

Lichomolgid Copepods (Cyclopoida)
Associated with Fungiid Corals
(Scleractinia) in the Moluccas

ARTHUR G. HUMES

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ABSTRACT

Humes, Arthur G. Lichomolgid Copepods (Cyclopoida) Associated with Fungiid Corals (Scleractinia) in the Moluccas. *Smithsonian Contributions to Zoology*, number 253, 48 pages, 30 figures, 1 table, 1978.—Eleven cyclopoid copepods (Lichomolgidae), 10 of them new, are reported from eight fungiid corals belonging to five genera in the Moluccas: *Paramarda aculeata*, new genus, new species, from *Halomitra philippinensis* and *Fungia (Pleuractis) paumotuensis*; *Anchimgolus notatus*, new species, from *Fungia actiniformis* and *Fungia paumotuensis*; *Anchimgolus latens*, new species, from *Fungia echinata*, *Fungia fungites*, *Fungia paumotuensis*, and *Herpolitha limax*; *Anchimgolus pandus*, new species, from *Fungia echinata*, *Fungia paumotuensis*, *Fungia actiniformis*, and *Polyphyllia talpina*; *Anchimgolus punctilis*, new species, from *Fungia paumotuensis* and *Fungia fungites*; *Anchimgolus orectus*, new species, from *Fungia paumotuensis*; *Anchimgolus convexus*, new species, from *Parahalomitra robusta*; *Anchimgolus tener* Humes, 1973, from *Parahalomitra robusta* and *Fungia echinata*; *Odontomolgus decens*, new species, from *Fungia actiniformis*; *Odontomolgus fultus*, new species, from *Halomitra philippinensis*; and *Mycoxynus fungianus*, new species from *Fungia echinata*.

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Lichomolgid Copepods (Cyclopoida) Associated with Fungiid Corals (Scleractinia) in the Moluccas

Arthur G. Humes

Introduction

Lichomolgid copepods from fungiid corals were first reported from New Caledonia (Humes, 1973), where three species were found: *Anchimoligus tener* Humes, 1973, from *Fungia (Ctenactis) echinata* (Pallas), *Odontomolgus scitulus* Humes, 1973, from *Fungia (Fungia) fungites* (Linnaeus), and *Mycoxynus longicauda* Humes, 1973, from *Parahalomitra irregularis* (Gardiner).

During field work in the Moluccas in April and May of 1975, 11 species of Lichomolgidae were recovered from eight species of Fungiidae. These copepods comprise one new genus, 10 new species, and one new host record, and are listed as follows:

Anchimoligus notatus, new species

from *Fungia (Heliofungia) actiniformis* (Quoy and Gaimard) and *Fungia (Pleuractis) paumotuensis* Stutchbury

Anchimoligus latens, new species

from *Fungia (Ctenactis) echinata* (Pallas), *Fungia (Fungia) fungites* Linnaeus, *Fungia (Pleuractis) paumotuensis*, and *Herpolitha limax* (Esper)

Anchimoligus pandus, new species

from *Fungia (Ctenactis) echinata*, *Fungia (Pleuractis) paumotuensis*, *Fungia (Heliofungia) actiniformis*, and *Polyphyllia talpina* (Lamarck)

Anchimoligus punctilis, new species

from *Fungia (Pleuractis) paumotuensis* and *Fungia (Fungia) fungites*

Anchimoligus orectus, new species

from *Fungia (Pleuractis) paumotuensis*

Anchimoligus convexus, new species

from *Parahalomitra robusta* (Quelch)

Anchimoligus tener Humes, 1973

from *Parahalomitra robusta* and *Fungia (Ctenactis) echinata*

Mycoxynus fungianus, new species

from *Fungia (Ctenactis) echinata*

Odontomolgus decens, new species

from *Fungia (Heliofungia) actiniformis*

Odontomolgus fultus, new species

from *Halomitra philippinensis* Studer

Paramarda aculeata, new genus, new species

from *Halomitra philippinensis* and *Fungia (Pleuractis) paumotuensis*

The copepods were collected by the author during the *Alpha Helix* East Asian Bioluminescence Expedition, which was supported by the National Science Foundation under grants OFS 74 01830 and OFS 74 02888 to the Scripps Institution of Oceanography and grant BMS 74 23242 to the University of California, Santa Barbara. The study of the copepods was aided by NSF grant BMS 74 17652.

The corals were isolated in plastic bags or pails of seawater immediately after collection in the field. Upon return to the ship the corals were placed in a cold room, where they remained for varying lengths of time until they could be examined. After removal from the cold room a small amount of 95 percent ethyl alcohol was added to each container sufficient to make about a 5 percent solution. The corals were allowed to remain in this for an hour or longer. Then they were vigorously and thoroughly washed by agitation. The water was then passed through a fine net (120 holes per inch) and

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the copepods were picked from the sediment retained.

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

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, P = paragnath, MXP = maxilliped, and P_1 = leg 1.

The measurements were made on specimens in lactic acid and are expressed in micrometers (microns) unless otherwise stated. The body length does not include the setae on the caudal rami. The lengths of the first antennal segments were measured along their posterior nonsetiferous margins.

Specimens that are deposited in the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, D.C., are listed under the catalog numbers of the former United States National Museum (USNM).

LICHOMOLGIDAE Kossmann, 1877

Anchimolgus Humes and Stock, 1972

Anchimolgus notatus, new species

FIGURES 1-3

TYPE MATERIAL.—149 ♀♀, 354 ♂♂, and 315 copepodids from two fungiid corals, *Fungia* (*Heliofungia*) *actiniformis* (Quoy and Gaimard), in 2 m, southern end of Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 2 May 1975. Holotype ♀, allotype, and 495 paratypes (145 ♀♀, 350 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) and the copepodids in the collection of the author.

OTHER SPECIMENS.—From *Fungia actiniformis*: 27 ♀♀, 31 ♂♂, and 3 copepodids from 8 hosts, in 3 m, Natsepa, Ambon, 3°37'05"S, 128°17'00"E, 24 April 1975.

From *Fungia* (*Pleuractis*) *paumotuensis* Stutchbury: 4 ♀♀, 12 ♂♂ from 2 hosts, in 2 m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 2 May 1975.

FEMALE.—Body (Figure 1a) with moderately

broad and flattened prosome. Length 1.40 mm (1.36–1.43 mm) and greatest width 0.66 mm (0.61–0.68 mm), based on 10 specimens. Epimera of segments of legs 1–3 pointed posteriorly but those of segment of leg 4 rounded. Ratio of length to width of prosome 1.46 : 1. Ratio of length of prosome to that of urosome 2.13 : 1.

Segment of leg 5 (Figure 1b) 78 × 224. Genital segment in dorsal view 198 long, 185 wide in its slightly expanded anterior three-fourths where the sides are nearly parallel, and 127 wide in its posterior fourth. Genital areas situated dorsolaterally near middle of segment. Each area (Figure 1c) with two small naked setae 9 long and a minute spiniform process. Three postgenital segments from anterior to posterior 60 × 112, 47 × 104, and 47 × 101. Posteroventral margin of anal segment with row of minute spinules on both sides.

Caudal ramus (Figure 1d) short, 73 × 48, with ratio of 1.5 : 1. Outer lateral seta 91, dorsal seta 90, outermost terminal seta 213, innermost terminal seta 247, and two median terminal setae 352 (outer) and 396 (inner), both somewhat swollen and inserted between smooth dorsal flange and ventral flange with minute marginal spinules. Dorsal seta sparsely haired, but remaining setae with many long hairs.

Body surface with a few small hairs (sensilla) as in Figure 1a.

Egg sac (Figure 1a) 462 × 231, containing approximately 25 eggs about 91 in average diameter.

Rostrum (Figure 1e) broadly rounded. First antenna (Figure 1f) 609 long. Lengths of seven segments 36 (91 along anterior margin), 156, 39, 153, 86, 60, and 24 respectively. Formula: 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. Long seta on distal anterior corner of second segment swollen proximally (Figure 1g). All setae naked except four on last segment, which are lightly feathered.

Second antenna (Figure 1h) 423 long. First and second segments with minute inner seta. Third segment with three small inner distal setae. Fourth segment 81 along outer edge, 49 along inner edge, and 23 wide. Claw 58 along axis. A minute setule near insertion of claw.

Labrum (Figure 1i) with two broad posteroventral lobes. Mandible (Figure 2a) having on convex side two digitiform processes followed by serrated fringe and bearing on concave side two lobes with

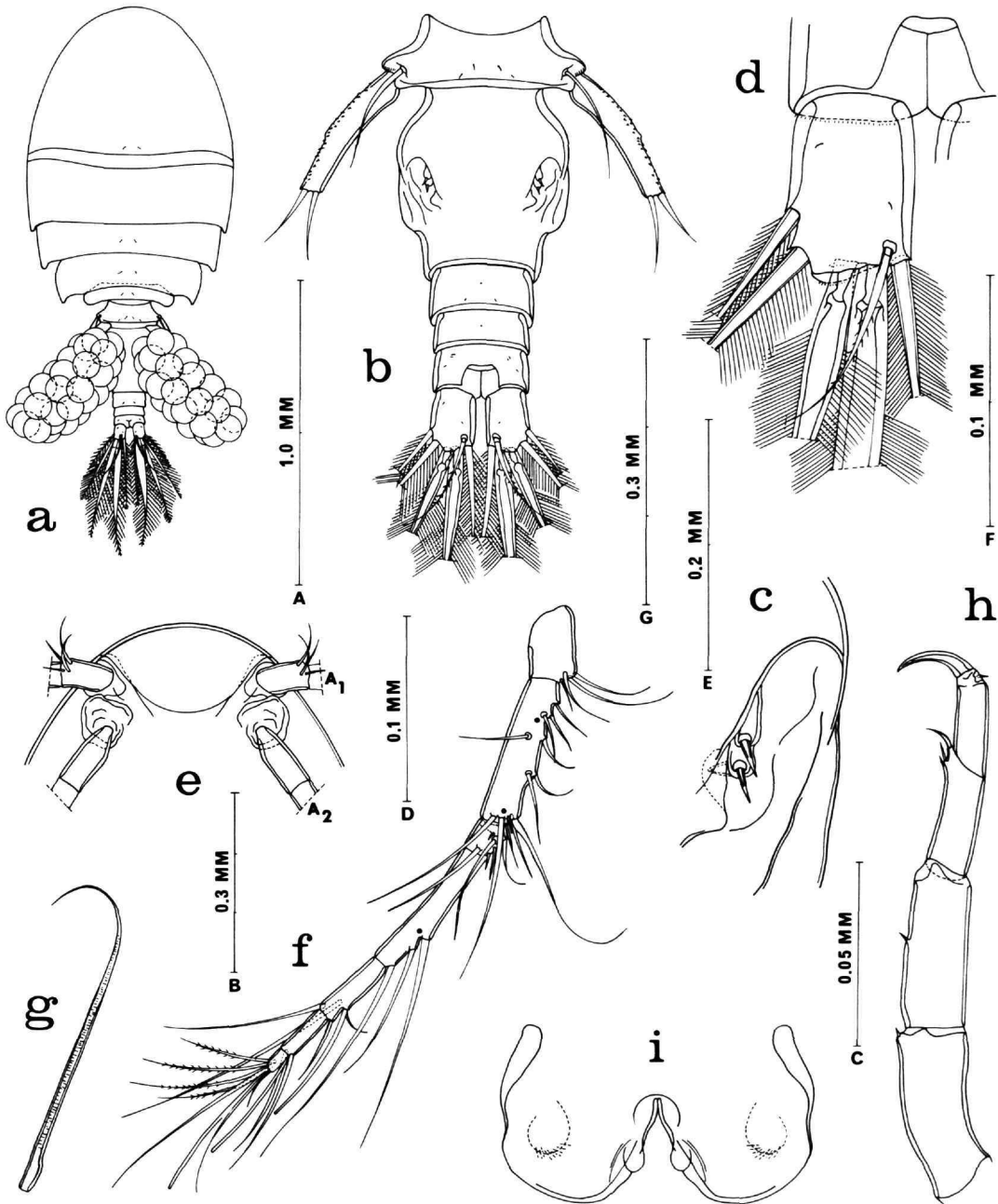


FIGURE 1.—*Anchimoligus notatus*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, genital area, dorsal (C); *d*, caudal ramus, dorsal (F); *e*, rostrum, ventral (B); *f*, first antenna, with three round dots indicating positions of aesthetes added in male, dorsal (G); *g*, seta with swollen base on segment 2 of first antenna, dorsal (D); *h*, second antenna, antero-inner (E); *i*, labrum, with paragnaths indicated by broken lines, ventral (F).

long spinules; lash moderately short with spinules. Paragnath (Figure 1i) a small lobe with hairs. First maxilla (Figure 2b) with four setae. Second maxilla (Figure 2c) with a few hairs on distal outer posterior surface of first segment; second segment with inner seta bearing spinules on both sides. Maxilliped (Figure 2d) with second segment having two small naked setae; small third segment with two setae and terminating in sharply pointed process.

Ventral area between maxillipeds and first pair of legs (Figure 2e) not protuberant.

Legs 1-4 (Figure 2f-i) with 3-segmented rami except for endopod of leg 4, which is 2-segmented. Formula for armature (Roman numerals indicating spines, Arabic numerals representing setae):

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

Coxa of leg 1 with rounded lobe on outer posterior surface. Third segment of endopod of legs 2 and 3 with outer spine nearly twice length of two terminal spines. Leg 4 with inner coxal seta small, 7.5, and naked. Exopod 175. First segment of endopod 17.5 × 14, with distal inner feathered seta 78. Second segment 78 × 12, with two terminal fringed spines 19 (outer) and 42 (inner). Both endopod segments haired along outer margins.

Leg 5 (Figure 2k) with long slender free segment having slight inner proximal expansion and slight notch on outer margin; length 167, width at expansion 29, and width distally 21. Two terminal naked setae 65 and 57. Segment ornamented with small spines along outer surface. Dorsal seta naked and 101. A few spinules on corner of body segment. In one female leg 5 shorter and wider, 130 × 31 (Figure 2j).

Leg 6 represented by two setae on genital area (Figure 1c).

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

MALE.—Body (Figure 3a) a little more slender than that of female. Length 1.26 mm (1.19-1.37 mm) and greatest width 0.49 mm (0.45-0.55 mm), based on 10 specimens. Ratio of length to width

of prosome 1.48 : 1. Ratio of length of prosome to that of urosome 1.40 : 1.

Segment of leg 5 (Figure 3b) 55 × 164. Genital segment slightly longer than wide, 286 × 253 (length including leg 6). Four postgenital segments from anterior to posterior 42 × 86, 42 × 91, 34 × 94, and 47 × 94.

Caudal ramus similar to that of female, but smaller, 57 × 44, with ratio of 1.30 : 1.

Rostrum like that of female. First antenna resembling that of female, but three long aesthetes added (at points indicated by round dots in Figure 1f). Formula: 4, 13 + 2 aesthetes, 6, 3 + 1 aesthete, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete.

Second antenna (Figure 3c) differing from that of female in having small spines on inner surfaces of segments 1-3.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 3d, e) with first segment having distinct knoblike process on outer surface. Second segment with two naked setae (one of them swollen proximally as in Figure 3f) and a row of spines. Small third segment unarmed. Claw 300 along axis (including large terminal lamella), divided in mid-region, and having two unequal proximal setae, longer seta distally bent with small spinules along one side.

Ventral area between maxillipeds and first pair of legs similar to that in female.

Leg 1 with endopod formula 0-1; 0-1; II, 4 (Figure 3g), but otherwise as in female. Legs 2-4 like those of female.

Leg 5 (Figure 3h) with free segment 73 × 12.5, shorter than in female and without marginal notch. Two terminal setae 15 (inner) and 44 (outer.)

Leg 6 (Figure 3i) a posteroventral flap on genital segment bearing two naked setae about 47.

Spermatophore not observed.

Living specimens with color similar to that of female.

ETYMOLOGY.—The specific name *notatus* (Latin, = marked or distinguished) alludes to the various small but distinctive features of this species.

COMPARISON WITH OTHER SPECIES OF *Anchimolgus*.—Until now three species of *Anchimolgus* have been known, all from scleractinian corals. These species are: *Anchimolgus digitatus* (Humes and Ho, 1968) from *Goniopora* in Madagascar, *Anchimolgus prolixipes* (Humes and Ho, 1968) from *Porites* in

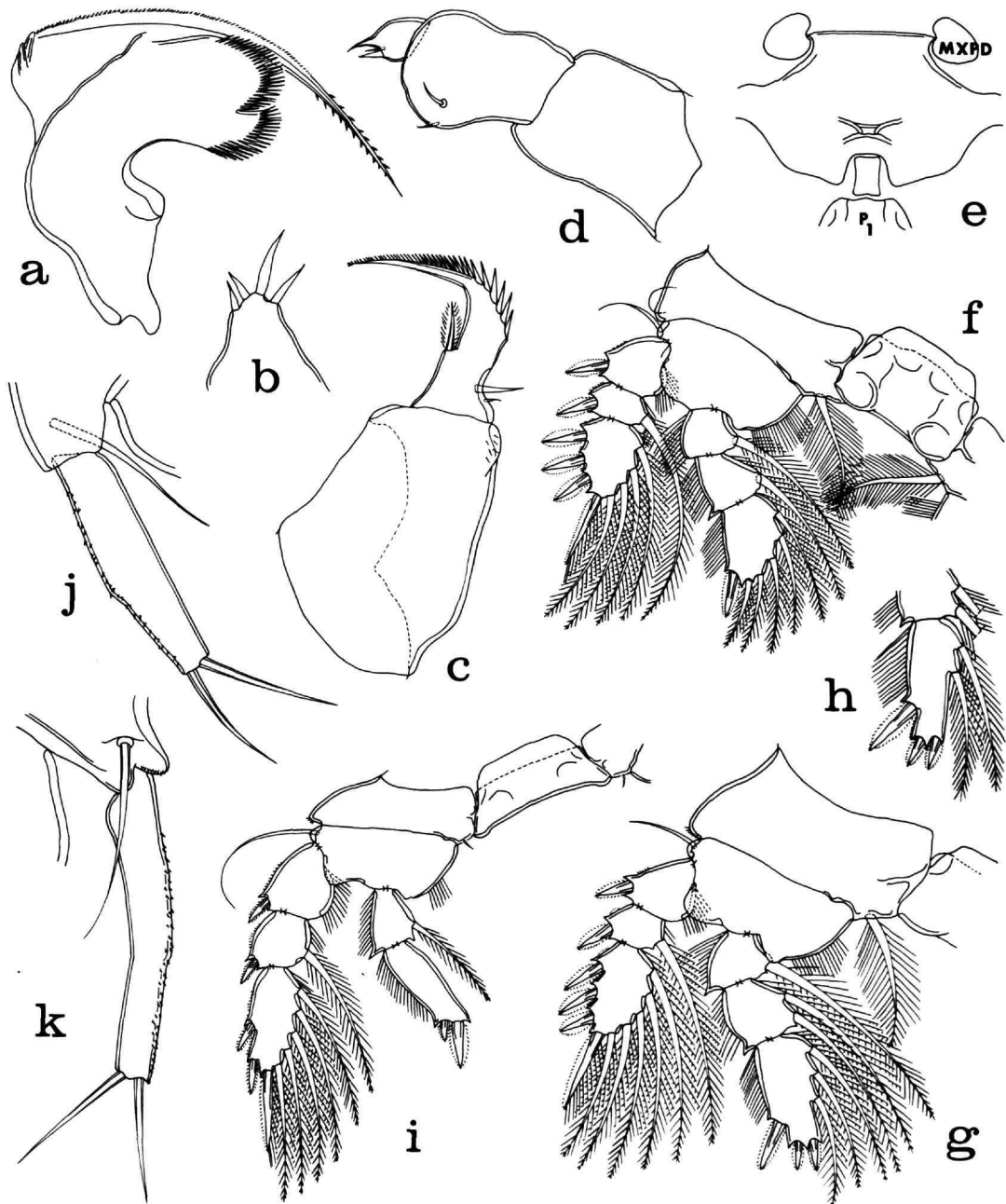


FIGURE 2.—*Anchimoligus notatus*, new species, female: *a*, mandible, posterior (C); *b*, first maxilla, ventral (F); *c*, second maxilla, posterior (F); *d*, maxilliped, antero-inner (F); *e*, area between maxillipeds and first pair of legs, ventral (G); *f*, leg 1 and intercoxal plate, anterior (E); *g*, leg 2, anterior (E); *h*, third segment of endopod of leg 3, anterior (E); *i*, leg 4 and intercoxal plate, anterior (E); *j*, leg 5, ventral (D); *k*, leg 5, dorsal (D).

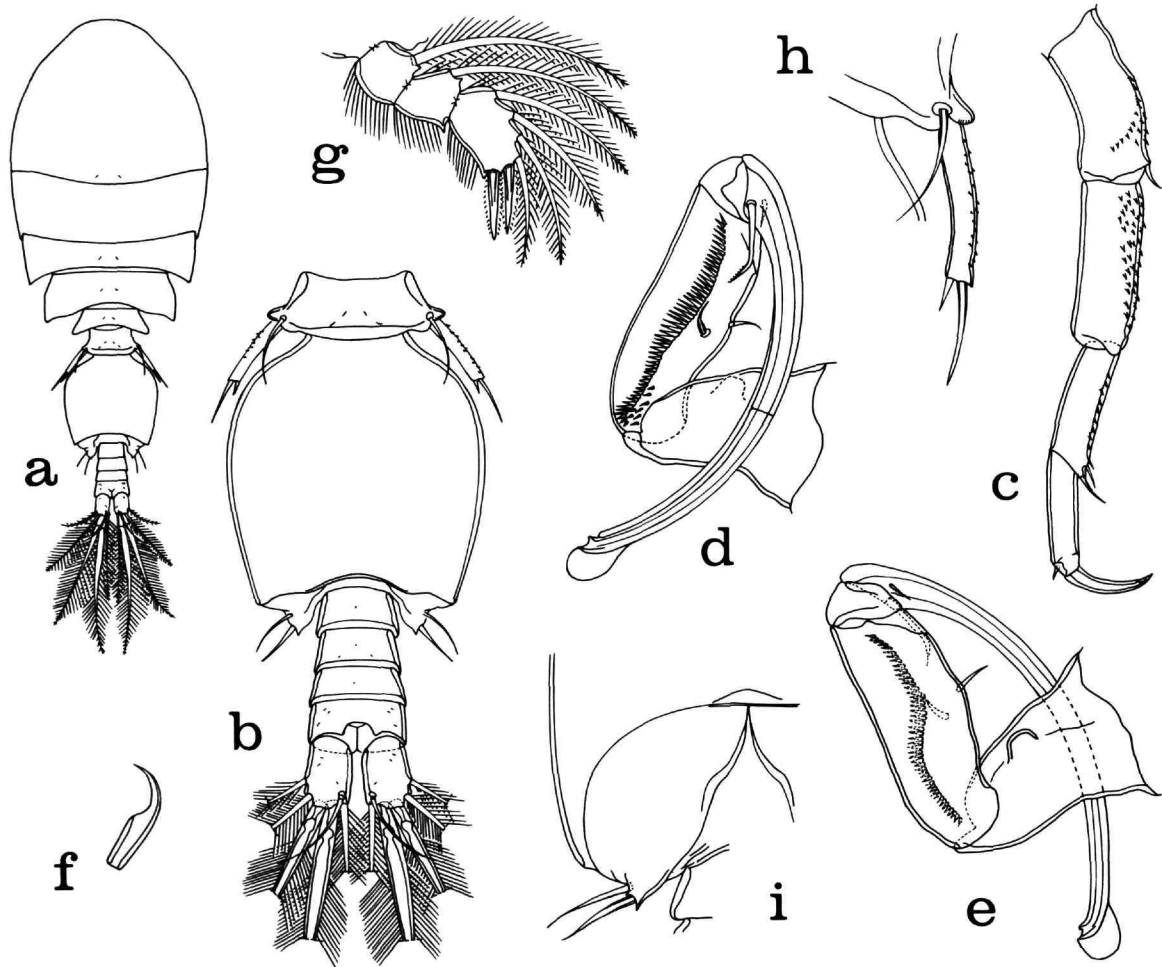


FIGURE 3.—*Anchimolgus notatus*, new species, male: a, dorsal (A); b, urosome, dorsal (G); c, second antenna, antero-inner (E); d, maxilliped, inner (E); e, maxilliped, outer (E); f, modified seta on second segment of maxilliped, inner (C); g, endopod of leg 1, anterior (E); h, leg 5, dorsal (D); i, leg 6, ventral (E).

Madagascar, and *Anchimolgus tener* Humes, 1973, from *Fungia* in New Caledonia.

Anchimolgus notatus may be distinguished from all three known species by the relative lengths of the three spines on the third endopod segment of legs 2 and 3. In the new species the outer spine is nearly twice the length of the two terminal spines, a condition not seen in the three previously described forms. Furthermore, in the new species the caudal ramus is shorter (female 1.5 : 1, male 1.3 : 1) than in any of the three previously known species

(where the ratio in the female is at least 2.65 : 1 or longer and in the male 2.0 : 1 or longer).

