

CALANOID COPEPODS FROM THE CARIBBEAN SEA AND GULF OF MEXICO. 2. NEW SPECIES AND NEW RECORDS FROM PLANKTON SAMPLES¹

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ABSTRACT

Twenty-eight new species of calanoid copepods and the male of *Bathypontia minor* (Wolfenden, 1906) are described from specimens found in vertically collected samples of plankton obtained in the Caribbean Sea and Gulf of Mexico. Diagnoses or systematic remarks are presented for 16 other species of calanoid copepods. Fifty-eight species of calanoid copepods not previously known from the Caribbean Sea and Gulf of Mexico are reported. A key is included for the identification of the species of *Spinocalanus*.

This paper reports the results of a systematic study on calanoid copepods found in 16 plankton samples (Table 1) which were selected from a series of vertical collections of plankton obtained by Dr. George D. Grice from the Caribbean Sea and Gulf of Mexico during R/V CHAIN Cruise 60. An earlier report on the copepod collections of this cruise concerned those species obtained by midwater trawls (Grice, 1969). The present samples were collected by a modified Nansen vertical net made of number 6 mesh (0.239-mm aperture) equipped with a flow-meter within the mouth and a time-depth recorder at the cod end of the net. The operation of this closing net has been described by Grice & Hülsemann (1967). The usual depth intervals sampled at each station were 100 to 0, 200 to 100, 500 to 200, 1000 to 500, 2000 to 1000, and 3000 to 2000 m.

As pointed out by Grice & Hülsemann (1965, 1967, 1968) the Nansen-type vertical net employed for the collection of the present samples often captures small individuals of shallow-living species while it is being lowered through the water to the sampling depth. In the present study, some of the supposedly epiplanktonic species, such as *Undinula vulgaris* (Dana), *Calocalanus pavoninus* Farran, *C. styliremis* Giesbrecht, *Paracalanus parvus* (Claus), *Clausocalanus arcuicornis* (Dana), *C. furcatus* (Brady), *C. mastigophorus* (Claus, 1863), and *C. paululus* Farran, were found in certain deep collections. They may have entered the net at shallower depths than those supposed to have been sampled. Grice & Hülsemann (1965, 1967) compiled lists of copepod species they considered contaminants of their deep samples.

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TABLE 1
COLLECTION DATA

Collection No.	Station No.	Position	Collection Depth (m)	Date	Time
11	1	11°03'N, 78°43'W	100-0	3-VI-66	0150-0210
12			200-102		0120-0145
13			500-208		0010-0052
14			1000-505		0220-0330
15			1850-1004		0345-0620
21	2	19°02'N, 81°57'W	100-0	9-VI-66	0715-0738
22			200-100		0830-0845
23			450-155		0745-0820
24			950-487		0850-0945
25			1900-980		0950-1150
26			2800-2000		1200-1450
42	4	21°55'N, 95°25.5'W	200-100	18-VI-66	0902-0915
43			500-203		0650-0725
44			1000-509		0735-0855
45			1900-1003		0405-0640
64	6	27°08'N, 89°55.5'W	1000-513	22-VI-66	0655-0800

Twenty-eight new species distributed among 12 genera, and the hitherto unknown male of *Bathypontia minor* (Wolfenden, 1906) are described below. Diagnoses or systematic remarks are presented for 16 other species which are either poorly known or so closely related to certain new species described here that redescriptions of their diagnostic features are desirable for easy identification.

A key for the identification of the species of *Spinocalanus* found in the present study is included, for although the genus was not treated in a recent monograph by Owre & Foyo (1967), it was represented in the present collections by a large number of closely related species. The anatomical terms used in the descriptions are defined in my previous paper (Park, 1968). Type-specimens have been deposited in the U. S. National Museum, Washington, D. C.

In all, 178 species of calanoid copepods were found in the present study, including the 28 new species mentioned above and 58 species not previously known from the areas. Including new species and new records reported by Grice (1969), this brings the total number of new and unreported copepod species found in the collections obtained from the Caribbean Sea and Gulf of Mexico during R/V CHAIN Cruise 60 to 107.

The ratio of the new species to the total number of species found in the present study is high. This is due in part to a critical study of some species complexes (e.g., *Spinocalanus abyssalis*, *Spinocalanus spinosus*, and

Scaphocalanus curtus) which resulted in the recognition of a number of new species. However, most of the 150 previously described species identified in the present study have a wide range of distribution. Comparing the results of the present study with those of similar studies by Grice & Hülsemann (1965, 1967), I find that 66 per cent (99 species) of the 150 previously described species found in the Caribbean Sea and Gulf of Mexico are also present in the northeastern Atlantic and that 69 per cent (104 species) of the 150 species also occur in the western Indian Ocean.

In order to compare the diversity and abundance of bathypelagic calanoid copepods in the Caribbean Sea and Gulf of Mexico with those reported for other areas, I completely analyzed certain of the deep collections. The numbers of adult calanoid copepods and species for each collection follow below (the numbers in parentheses are the numbers of adult specimens or species after the exclusion of contaminant species):

Collection No.	Station No.	Collection depth (m)	No. adult calanoids	No. calanoid species
15	1	1850-1004	147 (141)	39 (38)
25	2	1900-980	102 (98)	47 (44)
26	2	2800-2000	21	13
45	4	1900-1003	178 (158)	45 (36)

In these collections, the calculated number of adult calanoid copepods excluding contaminant species varied from 6 to 35 per 100 cubic meters, and the number of species ranged between 13 and 44. These numbers are comparable to those reported by Grice & Hülsemann (1965, 1967) for similar intervals of depth in the northeastern Atlantic and western Indian Ocean. Their collecting technique was similar to that of the present investigation.

The species found in the present study and the collection numbers where they occurred are listed below. (See Table 1 for collection data corresponding to collection number. The species not previously known from the areas are indicated by an asterisk.)

CALANIDAE	Collection No.
1. <i>Calanus tenuicornis</i> Dana, 1849	11-13
2. <i>Nannocalanus minor</i> (Claus, 1863)	11-13
3. <i>Neocalanus gracilis</i> (Dana, 1849)	11-13, 24
4. <i>Undinula vulgaris</i> (Dana, 1849)	11-13, 15
EUCALANIDAE	
5. <i>Eucalanus attenuatus</i> (Dana, 1849)	14, 15, 45
6. <i>E. elongatus hyalinus</i> Claus, 1866	13, 14, 44, 45
7. <i>E. monachus</i> Giesbrecht, 1888	12, 13, 15, 24, 25
8. <i>E. pileatus</i> Giesbrecht, 1888	11
*9. <i>E. subtenuis</i> Giesbrecht, 1888	11-13
10. <i>Mecynocera clausii</i> Thompson, 1888	11, 26
11. <i>Rhincalanus cornutus atlanticus</i> Schmaus, 1917	12-15, 24, 25, 45

PARACALANIDAE

12.	<i>Acrocalanus longicornis</i> Giesbrecht, 1888	11-13
13.	<i>Calocalanus pavo</i> Dana, 1849	11
14.	<i>C. pavoninus</i> Farran, 1936	11, 25, 45
*15.	<i>C. styliremis</i> Giesbrecht, 1888	11, 25, 45
*16.	<i>C. contractus</i> Farran, 1926	45
17.	<i>Paracalanus aculeatus</i> Giesbrecht, 1888	11, 12
*18.	<i>P. denudatus</i> Sewell, 1929	45
19.	<i>P. parvus</i> (Claus, 1863)	11, 45

PSEUDOCALANIDAE

20.	<i>Clausocalanus arcuicornis</i> (Dana, 1849)	12, 24
21.	<i>C. furcatus</i> (Brady, 1883)	11-13, 15, 45
22.	<i>C. mastigophorus</i> (Claus, 1863)	11, 12, 24
23.	<i>C. parapergens</i> Frost & Fleminger, 1968	11-13
24.	<i>C. paululus</i> Farran, 1926	11, 12, 25, 45
25.	<i>C. pergens</i> Farran, 1926	45
*26.	<i>Ctenocalanus vanus</i> Giesbrecht, 1888	11, 12, 45
*27.	<i>Farrania frigidus</i> (Wolfenden, 1911)	15, 25, 45, 64
*28.	<i>Microcalanus pygmaeus</i> (Sars, 1900)	15, 45

SPINOCALANIDAE

29.	<i>Mimocalanus crassus</i> , new species	15, 24-26, 45
*30.	<i>M. cultrifer</i> Farran, 1908	13, 24, 44, 45, 64
*31.	<i>M. nudus</i> Farran, 1908	15, 25, 26, 45
32.	<i>Monacilla tenera</i> Sars, 1907	25, 43, 45
33.	<i>M. typica</i> Sars, 1905	14, 15, 24, 25, 44, 45
*34.	<i>Spinocalanus abyssalis</i> Giesbrecht, 1888	14, 15, 24-26, 43-45
35.	<i>S. parabyssalis</i> , new species	13, 24, 43
*36.	<i>S. brevicaudatus</i> Brodsky, 1950	14, 15, 24, 43
*37.	<i>S. spinosus</i> Farran, 1908	14, 44, 64
38.	<i>S. pteronus</i> , new species	15, 25, 45
39.	<i>S. usitatus</i> , new species	14, 24, 25, 64
40.	<i>S. hoplites</i> , new species	25, 26
41.	<i>S. aspinosus</i> , new species	15, 25
42.	<i>S. oligospinosus</i> , new species	13, 24, 43, 64
*43.	<i>S. horridus</i> Wolfenden, 1911	44, 45
*44.	<i>S. magnus</i> Wolfenden, 1904	14, 15, 25, 45, 64
*45.	<i>S. polaris</i> Brodsky, 1950	25, 26
*46.	<i>Teneriforma naso</i> (Farran, 1936)	14, 45

AETIDEIDAE

47.	<i>Aetideus armatus</i> (Boeck, 1872)	12, 13, 24
48.	<i>Chiridiella bispinosa</i> , new species	64
*49.	<i>Chiridius gracilis</i> Farran, 1908	43
50.	<i>C. poppei</i> Giesbrecht, 1892	13, 64
51.	<i>Chirundina streetsii</i> Giesbrecht, 1895	12, 13, 44
*52.	<i>Euaetideus acutus</i> (Farran, 1929)	11, 12, 23, 42
53.	<i>E. giesbrechti</i> (Cleve, 1904)	42, 43
54.	<i>Euchirella curticauda</i> Giesbrecht, 1888	25
55.	<i>E. messinensis</i> (Claus, 1863)	14
56.	<i>E. pulchra</i> (Lubbock, 1856)	14, 25, 44
57.	<i>E. rostrata</i> (Claus, 1866)	64
58.	<i>E. splendens</i> Vervoort, 1963	14, 24

59.	<i>Gaetanus minor</i> Farran, 1905	12, 13, 23, 24, 43
60.	<i>G. pileatus</i> Farran, 1903	43
61.	<i>Gaidius tenuispinus</i> Sars, 1900	24
*62.	<i>Paivella inaciae</i> Vervoort, 1965	11, 12
63.	<i>Pseudoaetideus armatus</i> (Boeck, 1872)	24
*64.	<i>Snelliaetideus arcuatus</i> Vervoort, 1949	14
65.	<i>Undeuchaeta major</i> Giesbrecht, 1888	44
66.	<i>U. plumosa</i> (Lubbock, 1856)	11-14, 24, 25, 44, 45
67.	<i>Valdiviella oligarthra</i> Steuer, 1904	15, 25
EUCHAETIDAE		
68.	<i>Euchaeta bisinuata</i> Sars, 1907	24
69.	<i>E. marina</i> (Prestandrea, 1833)	11-13, 24
70.	<i>E. media</i> Giesbrecht, 1888	11, 24
71.	<i>E. paraconcinna</i> Fleminger, 1957	11, 15
PHAENNIDAE		
72.	<i>Xanthocalanus paululus</i> , new species	44, 45
SCOLECITHRICIDAE		
*73.	<i>Racovitzanus levis</i> Tanaka, 1961	23, 43
*74.	<i>R. porrecta</i> (Giesbrecht, 1888)	43, 45
*75.	<i>Scaphocalanus curtus</i> (Farran, 1926)	24, 43-45, 64
76.	<i>S. subcurtus</i> , new species	11-13, 23, 24, 43
77.	<i>S. amplius</i> , new species	12, 13, 23, 24, 43, 44
*78.	<i>S. echinatus</i> (Farran, 1905)	12, 13, 24, 44, 64
79.	<i>S. brevirostris</i> , new species	11-14, 24, 43, 64
*80.	<i>S. elongatus</i> A. Scott, 1909	24, 26
*81.	<i>S. major</i> (T. Scott, 1894)	24, 44, 64
*82.	<i>S. longifurca</i> (Giesbrecht, 1888)	25, 44, 45
83.	<i>S. acuminatus</i> , new species	25, 45
84.	<i>S. magnus</i> (T. Scott, 1894)	13, 15, 24, 44
*85.	<i>Scolecithricella abyssalis</i> (Giesbrecht, 1888)	23, 24, 43
86.	<i>S. dentata</i> (Giesbrecht, 1892)	11, 13, 14, 24, 42, 43, 45
87.	<i>S. emarginata</i> (Farran, 1905)	25, 64
*88.	<i>S. laminata</i> (Farran, 1926)	24, 26
*89.	<i>S. maritima</i> Grice & Hülsemann, 1967	45
*90.	<i>S. ovata</i> (Farran, 1905)	24, 44
91.	<i>S. tenuiserrata</i> (Giesbrecht, 1892)	12, 23
*92.	<i>S. valens</i> (Farran, 1926)	64
93.	<i>S. vittata</i> (Giesbrecht, 1892)	12, 42
94.	<i>S. pseudoarcurata</i> , new species	44
95.	<i>S. lobophora</i> , new species	44
96.	<i>Scolecithrix brady</i> Giesbrecht, 1888	11-13, 45
97.	<i>S. danae</i> (Lubbock, 1856)	11, 12
98.	<i>Scottocalanus helenae</i> (Lubbock, 1856)	44
99.	<i>S. persecans</i> (Giesbrecht, 1895)	44
100.	<i>S. securifrons</i> (T. Scott, 1894)	12, 14
THARYBIDAE		
*101.	<i>Undinella brevipes</i> Farran, 1908	45
TEMORIDAE		
102.	<i>Temora stylifera</i> (Dana, 1849)	11-13
103.	<i>T. turbinata</i> (Dana, 1849)	11, 12
104.	<i>Temoropia mayumbaensis</i> T. Scott, 1894	11-13, 24, 45

METRIDIIDAE

105. *Metridia brevicauda* Giesbrecht, 1889 14, 15, 24, 25, 45
 *106. *M. curticauda* Giesbrecht, 1889 14, 15, 24, 45
 107. *M. princeps* Giesbrecht, 1889 45
 108. *M. venusta* Giesbrecht, 1889 13, 14, 24
 109. *Pleuromamma abdominalis abdominalis*
 (Lubbock, 1856) 11-13, 24, 25
P. abdominalis edentata Steuer, 1932 11
 110. *P. gracilis gracilis* (Claus, 1863) 11-13, 15, 24, 25
 111. *P. xiphias* (Giesbrecht, 1889) 13, 14, 24

CENTROPAGIDAE

112. *Centropages caribbeanensis*, new species 11, 21

LUCICUTIIDAE

113. *Lucicutia bicornuta* Wolfenden, 1905 15
 114. *L. clausi* (Giesbrecht, 1889) 12, 13, 23, 24, 42, 43
 115. *L. paraclausi*, new species 12, 13, 23, 42
 *116. *L. curta* Farran, 1905 14, 15, 24, 44
 117. *L. flavicornis* (Claus, 1863) 11-15, 24, 25, 42, 43
 *118. *L. gaussae* Grice, 1963 15, 21
 *119. *L. gemina* Farran, 1926 12
 *120. *L. intermedia* Sars, 1905 25
 *121. *L. longiserrata* (Giesbrecht, 1889) 15, 24, 44
 122. *L. magna* Wolfenden, 1903 13, 24
 *123. *L. ovalis* (Giesbrecht, 1889) 14, 15, 24-26, 44, 45
 *124. *L. parva* Grice & Hülsemann, 1965 15, 25, 45
 *125. *L. sewelli* Tanaka, 1963 15, 25, 26

HETERORHABDIDAE

- *126. *Disseta minuta* Grice & Hülsemann, 1965 25
 127. *D. palumboi* Giesbrecht, 1889 14, 45, 64
 128. *Heterorhabdus abyssalis* (Giesbrecht, 1889) 15, 24, 25, 44, 45
 *129. *H. compactus* (Sars, 1900) 24-26
 130. *H. papilliger* (Claus, 1863) 12-14, 23, 24, 42, 44
 *131. *H. robustus* Farran, 1908 45
 132. *H. spinifer*, new species 11-13, 15, 23, 24, 43
 133. *H. spinifrons* (Claus, 1863) 12-14, 23, 24
 134. *H. caribbeanensis*, new species 25
 *135. *H. vipera* (Giesbrecht, 1889) 23-25, 43
 136. *H. medianus*, new species 23, 24, 43
 137. *Heterostylites longicornis* (Giesbrecht, 1892) 12
 *138. *H. major* (Dahl, 1894) 44
 *139. *Mesorhabdus brevicaudatus* (Wolfenden, 1905) 44
 *140. *M. gracilis* Sars, 1907 25, 26

AUGAPTILIDAE

141. *Augaptilus longicaudatus* (Claus, 1863) 13, 24
 *142. *A. megalurus* Giesbrecht, 1889 14
 *143. *Disco inflatus* Grice & Hülsemann, 1965 25, 44
 144. *D. oviformis*, new species 24
 145. *Euaugaptilus gracilis* Sars, 1905 15, 25, 26
 146. *E. filigerus* (Claus, 1863) 23
 147. *E. hecticus* (Giesbrecht, 1889) 12, 13, 23, 43
 *148. *E. humilis* Farran, 1926 25

149.	<i>E. nodifrons</i> (Sars, 1905)	23, 64
150.	<i>E. magnus</i> Wolfenden, 1904	25
151.	<i>E. oblongus</i> (Sars, 1905)	14
*152.	<i>E. palumboi</i> (Giesbrecht, 1889)	14, 24, 25, 43, 44, 63
153.	<i>E. sublongiseta</i> , new species	13
154.	<i>E. vescus</i> , new species	15
155.	<i>E. diminutus</i> , new species	23
156.	<i>E. unisetosus</i> , new species	23
157.	<i>E. longiantennalis</i> , new species	23
158.	<i>Haloptilus acutifrons</i> (Giesbrecht, 1892)	22
159.	<i>H. longicornis</i> (Claus, 1863)	11-14, 21-24, 42, 43
*160.	<i>H. longicirrus</i> Brodsky, 1950	14, 15, 24, 25, 45
161.	<i>H. paralongicirrus</i> , new species	12, 13, 15, 22-24, 42, 43
162.	<i>H. ornatus</i> (Giesbrecht, 1892)	13
163.	<i>H. caribbeanensis</i> , new species	25
164.	<i>Pseudaugaptilus longiremis</i> Sars, 1907	43, 44
*165.	<i>Pachyptilus pacificus</i> Johnson, 1936	15
ARIETELLIDAE		
166.	<i>Phyllopus helgae</i> Farran, 1908	24, 44
167.	<i>P. impar</i> Farran, 1908	15
CANDACIIDAE		
168.	<i>Candacia longimana</i> (Claus, 1863)	11, 12, 24
169.	<i>C. pachydactyla</i> (Dana, 1849)	11, 12
170.	<i>C. paenelongimana</i> Fleminger & Bowman, 1956	11, 13, 24
171.	<i>Paracandacia bispinosa</i> (Claus, 1863)	11, 12, 24
172.	<i>P. simplex</i> (Giesbrecht, 1889)	11, 12
PONTELLIDAE		
173.	<i>Pontellina plumata</i> (Dana, 1849)	11
174.	<i>Calanopia americana</i> Dahl, 1894	11, 12
BATHYPONTIIDAE		
*175.	<i>Bathypontia minor</i> (Wolfenden, 1906)	25, 45
*176.	<i>B. similis</i> Tanaka, 1965	15, 25, 44
*177.	<i>Temorites discoveryae</i> Grice & Hülsemann, 1965	15
ACARTIIDAE		
178.	<i>Acartia danae</i> Giesbrecht, 1889	11

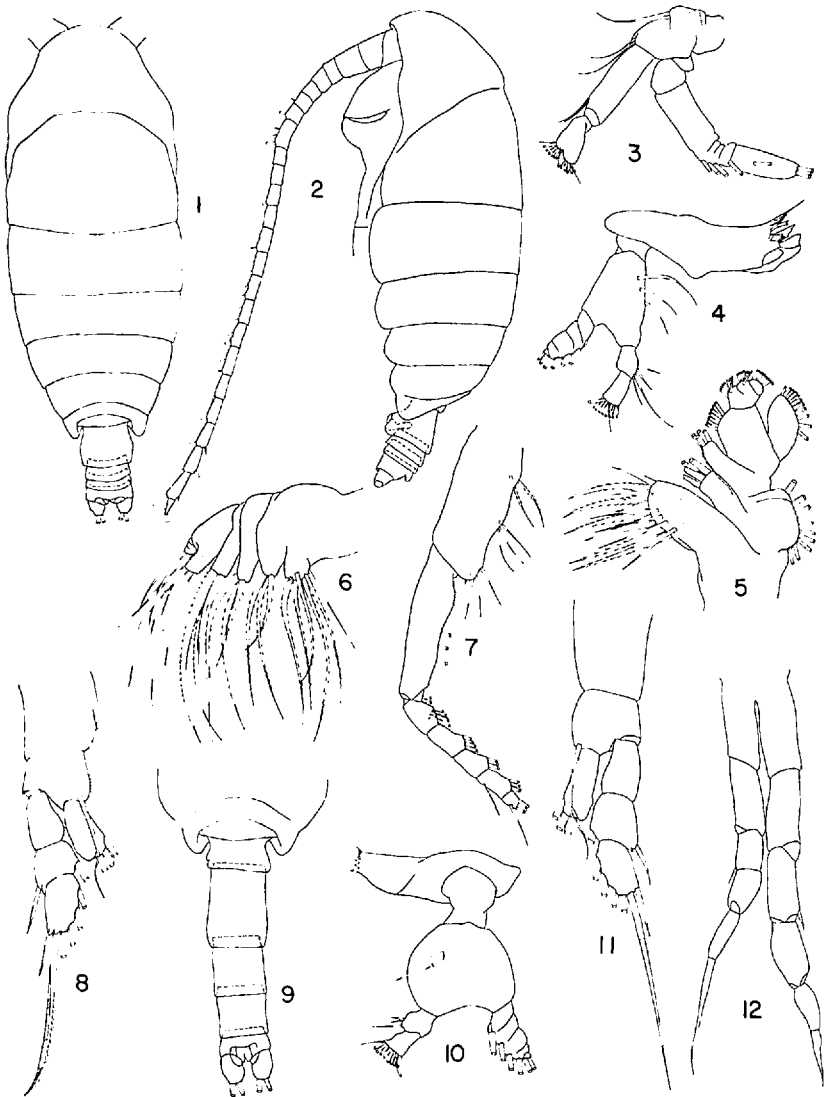
Mimocalanus crassus, new species

Figs. 1-12

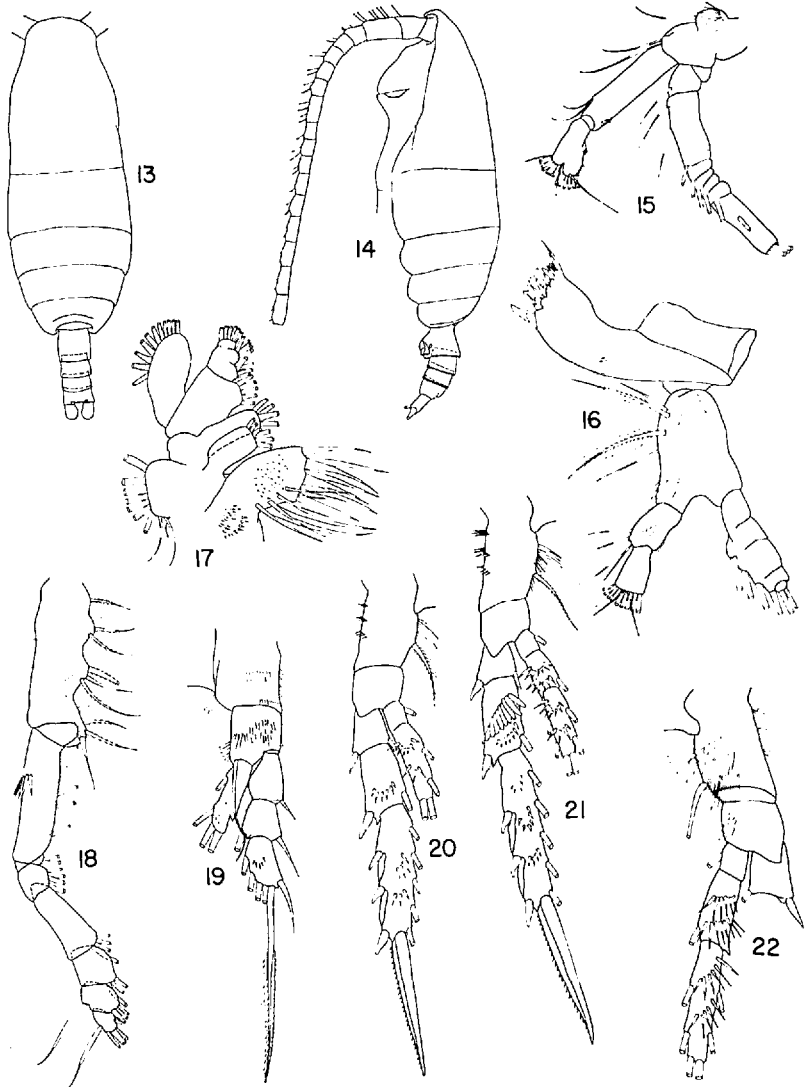
Mimocalanus species Grice & Hülsemann, 1967:21, figs. 19-25.

Occurrence.—Station 1: 1850-1004 m, 3 ♀♀ (1.00-1.10 mm). Station 2: 950-487 m, 1 ♀ (1.06 mm); 1900-980 m, 2 ♀♀ (1.04, 1.22 mm), 1 ♂ (1.30 mm); 2800-2000 m, 1 ♀ (1.22 mm). Station 4: 1900-1003 m, 3 ♀♀ (1.04-1.08 mm).

Diagnosis (Female).—Prosome about 4.5 times as long as urosome. Cephalosome with a distinct cervical groove. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments separate. Postero-



FIGURES 1-12. *Mimocalanus crassus*, n. sp.—1-8, female: 1, habitus, dorsal; 2, habitus, lateral; 3, antenna; 4, mandible; 5, maxillule; 6, maxilla; 7, maxilliped; 8, first leg, anterior.—9-12, male: 9, posterior part of metasome and urosome, dorsal; 10, mandible; 11, first leg, anterior; 12, fifth pair of legs, anterior.



