

BULLETIN

ZOÖLOGISCH MUSEUM

U N I V E R S I T E I T V A N A M S T E R D A M

Vol. 13 No. 3 1991

CORALLIOMYZONTIDAE, FAM. N. (COPEPODA: SIPHONOSTOMATOIDA), ASSOCIATED WITH SCLERACTINIAN CORALS IN MADAGASCAR.

Arthur G. Humes & Jan H. Stock

Abstract

Coralliomyzon tenens, gen. n., sp. n., associated with the coral *Turbinaria peltata* (Esper) in Madagascar, is placed in a new siphonostomatoid family, the Coralliomyzontidae, along with *Cholomyzon* Stock & Humes, 1969. The new family, close to the Asterocheridae, is characterized chiefly by the maxilliped having 2 basal segments and 2 distal segments forming together a clawlike part, the absence of an inner seta on the first and second segments of the exopod of leg 1, leg 4 reduced to a minute process with 1 or 2 setae, and leg 5 reduced to 2 setae.

INTRODUCTION

Siphonostomatoids copepods belonging to the family Asterocheridae are associated with scleractinian corals in the Indo-Pacific (e.g., Nair & Pillai, 1984; Stock, 1966; Stock & Humes, 1969; Ummerkutty, 1966) and the West Indies (Stock, 1975, 1987, 1989). In Madagascar, *Cholomyzon palpiferum* Stock & Humes, 1969, is associated with *Dendrophyllia* (see Stock & Humes, 1969). We now report a new siphonostomatoid associated with *Turbinaria*, also in Madagascar, and place it, along with the monotypic *Cholomyzon*, in a new family.

Siphonostomatoida Thorell, 1859

Coralliomyzontidae fam.n.

In general similar to Asterocheridae, but clawlike dis-

tal portion of maxilliped consisting of 2 segments only (instead of 4). Second antenna without exopodite. First and second segments of exopodite of leg 1 lacking inner seta. Leg 4 reduced to minute protuberance bearing 1 or 2 setules. Leg 5 lacking free segment and represented by minute protuberance bearing 2 setules.

Type genus: *Coralliomyzon*

***Coralliomyzon* gen. n.**

DIAGNOSIS

Coralliomyzontidae. Body flattened, prosome broad. Two postgenital urosomites in female, 3 in male. First antenna in female 11-segmented, with aesthete on penultimate segment, in male 9-segmented with similarly placed aesthete. Second antenna without exopo-

dite, and having 1 terminal seta. Oral cone short. Mandible with slender blade and 1-segmented palp bearing long seta. First maxilla with 2 lobes. Second maxilla with long recurved claw. Maxilliped consisting of 2 unarmed basal and 2 distal segments forming together clawlike part, in male with small prominence on first segment.

Legs 1-3 biramous, with 3-segmented rami. First 2 segments of exopodite of leg 1 without inner seta. In legs 1-3 third segment of exopodite with II, I, 3 and third segment of endopodite with 5, 5, 3. Leg 4 reduced to 1 seta.

Leg 5 represented by only 2 setae.

Associated with Scleractinia.

Gender neuter.

Type species

Coralliomyzon tenens sp. n.

Etymology

The generic name is formed from the Greek words *korallion*, coral, and *muzo*, to suck, alluding to the presumed method of feeding.

Coralliomyzon tenens sp. n.

(figs. 1-27)

Type material

301♀♀, 70 ♂♂, from the scleractinian coral *Turbinaria peltata* (Esper), in 3.5 m depth, behind reef at Nosy N'Tangam, near Nosy Bé, northwestern Madagascar, 23 October 1964. Holotype ♀, allotype, and 160 paratypes (130♀♀, 30♂♂) deposited in the Zoologisch Museum, Amsterdam (ZMA Co. 102.854). Other paratypes (130♀♀, 25♂♂) placed in the National Museum of Natural History, Smithsonian Institution, Washington. Remaining paratypes in the first author's collection.

Female

Body (figs. 1,2) flattened with large broad prosome and small urosome. Length (not including setae on caudal rami) 0.79 mm (0.77 - 0.83 mm) and greatest width 0.55 mm (0.54 - 0.58 mm), based on 10 specimens in lactic acid. Greatest dorsoventral thickness 0.27 mm.