Anchimolgus latens, new species

FIGURES 4-6

TYPE MATERIAL.—9 ♀♀, 11 ♂♂ from one *Fungia* (*Ctenactis echinata* (Pallas), in 3 m, southwestern side of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 25 May 1975. Holotype ♀,

allotype, and 15 paratypes (7 ♀♀, 9 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

OTHER SPECIMENS.—From *Fungia echinata*: 1 ♀, 1 ♂ from one host, in 5 m, Poelau Gomumu, south of Obi, Moluccas, 1°50'00"S, 127°30'54"E, 30 May 1975.

From *Fungia (Fungia) fungites* (Linnaeus): 13 ♀♀, 43 ♂♂ from 11 hosts, in 3 m, Natsepa, Ambon, 3°37'05"S, 128°17'00"E, 24 April 1975.

From *Fungia (Pleuractis) paumotuensis* Stutchbury: 1 ♀, 3 ♂♂ from 2 hosts, in 2 m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 2 May 1975.

From *Herpolitha limax* (Esper): 13 ♀♀, 43 ♂♂ from one host, in 2 m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 8 May 1975.

FEMALE.—Body (Figure 4a) with prosome slender and moderately thickened dorsoventrally. Length 1.52 mm (1.43–1.68 mm) and greatest width 0.49 mm (0.45–0.55 mm), based on 9 specimens. Epimera of segment of leg 1 inconspicuous, those of segment of leg 2 pointed posteriorly, those of segment of leg 3 truncated, and those of small segment of leg 4 rounded. Ratio of length to width of prosome 1.85:1. Ratio of length of prosome to that of urosome 1.57:1.

Segment of leg 5 (Figure 4b) 91 × 228. Genital segment 260 long, 194 in greatest width, and 118 in least width. Anterior two-thirds of segment expanded with slightly undulating margins in dorsal view. Genital areas located dorsolaterally just in front of middle of segment. Each area (Figure 4c) with two small naked setae about 20 and a small spiniform process. Postgenital segments from anterior 101 × 101, 81 × 91, and 86 × 96. Posteroventral margin of anal segment with row of minute spinules on both sides.

Caudal ramus (Figure 4d) elongated, 135 × 45, with ratio of 3:1. Outer lateral seta 125, dorsal seta 65, outermost terminal seta 154, innermost terminal seta 200, and two long median terminal setae 231 (outer) and 308 (inner), both inserted between smooth dorsal flange and ventral flange with minute marginal spinules. All setae with long dense lateral hairs except dorsal seta, which is naked.

Body surface with a few hairs (sensilla) as in Figure 4a.

Egg sac (Figure 4e) oval, variable in length, approximately 385–460 × 200, containing 12–13 irregular eggs with diameter 104–117.

Rostrum (Figure 4f) in ventral view with weakly defined posteroventral edge; in lateral view (Figure 4g) projecting triangularly. First antenna (Figure 4h) 465 long. Lengths of seven segments: 29 (63 along anterior margin), 138, 33, 99, 68, 45, and 19 respectively. Setation as in *Anchimolgus notatus*. Longest seta on first segment noticeably stouter than other antennal setae. All setae naked.

Second antenna (Figure 4i) 385 long. Formula for armature as in *A. notatus*, but minute setae on first two segments hyaline and obscure. Second segment with small slender spinules on inner surface. Fourth segment 63 along outer side, 45 along inner side, and 13 wide. Claw 36 along axis.

Labrum (Figure 4j) with two broad posteroventral lobes. Mandible (Figure 4k) and paragnath (Figure 4l) resembling those of *A. notatus*. First maxilla (Figure 4l) with four setae. Second maxilla (Figure 5a) similar to that of *A. notatus*, but spinules on inner seta on second segment much longer on inner side than on outer side. First spine on lash stouter and less pointed than succeeding spines. First segment lacking fine ornamentation. Maxilliped (Figure 5b) much like that of *A. notatus*, but pointed tip with a few spinules on both sides.

Ventral area between maxillipeds and first pair of legs as in *A. notatus*.

Legs 1–4 (Figure 5c–f) segmented and armed as in *A. notatus*. Third segment of endopod of legs 2 and 3 with outer spine shorter than inner terminal spine. Leg 4 with small naked coxal seta 15 long. Exopod 213. First segment of endopod 44 long including spiniform processes (39 without these processes) and 34 wide, its inner distal plumose seta 78. Second segment 68 with spiniform processes (65 without processes) and 24 in greatest width (18 in least width); two terminal fringed spines 39 (outer) and 70 (inner). Outer margin of both segments with hairs.

Leg 5 (Figure 5g) with long free segment 135, its greatest width at slight inner proximal expansion 34, its least width distally 26. Two terminal naked setae 81 and 60. Segment ornamented with small spines along outer surface. Dorsal seta 80 and naked.

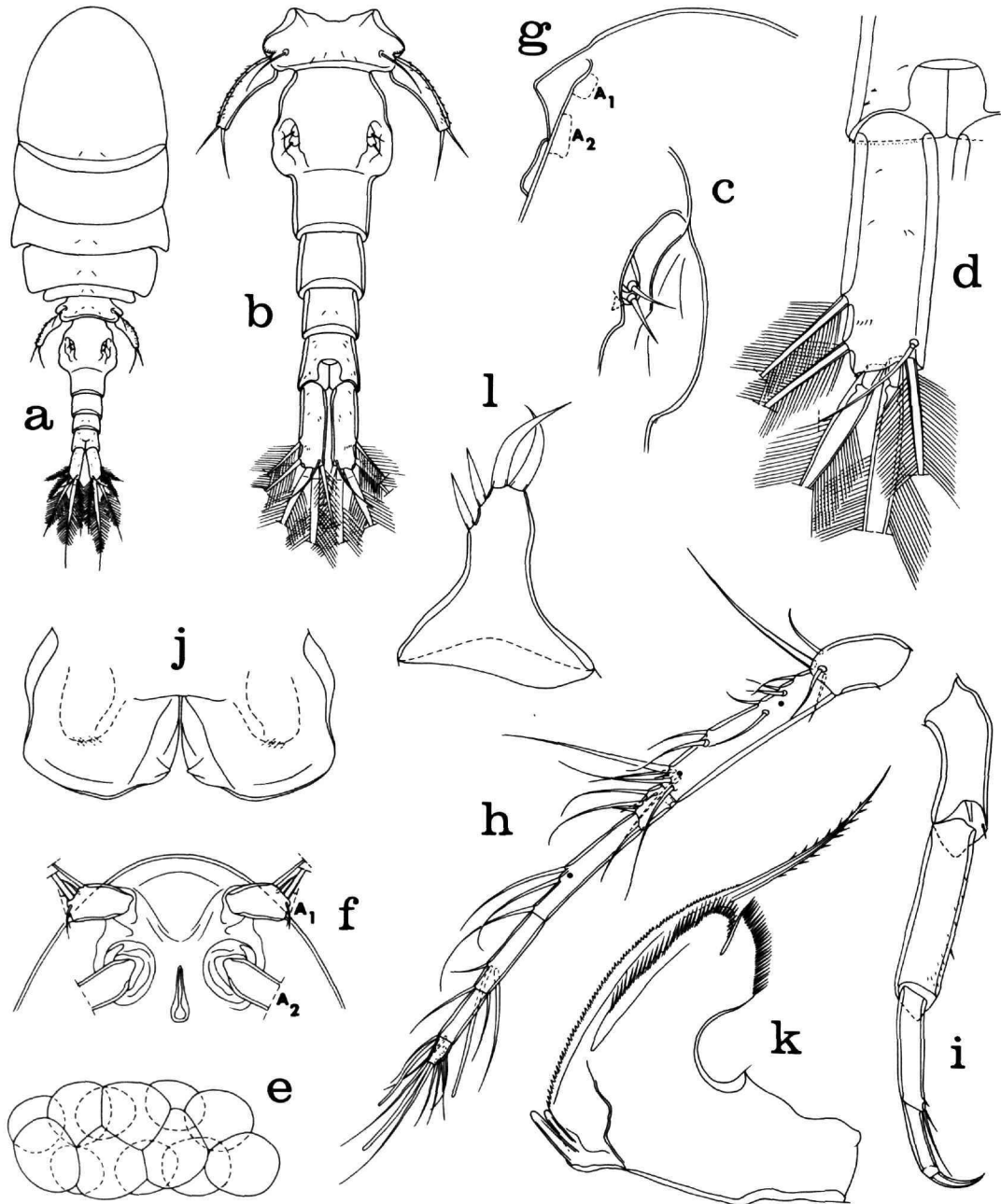


FIGURE 4.—*Anchinoligus latens*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (B); *c*, genital area, dorsal (D); *d*, caudal ramus, dorsal (D); *e*, egg sac, dorsal (B); *f*, rostrum, ventral (G); *g*, rostrum, lateral (G); *h*, first antenna with three round dots indicating positions of aesthetes added in male, dorsal (E); *i*, second antenna, antero-inner (E); *j*, labrum, with paragynaths indicated by broken lines, ventral (F); *k*, mandible, posterior (C); *l*, first maxilla, anterior (C).

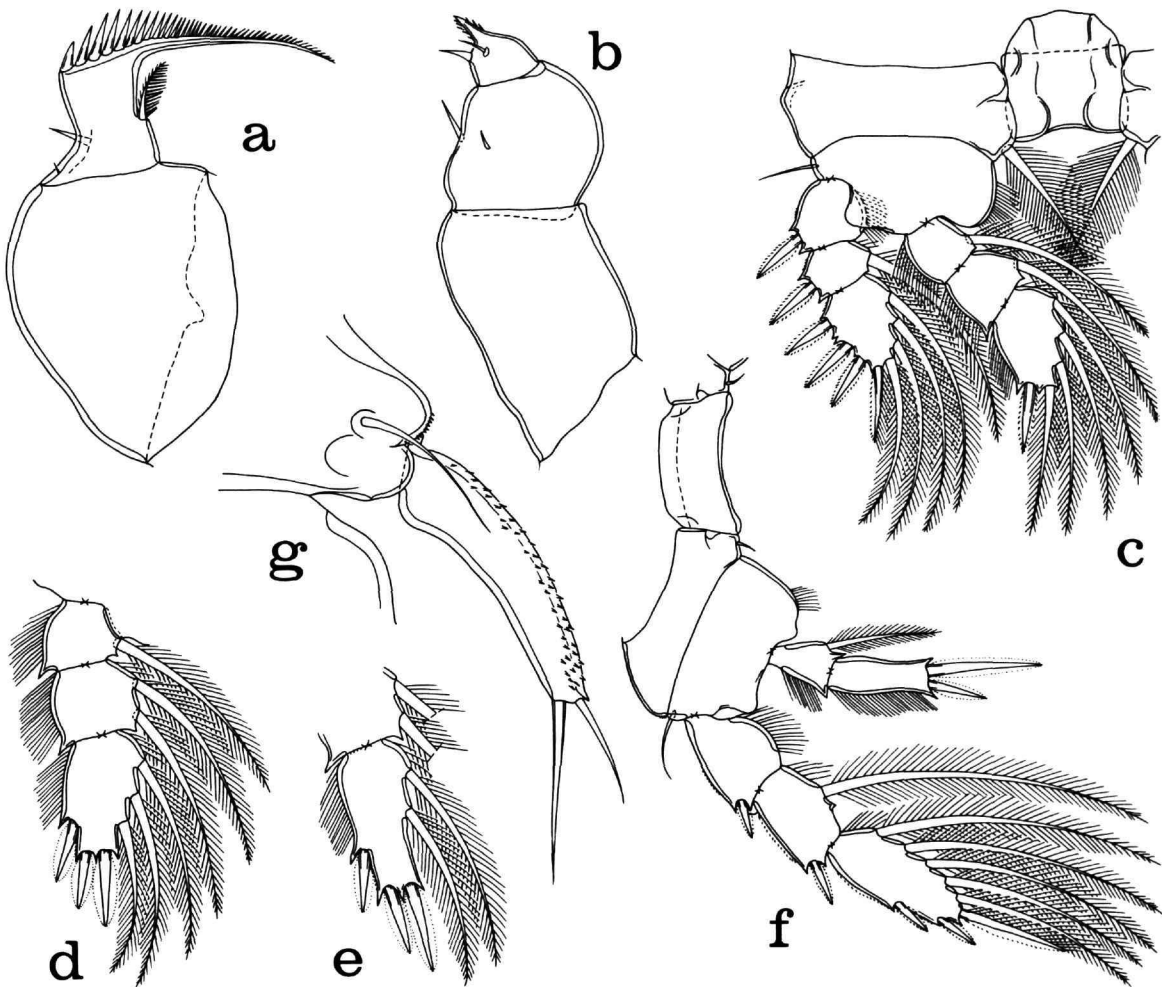


FIGURE 5.—*Anchimolgus latens*, new species, female: *a*, second maxilla, posterior (F); *b*, maxilliped, inner (F); *c*, leg 1 and intercoxal plate, anterior (E); *d*, endopod of leg 2, anterior (E); *e*, third segment of endopod of leg 3, anterior (E); *f*, leg 4 and intercoxal plate, anterior (E); *g*, leg 5, dorsal (D).

Leg 6 represented by two setae on genital area (Figure 4c).

Living specimens in transmitted light colored as in *A. notatus*.

MALE.—Body (Figure 6a) with prosome a little less slender than in female. Length 1.28 mm (1.22–1.35 mm) and greatest width 0.39 mm (0.37–0.41 mm), based on 10 specimens. Ratio of length to width of prosome 1.57 : 1. Ratio of length of prosome to that of urosome 1.08 : 1.

Segment of leg 5 (Figure 6b) 52×138 . Genital segment 286×221 , longer than wide. Four post-genital segments from anterior to posterior 49×73 , 49×70 , 36×68 , and 52×73 .

Caudal ramus resembling that of female but smaller, 94×39 , with ratio of 2.41 : 1.

Rostrum as in female. First antenna similar to that of female, but three long aesthetes added as in *A. notatus* (at points indicated by round dots in Figure 4h). Formula as in male of *A. notatus*.

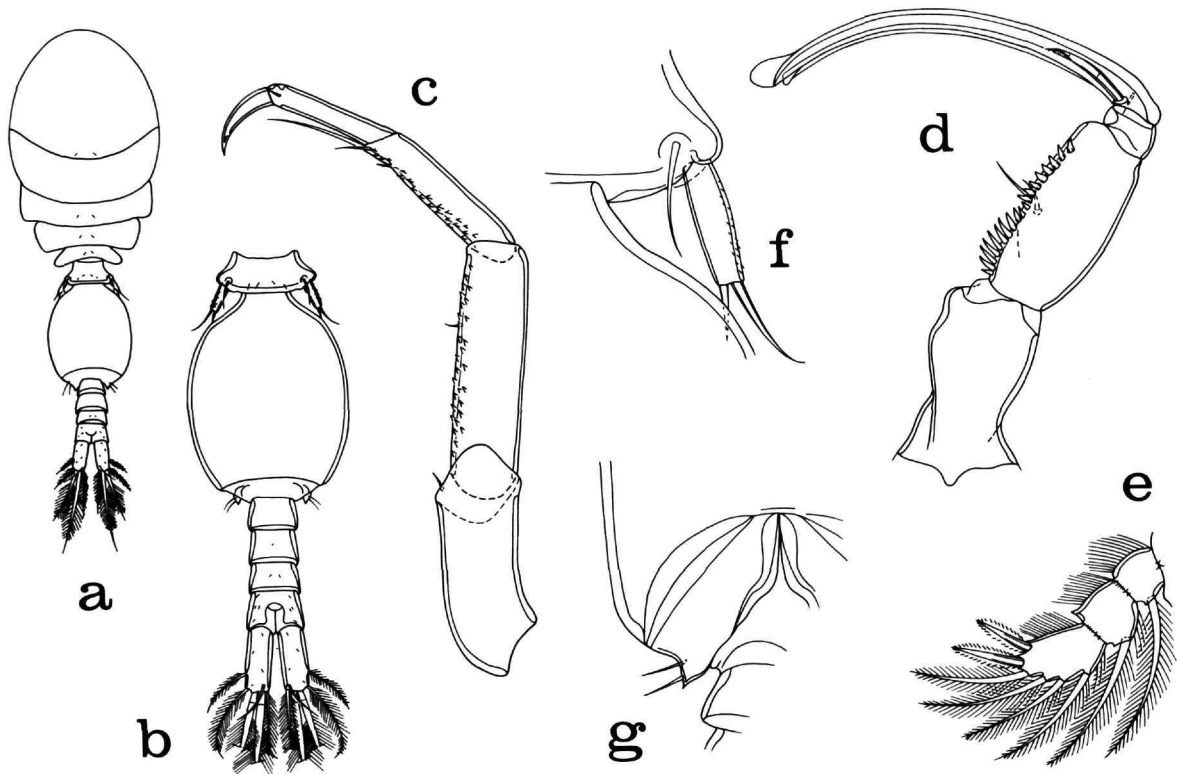


FIGURE 6.—*Anchimolgus latens*, new species, male: a, dorsal (A); b, urosome, dorsal (B); c, second antenna, postero-outer (D); d, maxilliped, inner (E); e, endopod of leg 1, anterior (E); f, leg 5, dorsal (F); g, leg 6, ventral (E).

Second antenna (Figure 6c) resembling that of female but inner surfaces of second and third segments with small spines.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 6d) with first segment unarmed. Second segment with two slender naked setae and row of spines. Small third segment unarmed. Claw 265 along axis (including terminal lamella) and bearing two unequal proximal setae, longer seta jointed and finely barbed distally along one side.

Ventral area between maxillipeds and first pair of legs similar to that in female.

Leg 1 with endopod formula 0-1; 0-1; II, 4 (Figure 6e) but in other respects like that of female. Legs 2-4 like those of female.

Leg 5 (Figure 6f) with free segment 42×13 , without proximal inner expansion. Two terminal setae 20 (inner) and 38 (outer).

Leg 6 (Figure 6g) a posteroventral flap on genital segment bearing two naked setae about 31.

Spermatophore not observed.

Living specimens colored as in female.

ETYMOLOGY.—The specific name *latens* (Latin, = hidden or sheltered) refers to the concealment of the copepods on the host.

COMPARISON WITH OTHER SPECIES OF *Anchimolgus*.—The shape of the genital segment in the female distinguishes *Anchimolgus latens* from all other species in the genus. The slightly enlarged seta on the first segment of the first antenna may be used as a recognition character in separating the new species from all but *Anchimolgus tener* Humes, 1973. This character, however, requires a keen eye and a certain amount of practice before it can be used successfully. The new species can best be separated from other species in the genus by use of the key provided below.

Anchimolgus latens is anatomically similar to *A. notatus* in certain respects, but differs in details such as the length of the caudal ramus, the slender third and fourth segments of the second antenna, the relative lengths of the spines on the third segment of the endopod of legs 2 and 3, the lengths of the terminal spines on the endopod of leg 4, and the nature of leg 5 in the female.

Anchimolgus pandus, new species

FIGURES 7-9

TYPE MATERIAL.—6 ♀ ♀, 4 ♂ ♂ from one *Fungia* (*Ctenactis*) *echinata* (Pallas), in 3 m, southwestern side of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 25 May 1975. Holotype ♀, allotype, and 6 paratypes (4 ♀ ♀, 2 ♂ ♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

OTHER SPECIMENS.—From *Fungia echinata*: 2 ♀ ♀ from one host, in 5 m, Poelau Gomumu, south of Obi, Moluccas, 1°50'00"S, 127°30'54"E, 30 May 1975.

From *Fungia* (*Pleuractis*) *paumotuensis* Stutchbury: 1 ♀ from two hosts, in 2 m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 2 May 1975.

From *Fungia* (*Heliofungia*) *actiniformis* (Quoy and Gaimard): 1 ♂ from eight hosts, in 3 m, Natsepa, Ambon, 3°37'05"S, 128°17'00"E, 24 April 1975.

From *Polyphyllia talpina* (Lamarck): 2 ♂ ♂ from one host, in 10 m, southern shore of Goenoeng Api, Banda Islands, 4°32'05"S, 129°51'30"E, 26 April 1975.

FEMALE.—Body (Figure 7a) with flattened and moderately broad prosome. Length 1.27 mm (1.23–1.31 mm) and greatest width 0.55 mm (0.53–0.57 mm), based on 6 specimens. Ratio of length to width of prosome 1.39 : 1. Ratio of length of prosome to that of urosome 1.57 : 1.

Segment of leg 5 (Figure 7b) 78 × 198. Genital segment 180 × 180, in dorsal view moderately broadened in anterior two-thirds with irregular margins. Genital areas located dorsolaterally just posterior to middle of segment. Each area (Figure 7c) with two naked setae 11 and 22 and a small spiniform process. Postgenital segments from anterior to posterior 65 × 91, 55 × 86, and 91 × 99.

Posteroventral margin of anal segment with row of small spinules on both sides.

Caudal ramus (Figure 7d) 101 × 48, approximately two times longer than wide. Outer lateral seta 240, dorsal seta 65, outermost terminal seta 154, innermost terminal seta 264, and two long median terminal setae 418 (outer) and 440 (inner), both inserted between small, smooth dorsal flange and ventral flange with minute marginal spinules. All setae with lateral hairs except naked dorsal seta.

Body surface with sparse hairs (sensilla) as in Figure 7a.

Egg sac (Figure 7e) elongated, 500 × 108, containing about 12 eggs 96–125 in diameter.

Rostrum (Figure 7f) with incomplete dorsoventral edge. First antenna (Figure 7g) 549 long. Lengths of seven segments: 47 (86 along anterior margin), 170, 40, 114, 63, 50, and 26 respectively. Setation as in *Anchimolgus notatus*. All setae naked.

Second antenna (Figure 7h) 265 long. Formula as in *A. notatus*, but setae on first two segments minute and often difficult to see. Fourth segment short, 41 along outer side, 22 along inner side, and 18 wide. Claw (Figure 7i) 44 along axis, with distinctly bent tip.

Labrum (Figure 7j) with two broad posteroventral lobes. Mandible (Figure 8a) and paragnath (Figure 7j) and first maxilla resembling those of *Anchimolgus latens*. Second maxilla (Figure 8b) with inner seta on second segment having spinules on both sides about equal in length. Proximalmost spine on lash stouter than succeeding spine. Maxilliped (Figure 8c) resembling in general that of *A. notatus*.

Ventral area between maxillipeds and first pair of legs (Figure 8d) resembling that of *A. notatus* and *A. latens*.

Legs 1–4 (Figure 8e–h) segmented and armed as in *A. notatus*. Coxa of leg 1 with rounded lobe on outer posterior surface. Exopod of leg 1 with proximal outer spine on third segment noticeably longer (39) than two adjacent spines (33 and 32). In legs 2 and 3 these spines nearly equal in length. Leg 4 with small naked coxal seta 10. Exopod 180. First segment of endopod 31 long including spiniform processes (29 without those processes) and 23 wide, inner distal plumose seta 65. Second segment 65 with spiniform processes (61 without processes) and

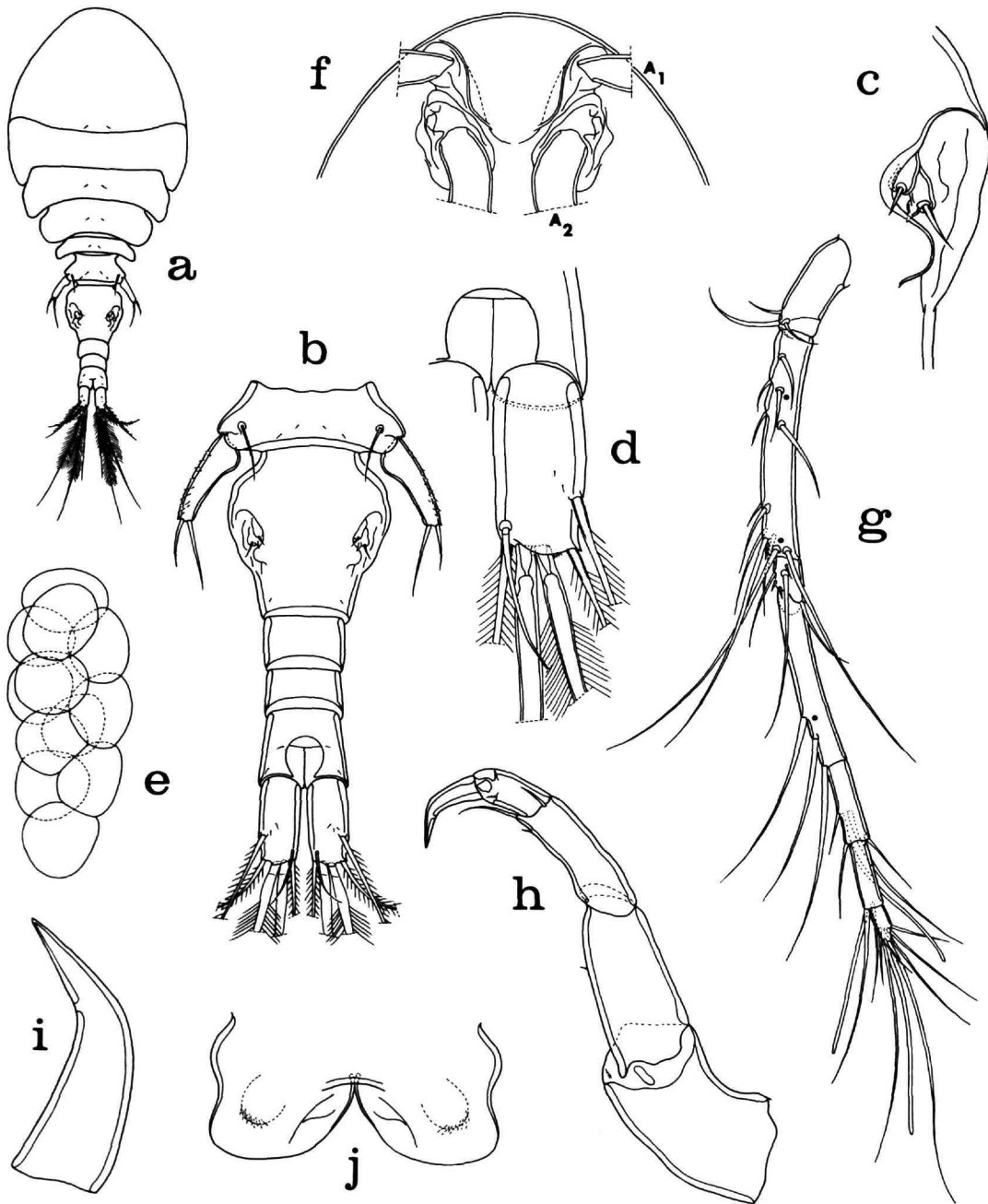


FIGURE 7.—*Anchimolgus pandus*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, genital area, dorsal (F); *d*, caudal ramus, dorsal (D); *e*, egg sac, ventral (B); *f*, rostrum, ventral (G); *g*, first antenna, with three round dots indicating positions of aesthetes added in male, dorsal (E); *h*, second antenna, antero-inner (D); *i*, claw of second antenna, antero-inner (H); *j*, labrum, with paragnaths indicated by broken lines, ventral (F).

