

The Isopods of Abyssal Depths in the Atlantic Ocean

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SUMMARY

In this monograph 176 species are described. Prior to this work only 66 species were known from the Arctic-Atlantic below 2000 meters and only 143 were known from the abyss of the world oceans, excluding probably pelagic species. This means that the results of this work based upon 84 abyssal trawl samples taken by the R.V. *Vema* and M.V. *Theta* increase by roughly one-fifth the number of abyssal species known for the entire world in the order Isopoda. The number of species from the Atlantic, where the fauna was best known previously, is increased by over two times. One hundred and seven new species are described from the Atlantic abyss and near abyss for the first time. Species new to the abyss but previously known elsewhere, are *Antennuloniscus dimeroceras* Barnard), *Stylomesus inermis* (Vanhöffen), *Nannoniscus oblongus* G. O. Sars, *Eurycope antarctica* Vanhöffen, and *Eurycope vicarius* Vanhöffen. Additionally five species previously recorded from the Atlantic abyss are excluded from this monograph due to the fact that they are too poorly known. These are *Eurycope*

abyssicola Beddard, *Acanthocope acutispina* Beddard, *Eurycope* sp., *Ischnomesus bacillus* Beddard, and *Storothyngura fragilis* (Beddard). The list of the new species is contained in the table of contents.

A total of nine new genera is described. These are *Antennuloniscus* (formerly part *Haploniscus*), *Dendromunna*, *Spinianirella*, *Notoxenoides*, *Xostylus*, *Abyssijaera*, *Mesosignum*, *Glabroserolis*, and *Vemathambema*. This brings the known abyssal Atlantic genera to 41 when one adds the five genera that were previously known from Atlantic shallow water and are reported herein from the abyss, *Leptanthura*, *Antarcturus*, *Acanthomunna*, *Nannoniscoides*, and *Stylomesus*.

Where possible analytical keys are given to the species (world) of each genus; partial keys are given to the species of *Gnathia* and *Eurycope*, and no key is given to the poorly defined genus *Ilyarachna*.

It is intended that the zoogeographic, ecologic, and phylogenetic relationships of these collections will be subject to analytic study in the second part of this monograph.

INTRODUCTION

In this paper the marine isopods of the abyss of the North and South Atlantic, including the Arctic Ocean and Caribbean Sea, are described. Every old and new species known up to 1960 is illustrated at least once. This study is based mainly upon the collections made in recent years by the research vessel belonging to the Lamont Geological Observatory, the R.V. *Vema*. The principal objective of this work has been to define abyssal communities based upon modern systematic studies and to determine where possible the probable sites of origin of these highly important abyssal organisms from their morphologic affinities and geographic distribution. Additionally, however, a study has been made on the food of the abyssal isopods through dissection and study of their gut content. Records were maintained also regarding the weight, size, state of sexual maturity, and brood size.

The collections on which this study was based come from *Vema* cruises 7 to 15 inclusive. These cruises were supported by grants from the Office of Naval Research, the Bureau of Ships of the U.S. Navy, and the National Science Foundation, as part of the International Geophysical Year. The laboratory work has been supported by a grant from the Rockefeller Foundation and the National Science Foundation.

The aid of the following chief scientists is particularly appreciated: Dr. J. Lamar Worzel, *Vema* 7 and 15; Dr. Bruce C. Heezen, *Vema* 10; Mr. Walter Beckman and Captain Valvin Sinclair, *Vema* 12; Captain H. Kohler, *Vema* 14; Dr. Jack Nafe, Dr. Charles Drake, and Professor Maurice Ewing, *Vema* 14 and 15. The aid of the following shipboard biologists on various cruises is especially appreciated: Mr. Peter Trurnit, Mr. Thomas Dow, and Mr. Arthur Clarke, Jr.

Discussions at various times with Professor Maurice Ewing, Dr. William Donn, Dr. Bruce Heezen, and Mr. David B. Ericson, all of the Lamont staff, have been particularly helpful in this work.

The illustrations were made in pencil from projected images of the animals. Parts requiring higher magnification were drawn with the aid of a camera lucida. Penciled sketches were "inked in" by Mr. Donald Robinson and by myself. Previously described species were painstakingly copied from the publications involved by Mr. Donald Robinson. Sorting of the preserved samples was done by Mr. Thomas Dow, Mr. Michael Tinker, and myself.

MATERIALS AND METHODS

The material examined came from deep sea trawl samples. Various trawl designs were tried: first, the epibenthic trawl developed by Mr. Robert Bieri (in Hedgpeth, 1957, p. 77, Fig. 10) and, second, a large biology trawl (LBT), which was discarded in favor of a small biology trawl (SBT) designed at the suggestion of Mr. Walter Beckman of the Lamont Geological Observatory. The LBT had an opening one meter square, but otherwise was identical with the SBT. The latter has an orifice one meter wide by ten centimeters high and a steel frame. Attached to the frame is a tapered nylon net three meters long with a mesh diameter of 0.5 millimeters. A bridle of chain is attached to the front, at the yolk of which a eighty-pound lead weight is attached (Fig. 1). The bridle is attached with swivels at each joint, allowing the trawl and weight to wind or unwind freely as tension is released or increased. The cod end of the net is tied to the frame to prevent it from tangling around the trawl wire. The trawl wire was 5/32-inch hydrographic wire, and trawling operations were carried out with tensions nearing the breaking point. For this reason a heavier or larger trawl could not be used from wire of such small diameter. The SBT under normal conditions could be lowered and retrieved at maximum winch speed. This is a highly important desideratum of shipboard operations.

The trawl samples when retrieved on the deck of the ship were put into suitable containers and preserved with 10 percent neutral formalin sea water buffered with Hexamine.¹ The entire sample, usually consisting of a quart of sediment and animals, was then sorted in the laboratory with the binocular stereoscopic microscope. Identified specimens are transferred into 70 percent alcohol.

The dissection of isopod specimens generally was done with the aid of a microscope while the specimens were immersed in glycerine on a microscope slide. Measurements were made with a calibrated ocular micrometer. The weight of specimens was determined from wet specimens which had been damp-dried with a paper towel after removal from the alcohol preservative. Food content analyses were usually made on material removed from the hind gut or gastric

¹ Trade name for hexamethylenamine (USP), available from the Amend Drug and Chemical Co. in New York.

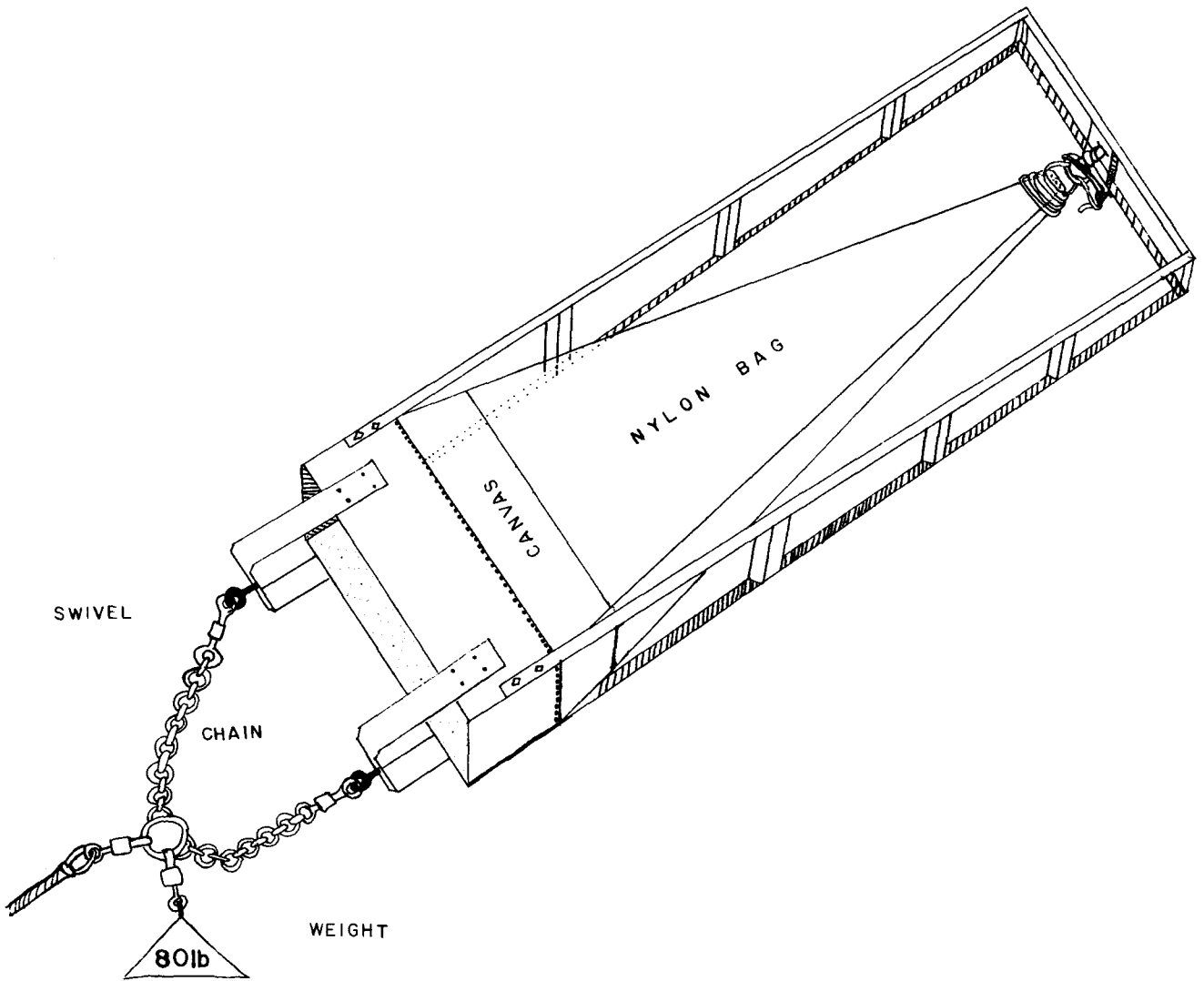


Figure 1. Small biology trawl (SBT) used in the majority of the Lamont collections from aboard *Vema*, frame length 3 meters, width 1 meter, diameter of orifice 10 centimeters.

mill, and in this way an uncontaminated sample was obtained.

Identified specimens were placed in cotton-stoppered vials in quart alcohol-filled jars. Entry in the catalogue provided each lot of a species from each trawl station from each cruise with a separate L.G.O. (Lamont Geological Observatory) catalogue number (cat. no.). Individual cruise biology trawl stations have been numbered consecutively (L.G.O. Bio-trawl No.).

DEFINITION OF THE AREA SAMPLED

In this study the abyssal isopods of the Arctic Ocean, the North and South Atlantic, and the Caribbean are described and studied. The zoogeographical implications will be discussed separately as a significant second part of this monograph by Dr. Bruce C. Heezen and myself. Therefore, in this, the systematic part, details of zoogeography are purposely avoided.

The abyssal stations on which this study has been based are compiled in a separate section, "List of Stations"; accordingly, it has been possible to give with each species a minimum of station detail, and only the L.G.O. Biotrawl number and number of specimens are listed.

HISTORY OF PREVIOUS WORK

For a general review of oceanographic expeditions up to 1926, the reader is referred to Schott's *Geographie des Atlantischen Ozeans* (1926).

The first capture of abyssal isopods resulted from the cruises of the *Lightning* (1868), *Porcupine* (1869-1870), and *Valorous* (c. 1870). These were reported on by Norman and Stebbing (1886), three species, and by Stebbing (1913), one species. Next came Beddard's great work (1884-1886, 1886) on the *Challenger* (1872-1876) collections. Beddard reported on around 58 species, but only about 24 of these were from below 2000 meters depth. Richardson (1909, etc.) and

Hansen (1897) reported on the abyssal isopods collected by the American *Albatross* cruises (1898–1913). The results of the *Travailleur* and *Talisman* (1880–1883) were treated by Richardson (1911), who also worked on the isopods collected by the *Princess Alice* 1–2 (1885–1914). The single most important work for the Atlantic is the monumental monograph by Hansen (1916) on the Danish *Ingolf* (1895–1896) and *Thor* (1904–1910) expeditions. Hansen treated 164 species in that work, but only 38 were from depths of 2000 meters or more. The Swedish *Albatross* (1947–1948) has added only one additional abyssal species (Nordenstam, 1955). The principal results of the Danish *Galathea* Atlantic collections are not yet available. The Pacific hadal isopods of the *Galathea* have been recorded by Wolff (1956). Some of the ultra abyssal isopods collected by the *Vitjaz* (1949–date) have been published by Birstein (1957, 1960). Several abyssal Atlantic species from the *Vema* 7 cruise (1955)

were reported by Menzies (1956). Abyssal Arctic polar isopods gathered by the U.S.S.R. have been published most recently by Gurjanova (1946a). The abyssal isopods of the Antarctic have been reported only by Vanhöffen (1914), based on the German South Polar Expedition of the *Gauss* (1901–1903).

A reasonably complete listing of all known benthic abyssal isopods is given in the following tabulation. Pelagic species are purposely excluded from the enumeration and are listed separately.

To date 69 abyssal benthic isopods have been described from the Atlantic Ocean, and each of these is treated in this work in addition to the 107 new species which are herein described. In this monograph only benthic species from depths of 2000 or more meters are described except when in unusual circumstances a species from shallower depth is considered.