Metasomite bearing leg 1 fused with cephalosome. Epimera of metasomites bearing legs 1-3 moderately pointed posteriorly. Metasomite bearing leg 4 short, narrow, and almost entirely hidden in dorsal view un-

der dorsum of segment bearing leg 3. Ratio of length to width of prosome 1.29:1. Ratio of length of prosome to that of urosome 3.9:1.

Urosomite bearing leg 5 (fig. 3) 26 x 127 μm. Genital urosomite 94 x 164 μm, much wider than long, expanded laterally. Genital areas located dorsolaterally on expanded portions just anterior to middle of metasomite. Each area (fig. 4) with 2 very small setae and bordered medially by row of minute knobs. Two post-genital urosomites from anterior to posterior 39 x 65 and 43 x 49 μm (greatest length of second urosomite near median line 49 μm).

Caudal ramus (fig. 5) small, unornamented, 20 x 15.5 μm, ratio 1.29:1. Outer lateral seta (placed dorsally) 15 μm, dorsal seta 20 μm, outermost terminal seta (placed subterminally) 22 μm, innermost terminal seta 20 μm, and 2 long median terminal setae 77 μm (outer) and 120 μm (inner). All setae smooth.

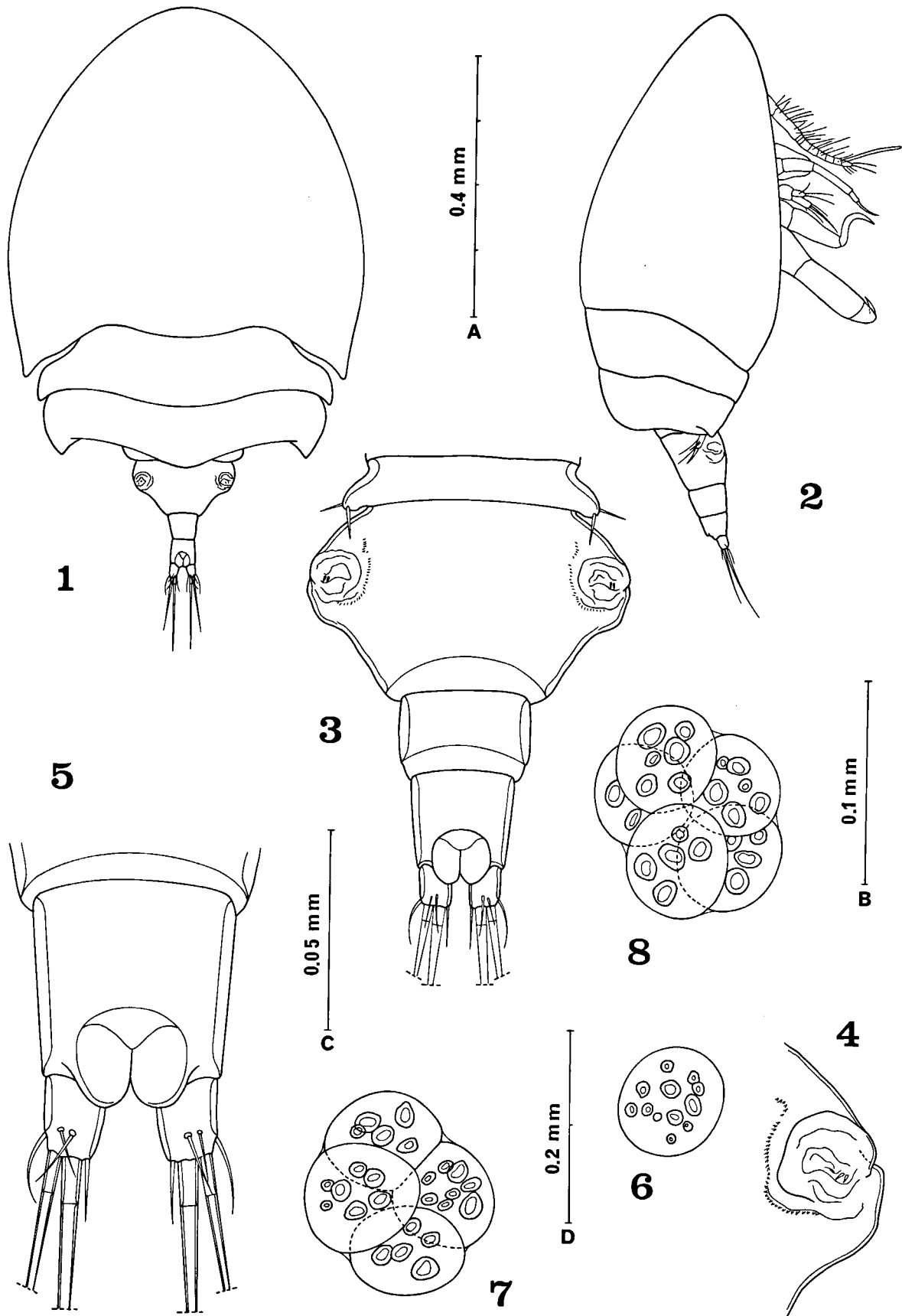
Body surface unornamented except for row of minute knobs near both genital areas.