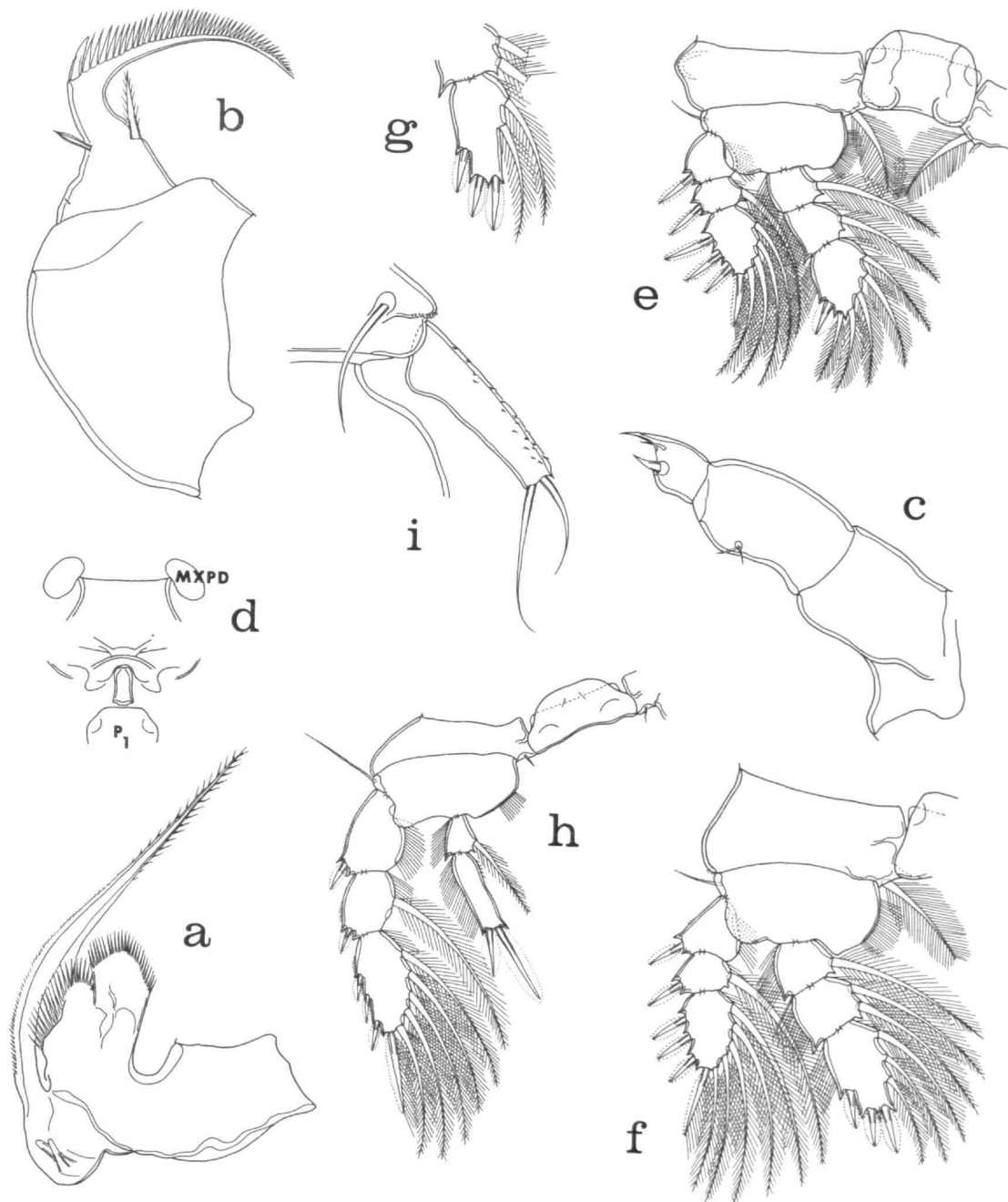


FIGURE 8.—*Anchimolgus pandus*, new species, female: *a*, mandible, posterior (C); *b*, second maxilla, anterior (C); *c*, maxilliped, inner (F); *d*, area between maxillipeds and first pair of legs, ventral (G); *e*, leg 1 and intercoxal plate, anterior (E); *f*, leg 2, anterior (E); *g*, third segment of endopod of leg 3, anterior (E); *h*, leg 4 and intercoxal plate, anterior (E); *i*, leg 5, anterior (D).

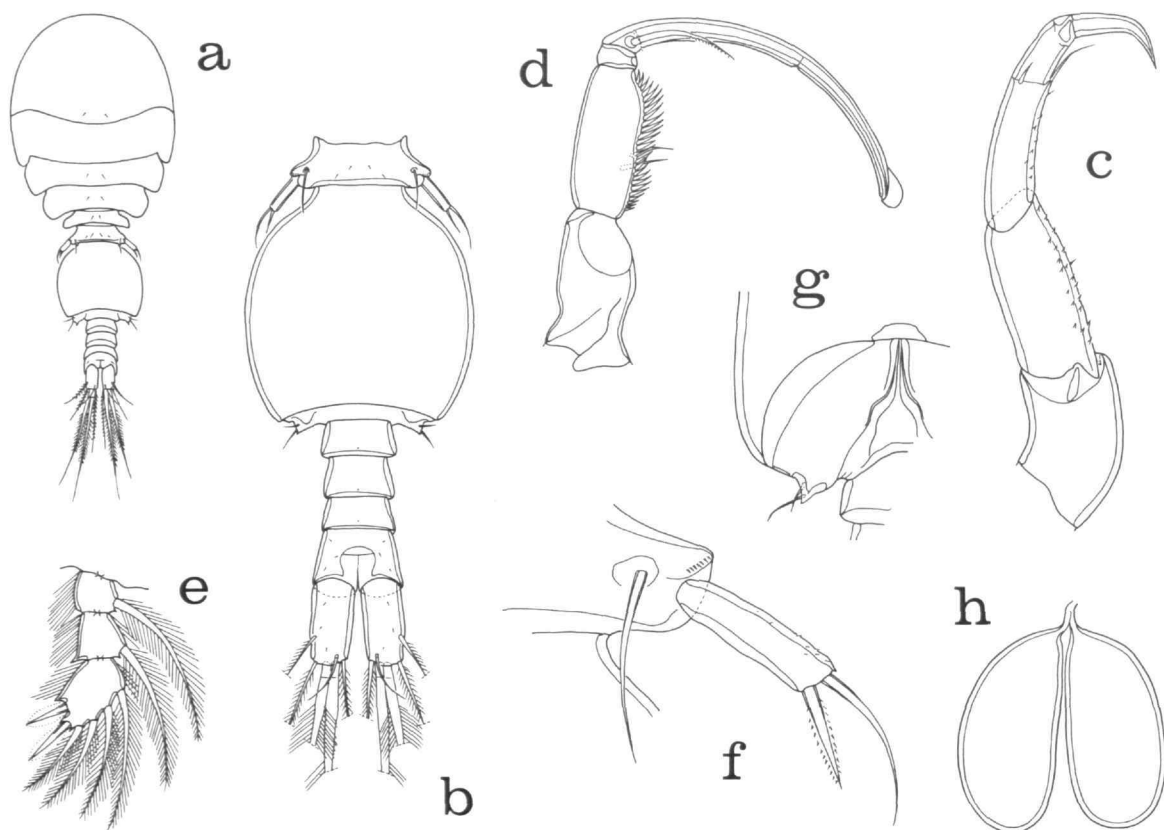


FIGURE 9.—*Anchimolgus pandus*, new species, male: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, second antenna, antero-inner (D); *d*, maxilliped, inner (E); *e*, endopod of leg 1, anterior (E); *f*, leg 5, dorsal (C); *g*, leg 6, ventral (E); *h*, spermatophores, attached to female, ventral (G).

19 in greatest width (15.5 in least width); two terminal fringed spines 34 (outer) and 65 (inner). Outer margins of both segments with hairs and proximal inner margin of second segment with short spinules.

Leg 5 (Figure 8i) with long free segment 107, its greatest width at proximal inner expansion 32, its least width distally 17. Two terminal naked setae 82 and 60. Segment bearing small spines along outer surface. Dorsal seta 75 and naked.

Leg 6 represented by two setae on genital area (Figure 7c).

Living specimens colored as in *A. notatus*.

MALE.—Body (Figure 9a) with moderately broad prosome. Length 1.07 mm (1.05–1.10 mm) and

greatest width 0.41 mm (0.40–0.42 mm), based on 4 specimens. Ratio of length to width of prosome 1.41 : 1. Ratio of length of prosome to that of urosome 1.52 : 1.

Segment of leg 5 (Figure 9b) 44×135 . Genital segment in dorsal view 229×221 (length including leg 6), approximately as long as wide. Four post-genital segments from anterior to posterior 31×72 , 39×69 , 32×70 , and 60×86 .

Caudal ramus similar to that of female, but smaller, 81×42 , with ratio of 1.93 : 1.

Rostrum like that of female. First antenna similar to that of female, but three long aesthetes added (at points indicated by round dots in Figure 7g) as in two previous species.

Second antenna (Figure 9c) like that of female but inner surfaces of second and third segments with small hyaline spines.

Labrum, mandible, paragnath, first maxilla, and second maxilla resembling those of female. Maxilliped (Figure 9d) similar in most respects to that of *A. latens*. Claw 212 along axis.

Ventral area between maxillipeds and first pair of legs like that of female.

Leg 1 with endopod formula 0-1; 0-1; I, I, 4 (Figure 9e), but otherwise resembling that of female. Legs 2-4 like those in female.

Leg 5 (Figure 9f) with free segment 38×10.5 , two terminal elements 26 and 39.

Leg 6 (Figure 9g) a posteroventral flap on genital segment bearing two naked setae 20 and 25.

Spermatophore (Figure 9h) 200×94 not including neck, attached to female in pairs.

Living specimens colored as in *A. notatus*.

ETYMOLOGY.—The specific name *pandus* (Latin, = bent or crooked) alludes to the bent tip on the claw of the second antenna.

COMPARISON WITH OTHER SPECIES OF *Anchimoligus*.—The claw of the second antenna in *Anchimoligus pandus* is unlike that of all other species in the genus in having a distinctly bent tip. This feature, observable without dissection, serves as a good recognition character for the new species.

The greater length of the proximal outer spine on the third segment of the exopod of leg 1 is also characteristic of *A. pandus*. In all other species the outer spines on the exopod of leg 1 are of nearly equal length. The formula III, I, 5 on the third exopod segment of leg 4 is a further distinctive feature of the new species.

Anchimoligus punctilis, new species

FIGURES 10-12

TYPE MATERIAL.—50 ♀♀, 72 ♂♂ from two *Fungia* (*Pleuactis*) *paumotuensis* Stutchbury, in 2 m, Poelau Naira, Banda Islands, $4^{\circ}31'45''S$, $129^{\circ}53'35''E$, 2 May 1975. Holotype ♀, allotype, and 124 paratypes (55 ♀♀, 69 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

OTHER SPECIMENS.—From *Fungia paumotuensis*: 1 ♂ from one host, in 3 m, Poelau Gomumu, south

of Obi, Moluccas, $1^{\circ}50'00''S$, $127^{\circ}30'45''E$, 30 May 1975; 1 ♀, 3 ♂♂ from 4 hosts, in 2 m, Poelau Naira, Banda Islands, $4^{\circ}31'45''S$, $129^{\circ}53'35''E$, 8 May 1975.

From *Fungia* (*Fungia*) *fungites* (Linnaeus): 4 ♀♀, 2 ♂♂ from 11 hosts, in 3 m, Natsepa, Ambon, $3^{\circ}27'05''S$, $128^{\circ}17'00''E$, 24 April 1975.

FEMALE.—Body (Figure 10a) resembling that of *Anchimoligus pandus*. Length 1.09 mm (1.01-1.22 mm) and greatest width 0.47 mm (0.42-0.57 mm), based on 10 specimens. Ratio of length to width of prosome 1.56:1. Ratio of length of prosome to that of urosome 1.72:1.

Segment of leg 5 (Figure 10b) 68×164 . Genital segment 156×161 , in dorsal view broadest in anterior half. Lateral walls in midregion of segment weakly sclerotized. Genital areas located dorsolaterally near middle of segment. Each area (Figure 10c) with two naked setae about 12 long and a minute spiniform process. Postgenital segments from anterior to posterior 42×76 , 34×75 , and 65×94 . Posteroventral edge of anal segment with row of minute spinules on both sides.

Caudal ramus (Figure 10d) relatively short, 73×43 , with ratio of 1.70:1. Outer lateral seta 156 and dorsal seta 42, both smooth. Outermost terminal seta 135, innermost terminal seta 203, and two long median terminal setae 330 (outer) and 352 (inner), both inserted between small, smooth dorsal flange and ventral flange with very small marginal spinules. All four terminal setae with lateral spinules, those on two median setae coarse.

Egg sac not seen.

Rostrum (Figure 10e) with posteroventral border poorly defined. First antenna (Figure 10f) 394 long and resembling that of *A. pandus*, with same setation. Length of seven segments: 36 (68 along anterior margin), 127, 30, 65, 44, 39, and 21 respectively. All setae naked.

Second antenna (Figure 10g) 255 long. Formula as in previous species, though setae are minute and sometimes difficult to see. Fourth segment short, 36 along outer edge, 22 along inner edge, and 27 wide. Claw (Figure 10h) 45 along axis with distal third slightly acute.

Labrum (Figure 10i) with two broad posteroventral lobes. Mandible (Figure 10j), paragnath (Figure 10i), first maxilla (Figure 10k), second maxilla (Figure 10l), maxilliped (Figure 11a), and ventral area between maxillipeds and first pair of legs (Fig-

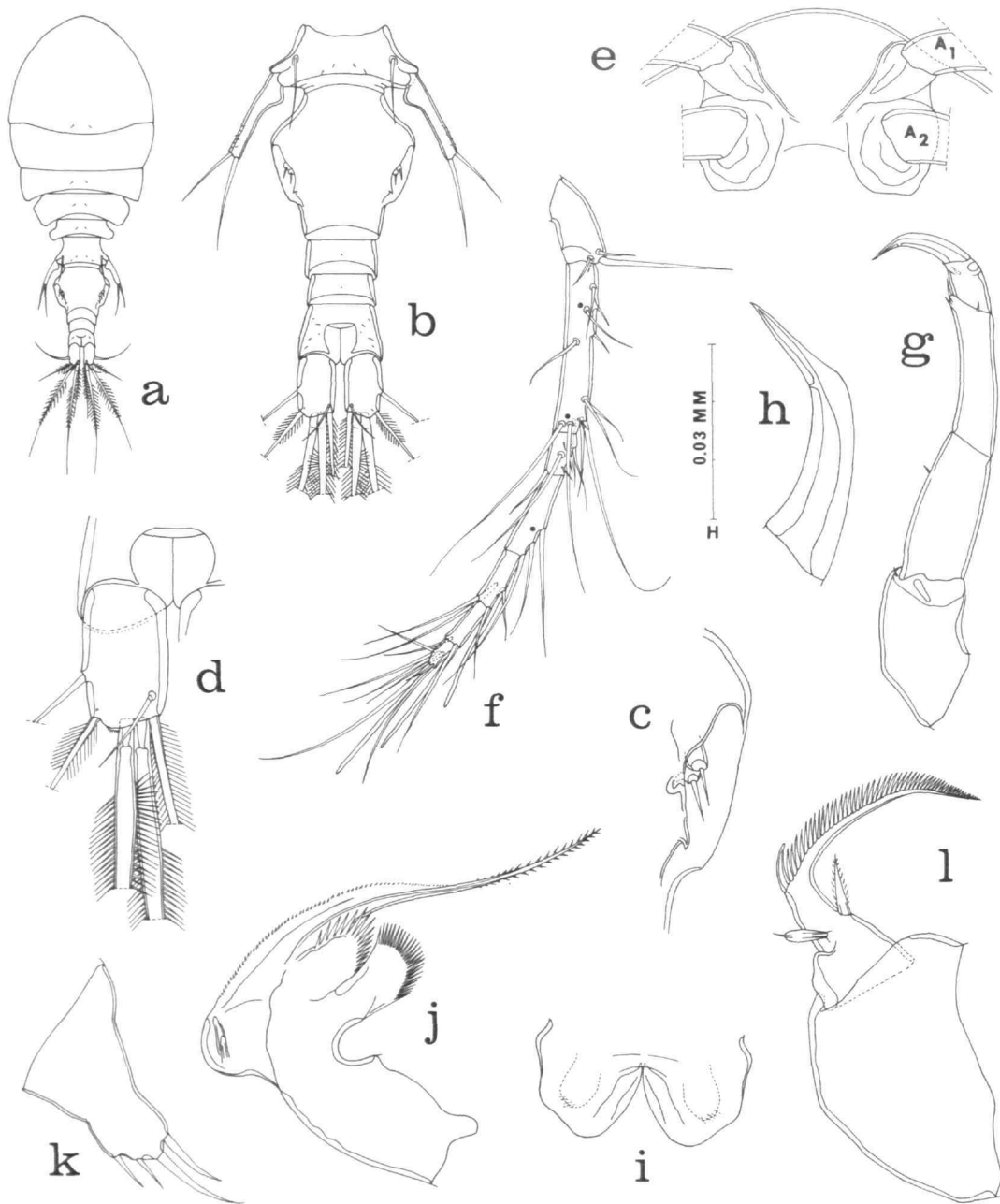


FIGURE 10.—*Anchimolgus punctilis*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, genital area, dorsal (F); *d*, caudal ramus, dorsal (D); *e*, rostrum, ventral (E); *f*, first antenna, with three round dots indicating positions of aesthetes added in male, dorsal (E); *g*, second antenna, antero-inner (D); *h*, claw of second antenna, anterior (H); *i*, labrum, with paragnaths indicated by broken lines, ventral (D); *j*, mandible, posterior (C); *k*, first maxilla, ventral (C); *l*, second maxilla, anterior (C).

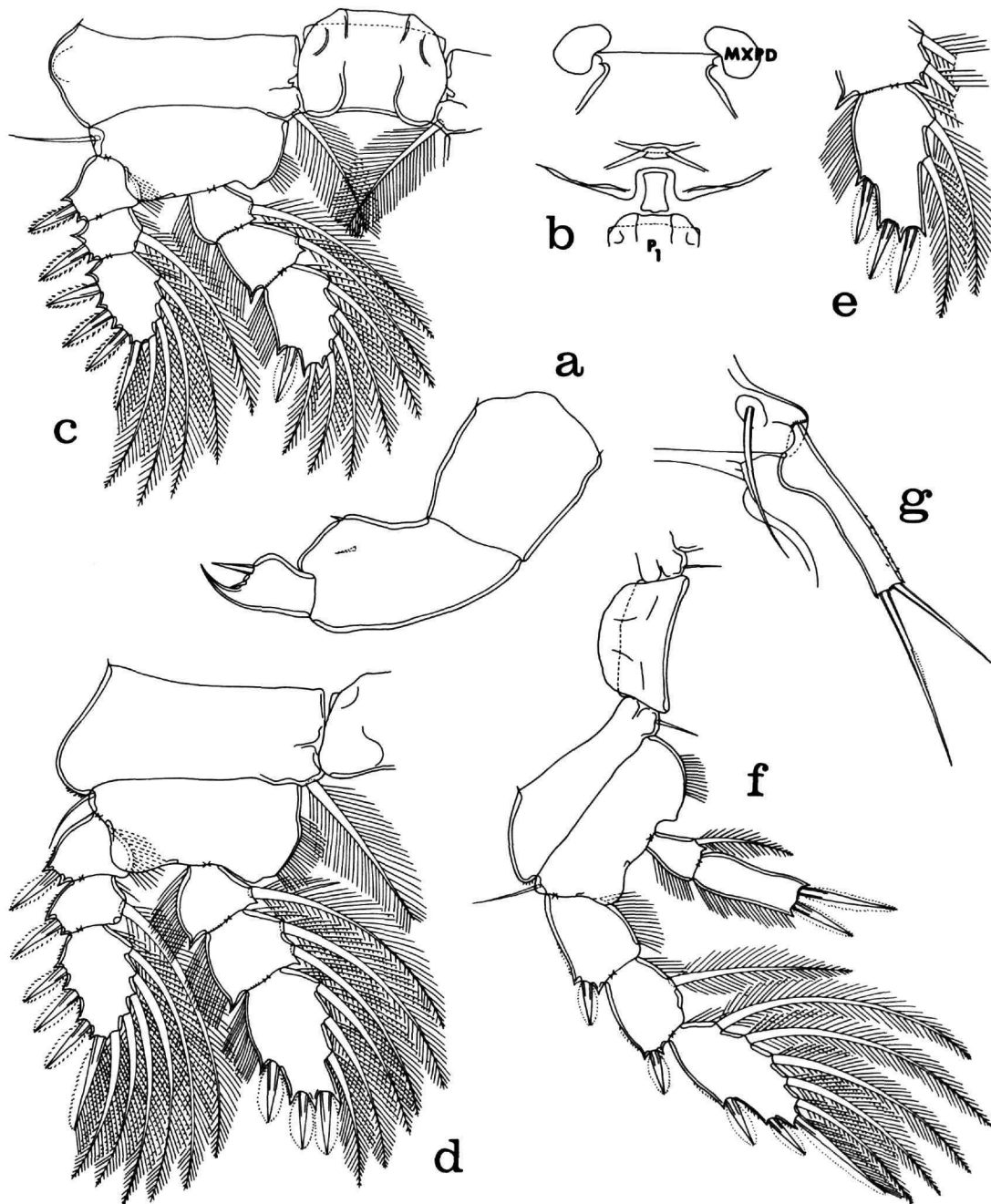


FIGURE 11.—*Anchimolgus punctilis*, new species, female: a, maxilliped, postero-inner (C); b, area between maxillipeds and first pair of legs, ventral (E); c, leg 1 and intercoxal plate, anterior (D); d, leg 2, anterior (D); e, third segment of endopod of leg 3, anterior (D); f, leg 4 and intercoxal plate, anterior (D); g, leg 5, dorsal (D).

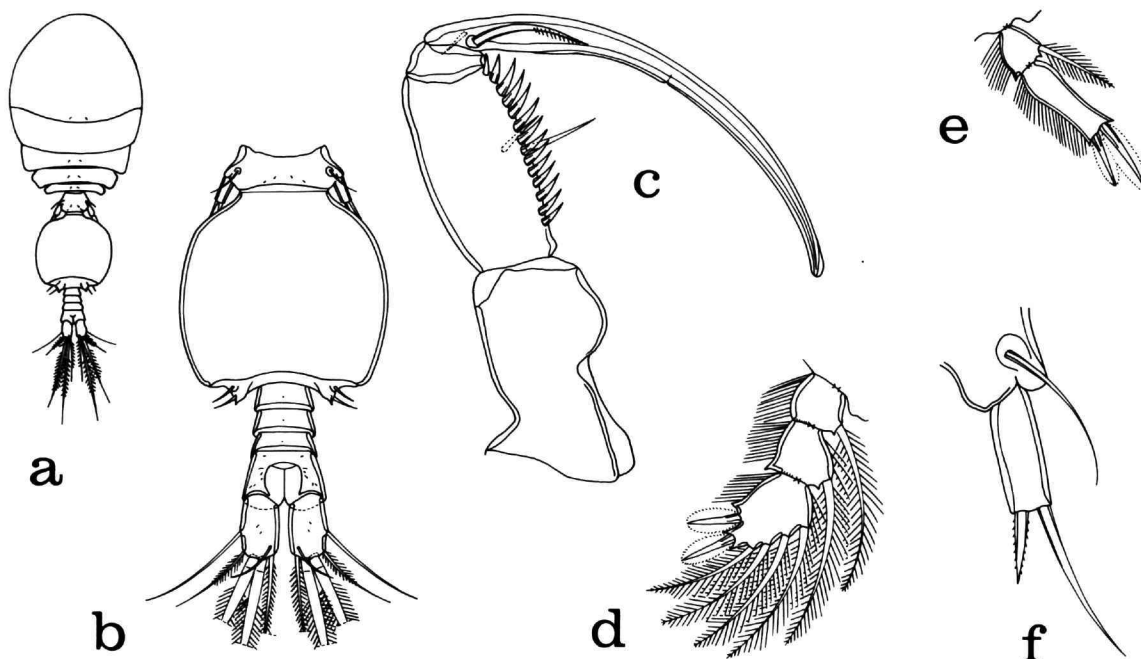


FIGURE 12.—*Anchimolgus punctilis*, new species, male: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, maxilliped, inner (F); *d*, endopod of leg 1, anterior (D); *e*, endopod of leg 4, anterior (D); *f*, leg 5, dorsal (C).

ure 11*b*) not differing greatly from those in *A. pandus*.

