsal suture line. Urosome (Fig. 9B) 6-segmented. Fifth pedigerous somite 110  $\mu\text{m}$  wide. Genital somite  $173 \times 177$   $\mu\text{m}$ . Four abdominal somites  $25 \times 54$ ,  $27 \times 58$ ,  $19 \times 58$ , and  $38 \times 69$   $\mu\text{m}$ , respectively. Caudal ramus  $47 \times 32$   $\mu\text{m}$ .

Rostrum as in female. Antennule with 3 additional aesthetascs: 2 on second and 1 on fourth segments. Antenna, labrum, mandible, maxillule, and maxilla as in female. Maxilliped (Fig. 9C) consisting of 3 segments and terminal claw. Syncoxa and endopod unarmed. Basis with 2 similar inner setae and row of spinules on inner margin. Terminal claw evenly curved, 115  $\mu\text{m}$  long, with 1 large and 1 minute naked setae proximally.

Third endopodal segment of leg 1 armed with 2 spines and 4 setae (Fig. 9D); outer terminal process enlarged and leaf-shaped. Legs 2–4 as in female. Free segment of leg 5 (Fig. 9E) small,  $23 \times 13$   $\mu\text{m}$ , terminally armed with small spiniform seta (16  $\mu\text{m}$ ) and larger seta (66  $\mu\text{m}$ ). Leg 6 represented by 2 similar setae on posterior corner of genital flap (Fig. 9B).

*Etymology.* The specific name *partenuipes* (the Latin *par* means “similar”) alludes to the similarity of the new species with *A. tenuipes* Kim.

*Remarks.* This species resembles very closely *A. tenuipes* Kim, 2003, associated with the hard coral *Seriatopora hystrix* Dana from New Caledonia (Kim, 2003). The shape of the antenna is, in particular, very similar between the two species.

The differences between the two species are: (1) the caudal ramus of the female is 1.92 times as long as wide in *A. tenuipes* but is 1.79 times as long as wide in *A. partenuipes*, (2) the anterolateral corners of the female genital double-somite is slightly angular in *A. tenuipes* but is rounded in *A. partenuipes*, (3) the number of the digitiform processes on the convex side of the mandible is 4 in *A. tenuipes* but is 3 in *A. partenuipes*, (4) the basal seta of female leg 5 is small in *A. tenuipes* but is relatively large in *A. partenuipes*, (5) the terminal setae on the endopod of leg 4 are subequal in length in *A. tenuipes* but is significantly unequal in *A. partenuipes*, and (6) the male maxilliped bears a proximal tubercle in *A. tenuipes* but does not in *A. partenuipes*.

#### *Anchimolgus parangensis* n. sp. (Figs. 10–12)

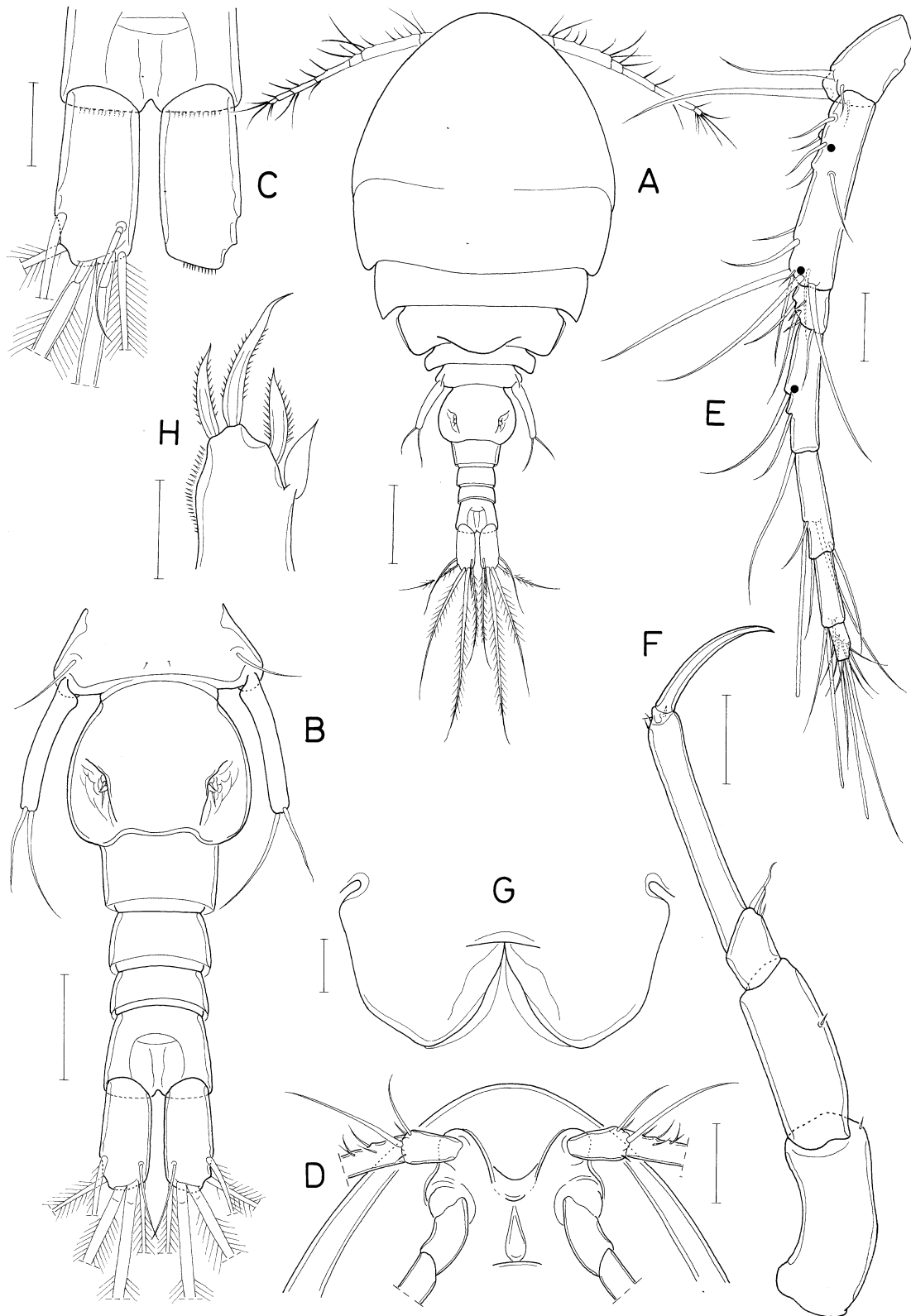
*Material examined.* Four ♀♀, 2 ♂♂ from the scleractinian coral *Hydnophora microconos* (Lamarck), depth 2 m, Parang Island, eastern Ceram ( $3^{\circ} 17'00''\text{S}$ ,  $130^{\circ} 44'48''\text{E}$ ),

collected by A.G. Humes, 23 May 1975. Holotype (♀: USNM 1081621), allotype (♂: USNM 1081622), and paratypes (2 ♀♀: USNM 1081623) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

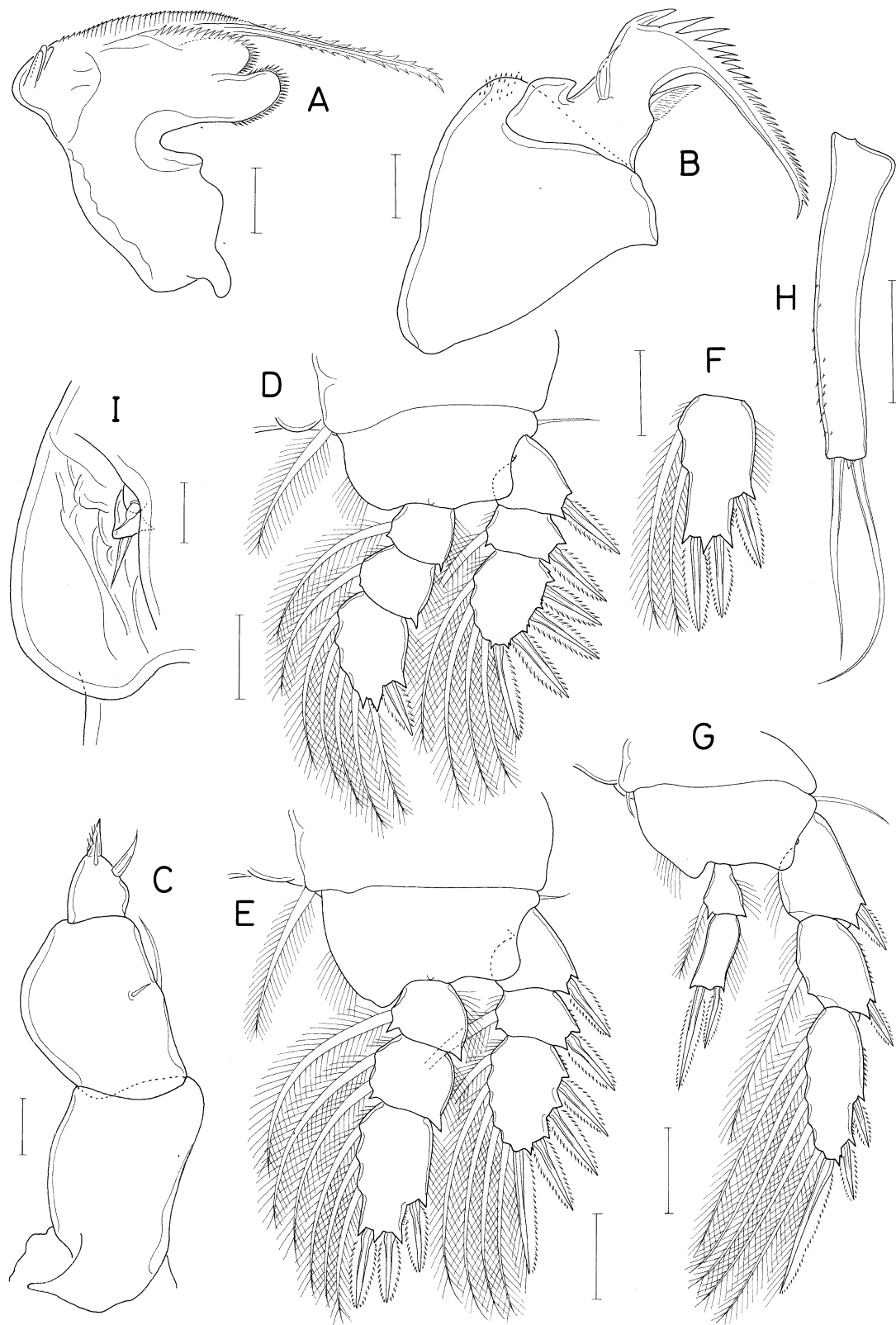
*Female.* Body (Fig. 10A) with broad prosome. Body length of dissected specimen 1.43 mm. Greatest width 660  $\mu\text{m}$ . Prosome oval and 940  $\mu\text{m}$  long. Cephalothorax with faint, incomplete dorsal suture line delimiting cephalosome and first pedigerous somite. Second pedigerous somite with pointed posterolateral corners. Third pedigerous somite with posterodorsal elevation (Fig. 10A) and narrow membrane on lateral margins. Urosome (Fig. 10B) 5-segmented. Fifth pedigerous somite 198  $\mu\text{m}$  wide. Genital double-somite 207  $\mu\text{m}$  long, with roundly expanded anterior part and narrower posterior part. Width 172  $\mu\text{m}$  across anterior expansion and 121  $\mu\text{m}$  across narrower posterior part. Three free abdominal somites  $57 \times 97$ ,  $43 \times 95$ , and  $72 \times 103$   $\mu\text{m}$ , respectively. Anal somite gradually widened distally. Caudal rami (Fig. 10C) broad,  $108 \times 48$   $\mu\text{m}$  (ratio 2.25 : 1); each ramus with 6 setae, inner dorsal and outer lateral ones naked, other 4 setae plumose.

Rostrum with obscure posterior margin (Fig. 10D). Antennule (Fig. 10E) 471  $\mu\text{m}$  long, slender, 7-segmented; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Aesthetascs slender. Antenna (Fig. 10F) 4-segmented, gradually narrowed distally. Coxobasis and first endopodal segment 100 and 87  $\mu\text{m}$ , respectively, each armed with minute inner seta. Second endopodal segment 33  $\mu\text{m}$  long with 3 unequal setae. Third endopodal segment much longer than third segment,  $128 \times 20$   $\mu\text{m}$ , with 4 minute outer distal setae. Terminal claw 78  $\mu\text{m}$  long, evenly curved, with sharp tip.

Labrum (Fig. 10G) with broad and tapering posterior lobes. Mandible (Fig. 11A) with deep proximal notch. Inner margin distinctly bilobed; proximal lobe prominently protruded. Convex side with 3 small digitiform processes. Distal lash very slender and elongated, with spinules on both margins. Maxillule (Fig. 10H) armed with subdistal foliaceous element and 3 terminal, broad setae bearing spinules on margins. Maxilla (Fig. 11B) with syncoxa bearing minute spinules near outer distal corner. Basis with distally directed process at proximal part of outer margin and 2 setae (anterior seta naked and broadened; inner seta foliaceous, with broad membrane on inner margin). Distal lash at right angle to segment, elongate, with serrate distal margin. Maxilliped (Fig. 11C) 3-segmented. Syncoxa unarmed. Basis with convex outer margin and 2 unequal inner setae of 28 and 8  $\mu\text{m}$ . Endopod tapering, with subterminal naked spine, terminal spine bearing minute spinules, and

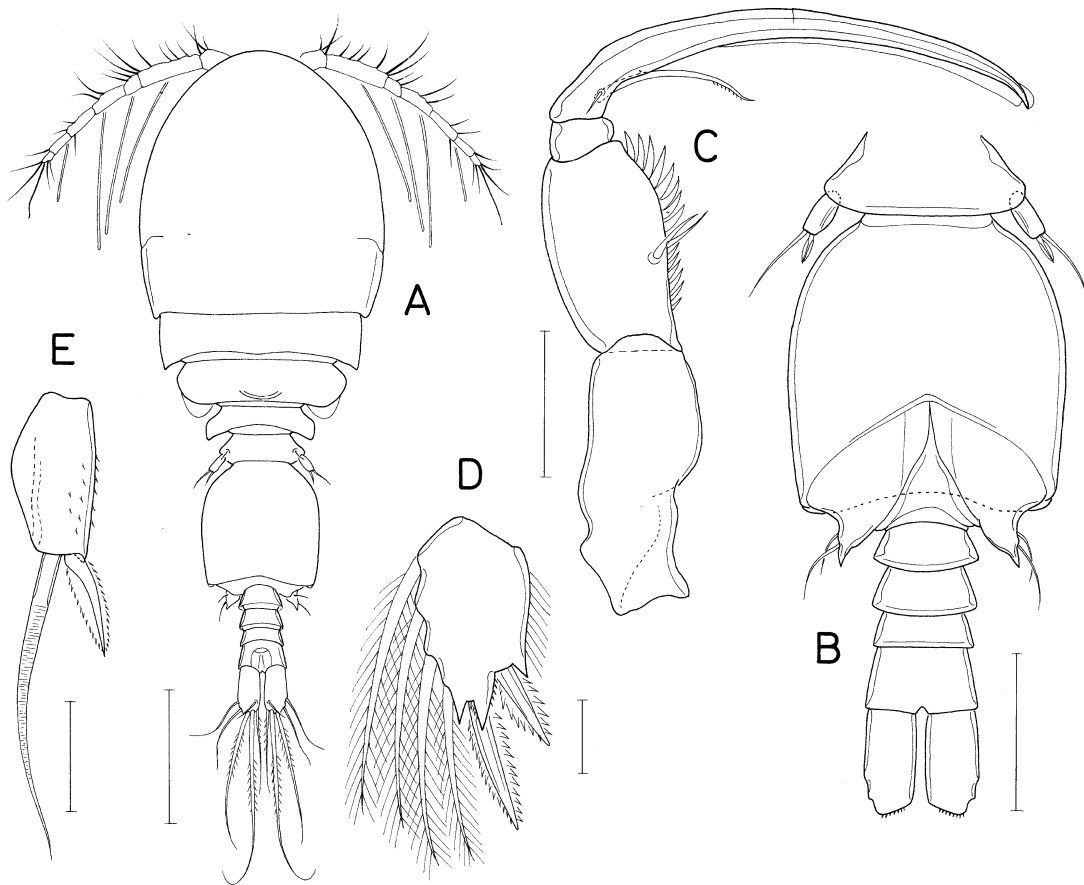


**Fig. 10.** *Anchimolgus parangensis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal ramus, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, labrum; H, maxillule. Scales: A, 0.2 mm; B, D, 0.1 mm; C, E, F, 0.05 mm; G, H, 0.02 mm.



**Fig. 11.** *Anchimolgus parangensis* n. sp., female. A, mandible; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, third endopodal segment of leg 3; G, leg 4; H, free segment of leg 5; I, left genital area. Scales: A-C, I, 0.02 mm; D-H, 0.05 mm.





**Fig. 12.** *Anchimolgus parangensis* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, maxillule; D, third endopodal segment of leg 1; E, free segment of leg 5. Scales: A, 0.2 mm; B, 0.1 mm; C, 0.05 mm; D, E, 0.02 mm.

small seta.

Legs 1-3 with 3-segmented exopod and endopod (Fig. 11D-F). Leg 4 (Fig. 11G) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 naked and small. Second endopodal segment of leg 4  $63 \times 20 \mu\text{m}$ ; its 2 terminal spines 63 and  $37 \mu\text{m}$ . Armature formula of legs 1-4 as in *A. gracilipes*.

Free segment of leg 5 (Fig. 11H) slender,  $133 \mu\text{m}$  long,  $27 \mu\text{m}$  wide at proximal expansion and  $17 \mu\text{m}$  wide at narrow distal part, with minute spinules on distal half of outer margin; 2 terminal setae 113 and  $83 \mu\text{m}$ . Leg 6 (Fig. 11I) represented by proximally thickened seta and spiniform posterior seta.

**Male.** Body (Fig. 12A) similar to that of female. Body length of dissected specimen 1.00 mm. Dorsal suture line delimiting cephalosome and first pedigerous somite obscure. Urosome (Fig. 12B) 6-segmented. Fifth pedigerous somite  $127 \mu\text{m}$  wide. Genital somite  $213 \times 175 \mu\text{m}$ . Four abdominal somites  $27 \times 75$ ,  $27 \times 66$ ,  $19 \times 63$ , and  $38 \times 71 \mu\text{m}$ , respectively. Caudal ramus  $67 \times 34 \mu\text{m}$ .

Rostrum as in female. Antennule with 3 additional aesthetascs: 2 on second and 1 on fourth segments, as indicated by dots in Fig. 10E. Antenna, labrum, mandible, maxillule, and maxilla as in female. Maxilliped (Fig. 12C) consisting of 3 segments and terminal claw. Syncoxa and endopod unarmed. Basis with 2 similar inner setae and row of spinules on inner margin. Terminal claw evenly curved,  $163 \mu\text{m}$  long, proximally with large seta and minute seta.

Third endopodal segment of leg 1 (Fig. 12D) armed with 2 spines and 4 setae, otherwise legs 1-4 as in female. Free segment of leg 5 (Fig. 12E) small,  $29 \times 15 \mu\text{m}$ , with convex inner margin and armed terminally with spine ( $20 \mu\text{m}$ ) and seta ( $57 \mu\text{m}$ ). Leg 6 represented by 2 similar setae on posterior corner of genital flap (Fig. 12B).

**Etymology.** The specific name is derived from the type locality, Parang Island.

**Remarks.** *Anchimolgus parangensis* n. sp. has an antenna in which the second endopodal segment is not more than one-fourth as long as the third endopodal segment. Similar antenna where the second endopodal segment is less than

half length of the third endopodal segment is revealed by seven species: *A. nasutus* Humes, *A. contractus* Humes, *A. multidentatus* Kim, *A. tenuipes* Kim, the preceding *A. partenuipes*, *A. moluccanus* Humes, and *A. tridentatus* Kim. Of these *A. nasutus*, *A. tenuipes*, *A. moluccanus*, *A. partenuipes*, and *A. tridentatus* are different from *A. paragensis*, because their caudal rami are more than three times as long as wide (in *A. nasutus*) or less than twice as long as wide (in other four species). The remaining *A. contractus* and *A. multidentatus* are separated from the new species by their following features.

*Anchimolgus contractus* has a small body (0.80–0.98 mm in the female, according to Humes 1979b), a small free segment of female leg 5 (53  $\mu\text{m}$  long), a tapering anterior expansion of the genital double-somite in the female, two pairs of large spiniform processes on the posteroventral margin of anal somite, and simple setae on the free segment of male leg 5.

*Anchimolgus multidentatus* has a weak anterior expansion of genital double-somite in the female, six or seven digitiform processes on the convex side of mandible, and two simple setae on the free segment of male leg 5.

#### ***Anchimolgus hastatus* n. sp. (Figs. 13, 14)**

**Material examined.** Two ♀♀ from a scleractinian coral of *Fingia* sp. [*Fungia* (*Pleuractis*) *paumotuensis* Stutchbury or *F. (Fungia) fungites* (Linnaeus)], depth 2 m, Naira, Banda Islands (4° 31' 45" S, 129° 53' 35" E), collected by A.G. Humes, 2 May 1975. Holotype (♀: USNM 1081617) has been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D. C., United States. Dissected paratype (♀) is kept in the collection of the author.

**Female.** Body (Fig. 13A) with narrow prosome. Body length of dissected specimen 1.16 mm. Greatest width 417  $\mu\text{m}$ . Prosome 725  $\mu\text{m}$  long. Urosome (Fig. 13B) 5-segmented. Cephalothorax with faint, incomplete dorsal suture line. Fifth pedigerous somite 144  $\mu\text{m}$  wide, wider than genital double-somite. Genital double-somite 183  $\mu\text{m}$  long, with roundly expanded anterior part and narrower posterior part. Width 133  $\mu\text{m}$  across anterior expansion. Three free abdominal somites 61  $\times$  73, 42  $\times$  67, and 57  $\times$  71  $\mu\text{m}$ , respectively. Caudal ramus (Fig. 13C) broad, 85  $\times$  36  $\mu\text{m}$  (ratio 2.36 : 1), with 6 setae; inner dorsal seta naked, other 5 setae plumose.

Rostrum with rounded posterior margin but its posterior apex fused with cephalothorax (Fig. 13D). Antennule (Fig. 13E) 467  $\mu\text{m}$  long, slender, 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Aesthetascs slender and con-

fluent with setae. Antenna (Fig. 13F) slender, 4-segmented, gradually narrowed distally. Coxobasis and first endopodal segment 108 and 96  $\mu\text{m}$ , each armed with minute inner seta. Second endopodal segment 31  $\mu\text{m}$  long with 2 minute, proximal setae and longer distal seta characteristically curved at tip. Third endopodal segment extremely long and slender, 154  $\times$  14  $\mu\text{m}$ , with 2 minute outer distal setae. Terminal claw thin, 98  $\mu\text{m}$  long, weakly curved distally.

Labrum (Fig. 13G) with broad posterior lobes. Mandible (Fig. 13H) with broad proximal notch. Inner margin distinctly bilobed; proximal lobe prominently protruded. Convex side with 2 digitiform processes and followed by serrate distal margin. Distal lash very thin and elongated, with spinules on both margins. Maxillule (Fig. 14A) armed with subdistal setiform element and 3 terminal broad setae bearing spinules on margins. Maxilla (Fig. 14B) with unarmed syncoxa. Basis with 2 setae: anterior seta naked; inner seta foliaceous, with broad membrane on inner margin. Distal lash at right angle to segment, elongate, with serrate distal margin. Maxilliped (Fig. 14C) 3-segmented. Syncoxa unarmed. Basis with convex outer margin and 2 small inner setae of 13 and 4  $\mu\text{m}$ . Endopod with subterminal naked spine and small seta, terminated by tapering, pointed process bearing several spinules.

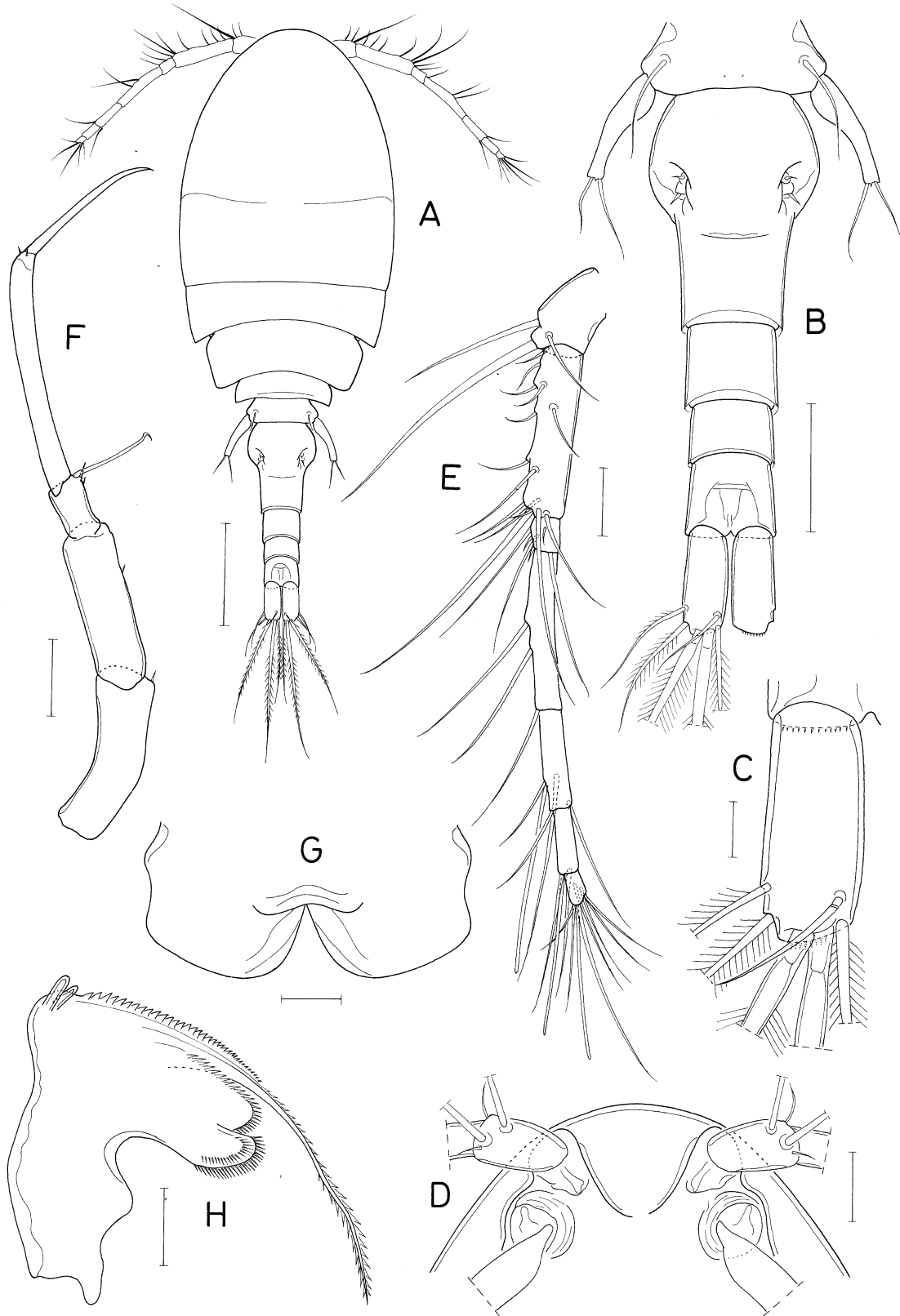
Legs 1–3 with 3-segmented exopod and endopod (Fig. 14D, E). Leg 4 (Fig. 14F) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1–3 naked and small. Endopod of leg 4 small; its second segment 28  $\times$  9  $\mu\text{m}$ ; terminal spines 39 and 22  $\mu\text{m}$ . Armature formula of legs 1–4 as in preceding *A. gracilipes*.

Free segment of leg 5 (Fig. 14G) 94  $\times$  25  $\mu\text{m}$ , proximally expanded, with several spinules on outer margin and 2 terminal setae of 71 and 46  $\mu\text{m}$ . Leg 6 represented by proximally thickened anterior seta and spiniform posterior seta (Fig. 14H).

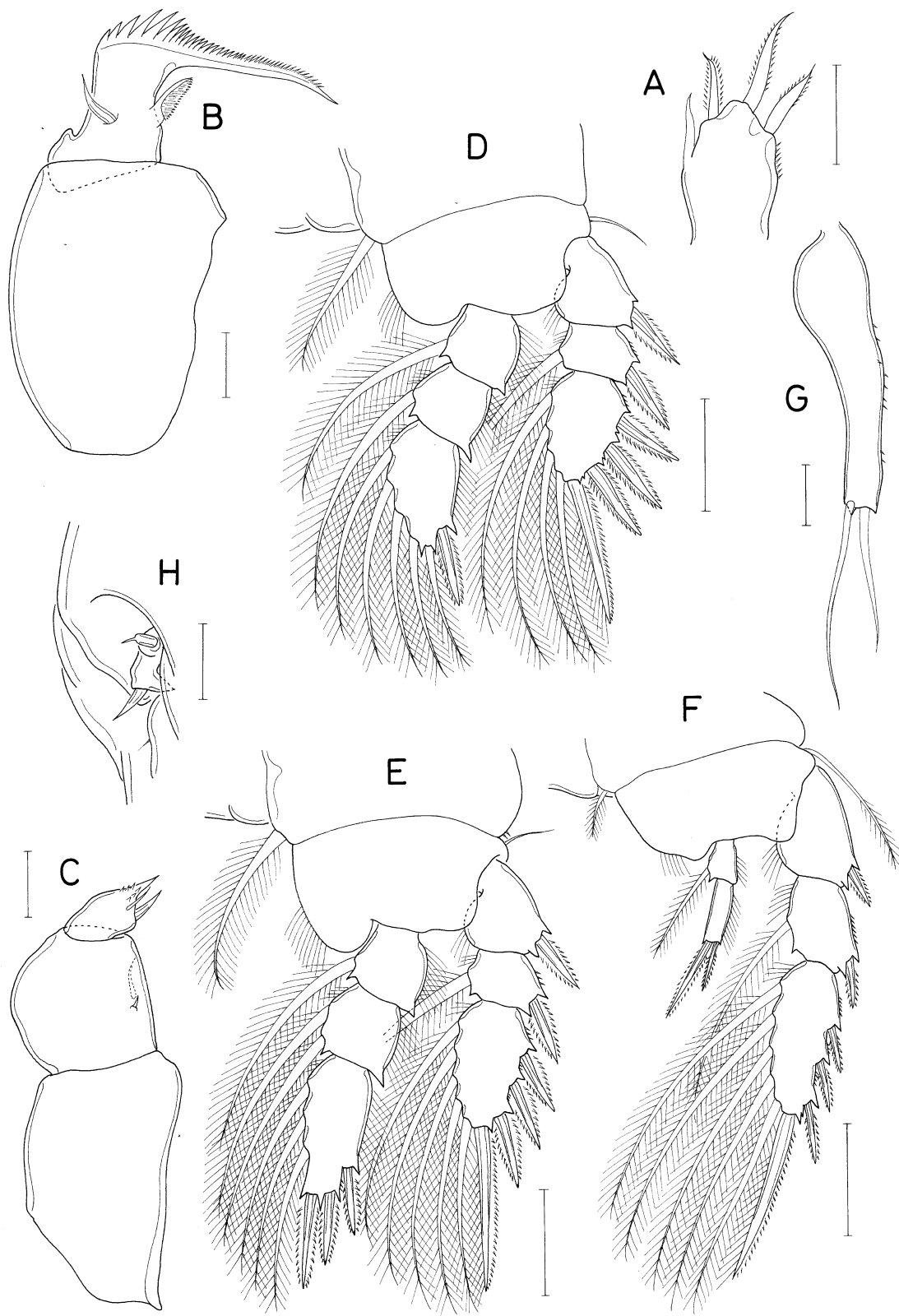
**Male.** Unknown.

**Etymology.** The specific name *hastatus* is a Latin meaning “armed with a spear”. It alludes to the slender claw of the antenna.

**Remarks.** This species possesses an unusually long, slender third endopodal segment of antenna. The third endopodal is about ten times as long as its width and five times as long as the second endopodal segment. This feature differentiates *Anchimolgus hastatus* from all congeners. Similarly elongated third endopodal segment of the antenna is observed in *A. paragensis*, but the magnitude of the elongation is not comparable to that of *A. hastatus*. In addition, the prominent proximal swelling of the free segment of female leg 5 and the small endopod of leg 4 are the significant characteristics that typifying *A. hastatus*.



**Fig. 13.** *Anchimolgus hastatus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, left caudal ramus, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, labrum; H, mandible. Scales: A, 0.2 mm; B, 0.1 mm; C-H, 0.02 mm.



**Fig. 14.** *Anchimolgus hastatus* n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 4; G, free segment of leg 5; H, left genital area. Scales: A-C, G, H, 0.02 mm; D-F, 0.05 mm.

***Anchimolgus orectus* Humes, 1978**

*Material examined.* Two ♀♀ from a scleractinian coral of *Fungia* sp. [*Fungia (Pleuractis) paumotuensis* Stutchbury or *F. (Fungia) fungites* (Linnaeus)], in 2 m, Naira, Banda Islands (4° 31'45''S, 129° 53'35''E), collected by A.G. Humes, 2 May 1975.

*Remarks.* This species was originally described as associate of the coral *Fungia paumotuensis* from the Moluccas. Some discrepancies from the original description are: the body length of the dissected female is 1.37 mm; the greatest width is 506 µm; the proximalmost spine of the distal lash of maxilla is blunt and thick; the free segment of leg 5 is 120 × 27 µm. The discrepancies are considered to be intra-specific variations, because the present specimens exhibit the characteristic antenna typical to *A. orectus*, in which the third endopodal segment is shorter than the second and the second endopodal segment bears two small setae and a long seta extending almost to the tip of terminal claw. That the posterior corners of the second pedigerous somite are pointed is also a remarkable feature of this species.

***Anchimolgus proxilipes* (Humes and Ho, 1968)**

*Material examined.* Fourteen ♀♀, 16♂♂ from a scleractinian coral of *Porites* sp. (aff. *P. galeata*), depth 2 m, Parang Island, eastern Ceram (3° 17'00''S, 130° 44'48''E), collected by A.G. Humes, 23 May 1975.

*Remarks.* This species is new to the Moluccas. It was described originally as an associate of a coral *Porites* sp. from Madagascar and no additional collection has been reported since. One female of the Moluccas specimens is 1.08 mm long and one of the males is 0.98 mm long. It is easily identified without dissection by the elongated free segment of female leg 5. The length of the free segment is variable and in some specimens the free segment is extended to the distal margin of anal somite.

Genus *Andrianellus* Humes and Stock, 1972

***Andrianellus papillipes* n. sp. (Figs. 15, 16)**

*Material examined.* Four ♀♀ from the scleractinian coral *Platygyra ryukyuensis* Yabe and Sugiyama, depth 2 m, Parang Island, eastern Ceram (3° 17'00''S, 130° 44'48''E), collected by A.G. Humes, 23 May 1975. Holotype (♀: USNM 1081627) and paratypes (2 ♀♀: USNM 1081628) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (♀) is kept in the collection of the author.

*Female.* Body (Fig. 15A) relatively broad. Body length of

dissected specimen 1.36 mm. Other three specimens 1.40, 1.44, and 1.45 mm. Greatest width 490 µm. Prosome 705 µm long. Dorsal suture line of cephalothorax obscure and incomplete between cephalosome and first pedigerous somite. Urosome (Fig. 15B) 5-segmented and distinctly tapering. Fifth pedigerous somite 227 µm wide. Genital double-somite wider than long, 208 × 244 µm and slightly tapering posteriorly, with rounded lateral margins. Genital areas located dorsally. Three free abdominal somites 83 × 127, 58 × 104, and 73 × 90 µm, respectively. Caudal ramus tapering and elongate (Fig. 15C), 197 × 31 µm (ratio 6.35 : 1), with 6 naked caudal setae, longest one 82 µm.

Rostrum connected to anterior part of labrum by ridge (Fig. 15D). Antennule (Fig. 15E) 292 µm long, slender, 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. Setae naked, relatively large. Antenna (Fig. 15F) moderately stocky, 4-segmented. Coxobasis and first endopodal segment approximately 79 × 51 and 113 × 40 µm, respectively, each armed with small inner seta. Second endopodal segment 33 × 33 µm, with 3 inner setae. Third endopodal segment markedly narrower than second, 46 × 21 µm, and unarmed. Terminal claw small, 21 µm long, and curved distally.

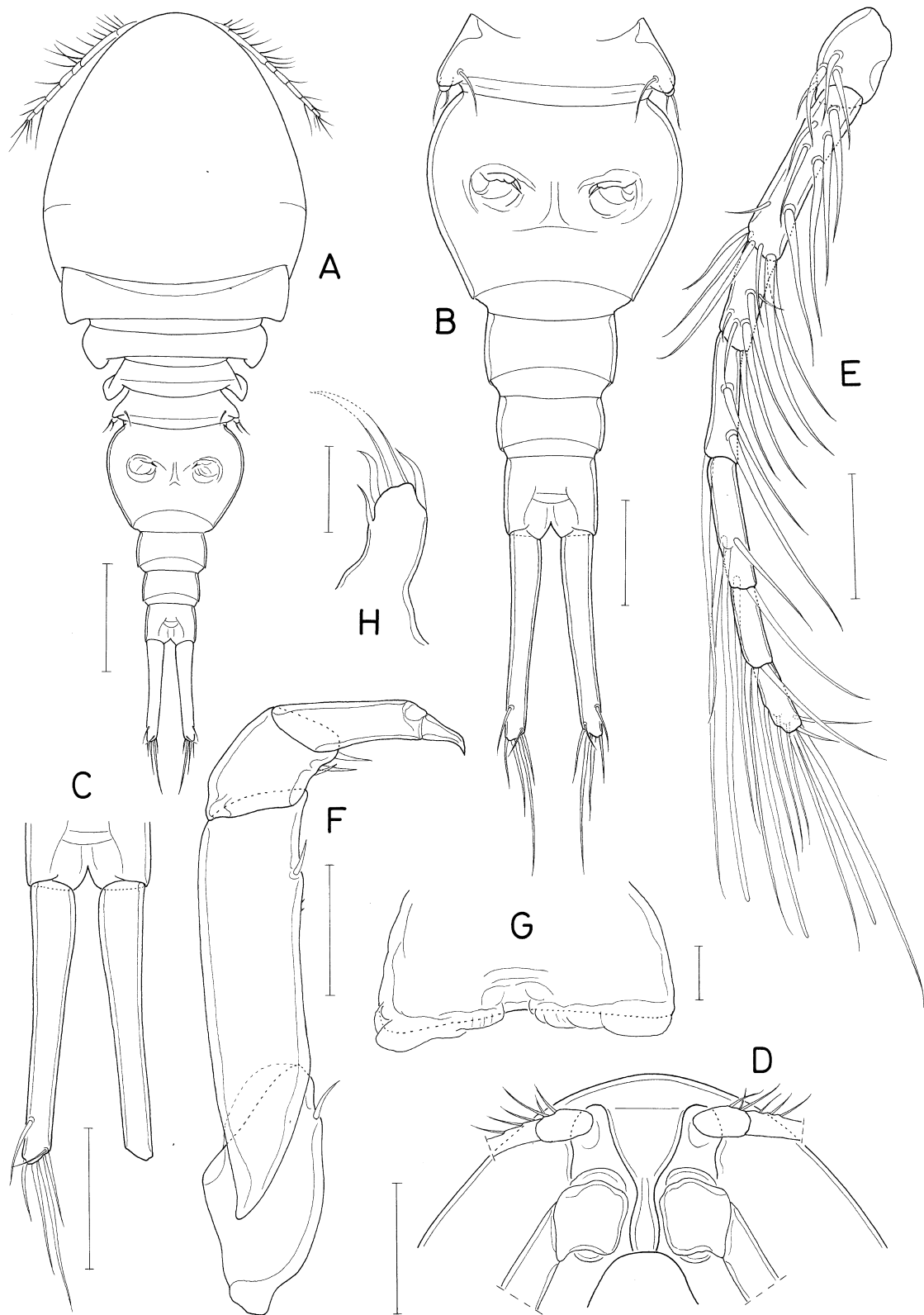
Labrum (Fig. 15G) widened distally, with almost linear posterior margin, without median incision. Mandible (Fig. 16A) with distinct proximal notch. Inner margin bilobed. Convex side with 4 spinules. Distal lash recurved and elongated, with serrate margins. Maxillule (Fig. 15H) armed with subdistal setiform process and 3 terminal naked setae. Maxilla (Fig. 16B) with syncoxa bearing large digitiform process on outer margin; this process about 4 times as long as wide and weakly tapering. Basis with minute outer proximal seta, naked anterior seta and pectinated inner seta. Distal lash roundly curved, with serrate distal margin. Maxilliped (Fig. 16C) 3-segmented. Syncoxa longest among segments but unarmed. Basis with 2 subequal inner setae of 10 and 8 µm, respectively. Endopod tapering, with 2 setae, subterminal naked spine, and terminated by pointed process bearing 3 spinules on both sides.

Legs 1-3 with 3-segmented exopod and endopod (Fig. 16D-F). Leg 4 (Fig. 16G) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 2-4 naked. Second endopodal segment of leg 4 slightly expanded near middle, 52 × 18 µm, and armed terminally with spine (47 µm). Armature formula of legs 1-4:

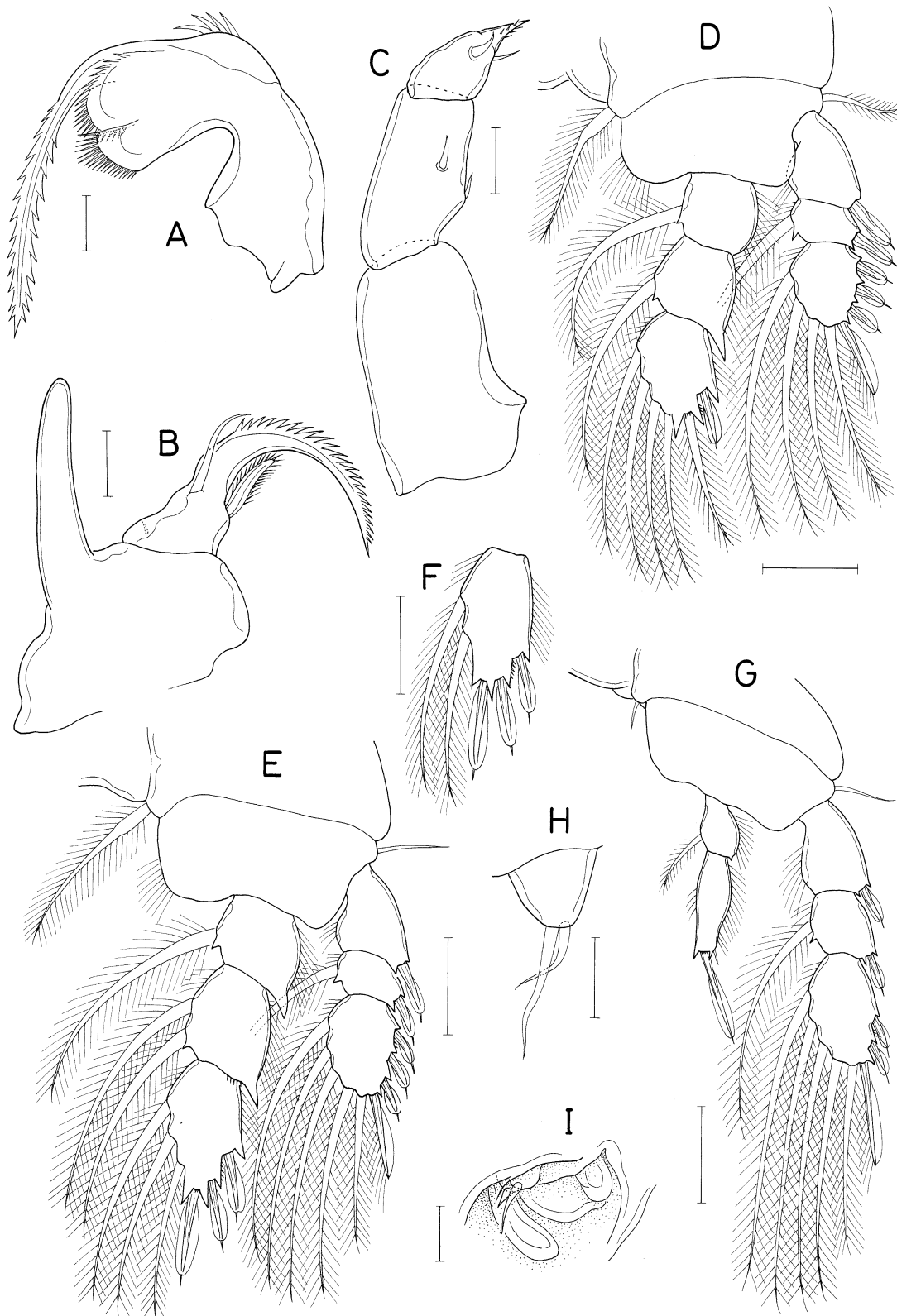
Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,5

Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,3

Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,2



**Fig. 15.** *Andrianellus papillipes* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, labrum; H, maxillule. Scales: A, 0.2 mm; B-F, 0.05 mm; G, H, 0.02 mm.



**Fig. 16.** *Andrianellus papillipes* n. sp., female. A, mandible; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, third endopodal segment of leg 3; G, leg 4; H, free segment of leg 5; I, right genital area. Scales: A-C, H, I, 0.02 mm; D-G, 0.05 mm.

Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. 0-1; I

Free segment of leg 5 (Fig. 16H) small, strongly tapering,  $18 \times 22 \mu\text{m}$ , with 2 terminal setae of 35 and 23  $\mu\text{m}$ . Leg 6 represented by 2 small setae in genital area (Fig. 16I).

*Male.* Unknown.

*Etymology.* The specific name is from the Latin *papilla* (=nipple) and *pes* (=foot). It alludes to the small, nipple-shaped free segment of leg 5 of the new species.

*Remarks.* *Andrianellus* Humes and Stock, 1972, has hitherto been a monotypic genus represented by *A. exsertidens* Humes and Stock, 1973, associated with the scleractinian corals of *Platygyra daedala* (Ellis and Solander) and *Favia* sp. in Madagascar.

*Andrianellus papillipes* is similar to *A. exsertidens* in the body form and other important features. The differences between the two species are in (1) the caudal ramus which is 197  $\mu\text{m}$  long and 6.35 times as long as wide in *A. papillipes* but is 120  $\mu\text{m}$  long and 3.87 times as long as wide in *A. exsertidens*, according to Humes and Stock (1973) and (2) the labrum in which the posterior margin is almost linear in *A. papillipes* but is clearly bilobed in *A. exsertidens*.

#### *Exodontomolgus* n. gen.

*Diagnosis.* Body cycloform. Urosome 5-segmented. Antennule 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc in female and 4, 13+2 aesthetascs, 6, 3+aesthetasc, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc in male. Antenna 4-segmented, with terminal claw, and 3 setae on second endopodal segment. Mandible with weakly bilobed inner margin; convex side with large process. Maxillule with 3 setae. Maxilla with basis bearing 3 setae and long distal lash. Maxilliped of female 3-segmented, with tapering second endopodal segment bearing 2 setae. Maxilliped of male consisting of 3 segments and long terminal claw. Legs 1-3 with 3-segmented rami. Third exopodal segment of leg 3 armed with 3 spines and 5 setae. Leg 4 with 3-segmented exopod and 2-segmented endopod; third exopodal segment with 3 spines and 5 setae; armature formula of endopod 0-1; II. No sexual dimorphism in legs 1-4.

*Type species.* *Exodontomolgus communis* n. sp.

*Etymology.* The generic name *Exodontomolgus* is from the Latin preposition *Ex* (=from, out of) and the generic name *Odontomolgus*. It alludes to the close relatedness of the new genus to *Odontomolgus*.

*Remarks.* In the revision of lichomolgoid complex, Humes and Boxshall (1996) established the Anchimolgidae as a new family and characterized this family with the typical

form of mandible in which the inner margin is differentiated into two pronounced convex lobes. With the similar form of the mandible, *Exodontomolgus* n. gen. belongs to the family Anchimolgidae. This genus is closely related to *Odontomolgus* in having a large process on the outer margin of the mandible, a four-segmented antenna, and the two terminal spines on the second endopodal segment of leg 4. However, the genus differs from *Odontomolgus* in the possession of three spines and five setae (formula II,I,5, instead of III,I,5) on the third exopodal segment of leg 3.

#### *Exodontomolgus communis* n. sp. (Figs. 17-19)

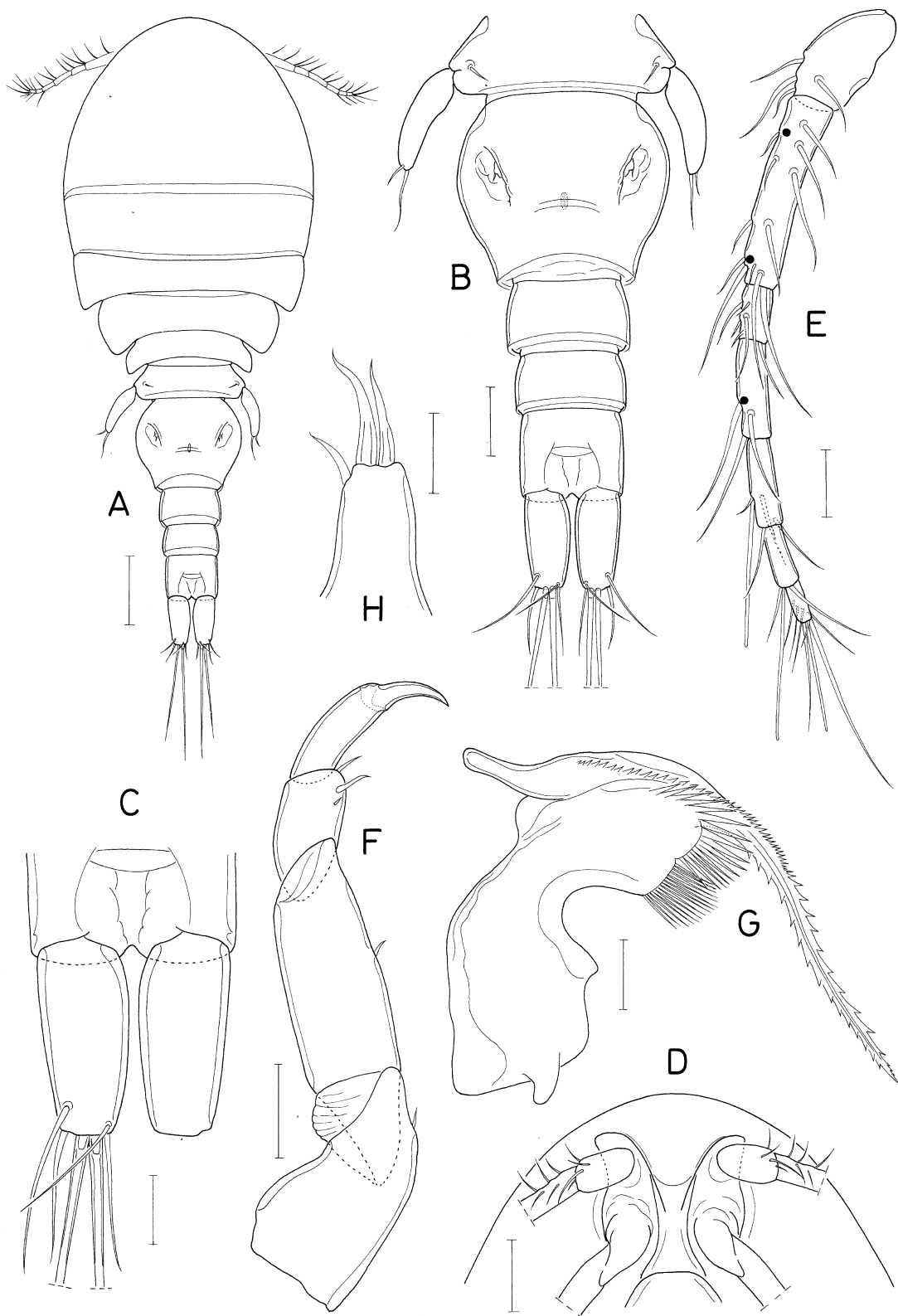
*Material examined.* Three ♀♀, 7♂♂ from the scleractinian coral *Alveopora mortenseni* Crossland, depth 3 m, Karang Mie (00° 20'07''S, 128° 25'00''E), collected by A.G. Humes, 19 May 1975. Holotype (♀: USNM 1081661), allotype (♂: USNM 1081662), and paratypes (1♀, 5♂♂: USNM 1081663) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1♀, 1♂) are kept in the collection of the author.

*Female.* Body (Fig. 17A) of usual form. Body length of dissected specimen 1.82 mm (other 2 specimens 1.65 and 1.91 mm). Greatest width 723  $\mu\text{m}$ . Prosoma 1.01 mm long. Urosome (Fig. 17B) 5-segmented. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Fifth pedigerous somite 327  $\mu\text{m}$  wide, wider than next somite. Genital double-somite  $269 \times 307 \mu\text{m}$ , distinctly shorter than wide, with roundly convex lateral margins. Genital areas located dorsally. Three free abdominal somites  $104 \times 179$ ,  $85 \times 162$ , and  $123 \times 148 \mu\text{m}$ , respectively. Caudal ramus  $142 \times 63 \mu\text{m}$ , 2.25 times as long as wide, slightly tapering distally, with slightly convex medial margin. All 6 caudal setae naked, longest one 385  $\mu\text{m}$  long.

Rostrum tapering posteriorly and connected to anterior part of labrum by broad ridge (Fig. 17D). Antennule (Fig. 17E) 7-segmented, slender, 442  $\mu\text{m}$  long, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked and relatively small. Antenna (Fig. 17F) 4-segmented, gradually narrowed distally. Coxobasis and first endopodal segment approximately  $100 \times 69$  and  $125 \times 54 \mu\text{m}$  respectively, each with small inner seta. Second endopodal segment  $50 \times 35 \mu\text{m}$ , armed with 3 setae, proximal one minute. Third endopodal segment  $50 \times 22 \mu\text{m}$  and unarmed. Terminal claw 41  $\mu\text{m}$  long, not delimited from third endopodal segment.

Labrum lost. Mandible (Fig. 17G) with broad inner proximal notch. Inner margin weakly bilobed, each lobe fringed with long spinules. Convex side with large, tapering process. Distal lash elongated, with serrate margins. Maxil-





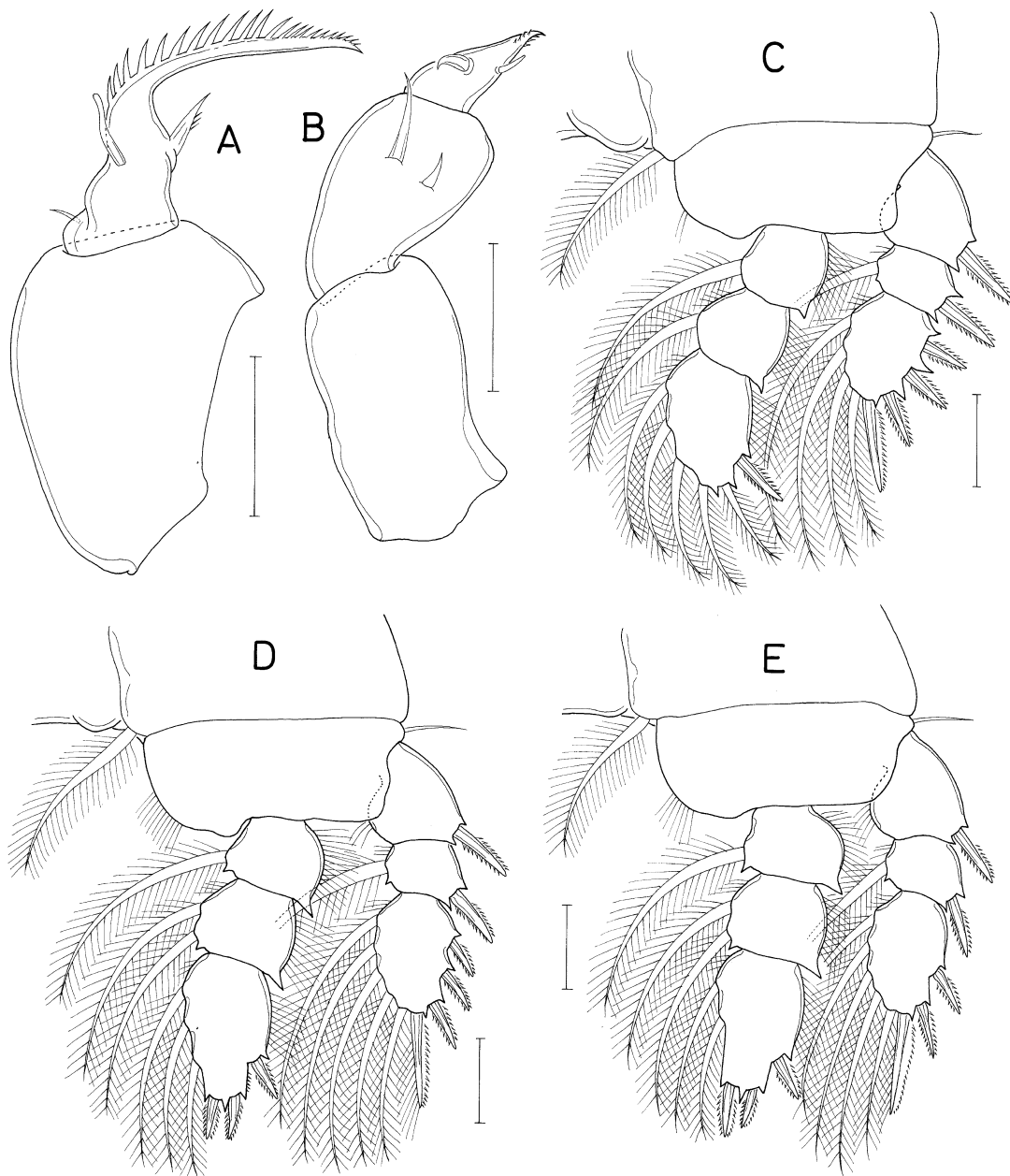
**Fig. 17.** *Exodontomolgus communis* n. gen., n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, mandible; H, maxillule. Scales: A, 0.2 mm; B, D, 0.1 mm; C, E, F, 0.05 mm; G, H, 0.02 mm.

lule (Fig. 17H) armed with subterminal seta and 2 terminal smooth setae. Maxilla (Fig. 18A) with unarmed syncoxa. Basis with 3 setae: small proximal seta, anterior seta with blunt tip and spiniform inner seta. Distal lash elongate, with spinules along distal margin. Maxilliped (Fig. 18B) 3-segmented. Syncoxa longest among segments but unarmed. Basis expanded distally, with 2 simple setae, each 30 and 13  $\mu\text{m}$  long. Endopod with subterminal spine and seta, terminated by tapering, pointed process bearing several spi-

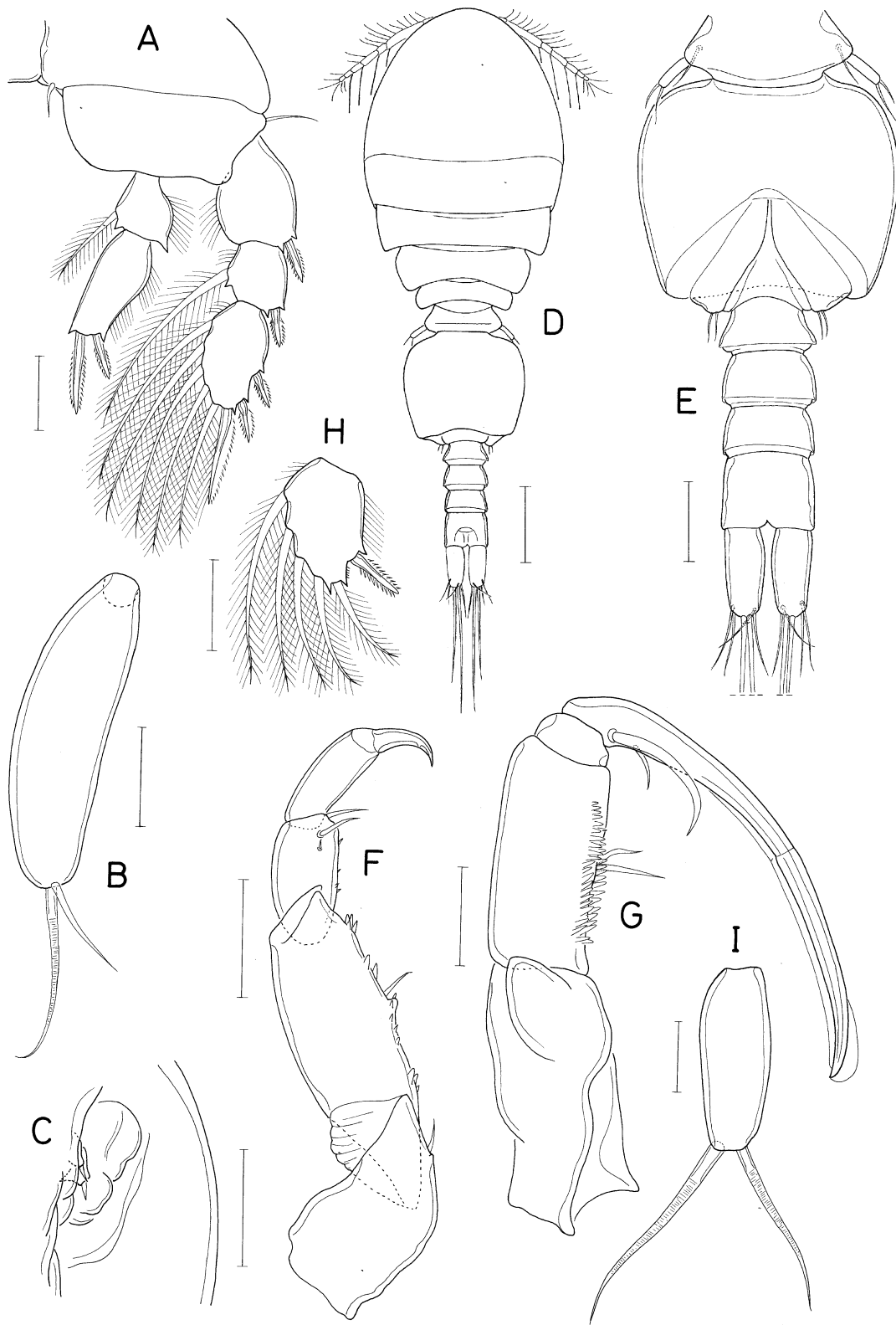
nules.

Legs 1-3 (Fig. 18C-E) with 3-segmented rami. Leg 4 (Fig. 19A) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 and inner coxal seta of leg 4 small and naked. Second endopodal segment of leg 4  $77 \times 36 \mu\text{m}$ , its 2 terminal spines 52 and 31  $\mu\text{m}$ , respectively. Armature formula of legs 1-4:

Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
 enp. 0-1; 0-1; I,5



**Fig. 18.** *Exodontomolgus communis* n. gen., n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, leg 3. Scales: 0.05 mm for all.



**Fig. 19.** *Exodontomolgus communis* n. gen., n. sp. Female: A, leg 4; B, free segment of leg 5; C, right genital area. Male: D, habitus, dorsal; E, urosome, ventral; F, antenna; G, maxilliped; H, third endopodal segment of leg 1; I, free segment of leg 5. Scales: A-C, F-H, 0.05 mm; D, 0.2 mm; E, 0.1 mm; I, 0.02 mm.

- Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,3  
Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. 0-1; 0-2; I,II,2  
Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. 0-1; II

Free segment of leg 5 (Fig. 19B)  $161 \times 46 \mu\text{m}$ , 3.50 times as long as wide, narrowed proximally and distally, with 2 terminal setae of 93 and  $55 \mu\text{m}$  long. Leg 6 represented by 2 small setae in genital area (Fig. 19C).

*Male.* Body (Fig. 19D) resembling that of female. Body length 1.47 mm (1.38–1.56 mm), based on 7 specimens. Body length of dissected specimen 1.53 mm. Greatest width  $667 \mu\text{m}$ . Prosoma  $787 \mu\text{m}$  long. Urosome (Fig. 19E) 6-segmented. Fifth pedigerous somite  $206 \mu\text{m}$  wide, much narrower than next somite. Genital somite large,  $288 \times 324 \mu\text{m}$ , nearly quadrangular and slightly narrowed posteriorly. Four abdominal somites  $59 \times 124$ ,  $68 \times 118$ ,  $59 \times 112$ , and  $88 \times 115 \mu\text{m}$ , respectively. Caudal ramus  $109 \times 50 \mu\text{m}$ , 2.18 times as long as wide.

Rostrum as in female. Antennule with 3 additional aesthetascs as indicated by dots in Fig. 17E, 2 on second segment and 1 on fourth segment. Antenna (Fig. 19F) added by scale-like spinules on inner margin of first endopodal segment and several minute spinules on inner margin of second endopodal segment. Terminal claw demarcated from third endopodal segment.