FIGURES 13-22. *Spinocalanus abyssalis*, female: 13, habitus, dorsal; 14, habitus, lateral; 15, antenna; 16, mandible; 17, maxillule; 18, maxilliped; 19, first leg, anterior; 20, second leg, posterior; 21, third leg, posterior; 22, fourth leg (second and third exopodal segments broken off), posterior.

lateral corner of metasome roundly produced, overlapping anterior half of genital segment. Antennule relatively thin and extends beyond end of caudal ramus by last four segments. Basis of mandible with three setae. Maxillule with 9 setae on outer lobe, 7 setae on basis, and 7 + 7 + 9 setae on endopod. First lobe of maxilla with six setae. Two distal segments of maxilliped each with a small external seta. In first leg, first exopodal segment without setae or spines, second exopodal segment with an external spine reaching end of third exopodal segment, and endopod with 3 or 4 setae. Holotype (from station 2, 950-487 m): USNM 123771.

Diagnosis (Male).—Antennule relatively thin, as in female. Mandible with reduced teeth on cutting edge and two setae on basis. First leg exactly like that of female. Fifth pair of legs asymmetrical; each uniramous, five-segmented, tipped with a strong spine, and with a small external spine on third segment.

Remarks.—*Mimocalanus crassus* is very close in habitus to *M. cultrifer* Farran, 1908, but can be distinguished from it in the female by the robust body, the relatively thin antennule, and the setation of the mouthparts, and in the male by the fifth pair of legs. The two males of *Mimocalanus* species described by Grice & Hülsemann (1967) from the Indian Ocean seem to belong to *M. crassus*, even if they are much smaller (0.78 mm) than the present specimen.

Spinocalanus abyssalis Giesbrecht, 1888

Figs. 13-22

Spinocalanus abyssalis var. *pygmaeus* Farran, 1926:243.

Occurrence.—Station 1: 1000-505 m, 4 ♀♀ (1.04-1.12 mm); 1850-1004 m, 16 ♀♀ (1.10-1.26 mm). Station 2: 950-487 m, 15 ♀♀ (1.02-1.06 mm); 1900-980 m, 16 ♀♀ (1.08-1.26 mm); 2800-2000 m, 5 ♀♀ (1.06-1.20 mm). Station 4: 500-203 m, 1 ♀ (1.00 mm); 1000-509 m, 25 ♀♀ (0.98-1.16 mm); 1900-1003 m, 44 ♀♀ (1.10-1.20 mm).

Diagnosis (Female).—Prosoma about 3.5 times as long as urosome. Exopod of antenna seven-segmented; first segment with or without a seta, second segment with three setae, and third to sixth segments each with a seta. Basis of mandible with four setae and some patches of stiff hairs. In maxillule, second inner lobe with 6 setae, third inner lobe 4 setae, basis 5 setae, and endopod 4 + 5 + 7 setae. In some specimens, base of fifth lobe of maxilla bearing scattered spinules. Maxilliped with a comb of spines on basis. Posterior surface of third exopodal segment of first leg with a row of spinules in some specimens. Second exopodal segment of third leg with a transverse row of large, lancet-form spines in addition to a row of small, regular spines on posterior surface.

Remarks.—Giesbrecht's original description of the species is based on specimens 1.10 to 1.25 mm long obtained from deep waters of the tropical Pacific Ocean (Giesbrecht, 1892). Finding two size-groups that appeared to belong to this species, Farran (1926) established a new variety, *Spinocalanus abyssalis* var. *pygmaeus*, for the smaller (0.95 to 1.10 mm) which was, however, closer in size to Giesbrecht's original Pacific specimens, and referred the larger (1.45 to 1.60 mm) to *Spinocalanus abyssalis*.

Brodsky (1950) first recognized these two forms as separate species, correctly referred the smaller to *Spinocalanus abyssalis* Giesbrecht, and gave the larger a new name, *Spinocalanus brevicaudatus*.

The genus *Spinocalanus*, which has not previously been reported from the Caribbean Sea or Gulf of Mexico, was represented in the present collections by 12 species, including six new species. Since most of the species are so closely related to one another that they are distinguishable by some anatomical details of only one or two appendages, a key is given below for the identification of the species.

KEY TO THE SPECIES OF *Spinocalanus* (FEMALES)

- | | | |
|----|---|------------------------------|
| 1. | Lateral side of metasome nude | 2 |
| 1. | Lateral side of metasome covered by spinules | 7 |
| 2. | Coxa of maxilliped with a comb of spines | <i>aspinosus</i> , n. sp. |
| 2. | Coxa of maxilliped without a comb of spines | 3 |
| 3. | Basis of maxilliped with a comb of spines | 4 |
| 3. | Basis of maxilliped without a comb of spines | 5 |
| 4. | Second exopodal segment of third leg with a transverse row of wide, lancet-form spines in addition to a row of small spines; total length less than 1.26 mm | <i>abyssalis</i> |
| 4. | Second exopodal segment of third leg with a transverse row of slender, lancet-form spines in addition to a row of small spines; total length over 1.40 mm | <i>brevicaudatus</i> |
| 5. | Posterolateral corner of metasome not produced ... | <i>parabyssalis</i> , n. sp. |
| 5. | Posterolateral corner of metasome produced, overlapping anterior half of genital segment | 6 |
| 6. | Distal two segments of maxilliped each with a large, dagger-shaped seta | <i>magnus</i> |
| 6. | Distal two segments of maxilliped each with a small, regular seta | <i>polaris</i> |
| 7. | Coxa and basis of maxilliped each with a comb of spines | 8 |
| 7. | Coxa of maxilliped without a comb of spines; total length about 1.80 to 1.90 mm | <i>spinosus</i> |

8. In maxilliped, the spines of coxa longer than or equal to those of basis 9
8. The spines of coxa shorter than those of basis 10
9. Ventrolateral edges of cephalosome extend laterally like a wing; the spines of basis of maxilliped about $\frac{1}{6}$ the length of the segment *pteronus*, n. sp.
9. Ventrolateral edges of cephalosome inconspicuous; the spines of basis of maxilliped about $\frac{1}{4}$ the length of the segment.... *hoplites*, n. sp.
10. The spines of coxa of maxilliped borne on a conspicuous protrusion *usitatus*, n. sp.
10. The spines of coxa of maxilliped not borne on a conspicuous protrusion 11
11. The spines of basis of maxilliped about $\frac{1}{3}$ the length of the segment; all metasomal segments with spinules *horridus*
11. The spines of basis of maxilliped about $\frac{1}{4}$ the length of the segment; only first one or two metasomal segments with spinules *oligospinosus*, n. sp.

***Spinocalanus parabyssalis*, new species**

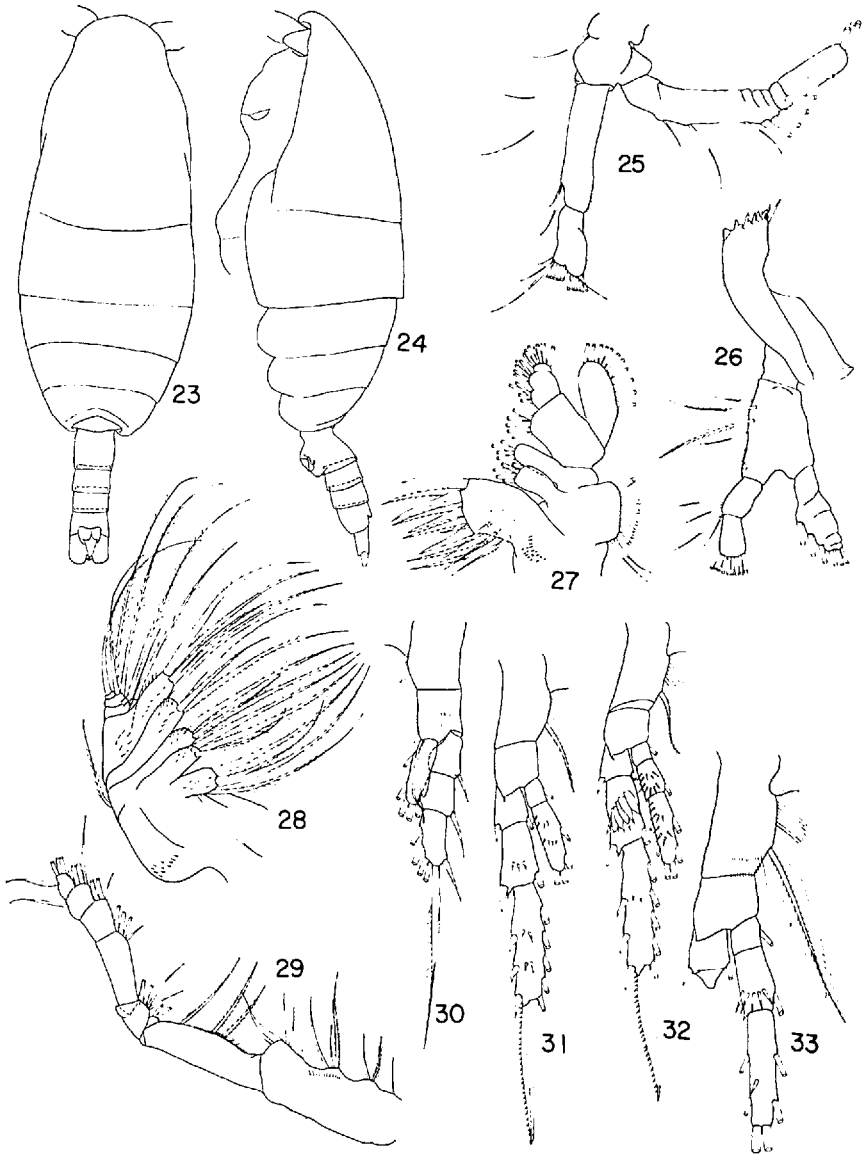
Figs. 23-36

Occurrence.—Station 1: 500-208 m, 3 ♀♀ (0.90-0.98 mm). Station 2: 950-487 m, 32 ♀♀ (0.90-1.04 mm), 1 ♂ (0.90 mm). Station 4: 500-203 m, 3 ♀♀ (0.94-0.96 mm).

Diagnosis (Female).—Prosome about 3 times as long as urosome. Exopod of antenna seven-segmented, first segment without setae. Basis and first endopodal segment of mandible each with four setae. Maxillule with 13 spines on first, 5 setae on second, and 4 setae on third inner lobe, 5 setae on basis, and 4 + 5 + 7 setae on endopod. In maxilla, base of fifth lobe usually bears scattered spinules. Basis of maxilliped without a comb of spines. Second endopodal segment of second leg without external setae. Posterior surface of second exopodal segment of third leg with a transverse row of large, lancet-form spines in addition to a row of small, regular spines. Holotype (0.98 mm long, from station 2): USNM 123783.

Diagnosis (Male).—Prosome about twice as long as urosome. Second urosomal segment about 1.5 times as long as the third. Mouthparts much reduced. Fifth pair of legs asymmetrical, left leg being larger; each consists of a two-segmented basipod, a three-segmented exopod, and a one-segmented endopod. Right exopod reaching middle of second segment of left exopod. Right endopod longer than left endopod.

Remarks.—This species resembles closely *Spinocalanus abyssalis* Giesbrecht, but can be readily distinguished from it by the absence of a comb



FIGURES 23-33. *Spinocalanus parabyssalis*, n. sp., female: 23, habitus, dorsal; 24, habitus, lateral; 25, antenna; 26, mandible; 27, maxillule; 28, maxilla; 29, maxilliped; 30, first leg, anterior; 31, second leg, posterior; 32, third leg, posterior; 33, fourth leg (second and third exopodal segments broken off), posterior.

of spines on the basis of the maxilliped. The two species also differ in size and vertical distribution—*Spinocalanus parabyssalis* is slightly smaller and inhabits shallower layers.

Spinocalanus brevicaudatus Brodsky, 1950

Occurrence.—Station 1: 1000-505 m, 1 ♀ (1.40 mm); 1850-1004 m, 1 ♀ (1.46 mm). Station 2: 950-487 m, 1 ♀ (1.42 mm), 1 ♂ (1.38 mm). Station 4: 500-203 m, 1 ♀ (1.48 mm).

Remarks.—*Spinocalanus brevicaudatus* had been known as a larger form of *Spinocalanus abyssalis* until Brodsky (1950) recognized it as a separate species. Although these two species are similar in the details of the appendages, the large, elongate body and the armament of the second exopodal segment of the third leg of the former will serve to distinguish it from the latter.

The fifth pair of legs of the present male well agrees with that of *Spinocalanus abyssalis* described by Tanaka (1937), which I believe is synonymous with *S. brevicaudatus*.

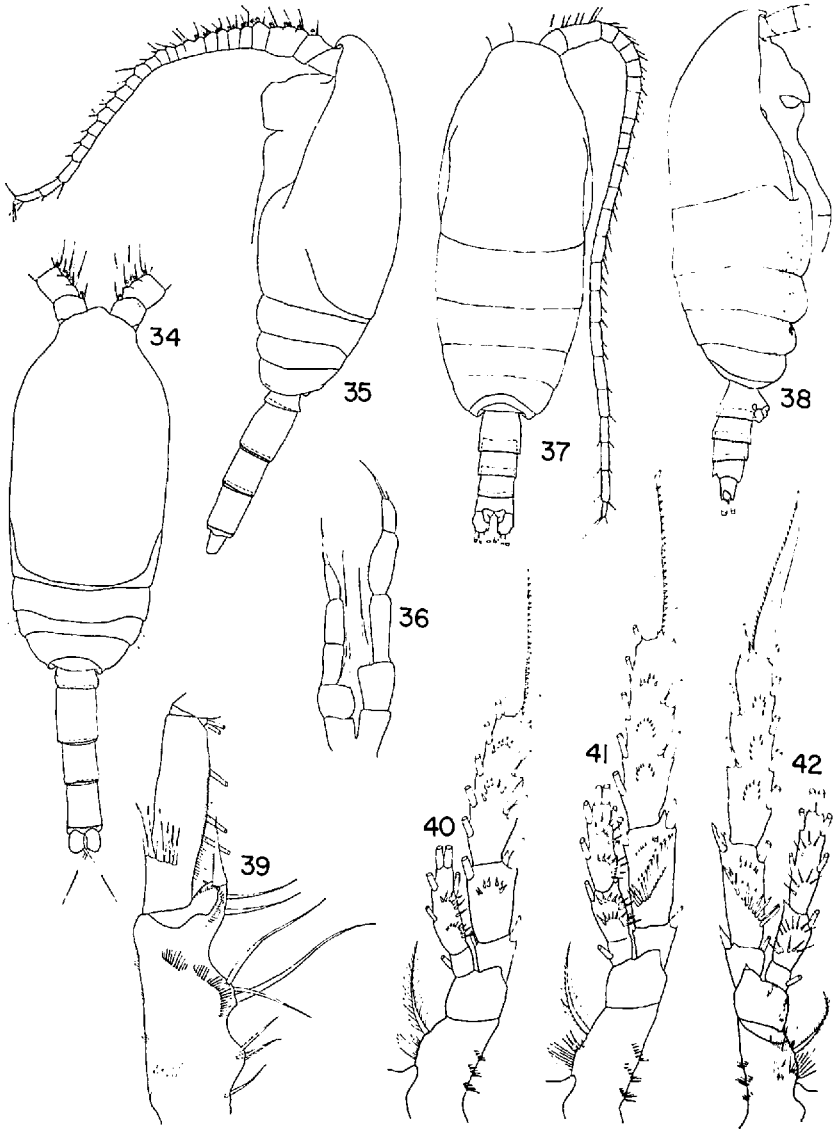
Spinocalanus spinosus Farran, 1908

Figs. 37-42

Occurrence.—Station 1: 1000-505 m, 1 ♀ (1.80 mm). Station 4: 1000-509 m, 6 ♀ ♀ (1.80-1.86 mm). Station 6: 1000-513 m, 2 ♀ ♀ (1.80, 1.82 mm).

Diagnosis (Female).—Prosome about 3 times length of urosome. Cephalosome and first metasomal segment separate, fourth and fifth metasomal segments separate. Lateral side of metasome covered by spinules. Antennule slightly longer than body, eighth and ninth segments completely fused. Exopod of antenna seven-segmented, first segment with 1 seta, and second segment three setae. Basis and first endopodal segment of mandible each with four setae. In maxillule, second and third inner lobes with 6 and 4 setae, respectively, basis 5 setae, and endopod 4 + 5 + 7 setae. Maxilliped with a transverse row of spines on basis, no such spines on coxa. In first leg, first external spine of exopod much smaller than the second, which is about equal to the third. Endopod of second leg reaching distal end of second exopodal segment. Second exopodal segment of third leg with a transverse row of large, lancet-form spines in addition to a row of small spines. Basipod of fourth leg with several patches of stiff hairs.

Remarks.—The present collections contained seven distinct forms of *Spinocalanus* that are related to one another, either by having integumental spinules or by the similarity of the appendages, and thus could be identified with *Spinocalanus spinosus* Farran, the only species in the genus known



FIGURES 34-42.—34-36, *Spinocalanus parabyssalis*, n. sp., male: 34, habitus, dorsal; 35, habitus, lateral; 36, fifth pair of legs, posterior.—37-42, *Spinocalanus spinosus*, female: 37, habitus, dorsal; 38, habitus, lateral; 39, basipod of maxilliped; 40, second leg, posterior; 41, third leg, posterior; 42, fourth leg, posterior.

to have integumental spinules, with *Spinocalanus horridus* Wolfenden synonymized with it.

Since these forms are clearly separated in the size of the body as well as in the details of the appendages, they are all described here as separate species, even if the relationship and biological significance of their morphological differences are by no means fully known. The form described here was chosen to correspond to the original description by Farran (1908) on the basis of his statements that the species is similar in the anatomy of the appendages to *Spinocalanus abyssalis*.

***Spinocalanus pteronus*, new species**

Figs. 43-50

Occurrence.—Station 1: 1850-1004 m, 3 ♀♀ (2.00-2.08 mm). Station 2: 1900-980 m, 1 ♀ (2.00 mm). Station 4: 1900-1003 m, 5 ♀♀ (1.86-2.00 mm).

Diagnosis (Female).—Prosoma a little more than 2.5 times length of urosome. Ventrolateral edges of cephalosome extend laterally like wings. Lateral side of metasome covered by spinules. Exopod of antenna seven-segmented, first segment with one seta, and second segment three setae. In mandible, basis and first endopodal segment each with 4 setae. In maxillule, second and third inner lobes with 6 and 4 setae, respectively, basis with 5 setae, and endopod with 4 + 5 + 7 setae. First five lobes of maxilla about equal in length, fifth lobe with some scattered spinules on base. Coxa of maxilliped with a comb of spines borne on a low tubercle. Basis also with a comb of spines about equal in length to those of coxa or one-sixth to one-seventh the length of the segment. In first leg, anterior surface of basipod with spinules, posterior surface of third exopodal segment with a row of spinules, second and third external spines of exopod about equal in length and larger than the first. Holotype (2.08 mm long from station 1): USNM 123784.

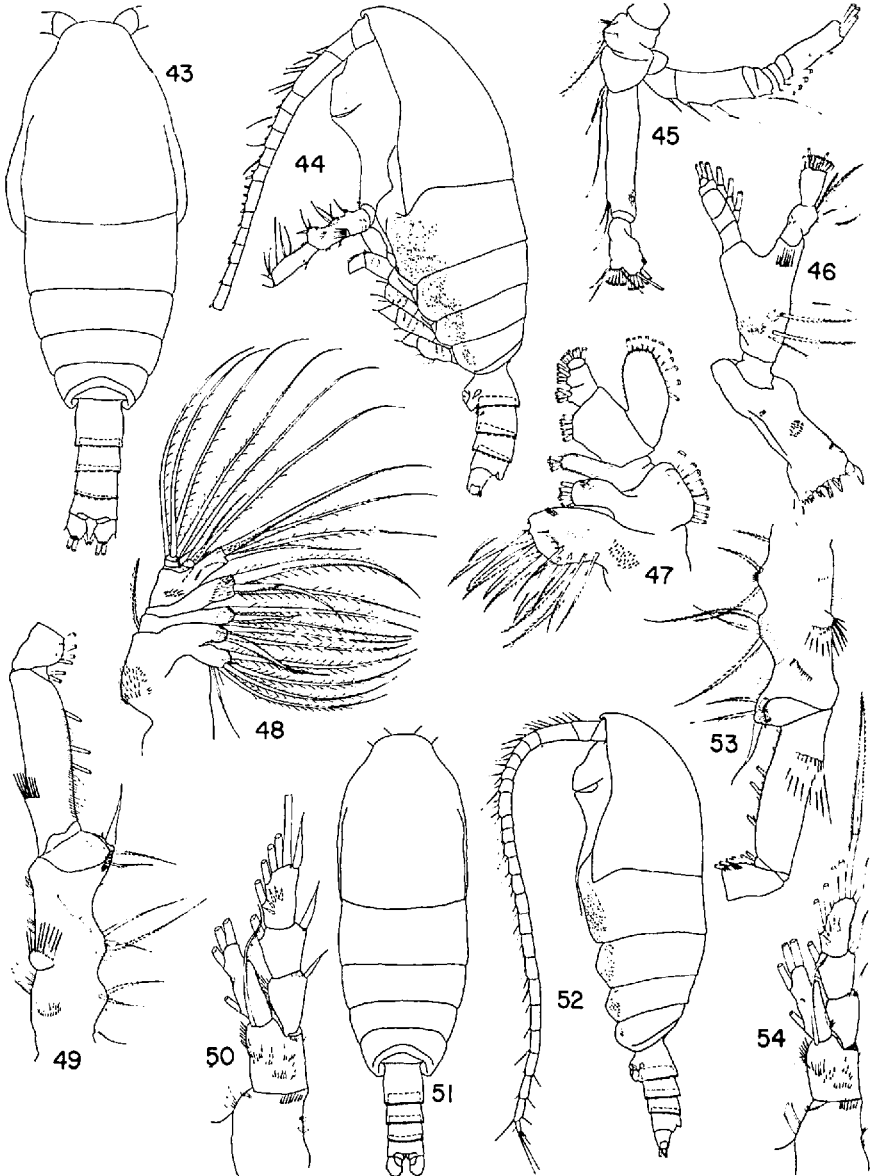
Remarks.—This species is readily recognized by the laterally extended ventrolateral edges of the cephalosome, which are particularly pronounced when viewed from the dorsal side of the body.

***Spinocalanus usitatus*, new species**

Figs. 51-54

Occurrence.—Station 1: 1000-505 m, 1 ♀ (1.70 mm). Station 2: 950-487 m, 1 ♀ (1.76 mm); 1900-980 m, 2 ♀♀ (1.74 mm). Station 6: 1000-513 m, 3 ♀♀ (1.72-1.74 mm).

Diagnosis (Female).—Prosoma about 3 times as long as urosome. Ventrolateral edges of cephalosome inconspicuous. Lateral side of metasome with



FIGURES 43-54.—43-50, *Spinocalanus pteronus*, n. sp., female: 43, habitus, dorsal; 44, habitus, lateral; 45, antenna; 46, mandible; 47, maxillule; 48, maxilla; 49, basipod of maxilliped; 50, first leg, anterior.—51-54, *Spinocalanus usitatus*, n. sp., female: 51, habitus, dorsal; 52, habitus, lateral; 53, basipod of maxilliped; 54, first leg, anterior.

spinules. Coxa of maxilliped with a large tubercle bearing a comb of spines. Basis with a comb of large spines, the largest about one-third the length of the segment or about twice as long as the spines on the coxa. Other appendages as in *Spinocalanus pteronus*. Holotype (from station 2, 950-487 m): USNM 123785.

Remarks.—The present species resembles closely *Spinocalanus pteronus*, but can be distinguished from it by the smaller body and the inconspicuous ventrolateral edges of the cephalosome.

***Spinocalanus hoplites*, new species**

Figs. 55-58

Occurrence.—Station 2: 1900-980 m, 4 ♀♀ (1.68-1.74 mm); 2800-2000 m, 3 ♀♀ (1.70-1.78 mm).

Diagnosis (Female).—Prosoma slightly more than 3 times length of urosome. Ventrolateral edges of cephalosome inconspicuous. Lateral side of metasome with spinules. Maxilla without spinules on base of fifth lobe. Coxa of maxilliped with a very large tubercle bearing a comb of strong spines. Basis with a comb of strong spines which are slightly shorter than those of the coxa. Other appendages as in *Spinocalanus pteronus*. Holotype (1.70 mm long, from 1900-980 m): USNM 123781.

Remarks.—This species is characterized by having an extraordinarily large comb of spines borne on a conspicuous protrusion of the coxa of the maxilliped.

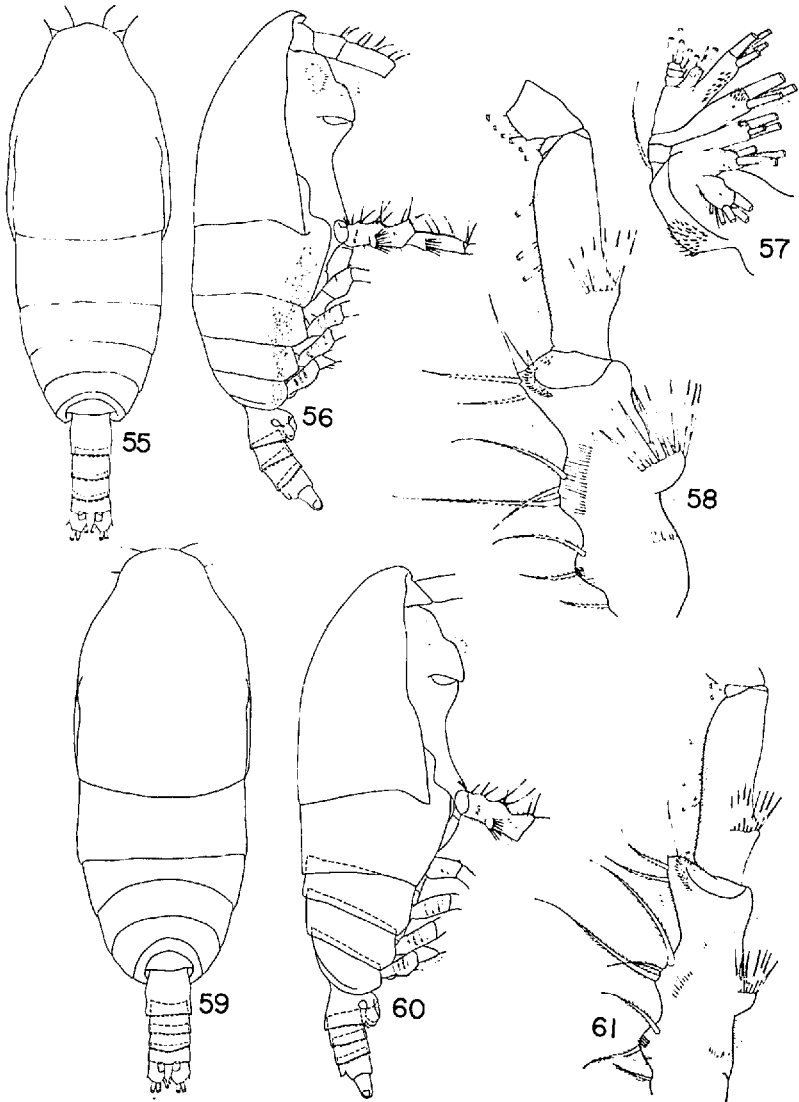
***Spinocalanus aspinosus*, new species**

Figs. 59-61

Occurrence.—Station 1: 1850-1004 m, 1 ♀ (1.46 mm). Station 2: 1900-980 m, 2 ♀♀ (1.32, 1.46 mm).