Legs 1–4 (Figure 11*c–f*) segmented and armed as in previous species. Leg 1 with coxa having rounded lobe on outer posterior surface. Leg 4 with inner coxal seta 26 and naked. Exopod 173. First segment of endopod 26×21 , its inner distal plumose seta 50. Second segment 55 long, 22 in greatest width, and 17.5 in least width; two terminal fringed spines 35 (outer) and 53 (inner). Outer margins of both segments haired.

Leg 5 (Figure 11*g*) with elongated free segment 101, its greatest width at proximal rounded inner expansion 23 and its least width distally 15. Segment ornamented with minute spines on distal outer surface. Two terminal setae 99 (with slight outer fringe) and 62. Dorsal seta 70.

Leg 6 represented by two setae on genital area (Figure 10*c*).

Living specimens in transmitted light opaque, eye red.

MALE.—Body (Figure 12*a*) resembling that of

A. pandus. Length 0.91 mm (0.84–0.96 mm) and greatest width 0.35 mm (0.31–0.37 mm), based on 10 specimens. Ratio of length to width of prosome 1.40:1. Ratio of length of prosome to that of urosome 1.22:1.

Segment of leg 5 (Figure 12*b*) 36×115 . Genital segment in dorsal view 200×200 (length including leg 6). Four postgenital segments from anterior to posterior 22×65 , 23×65 , 21×54 , and 52×81 .

Caudal ramus resembling that of female, but smaller, 60×39 , with ratio of 1.54:1.

Rostrum like that of female. First antenna similar to that of female, but three aesthetes added (at points indicated by round dots in Figure 10*f*) as in previous species. Second antenna resembling that of female, but a few very small spines on inner surfaces of second and third segments.

Labrum, mandible, paragnath, first maxilla, and second maxilla resembling those of female. Maxilliped (Figure 12*c*) similar to that of *A. pandus*, but with distal inner lobe on first segment, fewer and

stouter spines on second segment, and small inconspicuous terminal lamella on claw. Claw 151 along axis.

Ventral area between maxillipeds and first pair of legs like that of female.

Leg 1 with endopod formula 0-1; 0-1; I, I, 4 (Figure 12d) but in other respects resembling that of female. Legs 2-4 like those of female, except first segment of endopod of leg 4 having small outer distal spiniform process (Figure 12e).

Leg 5 (Figure 12f) with free segment 28×11 , without visible ornamentation. Two terminal elements 13 and finely barbed and 36 and naked.

Leg 6 much like that of *A. latens*.

Spermatophore not observed.

Living specimens colored as in female.

ETYMOLOGY.—The specific name *punctilis* (Latin, *pungere* = to prick or sting) plus the suffix *-ilis* (= having the nature of) alludes to the sharp claw on the second antenna.

COMPARISON WITH OTHER SPECIES OF *Anchimoligus*.—The short caudal ramus in *Anchimoligus punctilis* (less than 2:1) distinguishes it from other species in the genus except *A. notatus*. The latter, however, differs from *A. punctilis* in many respects, among them the proportions of segments 3 and 4 of the second antenna, the shape of the second antennal claw, the relative lengths of the three spines on the third segment of legs 2 and 3, and the nature of leg 5 in the female.

Other differences and means of separation of *A. punctilis* from the various species in the genus are noted in the key below.

Anchimoligus orectus, new species

FIGURES 13, 14

TYPE MATERIAL.—28 ♀♀, 65 ♂♂ from two *Fungia* (*Pleuractis*) *paumotuensis* Stutchbury, in 2 m, Poelau Naira, Banda Islands, $4^{\circ}31'45''S$, $129^{\circ}53'35''E$, 2 May 1975. Holotype ♀, allotype, and 88 paratypes (25 ♀♀, 63 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

OTHER SPECIMENS.—From *Fungia paumotuensis*: 25 ♀♀, 38 ♂♂ from four hosts, in 2 m, Poelau Naira, $4^{\circ}31'45''S$, $129^{\circ}53'35''E$, 2 May 1975.

FEMALE.—Body (Figure 13a) with slender pro-

some. Length 1.28 mm (1.22–1.36 mm) and greatest width 0.45 mm (0.42–0.47 mm), based on 10 specimens. Epimera of segments of legs 1–4 shaped as in *Anchimoligus latens*. Ratio of length to width of prosome 1.78:1. Ratio of length of prosome to that of urosome 1.51:1.

Segment of leg 5 (Figure 13b) 73×180 . Genital segment elongated, 203×143 , in dorsal view only slightly expanded laterally. Genital areas situated dorsally near middle of segment. Each area with two small setae and a minute spiniform process as in *Anchimoligus punctilis*. Postgenital segments from anterior to posterior 70×83 , 55×78 , and 68×86 . Posteroventral margin of anal segment with row of small spinules on both sides.

Caudal ramus (Figure 13c) moderately elongated, 109×40 , with ratio of 2.73:1. Outer lateral seta 122, dorsal seta 31, outermost terminal seta 159, innermost terminal seta 190, and two long median terminal setae 264 (outer) and 352 (inner), both inserted between dorsal and ventral flanges with minute marginal spinules. All setae with lateral spinules except naked dorsal seta.

Body surface with a few hairs (sensilla) as in Figure 13a.

Egg sac (Figure 13d) 418×209 , two times longer than wide, containing approximately 11 often irregular eggs with diameters ranging from 99–120.

Rostrum (Figure 13e) with weak posteroventral margin. First antenna 429 long and similar to that of *Anchimoligus punctilis*. Lengths of seven segments: 29 (62 along anterior margin), 127, 32, 86, 60, 42, and 20 respectively.

Second antenna (Figure 13f) 352 long and slender. Formula for armature as in previous species. Fourth segment 38 along outer edge, 27 along inner edge, and 10 wide. Claw 22 along axis and evenly recurved.

Labrum as in *A. punctilis*. Mandible (Figure 13g) with prominent digitiform processes. Paragnath and first maxilla like those of *A. punctilis*. Second maxilla (Figure 13h) and maxilliped (Figure 13i) not greatly different from previous species.

Ventral area between maxillipeds and first pair of legs as in *A. punctilis*.

Legs 1 and 2 as in *A. punctilis*. Leg 3 similar to that of *A. punctilis*, but three spines on third endopod segment slightly different in their relative lengths (Figure 13j). Leg 4 (Figure 14a) with small inner coxal seta 26 having inconspicuous short

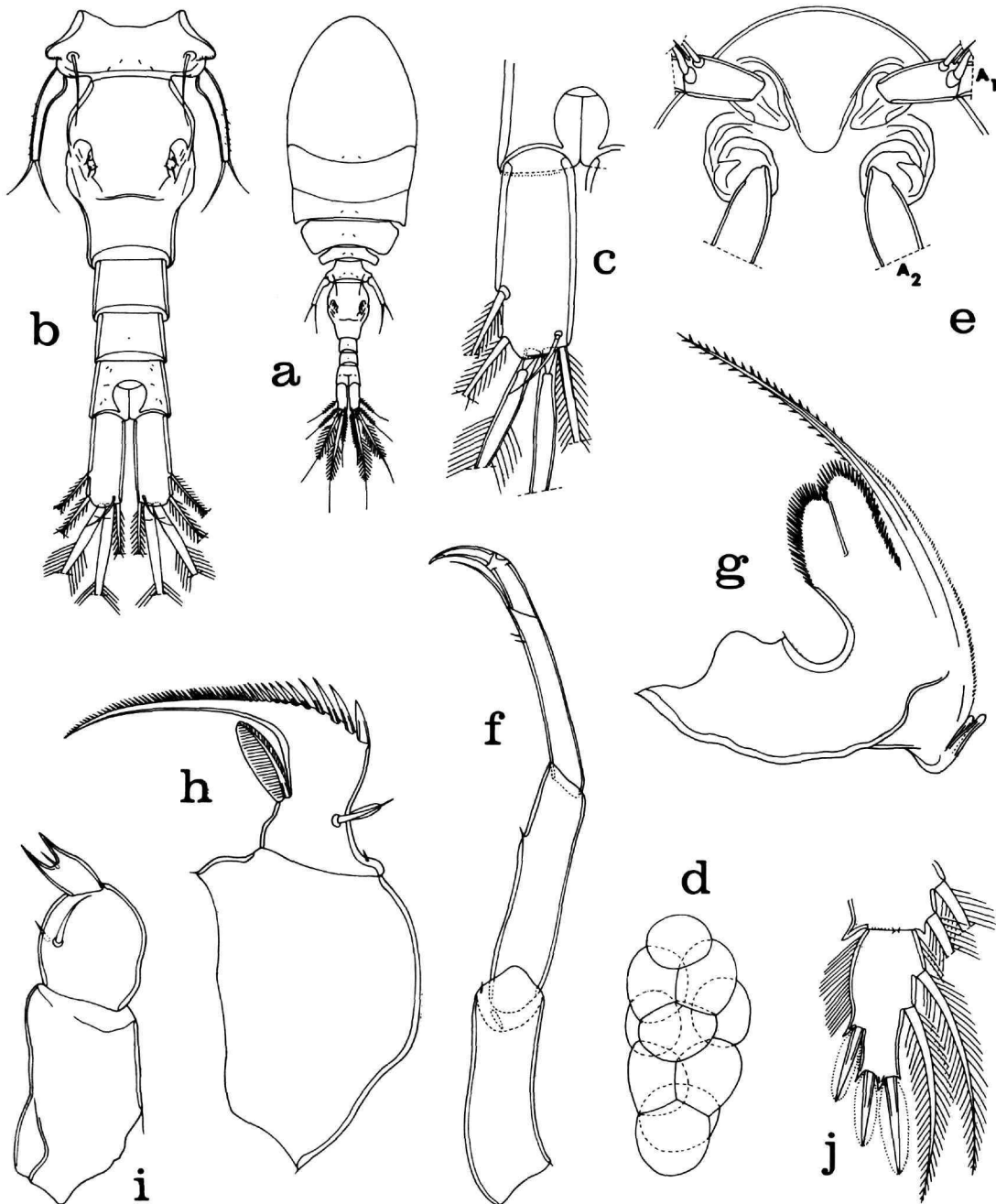


FIGURE 13.—*Anchimolgus orectus*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, caudal ramus, dorsal (D); *d*, egg sac, lateral (B); *e*, rostrum, ventral (E); *f*, second antenna, postero-outer (D); *g*, mandible, posterior (C); *h*, second maxilla, anterior (C); *i*, maxilliped, anterior (D); *j*, third segment of endopod of leg 3, anterior (D).

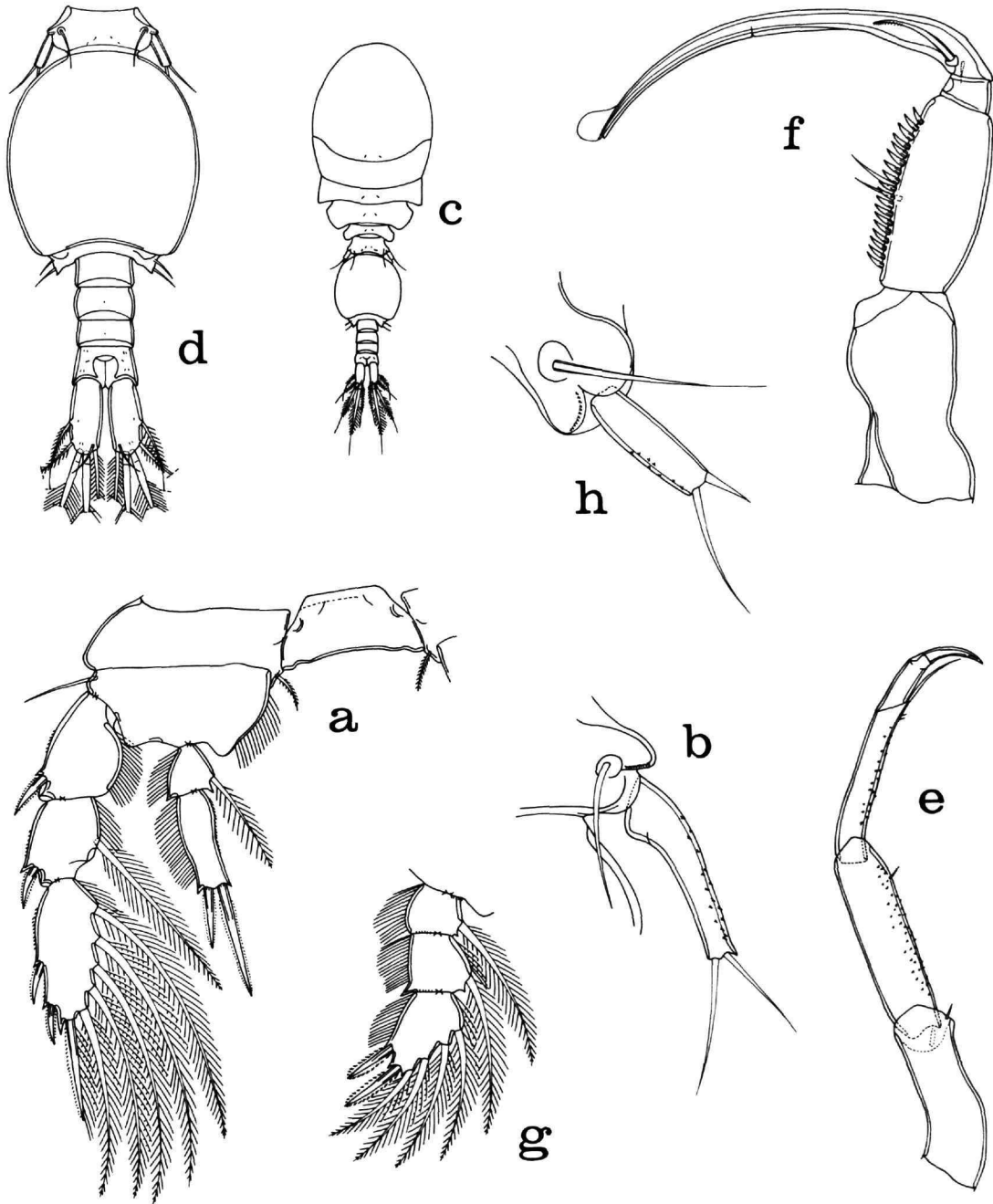


FIGURE 14.—*Anchimolgus orectus*, new species, female: *a*, leg 4 and intercoxal plate, anterior (D); *b*, leg 5, dorsal (D). Male: *c*, dorsal (A); *d*, urosome, dorsal (G); *e*, second antenna, postero-outer (D); *f*, maxilliped, inner (D); *g*, endopod of leg 1, anterior (D); *h*, leg 5, dorsal (C).

hairs. Exopod 170. First segment of endopod 27 long including spiniform processes (24 without processes) and 22 wide, its inner distal plumose seta 50. Second segment 50 with spiniform processes (47 without processes) and 17.5 in greatest width (13 in least width); two terminal fringed spines 28 (outer) and 60 (inner). Outer margin of both segments haired. Proximal inner margin of second segment with short spinules.

Leg 5 (Figure 14*b*) with elongated free segment 102, its greatest width at inner proximal expansion 26, least width distally 13. Two terminal setae 70 and 52. Segment with small spines on outer surface. Dorsal seta 75.

Leg 6 represented by two setae on genital area.

Living specimens in transmitted light opaque, eye red.

MALE.—Body (Figure 14*c*) slender. Length 1.08 mm (1.04–1.11 mm) and greatest width 0.35 mm (0.34–0.37 mm), based on 10 specimens. Ratio of length to width of prosome 1.63 : 1. Ratio of length of prosome to that of urosome 1.32 : 1.

Segment of leg 5 (Figure 14*d*) 48 × 126. Genital segment 240 × 206 (length including leg 6). Four postgenital segments from anterior to posterior 31 × 65, 36 × 65, 31 × 62, and 42 × 70.

Caudal ramus like that of female, but smaller, 82 × 36, with ratio of 2.78 : 1.

Rostrum as in female. First antenna like that of female, but three long aesthetes added as in previous species.

Second antenna (Figure 14*e*) similar to that of female but small spinules added on inner surfaces of second and third segments.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 14*f*) in general similar to that of previous species. Claw 216 along axis including terminal lamella.

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

Legs 1–4 like those of female except for formula I, I, 4 on third endopod segment of leg 1 (Figure 14*g*).

Leg 5 (Figure 14*h*) with free segment 34 × 10.5. Two terminal setae 14 and 39. Dorsal seta 68. Segment ornamented with a few minute spines on outer surface.

Leg 6 resembling that of *Anchimoligus latens*.

Spermatophore not seen.

Living specimens colored as in female.

ETYMOLOGY.—The specific name *orectus* (Greek, *ορεκτος* = stretched out) refers to the elongated genital segment of the female.

COMPARISON WITH OTHER SPECIES OF *Anchimoligus*.—The slender elongated genital segment of the female sets *Anchimoligus orectus* apart from all other species in the genus. Only in *Anchimoligus latens* does the female genital segment approach this condition. *Anchimoligus orectus* may be distinguished readily from *A. latens* by the relative lengths of the third and fourth second antennal segments (very unequal, 2.33 : 1, in the former; more nearly equal, 1.40 : 1, in the latter). Other means of separating *A. orectus* from its congeners are found in the keys to the genus provided below.

Anchimoligus convexus, new species

FIGURES 15–17

TYPE MATERIAL.—18 ♀ ♀, 6 ♂ ♂ from one *Parahalomitra robusta* (Quelch), in 3 m, Karang Mie, Weda Bay, Halmahera, Moluccas, 00°20'07"N, 128°25'00"E, 19 May 1975. Holotype ♀, allotype, and 19 paratypes (15 ♀ ♀, 4 ♂ ♂) 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 (Figure 15*a*) with slender prosome a little thickened dorsoventrally. Length 0.93 mm (0.88–0.99 mm) and greatest width 0.28 mm (0.26–0.31 mm), based on 10 specimens. Ratio of length to width of prosome 1.90 : 1. Ratio of length of prosome to that of urosome 1.49 : 1.

Segment of leg 5 (Figure 15*b*) 47 × 116. Genital segment in dorsal view elongated, 146 × 128 in greatest dimensions, expanded in its anterior two-thirds with rounded lateral margins. Genital areas located dorsally near middle of segment. Each area (Figure 15*c*) with two small naked setae about 7 long and a minute spiniform process. Postgenital segments from anterior to posterior 54 × 57, 44 × 51, and 49 × 52. Posteroventral margin of anal segment with row of minute spinules on both sides.

Caudal ramus (Figure 15*d*) elongated, 62 × 26, with ratio of 2.38 : 1. Outer lateral seta 140, dorsal seta 120, both naked. Outermost terminal seta 130, innermost terminal seta 160, and two long,

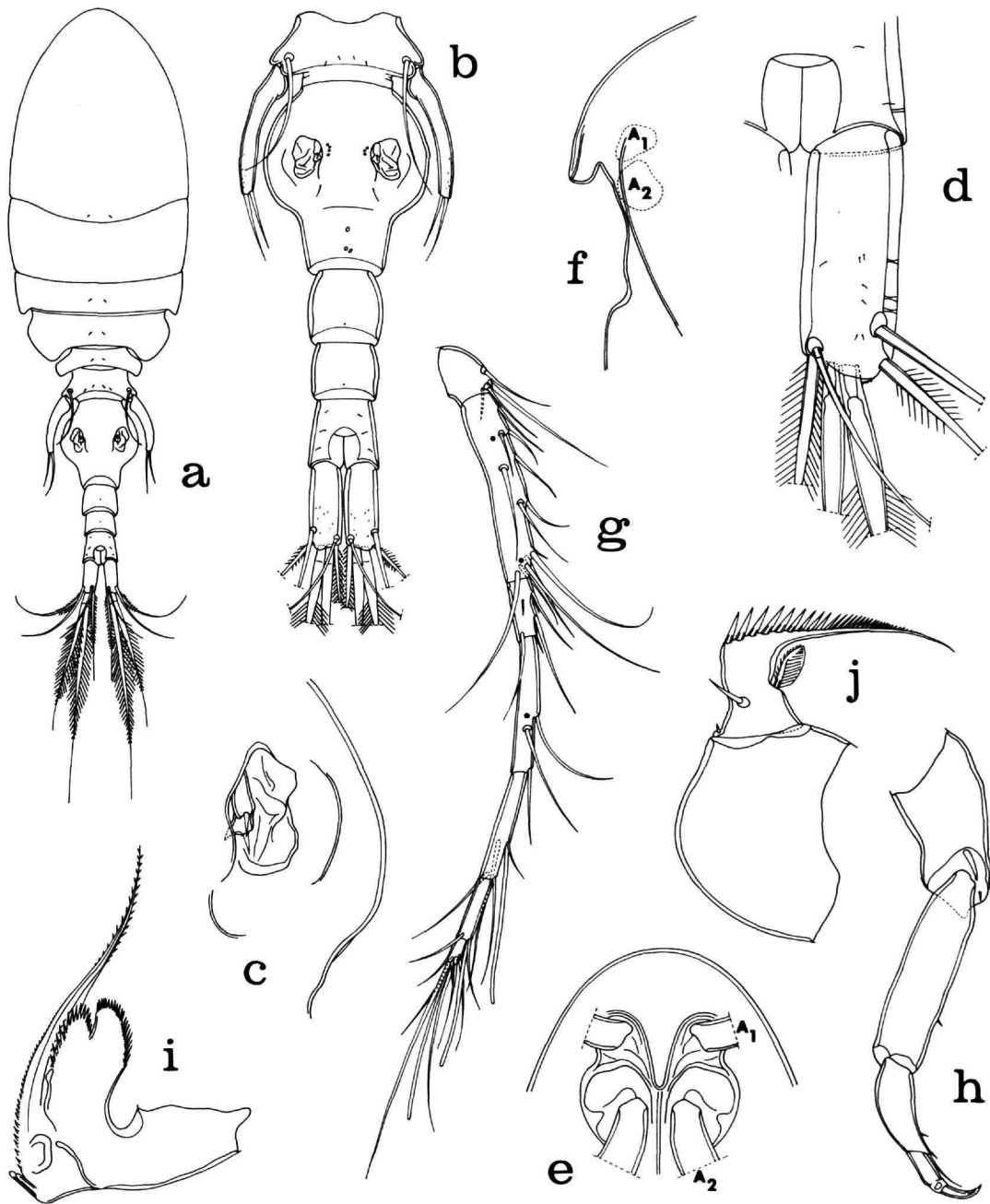


FIGURE 15.—*Anchimolgus convexus*, new species, female: *a*, dorsal (B); *b*, unosome, dorsal (E); *c*, genital area, dorsal (C); *d*, caudal ramus, dorsal (C); *e*, rostrum, ventral (E); *f*, rostrum, lateral (F); *g*, first antenna, with three round dots indicating positions of aesthetes added in male, dorsal (D); *h*, second antenna, antero-inner (D); *i*, mandible, posterior (C); *j*, second maxilla, anterior (D).

median terminal setae 247 (outer) and 352 (inner), both inserted between smooth dorsal flange and ventral flange with marginal row of small spinules; all these setae with lateral spinules.

Body surface with only a few hairs (sensilla) as in Figure 15a.

Egg sac unknown.

Rostrum (Figure 15e) slender with rounded posteroventral tip; in lateral view (Figure 15f) projecting conspicuously. First antenna (Figure 15g) 327 long. Lengths of seven segments: 13 (34 along anterior margin), 96, 31, 68, 53, 31, and 14 respectively.

Second antenna (Figure 15h) 234 long. Formula for armature as in previous species. Outer margin of third segment distinctly convex, with width here 20. Fourth segment 27 along outer edge, 19 along inner edge, and 10 wide. Claw 20 along its axis.

Labrum similar to that of *Anchimolgus punctilis*. Mandible (Figure 15i) differing only slightly from that of *A. punctilis*. Paragnath and first maxilla like those of *A. punctilis*. Second maxilla (Figure 15j) with spines on terminal lash evenly graduated, first spine not different from succeeding spines. Maxilliped (Figure 16a) resembling in major respects that in previous species.

