

# CORAL-INHABITING COPEPODS FROM THE MOLUCCAS, WITH A SYNOPSIS OF CYCLOPOIDS ASSOCIATED WITH SCLERACTINIAN CORALS.

by

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## Résumé

L'auteur signale six Copépodes des coraux des Moluques : *Mycoxynus villosus* n. sp. associé à *Herpolitha Umax* ; *Anchimolgus dígilatus* (Humes et Ho, 1968), à *Goniopora tenuídens* ; *Anchimolgus tener* Humes, 1973, à *Fungia echinata* et *Parahalomitra robusta* ; *Panjakus hydnochorae* Humes et Stock, 1973, à *Hydnophora exesa* ; *Monomolgus baculigerus* n. sp., à *Porites nigrescens* ; et *Kombia imminens* n. sp., à *Porites (Synaraea) monticulosa*. Une synopsis des cyclopoïdes qui s'associent aux Scléractinides comprend à peu près 102 copépodes et 99 hôtes.

## Introduction

In the course of investigations of copepods living in association with hard corals (Scleractinia) in the Indo-Pacific area and in the West Indies many cyclopoids have been found, as reported in several papers by Humes and co-workers (1964-present) and others (cited in Humes and Stock, 1973 and in the references below). This paper has two objectives: first, to record the association of certain copepods with Moluccan corals and second, to present a list of all cyclopoid copepods known to be associated with scleractinian corals. Such a synopsis will illustrate the diversity of these copepods and by assembling the scattered references will perhaps stimulate investigations of these widespread and common associates.

## Methods of collection and study

Coral colonies or fragments of the same colony were isolated in plastic bags or pails of sea water immediately after collection in the field. A small amount of 95 per cent ethyl alcohol was added to each container sufficient to make approximately a 5 per cent solution. The corals remained in this solution for an hour or longer. They were then vigorously and thoroughly washed by strong agitation. The water was then passed through a fine net (120 holes per 2.5cm) and the copepods were picked from the sediment retained. The copepods were preserved in 70 per cent alcohol with two changes to avoid the precipitation of calcium sulphate.

The copepods were measured and dissected in lactic acid, using the wooden slide technique described by Humes and Gooding (1964).

All figures have been drawn with the aid of a camera lucida. The letter after the explanation of each figure refers to the scale at which it was drawn. The abbreviations used are:  $A_1$  = first antenna,  $A_2$  = second antenna, L = labrum,  $MX_2$  = second maxilla, MXPD = maxilliped, and P<sub>1</sub> = leg 1.

## SPECIES DESCRIPTION

### LICHOMOLGIDAE Kossmann, 1877

#### *Mycoxynus* Humes, 1973

#### *MYCOXYNUS VILLOSUS* n. sp.

(Figs. 1-4)

**Type material.**— 8 ♀♀, 13 ♂♂ from one fungiid coral, *Herpolitha Umax* (Esper) in 2m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 8 May 1975. Holotype ♀, allotype, and 16 paratypes (5 ♀♀, 11 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

**Female.**— Body (Fig. 1 A) resembling that of *Mycoxynus fungianus* Humes, 1978. Length (not including setae on caudal rami) 1.38mm (1.33-1.42mm) and greatest width 0.40mm (0.35-0.41mm), based on six specimens in lactic acid. Ratio of length to width of prosome 2:1. Ratio of length of prosome to that of urosome 1.36:1.

Segment of leg 5 (Fig. 1B) 130x244μm. Genital segment 130x185μm in greatest dimensions, in side view projecting dorsally in anterior half (Fig. 1C). Genital areas situated dorsally in anterior half of segment. Each area (Fig. 1D) with two small naked setae 9μm and 13μm. Three postgenital segments from anterior to posterior 91x127, 78x101, and 94x82μm. Posteroventral margin of anal segment smooth.

Caudal ramus (Fig. 1E) elongate, 130x13μm, width taken at middle. Ratio of length to width 10:1. Outer lateral seta 29μm. Dorsal seta 30μm. Outermost terminal seta 31μm, innermost terminal seta 31μm, and two median terminal setae 110μm (outer) and 156μm (inner). All setae naked.

Body surface with many small refractile points (Fig. 1A).

Egg sacs (Fig. 1F), in few ovigerous specimens seen, adhering to each other, two sacs together 440-495x220μm in flat view. Each sac containing approximately 12 eggs 99-112μm in diameter.

Rostrum (Fig. 1G) linguiform. First antenna (Fig. 2A) 221μm long, with second and third segments incompletely separated on

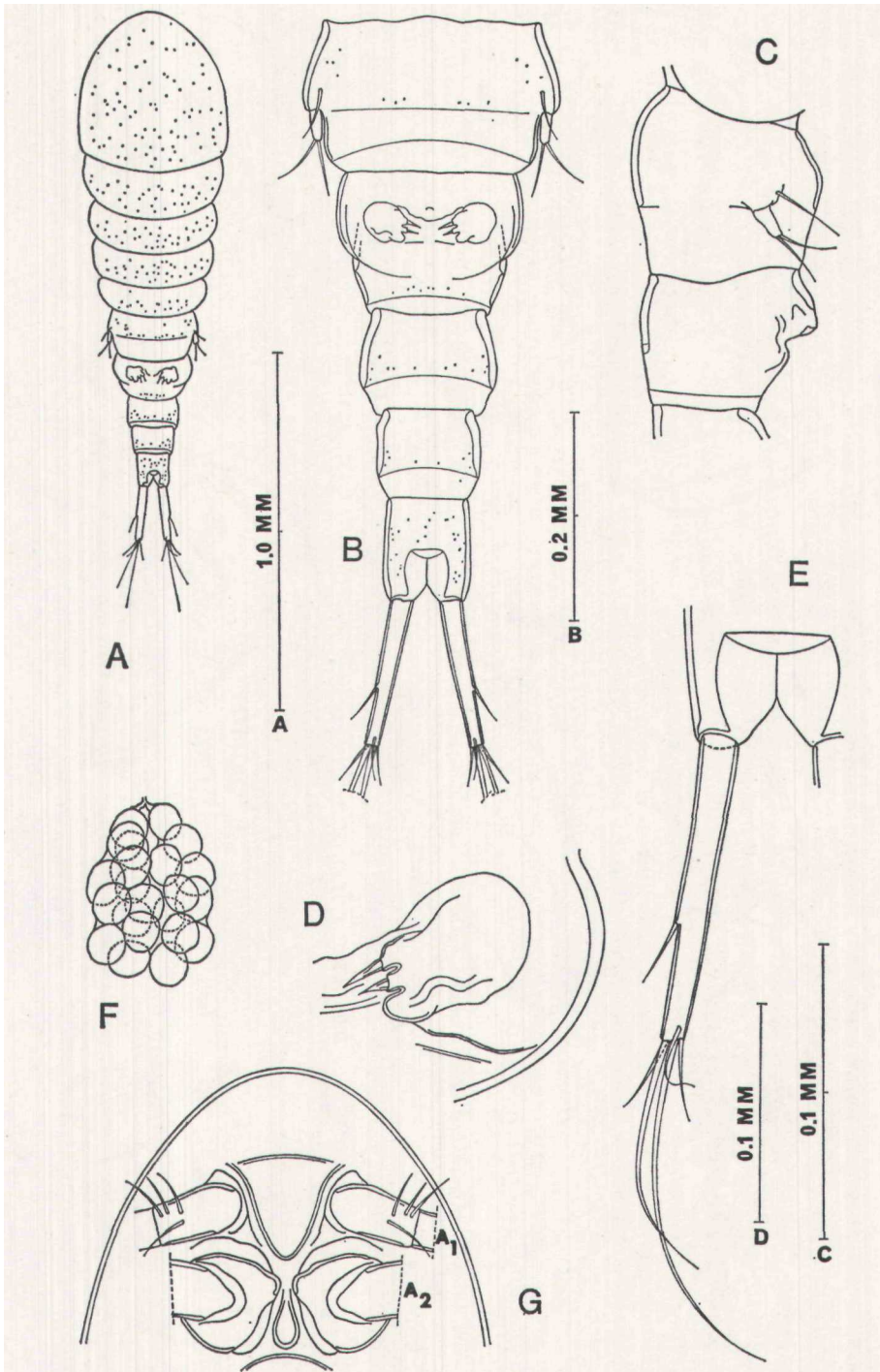


FIG. 1

*Mycoxynus villosus* n. sp., female.

A, dorsal (A); B, urosome, dorsal (B); C, segment of leg 5 and genital segment, lateral (B); D, genital area, dorsal (C); E, caudal ramus, dorsal (D); F, egg sacs, ventral (A); G, rostrum, ventral (B).

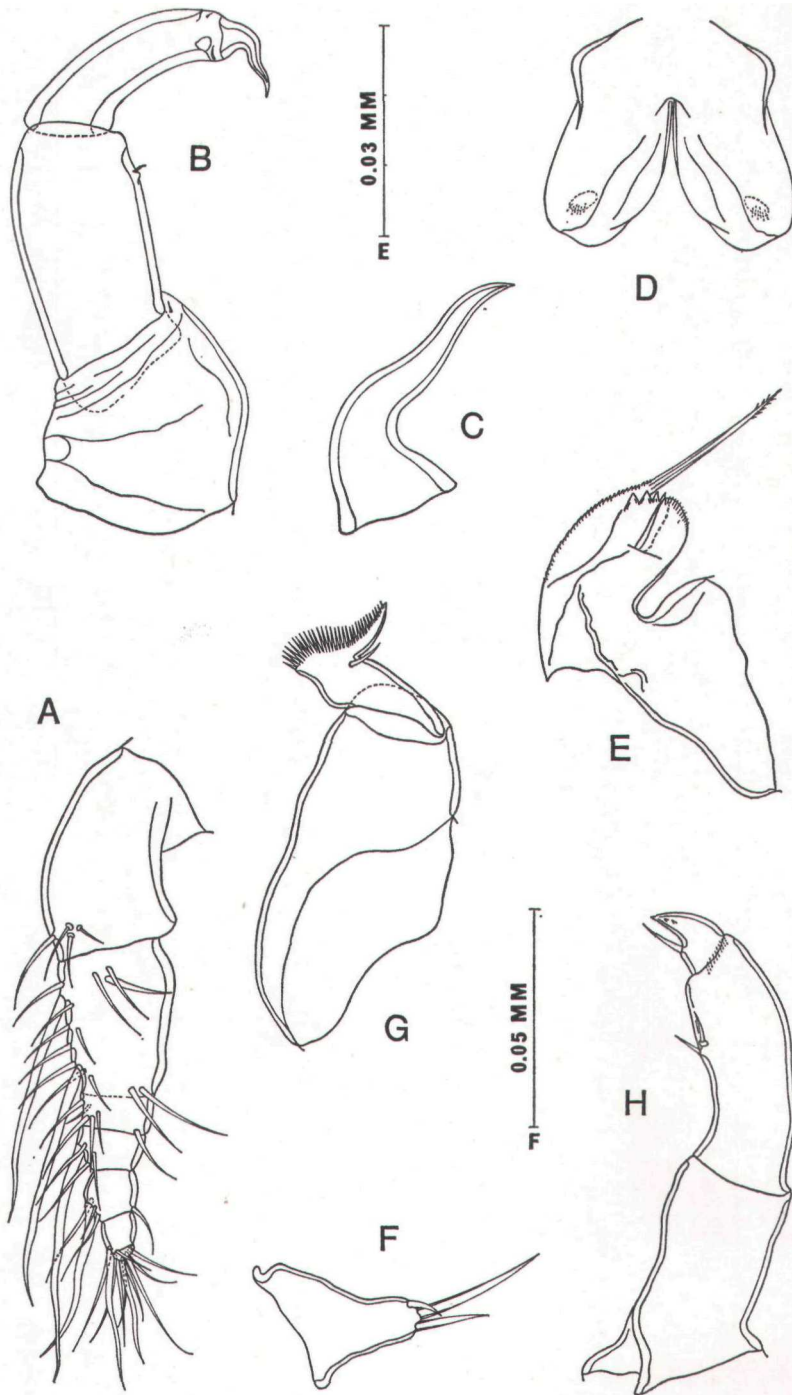


FIG. 2  
*Mycoxygnus villosus* n. sp., female.

A, first antenna, ventral (D); B, second antenna, anterior (D); C, claw of second antenna, anterior (E); D, labrum, with paragnaths indicated by broken lines, ventral (C); E, mandible, posterior (F); F, first maxilla, anterior (F); G, second maxilla, anterior (F); H, maxilliped, inner (F).

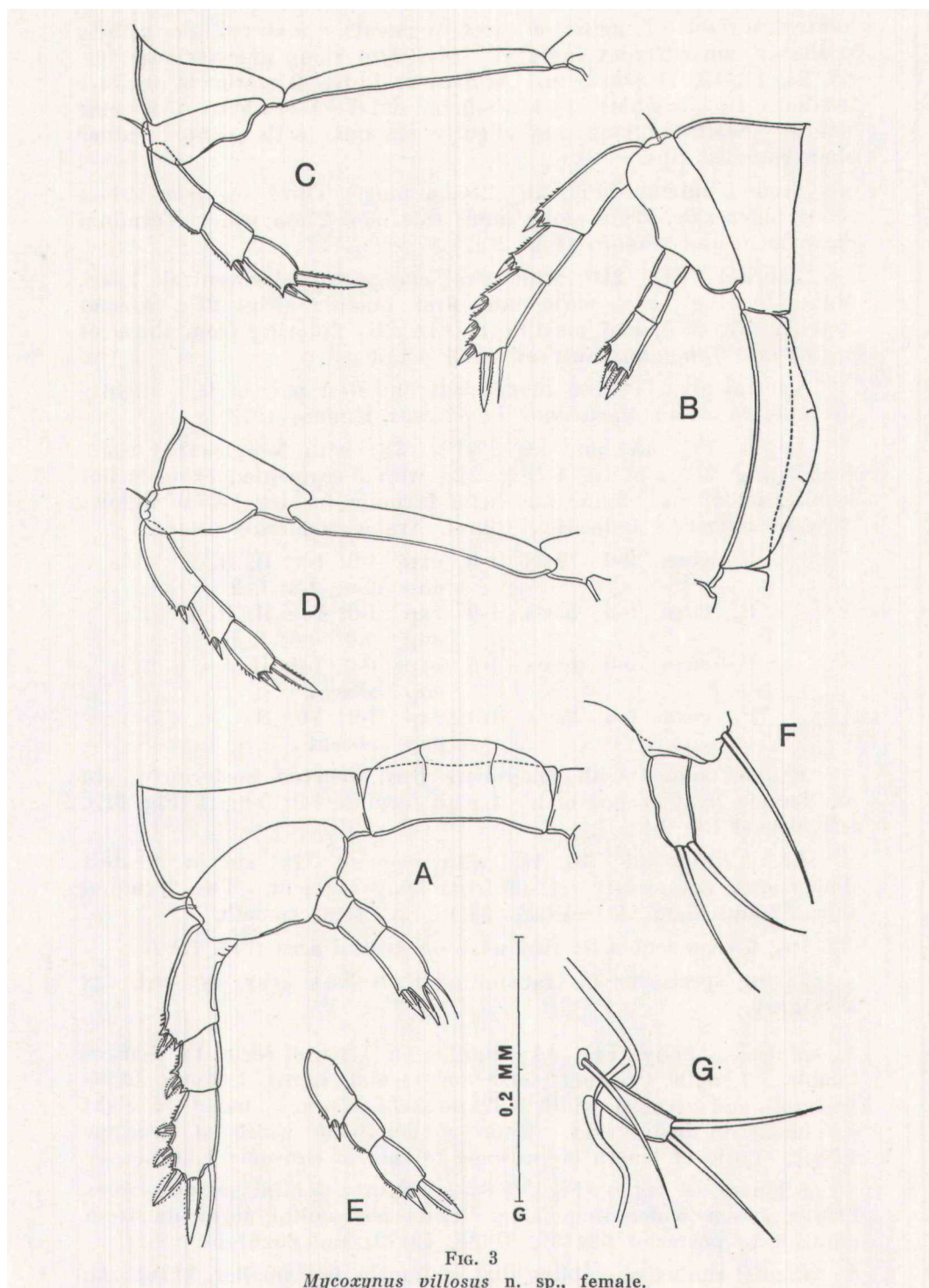


FIG. 3

*Mycoxynus villosus* n. sp., female.