Diagnosis (Female).—Ventrolateral edges of cephalosome inconspicuous. Lateral side of metasome without spinules. Maxilla without spinules on base of fifth lobe. Coxa of maxilliped with a conspicuous tubercle bearing a comb of strong spines. Basis with a comb of strong spines, which are about equal in length to those of the coxa or about one-fourth the length of the segment. Other appendages as in *Spinocalanus pteronus*. Holotype (from station 1): USNM 123780.

Remarks.—This species is more closely related to those with integumental spinules than to those without them in the anatomical details of the appendages, particularly of the maxilliped.



FIGURES 55-61.—55-58, *Spinocalanus hoplites*, n. sp., female: 55, habitus, dorsal; 56, habitus, lateral; 57, maxilla; 58, basipod of maxilliped.—59-61, *Spinocalanus aspinosus*, n. sp., female: 59, habitus, dorsal; 60, habitus, lateral; 61, basipod of maxilliped.

Spinocalanus oligospinosus, new species

Figs. 62-65

Occurrence.—Station 1: 500-208 m, 1 ♀ (1.42 mm). Station 2: 950-487 m, 4 ♀ ♀ (1.40-1.46 mm). Station 4: 500-203 m, 2 ♀ ♀ (1.40, 1.50 mm). Station 6: 1000-513 m, 1 ♀ (1.40 mm).

Diagnosis (Female).—Ventrolateral edges of cephalosome not produced. Only first one or two metasomal segments bear inconspicuous integumental spinules. Maxilla without spinules on base of fifth lobe. Coxa and basis of maxilliped each with a comb of spines; those of coxa much smaller and, in some individuals, almost invisible, but those of basis well developed, being about one-fourth the length of the segment. In second leg, endopod reaches distal end of second exopodal segment. Other mouthparts and swimming legs as in *Spinocalanus pteronus*. Holotype (1.42 mm long, from station 2): USNM 123782.

Remarks.—This species is readily distinguished from those with integumental spinules by the poorly developed coxal comb of spines of the maxilliped and the absence of the integumental spinules on the posterior part of the metasome.

Spinocalanus horridus Wolfenden, 1911

Figs. 66-70

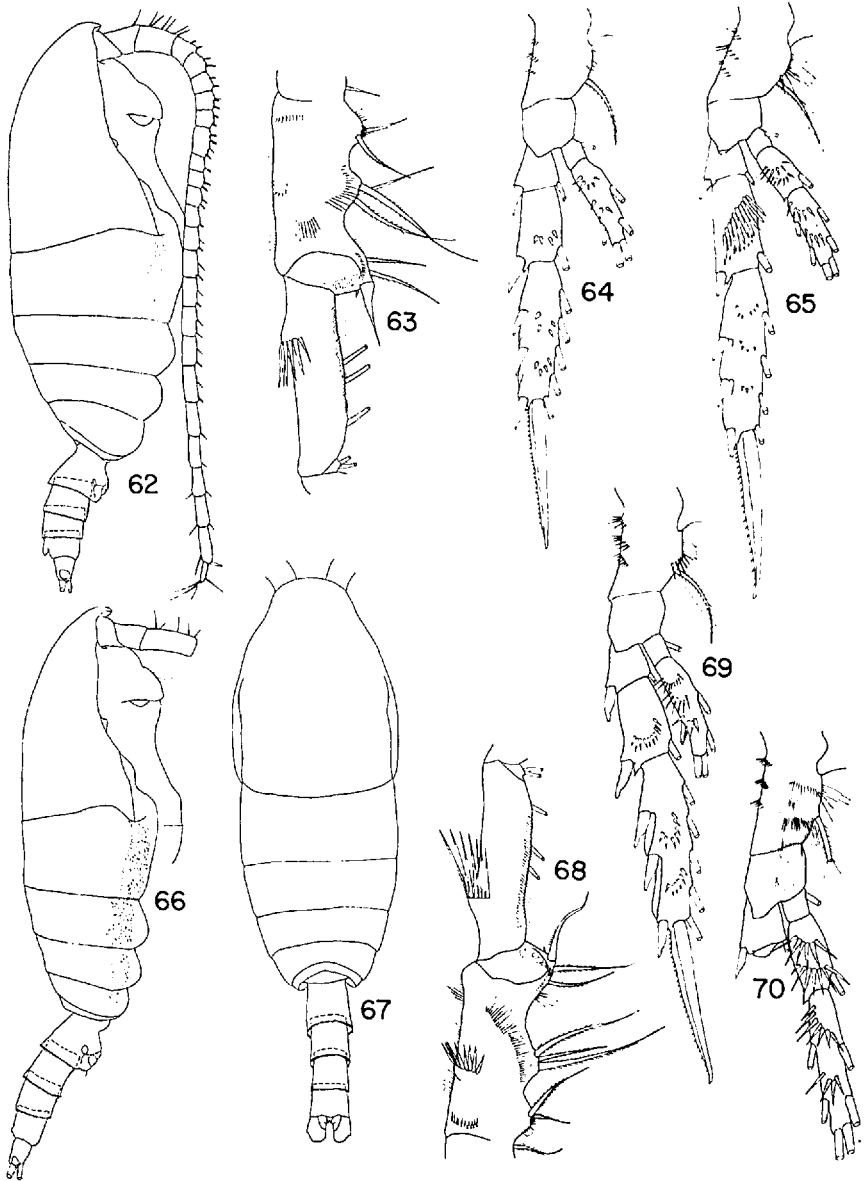
Occurrence.—Station 4: 1000-509 m, 2 ♀ ♀ (2.32, 2.36 mm); 1900-1003 m, 1 ♀ (2.36 mm).

Diagnosis (Female).—Body elongate. Prosome about 2.5 times as long as urosome. Lateral side of metasome covered by spinules. Maxilla without spinules on base of fifth lobe. Coxa and basis of maxilliped each with a comb of spines; those of basis much larger, being about one-third the length of the segment. Endopod of second leg extending beyond distal end of second exopodal segment. Other appendages as in *Spinocalanus pteronus*.

Remarks.—This species was originally described from deep water of the tropical South Atlantic Ocean (Wolfenden, 1911). The type-specimen was 2.35 mm long. Afterward, the name was made a synonym of *Spinocalanus spinosus* Farran by Vervoort (1946). But this species is clearly separable from *S. spinosus* and other related species by the large, elongate body, the structure of the maxilliped, and the relative length of the endopod of the second leg.

Spinocalanus magnus Wolfenden, 1904

Occurrence.—Station 1: 1000-505 m, 5 ♀ ♀ (2.16-2.44 mm); 1850-1004 m, 2 ♀ ♀ (2.16, 2.44 mm). Station 2: 1900-980 m, 1 ♀ (2.30 mm). Station



FIGURES 62-70.—62-65, *Spinocalanus oligospinosus*, n. sp., female: 62, habitus, lateral; 63, basipod of maxilliped; 64, second leg, posterior; 65, third leg, posterior.—66-70, *Spinocalanus horridus*, female: 66, habitus, lateral; 67, habitus, dorsal; 68, basipod of maxilliped; 69, second leg, posterior; 70, fourth leg (second and third exopodal segments broken off), posterior.

4: 1900-1003 m, 4 ♀♀ (2.28-2.44 mm). Station 6: 1000-513 m, 7 ♀♀ (2.32-2.44 mm).

Remarks.—The present specimens agree with the descriptions by Wolfenden (1906, 1911) and Sars (1925). The characters listed below are found to be useful for the identification of this species. Posterolateral corner of metasome produced, overlapping proximal half of genital segment. Exopod of antenna seven-segmented, first segment without setae, and second segment with two setae. Basis of mandible with four setae, and first endopodal segment two setae. Distal two segments of maxilliped each with a long external seta. Posterior surface of coxa of fourth leg with a transverse row of long spines.

Spinocalanus polaris Brodsky, 1950

Figs. 71-77

Occurrence.—Station 2: 1900-980 m, 2 ♀♀ (1.02, 1.06 mm); 2800-2000 m, 2 ♀♀ (1.06 mm).

Remarks.—This species is similar in habitus to *Spinocalanus magnus* Wolfenden, but can be distinguished from it by the smaller size and some anatomical details of the appendages that are listed below. Second exopodal segment of antenna with three setae. First endopodal segment of mandible with four setae. External setae on last two segments of maxilliped small. Endopod of first leg with three setae. Posterior surface of coxa of fourth leg with a short, transverse row of spines.

Spinocalanus polaris was originally described from deep water of the central Arctic (Brodsky, 1950) and subsequently found from the north-eastern Atlantic by Grice & Hülsemann (1965).

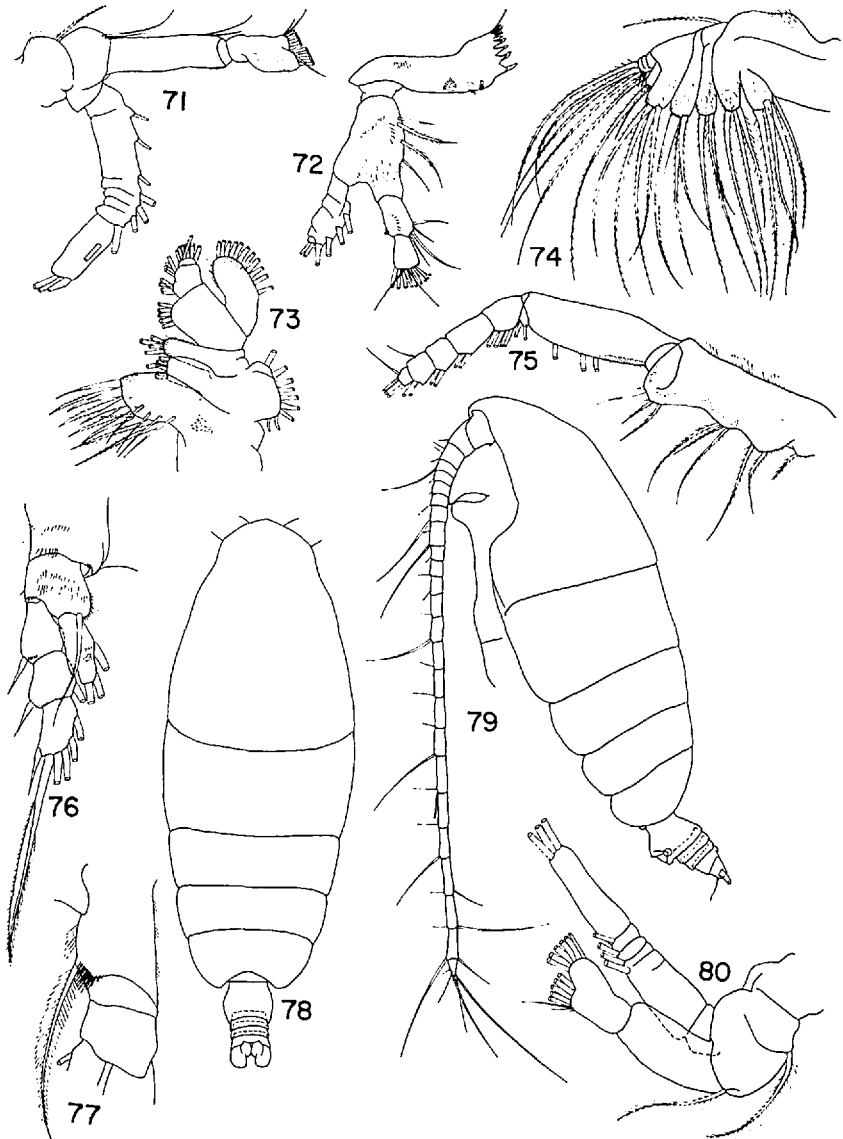
Chiridiella bispinosa, new species

Figs. 78-88

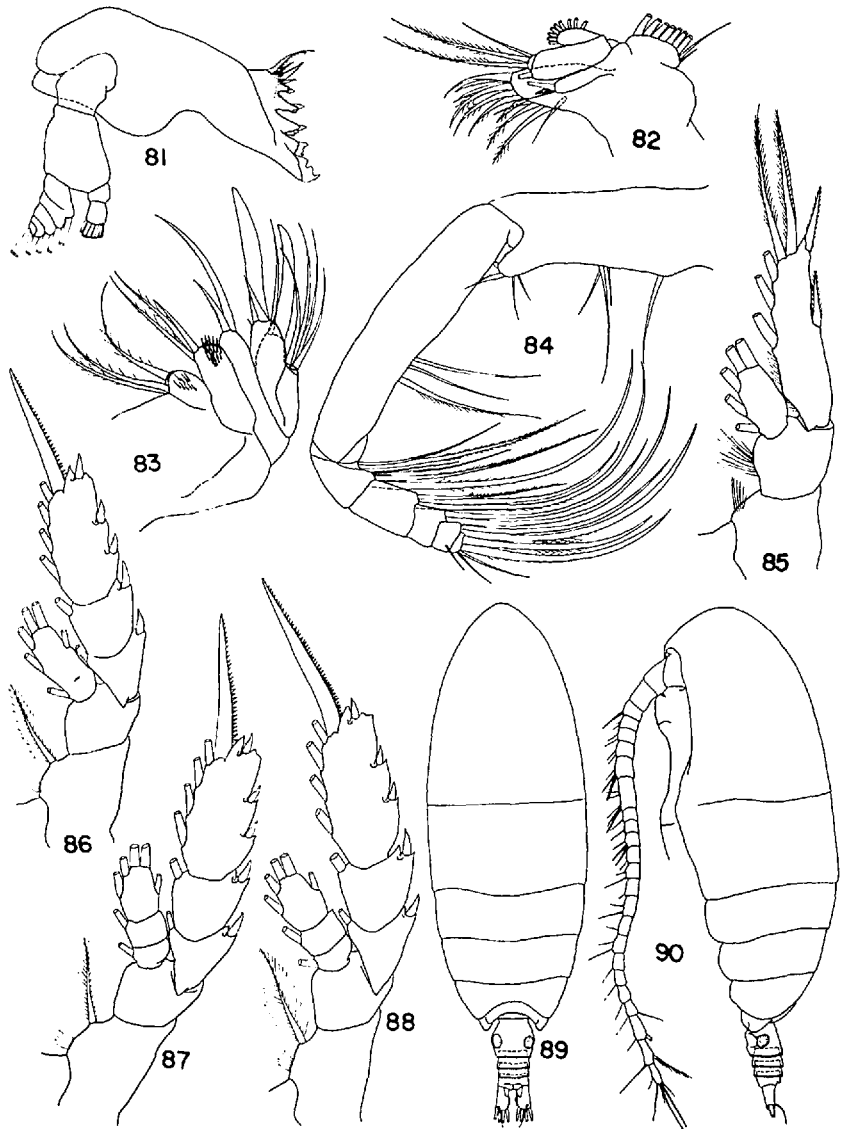
Occurrence.—Station 6: 1000-513 m, 1 ♀ (2.52 mm).

Diagnosis (Female).—Prosoma about 5 times length of urosome. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments fused. Antennule as long as body. Exopod of antenna seven-segmented and about 1.5 times length of endopod. In maxillule, second inner lobe absent, third inner lobe with 2 setae and a short process, basis with a single seta, endopod with 3 setae, and exopod with 9 setae. Distal two lobes of maxilla each with a heavily thickened spine. Basipod of maxilliped elongate. Both rami of first leg one-segmented, exopod with two external spines. Holotype: USNM 123755.

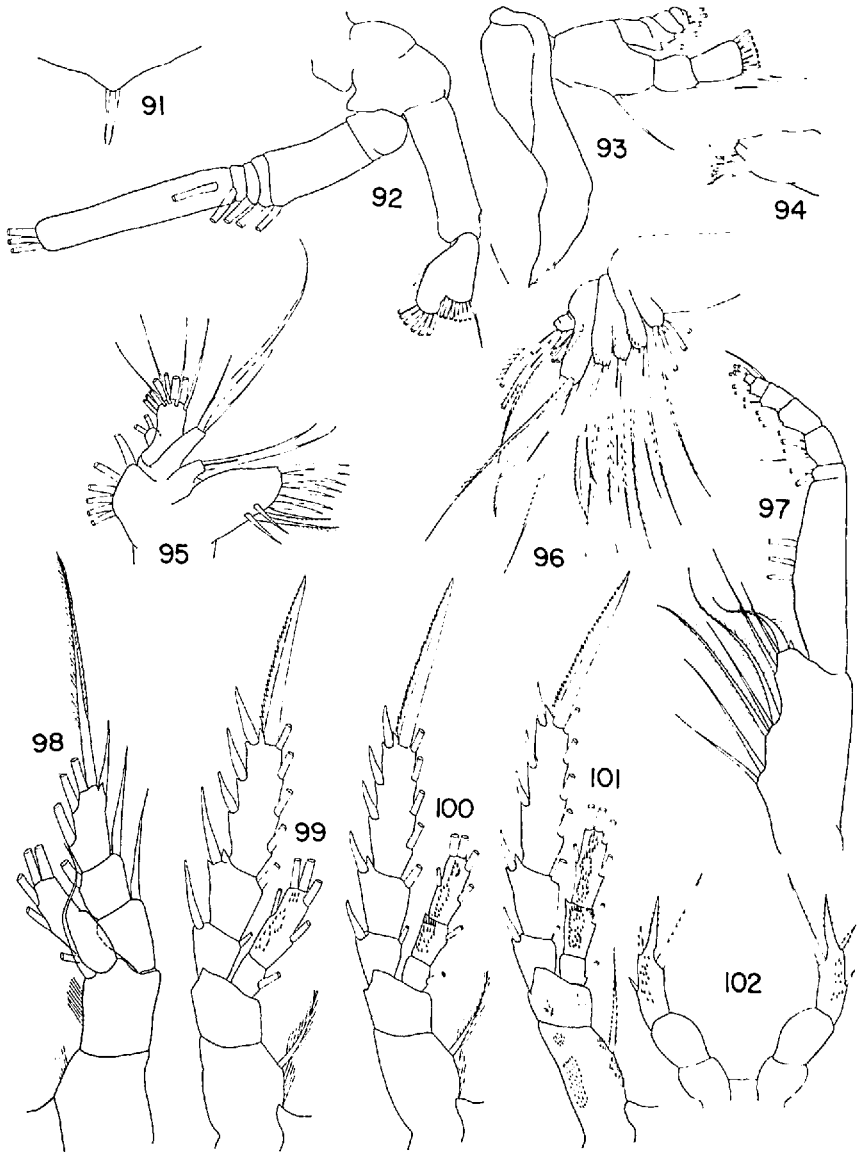
Remarks.—This species is closely related to *Chiridiella subaequalis* Grice & Hülsemann, 1965, but can readily be distinguished from it by the struc-



FIGURES 71-80.—71-77, *Spinocalanus polaris*, female: 71, antenna; 72, mandible; 73, maxillule; 74, maxilla; 75, maxilliped; 76, first leg, anterior; 77, basipod of fourth leg, posterior.—78-80, *Chiridiella bispinosa*, n. sp., female: 78, habitus, dorsal; 79, habitus, lateral; 80, antenna.



FIGURES 81-90.—81-88, *Chiridiella bispinosa*, n. sp., female: 81, mandible; 82, maxillule; 83, maxilla; 84, maxilliped; 85, first leg, anterior; 86, second leg, anterior; 87, third leg, anterior; 88, fourth leg, anterior.—89-90, *Xanthocalanus paululus*, n. sp., female: 89, habitus, dorsal; 90, habitus, lateral.



FIGURES 91-102. *Xanthocalanus paululus*, n. sp., female: 91, rostrum, anterior; 92, antenna; 93, mandible; 94, mandibular blade; 95, maxillule; 96, maxilla; 97, maxilliped; 98, first leg, anterior; 99, second leg, posterior; 100, third leg, posterior; 101, fourth leg, posterior; 102, fifth pair of legs.

ture of the maxillule and maxilla. In *C. subaequalis* the maxillule has three inner lobes and only 4 setae on the exopod; the heavy spines on the distal three lobes of the maxilla are equal in length.

***Xanthocalanus paululus*, new species**

Figs. 89-102

Occurrence.—Station 4: 1000-509 m, 2 ♀♀ (1.22, 1.24 mm); 1900-1003 m, 3 ♀♀ (1.24-1.28 mm).

Diagnosis (Female).—Prosome about 4.5 times length of urosome. Cephalosome and first metasomal segment separate. Fourth and fifth metasomal segments separate. Rostrum consists of two delicate filaments. Antennule about as long as body. Exopod of antenna six-segmented and about twice as long as endopod. In mandible, basis with 1 seta, endopod longer than exopod. Maxillule with 11 setae on basis and 2 setae on exopod. Distal portion of maxilla with 8 setae, 5 of which are long and plumose. Exopod of first leg with long external spines. Endopod of second leg two-segmented, the distal segment with spinules on the posterior surface. Endopod of third and fourth legs three-segmented, the distal segments with spinules on the posterior surface. Fifth leg uniramous and three-segmented, the distal segment tapers into a spiniform process and bears one internal and two external spines in addition to some scattered spinules. Holotype (1.24 mm long, from 1000-509 m): USNM 123786.

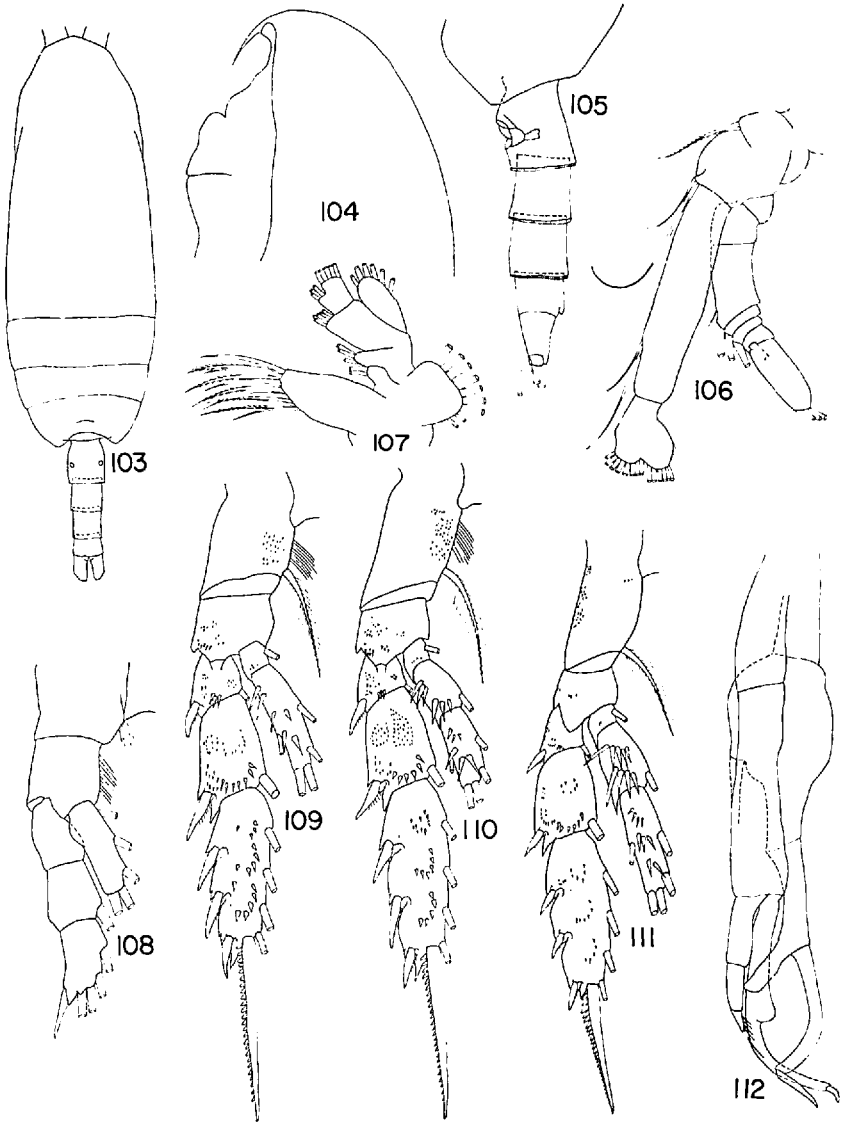
Remarks.—The present species is similar to *Xanthocalanus paraincertus* Grice & Hülsemann, 1965, but can readily be distinguished from it by the setation of the maxillule and the relative length of the spines of the first and fifth legs.

***Scaphocalanus curtus* (Farran, 1926)**

Figs. 103-112

Occurrence.—Station 2: 950-487 m, 4 ♀♀ (1.22-1.30 mm), 1 ♂ (1.30 mm). Station 4: 500-203 m, 1 ♀ (1.34 mm); 1000-509 m, 4 ♀♀ (1.22-1.28 mm); 1900-1003 m, 1 ♀ (1.24 mm). Station 6: 1000-513 m, 4 ♀♀ (1.26-1.28 mm).

Diagnosis (Female).—Prosome about 3 times as long as urosome. Posterolateral corner of metasome in lateral view triangularly produced. Rostrum consists of two slender filaments. Urosome slender, the first to third segments each being longer than wide. Exopod of antenna six-segmented and shorter than endopod. Maxillule with 10, 2, and 3 setae on first, second, and third inner lobes, respectively, 5 on basis, 3 + 5 on endopod, 6 on exopod, and 9 on outer lobe. Basipod of first leg without internal setae. Endopod one-segmented, with 5 setae. External margin of endopod with



FIGURES 103-112. *Scaphocalanus curtus*.—103-111, female: 103, habitus, dorsal; 104, forehead, lateral; 105, posterior part of metasome and urosome, lateral; 106, antenna; 107, maxillule; 108, first leg, anterior; 109, second leg, posterior; 110, third leg, posterior; 111, fourth leg, posterior.—112, male: fifth pair of legs (endopod of right leg broken off), posterior.

a low swelling. Posterior surface of second to fourth legs covered by spinules and spines. Fifth pair of legs lacking.

Diagnosis (Male).—First to fourth legs similar to those of female. In fifth pair of legs, second exopodal segment of right leg produced mediolaterally into a long process. Basipod of left leg reaching middle of second exopodal segment of right leg. First exopodal segment of left leg much longer than the following segment.

Remarks.—In the present collections, females of *Scaphocalanus* without the fifth pair of legs fall into three different groups, which are distinguishable from one another in size as well as in anatomical details. One of these, which is described above, is identified with *Scaphocalanus curtus* (Farran, 1926) and the other two are described below as new species.

***Scaphocalanus subcurtus*, new species**

Figs. 113-119

Occurrence.—Station 1: 100-0 m, 1 ♀ (1.00 mm); 200-102 m, 1 ♀ (0.96 mm); 500-208 m, 2 ♀ ♀ (1.00, 1.02 mm). Station 2: 450-155 m, 2 ♀ ♀ (0.96 mm); 950-487 m, 4 ♀ ♀ (1.02-1.06 mm). Station 4: 500-203 m, 2 ♀ ♀ (1.00, 1.04 mm).