Ventral area between maxillipeds and first pair of legs as in *A. punctilis*.

Legs 1-4 (Figure 16b-e) differing only slightly from other species. Outer spine on first exopod segment of leg 1 a little longer than succeeding spines. Leg 4 with inner coxal seta 17 and delicately haired. Exopod 104. First segment of endopod 21 × 13.5, its inner plumose seta 39. Second segment 36.5 with spiniform processes (34 without processes) and 11 in greatest width; two terminal fringed spines 37 (outer) and (52 inner). Outer margin of both segments haired.

Leg 5 (Figure 16f) with elongated free segment 101 long, 16 wide at small proximal inner expansion, 10.5 wide distally. Two terminal setae 48 and 57. Dorsal seta 105. All three setae naked. Free segment ornamented distally with a few minute outer spines.

Leg 6 represented by two setae on genital area (Figure 15c).

Living specimens in transmitted light opaque, eye red.

MALE.—Body (Figure 16g) slender. Length 0.74

mm (0.69–0.76 mm) and greatest width 0.22 mm (0.21–0.22 mm), based on 6 specimens. Ratio of length to width of prosome 1.90 : 1. Ratio of length of prosome to that of urosome 1.42 : 1.

Segment of leg 5 (Figure 17a) 29 × 83. Genital segment 180 × 146, length including leg 6. Four postgenital segments from anterior to posterior 26 × 49, 27 × 45, 23 × 44, and 29 × 47.

Caudal ramus like that of female, but smaller, 39 × 22, with ratio of 1.77 : 1.

Rostrum as in female. First antenna like that of female, but three long aesthetes added (at points indicated by round dots in Figure 15g) as in previous species.

Second antenna (Figure 17b) resembling that of female, but inner surface with small spines and seta on first segment more prominent than in opposite sex.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 17c) generally similar to that of previous species. Claw 154 along axis including terminal lamella.

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

Legs 1-4 like those of female except for formula I, I, 4 on third endopod segment of leg 1 (Figure 17d.)

Leg 5 (Figure 17e) with free segment 35 × 8, without inner proximal expansion. Two terminal setae 18 and 50. Dorsal seta 70. All setae naked. A few very small spinules on distal outer surface of free segment.

Leg 6 (Figure 17f) a posteroventral flap on genital segment bearing two naked setae about 25 and 30.

Spermatophore not seen.

Living specimens colored as in female.

ETYMOLOGY.—The specific name *convexus* (Latin, = arched outwardly or convex) alludes to the convex outer margin of the third segment of the second antenna.

COMPARISON WITH OTHER SPECIES OF *Anchimolgus*.—The convex outer margin of the third segment of the second antenna distinguishes *Anchimolgus convexus* from all other species in the genus.

The shape of the female genital segment in dorsal view, with its rounded lateral margins in the

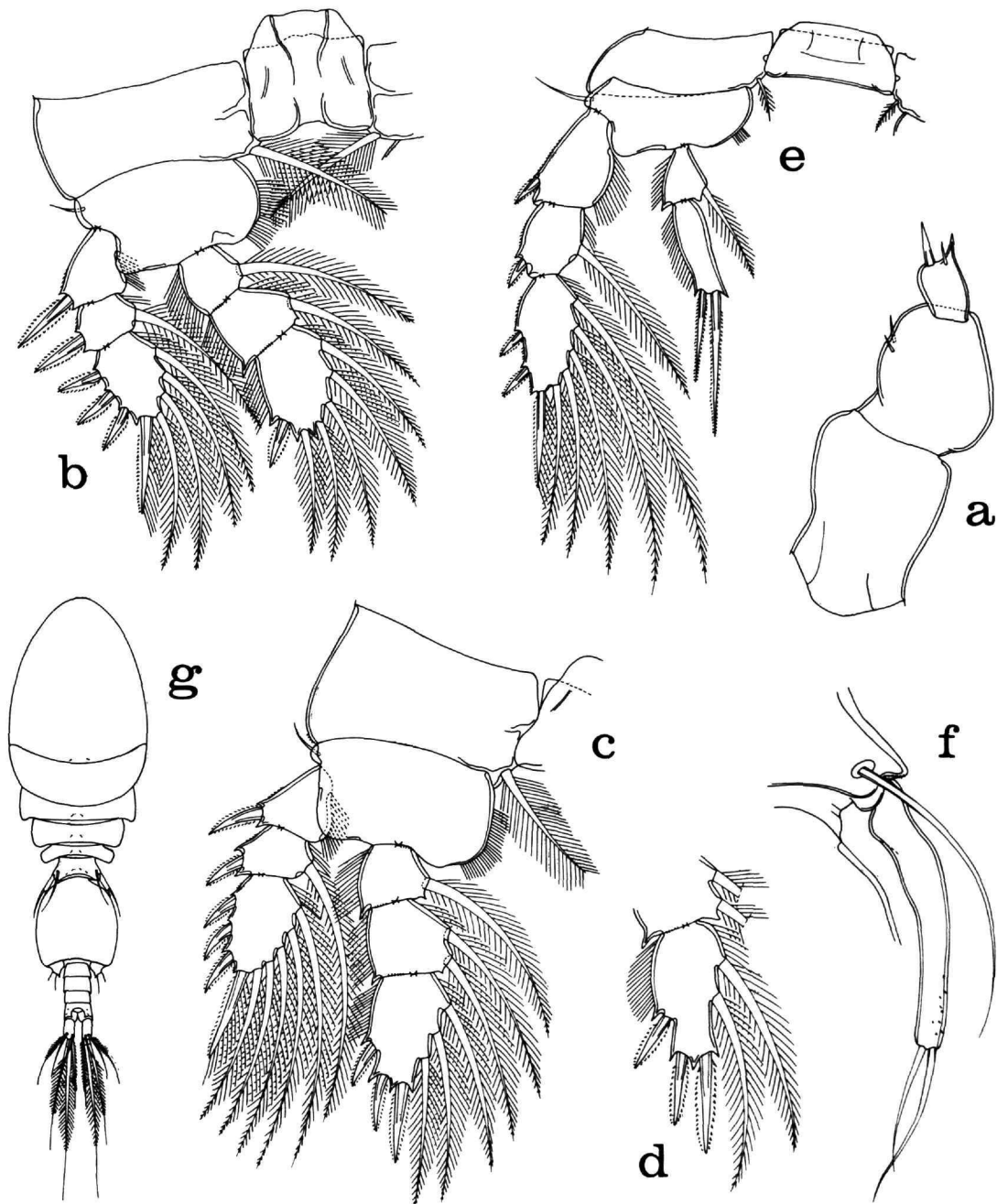


FIGURE 16.—*Anchimolgus convexus*, new species, female: *a*, maxilliped, postero-inner (D); *b*, leg 1 and intercoxal plate, anterior (F); *c*, leg 2, anterior (F); *d*, third segment of endopod of leg 3, anterior (F); *e*, leg 4 and intercoxal plate, anterior (F); *f*, leg 5, dorsal (F). Male: *g*, dorsal (B).

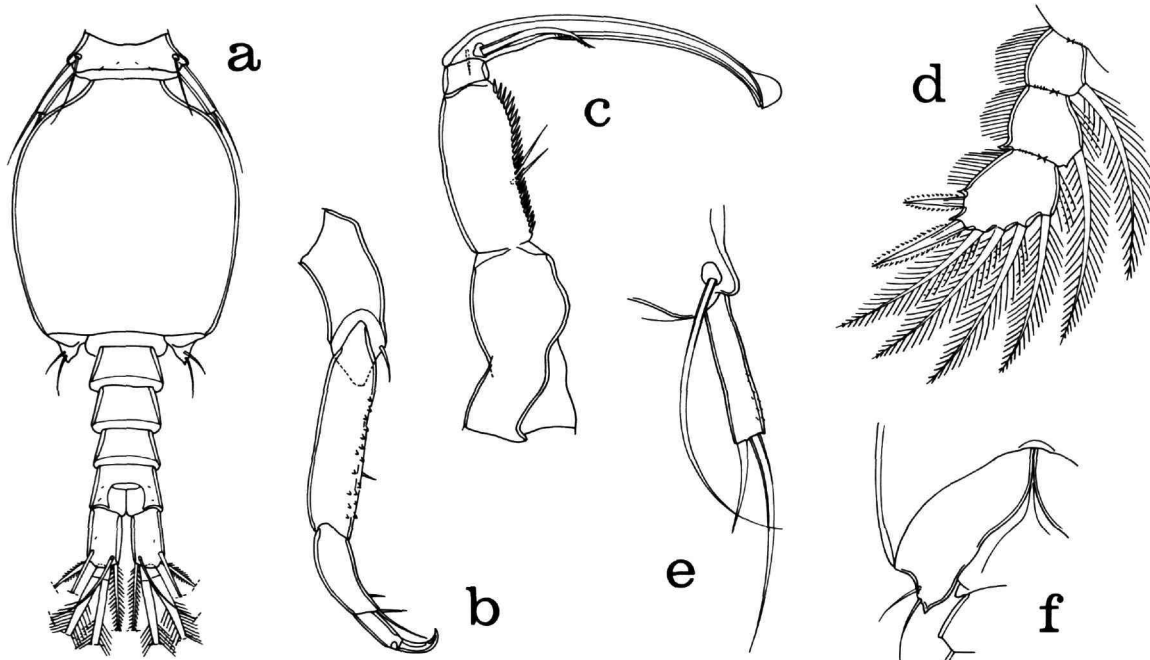


FIGURE 17.—*Anchimolgus convexus*, new species, male: *a*, urosome, dorsal (E); *b*, second antenna, antero-inner (D); *c*, maxilliped, inner (D); *d*, endopod of leg 1, anterior (F); *e*, leg 5, dorsal (C); *f*, leg 6, ventral (D).

anterior two-thirds, separates the new species from all other species except *Anchimolgus prolixipes* (Humes and Ho, 1968). Indeed *A. convexus* appears to be closely related to that Madagascan species from *Porites*. *Anchimolgus prolixipes* differs, how-

ever, from *A. convexus* not only in the shape of the third segment of the second antenna, but also in its weakly developed rostrum and in the free segment of leg 5 being longer than the genital segment.

Key to the Species of the Genus *Anchimolgus*

FEMALES

1. Third exopod segment of leg 4 with III, I, 5 *A. pandus*, new species
Third exopod segment of leg 4 with II, I, 5 2
2. Caudal ramus 6.1 : 1; with longest seta shorter than ramus
..... *A. digitatus* (Humes and Ho, 1968)
Caudal ramus less than 3.5 : 1, with longest seta much longer than ramus 3
3. Free segment of leg 5 a little longer than genital segment
..... *A. prolixipes* (Humes and Ho, 1968)
Free segment of leg 5 distinctly shorter than genital segment 4
4. Two terminal spines on third segment of legs 2 and 3 much shorter than outer spine;
outer edge of free segment of leg 5 with a small indentation *A. notatus*, new species
Two terminal spines on third endopod segment of legs 2 and 3 about as long as or longer
than outer spine; outer edge of free segment of leg 5 without an indentation 5
5. Second antenna 3-segmented, third and fourth segments fused *A. tener* Humes 1973
Second antenna 4-segmented 6
6. Outer edge of third segment of second antenna convex *A. convexus*, new species
Outer edge of third segment of second antenna nearly parallel with inner edge 7

Key to the Species of the Genus *Anchimolgus* (cont'd)

7. Third segment of second antenna about 1.4 times longer (greatest outer edge length) than fourth segment *A. latens*, new species
 Third segment of second antenna at least 2.3 times longer than fourth segment 8
8. Genital segment about as long as wide; caudal ramus 1.70 : 1 *A. punctilis*, new species
 Genital segment much longer than wide (1.42 : 1); caudal ramus 2.72 : 1
 *A. orectus*, new species

MALES

1. Third exopod segment of leg 4 with III, I, 5 *A. pandus*
 Third exopod segment of leg 4 with II, I, 5 2
2. Second antenna 3-segmented, third and fourth segments fused *A. tener*
 Second antenna 4-segmented 3
3. Caudal ramus 4.3 : 1, with longest seta shorter than ramus *A. digitatus*
 Caudal ramus less than 3 : 1, with longest seta much longer than ramus 4
4. Two terminal spines on third endopod segment of legs 2 and 3 much shorter than outer spine *A. notatus*
 Two terminal spines on third endopod segment of legs 2 and 3 about as long as or longer than outer spine 5
5. Third and fourth segments of second antenna combined shorter than second segments; small spines on second segment only 6
 Third and fourth segments of second antenna combined longer than second segment; small spines on second and third segments 7
6. Outer edge of third segment of second antenna convex; claw of maxilliped 154 *A. convexus*
 Outer edge of third segment of second antenna nearly parallel with inner edge, claw of maxilliped 172 *A. prolixipes*
7. Third segment of second antenna about 1.4 times longer (greatest outer edge length) than fourth segment *A. latens*
 Third segment of second antenna at least 2.3 times longer than fourth segment 8
8. Caudal ramus 1.54 : 1; claw of second antenna with distal third slightly acute *A. punctilis*
 Caudal ramus 2.78 : 1; claw of second antenna evenly arced *A. orectus*

***Mycoxynus* Humes, 1973**

***Mycoxynus fungianus*, new species**

FIGURES 18-20

TYPE MATERIAL.—20 ♀♀, 28 ♂♂, and 8 copepodids from one *Fungia* (*Ctenactis*) *echinata* (Pallas), in 3 m, southwestern shore of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 25 May 1975. Holotype ♀, allotype, and 40 paratypes (16 ♀♀, 24 ♂♂) 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 (Figure 18a) elongated and slender, similar to that of *Mycoxynus longicauda* Humes, 1973. Length 1.58 mm (1.50–1.75 mm) and greatest width 0.47 mm (0.44–0.51 mm), based on 10 specimens. Ratio of length to width of prosome 2.03 : 1. Ratio of length of prosome to that of urosome 1.46 : 1.

Segment of leg 5 (Figure 18b) 176 × 275. Genital segment 169 × 220, wider than long. Genital

areas situated dorsally in anterior half of segment. Each area (Figure 18c) with two small naked setae about 10 long. Three postgenital segments from anterior to posterior 91 × 125, 78 × 107, and 104 × 84. Posteroventral margin of anal segment smooth.

Caudal ramus (Figure 18d) greatly elongated, 166 × 14, width taken at middle. Ratio of length to width 11.9 : 1. Outer lateral seta 23. Dorsal seta 25. Outermost terminal seta 21, innermost terminal seta 23, and two median terminal setae 94 (outer) and 121 (inner). All setae naked.

Body surface with numerous small refractile areas and a few small hairs (sensilla).

Egg sac (Figure 18e) moderately elongated, length 638–693, width 253. Two sacs in most preserved specimens adhering together (in only one female separate). Each egg about 112 in diameter.

Rostrum (Figure 18f–h) linguiform in ventral view and projecting in lateral view. First antenna (Figure 18i) 285 long and 7-segmented, though separation of segments 2 and 3 distinct only on dorsal surface. Lengths of segments: 50 (99 along anterior

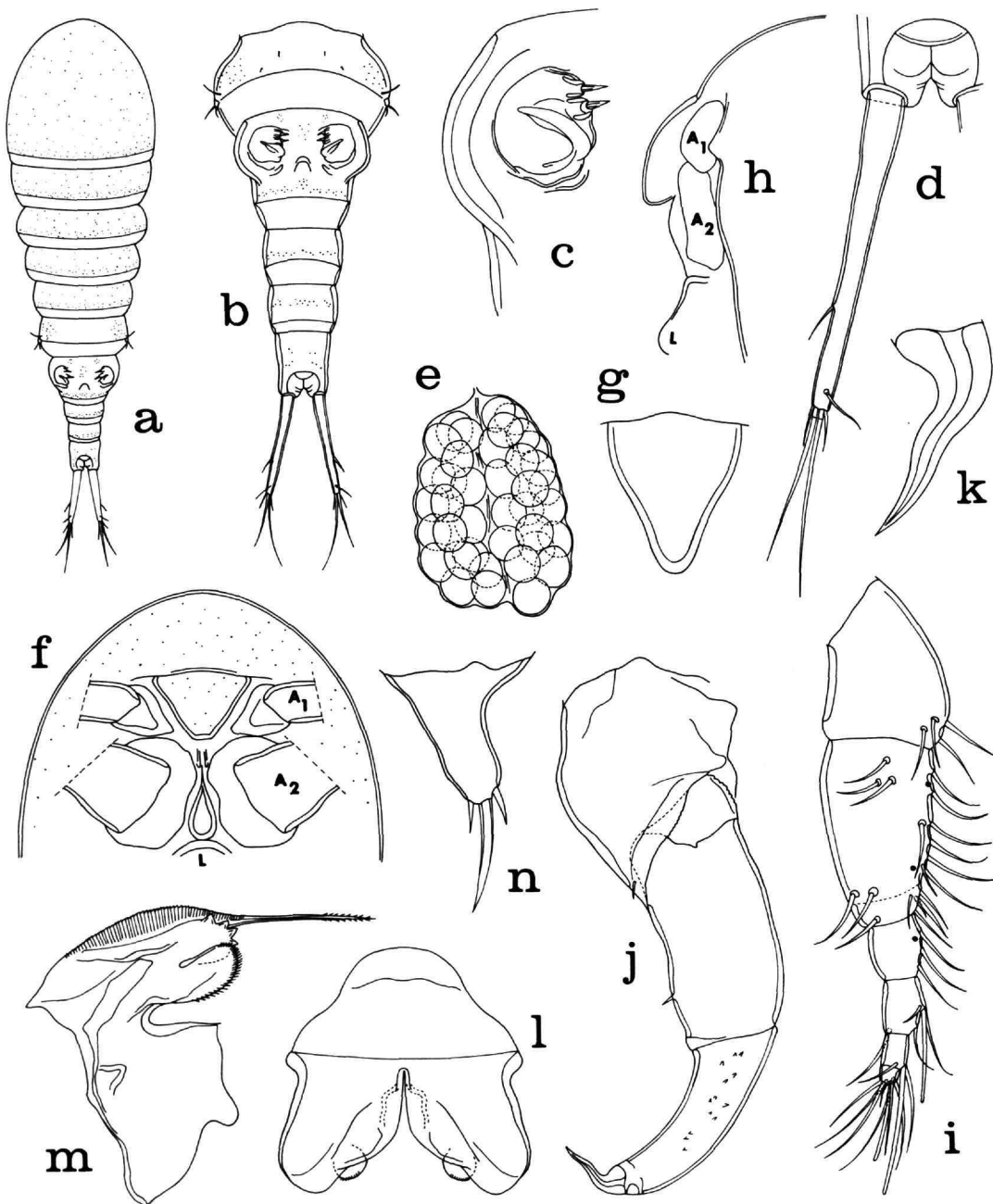


FIGURE 18.—*Mycoxynus fungianus*, new species, female: *a*, dorsal (A); *b*, urosome, dorsal (B); *c*, genital area, dorsal (D); *d*, caudal ramus, dorsal (D); *e*, egg sacs, dorsal (A); *f*, rostrum, ventral (G); *g*, rostrum, flat ventral view (E); *h*, rostrum, lateral (G); *i*, first antenna, with three round dots indicating positions of aesthetes in male, ventral (D); *j*, second antenna, anterior (D); *k*, claw of second antenna, anterior (H); *l*, labrum and paragnaths, ventral (F); *m*, mandible, posterior (C); *n*, first maxilla, posterior (C).

margin), 88, 16, 29, 26, 16, and 11 respectively. Armature: 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. All setae naked.

Second antenna (Figure 18j) 263 long and 3-segmented. First and second segments with single small inner seta. Third segment lacking setae, 116 along outer edge, 71 along inner edge, and 26 wide. Terminal claw 40, sharply pointed and sinuous (Figure 18k).

Labrum (Figure 18l) with two moderately slender posteroventral lobes. Mandible (Figure 18m), paragnath (Figure 18l), first maxilla (Figure 18n), and second maxilla (Figure 19a) resembling those of *Mycoxynus longicauda* except for small details. Maxilliped (Figure 19b) 3-segmented and arched anteriorly. Second segment broad in flat outer view (Figure 19c) with two small unequal naked setae and distal transverse outer row of spinules. Third

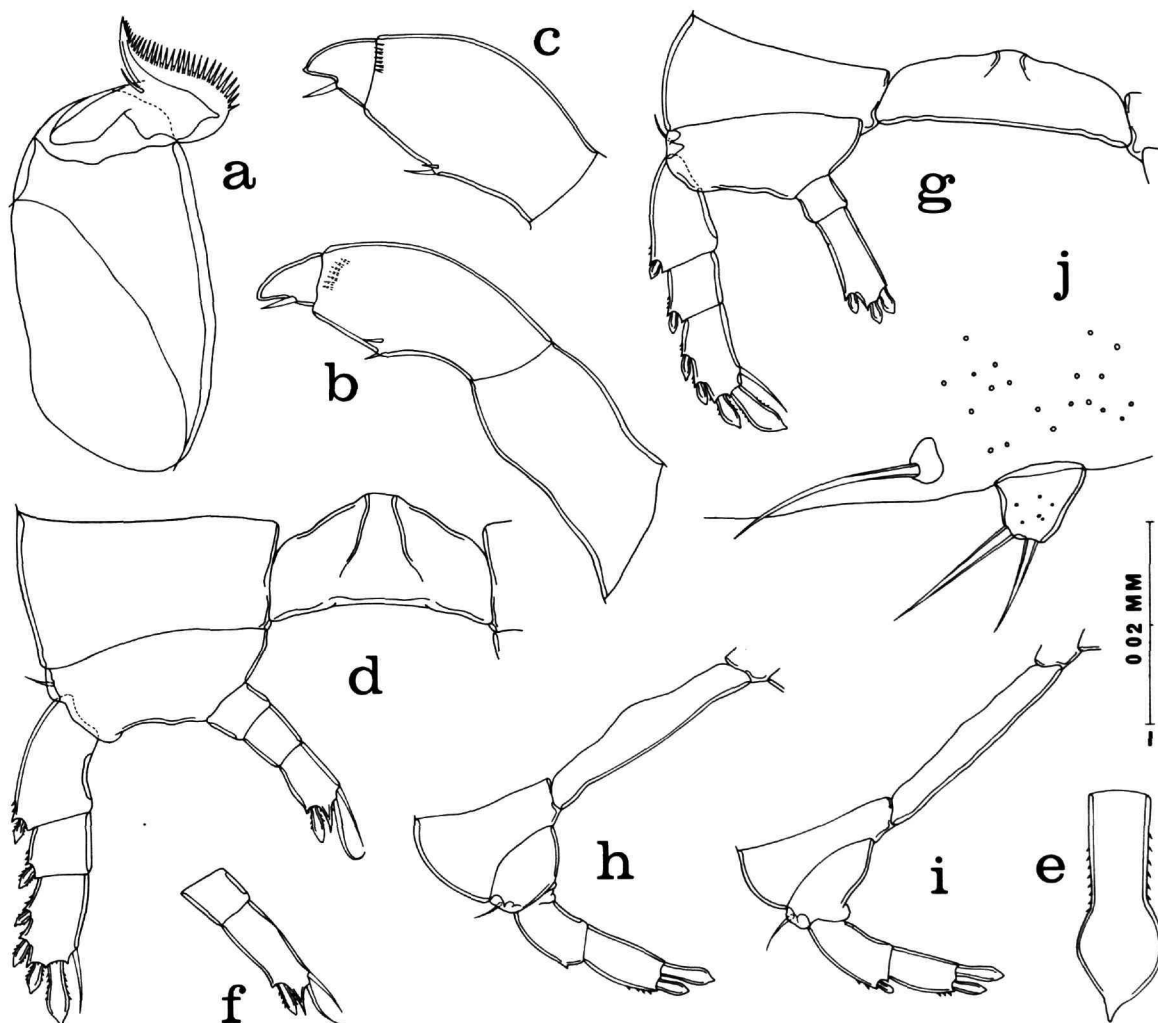


FIGURE 19.—*Mycoxynus fungianus*, new species, female: a, second maxilla, anterior (C); b, maxilliped, inner (C); c, second and third segments of maxilliped, outer (C); d, leg 1 and intercoxal plate, anterior (F); e, terminal spine on exopod of leg 1, anterior (F); f, abnormal right endopod of leg 1, anterior (F); g, leg 2 and intercoxal plate, anterior (F); h, leg 3 and intercoxal plate, anterior (F); i, leg 4 and intercoxal plate, anterior (F); j, leg 5, lateral (C).

segment bluntly pointed distally and bearing a naked seta. Ventral area between maxillipeds and first pair of legs similar to that of *M. longicauda*.

Leg 1 (Figure 19d) with 3-segmented rami. Leg 2 (Figure 19g) with 3-segmented exopod and 2-segmented endopod. Leg 3 (Figure 19h) and leg 4 (Figure 19i) with 2-segmented exopods but lacking endopods. Spine and setal formula for legs 1-4 as follows (Roman numerals representing spines, Arabic numerals setae):

P ₁	coxa	0-0	basis	1-0	exp	I-0; I-0;	II, II, 1
					enp	0-0; 0-0;	I, 2
P ₂	coxa	0-0	basis	1-0	exp	I-0; I-0;	II, II, 1
					enp	0-0; I, II	
P ₃	coxa	0-0	basis	1-0	exp	0-0; II	
					enp	absent	
P ₄	coxa	0-0	basis	1-0	exp	I-0; II	
					enp	absent	

Exopod spine with mucronate tip (Figure 19e). In one female right endopod of leg 1, 2-segmented

(Figure 19f). Endopod of leg 2 showing very slight indication of division of second segment.