A, leg 1 and intercoxal plate, anterior (C); B, leg 2 and intercoxal plate, anterior (C); C, leg 3 and intercoxal plate, anterior (C); D, leg 4 and intercoxal plate, anterior (C); E, right exopod of leg 4, anterior (C); F, leg 5, lateral (C); G, leg 5, dorsal (C).

ventral surface. Lengths of seven segments (measured along their posterior nonsetiferous margins): 61 (96 $\mu$ m along anterior margin), 68, 21, 17, 19, 11 and 5 $\mu$ m. Armature: 4, 13+2 aesthetes, 6, 3 + 1 aesthete, 4+1 aesthete, 2+1 aesthete, and 7+1 aesthete. All setae naked. Aesthetes long and slightly sinuous, with pointed rather than rounded tips.

Second antenna (Fig. 2B) 216 $\mu$ m long. Third segment 101 $\mu$ m along outer side, 75 $\mu$ m along inner side, and 27 $\mu$ m wide. Terminal claw 39 $\mu$ m and sinuous (Fig. 2C).

Labrum (Fig. 2D) with two elongate posteroventral lobes. Mandible (Fig. 2E), paragnath, first maxilla (Fig. 2F), second maxilla (Fig. 2G), and maxilliped (Fig. 2H) differing from those of *Mycoxynus fungianus* only in small details.

Ventral area between maxillipeds and first pair of legs slightly protuberant as in *Mycoxynus longicauda* Humes, 1973.

Leg 1 (Fig. 3A) and leg 2 (Fig. 3B) with 3-segmented rami. Leg 3 (Fig. 3C) and leg 4 (Fig. 3D) with 3-segmented exopods but lacking endopods. Spine and setal formula for leg 1-4 as follows (Roman numerals indicating spines, Arabic numerals setae):

|                |      |     |       |     |     |                     |
|----------------|------|-----|-------|-----|-----|---------------------|
| P <sub>1</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; II, II, 1 |
|                |      |     |       |     | enp | 0-0; 0-0; I, 2      |
| P <sub>2</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; II, II, 1 |
|                |      |     |       |     | enp | 0-0; 0-0; I, II     |
| P <sub>3</sub> | coxa | 0-0 | basis | 1-0 | exp | 0-0; I-0; II        |
|                |      |     |       |     | enp | absent              |
| P <sub>4</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; II        |
|                |      |     |       |     | enp | absent              |

Exopod spines with mucronate tips recurved posteriorly. In one female right exopod of leg 4 with formula I-0; 0-0; II (Fig. 3E), left exopod I-0; I-0; II.

Leg 5 (Figs. 3F, 3G, 1C) with segment 34x13 $\mu$ m in greatest dimensions, not clearly set off from body segment. Two terminal setae 52 and 47 $\mu$ m. Dorsal seta 58 $\mu$ m. All setae smooth.

Leg 6 represented by two setae on genital area (Fig. 1D).

Living specimens in transmitted light dark gray, eye red, egg sacs gray.

*Male*.— Body (Fig. 4A) similar in general form to that of female. Length (without setae on caudal rami) 1.03mm (0.94-1.09mm) and greatest width 0.32mm (0.31-0.34mm), based on eight specimens in lactic acid. Ratio of length to width of prosome 1.75:1. Ratio of length of prosome to that of urosome 1.11:1.

Segment of leg 5 (Fig. 4B) 52x229 $\mu$ m. Genital segment 104x21 $\mu$ m, much wider than long. Four postgenital segments from anterior to posterior 62x107, 57x88, 49x73, and 65x61 $\mu$ m.

Caudal ramus resembling that of female, but smaller, 117x12 $\mu$ m, ratio 9.75:1.

Rostrum as in female. First antenna like that of female, but aesthetes a little longer. Second antenna (Fig. 4C) 231 $\mu$ m long,



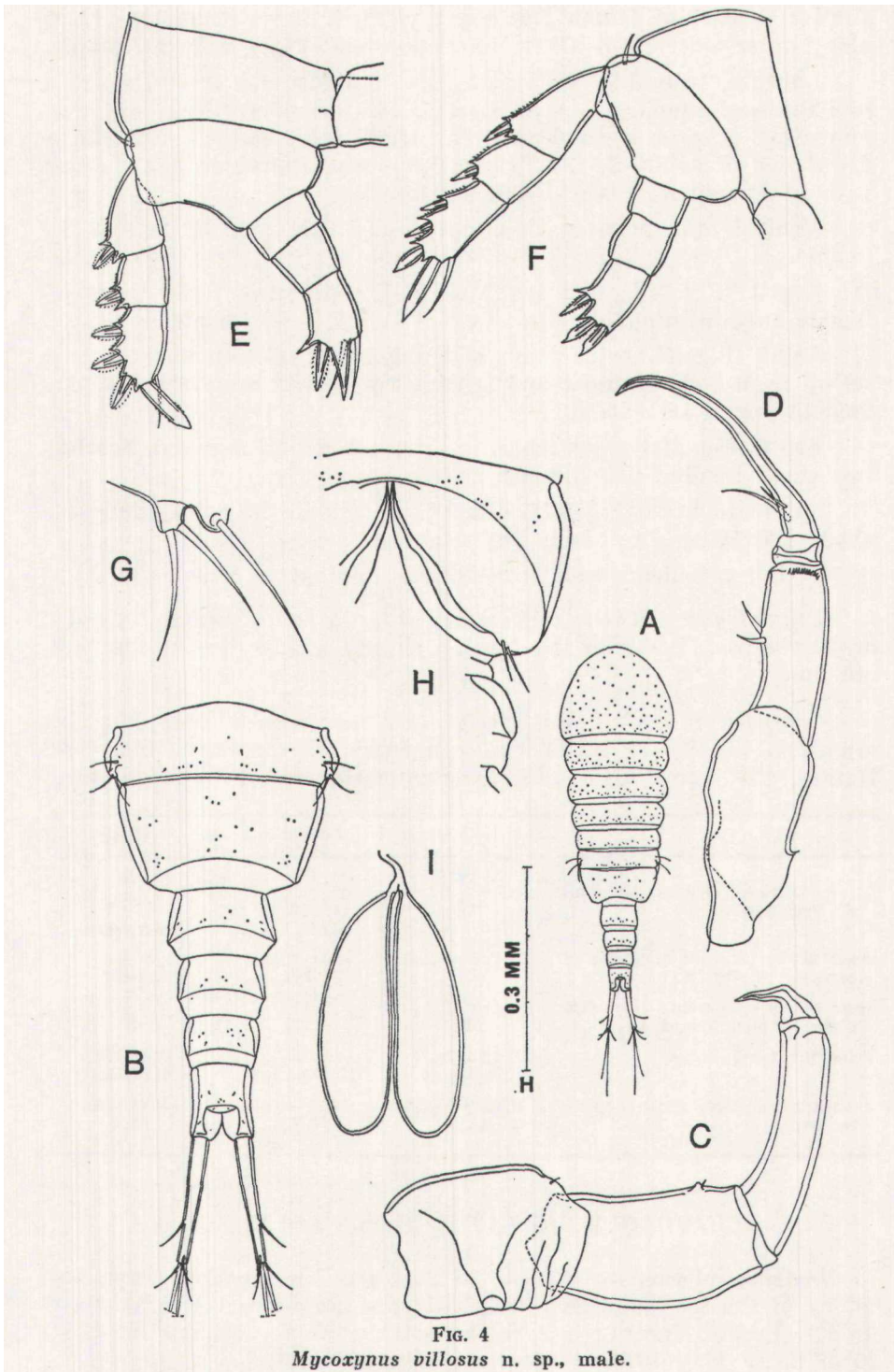


FIG. 4  
*Mycoxynus villosus* n. sp., male.

A, dorsal (A); B, urosome, dorsal (B) ; C, second antenna, anterior (I) ; D, maxilliped, outer (C) ; E, leg 1, anterior (C) ; F, leg 2, anterior (C) ; G, leg 5, lateral (C) ; H, genital area, ventral (G) ; I, spermatophores, attached to female in pair, lateral (H).

similar to that of female but third segment more elongate, 112 $\mu$ m along outer side, 73 $\mu$ m along inner side, and 21 $\mu$ m wide at middle.

Labrum, mandible, paragnath, first maxilla and second maxilla like those of female. Maxilliped (Fig. 4D) slender. First segment unarmed. Second segment with two small inner naked setae and a distal row of spinules. Small third segment unarmed. Claw 85 $\mu$ m with two unequal proximal naked setae.

Ventral area between maxillipeds and first pair of legs as in female.

Leg 1 (Fig. 4E) and leg 2 (Fig. 4F) differing from those of female only in minor details. Legs 3 and 4 as in female.

Leg 5 (Fig. 4G) with very small segment 11x10 $\mu$ m, incompletely set off from body segment and bearing two naked setae about 43 $\mu$ m. Smooth dorsal seta 55 $\mu$ m.

Leg 6 (Fig. 4H) a posteroventral flap on genital segment, bearing two small hyaline naked setae.

Spermatophore (Fig. 4I), attached to female in pairs, elongate, about 330x10 $\mu$ m, not including neck.

Living specimens with color similar to that of female.

*Etymology*.— The specific name *villosus*, Latin meaning shaggy or long-haired, refers to the fancied shaggy appearance of the first antenna.

*Comparison with other species*.— *Mycoxynus villosus* may be separated readily from its two congeners, *Mycoxynus longicauda* Humes, 1973, and *Mycoxynus fungianus* Humes, 1978, as follows:

|  | <i>M. longicauda</i>              | <i>M. fungianus</i>              | <i>M. villosus</i>             |
|--|-----------------------------------|----------------------------------|--------------------------------|
| ♀ <b>armature of second segment of first antenna</b> | <b>13</b>                         | 13                               | <b>13+2</b><br>aesthetes       |
| armature of second segment of exopod of leg 2        | <b>0-0</b>                        | 1-0                              | <b>1-0</b>                     |
| number of segments in exopods of legs 3 and 4        | <b>3</b>                          | 2                                | <b>3</b>                       |
| ♀ segment of leg 5                                   | minute,<br>23x15 $\mu$ m          | minute,<br>15.5x18.5 $\mu$ m     | elongate,<br>34x13 $\mu$ m     |
| ♀ caudal ramus, ratio length to width                | 268x39-15 $\mu$ m,<br><b>18:1</b> | 166x14 $\mu$ m,<br><b>11.9:1</b> | 130x13 $\mu$ m,<br><b>10:1</b> |

#### *ANCHIMOLGUS DIGITATUS* (Humes and Ho, 1968)

**Material collected**.— 32 ♀♀, 35 ♂♂, and 7 copepodids from one colony of the scleractinian coral *Goniopora tenuidens* (Quelch) (Poritidae), in 3m, Karang Mie, eastern Halmahera, 00°20'07"N, 128°25'00"E, 19 May 1975.

**Descriptive notes**.— Body size smaller than in type specimens. Female 1.60mm (1.49-1.75mm) in length and 0.53mm (0.50-0.66mm)



in greatest width. Male 1.34mm (1.27-1.46mm) and 0.44mm (0.41-0.50mm). Measurements based on ten specimens of both sexes in lactic acid. Caudal rami, though smaller (♀ 179x32 μm, ♂ 156x29μm), with approximately same ratio as in type specimens.

Egg sac oval, 418x192μm, containing about 12 large eggs approximately 117μm in average diameter.

Mandible similar to that in the Madagascan material but lacking row of small spinules near digitiform processes. Two larger setae on first maxilla with finely barbed lamellae.

*Remarks.*—In other respects the Moluccan specimens are similar to the type specimens. Differences observed between the Madagascan and Moluccan specimens are minor and probably within the range of variability in this species. Size variation in *Anchimolgus digitatus* has already been noted by Humes and Ho (1968a). The two groups of specimens, from widely separated localities (Halmahera and Madagascar) but both from *Goniopora*, are regarded as conspecific.

#### *ANCHIMOLGUS TENER* Humes, 1973

This species was recorded by Humes (1978) from two fungiid corals in the Moluccas. Inadvertently the collection data were omitted in that paper and are given as follows:

From *Fungia* (*Ctenactis*) *echinata* (Pallas): 7 ♀♀, 4 ♂♂ from one host, in 3m, southwestern side of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 25 May 1975; 1 ♀ from one host, in 5m, Poelau Gomumu, south of Obi, 1°50'00"S, 127°30'54"E, 30 May 1975.

From *Parahalomitra robusta* (Quelch): 1 ♀, 3 ♂♂ from one host, in 3m, Karang Mie, Halmahera, 00°20'07"N, 125°25'00"E, 19 May 1975.