LIST OF ISOPODS FROM DEPTHS GREATER THAN 2000 METERS—BY REGION

<i>Species</i>	<i>Depth Range (meters)</i>	<i>Depth Range (meters)</i>	<i>Depth Range (meters)</i>
ARCTIC OCEAN: POLAR BASIN			
1. <i>Ilyarachna derjugini</i> Gurjanova	2500	46. <i>Ilyarachna bicornis</i> Hansen, 1916	2702
2. <i>Eurycope hansenii</i> Ohlin, Gurjanova	460-2500	47. <i>Ilyarachna longicornis</i> G. O. Sars, Hansen, 1916	18-2788
3. <i>Eurycope incisa</i> Gurjanova	2380	48. <i>Ilyarachna spinosissima</i> Hansen, 1916	2702-3521
4. <i>Mesidothea megalura polaris</i> Gurjanova	1300-2500	49. <i>Ischnomesus armatus</i> Hansen, 1916	2702
NORTH ATLANTIC OCEAN			
5. <i>Abyssianira dentifrons</i> Menzies, 1956a	5104-5122	50. <i>Ischnomesus profundus</i> Hansen, 1916	3521
6. <i>Acanthaspida decorata</i> Hansen, Nierstrasz, 1941	4000	51. <i>Macrostylis abyssicola</i> Hansen, 1916	3229-3521
7. <i>Ananthura abyssorum</i> (Norman and Stebbing), 1886	3199	52. <i>Mesidothea megalura megalura</i> G. O. Sars, Hansen, 1916	1996-2465
8. <i>Anthelura truncata</i> (Hansen), 1916	2258-2702	53. <i>Munna acanthifera</i> Hansen, 1916	552-2258
9. <i>Calathura brachiata</i> (Stimpson), Hansen, 1916	18-2488	54. <i>Nannoniscus analis</i> Hansen, 1916	2258
10. <i>Desmosoma coarctatum</i> Hansen, 1916	24-2702	55. <i>Nannoniscus armatus</i> Hansen, 1916	3521
11. <i>Desmosoma gracilipes</i> Hansen, 1916	2258-2702	56. <i>Nannoniscus inermis</i> Hansen, 1916	2258
12. <i>Desmosoma insigne</i> Hansen, 1916	2702	57. <i>Nannoniscus spinicornis</i> Hansen, 1916	2465
13. <i>Desmosoma intermedium</i> Hult, 1941	30-2258	58. <i>Rhacura pulchra</i> Richardson, 1908a	3235
14. <i>Desmosoma longispinum</i> Hansen, 1916	3521	59. <i>Storhyngura magnispinis</i> (Richardson), 1908b	2258-2702
15. <i>Desmosoma simile</i> Hansen, 1916	2258	60. <i>Storhyngura truncata</i> (Richardson), 1908b	2788-3235
16. <i>Echinothambema ophiuroides</i> Menzies, 1956a	5104-5122	61. <i>Syneurycope hansenii</i> Menzies, 1956a	5104-5122
17. <i>Eurycope abyssicola</i> Beddard, 1886b (insufficient data available on the species)	3977	62. <i>Syneurycope parallela</i> Hansen, 1916	3474
18. <i>Eurycope complanata</i> Bonnier, 1896	950-2702	63. <i>Thambema amicorum</i> Stebbing, 1913	2486
19. <i>Eurycope furcata</i> G. O. Sars, Hansen, 1916	150-2258	SOUTH ATLANTIC OCEAN	
20. <i>Eurycope hansenii</i> Ohlin, Hansen, 1916	460-2669	64. <i>Eurycope murrayi</i> Walker, Hansen, 1916	2-<2700
21. <i>Eurycope murrayi</i> Walker, Hansen, 1916	1300-2775	65. <i>Pseudanthura lateralis</i> Richardson, 1911	930-3200
22. <i>Eurycope nodifrons</i> Hansen, 1916	2702	66. <i>Serolis neera</i> Beddard, 1886a	1097-3731
23. <i>Eurycope parva</i> Bonnier, Hansen, 1916	872-2702	MEDITERRANEAN	
24. <i>Eurycope producta</i> G. O. Sars, Hansen, 1916	72-2087	No abyssal species recorded	
25. <i>Gnathia caeca</i> Richardson	2638	NORTH PACIFIC	
26. <i>Gnathia stygia</i> (G. O. Sars)	552-2465	67. <i>Acanthocope intermedia</i> Beddard, 1886a	5670
27. <i>Haplomesus angustus</i> Hansen, 1916	1373-2137	68. <i>Arcturus parvus</i> Richardson, 1910	2272
28. <i>Haplomesus insignis</i> Hansen, 1916	698-2702	69. <i>Eurycope scabra</i> Hansen, 1897	2486
29. <i>Haplomesus quadrispinosus</i> G. O. Sars, Hansen, 1916	510-2702	70. <i>Eurycope spinifrons</i> Gurjanova, Nierstrasz, 1941	308-3000
30. <i>Haplomesus modestus</i> Hansen, 1916	2258	71. <i>Gnathia elongata</i> Hansen, 1916, Nierstrasz	120-3000
31. <i>Haplomesus tenuispinis</i> Hansen, 1916	2258-3474	72. <i>Haplomesus quadrispinosus</i> G. O. Sars, Birstein, 1960	4000-4150
32. <i>Haplomiscus bicuspis</i> (G. O. Sars) Hansen, 1916	360-2465	73. <i>Haplomunna coeca</i> Richardson, 1905	3993
33. <i>Haplomiscus excisus</i> Richardson, 1908a	3235	74. <i>Heteromesus thomsoni</i> (Beddard), 1886	3750
34. <i>Haplomiscus spinifer</i> Hansen, 1916	2970-4061	75. <i>Ischnomesus andriashevi</i> Birstein, 1960	4000-6560
35. <i>Haplomiscus unicornis</i> Menzies, 1956a	5104-5122	76. <i>Macrostylis latifrons</i> Beddard, 1886	3749
36. <i>Heteromesus granulatus</i> Richardson, 1908a	713-3235	77. <i>Microthambema tenuis</i> Birstein, 1961	5680-5690
37. <i>Heteromesus longiremis</i> Hansen, 1916	698-2707	78. <i>Storhyngura pulchra</i> (Hansen), 1897	2490-2690
38. <i>Heteromesus similis</i> Richardson, 1911	2995	79. <i>Storhyngura chelata</i> Birstein, 1957	5345-6860
39. <i>Heteromesus spinescens</i> Richardson, 1908a	2155-3337	80. <i>Storhyngura bicornis</i> Birstein, 1957	6156-6207
40. <i>Hydronisus abysii</i> Hansen, 1916	3521	81. <i>Storhyngura vitjazi</i> Birstein, 1957	7305-8430
41. <i>Hyssura producta</i> Norman and Stebbing, 1886	2651	82. <i>Storhyngura herculea</i> Birstein, 1957	6475-8100
42. <i>Ianirella laevis</i> Hansen, 1916	2258-2702	83. <i>Storhyngura brachycephala</i> Birstein, 1957	5670-5680
43. <i>Ianirella lobata</i> Richardson, 1908a	2480-3235	84. <i>Storhyngura tenuispinis kurilica</i> Birstein, 1957	7210-7230
44. <i>Ianirella vema</i> Menzies, 1956a	5104-5122	85. <i>Storhyngura tenuispinis tenuispinis</i> Birstein, 1957	7246
45. <i>Ilyarachna abyssorum</i> Richardson, 1911	4060-4165	86. <i>Acanthomunna proteus</i> Beddard, 1886	1281-2011
		87. <i>Antarcturus abyssicola</i> (Beddard), 1886	2560-4321
		88. <i>Acanthocope acutispina</i> Beddard, 1886a	2650
		89. <i>Naesicopea abyssorum</i> (Beddard), 1886a	1958

90. <i>Eurycope galathea</i> Wolff, 1956	6960-7000	134. <i>Ilyarachna antarctica</i> Vanhöffen, 1914	252-3423
91. <i>Eurycope madseni</i> Wolff, 1956	6960-7000	135. <i>Janthopsis nodosus</i> Vanhöffen, 1914 (and	
92. <i>Eurycope nodifrons</i> Hansen, Wolff, 1956	6960-7000	65° 42' S., 79° 49' E.)	3423
93. <i>Haploniscus robinsoni</i> Menzies and Tinker, 1960	2860-2858		
94. <i>Ianira abyssicola</i> Beddard, 1886	2468	ANTARCTIC	
95. <i>Ischnomesus bacilloides</i> (Beddard), 1886a	2652	136. <i>Microprotus antarcticus</i> Vanhöffen, 1914	3398
96. <i>Stylomesus wolffi</i> Birstein, 1960	4000-5530	137. <i>Serolis bromleyana</i> Suhm, Beddard, 1884	3612
97. <i>Stylomesus pacificus</i> Birstein, 1960	5450	138. <i>Serolis johnstoni</i> Hale	2267
98. <i>Stylomesus gracilis</i> Birstein, 1960	5680-5690	139. <i>Serolis meridionalis</i> Hodgson, Vanhöffen, 1914	2725
99. <i>Stylomesus menziesi</i> Birstein, 1960	5680-5690	140. <i>Stenetrium acutum</i> Vanhöffen, 1914	385-3397
100. <i>Heteromesus gigas</i> (Birstein), 1960	6560-8430	141. <i>Storhyngura elegans</i> Vanhöffen, 1914	3423
101. <i>Heteromesus scabriusculus</i> (Birstein), 1960	5450	142. <i>Storhyngura fragilis</i> (Beddard), 1886	? 2303
102. <i>Heteromesus robustus</i> (Birstein), 1960	5450-5817	143. <i>Stylomesus inermis</i> (Vanhöffen), 1914	2450
103. <i>Haplomesus brevispinis</i> Birstein, 1960	5510-5690		
104. <i>Haplomesus cornutus</i> Birstein, 1960	6471-6571	EXCLUDED PROBABLE PELAGICS: NORTH ATLANTIC	
105. <i>Haplomesus orientalis</i> Birstein, 1960	4000-4150	1. <i>Asconiscus simplex</i> G. O. Sars, Vanhöffen, 1914	0-3000
SOUTH PACIFIC			
106. <i>Ischnomesus bruni</i> Wolff, 1956	6960-7000	2. <i>Bathyposurus nybelini</i> Nordenstam, 1956	5500-7900
107. <i>Ischnomesus spärcki</i> Wolff, 1956	6660-7000	3. <i>Cumoechus insignis</i> Hansen, 1916	806-2465
108. <i>Leptanthura hendili</i> Wolff, 1956	6580	4. <i>Eurydyce grimaldi</i> Dollfus, Stephensen, 1915	0-2600
109. <i>Macrostylis galathea</i> Wolff, 1956	9820-10,000	5. <i>Eurydyce stygia</i> G. O. Sars, Hansen, 1916	2465
110. <i>Macrostylis hadalis</i> Wolff, 1956	7270	6. <i>Holophryxus acanthophyrae</i> Stephensen, 1913	<2000
111. <i>Storhyngura benti</i> Wolff, 1956	5230-7000	7. <i>Holophryxus richardi</i> Koehler, Hansen, 1916	0-2500
112. <i>Storhyngura furcata</i> Wolff, 1956	5850-6770	8. <i>Munneurycope tjalfensis</i> Stephensen, 1913	1200-2500
113. <i>Storhyngura novaezelandiae</i> (Beddard), 1886a	2012	9. <i>Munnopsoides eximius</i> Hansen, 1916	866-2702
114. <i>Storhyngura pulchra</i> Hansen, Wolff, 1956	6620	10. <i>Munnopsurus longipes</i> Tattersall, Hansen, 1916	710-2702
115. <i>Acanthocope spinicauda</i> Beddard, 1886a	3290	11. <i>Paramunnopsis oceanica</i> Tattersall, Hansen, 1916	0-2702
116. <i>Antarcturus abyssicola</i> (Beddard), 1886a	2560-4359	12. <i>Pseudomunnopsis beddardi</i> (Tattersall), 1905 (1906)	354-2702
117. <i>Antarcturus brunneus</i> (Beddard), 1886a	2928	13. <i>Paramunnopsis spinifer</i> (Vanhöffen), 1914	400-3000
118. <i>Antarcturus spinosus</i> (Beddard), 1886a	2516	14. <i>Notophryxus longicaudatus</i> Vanhöffen, 1914	0-3000
119. <i>Eurycope</i> sp. Beddard, 1886a	2925	EXCLUDED PROBABLE PELAGICS: SOUTH ATLANTIC	
120. <i>Eurycope sarsii</i> Beddard, 1886a	2514-2926	15. <i>Asconiscus simplex</i> G. O. Sars, Vanhöffen, 1914	0-3000
121. <i>Eurycope spinosa</i> Beddard, 1886a	3565	16. <i>Cryptoniscus</i> sp. Vanhöffen, 1914	30-3000
122. <i>Ischnomesus bacillus</i> (Beddard), 1886a	3292	17. <i>Microniscus ornatus</i> Vanhöffen, 1914	3000
123. <i>Serolis antarctica</i> Beddard, 1884	2517-2925	18. <i>Microniscus</i> sp. Vanhöffen, 1914	400-2500
124. <i>Serolis bromleyana</i> Suhm, Beddard, 1884	1280-2011	19. <i>Paramunnopsis oceanica</i> , Vanhöffen, 1914	0-3000
INDIAN OCEAN			
125. <i>Antarcturus furcatus</i> (Studer), 1914	3062	EXCLUDED PROBABLE PELAGICS: SOUTH PACIFIC AND INDIAN OCEAN	
126. <i>Antarcturus gaussianus</i> Vanhöffen, 1914	2450	20. <i>Anilocra meridionalis</i> Searle	2000-2500
127. <i>Antarcturus glacialis</i> (Beddard), 1886a	3062	21. <i>Microniscus</i> sp. Vanhöffen, 1914	400-2500
128. <i>Desmosoma longimana</i> Vanhöffen, 1914	2735	22. <i>Munnopsoides australis</i> Beddard, 1886a	2500-3000
129. <i>Eurycope ovalis</i> Vanhöffen, 1914	3423		
130. <i>Eurycope vicarius</i> Vanhöffen, 1914	3423		
131. <i>Haploniscus antarcticus</i> Vanhöffen, 1914	385-3397		
132. <i>Haploniscus curvirostris</i> Vanhöffen, 1914	3423		
133. <i>Iolanthe acanthonotus</i> Beddard, 1886a	3062		

SYSTEMATICS

The systematic arrangement of this monograph follows the scheme set forth by Menzies (in press). In outline this is:

- Order: Isopoda
 - Suborder: Gnathiidea
 - Suborder: Quatuordecapoda (Isopoda, *sensu stricto*)
 - Tribe 1: Asellota
 - Tribe 2: Valvifera

- Tribe 3: Flabellifera
- Tribe 4: Epicaridea
- Tribe 5: Oniscoidea
- Tribe 6: Phreatoicoidea

The Phreatoicoidea and Oniscoidea, with terrestrial and fresh water species, lack abyssal representatives and are, therefore, outside of the scope of this work.