Egg sac with 1 egg, 117 x 99 μm (fig. 6), 4 eggs, 220 x 192 μm (fig. 7), or 5 eggs, 226 x 200 μm (fig. 8). Eggs containing globular bodies with central mass.

Rostrum (fig. 9) weakly developed. First antenna (fig. 10) 226 μm long, 11-segmented. Lengths of segments (measured along their nonsetiferous posterior margins): 10 (47 μm along anterior margin), 82, 3, 4, 11, 11, 10, 9, 20, 19, and 22 μm, respectively. Armature: 2, 13, 2, 4, 2, 2, 2, 2, 2, 2 + 1 aesthete, and 10. Setae smooth, hyaline, and difficult to count.

Second antenna (fig. 11) slender, consisting of coxa, basis, and 3-segmented endopodite. Exopodite absent. First segment of endopodite elongate, slender, with row of spinules along outer margin. Second segment of endopodite short, indistinctly set off from third segment. Third segment short, slender, with terminal spiniform seta 20 μm

Oral cone (figs. 9, 12) short. Mandible (fig. 13) with slender blade 90 μm having few very small spinules at tip, palp 1-segmented, 21 μm long, bearing long smooth seta 119 μm. First maxilla (fig. 14) with small outer lobe bearing 3 setae, larger inner lobe with 4 setae, one of them long and stout; all setae smooth. Second maxilla (fig. 15) with prominent basal segment bearing long slender recurved claw. Maxilliped (fig. 16) consisting of 3 unarmed basal segments and



Figs. 1-8: *Coralliomyzon tenens*, gen. n., sp. n., female. 1, Dorsal (scale A); 2, Lateral (A); 3, Urosome, dorsal(B); 4, Genital area, dorsal (C); 5, Anal segment and caudal ramis, dorsal (C); 6, Egg, ventral (D); 7, Egg sac, ventral (D); 8, Egg sac, ventral (D).

2 distal segments together forming clawlike part. Clawlike last segment 94 μm with slightly sinuous tip.

Ventral surface between maxillipeds and first pair of legs (fig. 9) not protuberant.

Legs 1-3 (figs. 17,18,19) biramous with 3-segmented rami. Leg 4 reduced to single seta (fig. 20). Spine and setal formula as follows (Roman numerals indicating spines, Arabic numerals representing setae):

P1	coxa	0-0	basis	1-0	exp	I-0; I-0; II,I,3
					enp	0-1; 0-1; 5
P2	coxa	0-0	basis	1-0	exp	I-1; I-1; II,I,3
					enp	0-1; 0-1; 5
P3	coxa	0-0	basis	1-0	exp	I-1; I-1; II,I,3
					enp	0-1; 0-1; 3
P4						1

Inner coxal seta absent in all 4 legs. Leg 1 with exopodite lacking inner seta on first and second segments. Legs 1-3 with first and second segments of endopodites having only 1 seta. Two spiniform processes on outer side of second segment of endopodite of leg 1 unusually large. Two spiniform processes on third segment of endopodite of leg 1 large and unguiform. Spines on exopodite of leg 2 with recurved tips. Leg 4 consisting of minute process bearing 1 seta 19 μm long.