#### *PANJAKUS HYDNOPHORAE* Humes and Stock, 1973

Material collected.—10 ♀♀, 7 ♂♂, and 4 copepodids from *Hydnophora exesa* (Pallas), in 5m, Poelau Marsegoe, western Ceram, 2°59'30"S, 128°03'30"E, 15 May 1975; 5 ♀♀, 10 ♂♂ from *Hydnophora exesa* var. (probably ecovariant) in 18m, south of Poelau Naira, Banda Islands, 4°32'12"S, 129°53'40"E, 2 May 1975 (these specimens deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.).

*Remarks.*—*Panjakus hydnophorae* was described by Humes and Stock (1973) from *Hydnophora* sp., *Hydnophora* ? *exesa* (Pallas), and *Hydnophora tenella* (Quelch) in northwestern Madagascar. A comparison of the Moluccan specimens with specimens from *Hydnophora* sp. in Madagascar shows only two obvious differences, both regarded here as intraspecific. In the specimens from Ceram the body of the female is a little longer, 1.68mm (1.58-1.74mm)

based on three specimens in lactic acid. The caudal ramus is a little longer, 264 $\mu$ m (242-330 $\mu$ m), based on eight specimens, and relatively more slender.

*Monomolgus* Humes and Frost, 1964

*MONOMOLGUS BACULIGERUS* n. sp.

(Figs. 5-8)

Type material.—17 ♀♀, 26 ♂♂ from the scleractinian coral *Porites nigrescens* Dana, in 3m, Karang Mie, Weda Bay, eastern Halmahera, Moluccas, 0°20'07"N, 128°25'00"E, 19 May 1975. Holotype ♀, allotype, and 36 paratypes (13 ♀♀, 23 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

Female.—Body (Figs. 5A, 5B) resembling that of *Monomolgus unihastatus* Humes and Frost, 1964. Length (not including setae on caudal rami) 0.91mm (0.85-0.98mm) and greatest width 0.34mm (0.33-0.36mm), based on 10 specimens in lactic acid. Ratio of length to width of prosome 1.28:1. Ratio of length of prosome to that of urosome 1.17:1.

Segment of leg 5 (Fig. 5C) 44x143 $\mu$ m. Genital segment in dorsal view 130 $\mu$ m long, 120 $\mu$ m in greatest width in anterior half, 120 $\mu$ m in width in posterior half. Genital areas located dorso-laterally in anterior half of segment. Each area (Fig. 5D) bearing two minute setae about 4.5 $\mu$ m. Three postgenital segments from anterior to posterior 88x75, 75x70, and 52x67 $\mu$ m. Posteroventral margin of anal segment with row of minute spinules on each side.

Caudal ramus (Fig. 5E) moderately elongate, 73x29 $\mu$ m, ratio of length to width 2.52:1. Outer lateral seta 49 $\mu$ m. Dorsal seta 60 $\mu$ m. Outermost terminal seta 55 $\mu$ m, innermost terminal seta 60 $\mu$ m, and two medial terminal setae 104 $\mu$ m (outer) and 162 $\mu$ m (inner), both inserted between slight dorsal and ventral flanges, each with row of minute spinules. All setae naked.

Body surface with a few hairs (sensilla) as in Figures 5A, 5C.

Egg sac (Fig. 5A) containing only two or three eggs, each 104-125 $\mu$ m in diameter.

Rostrum (Fig. 5F) weakly developed. First antenna (Fig. 5G) 194 $\mu$ m long, with lengths of seven segments (measured along their posterior nonsetiferous margins) as follows: 11 (36 $\mu$ m along anterior margin), 59, 18, 25, 25, 20, and 11 $\mu$ m respectively. Armature: 4, 13, 6, 3, 4+1 aesthete, 2+1 aesthete, and 7+1 aesthete. All setae naked.

Second antenna (Fig. 6A) 143 $\mu$ m long. Third segment 30 $\mu$ m along outer edge, 17 $\mu$ m along inner edge, and 18 $\mu$ m wide. Formula 1, 1, 3, and one sinuous terminal claw 27 $\mu$ m.

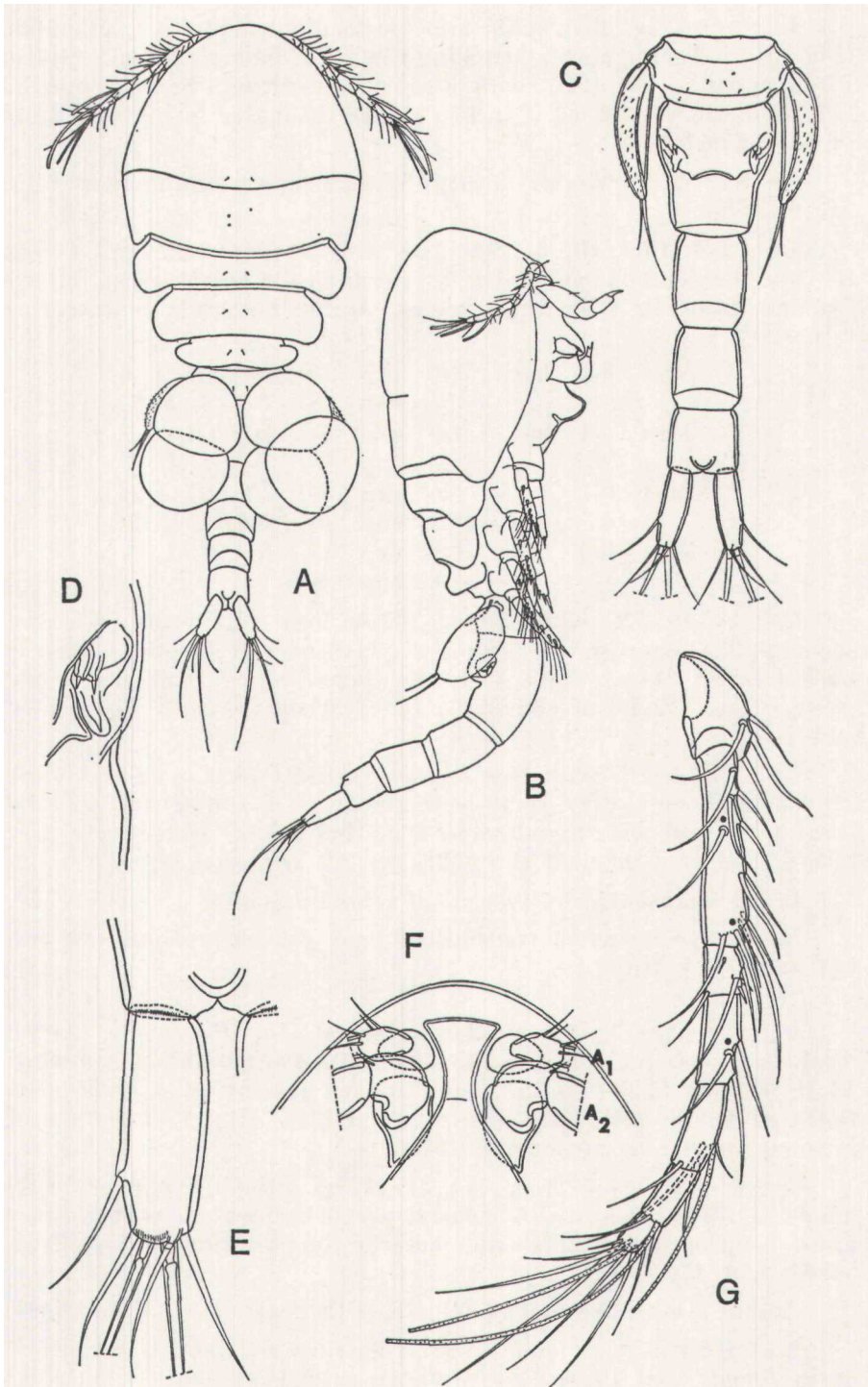


FIG. 5

*Monomolgus baculigerus* n. sp., female.

A, dorsal (H) ; B, lateral (H) ; C, urosome, dorsal (B) ; D, genital area, dorsal (C) ; E, caudal ramus, dorsal (C) ; F, rostral area, ventral (G) ; G, first antenna, dorsal (C).

Labrum (Fig. 6B) with two posteroventral lobes. Mandible (Fig. 6C) and paragnath resembling that of *Monomolgus unihastatus*. First maxilla (Fig. 6D) with two naked setae. Second maxilla (Fig. 6E) and maxilliped (Fig. 6F) similar in major respects to those of *M. unihastatus*.

Ventral area posterior to maxillipeds strongly protuberant (Figs. 5B, 6G, 6H).

Legs 1-4 (Figs. 6I, 6J, 7A, 7B) with 3-segmented rami except for 2-segmented endopod of leg 4. Formula for armature as follows (Roman numerals indicating) spines, Arabic numerals representing setae):

|                |      |     |       |     |                    |                     |
|----------------|------|-----|-------|-----|--------------------|---------------------|
| P <sub>1</sub> | coxa | 0-1 | basis | 1-0 | exp                | 1-0; I-1; III, I, 4 |
|                |      |     |       | enp | 0-1; 0-1; I, 5     |                     |
| P <sub>2</sub> | coxa | 0-1 | basis | 1-0 | exp                | 1-0; I-1; HI, I, 5  |
|                |      |     |       | enp | 0-1; 0-2; I, II, 3 |                     |
| P <sub>3</sub> | coxa | 0-1 | basis | 1-0 | exp                | 1-0; I-1; III, I, 5 |
|                |      |     |       | enp | 0-1; 0-2; I, II, 2 |                     |
| P <sub>4</sub> | coxa | 0-0 | basis | 1-0 | exp                | 1-0; I-1; II, I, 5  |
|                |      |     |       | enp | 0-0; I             |                     |

Leg 4 (Fig. 7B) with exopod 105µm long. Endopod with first segment 22x14µm; second segment 30x15µm and terminal slightly barbed spine 31µm. Both segments haired along their inner and outer edges. Endopod showing minor variations as in Figures 7C and 7D.

Leg 5 (Fig. 7E) with free segment broadly oval in lateral view, 120x65µm, having very small spinules over its outer surface and bearing two naked terminal setae 38µm and 68µm. Dorsal seta near insertion of free segment short, 28µm. All setae naked.

Leg 6 represented by two small setae on genital area (Fig. 5D).

Living specimens in transmitted light grayish opaque, eye red, egg sacs light gray.

**Male.**—Body (Fig. 7F) similar to that of *M. unihastatus*. Length (excluding setae on caudal rami) 0.89mm (0.88-0.94mm) and greatest width 0.29mm (0.28-0.30mm), based on ten specimens in lactic acid. Ratio of length to width of prosome 1.42:1. Ratio of length of prosome to that of urosome 1:1.14.

Segment of leg 5 (Fig. 7G) 29x117µm. Genital segment sub-quadrate, 177x190µm, with nearly parallel sides in dorsal view. Four postgenital segments from anterior to posterior 46x65, 52x65, 50x62, and 45x60µm.

Caudal ramus like that of female, with nearly same dimensions.

Rostral area as in female. First antenna segmented and armed as in female, but three long aesthetes added, so that formula is: 4, 13+2 aesthetes, 6, 3 + 1 aesthete, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. Second antenna (Fig. 7H) resembling that of female but with a few small inner spines on second segment and outer margin of third segment angularly produced.

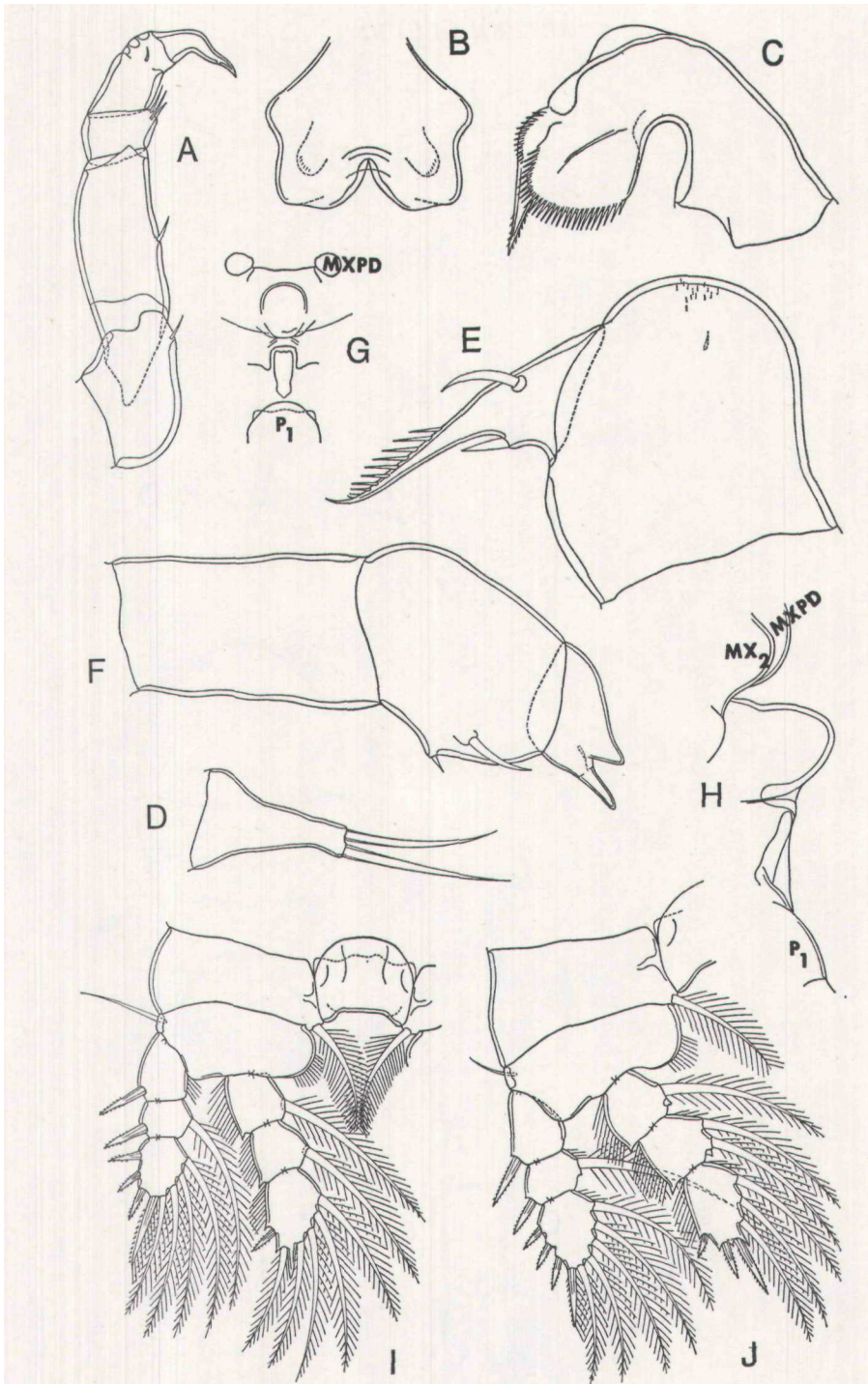


FIG. 6

*Monomolgus baculigerus* n. sp., female.