Suborder: GNATHIIDEA MONOD, 1926a

This major category of the Isopoda deserves mention in a treatise on abyssal organisms mainly because it is so poorly represented in the abyss. Only two species are known from below 2000 meters; these are *Gnathia stygia* (G. O. Sars) and *Gnathia caeca* Richardson. The majority of the species live in shelf depths (viz., down to 200 meters). The animals, by virtue of their parasitic mode of life, are intimately tied to a fish host. This is probably the major reason why they have not been successful in penetration of the deep sea.

The main zoogeographic conclusions that can be drawn from the great work by Monod (1926a) are that the gnathiid isopods are cosmopolitan in their distribution; that there are more species in the north and south temperate zones than elsewhere; and that the Antarctic has three times the number of species found in the Arctic. Bipolarity is not known in this group.

Diagnosis: Isopoda with five pairs of pereopods. Mandibles of male project beyond cephalon as a pair of pincers. Last pair of appendages lost and seventh somite much reduced. Appendages of first pereopod united into the cephalon as a second pair of maxillipeds (the pylopods). Adult male is the gnathia stage, adult female the praniza, and larval form the anceus.

Affinities: The gnathiidea have obviously been derived from a cirrolanid-type ancestor, and as early as the Jurassic the probable precursor *Urda* was developed. The nearest relative to *Urda* living today, however, is probably *Gnatholana*, a shallow water genus from Africa.

I tend to favor the consideration that the gnathiids represent a group which has evolved since the Mesozoic from an *Urda*-like ancestor. Since then they have become highly specialized fish parasites. *Gnatholana*,

on the other hand, probably represents a relict descendant from the *Urda* type.

Two new species of *Gnathia* were found in the *Vema* collections from bathyal depths off the South African coast. These are described here together with the only two known abyssal species, *G. stygia* and *G. caeca*.

A KEY TO THE FOURTEEN DESCRIBED SPECIES OF GNATHIIDEA KNOWN FROM DEPTHS OF 500 METERS AND GREATER (Modified from Monod, 1926a, pp. 282-339)

1. Pylopods with five articles 2
1. Pylopods with three articles 5
2. Frons produced as a triangulate process as far as the apex of the mandibles . . . *Bathygnathia* . . . 3
2. Frons not produced *Akidognathia* . . . 4
3. Apex of rostrum with a patch of setae *bathybia* (Beddard) (1638 meters, *Challenger*, 38° 11' N., 27° 9' W.)
3. Apex of rostrum nude *curvirostris* Richardson (709-1232 meters, *Albatross*, N. Atlantic, south of Martha's Vineyard and east of Georges Bank)
4. Pylopods operculate *cristatipes* (Stebbing) (980 meters, *Porcupine*, 48° 6' N., 9° 18' W.)
4. Pylopods pediform *poteriophora* Monod (914 meters, *Ingolf*, St. Croix, Antilles)
5. Frons produced 7
5. Frons not produced 6
6. Frontal process bifid *abyssorum* (G. O. Sars) (N. Atlantic, Norwegian fjords, 128-887 meters)
6. Frontal process trifid *oxyuraea* (Lilljeborg) (Norway, England, Mediterranean, 0-533 meters)
7. With eyes 8
7. Without eyes 11
8. Eyes produced on immovable swellings *elongata* (Krøyer) (0-890 meters, circumpolar, Norway, etc.)
8. Eyes not produced, sessile 9
9. Supraocular lobe produced *hirsuta* (G. O. Sars) (208-1755 meters, Norway, Davis Strait)
9. Supraocular lobe not produced 10

10. Head subcircular, mandibles small and not extending to margin of frons . . . *serrata* Richardson (709 meters, *Albatross*, N. Atlantic, south of Martha's Vineyard)
10. Head quadrate, mandibles normal *tuberculata* Richardson (1132 meters, *Albatross*, 37° 22' .30" N., 137° 47' E., off Japan)
11. Peraeopods strongly spinous, head small (much narrower than peraeon) . . . *stygia* (G. O. Sars) (535–2391 meters, N. Atlantic)
11. Peraeopods weakly spinous, head large (nearly as wide as peraeon) 12
12. Somite 4 of peraeon with a sulcus on dorsal surface at midline *caeca* Richardson (2638 meters, N. Atlantic)
12. Somite 4 of peraeon without a sulcus on dorsal surface at midline 13
13. Lateral border of head strongly convex. Lateral margin of peraeon convex . . . *bicolor* Hansen (1537 meters, N. Atlantic)
13. Lateral border of head scarcely convex, borders of peraeon subparallel *albescens* Hansen (842–1018 meters, N. Atlantic)

Genus: GNATHIA Leach

Gnathia vema, new species

Figure 2

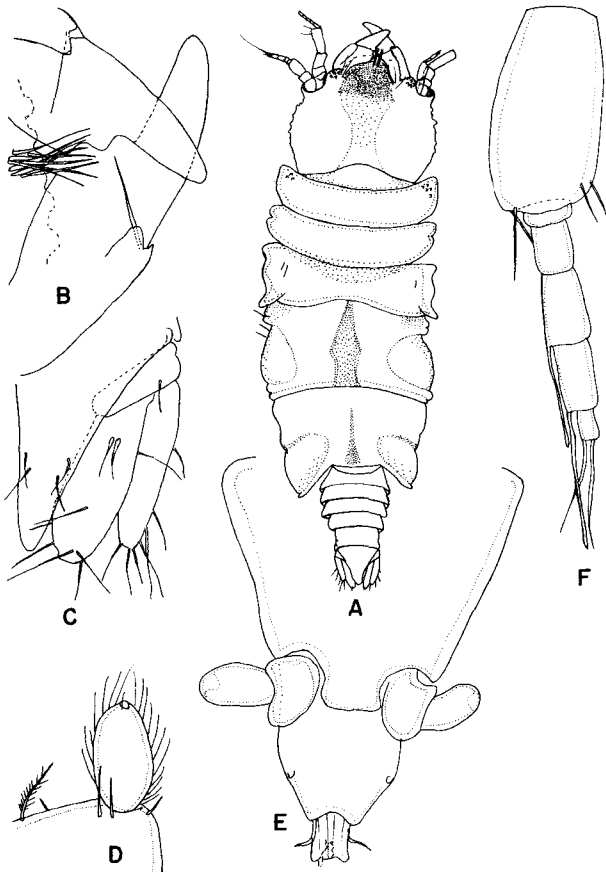


Figure 2. *Gnathia vema*, n. sp. A: male holotype; B: mandible and frons; C: pleotelson and uropod; D: pylopod; E: frons of praniza; F: first antenna, male.

Synonyms: None.

Diagnosis: *Gnathia* with a produced and entire frons, eyes lacking. Mandible with a pronounced redan and three teeth. Pylopod with three articles. Last article minute. Flagellum of first antenna with five articles, second also with five articles. Last two large peraeonal somites with a dorsal medial sulcus. Peraeopods not markedly spinous. Pleopoda lacking setae.

Measurements: Holotype male length 2.8 mm., width pleotelson 0.2 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 55, type plus two male paratypes and one praniza, cat. no. I-41.

Distribution: Known only from the type locality.

Affinities: This species is closely allied to *Gnathia caeca* Richardson, from which it differs in having teeth on the mandible; otherwise the two are very similar.

Gnathia caeca Richardson

Figure 3 A–B

Synonyms: *Gnathia caeca* Richardson, 1911, pp. 519–520; Stephensen, 1915, p. 7; Monod, 1926a, pp. 406–408.

Diagnosis: Pylopods with three articles. Head as wide as thorax. Eyes lacking. Frons produced but not as far as mandible apex. Supraocular lobes strongly tuberculate. Peraeopods without many stout spines. Fourth peraeonal somite with a pronounced dorso-medial sulcus. Margins of uropods and telson entire, without teeth.

Measurements: Length 5 mm. (Monod, op. cit., p. 407).

Type locality: North Atlantic, *Talisman* Station 76, latitude 25° 1' N., longitude 19° 15' W., 2638 meters (Monod, op. cit., p. 408).

Distribution: Known only from type locality.

Affinities: The species appears to be most nearly related to *G. bicolor* Hansen in key characteristics at least (*vide* Monod, op. cit., p. 332).

Gnathia stygia (G. O. Sars)

Figure 3 C–E

Synonyms: *Anceus stygius* G. O. Sars, 1877, p. 348; — 1885, pp. 85–92; — 1886, pp. 27, 85. *Gnathia stygius* (G. O. Sars), Stebbing, 1893, p. 338; — Ohlin, 1901, p. 22, Fig. 3. *Caecognathia stygia* (G. O. Sars), Dollfus, 1901, p. 244. *Caecognathia sarsi* A. Dollfus, 1901, pp. 244–245, Fig. 3. *Bathygnathia stygia* (err. typ.), Stephensen, 1915, p. 6. *Caecognathia stygia* (G. O. Sars), Stephensen, 1915, p. 7. *Gnathia Stygia* (G. O. Sars), Hansen, 1916, pp. 230–232; Monod, 1926a, pp. 398–405.

Diagnosis: Pylopods with three articles. Head narrower than thorax. Eyes lacking. Frons produced

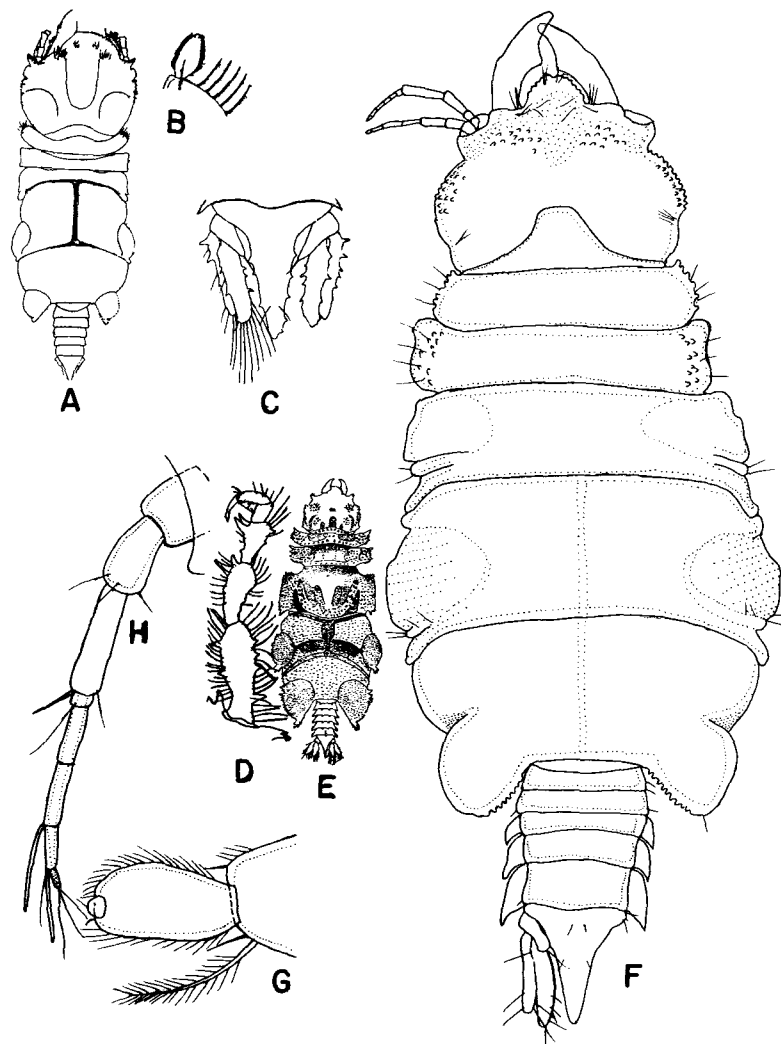


Figure 3. A-B: *Gnathia caeca* Richardson. A: male; B: pylopod (after Monod, 1926a, p. 406, Fig. 162). C-E: *Gnathia stygia* (G. O. Sars). C: pleotelson; D: fifth pereopod; E: male (after Monod, 1926a, pp. 400-401, Figs. 159-160). F-H: *Gnathia albescenoides*, n. sp. F: male holotype; G: pylopod; H: first antenna.

but not as far as the mandible apex. Supraocular lobes ramose. Pereopods with many stout spines. Fourth pereaeonal somite with a pronounced dorso-medial sulcus. Margin of uropods and telson dentate. Pleopoda elongate and smooth. Entire body provided with sharp tubercles. Flagellum of first antenna with five articles. That of second antenna with seven articles.

Measurements: Length to 11 mm. (Monod, op. cit., p. 402).

Type locality: North Atlantic, latitude 65° 53' N., longitude 7° 18' W., 2127 meters.