Labrum not examined. Mandible, maxillule, and maxilla as in female. Maxilliped (Fig. 19G) consisting of 3 segments and terminal claw. Syncoxa with large distal tubercle. Basis with straight margins, and 2 inner setae and longitudinal rows of small spinules on inner margin. Terminal claw  $233 \mu\text{m}$  long, evenly curved, proximally with larger seta and smaller seta.

Legs 1–4, including third endopodal segment of leg 1 (Fig. 19H), armed as in female. Free segment of leg 5 (Fig. 19I)  $53 \times 20 \mu\text{m}$ , 2.65 times as long as wide, with 2 terminal setae of 63 and  $51 \mu\text{m}$ . Leg 6 represented by 2 small setae on posterior corner of genital flap (Fig. 19E).

*Etymology.* The specific name *communis* (“ordinary” in Latin) is derived from the usual body form of the new species.

*Remarks.* This species similar to *Odontomolgus mundulus* Humes, 1974, in the form of the body, antenna, mandible, and maxilla. They are also associated with the same coral host *Alveopora mortenseni* Crossland. The similarity is, however, superficial, because the armature of the third endopodal segment of leg 3 is fundamentally different.

Genus *Jamescookina* Humes, 1991

***Jamescookina moluccensis* n. sp. (Figs. 20–22)**

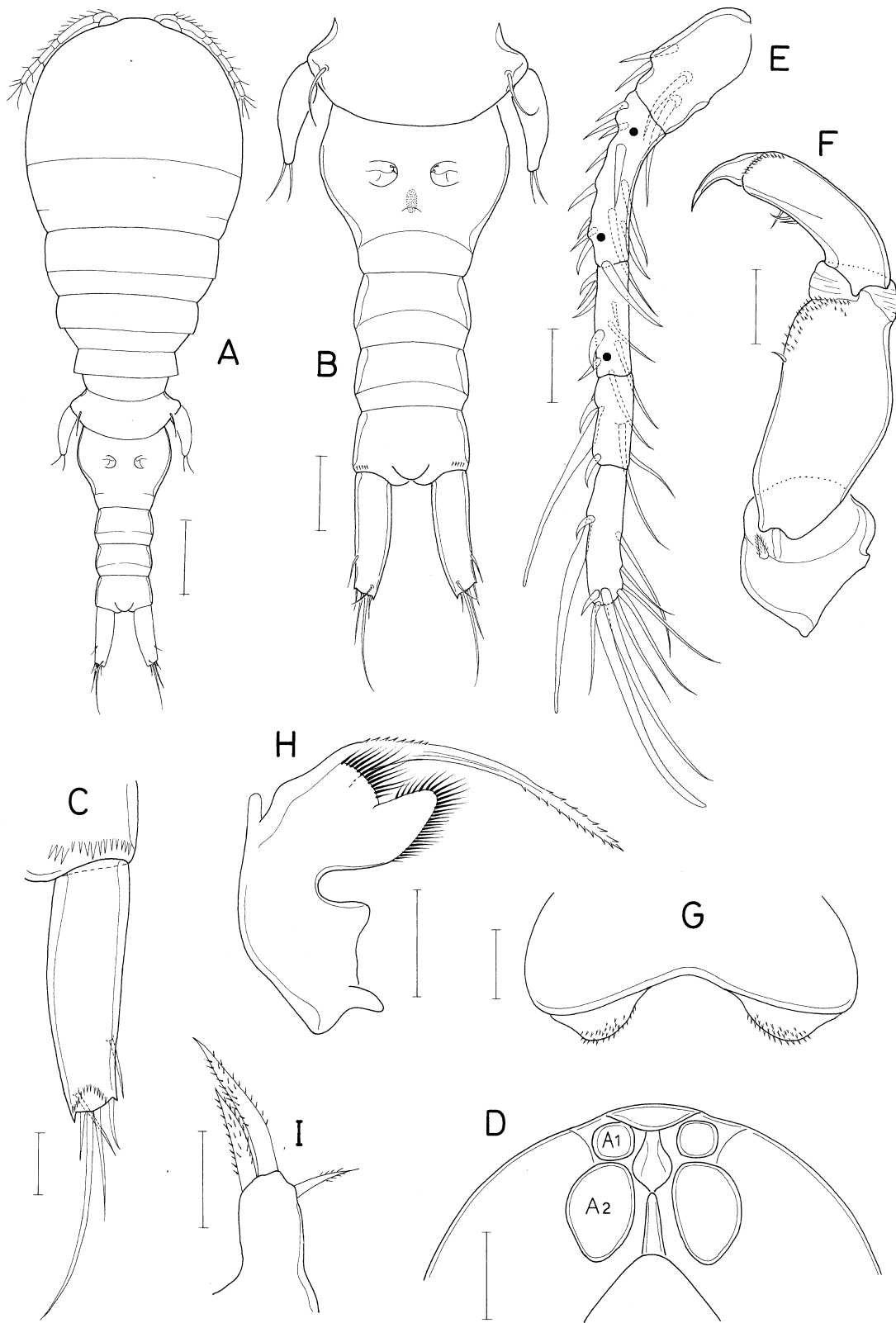
*Material examined.* Twelve ♀♀, 6♂♂ from the scleractinian coral *Echinopora lamellosa* (Esper), depth 2 m, Karang Mie ( $00^{\circ} 20'07''\text{S}$ ,  $128^{\circ} 25'00''\text{E}$ ), collected by A.G. Humes, 19 May 1975. Holotype (♀: USNM 1081629), allotype (♂: USNM 1081630), and paratypes (10♀♀, 4♂♂: USNM 1081631) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1♀, 1♂) are kept in the collection of the author.

*Female.* Body (Fig. 20A) with posteriorly tapering prosoma. Body length of dissected specimen  $879 \mu\text{m}$ . Mean body length  $801 \mu\text{m}$  ( $753\text{--}879 \mu\text{m}$ ) based on 10 specimens. Greatest width  $291 \mu\text{m}$ . Length of prosoma  $506 \mu\text{m}$ . Cephalosome with dorsal suture line. Urosome (Fig. 20B) 5-segmented. Fifth pedigerous somite  $147 \mu\text{m}$  wide. Genital double-somite strongly tapering,  $113 \times 125 \mu\text{m}$ . Genital areas positioned dorsally. Three free abdominal somites  $48 \times 78$ ,  $42 \times 75$ , and  $50 \times 77 \mu\text{m}$ , respectively. Anal somite ventrally with row of spinules near base of caudal rami. Caudal rami widely isolated from each other; each ramus (Fig. 20C)  $83 \times 25 \mu\text{m}$ , 3.32 times as long as wide, with 6 naked setae, longest seta  $68 \mu\text{m}$ .

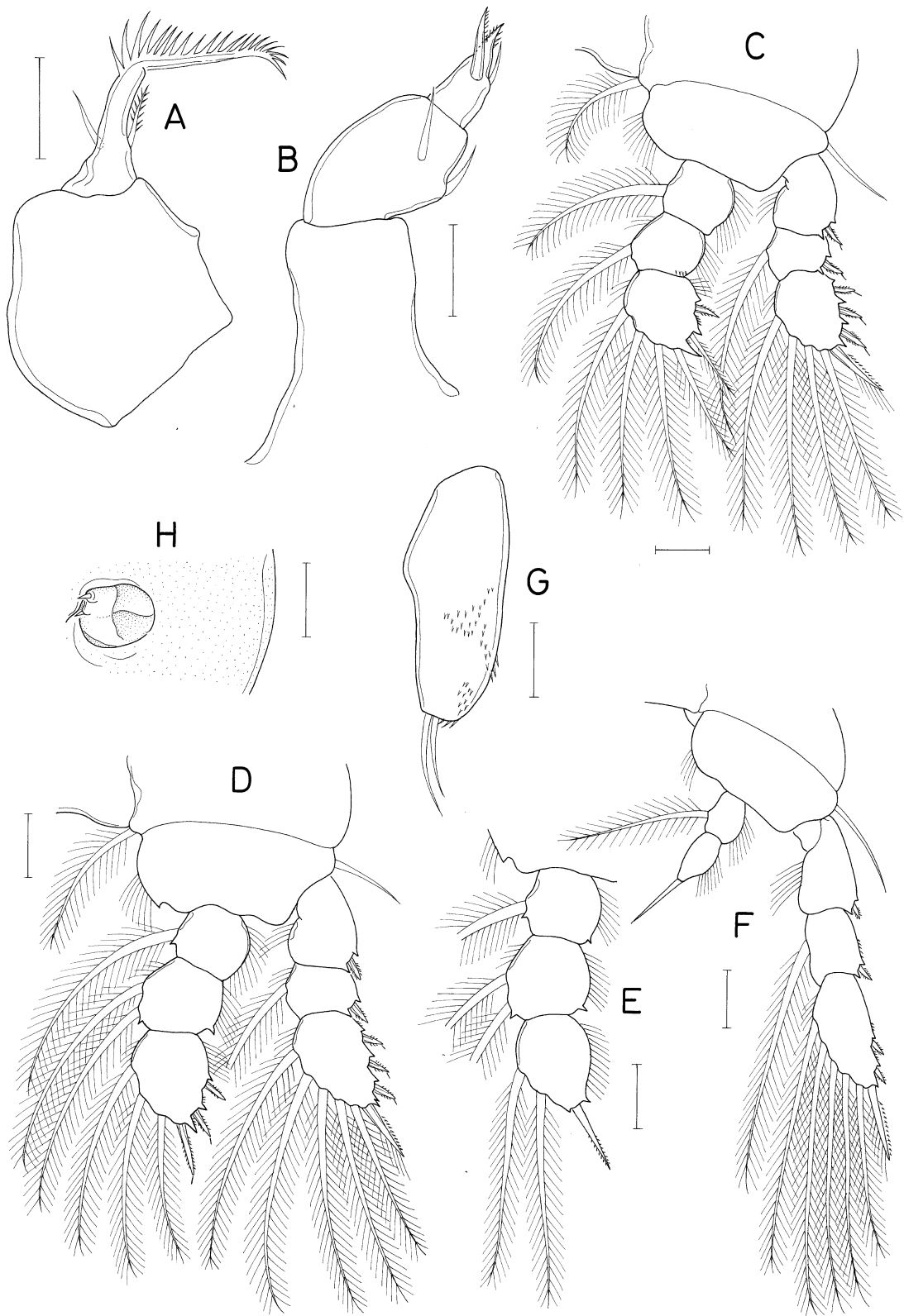
Rostrum wider than long, shaped as in Fig. 20D. Antennule (Fig. 20E)  $165 \mu\text{m}$  long, 5-segmented, with armature formula 4, 13, 9, 4+aesthetasc, and 9+2 aesthetascs. Setae on anterior margin short, some of them curved. Antenna (Fig. 20F) 3-segmented. Coxobasis broad but short, with small distal seta bearing setules on all surface. First endopodal segment longest, with small seta on inner margin and spinules on inner distal surface. Second endopodal segment  $42 \times 17 \mu\text{m}$  with 3 small setae on inner margin and spinules on distal margin. Terminal claw strongly tapering,  $19 \mu\text{m}$  long.

Labrum (Fig. 20G) much broader than long, with concave posterior margin (round, spinule-bearing posterior process on both sides in Fig. 20G considered to be paragnaths). Mandible (Fig. 20H) with deep inner proximal notch. Inner margin bilobed; proximal lobe distinctly protruded but distal lobe almost linear. Convex side with digitiform process. Distal lash elongate. Maxillule (Fig. 20I) armed with subterminal seta directed laterally and 2 terminal broad setae. Maxilla (Fig. 21A) with broad but unarmed syncoxa. Basis narrow, with 2 setae of similar size, inner one spinulated. Distal lash long and ornamented with long spines along distal margin. Maxilliped (Fig. 21B) 3-segmented. Syncoxa unarmed. Basis with 2 subequal setae, 16 and  $13 \mu\text{m}$ . Endopod pointed at tip with spine and seta.

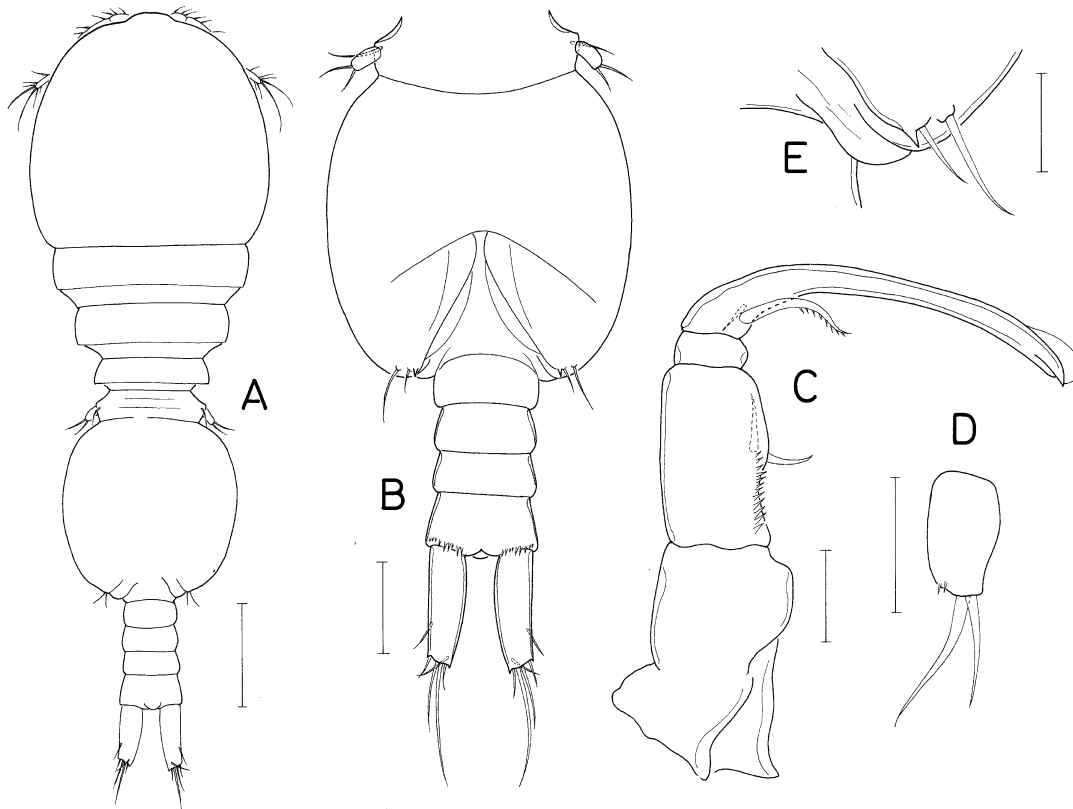
Legs 1–3 with 3-segmented rami. Legs 1 and 2 (Fig. 21C,



**Fig. 20.** *Jamescookina moluccensis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, labrum; H, mandible; I, maxillule. Scales: A, 0.1 mm; B, D, 0.05 mm; C, E-I, 0.02 mm.



**Fig. 21.** *Jamescookina moluccensis* n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, endopod of leg 3; F, leg 4; G, free segment of leg 5; H, right genital area. Scales: 0.02 mm for all.



**Fig. 22.** *Jamescookina moluccensis* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, maxilliped; D, free segment of leg 5; E, left posterolateral part of genital somite, ventral. Scales: A, 0.1 mm; B, 0.05 mm; C-E, 0.02 mm.

D) with acute terminal process on third endopodal segment. Legs 2 and 3 with pointed angle on inner posterior margin of basis (Fig. 21D, E). Inner coxal seta of leg 4 very small or absent (more commonly absent). Outer seta on basis of legs 1-4 naked. Second endopodal segment of leg 4 tapering, its terminal spine setiform. Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
 enp. 0-1; 0-1; I,1,4  
 Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,3  
 Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; 0-2; I,2  
 Leg 4: coxa 0-0 (1); basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; I

Free segment of leg 5 (Fig. 21G)  $69 \times 29 \mu\text{m}$ , 2.38 times as long as wide, with minute spinules in distal half; 2 terminal setae 27 and 22  $\mu\text{m}$ . Leg 6 represented by 2 small spiniform setae in genital area (Fig. 21H).

*Male.* Body (Fig. 22A) similar in form to that of female. Body length of dissected specimen 735  $\mu\text{m}$ . Mean body

length 707  $\mu\text{m}$  (687-735  $\mu\text{m}$ ) based on 6 specimens. Cephalothorax without dorsal suture line. Urosome (Fig. 22B) 6-segmented. Fifth pedigerous somite short and 112  $\mu\text{m}$  wide. Genital somite large, globular, and  $163 \times 167 \mu\text{m}$ . Four abdominal somites  $17 \times 57$ ,  $25 \times 57$ ,  $23 \times 57$ , and  $30 \times 62 \mu\text{m}$ , respectively. Caudal ramus  $67 \times 22 \mu\text{m}$ , 3.05 times as long as wide.

Rostrum as in female. Antennule with 3 additional aesthetascs: 2 on second and 1 on third segments as indicated by dots in Fig. 20E. Antenna and mouthparts, except for maxilliped, as in female. Maxilliped (Fig. 22C) with broad but unarmed syncoxa. Basis with 2 inner setae, each directed distally and laterally, and longitudinal row of spinules proximal to setae. Small endopod unarmed. Terminal claw 87  $\mu\text{m}$  long, proximally with pinnate seta, and setule.

Legs 1-4 armed as in female. Free segment of leg 5 (Fig. 22D) nearly quadrangular,  $18 \times 11 \mu\text{m}$ , with few minute spinules distally and 2 setae of 21 and 18  $\mu\text{m}$ , respectively. Leg 6 represented by 2 unequal setae and spiniform process on posterior corner of genital flap (Fig. 22E).

*Etymology.* Named after the Moluccas, the type locality.

*Remarks.* *Jamescookina moluccensis* n. sp. is very similar

to *J. exigua* Kim, 2003, known from New Caledonia. Both were found on the same host species *Echinopora lamellosa* (Esper). The differences between *J. moluccensis* and *J. exigua* are the 5-segmented antennule (6-segmented in *J. exigua*), the possession of a longer caudal ramus and the small pointed process on the inner posterior margin of the basis of legs 2 and 3, and the frequent absence of the inner coxal seta of leg 4.

Genus *Odontomolgus* Humes and Stock, 1972  
*Odontomolgus flammeus* n. sp. (Figs. 23, 24)

*Material examined.* Three ♀♀ from a scleractinian coral of *Fungia* sp. [*Fungia* (*Pleuraetis*) *paumotuensis* Stutchbury or *F. (Fungia) fungites* (Linnaeus)], depth 2 m, Naira, Banda Islands (4° 31'45''S, 129° 53'35''E), collected by A.G. Humes, 2 May 1975. Holotype (♀: USNM 1081635) and paratype (♀: USNM 1081636) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (♀) is kept in the collection of the author.

*Female.* Body (Fig. 23A) dorsoventrally deep. Length of dissected specimen 1.29 mm long. Greatest width 455 µm and greatest dorsoventral depth 422 µm. Prosome 733 µm long. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 23B) 5-segmented. Fifth pedigerous short and 244 µm wide. Genital double-somite 236 × 273 µm, large, posteriorly tapering, with rounded lateral margins. Genital areas closely positioned to each other near middle of dorsal surface. Three free abdominal somites gradually narrowed posteriorly, 73 × 129, 65 × 109, and 68 × 100 µm, respectively. Caudal rami parallel, widely separated; each ramus (Fig. 23C) 115 × 36 µm, 3.19 times as long as wide, with 6 naked setae, largest one 344 µm.

Rostrum short and strongly tapering (Fig. 23D). Antennule (Fig. 23E) 282 µm long, small, 7-segmented; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc; all setae naked. Antenna (Fig. 23F) stocky, 4-segmented. Coxobasis nearly as long as wide, with inner distal seta. First endopodal segment about 95 × 52 µm, with small inner seta. Second endopodal segment slightly wider than long, with 2 inner distal setae. Third endopodal segment about 29 × 21 µm and unarmed. Terminal claw 37 µm long and strongly curved.

Labrum lost. Mandible (Fig. 23G) with broad inner proximal notch. Inner margin weakly bilobed. Convex side with large process; this process longer than width of remaining part of mandible and tapering distally and proximally. Distal lash long and thin, with minute spinules along both margins. Maxillule (Fig. 23H) with 1 subter-

minal and 3 terminal setae, one terminal seta enlarged with setules on margins. Maxilla (Fig. 24A) with unarmed syncoxa. Basis with 2 setae: expanded digitiform anterior seta bearing pointed tip and smaller pectinated inner seta. Distal lash long and arched, with fine spinules along distal margin. Maxilliped (Fig. 24B) 3-segmented. Syncoxa unarmed. Basis with 2 inner setae of 19 and 8 µm, respectively. Endopod tapering with 2 setae and pointed tip bearing 2 or 3 minute spinules on both sides.

Legs 1-3 with 3-segmented rami (Fig. 24C, D). Leg 4 (Fig. 24F) with 3-segmented exopod and 2-segmented endopod. Outer setae on basis of legs 1-4 naked. Second endopodal segment of leg 4 37 × 20 µm, with setules on both margins; its 2 terminal spines unequal, 83 (inner) and 22 (outer) µm. Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4; enp. 0-1; 0-1; I,I,4
- Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5; enp. 0-1; 0-2; I,II,3
- Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5; enp. 0-1; 0-2; I,II,2
- Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5; enp. 0-1; II

Free segment of leg 5 (Fig. 24G) very small, 20 × 13 µm, with 2 terminal setae of 61 and 47 µm. Leg 6 represented by 2 small setae in genital area (Fig. 24H).

*Male.* Unknown.

*Etymology.* The specific name *flammeus* is a Latin meaning "flaming" which alludes to the large, flame-like broad seta on the maxillule.

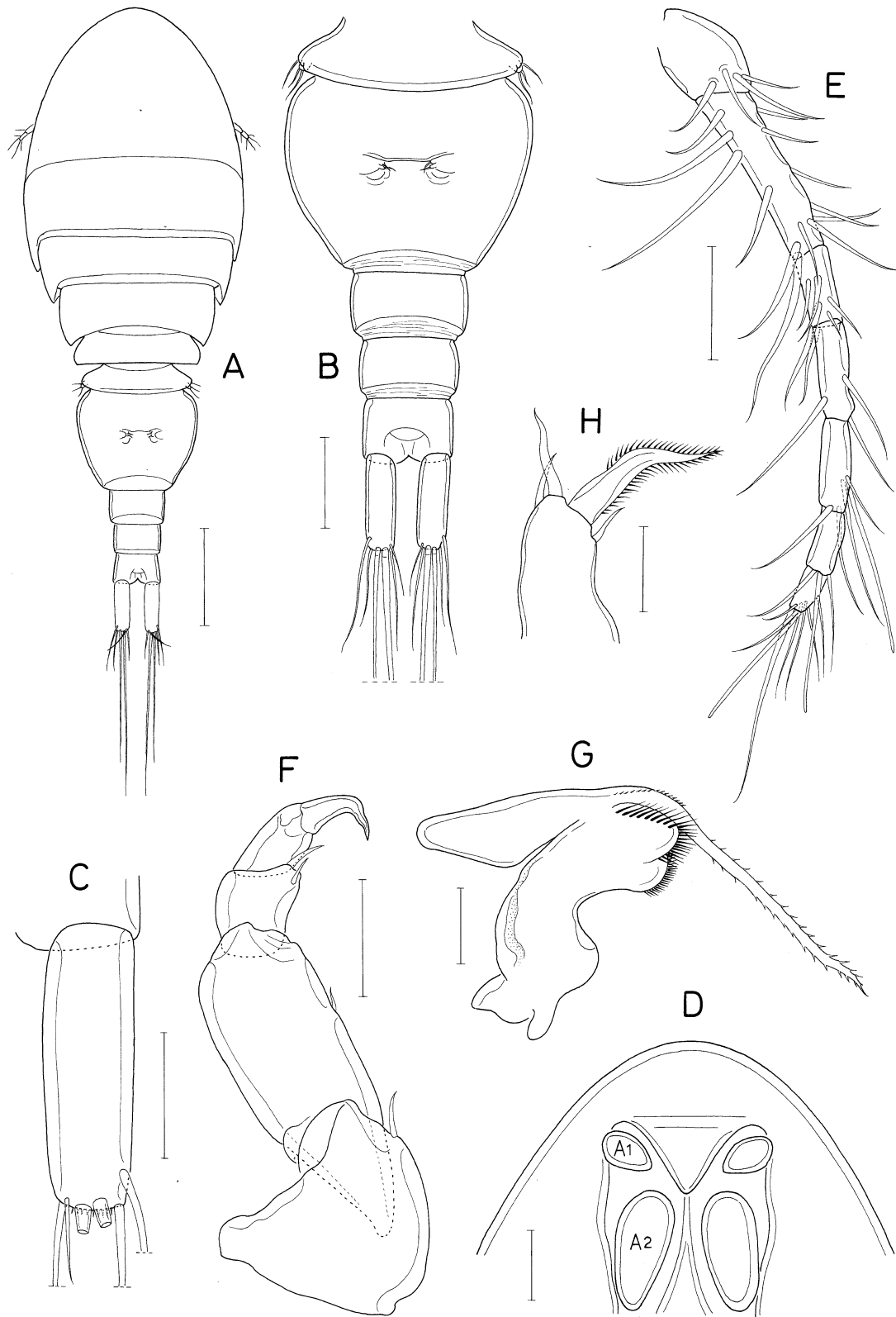
*Remarks.* *Odontomolgus flammeus* n. sp. possesses, as the most significant feature, the small free segment of leg 5, which is hardly observable with a low magnification of microscope. Such a small free segment is also known in *O. fultus* Humes, 1978, recorded from the Moluccas and *O. scitulus* Humes, 1973, recorded from New Caledonia.

*Odontomolgus scitulus* has genital areas located anteriorly, the tapering caudal rami, and the free segment of leg 5 which is more than twice as long as wide. *Odontomolgus fultus* has the shorter caudal rami which are 2.43 times as long as wide (3.19 times in *O. flammeus*) and genital areas widely isolated from each other. As a distinct feature of *O. flammeus*, one of apical setae on the maxillule is distinctly enlarged. The stout antenna and digitiform anterior seta on the basis of the maxilla are also diagnostic features of *O. flammeus*.

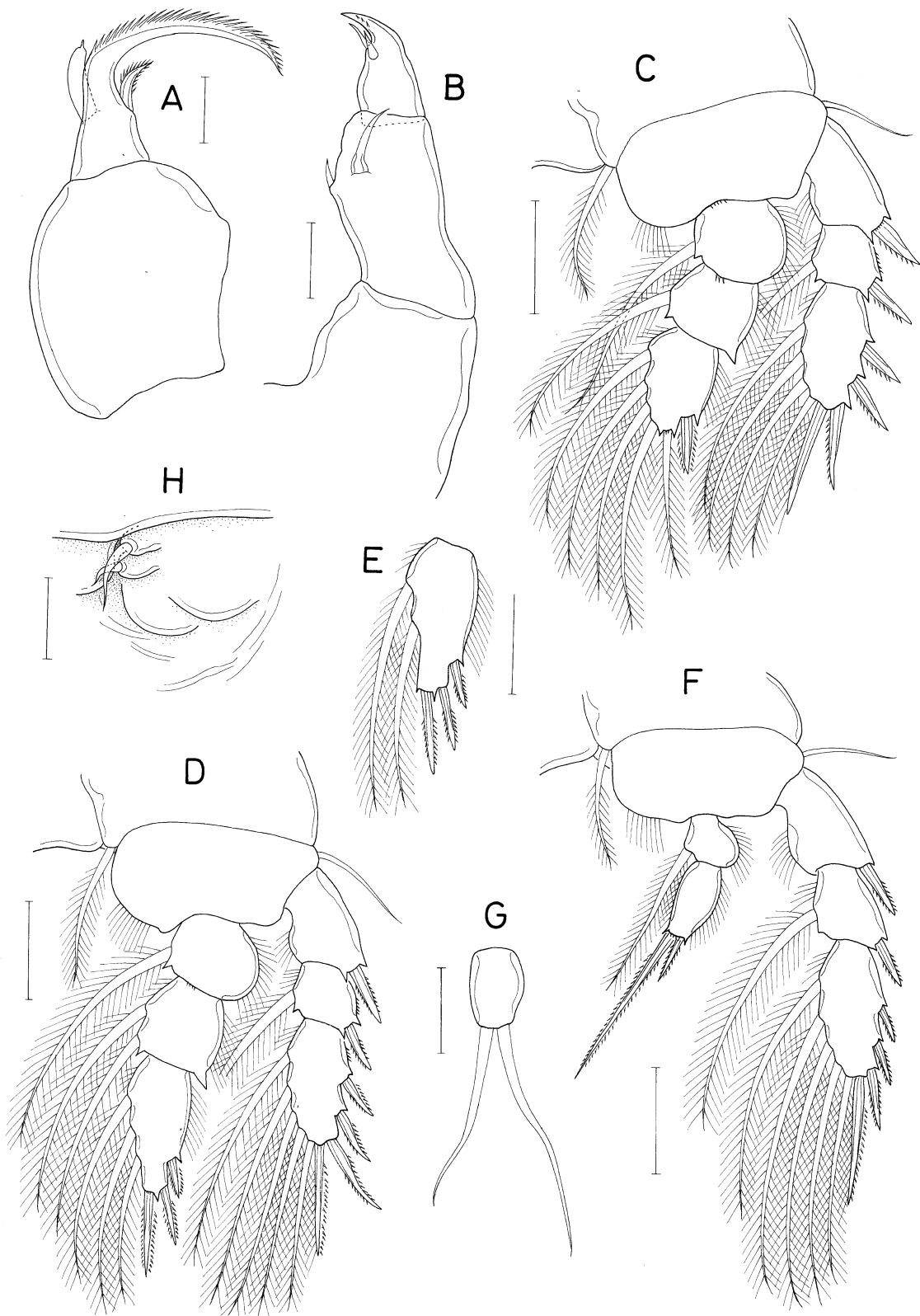
*Odontomolgus pavonus* n. sp. (Figs. 25-27)

*Material examined.* Twenty-two ♀♀, 13 ♂♂ from *Pavona*





**Fig. 23.** *Odontomolgus flammeus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, mandible; H, maxillule. Scales: A, 0.2 mm; B, 0.1 mm; C-F, 0.05 mm; G, H, 0.02 mm.



**Fig. 24.** *Odontomolgus flammeus* n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, third endopodal segment of leg 3; F, leg 4; G, free segment of leg 5; H, right genital area. Scales: A, B, G, H, 0.02 mm; C-F, 0.05 mm.

*danai* (Milne Edwards and Haime), depth 2 m, Natsepa, Ambon (3° 27'01''S, 128° 17'00''E), collected by A.G. Humes, 11 May 1975. Holotype (♀: USNM 1081632), allotype (♂: USNM 1081633), and paratypes (20 ♀♀, 11 ♂♂: USNM 1081634) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

**Female.** Body (Fig. 25A, B) narrow. Mean body length 1.18 mm (1.10–1.23 mm) based on 10 specimens. Body length of dissected specimen 1.18 mm. Prosoma dorsoventrally deeper than laterally wider, tapering in lateral view, with parallel lateral margins. Greatest width of prosoma 304 µm. Greatest depth of prosoma 375 µm. Cephalothorax with faint dorsal suture line between cephalosome and first pedigerous somite. Urosome (Fig. 25C) 5-segmented. Fifth pedigerous somite 160 µm wide, wider than genital double-somite. Genital double-somite 163 × 135 µm, with anterior lateral expansion and narrower posterior part. Genital areas positioned dorsally. Three free abdominal somites 63 × 81, 63 × 70, and 83 × 65 µm, respectively. Caudal ramus 107 × 26.7 µm, 4.01 times as long as wide, with parallel lateral margins and 6 setae; 2 median terminal setae distinctly larger than other 4 setae, naked but fringed with membranes on both margins in distal half (Fig. 25C).

Rostrum small, with obscure posterior apex (Fig. 25E). Antennule (Fig. 25F) 294 µm long and 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. Setae usually short and broad. Antenna (Fig. 25G) 4-segmented. Coxobasis and first endopodal segment about 70 × 42 and 100 × 30 µm, respectively, each with small inner seta. Second endopodal segment 34 × 27 µm, with 4 inner distal setae, one of them blunt, short and spiniform. Third endopodal segment shorter than second, 20 × 22 µm and unarmed. Terminal claw strong, 34 µm long and strongly curved.

Labrum (Fig. 25H) W-shaped, with shallow median incision and membrane on posterior margin of lobes. Mandible (Fig. 26A) with narrow inner proximal notch. Inner margin distinctly bilobed. Convex side with distinct, strongly tapering process. Distal lash elongate and crenulated on both margins. Maxillule (Fig. 26B) with 3 terminal setae bearing setules on all surfaces. Maxilla (Fig. 26C) with unarmed syncoxa. Basis narrow, with anterior seta, broad inner seta, and tubercle distal to inner seta. Distal lash confluent with segment, short, with 3 teeth and 2 small spinules distally. Maxilliped (Fig. 26D) 3-segmented. Syncoxa longest among segments but unarmed. Basis with 2 small setae of 9 and 4 µm. Endopod tapering, with seta, small, distally bifurcate spine, and blunt, digitiform terminal process bearing proximally several small blunt spinules.

Legs 1–3 with 3-segmented rami (Fig. 26E–G). Leg 4 (Fig. 26H) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1–4 relatively small and naked. Inner coxal seta of leg 4 minute and naked. Second endopodal segment of leg 4 45 × 17 µm; 2 terminal spines 44 and 24 µm. Armature formula of legs 1–4:

Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
 enp. 0-1; 0-1; I,I,4  
 Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,3  
 Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,2  
 Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; II

Free segment of leg 5 (Fig. 26I) 85 × 20 µm, 4.25 times as long as wide, proximally narrowed, with minute spinules on outer surface: 2 terminal setae small, 34 and 25 µm. Leg 6 represented by 2 small spiniform setae in genital area (Fig. 26J).

**Male.** Body (Fig. 27A) as in female, but without dorsal suture line between cephalosome and first pedigerous somite. Mean body length 1.08 mm (1.05–1.11 mm) based on 10 specimens. Body length of dissected specimen 1.05 mm. Prosoma 546 µm long. Cephalothorax 371 × 279 µm, without dorsal suture line. Urosome (Fig. 27B) 6-segmented. Fifth pedigerous somite 119 µm wide. Genital somite 187 × 170 µm, with rounded anterior and posterior corners. Four abdominal somites 38 × 60, 54 × 58, 45 × 56, and 52 × 54 µm, respectively. Caudal ramus 83 × 25 µm, 3.32 times as long as wide.

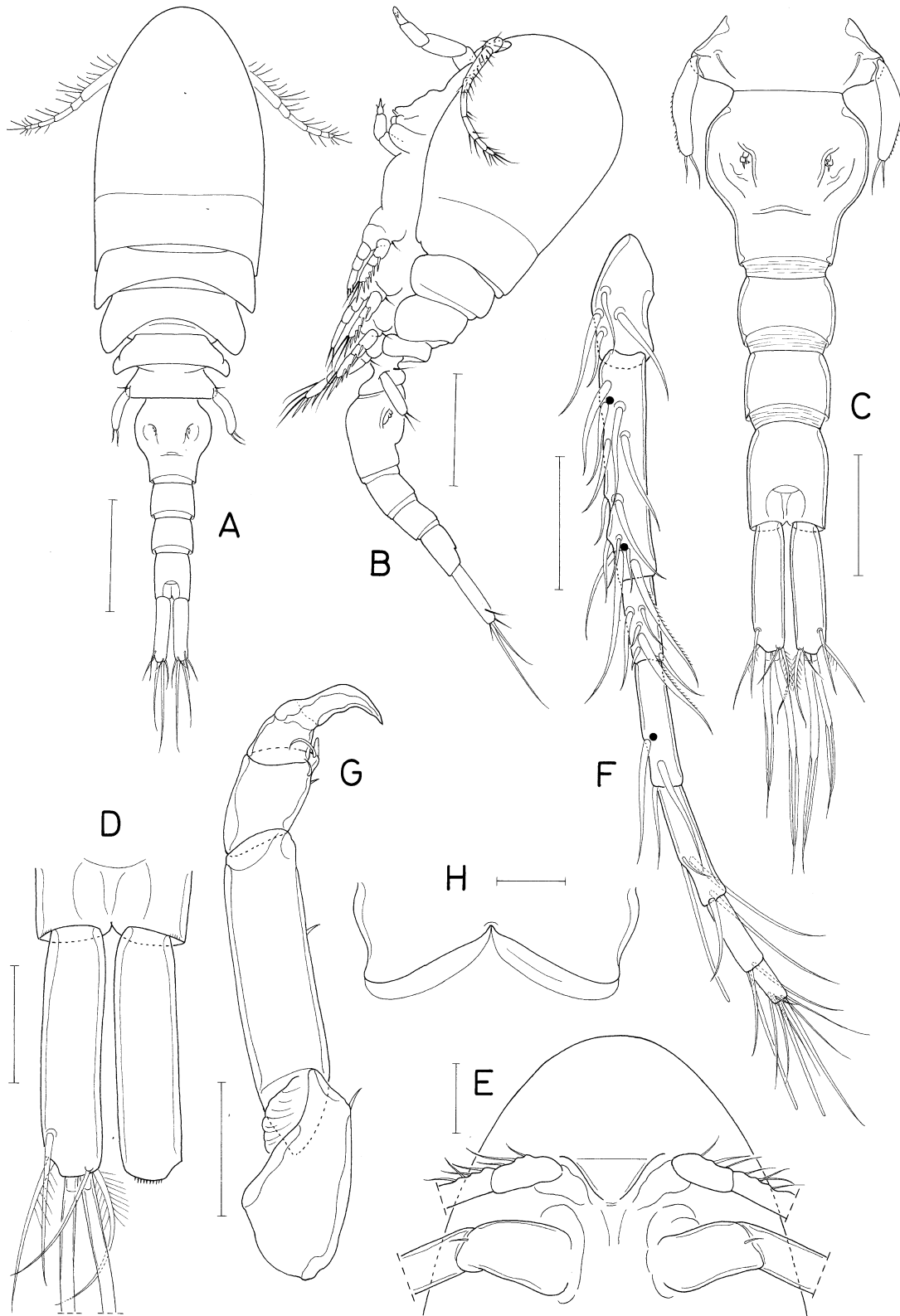
Rostrum as in female. Antennule with 3 additional aesthetascs, 2 on second and 1 on fourth segment, as indicated by dots in Fig. 25F. Antenna (Fig. 27C) with several scales on inner side of first endopodal segment.

Mouthparts as in female, except for maxilliped. Maxilliped (Fig. 27D) with distally expanded syncoxa. Basis with longitudinal row of spinules, 2 small subequal inner setae, and small tubercle bearing spinules. Endopod small, unarmed. Terminal claw 161 µm long, proximally with seta and setule.

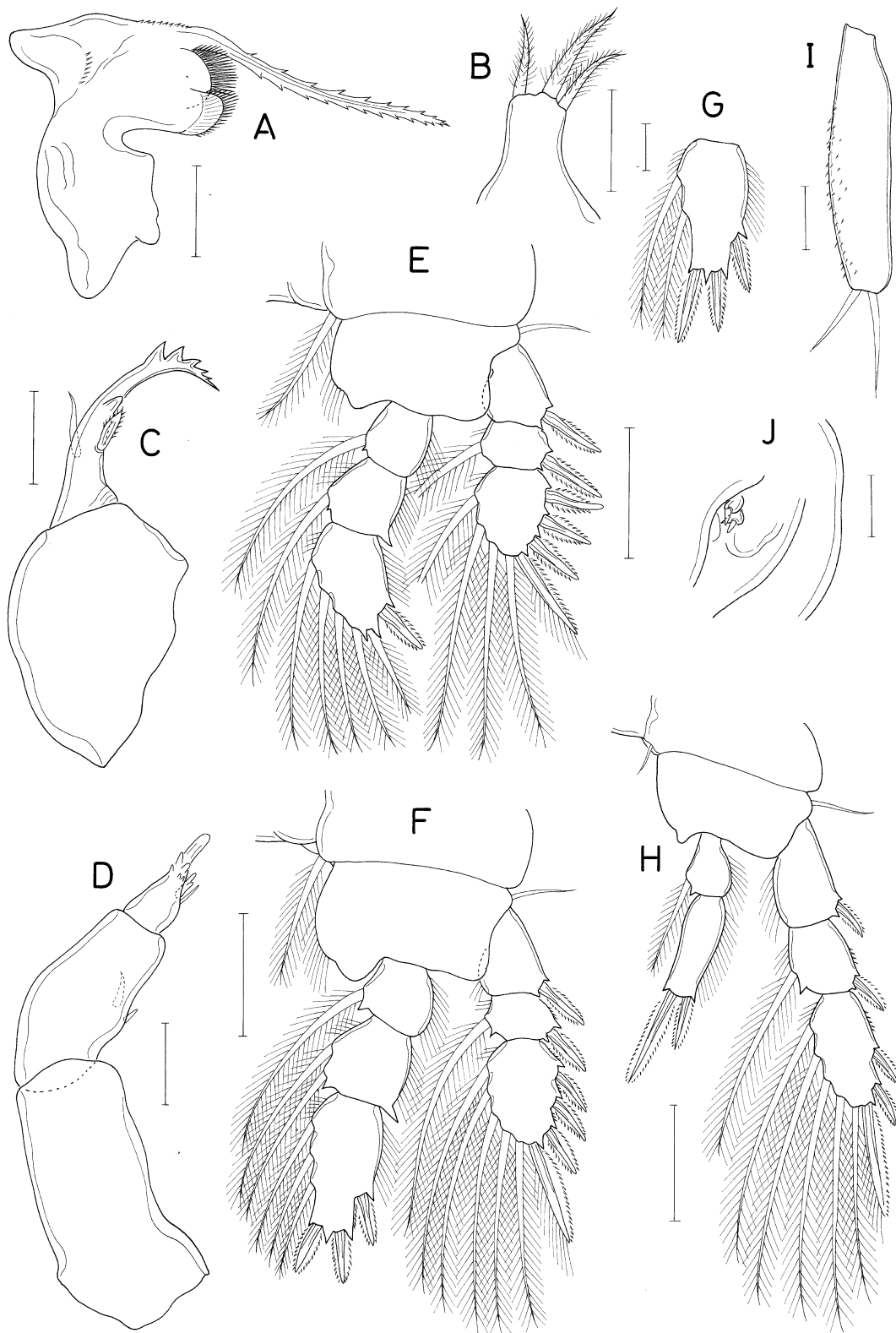
Legs 1–4 as in female, except for third endopodal segment of leg 1 bearing 2 spines and 4 setae (Fig. 27E). Free segment of leg 5 (Fig. 27F) 38 × 13 µm, slightly tapering distally, with 2 terminal setae, 33 and 26 µm. Leg 6 represented by 2 small setae on posterior corner of genital flap (Fig. 27B).

**Etymology.** Named after the generic name of the scleractinian host, *Pavona danai*.

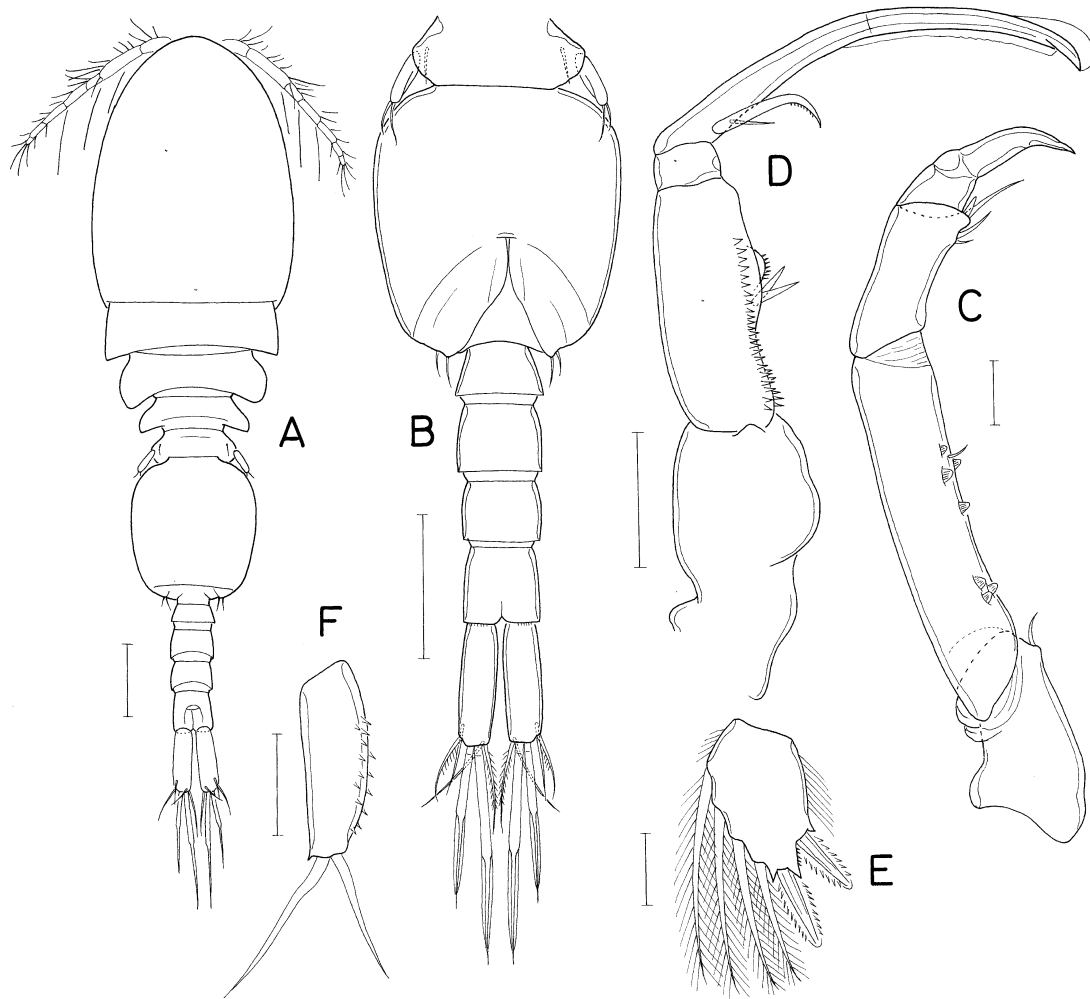
**Remarks.** Several species of *Odontomolgus* have, as the new species does, a characteristically narrow body. These



**Fig. 25.** *Odontomolgus pavonus* n. sp., female. A, habitus, dorsal; B, habitus, lateral; C, urosome, dorsal; D, caudal rami, dorsal; E, rostral area, ventral; F, antennule (dots indicating positions of additional aesthetascs in male); G, antenna; H, labrum. Scales: A, B, 0.2 mm; C, 0.1 mm; D-G, 0.05 mm; H, 0.02 mm.



**Fig. 26.** *Odontomolgus pavonus* n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, third endopodal segment of leg 3; H, leg 4; I, free segment of leg 5; J, right genital area. Scales: A-D, G, I, J, 0.02 mm; E, F, H, 0.05 mm.



**Fig. 27.** *Odontomolgus pavonus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, maxilliped; E, third endopodal segment of leg 1; F, free segment of leg 5. Scales: A, B, 0.1 mm; C-F, 0.02 mm.

species include *O. decens* Humes, 1978, *O. fultus* Humes, 1978, *O. scitulus* Humes, 1973, *O. bulbalis* Humes, 1991, and *O. pumilus* Humes, 1992. Of these, only *O. bulbalis* and *O. pumilus* are comparable with *O. pavonus* n. sp. in having three spines and five setae (armature formula II,I,5) on the third exopodal segment of leg 4 (other three species have an armature formula III,I,5). *Odontomolgus pavonus* can be distinguished from these two species by the absence of the following features exhibited by them.

In *O. bulbalis*, the third endopodal segment of antenna is 57  $\mu\text{m}$  long (Humes, 1991b) and longer than twice length of the second endopodal segment, and the caudal ramus of the female is 65  $\times$  29  $\mu\text{m}$  (ratio 2.24 : 1) in contrast to 107  $\times$  26.7  $\mu\text{m}$  (ratio 4.01 : 1) of *O. pavonus*.

In *O. pumilus*, the body is small, only 0.69-0.78 mm in the female, and the free segment of female leg 5 is 57  $\times$  9

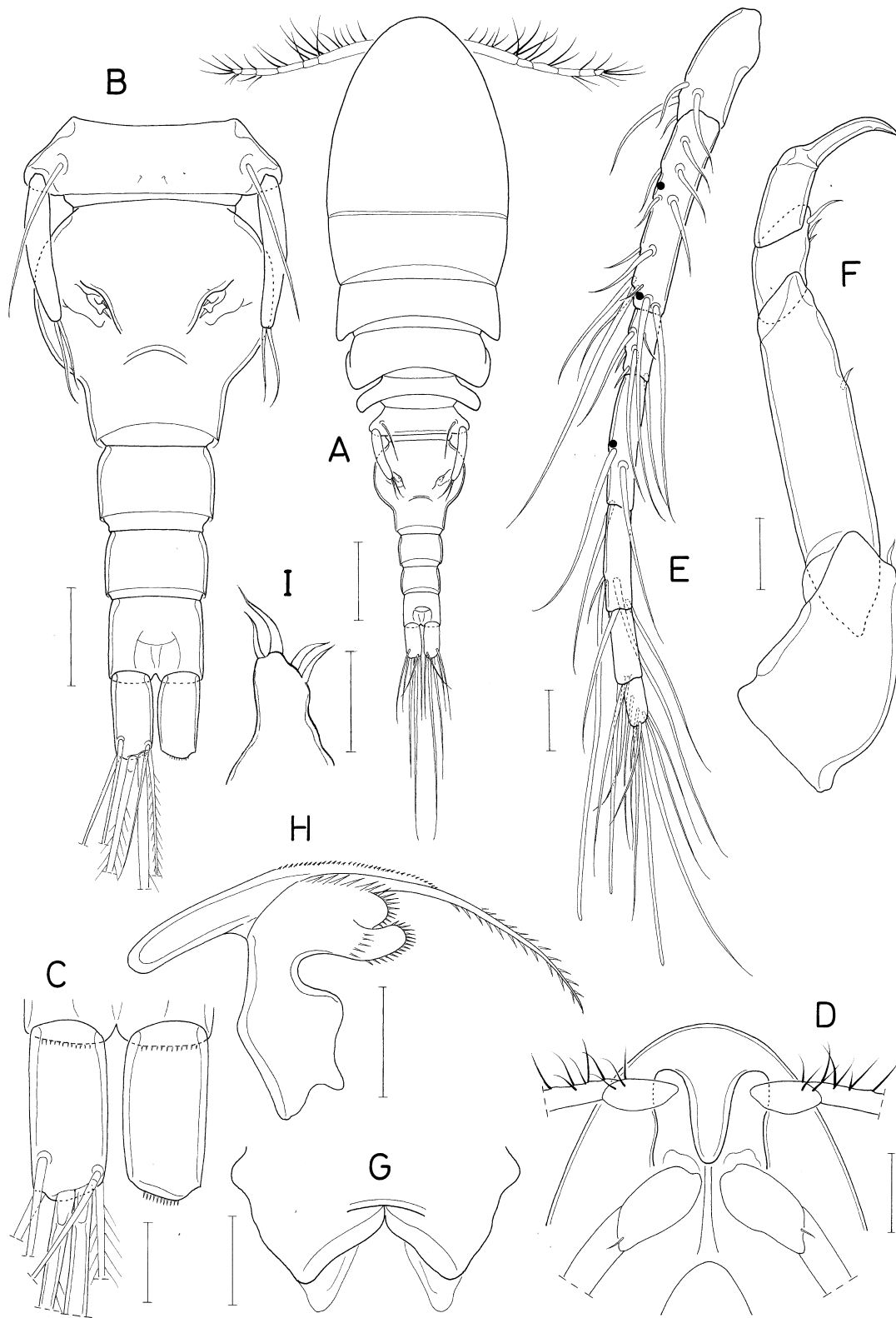
$\mu\text{m}$  (ratio 6.33 : 1) (Humes, 1992a), a dimension different from 85  $\times$  20  $\mu\text{m}$  (ratio 4.25 : 1) of *O. pavonus*.

As the diagnostic features of *O. pavonus*, the two median terminal setae of the caudal ramus bear membranous margins on the distal half and the basis of the maxilla bears proximally a tubercle. These two features are not observable in hitherto known species of the genus.

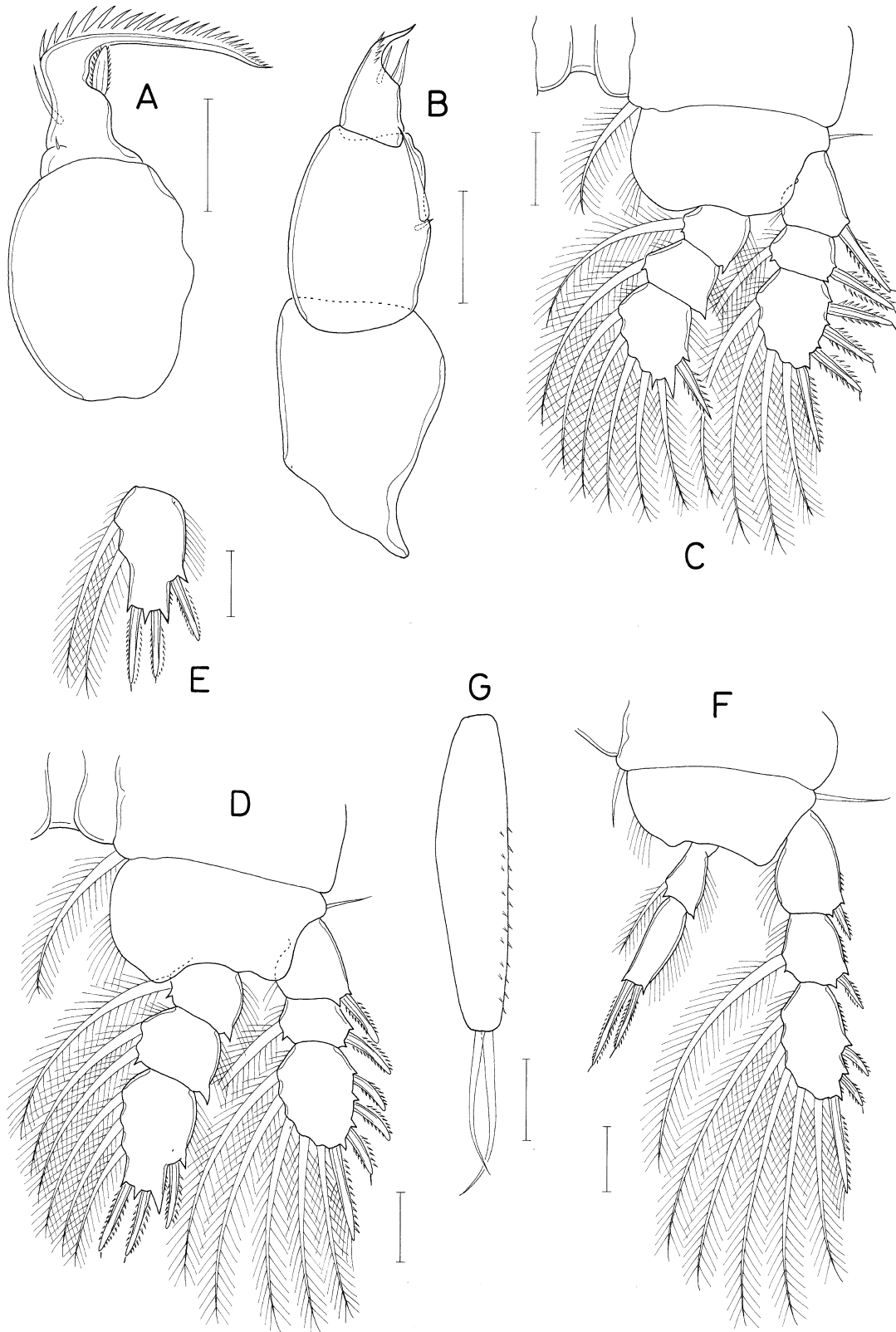
It is notable that *O. pavonus* has a less prominent process on the convex side of the mandible, therefore this species is similar to some members of *Anchimolgus*, such as *A. angustus* (Humes, 1992) which has also a narrow body and a similar maxilla.

***Odontomolgus parvus* n. sp. (Figs. 28-30)**

*Material examined.* Thirty-seven ♀♀, 28 ♂♂ from the

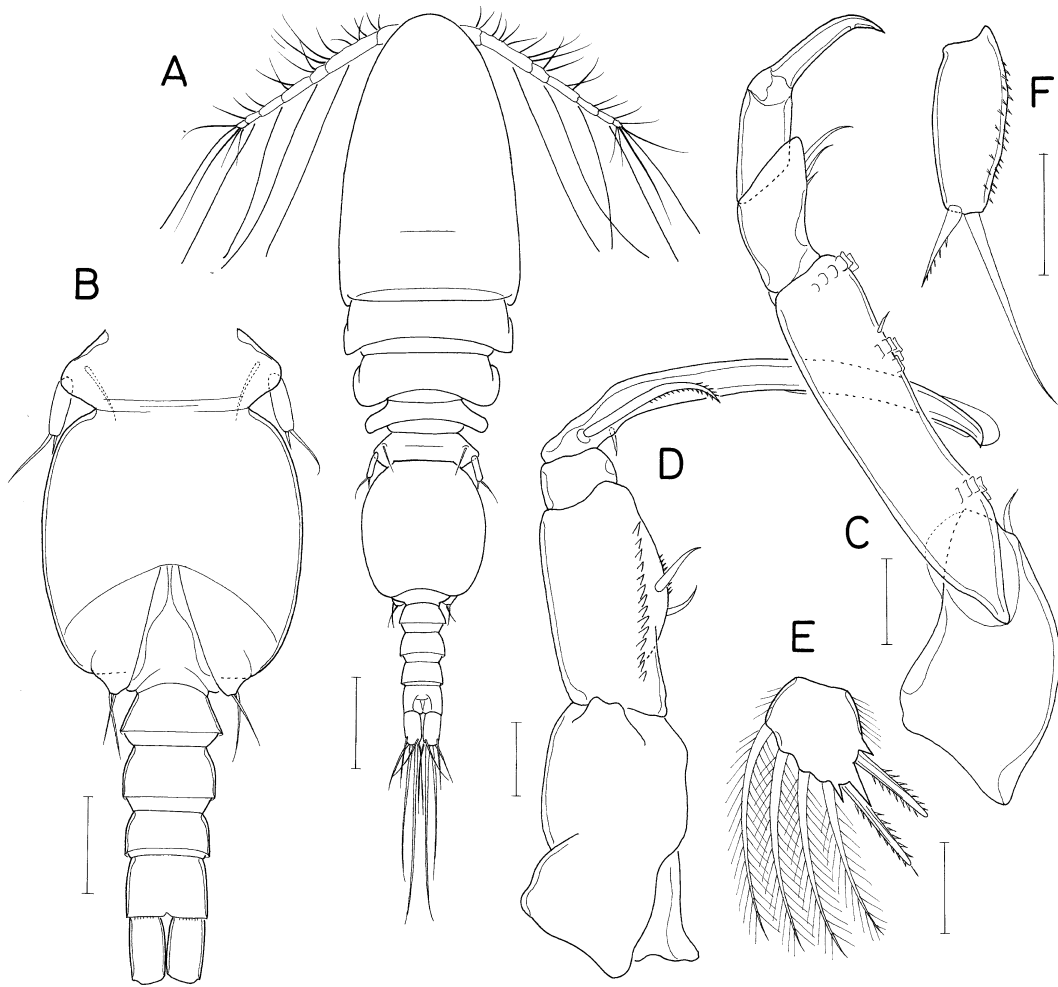


**Fig. 28.** *Odontomolgus parvus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, labrum; H, mandible; I, maxillule. Scales: A, 0.1 mm; B, D, 0.05 mm; C, E-I, 0.02 mm



**Fig. 29.** *Odontomolgus parvus* n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, third endopodal segment of leg 3; F, leg 4; G, free segment of leg 4. Scales: 0.02 mm for all.





**Fig. 30.** *Odontomolgus parvus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, maxilliped; E, third endopodal segment of leg 1; F, free segment of leg 5. Scales: A, 0.1 mm; B, 0.05 mm; C-F, 0.02 mm.

scleractinian coral *Goniastrea retiformis* (Lamarck), depth 2 m, Parang Island, eastern Ceram (3° 17'00"S, 130° 44'48"E), collected by A.G. Humes, 23 May 1975. Holotype (♀: USNM 1081637), allotype (♂: USNM 1081638), and paratypes (35 ♀♀, 26 ♂♂: USNM 1081640) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

**Female.** Body (Fig. 28A) small and narrow. Mean body length 810 μm (785–830 μm) based on 10 specimens. Body length of dissected specimen 817 μm. Greatest width 233 μm. Prosome 497 μm long, more than twice as long as wide. Cephalothorax with faint dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 28B) 5-segmented. Fifth pedigerous somite 128 μm wide,

wider than genital double-somite. Genital double-somite 120 × 120 μm, with strongly expanded anterior part and narrower posterior part. Genital areas positioned dorsally. Three free abdominal somites 42 × 59, 35 × 52, and 40 × 47 μm, respectively. Caudal ramus broad, 45 × 20 μm, 2.25 times as long as wide, with parallel lateral margins (Fig. 28C) and 6 caudal setae. Inner distal and 2 median terminal setae plumose, other three setae naked; largest seta 233 μm long.

Rostrum long, twice as long as wide, with rounded posterior apex (Fig. 28D). Antennule (Fig. 28E) slender, 245 μm long, 7-segmented; armature formula 4, 13, 6, 3, 4 + aesthetasc, 2 + aesthetasc, and 7 + aesthetasc. All setae naked. Antenna (Fig. 28F) 4-segmented and gradually narrowed distally. Coxobasis and first endopodal segment about 63 × 39 and 77 × 23 μm, respectively, each with small inner seta.

Second endopodal segment  $21 \times 17 \mu\text{m}$ , with 3 inner distal setae. Third endopodal segment slightly longer than second,  $23 \times 13 \mu\text{m}$  and unarmed. Terminal claw  $28 \mu\text{m}$  long and distally curved.

Labrum (Fig. 28G) with strongly tapering posterior lobes, each lobe with tapering membrane on posterior margin. Mandible (Fig. 28H) with deep inner proximal notch. Inner margin distinctly bilobed; proximal lobe extending beyond distal lobe. Convex side with elongate, digitiform process; this process more than 3 times as long as wide. Distal lash elongate and thin, with spinules on margins. Maxillule (Fig. 28I) with 2 terminal setae, subterminal seta, and subterminal setiform process. Maxilla (Fig. 29A) with unarmed syncoxa. Basis with minute proximal seta, simple anterior seta, and foliaceous inner seta. Distal lash forming right angle to segment, long, with spinule along distal margin. Maxilliped (Fig. 29B) 3-segmented, stocky. Syncoxa gradually broadened distally and unarmed. Basis with 2 unequal setae of  $17$  and  $4 \mu\text{m}$ , larger distal one directed distally. Endopod with seta and spine, and terminated by long, acute process bearing proximally several spinules on both sides.

Legs 1-3 with 3-segmented rami (Fig. 29C-E). Leg 4 (Fig. 29F) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 and inner coxal seta of leg 4 small and naked. Second endopodal segment of leg 4  $28 \times 10 \mu\text{m}$ , 2 terminal spines  $28$  and  $21 \mu\text{m}$ , and tipped by small flagellum. Armature formula of legs 1-4 as in preceding species.

Free segment of leg 5 (Fig. 29G) slightly expanded near middle,  $77 \times 18 \mu\text{m}$ , 4.28 times as long as wide, with minute spinules on outer surface, without proximal expansion; 2 terminal setae  $43$  and  $37 \mu\text{m}$ . Leg 6 represented by 2 small spiniform setae in genital area (Fig. 28B).

**Male.** Body (Fig. 30A) as in female, but dorsal suture line vestigial between cephalosome and first pedigerous somite. Mean body length  $783 \mu\text{m}$  ( $746$ - $850 \mu\text{m}$ ) based on 10 specimens. Body length of dissected specimen  $804 \mu\text{m}$ . Prosome  $461 \mu\text{m}$  long. Cephalothorax  $318 \times 200 \mu\text{m}$ , with vestigial dorsal suture line confined to middle. Urosome (Fig. 30B) 6-segmented. Fifth pedigerous somite  $113 \mu\text{m}$  wide. Genital somite  $147 \times 133 \mu\text{m}$ , with rounded anterior and posterior corners. Four abdominal somites  $27 \times 53$ ,  $33 \times 48$ ,  $23 \times 45$ , and  $32 \times 42 \mu\text{m}$ , respectively. Caudal ramus  $33 \times 19 \mu\text{m}$ , 1.74 times as long as wide.

Rostrum as in female. Antennule with 3 additional aesthetascs, 2 on second and 1 on fourth segment, as indicated by dots in Fig. 28E. Aesthetascs on antennule very long, usually longer than antennule itself. Antenna (Fig. 30C) with 3 transverse rows (proximal, subdistal and distal) of truncate scales on inner surface of first endopodal segment.

Mouthparts as in female, except for maxilliped. Maxil-

iped (Fig. 30D) with unarmed syncoxa. Basis segment with longitudinal row of spinules and 2 subequal inner setae. Endopod small and unarmed. Terminal claw evenly curved, proximally with seta and setule.