Leg 5 (fig. 21) reduced to 2 smooth setae, 1 stout 40 μm , 1 slender 26 μm .

Leg 6 probably represented by 2 minute setae on genital area (fig. 4).

Color of living specimens slightly opaque grey, sometimes pale amber, eye dark reddish brown, egg sacs light grey.

Male

Body (fig. 22) flattened as in female but much smaller. Length (not including setae on caudal rami) 0.55 mm (0.53 - 0.59 mm) and greatest width 0.36 mm (0.34 - 0.38 mm), based on 10 specimens in lactic acid. Greatest dorsoventral thickness 0.16 mm. Ratio of length to width of prosome 1.37:1. Ratio of length of prosome to that of urosome 3.3:1.

Urosomite bearing leg 5 (fig. 23) 11 x 91 μm . Genital urosomite 70 x 133 μm , nearly 2 times wider than long, with rounded lateral margins. Three postgenital urosomites from anterior to posterior 17 x 49, 17 x 40,

and 26 x 36 μm .

Caudal ramus 15 x 12 μm , ratio 1.25:1, resembling that of female.

Body surface unornamented.

Rostrum similar to that of female. First antenna (fig. 24) slightly modified, 203 μm long, 9-segmented. Lengths of segments (measured along their posterior nonsetiferous margins): 6 (23 μm along anterior margin), 60, 5.5, 11, 25, 11, 24, 20, and 15 μm , respectively. Armature: 2, 13, 4, 2, 4, 1, 1, 28 + 1 aesthete, and 10. Second antenna as in female.

Oral cone, mandible, first maxilla, and second maxilla like those of female. Maxilliped (fig. 25) similar to that of female, but first segment having small inner prominence with minute mucronate tip.

Legs 1-4 as in female.

Leg 5 (fig. 26) reduced to 2 setae as in female.

Leg 6 (fig. 27) posteroventral flap on genital segment bearing 2 setae approximately 17 μm .

Spermatophore not seen.