Distribution: Arctic Ocean (Gurjanova) to Norwegian Basin of North Atlantic, 552-2465 meters (Hansen, op. cit). Taken by the *Ingolf* from the following stations:

North of the Faeroes: Station 141, latitude 63° 22' N., longitude 6° 58' W., 1279 meters, temperature -0.6°, six specimens (five male); Station 139.

East of Iceland: Station 105, latitude 65° 34' N., longitude 7° 31' W., 1435 meters, temperature -0.8°, one specimen (male). Station 103, latitude 66° 23' N., longitude 8° 52' W., 1090 meters, temperature -0.6°, one specimen (male); Station 102, latitude 66° 23' N., longitude 10° 26' W., 1412 meters, temperature -0.9°, five specimens (one male).

North of Iceland: Station 126, latitude 67° 19' N., longitude 15° 52' W., 552 meters, temperature -0.5°, one specimen (larva); Station 124, latitude 67° 40' N., longitude 15° 40' W., 932 meters, temperature -0.6°, one and one-half specimens (male).

North east of Iceland: Station 120, latitude 67° 29' N., longitude 11° 32' W., 1666 meters, temperature -1.0°, two specimens (male); Station 119, latitude 67° 53' N., longitude 10° 19' W., 1902 meters, temperature -1.0°, one specimen (larva).

South of Jan Mayen: Station 117, latitude 69° 13' N., longitude 8° 23' W., 1889 meters, temperature -1.0.

two specimens (both larvae, one of them on *Liparis frigidus*); Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temperature -1.0°, one specimen (larva, taken on *Liparis frigidus*).

Gnathia albescenoides, new species
Figure 3 F-H

Synonyms: None.

Diagnosis: *Gnathia* with produced frons, eyes lacking. Mandible with slight redan but lacking teeth on cutting edge. Pylopod triarticulate, last article minute. Last two large peraeonal somites without a

dorsal medial sulcus. Flagellum of first antenna with five articles, second with six articles.

Measurements: Holotype male length 5.4 mm., width pleon 0.4 mm., allotype length 5.5 mm., width pleon 0.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 54, types plus five male paratypes, cat. no. I-42.

Distribution: Known only from type locality.

Affinities: This species is closely allied to *Gnathia albescens* H. J. Hansen. It differs from that species in having a narrower frons and in having six instead of eight articles to the flagellum of the second antenna. Otherwise the two are very similar.

Suborder: QUATUORDECAPODA (Isopoda, *sensu stricto*)

The quatuordecapods contain the majority of the abyssal isopods, but even here the abundance of abyssal species is strongly skewed toward the Asellota. The generally detritus-feeding habits of asellotes and the low incidence of parasitism (none known), commensalism (*Caecijera horvathi*, *Iais* spp., *Antias*

unirameus), and carnivorous feeding (none known) are probably the most important factors related to the ability of the asellotes to penetrate the abyss. Parasitic isopods in general are rare in the abyss. The anthurids perhaps constitute an exception.

Tribe: ASELLOTA

It is possible to divide the Asellota into three groups of equivalent rank, as shown in the following key. The characteristics used are shown in Figure 4.

A KEY TO THE SUBTRIBES OF THE
TRIBE ASELLOTA
(After Menzies, in press)

- 1. Male first pair of pleopods fused along midline; consisting of an elongate sympod, lacking rami. Second male pleopods coupled loosely with first pairs. First pair of female pleopods lacking; second fused along midline to form a large operculum covering the remaining pleopods. Pleon with one or two somites *Paraselloidea*
- 1. Male first pair of pleopods consist of a short sympod and a short ramus, neither coupled with second pair. First pair of pleopods of female not covering the remaining pleopods. Pleon with three somites *Stenetrioidea*
- 1. Basal article of male first pleopods free, not joined medially into a single piece. Neither the first pair of pleopods of female nor the basal article of male first pleopods fused together *Aselloidea*

It is perhaps well to add also that the Paraselloidea (Fig. 4) never have more than two somites comprising the pleon, whereas the Aselloidea and Stenetrioidea always have more than two complete pleonal somites. The structure of the pleon and pleopods shows definitely that the Paraselloidea represent a specialized advanced group, whereas the Stenetrioidea and Aselloidea conserve the greatest number of primitive characteristics. The Aselloidea contain only fresh

water species, whereas the Stenetrioidea are exclusively marine, most extensively developed in the shallow water of the subtropics, and have only one abyssal representative. To the Paraselloidea belongs the majority of the abyssal species. It is possible to divide the Paraselloidea into two additional previously unrecognized groups. The first category embraces species in which the anal opening is separated from the branchial cavity, and the second includes species in which the anus is enclosed within the branchial cavity. As obvious as this characteristic is in some genera (*viz.*, separated from the branchial chamber in *Haploniscus*, and contained within the branchial chamber in *Pleurogonium*), it is nevertheless impossible to utilize it at this date, due to the fact that it is not well enough described for the majority of asellote genera. At first I thought there might be a correlation between the separation of the anus from the branchial chamber and abyssal habitat, but this turns out not to be the case because in *Abyssijaera*, a genus in which the anus is enclosed within the branchial chamber, an abyssal habitat is typical, whereas in *Munna*, an intertidal genus, the anus is terminal and separated from the branchial chamber.

A separation of families in the number of pleonites comprising the pleon is a more hopeful one, but here again only in those cases where it is perfectly certain and obvious—e.g., *Haploniscus* with one and *Ilyarachna* with two pleonal somites.

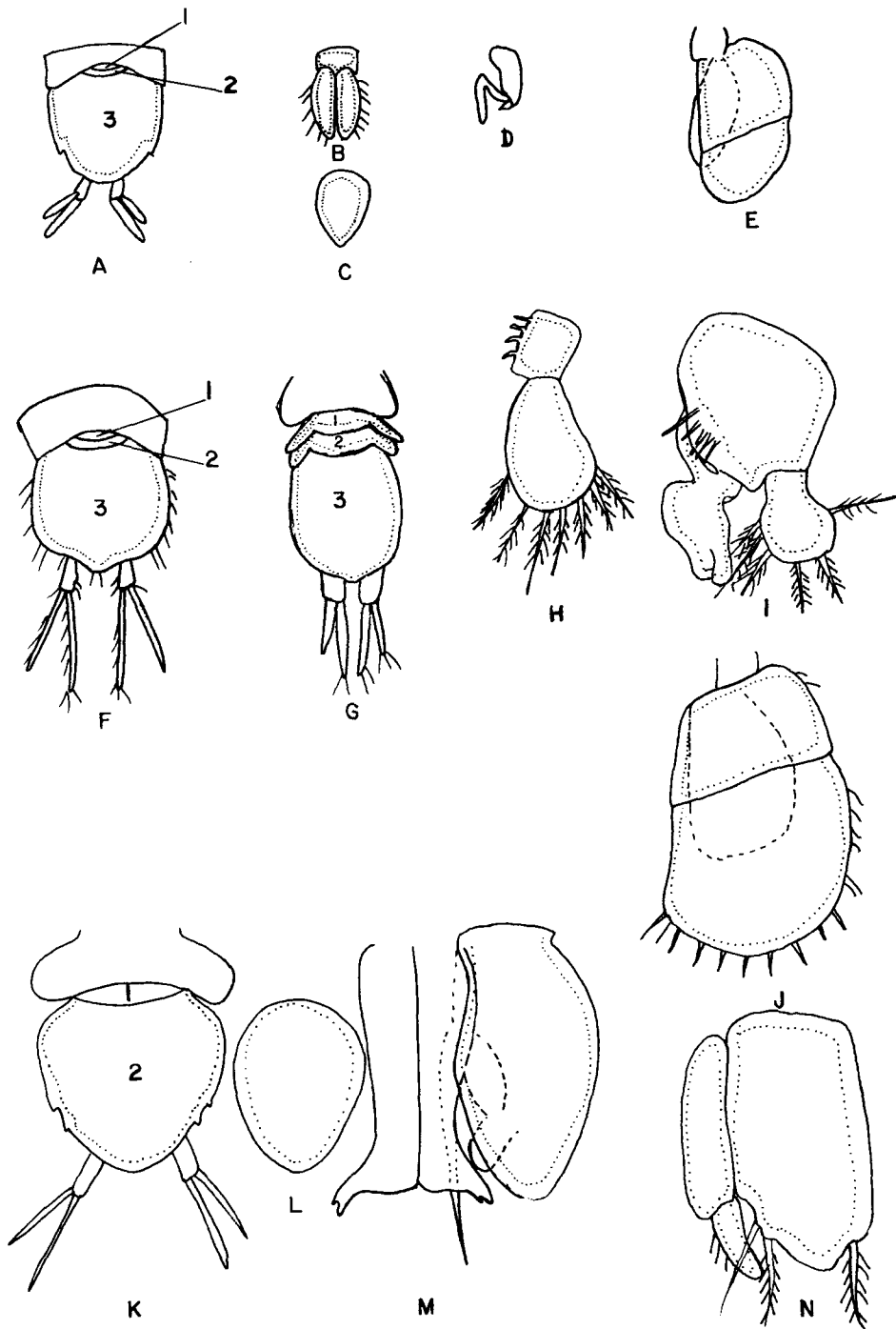


Figure 4. Characteristics of asellota. A-E: Stenetrioidea. A: pleon; B: male first pleopod; C: female first (second) pleopod; D: male second pleopod; E: third pleopod, either sex. F-J: Aselloidea. F: pleon *Asellus*; G: pleon *Stenasellus*; H: male first pleopod; I: male second pleopod; J: third pleopod, either sex. K-M: Paraselloidea. K: pleon *Janira*; L: female first (second) pleopod; M: first and second male pleopod; N: third pleopod, either sex. (Figures A-E after Hansen, 1916, from Richardson, 1905; F-J after Birstein, 1951; K-N after Menzies, 1952.)

A KEY TO THE FAMILIES OF THE
TRIBE ASELOTA, SUBTRIBE
PARASELLOIDEA*
(Modified after Menzies, in press)

- 1. None of the pereopods modified for swimming . . . 5
- 1. Some of the pereopods modified for swimming . . . 2
- 2. All pereopods except first pair modified for swimming, similar in structure . . . *Desmosomidae**
- 2. Only pereopods 5-6 or 7 inclusive paddle-like. Others simple walking legs or fossorial appendages 3
- 3. Only pereopods 5-6 paddle-like, seventh a simple walking leg *Ilyarachnidae**
- 3. Pereopods 5-7 inclusive paddle-like 4
- 4. Pereopods 5-7 inclusive lack dactyls . . . *Munnopsidae*
- 4. Pereopods 5-7 inclusive with dactyls . . . *Eurycopidae**
- 5. Uropoda lack peduncle 6
- 5. Uropoda with peduncle 7
- 6. Molar process of mandible normal, strong, truncated at denticulate grinding apex . . . *Munnidae**
- 6. Molar process of mandibles weak, pointed *Pleurogonidae**
- 7. Fourth and fifth peraeonal somites sometimes elongated twice as long as wide *Ischnomesidae**
- 7. All peraeonal somites similar in width, none twice as long as wide, most wider than long 8
- 8. Palp of maxilliped with narrow similar articles all less than one-half the width of endite 9
- 8. Palp of maxillipeds with last two articles narrow, others twice as wide 12
- 9. Molar process of mandible normal, strong, truncated at denticulate grinding apex 10
- 9. Molar process spiniform *Jaeropsidae*

- 10. Dactyl of seventh pereopod with one elongated terminal claw 11
- 10. Dactyl of seventh pereopod with two short claws *Antiasidae**
- 11. Coxal plates developed *Dendrotionidae**
- 11. Coxal plates lacking *Haplomiscidae**
- 12. Articles of maxillipedal palp one-half the width of endite *Acanthaspidae**
- 12. Articles of maxillipedal palp about as wide as endite 13
- 13. Dactyls of pereopods 2-7 inclusive with two principal claws and a smaller accessory claw *Ianiridae**
- 13. Dactyls of pereopods 2-7 inclusive with one or two terminal claws but never three 14
- 14. Molar process of mandible reduced to short setiferous tubercle *Nannoniscidae*
- 14. Molar process normal, expanded apically and truncated, grinding 15
- 15. Coxal plates present 17
- 15. Coxal plates absent 16
- 16. First pereopod with two stout dactyls *Echinothambemidae**
- 16. First pereopod with one dactyl only . . . *Macrostylidae**
- 17. Body not markedly elongated 18
- 17. Body length exceeds four times its width *Thambematidae**
- 18. Pleon with one somite, uropoda uniramous *Ianirellidae**
- 18. Pleon with two somites, uropoda biramous 19
- 19. Coxal plates spiniform *Schistosomidae*
- 19. Coxal plates rounded *Abysianiridae** and some *Munnidae*

* Families with abyssal representatives marked with asterisk.

Family: HAPLONISCIDAE

Type genus: *Haplomiscus* Richardson.

Diagnosis: Paraselloidea with free head. Eyes lacking. Mandibles normal with palp and expanded molar, lacinia, and setal row. Antennae shorter than body. All pereopods simple walking legs; dactyl with at least one terminal claw, never three. Uropoda ventral, with peduncle and one ramus only. All peraeonal somites of similar width, wider than long. First three articles of maxillipedal palp narrow, less than one-half the width of endite. Pleon with one somite only. Anus widely separated from branchial chamber. (Modified after Menzies, 1956a, p. 9.)

Composition: This family contains *Haplomiscus* Richardson, *Hydromiscus* Hansen, and a proposed new genus, *Antennulomiscus*. All are now known from the North and South Atlantic. The majority of the species are abyssal, although shallow water species are known.

Genus: HAPLONISCUS Richardson.

Type species: *Nannoniscus bicuspis* G. O. Sars, 1885, Richardson, 1908a, p. 75.