Leg 5 (Figure 19j) with small free segment 15.5×18.5 . Two terminal setae 33 and 22. Dorsal setae 45. All setae naked.

Leg 6 represented by two setae on genital area (Figure 18c).

Living specimens in transmitted light gray, intestine pale orange tan, eye red, egg sacs opaque gray.

MALE.—Body (Figure 20a) slender as in female. Length 1.32 mm (1.28-1.36 mm) and the greatest width 0.38 mm (0.35-0.40 mm), based on 10 specimens. Ratio of length to width of prosome 1.85:1. Ratio of length of prosome to that of urosome 1.12:1.

Segment of leg 5, 78×265 . Genital segment (Figure 20b) 133×250 , wider than long. Four post-genital segments from anterior to posterior, 81×130 , 73×101 , 62×86 , and 91×70 .

Caudal ramus resembling that of female, 152×13 , ratio 11.8:1.

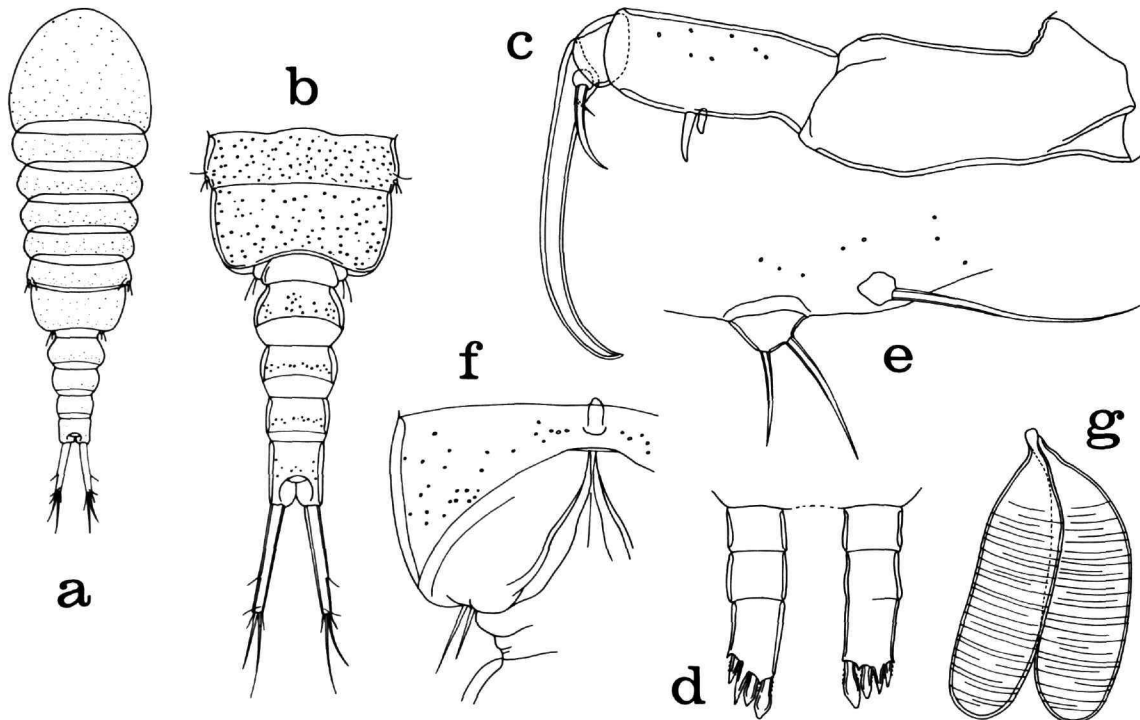


FIGURE 20.—*Mycoxynus fungianus*, new species, male: a, dorsal (A); b, urosome, dorsal (B); c, maxilliped, inner (C); d, right and left endopods of leg 2, anterior (F); e, leg 5, lateral (C); f, leg 6, ventral (E); g, spermatophores, attached to female, dorsal (B).

Rostrum like that of female. First antenna similar to that of female, but three aesthetes added as in male of *M. longicauda*, so that formula is: 4, 13 + 2 aesthetes, 6, 3 + 1 aesthete, 4 + 1 aesthete, and 7 + 1 aesthete.

Second antenna, labrum, mandible, paragnath, first maxilla, and second maxilla like those in female. Maxilliped (Figure 20c) resembling that of *M. longicauda*, but claw a little stouter and 73 along axis.

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

Legs 1–4 similar to those of female, but second segment of endopod of leg 2 showing a little stronger evidence of subdivision and in one specimen 3-segmented (Figure 20d).

Leg 5 (Figure 20e) with free segment 11 × 9.

Leg 6 (Figure 20f) the usual posteroventral flap on genital segment, bearing two naked setae 47 and 34.

Spermatophore (Figure 20g) attached to female in pairs, sausage shaped, about 400 × 120, not including neck. Surface transversely striated.

Living specimens with color resembling that of female.

ETYMOLOGY.—The specific name *fungianus* is a combination of *Fungia* and the Latin suffix *-anus* (belonging to).

COMPARISON WITH *Mycoxynus longicauda*.—The following features of *Mycoxynus fungianus* distinguish it from *M. longicauda*, an associate of *Parahalomitra irregularis* (Gardiner) in New Caledonia: (1) the shorter body length, ♀ 1.58 mm, ♂ 1.32 mm versus 1.80 mm and 1.57 mm; (2) the shorter caudal ramus, ♀ 166, ♂ 152 versus 268 and 208; (3) legs 1 and 2 with four spines on the third segment of the exopod versus three such spines; (4) legs 3 and 4 with the ramus 2-segmented versus 3-segmented; and (5) the claw of the female second antenna 40 versus 20.

***Odontomolgus* Humes and Stock, 1972**

***Odontomolgus decens*, new species**

FIGURES 21–23

TYPE MATERIAL.—55 ♀ ♀, 98 ♂ ♂, and 131 copepodids from two *Fungia* (*Heliofungia*) *actiniformis* (Quoy and Gaimard), in 2 m, southern end of Poelau Naira, Banda Islands, 4°31'45"S,

129°53'35"E, 2 May 1955. Holotype ♀, allotype, and 144 paratypes (50 ♀ ♀, 94 ♂ ♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes and the copepodids in the collection of the author.

OTHER SPECIMENS.—From *Fungia actiniformis*: 14 ♀ ♀, 19 ♂ ♂, and 16 copepodids from eight hosts, in 3 m, Natsepa, Ambon, 3°37'05"S, 128°17'00"E, 24 April 1975.

FEMALE.—Body (Figure 21a, b) slender. Prosome narrowed anteriorly in dorsal view and thickened dorsoventrally. Length 1.85 mm (1.77–1.93 mm) and greatest width 0.59 mm (0.54–0.62 mm), based on 10 specimens. Ratio of length to width of prosome 2.03 : 1. Ratio of length of prosome to that of urosome 1.85 : 1.

Segment of leg 5 (Figure 21c) 104 × 297. Genital segment 248 × 325, broadest in its anterior half where dorsolaterally it is slightly flattened and winglike (Figure 21b, c). Genital areas located dorsally in middle of segment. Each area (Figure 21d) with two small naked setae 6.5 and 11. Three post-genital segments from anterior to posterior 91 × 148, 66 × 135, and 95 × 135. Posteroventral margin of anal segment with row of small spinules on both sides.

Caudal ramus (Figure 21e) moderately elongated, 101 × 52, with ratio of 2 : 1. Outer lateral seta (here inserted distally and a little dorsally) 440, dorsal seta 138, outermost terminal seta 300, and innermost terminal seta 528, all naked. Two long median terminal setae 847 (outer) and 880 (inner), both inserted between smooth dorsal flange and ventral flange with minute marginal spinules and both with lateral hairs in their midregions. Small spinules at insertions of outer lateral seta and outermost terminal seta. Sensilla on distal dorsal surface of ramus.

Body surface with very few hairs (sensilla).

Egg sac (Figure 21a) approximately 517 × 220, containing 25–30 eggs about 103 in average diameter.

Rostrum (Figure 21f) small and rounded, placed subterminally. First antenna (Figure 21g) 389 long. Lengths of seven segments: 35 (70 along anterior margin), 78, 49, 70, 62, 36, and 24 respectively. Formula for armature: 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete (as in other species of the genus). All setae naked.

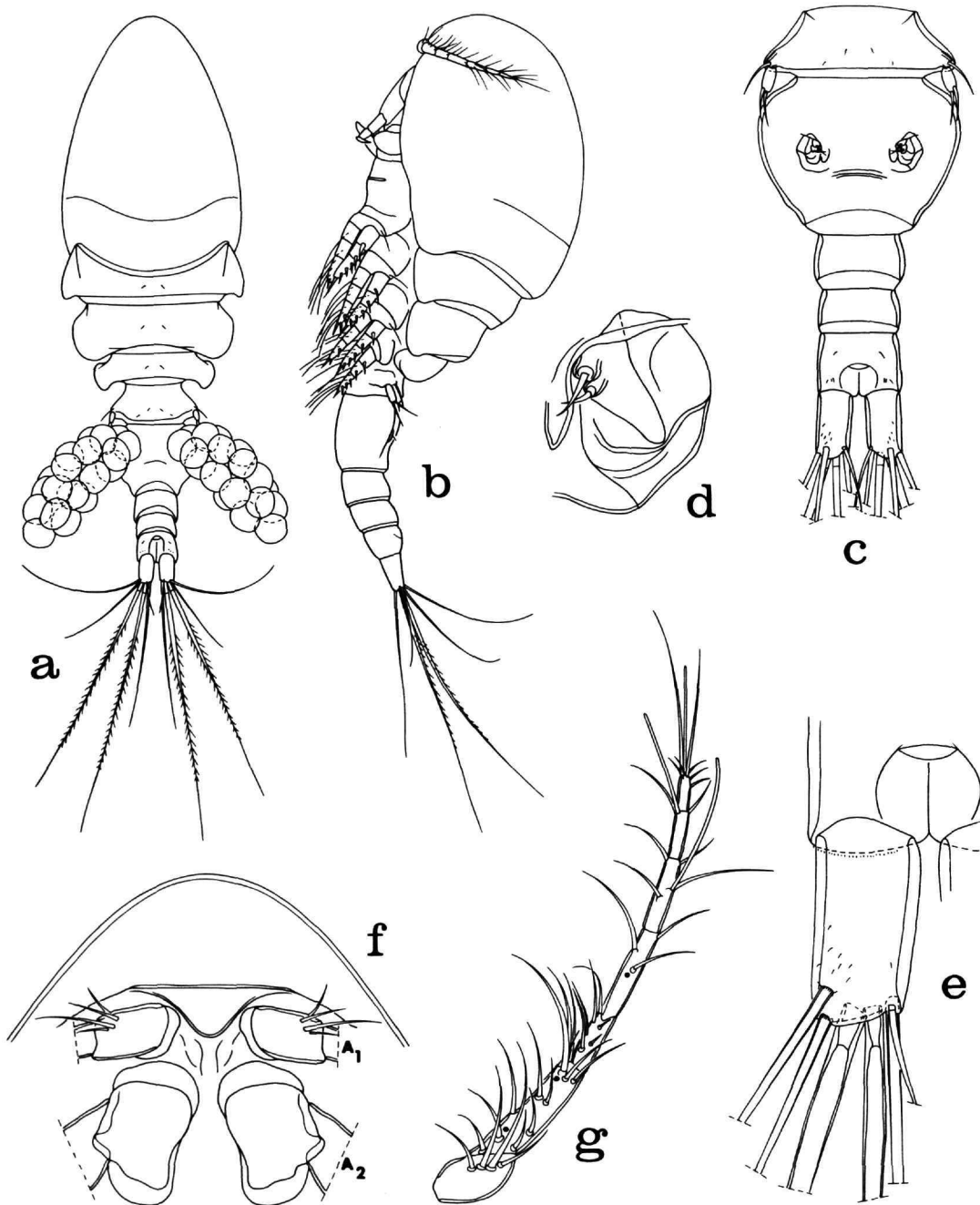


FIGURE 21.—*Odontomolgus decens*, new species, female: *a*, dorsal (A); *b*, lateral (A); *c*, urosome, dorsal (B); *d*, genital area, dorsal (C); *e*, caudal ramus, dorsal (D); *f*, rostrum, ventral (E); *g*, first antenna, with three round dots indicating positions of aesthetes added in male, anterodorsal (E).

Second antenna (Figure 22a) 340 long with formula 1, 1, 3, and one terminal claw. All setae small and naked. Fourth segment 46 along outer side, 27 along inner side, and 22 wide. Claw 34 and distally bent slightly angularly (Figure 22b). Near base of claw a small inconspicuous setule (Figure 22a).

Labrum (Figure 22c) with two posteroventral lobes having very hyaline edges. Mandible (Figure 22d) in general form resembling that of *Odontomolgus scitulus* Humes, 1973, and *Odontomolgus mundulus* Humes, 1974, with characteristic large hyaline proximally directed leaflike process. Paragnath (Figure 22c) a small inconspicuous smooth lobe. First maxilla (Figure 22e) with four smooth setae. Second maxilla (Figure 22f) with second segment bearing inner hyaline seta with lateral spinules and posterior surficial seta minutely barbed; lash with row of slender spines. Maxilliped (Figure 22g) with two naked setae on second segment; third segment with two small naked spinelike setae and small clawlike tip.

Ventral area between maxillipeds and first pair of legs (Figure 22h) not protuberant.

Legs 1-4 (Figures 22i, j; 23a, b) with 3-segmented rami except for endopod of leg 4, which is 2-segmented. Formula for the armature as in *Anchimolgus notatus* above, except that the third segment of the exopod of leg 4 has III, I, 5 instead of II, I, 5.

Inner coxal seta of legs 1-3 plumose, but in leg 4 this seta with short spinules. Inner margin of basis in legs 1-3 with row of hairs, but this margin smooth in leg 4. First segment of endopod of leg 1 lacking distal outer spiniform process. Outer spine on first segment of exopod of leg 1 stronger and more sclerotized than more distal spines. Leg 4 with exopod 164 long. First segment of endopod 26×26 , its inner distal seta 108. Second segment 42×23 , its two barbed terminal spines 21 (outer) and 100 (inner). Outer margins of both segments haired.

Leg 5 (Figure 23c) with unornamented free segment 44×20 . Two terminal naked setae 49 and 52. Seta on body near free segment 69 and naked.

Leg 6 represented by two setae on genital area (Figure 21d).

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

MALE.—Body (Figure 23d) slender. Length 1.61 mm (1.54-1.76 mm) and greatest width 0.49 mm

(0.47-0.51 mm), based on 10 specimens. Ratio of length to width of prosome 1.61 : 1. Ratio of length of prosome to that of urosome 1.39 : 1.

Segment of leg 5 (Figure 23e) 73×237 . Genital segment 255×286 , subquadrate in dorsal view and slightly wider in the anterior half than posteriorly. Four postgenital segments from anterior to posterior 65×120 , 70×120 , 55×109 , and 78×117 .

Caudal ramus resembling that of female but smaller, 81×43 , with ratio of 1.88 : 1.

Rostrum like that of female. First antenna similar to that of female but three aesthetes added (at points indicated by round dots in Figure 21g), so that formula is: 4, 13 + 2 aesthetes, 6, 3 + 1 aesthete, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete.

Second antenna (Figure 23f) resembling that of female but sexually dimorphic in having small spines along inner edge of second segment.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 23g) 4-segmented (assuming that proximal part of claw represents fourth segment). First segment with small inner distal knob. Second segment with two naked setae and two groups of small spines. Small third segment unarmed. Claw 275 along axis (including terminal lamella), divided incompletely at its midregion, and bearing two unequal proximal setae, longer seta bent and having row of slender spinules along one side.

Ventral area between maxillipeds and first pair of legs similar to that in female.

Leg 1 with sexual dimorphism in endopod (Figure 23h) where third segment has formula I, I, 4; otherwise leg 1 as in female. Legs 2-5 resembling those of female.

Leg 6 (Figure 23i) a posteroventral flap on genital segment bearing two naked setae approximately 53 long.

Spermatophore not observed.

Living specimens with color similar to that of female.

ETYMOLOGY.—The specific name *decens* (Latin, = handsome or becoming) alludes to the well-proportioned body form.

COMPARISON WITH OTHER SPECIES OF *Odontomolgus*.—Among the five species of *Odontomolgus* known until now only *Odontomolgus scitulus* Humes, 1973, from *Fungia* (*Fungia*) *fungites* (Linnaeus) in New Caledonia has the formula III, I, 5

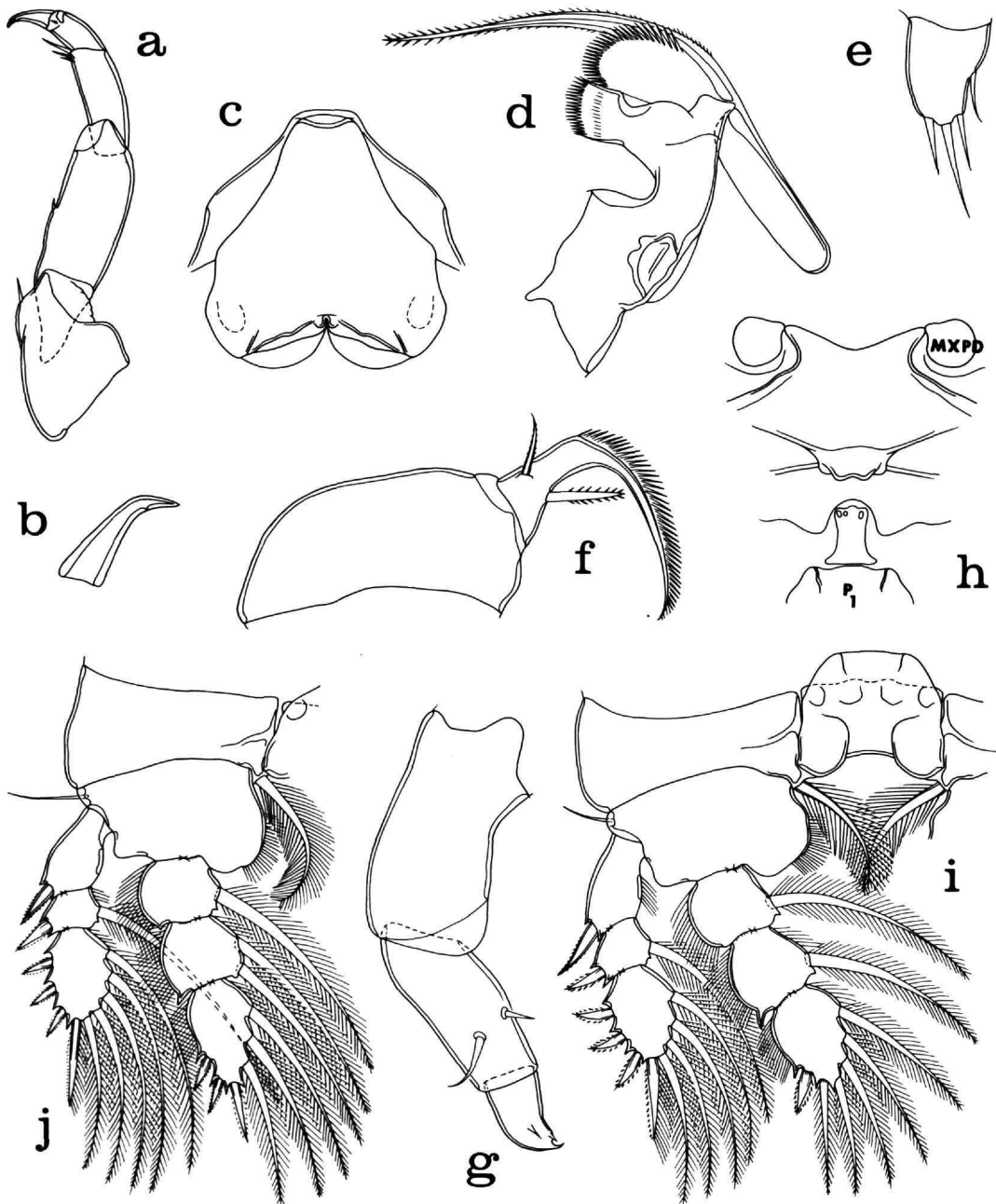


FIGURE 22.—*Odontomolgus decens*, new species, female: *a*, second antenna, inner (E); *b*, claw of second antenna, inner (C); *c*, labrum, with paragnaths indicated by broken lines, ventral (D); *d*, mandible, posterior (C); *e*, first maxilla, ventral (C); *f*, second maxilla, posterior (F); *g*, maxilliped, inner (F); *h*, area between maxillipeds and first pair of legs, ventral (E); *i*, leg 1 and intercoxal plate, anterior (E); *j*, leg 2, anterior (E).

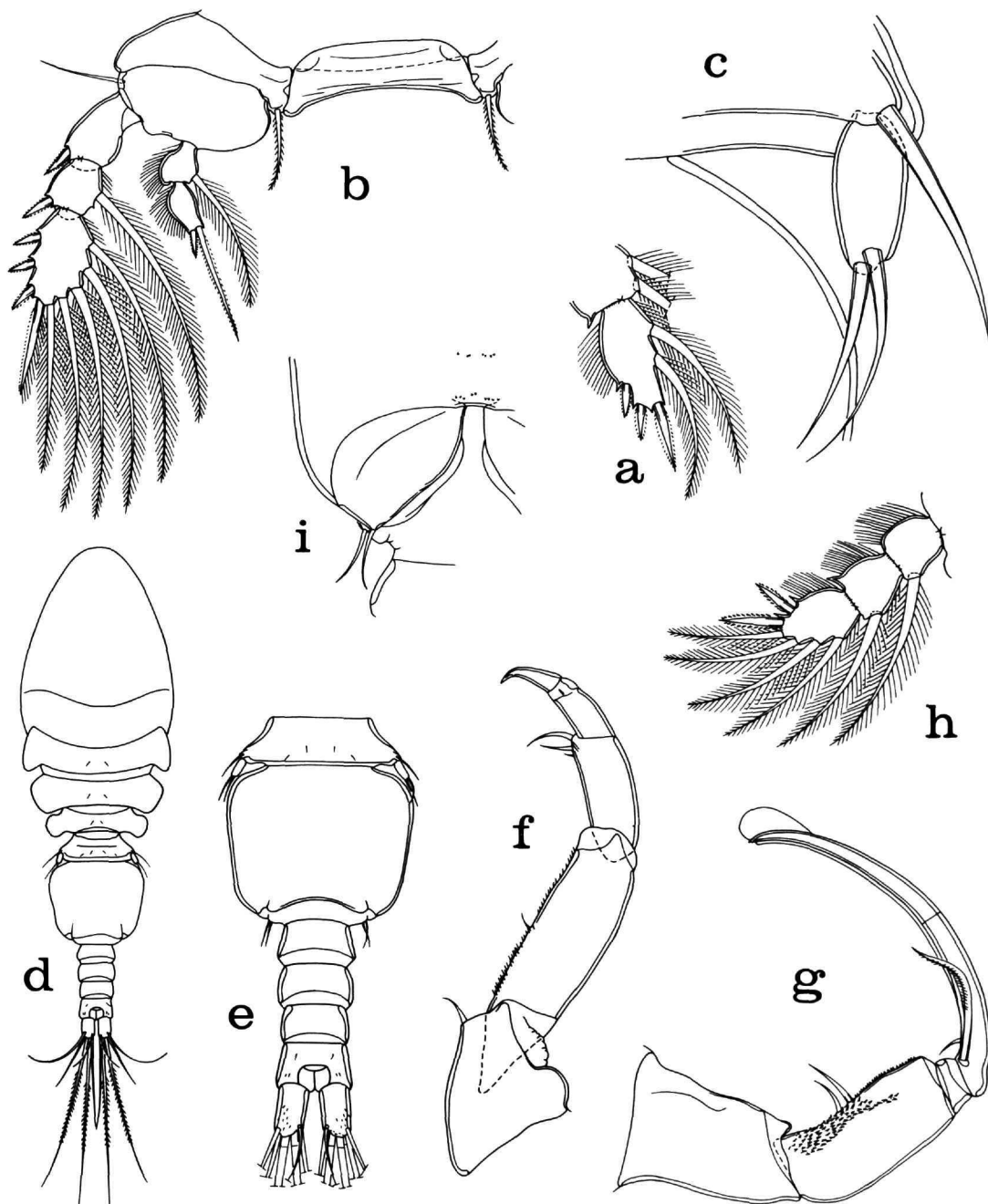


FIGURE 23.—*Odontomolgus decens*, new species, female: *a*, third segment of endopod of leg 3, anterior (E); *b*, leg 4 and intercoxal plate, anterior (E); *c*, leg 5, dorsal (C). Male: *d*, dorsal (A); *e*, urosome, dorsal (B); *f*, second antenna, inner (D); *g*, maxilliped, inner (E); *h*, endopod of leg 1, anterior (E); *i*, leg 6, ventral (E).

on the third exopod segment of leg 4, as in *Odontomolgus decens*. The other four species (see Humes and Stock, 1973 and Humes, 1974) have II, I, 5 on this segment. While *O. scitulus* and *O. decens* have many similar features, the two species differ in several ways, the most obvious being the longer caudal rami in *O. scitulus*. Several points of distinction are mentioned in the key to the species of *Odontomolgus* given below.