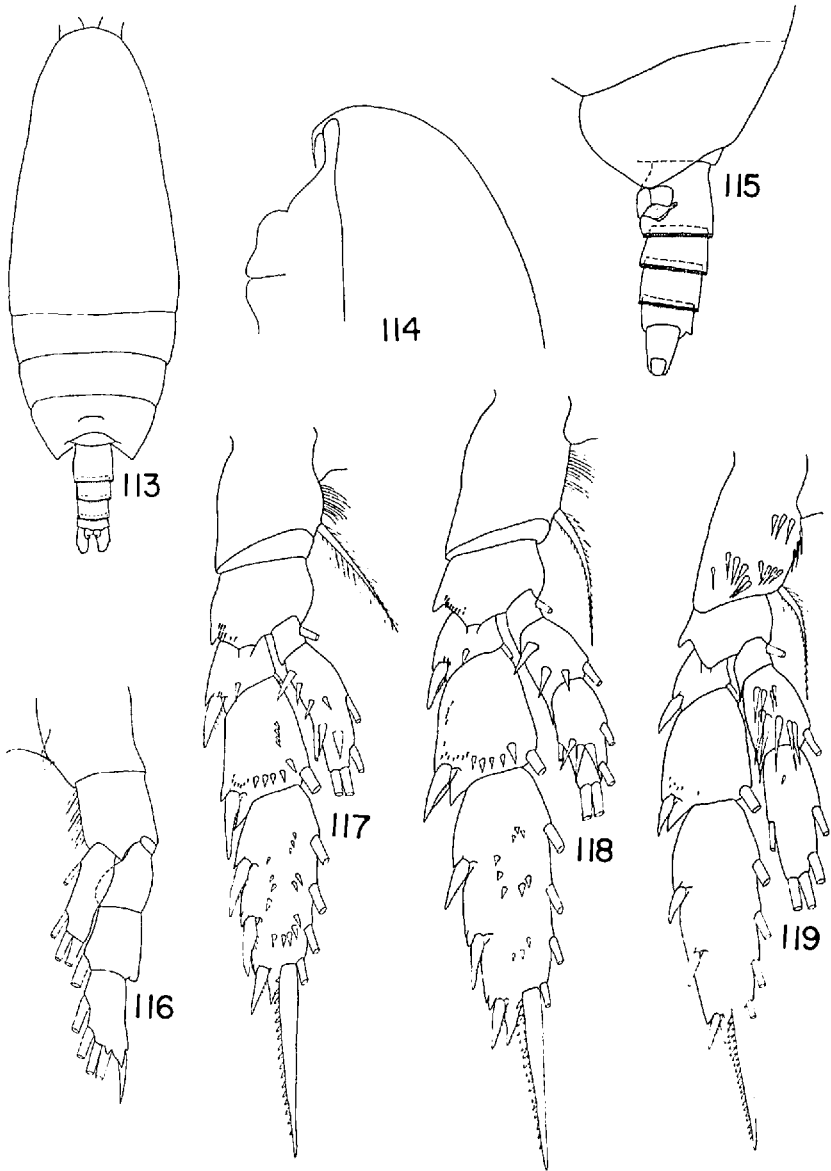
Diagnosis (Female).—Prosoma about 4 times as long as urosome. First metasomal segment fused with cephalosome. Fourth and fifth metasomal segments fused. Posterolateral corner of metasome in lateral view triangularly produced. Genital segment as long as wide. Second to fourth urosomal segments each much wider than long. Rostrum consists of two slender filaments. Mouthparts as in *Scaphocalanus curtus* (Farran). Basipod of first leg without setae. Endopod one-segmented, with 4 setae. External margin of endopod smooth, without a tubercle. Second to third legs similar to those of *Scaphocalanus curtus*, except the posterior surface of coxa without spinules and the same surface of the rami with fewer spines. In fourth leg, posterior surface of coxa and second endopodal segment with some large, lancet-form spines, but the same surface of the other segments almost nude. Fifth pair of legs lacking. Holotype (1.04 mm long, from station 2, 950-487 m): USNM 123777.

Remarks.—This species can readily be distinguished from *Scaphocalanus curtus* Farran, to which it is the most closely related, by the smaller size; the relatively short urosome, of which second to fourth segments are shorter than wide; and the armature of the fourth leg.

***Scaphocalanus amplius*, new species**

Figs. 120-127

Occurrence.—Station 1: 200-102 m, 1 ♀ (1.54 mm); 500-208 m, 3 ♀ ♀ (1.60-1.68 mm). Station 2: 450-155 m, 3 ♀ ♀ (1.62-1.66 mm); 950-487



FIGURES 113-119. *Scaphocalanus subcurtus*, n. sp., female: 113, habitus, dorsal; 114, forehead, lateral; 115, posterior part of metasome and urosome, lateral; 116, first leg, anterior; 117, second leg, posterior; 118, third leg, posterior; 119, fourth leg, posterior.

m, 5 ♀♀ (1.58-1.60 mm), 3 ♂♂ (1.76-1.86 mm). Station 4: 500-203 m, 1 ♀ (1.64 mm); 1000-509 m, 1 ♀ (1.62 mm).

Diagnosis (Female).—Prosome about 3 times as long as urosome. First metasomal segment fused with cephalosome. Fourth and fifth metasomal segments fused. Posterolateral corner of metasome in lateral view triangularly produced. First to third urosomal segments each longer than wide. Rostrum consists of two slender filaments. Mouthparts as in *Scaphocalanus curtus* (Farran). Basis of first leg with an internal seta. Endopod with 5 setae and a distinct tubercle on external margin. Second to third legs similar to those of *Scaphocalanus curtus* but their posterior surface seems to be less spinous. Fifth pair of legs lacking. Holotype (1.60 mm long, from station 2, 950-487 m): USNM 123773.

Diagnosis (Male).—Prosome about twice as long as urosome. Second urosomal segment about 1.5 times as long as third or fourth urosomal segment. Antennule slightly longer than prosome. First to fourth legs similar to those of female. In fifth pair of legs, basipod of left leg reaching to a line containing proximal two-thirds of right second exopodal segment. First and second exopodal segments of left leg about equal in length. Allotype (1.76 mm long): USNM 123774.

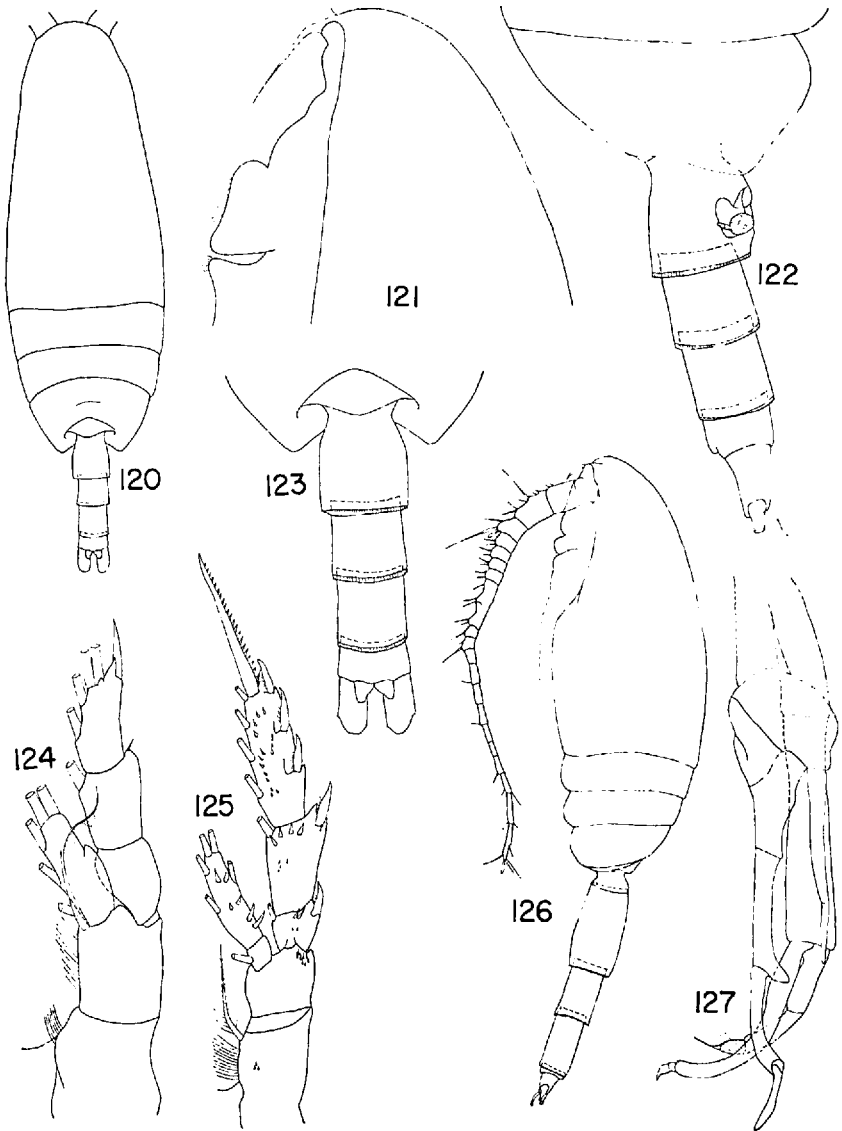
Remarks.—This species can be distinguished readily from either *Scaphocalanus curtus* Farran or *S. subcurtus* by the larger body and the structure of the first leg. Judging from the size of the body and the shape of the first leg, some of the females reported by Tanaka (1961) as *Scaphocalanus curtus* seem to belong to the present species.

***Scaphocalanus brevirostris*, new species**

Figs. 128-146

Occurrence.—Station 1: 100-0 m, 1 ♀ (1.88 mm); 200-102 m, 2 ♀♀ (1.72, 1.86 mm); 500-208 m, 1 ♂ (1.90 mm); 1000-505 m, 1 ♂ (1.80 mm). Station 2: 950-487 m, 12 ♀♀ (1.74-1.84 mm), 3 ♂♂ (1.84-1.90 mm). Station 4: 500-203 m, 1 ♀ (1.96 mm). Station 6: 1000-513 m, 1 ♀ (1.96 mm).

Diagnosis (Female).—Prosome about 3.5 times as long as urosome. Posterolateral corner of metasome in lateral view obtusely triangular. Rostrum consisting of broad base tipped with two minute filaments. Antennule slightly longer than prosome. Exopod of antenna six-segmented and shorter than endopod. Number of setae on various lobes of maxillule as follows: 13, 2, and 4 on first to third inner lobes, respectively, 5 on basis, 3 + 6 on endopod, 7 on exopod, and 9 on outer lobe. Posterior surface of coxa of second to fourth legs nude. First exopodal segment of second leg with an



FIGURES 120-127. *Scaphocalanus amplius*, n. sp.—120-125, female: 120, habitus, dorsal; 121, forehead, lateral; 122, posterior part of metasome and urosome, lateral; 123, *idem*, dorsal; 124, first leg, anterior; 125, second leg, posterior.—126-127, male: 126, habitus, lateral; 127, fifth pair of legs, anterior.

elongate, curved external spine. Posterior surface of second endopodal segment of fourth leg with a few long spines. Fifth leg two-segmented. The distal segment with two spines, one terminal and one internal. The terminal spine shorter than the segment itself. The internal spine extending beyond the distal end of the terminal spine and coarsely serrated along the outer margin. Holotype (1.80 mm long from station 2, 950-487 m): USNM 123775.

Diagnosis (Male).—Prosoma about twice length of urosome. Rostrum as in female. Antennule reaching about distal end of prosoma. Mouth parts much reduced. First to fourth legs similar to those of female, but internal seta of coxa of fourth leg very small. In fifth pair of legs, left basipod long, closely approaching to distal end of second exopodal segment of right leg. Exopod of left leg relatively long and its second segment slightly shorter than the first. Allotype (1.88 mm long, from station 2, 950-487 m): USNM 123776.

Remarks.—This species is closely related to *Scaphocalanus echinatus* (Farran, 1905), but mainly differs from it in having a smaller body and a rudimentary rostrum.

Scaphocalanus major (T. Scott, 1894)

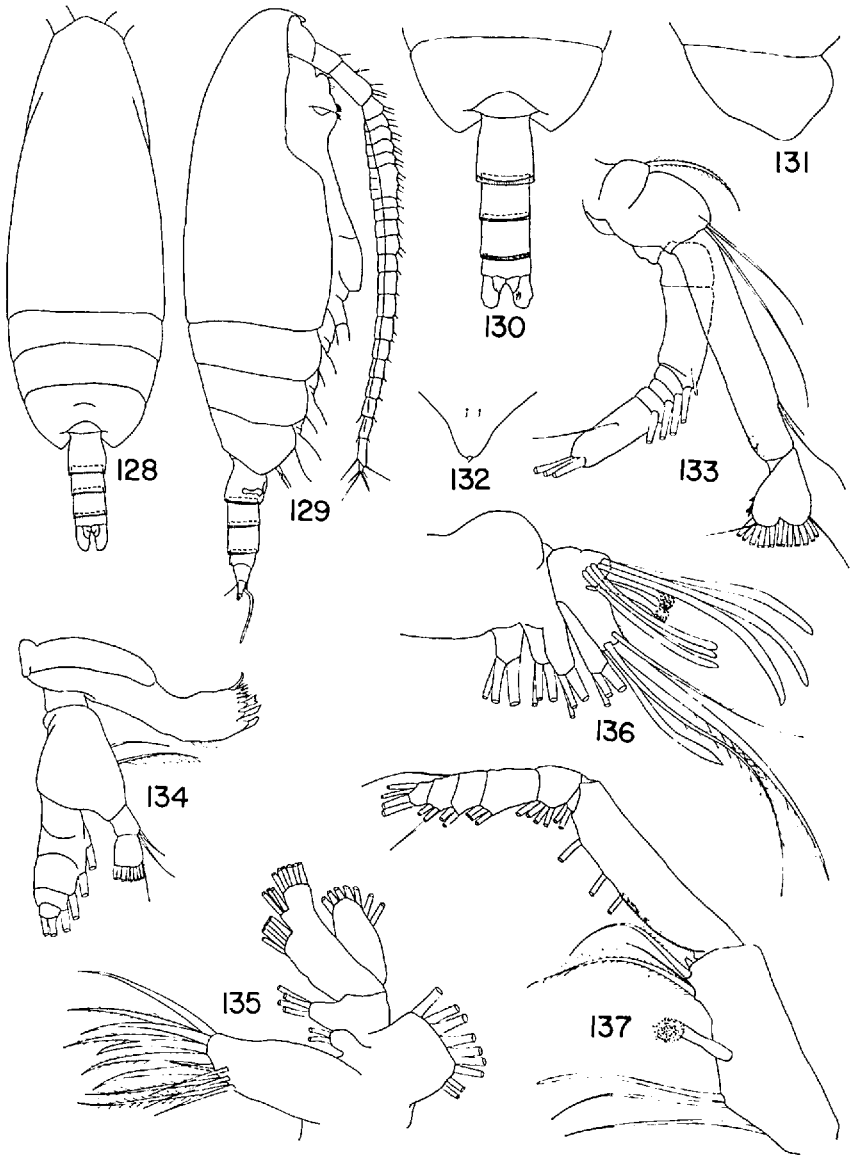
Figs. 147-153

Occurrence.—Station 2: 950-487 m, 1♀ (2.20 mm). Station 4: 1000-509 m, 2♀♀ (2.16, 2.40 mm). Station 6: 1000-513 m, 1♀ (2.10 mm).

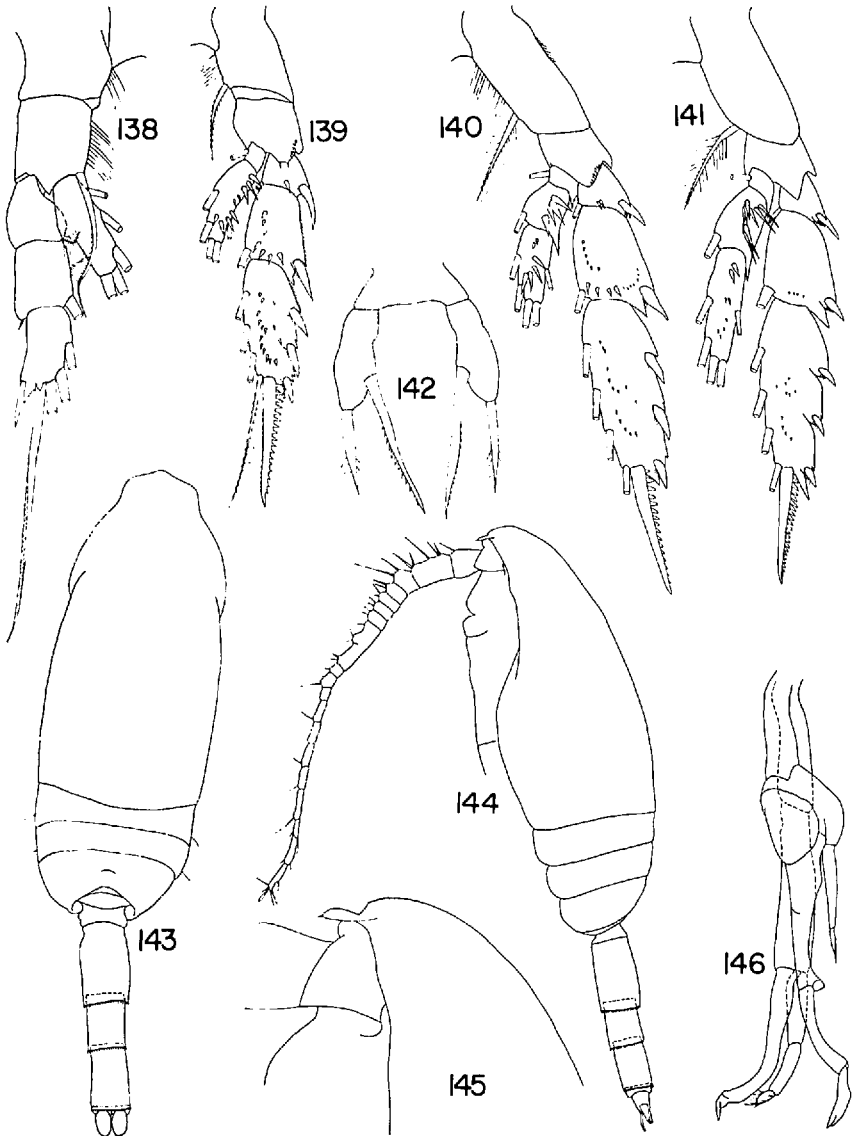
Diagnosis (Female).—Prosoma a little more than 3 times length of urosome. Posterolateral corner of metasoma in lateral view obtusely triangular. Rostrum consisting of two slender filaments. In first to fourth pairs of legs, entire posterior surface bearing spines and spinules. Fifth leg two-segmented. The distal segment with three spines—one terminal, one internal, and one external. The terminal spine shorter than the segment itself. The internal spine about twice as long as the segment and finely serrated. The external spine small and often absent.

Remarks.—This species seems to be widely distributed in the Atlantic, Pacific, and Indian oceans as summarized by Vervoort (1957, 1965), but has not been recorded previously from the Caribbean Sea and Gulf of Mexico.

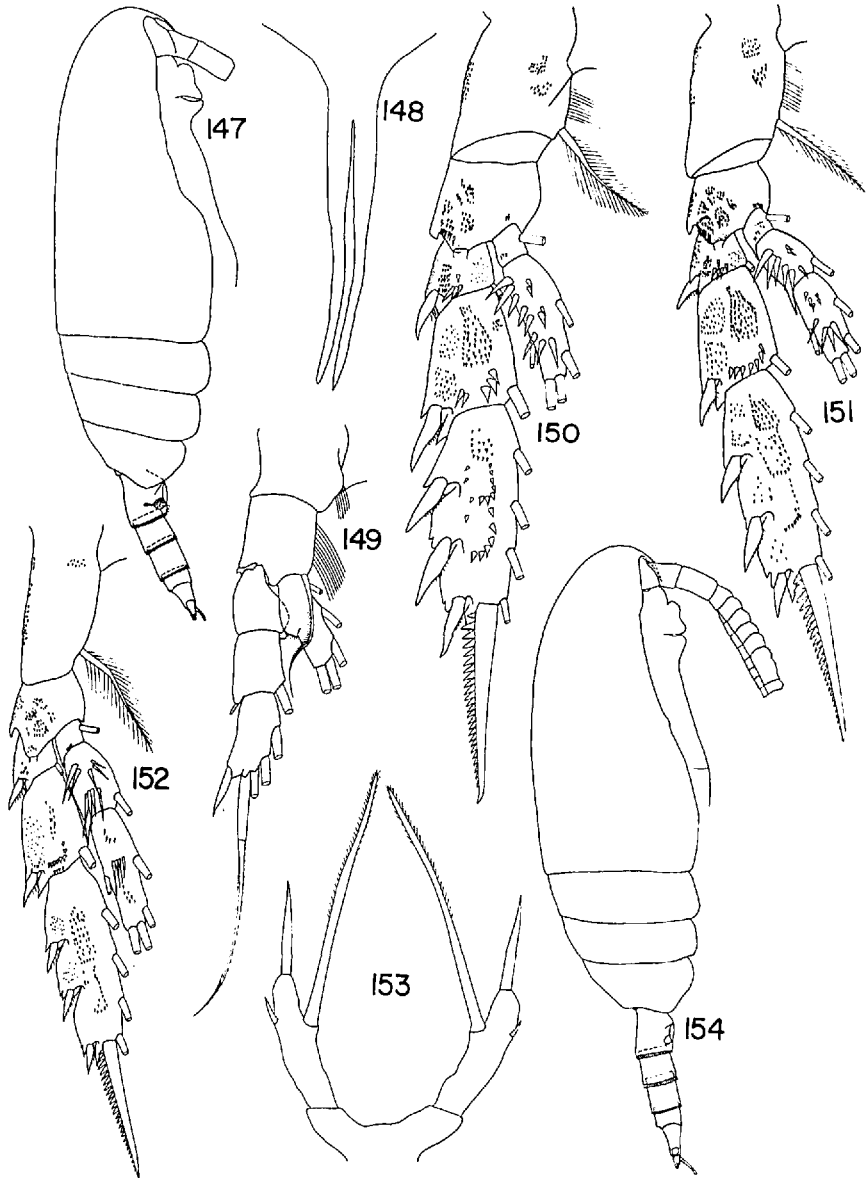
Vervoort (1957) and Tanaka (1961) synonymized *Scolecithrix gracilipes* Farran, 1908, with *Scaphocalanus major*. As pointed out by Farran (1926), in agreement with With (1915), *S. gracilipes*, however, seems to be synonymous with *Scaphocalanus brevicornis* (Sars), for their fifth pairs of legs are similar, particularly in the serration of the internal spine.



FIGURES 128-137. *Scaphocalanus brevirostris*, n. sp., female: 128, habitus, dorsal; 129, habitus, lateral; 130, posterior part of metasome and urosome, dorsal; 131, posterior part of metasome, right side; 132, rostrum, anterior; 133, antenna; 134, mandible; 135, maxillule; 136, maxilla; 137, maxilliped.



FIGURES 138-146. *Scaphocalanus breviostris*, n. sp.—138-142, female: 138, first leg, anterior; 139, second leg, posterior; 140, third leg, posterior; 141, fourth leg, posterior; 142, fifth pair of legs.—143-146, male: 143, habitus, dorsal; 144, habitus, lateral; 145, forehead, lateral; 146, fifth pair of legs, posterior.



FIGURES 147-154.—147-153, *Scaphocalanus major*, female: 147, habitus, lateral; 148, rostrum, anterior; 149, first leg, anterior; 150, second leg, posterior; 151, third leg, posterior; 152, fourth leg, posterior; 153, fifth pair of legs.—154, *Scaphocalanus longifurca*, female, habitus, lateral.

Scaphocalanus longifurca (Giesbrecht, 1888)

Figs. 154-157

Occurrence.—Station 2: 1900-980 m, 1 ♀ (1.50 mm). Station 4: 1000-509 m, 1 ♀ (1.66 mm); 1900-1003 m, 1 ♀ (1.62 mm).

Remarks.—This species is similar to *Scaphocalanus major* (T. Scott) in the armature of the second to fourth swimming legs and the structure of the fifth pair of legs, but can be distinguished from it by the smaller body and the outline of the posterolateral corner of the metasome.

Scaphocalanus longifurca was originally described from the tropical region of the Pacific Ocean (Giesbrecht, 1892). It has also been recorded from the Japanese waters (Tanaka, 1961) and the North Atlantic and Indian oceans (Grice & Hülsemann, 1965, 1967).

Scaphocalanus acuminatus, new species

Figs. 158-165

Occurrence.—Station 2: 1900-980 m, 3 ♀ ♀ (1.84-1.92 mm). Station 4: 1900-1003 m, 1 ♀ (1.82 mm).

Diagnosis (Female).—Posterolateral corner of metasome in lateral view triangularly produced. In dorsal view, tip pointing inward. Urosome relatively short, being about one-fourth length of prosome. Rostrum consisting of two slender filaments. Mouthparts and first to fourth swimming legs seem similar to those of *Scaphocalanus major*, but external spine of first exopodal segment of second leg curved and much larger in the present species. Fifth leg two-segmented. The distal segment with one internal, one terminal, and often one external spine. The terminal spine shorter than the segment itself. The internal spine about twice as long as the segment and finely serrated. Holotype (1.88 mm long, from station 2): USNM 123772.

Remarks.—In habitus, this species seems to be closely related to *Scaphocalanus insignis* Brodsky, 1950, although his description and illustration are too brief to allow any detailed comparison. The posterolateral corner of the metasome of the present species is also somewhat similar to that of *Scaphocalanus elongatus* A. Scott, 1909, which, however, is much larger in body size and has a relatively long urosome.