Legs 1-4 as in female, except for third endopodal segment of leg 1 bearing 2 spines and 4 setae (Fig. 30E). Free segment of leg 5 (Fig. 30F)  $30 \times 12 \mu\text{m}$ , slightly expanded in middle, with 2 terminal setae of  $35$  and  $13 \mu\text{m}$ . Leg 6 represented by 2 setae on posterior corners of genital flap (Fig. 30B).

**Etymology.** The name *parvus* ("small" in Latin) refers to the small body size of the species.

**Remarks.** Species of *Odontomolgus* may be divided into two groups: (1) two terminal spines on the second endopodal segment of leg 4 are significantly different in size, i.e., the larger inner spine is more than twice as long as the smaller outer one, as in *O. decens* Humes, 1978, *O. fultus* Humes, 1978, *O. scitulus* Humes, 1973, *O. flammeus* (described in the present paper), *O. pumilus* Humes, 1992 and *O. campulus* (Humes and Ho, 1968); (2) in other species of the genus, these two spines are subequal, i.e., the larger spine is less than twice as long as the smaller one, as in *Odontomolgus parvus* n. sp. Within this second group of species, *O. parvus* is similar to *O. bulbalis* Humes, 1991, and the preceding *O. pavonus* in having a narrow body.

*Odontomolgus parvus* is distinguished from *O. bulbalis* by having the third endopodal segment of the antenna which is only slightly longer than the second (distinctly longer in *O. bulbalis*), the smaller body (*O. bulbalis* is 1.19-1.27 mm long in the female, according to Humes, 1991b), and the rostrum which is elongated posteriorly, about twice as long as wide (as long as wide in *O. bulbalis* according to illustration by Humes, 1991b).

*Odontomolgus parvus* is also distinguished from *O. pavonus* by having the shorter caudal rami which is 2.25 times as long as wide (4.01 times as long in *O. pavonus*), the much more pronounced process on the convex side of the mandible, the maxillule bearing 4 elements (3 in *O. pavonus*), and the different shape of the maxilla.

#### ***Paranchimolgus* n. gen.**

**Diagnosis.** Body narrow. Urosome 5-segmented. Antennule 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc in female. Male antennule with 3 additional aesthetascs: 2 on second and 1 on fourth segments. Antenna 4-segmented, armature formula 1, 1, 3, 0+claw. Labrum with semi-circular posterior lobes. Mandible with deep inner proximal notch and bilobed inner margin. Distal lash of maxilla strongly reflexed. Female maxilliped 3-segmented, endopod (third segment)

bearing 2 setae and pointed tip. Male maxilliped consisting of 3 segments and long terminal claw. Legs 1-3 with 3-segmented rami. Third endopodal segment of leg 1 armed with 2 spines and 4 setae (formula I,I,4) in both sexes. Third exopodal segment of leg 3 armed with 3 spines and 5 setae (formula II,I,5). Leg 4 with 3-segment exopod and 2-segmented endopod. Endopod of leg 4 with armature formula 0-1; II.

*Type species. Paranchimoligus parallelus* n. sp.

*Etymology.* The generic name *Paranchimoligus* alludes to the close relationship with the genus *Anchimoligus* (the Latin *par* means "similar").

*Remarks.* With the two convex lobes of the inner margin of the mandible, this genus belongs to the family Anchimolgidae. Within the Anchimolgidae, *Paranchimoligus* n. gen. is similar to *Anchimoligus*. Both genera have in common the four-segmented antenna and unmodified mandible (without prominent process on the convex margin) and maxilla (without any process on the first segment). However, *Paranchimoligus* differs from *Anchimoligus* in having only three spines and five setae (lacking one outer spine) on the third exopodal segment of leg 3. Interestingly, the genus *Exodontomoligus* described in the present work, which is discovered simultaneously from the same host, along with *Paranchimoligus*, has the same setation on the same segment of leg 3, but because the mandibles differ between the two species, the similarities of the leg setation and other morphologies are considered to be homoplasies resulting from the adoption of a same species of host.

### ***Paranchimoligus parallelus* n. sp. (Figs. 31-33)**

*Material examined.* Twelve ♀♀, 5♂♂ from the scleractinian coral *Alveopora mortenseni* Crossland, depth 3 m, Karang Mie (00° 20'07"S, 128° 25'00"E), collected by A.G. Humes, 19 May 1975. Holotype (♀: USNM 1081664), allotype (♂: USNM 1081665), and paratypes (10♀♀, 2♂♂: USNM 1081666) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1♀, 2♂♂) are kept in the collection of the author.

*Female.* Body (Fig. 31A) narrow, with weak exoskeleton. Mean body length 1.27 mm (1.21-1.33 mm) based on 10 specimens. Body length of dissected specimen 1.22 mm. Prosome 632 µm long, with parallel lateral margins. Cephalothorax divided into cephalosome and first pedigerous somite by dorsal suture line and lateral constrictions. Second and third pedigerous somites delimited by lateral constriction, without suture line between them. Urosome tapering (Fig 31C), and reflexed dorsally (Fig. 31B). Fifth pedigerous somite 235 µm wide, wider than next somite,

with short, broad process near base of free segment of leg 5. Genital double-somite nearly circular in dorsal view and 195 × 210 µm. Genital areas small, positioned dorsally. Three free abdominal somites 77 × 108, 65 × 87, and 55 × 78 µm, respectively. Anal somite with spinules on postero-ventral margin. Caudal rami slightly divergent. Each ramus (Fig. 31D) 105 × 28 µm, 3.75 times as long as wide, with 6 naked setae and 3 small, terminal spinules; outer lateral seta located in middle of lateral margin; largest terminal seta 163 µm long. Egg sac (Fig. 31E) approximately 427 × 227 µm. Eggs loosely aggregated. Each egg 127 µm in diameter.

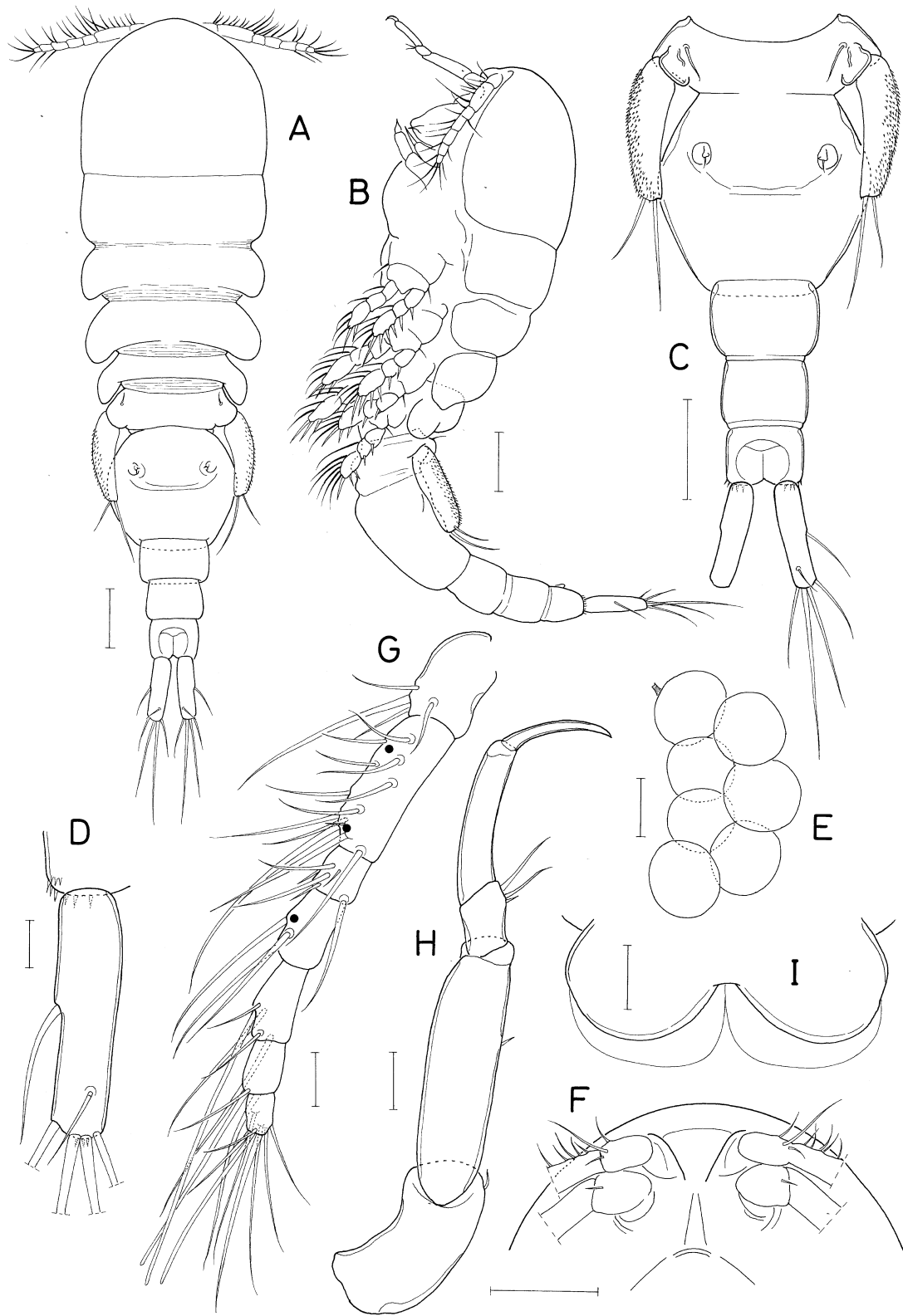
Rostrum obscure (Fig. 31F). Antennule (Fig. 31G) 206 µm long, 7-segmented; armature formula 4, 13, 6, 3, 4+ aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked; some of them distinctly longer than others. Antenna (Fig. 31H) 4-segmented. Coxobasis and first endopodal segment 55 × 29 and 80 × 25 µm, respectively, each with small inner seta. Second endopodal segment 20 × 17 µm, with 3 inner distal setae, proximal one of them minute. Third endopodal segment 50 × 14 µm, unarmed, and distinctly narrower than proximal segments. Terminal claw markedly slender, weakly curved, 38 µm long.

Labrum (Fig. 31I) with semi-circular posterior lobes bearing broad membrane on posterior margin. Mandible (Fig. 32A) with deep, broad proximal notch. Inner margin bilobed. Convex side with narrow, wing-like expansion bearing row of minute spinules. Distal lash long and serrated. Maxillule (Fig. 32B) with 3 terminal naked setae, middle one distinctly larger than other 2 setae. Maxilla (Fig. 32C) with distally narrowed, unarmed syncoxa. Basis tapering and narrow, with 2 setae; inner seta simple, smaller than anterior seta. Distal lash slender, forming right angle with segment, with characteristic arrangement of spinules on distal margin: largest proximal spine followed by 2 minute spinules and row of small spinules. Maxilliped (Fig. 32D) 3-segmented. Syncoxa broadest among segments but unarmed. Basis with 2 small inner setae 11 and 5 µm. Endopod distinctly tapering, with 2 small setae and pointed tip.

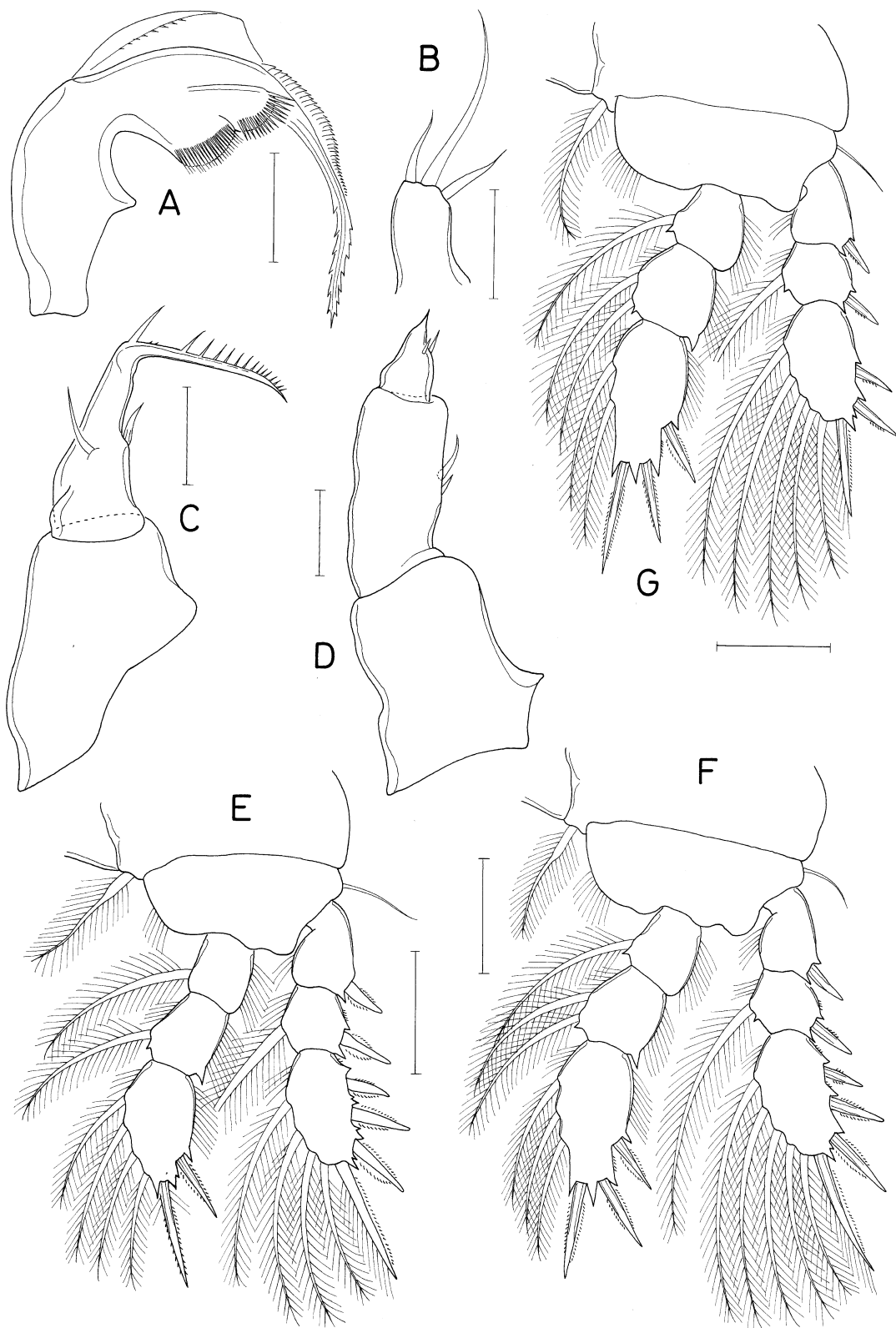
Legs 1-3 (Fig. 32E-G) with 3-segmented rami. Third endopodal segment of leg 1 armed with 2 spines and 4 setae. Third exopodal segment of leg 3 armed with 3 spines and 5 setae as in leg 4. Outer seta of legs 1-4 small and naked. Inner coxal seta of legs 1-3 proximally thicker than remaining distal part. Leg 4 (Fig. 33A) with 3-segmented exopod and 2-segmented endopod, without inner coxal seta; second endopodal segment of leg 4 slightly swollen, 57 × 27 µm, terminally with 3 sharp processes, and 2 spines of 62 and 36 µm long. Armature formula of legs 1-4:

Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,I,4

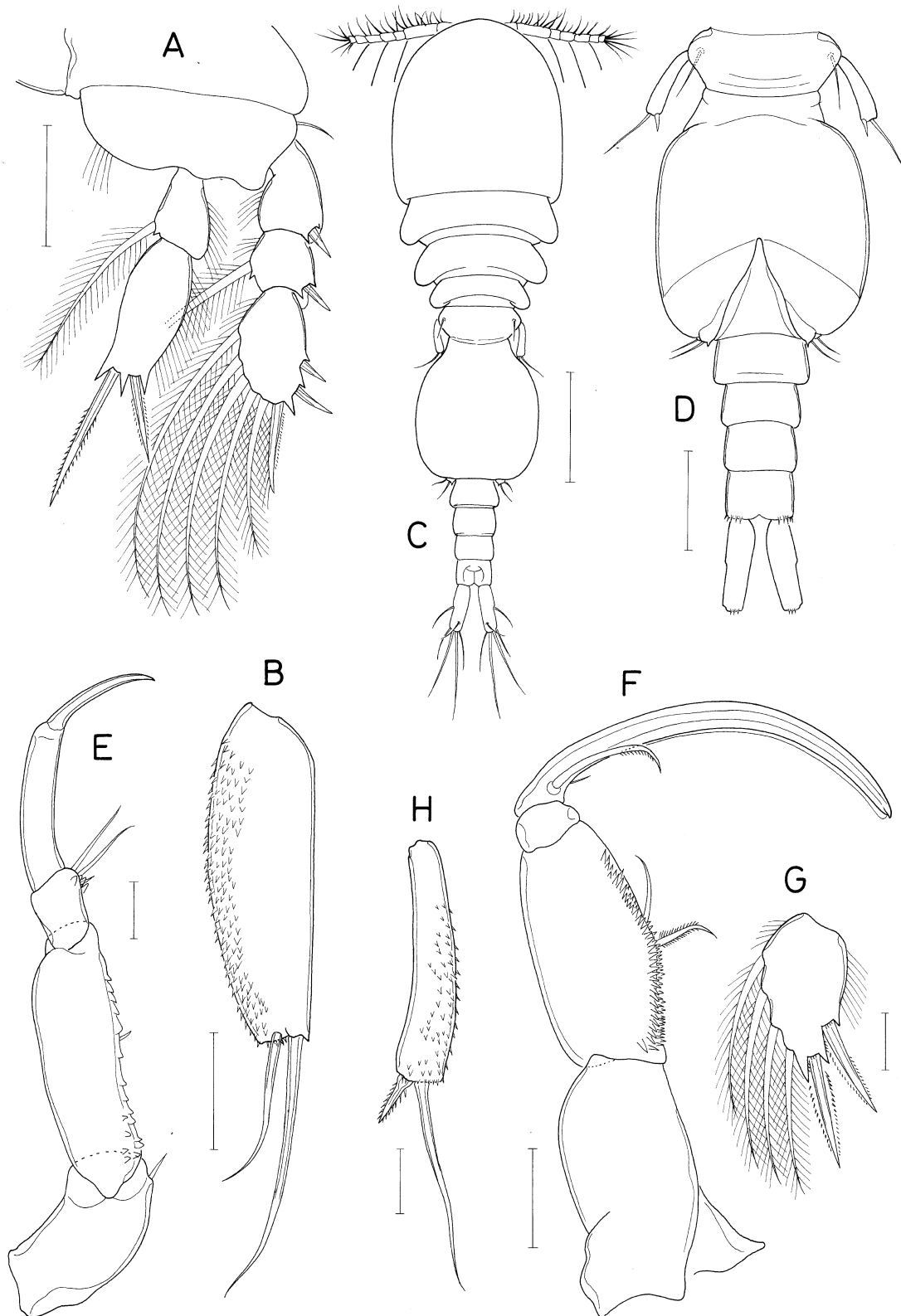
Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;



**Fig. 31.** *Paranchimoligus parallelus* n. gen., n. sp., female. A, habitus, dorsal; B, habitus, lateral; C, urosome, dorsal; D, left caudal ramus, dorsal; E, egg sac; F, rostral area, ventral; G, antennule (dots indicating positions of additional aesthetascs in male); H, antenna; I, labrum. Scales: A-C, E, F, 0.1 mm; D, G-I, 0.02 mm.



**Fig. 32.** *Paranchimolgus parallelus* n. gen., n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, leg 3. Scales: A-D, 0.02 mm; E-G, 0.05 mm.



**Fig. 33.** *Paranchimolgus parallelus* n. gen., n. sp. Female: A, leg 5; B, free segment of leg 5. Male: C, habitus, dorsal; D, urosome, ventral; E, antenna; F, maxilliped; G, third endopodal segment of leg 1; H, free segment of leg 5. Scales: A, B, F, 0.05 mm; C, 0.2 mm; D, 0.1 mm; E, G, H, 0.02 mm.

enp. 0-1; 0-2; I,II,3

Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;

enp. 0-1; 0-2; I,II,2

Leg 4: coxa 0-0; basis 1-0; exp. I-0; I-1; II,I,5;

enp. 0-1; II

Free segment of leg 5 (Fig. 33B)  $145 \times 46 \mu\text{m}$ , 3.15 times as long as wide, with straight inner margin, convex outer margin, numerous spinules on outer surface; 2 terminal seta 117 and  $70 \mu\text{m}$ . Leg 6 represented by small seta in genital area (Fig. 31C).

*Male*. Body (Fig. 33C) similar to that of female, but without dorsal suture line between cephalosome and first pedigerous somite. Body length of dissected specimen 1.11 mm. Greatest width  $309 \mu\text{m}$ . Cephalothorax without dorsal suture line or lateral constriction. Urosome (Fig. 33D) 6-segmented. Fifth pedigerous somite distinctly narrower than next somite. Genital somite large,  $247 \times 210 \mu\text{m}$ . Four abdominal somites  $43 \times 94$ ,  $42 \times 80$ ,  $47 \times 73$ , and  $47 \times 67 \mu\text{m}$ , respectively. Caudal ramus  $90 \times 27 \mu\text{m}$ , 3.33 times as long as wide.

Rostrum as in female. Antennule with 3 additional aesthetascs, 2 on second and 1 on fourth segment, as indicated by dots in Fig. 31G. Antenna (Fig. 33E) with scale-like prominences on inner margin of first and second segments of endopod.

Mouthparts as in female, except for maxilliped. Maxilliped (Fig. 33F) with unarmed syncoxa. Basis slightly expanded near middle, with 3 rows of spinules (one row limited to proximal half of basis) and 2 inner setae of similar length, proximal one of latter with spinules on margins. Small endopod unarmed. Terminal claw  $188 \mu\text{m}$  long and strongly curved, proximally with seta and setule.

Legs 1-4 with armature formula identical to that of female. Free segment of leg 5 (Fig. 33H)  $75 \times 15 \mu\text{m}$ , 5.0 times as long as wide, gradually broadened distally, and armed terminally with small spine ( $17 \mu\text{m}$ ) and long seta ( $67 \mu\text{m}$ ). Leg 6 represented by 2 small setae on posterior corners of genital flap (Fig. 33D).

*Etymology*. The specific name *parallelus* ("parallel" in Latin) is derived from the parallel lateral margins of the prosome.

*Remarks*. The absence of the sexual dimorphism in legs 1-4, including the third endopodal segment of leg 1 (bearing two spines and four setae in both sexes), is noticeable.

Genus *Scyphuliger* Humes, 1991

*Scyphuliger karangmiensis* n. sp. (Figs. 34-36)

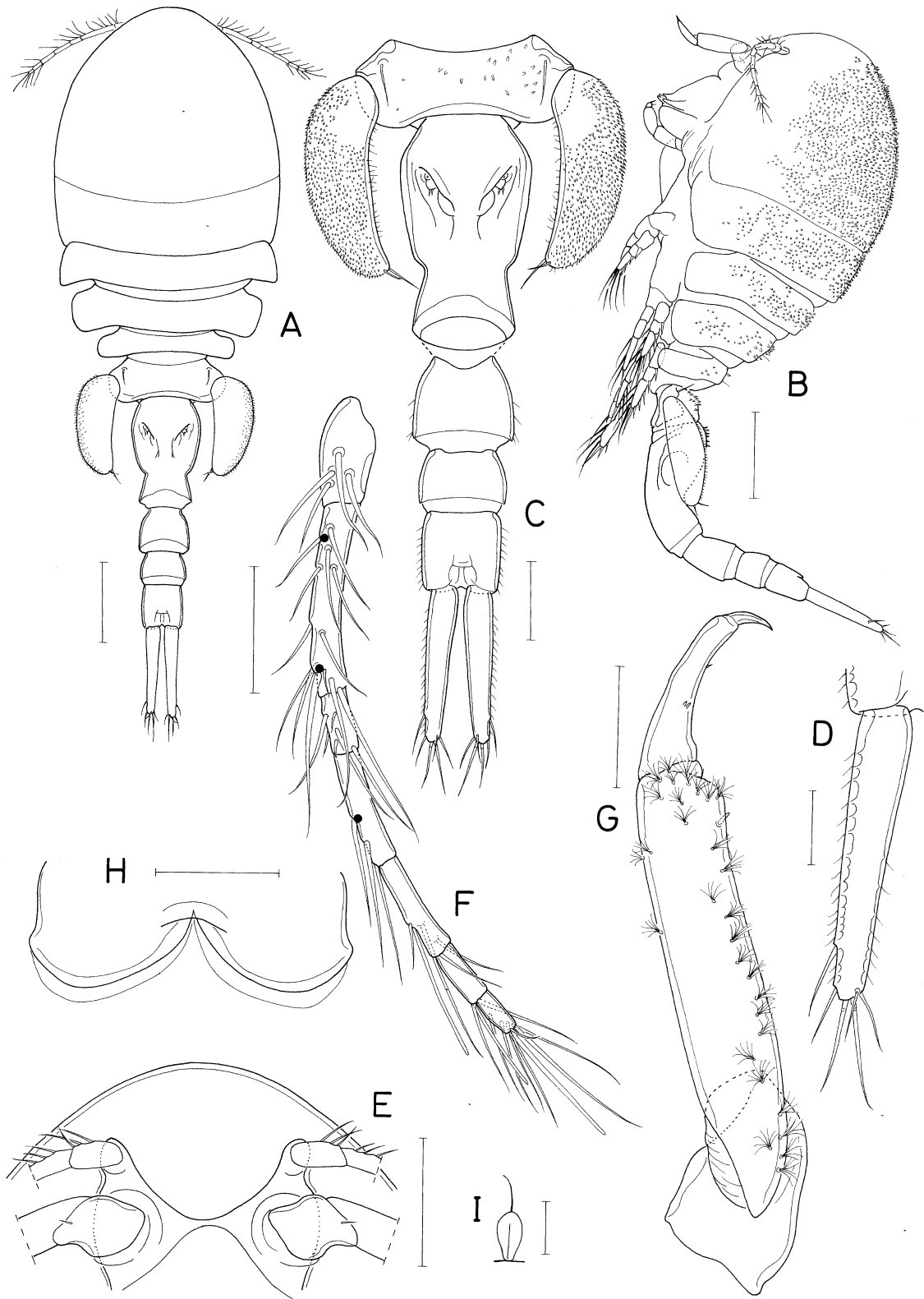
*Material examined*. Twelve ♀♀, 15 ♂♂ from the scleractinian coral *Acropora intermedia* (Brook), depth 2 m, Karang Mie ( $00^{\circ} 20'07''\text{S}$ ,  $128^{\circ} 25'00''\text{E}$ ), collected by A.G.

Humes, 19 May 1975. Holotype (♀: USNM 1081656), allotype (♂: USNM 1081657), and paratypes (10 ♀♀, 13 ♂♂: USNM 1081658) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

*Female*. Body (Fig. 34A, B) with moderately broad prosome and slender urosome. Mean body length 1.74 mm (1.66–1.84 mm) based on 10 specimens. Body length of dissected specimen 1.78 mm. Greatest width  $560 \mu\text{m}$ , greatest dorsoventral depth  $455 \mu\text{m}$ . Prosome  $875 \mu\text{m}$  long, covered dorsally with numerous, minute leaf-like sensillae (Fig. 34B, I). Cephalothorax with faint dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 34C) 5-segmented and strongly curved, with concave dorsal side. Fifth pedigerous somite  $276 \mu\text{m}$  wide, much wider than next somite. Genital double-somite  $265 \times 168 \mu\text{m}$ , with lateral constriction at posterior 1/3 ( $103 \mu\text{m}$  wide across this constriction). Genital areas positioned dorsally. Three free abdominal somites  $117 \times 129$ ,  $79 \times 112$ , and  $103 \times 100 \mu\text{m}$ , respectively. First free abdominal somite distinctly broadened distally. First free abdominal and anal somites with fine setules on lateral margins. Caudal ramus (Fig. 34D) gradually tapering distally,  $200 \times 37 \mu\text{m}$ , 5.41 times as long as wide, with setules on lateral margins and 6 caudal setae small and naked; outer lateral seta located at distal 1/6, longest seta  $75 \mu\text{m}$ .

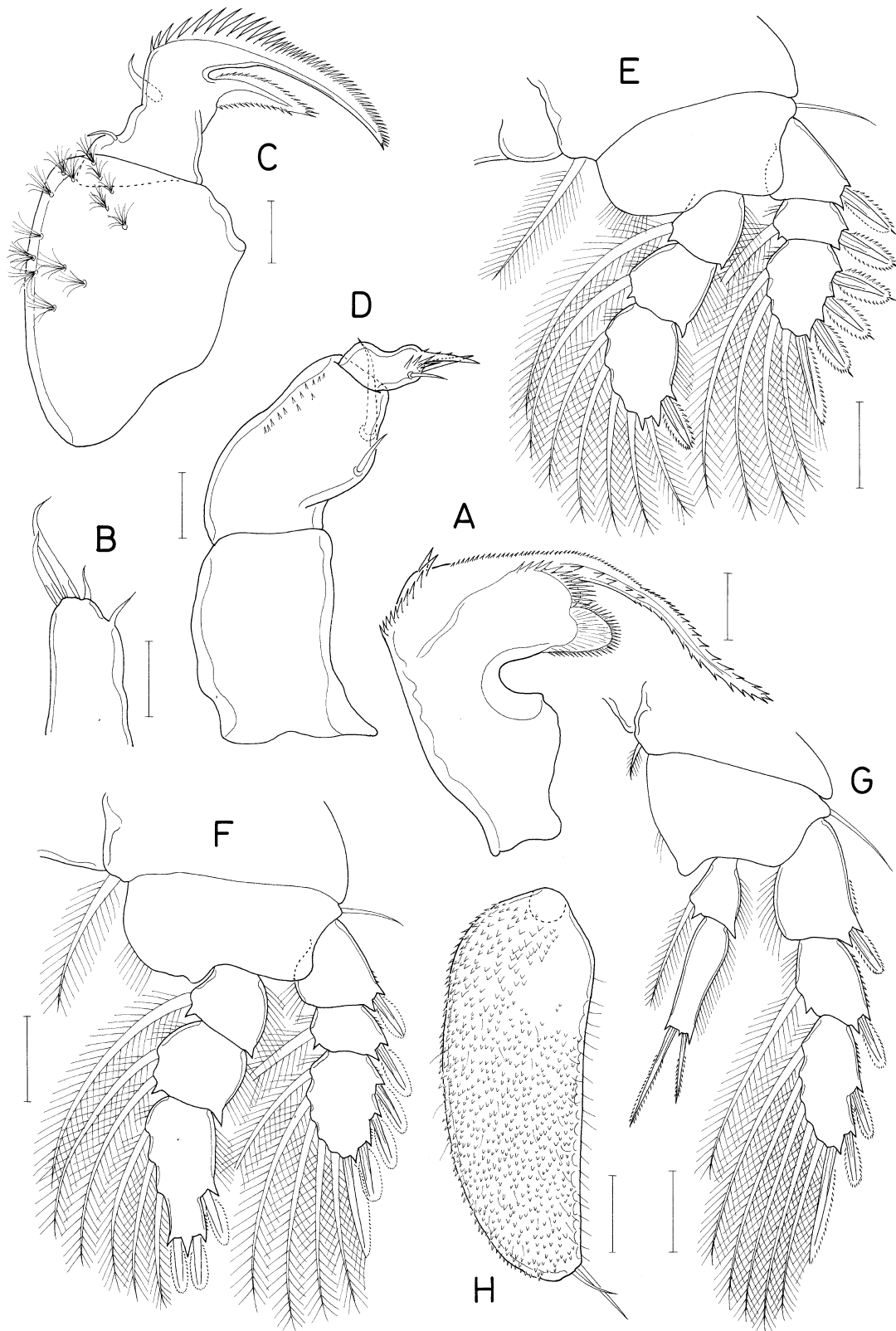
Rostrum broad with rounded posterior apex (Fig. 34E). Antennule (Fig. 34F) slender,  $277 \mu\text{m}$  long; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Aesthetascs slender and confluent with setae. Antenna (Fig. 34G) 3-segmented. Coxo-basis approximately  $57 \times 52 \mu\text{m}$  and unarmed. First endopodal segment  $145 \times 37 \mu\text{m}$ , with minute inner distal seta and about 30 branched setules (or sensillae). Second endopodal segment tapering and distinctly more slender than proximal segments,  $65 \times 23 \mu\text{m}$ , with 3 minute setae. Terminal claw small,  $18 \mu\text{m}$  long.

Labrum (Fig. 34H) with narrow membrane on posterior margin of broad posterior lobes. Mandible (Fig. 35A) with deep proximal notch. Inner margin bilobed; proximal lobe projected. Convex side with row of about 10 spinules near outer corner. Distal lash elongated, with serrated margins and 5 or 6 small lateral spinules on one side. Maxillule (Fig. 35B) armed with subterminal setiform element and 3 terminal naked setae. Maxilla (Fig. 35C) with syncoxa bearing about 15 branched setules. Basis armed with small proximal seta, simple anterior seta, and enlarged, foliaceous inner seta bearing spinulated margins. Distal lash perpendicular to basis; distal margin with larger spinules in proximal half and smaller spinules in distal half. Maxilliped (Fig. 35D)

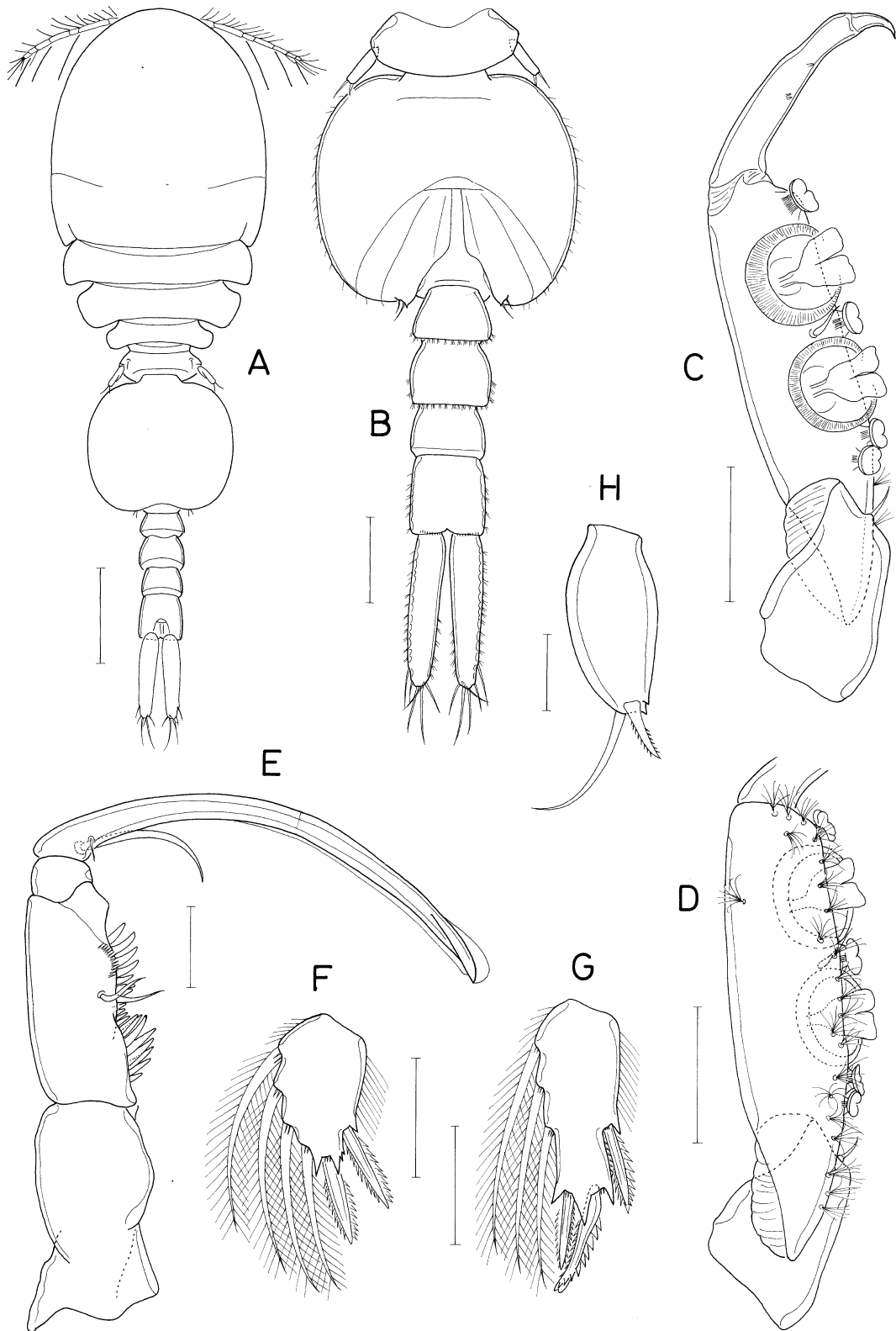


**Fig. 34.** *Scyphuliger karangmiensis* n. sp., female. A, habitus, dorsal; B, habitus, lateral; C, urosome, dorsal; D, left caudal ramus, dorsal; E, rostral area, ventral; F, antennule (dots indicating positions of additional aesthetascs in male); G, antenna; H, labrum; I, ornament element on dorsal surface of prosome. A, B, 0.2 mm; C, E, 0.1 mm; D, F-H, 0.05 mm; I, 0.01 mm.





**Fig. 35.** *Scyphuliger karangmiensis* n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, leg 4; H, free segment of leg 5. A-D, 0.02 mm; E-H, 0.05 mm.



**Fig. 36.** *Scyphuliger karangmiensis* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, proximal segments of antenna; E, maxilliped; F, third endopodal segment of leg 1; G, third endopodal segment of leg 2; H, free segment of leg 5. Scales: A, 0.2 mm; B, 0.1 mm; C-G, 0.05 mm; H, 0.02 mm.

with unarmed syncoxa. Basis with convex inner margin, minute spinules on distal half of outer surface, 2 inner setae 29 and 15  $\mu\text{m}$ . Endopod with 2 setae and several spinules, and terminated by acute, spiniform process.

Legs 1-3 with 3 segmented rami (Fig. 35E, F). Leg 4 (Fig. 35G) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1-4 naked. Second endopodal segment of leg 4  $73 \times 24 \mu\text{m}$ , with 2 terminal spines of 67 and 43  $\mu\text{m}$ . Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
 enp. 0-1; 0-1; I,1,4  
 Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,3  
 Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; 0-2; I,II,2  
 Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; II

Free segment of leg 5 (Fig. 35H) large,  $258 \times 95 \mu\text{m}$ , 2.72 times as long as wide, weakly tapering, with straight inner margin, convex outer margin, and numerous spinules and setules on all surface; 2 terminal setae small and adjoined. Leg 6 represented by 3 minute setae in genital area (Fig. 34C).

*Male.* Body (Fig. 36A) similar to that of female. Mean body length 1.52 mm (1.46-1.57 mm) based on 10 specimens. Body length of dissected specimen 1.50 mm. Cephalothorax with incomplete dorsal suture line. Greatest width 450  $\mu\text{m}$ . Prosome 725  $\mu\text{m}$  long. Urosome (Fig. 36B) 6-segmented. Fifth pedigerous somite 171  $\mu\text{m}$  wide, much narrower than next somite. Genital somite  $262 \times 302 \mu\text{m}$ , nearly globular, with fine setules on all surface. Four abdominal somites  $58 \times 92$ ,  $74 \times 95$ ,  $58 \times 88$ , and  $88 \times 88 \mu\text{m}$ , respectively. Caudal ramus  $179 \times 38 \mu\text{m}$ , 4.71 times as long as wide.

Rostrum as in female. Antennule with 3 additional aesthetascs, 2 on second and 1 on fourth segments as indicated by dots in Fig. 34F. First endopodal segment of antenna with 2 large and 4 smaller suckers (with arrangement of 2 small suckers, large sucker, small sucker, large sucker, and small sucker, from proximal to distal) and about 25 branched setules (Fig. 36C, D).

Mouthparts as in female, except for maxilliped. Maxilliped (Fig. 36E) with first segment unarmed. Second segment with longitudinal row of spinules of irregular sizes, short row of minute spinules and 2 inner setae of similar size, one of latter curved proximally. Small endopod unarmed. Terminal claw arched, 283  $\mu\text{m}$  long, as long as proximal 3 segments combined, proximally with seta and setule.

Third endopodal segment of leg 1 (Fig. 36F) armed with 2 spines and 4 setae. Third endopodal segment of leg 2 (Fig. 36G) armed as in female, but spines larger. Free segment of

leg 5 (Fig. 36H)  $49 \times 24 \mu\text{m}$ , expanded in middle, terminally with small setiform spine (17  $\mu\text{m}$ ) and longer seta (38  $\mu\text{m}$ ). Leg 6 represented by 2 small setae on posterior corner of genital flap (Fig. 36B).

*Etymology.* The specific name is derived from the name of the type locality, Karang Mie.

*Remarks.* The number and arrangement of suckers on the first endopodal segment of the male antenna are taxonomically important in the genus *Scyphuliger*. The basic arrangement of these suckers is one small, one large, one small, one large, and one small suckers (formula suggested as S,L,S,L,S), from proximal to distal. This basic pattern of sucker arrangement is revealed by eight known species: *S. concavipis* Humes, 1991; *S. eumorphus* Humes, 1993; *S. longicaudatus* Kim, 2003; *S. pennatus* Kim, 2003; *S. pilosus* Kim, 2003; *S. manifestus* Humes, 1991; *S. tenuatus* (Humes, 1990); and *S. vicinus* Kim, 2004. The following species deviate from the basic pattern of sucker arrangement: *S. latus* Kim, 2003, with seven small suckers (suggested formula 7S); *S. paucisurculus* Kim, 2003, with two large and two small suckers (formula 2L,2S); and *S. humesi* Kim, 2004, with one large and four small suckers, in addition to a peg-like element (formula 3S,L,S). With two large and four small suckers (formula 2S,L,S,L,S), *S. karangmiensis* can be differentiated from all the above 11 species.

Males of *S. aristoides* Humes, 1993, and *S. placidus* Kim, 2004, are not known. *Scyphuliger karangmiensis* differs from *S. aristoides* in having four armature elements on the maxillule (three in *S. aristoides*), the longer free segment of female leg 5 ( $258 \times 95 \mu\text{m}$ , in contrast to  $192 \times 104 \mu\text{m}$  in *S. aristoides* according to Humes, 1993b), and the first and second abdominal somites each of which are shorter than wide (longer than wide in *S. aristoides*).

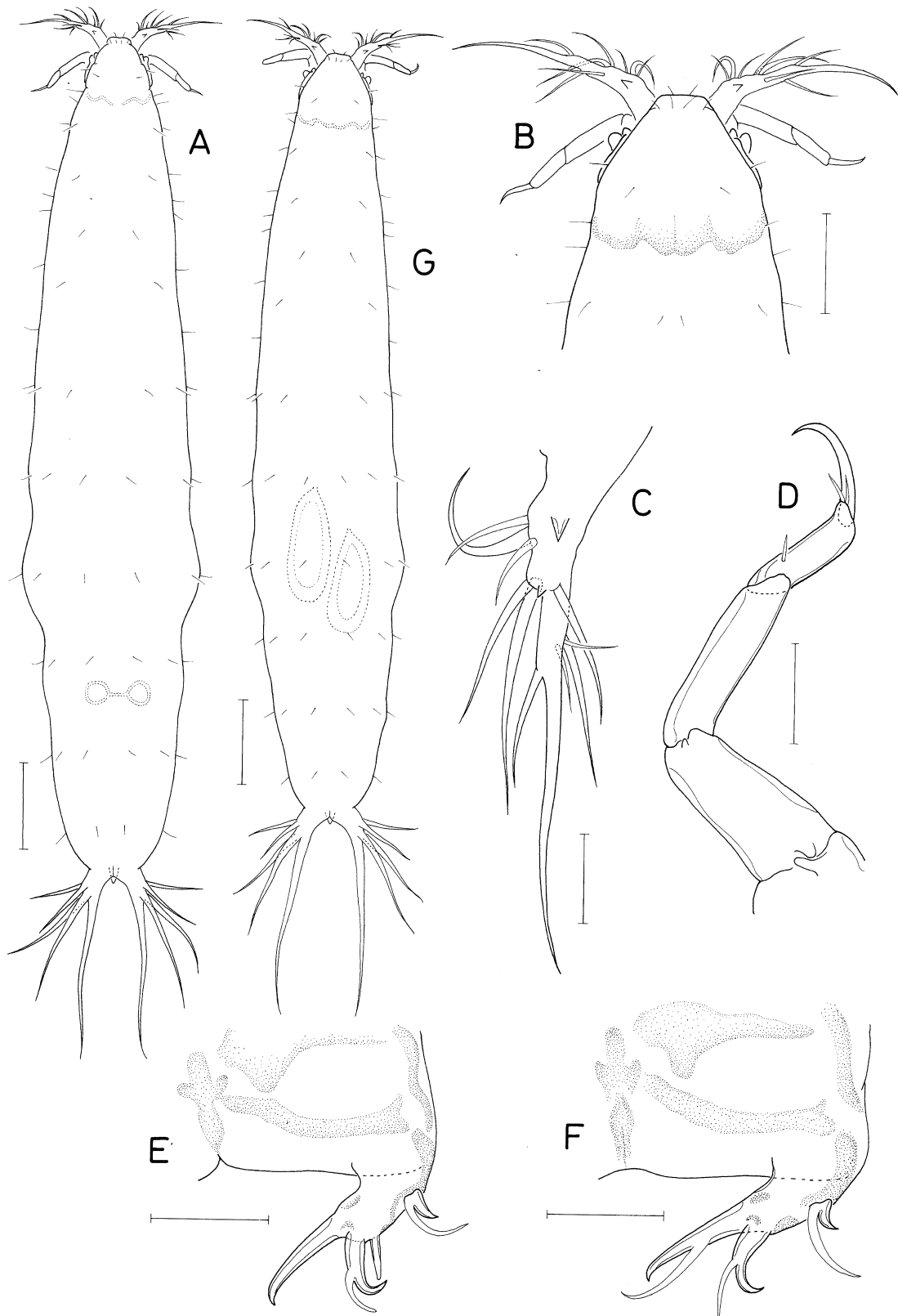
*Scyphuliger karangmiensis* is also distinguished from *S. placidus* by having the posteriorly constricted genital double-somite in the female (it is tapering, without a constriction in *S. placidus*), the elongated antenna (stocky in *S. placidus*), the distally weakly tapering free segment of female leg 5 (oviform in *S. placidus*), and the tapering and more elongated caudal ramus (the caudal ramus of *S. placidus* bears parallel lateral margins and is 4.22 times as long as wide, according to Kim, 2004a).

Family Lamippidae Joliet, 1882

Genus *Enalcyonium* Olsson, 1870

*Enalcyonium circulatum* n. sp. (Fig. 37)

*Material examined.* Eighty-six ♀♀, 61 ♂♂ from a gorgonian of *Muricella* sp., depth 2 m, Parang Island, eastern Ceram ( $3^{\circ} 17'00''\text{S}$ ,  $130^{\circ} 44'48''\text{E}$ ), collected by A.G. Humes, 23 May 1975. Holotype (♀: USNM 1081668),



**Fig. 37.** *Enalcyonium circulatum* n. sp. Female: A, habitus, dorsal; B, cephalic area, dorsal; C, antennule; D, antenna; E, leg 1; F, leg 2. Male: G, habitus, dorsal. Scales: A, G, 0.1 mm; B, 0.05 mm; C-F, 0.02 mm.

allotype (♂: USNM 1081669), and paratypes (83 ♀♀, 58 ♂♂: USNM 1081670) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2 ♀♀, 2 ♂♂) are kept in the collection of the author.

**Female.** Body (Fig. 37A) fusiform, tapering anteriorly and posteriorly, with annular expansion around body in posterior 0.35, slight constrictions before and after this expansion, and about 10 circular rows of minute setules. Body length 987 µm (938–1,077 µm) based on 10 specimens. Greatest width across body expansion 205 µm. Cephalic area (Fig. 37B) strongly tapering anteriorly, with truncated apex and weak transverse sclerotization posteriorly. Width of cephalic area in front of sclerotized area 83 µm. Width of truncated anterior apex 23 µm. Genital areas positioned on ventral side at posterior 0.21 length of body. Posterior end of body with small, nipple-shaped process between bases of caudal rami.

Caudal rami divergent (Fig. 37A). Each ramus with 5 setiform elements, consisting of 2 smaller outer proximal ones (77 and 76 µm), 2 intermediate elements (146 and 121 µm), and large distal element (202 µm).

Antennule (Fig. 37C) unsegmented, tapering, approximately 60 µm long excluding terminal seta, armed with 2 cusps (larger proximal and smaller middle ones) and 11 setae. All setae similar in shape but varied in size; largest terminal seta 67 µm. Antenna (Fig. 37D) 3-segmented, each segment 33, 33, and 22 µm from proximal to distal (average lengths of inner and outer margins). Coxobasis and first endopodal segment unarmed. Second endopodal segment with inner proximal seta and 2 distal setae. Terminal claw 23 µm long, strongly curved distally. Oral appendages lacking.

Leg 1 (Fig. 37E) with exopod, but lacking interramal lobe and inner lobe or endopod. Protopod unarmed, with straight posterior margin. Exopod fused with protopod, with arrangement of proximal flagellated small spine, setiform spine, larger flagellated spine, and largest simple, terminal spine (armature formula IV). Leg 2 (Fig. 37F) similar in form to leg 1. Exopod with 3 flagellated spines (armature formula III): 2 proximal spines with flagellum on distal margin, but terminal spine with flagellum on proximal (outer) margin. Endopod, inner lobe and interramal lobe lacking. Other legs absent.

**Male.** Body (Fig. 37G) resembling that of female. Length of dissected specimen 895 µm. Mean body length 859 µm (746–908 µm) based on 10 specimens. Greatest width 178 µm across posterior body expansion. Spermatophore approximately 135 × 50 µm, located near widest part of body (Fig. 37G). Caudal rami, antennule, antenna and legs not different from those of female.

**Etymology.** The specific name *circulatum* is derived from

the Latin *circulus* (=circular figure) and alludes to the circularly expanded area of body.

**Remarks.** Boxshall and Halsey (2004) recognized 21 species in the genus *Enalcyonium* (not including *Lamippula chattoni* which was erroneously included in the list of *Enalcyonium*). Kim (2004) recorded six additional species from New Caledonia. The arrangement of the setae and spines on the exopod of legs 1 and 2 is useful in distinguishing species of *Enalcyonium*. Ten species of *Enalcyonium* are known to have three spines (formula III) on the exopod of leg 2. Of these, the following three species are known to have three spines (formula III) on the exopod of leg 1, like *E. circulatum* n. sp.: *E. carrikeri* Dudley, 1973, *E. heegaardi* Bouligand, 1960, and *E. nudum* Stock, 1973.

*Enalcyonium carrikeri* has two large and two small setae on the caudal ramus and inner lobe (endopod) on legs 1 and 2, therefore, differs from *E. circulatum*. Although *E. heegaardi* was incompletely recorded, this species is known to have a well-developed inner lobe (endopod) on leg 1. *Enalcyonium nudum* possesses 4 caudal setae of similar sizes and inner lobe on legs 1 and 2.

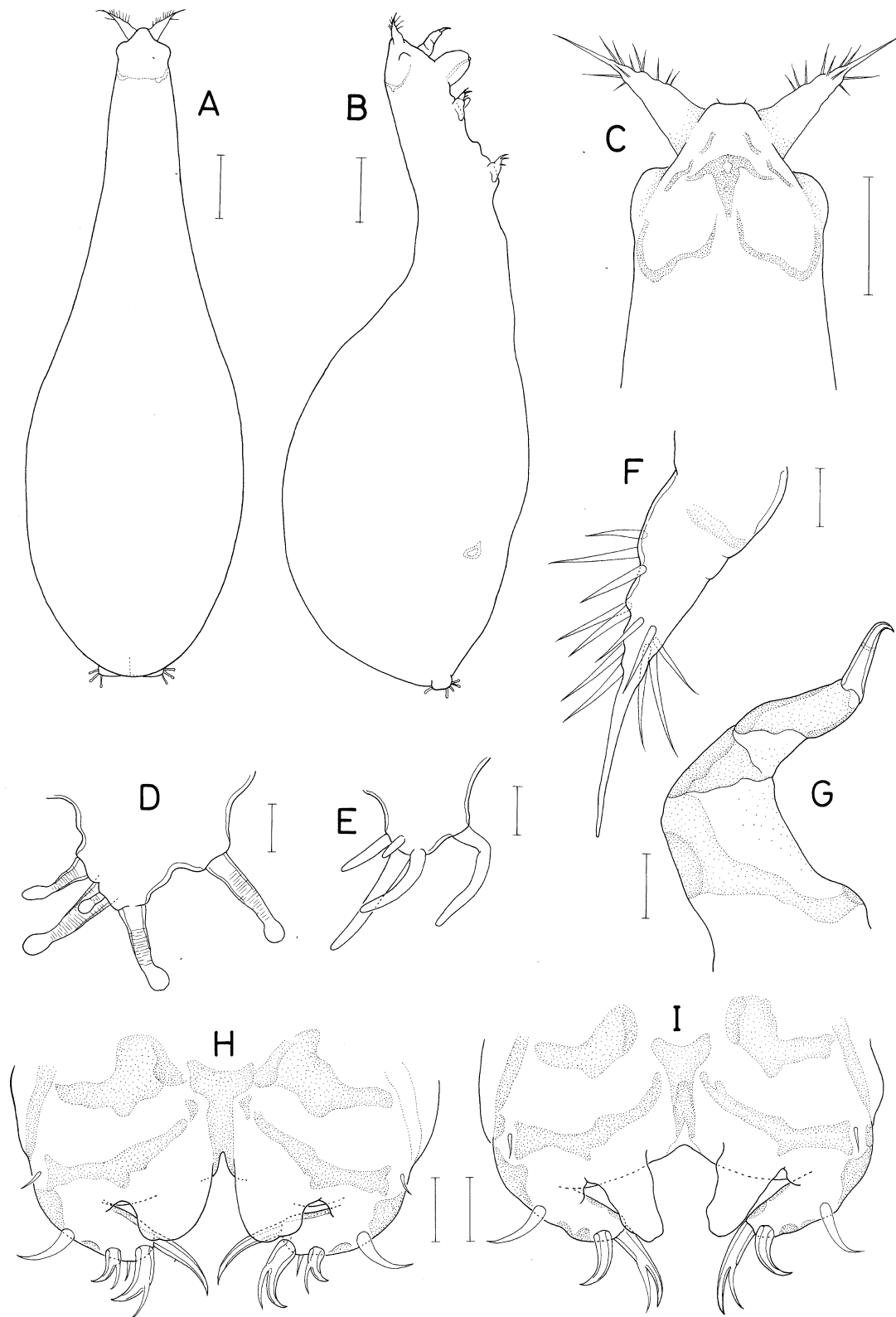
The presence of setules on the body surface may be a distinguishing feature of *E. circulatum*. This feature is shared by *E. capillatum* Kim, 2004, *E. ciliatum* Stock, 1973, and *E. digitigerum*, Ho, 1984. However, these three species have the armature on the caudal ramus, antennule and leg 1 different from that of *E. circulatum*.

#### ***Enalcyonium ceramensis* n. sp. (Figs. 38, 39)**

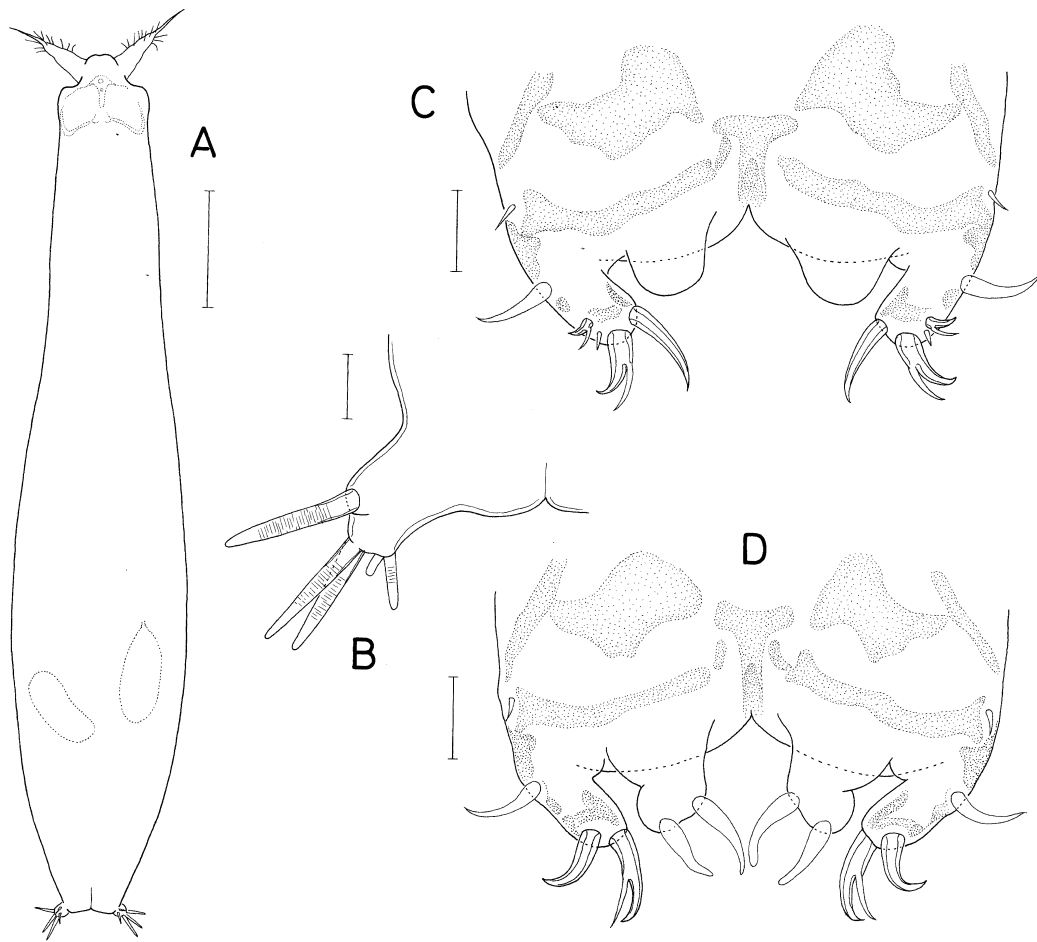
**Material examined.** Fourty-two ♀♀, 25 ♂♂ from the gorgonian *Rumphella aggregata* (Nothing), depth 10 m, Parang Island, eastern Ceram (3° 17'00"S, 130° 44'48"E), collected by A.G. Humes, 23 May 1975. Holotype (♀: USNM 1081671), allotype (♂: USNM 1081672), and paratypes (33 ♀♀, 21 ♂♂: USNM 1081673) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (8 ♀♀, 3 ♂♂) are kept in the collection of the author.

**Female.** Body (Fig. 38A, B) greatly inflated posteriorly, dorsoventrally deeper than laterally wider, variable in size depending on growth states. Body length of dissected largest specimen 1.02 mm. Mean body length of fully-grown adults 934 µm (831–1,020 µm) based on 10 specimens. Greatest width 341 µm, Greatest depth 379 µm. Cephalic area (Fig. 38C) tapering anteriorly, with truncated apex, ear-like small lateral expansions, and dorsal sclerotization. Width of cephalic area across ear-like expansions 82 µm.

Caudal ramus (Fig. 38D) short and much broader than long, with 5 club-shaped digitations tipped by globular inflation in fully-grown adult. These 5 digitations consisting



**Fig. 38.** *Enalcyonium ceramensis* n. sp., female. A, habitus, dorsal; B, habitus, lateral; C, cephalic area, dorsal; D, caudal ramus of fully grown adult; E, caudal ramus of young adult; F, antennule; G, antenna; H, pair of leg 1; I, pair of leg 2. Scales: A, B, 0.1 mm; C, 0.05 mm; D-I, 0.01 mm.



**Fig. 39.** *Enalcyonium ceramensis* n. sp., male. A, habitus, dorsal; B, caudal ramus; C, pair of leg 1; D, pair of leg 2. Scales: A, 0.1 mm; B-D, 0.01 mm.

of 3 large ones, medium-sized outer one, and small one bearing same base with outermost large one; innermost large digitation separated from other 4. In young adult these digitations terminally blunt but not inflated (Fig. 38E).

Antennule (Fig. 38F) distinctly tapering, unsegmented, approximately 44  $\mu\text{m}$  long excluding terminal setiform element, with 12 setae and terminal setiform element; latter element process-like, bluntly ended, and 28  $\mu\text{m}$  long. Antenna (Fig. 38G) indistinctly 3-segmented and tapering. Suture between first and second endopodal segments obscure. All segments unarmed. Claw nearly as long as third segment and distally curved. Oral cone distinctly protruded (Fig. 38B). Mouth appendages lacking.

Leg 1 (Fig. 38H) with small outer seta on protopod. Exopod not demarcated from protopod, with arrangement of elements from proximal to distal: seta, small spine bearing inner flagellum, small seta, spine bearing inner flagellum and terminal simple spine (formula 1,I,1,I,I). Inner lobe

(endopod) distinct, broader than long and truncated. Leg 2 (Fig. 38I) with small outer seta on protopod. Exopod not demarcated from protopod, with proximal seta, simple spine, and terminal spine bearing outer flagellum (formula 1,I,I). Inner lobe distinctly longer than wide and extending beyond distal end of exopod. Anterior lobe lacking. Other legs absent.

*Male.* Body (Fig. 39A) not inflated, but slightly broadened posteriorly. Body length of one of dissected specimens 740  $\mu\text{m}$ . Mean body length 706  $\mu\text{m}$  (645-740  $\mu\text{m}$ ) based on 10 specimens. Caudal ramus (Fig. 39B) slightly longer than wide. Caudal digitations simple, without terminal inflation. Antennule and antenna not different from those of female. Leg 1 (Fig. 39C) armed as in female, but inner lobe less prominent. Proximal spine distinctly smaller than that of female. Leg 2 (Fig. 39D) with distinct sexual dimorphism in having 2 terminal setiform elements on inner lobe bearing indentation on outer margin.

*Etymology.* The species is named after Ceram, the type locality.

*Remarks.* By having three spines and two setae on the exopod of leg 1, *Enalcyonium ceramensis* n. sp. is distinguished from all congeners. *Enalcyonium caledonensis* Kim, 2004, and *E. bullatum* Kim, 2004, both known from New Caledonia (Kim, 2004b), are recorded as having five setation elements (setae and spines) on the same exopod, but these elements are four spines and one seta (in *E. caledonensis*) or two spines and three setae (in *E. bullatum*) with different arrangements.

It is notable that leg 2 of *E. ceramensis* displays sexual dimorphism; the inner lobe of the male is armed with two distal setae. Similar sexual dimorphism is known also in *E. carrikeri* Dudley, 1973, where the anterior lobe is naked in the female but is armed with two setae in the male (Dudley, 1973). However, this species is different from *E. ceramensis* in many other respects.

Family Lichomolgidae Kossmann, 1877

***Parastericola* n. gen.**

*Diagnosis.* Lichomolgidae. Body cycloform. Urosome 5-segmented in female and 6-segmented in male. Segmentation between pre-anal and anal somites obscure. Caudal ramus with 7 setae. Antennule 7-segmented, with armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc in both sexes. Antenna 3-segmented, Second endopodal segment armed with 3 setae on inner margin and 5 setae, large claw, and small, spiniform claw distally. Mandible slender and tapering, with long lash. Maxillule with 4 elements. Legs 1-3 as usual, without sexual dimorphism. Leg 4 with 1-segmented endopod bearing 2 terminal spines and 2 inner setae; third exopodal segment armed with 3 spines and 5 setae. Free segment leg 5 with terminal spine and seta in both sexes.

*Type species.* *Parastericola rimosus* n. sp.

*Etymology.* Named for the close relationship of this genus with *Astericola* (*par*, the Latin prefix, means “similar to”).

*Remarks.* The most characteristic feature of the new genus is the presence of a single-segmented endopod of leg 4. Two genera in the Lichomolgidae, *Heteranthessius* T. Scott, 1904, and *Lichomolgella* Sars, 1918, also have a single-segmented endopod on leg 4. However, *Parastericola* n. gen. is not similar to these genera because the endopod of the same leg bears only two armature elements (two setae or spines).

A full setation of the 3-segmented endopod of leg 4 in the Lichomolgidae (i.e. one seta on each first and second segments and two spines on the third segment) is displayed in six genera in this family: *Diogenella* Stock, 1968, *Diogenidium* Edwards, 1891, *Herrmannella* Canu, 1891, *Lichomol-*

*igidium* Kossmann, 1877, *Modiolicola* Aurivillius, 1882, and *Pteroidicola* Kim, 2003. Three lichomolgid genera are associated with the Asteroidea: *Astericola* Rosoll, 1888, *Stellicola* Kossmann, 1877, and *Synstellicola* Humes and Stock, 1972. These genera have a two-segmented endopod on leg 4, with one seta on the first segment and two spines plus one seta on the second segment (armature formula 0-1; II,1). This two-segmented state is the result of the fusion of the second and third segments of the original three-segmented endopod, as revealed by the above six genera.