Richardson (op. cit.) established this species in

1908 with *Nannoniscus bicuspis* G. O. Sars, 1885, as the type. At the same time Richardson described two additional species, *H. excisus* and *H. retrospinis*. Vanhöffen, 1914, described two species, *H. antarcticus* and *H. curvirostris*. Hansen, 1916, added two more species, *H. spinifer* and *H. armadilloides*. Barnard, 1920, described *H. dimeroceras*, and Menzies, 1956a, added *H. unicornis*, and with Tinker (1960), *H. robinsoni*.

Menzies (op. cit.) constructed a key to the species based upon the presence or absence of a complete seventh peraeonal somite. The collections now available show that this characteristic is not the best one to use, as the segmentation may be obscure, even though present, in certain species and is not described accurately for the known species. A more obvious characteristic divides the species of this genus into two groups which are tentatively considered as separate genera.

Generic diagnosis: Haplomiscidae with uniramous uropoda. Peraeon with 6-7 articulated somites. Epimera (coxal plates) not visible in dorsal view. Third article of the peduncle of the second antenna about as long as wide. (After Menzies, 1956a.)

Composition: To this genus belong all the species mentioned above except *dimeroceras* Barnard, which is transferred to *Antennuloniscus*. The 20 following new species described herein also belong to *Haploniscus*.

Depth distribution:	Meters	
<i>bicuspis</i> (G. O. Sars)	360-2465	Hansen, 1916, p. 30
<i>spinifer</i> Hansen	2970-3474	Hansen, 1916, p. 31
<i>armadilloides</i> Hansen	1301-1301	Hansen, 1916, p. 32
<i>antarcticus</i> Vanhöffen	385-3397	Vanhöffen, 1914, p. 557
<i>curvirostris</i> Vanhöffen	3423-3423	Vanhöffen, 1914, p. 558
<i>excisus</i> Richardson	3235-3235	Richardson, 1908a, p. 76
<i>retrospinis</i> Richardson	713-713	Richardson, 1908a, p. 77
<i>unicornis</i> Menzies	5104-5122	Menzies, 1956a, p. 1
<i>robinsoni</i> Menzies and Tinker	2860-2858	Menzies and Tinker, 1960, pp. 2-4.

The genus is obviously eurybathyal, extending from bathyal depths to the abyss. To date it is unknown from hadal depths (viz., below 6000 meters).

Diagnostic characteristics: The diagnostic characteristics are shown in Figure 5. The cephalon frontal margin (frons) may be quadrate, excavate, or convex

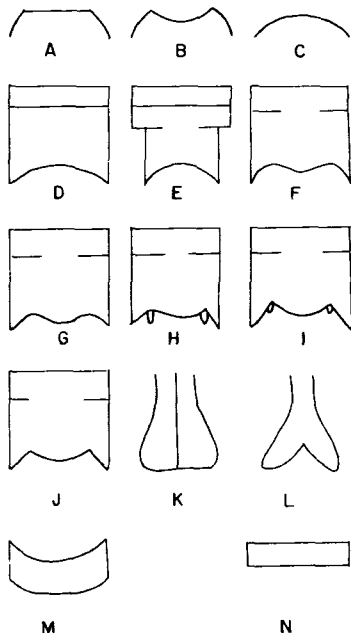


Figure 5. Key characteristics of *Haploniscus*. A-C: frons of cephalon; D-F: shape of pleon; G-J: posterior margin of pleon and uropods; K-L: male first pleopods; M-N: fourth peraeonal somite.

and with or without medial projections (Fig. 5 A-C). The lateral margin of the seventh peraeonal somite may project beyond the margin of the pleon or may be continuous with it (Fig. 5 D-E). The postero-lateral angles of the pleon may or may not project beyond the postero-medial margin of the pleon (Fig. 5 F-G). The uropods may or may not extend to the margin of the pleon or may be concealed from dorsal view (Fig. 5 H-J). The sympod of the first pleopod of the male may or may not be separated at the apex

(Fig. 5 K-L). The antero-lateral margin of the fourth peraeonal somite may be produced forward in various degrees or may not be produced (Fig. 5 M-N). Additionally, the flagellum of the first antenna may have a differing number of articles and the frontal border of the cephalon may or may not conceal the first article of the first antenna. The spine on the peduncle of the second antenna may be present or absent. These characteristics not only serve to distinguish one species from another but also serve to indicate the genetic similarities between various species. It is on the characteristics that the following natural key to the species is based.

A KEY TO THE SPECIES OF HAPLONISCUS

1. First article of first antenna concealed by cephalon dorsally 2
1. First article of first antenna not concealed by cephalon dorsally 8
2. Postero-lateral angles of pleon project beyond medial margin *curvirostris* Vanhöffen
2. Postero-lateral angles of pleon not projecting beyond medial margin 3
3. Uropoda extending to posterior margin of pleon 4
3. Uropoda not extending to posterior margin of pleon 6
4. Frontal margin with medial projection *armadilloides* Hansen
4. Frontal margin entire, without medial projection 5
5. Lateral border of pleon and peraeon continuous, body tuberculate *tuberculatus*, n. sp.
5. Pleon set in from peraeon at lateral margin *parallelus*, n. sp.
6. Uropoda concealed in dorsal view 7
6. Uropoda exposed in dorsal view *ovalis*, n. sp.
7. Pleon quadrate *trituberculatus*, n. sp.
7. Pleon pointed *telus*, n. sp.
8. Frontal margin of cephalon excised 9
8. Frontal margin of cephalon straight or convex 14
9. Frontal margin with medial projection 10
9. Frontal margin entire, without medial projection 22
10. Postero-lateral angles of pleon produced beyond medial margin 24
10. Postero-lateral angles of pleon not produced beyond medial margin 11
11. Medial projection of front with a projected base 12
11. Medial projection of front entire 13
12. Pleon set in from peraeon *tricornoides*, n. sp.
12. Pleonal and peraeonal margins continuous *tricornis*, n. sp.
13. Frontal projection with a broad base, tapering to a point *bicuspis* (G. O. Sars)
13. Frontal projection widest at least one-half its length *spatulifrons*, n. sp.
14. Frontal margin with a medial projection 15
14. Frontal margin without a medial projection 20
15. Pleon set in from peraeon 16
15. Pleonal and peraeonal lateral margins continuous 18
16. Medial projection bifid *rugosus*, n. sp.
16. Medial projection a single knob 17
17. Flagellum of first antenna with four articles *polaris*, n. sp.
17. Flagellum of first antenna with five articles *antarcticus* Vanhöffen

- 18. Medial projection a simple knob 19
- 18. Medial projection longer than wide *unicornis* Menzies
- 19. Postero-lateral angles of pleon exceed twice the length of uropoda *retrospinis* Richardson
- 19. Postero-lateral angles of pleon equal the length of uropoda *percavix*, n. sp.
- 20. Lateral border of fourth peraeonal somite produced forward *quadrifrons*, n. sp.
- 20. Lateral border of fourth peraeonal somite not produced forward 21
- 21. Uropoda extending almost to the margin of the postero-lateral angles of the pleon *acutus*, n. sp.
- 21. Uropoda very short, less than one-half the length of the pleon postero-lateral angles *spinifer* Hansen
- 22. Lateral borders of fourth peraeonal somite produced forward and pointed at antero-lateral angle *elevatus*, n. sp.
- 22. Lateral borders of fourth peraeonal somite not produced forward or with blunt lateral angles 23
- 23. Pleon set in from peraeon 27
- 23. Lateral border of pleon and peraeon continuous *minutus*, n. sp.
- 24. Frontal projection trifold 25
- 24. Frontal projection entire 26
- 25. Lateral border peraeon and pleon continuous *tridens*, n. sp.
- 25. Lateral border pleon set in from peraeon *capensis*, n. sp.
- 26. Uropods extending to postero-lateral margin of pleon *nondescriptus*, n. sp.
- 26. Uropods not extending to postero-lateral margin of pleon *princeps*, n. sp.
- 27. Uropods extending beyond postero-lateral margin of pleon *excisus* Richardson
- 27. Uropods not extending to postero-lateral margin of pleon *tropicalis*, n. sp.

Haploniscus bicuspis (G. O. Sars)

Figure 6 A-D

Synonyms: *Nannoniscus bicuspis* G. O. Sars, 1877, p. 352. *Haploniscus bicuspis* (G. O. Sars); — Richardson, 1908a, p. 75; — Hansen, 1916, pp. 29-30, Pl. II (incomplete).

Diagnosis: Frontal border of cephalon with a median projection, base broad tapering to a point. Flagellum of first antenna with six articles. Lateral margins of peraeon and pleon continuous. Antero-lateral margin of fourth peraeonal somite not produced forward, lateral angles blunt. First article of first antenna not concealed by cephalon dorsally. Uropods extending to posterior margin of pleon and to the end of the postero-lateral angles.

Measurements: Length 2.90 mm. (G. O. Sars, 1885, p. 122).

Type locality: North Atlantic, west of Norway, latitude 63° 5' N., 988 meters (Hansen, 1916, p. 30) or possibly latitude 69° 46' N., 1220 meters.

Distribution: Hansen (op. cit.) records the species from 15 *Ingolf* stations, and one—Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters—is

from abyssal depth. Presumably it is eurybathial, extending from 360 meters to 2465 meters.

Here it is recorded from the South Atlantic, L.G.O. Biotrawl No. 12, one male and two females, cat. no. I-5; and L.G.O. Biotrawl No. 53, one male and four females, cat. no. I-4.

It is highly probable that Hansen (op. cit.) confused at least two species in what he called *bicuspis*; his illustrations, Pl. II, show specimens in which the uropoda do and do not reach the posterior margin of the pleon. For this reason not all of his distributional data is cited here. I have not seen his specimens. The male that he figures is doubtless a distinct bathyal species and probably is identical with Richardson's *retrospinis*. It differs from the true *bicuspis* in having the apex of the male pleopod swollen and the uropods not reaching the posterior margin of the pleon; that is, the postero-lateral angles of the pleon are much produced.

Affinities: This species is related to *tricornis* and *tricornoides*, from both of which it differs in lacking a projected base on the medial spine of the frontal margin of the cephalon.

Haploniscus unicornis Menzies

Figure 6 E-G

Synonym: *Haploniscus unicornis* Menzies, 1956a, p. 9.

Diagnosis: Frontal border of cephalon convex, with elongated (longer than breadth of base) spine-like horn. Lateral borders of pleon and peraeon continuous. Flagellum of first antenna with five articles. Postero-lateral angles of pleon produced beyond medial margin. First article of first antenna not concealed by cephalon dorsally. Antero-lateral border of fourth peraeonal somite not produced forward; lateral margin quadrate. Uropoda extending beyond apex of pleon but not to tips of postero-lateral angles of pleon.

Measurements: Female length 1.45 mm., width at second peraeonal somite 0.60 mm. (Menzies, 1956a, p. 9).

Type locality: North Atlantic, L.G.O. Biotrawl No. 1, 5104-5122 meters, cat. no. 11759, A.M.N.H.

Distribution: Known only from type locality.

Affinities: The elongate spine which is much larger than its base on the front of the cephalon distinguishes this species from the others.

Haploniscus excisus Richardson

Figure 6 H

Synonyms: *Haploniscus excisus* Richardson, 1908a, pp. 75-77, Figs. 4-5.

Diagnosis: Frontal border of cephalon excavated, entire. Flagellum of first antenna with five articles. Pleon set in from peraeon. Lateral borders of fourth