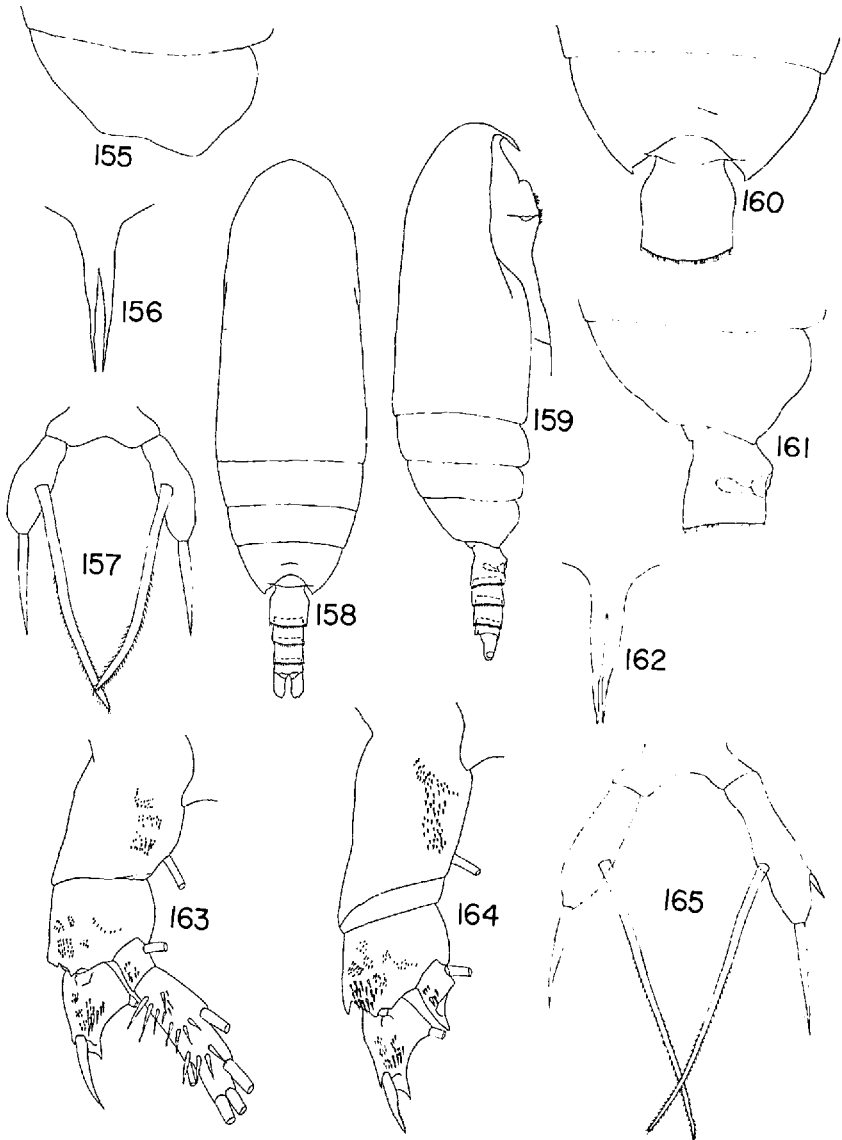
Scolecithricella valens (Farran, 1926)

Figs. 166-174

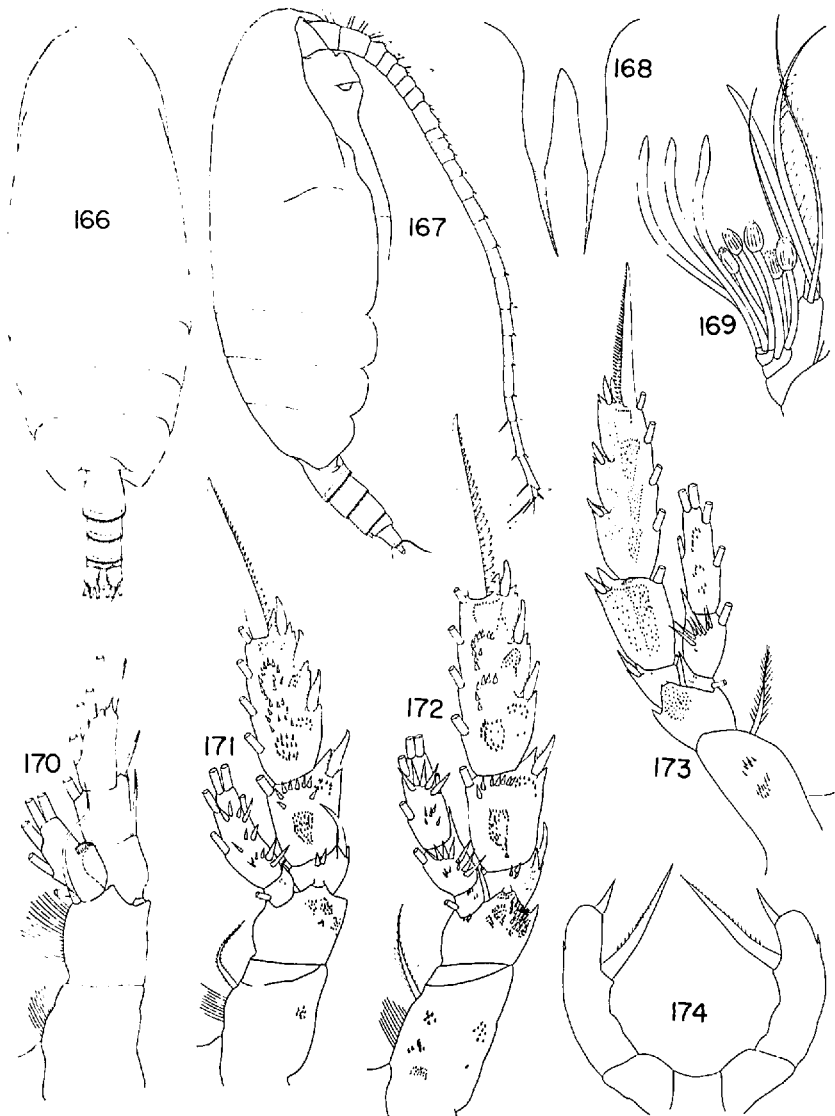
Scolecithricella paravalida Brodsky, 1950:262, fig. 171.

Occurrence.—Station 6: 1000-513 m, 2 ♀ ♀ (2.52, 2.56 mm).

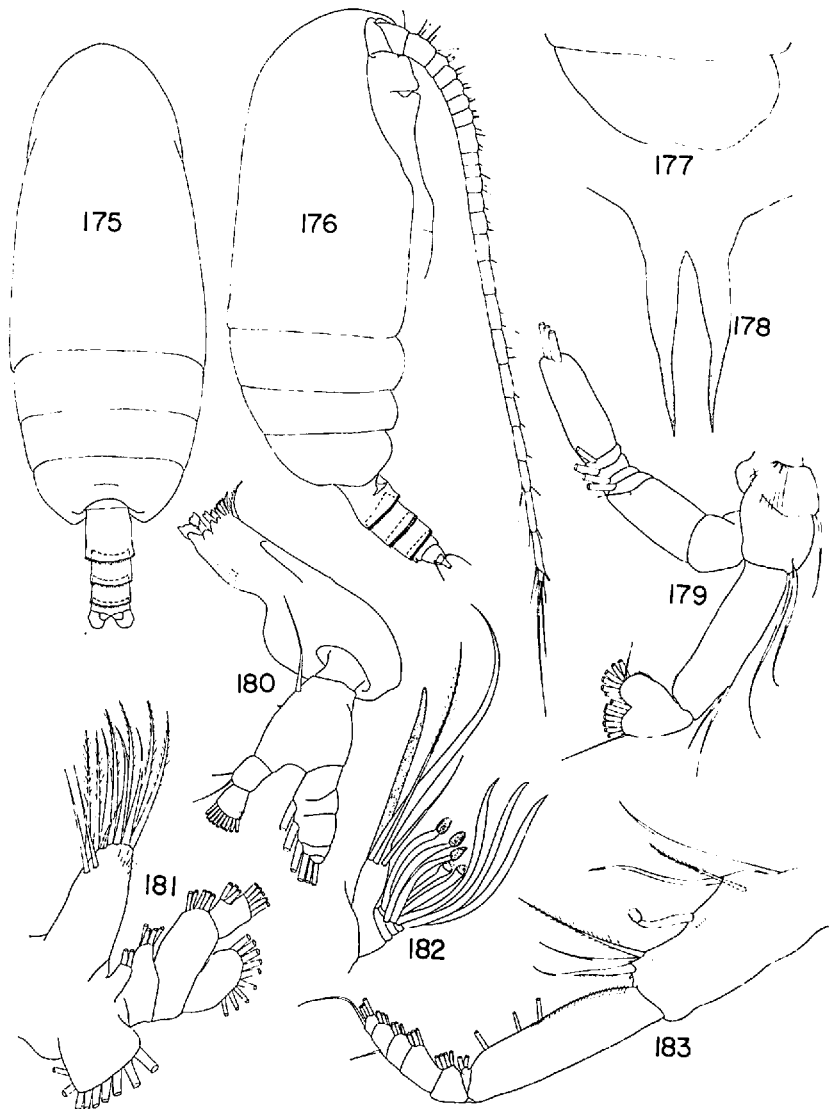
Remarks.—This species was originally described briefly from the Bay of Biscay and off the west coast of Ireland on the basis of three females whose



FIGURES 155-165.—155-157, *Scaphocalanus longifurca*, female: 155, posterior part of metasome, right side; 156, rostrum, anterior; 157, fifth pair of legs.—158-165, *Scaphocalanus acuminatus*, n. sp., female: 158, habitus, dorsal; 159, habitus, lateral; 160, posterior part of metasome and genital segment, dorsal; 161, *idem*, lateral; 162, rostrum, anterior; 163, second leg (distal part of exopod broken off), posterior; 164, third leg (distal parts of rami broken off), posterior; 165, fifth pair of legs.



FIGURES 166-174. *Scolecithricella valens*, female: 166, habitus, dorsal; 167, habitus, lateral; 168, rostrum, anterior; 169, distal part of maxilla; 170, first leg, anterior; 171, second leg, posterior; 172, third leg, posterior; 173, fourth leg, posterior; 174, fifth pair of legs.



FIGURES 175-183. *Scolecithricella pseudoarcuata*, n. sp., female: 175, habitus, dorsal; 176, habitus, lateral; 177, posterior part of metasome, right side; 178, rostrum, anterior; 179, antenna; 180, mandible; 181, maxillule; 182, distal part of maxilla; 183, maxilliped.

appendages were much damaged (Farran, 1926). Two females whose characters seem to be identical with those of this species were found in the present collections. Upon detailed studies of the specimens, it has been found that *Scolecithricella paravalida* Brodsky, 1950, is a junior synonym of this species.

As originally described by Farran (1926), *Scolecithricella valens* is closely related to *Scolecithricella valida* (Farran), but can be readily distinguished from it by the smaller size. The geographical distribution of the species has been summarized by Vervoort (1965).

***Scolecithricella pseudoarcuata*, new species**

Figs. 175-187

Amallothrix arcuata, Sewell, 1947:155, text-figs. 40 and 41.

Scolecithricella arcuata, Tanaka, 1962:76, fig. 145.

Occurrence.—Station 4: 1000-509 m, 1 ♀ (2.44 mm).

Diagnosis (Female).—Body robust. Prosome about 3.5 times length of urosome. Posterolateral margin of metasome in lateral view slightly emarginated. Rostrum consisting of two large filaments. Antennule slightly longer than body. Exopod of antenna seven-segmented and slightly longer than endopod. Basis of mandible with a long and a minute seta. In maxillule, first to third inner lobes with 12, 2, and 4 setae, respectively, basis with 5 setae, endopod with 3 + 5 setae, and exopod and outer lobe each with 9 setae. Three exopodal segments of first leg each with an outer spine. Second and third legs each with a long, curved external spine on first exopodal segment. Fifth leg two-segmented. The distal segment with three spines—one internal, one terminal, and one external. The internal spine slightly longer than the segment and bears coarse spinules along the external margin. The terminal spine about one-third the length of the internal spine. The external spine small. Holotype: USNM 123779.

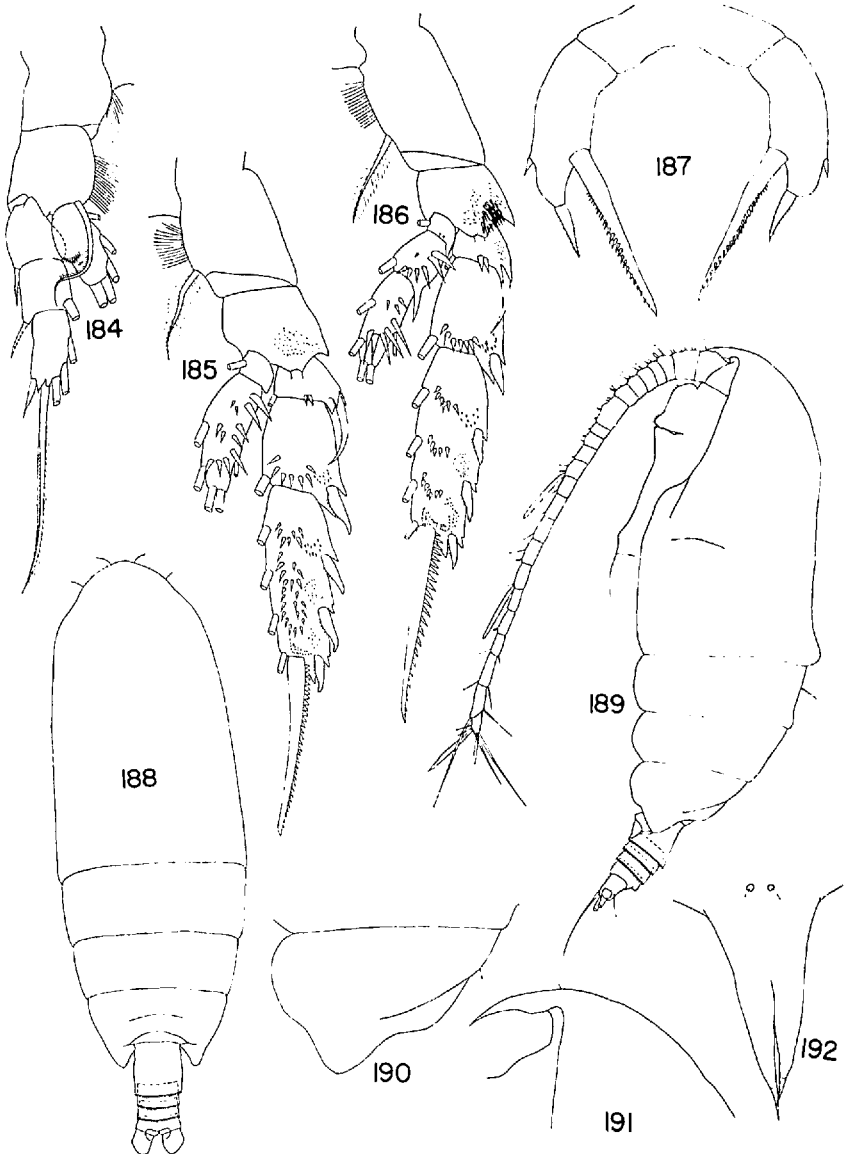
Remarks.—The present female is identical with those described as *Scolecithricella arcuata* by Sewell (1947) and Tanaka (1962), but different from that described by Sars (1925) for the species. According to Sars (1925), *S. arcuata* has swimming legs similar to those of *Scolecithricella lobata*, which are quite different from those described by Sewell (1947) and Tanaka (1962). A new name is therefore proposed here for the present female.

***Scolecithricella lobophora*, new species**

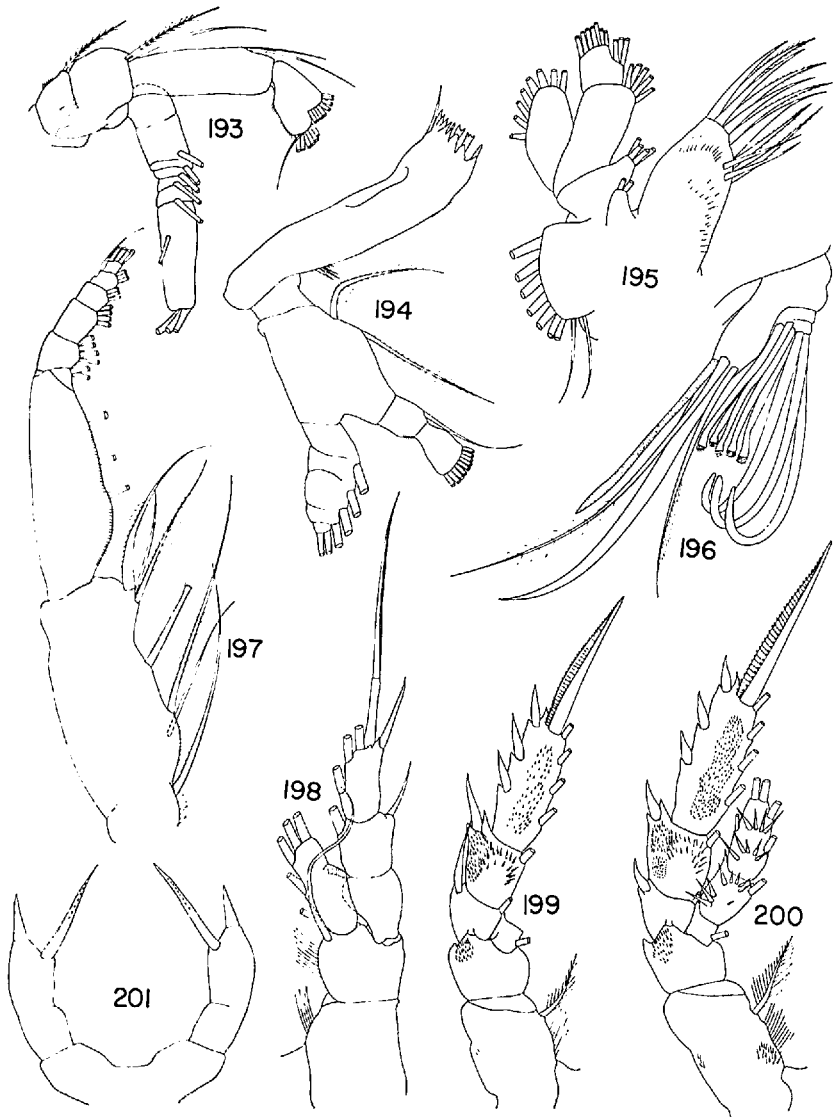
Figs. 188-201

Occurrence.—Station 4: 1000-509 m, 1 ♀ (1.60 mm).

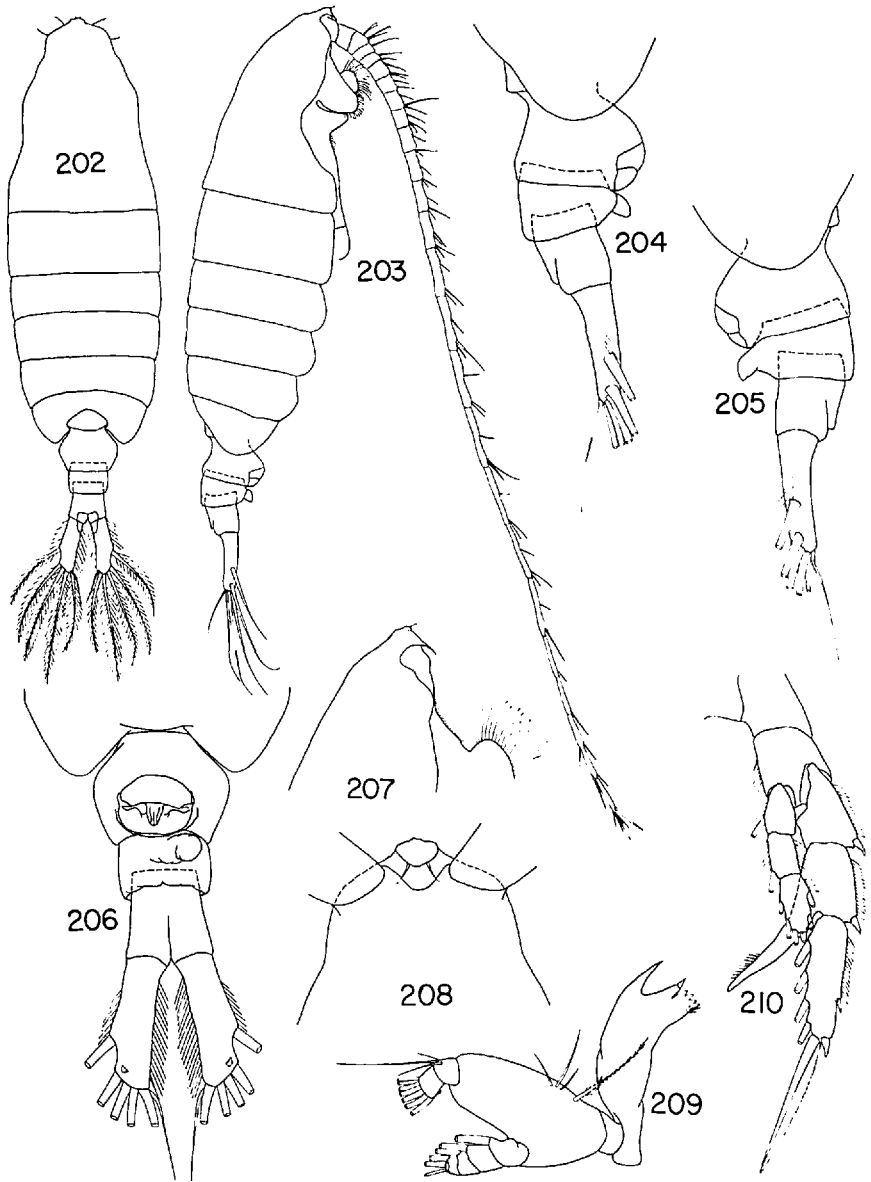
Diagnosis (Female).—Prosome about 4.5 times length of urosome. First metasomal segment produced dorsodistally into a lobe. Posterolateral



FIGURES 184-192.—184-187, *Scolecithricella pseudoarcuata*, n. sp., female: 184, first leg, anterior; 185, second leg, posterior; 186, third leg, posterior; 187, fifth pair of legs.—188-192, *Scolecithricella lobophora*, n. sp., female: 188, habitus, dorsal; 189, habitus, lateral; 190, posterior part of metasome, left side; 191, forehead, lateral; 192, rostrum, anterior.



FIGURES 193-201. *Scolecithricella lobophora*, n. sp., female: 193, antenna; 194, mandible; 195, maxillule; 196, distal part of maxilla; 197, maxilliped; 198, first leg, anterior; 199, second leg (distal part of endopod broken off), posterior; 200, third leg, posterior; 201, fifth pair of legs.



FIGURES 202-210. *Centropages caribbeanensis*, n. sp., female: 202, habitus, dorsal; 203, habitus, lateral; 204, posterior part of metasome and urosome, right side; 205, *idem*, left side; 206, *idem*, ventral; 207, forehead, lateral; 208, forehead, ventral; 209, mandible; 210, fifth leg, anterior.

corner of metasome in lateral view produced into a triangular lobe overlapping proximal half of genital segment. Rostrum large and biramous. Antennule reaching about end of prosome. Exopod of antenna seven-segmented and longer than endopod. Mandibular blade bearing proximally a row of spines. Basis of mandible with two long setae, and first endopodal segment with a single seta. In maxillule, first and second inner lobes with 2 and 4 setae, respectively, basis with 5 setae, endopod with 3 + 7 setae, and exopod with 8 setae. Maxilla with five short and three long vermiform structures on distal portion. Basis of maxilliped widest at one-third the length of the segment from the proximal end. First exopodal segment of first leg without spines or setae. First exopodal segment of second leg with a long, curved external spine. Fifth leg three-segmented, with the distal two segments partially fused. The last segment with two spines—one terminal and one internal. The internal spine more than twice the length of the terminal spine. Holotype: USNM 123778.

Remarks.—This species is characteristic in having a lobe on the dorso-distal margin of the first metasomal segment, a strong rostrum, and a long, curved spine on the first exopodal segment of the second leg.

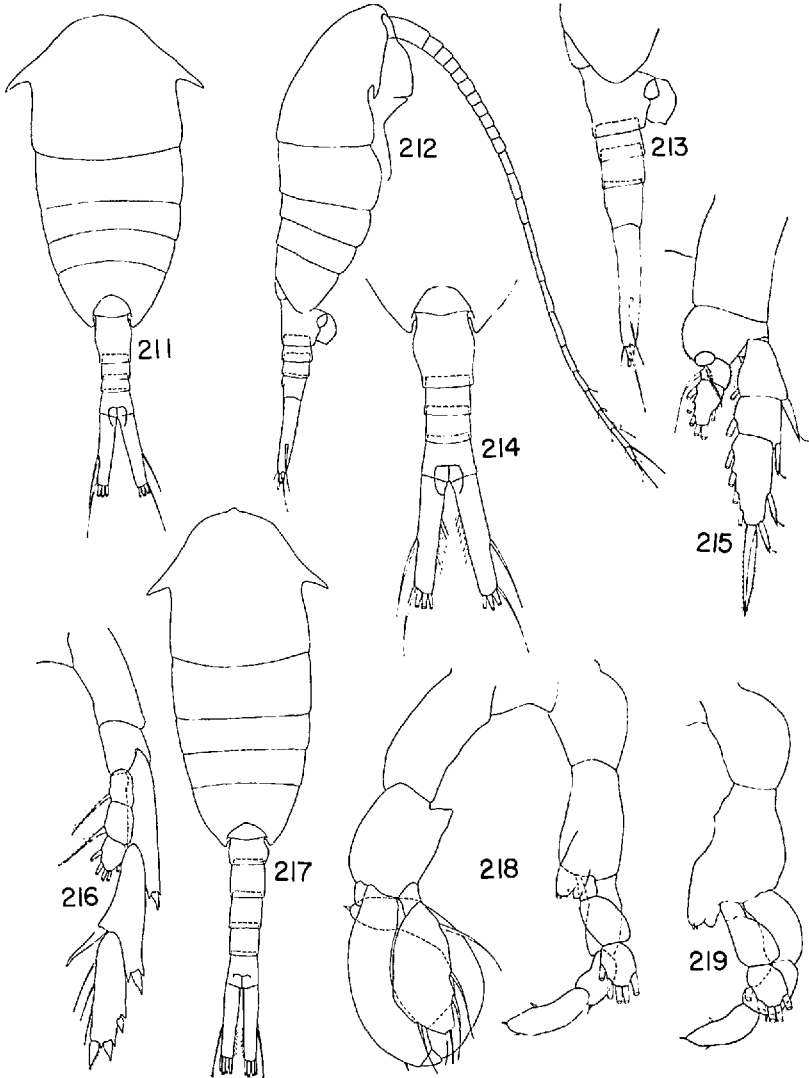
***Centropages caribbeanensis*, new species**

Figs. 202-210

Occurrence.—Station 1: 100-0 m, 4 ♀♀ (1.90-2.00 mm). Station 2: 100-0 m, 1 ♀ (1.82 mm).

Diagnosis (Female).—Prosome about 3 times length of urosome. Postero-lateral corner of metasome in lateral view broadly rounded. Genital segment symmetrical in dorsal view, with equally swollen lateral sides. Urosomal segments without spines or spinules, but the second segment with a conical process on the left side. Caudal ramus about 3 times as long as wide. Antennule exceeds end of caudal ramus by last six segments. Basis of mandible with four setae. Internal spiniform process of second exopodal segment of fifth leg about as long as third exopodal segment. Other mouthparts and swimming legs similar to those of *Centropages elegans* Giesbrecht, redescribed in detail by Park (1968). Holotype (1.90 mm long, from station 1): USNM 123754.

Remarks.—This species is closely related to *Centropages elegans* Giesbrecht, which has so far been known only from the Pacific Ocean, but can readily be distinguished from it by the location of the conical process on the ventral side of the second urosomal segment and the absence of spinules on the dorsodistal margins of the first and second urosomal segments.



FIGURES 211-219. *Lucicutia clausi*.—211-216, female: 211, habitus, dorsal; 212, habitus, lateral; 213, posterior part of metasome and urosome, lateral; 214, *idem*, dorsal; 215, first leg, anterior; 216, fifth leg, anterior.—217-219, male: 217, habitus, dorsal; 218, fifth pair of legs, anterior; 219, left fifth leg, anterior.

Lucicutia clausi (Giesbrecht, 1889)

Figs. 211-219

Occurrence.—Station 1: 200-102 m, 3 ♀♀ (1.76-1.80 mm); 500-208 m, 2 ♀♀ (1.72, 1.76 mm). Station 2: 450-155 m, 2 ♀♀ (1.70, 1.72 mm), 2 ♂♂ (1.74, 1.76 mm); 950-487 m, 1 ♀ (1.64 mm). Station 4: 200-100 m, 3 ♂♂ (1.82-1.84 mm); 500-203 m, 2 ♀♀ (1.80, 2.02 mm), 1 ♂ (2.00 mm).