The fusion between the two segments of this two-segmented endopod, without the reduction of setation, will possibly result in one-segmented endopod with two spines and two setae (possible armature formula II,2). This character state had not been recorded hitherto until the present discovery of the new genus *Parastericola*.

*Parastericola* and the three genera associated with Asteroidea share the three-segmented antenna, four elements on the maxillule, one spine and one seta on the free segment of leg 5 and the identical armature formula for legs 1-3. Therefore, these four genera are closely related.

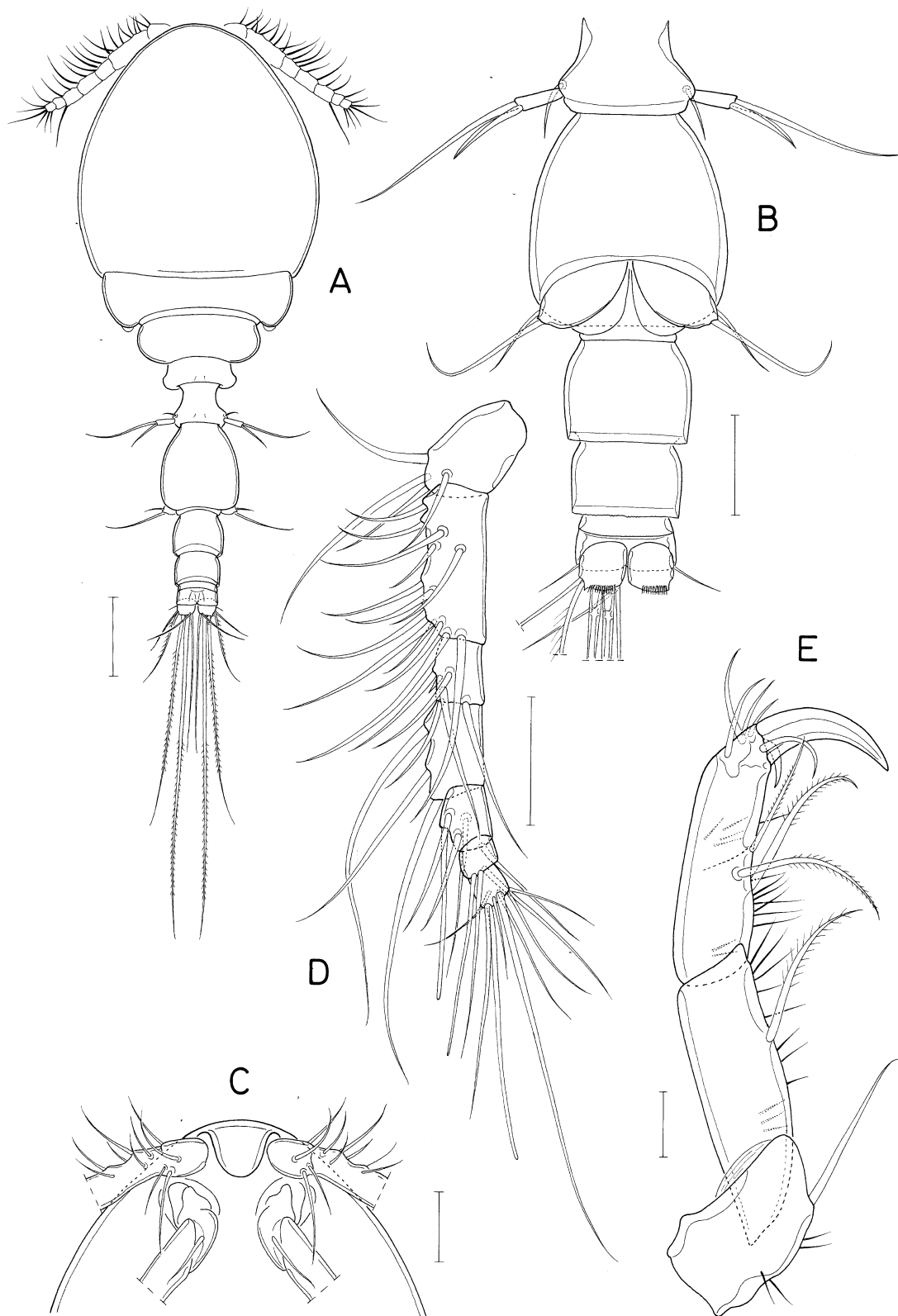
It is noticeable that in *Parastericola* the segmentation between the pre-anal and anal somites is obscured and the antenna bears a large claw and a small, setiform claw terminally. This morphological condition may suggest *Parastericola* is an evolutionary intermediary between *Astericola* (bearing two or three terminal claws on the antenna and a three-segmented abdomen) and *Synstellicola* (bearing one terminal claw on the antenna and two-segmented abdomen).

***Parastericola rimosus* n. sp. (Figs. 40-42)**

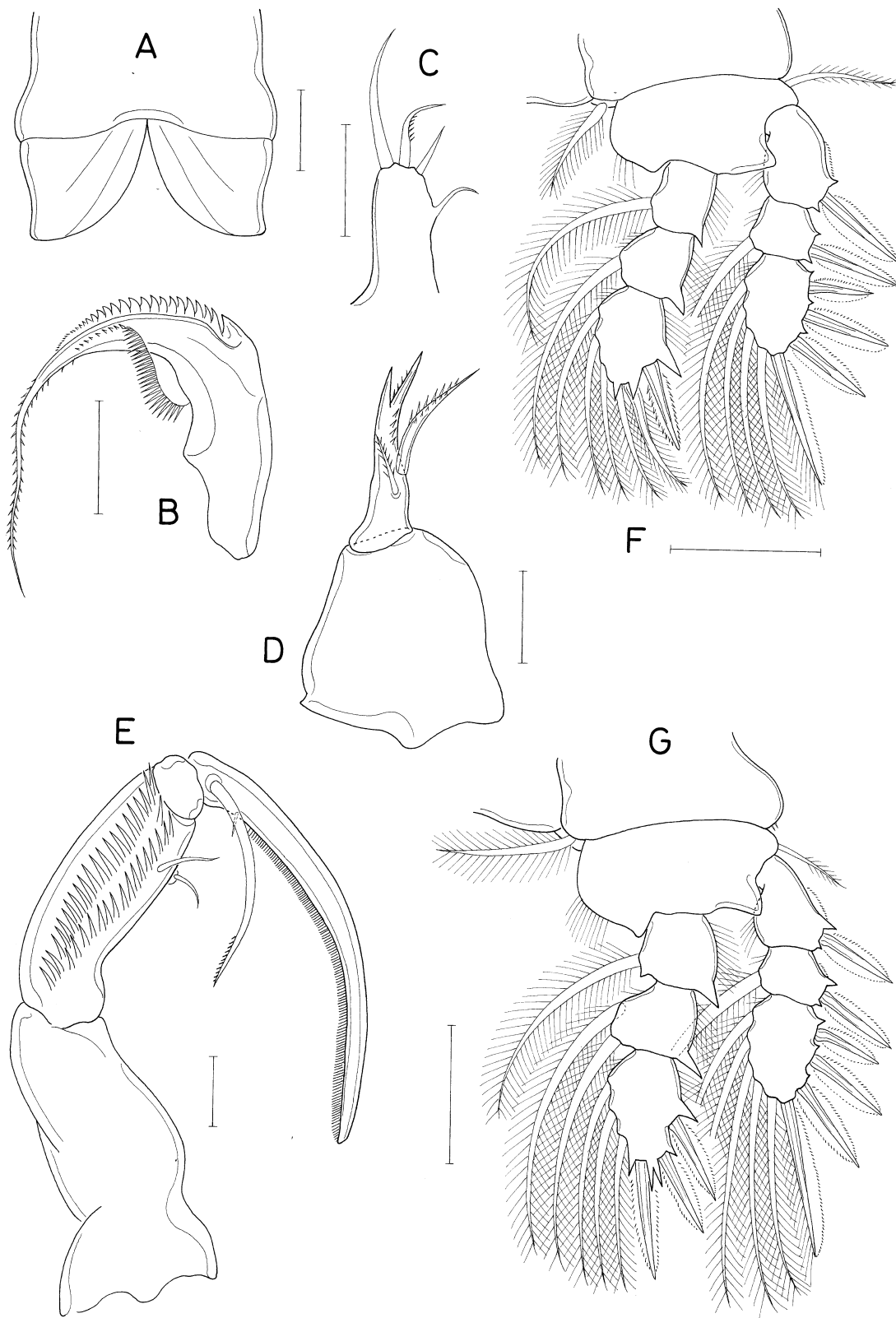
*Material examined.* One ♀, 14 ♂♂ from the sea star *Choriaster granulatus* Lutken, depth 10 m, Gomumu Island, south of Obi (1° 50'00"S, 127° 30'54"E), collected by A.G. Humes, 30 May 1975. Holotype (♂: USNM 1081674), allotype (♀: USNM 1081674, dissected and mounted on a slide), and paratypes (13 ♂♂: USNM 1081676) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (1 ♂) is kept in the collection of the author.

*Male.* Body (Fig. 40A) with elliptical prosome and slender urosome. Mean body length 716 µm (638-769 µm) based on 10 specimens. Body length of dissected specimen 738 µm. Greatest width 298 µm. Cephalothorax 309 µm long, occupying more than 60% length of prosome, without dorsal suture line. Second to fourth pedigerous somites gradually narrowed. Fourth pedigerous somite very narrow. Urosome (Fig. 40B) 6-segmented. Fifth pedigerous somite 69 µm wide. Genital somite 113 × 104 µm, gradually broadened distally. Four abdominal somites 51 × 64, 36 × 56, 9 × 47,

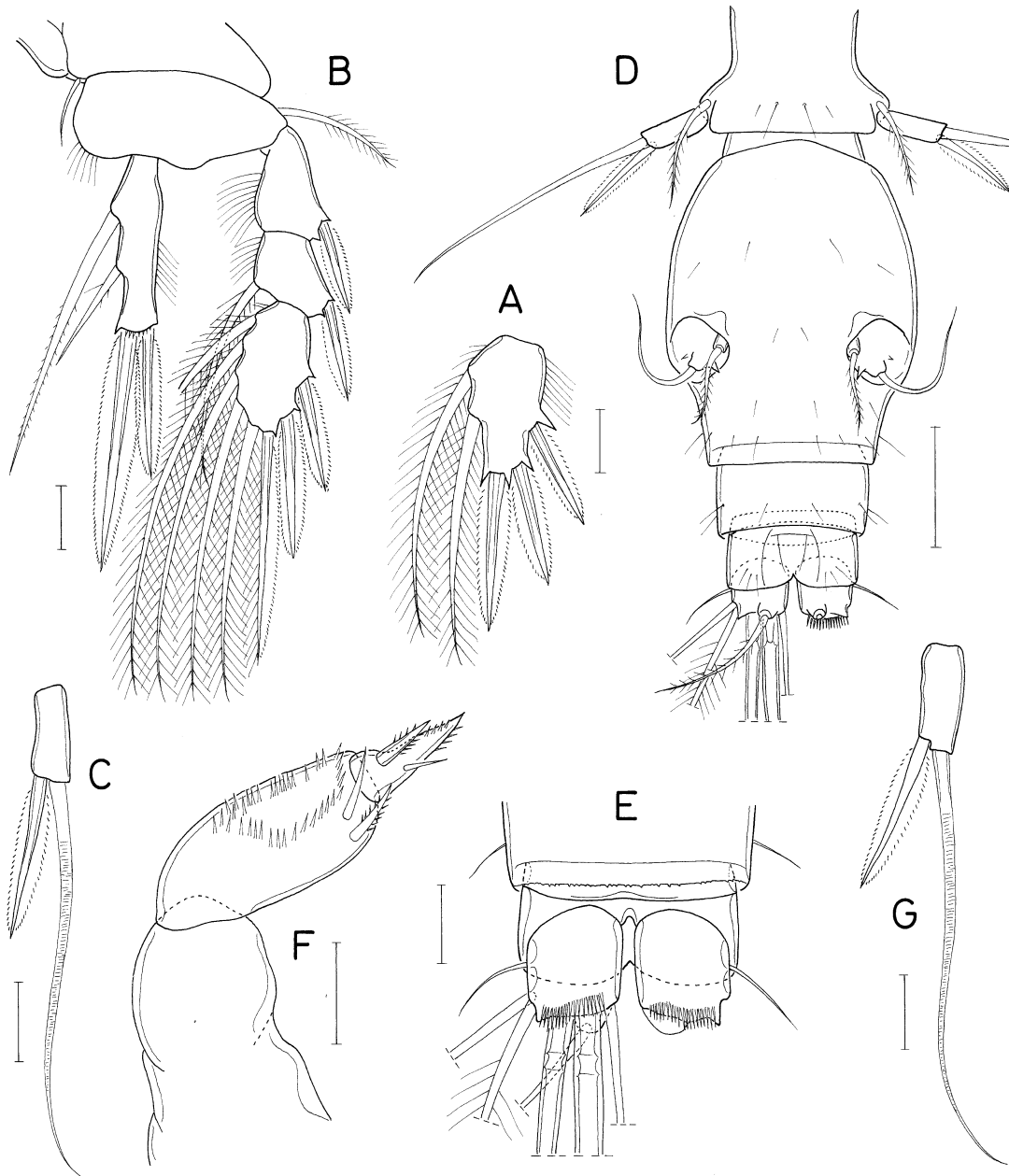




**Fig. 40.** *Parastericola rimosus* n. gen. n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, rostral area, ventral; D, antennule; E, antenna. Scales: A, 0.1 mm; B-D, 0.05 mm; E, 0.02 mm.



**Fig. 41.** *Parastericola rimosus* n. gen. n. sp., male. A, labrum; B, mandible; C, maxillule; D, maxilla; E, maxilliped; F, leg 1; G, leg 2. Scales: A-E, 0.02 mm; F, G, 0.05 mm.



**Fig. 42.** *Parastericola rimosus* n. gen. n. sp. Male: A, third endopodal segment of leg 3; B, leg 4; C, free segment of leg 5. Female: D, urosome, dorsal; E, distal part of abdomen, ventral; F, maxilliped; G, free segment of leg 5. Scales: A-C, E-G, 0.02 mm; D, 0.05 mm.

and  $16 \times 51 \mu\text{m}$ , respectively. Pre-anal somite very short and obscurely segmented from anal somite. Caudal ramus  $23 \times 22 \mu\text{m}$ , nearly as long as wide, originated from ventral surface of anal somite, with fine spinules on posteroventral margin and 7 caudal setae. Smallest outer proximal, outer distal, and inner dorsal setae naked. Other setae plumose. Longest terminal seta  $406 \mu\text{m}$ , longer than urosome.

Rostrum distinct, with rounded posterior apex (Fig. 40C).

Antennule (Fig. 40D)  $195 \mu\text{m}$  long; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Setae usually long and densely arranged. Segments, in particular terminal segments, short. Antenna (Fig. 40E) 3-segmented, ornamented with long setules in addition to setae. Coxobasis and first endopodal segment approximately  $43 \times 32$  and  $62 \times 27 \mu\text{m}$  respectively, each armed with large inner seta. Second endopodal segment 69

× 24 μm, with rudimentary suture line on one side, 3 large setae on inner margin, and 5 setae, large claw (42 μm) and small, recurved, setiform claw distally.

Labrum (Fig. 41A) divided by lateral suture into proximal part and posterior lobes, with deep median incision and nearly parallel lateral margins. Mandible (Fig. 41B) of typical lichomolgid type, slender and tapering, with long lash, denticulated outer margin, and spinulated lamella along inner margin, without proximal notch. Maxillule (Fig. 41C) armed with subdistal setiform element and 3 terminal setae. Maxilla (Fig. 41D) with broad and tapering syncoxa bearing outer proximal angle. Basis narrow, with bifurcated end, spiniferous anterior seta, and large spiniform inner seta bearing spinules on distal margin; distal lash lacking. Maxilliped (Fig. 41E) slender, consisting of 3 segments and terminal claw. Syncoxa unarmed, slightly longer than basis. Basis with 2 longitudinal rows of large spinules and 2 inner subdistal setae. Short endopod unarmed. Terminal claw 118 μm long, distinctly arched, with minute spinules (or setules) along whole inner margin and large seta and small setule proximally.

Legs 1–3 with 3-segmented rami. Leg 4 (Fig. 42B) with 3-segmented exopod and 1-segmented endopod. Spines on these legs large (Figs. 41F, G, 42A). Terminal process on third endopodal segment of legs 2 and 3 characteristically bifurcated (Fig. 41G). Endopod of leg 4 55 × 17 μm, with 2 terminal spines, inner 77 μm, outer 47 μm, and 2 stiff inner setae, proximal one 91 μm and distal 36 μm. Armature formula of legs 1–4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,5
- Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,3
- Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,2
- Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. II,2

Free segment of leg 5 (Fig. 42C) 23 × 10 μm, with large naked seta (101 μm) and lamellated spine (41 μm) terminally. Leg 6 represented by large seta and smaller seta on distal part of genital flap (Fig. 40B).

*Female.* Shape of prosome not examined (prosome of single female broken). Urosome (Fig. 42D) 5-segmented. Fifth pedigerous somite 79 μm wide. Genital double-somite 129 × 104 μm, occupying more than half-length of urosome, slightly expanded laterally. Genital areas large and positioned dorsolaterally at place posterior to midlength of somite. First free abdominal somite 35 × 64 μm. Second free abdominal somite extremely short, 6 × 53 μm, inserted in posterior part of first abdominal somite. Anal somite 24 × 55

μm. Caudal ramus 24 × 24 μm, shaped and armed as in male.

Rostrum not examined. Antennule and antenna not different from those of male. Mouthparts as in female as well, except for maxilliped. Maxilliped (Fig. 42F) 3-segmented. Syncoxa unarmed. Basis with circle of small spinules and 2 inner distal setae of 14 and 12 μm. Endopod distinctly tapering, with spine, seta, and pointed end bearing 2 spinule rows.

Legs 1–4 not different from those of male. Free segment of leg 5 (Fig. 42G) 29 × 12 μm; terminal spine and seta 44 and 119 μm long, respectively. Leg 6 represented by plumose seta, simple longer seta, and small spiniform process in genital area (Fig. 42D).

*Etymology.* The specific name *rimosus* is a Latin meaning “having fissure”. It alludes to the fissure-like segmentation between the anal and pre-anal somites.

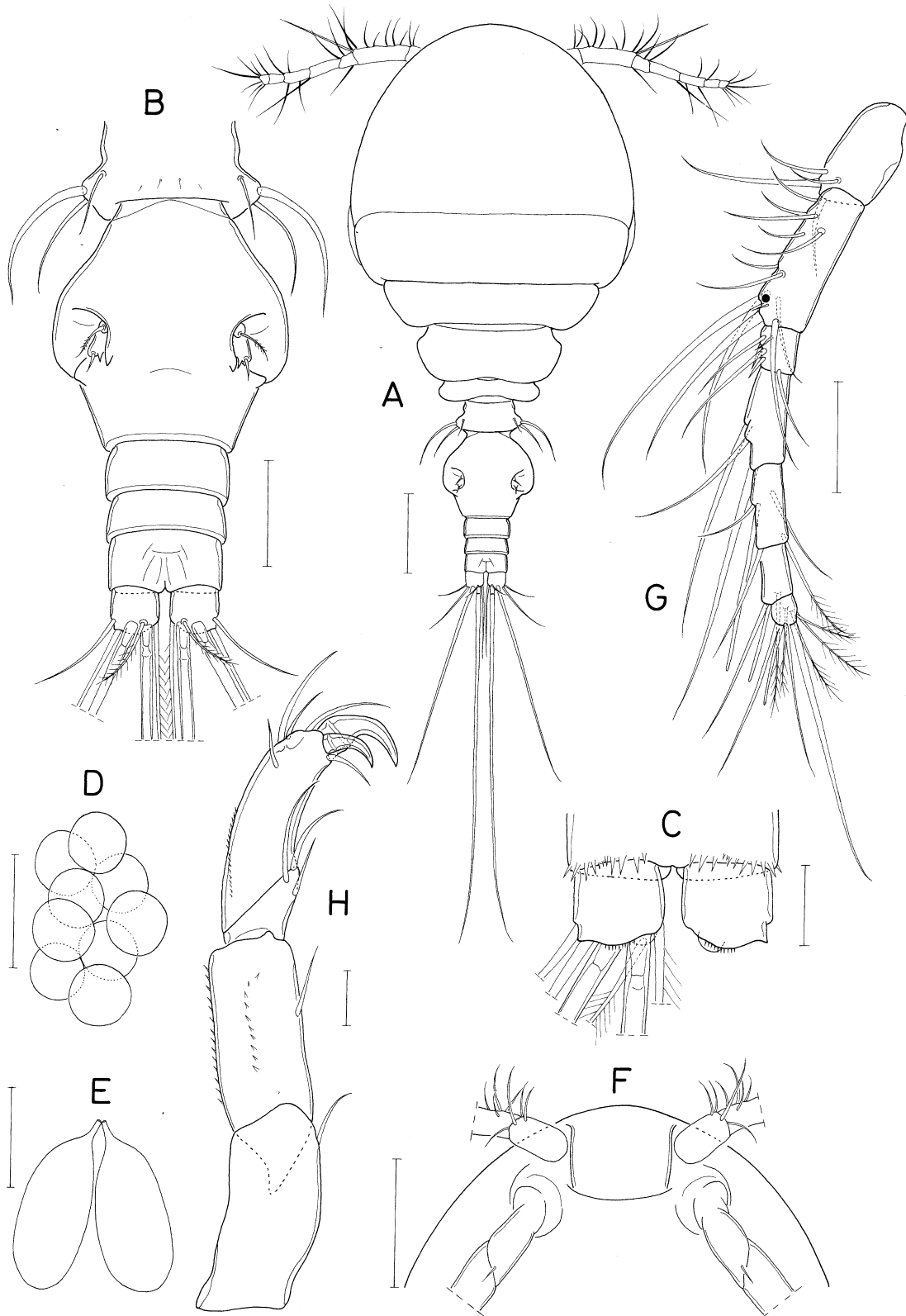
Family Pseudanthessiidae Humes and Stock, 1972

Genus *Pseudanthessius* Claus, 1889

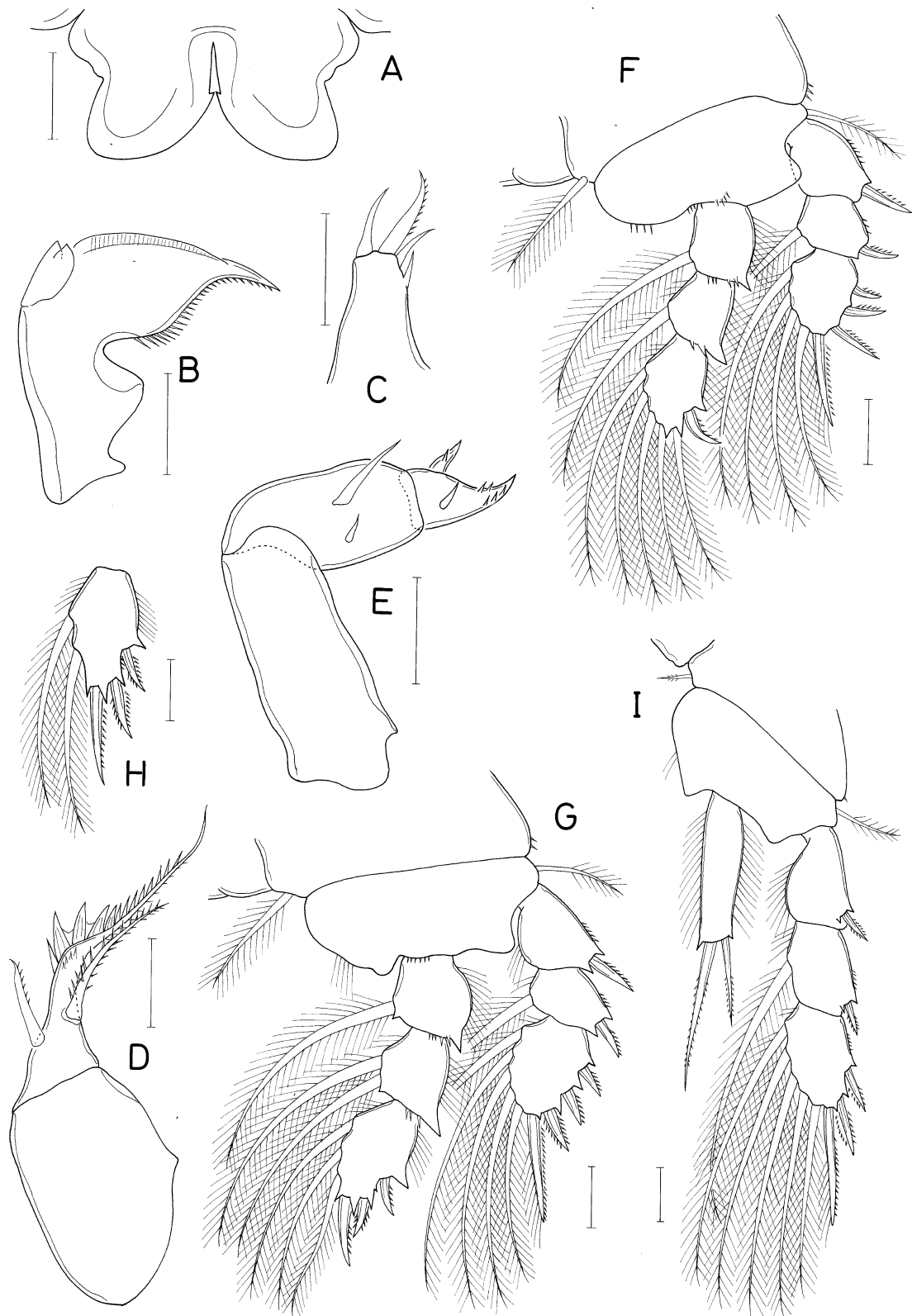
***Pseudanthessius truncus* n. sp. (Figs. 43–45)**

*Material examined.* Sixteen ♀♀, 27 ♂♂ from the echinoid *Himerometra robustipinna* (Carpenter), depth 2 m, Marsegoe Island (2° 59'30''S, 128° 03'30''E), collected by A.G. Humes, 15 May 1975. Holotype (♀: USNM 1081677), allotype (♂: USNM 1081678), and paratypes (14 ♀♀, 25 ♂♂: USNM 1081680) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

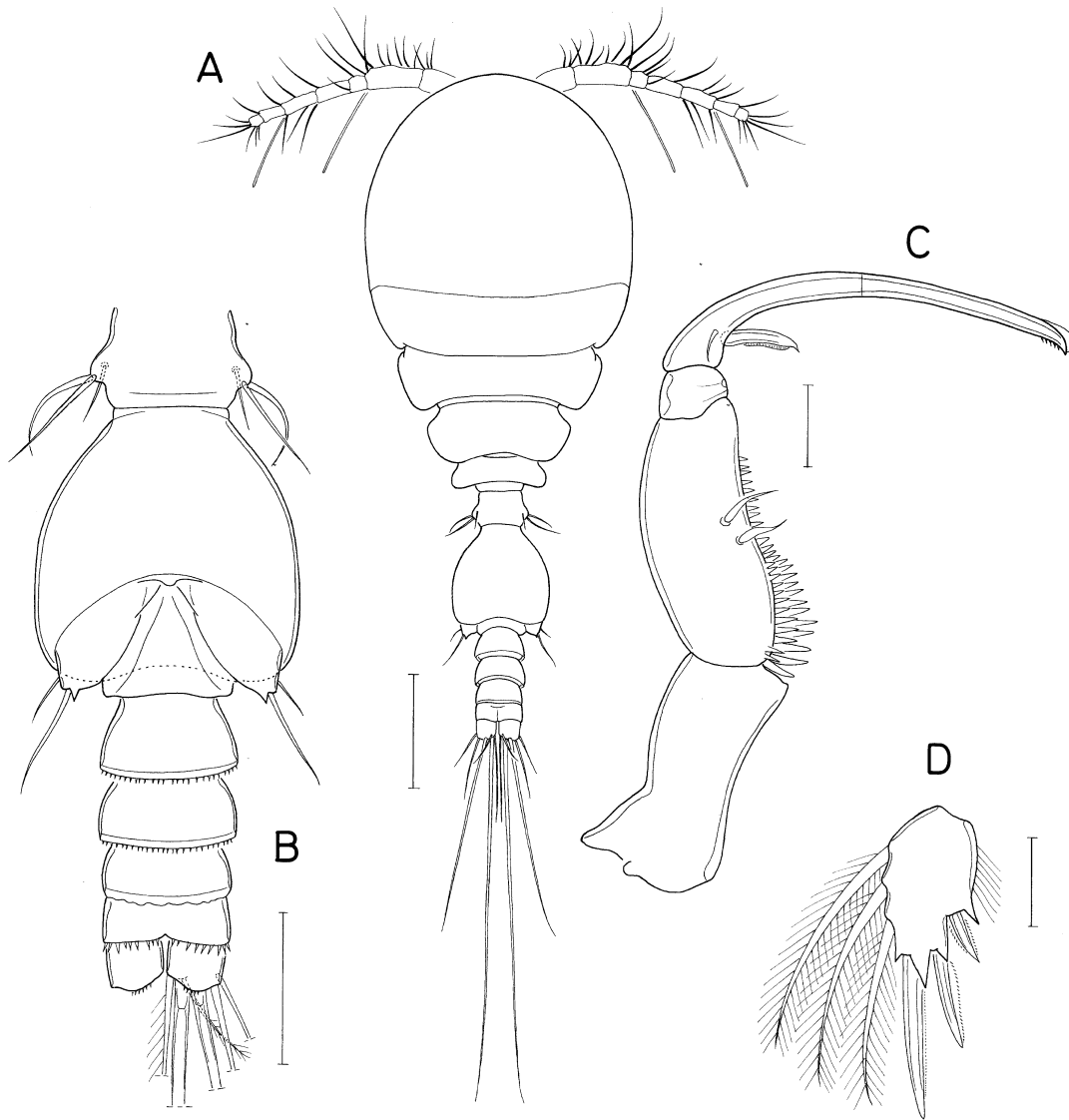
*Female.* Body (Fig. 43A) small with broad prosome and narrow urosome. Body length of dissected specimen 706 μm. Mean body length 697 μm (640–733 μm) based on 10 specimens. Greatest width 359 μm. Prosome 471 μm long, occupying more than 60% length of body. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Combined cephalothorax and second pedigerous somites forming circle. Third and fourth pedigerous somites narrow. Urosome (Fig. 43B) 5-segmented. Fifth pedigerous somite narrow, 86 μm wide. Genital double-somite 111 × 113 μm, distinctly expanded laterally in middle, with tapering posterior part. Genital areas large and positioned dorsolaterally. Three free abdominal somites short, 22 × 60, 19 × 58, and 25 × 54 μm, respectively. Anal somite ornamented with spinules of various sizes on posteroventral margin (Fig. 43C). Caudal ramus wider than long, quadrangular (Fig. 43C), 21 × 23 μm, 1.10 times wider than long, with 6 setae: dorsal and inner distal setae plumose; longest one of median terminal setae 426 μm and weakly plumose; other 3 setae naked. Egg sac 187 × 132



**Fig. 43.** *Pseudanthessius truncus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, ventral; D, egg sac; E, spermatophores from female; F, rostral area, ventral; G, antennule (dot indicating position of additional aesthetasc in male); H, antenna. Scales: A, D, F, 0.1 mm; B, E, G, 0.05 mm; C, H, 0.02 mm.



**Fig. 44.** *Pseudanthessius truncus* n. sp., female. A, labrum; B, mandible; C, maxillule; D, maxilla; E, maxilliped; F, leg 1; G, leg 2; H, third endopodal segment of leg 3; I, leg 4. Scales: 0.02 mm for all.



**Fig. 45.** *Pseudanthessius truncus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, maxilliped; D, third endopodal segment of leg 2. Scales: A, 0.1 mm; B, 0.05 mm; C, D, 0.02 mm.

$\mu\text{m}$ , containing loosely aggregated eggs; each egg  $55 \mu\text{m}$  in diameter. Spermatophores attached to female (Fig. 43E)  $88 \times 37 \mu\text{m}$ .

Rostrum broad, with parallel lateral margins and truncated posterior margin (Fig. 43F). Antennule (Fig. 43G)  $240 \mu\text{m}$  long, 7-segmented; armature formula 4, 13, 6, 3, 4+ aesthetasc, 2+aesthetasc, and 7+aesthetasc. Some setae on distal 3 segments plumose. Antenna (Fig. 43H) 4-segmented. Coxobasis  $65 \times 33 \mu\text{m}$ . First endopodal segment  $67 \times 32 \mu\text{m}$ , with small spinules on outer margin and lateral surface. Second endopodal short,  $15 \times 29 \mu\text{m}$ , with 3 inner distal setae and oblique distal margin. Third endopodal segment

$63 \times 26 \mu\text{m}$ , slightly curved, and distally armed with 5 setae and 2 claws (35 and  $22 \mu\text{m}$  long).

Labrum (Fig. 44A) with deep and narrow medial incision. Lateral margins constricted. Mandible (Fig. 44B) strongly tapering, with distinct inner proximal notch and short lash. Inner margin with small spinules. Convex side with single large scale bearing bluntly bifurcated tip. Maxillule (Fig. 44C) with subdistal setiform element and 3 terminal setae, middle one broad and spinulated unilaterally. Maxilla (Fig. 44D) narrow. Syncoxa unarmed. Basis with 2 setae, inner one long and spiniferous. Distal lash not demarcated from segment, slender and elongated; distal margin with 4 large

spines followed by small spinules. Maxilliped (Fig. 44E) 3-segmented. Syncoxa longest but unarmed. Basis with 2 very unequal setae (17 and 5  $\mu\text{m}$ ). Endopod tapering, with spine (bearing spinule), seta, and 2 or 3 spinules on both sides of terminal process.

Legs 1-3 with 3-segmented rami (Fig. 44F, G). Leg 4 (Fig. 44I) with 3-segmented exopod and 1-segmented endopod. Endopod of leg 4  $55 \times 10 \mu\text{m}$ , with setules on both lateral margins; 2 terminal spines 55 and 32  $\mu\text{m}$ . Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,5
- Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,3
- Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
enp. 0-1; 0-2; I,II,2
- Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
enp. II

Leg 5 represented by 3 lateral naked setae on fifth pedigerous somite (Fig. 43B). Leg 6 represented by 2 small setae and spiniform process in genital area (Fig. 43B).

*Male.* Body (Fig. 45A) with less expanded prosome. Body length of dissected largest specimen 585  $\mu\text{m}$ . Mean body length 559  $\mu\text{m}$  (540-585  $\mu\text{m}$ ) based on 10 specimens. Greatest width 235  $\mu\text{m}$ , Urosome (Fig. 45B) 6-segmented. Cephalothorax with dorsal suture line. Fifth pedigerous somite 52  $\mu\text{m}$  wide. Genital somite  $94 \times 87 \mu\text{m}$ , anteriorly narrow and gradually broadened distally. Four abdominal somites  $27 \times 45$ ,  $21 \times 45$ ,  $18 \times 43$ , and  $15 \times 42 \mu\text{m}$ , respectively. Posteroventral margin of first and second abdominal somites fringed with fine spinules. That of anal somite with larger spinules. Caudal ramus  $16 \times 19 \mu\text{m}$ .

Rostrum as in female. Antennule with 1 additional aesthetasc on second segment, as indicated by dot in Fig. 43G. Antenna and mouthparts, except for maxilliped, same as for female. Maxilliped (Fig. 45C) with unarmed syncoxa. Basis similar in length to syncoxa, with 2 inner setae in middle of segment and 2 rows of spinules, one of these rows limited in proximal half of inner margin. Endopod small, unarmed. Terminal claw 98  $\mu\text{m}$  long, with spiniform seta and setule proximally.

Legs 1-5 armed as in female. Terminal spines on third endopodal segment of leg 2 more elongated, without spinules (Fig. 45D). Leg 6 represented by 2 unequal setae and small pointed process on posterior end of genital flaps (Fig. 45B).

*Etymology.* The specific name *truncus* ("truncated" in Latin) alludes to the truncated rostrum of the new species.

*Remarks.* *Pseudanthessius truncus* n. sp. has a notably short caudal ramus which is shorter than wide. Similarly short

caudal ramus is observed in *P. madrasensis* Reddiah, 1968, *P. major* Stock, 1967, and *P. pectinifer* Stock, Humes and Gooding, 1963 (although *P. brevicauda* Ummerkuty, 1967, *P. anormalus* Ummerkuty, 1967, *P. minutus* Reddiah, 1968, and *P. faouzii* Steuer, 1940, are also recorded to have a short caudal ramus, these four species are too incompletely described to be compared as indicated by Humes and Stock, 1973). Interestingly, the above three relatives have, like *P. truncus*, a scale on the convex side of mandible. *Pseudanthessius truncus* differs from these relatives in the absence of the following features exhibited by the three species.

*Pseudanthessius madreensis* is unusual in the genus in having only a single seta (two setae in *P. truncus* and other species of the genus) on the endopod of leg 4.

*Pseudanthessius major* has a claw, in addition of two setae, on the third segment of antenna (only three setae in *P. truncus*) and the curved third spine on the third endopodal segment of leg 1.

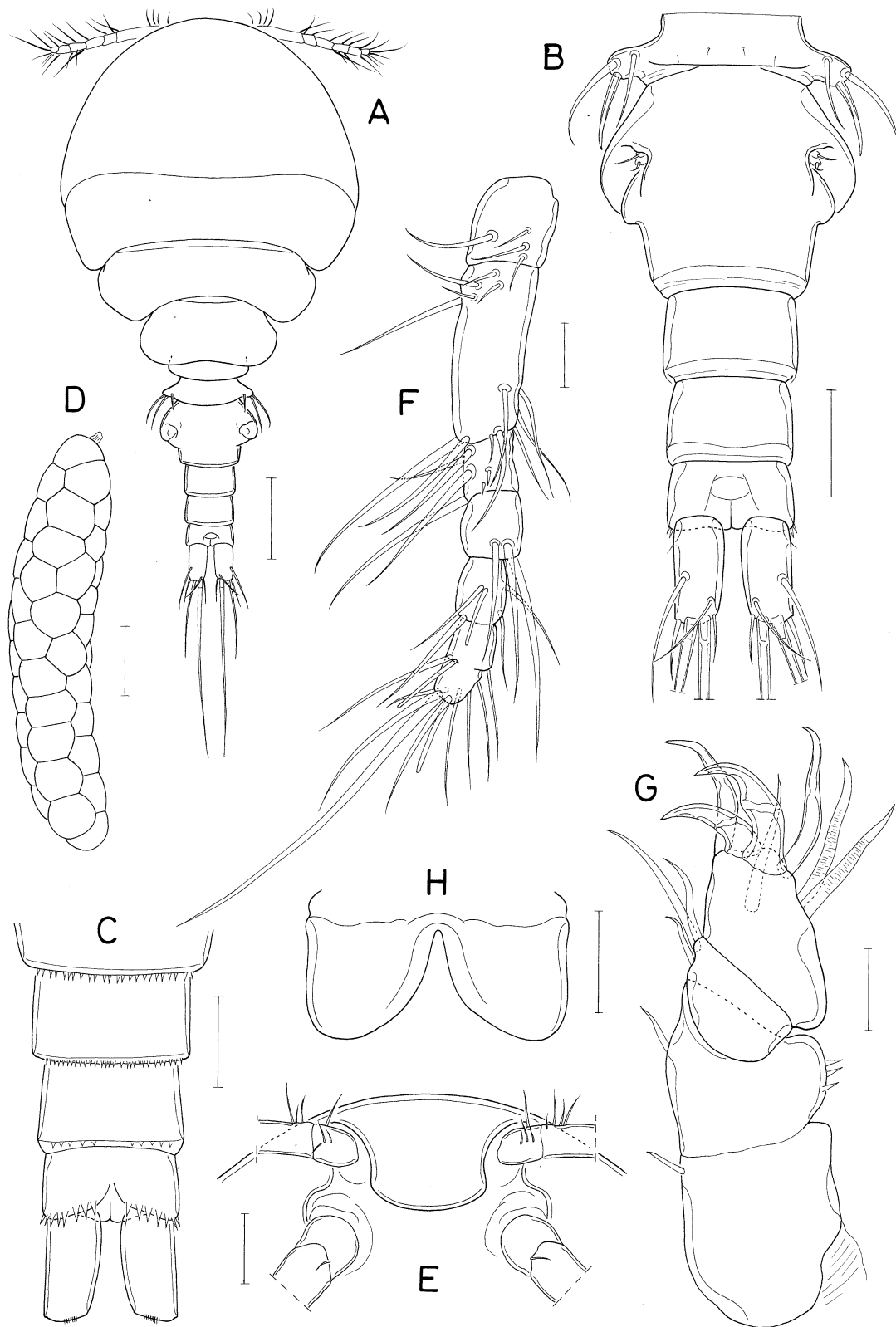
*Pseudanthessius pectinifer* has a strongly tapering rostrum and two small, similar terminal claws on the antenna.

#### *Pseudanthessius planus* n. sp. (Figs. 46, 47)

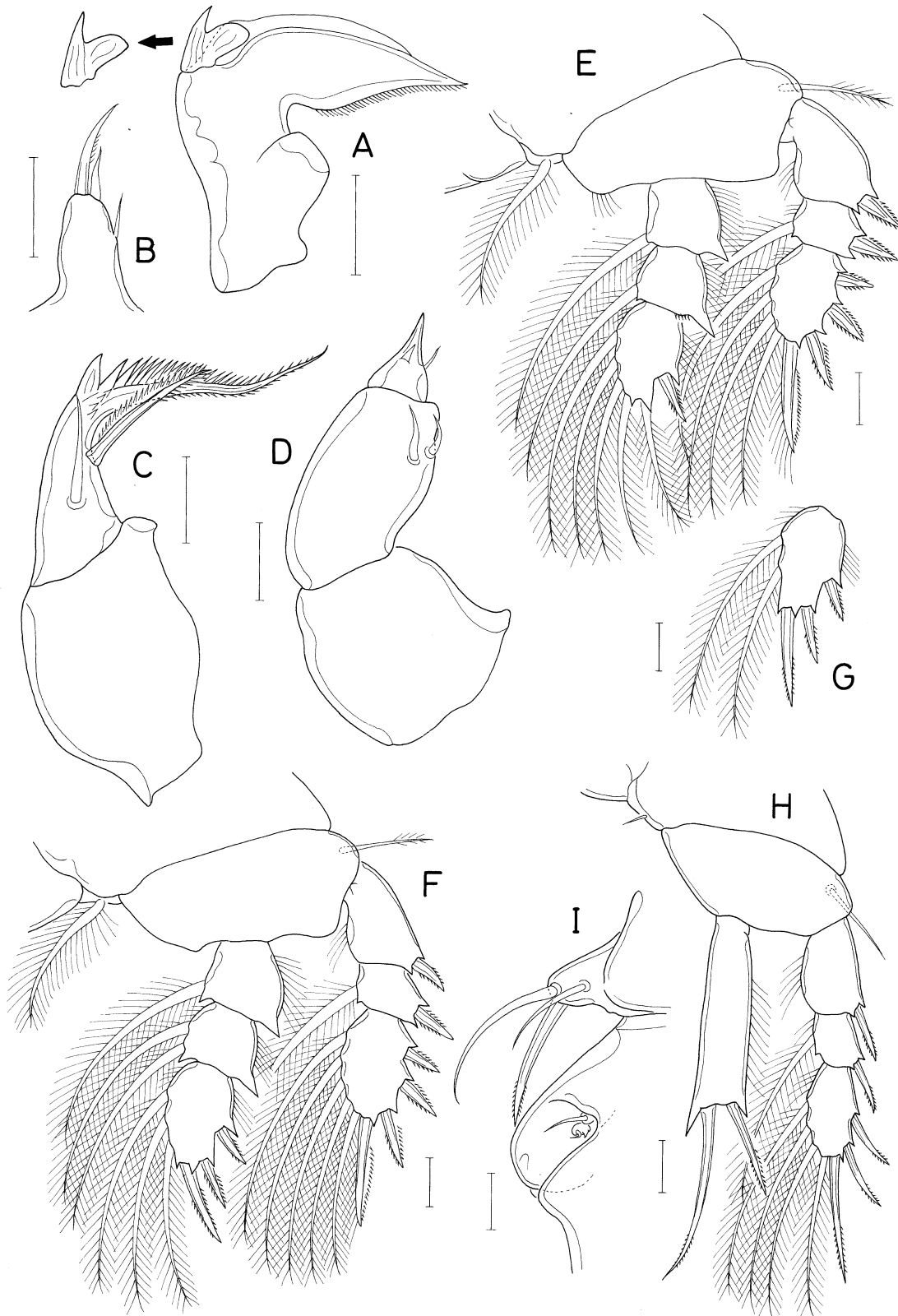
*Material examined.* Two ♀♀ from the echinoid *Himerometra robustipinna* (Carpenter), depth 2 m, Marsegoe Island ( $2^{\circ} 59'30''\text{S}$ ,  $128^{\circ} 03'30''\text{E}$ ), collected by A.G. Humes, 15 May 1975. Holotype (♀: USNM 1081681) has been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (♀) is retained in the collection of the author.

*Female.* Body (Fig. 46A) flat, wide. Body length of dissected specimen 935  $\mu\text{m}$ . Greatest width 496  $\mu\text{m}$ . Prosome expanded laterally, 550  $\mu\text{m}$  long, and nearly circular in dorsal view. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Fourth pedigerous somite very narrow. Urosome (Fig. 46B) 5-segmented. Fifth pedigerous somite short, 145  $\mu\text{m}$  wide across lateral protrusions. Genital double-somite wider than long,  $117 \times 157 \mu\text{m}$ , with laterally expanded anterior part and narrower posterior part. Genital areas located dorsolaterally. Three free abdominal somites  $52 \times 86$ ,  $48 \times 80$ , and  $35 \times 75 \mu\text{m}$ , respectively. Posteroventral margin of genital double-somite with spinules (Fig. 46C). Posteroventral margin of first free abdominal somite with fine spinules. Posteroventral margin of second free abdominal and anal somites fringed with weakly crenulated membrane and larger spinules, respectively. Caudal ramus  $64 \times 31 \mu\text{m}$ , 2.06 times as long as wide, with small outer proximal setule and 6 setae. Outer lateral seta located slightly posterior to midlength of





**Fig. 46.** *Pseudanthessius planus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, abdomen, ventral; D, egg sac; E, rostral area, ventral; F, antennule; G, antenna; H, labrum. Scales: A, D, 0.1 mm; B, C, E, 0.05 mm; F-H, 0.02 mm.



**Fig. 47.** *Pseudanthessius planus* n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, third endopodal segment of leg 3; H, leg 4; I, leg 5 and genital area, left. Scales: 0.02 mm for all.

ramus. Longest median terminal seta 250  $\mu\text{m}$ . Second longest seta 126  $\mu\text{m}$ . All setae naked. Egg sac (Fig. 46D) elongate, 592  $\times$  123  $\mu\text{m}$ . Each egg 69  $\mu\text{m}$  in diameter.

Rostrum broad, with nearly truncate posterior margin (Fig. 46E). Antennule (Fig. 46F) 188  $\mu\text{m}$  long, 6-segmented (resulting from fusion of terminal 2 segments of original 7-segmented antennule); armature formula 4, 13, 6, 3, 4+ aesthetasc, and 9+2 aesthetascs. Setae naked and varied in size. Antenna (Fig. 46G) massive, 116  $\mu\text{m}$  long, 4-segmented. All segments wider than long. Armature formula 1, 1, 3, and 3+4 claws. First endopodal segment with 3-5 spinules on expanded outer margin. Second endopodal segment distinctly narrower than other segments. Third endopodal segment expanded proximally, its 4 claws consisting of 2 thick and 2 slender but longer ones.

Labrum (Fig. 46H) broad, with deep posteromedian incision. Mandible (Fig. 47A) with shallow inner proximal notch and strongly tapering distal part. Inner margin with fine spinules. Convex side with large scale bearing characteristic, leaf-like lateral expansion on medial margin. Maxillule (Fig. 47B) armed with subdistal element and 2 unequal terminal setae. Maxilla (Fig. 47C) with unarmed syncoxa. Basis with naked anterior seta, and long, spiniform inner seta bearing spinules along whole distal margin and distal part of proximal margin. Distal lash long, with large proximal tooth followed by row of spinules on distal margin, small spinules on proximal (inner) margin, several lateral spinules on proximal part. Maxilliped (Fig. 47D) 3-segmented. Syncoxa wider than long and unarmed. Basis with 2 inner setae, 15 and 11  $\mu\text{m}$ , respectively. Endopod strongly tapering, with short spiniform seta, slender seta, and pointed tip.

Legs 1-3 with 3-segmented rami (Fig. 47E, F). Leg 4 (Fig. 47H) 3-segmented exopod and 1-segmented endopod. Inner coxal seta of legs 1-3 large and plumose. Inner coxal seta of leg 4 minute and naked. Endopod of leg 4 large, 76  $\times$  21  $\mu\text{m}$ , gradually broadened distally, with pointed process at both distal corners, 2 slender terminal claws of 73 (inner) and 39  $\mu\text{m}$  (outer). Armature formula of legs 1-4 as in preceding species.

Leg 5 represented by proximal seta, distal seta, and setiform spine (47  $\mu\text{m}$ ) on lateral process of fifth pedigerous somite (Fig. 47I). Leg 6 represented by seta, minute seta, and small pointed process in genital area (Fig. 47I).

*Male.* Unknown.

*Etymology.* The specific name *planus* ("flat" in Latin) refers to the flat body of the new species.

*Remarks.* This species is easily distinguished from all congeners by having the characteristically stout antenna in which three distal segments are much wider than long. One of the major distinguishing features, the anal somite is

shorter than the pre-anal somite, has not been recorded in any other species of *Pseudanthessius*. The unique shape of the outer scale of the mandible also distinguish *P. planus* from all congeners.

Family Rhynchomolgidae Humes and Stock, 1972

Genus *Acanthomolgus* Humes and Stock, 1972

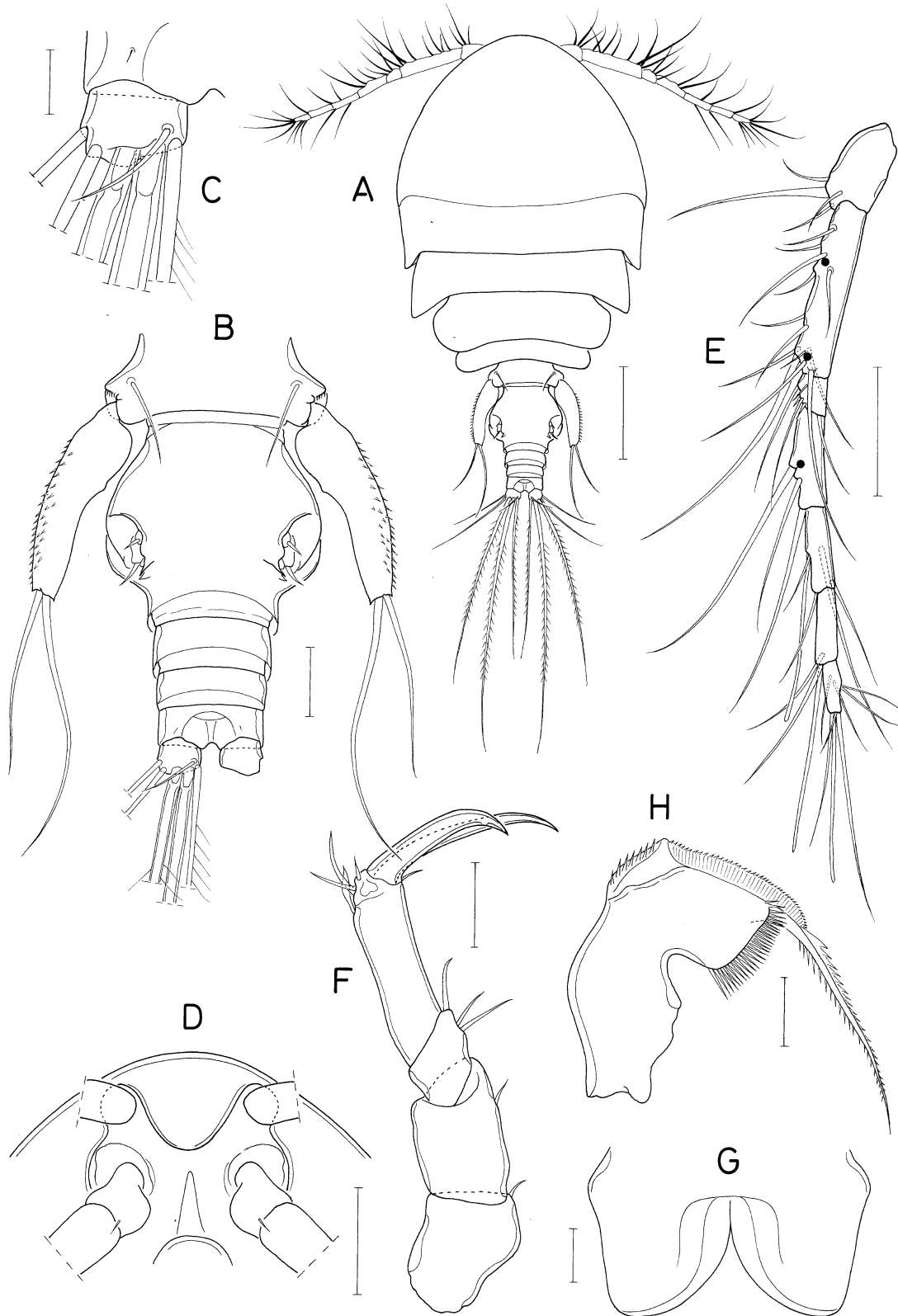
*Acanthomolgus gomumuensis* n. sp. (Figs. 48-50)

*Material examined.* Seven ♀♀, 6♂♂ from the alcyonacean *Dendronephthya (Morchellana) grandiflora* Henderson, depth 10 m, Gomumu Island, south of Obi (1° 50' 00''S, 127° 30' 45''E), collected by A.G. Humes, 30 May 1975. Holotype (♀: USNM 1081682), allotype (♂: USNM 1081683), and paratypes (5 ♀♀, 4 ♂♂: USNM 1081684) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

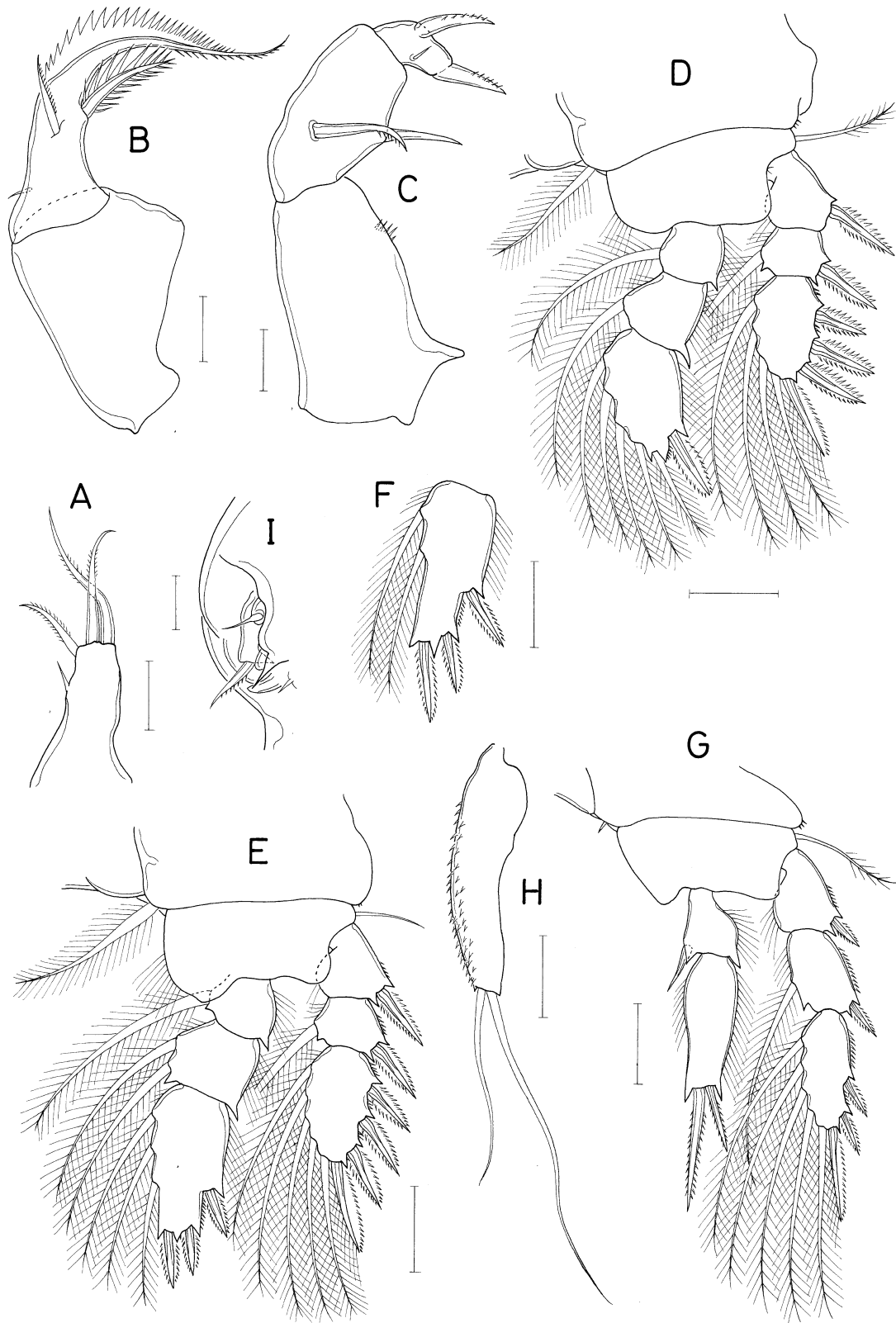
*Female.* Body (Fig. 48A) with relatively large prosome and small urosome. Mean body length 946  $\mu\text{m}$  (892-1,000  $\mu\text{m}$ ) based on 6 specimens. Body length of dissected largest specimen 1.0 mm. Greatest width 540  $\mu\text{m}$ . Prosome 700  $\mu\text{m}$  long, occupying 70% length of body. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Epimera of cephalothorax and second pedigerous somite projected posteriorly. Urosome (Fig. 48B) 5-segmented. Fifth pedigerous somite 158  $\mu\text{m}$  wide. Genital double-somite 142  $\times$  153  $\mu\text{m}$ , consisting of distinctly expanded anterior part and short, narrower posterior part. Genital areas positioned dorsolaterally. Dorsal region posterior to genital area with acute process, bluntly tapering process, and small spinule (Fig. 49I). Three free abdominal somites short and unornamented, 33  $\times$  85, 25  $\times$  80, and 27  $\times$  75  $\mu\text{m}$ , respectively. Caudal ramus (Fig. 48C) 27  $\times$  32  $\mu\text{m}$ , 0.84 times as long as wide, with smooth posterior margin and 6 setae; longest seta 550  $\mu\text{m}$  long, distinctly longer than urosome.

Rostrum broad, with rounded posterior margin (Fig. 48D). Antennule (Fig. 48E) slender, 454  $\mu\text{m}$  long; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Antenna (Fig. 48F) 4-segmented. Coxobasis distally broadened, 70  $\times$  58  $\mu\text{m}$ , with small inner distal seta. First endopodal segment 68  $\times$  52  $\mu\text{m}$ , with small inner subdistal seta. Second endopodal segment 25  $\times$  40  $\mu\text{m}$ , with 3 inner setae. Third endopodal segment 100  $\times$  33  $\mu\text{m}$ , 3.0 times as long as wide, with 5 setae and 2 claws; one of outer setae scalpel-like; 2 terminal claws 110 and 86  $\mu\text{m}$ , shorter claw distinctly thicker than longer one.

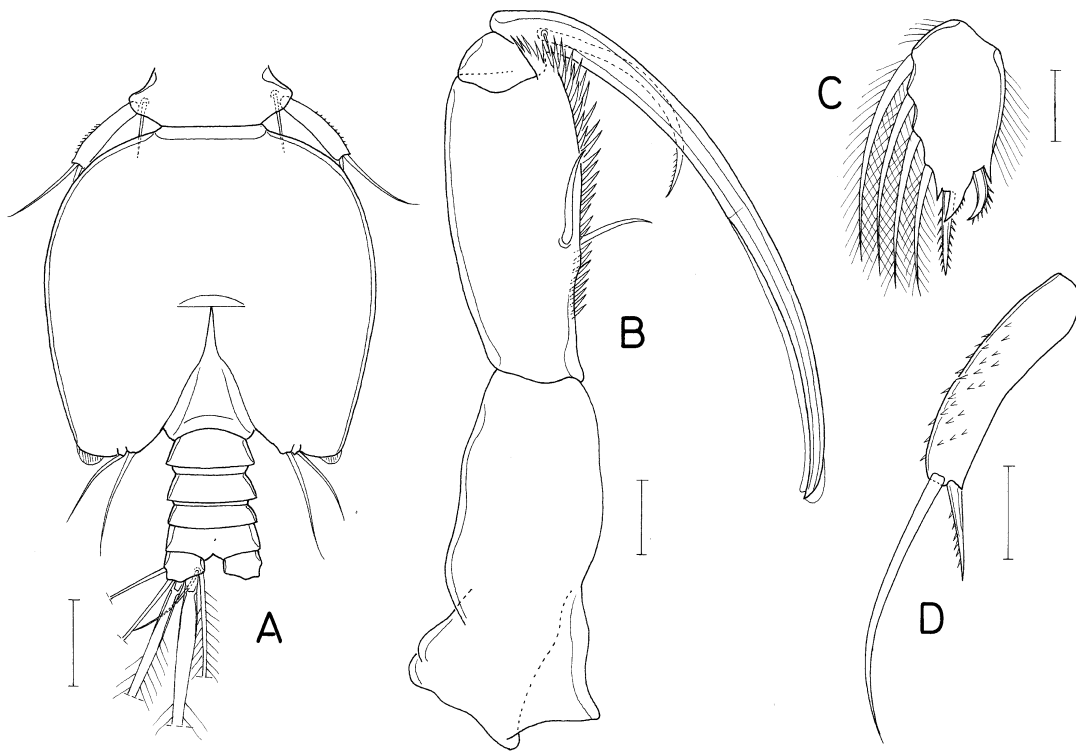
Labrum (Fig. 48G) with deep median incision. Mandible (Fig. 48H) with distinct inner proximal notch. Inner margin



**Fig. 48.** *Acanthomolgus gomumuensis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, left caudal ramus, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, labrum; H, mandible. Scales: A, 0.2 mm; B, F, 0.05 mm; C, G, H, 0.02 mm; D, E, 0.1 mm.



**Fig. 49.** *Acanthomolgus gomumuensis* n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, third endopodal segment of leg 3; G, leg 4; H, free segment of leg 5; I, left genital area. Scales: A-C, I, 0.02 mm; D-H, 0.05 mm.



**Fig. 50.** *Acanthomolgus gomumuensis* n. sp., male. A, urosome, ventral; B, maxilliped; C, third endopodal segment of leg 1; D, free segment of leg 5. Scales: A, 0.05 mm; B-D, 0.02 mm.

straight and perpendicular to distal lash, with spinules. Convex side with 7 spinules and row of minute spinules. Distal lash thin and long with spinules on both margins. Maxillule (Fig. 49A) armed with small subdistal element and 3 terminal setae. Maxilla (Fig. 49B) with unarmed syncoxa. Basis with small outer proximal seta, anterior seta bearing minute spinules on inner margin, inner seta bearing larger spinules along distal margin and small spinules along proximal margin. Distal lash long, with crenulated distal margin and minute spinules on proximal margin. Maxilliped (Fig. 49C) 3-segmented. Syncoxa longer than second, with several small spinules on inner margin. Basis with 2 inner setae 33 and 25  $\mu\text{m}$  long. Endopod with 2 similar spines and small seta.

Legs 1-3 with 3-segmented rami (Fig. 49D-F). Leg 4 (Fig. 49G) exopod 3-segmented, endopod 2-segmented; inner coxal seta minute; inner spine of first endopodal segment short, 31  $\mu\text{m}$ ; second endopodal segment 83  $\mu\text{m}$  long, with setules on both margins, and 2 terminal spines 75 and 42  $\mu\text{m}$ . Armature formula of legs 1-4:

Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
 enp. 0-1; 0-1; I,5

Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,3

Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,5;  
 enp. 0-1; 0-2; I,II,2

Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,5;  
 enp. 0-1; II

Free segment of leg 5 (Fig. 49H) slightly expanded proximally, 152  $\times$  41  $\mu\text{m}$ , with numerous spinules on outer side; 2 terminal setae long, 218 and 123  $\mu\text{m}$ ; longer seta extending over caudal rami. Leg 6 represented by seta and spine in genital area (Fig. 49I).

**Male.** Body similar to that of female. Body length of dissected specimen 850  $\mu\text{m}$ . Greatest width 346  $\mu\text{m}$ . Prosome 521  $\mu\text{m}$  long. Urosome (Fig. 50A) 6-segmented. Fifth pedigerous somite 97  $\mu\text{m}$  wide. Genital somite large, 183  $\times$  195  $\mu\text{m}$ , with short membrane near posterolateral corners. Four abdominal somites 20  $\times$  52, 18  $\times$  53, 12  $\times$  52, and 15  $\times$  56  $\mu\text{m}$ , respectively. Caudal ramus 17  $\times$  15  $\mu\text{m}$ , slightly longer than wide.