Odontomolgus fultus, new species

FIGURES 24-26

TYPE MATERIAL.—20 ♀♀, 7 ♂♂ from one *Halomitra philippinensis* Studer, in 10 m, southwestern shore of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 4 May 1975. Holotype ♀, allotype, and 21 paratypes (16 ♀♀, 5 ♂♂) 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 (Figure 24a) with slender prosome thickened dorsoventrally as in *Odontomolgus decens*. Length 1.51 mm (1.45–1.57 mm) and greatest width 0.46 mm (0.44–0.47 mm), based on 10 specimens. Ratio of length to width of prosome 1.82 : 1. Ratio of length of prosome to that of urosome 1.44 : 1.

Segment of leg 5 (Figure 24b) 65 × 286. Genital segment 220 × 308, wider than long, broadest in anterior half with lateral margins tapering evenly posteriorly. This segment in lateral view raised dorsally in anterior two-thirds (Figure 24c). Genital areas situated dorsally just behind middle of segment. Each area with two unequal naked setae as in *O. decens*. Three postgenital segments from anterior to posterior 83 × 150, 81 × 125, and 94 × 125. Posteroventral border of anal segment with row of minute spinules set back from edge on both sides.

Caudal ramus (Figure 24d) elongated, 114 × 47, with ratio of 2.43 : 1. Outer lateral seta 180, dorsal seta 53, outermost terminal seta 130, and innermost terminal seta 170. Two long median terminal setae 355 (outer) and 627 (inner), both inserted between small, smooth dorsal flange and ventral flange with minute spinules. All setae naked.

Body surface with very few hairs (sensilla).

Egg sac not seen.

Rostrum (Figure 24e) linguiform. First antenna

(Figure 24f) 297 long. Lengths of seven segments: 18 (49 along anterior margin), 81, 36, 44, 37, 29, and 21 respectively. Formula for armature as in *O. decens*. All setae naked.

Second antenna (Figure 24g) 265 long and armed as in *O. decens*. First and second segments large. Third and fourth segments smaller and nearly equal in length. Fourth segment 44 along outer edge, 29 along inner edge, and 22 wide. Terminal claw (Figure 24h) 43 along axis with slightly sinuous apex.

Labrum, mandible, and paragnath resembling those of *O. decens*. First maxilla (Figure 24i) with two small naked setae and two large finely barbed setae. Second maxilla (Figure 24j) with second segment bearing inner hyaline delicately barbed seta (less strongly barbed than in *O. decens*) and posterior surficial seta with smooth lamellate margins. Maxilliped (Figure 25a) with tip finely barbed.

Ventral area between maxillipeds and first pair of legs (Figure 25b) slightly protuberant.

Legs 1–4 (Figure 25c–f) segmented and armed as in *O. decens*. Spines on rami of leg 1 curved with very short barbs (rather than straight with conspicuous barbs as in *O. decens*). Outer spine on first segment of leg 1 stronger than more distal spines (as in *O. decens*). Leg 4 with exopod 143 long. First segment of endopod 23 × 26, inner distal seta 81. Second segment 34 × 21, two finely barbed terminal spines 34 (outer) and 100 (inner). Outer margins of both segments haired. Inner coxal seta of leg 4 with short spinules as in *O. decens*.

Leg 5 (Figure 25g) with small unornamented free segment 19 × 14 situated ventrally. Two terminal setae approximately 50 and 70. Adjacent dorsal seta 55. All setae naked.

Leg 6 represented by two setae on genital area (Figure 24b).

Living specimens in transmitted light opaque, slightly tan, eye red.

MALE.—Body (Figure 26a) slender. Length 1.40 mm (1.32–1.46 mm) and greatest width 0.38 mm (0.36–0.40 mm), based on 7 specimens. Ratio of length to width of prosome 2.11 : 1. Ratio of length of prosome to that of urosome 1.13 : 1.

Segment of leg 5 (Figure 26b) 52 × 242. Genital segment 270 × 295, a little wider than long. Four postgenital segments from anterior to posterior 57 × 117, 70 × 110, 57 × 104, and 75 × 107.

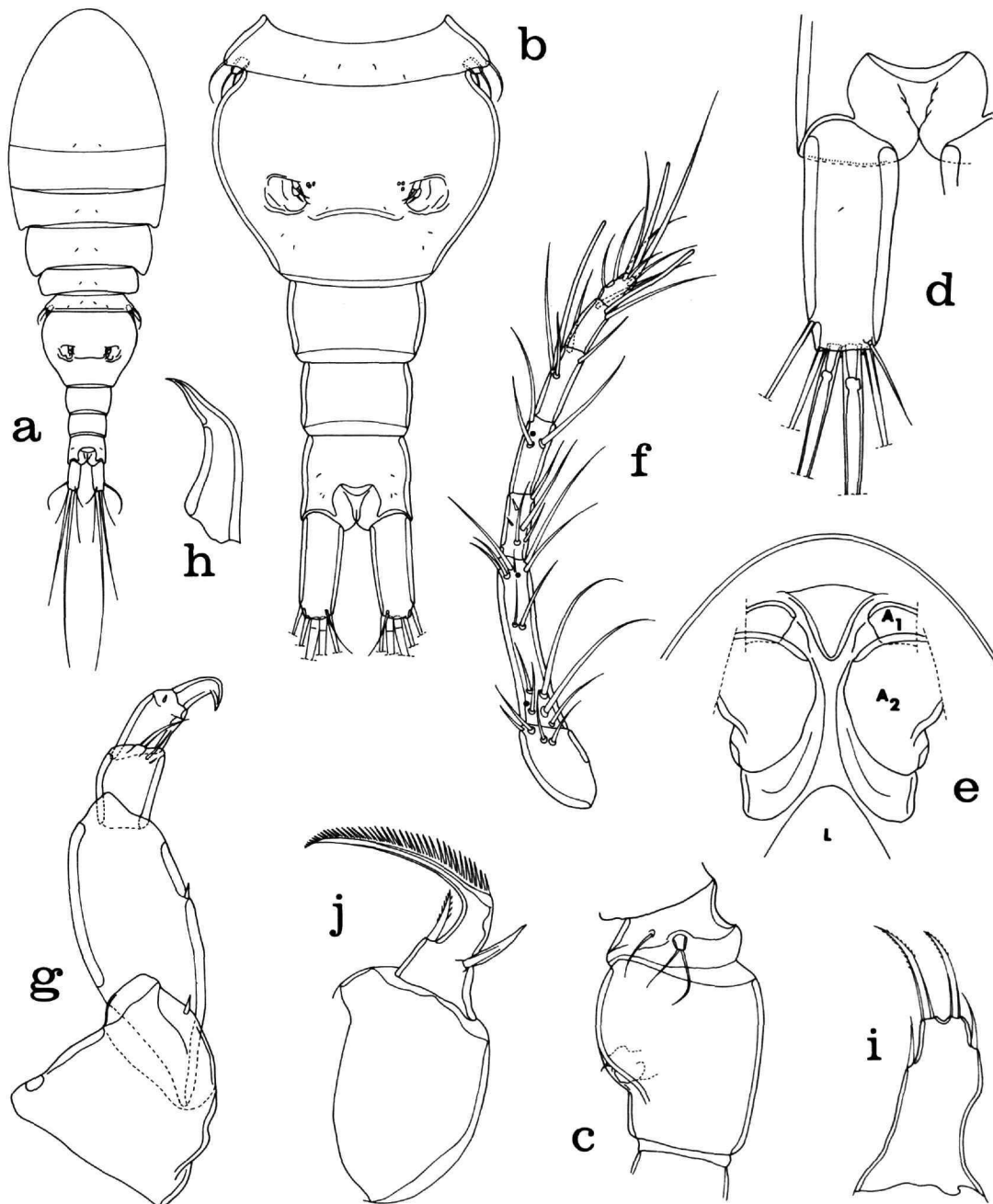


FIGURE 24.—*Odontomolgus fultus* new species, female: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, segment of leg 5 and genital segment, lateral (G); *d*, caudal ramus, dorsal (D); *e*, rostrum, ventral (E); *f*, first antenna, with three round dots indicating positions of aesthetes added in male, anterodorsal (D); *g*, second antenna, inner (D); *h*, claw of second antenna, inner (C); *i*, first maxilla, posterior (C); *j*, second maxilla, posterior (F).

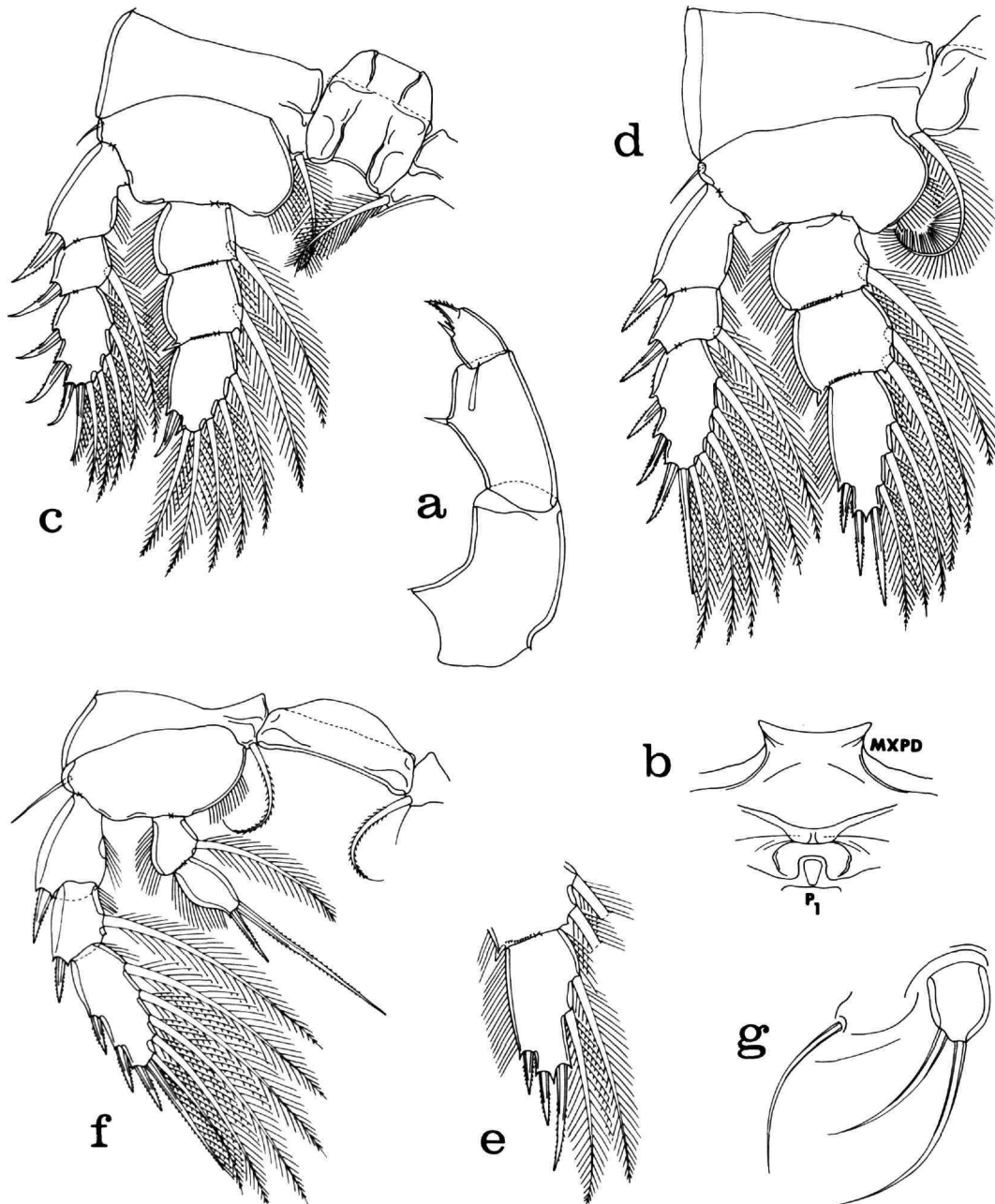


FIGURE 25.—*Odontomolgus fultus*, new species, female: *a*, maxilliped, inner (F); *b*, area between maxillipeds and first pair of legs, ventral (E); *c*, leg 1 and intercoxal plate, anterior (D); *d*, leg 2, anterior (D); *e*, third segment of endopod of leg 3, anterior (D); *f*, leg 4 and intercoxal plate, anterior (D); *g*, leg 5, lateral (C).

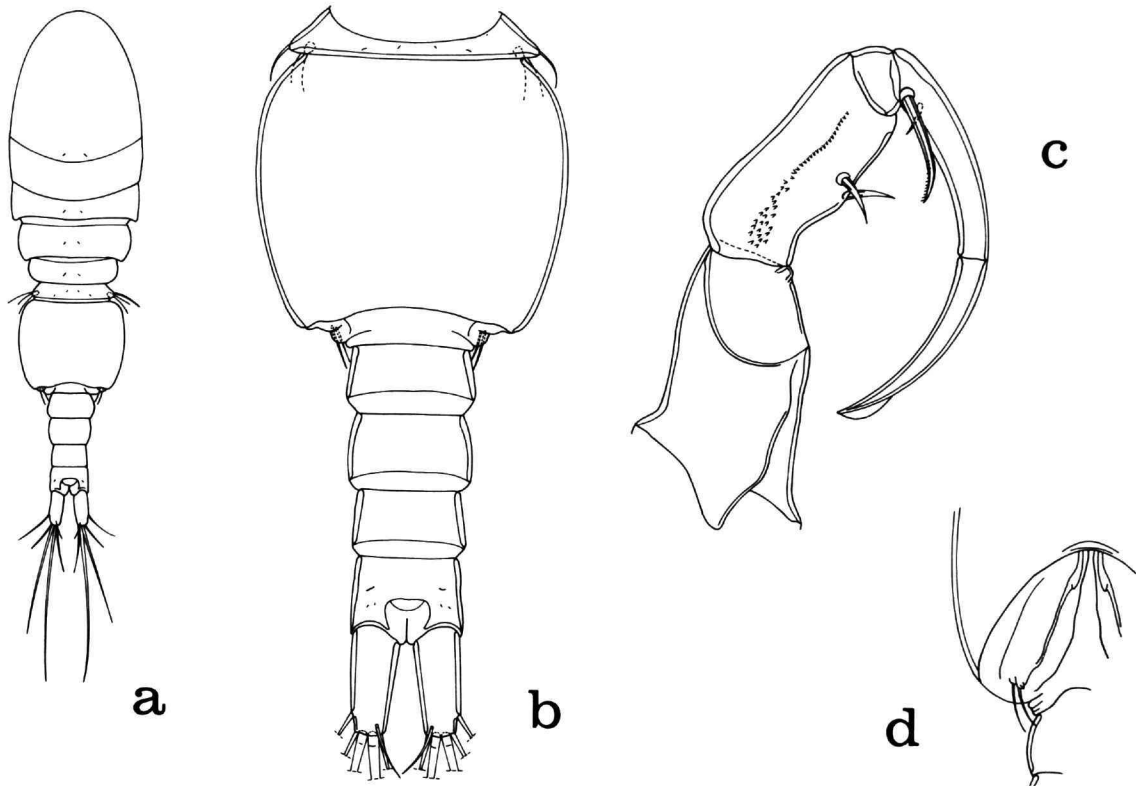


FIGURE 26.—*Odontomolgus fultus*, new species, male: *a*, dorsal (A); *b*, urosome, dorsal (G); *c*, maxilliped, inner (D); *d*, leg 6, ventral (G).

Caudal ramus similar to that of female but smaller, 99×42 , ratio 2.36 : 1.

Rostrum like that of female. First antenna with three aesthetes added as in *O. decens*, with same formula as in that species. Second antenna as in female.

Labrum, mandible, paragnath, first maxilla, and second maxilla resembling those of female. Maxilliped (Figure 26c) resembling that of *O. decens*, but only one group of spines on second segment and claw 168 along axis with smaller terminal lamella.

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

Legs 1–4 like those of female. Leg 5 resembling that of female with free segment 17×13 .

Leg 6 (Figure 26d) a posteroventral flap on genital segment bearing two naked setae about 50 long.

Spermatophore not observed.

Living specimens with color resembling that of female.

ETYMOLOGY.—The specific name *fultus* (Latin, = propped up or sustained) alludes to the two large proximal segments of the second antenna that have the appearance of a pedestal for the two small distal segments.

COMPARISON WITH OTHER SPECIES OF *Odontomolgus*.—Two species of *Odontomolgus*, *O. scitulus* Humes, 1973, and *O. decens*, new species above, have the formula III, I, 5 on the third exopod segment of leg 4, as in *Odontomolgus fultus*. *Odontomolgus fultus* may be readily distinguished from *O. decens*, where the third segment of the second antenna is much longer than the fourth segment and the female caudal ramus is shorter (ratio 2 : 1). *Odontomolgus fultus*, though close in many re-

spects to *O. scitulus*, may be separated from the latter where the female caudal ramus is longer (ratio 3.8 : 1), the female genital areas are located

in the anterior third of the segment, and the terminal spines on the endopod of leg 4 have the ratio of about 2 : 1 (instead of 3 : 1 as in *O. fultus*).

Key to the Species of the Genus *Odontomolgus*

FEMALES

1. Third segment of exopod of leg 4 with II, I, 5 2
Third segment of exopod of leg 4 with III, I, 5 5
2. Second segment of second maxilla with a setiform sphere; longest seta on caudal ramus shorter than ramus *O. actinophorus* (Humes and Frost, 1964)
Second segment of second maxilla without a setiferous sphere; longest seta on caudal ramus much longer than ramus 3
3. Genital segment in dorsal view angularly constricted in its posterior fourth; free segment of leg 5 elongated, at least 4 : 1, with a small inner proximal expansion
..... *O. rhadinus* (Humes and Ho, 1967)
Genital segment in dorsal view tapered, without an angular constriction; free segment of leg 5 less than 3 : 1, without an inner proximal expansion 4
4. Length of body 1.21 mm; fourth segment of second antenna shorter than third
..... *O. campulus* (Humes and Ho, 1968)
Length of body 1.90 mm; fourth segment of second antenna longer than third
..... *O. mundulus* Humes, 1974
5. Third segment of second antenna much longer than fourth segment; free segment of leg 5, 44 long *O. decens*, new species
Third segment of second antenna about as long as fourth segment; free segment of leg 5, 25 or less in length 6
6. Caudal ramus about 3.8 : 1; claw of second antenna angularly recurved with tip not sinuous *O. scitulus* Humes, 1973
Caudal ramus about 2.43 : 1; claw of second antenna with sinuous tip ... *O. fultus*, new species

MALES

1. Third segment of exopod of leg 4 with II, I, 5 2
Third segment of exopod of leg 4 with III, I, 5 5
2. Longest seta on caudal ramus shorter than ramus *O. actinophorus*
Longest seta on caudal ramus much longer than ramus 3
3. Second segment of second antenna with inner spinules; genital segment longer than wide
..... *O. rhadinus*
Second segment of second antenna with ornamentation other than spinules; genital segment wider than long 4
4. Second segment of second antenna with many short spinelike bosses; free segment of leg 5 small, 15 × 9 *O. campulus*
Second segment of second antenna with irregularly sized obtuse spines or processes; free segment of leg 5 larger, 34 × 13 *O. mundulus*
5. Second segment of second antenna with inner spinules; third segment of endopod of leg 1 with I, I, 4 *O. decens*
Second segment of second antenna without ornamentation; third segment of endopod of leg 1 with I, 5 6
6. Caudal ramus 3.6 : 1; second antenna with claw angularly recurved with tip not sinuous *O. scitulus*
Caudal ramus 2.36 : 1; second antenna with claw having sinuous tip ... *O. fultus*, new species

Paramarda, new genus

DIAGNOSIS.—Lichomolgidae. Body transformed. Urosome 5-segmented in female, 6-segmented in male. Caudal ramus with six relatively short setae.

Rostrum broad, rounded posteroventrally. First antenna 7-segmented, in female with formula 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete; in male, 4, 13 + 2 aesthetes, 6, 3 + 1 aesthete, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. Second

antenna 3-segmented, with formula 1, 1, 3, and one terminal claw.

Labrum, mandible, paragnath, first maxilla, and second maxilla similar in general form to those of *Amarda* Humes and Stock, 1972. Maxilliped also resembling *Amarda*, but in male with small spinules on second segment.

Legs 1–4 with reduced armature and similar in both sexes. Legs 1 and 2 with 3-segmented exopods and 2-segmented endopods. Leg 3 with 2-segmented exopod but lacking endopod (in male this exopod sometimes 3-segmented). Leg 4 with 2-segmented exopod but without endopod. Leg 5 in both sexes with small free segment bearing two terminal setae. Leg 6 represented in female by two setae on genital area and in male by a posteroventral flap on genital segment bearing two setae.

Other features as in species described below.

Associated with scleractinian corals.

TYPE-SPECIES.—*Paramarda aculeata*, new species.

ETYMOLOGY.—The generic name is a combination of *παρά* (Greek, = beside) plus *Amarda*, referring to the close relationship of the new genus to *Amarda*, a genus associated with the scleractinian genus *Favia* in Madagascar.

Paramarda aculeata, new species

FIGURES 27–30

TYPE MATERIAL.—19 ♀♀, 18 ♂♂ from one *Halomitra philippinensis* Studer, in 10 m, southwestern shore of Goenoeng Api, Banda Islands, 4°31'45"S, 129°51'55"E, 4 May 1975. Holotype ♀, allotype, and 28 paratypes (14 ♀♀, 14 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) in the collection of the author.

OTHER SPECIMENS.—2 ♀♀, 10 ♂♂ from 2 *Fungia (Pleuractis) paumotuensis* Stutchbury, in 2 m, Poelau Naira, Banda Islands, 4°31'45"S, 129°53'35"E, 2 May 1975.

FEMALE.—Body (Figure 27a, b) with broad thick prosome. Length 1.40 mm (1.34–1.47 mm) and greatest width 1.03 mm (0.98–1.09 mm), based on 10 specimens. Ratio of length to width of prosome 0.91 : 1. Ratio of length of prosome to that of urosome 1.79 : 1. Segment of leg 1 clearly delimited dorsally from cephalosome. Segments of legs 1–3

with prominent epimera, but segment of leg 4 lacking such epimera.

Segment of leg 5 (Figure 27c) very short and broad, 70 × 400. Genital segment 165 × 320, about two times wider than long. Genital areas located dorsally at level of broadest part of segment. Each area (Figure 27d) with two naked setae about 17 and a small spiniform process. Three postgenital segments from anterior to posterior 112 × 159, 96 × 143, and 125 × 126. Posteroventral border of anal segment with small spines.

Caudal ramus (Figure 27e) elongated, 135 × 33, with ratio of 4.09 : 1. Outer lateral seta 39, dorsal seta 34, outermost terminal seta 42, and innermost terminal seta 52, all naked. Two long median terminal setae 117 (outer) and 159 (inner), both with narrow lamellae and dorsal and ventral rows of spinules as in Figure 27f. Ramus unornamented except for one or two minute hairs.

Body surface with many small refractile points (Figure 27a).

Egg sac not seen.

Rostrum (Figure 27g) broadly triangular with rounded tip. First antenna (Figure 27h) 407 long. Lengths of seven segments: 70 (96 along anterior margin), 114, 31, 57, 60, 36, and 13 respectively. Formula for armature as given in generic diagnosis above. All setae naked. Three proximal segments with a few refractile points.

Second antenna (Figure 28a) approximately 350 long, but length variable depending on angle of third segment. Armature as given above in generic diagnosis. Third segment 146 along outer edge, 94 along inner edge, and 34 wide. Claw 68 along axis, sharply pointed and sinuous (Figure 28b). Small setule near base of claw.