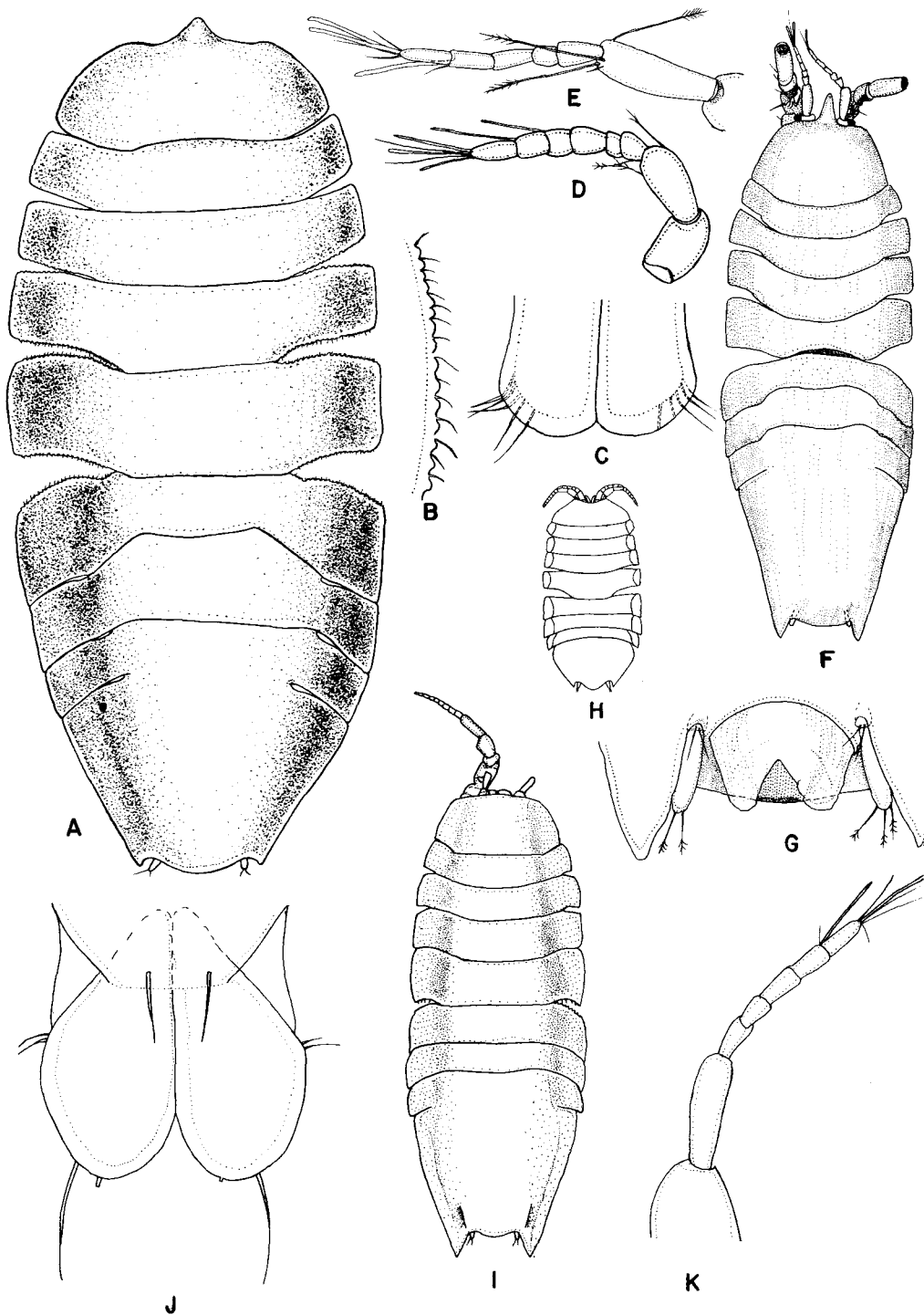


Figure 6. A-D: *Haploniscus bicuspis* (G. O. Sars). A: male dorsal view, 5.1 mm. long, 2.1 mm. wide, L.G.O. Sta. 12; B: anterior border fifth pereopod somite; C: male first pleopod; D: first antenna. E-G: *Haploniscus unicornis* Menzies. E: first antenna; F: dorsal view type; G: ventral view pleotelson (after Menzies, 1956a). H: *Haploniscus excisus* Richardson, dorsal view type (after Richardson, 1908a). I-K: *Haploniscus spinifer* Hansen. I: dorsal view male; J: male first pleopod; K: first antenna (after Hansen, 1916, Pl. II).

pereopod somite not produced forward, lateral edges blunt. First article of first antenna not concealed by cephalon dorsally. Uropods extending beyond postero-lateral margin of pleon.

Measurements: None available.
Type locality: North Atlantic, east of Georges Bank, Albatross Station 2572, 3235 meters.
Distribution: Known only from type locality.

Affinities: This species is closely related to *H. tropicalis*, from which it differs in having the uropoda extending beyond the postero-lateral margin of the pleon.

Haploniscus spinifer Hansen

Figure 6 I-K

Synonyms: *Haploniscus spinifer* Hansen, 1916, p. 31, Pl. II.

Diagnosis: Frontal border of cephalon very slightly convex, entire. Flagellum of first antenna with five articles. Pleon set in from peraeon. Antero-lateral margin of fourth peraeonal somite not produced

forward, lateral borders straight. First article of first antenna not concealed by cephalon dorsally. Postero-lateral angles of pleon produced beyond medial border, uropods extending beyond medial border but not beyond postero-lateral angles. Apex of male first pleopod separated, swollen with two apical setae.

Measurements: Largest male 2.8 mm. length (Hansen, 1916, p. 31).

Type locality: This is uncertain because Hansen lists three *Ingolf* stations and further cites some variability which seems too wide for a single species. The male pleopod which he figures came from a specimen from *Ingolf* Station 22, and this seems the

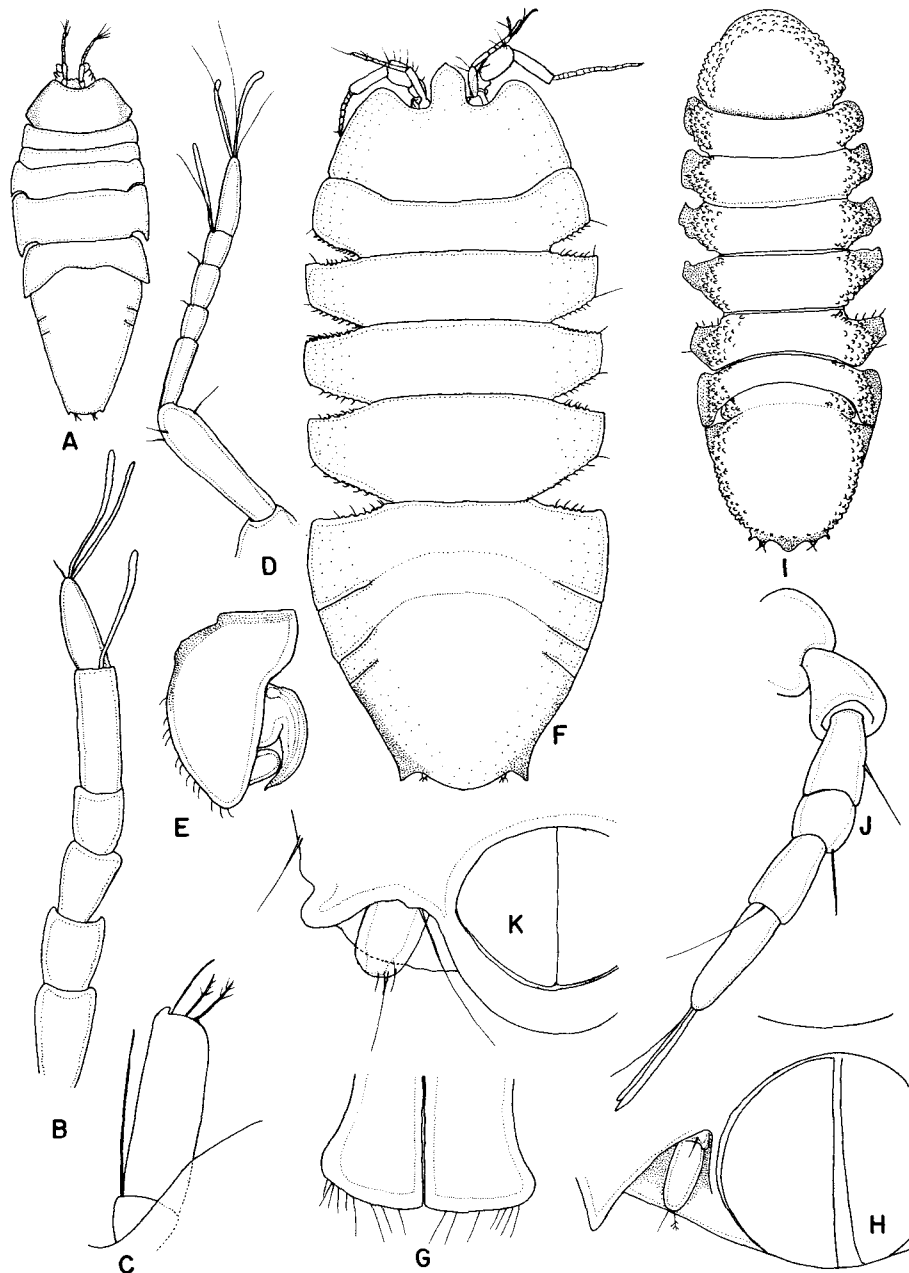


Figure 7. A-C: *Haploniscus minutus*, n. sp. A: female dorsal view; B: first antennal flagellum; C: uropod. D-H: *Haploniscus spatulifrons*, n. sp. D: first antenna; E: second pleopod; F: male dorsal view; G: first pleopod; H: anus and uropod. I-K: *Haploniscus tuberculatus*, n. sp. I: female dorsal view; J: first antenna; K: anus and uropods.

logical choice of type locality; latitude, 58° 10' N., longitude 48° 25' W., 3474 meters, temperature 1.4° C., four specimens.

Distribution: Uncertain. It was collected from North Atlantic, *Ingolf* Station 22; South Atlantic, L.G.O. Biotrawl No. 18, one female, one male, cat. no. I-22, and L.G.O. Biotrawl No. 16, three females, cat. no. I-23.

Affinities: This species appears to be most closely related to *acutus*, n. sp.

Haploniscus minutus, new species

Figure 7 A-C

Synonyms: None.

Diagnosis: Frontal border excised, entire. Pleon and peraeonal lateral borders continuous. Flagellum of first antenna with six articles. Postero-lateral angles of pleon not projected beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropoda extending beyond posterior medial margin of pleon. Antero-lateral borders of fourth pleonal somite not projected forward. Dorsum of head not tuberculate.

Measurements: Holotype female length 2.5 mm., width pleon 0.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, one female, cat. no. I-15.

Distribution: Known only from type locality.

Affinities: The species is close to *H. excisus*, differing markedly from it in having the lateral borders of the pleon and peraeon continuous.

Haploniscus spatulifrons, new species

Figure 7 D-H

Synonyms: None.

Diagnosis: Frontal border deeply excavate and with a pronounced pointed spatulate projection. Pleon and peraeon lateral borders continuous. Flagellum of first antenna with five articles. Postero-lateral angles of pleon not produced beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods not extending to posterior border of pleon. Rami of sympod of male first pleopod round at apex. Antero-lateral borders of fourth peraeonal somite not produced forward.

Measurements: Holotype male length 5.3 mm., width pleon 2.0 mm. Allotype female length 2.6 mm., width pleon 0.9 mm.

Type locality: South Atlantic, types and only specimens from L.G.O. Biotrawl No. 51, cat. no. I-10.

Distribution: Known only from type locality.

Affinities: The species is perhaps most nearly allied to *H. bicuspis* (G. O. Sars), but its spatulate rostrum distinguishes it.

Haploniscus tuberculatus, new species

Figure 7 I-K

Synonyms: None.

Diagnosis: Frontal border of cephalon convex, entire. Lateral borders of pleon and peraeon continuous. Flagellum of first antenna with four articles. Postero-lateral angles of pleon not projecting beyond medial margin. Dorsum of pleon tuberculate. First article of first antenna concealed by cephalon. Uropods extending beyond posterior margin of pleon. Antero-lateral borders of fourth peraeonal somite not produced forward.

Measurements: Holotype female length 1.7 mm., width pleon 0.4 mm.

Type locality: South Atlantic, type and only specimen collected from L.G.O. Biotrawl No. 51, cat. no. I-20.

Distribution: Known only from type locality.

Affinities: This species is most nearly related to *H. parallelus*, n. sp., from which it differs in having the lateral borders of the pleon and peraeon continuous.

Haploniscus tridens, new species

Figure 8

Synonyms: None.

Diagnosis: Frontal border deeply excavate and with a sharp trifold median projection. Pleon and peraeon lateral borders continuous. Flagellum of first antenna with five articles. Postero-lateral margins of pleon produced beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods extending to posterior border of pleon. Rami of sympod of male first pleopod separated slightly at apex. Antero-lateral borders of fourth peraeonal somite not produced forward.

Measurements: Male holotype length 3.2 mm., width pleotelson 1.6 mm., allotype 4.2 mm. length, width pleotelson 2.0 mm.

Type locality: South Atlantic, types and one fragment from L.G.O. Biotrawl No. 12, cat. no. I-1.

Distribution: Known from type locality and from South Atlantic, L.G.O. Biotrawl No. 212, one intersex, cat. no. I-59, one intersex, cat. no. I-61.

Affinities: The species is most closely allied to *H. capensis*, n. sp., differing from it most obviously in having the lateral borders of the pleon and peraeon continuous.

Haploniscus elevatus, new species

Figure 9 A-D

Synonyms: None.

Diagnosis: Frontal border excavate with a very slight, wide medial lobe. Pleon strongly set in from

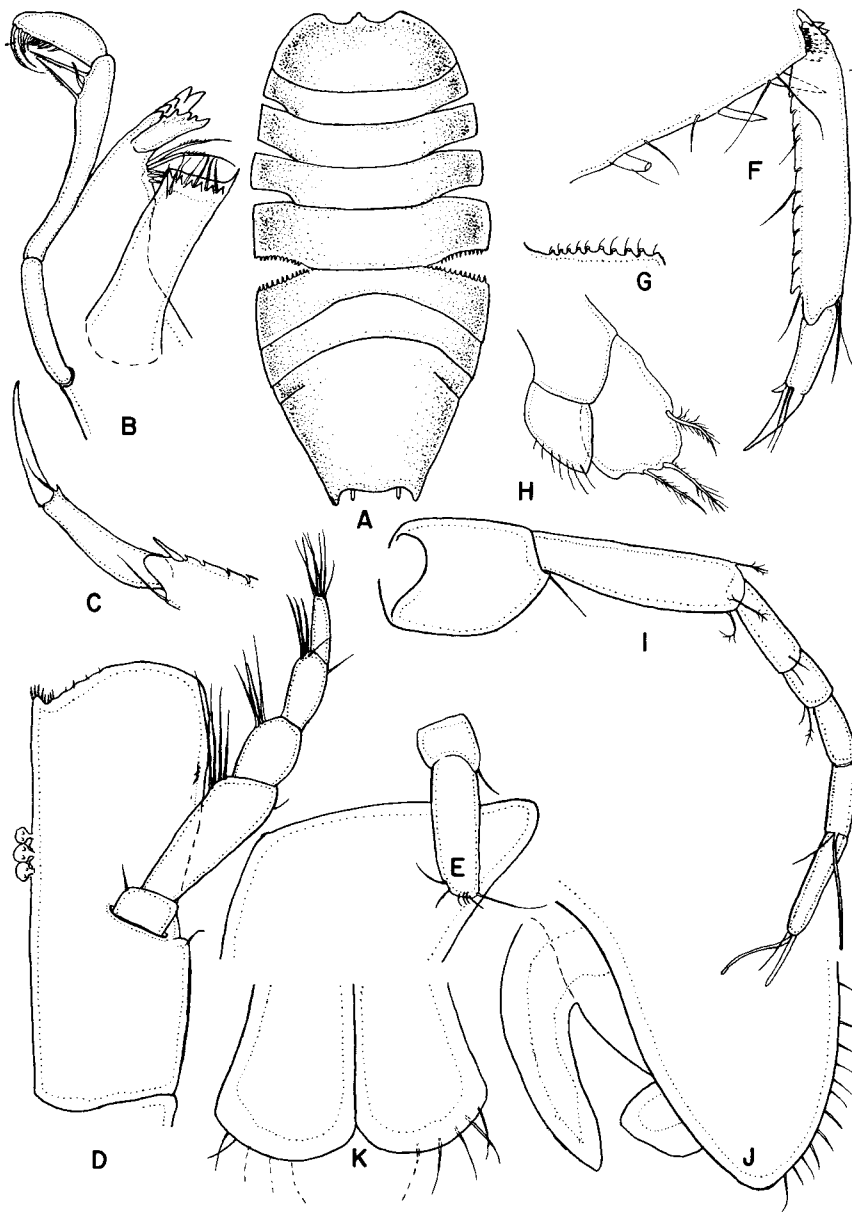


Figure 8. *Haploniscus tridens*, n. sp. A: dorsal view male holotype; B: left mandible; C: sixth pereopod; D: maxilliped; E: uropod; F: second pereopod; G: proximal border fifth pereopodal somite; H: third pleopod; I: first antenna; J: second pleopod; K: first pleopod.

lateral border of pereaon. Flagellum of first antenna with five articles. Postero-lateral angles of pleon not produced beyond medial margin. Dorsum of pleon with large swelling medially near apex. First article of first antenna not concealed by cephalon. Uropods not extending to posterior border of pleon. Rami of sympod of male first pleopod united at apex. Antero-lateral border of fourth pereopodal somite produced forward.