Rostrum as in female. Antennule with 2 additional aesthetascs on second segment and 1 aesthetasc on fourth segment, as indicated by dots in Fig. 48E. Antenna, and mouthparts as for female, except for maxilliped. Maxilliped (Fig. 50B) consisting of 3 segments and terminal claw. Syncoxa 185  $\mu\text{m}$  long and unarmed. Basis gradually broad-

dened distally, with row of spinules on entire inner margin, additional row of spinules on distal part of inner margin, spinulated process near inner distal corner, and 2 subequal setae. Small endopod unarmed. Terminal claw weakly arched, 155  $\mu\text{m}$  long, with narrow membrane fringed on distal half of inner (concave) margin and large seta and small setule proximally.

Third endopodal segment of leg 1 (Fig. 50C) armed with 2 spines and 4 setae; proximal spine curved; terminal process more pronounced than in female. Legs 2-4 as in female. Free segment of leg 5 (Fig. 50D)  $53 \times 12 \mu\text{m}$ , with nearly parallel lateral margins, spine (21  $\mu\text{m}$ ) and seta (60  $\mu\text{m}$ ) terminally. Leg 6 as 2 subequal setae on posterior margin of genital somite (Fig. 50A).

*Etymology.* Named after the type locality, Gomumu Island.

*Remarks.* Several species of *Acanthomolgus* have, like *A. gomumuensis* n. sp., a combination of the following characters: (1) caudal ramus as long as or shorter than wide; (2) the longest terminal claw on the antenna as long as or longer than the terminal segment; (3) free segment of female leg 5 3.0-4.5 times as long as wide. This combination of characters is shared by *A. astrictus* Humes and Stock, 1973, *A. boholensis* Humes, 1990, *A. brevifurca* Humes, 1990, *A. cuneipes* (Humes and Ho, 1968), *A. fissisetiger* (Humes and Ho, 1968), *A. geminus* Kim, 2004, and *A. varirostratus* (Humes and Ho, 1968). Of these seven species, *A. brevifurca*, *A. cuneipes*, and *A. fissisetiger* have a distinct proximal inner swelling on the free segment of female leg 5 and are, therefore, distinguished from *A. gomumuensis*. *Acanthomolgus gomumuensis* differs from *A. astrictus* in lacking of a distinct process on the inner margin of the free segment of female leg 5. It differs also from *A. boholensis*, because the latter species has a pair of terminal claws on the antenna, which are very unequal in thickness, a small body (0.68-0.72 mm in the female, according to Humes, 1990a), and a small inner seta on the basis of maxilla. *Acanthomolgus gomumuensis* is distinguished from *A. geminus* by having a larger body (*A. geminus* are recorded by Kim, 2005c to be 732  $\mu\text{m}$  long in the female and 610  $\mu\text{m}$  long in the male), one spine and one seta terminally on the free segment of the male leg 5, a straight endopod of the male leg 1, and a more slender antenna.

In addition, the presence of a scalpel-like distal seta on the terminal segment of the antenna and a tapering process accompanied by a small spinule at the region posterior to genital area are characters unique to the new species.

#### *Acanthomolgus dispadactylus* n. sp. (Figs. 51-53)

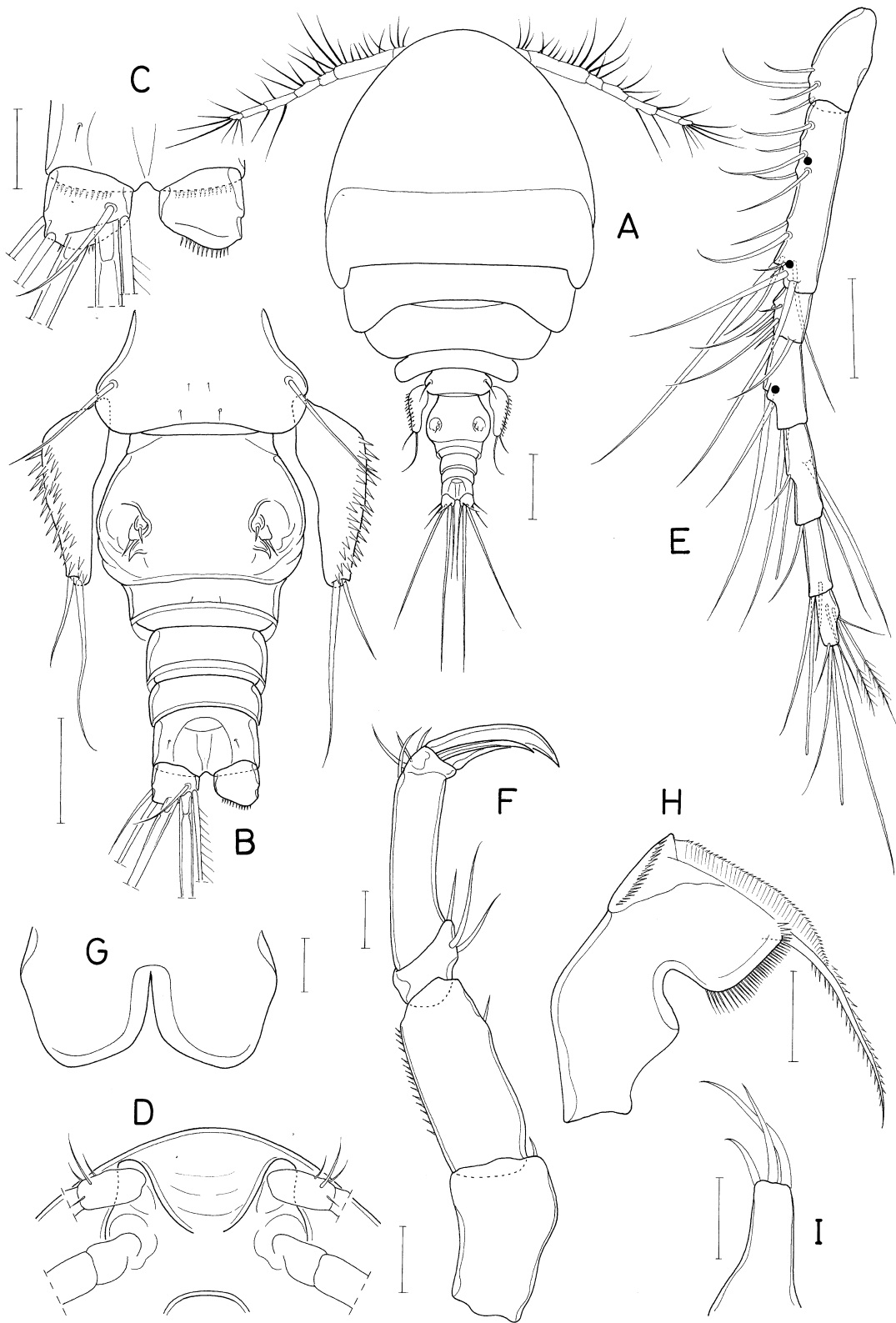
*Material examined.* Nine ♀♀, 2♂♂ from the alcyonacean *Dendronephthya (Morchellana) grandiflora* Henderson,

depth 10 m, Gomumu Island, south of Obi (1° 50'00"S, 127° 30'45"E), collected by A.G. Humes, 30 May 1975. Holotype (♀: USNM 1081685), allotype (♂: USNM 1081686), and paratypes (7♀♀: USNM 1081687) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1♀, 1♂) are kept in the collection of the author.

*Female.* Body (Fig. 51A) small, with semicircular prosome and small urosome. Body length of dissected specimen 731  $\mu\text{m}$ . Mean body length 712  $\mu\text{m}$  (613-767  $\mu\text{m}$ ) based on 8 specimens. Greatest width 412  $\mu\text{m}$ . Prosome 562  $\mu\text{m}$  long, occupying more than 75% length of body. Cephalothorax with faint dorsal suture line delimiting cephalosome and first pedigerous somite. Urosome (Fig. 51B) 5-segmented. Fifth pedigerous somite 99  $\mu\text{m}$  wide. Genital double-somite  $91 \times 98 \mu\text{m}$ ; anterior part expanded roundly; narrower posterior part 69  $\mu\text{m}$  wide, delimited from anterior part by dorsal line. Genital areas located dorsolaterally. Posterior part of genital area with beak like process (Fig. 52H). Three free abdominal somites  $24 \times 56$ ,  $16 \times 52$ , and  $23 \times 50 \mu\text{m}$ , respectively. Anal somite fringed with spinules on posteroventral margin. Caudal ramus  $20 \times 21 \mu\text{m}$ , with short inner margin, longer outer margin, and spinules on posterior margin (Fig. 51C). Longest of 6 caudal setae 250  $\mu\text{m}$ . Inner distal seta plumose along inner margin; other 5 setae naked.

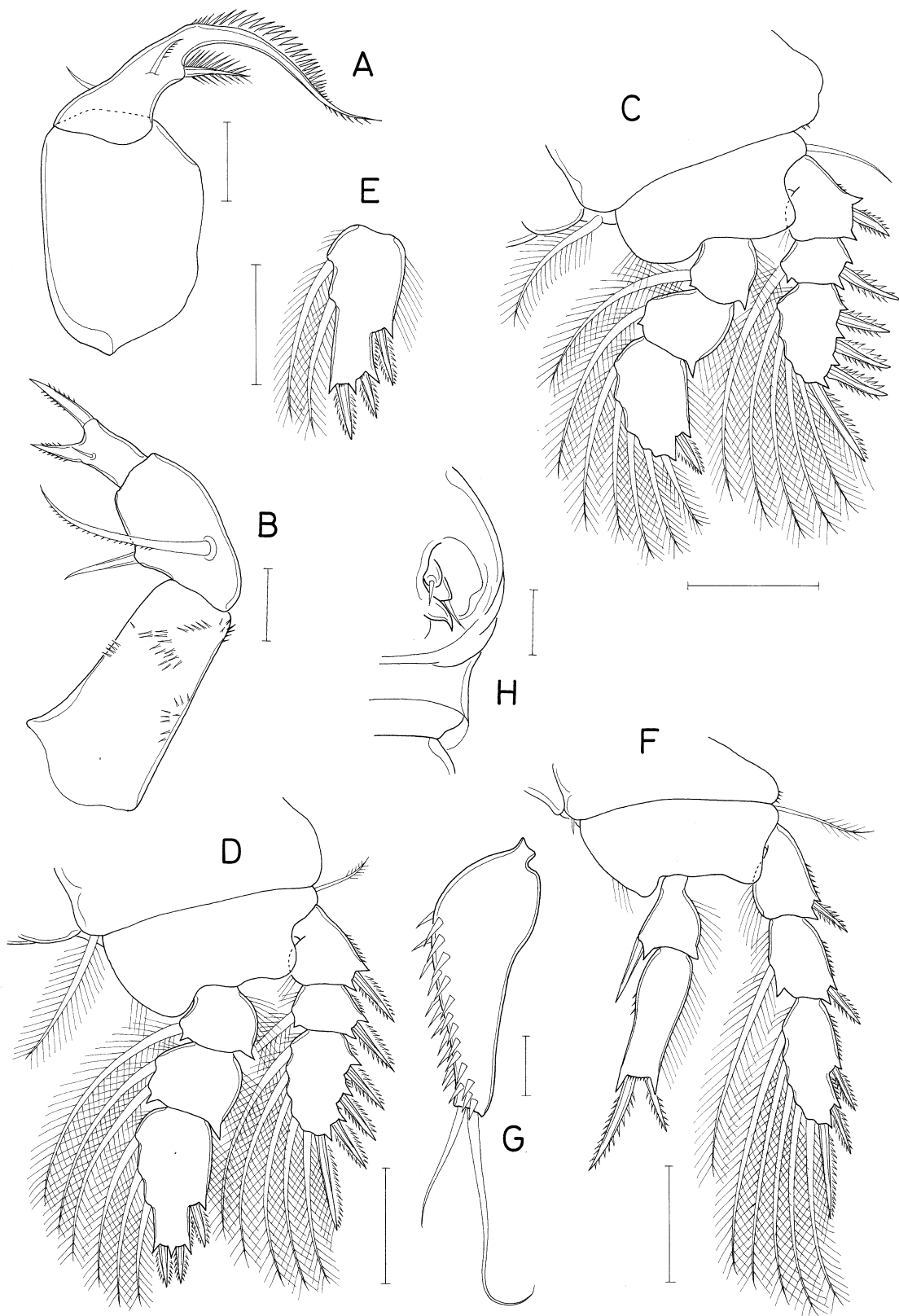
Rostrum broad (Fig. 51D), with posterior apex fused with ventral surface of body. Antennule (Fig. 51E) slender, 324  $\mu\text{m}$  long, 7-segmented; armature formula 4, 13, 6, 3, 4+ aesthetasc, 2+aesthetasc, and 7+aesthetasc. Antenna (Fig. 51F) 4-segmented. Coxobasis distally broadened,  $50 \times 36 \mu\text{m}$ , with small inner distal seta. First endopodal segment  $65 \times 31 \mu\text{m}$ , with spinules on outer margin and small inner seta. Second endopodal segment  $15 \times 26 \mu\text{m}$ , with 3 inner setae. Third endopodal segment  $67 \times 19 \mu\text{m}$ , 3.53 times as long as wide, with 4 outer distal setae, large claw of 47  $\mu\text{m}$  and extremely slender claw of 34  $\mu\text{m}$ .

Labrum (Fig. 51G) with deep posteromedian incision. Mandible (Fig. 51H) with deep inner proximal notch. Inner margin straight and perpendicular to distal lash, with spinules. Convex side with row of minute spinules and followed by minute spinules. Distal lash slender and long, with spinules on both margins. Maxillule (Fig. 51I) armed terminally with 3 naked setae. Maxilla (Fig. 52A) with unarmed syncoxa. Basis with small outer proximal seta, small anterior seta, and inner seta bearing spinules on both margins. Distal lash arched, with spinules on proximal 70% of distal margin and small spinules on distal part of proximal margin. Maxilliped (Fig. 52B) 3-segmented. Syncoxa longest among segments, with scattered spinules. Basis with 2 setae (53 and 21  $\mu\text{m}$ ). Endopod with spine, spiniform process and

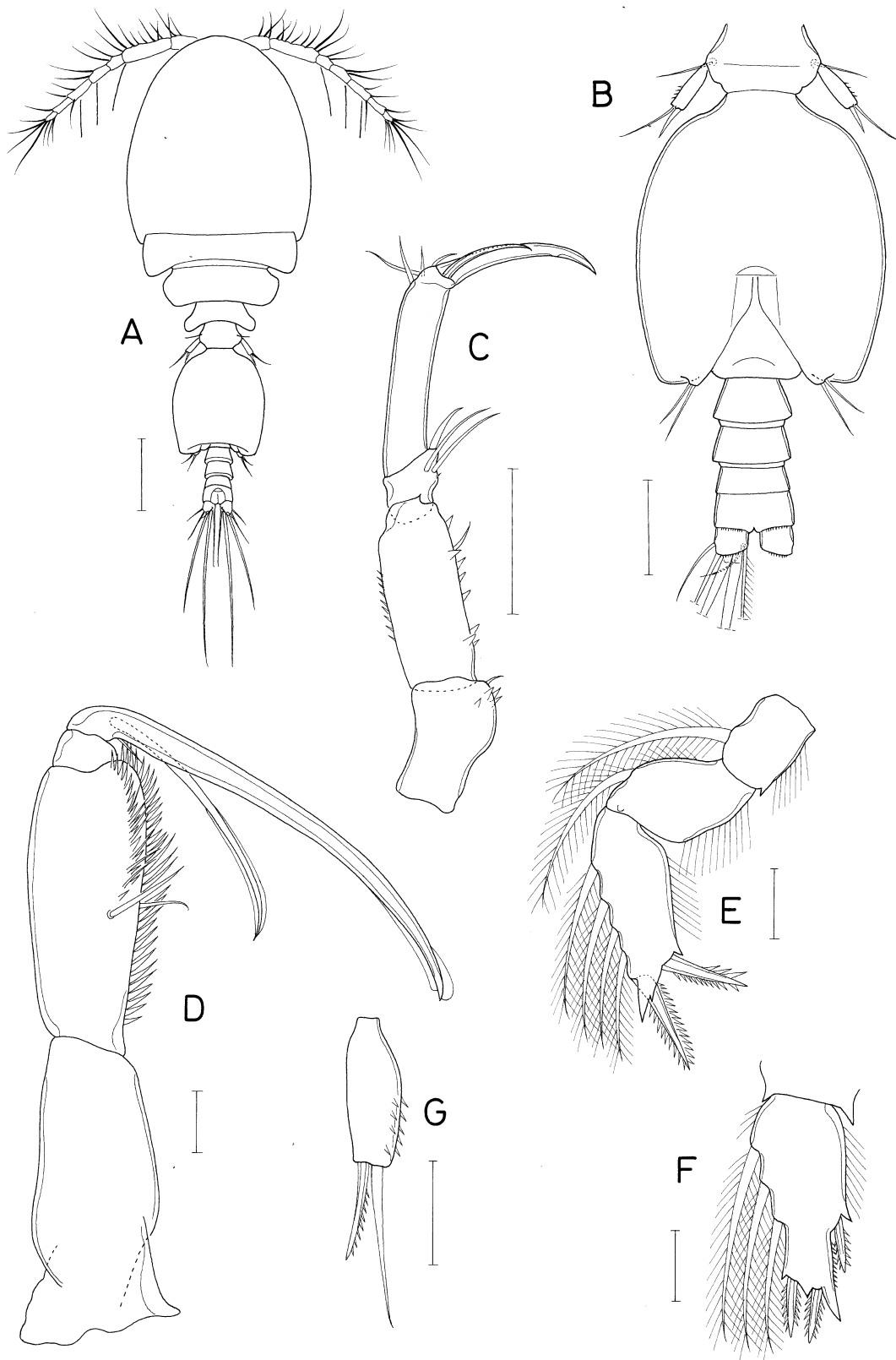


**Fig. 51.** *Acanthomolgus dispadatylus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, labrum; H, mandible; I, maxillule. Scales: A, 0.1 mm; B, D, E, 0.05 mm; C, F-I, 0.02 mm.





**Fig. 52.** *Acanthomolgus dispadactylus* n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, third endopodal segment of leg 3; F, leg 4; G, free segment of leg 5; H, right genital area. Scales: A, B, G, H, 0.02 mm; C-F, 0.05 mm.



**Fig. 53.** *Acanthomolgus dispadatylus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, maxilliped; E, endopod of leg 1; F, third endopodal segment of leg 2; G, free segment of leg 5. Scales: A, 0.1 mm; B, C, 0.05 mm; D-G, 0.02 mm.

small seta.

Legs 1-3 with 3 segmented rami (Fig. 52C-E). Leg 4 (Fig. 52F) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of leg 3 distinctly larger than that of leg 2. Leg 4 with minute inner coxal seta; inner spine on first endopodal segment 29  $\mu\text{m}$  long. Second endopodal segment 58  $\times$  22  $\mu\text{m}$ , with setules on outer margin and several spinules on inner margin; 2 terminal claws 45 and 25  $\mu\text{m}$ , with spinules on both margins. Armature formula of legs 1-4 as in preceding species.

Free segment of leg 5 (Fig. 52G) strongly tapering, 92  $\times$  33  $\mu\text{m}$ , with large spinules on outer side; 2 terminal setae 79 and 43  $\mu\text{m}$ . Leg 6 represented by 2 setae in genital area (Fig. 52H).

*Male.* Body (Fig. 53A) narrower than that of female. Body length of dissected specimen 657  $\mu\text{m}$ . Greatest width 257  $\mu\text{m}$ . Prosome 397  $\mu\text{m}$  long. Cephalothorax without dorsal suture line. Urosome (Fig. 53B) 6-segmented. Fifth pedigerous somite 60  $\mu\text{m}$  wide. Genital somite large, 150  $\times$  131  $\mu\text{m}$ . Genital flap indistinctly demarcated. Four abdominal somites 25  $\times$  41, 21  $\times$  41, 14  $\times$  38, and 18  $\times$  39  $\mu\text{m}$ , respectively. Caudal ramus 15  $\times$  18  $\mu\text{m}$ .

Rostrum as in female. Antennule with 2 additional aesthetascs on second segment and 1 aesthetasc on fourth segment, as indicated by dots in Fig. 51E. Antenna (Fig. 53C) with additional scale-like spinules on inner distal area of coxobasis and on inner margin of first endopodal segment. Labrum, mandible, maxillule and maxilla as in female. Maxilliped (Fig. 53D) consisting of 3 segments and terminal claw. Basis gradually broadened distally, with row of spinules on whole inner margin, additional row of spinules on distal part of inner margin, and 2 inner setae of different sizes. Small endopod unarmed. Terminal claw weakly curved, 150  $\mu\text{m}$  long, with short membrane on distal part of inner margin and proximally small setule and large seta distally fringed with membrane on both margins.

Endopod of leg 1 (Fig. 53E) geniculate; third segment armed with 2 spines and 4 setae. Third endopodal segment of leg 2 (Fig. 53F) with developed inner distal process. Legs 3 and 4 as for female.

Free segment of leg 5 (Fig. 53G) 28  $\times$  11  $\mu\text{m}$ , with spine (18  $\mu\text{m}$ ) and naked seta (31  $\mu\text{m}$ ) terminally. Leg 6 represented by 2 subequal setae on posterior corners of genital somite (Fig. 53B).

*Etymology.* The specific name *dispadactylus* is a combination of the Latin *dispar* (=different) and *dactylus* (=a finger). It alludes to the distinct difference in the thickness of the two terminal claws on the antenna.

*Remarks.* The most striking feature of *Acanthomolgus dispadactylus* n. sp. seems to be the distinct difference in the thickness of the two terminal claws on the antenna: at

the base the smaller claw is at most one-fourth as thick as the larger one. A difference in the thickness of the claws is also recorded in *A. boholensis* Humes, 1990, *A. combinatus* Humes, 1972, *A. astrictus* Humes and Stock, 1973, and *A. mopsellae* Humes, 1974. However, these four species display, unlike *A. diapadactylus*, the following features and therefore differ from the new species.

In *A. boholensis* the thinner terminal antennal claw is longest (reversed state in *A. dispadactylus*) and the maxillule has four setae.

In *A. combinatus* the free segment of the female leg 5 has a distinct proximal swelling, the body of the female is longer and more slender (1.02-1.19 mm long) (Humes, 1974), the inner seta on the basis of the maxilla is elongated and more than half length of distal lash.

In *A. astrictus* the most slender terminal antennal claw is longest, the maxillule has four setae, the free segment of the female leg 5 has a proximal process on the inner margin, and the free segment of the male leg 5 is more slender than that of *A. dispadactylus*.

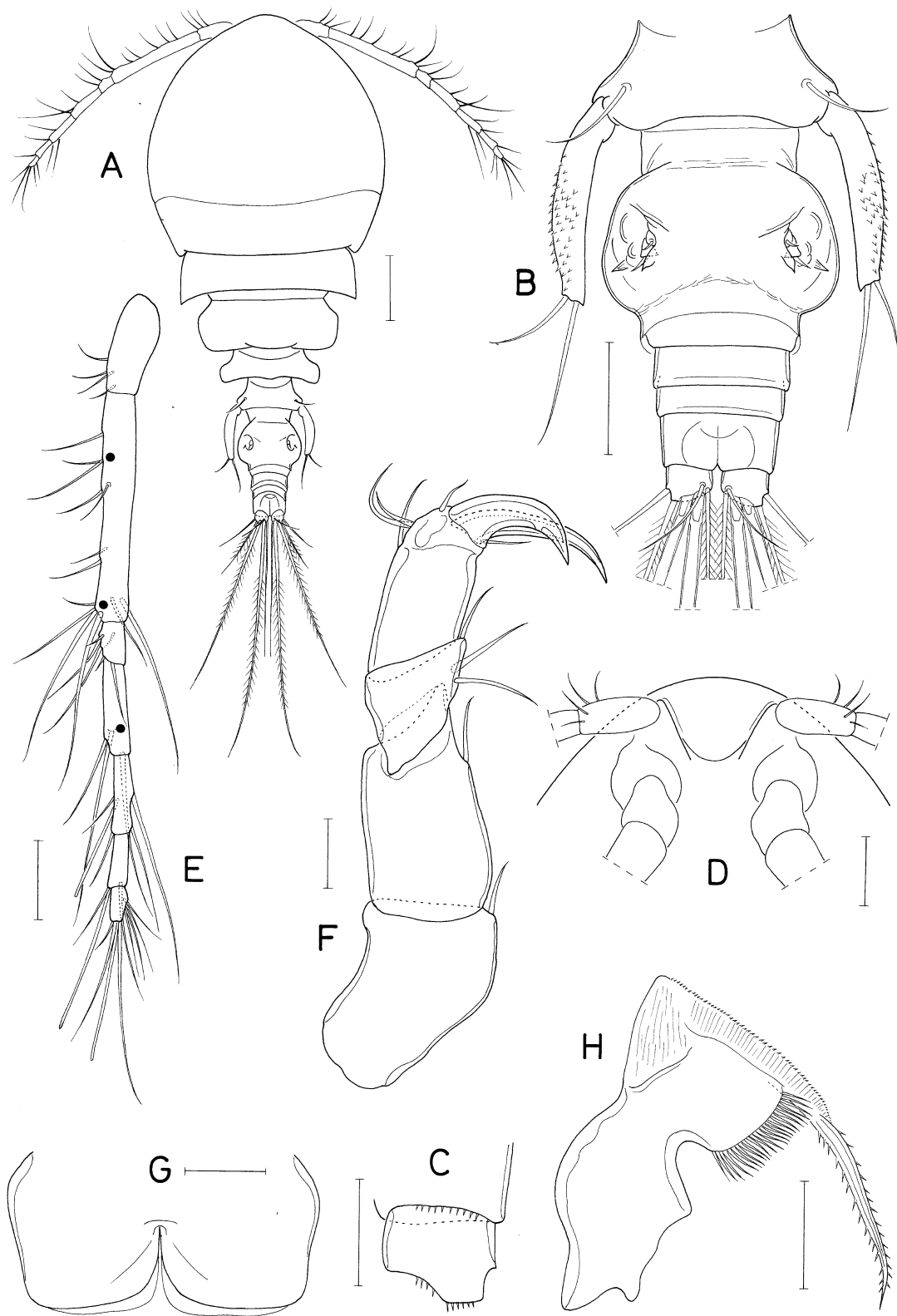
In *A. mopsellae* the most slender terminal antennal claw is also longest, the body of the female is longer (0.89-1.02 mm) (Humes, 1974), and the free segment of the female leg 5 is narrow and proximally curved, with two terminal setae nearly equal in length.

It is remarkable in *A. dispadactylus* that the shape of the larger proximal seta on the claw of the male maxilliped is typical to this species, because it is significantly enlarged and characteristically fringed with membrane in the distal half of both margins.

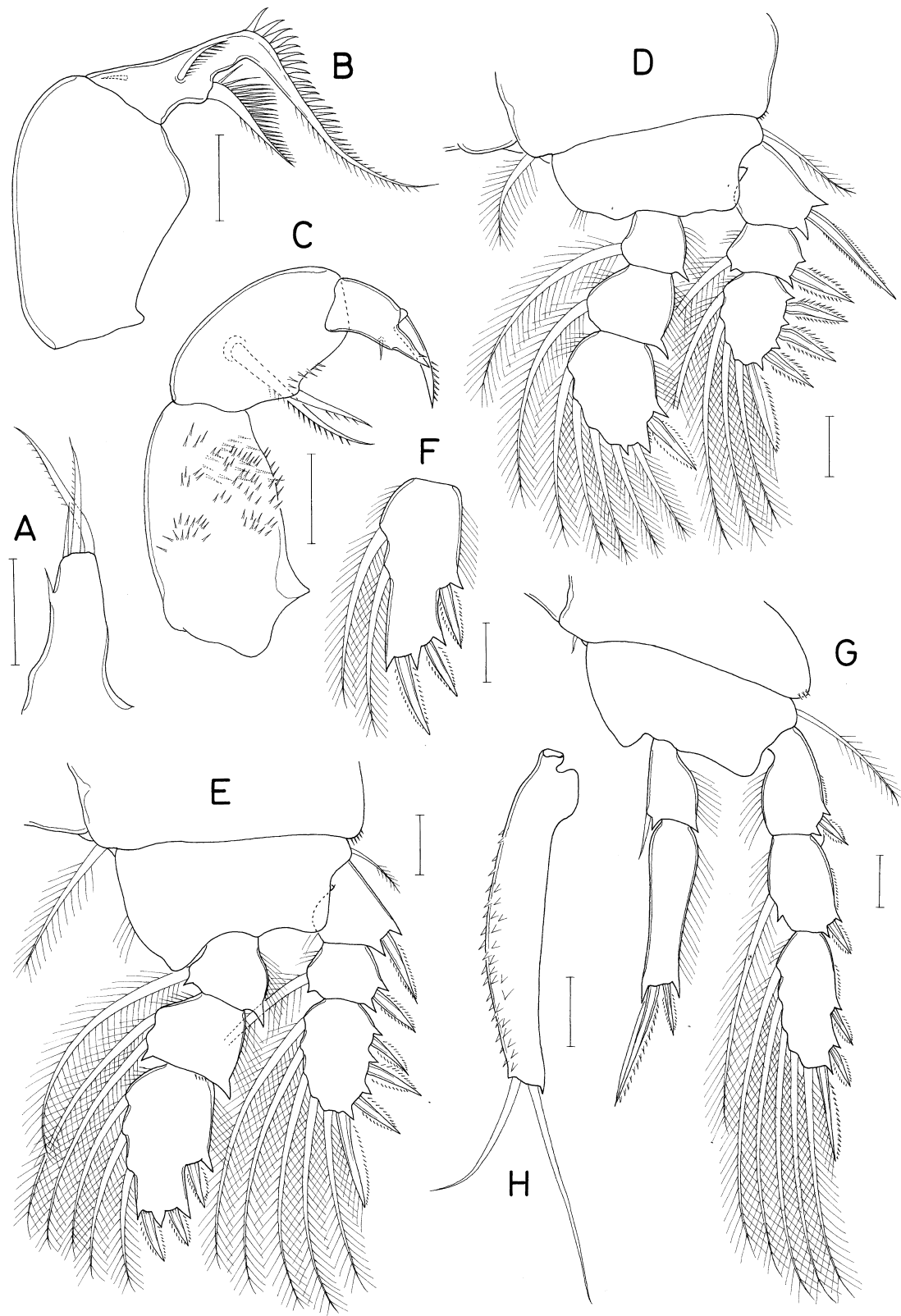
#### *Acanthomolgus bandaensis* n. sp. (Figs. 54-56)

*Material examined.* Eleven ♀♀, 7 ♂♂ from an alcyonacean (dull orange), depth 25 m, Banda Islands (4° 32'55" S, 129° 52'30"E), collected by A.G. Humes, 26 May 1975. Holotype (♀: USNM 1081688), allotype (♂: USNM 1081689), and paratypes (9 ♀♀, 5 ♂♂: USNM 1081690) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) in the collection of the author.

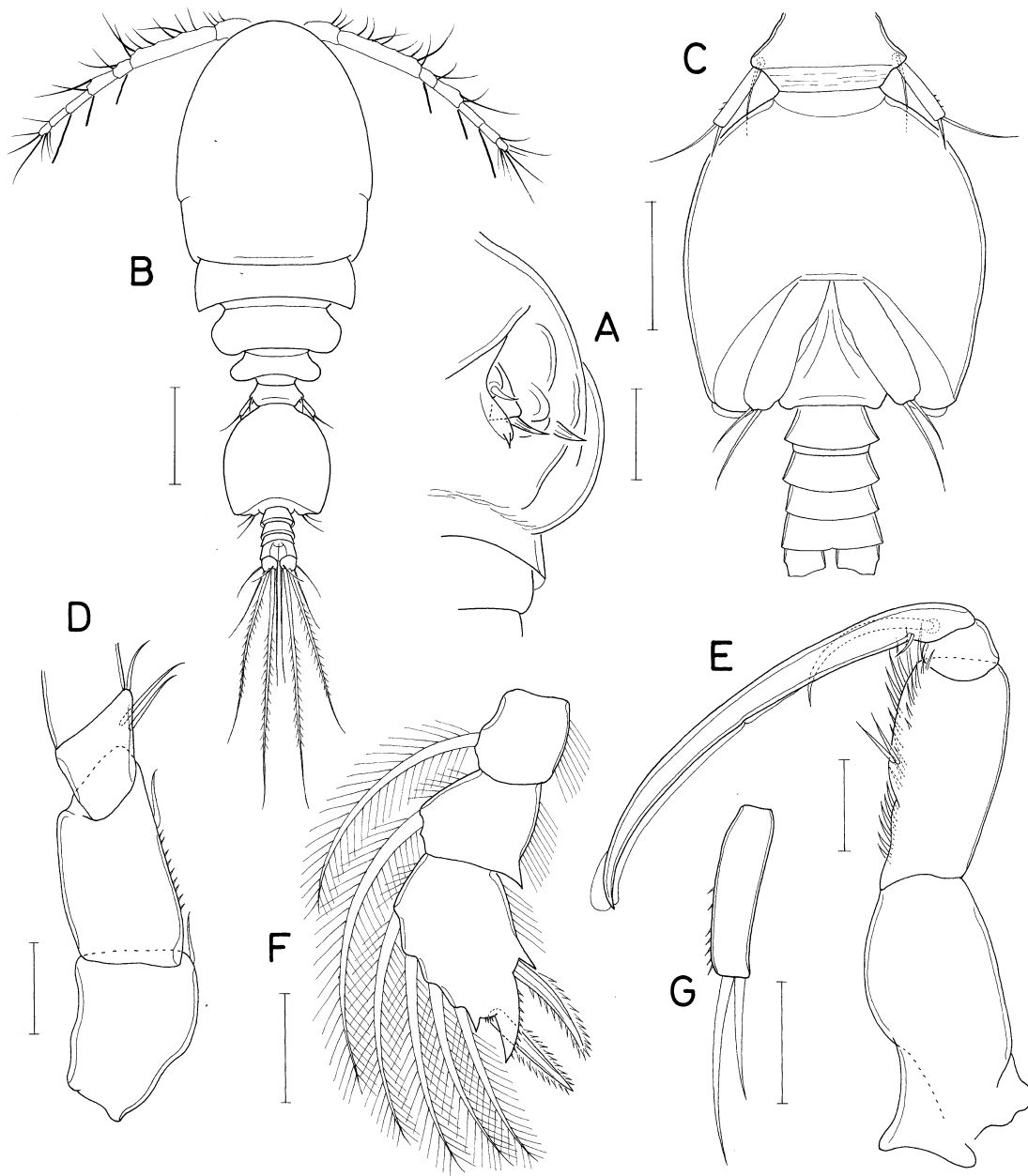
*Female.* Body (Fig. 54A) small and moderately broad. Body length of dissected specimen 795  $\mu\text{m}$ . Mean body length 776  $\mu\text{m}$  (738-831  $\mu\text{m}$ ) based on 10 specimens. Greatest width 370  $\mu\text{m}$ . Prosome 570  $\mu\text{m}$  long. Cephalothorax with faint dorsal suture line delimiting cephalosome and first pedigerous somite. Second pedigerous somite with pointed posterolateral corners. Urosome (Fig. 54B) 5-segmented. Fifth pedigerous somite 109  $\mu\text{m}$  wide. Genital double-somite 96  $\times$  105  $\mu\text{m}$ , anterior part expanded roundly; nar-



**Fig. 54.** *Acanthomolgus bandaensis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, dorsal; D, rostral area, ventral; E, antennule (dots indicating positions of additional aesthetascs in male); F, antenna; G, labrum; H, mandible. Scales: A, 0.1 mm; B, D, E, 0.05 mm; C, F-H, 0.02 mm.



**Fig. 55.** *Acanthomolgus bandaensis* n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, third endopodal segment of leg 3; G, leg 4; H, free segment of leg 5. Scales: 0.02 mm for all.



**Fig. 56.** *Acanthomolgus bandaensis* n. sp. Female: A, right genital area. Male: B, habitus, dorsal; C, urosome, ventral; D, proximal part of antenna; E, maxilliped; F, endopod of leg 1; G, free segment of leg 5. Scales: A, D-G, 0.02 mm; B, 0.1 mm; C, 0.05 mm.

rower posterior part short, 71  $\mu\text{m}$  wide. Genital areas located dorsolaterally. Posterior part of genital area with minute process and larger spiniform process (Fig. 56A). Three free abdominal somites  $18 \times 60$ ,  $13 \times 57$ , and  $22 \times 52$   $\mu\text{m}$ , respectively. Caudal ramus (Fig. 54C)  $17 \times 21$   $\mu\text{m}$ , 0.81 times as long as wide, with short inner margin, longer outer margin, and spinules on posterior margin. Longest of 6 caudal setae 438  $\mu\text{m}$ , distinctly longer than urosome. Outer lateral

and inner dorsal setae naked. Other 4 setae plumose.

Rostrum broad (Fig. 54D), with obscure posterior apex. Antennule (Fig. 54E) slender, 392  $\mu\text{m}$  long, 7-segmented; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Antenna (Fig. 54F) 4-segmented, stout. Coxobasis distally broadened,  $53 \times 37$   $\mu\text{m}$ , with inner distal seta. First endopodal segment  $50 \times 35$   $\mu\text{m}$ , with inner seta. Second endopodal segment  $20 \times 29$

$\mu\text{m}$ , with 3 inner setae. Third endopodal segment  $40 \times 25 \mu\text{m}$ , 1.60 times as long as wide, with 5 setae and 2 claws; thicker claw  $37 \mu\text{m}$  long, and slender claw  $47 \mu\text{m}$  long.

Labrum (Fig. 54G) with narrow median incision and thin membrane on posterior margin of lobes. Mandible (Fig. 54H) with broad inner proximal notch. Inner margin straight and perpendicular to distal lash, with spinules. Convex side triangularly protruded and unornamented. Distal lash long, with spinules on both margins. Maxillule (Fig. 55A) with small subdistal element and 3 terminal setae, one smaller than other 2. Maxilla (Fig. 55B) with unarmed syncoxa. Basis with anterior seta bearing setules on inner margin, inner seta bearing long setules along distal margin and minute spinules on proximal margin. Distal lash elongate and proximally bent, with row of spinules on distal margin and minute spinules on proximal margin. Maxilliped (Fig. 55C) 3-segmented. Syncoxa with numerous, scattered spinules. Basis armed with 2 setae,  $39 \mu\text{m}$  and  $19 \mu\text{m}$  long. Endopod with spine, spiniform process and small seta.

Legs 1-3 with 3 segmented rami (Fig. 55D-F). Leg 4 (Fig. 55G) with 3-segmented exopod and 2-segmented endopod. Outer spine on first exopodal segment of leg 1 characteristically elongate,  $41 \mu\text{m}$  long, more than 1.5 times as long as width of segment. Leg 4 with minute inner coxal seta; inner spine on first endopodal segment small,  $16 \mu\text{m}$  long; second endopodal segment rather elongated,  $59 \times 18 \mu\text{m}$ , with setules on outer margin and 2 spines ( $45$  and  $18 \mu\text{m}$  long) terminally. Armature formula of legs 1-4 as in preceding species.

Free segment of leg 5 (Fig. 55H)  $95 \times 17 \mu\text{m}$ , with inner proximal swelling, scale-like spinules on outer surface, and 2 simple terminal setae of  $60$  and  $50 \mu\text{m}$ . Leg 6 represented by seta and spinule in genital area (Fig. 56A).

*Male.* Body (Fig. 56B) narrower than that of female. Body length  $582 \mu\text{m}$  ( $572$ - $598 \mu\text{m}$ ) based on 6 specimens. Body length of dissected specimen  $572 \mu\text{m}$ . Greatest width  $205 \mu\text{m}$ . Prosome  $375 \mu\text{m}$  long. Dorsal suture line of cephalothorax confined to lateral sides. Urosome (Fig. 56C) 6-segmented. Fifth pedigerous somite  $60 \mu\text{m}$  wide. Genital somite large,  $122 \times 117 \mu\text{m}$ . Four abdominal somites  $18 \times 36$ ,  $13 \times 37$ ,  $11 \times 36$ , and  $13 \times 39 \mu\text{m}$ , respectively. Caudal ramus  $12 \times 16 \mu\text{m}$ .

Rostrum as in female. Antennule with 2 additional aesthetascs on second segment and 1 aesthetasc on fourth segment, as indicated by dots in Fig. 54E. These three aesthetascs relatively short, not extending over end of antennule. Antenna with additional spinules on inner margin of first endopodal segment. Labrum, mandible, maxillule and maxilla as in female. Maxilliped (Fig. 56E) consisting of 3 segments and terminal claw. Basis with row of spinules on whole inner margin, additional row of spinules on distal

part of inner margin, and 2 inner setae of similar sizes. Small endopod unarmed. Terminal claw weakly curved,  $102 \mu\text{m}$  long, with narrow membrane on distal half of inner margin and small setule and large seta proximally.

Endopod of leg 1 (Fig. 56F) not geniculate; third segment with 2 spines, 4 setae and enlarged distal process. Legs 2-4 as in female. Free segment of leg 5 (Fig. 56G)  $28 \times 8 \mu\text{m}$  and quadrate, terminally with 2 simple setae of  $31$  and  $20 \mu\text{m}$ , respectively. Leg 6 represented by 2 unequal setae on posterior corners of genital flap.

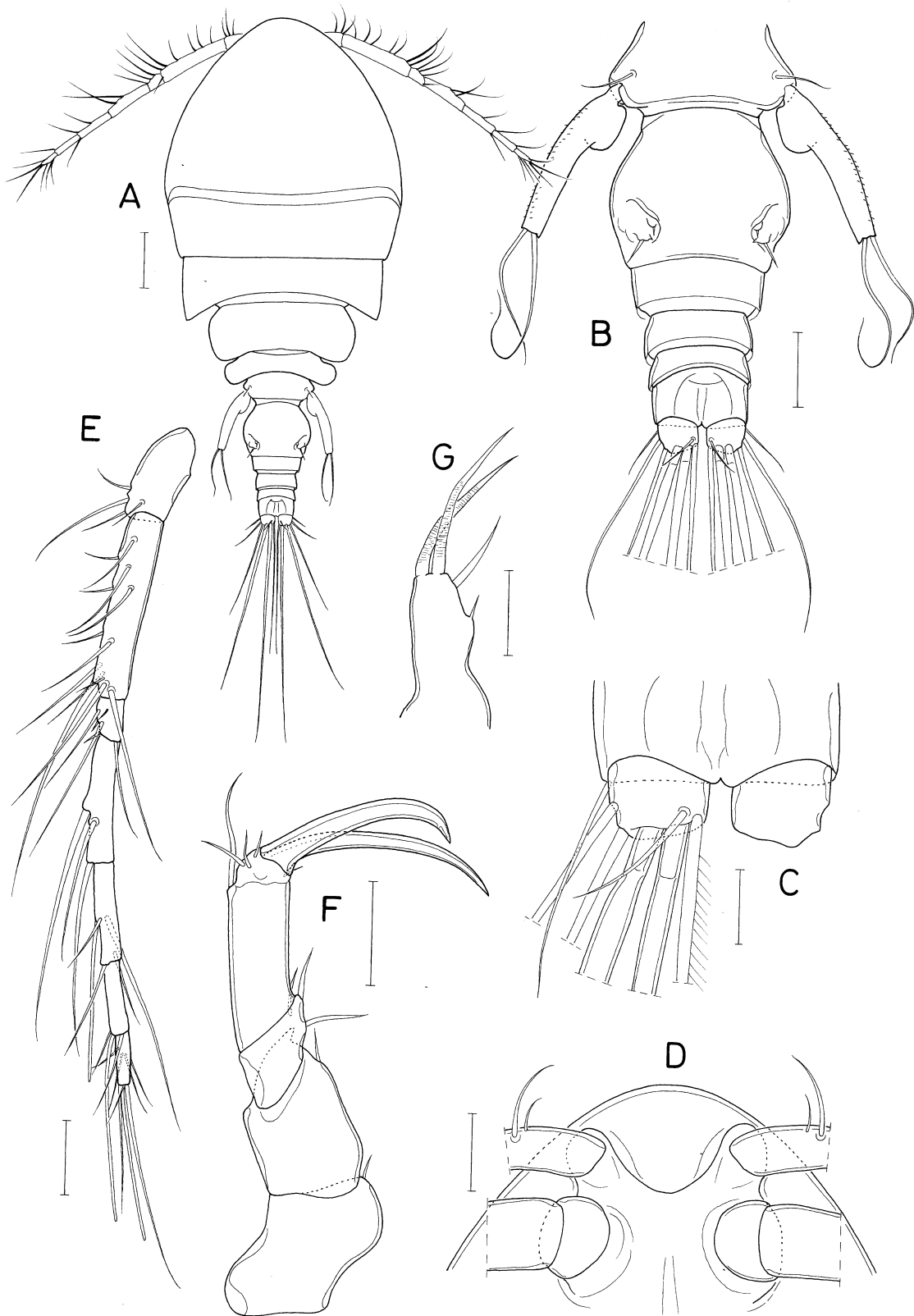
*Etymology.* The specific name is derived from the type locality of the new species, Banda Island.

*Remarks.* The most significant feature of *Acanthomolgus bandaensis* n. sp. is the presence of the unusually long outer spine on the first exopodal segment of leg 1. This spine is  $41 \mu\text{m}$  long and more than 1.5 times as long as the width of the first exopodal segment. This character is shared by only a single known species in the genus, *A. longispinifer* (Humes and Ho). Similarities extended to other appendages. For example, these two species share the similarly stout antenna, the distinctly protruded outer margin of mandible, and a similar maxilla and maxilliped. The only significant difference lies in the free segment of the female leg 5, in which the inner proximal swelling is weak and simple in *A. bandaensis*, but it is prominent, bearing ear-like posterior process in *A. longispinifer*. In addition, the range of body length differs:  $0.74$ - $0.83$  mm (mean  $0.78$  mm) in the female and  $0.57$ - $0.60$  mm (mean  $0.58$  mm) in the male for *A. bandaensis*;  $0.84$ - $0.90$  mm (mean  $0.88$  mm) in the female and  $0.64$ - $0.70$  mm (mean  $0.67$  mm) in the male for *A. longispinifer*, according to Humes and Ho (1968b).

#### *Acanthomolgus ambonensis* n. sp. (Figs. 57, 58)

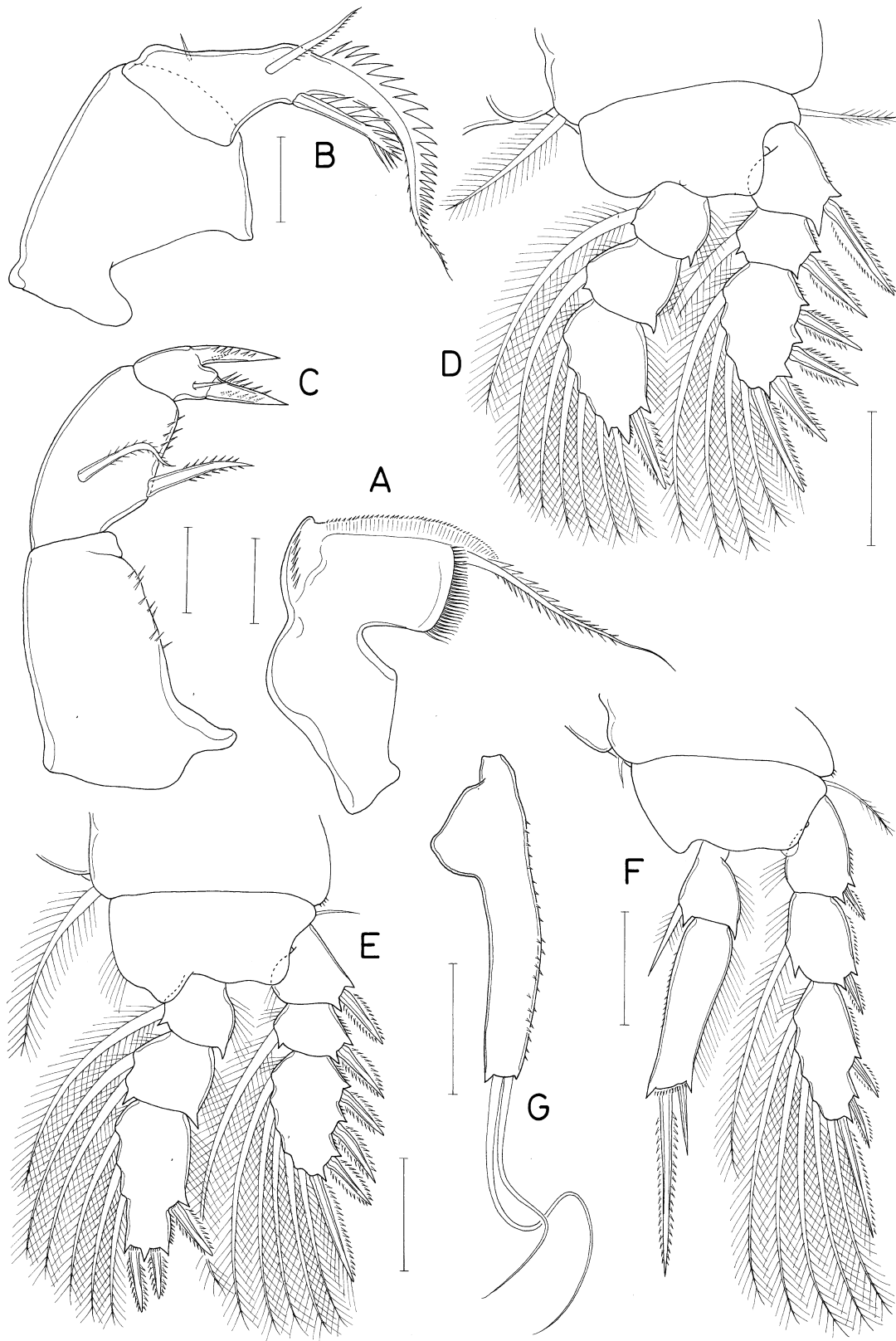
*Material examined.* Four ♀♀ from the alcyonacean *Nephtea galbuloides* Verseveldt, depth 3 m, Natsepa, Ambon ( $3^{\circ} 27' 01''\text{S}$ ,  $128^{\circ} 17' 00''\text{E}$ ), collected by A.G. Humes, 24 April 1975. Holotype (♀: USNM 1081691) and paratypes (2 ♀♀: USNM 1081692) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (1 ♀) is retained in the collection of the author.

*Female.* Body (Fig. 57A) moderately broad. Body length of dissected largest specimen  $908 \mu\text{m}$ . Other specimens  $792$ ,  $858$ , and  $861 \mu\text{m}$ . Greatest width  $425 \mu\text{m}$ . Prosome  $633 \mu\text{m}$  long. Cephalothorax with dorsal suture line delimiting cephalosome and first pedigerous somite. Second pedigerous somite with pointed posterolateral corners. Urosome (Fig. 57B) 5-segmented. Fifth pedigerous somite  $125 \mu\text{m}$  wide. Genital double-somite  $134 \times 121 \mu\text{m}$ , with weakly expanded anterior part; narrower posterior part  $88 \mu\text{m}$  wide and



**Fig. 57.** *Acanthomolgus ambonensis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, maxillule. Scales: A, 0.1 mm; B, D-F, 0.05 mm; C, G, 0.02 mm.





**Fig. 58.** *Acanthomolgus ambonensis* n. sp., female. A, mandible; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 4; G, free segment of leg 5. Scales: A-C, 0.02 mm; D-G, 0.05 mm.

delimited from anterior part by dorsal suture line. Genital areas located dorsolaterally. Three free abdominal somites  $26 \times 73$ ,  $17 \times 68$ , and  $27 \times 64$   $\mu\text{m}$ , respectively. Posteroventral margin of anal somite unornamented. Caudal ramus  $23 \times 27$   $\mu\text{m}$ , 0.85 times as long as wide, with 6 caudal setae (Fig. 57C). Longest seta 396  $\mu\text{m}$ , distinctly longer than urosome. Inner distal seta plumose along inner margin. Other 5 setae naked.

Rostrum broad, with rounded posterior apex (Fig. 57D). Antennule (Fig. 57E) slender, 442  $\mu\text{m}$  long, 7-segmented; armature formula 4, 13, 6, 3, 4+aesthetasc, 2+aesthetasc, and 7+aesthetasc. All setae naked. Antenna (Fig. 57F) 4-segmented. Coxobasis distally broadened,  $55 \times 54$   $\mu\text{m}$ , with small inner distal seta. First endopodal segment  $56 \times 49$   $\mu\text{m}$ , with inner distal seta. Second endopodal segment  $22 \times 34$   $\mu\text{m}$ , with 3 inner setae. Third endopodal segment  $79 \times 29$   $\mu\text{m}$ , 2.72 times as long as wide, with 5 setae and 2 long subequal claws; slender claw 109  $\mu\text{m}$  and thicker claw 91  $\mu\text{m}$ .

Labrum not examined. Mandible (Fig. 58A) with deep inner proximal notch. Inner margin straight and perpendicular to distal lash, with spinules. Convex side with row of small spinules. Distal lash elongate, with spinules on both margins. Maxillule (Fig. 57G) armed with small subdistal element and 3 terminal naked setae. Maxilla (Fig. 58B) with unarmed syncoxa. Basis with small outer proximal seta, slender anterior seta bearing setules on inner margin, and inner seta bearing large spinules along distal margin and smaller spinules on distal part of proximal margin. Distal lash distinctly curved, with serrate distal margin and minute spinules on proximal margin. Maxilliped (Fig. 58C) 3-segmented. Syncoxa with spinules on inner side. Basis armed with 2 setae, 27 and 26  $\mu\text{m}$  long. Endopod with 2 spiniferous spines and small seta.

Legs 1-3 with 3 segmented rami (Fig. 58D, E). Leg 4 (Fig. 58F) with 3-segmented exopod and 2-segmented endopod. Outer spine on first exopodal segment of leg 1 45  $\mu\text{m}$  long, larger than other spines on same leg. Outer seta on basis of leg 2 small and naked, but that of leg 3 larger and plumose. Leg 4 with minute inner coxal seta; inner spine of first endopodal segment 33  $\mu\text{m}$  long and proximally plumose; second endopodal segment elongated,  $77 \times 23$   $\mu\text{m}$ , with setules on outer margin, and minute spinules on inner margin; 2 terminal spines unequal, inner one 82  $\mu\text{m}$ , with serrate margins, outer one small, 31  $\mu\text{m}$  and naked. Armature formula of legs 1-4 as in preceding species.

Free segment of leg 5 (Fig. 58G)  $125 \times 38$   $\mu\text{m}$ , with triangular inner proximal swelling and minute spinules on outer surface; 2 terminal setae naked, 158 and 104  $\mu\text{m}$  long. Leg 6 represented by 2 unequal setae genital area (Fig. 57B).

*Male.* Unknown.

*Etymology.* This species is named after the type locality,

Ambon.

*Remarks.* This species has an unusually large outer spine (distinctly longer than the width of the first exopodal segment) on the first exopodal segment of leg 1, as in *A. longispinifer* and *A. bandaensis*. Unlike these two congeners, *A. ambonensis* n. sp. possesses a less prominent anterior expansion of the genital double-somite in the female, terminal antennal claws which are longer than the terminal segment, a triangular proximal inner expansion of the free segment of female leg 5 with very long terminal setae, and strongly unequal terminal spines on the second endopodal segment of leg 4.

#### *Acanthomolgus longispinifer* (Humes and Ho, 1968)

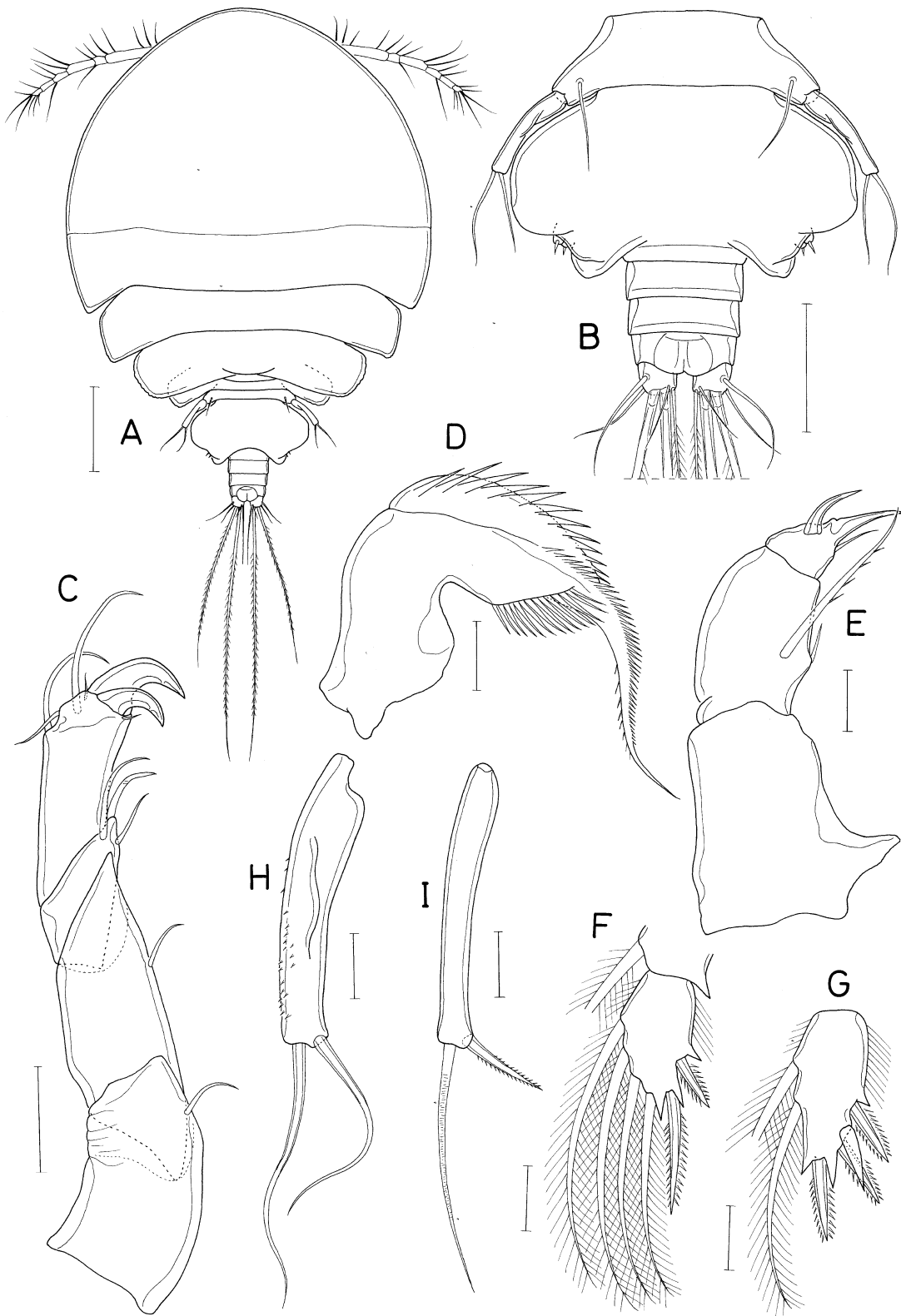
*Material examined.* Forty-eight ♀♀, 22 ♂♂ from an alcyonacean of *Dendronephthya* sp., depth 17 m, Banda Islands ( $4^{\circ} 31'45''\text{S}$ ,  $129^{\circ} 51'55''\text{E}$ ), collected by A.G. Humes, 30 May 1975.

*Remarks.* This species has been reported only from Madagascar by Humes and Ho (1968b) as an associate of the gorgonacean *Siphonogorgia pichoni* Verseveldt (Humes and Stock, 1973). The present report is the new host record. Mean body length of the present specimens is 845  $\mu\text{m}$  (730-923  $\mu\text{m}$ ,  $n=10$ ) for females and 722  $\mu\text{m}$  (680-760  $\mu\text{m}$ ,  $n=10$ ) for males. In the original description, Humes and Ho (1968b) recorded the expanded anterior part of the genital double-somite in dorsal view as gradually broadened from anterior to posterior, a shape different from that of the present specimens where the same part is slightly tapering. However, other features of this species described by Humes and Ho (1968b), in particular the elongate outer spine on the first exopodal segment of leg 1 and the ornamentation in the genital area, are not different from those of the specimens from the Moluccas.

#### *Acanthomolgus exilipes* (Humes and Ho, 1968)

*Material examined.* Six ♀♀, 3 ♂♂ from the alcyonacean *Dendronephthya* (*Morchellana*) *grandiflora* Henderson, depth 10 m, Gomumu Island, south of Obi ( $1^{\circ} 50'00''\text{S}$ ,  $127^{\circ} 30'45''\text{E}$ ), collected by A.G. Humes, 30 May 1975.

*Remarks.* The above alcyonacean is a new host record for *Acanthomolgus exilipes*. The mean length of the female specimens examined was 958  $\mu\text{m}$  (915-1,010  $\mu\text{m}$ ) based on five specimens. The caudal ramus was wider than long,  $29 \times 32$   $\mu\text{m}$ , unlike in the description provided by Humes and Ho (1968a) who recorded as it is longer than wide in the specimens from Madagascar. But the characteristic shape of the genital double-somite and other major features agree well with the original description.



**Fig. 59.** *Doridicola patulus* (Humes). Female: A, habitus, dorsal; B, urosome, dorsal; C, antenna; D, mandible; E, maxilliped; H, free segment of leg 5. Male: F, third endopodal segment of leg 1; G, third endopodal segment of leg 3; I, free segment of leg 5. Scales: A, 0.2 mm; B, 0.1 mm; C, 0.05 mm; D-I, 0.02 mm.

Genus *Doridicola* Leydig, 1853

***Doridicola patulus* (Humes, 1959) (Fig. 59)**

*Material examined.* Seven ♀♀, 1♂ from the nudibranch *Phyllidia verrucosa* Lamarck, depth 5 m, Goenoeng Api, Banda Islands (4° 31'55"S, 129° 52'12"E), collected by A. G. Humes, 8 May 1975.

*Description.* The present specimens reveal some discrepancies with the original description by Humes (1959). Thus, a supplementary description is provided herein.

*Female.* Body (Fig. 59A) greatly expanded. Body length of dissected specimen 1.18 mm. Greatest width 866 µm. Urosome (Fig. 59B) small. Fifth pedigerous somite 58 × 208 µm, distinctly broadened distally. Genital double-somite markedly expanded, 138 × 271 µm. Three free abdominal somites 29 × 92, 28 × 87, and 31 × 81 µm, respectively. Caudal ramus 25 × 31 µm, 0.81 times as long as wide.

Antennule as in original description. Antenna (Fig. 59C) rather stout. First to fourth segments approximately 82 × 59, 100 × 51, 27 × 44, and 76 × 37 µm, respectively. Two terminal claws stout, 47 and 33 µm.

Mandible (Fig. 59D) with inner margin oblique to distal lash. Convex side with large spinules. Maxilliped (Fig. 59E) with second segment bearing 2 very unequal inner setae, each 62 and 12 µm. Terminal segment with spine, small seta and acute terminal process.

Free segment of leg 5 (Fig. 59H) 90 × 18.5 µm, with minute spinules on outer surface and longitudinal ridge near middle; 2 terminal setae 88 and 74 µm.

*Male.* Third endopodal segment of leg 1 (Fig. 59F) armed with 2 spines and 4 setae; distal spine elongated. Third endopodal segment of leg 3 (Fig. 59G) with foliaceous element near base of second outer spine.

*Remarks.* Humes (1959) described *Doridicola patulus* as an associate of the nudibranch *Phyllidia trilineata* Cuvier from Madagascar. The discovery of this species on a new host, the nudibranch *Phyllidia verrucosa*, is the only record since its original discovery by Humes (1959).

*Doridicola patulus* is characteristic in having an expanded body, especially a broad genital double-somite. This species is very similar to *D. parapatulus* described by Kim (2004a) from the nudibranch *Glossodoris astromarginata* (Cuvier) on the Great Barrier Reef, Australia. As a distinguishing character the female genital double-somite of *D. patulus* is much more expanded than that of *D. parapatulus*.