Remarks.—In the present collections, specimens of *Lucicutia* that have spiniform processes on the sides of the head and a total length of 1.52 to 2.02 mm, and thus can be referable to *Lucicutia clausi* (Giesbrecht), were found to be separable into two distinct groups. One of these seems to correspond to the description of the species by Giesbrecht (1892), and the other is described below as a new species.

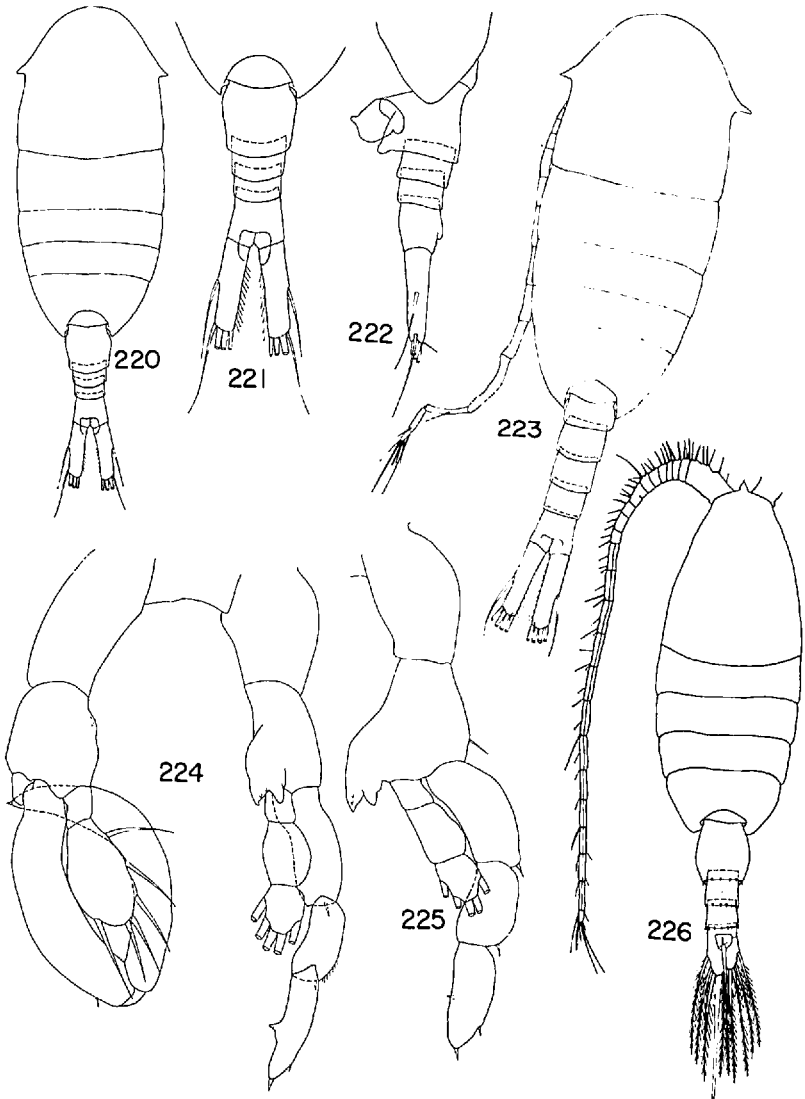
Some previous authors, including Hülsemann (1966), who has reviewed the genus, have recognized these forms but considered them intraspecific variations, without giving anatomical details. In *Lucicutia clausi*, both the female and the male have spiniform processes that are pointed backward on the sides of the head, and their caudal rami are about 5 times as long as wide. The female is further characterized by the genital segment, which is longer than wide in either dorsal or lateral view, and by the relatively long urosome—more than one-half the length of the prosome. In the male, the urosome is about two-thirds the length of the prosome.

Lucicutia paraclausi, new species

Figs. 220-225

Occurrence.—Station 1: 200-102 m, 1 ♀ (1.80 mm); 500-208 m, 1 ♀ (1.84 mm). Station 2: 450-155 m, 1 ♀ (1.72 mm), 1 ♂ (1.74 mm). Station 4: 200-100 m, 1 ♂ (1.52 mm).

Diagnosis (Female).—Head with small lateral spiniform processes pointed straight laterad. In some individuals these processes minute. Urosome about equal to or slightly shorter than one-half length of prosome. Genital segment in dorsal view about as wide as long, and in lateral view bearing a conspicuous ventral protrusion. Caudal ramus about 3.5 times as long as wide. Antennule extending beyond end of caudal ramus by last two segments. In maxillule, second and third inner lobes each with 3 setae, basis with 3 setae, and first and second endopodal segments with 4 and 5 setae, respectively. In first leg, endopod two-segmented and exopod three-segmented. In fifth leg, both endopod and exopod three-segmented; internal spine of second exopodal segment about one-half length of third exopodal segment, and terminal spine of third exopodal segment about one-fourth the length of the segment. Holotype (from station 2): USNM 123769.



FIGURES 220-226.—220-225, *Lucicutia paraclausi*, n. sp.—220-222, female: 220, habitus, dorsal; 221, posterior part of metasome and urosome, dorsal; 222, *idem*, lateral.—223-225, male: 223, habitus, dorsal; 224, fifth pair of legs, anterior; 225, left fifth leg, anterior.—226, *Heterorhabdus spinifer*, n. sp., female, habitus, dorsal.

Diagnosis (Male).—Lateral spiniform processes of head as in female. Prosome about 1.7 times length of urosome. Caudal ramus about 3.5 to 4.0 times as long as wide. In fifth pair of legs, right basis with a small internal process. Mediodistal margin of left basis with a large protrusion divided distally into two points. The median point with three small teeth. Allotype (from station 2): USNM 123770.

Remarks.—This species can be distinguished from *Lucicutia clausi* (Giesbrecht) by the shape of the lateral spiniform processes of the head, the relative length of the caudal ramus, and, in the female, by the shape of the genital segment. In anatomical details, the appendages seem to be identical to those of *Lucicutia clausi*.

According to the illustrations, *Lucicutia clausi* described by Tanaka (1963) should be referred to this species.

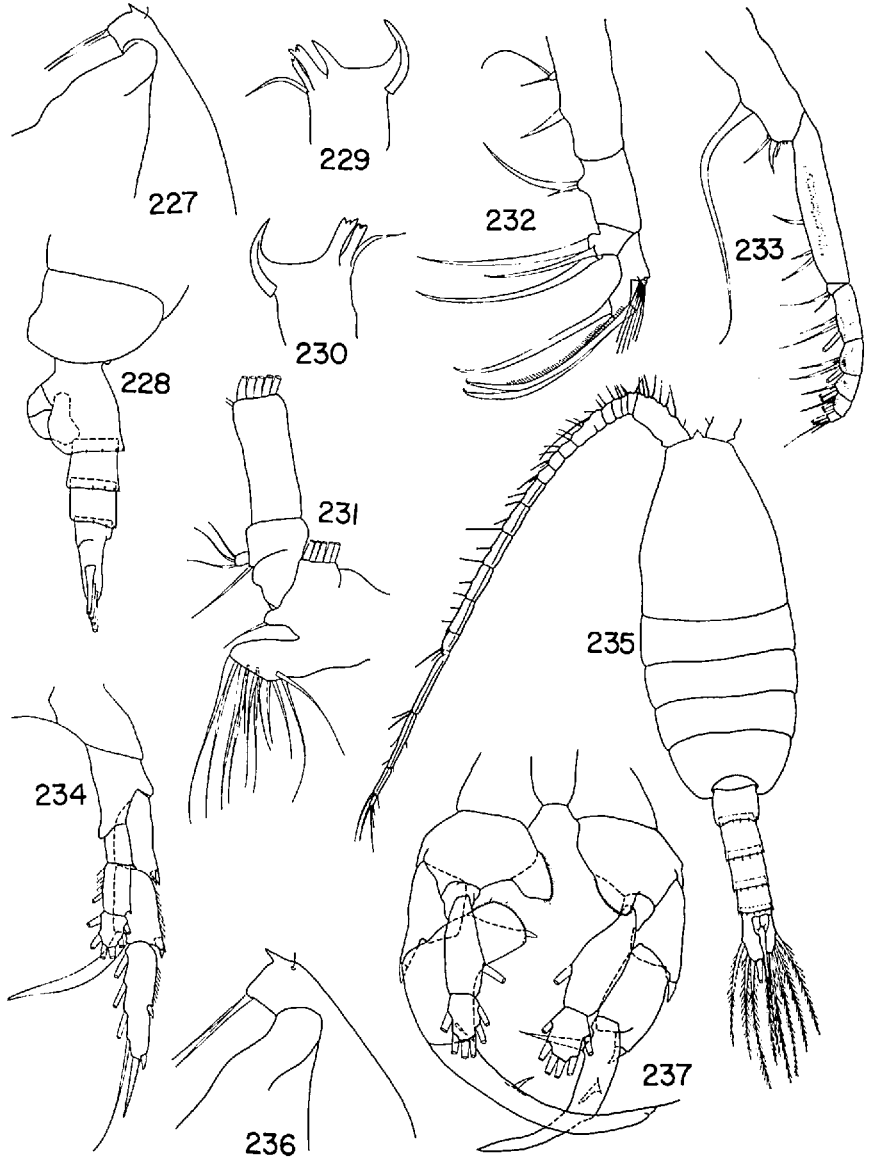
Heterorhabdus spinifer, new species

Figs. 226-237

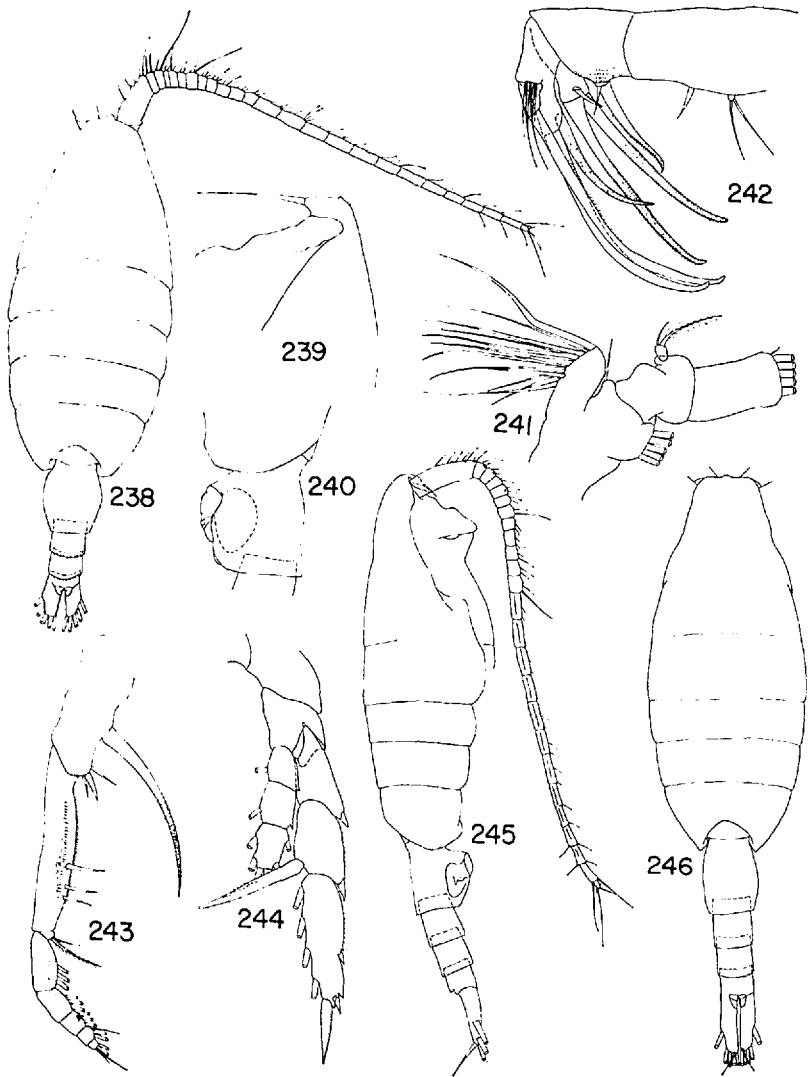
Occurrence.—Station 1: 100-0 m, 4 ♀♀ (1.60-1.72 mm), 3 ♂♂ (1.62-1.68 mm); 200-102 m, 1 ♂ (1.72 mm); 500-208 m, 4 ♀♀ (1.62-1.68 mm); 1850-1004 m, 1 ♂ (1.68 mm). Station 2: 450-155 m, 6 ♀♀ (1.58-1.64 mm), 2 ♂♂ (1.60, 1.62 mm); 950-487 m, 3 ♀♀ (1.60-1.64 mm). Station 4: 500-203 m, 1 ♀ (1.66 mm).

Diagnosis (Female).—Prosome a little more than twice length of urosome. Anterior end of head produced into a sharp point. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments fused. Caudal rami asymmetrical, left ramus being larger with second median seta thick and elongated. Antennule reaching end of caudal ramus. Teeth of both mandibular blades of nearly equal size. In maxillule, second inner lobe and basis each with a single seta, and endopod with three setae. Penultimate lobe of maxilla with two spines of equal length. Coxa of maxilliped with an elongated median seta extending beyond end of basis and three relatively short distal setae, the strongest of which is about one-fifth length of basis. In fifth leg, first endopodal segment without setae and much shorter than second segment. First exopodal segment without internal setae. Internal spine of second exopodal segment longer than third exopodal segment. Terminal spine of third exopodal segment about one-half the length of the segment. Holotype (1.60 mm long, from station 2, 450-155 m): USNM 123767.

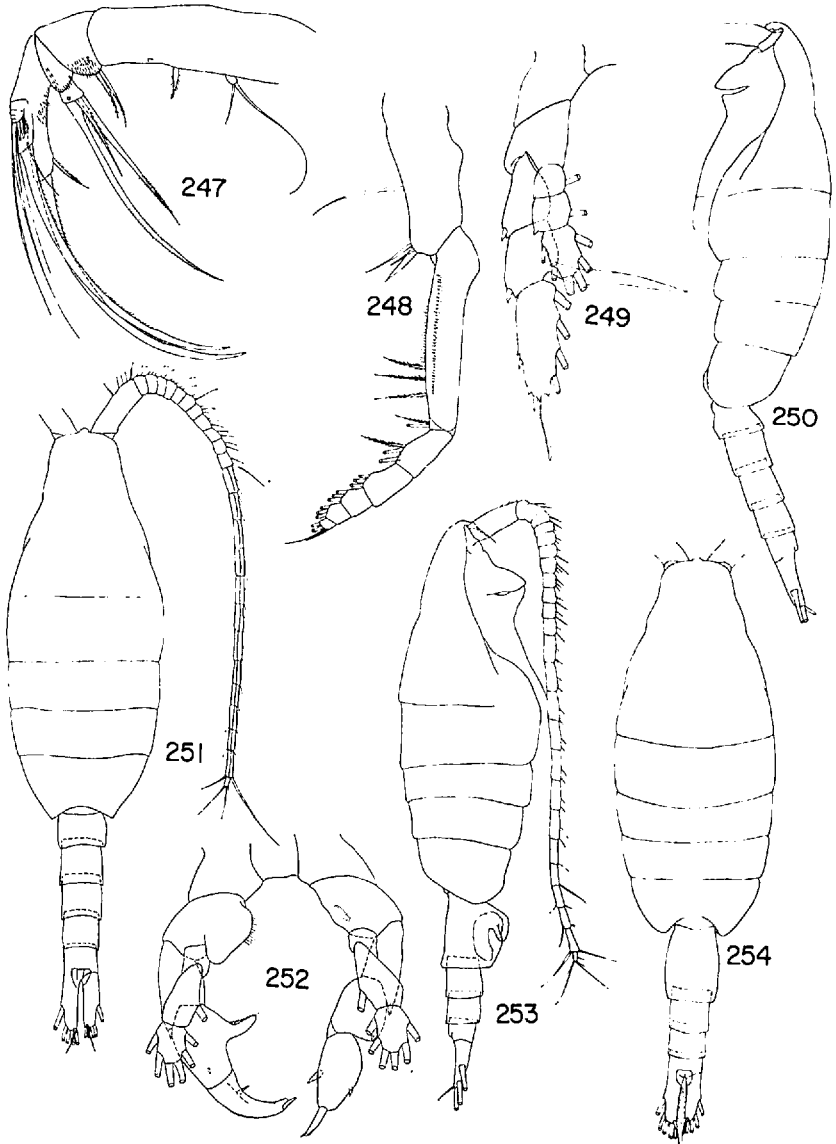
Diagnosis (Male).—Prosome a little more than twice length of urosome. Anterior end of head with a spiniform process as in female. Left antennule geniculated and reaching end of caudal ramus. Mouthparts and first to fourth swimming legs as in female. In fifth pair of legs, basis with a



FIGURES 227-237. *Heterorhabdus spinifer*, n. sp.—227-234, female: 227, forehead, lateral; 228, posterior part of metasome and urosome, lateral; 229, right mandibular blade; 230, left mandibular blade; 231, maxillule; 232, maxilla; 233, maxilliped; 234, fifth leg, anterior.—235-237, male: 235, habitus, dorsal; 236, forehead, lateral; 237, fifth pair of legs, anterior.



FIGURES 238-246.—238-244, *Heterorhabdus caribbeanensis*, n. sp., female: 238, habitus, dorsal; 239, forehead, lateral; 240, posterior part of metasome and genital segment, lateral; 241, maxilliped; 242, maxilla; 243, maxilliped; 244, fifth leg, anterior.—245-246, *Heterorhabdus vipera*, female: 245, habitus, lateral; 246, habitus, dorsal.



FIGURES 247-254.—247-252, *Heterorhabdus vipera*.—247-249, female: 247, maxilla; 248, maxilliped; 249, fifth leg, anterior.—250-252, male: 250, habitus, lateral; 251, habitus, dorsal; 252, fifth pair of legs, anterior.—253-254, *Heterorhabdus medianus*, n. sp., female: 253, habitus, lateral; 254, habitus, dorsal.

lamelliform inner process fringed with hairs. The process on right basis much higher. Second exopodal segment of right leg with a large, characteristic inner projection. Allotype (1.62 mm long, from station 2, 450-155 m): USNM 123768.

Remarks.—This species is closely related to *Heterorhabdus spinifrons* (Claus) and *H. subspinifrons* Tanaka, in having a spiniform process on the anterior end of the head. It is, however, readily distinguished from these two species by the absence of such processes as are found on the genital segment in *H. subspinifrons*, and by the two spines of equal length on the penultimate lobe of the maxilla. In anatomical details of appendages, the present species is closely related to *H. papilliger* (Claus), except for the fifth pair of legs, i.e., in *H. spinifer* the female has no setae on the first endopodal segment, and the male has a characteristic internal projection on the second exopodal segment of the right leg.

***Heterorhabdus caribbeanensis*, new species**

Figs. 238-244

Occurrence.—Station 2: 1900-980 m, 1 ♀ (1.74 mm).

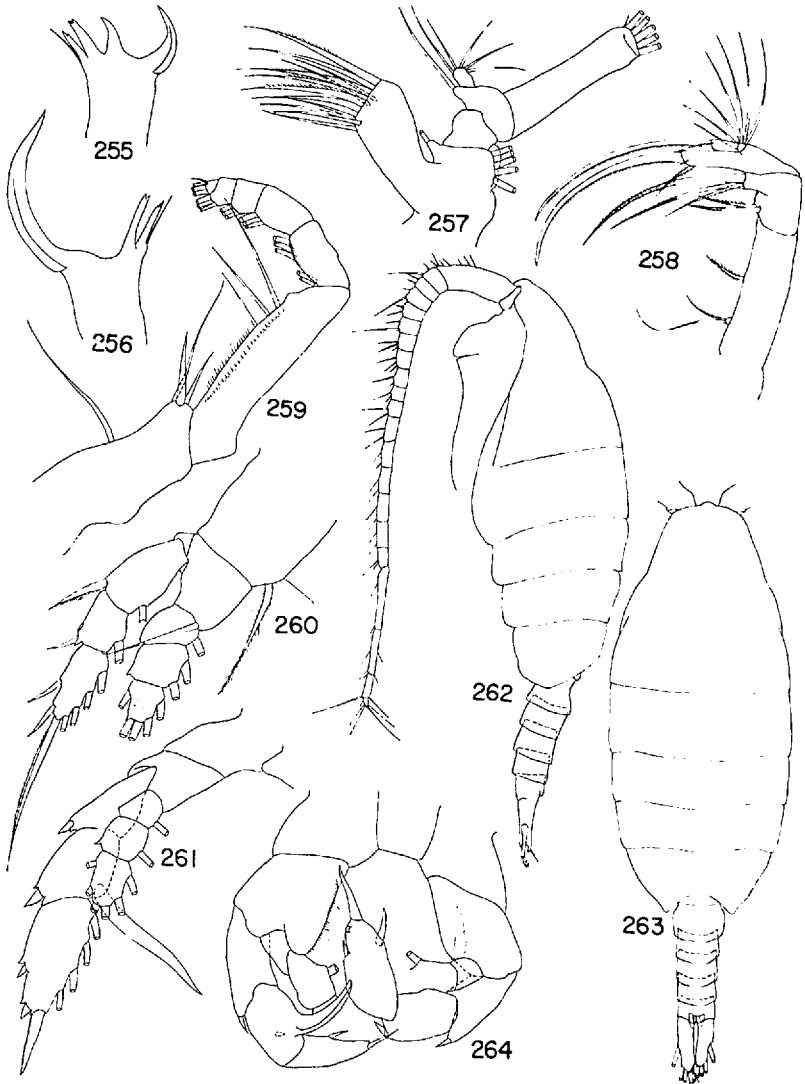
Diagnosis (Female).—Prosome a little more than twice length of urosome. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments fused. Caudal rami slightly asymmetrical, second median seta of left ramus being thick and elongated. Antennule slightly shorter than body. Teeth of cutting edges of both mandibles nearly equal in size. In maxillule, second inner lobe with a single seta, basis without setae, and endopod with two setae. Penultimate lobe of maxilla with two unequal spines, the smaller about one-half the length of the larger. In maxilliped, coxa with an elongate median spine not reaching end of basis. First to fourth swimming legs as in *Heterorhabdus spinifer*. In fifth leg, internal spine of second exopodal segment shorter than third exopodal segment. Terminal spine of third exopodal segment about one-half the length of the segment. Holotype: USNM 123766.

Remarks.—Although the observation is based on a single specimen, the anatomical details of such appendages as maxillule, maxilla, and maxilliped are so distinct from those of the known species that I consider the specimen a member of a valid species.

***Heterorhabdus vipera* (Giesbrecht, 1889)**

Figs. 245-252

Occurrence.—Station 2: 450-155 m, 1 ♀ (2.32 mm); 950-487 m, 2 ♀ ♀ (2.16, 2.24 mm), 2 ♂ ♂ (2.24, 2.28 mm); 1900-980 m, 1 ♀ (2.40 mm). Station 4: 500-203 m, 1 ♀ (2.40 mm).



FIGURES 255-264. *Heterorhabdus medianus*, n. sp.—255-261, female: 255, right mandibular blade; 256, left mandibular blade; 257, maxillule; 258, maxilla; 259, maxilliped; 260, first leg, anterior; 261, fifth leg, anterior.—262-264, male: 262, habitus, lateral; 263, habitus, dorsal; 264, fifth pair of legs (distal parts of endopods omitted), anterior.

Remarks.—This species was originally described from the tropical region of the Pacific Ocean (Giesbrecht, 1892), and subsequently recorded from the South Atlantic Ocean by Wolfenden (1911), North Atlantic Ocean by Farran (1926), Indian Ocean by Sewell (1932), and Japanese waters by Tanaka (1964a). The present findings, however, constitute the first record from the Caribbean Sea and Gulf of Mexico.

The species is readily recognized by the slender body with a relatively long urosome. The posterolateral corner of the metasome in dorsal view is triangularly produced. The males found in the present collections, however, show considerable differences in the structure of the fifth pair of legs as compared to the description by Giesbrecht (1892), but rather agree with the description of *Heterorhabdus tenuis* Tanaka, 1964, established on a single male specimen obtained from the Japanese waters, from where he also obtained a single female of *Heterorhabdus vipera*. Therefore, the males reported here may be referred to *H. tenuis*, if they really do not belong to *H. vipera*.

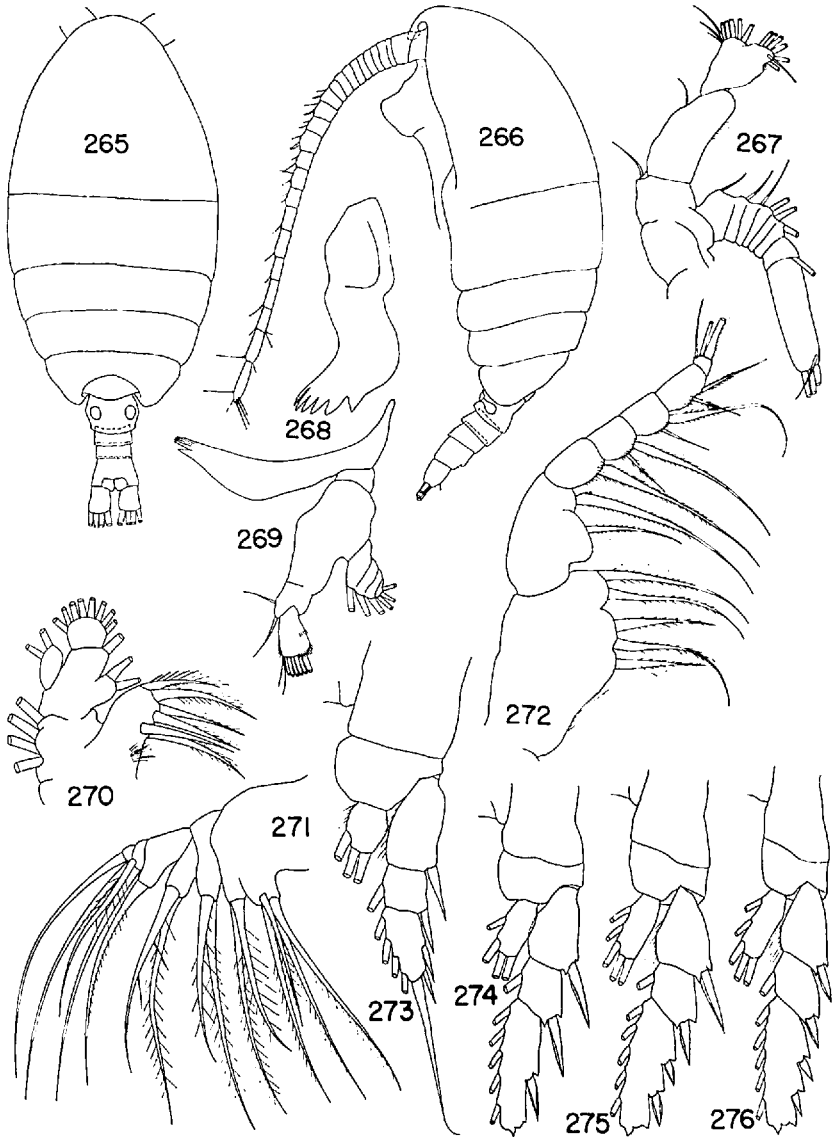
***Heterorhabdus medianus*, new species**

Figs. 253-264

Occurrence.—Station 2: 450-155 m, 1 ♀ (2.56 mm); 950-487 m, 1 ♂ (2.52 mm). Station 4: 500-203 m, 1 ♀ (2.60 mm).