A, second antenna, postero-inner (C); B, labrum, with paragnaths indicated by broken lines, ventral (D); C, mandible, posterior (E); D, first maxilla, posterior (E); E, second maxilla, posterior (E); F, maxilliped, antero-inner (E); G, area between maxillipeds and first pair of legs, ventral (G); H, area between maxillipeds and first pair of legs, lateral (D); I, leg 1 and intercoxal plate, anterior (D); J, leg 2, anterior (D).



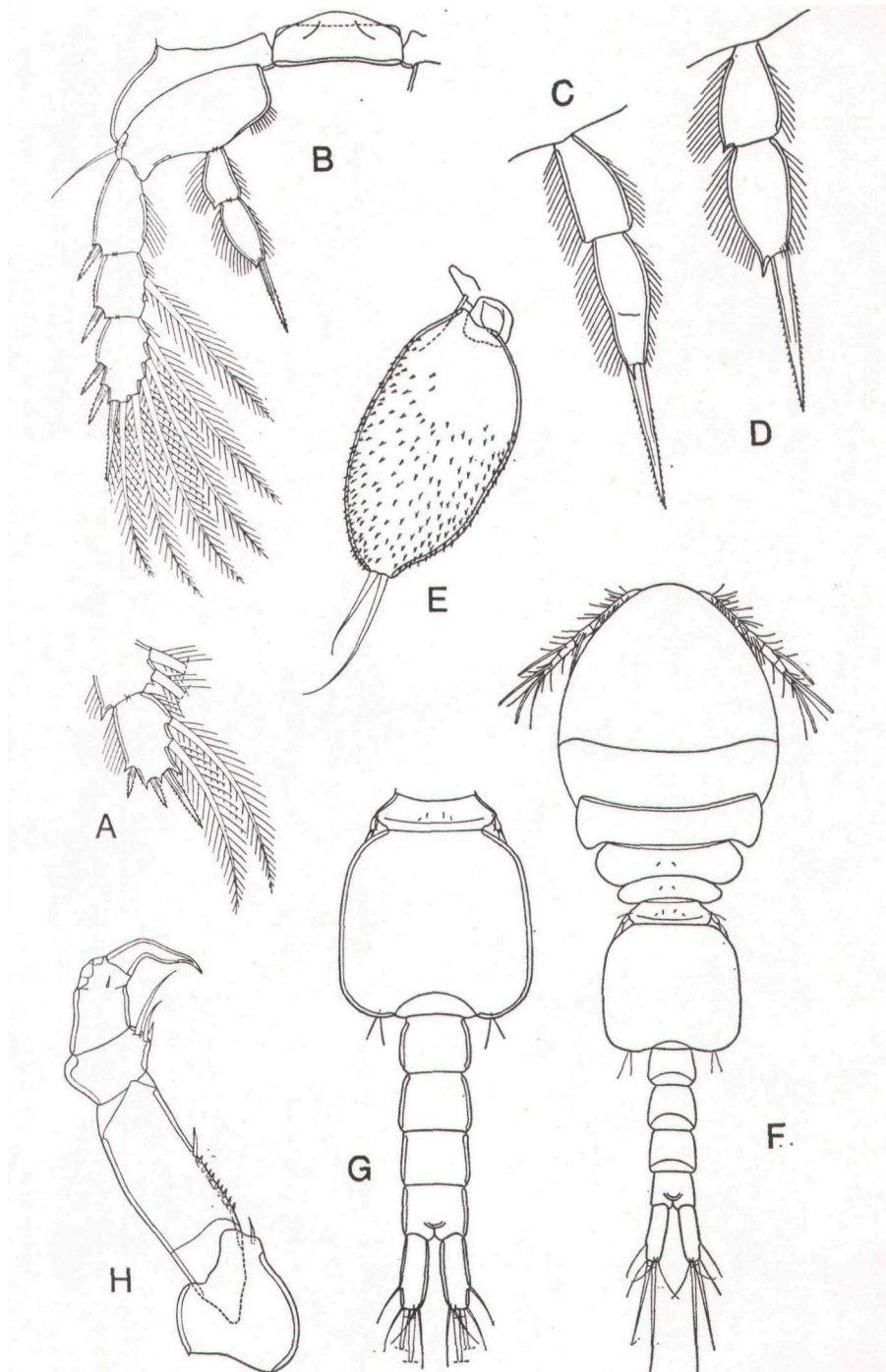


FIG. 7

*Monomolgus baculigerus* n. sp., female.

A, third segment of endopod of leg 3, anterior (D); B, leg 4 and intercoxal plate, anterior (D); C, left endopod of leg 4, anterior (F); D, right endopod of leg 4, anterior (F); E, leg 5, lateral (D). Male. F, dorsal (H); G, urosome, dorsal (B); H, second antenna, postero-inner (C).

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Fig. 8A) resembling that of *M. unihastatus*. Claw 148 $\mu$ m along its axis including terminal lamella.

Ventral area between maxillipeds and first pair of legs as in female.

Legs 1-4 segmented as in female and with similar armature except for third segment of endopods of legs 1 and 2. This segment of leg 1 with four spines, innermost shaped like a boomerang, and two plumose setae (Fig. 8B). Corresponding segment of leg 2 with comparable armature (Fig. 8C). Third endopod segment of leg 3

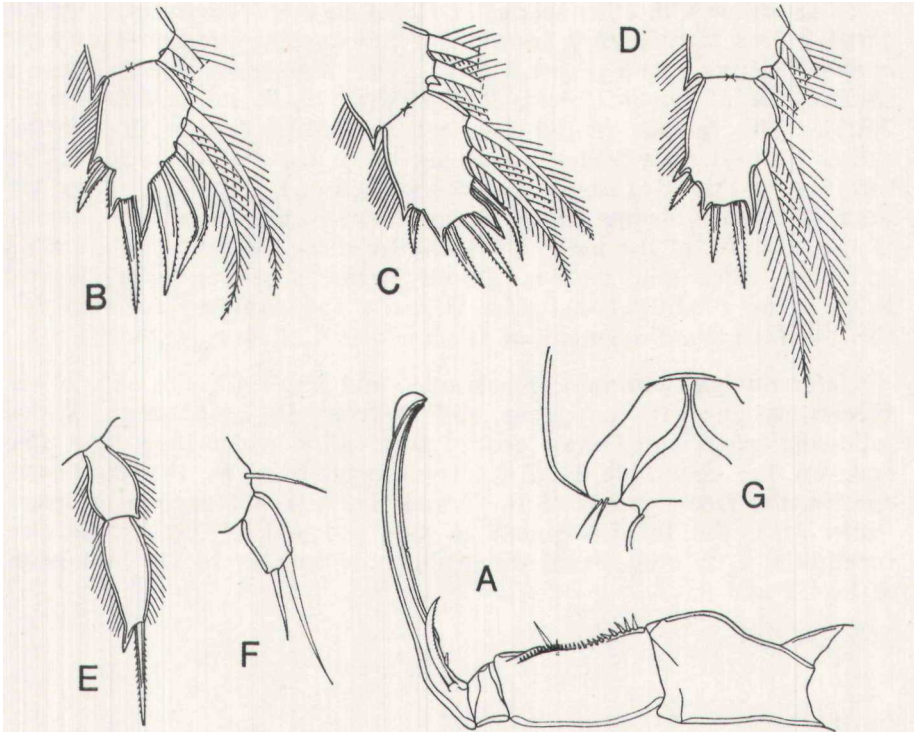


FIG. 8

*Monomolgus baculigerus* n. sp., male.

A, maxilliped, inner (D); B, third segment of endopod of leg 1, anterior (C); C, third segment of endopod of leg 2, anterior (C); D, third segment of endopod of leg 3, anterior (C); E, endopod of leg 4, anterior (C); F, leg 5, dorsal (F); G, genital area ventral (G).

(Fig. 8D) with usual three spines and two setae. Endopod of leg 4 (Fig. 8E) with second segment having more pronounced inner terminal spiniform process than in female. Formula for endopods of legs 1-4 as follows:

P<sub>1</sub> 0-1; 0-1; IV, 2  
 P<sub>2</sub> 0-1; 0-2; IV, 2  
 P<sub>3</sub> 0-1; 0-2; I, II, 2  
 P<sub>4</sub> 0-0; I

Leg 5 (Fig. 8F) with very small free segment, 14x7.5 $\mu$ m.

Leg 6 (Fig. 8G) a posteroventral flap on genital segment bearing two slender naked setae about 29 $\mu$ m long.

Spermatophore not seen.

Living specimens with color similar to that of female.

Etymology.—The specific name *baculigems* is derived from Latin *baculus*, a rod or stick, and *gerere*, to bear, alluding to the rodlike spines on the third segment of the endopod of legs 1 and 2 in the male.

Comparison with other species of *Monomolgus*.—*Monomolgus baculigerus* differs significantly from the type—species, *Monomolgus unihastatus* Humes and Frost, 1964. The Moluccan species has a shorter caudal ramus (female 2.52:1) than in *M. unihastatus* (ratio 3.9:1). The female genital segment is a little longer than wide, rather than slightly wider than long as in the type—species. The formula for the third segment of the exopod of leg 4 is II, I, 5, rather than III, I, 5. Strong sexual dimorphism is seen in the endopods of legs 1 and 2 of the male where the formula for the third segment is IV, 2. Such modification of four elements occurs to my knowledge in no other lichomolgids. Usually the modified formula for the third endopod segment of the male is I, I, 4.

*Monomolgus psammocorae* Humes and Ho, 1967, the only other species assigned to the genus, differs from *M. baculigerus* in the following ways: the female genital segment is wider than long, the lash on the mandible is distinctly longer than in the Moluccan species, the free segment of the female leg 5 is not unusually broad (ratio 3:1), the third segment of the endopod of leg 3 has the formula I, I, 2, and sexual dimorphism is lacking in the endopods of legs 1 and 2.

#### PSEUDANTHESSIIDAE Humes and Stock, 1972

##### *Kombia* Humes, 1962

##### *KOMBIA IMMINENS* n. sp. (Figs. 9-12)

Type material.—5 ♂♂, 1 ♀ from the scleractinian *Pontes* (*Synaraea*) *monticulosa* (Dana), in 15m, Poelau Parang, eastern Ceram, 3-17'00'S, 130°44'48"E, 23 May 1975. Holotype ♂, allotype, and 3 paratypic ♂♂ deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypic male dissected and in the collection of the author. Allotypic ♀ with the first antenna, second antenna, and maxilliped on the left side removed.

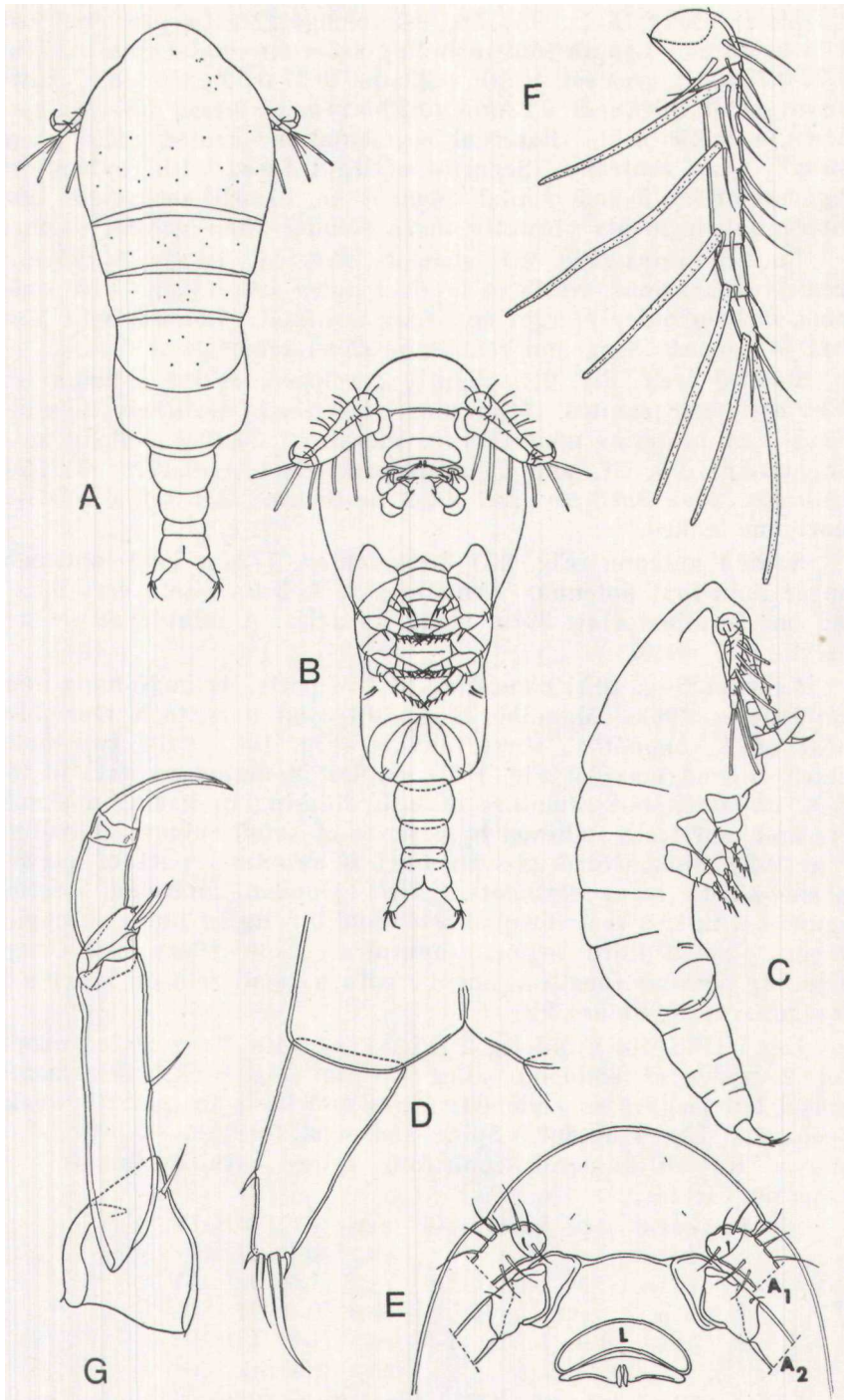


FIG. 9

*Kobia imminens* n. sp., male.