Genus *Kombia* Humes, 1962

***Kombia avitus* n. sp. (Figs. 60-62)**

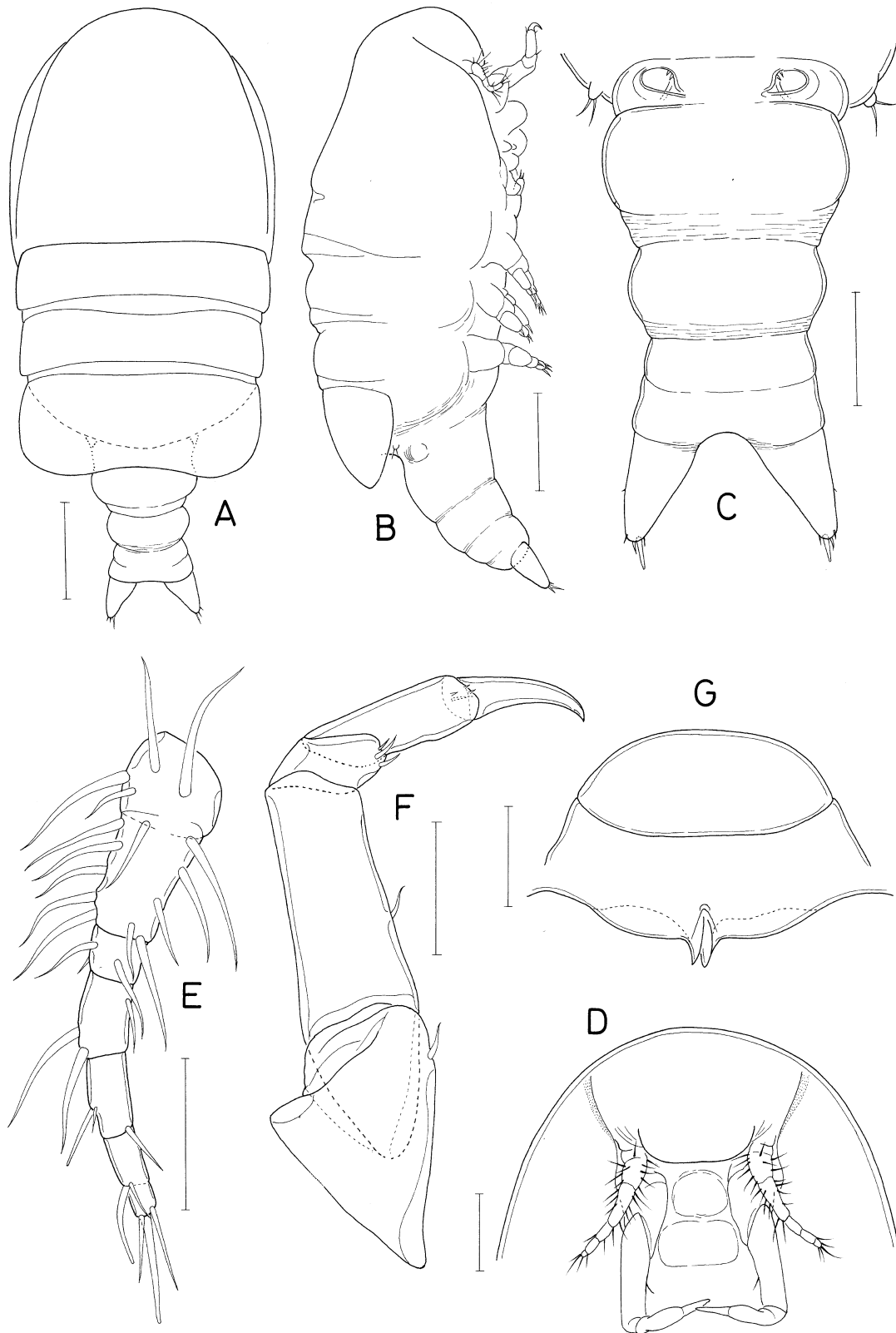
*Material examined.* Seven ♀♀, 7♂♂ from a scleractinian coral *Porites* sp. (aff. *P. galeata*), depth 2 m, Parang Island,

eastern Ceram (3° 17'00"S, 130° 44'48"E), collected by A. G. Humes, 23 May 1975. Holotype (♀: USNM 1081693), allotype (♂: USNM 1081694), and paratypes (4♀♀, 5♂♂: USNM 1081695) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2♀♀, 1♂♂) are kept in the collection of the author.

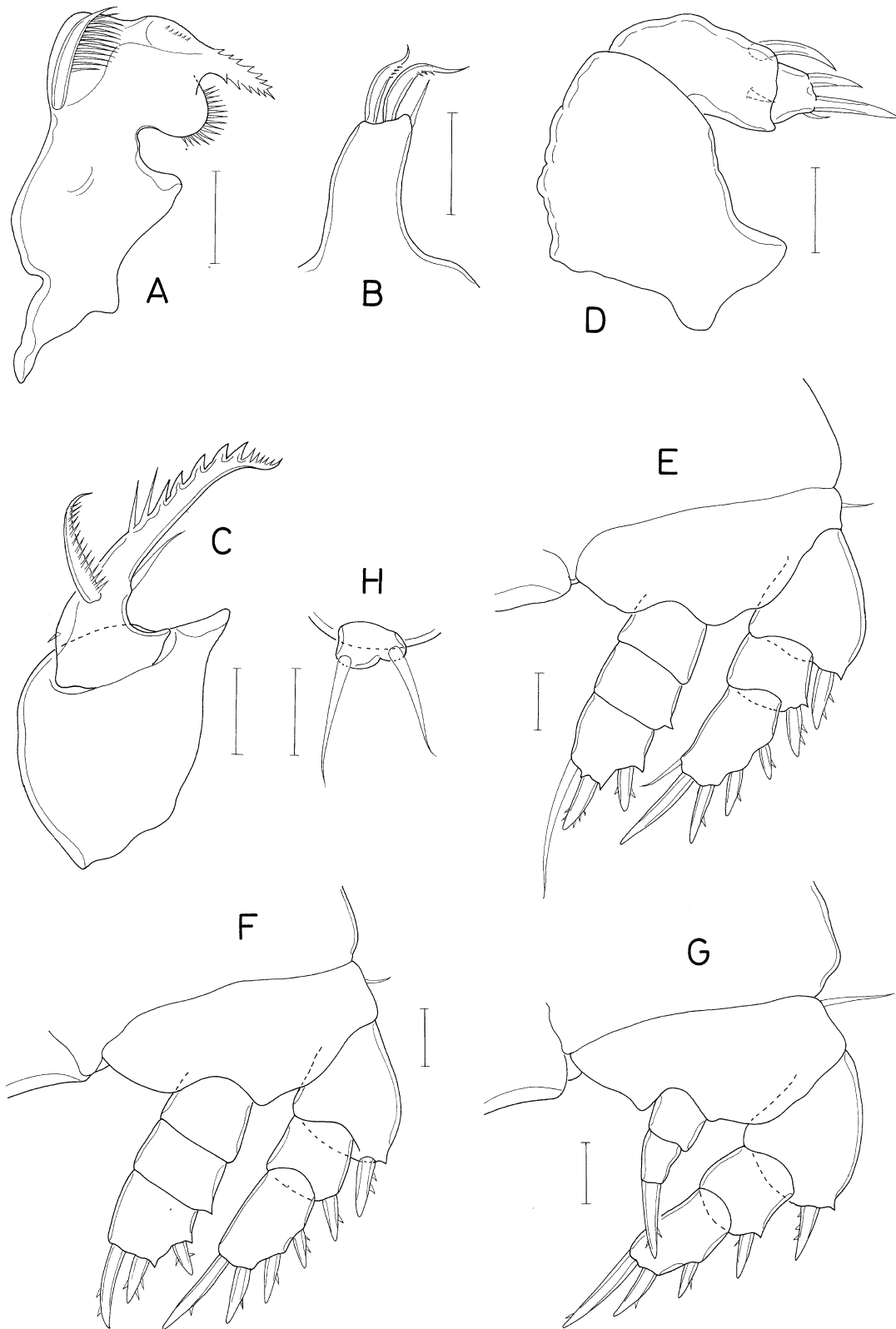
*Female.* Body (Fig. 60A, B) with large prosome and small urosome. Body length of dissected specimen 1.25 mm. Prosome 939 µm long and nearly equally broad throughout its length. Cephalothorax wider than long, 478 × 550 µm, without dorsal suture line. Second to fourth pedigerous somites 117 × 528, 120 × 506, and 189 × 500 µm. Tergum of fourth pedigerous somite with slightly concave posterior margin and overhanging posterior part. Urosome (Fig. 60C) indistinctly 5-segmented. Fifth pedigerous somite completely fused with fourth pedigerous somite. Genital double-somite in dorsal view subdivided by lateral constriction and incomplete dorsal suture line into short anterior part (42 × 208 µm) containing genital areas and longer posterior part (115 × 217 µm) bearing convex lateral margins (Fig. 60C). First to third free abdominal somites 81 × 175, 42 × 152, and 52 × 169 µm, respectively, obscurely delimited from one another. Caudal rami divergent, widely separated from each other; each ramus strongly tapering, 94 × 60 µm, 1.57 times as long as wide, with 5 small setae; outer lateral seta hardly visible, located near middle of outer margin. Spermatophore elliptical, 235 × 137 µm, and paired on each genital area.

Rostrum broad but indistinct (Fig. 60D). Antennule (Fig. 60E) tapering, 160 µm long, 6-segmented, but first and second segments incompletely divided. Armature formula 4, 11, 3, 3, 2+aesthetasc, and 3+2 aesthetascs. Sixth segment with trace of segmentation. Aesthetascs setiforms. Antenna (Fig. 60F) 4-segmented. Coxobasis strongly tapering distally, about 71 × 79 µm, with inner distal seta. First endopodal segment 89 × 46 µm, with seta on inner margin. Small second endopodal segment with 3 small setae. Third endopodal segment 49 × 22 µm, distally with 4 minute setae. Terminal claw 46 µm and weakly curved.

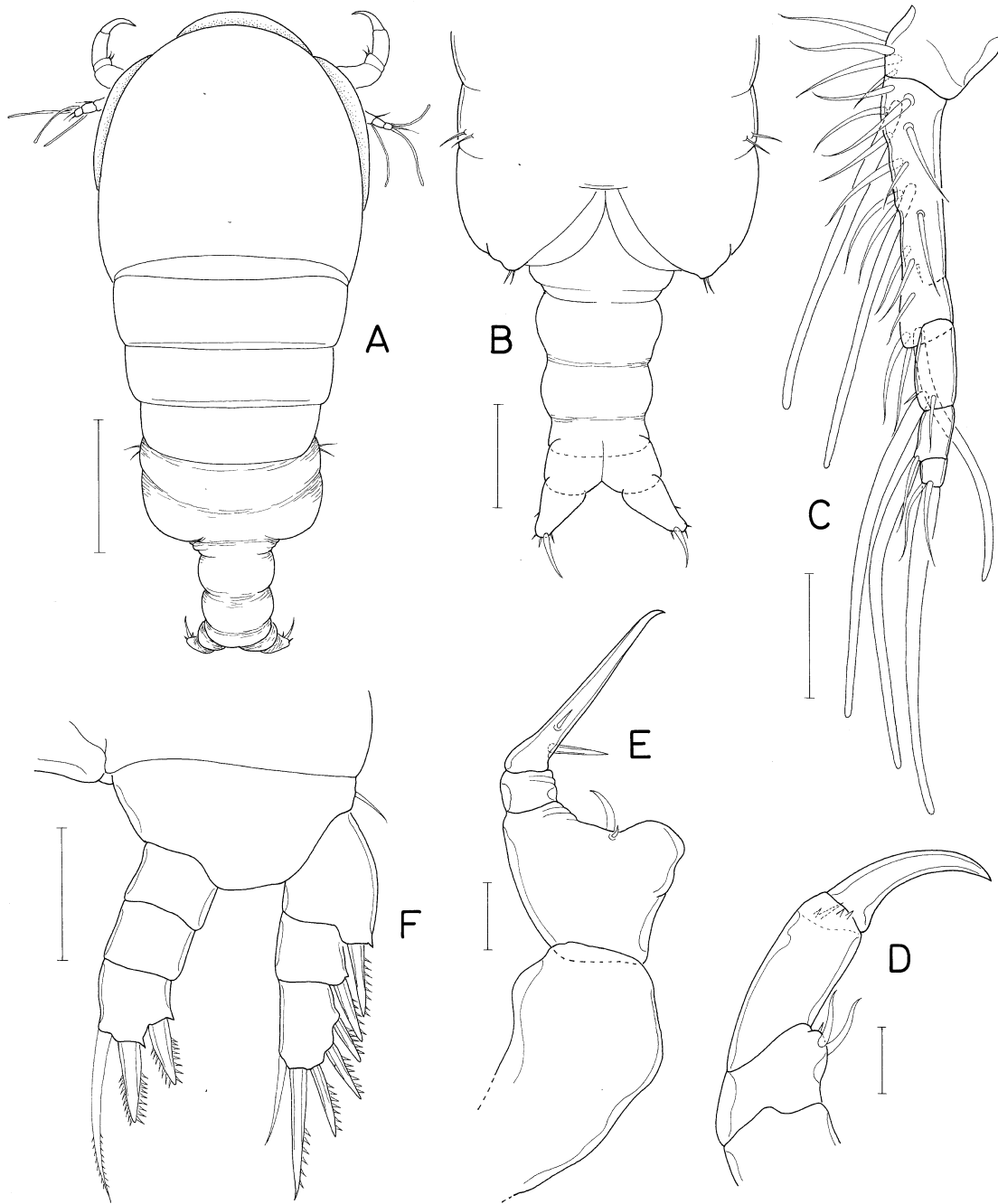
Labrum as Fig. 60G. Mandible (Fig. 61A) with distinct proximal notch and convex inner margin. Outer margin with proximal constriction and large distal spine pectinated along medial margin. Distal lash short and crenulate. Maxillule (Fig. 61B) terminally with 2 thick, larger setae and small seta. Maxilla (Fig. 61C) with unarmed syncoxa. Basis with small outer proximal seta, large anterior seta bearing spinules along medial margin, and simple inner seta. Distal lash with on distal margin 2 spinules, 5 teeth, and several small spinules, from proximal to distal. Maxilliped (Fig. 61D) 3-segmented. Large syncoxa unarmed.



**Fig. 60.** *Komba avitus* n. sp., female. A, habitus, dorsal; B, habitus, lateral; C, urosome, dorsal; D, rostral area, ventral; E, antennule; F, antenna; G, labrum. Scales: A, B, 0.2 mm; C, D, 0.1 mm; E-G, 0.05 mm.



**Fig. 61.** *Kombia avitus* n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, leg 3; H, free segment of leg 5. Scales: 0.02 mm for all.



**Fig. 62.** *Komba avitus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antennule; D, distal part of antenna; E, maxilliped; F, leg 1. Scales: A, 0.2 mm; B, 0.1 mm; C, F, 0.05 mm; D, E, 0.02 mm.

Basis perpendicular to syncoxa, with spine and small seta. Endopod with 2 spines (20 and 13  $\mu$ m long) and small seta.

Legs 1 and 2 (Fig. 61E, F) with 3-segmented rami and no inner coxal seta. Leg 3 (Fig. 61G) with 3-segmented exopod and 2-segmented endopod. Leg 4 lacking. First exopodal segment of legs 1-3 expanded outward. Spines of these legs

blunt, with few spinules; number of these spinules constant on each spine. Armature formula of legs 1-3:

Leg 1: coxa 0-0; basis 1-0; exp. I-0; I-0; III,I,1;  
enp. 0-0; 0-0; I,I,1

Leg 2: coxa 0-0; basis 1-0; exp. I-0; I-0; II,II;  
enp. 0-0; 0-0; I,II

Leg 3: coxa 0-0; basis 1-0; exp. I-0; I-0; I,II;  
enp. 0-0; I

Free segment of leg 5 (Fig. 61H) small and much wider than long, with 2 simple setae. Leg 6 represented by 2 minute setae in genital area (Fig. 60C).

*Male.* Body (Fig. 62A) with slightly tapering prosome, without posterior tergum of fourth pedigerous somite. Mean body length 1.02 mm (0.93–1.08 mm) based on 7 specimens. Prosome 687  $\mu\text{m}$  long. Cephalothorax  $404 \times 417 \mu\text{m}$ . Urosome (Fig. 62B) 6-segmented but fifth pedigerous somite almost fused with fourth and genital somites, distinguished by lateral constrictions. Genital somite about  $142 \times 292 \mu\text{m}$ , much wider than long. Four abdominal somites incompletely segmented and  $62 \times 123$ ,  $53 \times 107$ ,  $28 \times 98$ , and  $35 \times 113 \mu\text{m}$ , respectively. Caudal ramus  $60 \times 41 \mu\text{m}$ , fused to anal somite.

Rostrum as for female. Antennule (Fig. 62C) 5-segmented, 191  $\mu\text{m}$  long; armature formula 4, 16+3 aesthetascs, 2+aesthetasc, 1+aesthetasc, and 2+aesthetasc. Second segment with vestigial segmentation line distally delimiting distal part bearing 3 setae and 1 aesthetasc. Antenna similar to that of female, but second endopodal segment with 2 larger setae and minute seta (Fig. 62D).

Labrum, mandible, maxillule, and maxilla as in female. Maxilliped (Fig. 62E) with unarmed syncoxa. Basis with strongly protruded inner margin bearing 2 setae, one of them minute. Endopod small and unarmed. Terminal claw spiniform, tapering, straight, and proximally with spiniform seta and small seta.

Legs 1–4 armed as in female, but spines on legs 1–3 more spiniferous (Fig. 62F). Leg 5 represented by 2 small lateral setae on fifth pedigerous somite (Fig. 62B). Leg 6 represented by 2 minute distal setae on genital flap.

*Etymology.* The specific name *avitus* is a Latin meaning “ancestral” which alludes to the presence of more plesiomorphic conditions of legs and antennule than in other species of the genus.

*Remarks.* *Kombia avitus* n. sp. is readily distinguished from the four other species in the genus by the six-segmented female antennule (3- to 5-segmented in other species), the 3-segmented endopod of legs 1 and 2 (2-segmented in other species), and the presence of an endopod in leg 3 (absent in other species).

Genus *Pionomolgus* Dojiri and Grygier, 1990

*Pionomolgus moluccensis* n. sp. (Figs. 63–65)

*Material examined.* One ♀, 5 ♂♂ from washings of the scleractinian coral *Echinopora lamellosa* (Esper) (exact association site of host unknown), depth 2 m, Karang Mie

( $00^{\circ} 20' 07''\text{S}$ ,  $128^{\circ} 25' 00''\text{E}$ ), collected by A.G. Humes, 19 May 1975. Holotype (♂: USNM 1081697), allotype (♀: USNM 1081698; maxilla, maxilliped, and legs 1–4 of right side dissected out), and paratypes (3 ♂♂: USNM 1081699) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratype (1 ♂) is kept in the collection of the author.

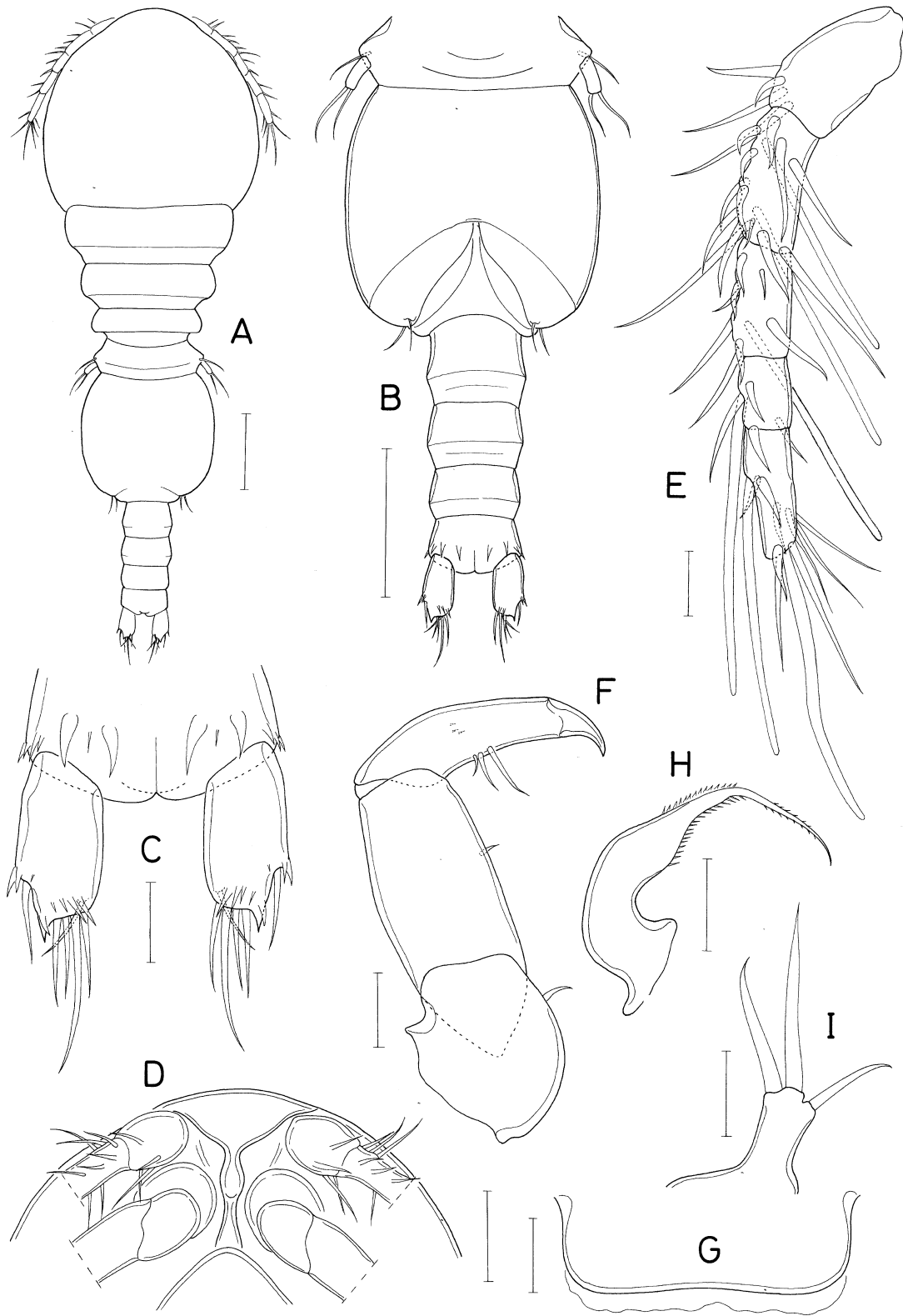
*Male.* Body (Fig. 63A) cyclopiform. Body length of dissected specimen 830  $\mu\text{m}$ . Other specimens 800, 813, and 874  $\mu\text{m}$ . Greatest width 283  $\mu\text{m}$ . Prosome distinctly tapering posteriorly and 433  $\mu\text{m}$  long. Cephalothorax without dorsal suture line. Urosome (Fig. 63B) 6-segmented. Fifth pedigerous somite 157  $\mu\text{m}$  wide. Genital somite  $165 \times 170 \mu\text{m}$ , with rounded posterolateral corners. Four abdominal somites  $48 \times 65$ ,  $42 \times 63$ ,  $34 \times 62$ , and  $29 \times 62 \mu\text{m}$ . Anal somite ventrally with several spinules (Fig. 63B, C). Caudal rami widely isolated from each other (Fig. 63C), each ramus  $40 \times 21 \mu\text{m}$ , with 6 simple setae, bifurcate process at posterior apex and near base of outer seta, and spinules on posteroventral area; all 6 setae naked, largest one 37  $\mu\text{m}$  long.

Rostrum with posterior ridge extending to anterior part of labrum (Fig. 63D). Antennule (Fig. 63E) 5-segmented, 176  $\mu\text{m}$  long; armature formula 4, 13+2 aesthetascs, 8+aesthetasc, 4+aesthetasc, and 9+2 aesthetascs; some setae on anterior margin short and thick. Antenna (Fig. 63F) 3-segmented, each segments approximately  $52 \times 41$ ,  $62 \times 33$ , and  $46 \times 17 \mu\text{m}$  from proximal to distal. Coxobasis and first endopodal segment each with inner seta. Second endopodal segment with 3 setae near middle of inner margin. Terminal claw short, 15  $\mu\text{m}$  long, incompletely delimited from third segment.

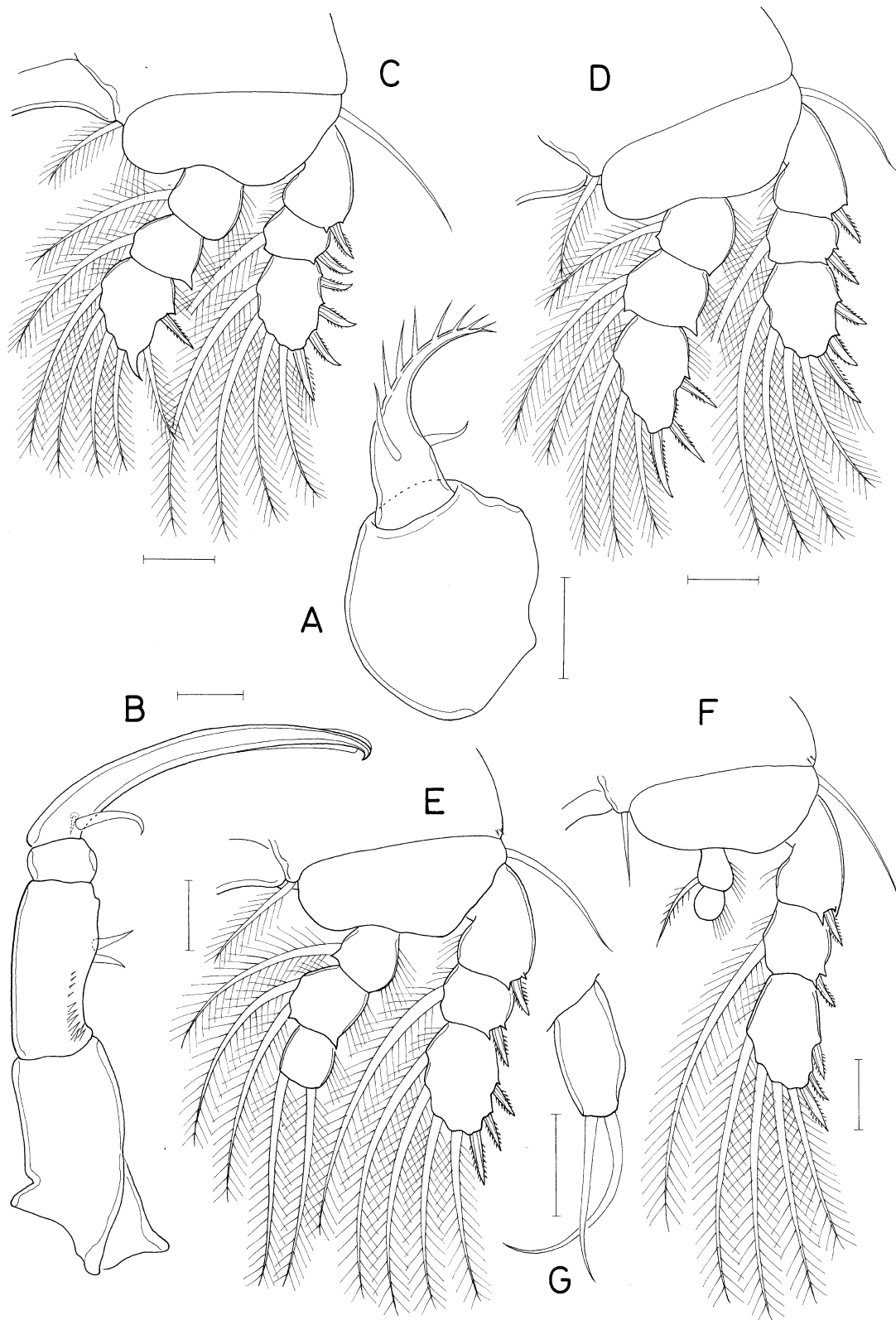
Labrum (Fig. 63G) with linear posterior margin fringed with membrane, without medial incision. Mandible (Fig. 63H) slender, simple, tapering, with elongate distal lash bearing spinules on both margins. Maxillule (Fig. 63I) with 3 naked setae terminally, 2 distinctly larger than other. Maxilla (Fig. 64A) with unarmed syncoxa. Basis with simple anterior and inner setae. Distal lash not demarcated from segment, with 7–9 acute spines on distal (outer) margin. Maxilliped (Fig. 64B) with unarmed syncoxa. Basis with 2 inner setae (each 12 and 10  $\mu\text{m}$  long) and small spinules in proximal half of segment. Endopod small and unarmed. Terminal claw 107  $\mu\text{m}$ , tapering, weakly arched, with seta and setule proximally.

Legs 1–3 (Fig. 64C–E) with 3-segmented rami. Leg 4 (Fig. 64F) with 3-segmented exopod and 2-segmented endopod. Outer seta on basis of legs 1–4 relatively large but naked. Endopod of leg 4 small, shorter than first exopodal segment, first segment with or without seta (usually with-

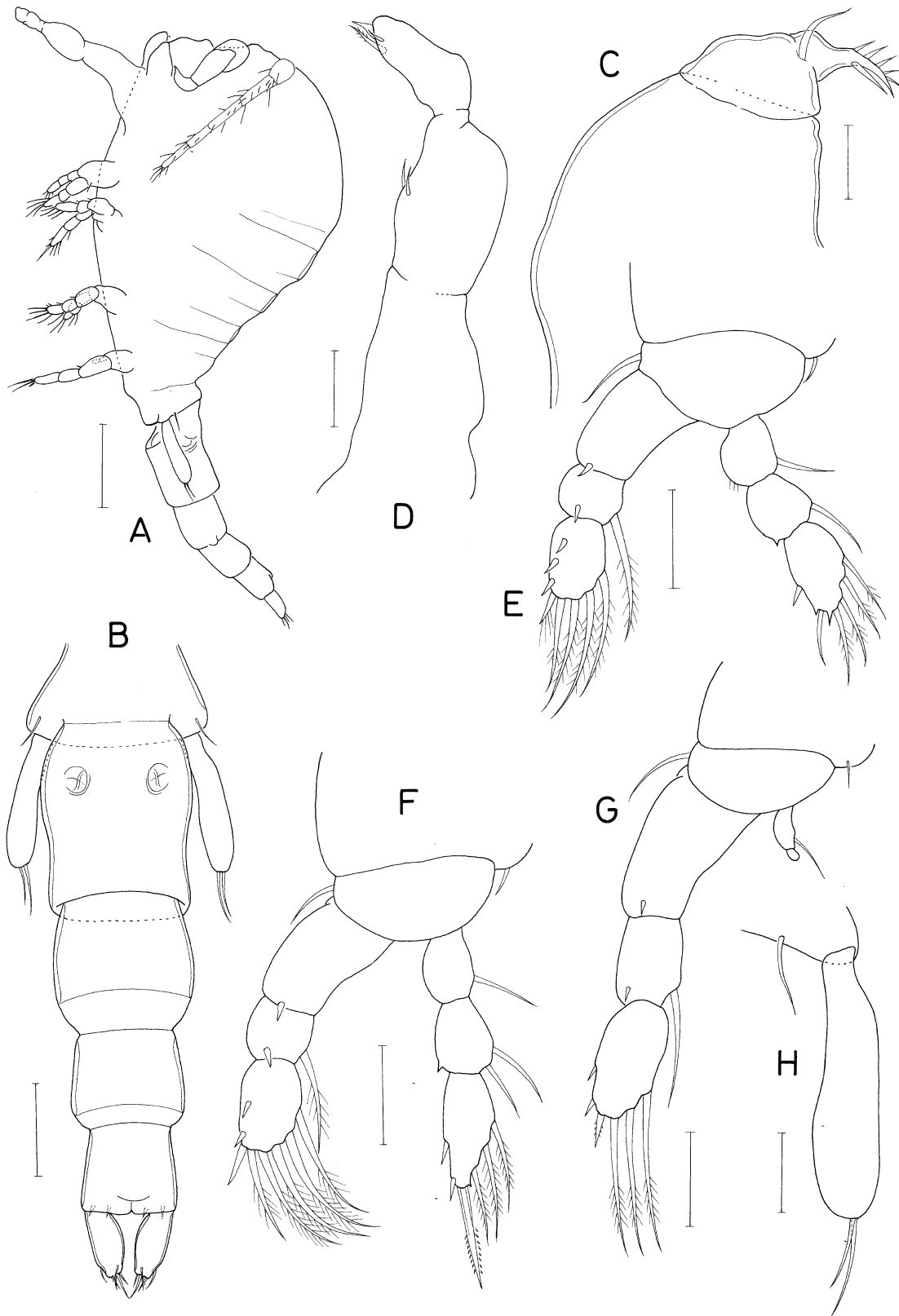




**Fig. 63.** *Pionomolgus moluccensis* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, caudal rami, ventral; D, rostral area, ventral; E, antennule (dots on second and third segments indicating insertions of aethetasci); F, antenna; G, labrum; H, mandible; I, maxillule. Scales: A, B, 0.1 mm; C, E-I, 0.02 mm; D, 0.05 mm.



**Fig. 64.** *Pionomolgus moluccensis* n. sp., male. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, leg 3; F, leg 4; G, free segment of leg 5. Scales: 0.02 mm for all.



**Fig. 65.** *Pionomolgus moluccensis* n. sp., female. A, habitus, lateral; B, urosome, dorsal (drawn in situ); C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, leg 4; H, leg 5. Scales: A, 0.2 mm; B, 0.1 mm; C, 0.02 mm; D-H, 0.05 mm.

out). Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-0; exp. I-0; I-1; III,I,4;  
enp. 0-1; 0-1; I,1,4  
Leg 2: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,4;  
enp. 0-1; 0-2; I,II,3  
Leg 3: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,4;  
enp. 0-1; 0-2; 2  
Leg 4: coxa 0-1; basis 1-0; exp. I-0; I-1; II,I,4;  
enp. 0-1 (or 0-0); 0

Free segment of leg 5 (Fig. 64G)  $24 \times 13 \mu\text{m}$ , with 2 simple terminal setae (40 and  $33 \mu\text{m}$ ). Leg 6 represented by 2 similar distal setae on genital flap (Fig. 63B).

*Female.* Body (Fig. 65A) with swollen prosome and narrow urosome. Body length 1.42 mm. Prosome  $833 \mu\text{m}$  long, strongly tapering in lateral view, much dorsoventrally deeper than laterally wider. Prosomal somites vaguely delimited. Cephalothorax with faint dorsal suture line. Urosome (Fig. 65B) 5-segmented. Fifth pedigerous somite  $193 \mu\text{m}$  wide. Genital double-somite  $195 \times 163 \mu\text{m}$ , with slight anterior expansion. Genital areas located dorsally. Three free abdominal somites  $137 \times 150$ ,  $100 \times 122$ , and  $87 \times 103 \mu\text{m}$ , respectively. Anal somite with 2 pairs of spinules on posteroventral margin. Caudal rami convergent, each ramus  $73 \times 35 \mu\text{m}$ , 2.09 times as long as wide.

Rostrum not examined. Antennule lacking aesthetascs on second and third segments. Antenna, labrum, mandible, and maxillule as in female. Maxilla (Fig. 65C) with enlarged syncoxa. Basis smaller than that of male, with four spinules on distal margin. Maxilliped (Fig. 65D) elongated and 3-segmented but segmentations incomplete. Syncoxa unarmed. Basis with 2 small setae on inner margin. Endopod with 2 unequal setae and setiform spine.

Third exopodal segment of leg 2 (Fig. 65F) with 3 spines and 5 setae (formula II,I,5). Leg 3 with same armature formula as male. Leg 4 (Fig. 65G) with much smaller endopod and 3 spines and 3 setae (formula II,I,3) on third exopodal segment. All spines on legs 1-4 setiform and small. All setae reduced in size.

Free segment of leg 5 elongated (Fig. 65H), gradually broadened distally,  $170 \times 42 \mu\text{m}$ , with 2 simple terminal setae (62 and  $43 \mu\text{m}$  long).

*Etymology.* The new species is named after the geographic area "the Moluccas" in which the type locality is located.

*Remarks.* Prior to this study, *Pionomolgus* Dojiri and Grygier, 1990, was a monotypic genus represented by *Pionomolgus gallicolus* Dojiri and Grygier, 1990. It is known as a gall-inducing species of the coral *Echinopora lamellosa* (Esper) in Australia. *Pionomolgus moluccensis* n. sp. differs in many ways from *P. gallicolus* in having (1) the female with a less swollen prosome (greatly swollen in *P. galli-*

*colus*), (2) the female genital double-somite longer than wide (wider than long in *P. gallicolus*), (3) the abdominal somites slightly wider than long (much wider than long in *P. gallicolus*), (4) a 5-segmented antennule (6-segmented in *P. gallicolus*), (5) a 3-segmented antenna (4-segmented in *P. gallicolus*), (6) the armature formula II,I,3 for the third exopodal segment of leg 4 in the female (II,I,5 or II,I,4 in *P. gallicolus*), and (7) a longer free segment of leg 5 of the female ( $170 \times 42 \mu\text{m}$ , compared to  $112 \times 40 \mu\text{m}$  in *P. gallicolus*).

Order Siphonostomatoidea Thorell, 1859

Family Artotrogidae Brady, 1880

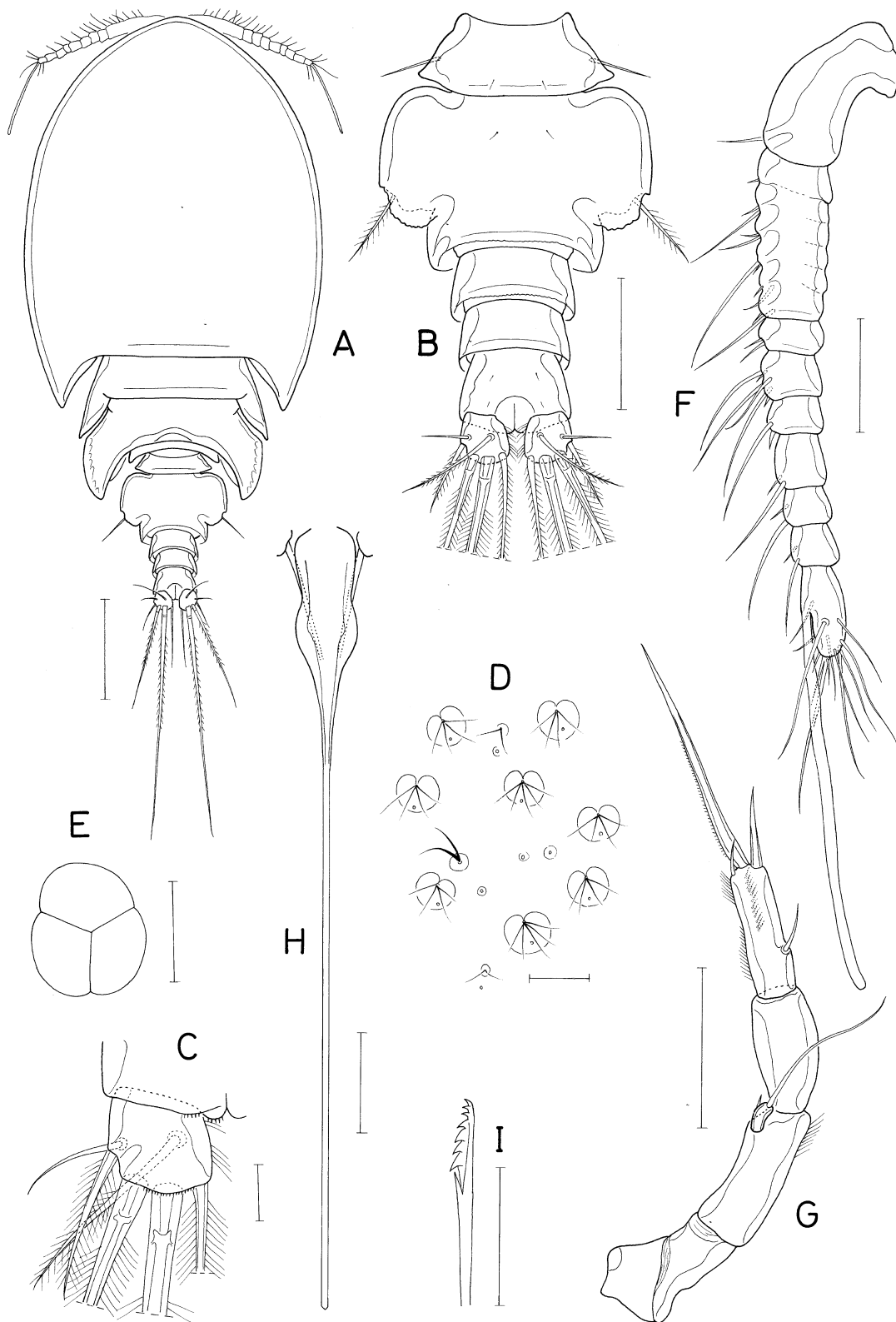
Genus *Cryptopontius* Giesbrecht, 1899

***Cryptopontius acutus* n. sp. (Figs. 66-68)**

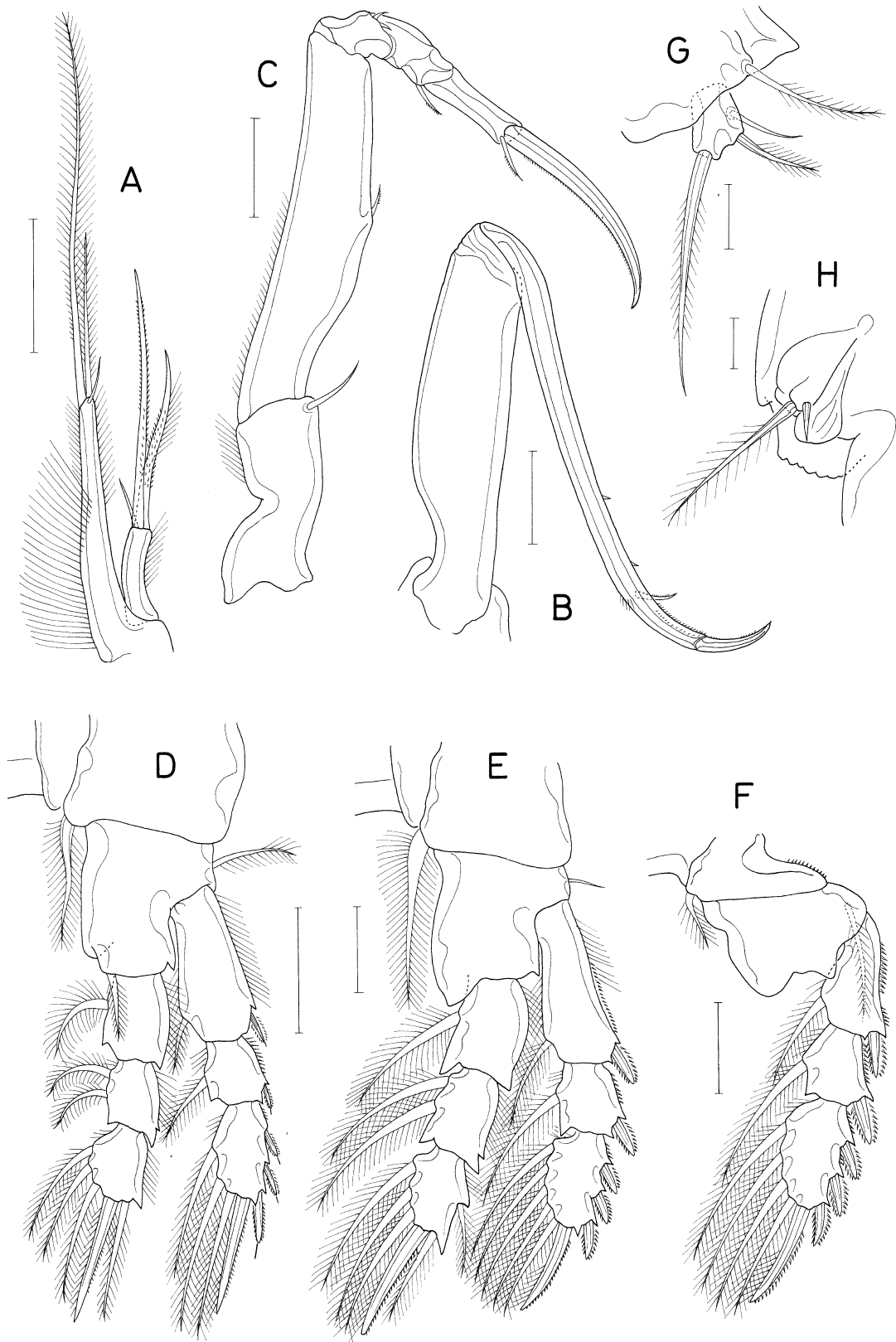
*Material examined.* Three ♀♀, 5 ♂♂ from the scleractinian coral *Hydnophora eyessa* (Pallas), depth 5 m, Mar-segoe Island ( $2^{\circ} 59'30''\text{S}$ ,  $128^{\circ} 03'30''\text{E}$ ), collected by A.G. Humes, 15 May 1975. Holotype (♀: USNM 1081715), allotype (♂: USNM 1081716), and paratypes (1 ♀, 3 ♂♂: USNM 1081717) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

*Female.* Body (Fig. 66A) moderately broad. Body length of dissected specimens 1.18 mm (other 2 specimens 1.16 and 1.15 mm). Cephalothorax  $675 \times 590 \mu\text{m}$ , longer than wide, incorporating first pedigerous somite, with rounded anterior apex and posterolateral extensions; this extensions extended slightly over posterior margin of next somite. Dorsal surface of cephalothorax ornamented with numerous pits and branched sensillae (Fig. 66D). Cephalic area without dorsal crest. Second pedigerous somite narrow,  $80 \times 370 \mu\text{m}$ , with posterolaterally tapering and pointed epimera. Third pedigerous somite  $100 \times 355 \mu\text{m}$ , its broad epimera extending to level of middle of genital double-somite. Fourth pedigerous somite very small,  $180 \mu\text{m}$  wide, and barely seen in dorsal view of body. Urosome (Fig. 66B) 5-segmented. Fifth pedigerous somite  $50 \times 148 \mu\text{m}$ , posteriorly broadened and laterally pointed. Genital double-somite  $129 \times 208 \mu\text{m}$ , with distinctly expanded anterior part and short, narrower posterior part ( $133 \mu\text{m}$  wide across this part). Posterolateral corners of anterior part weakly serrated. Genital areas positioned ventrolaterally (Fig. 67H). Three free abdominal somites  $40 \times 96$ ,  $40 \times 85$ , and  $48 \times 85 \mu\text{m}$ , respectively. Caudal ramus (Fig. 66C)  $33 \times 38 \mu\text{m}$ , 0.87 times as long as wide, with setules on inner margin, fine spinules on posteroventral margin, and 6 caudal setae. Egg sac (Fig. 66E)  $265 \times 225 \mu\text{m}$ , containing 3 eggs.

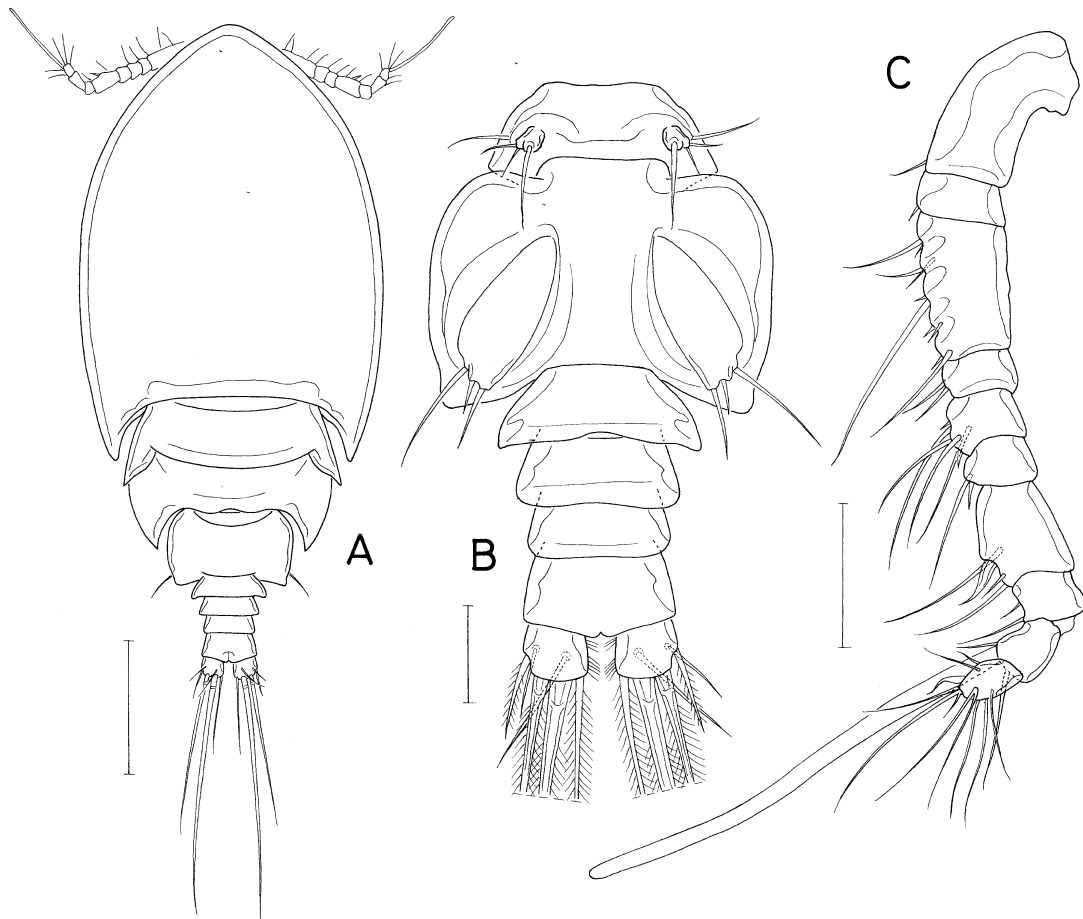
Rostrum as tapering process directed ventrally. Antennule



**Fig. 66.** *Cryptopontius acutus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, ventral; D, sensillae on dorsal surface of cephalothorax; E, egg sac; F, antennule; G, antenna; H, siphon; I, tip of mandible. Scales: A, E, 0.2 mm; B, H, 0.1 mm; C, D, I, 0.02 mm; F, G, 0.05 mm.



**Fig. 67.** *Cryptopontius acutus* n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 4; G, leg 5; H, leg 6. Scales: A-F, 0.05 mm; G, H, 0.02 mm.



**Fig. 68.** *Cryptopontius acutus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antennule. Scales: A, 0.2 mm; B, C, 0.05 mm.

(Fig. 66F) 280  $\mu$ m long, 9-segmented; armature formula 1, 10, 2, 6, 2, 2, 2, 2, and 13+aesthetasc. Second segment divided by constrictions and rudimentary sutures. Aesthetasc on terminal segment exceeding half length of antennule. Antenna (Fig. 66G) with unarmed precoxa (first segment) and coxa (second segment). Basis (third segment) 44  $\times$  16  $\mu$ m, with setules near inner distal area. Exopod small, 1-segmented, 9  $\times$  4.5  $\mu$ m, with small spiniform subdistal seta and longer terminal seta. Endopod 2-segmented. First endopodal segment 38  $\times$  20  $\mu$ m, slightly swollen and unarmed. Second endopodal segment 41  $\times$  14  $\mu$ m, with proximal seta, 3 terminal elements consisting of small spine (25  $\mu$ m), long spine (76  $\mu$ m), minute seta and rows of setules on surface.

Oral siphon (Fig. 66H) thin, 775  $\mu$ m long, extending to posterior margin of second pedigerous somite. Mandible thread-like, with several denticles distally (Fig. 66I). Maxillule (Fig. 67A) bilobed. Outer lobe shorter than inner lobe,

35  $\mu$ m long, with 3 terminal setae including distinctly smaller one (largest seta 97  $\mu$ m long). Inner lobe 99  $\mu$ m long and weakly tapering, terminally with 2 plumose seta (147 and 60  $\mu$ m long), and minute seta. Maxilla (Fig. 27B) 2-segmented. Syncoxa unarmed and proximally constricted. Basis slender, with 2 spinules on concave margin, small subdistal seta and several setules near subdistal seta. Claw small and well delimited from basis by suture. Maxilliped (Fig. 67C) consisting of 6 segments and claw. Syncoxa with inner distal seta and outer distal setules. Basis longest among segments, with small inner seta and fine setules on outer margin. Endopod 4-segmented. First segment with 2 small setae. Second segment unarmed. Third and fourth segments each armed with inner distal setae. Claw smoothly curved with minute spinules along concave margin.

Legs 1-3 with 3-segmented rami (Fig. 67D, E). Leg 4 (Fig. 67F) with 3-segmented exopod, without endopod. Inner seta on basis of leg 1 not reaching posterior margin of

first endopodal segment. Inner coxal seta of leg 2 reaching posterior margin of basis, but that of leg 3 shorter. Outer seta on basis of leg 2 small, but that of leg 3 slightly larger. Otherwise, leg 3 not different from leg 2. Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-1; exp. I-1; I-1; III,I,3;  
enp. 0-1; 0-2; 0,1+I,3
- Legs 2 & 3: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,5;  
enp. 0-1; 0-2; 1,1+I,3
- Leg 4: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,4;  
enp. lacking.

Leg 5 (Fig. 67G) with armature formula 1,3. Free segment small,  $21 \times 16 \mu\text{m}$ , distally widened, with 3 setae; largest inner terminal seta spiniform and  $75 \mu\text{m}$  long. Leg 6 represented by plumose seta ( $73 \mu\text{m}$  long) and small spiniform setae (Fig. 67H).

*Male.* Body (Fig. 68A) similar to that of female. Body length of dissected specimen 1.00 mm. Other 3 specimens 0.98, 1.02, and 1.06 mm, respectively. Fourth and fifth pedigerous somites concealed in dorsal view. Cephalothorax  $555 \times 455 \mu\text{m}$ . Urosome (Fig. 68B) 6-segmented. Fifth pedigerous somite  $117 \mu\text{m}$  wide. Genital somite nearly quadrate and  $108 \times 175 \mu\text{m}$ . Four abdominal somites  $38 \times 103$ ,  $33 \times 83$ ,  $28 \times 73$ , and  $35 \times 78 \mu\text{m}$ , respectively. First abdominal somite distinctly broadened distally. Caudal ramus  $28 \times 33 \mu\text{m}$ .

Antennule (Fig. 68C) 10-segmented,  $245 \mu\text{m}$  long, and geniculate between penultimate and antepenultimate segments, with armature formula 1, 1, 10, 2, 6, 2, 4, 2, 2+aesthetasc, and 11. One of 4 setae on seventh segment spiniform. Antenna, mouthparts, and legs 1-4 as in female.

Free segment of leg 5  $18 \times 16 \mu\text{m}$ . Leg 6 represented by 3 setae on distal part of genital flap (Fig. 68B).

*Etymology.* The specific name *acutus*, meaning “sharpened” in Latin, refers to the pointed epimera of the third pedigerous somite, a feature observable in the new species and many other species of *Cryptopontius*.

*Remarks.* Leg 1 of *Cryptopontius acutus* n. sp. bears seven setation elements on the third exopodal segment and two setae on the second endopodal segment. This armature state is shared with *C. paracapitalis* Eiselt, 1962, *C. ricinius* Malt, 1991, and *C. quinquesetus* Kim, 1996. *Cryptopontius longipes* Nicholls, 1944, is not known for the setation of the second endopodal segment of leg 1 but is included in a comparison with the new species, because the third exopodal segment of the same leg of *C. longipes* is armed with seven elements.

*Cryptopontius ricinius* and *C. quinquesetus* are dissimilar to *C. acutus*, because they have an 8-segmented antennule in the female. *Cryptopontius paracapitalis* and *C. longipes*

differ also from *C. acutus* in having the following features. In *Cryptopontius paracapitalis* the second segment of the antennule is short, much shorter than the third segment which is the longest segment in *C. acutus*, and the inner lobe of the maxillule bears one short terminal seta (three setae in *C. acutus*) which is shorter than the terminal setae on the outer lobe (much longer in *C. acutus*), according to the illustration given by Nicholls (1944).

*Cryptopontius longipes* has, unlike *C. acutus*, a slender body, the free segment of female leg 5 longer than wide (shorter than wide in *C. acutus*), and a 9-segmented male antennule (10-segmented in *C. acutus*).

Family Asterocheridae Giesbrecht, 1899

Genus *Asteropontius* Thompson and A. Scott, 1903

*Asteropontius fungicola* n. sp. (Figs. 69-71)

*Material examined.* Twenty-five ♀♀, 11 ♂♂ from a scleractinian coral of *Fungia* sp. [*Fungia (Pleuractis) paumotuensis* Stutchbury or *F. (Fungia) fungites* (Linnaeus)], depth 2 m, Naira, Banda Islands ( $4^{\circ} 31'45''\text{S}$ ,  $129^{\circ} 53'35''\text{E}$ ), collected by A.G. Humes, 2 May 1975. Holotype (♀: USNM 1081703), allotype (♂: USNM 1081704), and paratypes (22 ♀♀, 9 ♂♂: USNM 1081705) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2 ♀♀, 1 ♂) are kept in the collection of the author.

*Female.* Body (Fig. 69A) with moderately broad prosome. Mean body length  $935 \mu\text{m}$  ( $885-977 \mu\text{m}$ ) based on 10 specimens. Body length of dissected specimen  $971 \mu\text{m}$ . Greatest width  $464 \mu\text{m}$ . Prosome  $633 \mu\text{m}$  long. Cephalothorax slightly wider than long, without dorsal suture line. Third pedigerous somite fringed with thin membrane on lateral margins. Urosome (Fig. 69B) 4-segmented. Fifth pedigerous somite  $148 \mu\text{m}$  wide, with spinules on lateral margins. Genital double-somite  $135 \times 115 \mu\text{m}$ , distinctly longer than wide, with weakly expanded anterior part, tapering posterior part, and fine setules on lateral margins posterior to genital areas. Genital areas located dorsolaterally anterior to midway of somite. Two free abdominal somites  $65 \times 75$  and  $50 \times 75 \mu\text{m}$ , respectively, each with spinules (or scales) on lateral margins. Caudal ramus (Fig. 69C)  $33 \times 35 \mu\text{m}$ , slightly wider than long, with smooth and short inner margin, spinules on both longer outer and oblique distal margins, and 6 caudal setae. Two dorsal setae naked, and other 4 setae plumose. Longest inner median terminal seta expanded proximally.

Rostrum strongly tapering, with long, transparent digitiform apical process posteriorly (Fig. 69D). Antennule (Fig. 69E)  $441 \mu\text{m}$  long and 20-segmented. Proximal 11 seg-



ments broader than distal segments. First segment with distal seta and setules on anterior margin. Ninth segment with 7 setae. Eighteenth segment with 2 setae and large aesthetasc. Terminal segment with 10 setae. Other segments each with 2 setae. Antenna (Fig. 69F) with short coxobasis (first segment) of about  $33 \times 28 \mu\text{m}$ . Basis (second segment) about  $67 \times 25 \mu\text{m}$  and unarmed. Exopod very small,  $6 \times 3 \mu\text{m}$ , with subdistal seta and 2 terminal setae. Endopod 3-segmented. First segment  $73 \times 17 \mu\text{m}$ , with fine spinules on outer side. Second and third segments each with inner distal seta. Terminal claw  $77 \mu\text{m}$  long and slender.

Oral cone reaching insertions of maxillipeds (Fig. 69D). Mandibular stylet  $144 \mu\text{m}$  long, broadened distally with fine denticles (Fig. 69G). Mandibular palp with large and minute setae, but larger seta fused with segment. Combined palp and larger seta  $107 \mu\text{m}$ , distinctly shorter than mandibular stylet. Maxillule (Fig. 70A) bilobed. Inner lobe  $58 \times 17 \mu\text{m}$ , with 5 unequal setae (one minute), row of large setules, and setules on inner margin. Outer lobe  $20 \times 9 \mu\text{m}$ , less than half length of inner lobe, with 4 naked distal setae (one minute). Maxilla (Fig. 70B) 2-segmented. Syncoxa  $105 \mu\text{m}$  and unornamented. Basis arched, with several minute spinules on proximal part of convex margin and patch of setules near middle. Maxilliped (Fig. 70C) 6-segmented. Syncoxa and basis unarmed. Endopod 4-segmented, each armed with 2, 1, 1, and 1 setae, respectively. Terminal claw slender, slightly longer than distal 4 segments combined.

Legs 1-4 with 3-segmented rami (Fig. 70D-G). These 4 legs with spinules near inner distal area. Outer spine on first exopodal segment of leg 1  $29 \mu\text{m}$  long, extending slightly over posterior margin of second segment. Armature formula of these legs:

- Leg 1: coxa 0-1; basis 1-1; exp. I-1; I-1; III,2,2;  
 enp. 0-1; 0-2; 1,2,3  
 Leg 2: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,4;  
 enp. 0-1; 0-2; 1,2,3  
 Leg 3: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,4;  
 enp. 0-1; 0-2; 1,1+I,3  
 Leg 4: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,4;  
 enp. 0-1; 0-2; 1,1+I,2

Free segment of leg 5 (Fig. 71A) nearly quadrate,  $47 \times 27 \mu\text{m}$ , 1.74 times as long as wide, with smooth margins and 3 terminal naked setae, each setae 65, 59, and  $38 \mu\text{m}$  from outer to inner. Leg 6 represented by plumose seta and minute seta in genital area (Fig. 71B).

*Male.* Body (Fig. 71C) more slender than that of female. Mean body length  $647 \mu\text{m}$  ( $620-685 \mu\text{m}$ ), based on 10 specimens. Body length of dissected specimen  $632 \mu\text{m}$ . Greatest width  $259 \mu\text{m}$ . Third pedigerous somite without lateral membrane. Urosome (Fig. 71D) 5-segmented. Fifth

pedigerous somite  $91 \mu\text{m}$  wide. Genital somite  $111 \times 100 \mu\text{m}$ , with several spinules (or scales) on lateral margins. Three abdominal somites  $18 \times 50$ ,  $30 \times 49$ , and  $30 \times 49 \mu\text{m}$ , respectively. Second abdominal and anal somites each with 3 spinules on each lateral margins. Caudal ramus  $18 \times 21 \mu\text{m}$ .

Rostrum as in female. Antennule (Fig. 71E) 17-segmented,  $285 \mu\text{m}$  long. Armature formula: 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 4, 2, 2, 4, 3+aesthetasc, and 11. Aesthetasc on penultimate segment  $110 \mu\text{m}$  long. Antenna, oral cone, mandible, maxillule like those of female. Maxilliped with small, wrinkled inner distal element on syncoxa and blunt process on inner margin of basis (Fig. 71F).

Leg 1 with patch of spinules on outer surface of third endopodal segment (Fig. 71G). Third endopodal segment of leg 3 (Fig. 71H) terminally with stout process and slender process near base of distal seta.

Leg 5 (Fig. 71I) with free segment of  $12 \times 12 \mu\text{m}$ ; its 3 terminal setae 31, 31, and  $16 \mu\text{m}$  long. Leg 6 represented 2 unequal setae on genital flap (Fig. 71D).

*Etymology.* The specific name *fungicola* is a combination the words *Fungia*, the generic name of the host and the Latin *colo* meaning "to inhabit".

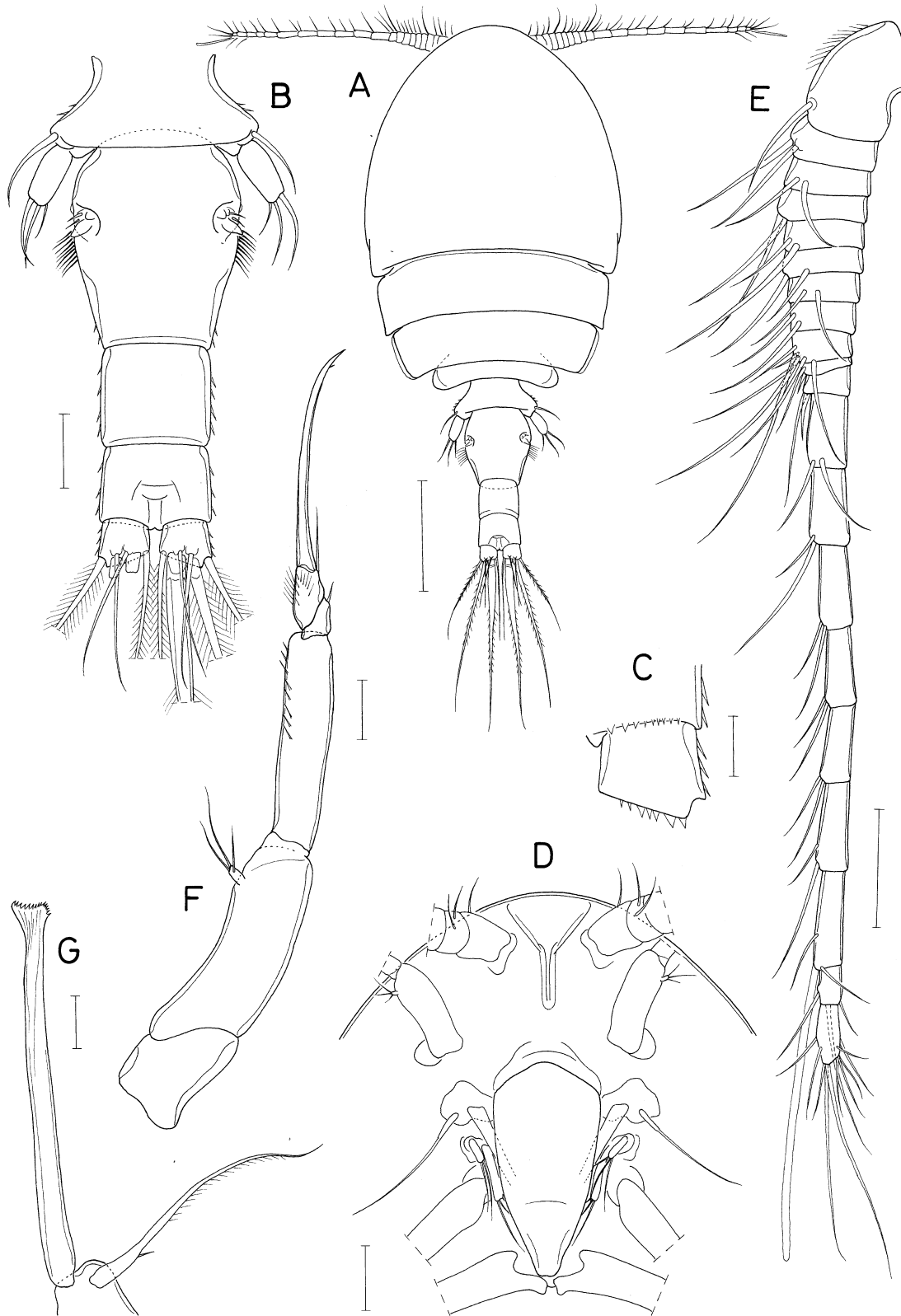
*Remarks.* *Asteropontius fungicola* n. sp. has the following combination of diagnostic characters: (1) the third exopodal segment of leg 1 is armed with three spines and four setae (formula III,4; not III,I,3 or III,I,4 or II,3); (2) the third endopodal segment of leg 2 is armed with six setae (formula 1,2,3; not 1,1+I,3); (3) the third endopodal segment of leg 3 is armed with one spine and five setae (formula 1,1+I,3; not 1,2,3). This combination of characters is shared by the following six congeners: *A. longipalpus* Stock, 1975, *A. parvipalpus* Stock, 1975, *A. proximus* Stock, 1987, *A. ungelatus* Stock, 1975, *A. minutus* Kim, 2003, and *A. dissimilis* Kim, 2003. *Asteropontius fungicola* can be distinguished from these congeners by the absence of the following features.