Diagnosis (Female).—Body moderately slender. Prosome about twice length of urosome. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments fused. Posterolateral corner of metasome in dorsal view round. Caudal rami asymmetrical, second median seta of left ramus being thick and elongated. Antennule shorter than body. Cutting edge of left mandible with a large upper tooth separated by a wide gap from small lower teeth, which is much larger than the corresponding tooth of right mandible. In maxillule, second inner lobe and basis each with a single seta, and endopod with five setae. Penultimate lobe of maxilla elongate and not covered by spinules. Coxa of maxilliped with a slender median seta and three relatively long distal setae. The strongest distal seta about one-third length of basis. In fifth leg, internal spine of second exopodal segment longer than third exopodal segment. Terminal spine of third exopodal segment about one-half the length of the segment. Holotype (from station 2): USNM 123764.

Diagnosis (Male).—Prosome a little over twice length of urosome. Posterolateral corner of metasome in dorsal view triangularly produced. Antennule shorter than body. Mouthparts and first four pairs of legs as in female. In fifth pair of legs, both endopod and exopod three-segmented. Second exopodal segment of right leg with an elongate process arising from the mediolateral corner. Allotype: USNM 123765.



FIGURES 265-276. *Disco oviformis*, n. sp., female: 265, habitus, dorsal; 266, habitus, lateral; 267, antenna; 268, mandibular blade; 269, mandible; 270, maxillule; 271, maxilla; 272, maxilliped; 273, first leg, anterior; 274, second leg (terminal spines broken off), anterior; 275, third leg (terminal spines broken off), anterior; 276, fourth leg (terminal spines broken off), anterior.

Remarks.—This species shows somewhat intermediate characteristics between *Heterorhabdus vipera* (Giesbrecht) and *H. robustus* Farran, and can be distinguished from these two species by the size and shape of the body and by the relatively long setae on the coxa of the maxilliped. The male of the present species is further characterized by the long internal process of the second exopodal segment of the right fifth leg. In the female fifth leg, the internal spine of the second exopodal segment seems to be relatively longer in the present species than in *H. robustus*.

***Disco oviformis*, new species**

Figs. 265-276

Occurrence.—Station 2: 950-487 m, 1 ♀ (0.82 mm).

Diagnosis (Female).—Prosoma in dorsal view ovoid. First metasomal segment separate from cephalosome. Fourth and fifth metasomal segments fused. Rostrum single, large, and obtusely rounded. Posterolateral corner of metasome in lateral view broadly rounded. Urosome about one-third length of prosoma. First three urosomal segments much wider than long. Anal segment wider than long and much longer than the preceding segment. Caudal ramus slightly longer than wide and shorter than anal segment. Antennule reaching about end of genital segment. Exopod of antenna eight-segmented and slightly shorter than endopod. First seven exopodal segments each with an internal seta. Mandibular blade with six large teeth. Maxillule with 6 and 2 setae, respectively, on first and second inner lobes, 1 seta on basis, 8 setae on endopod, 2 setae on exopod, and 4 setae on outer lobe. In maxilla, first lobe with 4 setae, second to fourth lobes each with 2 setae, fifth lobe with a single seta, and endopod with 4 setae. Maxilliped with a well developed basipod bearing 5 setae on coxa and 2 setae on basis. First to fourth legs each with a one-segmented endopod and a three-segmented exopod. External spines of exopods diminish gradually in size from proximal to distal. Fifth pair of legs lacking. Holotype: USNM 123756.

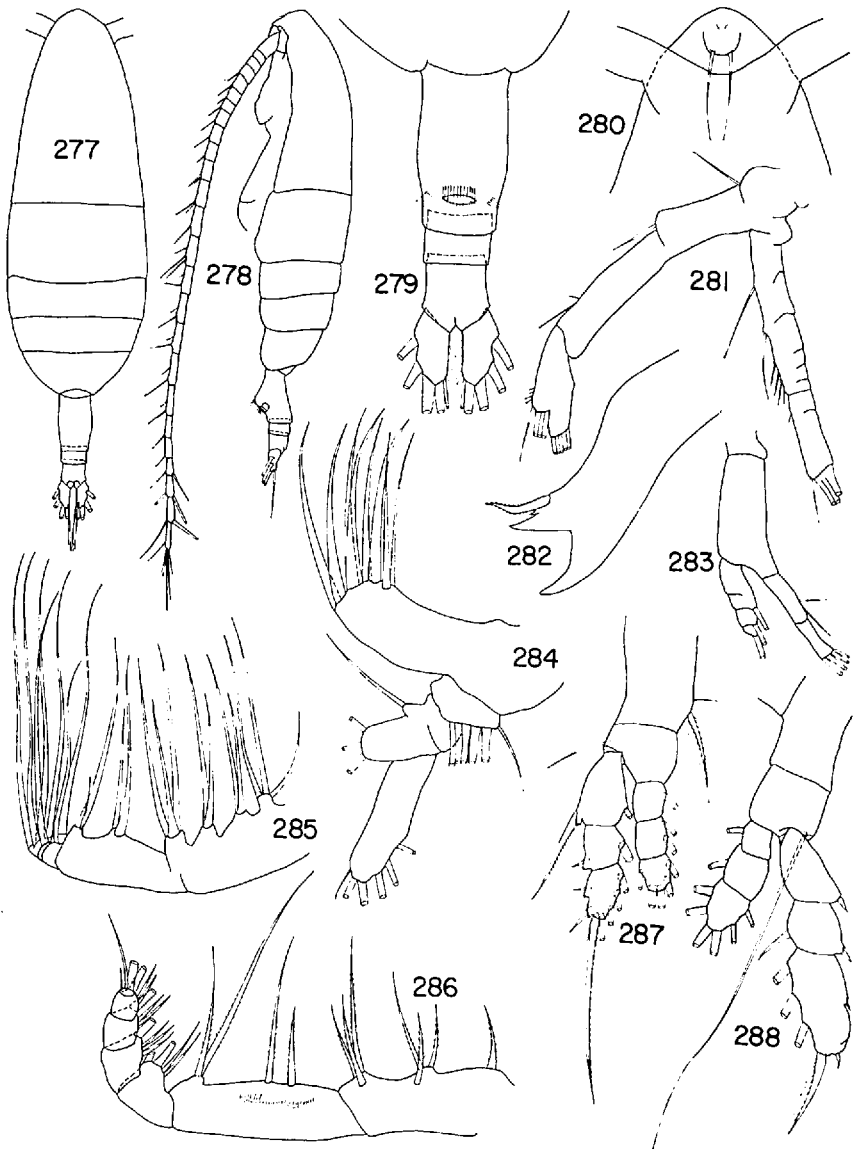
Remarks.—In anatomical details of appendages, this species closely resembles *Disco fiordicus* Fosshagen, 1967, originally described from Sognefjord and Hardangerfjord of Norway. However, the much larger and wider body and the relatively short urosomal segments of the present species may serve to distinguish it from *D. fiordicus*.

***Euaugaptilus sublongiseta*, new species**

Figs. 277-288

Occurrence.—Station 1: 500-208 m, 1 ♀ (1.86 mm).

Diagnosis (Female).—Urosome a little less than one-third length of prosoma. Genital segment about equal in length to remaining portion of



FIGURES 277-288. *Euaugaptilus sublongiseta*, n. sp., female: 277, habitus, dorsal; 278, habitus, lateral; 279, urosome, ventral; 280, forehead, ventral; 281, antenna; 282, mandibular blade; 283, mandibular palp; 284, maxillule; 285, maxilla; 286, maxilliped; 287, first leg, anterior; 288, fifth leg, anterior.

urosome. Caudal ramus as long as anal segment. Rostrum consisting of two slender filaments. Antennule exceeding end of body by last four segments. Exopod of antenna eight-segmented, proximal seven segments each with a small seta. Mandible biramous, endopod longer than exopod. Mandibular blade with three teeth and a strong basal spine. Maxillule with 1 seta on third inner lobe, 3 setae on basis, 6 setae on exopod, and 6 setae on outer lobe. Exopods and endopods of first to fifth legs three-segmented. Holotype: USNM 123759.

Remarks.—This species is closely related to *Euaugaptilus longiseta* Grice & Hülsemann, 1965, but can be distinguished from it by the smaller body, relatively long genital segment, and relatively short antennule.

***Euaugaptilus vescus*, new species**

Figs. 289-299

antenna eight-segmented, proximal six segments each with a seta. Mandible biramous, exopod longer than endopod. Mandibular blade with four teeth
Occurrence.—Station 1: 1850-1004 m, 1 ♀ (1.56 mm).

Diagnosis (Female).—Prosome about 3.5 times length of urosome. Genital segment slightly longer than the following two combined. Caudal ramus as long as anal segment. Rostrum consists of two short filaments. Antennule exceeds end of body by last two or three segments. Exopod of antenna eight-segmented, with 3 internal and 4 terminal setae. Mandible biramous, endopod longer than exopod. Mandibular blade with four teeth and a long basal spine. Maxillule with 1 seta on basis, 5 setae on exopod, and 6 setae on outer lobe. Second and third inner lobes and endopod absent. Exopods and endopods of all five pairs of swimming legs three-segmented. Exopod of fifth leg lacking outer spines. Holotype: USNM 123761.

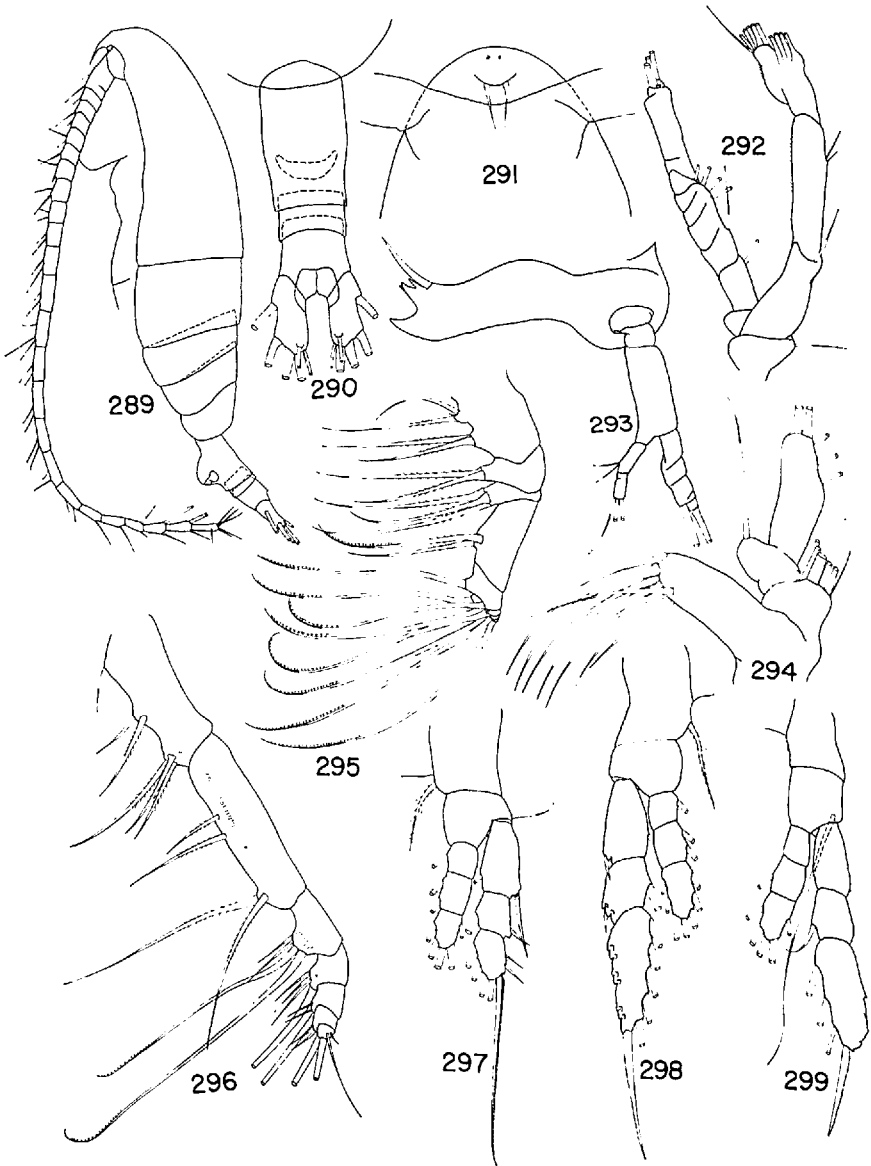
Remarks.—This species is characteristic in the structure of the mandible and maxillule. The male of *Euaugaptilus longiseta* described by Grice & Hülsemann (1967) has cephalic appendages closer to those of the present female than to those of the female of that species.

***Euaugaptilus diminutus*, new species**

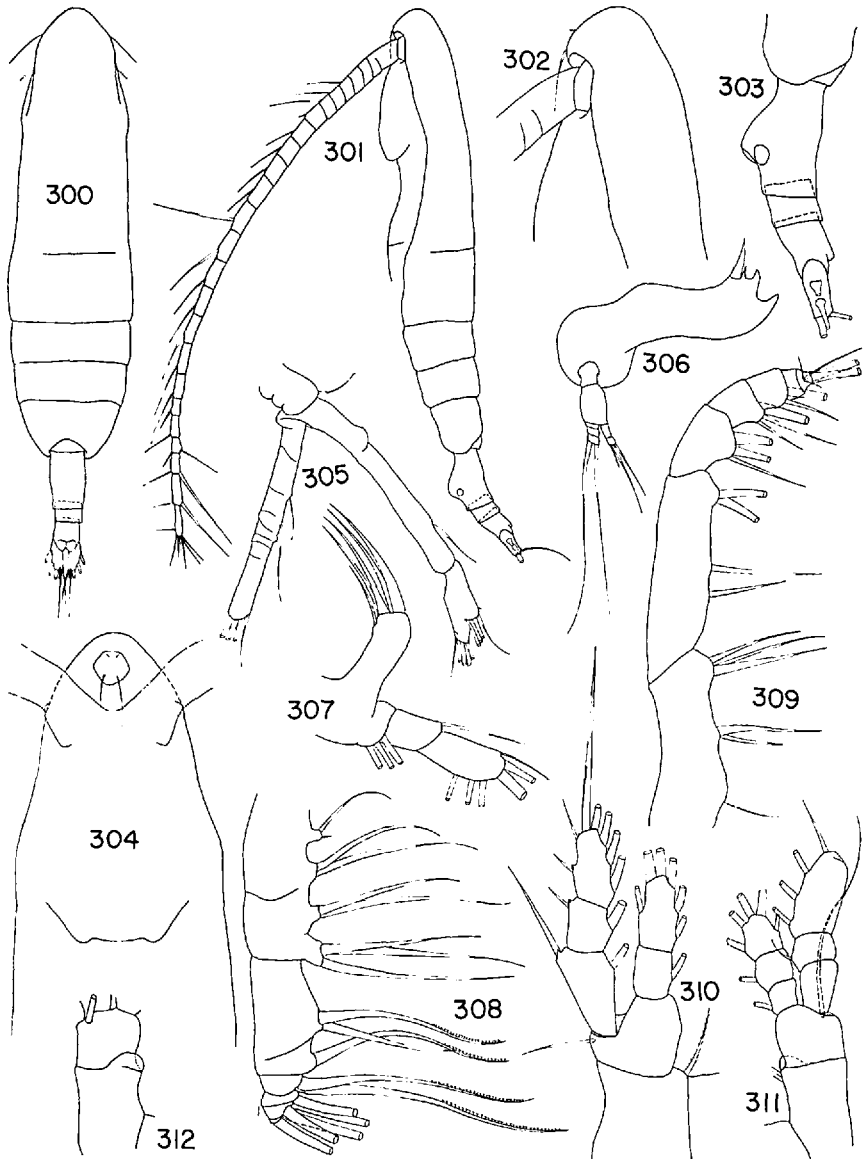
Figs. 300-312

Occurrence.—Station 2: 450-155 m, 2 ♀♀ (1.32, 1.44 mm).

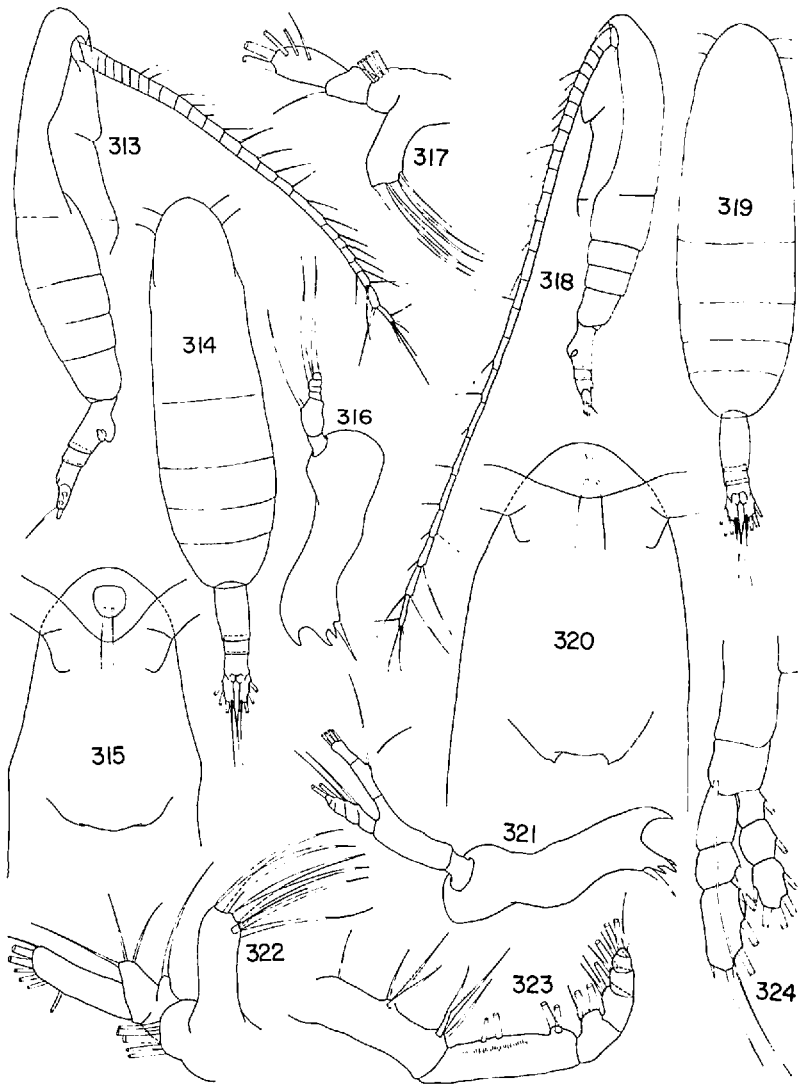
Diagnosis (Female).—Prosome about 4 times length of urosome. Genital segment slightly longer than the following two combined. Caudal ramus about as long as anal segment. Rostrum consisting of two slender filaments. Antennule reaching distal end of anal segment. Exopod of antenna eight-segmented, with 3 internal and 4 terminal setae. Mandible with a small, biramous palp. Maxillule with 1 seta on basis, 6 setae on exopod, and 3 or 4 setae on outer lobe; second and third inner lobes and endopod absent.



FIGURES 289-299. *Euaugaptilus vescus*, n. sp., female: 289, habitus, lateral; 290, urosome, dorsal; 291, forehead, ventral; 292, antenna; 293, mandible; 294, maxillule; 295, maxilla; 296, maxilliped; 297, first leg, anterior; 298, second leg, anterior; 299, fifth leg, anterior.



FIGURES 300-312. *Euauaptilus diminutus*, n. sp., female: 300, habitus, dorsal; 301, habitus, lateral; 302, forehead, lateral; 303, posterior part of metasome and urosome, lateral; 304, head, ventral; 305, antenna; 306, mandible; 307, maxillule; 308, maxilla; 309, maxilliped; 310, first leg, anterior; 311, fifth leg, anterior; 312, basipod of fifth leg, posterior.



FIGURES 313-324.—313-317, *Euaugaptilus unisetosus*, n. sp., female: 313, habitus, lateral; 314, habitus, dorsal; 315, head, ventral; 316, mandible; 317, maxillule.—318-324, *Euaugaptilus longiantennalis*, n. sp., female: 318, habitus, lateral; 319, habitus, dorsal; 320, head, ventral; 321, mandible; 322, maxillule; 323, maxilliped; 324, fifth leg, posterior.

Endopod of first leg two-segmented, exopod three-segmented. Endopods and exopods of second to fifth legs three-segmented. In fifth leg, coxa with a lobe on mediiodistal margin, exopod without external spines. Holotype (1.44 mm long): USNM 123757.

Remarks.—This species is similar to *Euaugaptilus vescus* in the shape of the body and some details of the mouthparts, particularly of the mandible and maxillule. However, the segmentation of the first leg and the setation of the mouthparts will serve to distinguish them from each other.

***Euaugaptilus unisetosus*, new species**

Figs. 313-317

Occurrence.—Station 2: 450-155 m, 1 ♀ (1.52 mm).

Diagnosis (Female).—Prosome about 3.5 times length of urosome. Rostrum consisting of two slender filaments. Genital segment slightly shorter than remaining portion of urosome. Caudal ramus as long as anal segment. Antennule reaching about distal end of genital segment. Mandibular palp poorly developed—exopod bearing only two setae, and endopod represented by a single seta. Maxillule with 1 seta on basis, 5 setae on exopod, and 4 setae on outer lobe; second and third inner lobes and endopod missing. Other mouthparts and swimming legs as in *Euaugaptilus diminutus*. Holotype: USNM 123760.

Remarks.—This species is closely related to *Euaugaptilus diminutus*, except for the details of such appendages as antennules, mandibles, and maxillules.

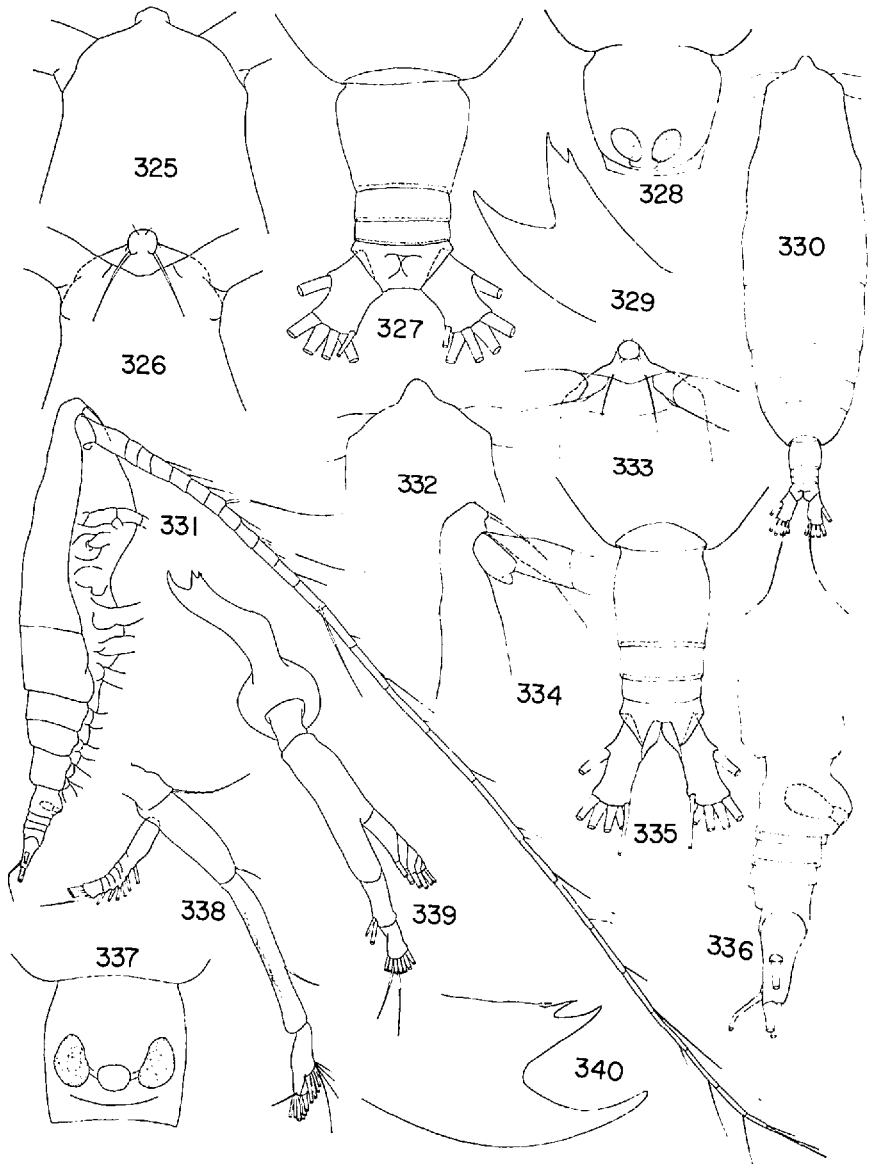
***Euaugaptilus longiantennalis*, new species**

Figs. 318-324

Occurrence.—Station 2: 450-155 m, 1 ♀ (1.66 mm).

Diagnosis (Female).—Prosome about 4 times length of urosome. Rostrum consisting of two slender filaments. Genital segment as long as the rest of urosome. Caudal ramus as long as anal segment. Antennule exceeding end of caudal ramus by last seven segments. Mandibular blade with four teeth and one basal spine. Mandibular palp biramous, exopod carrying four setae and shorter than endopod. Maxillule with 1 seta on third inner lobe, 3 setae on basis, 7 setae on exopod, and 6 setae on outer lobe; second inner lobe and endopod missing. Both rami of fifth leg three-segmented. First and second exopodal segments without external spines. Antenna, maxilla, and first to fourth legs similar to those of *Euaugaptilus sublongiseta*. Holotype: USNM 123758.

Remarks.—*Euaugaptilus longiantennalis* is characteristic in having long



FIGURES 325-340.—325-329, *Haloptilus longicornis*, female: 325, forehead, dorsal; 326, forehead, ventral; 327, urosome, dorsal; 328, genital segment, ventral; 329, mandibular blade.—330-340, *Haloptilus longicirrus*, female: 330, habitus, dorsal; 331, habitus, lateral; 332, forehead, dorsal; 333, forehead, ventral; 334, forehead, lateral; 335, urosome, dorsal; 336, urosome, lateral; 337, genital segment, ventral; 338, antenna; 339, mandible; 340, mandibular blade.

antennules and a small body. In anatomical details of appendages, this species is related to *Euaugaptilus sublongiseta*, but the two species can be distinguished from each other in the details of the mandibles, maxillules, and fifth pair of legs.