Etymology

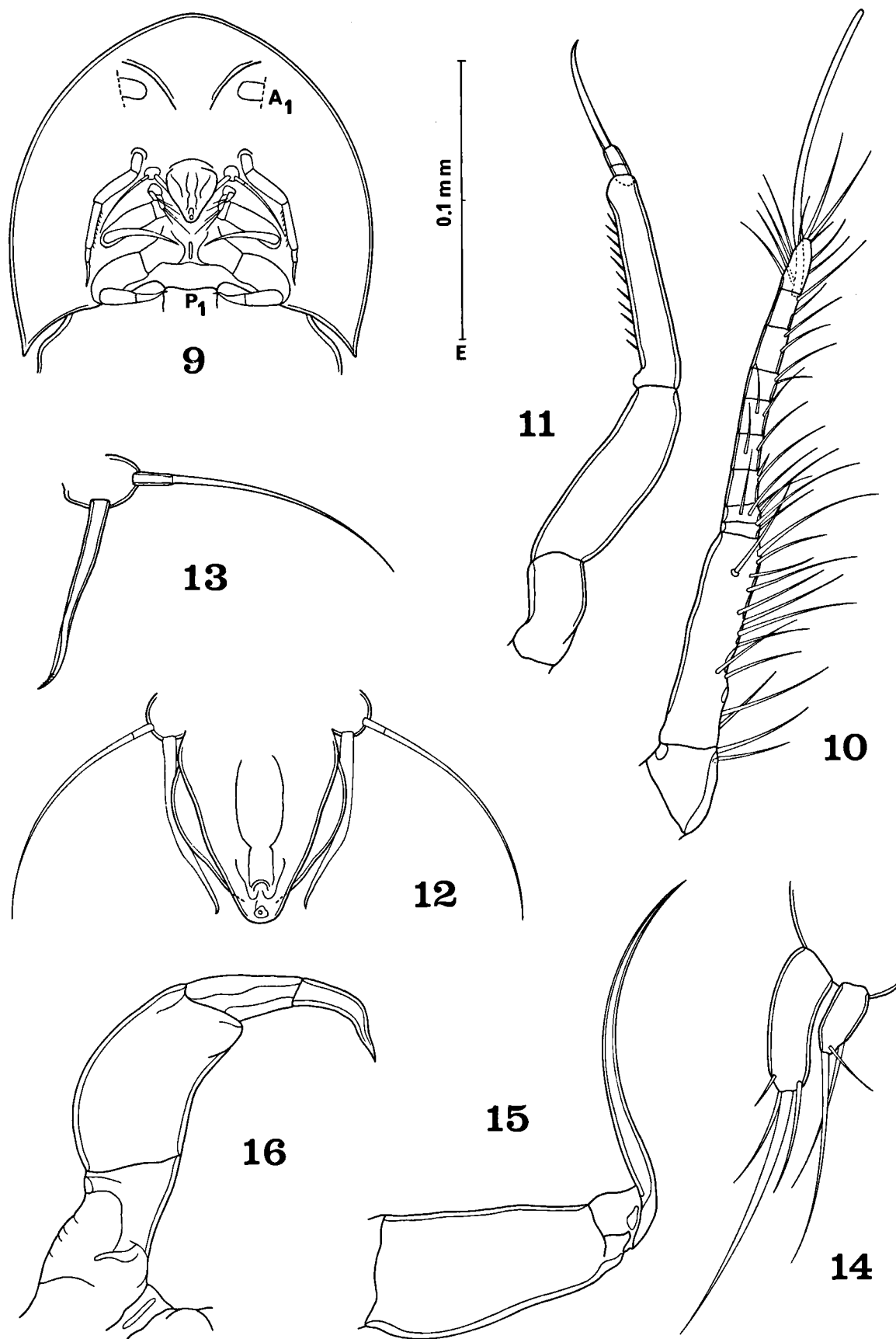
The specific name *tenens*, from *teneo*, Latin, to cling, alludes to the clawlike features of the maxilliped and the endopodites of legs 1-3.

Remarks

Twenty-seven genera, originally grouped in the family Asterocheridae, have two postgenital urosomites in the female and three such urosomites in the male. These include the 24 genera listed in Stock's (1987) key, *Coralliomyzon*, and two new genera (Humes, in press). Among these genera the affinity of *Coralliomyzon* and *Cholomyzon*, both monotypic, is demonstrable in several ways. In both genera the maxilliped consists of 2 basal segments and 2 distal segments forming a clawlike part. This is in contrast to the 5-segmented condition in all other genera where the maxilliped has been described.

Other evidence for the relationship of *Coralliomyzon* and *Cholomyzon* is to be seen in the absence of an exopodite on the second antenna, the first and second segments of the exopodite of leg 1 with the formula I-0; I-0, leg 4 reduced to 1 or 2 setae, and leg 5 lacking a free segment and represented by only 2 setae.

For these reasons, the two genera have been unit-



Figs. 9-16: *Coralliomyzon tenens*, gen. n., sp. n., female. 9, Cephalosome, ventral (scale A); 10, First antenna, dorsal (E); 11, Second antenna, dorsal (E); 12, Oral cone and mandibles, ventral (B); 13, Mandible, ventral (B); 14, First maxilla, anterior (C); 15, Second maxilla, posterior (E); 16, Maxilliped, anterior (B).

ed in a new family, the Coralliomyzontidae. The two coralliomyzontid genera may be distinguished as follows:

In *Cholomyzon* the first antenna of the female is 11-segmented and that of the male 11-segmented, the third segment of the maxilliped has 2 small spines, the basis of leg 1 has an inner spine, the exopodite of leg 1 has the formula I-0; I-0; II,4, the endopodite of leg 1 has the formula 0-1; 0-0; 4 and does not have hooklike processes, the third segment of the endopodite of leg 2 has the formula I,5, and leg 4 consists of a rudiment with two setae.