In *A. longipalpus* the exopod of the antenna is elongate, about 4-5 times as long as wide, according to the illustration given by Stock (1975), the mandibular palp is rudimentary, and the maxilla is massive.

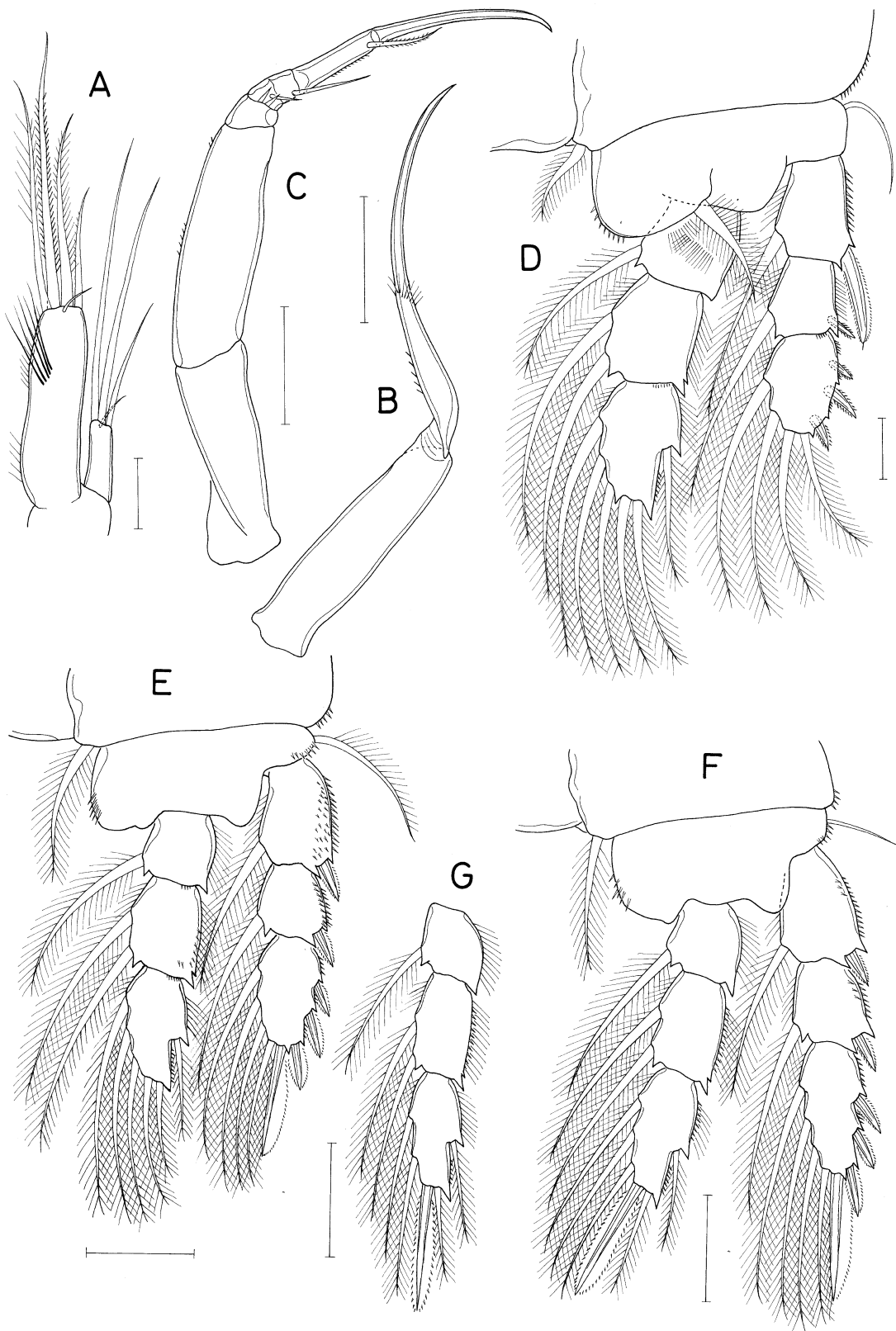
In *A. parvipalpus* the body is 1.41-1.48 mm long in the female (Stock, 1975), thus distinctly longer than that of *A. fungicola*, the free segment of female leg 5 is  $87 \times 38 \mu\text{m}$  (versus  $47 \times 27 \mu\text{m}$  in *A. fungicola*), and all four terminal setae on the outer lobe of the maxillule extend over distal margin of outer lobe, according to the illustration given by Stock (1975).

In *A. proximus* the maxillule bears only two setae on the outer lobe (versus four setae in *A. fungicola*), and the free segment of female leg 5 is  $69 \times 32 \mu\text{m}$  in size (Stock, 1987).

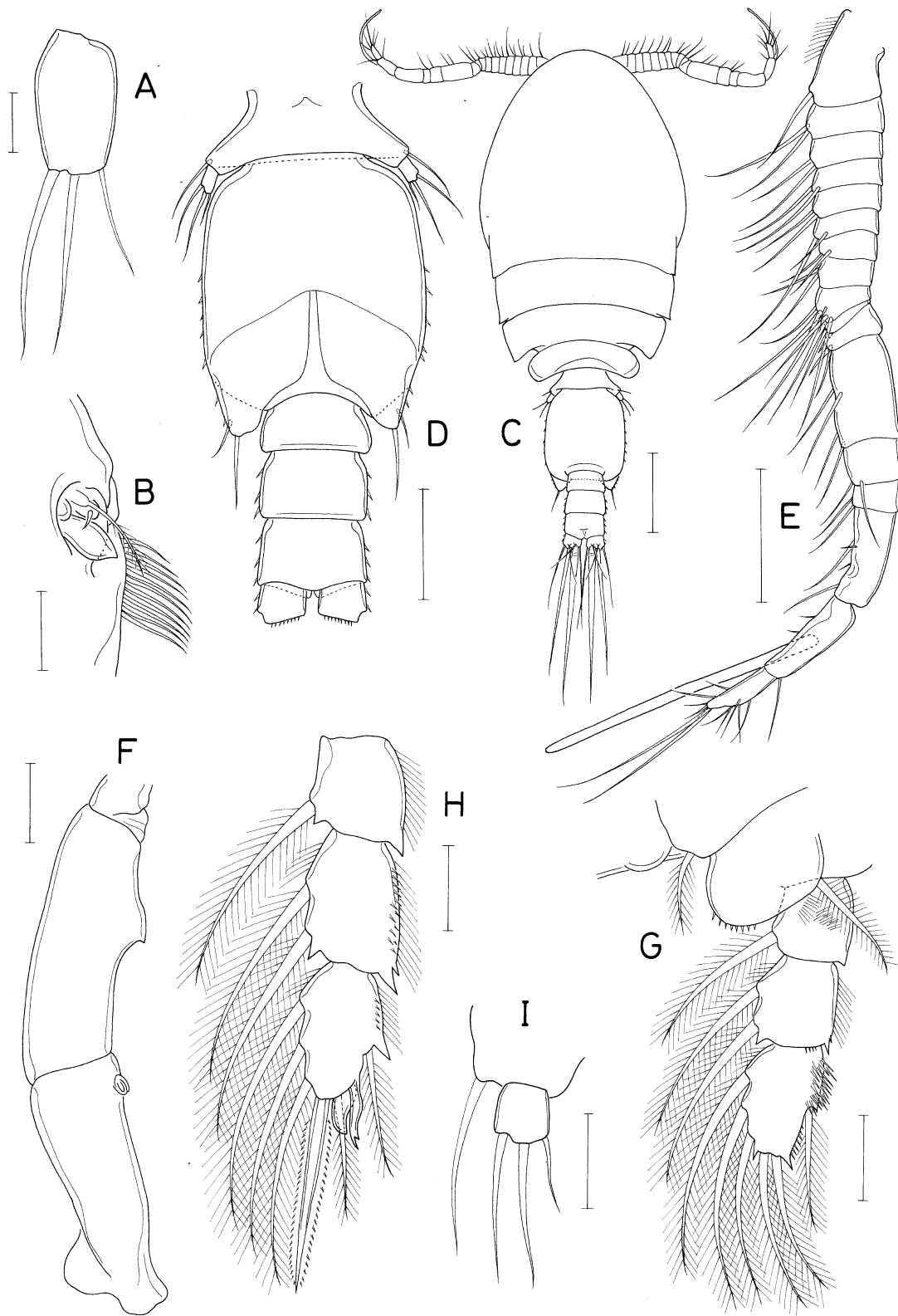
In *A. ungelatus* the body is 1.327-1.381 mm long in the



**Fig. 69.** *Asteropontius fungicola* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, left caudal rami, ventral; D, cephalic area, ventral; E, antennule; F, antenna; G, mandible. Scales: A, 0.2 mm; B, D, E, 0.05 mm; C, F, G, 0.02 mm.



**Fig. 70.** *Asteropontius fungicola* n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 3; G, endopod of leg 4. Scales: A, D, 0.02 mm; B, C, E-G, 0.05 mm.



**Fig. 71.** *Asteropontius fungicola* n. sp. Female: A, free segment of leg 5; B, right genital area. Male: C, habitus, dorsal; D, urosome, ventral; E, antennule; F, proximal part of maxilliped; G, endopod of leg 1; H, endopod of leg 3; I, leg 5. Scales: A, B, F-I, 0.02 mm; C, 0.1 mm; D, E, 0.05 mm.

female (Stock, 1975), the maxilla is massive, the terminal seta on the mandibular palp is rudimentary, the inner lobe of the maxillule is armed terminally with five large setae (four large and one minute setae in *A. fungicola*).

In *A. minutus* the caudal ramus is longer than wide, the terminal claw of the antenna is spiniform and very short, distinctly shorter than the first endopodal segment, and the antennule is 19-segmented in the female and 18-segmented in the male (Kim, 2003).

In *A. dissimilis* the oral siphon extends over the insertions of the maxilliped, the free segment of female leg 5 is  $73 \times 33 \mu\text{m}$  (Kim, 2003) and the inner process on the basis of the male maxilliped is located proximally.

#### *Asteropontius goniopora* n. sp. (Figs. 72-74)

**Material examined.** Twenty-eight ♀♀, 3♂♂ from the scleractinian coral *Goniopora tenuidens* (Quelch), depth 3 m, Karang Mie ( $00^{\circ} 20'07''\text{S}$ ,  $128^{\circ} 25'00''\text{E}$ ), collected by A. G. Humes, 19 May 1975. Holotype (♀: USNM 1081706), allotype (♂: USNM 1081707), and paratypes (25 ♀♀, 1 ♂: USNM 1081708) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (2 ♀♀, 1 ♂) are kept in the collection of the author.

**Female.** Body (Fig. 72A) with broad prosome. Body length of dissected specimen  $971 \mu\text{m}$ . Mean body length  $983 \mu\text{m}$  ( $962\text{--}1,054 \mu\text{m}$ ) based on 10 specimens. Greatest width  $525 \mu\text{m}$ . Prosome  $721 \mu\text{m}$  long. Cephalothorax distinctly wider than next 2 somites. Cephalothorax, and second and third pedigerous somites  $438$ ,  $108$ , and  $125 \mu\text{m}$  long, respectively. Fourth pedigerous somite much narrower than third, with thin membrane on lateral margins. Urosome (Fig. 72B) 4-segmented. Fifth pedigerous somite  $163 \mu\text{m}$  wide, with spinules on lateral margins. Genital double-somite  $108 \times 130 \mu\text{m}$ , distinctly wider than long, with broad anterior part, short, narrower posterior part, and fine setules on lateral margins posterior to genital areas. Genital areas located dorsolaterally near midlength of somite. Two free abdominal somites  $48 \times 75$  and  $32 \times 70 \mu\text{m}$ . Anal somite with spinules (or scales) on lateral margins. Caudal ramus (Fig. 72C)  $26 \times 31 \mu\text{m}$ , wider than long, with smooth, short inner margin, spinules on outer and distal margins, and 6 caudal setae. Two dorsal setae naked, and other 4 setae plumose. Longest inner median terminal seta  $325 \mu\text{m}$  long.

Rostrum with obscure posterior contour (Fig. 72D). Antennule (Fig. 72E)  $395 \mu\text{m}$  long and 20-segmented. Proximal 11 segments broader than distal segments. First segment with distal seta and setules on anterior margin. Ninth segment with 7 setae. Eighteenth segment with 2 setae and large aesthetasc. Terminal segment sub-divided by rudi-

mentary division, with 9 setae. Other segments each with 2 setae. All setae naked. Antenna (Fig. 72F) with coxa (first segment) of about  $33 \times 29 \mu\text{m}$ . Basis (second segment) about  $75 \times 32 \mu\text{m}$ , with long patch of minute spinules. Exopod very small,  $6 \times 3 \mu\text{m}$ , with subdistal seta and 2 terminal setae. Endopod 3-segmented. First segment  $79 \times 19 \mu\text{m}$ , with fine spinules on distal half of outer margin. Second and third segments each with small inner distal seta. Terminal claw  $73 \mu\text{m}$  long and unornamented.

Oral cone reaching insertions of maxillipeds (Fig. 72D). Mandibular stylet  $134 \mu\text{m}$  long, distally broadened with fine denticles (Fig. 73A). Mandibular palp fused with large terminal plumose seta with minute seta near base of larger seta. Combined palp and terminal seta  $146 \mu\text{m}$ , slightly longer than mandibular stylet. Maxillule (Fig. 73B) bilobed. Inner lobe  $53 \times 18 \mu\text{m}$ , with 5 unequal setae (two of them distinctly small) and row of large setules and small setules. Outer lobe  $28 \times 9 \mu\text{m}$ , with 4 naked distal setae (one of them minute). Maxilla (Fig. 73C) 2-segmented. Syncoxa  $115 \mu\text{m}$  and unornamented. Basis forming arched claw, with patch of setules near middle. Maxilliped (Fig. 73D) 6-segmented. Syncoxa and basis unarmed. Endopod 4-segmented, each armed with 2, 1, 1, and 1 setae, respectively. Terminal claw with fine spinules along inner margin.

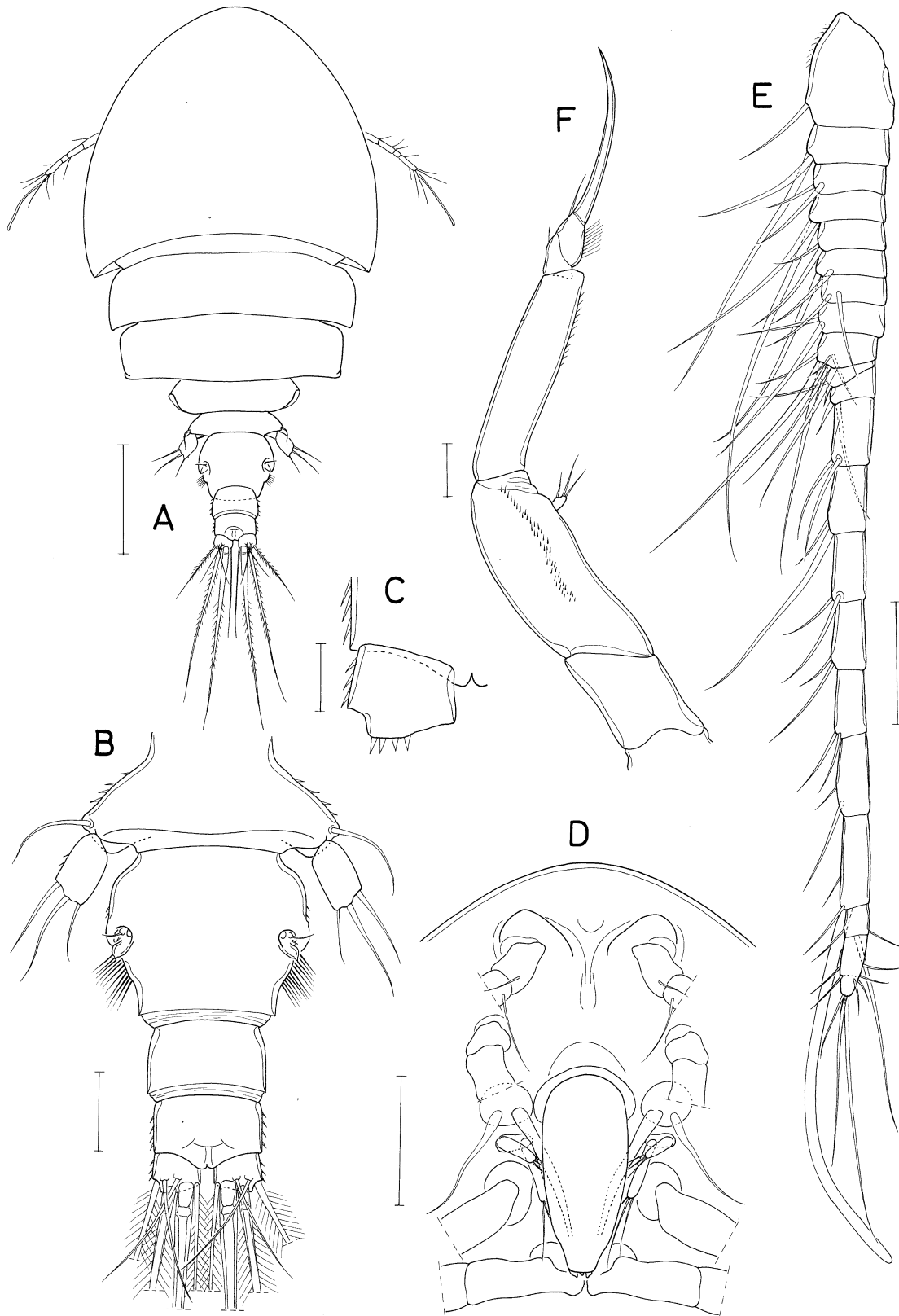
Legs 1-4 with 3-segmented rami and naked outer seta on basis. Leg 1 (Fig. 73E) with spinules near inner distal area of basis; outer spine on first exopodal segment  $35 \mu\text{m}$  long, extending to insertion of proximal spine of third exopodal segment. Outer distal corner of second endopodal segment of legs 1-4 bifid. Armature formula of these legs as in preceding species.

Free segment of leg 5 (Fig. 73I) nearly quadrate,  $46 \times 28 \mu\text{m}$ , 1.64 times as long as wide, with smooth margins and 3 naked terminal setae, 55, 76, and  $38 \mu\text{m}$  long. Leg 6 represented by plumose seta and small spiniform seta in genital area (Fig. 74A).

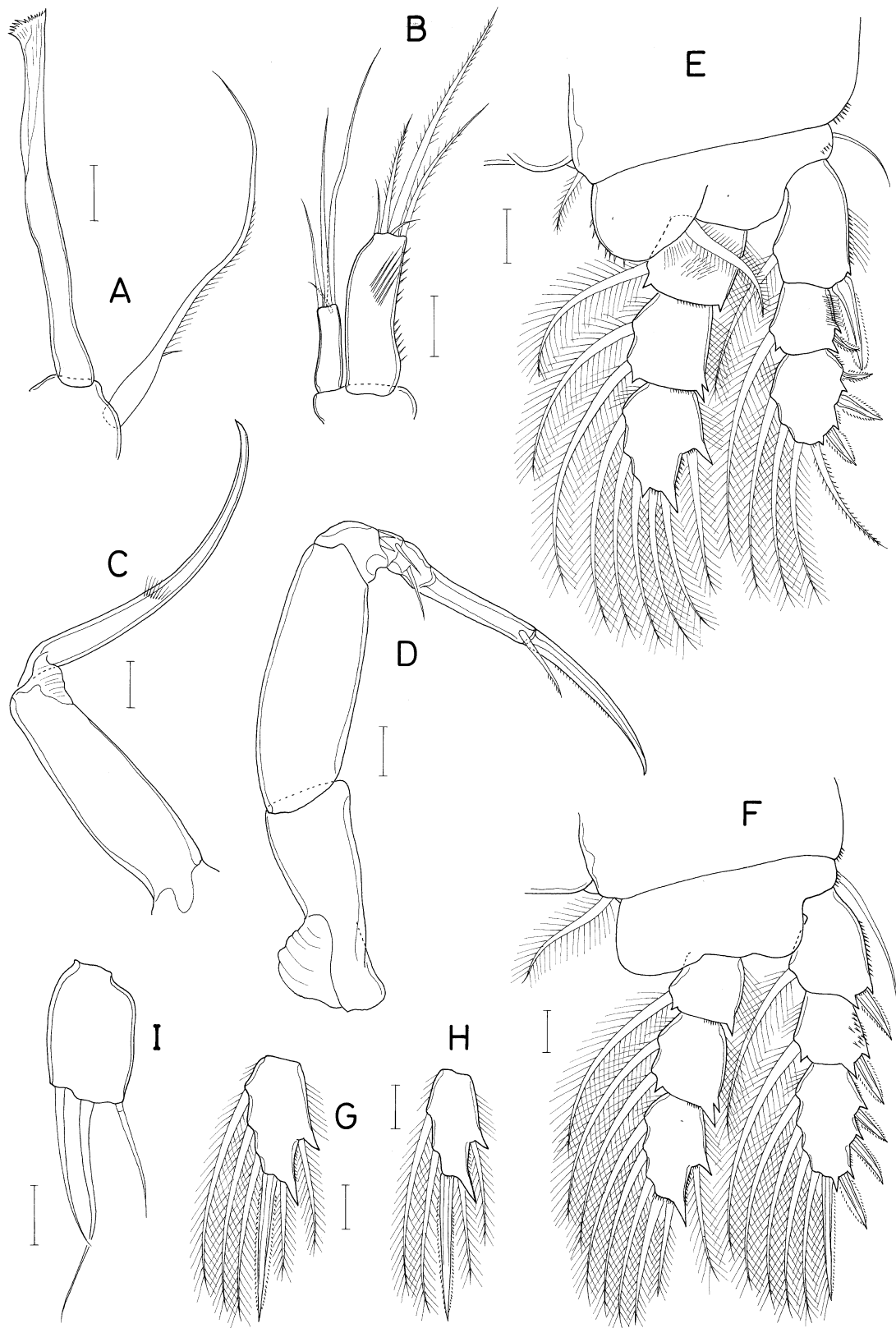
**Male.** Body (Fig. 74B) more slender than that of female. Body length of dissected specimen  $642 \mu\text{m}$ . Other 2 specimens  $596$  and  $654 \mu\text{m}$ , respectively. Greatest width  $320 \mu\text{m}$ . Prosome tapering posteriorly and  $435 \mu\text{m}$  long. Urosome (Fig. 74C) 5-segmented. Fifth pedigerous somite  $93 \mu\text{m}$  wide. Genital somite  $100 \times 111 \mu\text{m}$ , with scales on all surfaces. Three abdominal somites  $20 \times 58$ ,  $23 \times 54$ , and  $20 \times 53 \mu\text{m}$ , respectively. Second abdominal and anal somites with spinules on lateral margins. Caudal ramus  $16 \times 23 \mu\text{m}$ .

Rostrum as in female. Antennule (Fig. 74D) 16-segmented,  $287 \mu\text{m}$  long, geniculate between 14th and 15th segments. Armature formula: 1, 2, 2, 2, 2, 2, 2, 7, 2, 2, 6, 2, 4, 4+aesthetasc, and 10.

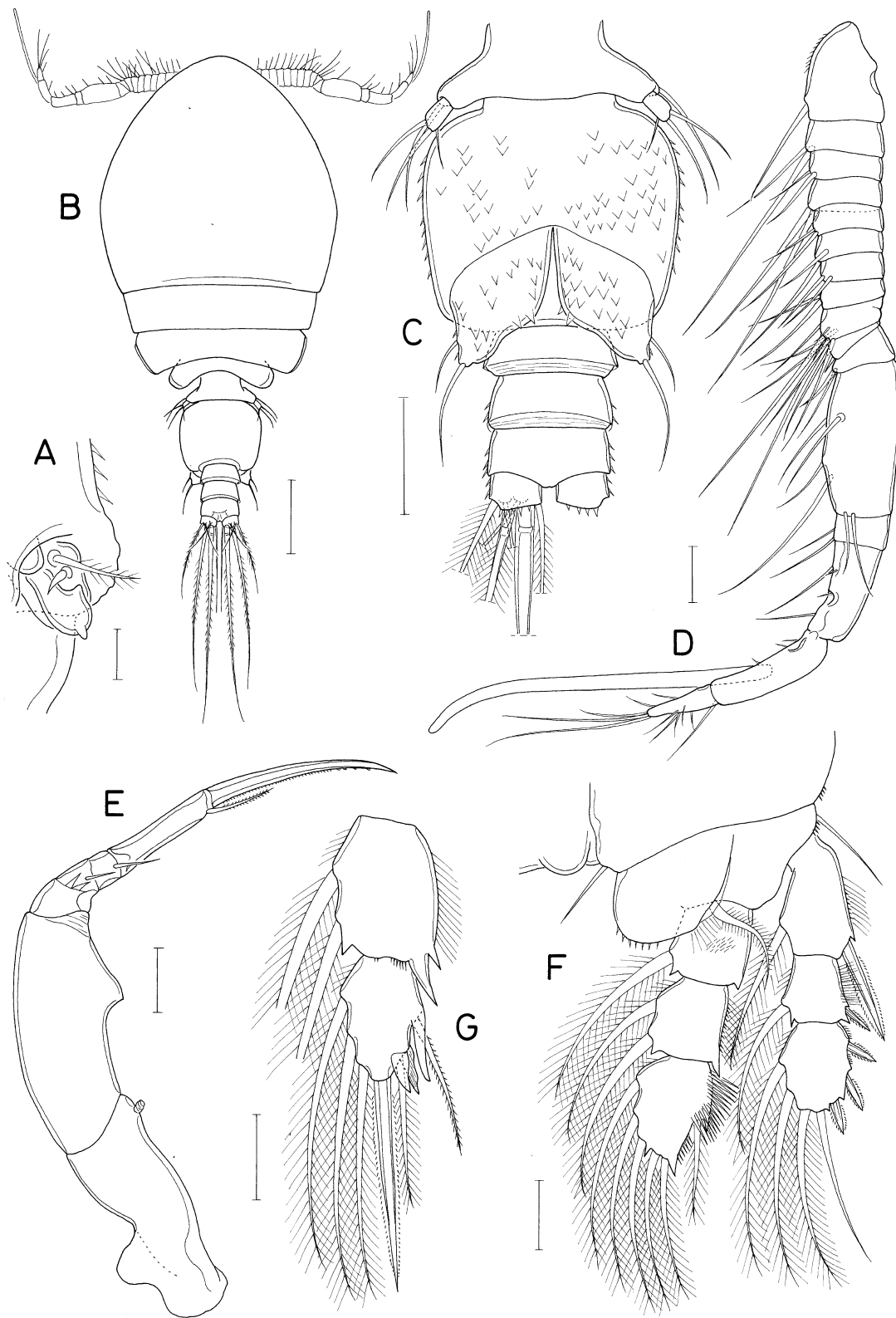
Antenna, oral cone, mandible, maxillule like those of female. Maxilliped (Fig. 74E) with small, wrinkled, inner



**Fig. 72.** *Asteropontius goniporae* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, right caudal ramus, ventral; D, cephalic area, ventral; E, antennule; F, antenna. Scales: A, 0.2 mm; B, E, 0.05 mm; C, F, 0.02 mm; D, 0.1 mm.



**Fig. 73.** *Asteropontius goniopora* n. sp., female. A, mandible; B, maxillule; C, maxilla; D, maxilliped; E, leg 1; F, leg 2; G, third endopodal segment of leg 3; H, third endopodal segment of leg 4; I, free segment of leg 5. Scales: 0.02 mm for all.



**Fig. 74.** *Asteropontius goniopora* n. sp. Female: A, right genital area. Male: B, habitus, dorsal; C, urosome, ventral; D, antennule; E, maxilliped; F, leg 1; G, second and third endopodal segment of leg 3. Scales: A, 0.01 mm; B, 0.1 mm; C, 0.05 mm; D-G, 0.02 mm.



distal element on syncoxa and blunt process on inner margin of basis.

Leg 1 (Fig. 74F) with dense spinules on outer surface of third endopodal segment; distal seta on third exopodal segment naked. Third endopodal segment of leg 3 (Fig. 74G) with enlarged outer process and 2 foliaceous elements near base of inner distal seta.

Leg 5 with free segment of  $13 \times 8 \mu\text{m}$ . Leg 6 represented 2 unequal posterior setae on genital flap (Fig. 74C).

*Etymology.* The specific name *gonioporae* is derived from the generic name of the host *Goniopora tenuidens*.

*Remarks.* *Asteropontius gonioporae* n. sp. has the armature formula for legs 1-4 identical to that of previous species and its six relatives. By the possession of the mandibular palp combined with its terminal seta which is longer than the mandibular stylet, *A. gonioporae* is differentiated from *A. fungicola*, *A. longipalpus*, *A. parvipalpus*, *A. proximus*, *A. ungelatus*, and *A. dissimilis* (except for *A. minutus*). By the possession of the female genital double-somite, which is distinctly wider than long, *A. gonioporae* is differentiated from *A. fungicola*, *A. longipalpus*, *A. minutus*, *A. proximus*, *A. ungelatus*, and *A. dissimilis* (except for *A. parvipalpus*).

Genus *Collocheres* Canu, 1893

***Collocheres humesi* n. sp. (Figs. 75-77)**

*Material examined.* Seventeen ♀♀, 33 ♂♂ from the ctenoid *Comantheria briareus* (Bell), depth 17 m, Banda Islands ( $4^{\circ} 31' 45''\text{S}$ ,  $129^{\circ} 51' 55''\text{E}$ ), collected by A.G. Humes, 30 April 1975. Holotype (♀: USNM 1081709), allotype (♂: USNM 1081710), and paratypes (15 ♀♀, 31 ♂♂: USNM 1081711) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

*Female.* Body (Fig. 75A) narrow. Body length of dissected specimen 795  $\mu\text{m}$ . Mean body length 838  $\mu\text{m}$  (790-869  $\mu\text{m}$ ), based on 8 specimens. Prosome 450  $\mu\text{m}$  long, with nearly parallel lateral margins. Greatest width 233  $\mu\text{m}$ . Cephalothorax 293  $\mu\text{m}$  long, without dorsal suture line. Fourth pedigerous somite with lobate lateral expansion on both sides. Urosome (Fig. 1B) 5-segmented. Fifth pedigerous somite 89  $\mu\text{m}$  wide. Genital double-somite  $128 \times 87 \mu\text{m}$ , with slightly expanded anterior part, 2 small serrations on each lateral margins of narrower posterior part; postero-lateral corners slightly projected posteriorly. Genital areas located at anterior 37% length of somite. Posteroventral margin of genital double-somite and abdominal somites unornamented. Three free abdominal somites from anterior to posterior  $50 \times 56$ ,  $36 \times 46$ , and  $27 \times 45 \mu\text{m}$ . Caudal rami divergent, each ramus (Fig. 75C)  $63 \times 21 \mu\text{m}$ , 3.0 times as

long as wide, with 6 setae, setules on inner margin, and minute spinules on distal apex; 2 dorsal setae smooth; outer distal seta with setules on inner margin; other 3 setae plumose on both margins.

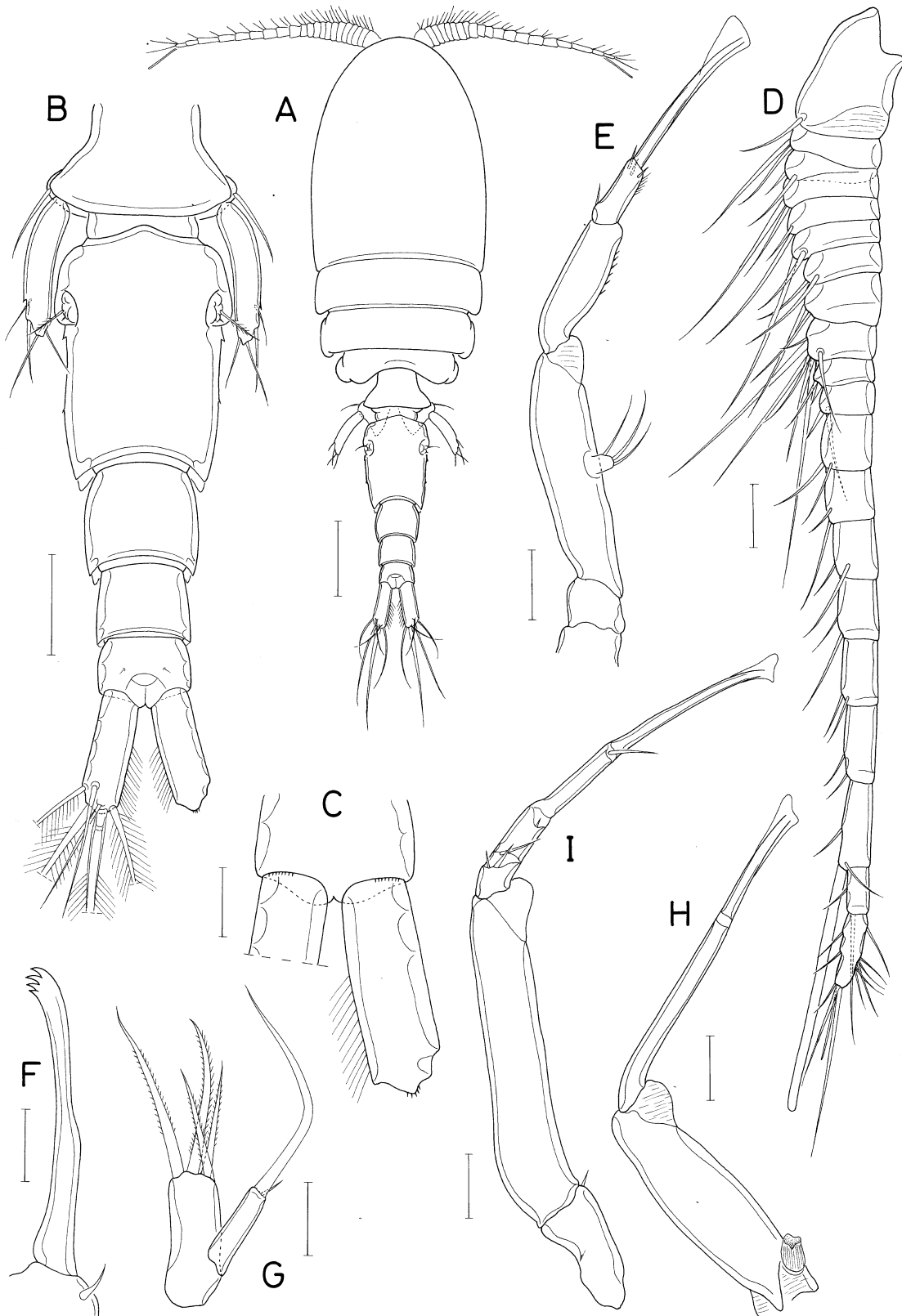
Rostrum lacking. Antennule (Fig. 75D) 20-segmented, 266  $\mu\text{m}$  long, and gradually tapering; setae: 1 on first, 7 on 9th, 2+aesthetac on 18th, 12 on terminal, and 2 on other segments. One terminal setae on terminal segment aesthetac-like. Antenna (Fig. 75E) with small coxa of  $12 \times 17 \mu\text{m}$ . Basis  $67 \times 18 \mu\text{m}$ . Exopod located near midlength of inner margin of basis, fused with basis,  $6 \times 5 \mu\text{m}$ , with lateral seta and 2 distal setae. Endopod 2-segmented. First segment of  $38 \times 13 \mu\text{m}$ , with minute spinules on inner margin. Second segment 19  $\mu\text{m}$  long, with outer proximal seta and 3 minute distal setae. Terminal claw 50  $\mu\text{m}$  long, with spatulate hyaline tip.

Oral cone (Fig. 76A) stout and  $104 \times 92 \mu\text{m}$ . Mandibular stylet 84  $\mu\text{m}$  long and distally armed with 4 teeth (Fig. 75F). Palp represented by small seta of 12  $\mu\text{m}$  long (Fig. 75F). Maxillule (Fig. 75G) bilobed. Outer lobe smaller than inner lobe,  $24 \times 8 \mu\text{m}$ , distally with large seta of 72  $\mu\text{m}$  long and small setule. Inner lobe  $36 \times 15 \mu\text{m}$ , distally with 4 spinulated setae. Maxilla (Fig. 75H) 2-segmented. Both segments unarmed. Terminal claw delimited from slender second segment by faint annule, with spatulate hyaline tip. Maxilliped (Fig. 75I) 6-segmented. Syncoxa with small inner distal seta. Basis elongate, slender and unarmed. Four endopodal segments with 2, 1, 1, and 1 setae. Seta on third endopodal segment characteristically minute. Claw slender with spatulate hyaline tip.

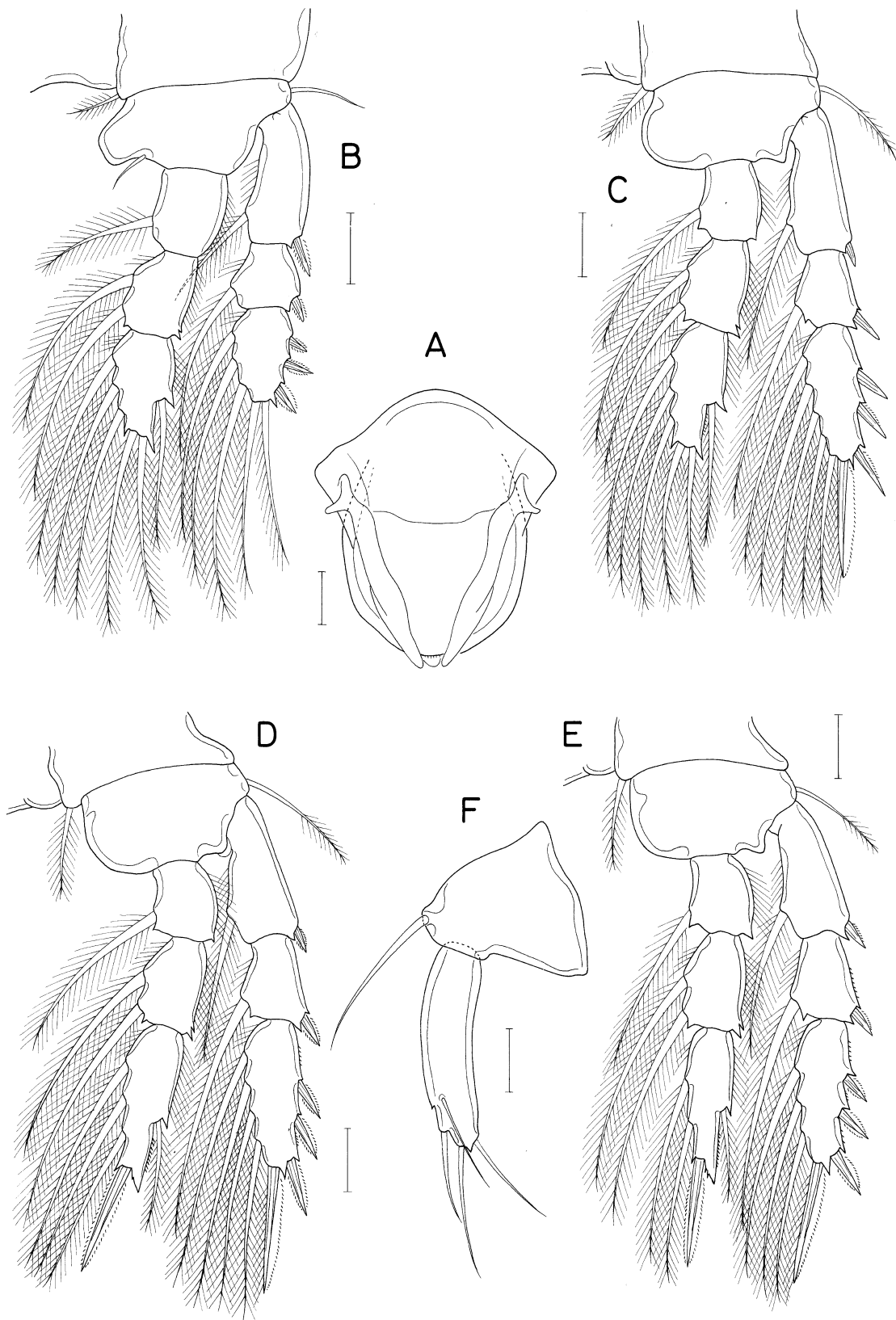
Legs 1-4 (Fig. 76B-E) with 3-segmented rami. Inner margin of basis of leg 1 projected and truncated (Fig. 76B); 2 terminal setae on third exopodal segment plumose only along inner margin. Distal outer process of second endopodal segment of leg 1-4 weakly bifurcate. Armature formula of legs 1-4:

- Leg 1: coxa 0-1; basis 1-1; exp. I-1; I-1; III,2,3;  
 enp. 0-1; 0-2; 1,2,3  
 Leg 2: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,5;  
 enp. 0-1; 0-2; 1,2,3  
 Leg 3: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,4;  
 enp. 0-1; 0-2; 1,I,3  
 Leg 4: coxa 0-1; basis 1-0; exp. I-1; I-1; III,I,3;  
 enp. 0-1; 0-2; 1,I,2

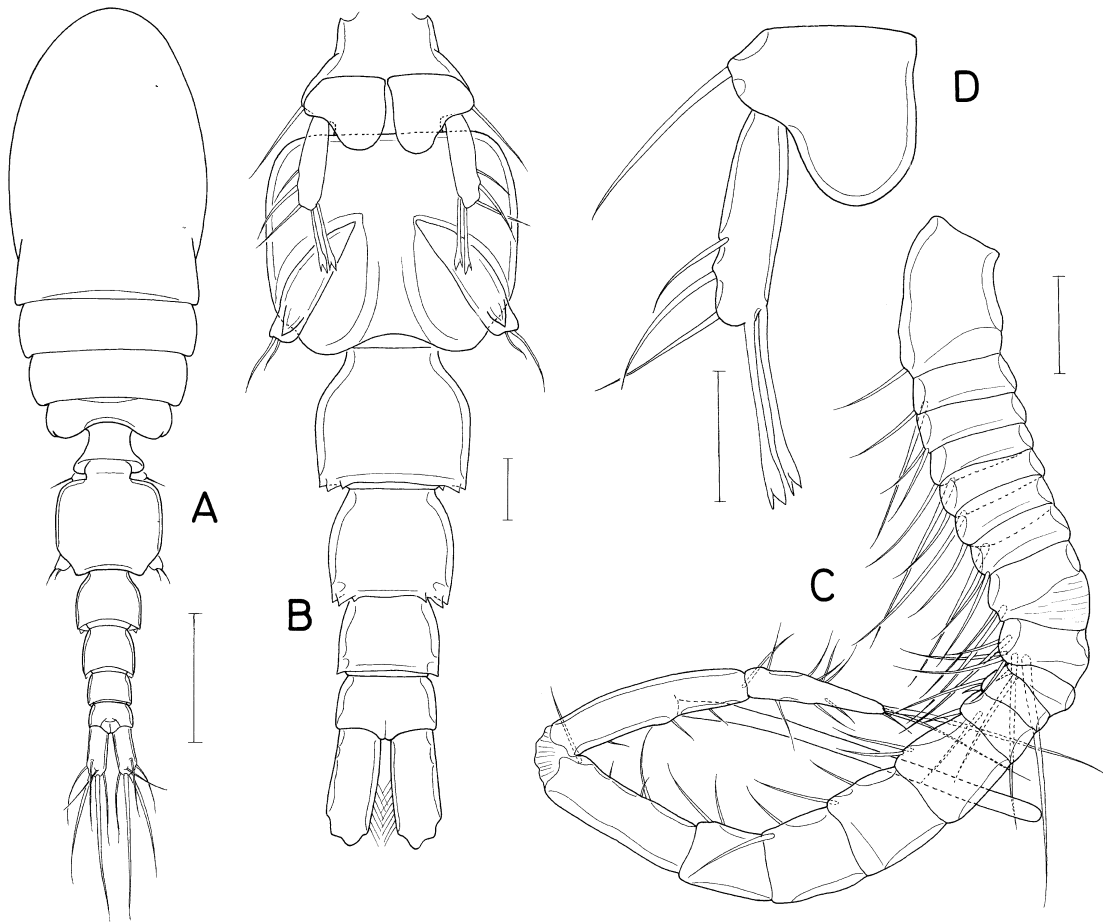
Leg 5 (Fig. 76F) 2-segmented. First segment  $47 \times 55 \mu\text{m}$ , bearing outer seta (57  $\mu\text{m}$ ) and triangularly projected inner margin. Second segment  $68 \times 16 \mu\text{m}$ , 4.25 times as long as wide, armed with 4 naked setae, longest terminal seta 42  $\mu\text{m}$ . Leg 6 represented by plumose seta and minute spinule in genital area (Fig. 75B).



**Fig. 75.** *Collocheres humesi* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, left caudal ramus, ventral; D, antennule; E, antenna; F, mandible; G, amxillule; H, maxilla; I, maxilliped. Scales: A, 0.1 mm; B, 0.05 mm; C-I, 0.02 mm.



**Fig. 76.** *Collocheres humesi* n. sp., female. A, oral cone; B, leg 1; C, leg 2; D, leg 3; E, leg 4; F, leg 5. Scales: 0.02 mm for all.



**Fig. 77.** *Collocheres humesi* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antennule; D, leg 5. Scales: A, 0.1 mm; B-D, 0.02 mm.

*Male.* Body (Fig. 77A) narrower than that of female. Body length 642  $\mu$ m (615–654  $\mu$ m) based on 10 specimens. Cephalothorax 225  $\times$  150  $\mu$ m, with slight lateral constriction posteriorly. Urosome (Fig. 77B) 6-segmented. Fifth pedigerous somite 57  $\mu$ m wide. Genital somite 74  $\times$  82  $\mu$ m, with rounded corners in dorsal view. Abdominal somites from anterior to posterior 46  $\times$  51, 35  $\times$  41, 26  $\times$  33, and 17  $\times$  33  $\mu$ m, respectively. Caudal ramus 38  $\times$  15  $\mu$ m.

Rostrum lacking as in female. Antennule (Fig. 77C) 19-segmented, geniculate in 2 places, with 1 seta on first segment, 7 setae on 9th, 4 on 17th, 4+aesthetasc on penultimate, and 10 on terminal segments. Antenna as in female.

Oral cone, mandible, maxillule, maxilla, maxilliped, and legs 1–4 similar to those of female. Leg 5 (Fig. 77D) with first segment 28  $\times$  32  $\mu$ m, roundly projected inner margin. Second segment 32  $\times$  9  $\mu$ m (=3.56:1), with 3 outer, distal setae and 2 inner, broad setae (each 28  $\mu$ m long) bearing bifurcate tip. Leg 6 represented by 2 setae and process on posteroventral flap (Fig. 77B).

*Etymology.* This species is named for Dr. A. G. Humes who collected specimens of this species and many others.

*Remarks.* Five congeners, *C. giesbrechti* Thompson and Scott, 1903, *C. inaequalis* Ho, 1982, *C. oribullatus* Kim, 2004, *C. tamladus* Shin and Kim, 2004, and *C. titillator* Humes, 1987, are selected as relatives of *C. humesi* n. sp., because they share in common a similar ratio of the length to width for the caudal ramus (2.5–3.5 : 1) and the second segment of female leg 5 being more than 3.5 times as long as wide.

*Collocheres humesi* is distinguished from these relatives by the following features: four distal teeth on the mandibular stylet (nine teeth in *C. tamladus* and *C. titillator*), the small palp which is less than half length of the mandibular stylet (the palp is at least half as long as the mandibular stylet in *C. giesbrechti*, *C. tamladus*, and *C. titillator*), the maxillule in which the outer lobe is shorter than the inner lobe (reverse state in *C. inaequalis*), the nearly parallel lateral margins of the genital double-somite in the female

(tapering in *C. oribullatus*), and the usual shape of the oral cone (strongly expanded distally in *C. oribullatus*).

***Collocheres amicus* n. sp. (Figs. 78-80)**

*Material examined.* Fifty-seven ♀♀, 5♂♂ from the crinoid *Comantheria briareus* (Bell), depth 17 m, Banda Islands (4° 31'45"S, 129° 51'55"E), collected by A.G. Humes, 30 April 1975. Holotype (♀: USNM 1081712), allotype (♂: USNM 1081713), and paratypes (55 ♀♀, 3 ♂♂: USNM 1081714) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 1 ♂) are kept in the collection of the author.

*Female.* Body (Fig. 78A) small and narrow. Body length 585 µm (565-596 µm) based on 10 specimens. Prosome 313 µm long, with nearly parallel lateral margins. Greatest width 160 µm. Cephalothorax 208 µm long, without dorsal suture line. Fourth pedigerous somite with concave posterior margin. Urosome (Fig. 78B) 5-segmented. Fifth pedigerous somite 63 µm wide. Genital double-somite 92 × 64 µm, with spiniform processes on posterolateral corners; lateral margins nearly parallel, without serrations. Genital areas located at anterior 38% length of somite. Three free abdominal somites from anterior to posterior 33 × 43, 21 × 33, and 17 × 33 µm, respectively. Caudal rami (Fig. 78C) divergent, each ramus 40 × 15 µm, 2.67 times as long as wide, with 6 setae, setules on inner margin, and minute pore on produced posterior tip; 2 dorsal setae smooth; outer distal seta with setules on inner margin; other 3 setae plumose on both margins.

Rostrum long and tapering (Fig. 78D) but its posterior apex fused with ventral surface of cephalothorax. Antennule (Fig. 78E) 20-segmented, 204 µm long, and gradually tapering, with setae 1 on first segment, 7 on 9th, 2+aesthetac on 18th, 12 on terminal, and 2 on other segments. One of terminal setae on terminal segment aesthetasc-like. Antenna (Fig. 78F) with small coxa of 9 × 11 µm. Basis 44 × 13 µm, slightly expanded subdistally. Exopod located at middle of inner margin of basis, approximately 3 × 3 µm, with lateral seta and 2 distal setae. Endopod 2-segmented. First segment 24 × 8 µm, with setules on distal half of inner margin. Second segment 13 µm long, with small outer proximal seta and 3 minute distal setae. Terminal claw 36 µm long, with spatulate hyaline tip.

Oral cone (Fig. 78G) oval, 50 × 44 µm. Mandibular stylet 63 µm long and distally armed with 4 teeth (Fig. 78H). Palp represented by small seta of 8 µm long. Maxillule (Fig. 78I) bilobed. Outer lobe 17 × 5 µm, distally with large seta (42 µm) and small setule. Inner lobe 19 × 9 µm, expanded subdistally, with subdistal spinules and 4 simple terminal setae.

Maxilla (Fig. 79A) 2-segmented. Syncoxa proximally with aesthetasc-like elongate process (probably duct of maxillary gland). Basis slender and unarmed. Terminal claw delimited from second segment by faint annule, with spatulate hyaline tip. Maxilliped (Fig. 79B) 6-segmented. Syncoxa with small inner distal seta. Basis elongate, slender and unarmed. Four endopodal segments each armed with 2, 1, 1, and 1 setae. Distal seta on third endopodal segment minute. Claw slender with spatulate hyaline tip.

Legs 1-4 (Fig. 79C-F) with 3-segmented rami. Inner margin of basis of leg 1 roundly projected (Fig. 79C); 2 terminal setae on third exopodal segment plumose only along inner margin; second outer spine on third exopodal segment directed outward. Distal outer process of second endopodal segment of legs 2-4 bifurcate. Outer seta on basis of legs 1-4 naked. Armature formula of legs 1-4 as in preceding species.

Leg 5 (Fig. 79G) 2-segmented. First segment 31 × 33 µm, bearing outer seta of 46 µm long and roundly projected inner margin. Second segment 46 × 18 µm, 2.56 times as long as wide, armed with 4 naked setae, longest terminal one of them 34 µm long. Leg 6 represented by simple seta and spiniform seta in genital area (Fig. 78B).

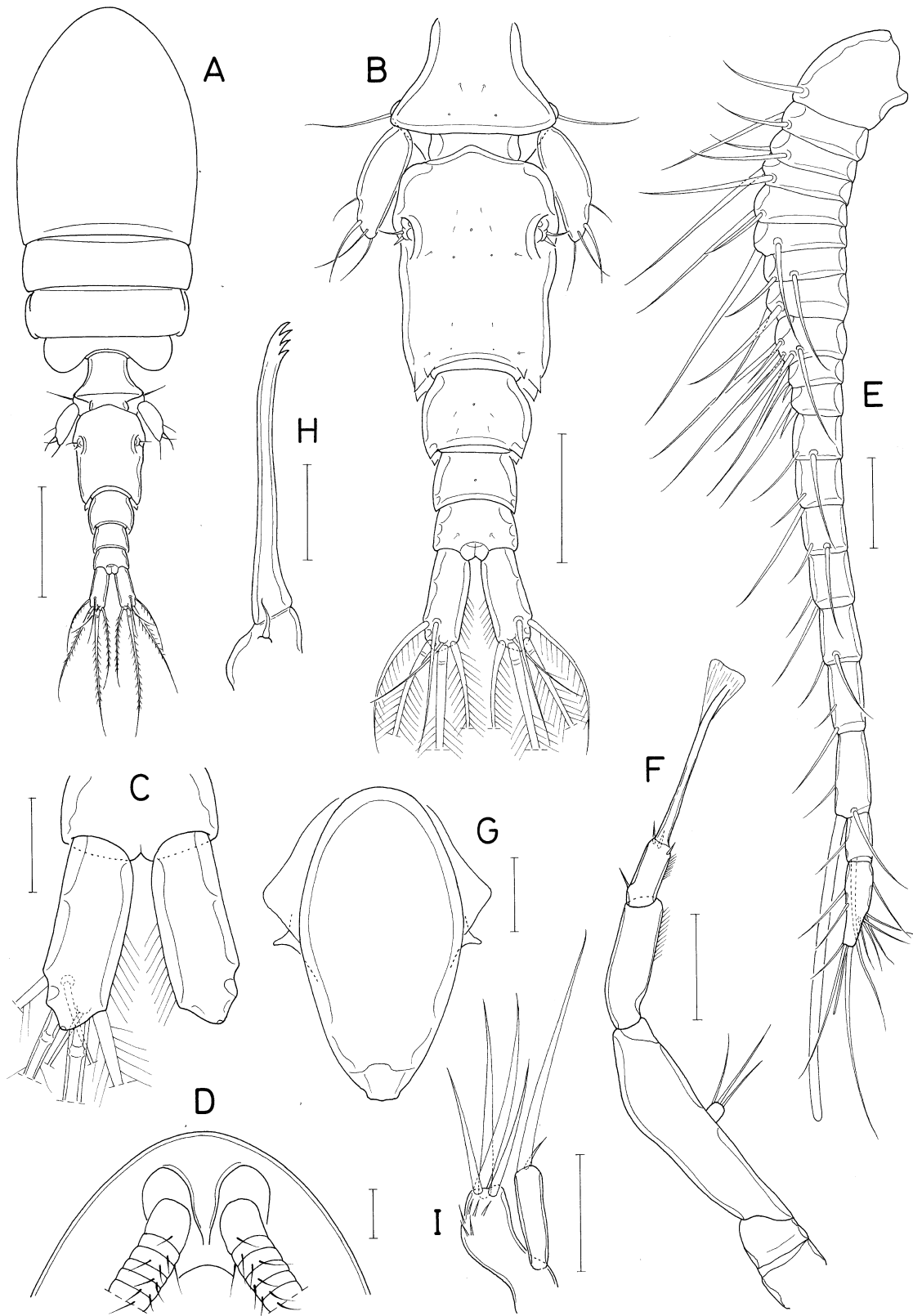
*Male.* Body (Fig. 80A) similar to that of female. Body length 457 µm (453-463 µm) based on 6 specimens. Prosome 247 µm long. Cephalothorax 163 × 125 µm. Urosome (Fig. 80B) 6-segmented. Fifth pedigerous somite 47 µm wide. Genital somite 58 × 69 µm, with rounded corners in dorsal and ventral views. Abdominal somites from anterior to posterior 32 × 42, 25 × 34, 17 × 28, and 13 × 28 µm, respectively. Caudal ramus 22 × 13 µm.

Rostrum as in female. Antennule (Fig. 80C) 19-segmented, with 2 geniculations. Setae: 1 on first segment, 7 on 9th, 3 on 17th, 3+aesthetac on penultimate, and 9 on terminal segments. Antenna as in female.

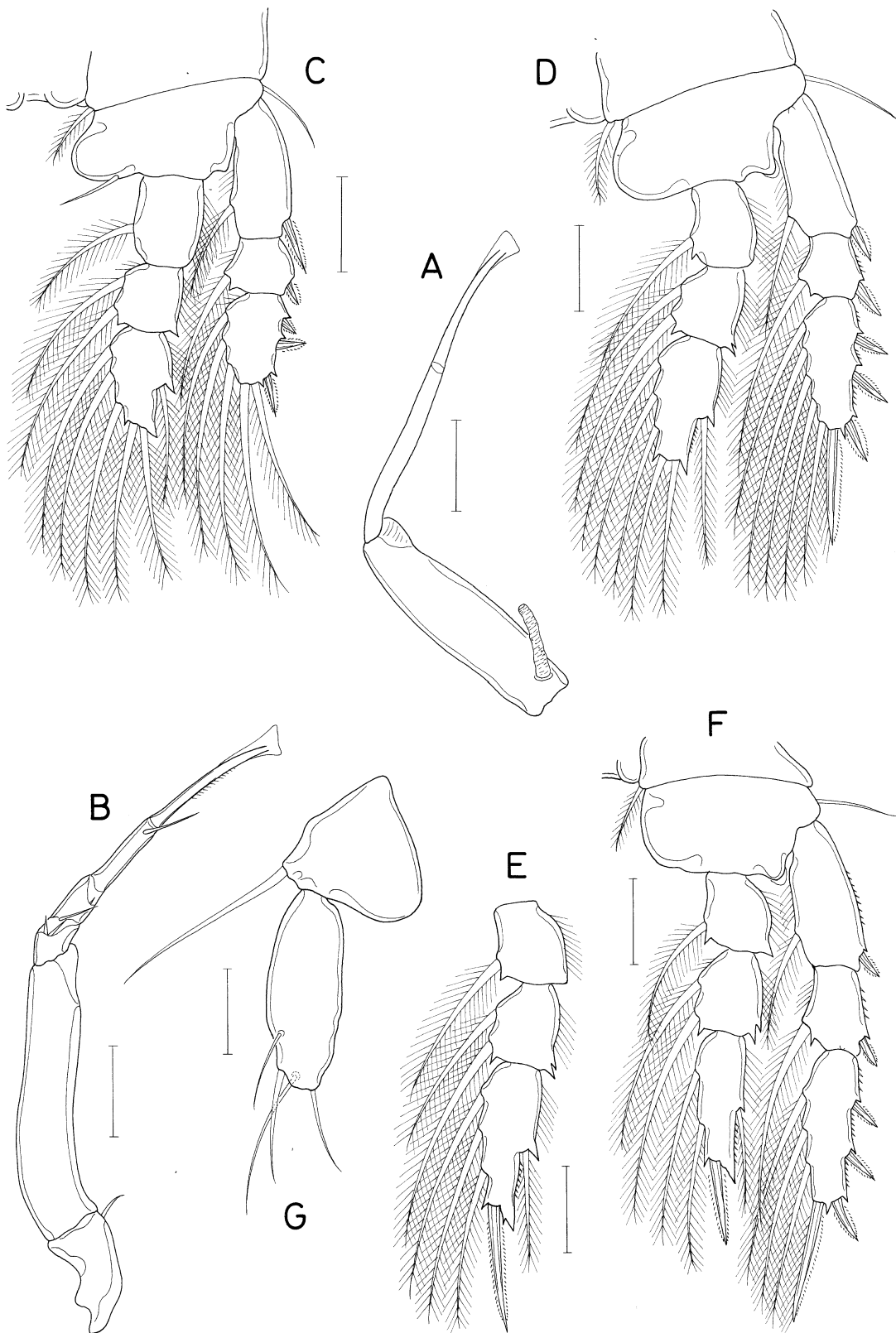
Oral cone, mandible, maxillule, maxilla, maxilliped, and legs 1-4 similar to those of female. Leg 5 (Fig. 80D), first segment 22 × 26 µm. Second segment 26 × 6 µm (4.67 : 1), with 3 outer setae and 2 inner broad, hyaline setae (19 and 18 µm long) bearing bifurcate tip. Leg 6 represented by 2 setae and process on posteroventral flap (Fig. 80B).

*Etymology.* The specific name *amicus* (a Latin meaning "friend") refers to the co-occurrence of this species with *C. humesi* on the same host, *Comantheria briareus*.

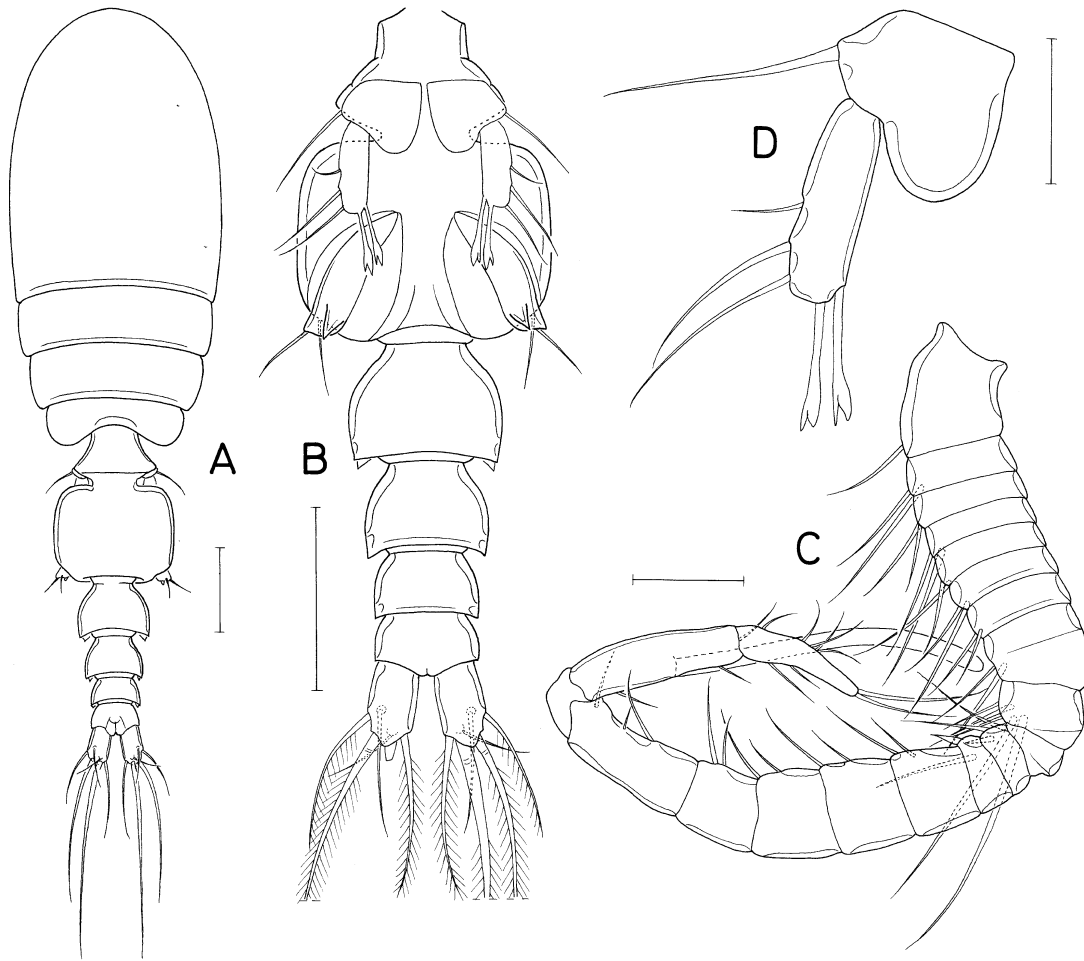
*Remarks.* Only two species of *Collocheres*, *C. parvus* Humes, 1987, and *C. uncinatus* Stock, 1966, are comparable with *C. amicus* n. sp. in having the following combination of characters: (1) the caudal ramus 2.0-3.5 times as long as wide; (2) the second segment of female leg 5 is 2.0-3.0 times as long as wide. *Collocheres amicus* n. sp. can be differentiated from both species by having a maxillae with



**Fig. 78.** *Collocheres amicus* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, caudal rami, ventral; D, rostral area, ventral; E, antennule; F, antenna; G, oral cone; H, mandible; I, maxillule. Scales: A, 0.1 mm; B, 0.05 mm; C-I, 0.02 mm.