A, dorsal (H); B, ventral (H); C, lateral (H); D, caudal ramus, dorsal (F); E, rostral area, ventral (G); F, first antenna, ventral (D); G, second antenna, anterior (C).

Male.— Body (Figs. 9A, 9B, 9C) elongate, with prosome wider than urosome. Length (not including setae on caudal rami) 0.74mm (0.72-0.77mm), greatest width 0.29mm (0.27-0.30mm), and greatest dorsoventral thickness 0.23mm (0.22-0.24mm), based on five specimens in lactic acid. External segmentation defined more clearly dorsally than ventrally. Segment of leg 1 fused with cephalosome. Segment of leg 5 and genital segment not clearly separated. Four postgenital segments abruptly more slender than genital segment.

Caudal ramus (Fig. 9D) elongate, tapered distally, 50x25 $\mu$ m in greatest dimensions, width at level of outer seta 18 $\mu$ m. Five naked setae, one on outer margin and four terminal. Longest seta 27 $\mu$ m, next to longest 18 $\mu$ m, and remaining short setae about 6 $\mu$ m.

Rostral area (Fig. 9E) slightly developed. First antenna (Fig. 9F) clearly 4-segmented, 138 $\mu$ m long. Lengths of segments (measured along their posterior nonsetiferous margins): 26 (22 $\mu$ m along anterior margin), 70, 21, and 21 $\mu$ m respectively. Armature: 4, 15+3 aesthetes, 2+1 aesthete, and 4+2 aesthetes. All setae relatively short and naked.

Second antenna (Fig. 9G) 4-segmented, 172 $\mu$ m long, noticeably longer than first antenna. Armature: 1, 1, 3 (one seta very small), and one terminal claw 39 $\mu$ m along its axis. A minute setule near insertion of claw.

Labrum (Fig. 10A) consisting of two parts, as in *Kombia angulata* Humes, 1962. Mandible (Fig. 10B) and paragraph resembling those of *K. angulata*. First maxilla (Fig. 10C) with two naked setae. Second maxilla (Fig. 10D) similar in major respects to that of *K. angulata*, but armature of lash differing in having a slender seta and four teeth followed by a series of small spines. Maxilliped (Fig. 10E) 3-segmented (4-segmented if proximal part of claw is considered to be a segment). First segment unarmed. Second segment with two very unequal setae and having an inner subconical process. Small third segment unarmed. Claw 19 $\mu$ m long (length including possible fourth segment), with a small seta on inner side. Oral area as in Figure 9B.

Leg 1 (Fig. 10F) and leg 2 (Fig. 11 A) with 3-segmented exopod and 2-segmented endopod. Leg 3 (Fig. 11B) with 3-segmented exopod but lacking an endopod. Coxa and basis in legs 1-3 weakly separated. Leg 4 absent. Spine and setal formula of legs 1-3 as follows (Roman numerals indicating spines, Arabic numerals representing setae):

|                |      |     |       |     |     |                 |
|----------------|------|-----|-------|-----|-----|-----------------|
| P <sub>1</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; IV, 1 |
|                |      |     |       |     | enp | 0-0; II, 1      |
| P <sub>2</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; IV    |
|                |      |     |       |     | enp | 0-0; II         |
| P <sub>3</sub> | coxa | 0-0 | basis | 1-0 | exp | I-0; I-0; III   |
|                |      |     |       |     | enp | absent          |

Leg 5 (Figs. 9B, 9C, 11C) consisting of two slender naked setae 26 $\mu$ m and 21 $\mu$ m.

Leg 6 (Fig. 11D) represented by a posteroventral flap on genital segment bearing two small setae about 13 $\mu$ m.

Color in life in transmitted light opaque gray, eye red.



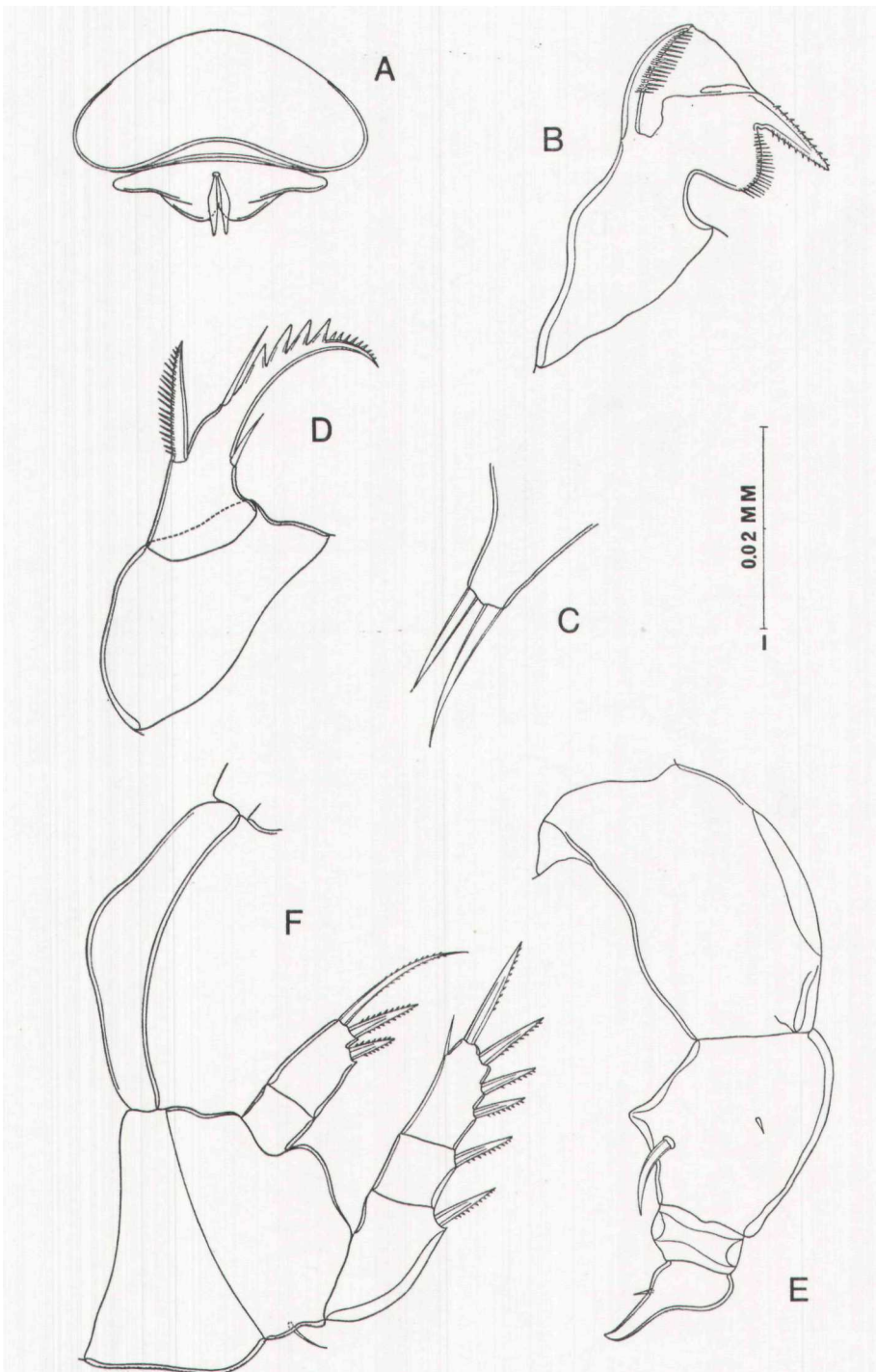


FIG. 10

*Kobia imminens* n. sp., male.

A, labrum, ventral (C); B, mandible, posterior (E); C, first maxilla, anterior (D); D, second maxilla, posterior (E); E, maxilliped, antero-inner (E); F, leg 1 and intercoxal plate, anterior (F).

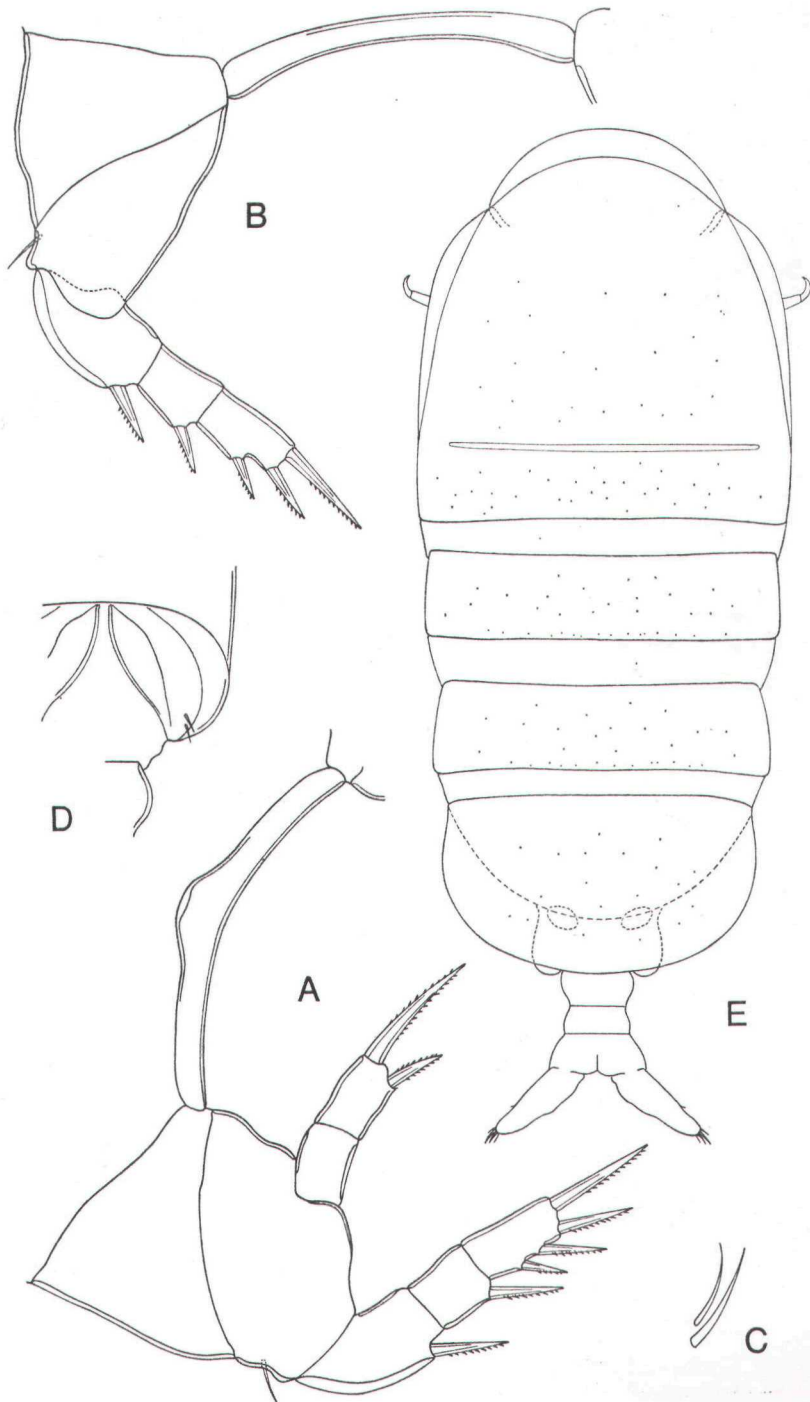


FIG. 11

*Komba imminens* n. sp., male.

A, leg 2 and intercoxal plate, anterior (F); B, leg 3 and intercoxal plate, anterior (F); C, leg 5, ventral (F); D, genital area, ventral (G). Female. E, dorsal (H).

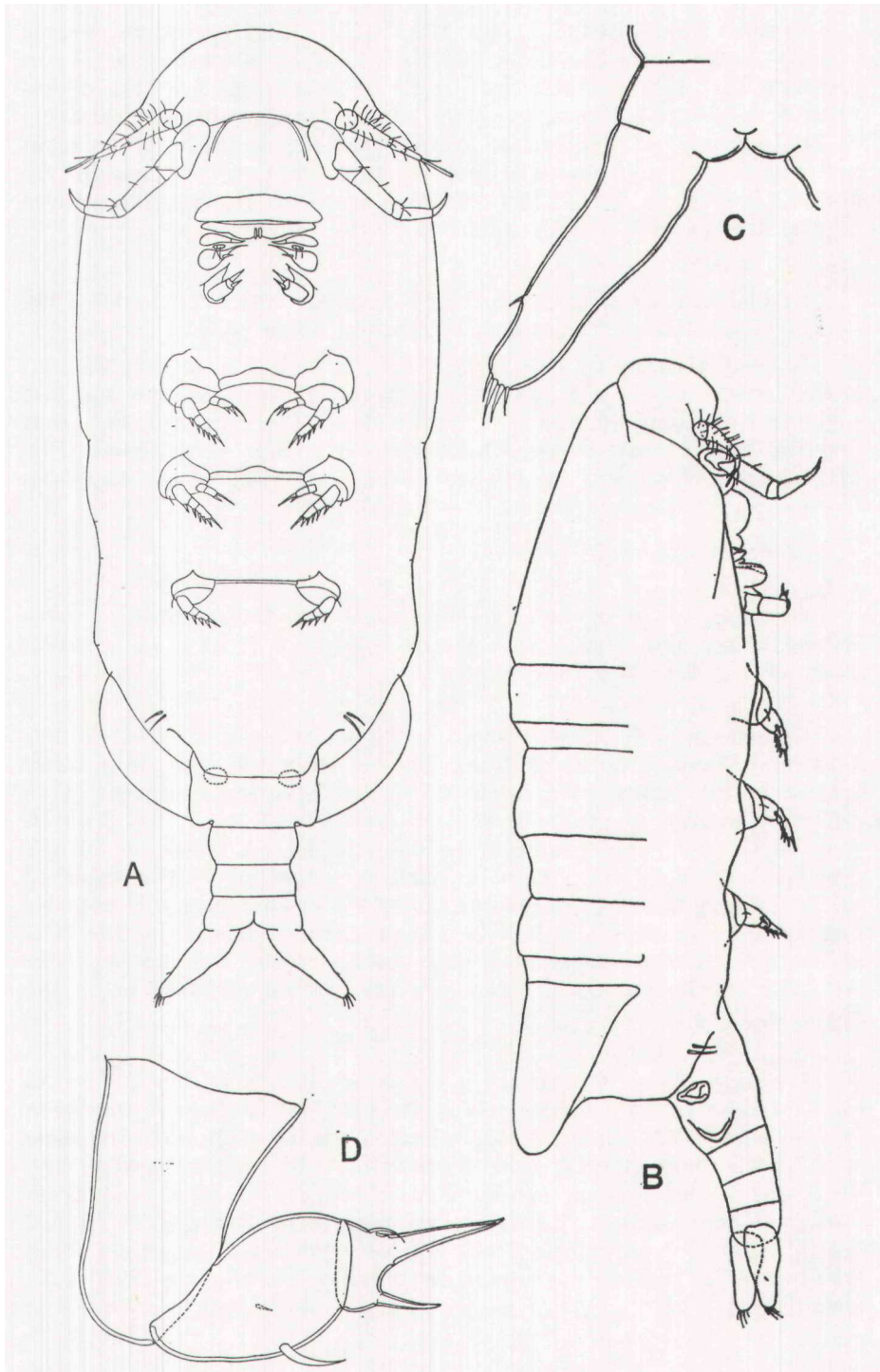


FIG. 12

*Komba imminens* n. sp., female.