Haloptilus longicornis (Claus, 1863)

Figs. 325-329

Occurrence.—Station 1: 100-0 m, 4 ♀♀ (2.08-2.16 mm), 1 ♂ (1.24 mm); 200-102 m, 8 ♀♀ (2.00-2.16 mm); 500-208 m, 6 ♀♀ (2.06-2.16 mm); 1000-505 m, 1 ♀ (2.12 mm). Station 2: 100-0 m, 32 ♀♀ (2.00-2.16 mm); 200-100 m, 7 ♀♀ (2.04-2.12 mm); 450-155 m, 29 ♀♀ (1.94-2.12 mm); 950-487 m, 1 ♀ (2.04 mm). Station 4: 200-100 m, 17 ♀♀ (2.00-2.12 mm); 500-203 m, 2 ♀♀ (2.04, 2.08 mm).

Remarks.—The present collections contained three forms of females of *Haloptilus*, which, having long antennules, are closely related to one another. They are separable mainly by the body size, the shape of the forehead, and the genital segment. The smallest is identified with *Haloptilus longicornis* (Claus), the largest with *H. longicirrus* Brodsky, and the intermediate is described here as a new species. They also seem to be separated in their vertical distribution, i.e., *H. longicornis* is abundant in the upper 200 m, *H. longicirrus* is found only below 500 m, and the new species is common in between.

H. longicornis is the most numerous of the three species and can be distinguished by the following characters: Forehead with a protrusion which in dorsal view is clearly set off. Genital segment wider than long, with two spermathecae located close to each other. Caudal rami about 1.5 times as long as wide. Basis of maxillule usually with four setae. In fifth leg, coxa and second exopodal segment without internal setae, basis with an external seta extending much beyond end of exopod.

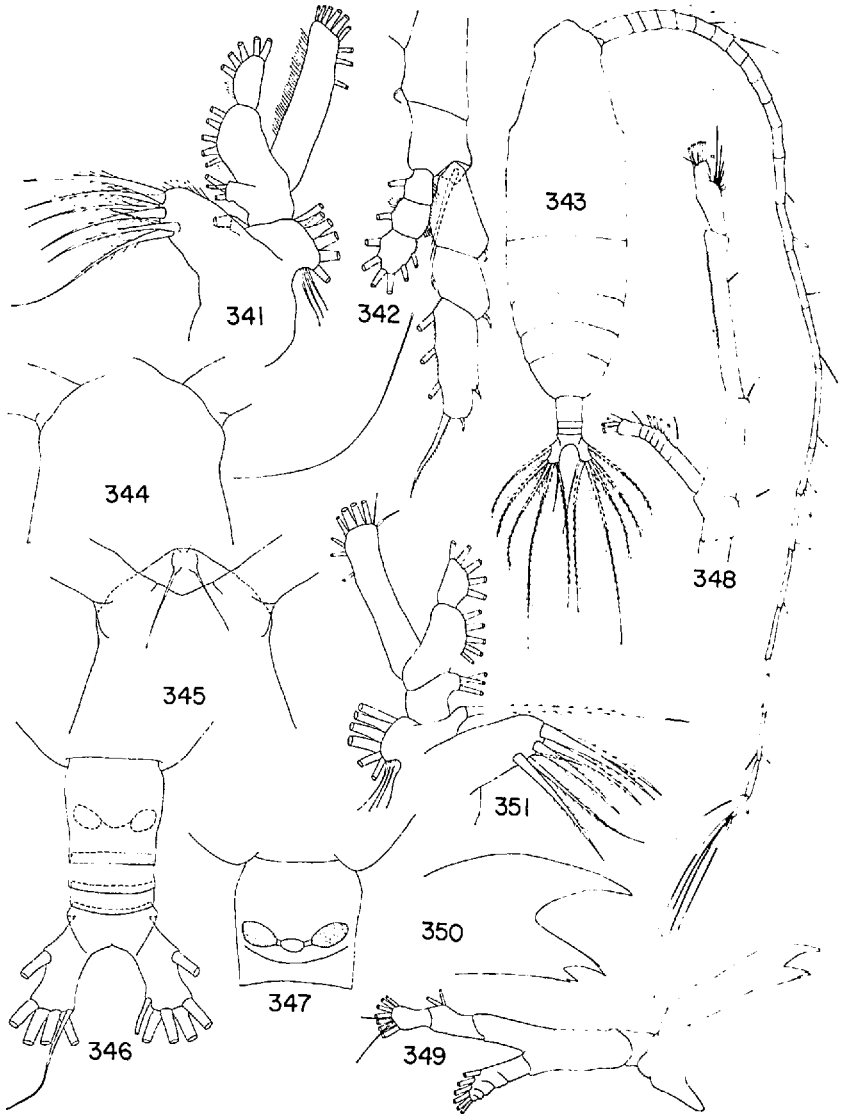
Haloptilus longicirrus Brodsky, 1950

Figs. 330-342

Haloptilus setuliger Tanaka, 1964b:40, fig. 193.

Occurrence.—Station 1: 1000-505 m, 3 ♀♀ (3.22-3.26 mm); 1850-1004 m, 3 ♀♀ (3.04-3.32 mm). Station 2: 950-487 m, 1 ♀ (2.96 mm); 1900-980 m, 3 ♀♀ (3.12-3.20 mm). Station 4: 1900-1003 m, 1 ♀ (3.20 mm).

Diagnosis (Female).—Prosoma about 4.5 times length of urosome. Forehead with a round projection, which in dorsal view is not set off as it is in *H. longicornis*. Genital segment about as wide as long, and two spermathecae widely separated. Caudal rami more than twice as long as wide. Antennule exceeding end of caudal ramus by last 10 segments. Exopod



FIGURES 341-351.—341-342, *Haloptilus longicirrus*, female: 341, maxillule; 342, fifth leg, anterior.—343-351, *Haloptilus paralongicirrus*, n. sp., female: 343, habitus, dorsal; 344, forehead, dorsal; 345, forehead, ventral; 346, urosome, dorsal; 347, genital segment, ventral; 348, antenna; 349, mandible; 350, mandibular blade; 351, maxillule.

of antenna seven-segmented. Basis of maxillule with five setae. In fifth leg, coxa and second exopodal segment each with a small internal seta, basis with an external seta which is about twice as long as exopod.

Remarks.—This species was originally described from deep waters of the northwestern Pacific Ocean (Brodsky, 1950) and subsequently recorded from the western North Atlantic Ocean by Grice (1963) and off the coast of tropical West Africa by Vervoort (1965).

Tanaka (1964b) described a similar species (*H. setuliger*) from off the Pacific coast of Middle Japan, which I believe is synonymous with *H. longicirrus*.

***Haloptilus paralongicirrus*, new species**

Figs. 343-355

Occurrence.—Station 1: 200-102 m, 3 ♀♀ (2.36-2.48 mm); 500-208 m, 1 ♀ (2.52 mm); 1850-1004 m, 1 ♀ (2.44 mm). Station 2: 200-100 m, 2 ♀♀ (2.44, 2.48 mm); 450-155 m, 11 ♀♀ (2.32-2.60 mm); 950-487 m, 2 ♀♀ (2.44, 2.48 mm). Station 4: 200-100 m, 6 ♀♀ (2.48-2.64 mm); 500-203 m, 2 ♀♀ (2.56, 2.60 mm).

Diagnosis (Female).—Forehead in dorsal view broadly rounded without a distinct projection. Urosome about one-fifth length of prosome. Genital segment as wide as long, with two spermathecae widely separated. Caudal rami about twice as long as wide. Antennule exceeding end of caudal ramus by last ten segments. Basis of maxillule usually with four or occasionally five setae. In fifth leg, coxa with a small internal seta, first two exopodal segments usually without internal setae, and basis with a long external seta. Holotype (2.50 mm long, from station 2, 450-155 m): USNM 123763.

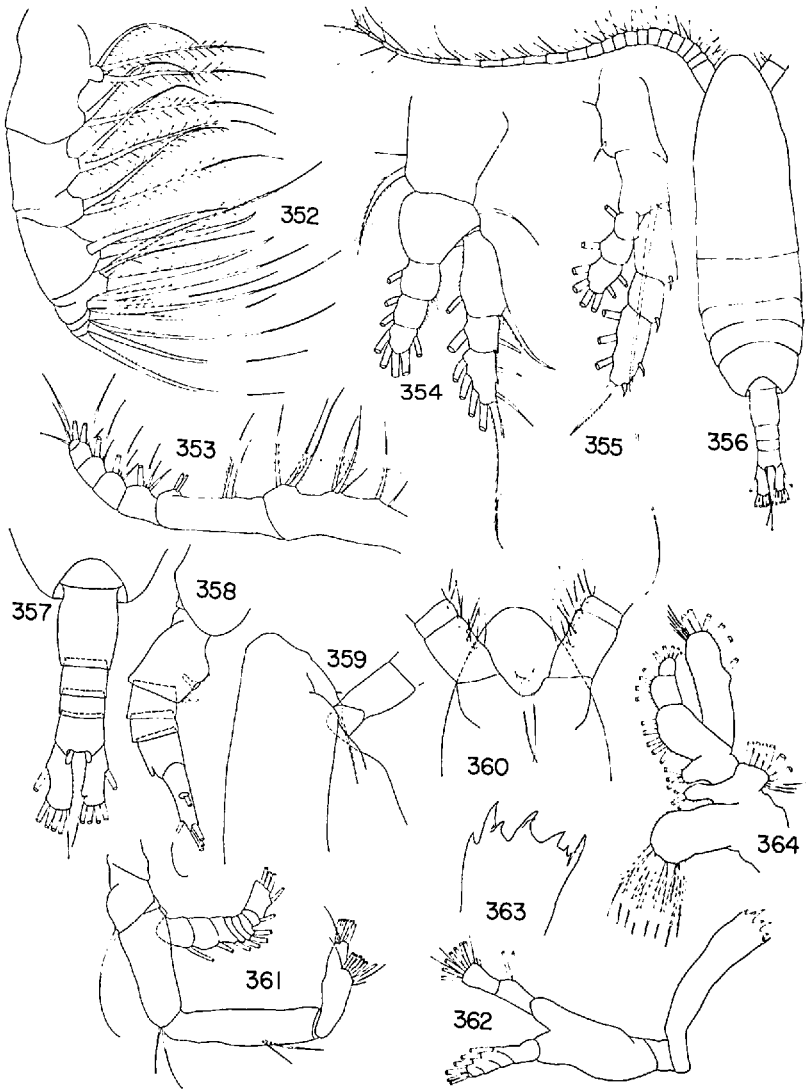
Remarks.—In anatomical details of appendages, this species is almost indistinguishable from *Haloptilus longicirrus* Brodsky. The two species are, however, clearly separable by obvious differences in the body size and the shape of the forehead, although, until the entire range of their distribution and morphological variability is known, it cannot be determined whether these differences involve specific characters or simply ecophenotypic variations caused by the differences in their vertical distribution.

***Haloptilus caribbeanensis*, new species**

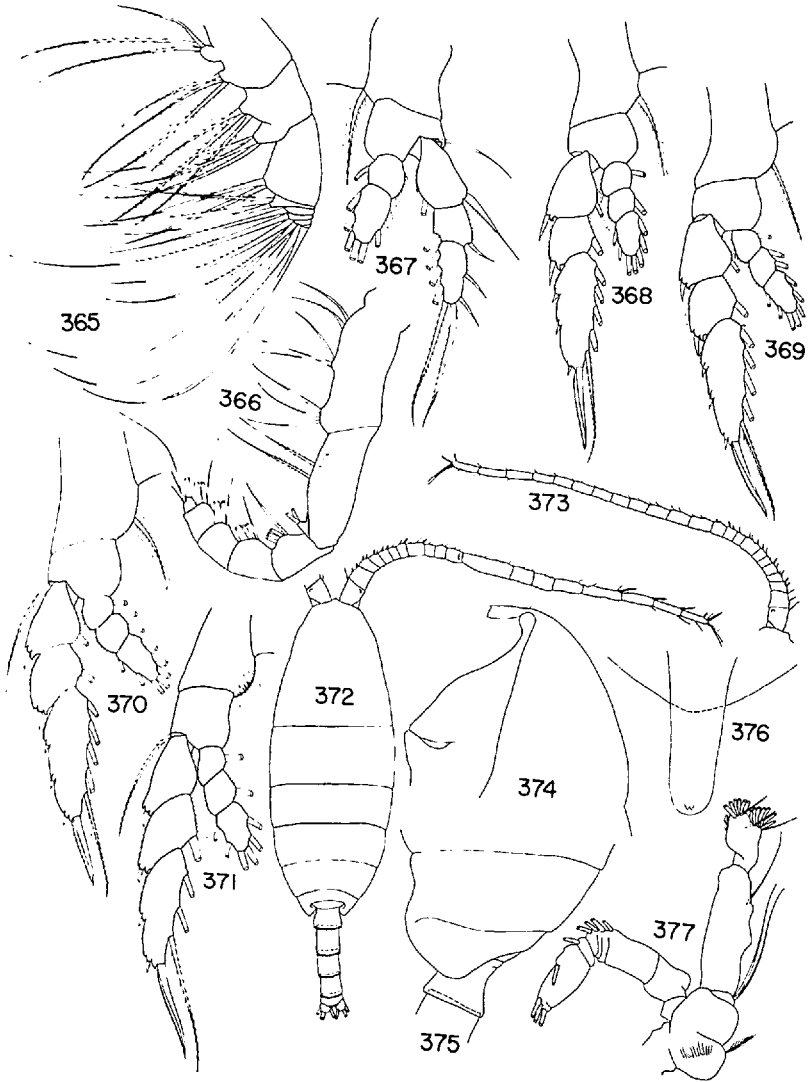
Figs. 356-371

Occurrence.—Station 2: 1900-980 m, 1 ♀ (6.42 mm).

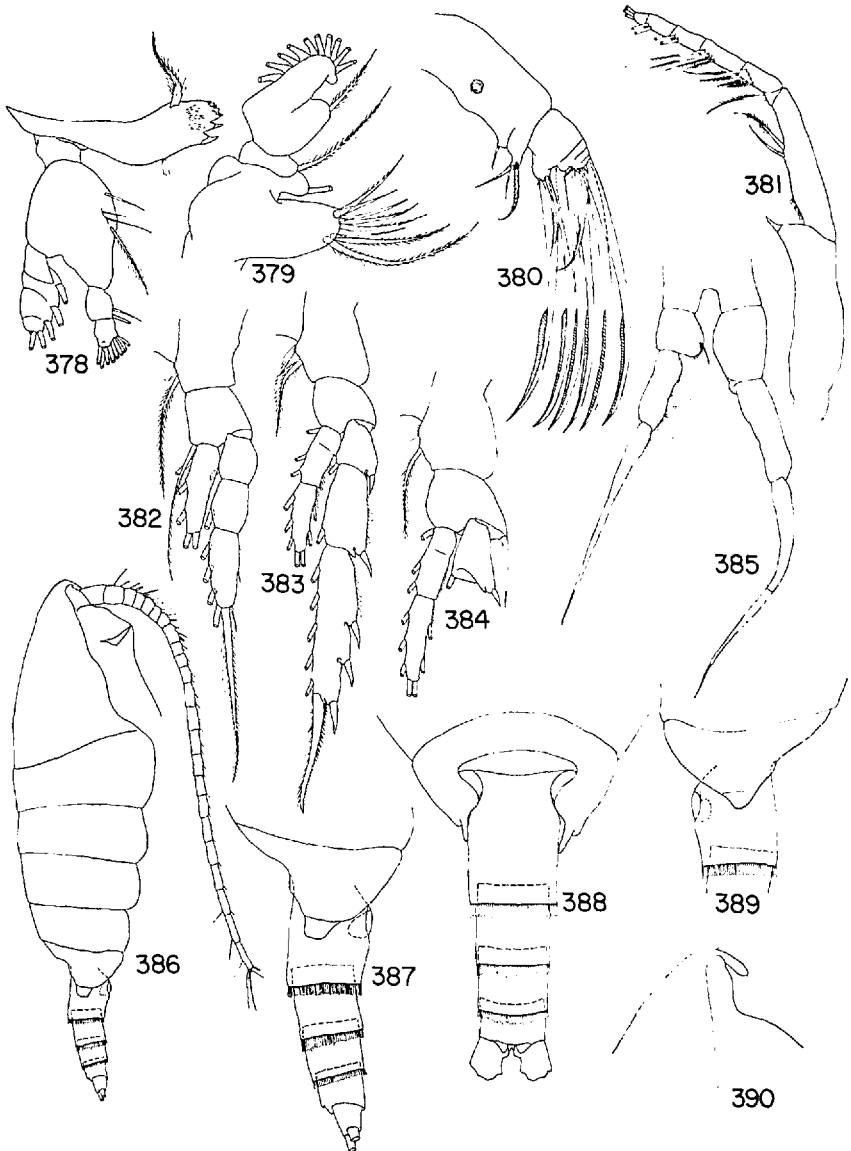
Diagnosis (Female).—Prosome about 3 times length of urosome. Cephalosome roundly produced anteriorly and separated from first metasomal segment. Fourth and fifth metasomal segments fused. Genital segment slightly shorter than the following three combined. Caudal ramus about 2.5 times



FIGURES 352-364.—352-355, *Haloptilus paralongicirrus*, n. sp., female: 352, maxilla; 353, maxilliped; 354, first leg, anterior; 355, fifth leg, anterior.—356-364, *Haloptilus caribbeanensis*, n. sp., female: 356, habitus, dorsal; 357, urosome, dorsal; 358, urosome, lateral; 359, forehead, lateral; 360, forehead, ventral; 361, antenna; 362, mandible; 363, mandibular blade; 364, maxillule.



FIGURES 365-377.—365-371, *Haloptilus caribbeanensis*, n. sp., female: 365, maxilla; 366, maxilliped; 367, first leg, anterior; 368, second leg, anterior; 369, third leg, anterior; 370, fourth leg, anterior; 371, fifth leg, anterior.—372-377, *Bathypontia minor*, male: 372, habitus, dorsal; 373, left antennule; 374, fore-head, lateral; 375, posterior part of metasome and anterior part of urosome, lateral; 376, rostrum, anterior; 377, antenna.



FIGURES 378-390.—378-385, *Bathypontia minor*, male: 378, mandible; 379, maxillule; 380, maxilla; 381, maxilliped; 382, first leg, anterior; 383, second leg, anterior; 384, third leg (second and third exopodal segments broken off), anterior; 385, fifth pair of legs, posterior.—386-390, *Bathypontia similis*, female: 386, habitus, lateral; 387, posterior part of metasome and urosome, right side; 388, *idem*, dorsal; 389, posterior part of urosome and genital segment, left side; 390, forehead, lateral.

as long as wide. Rostrum consisting of two slender filaments. Antennule reaching about end of caudal ramus. Exopod of antenna eight-segmented, first seven segments each with a seta and last segment with four setae. Cutting edge of mandible with seven teeth of different shape and size. Maxillule with 5 setae on basis, 4 + 5 setae on endopod, and 11 setae on exopod. Maxilliped robust, with five endopodal segments bearing 4, 4, 3, 3, and 4 setae, respectively. First leg with a two-segmented endopod and a three-segmented exopod; first external spine of exopod much longer than the following three spines of equal length. Holotype: USNM 123762.

Remarks.—The female described above is identical with that which Grice (1969) reported as *Haloptilus furcatus* Sars. The specimen indeed agrees with the description of that species by Sars (1925) in the habitus and the anatomy of the mouthparts, particularly of the mandible, but obviously differs from it in the following characters: The forehead is conspicuously produced, and the endopod of the first leg is two-segmented instead of three-segmented. I consider these characters significant, by which the present specimen should be distinguished from *H. furcatus* as a separate species.

Pseudaugaptilus longiremis Sars, 1907

Pseudaugaptilus orientalis Tanaka, 1964b:85, fig. 216.

Occurrence.—Station 4: 500-203 m, 1 ♀ (3.72 mm); 1000-509 m, 1 ♀ (3.76 mm).

Remarks.—The present specimens agree well with the descriptions and illustrations of the species by Sars (1925), except for the following details: Second to seventh exopodal segments of antenna each with a seta, and eighth segment with four setae. Second exopodal segment of first leg with an external spine.

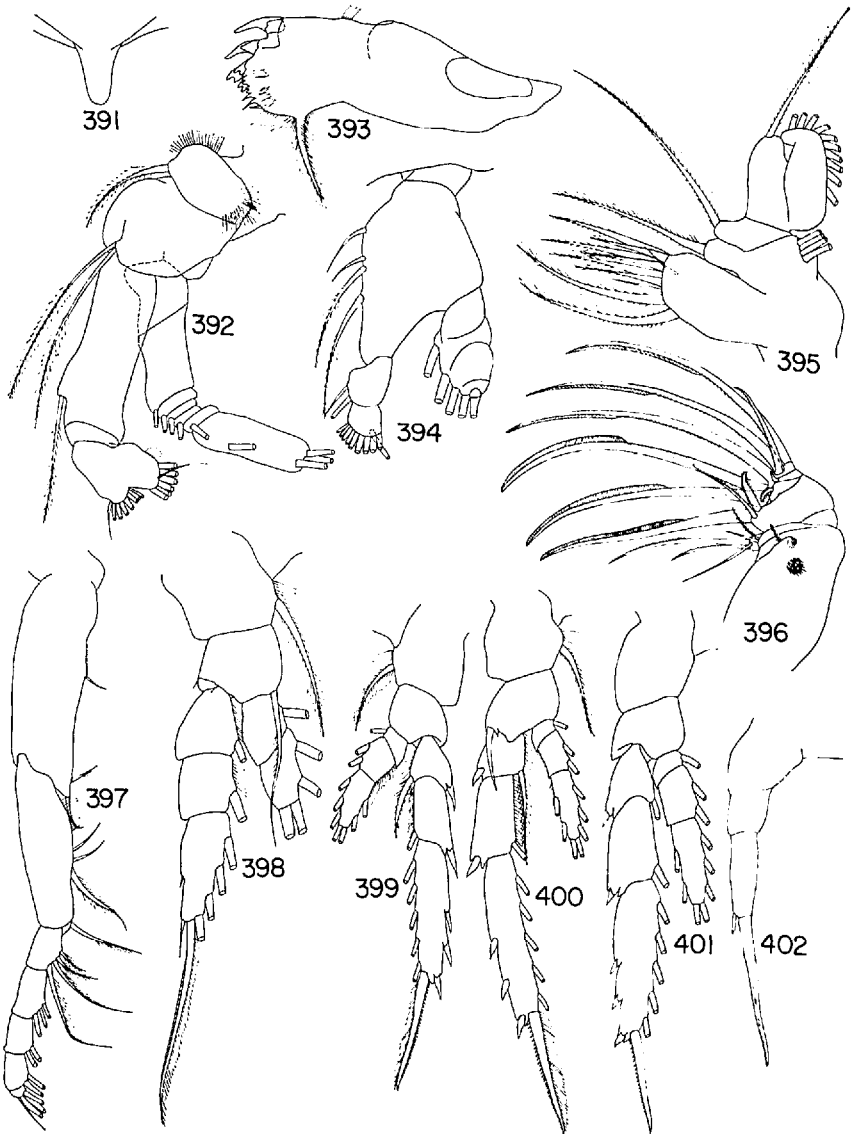
Pseudaugaptilus orientalis Tanaka, 1964, which is considered here as being synonymous with *P. longiremis*, was originally distinguished from it by the presence of an external spine on the second exopodal segment of the first leg.

Bathypontia minor (Wolfenden, 1906)

Figs. 372-385

Occurrence.—Station 2: 1900-980 m, 1 ♂ (2.48 mm). Station 4: 1900-1003 m, 1 ♀ (2.68 mm).

Diagnosis (Male).—Prosoma about 3 times length of urosome. All five metasomal segments separate. Rostrum elongate, broad, and distally rounded bearing two minute points. Antennules slightly shorter than body,



FIGURES 391-402. *Bathypontia similis*, female: 391, rostrum, anterior; 392, antenna; 393, mandibular blade; 394, mandibular palp; 395, maxillule; 396, maxilla; 397, maxilliped; 398, first leg, anterior; 399, second leg, anterior; 400, third leg, anterior; 401, fourth leg, anterior; 402, fifth leg.

with right one geniculated. Exopod of antenna as long as endopod and seven-segmented, second to sixth segments each carrying a seta. Mandibular blade with a strong basal seta arising subterminally and perpendicular to the blade. In maxillule, second and third inner lobes and basis each with a single seta; exopod well developed, carrying ten setae; outer lobe without setae; endopod absent. Distal portion of maxilla with six equal, strong setae in addition to five small setae of different length. Proximal portion of maxilla bearing medially a patch of spinules and distally two lobes with one and three setae, respectively. Maxilliped elongate; coxa bearing distally a single spine. First leg with a one-segmented endopod and a three-segmented exopod. In second and third legs, first and second endopodal segments partially fused. Basis of third leg with a strong external spine extending beyond distal end of first exopodal segment. Fifth legs uniramous and five-segmented. Middle three segments of right leg much longer than three corresponding segments of left leg.

Remarks.—This species was originally established on female specimens obtained from deep waters of the equatorial eastern Atlantic Ocean (Wolfenden, 1906, 1911). Grice & Hülsemann (1965) reillustrated the female of the species on the basis of the material obtained from the North Atlantic Ocean. The male is here described for the first time, and it is the first record of the species from the Caribbean Sea.

Bathypontia similis Tanaka, 1965

Figs. 386-402

Occurrence.—Station 1: 1850-1004 m, 1 ♀ (2.80 mm). Station 2: 1900-980 m, 2 ♀ ♀ (2.80 mm). Station 4: 1000-509 m, 1 ♀ (3.12 mm).

Diagnosis (Female).—Prosoma about 3 times length of urosome. Last metasomal segment asymmetrical, with right side more produced distally. Rostrum single, broad, and distally rounded. Antennule 24-segmented, reaching middle of urosome. Exopod of antenna seven-segmented, second to sixth segments each with a seta. Mandibular blade with a strong basal seta widely separated from teeth. In maxillule, second and third inner lobes and basis each with a single seta; exopod well developed, with ten setae; endopod absent. Distal portion of maxilla with six subequal, strong setae in addition to five small setae of different length. Proximal three lobes of maxilla with 1, 2, and 3 setae, respectively; close to the first lobe are two patches of spinules. In first leg, endopod two-segmented and exopod three-segmented. Both rami of second to fourth legs three-segmented. Basis of third leg with an elongate external spine extending beyond distal end of first exopodal segment. Fifth leg uniramous, three-segmented, and tipped with a large terminal spine and a small external spine.

Remarks.—This species was originally described from deep waters off the Pacific coast of Middle Japan (Tanaka, 1965). Grice & Hülsemann (1967) found the species from deep waters of the tropical Indian Ocean. The present findings constitute the first record from the Atlantic Ocean.

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SUMARIO

COPÉPODOS CALÁNIDOS DEL MAR CARIBE Y EL GOLFO DE MÉXICO. 2. NUEVAS ESPECIES Y NUEVOS REPORTES OBTENIDOS EN MUESTRAS DE PLANCTON

Se hizo un estudio sistemático de los copépodos calánidos encontrados en muestras de plancton colectadas en series verticales en el Mar Caribe y el Golfo de México. Se encontraron 178 especies, incluyendo 28 nuevas especies y 58 que no habían sido previamente reportadas en el área. Se dan diagnósticos e ilustraciones o datos sistemáticos de las nuevas especies y de 16 otras. Se incluye una clave para las especies de *Spinocalanus*. Se describe por primera vez el macho de *Bathypontia minor* (Wolfenden, 1906).

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