**Fig. 79.** *Collocheres amicus* n. sp., female. A, maxilla; B, maxilliped; C, leg 1; D, leg 2; E, endopod of leg 3; F, leg 4; G, leg 5. Scales: 0.02 mm for all.



**Fig. 80.** *Collocheres amicus* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antennule; D, leg 5. Scales: A, B, 0.05 mm; C, D, 0.02 mm.

the outer lobe shorter than the inner lobe (reversed condition in *C. parvus* and *C. uncinatus*). It is further differentiated from *C. parvus* by having a longer second segment in leg 5 of the male (4.67 times as long as wide, compared to 2.63 times as long in *C. parvus*) and from *C. uncinatus* by the absence of serration on the lateral margins of the female genital double-somite.

Family Stellicomitidae Humes and Cressey, 1958

***Molucomes* n. gen.**

**Diagnosis.** Body swollen. Caudal ramus with 5 setae and terminated by setiform process. Antennule, antenna, mouthparts, and legs enclosed with transparent membrane. Antennule 3-segmented. Antenna 4-segmented. Mandible absent. Maxillule bilobed. Maxilliped 4-segmented. Legs 1, 2, and 5 lobate. Legs 3 and 4 with 2-segmented exopod, without

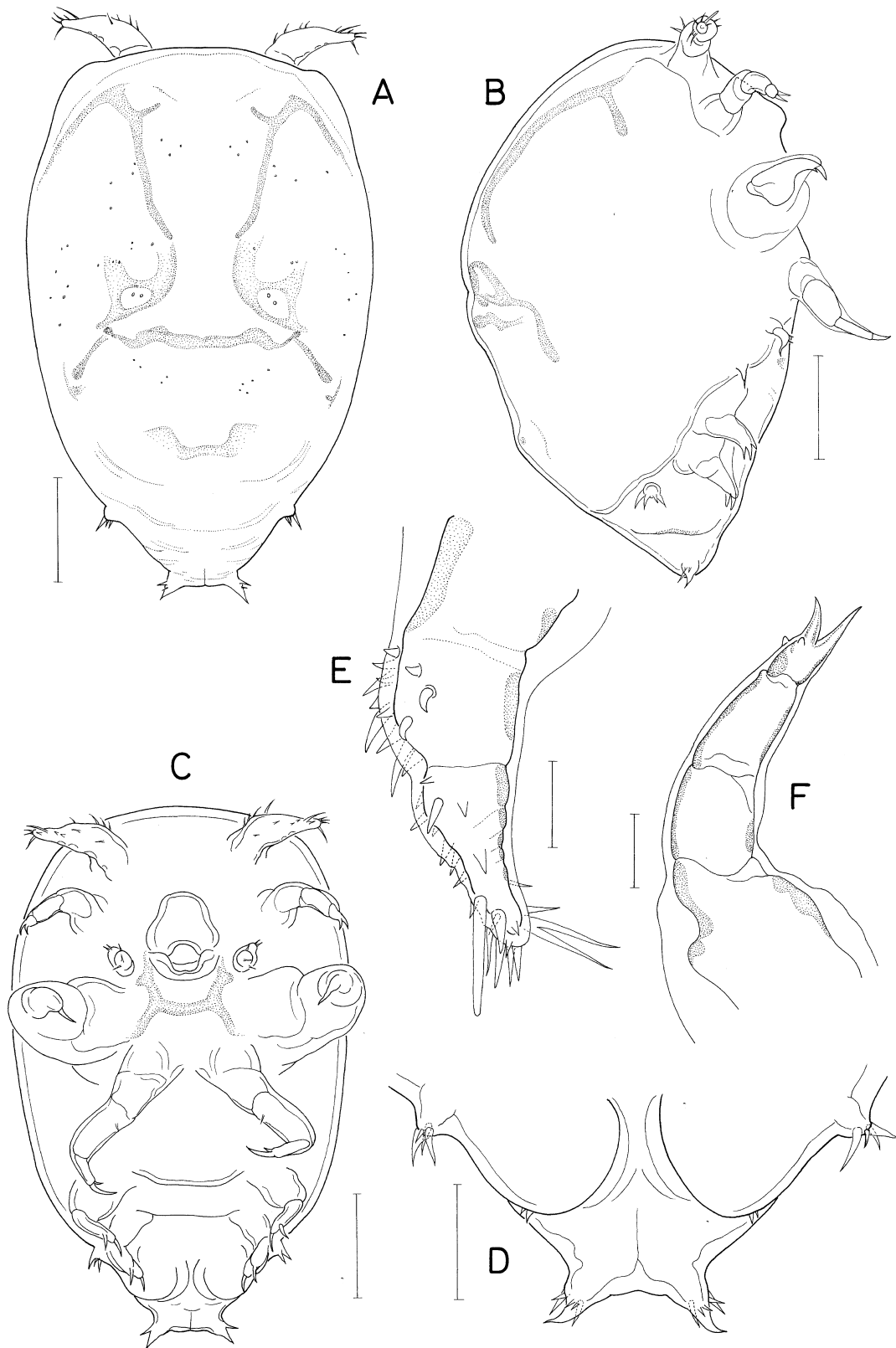
endopod.

**Type species.** *Molucomes ovatus* n. sp.

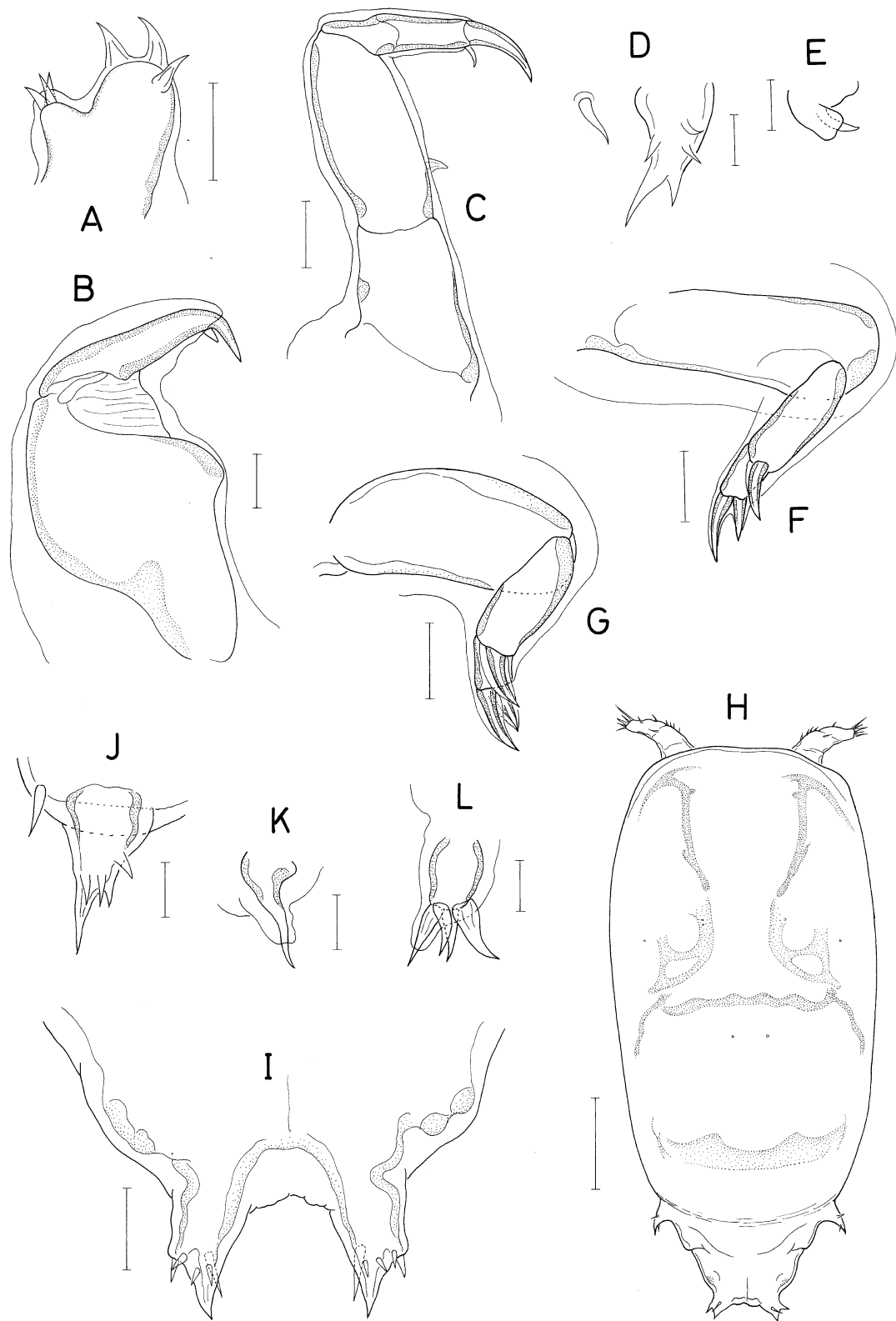
**Etymology.** The name is derived from “the Moluccas”, and “-comes”, the ending of several generic names in the Stellicomitidae.

**Remarks.** With the minute, unsegmented body and very small urosome, this genus belongs undoubtedly to the family Stellicomitidae, a group of copepods associated with starfishes. Six known genera of this family have been differentiated from each other chiefly by the termination of maxilla, the structure of legs 1-4 and the nature of caudal ramus (Humes, 1986b). *Molucomes* n. gen. has a maxilla terminated by a claw, unlike *Stellicomes* Humes and Cressey, 1958, and *Astroxyneus* Humes, 1971, which have a maxilla terminated by a spinulated pad. *Molucomes* also have five caudal setae whereas *Onychopygus* Humes and Cressey, 1958, *Asterocomes* Rao, 1962, and *Chorioxyneus*





**Fig. 81.** *Molucomes ovatus* n. gen., n. sp., male. A, habitus, dorsal; B, habitus, lateral; C, habitus, ventral; D, distal part of body, ventral; E, antennule; F, antenna. Scales: A-C, 0.1 mm; D, 0.05 mm; E, F, 0.02 mm.



**Fig. 82.** *Molucomes ovatus* n. gen., n. sp. Male: A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 3; G, leg 4. Female: H, habitus, dorsal; I, distal part of body, ventral; J, leg 1; K, leg 2; L, leg 5. Scales: A-C, F, G, I, 0.02 mm; D, E, J-L, 0.01 mm; H, 0.1 mm.

Humes, 1986, have four caudal setae. The remaining genus *Leicomes* Humes, 1971 is relatively close to *Molucomes* in having a similar maxilla and legs 1 and 2 lobate. However, *Molucomes* is distinguished from *Leicomes* and all other genera by the possession of the 2-segmented exopod on legs 3 and 4 (1-segmented in *Leicomes* and 3-segmented in other genera).

The starfish *Acanthaster planci* is known to act as host of two species in two genera of the Stellicomitidae, *Onychopygus inpavidus* Humes and Cressey, 1958, and *Stellicomes bisphaerulifer* Humes, 1986. However, these two copepod taxa are not similar to the genus *Molucomes*.

### ***Molucomes ovatus* n. sp. (Figs. 81, 82)**

**Material examined.** Three ♀♀, 38♂♂ from the starfish *Acanthaster planci* (Linnaeus), depth 3 m, Gomumu Island, south of Obi (1° 50'00"S, 127° 30'54"E), collected by A.G. Humes, 30 May 1975. Holotype (♂: USNM 1081718), allotype (♀: USNM 1081719), and paratypes (1 ♀, 35♂♂: USNM 1081720) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States. Dissected paratypes (1 ♀, 2♂♂) are kept in the collection of the author.

**Male.** Body (Fig. 81A-C) swollen, not segmented, nor divisible into prosome and urosome in dorsal view, with broadly truncated anterior margin and tapering posterior part. Body length 505 µm (465-527 µm) based on 10 specimens. Greatest width 336 µm, and greatest dorsoventral depth 325 µm. In ventral view, area corresponding to cephalothorax occupying nearly anterior half of body, and urosomal part confined to posterior 25%. Dorsal area of cephalothoracic portion with sclerotizations and minute pits. Urosomal portion (Fig. 81D) strongly tapering, with genital flaps visible. Caudal ramus lobate, with 5 setae and 1 large, setiform process.

Rostrum absent. Antennule, antenna, mouthparts, and most legs enclosed by membrane. Antennule (Fig. 81E) strongly tapering, divisible into 3 internal segments. First segment faintly demarcated from second segment and unarmed. Second segment with 13 thick setae. Third segment with 23 setae and 1 aesthetasc, 2 longer subdistal ones of them with common base. Antenna (Fig. 81F) 4-segmented and distinctly tapering. Proximal 3 segments unarmed. Third endopodal segment (fourth segment) distally bifurcate, with 2 small, subdistal papilliform processes (or process-like setae).

Oral cone not visible in lateral view of body. Mandible lacking. Maxillule (Fig. 82A) positioned at lateral sides of oral cone (Fig. 81C) and bilobed. Outer lobe (exopod) with 3 setae and larger inner lobe (endopod) with 3 spiniform

setae. Maxilla (Fig. 82B) 2 segmented and enclosed by membrane except for distal part of basis. Syncoxa expanded and unarmed. Basis strongly curved distally, with subdistal spiniform seta. Maxilliped (Fig. 82C) 4-segmented. Syncoxa unarmed. Basis with spiniform seta on proximal part of inner margin. First endopodal segment unarmed. Second endopodal segment weakly divided from third, with inner distal seta. Terminal claw curved and as long as second endopodal segment.

Legs 1 and 2 very small. Leg 1 (Fig. 82D) consisting of lobe (endopod) bearing 3 subdistal setae and 2 distal process-like setae. Exopod represented by seta. Leg 2 (Fig. 82E) lobate, curved inward, with spiniform terminal seta. Legs 3 and 4 (Fig. 82F, G) with 2-segmented exopod, without endopod. Both legs identical in shape and armature, with 1 and 2 spines on first and second segments, respectively. Endopod lacking. Leg 5 located on lateral margins of body and represented by small lobe bearing 4 spiniform setae (Figs. 81D, 82L). Leg 6 represented by 2 small seta on posterior margin of genital flap (Fig. 81D).

**Female.** Body (Fig. 82H) narrower than that of male. Body length of dissected specimen 625 µm. Other 2 specimens 631 and 661 µm. Greatest width 289 µm, and greatest dorsoventral depth 314 µm. Urosome divided from prosome by lateral and dorsal constrictions (Fig. 82H). Genital areas hardly visible. Caudal ramus armed as in male (Fig. 82I).

Rostrum absent as in male. Antennule, antenna, mouthparts, and legs, including legs 1 (Fig. 82J) and 2 (Fig. 82K), not different from those of male. Leg 5 (Fig. 82L) as more pronounced lobe but armed as in male.

**Etymology.** The specific name *ovatus* is a Latin meaning "oval" alluding to the oviform body of the new species.

### **Copepods and their invertebrate hosts from the Moluccas**

#### Order Cyclopoida

##### Family Cyclopidae

*Euryte bellatula* Humes, 1991: *Montipora compressa* and *M. prolifera* (by Humes, 1991a).

##### Family Notodelphyidae

*Notodelphys matronalis* Leigh-Sharpe, 1934: *Ascidia rabdophora* and *Styela asymmetrica* (by Leigh-Sharpe, 1934).

#### Order Poecilostomatoida

##### Family Anthessiidae

*Anthessius alatus* Humes & Stock, 1965: *Tridacna squamosa* (by Humes, 1976a).

*Anthessius discipedatus* Humes, 1976: *Hippopus hippopus* (by Humes, 1976a).

Family Anchimolgidae

*Allopodion mirum* Humes, 1978: *Montipora* sp. cf. *undata* (by Humes, 1978c).

*Amarda curvus* n. sp.: *Goniastrea retiformis* (in the present paper).

*Amarda goniastreae* Humes, 1985: *Goniastrea retiformis* (by Humes, 1985a).

*Anchimoligus angustus* (Humes, 1992): *Gardineroseris planulata* (by Humes, 1992a; Kim, 2006).

*Anchimoligus breviararius* Humes, 1995: *Goniopora stokesi* (by Humes, 1995).

*Anchimoligus compressus* Humes, 1996: *Galaxea fascicularis* (by Humes, 1996a).

*Anchimoligus conformatus* Humes, 1995: *Goniopora* sp. (by Humes, 1995).

*Anchimoligus contractus* Humes, 1979: *Galaxea fascicularis* (by Humes, 1979b).

*Anchimoligus convexus* Humes, 1979: *Parahalomitra robusta* (by Humes, 1978a).

*Anchimoligus digitatus* (Humes & Ho, 1968): *Goniopora tenuidens* (by Humes, 1979c).

*Anchimoligus gigas* Humes, 1995: *Goniopora stokesi* (by Humes, 1995).

*Anchimoligus gracilipes* n. sp.: *Pavona danai* (in the present paper).

*Anchimoligus hastatus* n. sp.: *Fungia* sp. (in the present paper).

*Anchimoligus latens* Humes, 1978: *Fungia echinata*, *F. fungites*, *F. paumotuensis*, and *Herpolitha limax* (by Humes, 1978a).

*Anchimoligus mimeticus* Humes, 1995: *Goniopora* sp., *Goniopora* cf. *tenuidens*, and *G. pedunculata* (by Humes, 1995).

*Anchimoligus moluccanus* Humes, 1996: *Galaxea fascicularis* (by Humes, 1996a).

*Anchimoligus nasutus* Humes, 1996: *Galaxea fascicularis* (Humes, 1996a).

*Anchimoligus notatus* Humes, 1978: *Fungia actiniformiis* and *F. paumotuensis* (by Humes, 1978a).

*Anchimoligus orectus* Humes, 1978; *Fungia paumotuensis* (by Humes, 1978a); *Fungia* sp. (in the present paper).

*Anchimoligus pandus* Humes, 1978: *Fungia actiniformiis*, *F. echinata*, *F. paumotuensis*, and *Polyphyllia talpina* (by Humes, 1978a).

*Anchimoligus papillipes* n. sp.: *Platygyra ryukyuensis* (in the present paper).

*Anchimoligus parangensis* n. sp.: *Hydnophora microconos* (in the present paper).

*Anchimoligus partenuipes* n. sp.: *Pocillopora damicornis* (in the present paper).

*Anchimoligus proxilipes* (Humes & Ho, 1968): *Porites* sp. (in the present paper).

*Anchimoligus punctilis* Humes, 1978: *Fungia fungites* and *F. paumotuensis* (by Humes, 1978a).

*Anchimoligus tener* Humes, 1973: *Fungia echinata* and *Parahalomitra robusta* (by Humes, 1979c).

*Andrianellus papillipes* n. sp.: *Platygyra ryukyuensis* (in the present paper).

*Cerioxynus bandensis* Humes, 1979: *Favites virens* (by Humes, 1979a).

*Cerioxynus moluccensis* Humes, 1979: *Favites pentagona* (by Humes, 1979a).

*Cerioxynus oulophylliae* Humes, 1986: *Oulophyllia crispa* (by Humes, 1986a).

*Clamocus spinifer* Humes, 1979: *Galaxea fascicularis* (by Humes, 1979b).

*Ecphysarion lobophorum* (Humes & Ho, 1968): *Acropora rambleri* and *A. hyacinthus* (by Humes, 1993b).

*Ecphysarion spinulatum* Humes, 1993: *Acropora palifera* (by Humes, 1993b).

*Exodontomolgus communis* n. gen. n. sp.: *Alveopora mortenseni* (in the present paper).

*Euxynus capulus* Humes, 1992: *Gardineroseris planulata* (by Humes, 1992a).

*Haplomolgus montiporae* Humes & Ho, 1968: *Montipora compressa* (by Humes, 1978c).

*Haplomolgus subdeficiens* Humes, 1978: *Montipora* sp. cf. *undata* (by Humes, 1978c).

*Jamescookina moluccensis* n. sp.: *Echinopora lamellosa* (in the present paper).

*Kawanolus parangensis* Humes, 1978: *Montipora* sp. cf. *undata* (by Humes, 1978c).

*Karanges galaxeanus* Humes, 1979: *Galaxea fascicularis* (by Humes, 1979b).

*Karanges hypsorophus* Humes, 1979: *Galaxea fascicularis* (by Humes, 1979b).

*Kombia avitus* n. sp.: *Porites* sp. (in the present paper).

*Mycoxynus fungianus* Humes, 1978: *Fungia echinata* (by Humes, 1978a).

*Mycoxynus villosus* Humes, 1979: *Herpolitha limax* (by Humes, 1979c).

*Odontomolgus decens* Humes, 1978: *Fungia actiniformiis* (by Humes, 1978a).

*Odontomolgus flammeus* n. sp.: *Fungia* sp. (in the present paper).

*Odontomolgus forhani* Humes, 1978: *Montipora compressa* and *Montipora prolifera* (by Humes, 1978c); *Montipora* cf. *undata* (by Humes, 1991a).

*Odontomolgus fultus* Humes, 1978: *Halonitra philippinen-*

- sis (by Humes, 1978a).
- Odontomolgus mucosus* Kim, 2006: *Gardineroseris planulata* (by Kim, 2006).
- Odontomolgus parvus* n. sp.: *Goniastrea retiformis* (in the present paper).
- Odontomolgus pavonus* n. sp.: *Pavona danai* (in the present paper).
- Odontomolgus unioviger* Kim, 2006: *Gardineroseris planulata* (by Kim, 2006).
- Paramarda aculeata* Humes, 1978: *Fungia paumotuensis* and *Halomitra philippinensis* (by Humes, 1978a).
- Panjakus auriculatus* Humes & Dojiri, 1979: *Lobophytum crassum* (by Humes & Dojiri, 1979a).
- Panjakus fastigatus* Kim, 2005: *Platygyra ryukyuensis* (by Kim, 2005a).
- Panjakus hydnochorae* Humes & Stock, 1973: *Hydnophora exesa* (by Humes, 1979c).
- Panjakus iratus* Kim, 2005: *Hydnophora microconos* (by Kim, 2005a).
- Panjakus papillipes* Kim, 2005: *Platygyra ryukyuensis* (by Kim, 2005a).
- Panjakus saccipes* Kim, 2005: *Hydnophora microconos* (by Kim, 2005a).
- Paranchimolgus parallelus* n. gen. n. sp.: *Alveopora mortenseni* (in the present paper).
- Rakotoa ceramensis* Humes, 1979: *Favites pentagona* (by Humes, 1979a).
- Scyphuliger eumorphus* Humes, 1993: *Acropora corymbosa*, *A. hyacinthus*, and *A. rambleri* (by Humes, 1993b).
- Scyphuliger karangmiensis* n. sp.: *Acropora intermedia* (in the present paper).
- Sociellus geminus* Kim, 2006: *Gardineroseris planulata* (by Kim, 2006).

#### Family Eunicicolidae

- Spongicola tropicanus* Kim, 2004: *Phyllospongia foliascens* (by Kim, 2005b).

#### Family Lamippidae

- Enalcyonium circulatum* n. sp.: *Muricella* sp. (in the present paper).
- Enalcyonium ceramensis* n. sp.: *Rumphella aggregata* (in the present paper).
- Lamippe* sp.: *Caligorgia* sp. (by Leigh-Sharpe, 1934).

#### Family Lichomolgidae

- Astericola carens* Humes, 1986: *Archaster typicus* (by Humes, 1986b).
- Lichomolgus hippopi* Humes, 1976: *Hippopus hippopus* (by Humes, 1976a).

- Lichomolgus tridacnae* Humes, 1972: *Hippopus hippopus* (by Humes, 1976a).
- Parastericola rimosus* n. gen. n. sp.: *Choriaster granulatus* (in the present paper).
- Stellicola astrivagus* Humes, 1986: *Choriaster granulatus* (by Humes, 1986b).
- Stellicola caeruleus* (Stebbing, 1900): *Linckia guildingi*, *L. laevigata*, and *L. multiflora* (by Humes, 1976b).
- Stellicola flexilis* Humes, 1976: *Linckia guildingi*, *L. laevigata*, and *L. multiflora* (by Humes, 1976b).
- Stellicola illgi* Humes & Stock, 1973: *Linckia laevigata* (by Humes, 1976b).
- Stellicola novaecaledoniae* Humes, 1976: *Linckia guildingi* and *L. multiflora* (by Humes, 1976b).
- Stellicola oreastriphilus* Kossmann, 1877: *Choriaster granulatus* and *Culcita novaeguineae* (by Humes, 1986b).
- Stellicola parvulipes* Humes, 1976: *Culcita novaeguineae* (by Humes, 1986b).
- Stellicola pollex* Humes & Ho, 1967: *Linckia guildingi*, *L. laevigata*, and *L. multiflora* (by Humes, 1976b; 1986b).
- Synstellicola acanthasteris* (Humes, 1970): *Acanthaster polanci* (by Humes, 1986b).
- Synstellicola kossmanni* (Humes & Ho, 1967): *Choriaster granulatus*, *Protoreaster nodosus*, and *P. nodulosus* (by Humes, 1986b).
- Synstellicola pichoni* (Humes & Ho, 1967): *Choriaster granulatus* and *Protoreaster nodosus* (by Humes, 1986b).

#### Family Macrochironidae

- Macrochiron angulare* Humes, 1977: *Aglaophenia cupressina* (by Humes, 1977b).
- Macrochiron cheliferum* (Thompson & A. Scott, 1903): *Aglaophenia cupressina* (by Humes, 1977b).
- Macrochiron lobatum* Humes & De Maria, 1969: *Lyto-carpus balei* (by Humes, 1977b).
- Macrochiron valgum* Humes, 1966: *Aglaophenia cupressina* (by Humes, 1977b).
- Macrochiron vervoorti* Humes & De Maria, 1969: *Aglaophenia cupressina* (by Humes, 1977b).

#### Family Pseudanthessiidae

- Mecomerinx heterocentroti* Humes, 1977: *Heterocentrotus mamillatus* (by Humes, 1977a).
- Mecomerinx sewellana* Humes, 1977: *Tripneustes gratilla* (by Humes, 1977a).
- Pseudanthessius comanthi* Humes, 1972: *Comanthus bennetti* and *C. samoanus* (by Humes, 1987).
- Pseudanthessius truncus* n. sp.: *Himerometra robustipinna* (in the present paper).
- Pseudanthessius planus* n. sp.: *Himerometra robustipinna* (in the present paper).

Family Rhynchomolgidae

- Acanthomolgus ambonensis* n. sp.: *Nephthea galbuloides* (in the present paper).
- Acanthomolgus astrictus* Humes & Stock, 1973: *Acalyngorgia* sp. and *Muricella* sp. (by Humes, 1993a).
- Acanthomolgus bandaensis* n. sp.: an *alcyonacean* sp. (in the present paper).
- Acanthomolgus brevifurca* Humes, 1990: *Siphonogorgia variabilis* (by Humes, 1990a).
- Acanthomolgus combinatus* Humes, 1974: *Echinogorgia* sp. (by Humes, 1993a).
- Acanthomolgus exilipes* (Humes & Ho, 1968): *Dendronephthya mucronata* (by Humes, 1990a); *Dendronephthya grandiflora* (in the present paper).
- Acanthomolgus dispadactylus* n. sp.: *Dendranephtya grandiflora* (in the present paper).
- Acanthomolgus gomumuensis* n. sp.: *Dendranephtya grandiflora* (in the present paper).
- Acanthomolgus variostratus* (Humes & Ho, 1968): *Dendronephthya mucronata* (by Humes, 1990a).
- Alcyonomolgus incisus* (Humes & Ho, 1968): *Sarcophyton ehrenbergi* (by Humes, 1990a).
- Alcyonomolgus relativus* (Humes, 1982): *Sarcophyton relativus* (by Humes, 1982).
- Anisomolgus limbatus* Humes & Dojiri, 1979: *Lobophytum crassum* (by Humes & Dojiri, 1979a).
- Acanthomolgus longispinifer* (Humes and Ho, 1968): *Dendranephtya* sp. (in the present paper).
- Anisomolgus relativus* Humes, 1982: *Sarcophyton ehrenbergi* (by Humes, 1982).
- Anisomolgus protentus* (Humes & Frost, 1964): *Sarcophyton glaucum* (by Humes, 1982).
- Anisomolgus pterolobatus* Humes, 1982: *Sarcophyton glaucum* (by Humes, 1982).
- Anisomolgus sarcophyticus* Humes, 1982: *Sarcophyton glaucum* (by Humes, 1982).
- Colobomolgus bandensis* Humes, 1990: *Sinularia polydactyla* (by Humes, 1990a).
- Critomolgus foxi* (Gurney, 1927): *Cladiella polyclados* (by Humes, 1990a).
- Doridicola aculeatus* (Humes & Ho, 1968): *Litophyton acutifolium* and *L. stuhlmanni* (by Humes & Dojiri, 1979b); *Nephthea albida*, *N. chabrolii*, *N. cupressiformis*, *N. galbuloides*, and *N. sphaerophora* (by Humes, 1980a).
- Doridicola lumarius* (Humes, 1980): *Nephthea galbuloides* and *N. cupressiformis* (by Humes, 1980a).
- Doridicola capnellae* (Humes, 1990): *Capnella imbricata* (by Humes, 1990a).
- Doridicola connexus* Humes, 1986: *Astroboa nuda* (by Humes, 1986c).
- Doridicola echinasteris* (Humes, 1976): *Echinaster luzonicus* (by Humes, 1986b).
- Doridicola patulus* (Humes, 1959): *Phyllidia verrucosa* (in the present paper).
- Doridicola petalopus* Humes, 1990: ?*Xenia* sp. (by Humes, 1990a).
- Doridicola praelongipes* (Humes, 1975): *Xenia viridis* (by Humes, 1990a).
- Doridicola rostripes* Humes, 1990: ?*Xenia* sp. (by Humes, 1990a).
- Doridicola spinulifer* (Humes & Frost, 1964): *Paralemnalia thyrsoides* (by Humes, 1990a).
- Doridicola vulcanius* Humes, 1990: *Paralemnalia thyrsoides* (by Humes, 1990a).
- Kombia avitus* n. sp.: *Porites* sp. (in the present paper).
- Kombia imminens* Humes, 1979: *Porites monticulosa* (by Humes, 1979c).
- Mecra ellipsaria* Humes, 1980: *Nephthea sphaerophora* (by Humes, 1980a).
- Moluccomolgus lordus* Humes, 1992: *Gardineroseris planulata* (by Humes, 1992a).
- Monomolgus baculigerus* Humes, 1979: *Porites nigrescens* (by Humes, 1979c).
- Monomolgus unihastatus* Humes, 1979: *Porites nigrescens* (by Humes, 1979c).
- Paradoridicola angularis* Humes, 1990: *Alcyonium molle* (by Humes, 1990a).
- Paradoridicola contiguus* Humes, 1990: *Sinularia flexibilis* (by Humes, 1990a).
- Paradoridicola drepanophorus* Humes, 1990: *Alcyonium molle* (by Humes, 1990a).
- Paradoridicola sinularianus* Humes, 1990: *Sinularia nanolobata* (by Humes, 1990a).
- Paradoridicola spinulatus* Humes, 1982: *Sarcophyton glaucum* (by Humes, 1982).
- Paradoridicola squamiger* (Humes & Frost, 1964): *Sinularia ceramensis* (by Humes, 1990a).
- Paradoridicola virgulifer* Humes, 1990: *Sinularia polydactyla* (by Humes, 1990a).
- Paramolgus accinctus* Humes, 1980: *Litophyton stuhlmanni* (by Humes & Dojiri, 1979b); *Nephthea albida*, *N. cupressiformis*, *N. galbuloides*, and *N. sphaerophora* (by Humes, 1980a).
- Paramolgus centor* Humes, 1990: *Paralemnalia thyrsoides* (by Humes, 1990a).
- Paramolgus dapsilis* Humes, 1993: *Suberogorgia reticulata* (by Humes, 1993a).
- Paramolgus eparmatoides* Humes, 1992: *Gardineroseris planulata* (by Humes, 1992a).
- Paramolgus extendens* Humes & Dojiri, 1979: *Cespitularia*

*multipinnata* (by Humes & Dojiri, 1979c).  
*Paramolgus gibberulus* Humes, 1992: *Gardineroseris planulata* (by Humes, 1992a).  
*Paramolgus insectus* (Humes, 1969): *Antipathes abies* (by Humes, 1979d).  
*Paramolgus inconstans* Humes & Dojiri, 1979: *Lobophytum crassum* (by Humes & Dojiri, 1979a).  
*Paramolgus litophyticus* Humes & Dojiri, 1979: *Litophyton acutifolium* (by Humes & Dojiri, 1979b).  
*Paramolgus nephtheanus* Humes, 1980: *Nephthea chabrolii*, *N. sphaerophora*, *N. cupressiformis*, *N. albida*, and *N. galbuloides* (by Humes, 1980a).  
*Paramolgus pollicaris* Humes & Dojiri, 1979: *Cespitularia multipinnata* (by Humes & Dojiri, 1979c).  
*Paramolgus prominulus* Humes, 1980: *Litophyton acutifolium* and *L. stuhlmanni* (by Humes & Dojiri, 1979b); *Nephtea albida*, *N. cupressiformis*, and *N. sphaerophora* (by Humes, 1980a).  
*Paramolgus quadrangulus* Humes, 1990: *Sinularia dura* (by Humes, 1990a).  
*Paramolgus resectus* Humes & Dojiri, 1979: *Litophyton stuhlmanni* (by Humes & Dojiri, 1979b).  
*Paramolgus setellus* Humes, 1992: *Gardineroseris planulata* (by Humes, 1992a).  
*Paramolgus squamiger* (Humes & Frost, 1964): *Sinularia ceramensis* (by Humes, 1990a).  
*Paramolgus subincisus* Humes, 1990: ?*Xenia* sp. (by Humes, 1990a).  
*Paramolgus timendus* Humes, 1990: *Alcyonium molle* (by Humes, 1990a).  
*Perosyna indonesica* Humes, 1982: *Sarcophyton glaucum* (by Humes, 1982).  
*Pionomolgus moluccensis* n. sp.: *Echinopora lamellosa* (in the present paper).  
*Telestacicola sertus* Humes, 1977: *Aglaophenia cupressina* (by Humes, 1977b).  
*Wedanus inconstans* Humes, 1978: *Goniopora tenuidens* (by Humes, 1978b).  
*Zamolgus cracens* Humes & Dojiri, 1979: *Cespitularia multipinnata* (by Humes & Dojiri, 1979c).

#### Family Synapticolidae

*Chauliolobion imparile* Humes, 1980: *Bohadschia argus* (by Humes, 1980b).  
*Chauliolobion forcipatum* Humes, 1980: *Stichopus chloronotus* (by Humes, 1980b).  
*Chauliolobion tectuliferum* Humes, 1980: *Thelenota ananas* (by Humes, 1980b).  
*Scambicornus batiolatus* Humes, 1980: *Holothuria atra* and *Thelenota aranas* (by Humes, 1980b).  
*Scambicornus disparilis* Humes, 1980: *Holothuria atra* (by

Humes, 1980b).  
*Scambicornus idoneus* (Humes & Cressey, 1961): *Bohadschia argus* and *Holothuria atra* (by Humes, 1980b).  
*Scambicornus lobulatus* Humes, 1967: *Actinopyga echinites* and *Bohadschia argus* (by Humes, 1980b).  
*Scambicornus poculiferus* (Humes & Cressey, 1961): *Synapta maculata* (by Humes, 1980b).  
*Scambicornus sentifer* Humes, 1980: *Labidodemas semperianum* (by Humes, 1980b).  
*Scambicornus subtilis* (Humes & Cressey, 1961): *Holothuria atra* (by Humes, 1980b).  
*Scambicornus tuberatus* (Humes & Cressey, 1961): *Bohadschia argus* (by Humes, 1980b).  
*Scambicornus tylotus* Humes, 1975: *Bohadschia argus* (by Humes, 1980b).

#### Family Taeniacanthidae

*Clavisodalis sentifer* Dojiri & Humes, 1982: *Diadema setosum* (by Dojiri & Humes, 1982).  
*Echinocius pectinatus* Humes & Cressey, 1961: *Diadema setosum* (by Dojiri & Humes, 1982).

#### Family Xarifiidae

*Lipochrus* sp. Humes & Dojiri, 1982: *Acropora rambleri* (by Humes & Dojiri, 1982).  
*Xarifia albusa* Humes & Dojiri, 1982: *Acropora rambleri* (by Humes, & Dojiri, 1982).  
*Xarifia anomala* Humes & Ho, 1968: *Acropora hyacinthus*, *A. intermedia*, and *A. palifera* (by Humes & Dojiri, 1982).  
*Xarifia anopla* Humes & Dojiri, 1982: *Montipora* cf. *undata* (by Humes & Dojiri, 1982).  
*Xarifia breviramea* Humes, & Dojiri, 1982: *Acropora rambleri* and *A. intermedia* (by Humes & Dojiri, 1982).  
*Xarifia comata* Humes, 1962: *Pocillopora eydouxi* (by Humes, 1985b).  
*Xarifia comptula* Humes & Dojiri, 1983: *Hydnophora exesa* (by Humes & Dojiri, 1983).  
*Xarifia curtata* Humes & Dojiri, 1983: *Hydnophora exesa* (by Humes & Dojiri, 1983).  
*Xarifia echinopora* Humes & Dojiri, 1982: *Echinopora lamellosa* (by Humes & Dojiri, 1982).  
*Xarifia exserens* Humes, 1985: *Galaxea fascicularis* (by Humes, 1985b).  
*Xarifia exuta* Humes & Dojiri, 1982: *Acropora palifera* (by Humes & Dojiri, 1982).  
*Xarifia fimbriata* Humes, 1960: *Pocillopora damicornis* and *P. eydouxi* (by Humes, 1985b).  
*Xarifia fissilis* Humes, 1985: *Pocillopora damicornis* (by Humes, 1985b).  
*Xarifia gracilipes* Humes & Dojiri, 1983: *Euphyllia glabre-*

*scens* (by Humes & Dojiri, 1983).  
*Xarifia hadra* Humes & Dojiri, 1983: *Goniopora pedunculata* and *G. tenuidens* (by Humes & Dojiri, 1983).  
*Xarifia heteromeles* Humes & Dojiri, 1982: *Montipora cf. undata* (by Humes & Dojiri, 1982).  
*Xarifia jugalis* Humes, 1985: *Pocillopora damicornis* and *P. eydouxi* (by Humes, 1985b).  
*Xarifia lacerans* Humes, 1985: *Turbinaria danae* (by Humes, 1985b).  
*Xarifia levis* Humes, 1985: *Seriatopora hystrix* (by Humes, 1985b).  
*Xarifia maldivensis* Humes, 1960: *Pocillopora eydouxi* (by Humes, 1985b).  
*Xarifia mediolobata* Humes & Dojiri, 1982: *Alveopora mortensini* (by Humes & Dojiri, 1982).  
*Xarifia mucronata* Humes & Dojiri, 1982: *Acropora palifera* (by Humes & Dojiri, 1982).  
*Xarifia obesa* Humes & Ho, 1968: *Pocillopora damicornis*, *P. eydouxi*, and *Stylophora pistillata* (by Humes, 1985b).  
*Xarifia pectinea* Humes & Dojiri, 1982: *Acropora rambleri*, *A. hyacinthus*, and *A. intermedia* (by Humes & Dojiri, 1982).  
*Xarifia radians* Humes & Dojiri, 1982: *Alveopora mortenseni* (by Humes & Dojiri, 1982).  
*Xarifia rex* Humes & Dojiri, 1983: *Goniopora tenuidens* (by Humes & Dojiri, 1983).  
*Xarifia scutipes* Humes & Dojiri, 1983: *Goniopora pedunculata* and *G. tenuidens* (by Humes & Dojiri, 1983).  
*Xarifia sabiuraensis* Misaki, 1978: *Acropora rambleri*, *A. hyacinthus*, and *A. intermedia* (by Humes & Dojiri, 1982).  
*Xarifia syntoma* Humes & Dojiri, 1982: *Montipora cf. undata* (by Humes & Dojiri, 1982).  
*Xarifia temnura* Humes & Ho, 1968: *Montipora cf. undata* (by Humes & Dojiri, 1982).  
*Xarifia torigera* Humes, 1985: *Favites flexuosa* (by Humes, 1985b).  
*Xarifia trituberata* Humes & Dojiri, 1982: *Acropora rambleri*, *A. hyacinthus*, and *A. intermedia* (by Humes & Dojiri, 1982).  
*Xarifia tumorisa* Misaki, 1978: *Acropora intermedia* (by Humes & Dojiri, 1982).  
*Xarifia uncinata* Humes, 1985: *Turbinaria danae* (by Humes, 1985b).  
*Xarifia varilabrata* Humes, 1985: *Seriatopora hystrix* (by Humes, 1985b).  
*Xarifia* sp.: *Fungia echinata* (by Humes & Dojiri, 1983; Humes, 1985b); *Parahalomitra robusta*, *Platygyra siensis*, and *Tubastrea* sp. (by Humes, 1985b).

Family uncertain

*Parangium abstrusum* Humes, 1985: *Goniastrea retiformis* (by Humes, 1985a).

Order Siphonostomatoida

Family Artotrogidae

*Cryptopontius acutus* n. sp.: *Hydnophora eyessa* (in the present paper).

Family Asterocheridae

*Asterocheres dysideae* Humes, 1996: *Dysidea* sp. (by Humes, 1996b).

*Asterocheres brevisurculus* Kim, 2005: *Phyllospongia foliascens* (by Kim, 2005b).

*Asteropontius bandicola* Humes, 1992: *Antipathes abies* (by Humes, 1992b).

*Asteropontius fungicola* n. sp.: *Fungia* sp. (in the present paper).

*Asteropontius goniopora* n. sp.: *Goniopora tenuidens* (in the present paper).

*Cholomyzon brevisetigerum* Humes, 1997: *Tubastraea micracantha* (by Humes, 1997a).

*Collocheres comanthiphilus* Humes, 1987: *Comanthus bennetti* and *C. samoanus* (by Humes, 1987).

*Collocheres amicus* n. sp.: *Comantheria briareus* (in the present paper).

*Collocheres humesi* n. sp.: *Comantheria briareus* (in the present paper).

*Collocheres inflatiseta* Humes, 1987: *Comaster multibrachiatum* (by Humes, 1987).

*Collocheres parvus* Humes, 1987: *Comaster multibrachiatum* (by Humes, 1987).

*Collocheres prionotus* Humes, 1990: *Capillaster multiradiatus* (by Humes, 1990b).

*Collocheres serrulatus* Humes, 1987: *Comantheria rotula* (by Humes, 1987).

*Collocherides singularis* Humes, 1986: *Astroboa nuda* (by Humes, 1986c).

*Collocheres titillator* Humes, 1987: *Comaster gracilis* (by Humes, 1987).

*Collocheres uncinatus* Stock, 1966: *Capillaster multiradiatus* (by Humes, 1990b).

*Coralliomyzon latitergum* Humes, 1997: *Tubastraea micracantha* (by Humes, 1997a).

*Glyptocheres comanthinae* Humes, 1987: *Comanthina schlegeli* (by Humes, 1987).

*Glyptocheres extrusus* Humes, 1987: *Comanthus bennetti* and *C. samoanus* (by Humes, 1987).

*Gomumucheres angularis* Humes, 1996: *Dysidea* sp. (by Humes, 1996b).

*Hetairosyna galaxeae* Humes, 1996: *Galaxea fascicularis*



- (by Humes, 1996a).  
*Hetairosyna sororia* Humes, 1991: *Montipora* cf. *undata* (by Humes, 1991a).  
*Hetairosyna terpna* Humes, 1991: *Montipora compressa* and *M. prolifera* (by Humes, 1991a).  
*Hetairosyna wedensis* Humes, 1996: *Galaxea fascicularis* (by Humes, 1996a).  
*Orecturus excavatus* (Humes, 1989): *Dendronephthya koellikeri* and *Dendronephthya* sp. (by Humes, 1989).  
*Orecturus finitimus* Humes, 1993: *Acanthogorgia* sp. (by Humes, 1993a).  
*Orecturus forticulus* Humes, 1993: *Melitodes ochracea* (by Humes, 1993a).  
*Orecturus grandisetiger* Humes, 1992: *Antipathes reticulata* (by Humes, 1992b); *Acanthogorgia* sp. (by Humes, 1993a).  
*Parasterocheres cristatus* Humes, 1996: *Dysidea* sp. (by Humes, 1996b).  
*Phyllocheres petalus* Humes, 1996: *Dysidea* sp. (by Humes, 1996b).  
*Temanus halmaherensis* Humes, 1997: *Parahalomitra robusta* (by Humes, 1997b).

#### Family Nanaspididae

- Nanaspis manca* Humes, 1973: *Thelenota ananas* (by Humes, 1980b).  
*Nanaspis moluccana* Humes, 1980: *Stichopus chloronotus* (by Humes, 1980b).  
*Nanaspis spinifera* Humes, 1973: *Thelenota ananas* (by Humes, 1980b).

#### Family Stellicometidae

- Astroxyneus choriasteris* Humes, 1986: *Choriaster granulatus* (by Humes, 1986b).  
*Astroxyneus culcitae* Humes, 1971: *Culcita novaeguineae* and *Linckia laevigata* (by Humes, 1986b).  
*Chorioxyneus moluccensis* Humes, 1986: *Choriaster granulatus* (by Humes, 1986b).  
*Molucomes ovatus* n. gen. n. sp.: *Acanthaster planci* (in the present paper).  
*Stellicomes bisphaerulifer* Humes, 1986: *Acanthaster polanci* (by Humes, 1986b).  
*Stellicomes tumidulus* Humes & Cressey, 1958: *Choriaster granulatus* (by Humes, 1986b).

#### Family Vahiniidae

- Vahinius verbericolus* Humes, 1979: *Cirripathes anguina* (by Humes, 1979d).

#### Order Harpacticoida

##### Family Peltidiidae

- Alteuthellopsis corallina* Humes, 1981: *Goniastrea retiformis* (by Humes, 1981b).  
*Paraidya minor* Sewell, 1940: *Dardanus guttatus*, *D. lagopodes*, and *D. megistos* (by Humes, 1981a).  
*Paraidya major* Sewell, 1940: *Dardanus guttatus*, *D. lagopodes*, and *D. megistos* (by Humes, 1981a).  
*Porcellidium brevicaudatum* Thompson & Scott, 1903: *Calcinus minutus*, *Dardanus guttatus*, *D. lagopodes*, *D. megistos*, and *Trizopagurus trigatus* (by Humes, 1981a).  
*Sunaristes tranteri* Harmond, 1973: *Calcinus gaimardi*, *C. latene*, *C. minutus*, *Calcinus* sp., *Dardanus guttatus*, *D. lagopodes*, and *Trizopagurus trigatus* (by Humes, 1981a).

#### Family Tegastidae

- Tegastes cnidicus* Humes, 1981: *Aglaophenia cupressina* (by Humes, 1981b).  
*Parategastes conexus* Humes, 1984: *Stereonephthya ulicoides* (by Humes, 1984).

### Invertebrates and their associated copepods from the Moluccas

#### Porifera

- Dysidea* sp.: *Asterocheres dysideae*, *Parasterocheres cristatus*, *Phyllocheres petalus*, and *Gomumucheres angularis*.  
*Phyllospongia foliascens* (Pallas): *Spongicola tropicanus* and *Asterocheres brevisurculus*.

#### Hydrozoa

- Aglaophenia cupressina* Lamouroux: *Macrochiron angulare*, *M. cheliferrum*, *M. valgum*, *M. vervoorti*, *Telestacicola sertus*, and *Tegastes cnidicus*.  
*Lytocarpus balei* Nutting: *Macrochiron lobatum*.

#### Alcyonacea

- Alcyonacean* sp.: *Acanthomolgus bandaensis*.  
*Acanthogorgia* sp.: *Orecturus finitimus* and *Orecturus grandisetiger*.  
*Acalycigorgia* sp.: *Acanthomolgus astrictus*.  
*Alcyonium molle* Thomsen & Dean; *Paradoridicola angularis*, *P. drepanophorus*, and *Paramolgus timendus*.  
*Caligorgia* sp.: *Lamippe* sp.  
*Capnella imbricata* Quoy & Gaimard: *Doridicola capnellae*.  
*Cespitularia multipinnata* (Quoy & Gaimard): *Paramolgus extendens*, *P. pollicaris*, and *Zamolgus cracens*.  
*Cladiella pachyclados* (Klunzinger): *Critomolgus foxi*.  
*Dendronephthya grandiflora* (Henderson): *Acanthomolgus*

*exilipes*, *A. gomumuensis*, and *A. dispadactylus*.  
*Dendronephthya koellikeri* (Kukenthal): *Orecturus excavatus*.  
*Dendronephthya mucronata* (Putter): *Acanthomolgus exilipes* and *A. variostratus*.  
*Dendronephthya* sp.: *Orecturus excavatus* and *Acanthomolgus longispinifer*.  
*Echinogorgia* sp.: *Acanthomolgus combinatus*.  
*Litophyton acutifolium* Kukenthal: *Paramolgus litophyticus*, *P. prominulus*, and *Metaxymolgus aculeatus*.  
*Lobophytum crassum* von Marenzeller: *Anisomolgus insolens*, *A. limbatus*, *Panjakus auriculatus*, and *Paramolgus inconstans*.  
*Litophyton stuhlmanni* (May): *Paramolgus resectus*, *P. accinctus*, *P. prominulus*, and *Metaxymolgus aculeatus*.  
*Melitodes ochracea* (L.): *Orecturus forticulus*.  
*Muricella* sp.: *Acanthomolgus astrictus* and *Enalcyonium circulum*.  
*Nephthea albida* (Holm): *Metaxymolgus aculeatus*, *Paramolgus nephtheanus*, *P. prominulus*, and *P. accinctus*.  
*Nephthea chabrolii* Audouin: *Metaxymolgus aculeatus* and *Paramolgus nephtheanus*.  
*Nephthea cupressiformis* Kukenthal: *Metaxymolgus aculeatus*, *M. lumarius*, *Paramolgus nephtheanus*, *P. prominulus*, and *P. accinctus*.  
*Nephthea galbuloides* Verseveldt: *Acanthomolgus ambonensis*, *Metaxymolgus aculeatus*, *M. lumarius*, *Paramolgus nephtheanus*, *P. accinctus*, and *Mecra ellipsaria*.  
*Nephthea spaherophora* Kutenthal: *Mecra ellipsaria*, *Metaxymolgus aculeatus*, *Paramolgus accinctus*, *P. nephtheanus*, and *P. prominulus*.  
*Paralemnalia thyrsoides* (Ehrenberg): *Doridicola spinulifer*, *Doridicola vulcanius*, and *Paramolgus centor*.  
*Rumphella aggregata* (Nothing): *Enalcyonium ceramensis*.  
*Sarcophyton ehrenbergi* Marenzeller: *Anisomolgus indisus* and *A. relativus*.  
*Sarcophyton elegans* Moser: *Alcyonomolgus protentus*, *A. pterolobatus*, *A. sarcophyticus*, *Paradoridicola spinulatus*, and *Perosyna indonesica*.  
*Sarcophyton glaucum* (Quoy & Gaimard): *Alcyonomolgus pterolobatus*, *A. protentus*, *A. sarcophyticus*, *Paradoridicola spinulatus*, and *Perosyna indonesica*.  
*Sinularia ceramensis* Verseveldt: *Paradoridicola squamiger*.  
*Sinularia dura* (Pratt): *Paramolgus quadrangulus*.  
*Sinularia flexibilis* (Quoy & Gaimard): *Paradoridicola contiguus*.  
*Sinularia nanolobata* Verseveldt: *Paradoridicola sinularianus*.  
*Sinularia polydactyla* (Ehrenberg): *Colobomolgus bandensis* and *Paradoridicola virgulifer*.

*Siphonogorgia variabilis* (Hickson): *Acanthomolgus brevifurca*.  
*Stereonephthya ulicoides* Thomson & Dean: *Parategastes conexus*.  
*Suberogorgia reticulata* (Ellis & Solander): *Paramolgus dapsilis*.  
*Tubastraea micracantha* (Ehrenberg): *Cholomyzon brevisetigerum* and *Coralliomyzon latitergum*.  
?Xenia sp.: *Doridicola petalopus*, *D. rostripes*, and *Paramolgus subincisus*.  
*Xenia viridis* Schenk: *Doridicola praelongipes*.

#### Scleractinia

*Acropora corymbosa* (Lamarck): *Scyphuliger eumorphus*.  
*Acropora hyacinthus* (Dana): *Xarifia anomala*, *X. pectinea*, *X. sabiuraensis*, *X. trituberata*, *Scyphuliger eumorphus*, and *Ecphysarion lobophorum*.  
*Acropora intermedia* (Brook): *Scyphuliger karangmiensis*, *Xarifia anomala*, *X. breviramea*, *X. pectinea*, *X. sabiuraensis*, *X. trituberata*, and *X. tumorisa*.  
*Acropora palifera* (Lamarck): *Xarifia anomala*, *X. exuta*, *X. mucronata*, and *Ecphysarion spinulatum*.  
*Acropora rambleri* (Bassett-Smith): *Lipochrus* sp., *Xarifia albusa*, *X. breviramea*, *X. pectinea*, *X. sabiuraensis*, *X. trituberata*, *Scyphuliger eumorphus*, and *Ecphysarion lobophorum*.  
*Alveopora mortenseni* Crossland: *Exodontomolgus communis*, *Paranchimolgus parallelus*, *Xarifia mediolobata*, and *X. radians*.  
*Antipathes abies* (L.): *Paramolgus insectus* and *Asteropontius bandicola*.  
*Antipathes reticulata* Esper: *Orecturus grandisetiger*.  
*Cirripathes anguina* Dana: *Vahinius verbericolus*.  
*Echinopora lamellosa* (Esper): *Jamescookina moluccensis*, *Pionomolgus moluccensis*, and *Xarifia echinopora*.  
*Euphyllia glabrescens* (Chamisso & Eysenhardt): *Xarifia gracilipes*.  
*Favites flexuosa* (Dana): *Xarifia torigera*.  
*Favites pentagona* (Esper): *Cerioxynus moluccensis* and *Rakotoa ceramensis*.  
*Favites virens* (Dana): *Cerioxynus bandensis*.  
*Fungia actiniformis* (Quoy & Gaimard): *Anchimolgus notatus*, *A. pandus*, and *Odontomolgus decens*.  
*Fungia echinata* (Pallas): *Anchimolgus latens*, *A. pandus*, *A. tener*, *Mycoxynus fungianus*, and *Xarifia* sp.  
*Fungia fungites* (L.): *Anchimolgus latens* and *A. punctilis*.  
*Fungia paumotuensis* Stutchbury: *Anchimolgus latens*, *A. notatus*, *A. orectus*, *A. pandus*, *A. punctilis*, and *Paramarda aculeata*.  
*Fungia* sp.: *Anchimolgus hastatus*, *A. orectus*, *Odontomolgus flammeus*, and *Asteropontius fungicola*.

*Galaxea fascicularis* (L.): *Clamocus spinifer*, *Karanges galaxeanus*, *K. hypsorophus*, *Anchimoligus nasutus*, *A. compressus*, *A. moluccanus*, *A. contractus*, *Hetairosyna galaxeae*, *H. wedensis*, and *Xarifia exserens*.

*Gardineroseris planulata* (Dana): *Anchimoligus angustus*, *Odontomoligus mucosus*, *O. unioviger*, *Sociellus geminus*, *Paramoligus eparmatoides*, *P. gibberulus*, *P. setellus*, *Euxynus capulus*, and *Moluccomoligus lordus*.

*Goniastrea retiformis* (Lamarck): *Aleuthellopsis corallina*, *Amarda goniastreae*, *A. curvus*, *Odontomoligus parvus*, and *Parangium abstrusum*.

*Goniopora pedunculata* (Quey & Gaimard): *Anchimoligus mimeticus*, *Xarifia hadra*, and *X. scutipes*.

*Goniopora* sp.: *Anchimoligus conformatus* and *A. mimeticus*.

*Goniopora stokesi* Milne Edwards & Haime: *Anchimoligus gigas*, *A. brevius*, *Wedanus inconstans*, *Xarifia hadra*, *X. scutipes*, and *X. resex*.

*Goniopora tenuidens* (Quelch): *Anchimoligus digitatus* and *Asteropontius goniopora*.

*Goniopora* cf. *tenuidens* (Quelch): *Anchimoligus mimeticus*.

*Halonitra philippinensis* Studer: *Odontomoligus fultus* and *Paramarda aculeata*.

*Herpolitha limax* (Esper): *Anchimoligus latens* and *Mycoxynus villosus*.

*Hydnophora exesa* (Pallas): *Panjakus hydnophorae*, *Xarifia comptula*, and *X. curtata*.

*Hydnophora eyessa* (Pallas): *Cryptopontius acutus*.

*Hydnophora microconos* (Lamarck): *Anchimoligus parangensis*, *Panjakus iratus*, and *P. saccipes*.

*Montipora compressa* (Esper): *Odontomoligus forhani*, *Haplomoligus montiporae*, *Euryte bellatula*, and *Hetairosyna terpna*.

*Montipora prolifera* Brueggemann: *Odontomoligus forhani*, *Euryte bellatula*, and *Hetairosyna terpna*.

*Montipora* cf. *undata* Bernard: *Allopodion mirum*, *Kawanolus parangensis*, *Haplomoligus subdeficiens*, *Odontomoligus forhani*, *Xarifia anopla*, *X. heteromeles*, *X. syntoma*, *X. temnura*, and *Hetairosyna sororia*.

*Oulophyllia crispa* (Lamarck): *Cerioxynus oulophyllia*.

*Parahalomitra robusta* (Quelch): *Anchimoligus tener*, *A. convexus*, *Temanus halmaherensis*, and *Xarifia* sp.

*Pavona danai* (Milne Edwards & Haime): *Anchimoligus gracillipes* and *Odontomoligus pavonus*.

*Platygyra ryukyuensis* (Yabe & Sugiyama): *Andrianellus papillipes*, *Panjakys fastigatus*, and *P. parvipes*.

*Platygyra sinensis* (Milne Edwards & Haime): *Xarifia* sp.

*Polyphyllia talpina* (Lamarck): *Anchimoligus pandus*.

*Porites monticulosa* (Dana): *Kombia imminens*.

*Porites nigrescens* Dana: *Monomoligus baculigerus*.

*Porites* sp.: *Anchimoligus proxilipes* and *Kombia avitus*.

*Pocillopora damicornis* (L.): *Anchimoligus partenuipes*,

*Xarifia fissilis*, *X. jugalis*, *X. fimbriata*, and *X. obesa*.

*Pocillopora eydouxi* Milne Edwards & Haime: *Xarifia jugalis*, *X. fimbriata*, *X. maldivensis*, *X. comata*, and *X. obesa*.

*Seriatopora hystrix* Dana: *Xarifia levis* and *X. varilabrata*.

*Stylophora pistillata* (Esper): *Xarifia obesa*.

*Tubastrea* sp.: *Xarifia* sp.

*Turbinaria danae* Bernard: *Xarifia lacerans* and *X. uncinata*.

#### Pelecypoda

*Hippopus hippopus* (L.): *Anthessius discipedatus*, *Lichomoligus tridacnae*, and *L. hippopi*.

*Tridacna squamosa* Lamarck: *Anthessius alatus*.

#### Anomura (hermit crabs)

*Calcinus gaimardi* (H. Milne Edwards): *Sunaristes tranteri*.

*Calcinus latene* (Randall): *Porcellidium brevicaudatum* and *Sunaristes tranteri*.

*Calcinus minutus* Buitendijk: *Sunaristes tranteri* and *Porcellidium brevicaudatum*.

*Calcinus* sp.: *Sunaristes tranteri*.

*Dardanus guttatus* (Olivier): *Sunaristes tranteri*, *Porcellidium brevicaudatum*, *Paraidya minor*, and *P. major*.

*Dardanus lagopodes* (Forsk.) : *Sunaristes tranteri*, *Porcellidium brevicaudatum*, *Paraidya minor*, and *P. major*.

*Dardanus megistos* (Herbst): *Porcellidium brevicaudatum*, *Paraidya minor*, and *P. major*.

*Trizopagurus trigatus* (Herbst): *Sunaristes tranteri* and *Porcellidium brevicaudatum*.

#### Crinoidea

*Capillaster multiradiata* (L.): *Collocheres prionotus* and *C. uncinatus*.

*Comantheria briareus* (Bell): *Collocheres amicus* and *C. humesi*.

*Comantheria rotula* A.H. Clark: *Collocheres serrulatus*.

*Comanthina schlegeli* (P.H. Carpenter): *Glyptocheres comanthinae*.

*Comanthus bennetti* (J. Muller): *Collocheres comanthophilus*, *Glyptocheres extrusus*, and *Pseudanthessius comanthi*.

*Comanthus samoanus* A.H. Clark: *Collocheres comanthophilus*, *Glyptocheres extrusus*, and *Pseudanthessius comanthi*.

*Comaster gracilis* (Hartlaub): *Collocheres titillator*.

*Comaster multibrachiatus* (P.H. Carpenter): *Collocheres inflatseta* and *Collocheres parvus*.

*Himenometra robustipinna* (Carpenter): *Pseudanthessius planus* and *P. tropicanus*.

Asteroidea

- Acanthaster planci* (L.): *Molucomes ovatus*, *Stellicomes bisphaerulifer*, and *Synstellicola acanthasteris*.  
*Archaster typicus* Muller & Troschel: *Astericola carens*.  
*Choriaster granulatus* Lutken: *Parastericolla rimosus*, *Astroxyneus choriasteris*, *Chorioxyneus moluccensis*, *Stellicomes tumidulus*, *Synstellicola kossmanni*, *S. pichoni*, and *Stellicola astrivagus*, and *S. oreastriphilus*.  
*Culcita novaeguineae* Muller & Troschel: *Astroxyneus culcitae*, *Stellicola oreastriphilus*, and *S. parvulipes*.  
*Echinaster luzonicus* (Gray): *Doridicola echinasteris*.  
*Linckia guildingi* Gray: *Stellicola caeruleus*, *S. flexilis*, *S. novaecaledoniae*, and *S. pollex*.  
*Linckia laevigata* (L.): *Stellicola caeruleus*, *S. flexis*, *S. illgi*, *S. pollex*, and *Astroxyneus culcitae*.  
*Linckia multiflora* (Lamarck): *Stellicola caeruleus*, *S. flexis*, *S. novaecaledoniae*, and *S. pollex*.  
*Protoreaster nodosus* (L.): *Synstellicola kossmanni* and *S. pichoni*.  
*Protoreaster nodulosus* (Perrier): *Synstellicola kossmanni*.

Ophiuroidea

- Astroboa nuda* (Lyman): *Doridicola connexus* and *Collocherides singularis*.

Echinoidea

- Diadema setosum* (Leske): *Clavisodalis sentifer* and *Echinocius pectinatus*.  
*Heterocentrotus mammillatus* (L.): *Mecomerinx heterocentroti*.  
*Tripneustes gratilla* (L.): *Mecomerinx sewellana*.

Holothuroidea

- Actinopyga echinites* (Jaeger): *Scambicornus lobulatus*.  
*Bohadschia argus* (Jaeger): *Scambicornus tylotus*, *S. tuberatus*, *S. idoneus*, *S. lobulatus*, and *Chauliolobion imparile*.  
*Holothuria atra* (Jaeger): *Scambicornus batiolatus*, *S. disparilis*, and *S. subtilis*.  
*Labidodemas semperianum* Selenka: *Scambicornus sentifer*.  
*Stichopus chloronotus* Brandt: *Chauliolobion forcipatum*, *Scambicornus modestus*, and *Nanapis moluccana*.  
*Synapta maculata* (Chamisso & Eysenhardt): *Scambicornus poculiferus*.  
*Thelenota ananas* (Jaeger): *Nanaspis manca*, *N. spinifera*, and *N. pusilla*, *Chauliolobion tectuliferum*, and *Scambicornus batiolatus*.

Ascidacea

- Ascidia rhabdophora* Sluiter: *Notodelphys matronalis*.  
*Styela asymmetrica* Sluiter: *Notodelphys matronalis*.

ACKNOWLEDGEMENTS

I am indebted to Mr. T. Chad Walter and Dr. Frank D. Ferrari, National Museum of Natural History, Smithsonian Institution, who made the author possible to study the copepod specimens from the Moluccas. This study was supported by the Korea Research Foundation (R05-2004-000-10302-0).

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