A, ventral (H); B, lateral (H); C, caudal ramus, dorsal (D); D, mazzilliped, antero-inner (E).

Female.—Body (Figs. HE, 12A, 12B) with prosome nearly equally broad throughout its length. Length (excluding setae on caudal rami) 1.32mm, greatest width 0.52mm, and greatest dorso-ventral thickness 0.33mm, based on single female collected, measured in lactic acid. Tergum of segment of leg 4 produced to form a broad shieldlike area overhanging anterior part of urosome in dorsal view (Figs. HE, 12B). Genital segment broader than three postgenital segments, with lobate posterior outer corners.

Egg sac not seen.

Caudal ramus (Fig. 12C) more elongate than in male, 126x 39 $\mu$ m (width taken at middle). Terminal setae short.

Rostral area as in Figure 12A. First antenna segmented and armed as in male, but without aesthetes except for one on last segment. Second antenna, labrum, mandible, paragnath, first maxilla, and second maxilla like those of male. Maxilliped (Fig. 12D) 3-segmented and in general resembling that of *K. angulata*.

Legs 1-5 as in male.

Color in life as in male.

Etymology.—The specific name *imminens*, Latin meaning projecting above and over, refers to the shieldlike tergum of the segment of leg 4 in the female.

Comparison with *Kombia angulata*.—The male of *Kombia imminens* may be distinguished from *Kombia angulata*, the only other species in the genus, by possession of the following features: (1) a relatively broader prosome and (2) the nature of the inner prominence on the second segment of the maxilliped. The female of the new species from Ceram may be readily recognized by the enlarged shieldlike tergum of the segment of leg 4, overhanging the anterior part of the urosome. In both sexes of *Kombia imminens* the first antenna is clearly 4-segmented and more slender than in *K. angulata*, and the first maxilla has two setae instead of three as in the Madagascan species.

Remarks.—The discovery of *Kombia imminens* in Ceram marks the first time that the previously monotypic genus *Kombia* has been found outside of Madagascar. There *Kombia angulata* was described by Humes (1962a) from *Psammocora* sp. Later Humes and Ho (1968a) reported it again from Madagascar, this time from *Porites* (*Synaraea*) sp., *Porites* sp. cf. *nigrescens* Dana, and *Porites*, young colony. Humes and Stock (1973) reported *K. angulata* from *Porites* sp. in Madagascar and from *Porites somaliensis* Gravier in Mauritius.

## CYCLOPOID COPEPODS ASSOCIATED WITH SCLERACTINIA

The names of the corals are listed in the form used by the several authors in the citation of the copepod-coral association.

## Family Asterocheridae Giesbrecht, 1899

|  |               |
|--|---------------|
| <i>Asteroponilius corallophilus</i> Stock, 1966                              |               |
| from <i>Pocillopora damicornis</i> (Linnaeus)                                | Mauritius     |
| from <i>Pocillopora damicornis</i> forma <i>favosa</i>                       | Mauritius     |
| from <i>Montipora</i> —3 species   | Mauritius     |
| from <i>Sfylophora</i> sp. cf. <i>S. erythraea</i> von Marenzeller           | Mauritius     |
| from <i>Sfylophora pistillata</i> (Esper)                                    | Mauritius     |
| from <i>Sfylophora subseriata</i> (Ehrenberg)                                | Mauritius     |
| from <i>Porties</i> sp.  | Mauritius     |
| <i>Bradypontius pichoni</i> Stock, 1966                                      |               |
| from <i>Plalygyra</i> sp. (with epibiotic algae and sponges)                 | Mauritius     |
| <i>Cholomyzon palpiferum</i> Stock and Humes, 1969                           |               |
| from <i>Dendrophyllia nigrescens</i> Dana                                    | NW Madagascar |
| from <i>Dendrophyllia micranthus</i> Kükenthal var. <i>grandis</i> Crossland | NW Madagascar |
| from <i>Dendrophyllia</i> sp.  | NW Madagascar |
| <i>Monocheres mauritianus</i> Stock, 1975                                    |               |
| from <i>Pocillopora damicornis</i> Dana                                      | Mauritius     |
| <i>Pellomyzon rostratum</i> Stock, 1975                                      |               |
| from <i>Montastraea cavernosa</i> (Linnaeus)                                 | Curaçao       |
| <i>Pleropontius pediculus</i> Stock, 1966                                    |               |
| from <i>Echinopora lamellosa</i> (Esper)                                     | Mauritius     |

## Family Clausiidae Giesbrecht, 1895

|  |          |
|--|----------|
| <i>Indoclausia bacescui</i> Sebastian and Pillai, 1974 |          |
| from <i>Montipora foliacea</i>                         | SE India |
| <i>Stockia indica</i> Sebastian and Pillai, 1974       |          |
| from <i>Favia</i> sp.                                  | SE India |

## Family Corallovexiidae Stock, 1975

|  |         |
|--|---------|
| <i>Corallovexia brevibrachium</i> Stock, 1975                                |         |
| from <i>Diploria labyrinthiformis</i> (Linnaeus)                             | Curaçao |
| <i>Corallovexia dorospinosa</i> Stock, 1975                                  |         |
| from <i>Montastraea cavernosa</i> (Linnaeus)                                 | Curaçao |
| from <i>Montastraea brasiliiana</i> (Verrill)                                | Curaçao |
| <i>Corallovexia dorsospinosa</i> var. <i>minor</i> Stock, 1975               |         |
| from <i>Montastraea cavernosa</i> (Linnaeus)                                 | Curaçao |
| <i>Corallovexia kristenseni</i> Stock, 1975                                  |         |
| from <i>Colpophyllia natans</i> (Müller)                                     | Curaçao |
| <i>Corallovexia longibrachium</i> Stock, 1975                                |         |
| from <i>Manicina areolata</i> (Linnaeus) forma <i>mayori</i>                 | Curaçao |
| from <i>Colpophyllia natans</i> (Müller)                                     | Curaçao |
| from <i>Diploria strigosa</i>  | Curaçao |
| <i>Corallovexia mediobrachium</i> Stock, 1975                                |         |
| from <i>Diploria strigosa</i> (Dana)   | Curaçao |
| from <i>Diploria clivosa</i> (Ellis and Solander)                            | Curaçao |
| from <i>Manicina areolata</i> (Linnaeus) forma <i>mayori</i> (possible host) | Curaçao |
| <i>Corallovexia mixtibrachium</i> Stock, 1975                                |         |
| from <i>Colpophyllia natans</i> (Müller)                                     | Curaçao |
| <i>Corallovexia similis</i> Stock, 1975                                      |         |
| from <i>Acropora palmata</i> (Lamarck)                                       | Curaçao |



|  |                    |
|--|--------------------|
| <i>Corallovexia ventrospinosa</i> Stock, 1975<br>from <i>Montastraea brasiliiana</i> (Verrill)<br>from <i>Montastraea cavernosa</i> (Linnaeus) | Curaçao<br>Curaçao |
| <i>Corallovexia</i> sp. — in Stock (1975)<br>from <i>Montastraea annularis</i> (Ellis and Solander)  | Curaçao            |
| <i>Corallonoxia baki</i> Stock, 1975<br>from <i>Eusmilia fastigiata</i> (Pallas)<br>from <i>Dendrogyra cylindrus</i> Ehrenberg                 | Curaçao<br>Curaçao |
| <i>Corallonoxia longicauda</i> Stock, 1975<br>from <i>Meandrina meandrites</i> (Linnaeus)<br>from <i>Dendrogyra cylindrus</i> Ehrenberg        | Curaçao<br>Curaçao |
| <i>Corallonoxia</i> sp. — in Stock (1975)<br>from <i>Dichocoenia stokesii</i> Milne Edwards and Haime  | Curaçao            |

## Family Lichomolgidae Kossmann, 1877

|  |   |
|--|---|
| <i>Allopodion mirum</i> Humes, in press<br>from <i>Montipora</i> sp. cf. <i>M. undata</i> Bernard  | Ceram (Moluccas)  |
| <i>Amarda compta</i> Humes and Stock, 1973<br>from <i>Favia</i> sp.  | NW Madagascar   |
| <i>Amarda cultrata</i> Humes and Stock, 1973<br>from <i>Favia</i> sp.  | NW Madagascar   |
| <i>Amarlopsis merulinae</i> Humes, 1974<br>from <i>Merulina ampliata</i> (Ellis and Solander)  | New Caledonia   |
| <i>Anchimoligus contractus</i> Humes, in press<br>from <i>Galaxea fascicularis</i> (Linnaeus)  | Halmahera (Moluccas)  |
| <i>Anchimoligus convexus</i> Humes, 1978<br>from <i>Parahalomitra robusta</i> (Quelch)   | Halmahera (Moluccas)  |
| <i>Anchimoligus digitatus</i> (Humes and Ho, 1968)<br>from <i>Goniopora</i> sp.<br>_____ in Humes and Stock, 1973<br>from <i>Favia</i> sp.<br>from <i>Goniopora</i> sp.<br>_____ in present paper<br>from <i>Goniopora tenuidens</i> (Quelch)                              | NW Madagascar<br>NW Madagascar<br>NW Madagascar<br>Halmahera (Moluccas)           |
| <i>Anchimoligus latens</i> Humes, 1978<br>from <i>Fungia (Ctenactis) echinata</i> (Pallas)<br>from <i>Fungia (Fungia) fungites</i> (Linnaeus)<br>from <i>Fungia (Pleuractis) paumotuensis</i> Stutchbury<br>from <i>Herpolitha limax</i> (Esper)                           | Banda, Obi (Moluccas)<br>Ambon (Moluccas)<br>Banda (Moluccas)<br>Banda (Moluccas) |
| <i>Anchimoligus notatus</i> Humes, 1978<br>from <i>Fungia (Heliofungia) actiniformis</i> (Quoy and Gaimard)<br>from <i>Fungia (Pleuractis) paumotuensis</i> Stutchbury   | Banda, Ambon (Moluccas)<br>Banda (Moluccas)                                       |
| <i>Anchimoligus orectus</i> Humes, 1978<br>from <i>Fungia (Pleuractis) paumotuensis</i> Stutchbury   | Banda (Moluccas)  |
| <i>Anchimoligus pandus</i> Humes, 1978<br>from <i>Fungia (Ctenactis) echinata</i> (Pallas)<br>from <i>Fungia (Pleuractis) paumotuensis</i> Stutchbury<br>from <i>Fungia (Heliofungia) actiniformis</i> (Quoy and Gaimard)<br>from <i>Polyphyllia talpina</i> (Lamarck)     | Banda, Obi (Moluccas)<br>Banda (Moluccas)<br>Ambon (Moluccas)<br>Banda (Moluccas) |
| <i>Anchimoligus prolixipes</i> (Humes and Ho, 1988)<br>from <i>Porites</i> sp. cf. <i>P. andrewsi</i> Vaughan<br>from <i>Porites</i> sp. cf. <i>P. nigrescens</i> Dana<br>from <i>Porites (Synaraea)</i> sp.<br>_____ in Humes and Stock (1973)<br>from <i>Porites</i> sp. | NW Madagascar<br>NW Madagascar<br>NW Madagascar<br>NW Madagascar                  |
| <i>Anchimoligus punctilis</i> Humes, 1978<br>from <i>Fungia (Pleuractis) paumotuensis</i> Stutchbury<br>from <i>Fungia (Fungia) fungites</i> (Linnaeus)  | Banda, Obi (Moluccas)<br>Ambon (Moluccas)   |
| <i>Anchimoligus tener</i> Humes, 1973<br>from <i>Fungia (Ctenactis) echinata</i> (Pallas)<br>_____ in Humes, 1978, and present paper<br>from <i>Parahalomitra robusta</i> (Quelch)<br>from <i>Fungia (Ctenactis) echinata</i> (Pallas)                                     | New Caledonia<br>Halmahera (Moluccas)<br>Banda, Obi (Moluccas)                    |
| <i>Andrianellus exsertidens</i> Humes and Stock, 1973<br>from <i>Favia</i> sp.<br>from <i>Platygyra daedala</i> (Ellis and Solander)   | NW Madagascar<br>NW Madagascar  |
| <i>Cerioxynus alatus</i> Humes, 1974<br>from <i>Favia fava</i> (Forsk.)  | New Caledonia   |
| <i>Cerioxynus bandensis</i> Humes, in press<br>from <i>Favites virens</i> (Dana)   | Banda (Moluccas)  |