In *Coralliomyzon* the first antenna of the female is 11-segmented, and that of the male 9-segmented, the third segment of the maxilliped is unarmed, the basis of leg 1 lacks an inner element, the exopodite of leg 1 has the formula I-0; I-0; II,1,3, the endopodite of leg 1 has the formula 0-1; 0-1; 5 and has two hooklike processes, the third segment of the endopodite of leg 2 has five setae, and leg 4 consists of only one seta.

Other differences between *Cholomyzon palpiferum* and *Coralliomyzon tenens* are seen in the shape of the genital urosomite in the female, the number of aesthetes on the first antenna, and the nature of the sexual dimorphism in the maxilliped. It is of interest to note that weak sexual dimorphism in the maxilliped occurs frequently in siphonostomatoids related to the Coralliomyzontidae, having been described in eight asterocherid genera.

Cholomyzon Stock & Humes, 1969

Cholomyzon palpiferum Stock & Humes, 1969

This species, originally placed in the Asterocheridae, is known from *Dendrophyllia nigrescens* Dana, *Dendrophyllia micranthus* Klunzinger var. *grandis* Cross-

land, and *Dendrophyllia* spec. in the region of Nosy Bé, northwestern Madagascar (Stock & Humes, 1969).

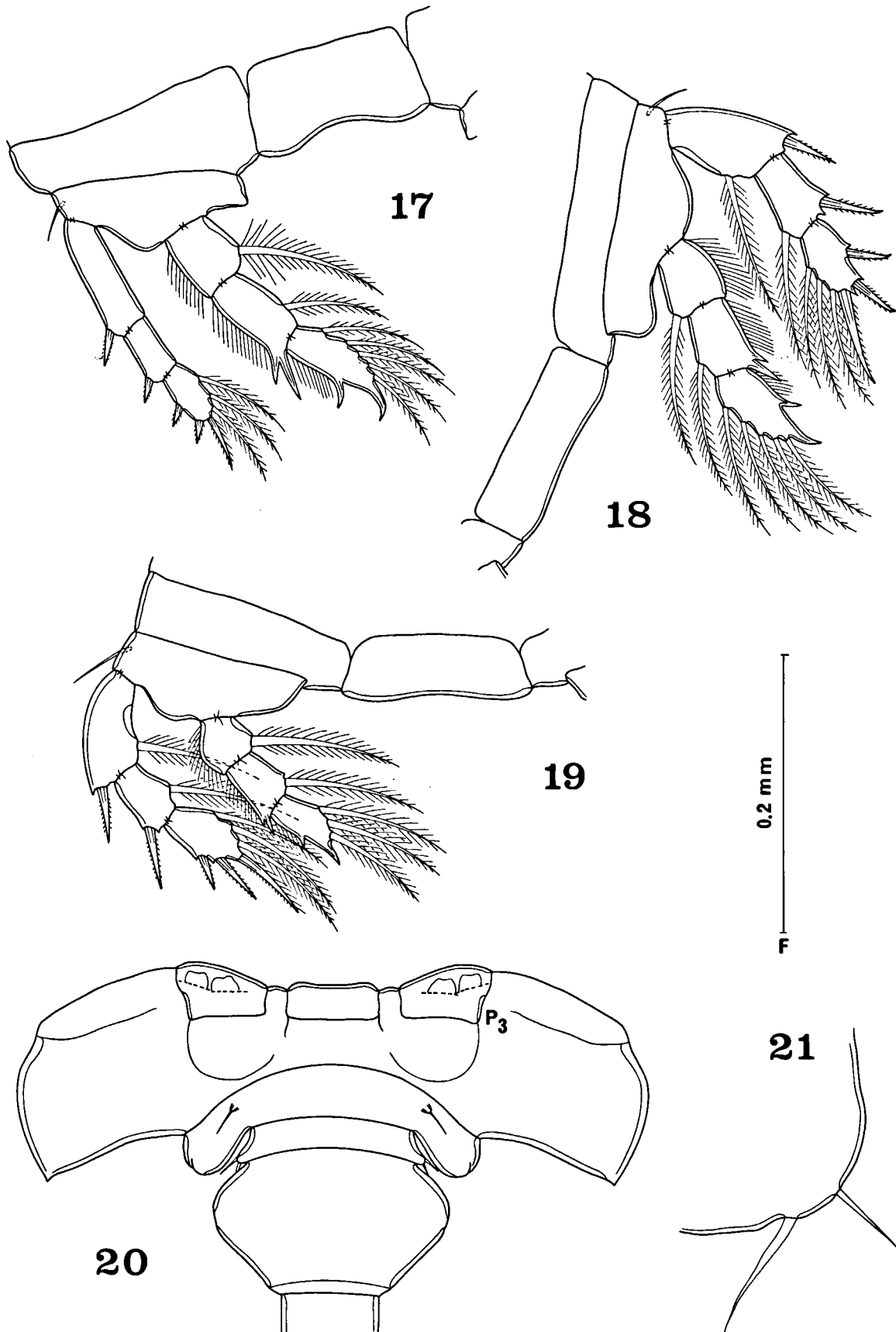
ACKNOWLEDGEMENTS

The copepods were collected by AGH during the International Indian Ocean Expedition, U. S. Programs in Biology, 1963 - 1964.

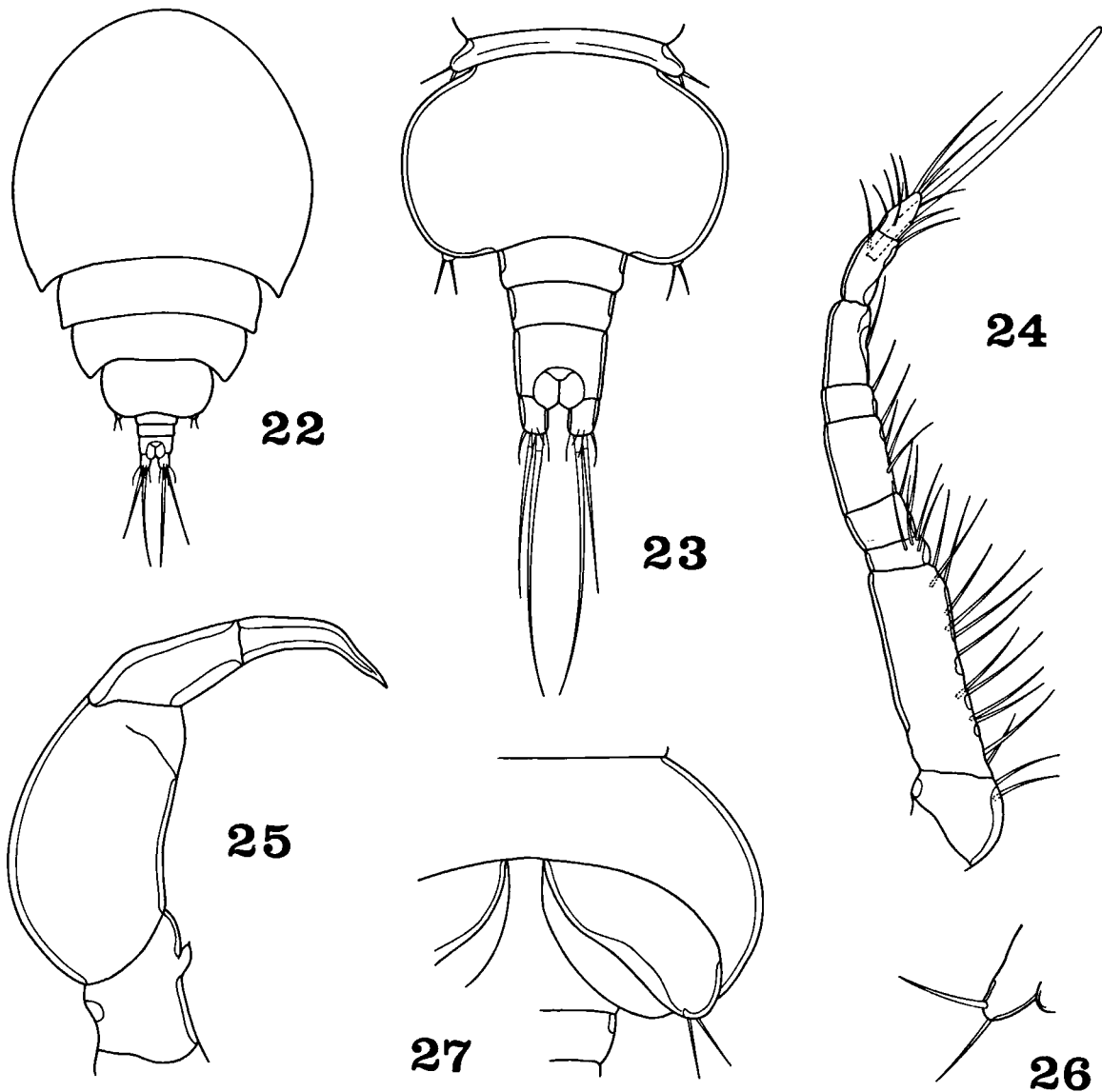
Subsequent study was supported by a grant, BSR-851461, from the National Science Foundation of the United States.