Measurements: Male holotype length 1.9 mm., width pleon 0.8 mm.

Type locality: South Atlantic, type only from L.G.O. Biotrawl No. 52, cat. no. I-11.

Distribution: Known only from type locality.

Affinities: In general aspect *H. elevatus* resembles *H. princeps*, but the antero-lateral borders of pereopodal somites 3-4 are not as greatly produced forward.

Haploniscus quadrifrons, new species

Figure 9 E-G

Synonyms: None.

Diagnosis: Frontal border of cephalon entire and straight. Pleon set in from pereaon at lateral margins. Flagellum of first antenna with five articles. Postero-lateral angles of pleon produced much beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods

not extending to postero-lateral margin of pleon. Rami of sympod of male first pleopoda separated. Antero-lateral border of fourth peraeonal somite strongly produced forward.

Measurements: Holotype male length 2.1 mm., width pleon 0.6 mm.

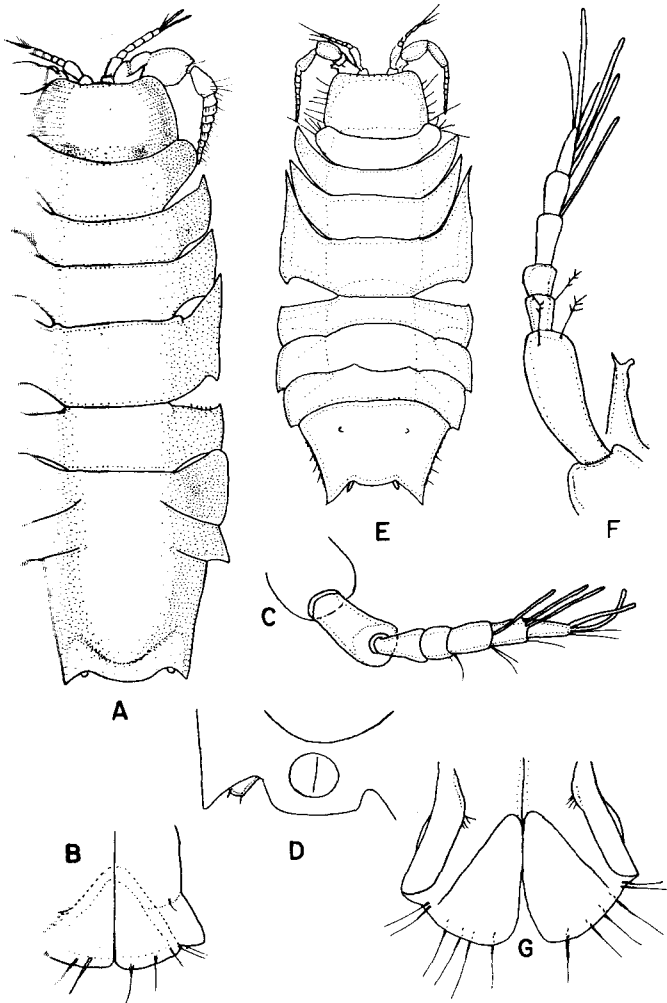


Figure 9. A-D: *Haploniscus elevatus*, n. sp. A: dorsal view male; B: first pleopod; C: first antenna; D: anus and uropod. E-G: *Haploniscus quadrifrons*, n. sp. E: dorsal view male type; F: first antenna; G: first pleopod.

Type locality: South Atlantic, holotype and two fragments from L.G.O. Biotrawl No. 22, cat. no. I-16.

Distribution: Also found at L.G.O. Biotrawl No. 23, one male, cat. no. I-17.

Affinities: This species is closely allied to *H. princeps* and *H. elevatus*, from which it is distinguished by the two dorsal tubercles on the pleon.

Haploniscus princeps, new species

Figure 10 A-C

Synonyms: None.

Diagnosis: Frontal border of cephalon excised, with a median slight but wide projection. Pleon

set in from peraeon. Flagellum of first antenna with four articles. Postero-lateral angles of pleon projecting beyond medial margin. Dorsum of pleon smooth. First article of peduncle of first antenna not concealed by cephalon. Uropods not extending to postero-lateral border of pleon. Rami of sympod of male first pleopod joined at apex. Antero-lateral margins of fourth peraeonal somite produced forward.

Measurements: Holotype female length 2.1 mm., width pleotelson 0.65 mm. Male allotype length 2.2 mm., (fragment).

Type locality: South Atlantic, types plus three female paratypes, L.G.O. Biotrawl No. 53, cat. no. I-14.

Distribution: Also found at L.G.O. Biotrawl No. 14, eleven females and one male, cat. no. I-203.

Affinities: *H. princeps* is closely allied to *H. elevatus*, *H. nondescriptus*, and *H. quadrifrons*. The absence of dorsal tubercles on the pleon and the short uropoda distinguish it.

Haploniscus percaix, new species

Figure 10 D-E

Synonyms: None.

Diagnosis: Frontal border of cephalon straight but with minute medial knob. Lateral margins of pleon and peraeon continuous. Flagellum of first antenna with five articles. Postero-lateral angles of pleon projecting beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods extending to posterior margin of pleon. Antero-lateral angles of fourth peraeonal somite not produced forward.

Measurements: Male holotype intersex length 2.4 mm., width pleotelson 0.7 mm., female allotype length 3.4 mm., width pleotelson 1.5 mm.

Type locality: South Atlantic, types plus one male intersex paratype, L.G.O. Biotrawl No. 53, cat. no. I-6.

Distribution: Also found at L.G.O. Biotrawl No. 16, one male, one female, cat. no. I-7, and North Atlantic, Atlantis Station 15, one female, cat. no. I-207.

Affinities: This species is related to *H. retrospinis* Richardson, from which it differs in having the postero-lateral angles of the pleon two times the length of the uropoda.

Haploniscus tricornis, new species

Figure 10 F-I

Synonyms: None.

Diagnosis: Frontal border cephalon excavate but with a medial apically trifid projection. Lateral margins of pleon and peraeon continuous. Flagellum of first antenna with six articles. Postero-lateral angles of pleon not projecting beyond medial pleonal

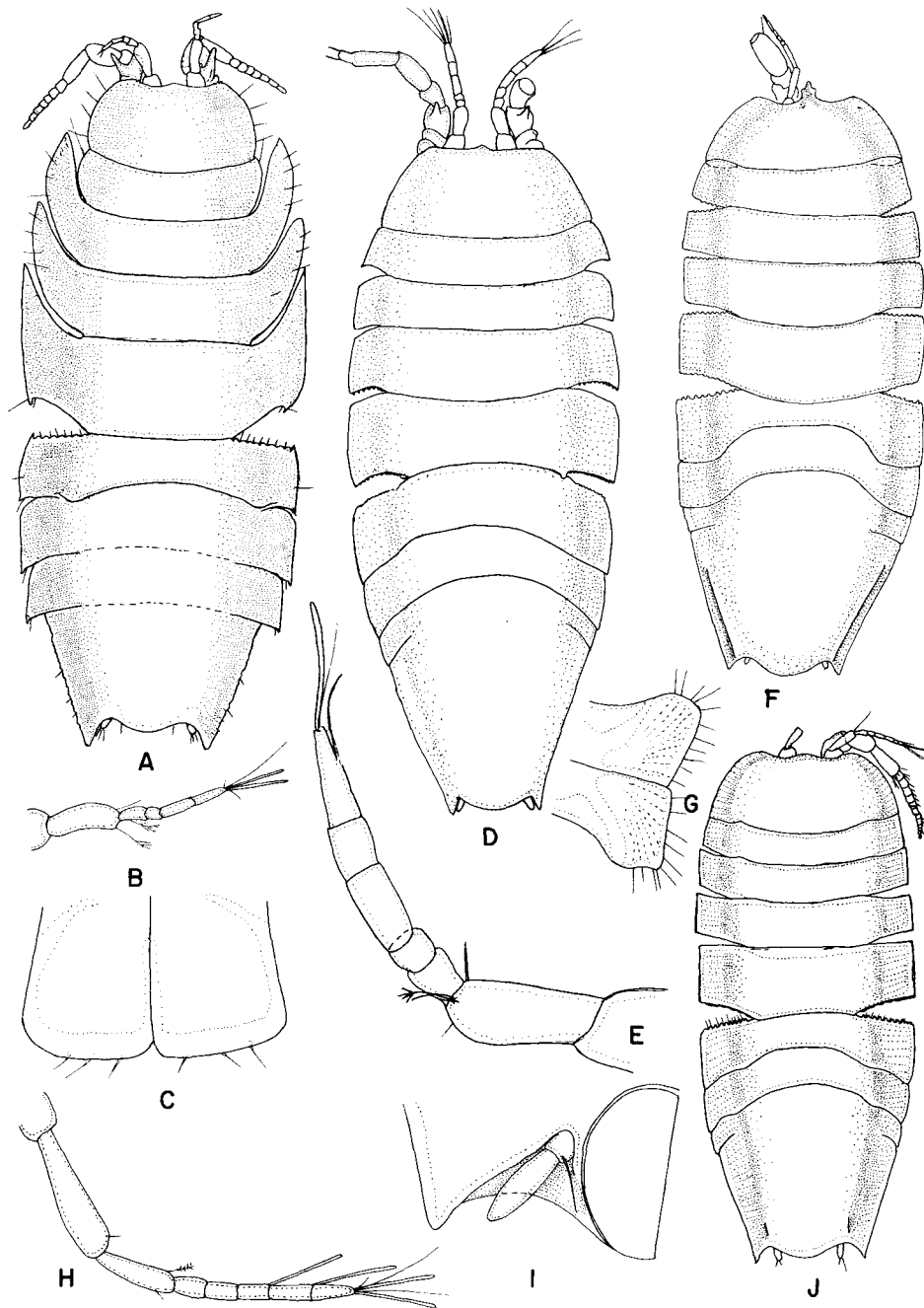


Figure 10. A-C: *Haploniscus princeps*, n. sp. A: female allotype dorsal view; B: first antenna; C: first pleopod male. D-E: *Haploniscus percavix*, n. sp. D: intersex holotype dorsal view; E: first antenna. F-I: *Haploniscus tricornis*, n. sp. F: dorsal view male type; G: first pleopod; H: first antenna; I: uropod and anus. J: *Haploniscus nondescriptus*, n. sp., female type dorsal view.

margin. Dorsum of pleon with a ridge on each side of pleon. First article of first antenna not concealed by cephalon. Uropods not extending to posterior margin of pleon. Rami of sympod of male first pleopod joined at apex. Antero-lateral angles of fourth peraeonal somite not produced forward.

Measurements: Holotype male length 4.2 mm., width pleotelson 1.3 mm.

Type locality: South Atlantic, holotype only, L.G.O. Biotrawl No. 51, cat. no. I-18.

Distribution: Also found at L.G.O. Biotrawl No. 47, one male, one female, cat. no. I-19.

Affinities: The species *H. tricornis* and *H. tricornoides* seem closely related; in the latter the pleon is set in from the peraeonal lateral margin, but not in the former.

Haploniscus nondescriptus, new species

Figure 10 J

Synonyms: None.

Diagnosis: Frontal border of cephalon excised with a broad low median projection. Pleon and peraeon lateral margins continuous. Flagellum of first antenna with five articles. Postero-lateral angles of pleon slightly exceeding median margin. Dorsum of pleon with a pair of slight short ridges above uropodal insertion. First article of peduncle of first antenna concealed from dorsal view by cephalon. Uropods not extending to postero-lateral margin of pleon. Antero-lateral margins of fourth peraeonal somite not produced forward.

Measurements: Holotype female length 3.6 mm., width pleon 1.3 mm.

Type locality: South Atlantic, holotype female, plus two female paratypes, L.G.O. Biotrawl No. 53, cat. no. I-21.