- Cerioxynus faviticulus* Humes, 1974  
from *Favites halicora* (Ehrenberg) New Caledonia
- Cerioxynus moluccensis* Humes, in press  
from *Favites pentagona* (Esper) Ceram (Moluccas)
- Clamocus spinifer* Humes, in press  
from *Galaxea fascicularis* (Linnaeus) Halmahera (Moluccas)
- Gelastomolgus spondyli* Humes, 1968 — in Humes and Stock,  
1973  
from *Plerogyra* sp. (accidental host?) NW Madagascar
- Haplomolgus montiporae* Humes and Ho, 1968  
from *Montipora sinensis* Bernard NW Madagascar  
from *Montipora* sp. NW Madagascar  
from *Montipora* sp. cf. *M. stellata* Bernard NW Madagascar
- \_\_\_\_\_ in Humes and Stock, 1973  
from *Montipora* sp. NW Madagascar
- \_\_\_\_\_ in Humes, in press  
from *Montipora compressa* (Esper) Ambon (Moluccas)
- Haplomolgus subdeficiens* Humes, in press  
from *Montipora* sp. cf. *M. undata* Bernard Ceram (Moluccas)
- Humesiella corallicola* Sebastian and Pillai, 1973  
from *Hydnophora* sp. SE India
- Karanges galaxeanus* Humes, in press  
from *Galaxea fascicularis* (Linnaeus) Halmahera (Moluccas)
- Karanges hypsorophus* Humes, in press  
from *Galaxea fascicularis* (Linnaeus) Halmahera (Moluccas)
- Kawanolus parangensis* Humes, in press  
from *Montipora* sp. cf. *M. undata* Bernard Ceram (Moluccas)
- Monomolgus baculigerus* n. sp.  
from *Porites nigrescens* Dana Halmahera (Moluccas)
- Monomolgus psammocorae* Humes and Ho, 1967  
from *Psammocora contigua* (Esper) NW Madagascar
- Monomolgus unihastatus* Humes and Frost, 1964  
from *Porites* sp. cf. *P. andrewsi* Vaughan NW Madagascar  
\_\_\_\_\_ in Humes and Ho, 1968  
from *Porites* sp. cf. *P. nigrescens* Dana NW Madagascar  
\_\_\_\_\_ in Humes and Stock, 1973  
from *Porites* sp. NW Madagascar
- Mycoxynus fungianus* Humes, 1978  
from *Fungia (Ctenactis) echinata* (Pallas) Banda (Moluccas)
- Mycoxynus longicauda* Humes, 1973  
from *Parahalomitra irregularis* (Gardiner) New Caledonia
- Mycoxynus villosus* n. sp.  
from *Herpolitha Umax* (Esper) Banda (Moluccas)
- Odontomolgus actinophorus* (Humes and Frost, 1964)  
from *Pavona angulata* Klunzinger NW Madagascar  
from *Pavona cactus* (Forsk.) NW Madagascar
- \_\_\_\_\_ in Humes and Ho, 1968  
from *Pavona danai* (Milne Edwards and Haime) NW Madagascar  
from *Pavona danai* or *Pavona angularis* (Klunzinger) NW Madagascar  
from *Pavona ? venusta* (Dana) NW Madagascar
- Odontomolgus campulus* (Humes and Ho, 1968)  
from *Alveopora* sp. NW Madagascar  
\_\_\_\_\_ in Humes and Stock, 1973  
from *Goniopora* sp. NW Madagascar
- Odontomolgus decens* Humes, 1978  
from *Fungia (Heliofungia) actiniformis* (Quoy and Gaimard) Banda, Ambon (Moluccas)
- Odontomolgus forhani* Humes, in press  
from *Montipora compressa* (Esper) Ambon (Moluccas)  
from *Montipora prolifera* (Brueggemann) Banda (Moluccas)
- Odontomolgus fultus* Humes, 1978  
from *Halomitra philippinensis* Studer Banda (Moluccas)
- Odontomolgus mundulus* Humes, 1974  
from *Alveopora mortenseni* Crossland New Caledonia  
from *Alveopora catalai* Wells New Caledonia
- Odontomolgus rhadinus* (Humes and Ho, 1967)  
from *Psammocora contigua* (Esper) NW Madagascar  
\_\_\_\_\_ in Humes and Stock, 1973  
from *Pavona* sp. NW Madagascar
- Odontomolgus scitulus* Humes, 1973  
from *Fungia (Fungia) fungites* (Linnaeus) New Caledonia

- Panjakus hydnothorae* Humes and Stock, 1973  
 from *Hydnothorax* sp.  
 from *Hydnothorax exesa* (Pallas) NW Madagascar  
 from *Hydnothorax I exesa* (Pallas) NW Madagascar  
 from *Hydnothorax tenella* Quelch NW Madagascar
- Panjakus platygyrac* Humes and Stock, 1973  
 from *Platygyra I lamellina* (Ehrenberg) NW Madagascar  
 from *Platygyra daedala* (Ellis and Solander) NW Madagascar  
 from *Platygyra* sp. cf. *P. daedala* (Ellis and Solander) NW Madagascar
- in Humes, 1974  
 from *Platygyra astreiformis* (Milne Edwards and Haime) New Caledonia
- in Humes, 1975  
 from *Platygyra daedala* (Ellis and Solander) Mauritius
- Paramarda aculeata* Humes, 1978  
 from *Halomitra philippinensis* Studer Banda (Moluccas)  
 from *Fungia (Pleuractis) paumotuensis* Stutchbury Banda (Moluccas)
- Prionomolgus lanceolatus* Humes and Ho, 1968  
 from *Pachyseris speciosa* (Dana) NW Madagascar
- Rakotoa ceramensis* Humes, in press  
 from *Favites pentagona* (Esper) Ceram (Moluccas)
- Rakotoa proteus* Humes and Stock, 1973  
 from *Favia* sp. NW Madagascar
- Ravahina tumida* Humes and Ho, 1968  
 from *Porites* sp. cf. *P. andrewsi* Vaughan NW Madagascar
- Schedomolgus arcuatipes* (Humes and Ho, 1968)  
 from *Acropora palifera* (Lamarck) NW Madagascar
- Schedomolgus lobophorus* (Humes and Ho, 1968)  
 from *Acropora scherzeriana* Brueggemann NW Madagascar  
 from *Acropora* sp. NW Madagascar  
 from *Acropora cytherea* Dana NW Madagascar
- in Humes and Stock, 1973  
 from *Acropora florida* (Dana) Eniwetok Atoll
- Spaniomolgus compositus* (Humes and Frost, 1964)  
 from *Seriatopora subseriata* Ehrenberg NW Madagascar
- in Humes and Ho, 1968  
 from *Seriatopora octoptera* Ehrenberg NW Madagascar  
 from *Seriatopora* sp. NW Madagascar
- in Humes and Stock, 1973  
 from *Seriatopora* sp. NW Madagascar
- in Humes, 1975  
 from *Stylophora* sp. Mauritius
- Spaniomolgus crassus* (Humes and Ho, 1968)  
 from *Stylophora pistillata* (Esper) NW Madagascar  
 from *Stylophora mordax* (Dana) NW Madagascar  
 from *Atropora* sp. NW Madagascar
- Spaniomolgus geminus* (Humes and Ho, 1968)  
 from *Stylophora pistillata* (Esper) NW Madagascar  
 from *Stylophora mordax* (Dana) NW Madagascar  
 from *Acropora* sp. NW Madagascar
- in Humes and Stock, 1973  
 from *Stylophora* sp. NW Madagascar
- Wedanus inconstans* Humes, in press  
 from *Goniopora tenuidens* (Quelch) Halmahera (Moluccas)
- Xenomolgus varius* Humes and Stock, 1973  
 from *Porites* sp. Mauritius

### Family Pseudanthessiidae Humes and Stock, 1972

- Kombia angulata* Humes, 1962  
 from *Psammocora* sp. NW Madagascar
- in Humes and Ho, 1968  
 from *Porites (Synaraea)* sp. NW Madagascar  
 from *Porites* sp. cf. *P. nigrescens* Dana NW Madagascar  
 from *Porites*, young colony NW Madagascar
- in Humes and Stock, 1973  
 from *Porites* sp. NW Madagascar  
 from *Porites somaliensis* Gravier Mauritius
- Kombia imminens* n. sp.  
 from *Porites (Synaraea) monticulosa* (Dana) Ceram (Moluccas)
- Rhynchomolgus corallophilus* Humes and Ho, 1967  
 from *Psammocora contigua* (Esper) NW Madagascar

## Family Xarifiidae Humes, 1960

|   |                 |
|---|-----------------|
| <i>Xarifia anomala</i> Humes and Ho, 1968<br>from <i>Acropora palifera</i> (Lamarck)              | NW Madagascar   |
| <i>Xarifia brevicauda</i> Humes and Ho, 1968<br>from <i>Alveopora</i> sp.                         | NW Madagascar   |
| <i>Xarifia comata</i> Humes, 1962<br>from <i>Pocillopora verrucosa</i> (Ellis and Solander)       | NW Madagascar   |
| from <i>Pocillopora</i> sp. cf. <i>P. verrucosa</i> (Ellis and Solander)                          | NW Madagascar   |
| <i>Xarifia decorata</i> Humes and Ho, 1968<br>from <i>Stylophora pistillata</i> (Esper)           | NW Madagascar   |
| from <i>Stylophora mordax</i> (Dana)  | NW Madagascar   |
| <i>Xarifia diminuta</i> Humes and Ho, 1967<br>from <i>Psammocora contigua</i> (Esper)             | NW Madagascar   |
| <i>Xarifia dispar</i> Humes, 1962<br>from <i>Echinopora carduus</i> Klunzinger                    | NW Madagascar   |
| in Humes and Ho, 1968   |                 |
| from <i>Echinopora gemmacea</i> (Lamarck)   | NW Madagascar   |
| from <i>Echinopora lamellosa</i> (Esper)  | NW Madagascar   |
| <i>Xarifia exigua</i> Humes and Ho, 1968<br>from <i>Pachyseris speciosa</i> (Dana)                | NW Madagascar   |
| <i>Xarifia fimbriata</i> Humes, 1960<br>from <i>Pocillopora</i> sp.                               | Maldive Islands |
| <i>Xarifia gerlachi</i> Humes, 1962<br>from <i>Acropora corymbosa</i> (Lamarck)                   | NW Madagascar   |
| from <i>Acropora</i> sp. cf. <i>A. teres</i> (Verrill)  | NW Madagascar   |
| from <i>Acropora cytherea</i> Dana  | NW Madagascar   |
| <i>Xarifia hamata</i> Humes and Ho, 1968<br>from <i>Turbinaria</i> sp.                            | NW Madagascar   |
| <i>Xarifia infrequens</i> Humes, 1962<br>from <i>Acropora corymbosa</i> (Lamarck)                 | NW Madagascar   |
| from <i>Acropora cytherea</i> Dana  | NW Madagascar   |
| <i>Xarifia lamellispinosa</i> Humes and Ho, 1968<br>from <i>Pachyseris speciosa</i> (Dana)        | NW Madagascar   |
| <i>Xarifia lissa</i> Humes and Ho, 1968<br>from <i>Stylophora pistillata</i> (Esper)              | NW Madagascar   |
| from <i>Stylophora mordax</i> (Dana)  | NW Madagascar   |
| <i>Xarifia longipes</i> Humes, 1962<br>from <i>Pavona angulata</i> Klunzinger                     | NW Madagascar   |
| <i>Xarifia maldivensis</i> Humes, 1960<br>from <i>Pocillopora</i> sp.                             | Maldive Islands |
| <i>Xarifia obesa</i> Humes and Ho, 1968<br>from <i>Pocillopora verrucosa</i> (Ellis and Solander) | NW Madagascar   |
| from <i>Pocillopora</i> sp. cf. <i>P. verrucosa</i> (Ellis and Solander)                          | NW Madagascar   |
| from <i>Pocillopora danae</i> Verrill   | NW Madagascar   |
| <i>Xarifia reducta</i> Humes, 1962<br>from <i>Seriatopora octoptera</i> Ehrenberg                 | NW Madagascar   |
| from <i>Seriatopora caliendrum</i> Ehrenberg  | NW Madagascar   |
| <i>Xarifia serrata</i> Humes, 1962<br>from <i>Pocillopora damicornis</i> Dana                     | NW Madagascar   |
| from <i>Seriatopora subseriata</i> Ehrenberg  | NW Madagascar   |
| from <i>Pocillopora verrucosa</i> (Ellis and Solander)  | NW Madagascar   |
| from <i>Pocillopora</i> sp. cf. <i>P. verrucosa</i> (Ellis and Solander)                          | NW Madagascar   |
| in Humes and Ho, 1968   |                 |
| from <i>Pocillopora bulbosa</i> Ehrenberg   | NW Madagascar   |
| <i>Xarifia temnura</i> Humes and Ho, 1968<br>from <i>Montipora sinensis</i> Bernard               | NW Madagascar   |
| <i>Xarifia tenuis</i> Humes, 1962<br>from <i>Acropora cytherea</i> Dana                           | NW Madagascar   |
| <i>Xarifia</i> sp. — in Humes, 1960<br>from <i>Stylophora</i> sp.                                 | Red Sea         |
| from <i>Acropora</i> sp.  | Maldive Islands |
| <i>Orstomella faviae</i> Humes and Ho, 1968<br>from <i>Favia</i> sp.                              | NW Madagascar   |
| <i>Orstomella lobophylliae</i> Humes and Ho, 1968<br>from <i>Lobophyllia costata</i> (Dana)       | NW Madagascar   |
| from <i>Lobophyllia corymbosa</i> (Forsk.)  | NW Madagascar   |

In addition to these copepods, an unpublished doctoral thesis by Sebastian (1972) contains descriptions of five new species and records of four previously known cyclopoids, all from corals in southern India.