REFERENCES

- HUMES, A. G., In press. Copepoda associated with the scleractinian coral genus *Montipora* in the Indo-Pacific. Proc. Biol. Soc. Wash.
- NAIR, B. U. & N. K. PILLAI, 1984. On three new species of asterocherid copepods, with a redescription of *Indomyzon quasimi* Ummerkutty. Rec. zool. Surv. India, 81: 357-372.
- STOCK, J. H., 1966. Cyclopoida siphonostoma from Mauritius (Crustacea, Copepoda). Beaufortia, 13: 145-194.
- STOCK, J. H., 1975. *Peltomyzon rostratum* n. gen., n. sp., a siphonostome cyclopoid copepod associated with the West Indian coral *Montastrea*. Bull. zool. Mus. Univ. Amst. 4: 111-117.
- STOCK, J. H., 1987. Copepoda Siphonostomatoidea associated with West Indian hermatypic corals, 1. Associates of Scleractinia: Faviinae. Bull. mar. Sci., 40: 464-483.
- STOCK, J. H., 1989. Copepoda Siphonostomatoidea associated with West Indian hermatypic corals, 2. Associates of Scleractinia: Montastreae and Trochosmiliidae. Studies on honour of Dr. Pieter Wagenaar Hummelinck. In: Uitgaven natuurwet. Studiekroeg voor Suriname en Ned. Antillen, Amsterdam, 123: 145-169.
- STOCK, J. H., & A. G. HUMES, 1969. *Cholomyzon palpiferum* n. gen., n. sp., a siphonostome cyclopoid copepod parasitic in the coral *Dendrophyllia* from Madagascar. Crustaceana, 16: 57-64.
- UMMERKUTTY, A. N. P., 1966. Studies on Indian copepods - 13. Brief notes on the asterocherid copepods obtained from the south east coast of India with description of *Indomyzon quasimi* n. gen., n. sp. and a discussion on the family Asterocheridae. Crustaceana, 11: 17-32.



Figs. 17-21: *Coralliomyzon tenens*, gen. n., sp. n., female. 17, Leg 1 and intercoxal plate, anterior (scale E); 18, Leg 2 and intercoxal plate, anterior (E); 19, Leg 3 and intercoxal plate, anterior (E); 20, Segments bearing legs 3,4, and 5 plus genital segment, ventral (F); 21, Leg 5, posterior (C).



Figs. 22-27: *Coralliomyzon tenens*, gen.n., sp.n. 22; Dorsal (scale A); 23, Urosome, dorsal (B); 24, First antenna, ventral (E); 25, Maxilliped, anterior (E); 26, Leg 5, dorsal (C); 27, Leg 5, ventral (E).

Arthur G. Humes
 Boston University Marine Programs
 Marine Biological Laboratory
 Woods Hole, Massachusetts 02543, U.S.A.

Jan. H. Stock
 Institute of Taxonomic Zoology
 P.O. Box 4766
 1009 AT Amsterdam
 The Netherlands.

received: 1 October 1990.

distributed: 26 April 1991.