Labrum (Figure 28c) with two rounded posteroventral lobes. Mandible (Figure 28d) resembling that of *Amarda*, but winglike process on convex side with sharply pointed tip and small setule, and lash barbed distally. Paragnath (Figure 28e) a small elongated lobe with few hairs. First maxilla (Figure 28e) with four smooth setae, one much larger than others and hyaline. Second maxilla (Figure 28f) 2-segmented, resembling that of *Amarda*, but short reflexed terminal lash bearing slender spines instead of teeth. Maxilliped (Figure 28g) 3-segmented, second segment flattened and arched forward, bearing two small naked setae and distal transverse row of spinules (Figure 28h). Third segment with two

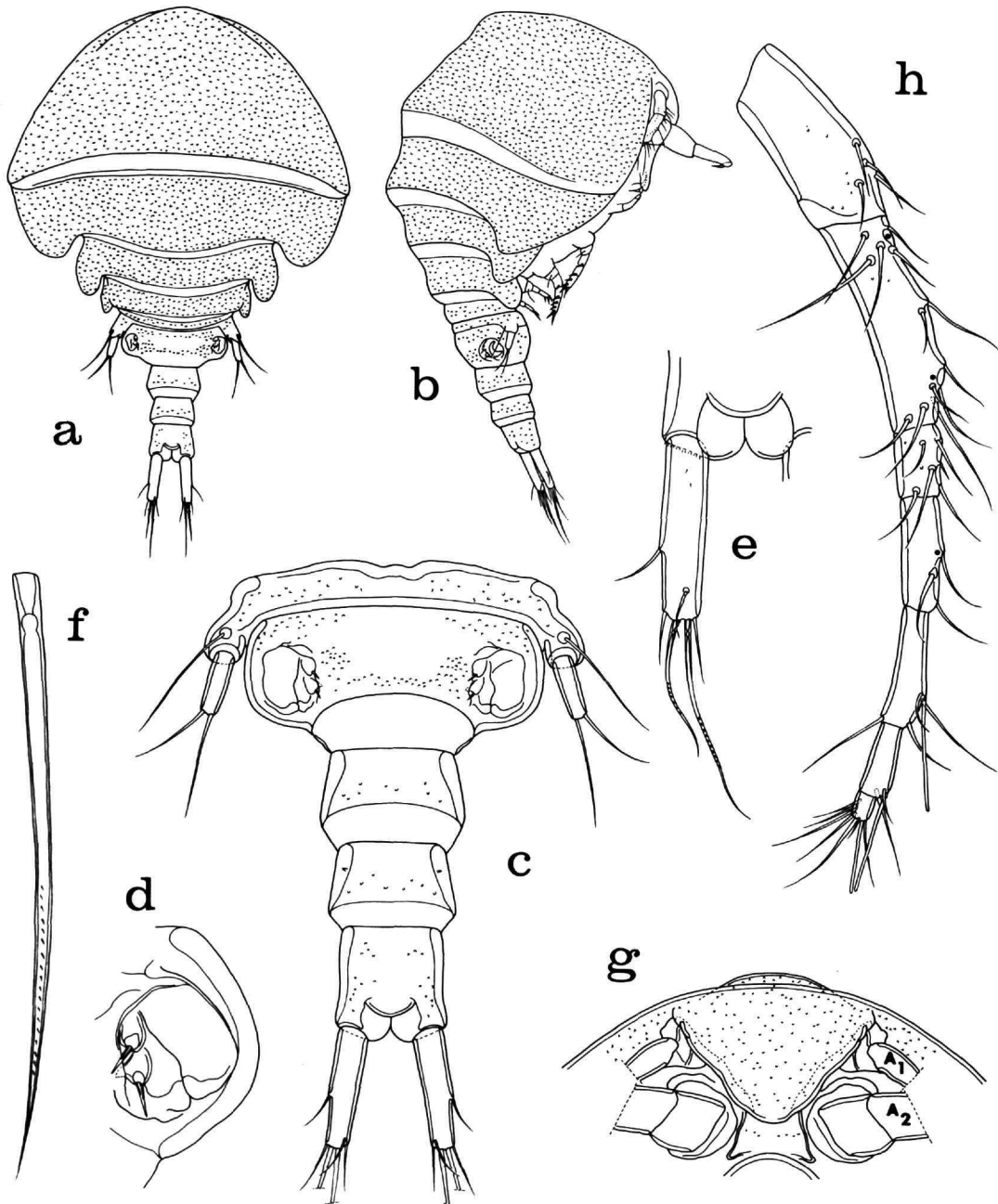


FIGURE 27.—*Paramarda aculeata*, new genus, new species, female: *a*, dorsal (A); *b*, lateral (A); *c*, urosome, dorsal (G); *d*, genital area, dorsal (D); *e*, caudal ramus, dorsal (E); *f*, longest seta on caudal ramus, dorsal (C); *g*, rostrum, ventral (B); *h*, first antenna, with three round dots indicating positions of aesthetes added in male, ventral (D).

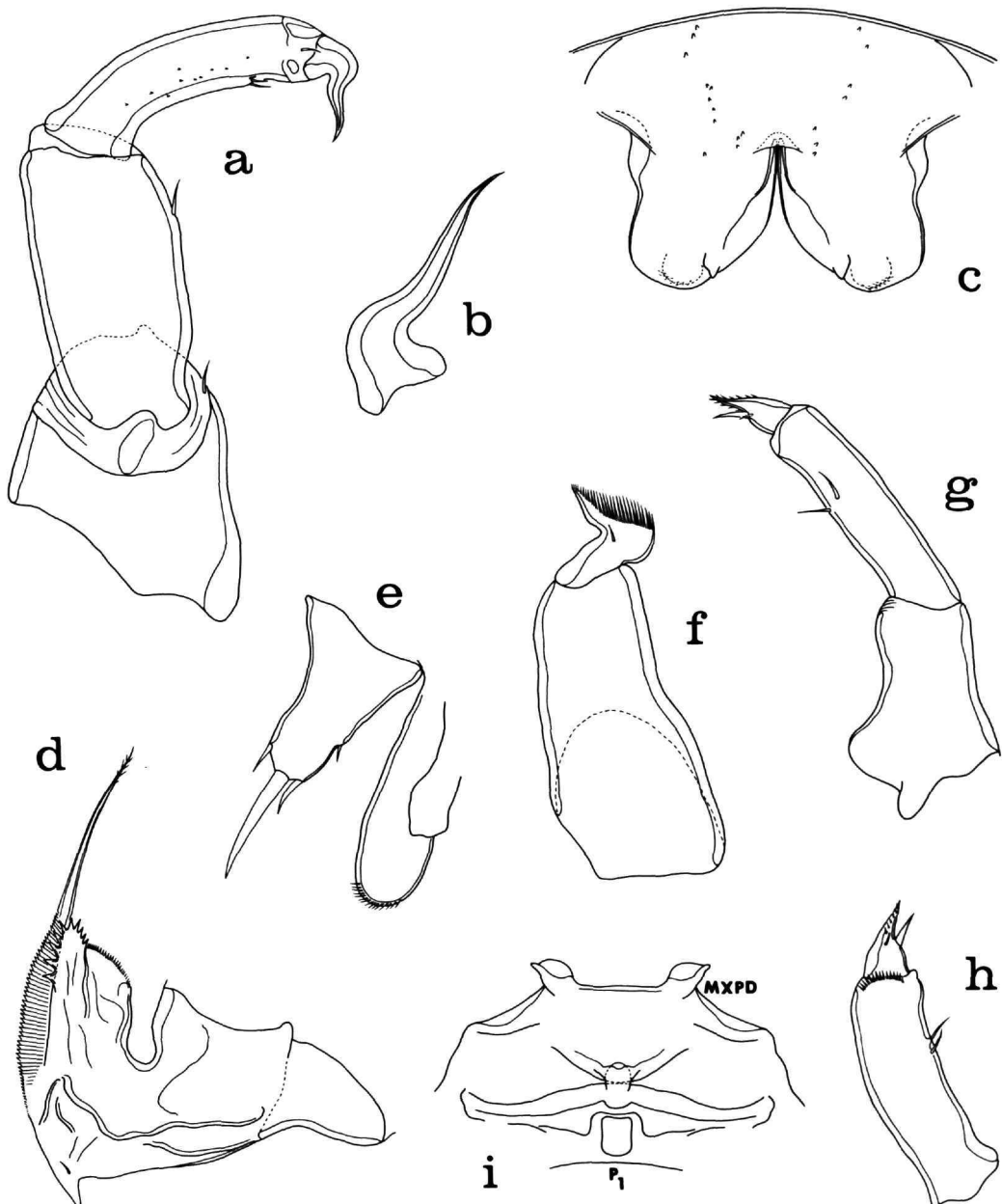


FIGURE 28.—*Paramarda aculeata*, new genus, new species, female: *a*, second antenna, antero-inner (D); *b*, claw of second antenna, flat view, postero-outer (C); *c*, labrum with paragnaths indicated by broken lines, ventral (F); *d*, mandible, posterior (C); *e*, first maxilla and paragnath, anterior (C); *f*, second maxilla, posterior (F); *g*, maxilliped, antero-inner (F); *h*, second and third segments of maxilliped, postero-outer (F); *i*, area between maxillipeds and first pair of legs, ventral (E).

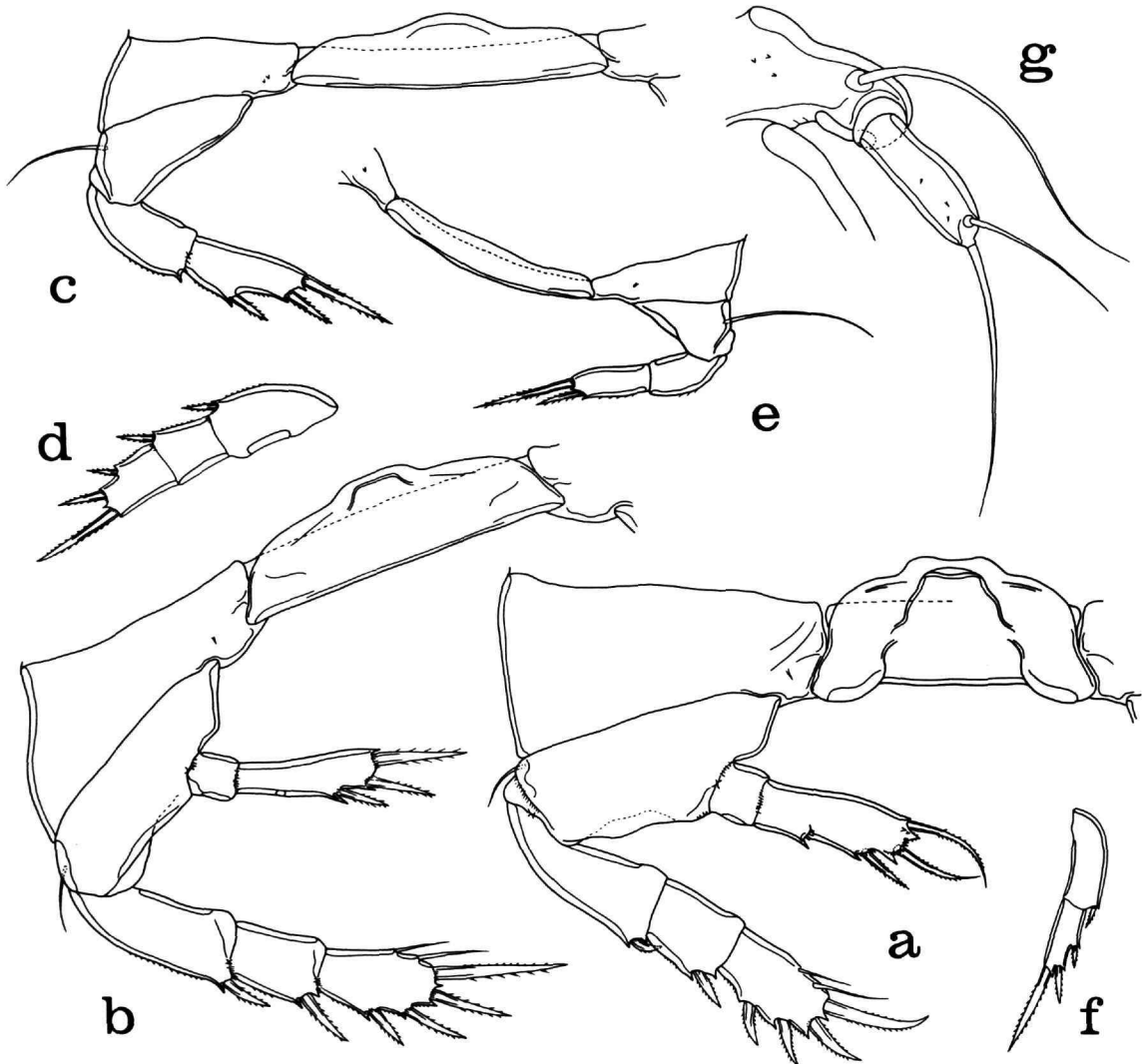


FIGURE 29.—*Paramarda aculeata*, new genus, new species, female: a, leg 1 and intercoxal plate, anterior (D); b, leg 2 and intercoxal plate, anterior (D); c, leg 3 and intercoxal plate, anterior (D); d, ramus of leg 3, anterior (D); e, leg 4 and intercoxal plate, anterior (D); f, ramus of leg 4, anterior (D); g, leg 5, dorsal (D).

small very unequal setae and terminating in barbed spiniform tip.

Ventral area between maxillipeds and first pair of legs (Figure 28i) not protuberant (Figure 27b). Elongated sclerite in front of intercoxal plate of leg 1 weakly developed.

Leg 1 (Figure 29a) and leg 2 (Figure 29b) with

3-segmented exopods and 2-segmented endopods. Leg 3 (Figure 29c) with 2-segmented (in some specimens 3-segmented as in Figure 29d) exopod and leg 4 (Figure 29e) with 2-segmented exopod (Figure 29f); both of these legs lacking endopods. Armature of legs 1–4 as follows (Roman numerals indicating spines, Arabic numerals representing setae):

P ₁	coxa	0-0	basis	1-0	exp	I-0; I-0;	III, I, 2
					enp	0-0; I, II	
P ₂	coxa	0-0	basis	1-0	exp	I-0; I-0;	III, I, 2
					enp	0-0; I, II	
P ₃	coxa	0-0	basis	1-0	exp	0-0; I, II	
					or	I-0; I-0;	I, II
					enp	absent	
P ₄	coxa	0-0	basis	1-0	exp	0-0; II	
					or	I-0; I, II	
					enp	absent	

Coxa in all four legs without inner seta.

Leg 5 (Figure 29g) with free segment 62 × 26,

its two terminal setae 117 and 78. Dorsal seta 130. All three setae smooth. Free segment without ornamentation except for very few refractile points.

Leg 6 represented by two setae on genital area (Figure 27d).

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

MALE.—Body (Figure 30a) with broad thickened prosome as in female. Length 1.06 mm (1.03–1.10 mm) and greatest width 0.72 mm (0.70–0.75 mm), based on 10 specimens. Ratio of length to width of

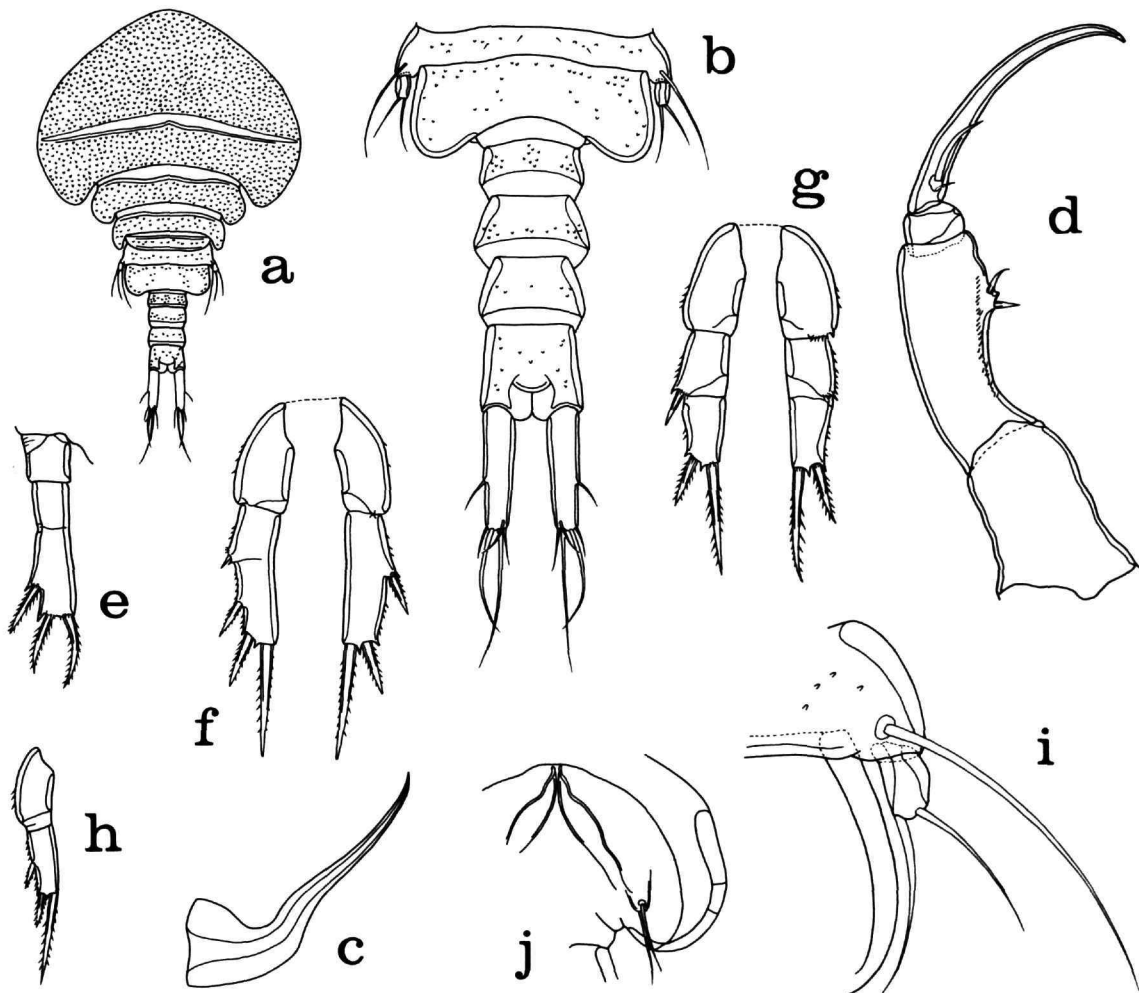


FIGURE 30.—*Paramarda aculeata*, new genus, new species, male: a, dorsal (A); b, urosome, dorsal (G); c, claw of second antenna, antero-inner (C); d, maxilliped, inner (D); e, endopod of leg 2, anterior (D); f, rami of right and left leg 3, anterior (D); g, rami of right and left leg 3, anterior (D); h, ramus of leg 4, anterior (D); i, leg 5, dorsal (F); j, leg 6, ventral (E).

prosoma 0.91 : 1. Ratio of length of prosoma to that of urosome 1.48 : 1.

Segment of leg 5 (Figure 30*b*) 42 × 257. Genital segment 91 × 234, more than 2.5 times wider than long. Four postgenital segments from anterior to posterior 49 × 99, 65 × 109, 62 × 99, and 86 × 100.

Caudal ramus resembling that of female but smaller, 120 × 27, with ratio of 4.44 : 1.

Rostrum like that of female.

First antenna similar to that of female but three aesthetes added, two on second segment and one on fourth segment (at points indicated by round dots in Figure 27*h*). Second antenna resembling that of female but claw a little more attenuated (Figure 30*c*).

Labrum, mandible, paragnath, first maxilla, and second maxilla like those in female. Maxilliped (Figure 30*d*) 4-segmented. Second segment with two small naked setae and group of small spinules. Claw 127 along axis, lacking terminal lamella, and bearing proximally two very unequal naked setae.

Ventral area between maxillipeds and first pair of legs similar to that in female.

Legs 1-4 segmented and armed as in female. Certain specimens showing variations from the typical pattern: in endopod of leg 2 (Figure 30*e*), in leg 3 (Figure 30*f, g*), and in leg 4 (Figure 30*h*).

Leg 5 (Figure 30*i*) with unornamented free segment 26 × 14, much smaller than in female. Two terminal setae 73 and 60. Dorsal seta 135.

Leg 6 (Figure 30*j*) a posteroventral flap on genital segment bearing two slender naked setae about 50 long.

Spermatophore not observed.

Color in life as in female.

ETYMOLOGY.—The specific name *aculeata* (Latin, = sharp-pointed) refers to the slender pointed claw on the second antenna.

COMPARISON OF *Paramarda* WITH RELATED GENERA.—Four lichomolgid genera have, as in *Paramarda*, 3-segmented second antennae and a reduction in segmentation or absence of certain rami of legs 1-4, departing from the usual lichomolgid condition of 3-segmented rami throughout except for the reduced endopod of leg 4. Each of these coral-inhabiting genera may be distinguished from *Paramarda* by the number of segments in legs 1-4, as shown in Table 1. *Paramarda* stands apart from these genera in having legs 3 and 4 with 2-segmented exopods (rarely 3-segmented in leg 3) and lacking endopods.

NOTE ON RELATIONSHIP TO THE HOST.—The host specimen of *Halomitra philippinensis* was isolated immediately after collection in a pail of seawater.

TABLE 1.—Comparison of the number of segments in legs 1-4 in *Paramarda* and related genera

Ramus	<i>Mycoxynus</i> Humes, 1973	<i>Cerioxynus</i> Humes, 1974	<i>Amarda</i> Humes and Stock, 1972	<i>Amardopsis</i> Humes, 1974	<i>Paramarda</i> , new genus
P ₁					
exopod	3	3	3	3	3
endopod	3	3	2 or 3	2	2
P ₂					
exopod	3	3	3	3	3
endopod	3	3	2 or 3	2	2
P ₃					
exopod	3	3	2	1	2 or 3
endopod	-	-	-	1	-
P ₄					
exopod	3	2	-	-	2
endopod	-	-	-	-	-

It remained in a refrigerated room on board ship for 24 hours and then stood at room temperature for another 24 hours before examination. Sufficient 95 percent ethyl alcohol was added to the pail to make an approximately 5 percent solution. The coral was thoroughly and vigorously washed in this solution 10 successive times, with copepods recovered each time by straining the water through a fine net (120 holes per inch). In the tenth washing 3 copepods were found. This indicates that *Paramarda* lives not loosely on the outer surface of the coral but rather inside the coral polyps, whence it is dislodged only with strong agitation.

Host Specificity of Copepods Associated with Moluccan Fungiid Corals

Certain copepods may live together on a single individual coral. One specimen of *Fungia echinata* had four copepod associates: *Anchimolgus tener*, *Anchimolgus latens*, *Anchimolgus pandus*, and *Mycoxynus fungianus*. A specimen of *Halomitra philippinensis* contained both *Odontomolgus fultus* and *Paramarda aculeata*.

Several species of copepods may be associated with one species of coral. *Fungia paumotuensis* had six copepod associates and *Fungia echinata* had five (see list below). Of the 11 copepods reported here five occurred on only one host (see list on page 1). Six copepods lived on more than one host and two of these, *Anchimolgus latens* and *Anchimolgus pandus*, were recovered from as many as four hosts.

List of Fungiid Corals and Their Associated Copepods

(including those from the Moluccas and previous records from New Caledonia in parentheses)

- Fungia actiniformis*
Anchimolgus notatus, new species
Anchimolgus pandus, new species
Odontomolgus decens, new species
- Fungia echinata*
Anchimolgus latens, new species
Anchimolgus pandus, new species
Anchimolgus tener Humes, 1973
(*Anchimolgus tener* Humes, 1973)
Mycoxynus fungianus, new species
- Fungia fungites*
Anchimolgus latens, new species
Anchimolgus punctilis, new species
(*Odontomolgus scitulus* Humes, 1973)
- Fungia paumotuensis*
Anchimolgus latens, new species
Anchimolgus notatus, new species
Anchimolgus orectus, new species
Anchimolgus pandus, new species
Anchimolgus punctilis, new species
Paramarda aculeata, new genus, new species
- Halomitra philippinensis*
Odontomolgus fultus, new species
Paramarda aculeata, new genus, new species
- Hevpolitha limax*
Anchimolgus latens, new species
(*Parahalomitra irregularis*)
(*Mycoxynus longicauda* Humes, 1973)
- Parahalomitra robusta*
Anchimolgus convexus, new species
Anchimolgus tener Humes, 1973
- Polyphyllia talpina*
Anchimolgus pandus, new species

Literature Cited

- Humes, A. G.
1973. Cyclopoid Copepods (Lichomolgidae) from Fungiid Corals in New Caledonia. *Zoologischer Anzeiger*, 190(5/6):312-333.
1974. *Odontomolgus mundulus* n. sp. (Copepoda, Cyclopoida) Associated with the Scleractinian Coral Genus *Alveopora* in New Caledonia. *Transactions of the American Microscopical Society*, 93(2):153-162.
- Humes, A. G., and B. W. Frost
1964. New Lichomolgid Copepods (Cyclopoida) Associated with Alcyonarians and Madreporarians in Madagascar. *Cahiers ORSTOM Océanographie*, 1963, 6(série Nosy Bé II):131-212.
- Humes, A. G., and J.-S. Ho
1967. New Cyclopoid Copepods Associated with the Coral *Psammocora contigua* (Esper) in Madagascar. *Proceedings of the United States National Museum*, 122(3586):1-32.
1968. Lichomolgid Copepods (Cyclopoida) Associated with Corals in Madagascar. *Bulletin of the Museum of Comparative Zoology at Harvard University*, 136(10):353-413.
- Humes, A. G., and J. H. Stock
1972. Preliminary Notes on a Revision of the Lichomolgidae, Cyclopoid Copepods Mainly Associated with Marine Invertebrates. *Bulletin Zoologisch Museum, Universiteit van Amsterdam*, 2(12):121-133.
1973. A Revision of the Family Lichomolgidae Kossmann, 1877, Cyclopoid Copepods Mainly Associated with Marine Invertebrates. *Smithsonian Contributions to Zoology*, 127: 368 pages.

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