## Scleractinia and their associated cyclopoid copepods

|   |  |   |
|---|--|---|
| <i>Acropora corymbosa</i> (Lamarck)                                       | <i>Echinopora carduus</i>                                  | <i>Hydnophora exesa</i> (Pallas)                    |
| <i>Xarifia gerlachi</i>   | Klunzinger   | <i>Panjakus hydnohorae</i>                          |
| <i>Xarifia infrequens</i>   | <i>Xarifia dispar</i>                                      | <i>Hydnophora l'exesa</i> (Pallas)                  |
| <i>Acropora cytherea</i> Dana   | <i>Echinopora gemmacea</i> (Lamarck)                       | <i>Panjakus hydnohorae</i>                          |
| <i>Schedomolgus lobophorus</i>  | <i>Xarifia dispar</i>                                      | <i>Hydnophora tenella</i> Quelch                    |
| <i>Xarifia gerlachi</i>   | <i>Echinopora lamellosa</i> (Esper)                        | <i>Panjakus hydnohorae</i>                          |
| <i>Xarifia infrequens</i>   | <i>Pteropontius pediculus</i>                              | <i>Hydnophora</i> sp.                               |
| <i>Xarifia lenius</i>   | <i>Xarifia dispar</i>                                      | <i>Humesiella corallicola</i>                       |
| <i>Acropora florida</i> (Dana)  | <i>Eusmilia fastigiata</i> (Pallas)                        | <i>Panjakus hydnohorae</i>                          |
| <i>Schedomolgus lobophorus</i>  | <i>Corallonoxia baki</i>                                   | <i>Lobophyllia corymbosa</i> (Forskaal)             |
| <i>Acropora palmata</i> (Lamarck)   | <i>Favia favaus</i> (Forskaal)                             | <i>Orstomella lobophylliae</i>                      |
| <i>Coralloxenia similis</i>   | <i>Cerioxynus alatus</i>                                   | <i>Lobophyllia costata</i> (Dana)                   |
| <i>Acropora palifera</i> (Lamarck)  | <i>Favia</i> sp.   | <i>Orstomella lobophylliae</i>                      |
| <i>Schedomolgus arcuatipes</i>  | <i>Amarda compta</i>                                       | <i>Manicina areolata</i> (Linnaeus)                 |
| <i>Xarifia anomala</i>  | <i>Amarda cultrata</i>                                     | forma <i>mayori</i>                                 |
| <i>Acropora scherzeriana</i> Brueggemann                                  | <i>Anchimolgus digitatus</i>                               | <i>Coralloxenia longibrachium</i>                   |
| <i>Schedomolgus lobophorus</i>  | <i>Andrianellus exsertidens</i>                            | <i>Coralloxenia</i>                                 |
| <i>Acropora</i> sp. cf. <i>A. teres</i> (Verrill)                         | <i>Rakota proteus</i>                                      | mediobranchium                                      |
| <i>Xarifia gerlachi</i>   | <i>Orstomella javiae</i>                                   | <i>Meandrina meandrites</i> (Linnaeus)              |
| <i>Acropora</i> sp.   | <i>Stockia indica</i>                                      | <i>Corallonoxia longicauda</i>                      |
| <i>Schedomolgus lobophorus</i>  | <i>Favites halicora</i> (Ehrenberg)                        | <i>Merulina ampliata</i> (Ellis and Solander)       |
| <i>Spaniomolgus crassus</i>   | <i>Cerioxynus faviticulus</i>                              | <i>Amardopsis merulinae</i>                         |
| <i>Spaniomolgus geminus</i>   | <i>Favites pentagona</i> (Esper)                           | <i>Montastraea annularis</i> (Ellis and Solander)   |
| <i>Xarifia</i> sp.  | <i>Cerioxynus moluccensis</i>                              | <i>Coralloxenia</i> sp.                             |
| <i>Alveopora catalai</i> Wells  | <i>Rakotoa ceramensis</i>                                  | <i>Montastraea brasiliiana</i> (Verrill)            |
| <i>Odontomolgus mundulus</i>  | <i>Favites virens</i> (Dana)                               | <i>Coralloxenia dorsospinosa</i>                    |
| <i>Alveopora mortenseni</i> Crossland                                     | <i>Cerioxynus bandensis</i>                                | <i>Coralloxenia ventrospinosa</i>                   |
| <i>Odontomolgus mundulus</i>  | <i>Fungia (Heliofungia) aciniformis</i> (Quoy and Gaimard) | <i>Montastraea cavernosa</i> (Linnaeus)             |
| <i>Alveopora mortenseni</i> Crossland                                     | <i>Anchimolgus notatus</i>                                 | <i>Coralloxenia dorsospinosa</i>                    |
| <i>Odontomolgus mundulus</i>  | <i>Anchimolgus pandus</i>                                  | <i>Coralloxenia dorsospinosa</i> var. <i>minor</i>  |
| <i>Alveopora</i> sp.  | <i>Odontomolgus decens</i>                                 | <i>Coralloxenia ventrospinosa</i>                   |
| <i>Odontomolgus campulus</i>  | <i>Fungia (Ctenactis) echinata</i> (Pallas)                | <i>Peltomyzon rostratum</i>                         |
| <i>Xarifia brevicauda</i>   | <i>Anchimolgus laiens</i>                                  | <i>Montipora compressa</i> (Esper)                  |
| <i>Colpophyllia natans</i> (Müller)                                       | <i>Anchimolgus pandus</i>                                  | <i>Haplomolgus montiporae</i>                       |
| <i>Coralloxenia kristenseni</i>   | <i>Anchimolgus tener</i>                                   | <i>Odontomolgus forhani</i>                         |
| <i>Coralloxenia longibrachium</i>   | <i>Mycoxynus fungianus</i>                                 | <i>Montipora foliacea</i>                           |
| <i>Coralloxenia mixtibrachium</i>   | <i>Fungia (Fungia) fungites</i> (Linnaeus)                 | <i>Indoclausia bacescui</i>                         |
| <i>Dendrogyra cylindrus</i> Ehrenberg                                     | <i>Anchimolgus latens</i>                                  | <i>Montipora prolifera</i>                          |
| <i>Corallonoxia baki</i>  | <i>Anchimolgus punctilis</i>                               | <i>Odontomolgus forhani</i>                         |
| <i>Corallonoxia longicauda</i>  | <i>Odontomolgus scitulus</i>                               | <i>Montipora sinensis</i> Bernard                   |
| <i>Dendrophyllia micranthus</i> Kükenenthal var. <i>grandis</i> Crossland | <i>Fungia (Pleuactis) paumotuensis</i> Stutchbury          | <i>Haplomolgus montiporae</i>                       |
| <i>Cholomyzon palpiferum</i>  | <i>Anchimolgus latens</i>                                  | <i>Xarifia temnura</i>                              |
| <i>Dendrophyllia nigrescens</i> Dana                                      | <i>Anchimolgus notatus</i>                                 | <i>Montipora</i> sp. cf. <i>M. stellata</i> Bernard |
| <i>Cholomyzon palpiferum</i>  | <i>Anchimolgus orectus</i>                                 | <i>Haplomolgus montiporae</i>                       |
| <i>Dendrophyllia</i> sp.  | <i>Anchimolgus pandus</i>                                  | <i>Montipora</i> sp. cf. <i>M. undata</i> Bernard   |
| <i>Cholomyzon palpiferum</i>  | <i>Anchimolgus punctilis</i>                               | <i>Allopodion mirum</i>                             |
| <i>Dichocoenia stokesii</i> Milne Edwards and Haime                       | <i>Paramarda aculeata</i>                                  | <i>Haplomolgus subdeficiens</i>                     |
| <i>Corallonoxia</i> sp.   | <i>Galaxea fascicularis</i> (Linnaeus)                     | <i>Kawanolus paragensis</i>                         |
| <i>Diploria clivosa</i> (Ellis and Solander)                              | <i>Anchimolgus contractus</i>                              | <i>Montipora</i> sp.                                |
| <i>Coralloxenia mediobranchium</i>  | <i>Anchimolgus digitatus</i>                               | <i>Asteropontius corallophilus</i>                  |
| <i>Diploria labyrinthiformis</i> (Linnaeus)                               | <i>Odontomolgus campulus</i>                               | <i>Haplomolgus montiporae</i>                       |
| <i>Coralloxenia brevibrachium</i>   | <i>Halomitra philippinensis</i> Studer                     | <i>Pachyseris speciosa</i> (Dana)                   |
| <i>Diploria strigosa</i> (Dana)   | <i>Odontomolgus fultus</i>                                 | <i>Prionomolgus lanceolatus</i>                     |
| <i>Coralloxenia longibrachium</i>   | <i>Paramarda aculeata</i>                                  | <i>Xarifia exigua</i>                               |
| <i>Coralloxenia mediobranchium</i>  | <i>Herpolitha Umax</i> (Esper)                             | <i>Xarifia lamellispinosa</i> (Gardiner)            |
|   | <i>Anchimolgus latens</i>                                  | <i>Paralialomitra irregularis</i> (Quelch)          |
|   | <i>Mycoxynus villosus</i>                                  | <i>Mycoxynus longicauda</i>                         |
|   |  | <i>Parahalomitra robusta</i> (Quelch)               |
|   |  | <i>Anchimolgus convexus</i>                         |
|   |  | <i>Anchimolgus tener</i>                            |



|   |   |   |
|---|---|---|
| <i>Pavona unguata</i> Klunzinger                                | <i>Pocillopora verrucosa</i> (Ellis and Solander)                   | <i>Psammocora contigua</i> (Esper)                            |
| <i>Odontomolgus actinophorus</i>                                | <i>Xarifia cornata</i>  | <i>Monomolgus psammocorae</i>                                 |
| <i>Xarifia longipes</i>   | <i>Xarifia obesa</i>  | <i>Odontomolgus rhadinus</i>                                  |
| <i>Pavona cactus</i> (Forskaal)                                 | <i>Xarifia serrata</i>  | <i>Rhynchomolgus corallophilus</i>                            |
| <i>Odontomolgus actinophorus</i>                                |   | <i>Xarifia diminuta</i>                                       |
| <i>Pavona danai</i> (Milne Edwards and Haime)                   | <i>Pocillopora</i> sp. cf. <i>P. verrucosa</i> (Ellis and Solander) | <i>Psammocora</i> sp.   |
| <i>Odontomolgus actinophorus</i>                                | <i>Xarifia cornata</i>  | <i>Kombia angulata</i>  |
| <i>Pavona danai</i> or <i>Pavona angularis</i> (Klunzinger)     | <i>Xarifia obesa</i>  | <i>Seriatopora caliendrum</i> Ehrenberg                       |
| <i>Odontomolgus actinophorus</i>                                | <i>Xarifia serrata</i>  | <i>Xarifia reducta</i>  |
| <i>Pavona ? venusta</i> (Dana)                                  | <i>Pocillopora</i> sp.  | <i>Seriatopora octoptera</i> Ehrenberg                        |
| <i>Odontomolgus actinophorus</i>                                | <i>Xarifia fimbriata</i>  | <i>Spaniomolgus compositus</i>                                |
| <i>Pavona</i> sp.   | <i>Xarifia maldivensis</i>  | <i>Xarifia reducta</i>  |
| <i>Odontomolgus rhadinus</i>                                    | <i>Polyphyllia talpina</i> (Lamarck)                                | <i>Seriatopora subseriata</i> Ehrenberg                       |
| <i>Platygyra astreiformis</i> (Milne Edwards and Haime)         | <i>Anchimolgus pondus</i>   | <i>Spaniomolgus compositus</i>                                |
| <i>Panjakus platygyrae</i>                                      | <i>Porites</i> (Synaraea) <i>monticulosa</i> (Dana)                 | <i>Xarifia reducta</i>  |
| <i>Platygyra daedala</i> (Ellis and Solander)                   | <i>Kombia imminens</i>  | <i>Seriatopora subseriata</i> Ehrenberg                       |
| <i>Panjakus platygyrae</i>                                      | <i>Porites nigrescens</i> Dana                                      | <i>Spaniomolgus compositus</i>                                |
| <i>Andrianellus exsertidens</i>                                 | <i>Monomolgus baculigerus</i>                                       | <i>Xarifia serrata</i>  |
| <i>Platygyra ? lamellina</i> (Ehrenberg)                        | <i>Porites somaliensis</i> Gravier                                  | <i>Seriatopora</i> sp.  |
| <i>Panjakus platygyrae</i>                                      | <i>Kombia angulata</i>  | <i>Spaniomolgus compositus</i>                                |
| <i>Platygyra</i> sp. cf. <i>P. daedala</i> (Ellis and Solander) | <i>Porites</i> sp. cf. <i>P. andrewsi</i> Vaughan                   | <i>Stylophora mordax</i> (Dana)                               |
| <i>Panjakus platygyrae</i>                                      | <i>Anchimolgus prolixipes</i>                                       | <i>Spaniomolgus crassus</i>                                   |
| <i>Platygyra</i> sp.  | <i>Monomolgus unihastatus</i>                                       | <i>Spaniomolgus geminus</i>                                   |
| <i>Bradypontius pichoni</i>                                     | <i>Ravahina tumida</i>  | <i>Xarifia decorata</i>                                       |
| <i>Plerogyra</i> sp.  | <i>Porites</i> sp. cf. <i>P. nigrescens</i> Dana                    | <i>Xarifia lissa</i>  |
| <i>Gelastomolgus spondyli</i> (accidental?)                     | <i>Anchimolgus prolixipes</i>                                       | <i>Stylophora pistillata</i> (Esper)                          |
| <i>Pocillopora bulbosa</i> Ehrenberg                            | <i>Kombia angulata</i>  | <i>Asteropontius corallophilus</i>                            |
| <i>Xarifia serrata</i>  | <i>Monomolgus unihastatus</i>                                       | <i>Spaniomolgus crassus</i>                                   |
| <i>Pocillopora damicornis</i> Dana                              | <i>Porites</i> (Synaraea) sp.                                       | <i>Spaniomolgus geminus</i>                                   |
| <i>Asteropontius corallophilus</i>                              | <i>Anchimolgus prolixipes</i>                                       | <i>Xarifia decorata</i>                                       |
| <i>Monocheres mauritanus</i>                                    | <i>Kombia angulata</i>  | <i>Xarifia lissa</i>  |
| <i>Xarifia serrata</i>  | <i>Porites</i> sp.  | <i>Stylophora subseriata</i> (Ehrenberg)                      |
| <i>Pocillopora damicornis</i> forma favosa                      | <i>Anchimolgus prolixipes</i>                                       | <i>Asteropontius corallophilus</i>                            |
| <i>Asteropontius corallophilus</i>                              | <i>Asteropontius corallophilus</i>                                  | <i>Stylophora</i> sp. cf. <i>S. erythraea</i> von Marenzeller |
| <i>Pocillopora danae</i> Verrill                                | <i>Kombia angulata</i>  | <i>Asteropontius corallophilus</i>                            |
| <i>Xarifia obesa</i>  | <i>Monomolgus unihastatus</i>                                       | <i>Stylophora</i> sp.   |
|   | <i>Xenomolgus varius</i>  | <i>Spaniomolgus compositus</i>                                |
|   | <i>Porites</i> , young colony                                       | <i>Xarifia</i> sp.  |
|   | <i>Kombia angulata</i>  | <i>Turbinarla</i> sp.   |
|   |   | <i>Xarifia hamata</i>   |

### Acknowledgments

The copepods were collected by the author during the *Alpha Helix* East Asian Bioluminescence Expedition, which was supported by the National Science Foundation of the United States under grants OFS 74 01830 and OFS 74 02888 to the Scripps Institutions of Oceanography and grant BMS 74 23242 to the University of California, Santa Barbara. The study of the copepods was aided by NSF grant DEB 77 11879.

I thank Dr. John W. Wells, Department of Geological Sciences, Cornell University, for the identification of the corals from the Moluccas.

### Summary

The author records six coral-inhabiting Copepods from the Moluccas: *Mycoxynus villosus* n. sp., associated with *Herpolitha Umax*; *Anchimolgus digitatus* (Humes and Ho, 1968), with *Goniopora tenuidens*; *Anchimolgus tener* Humes, 1973, with *Fungia echinata* and *Parahalomitra robusta*; *Panjakus hydnothorae* Humes and Stock, 1973, with *Hydnophora exesa*; *Monomolgus baculigerus* n. sp., with *Porites nigrescens* and *Kombia imminens* n. sp. with *Porites* (Synaraea) *monticulosa*.

A synopsis of cyclopoids associated with scleractinians contains about 102 copepods and 99 hosts.

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