Distribution: Known only from type locality.

Affinities: This species is allied to *H. princeps*, but the uropoda extend to the posterior margin of the pleon at the postero-lateral angles.

Haploniscus acutus, new species

Figure 11 A-C

Synonyms: None.

Diagnosis: Frontal border of cephalon excavate, entire. Pleon inset from peraeonal lateral margin. Flagellum of first antenna with five articles. Postero-lateral angles of pleon projecting beyond medial pleonal margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods not extending to postero-lateral margin of pleon. Antero-lateral angles of fourth peraeonal somite not produced forward.

Measurements: Holotype female length 3.3 mm., width pleotelson 1.2 mm.

Type locality: South Atlantic, holotype female, L.G.O. Biotrawl No. 51, cat. no. I-13.

Distribution: Known only from type locality.

Affinities: Closely related to *H. spinifer* Hansen, but with the uropoda much longer—that is, extending almost to the tip of the postero-lateral angles of the pleon.

Haploniscus parallelus, new species

Figure 11 D-H

Synonyms: None.

Diagnosis: Frontal margin of cephalon convex, entire. Pleon set in from lateral margins of peraeon. Flagellum of first antenna with four articles. Postero-lateral angles of pleon not projecting beyond medial pleonal margin. Dorsum of pleon smooth. First article of first antenna concealed by cephalon. Rami of sympod of first male pleopod joined at apex. Uropods extending beyond posterior margin of pleon. Antero-lateral angles of fourth pleonal somite produced forward.

Measurements: Holotype male length 1.8 mm., width pleon 0.55 mm., allotype length 2.1 mm., width pleon 0.6 mm.

Type locality: South Atlantic, types plus one female and two fragmentary paratypes, L.G.O. Biotrawl No. 12, cat. no. I-2.

Distribution: Also taken from L.G.O. Biotrawl No. 52, two females, cat. no. I-3.

Affinities: This species is related to *H. tuberculatus*, but has the pleonal margin set in from the peraeonal margin.

Haploniscus capensis, new species

Figure 11 I-K

Synonyms: None.

Diagnosis: Frontal border of cephalon excavated and with very short trifid projection medially. Pleon set in from peraeon. Flagellum of first antenna with five articles. Postero-lateral angles of pleon projecting beyond medial pleonal margin and are medially recurved. Dorsum of pleon with short carinae above uropods. First article of first antenna not concealed by cephalon. Rami of male first pleopods not separated at apex. Uropods not extending to posterior margin of pleon. Antero-lateral angles of fourth pleonal somite not produced forward.

Measurements: Holotype male length 2.9 mm., width pleotelson 0.5 mm., allotype gravid length 2.7 mm., width pleotelson 1.1 mm., and nine male, ten female, one juvenile paratypes.

Type locality: South Atlantic, types only, L.G.O. Biotrawl No. 55, cat. no. I-25.

Distribution: Known only from type locality.

Affinities: This species resembles *H. tridens* in many respects, differing from it in having the lateral borders of the peraeon and pleon discontinuous.

Haploniscus trituberculatus, new species

Figure 11 L-Q

Synonyms: None.

Diagnosis: Frontal border of cephalon excavate, entire. Pleon set in from peraeon. Flagellum of first antenna with four articles. Postero-lateral angles of pleon not projecting beyond medial pleonal margin. Dorsum of pleon with two tubercles located on anterior third of pleon and a large dorsally indented swelling medially near posterior margin. First article of first antenna concealed by cephalon. Rami of male first pleopods not separated at apex. Uropods concealed, extending to posterior margin of pleon.

Measurements: Holotype male length 2.25 mm., width pleotelson 0.55 mm., allotype length 2.6 mm., width pleotelson 0.7 mm., plus two male, three female, and two fragmentary paratypes.

Type locality: South Atlantic, types, L.G.O. Biotrawl No. 51, cat. no. I-24.

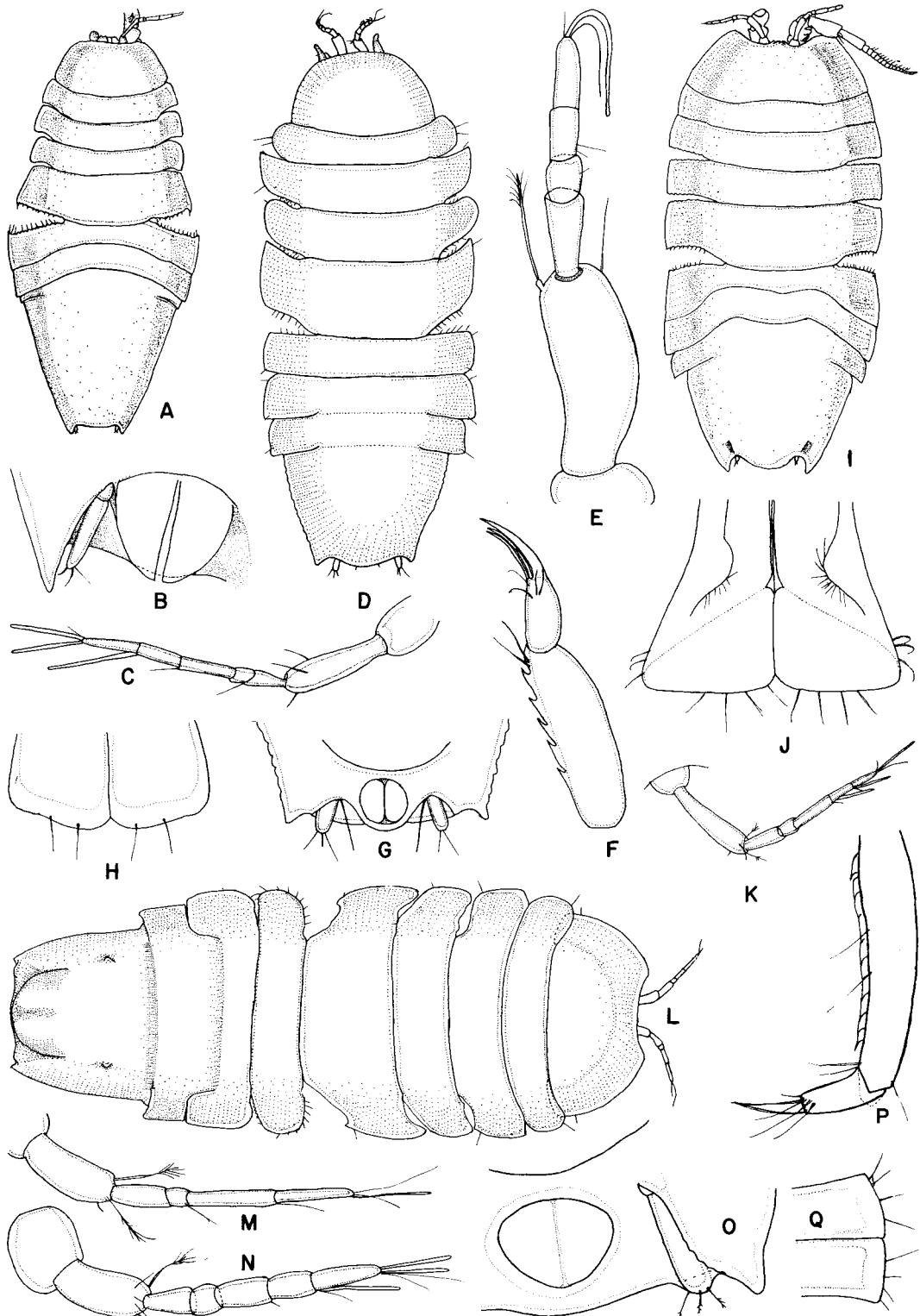


Figure 11. A-C: *Haploniscus acutus*, n. sp. A: holotype dorsal view; B: anus and uropod; C: first antenna. D-H: *Haploniscus parallelus*, n. sp. D: holotype dorsal view; E: first antenna; F: first peraeopod; G: anus and uropods; H: first pleopod. I-K: *Haploniscus capensis*, n. sp. I: holotype dorsal view; J: first pleopod; K: first antenna. L-Q: *Haploniscus trituberculatus*, n. sp. L: holotype dorsal view; M: first antenna allotype; N: first antenna holotype; O: anus and uropod; P: first peraeopod; Q: first pleopod.

Distribution: Also found at L.G.O. Biotrawl No. 14, one female fragment, cat. no. I-202.

Affinities: This species closely resembles *H. telus*, but has the pleon more quadrate than tapering or pointed.

Haploniscus polaris, new species

Figure 12 A-B

Synonyms: None.

Diagnosis: Frontal border convex, with minute medial projection. Pleon set in from peraeon. Flagellum of first antenna with four articles. Postero-lateral angles of pleon projecting beyond medial margin. Dorsum of pleon with a slight ridge forward of each uropod. Uropods not extending to postero-lateral border of pleon. Antero-lateral border of

fourth peraeonal somite not produced forward.

Measurements: Holotype female length 2.1 mm., width pleon 0.8 mm.

Type locality: South Atlantic, type only, L.G.O. Biotrawl No. 52, cat. no. I-32.

Distribution: Known only from type locality.

Affinities: This species is closely related to *H. antarcticus* Vanhöffen, from which it differs in having a relatively longer pleon and in having only four articles, not five, to the flagellum of the first antenna.

Haploniscus telus, new species

Figure 12 C-E

Synonyms: None.

Diagnosis: Frontal border excised, entire. Pleon

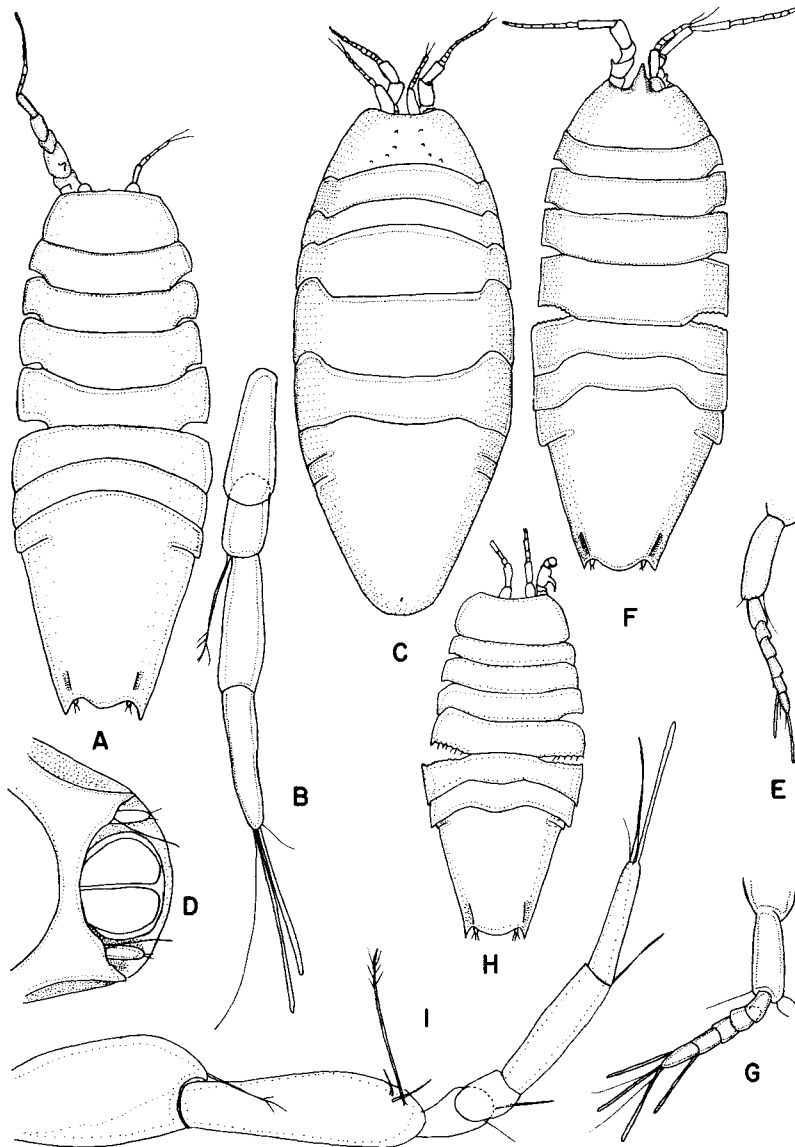


Figure 12. A-B: *Haploniscus polaris*, n. sp. A: female holotype dorsal view; B: first antennal flagellum. C-E: *Haploniscus telus*, n. sp. C: female holotype dorsal view; D: anus and uropods; E: first antenna. F-G: *Haploniscus tricornoides*, n. sp. F: female holotype dorsal view; G: first antenna. H-I: *Haploniscus tropicalis*, n. sp. H: immature female holotype dorsal view; I: first antenna.

and peraeonal lateral borders continuous. Flagellum of first antenna with six articles. Postero-lateral angles of pleon not projecting beyond medial margin. Dorsum of pleon smooth. First article of first antenna concealed by cephalon. Uropods not extending beyond posterior margin of pleon. Antero-lateral borders of fourth peraeonal somite not projected forward. Dorsum of cephalon tuberculate.

Measurements: Holotype female, length 2.5 mm., width pleon 0.8 mm.

Type locality: South Atlantic, type only L.G.O. Biotrawl No. 52, cat. no. I-20.

Distribution: Known only from type locality.

Affinities: This species may be distinguished from *H. trituberculatus*, its nearest relative, because of its tapering pleon.

Haploniscus tricornoides, new species

Figure 12 F-G

Synonyms: None.

Diagnosis: Frontal border excised, with pronounced medial projections. Pleon set in from peraeon. Flagellum of first antenna with five articles. Postero-lateral angles of pleon equal median projection in extent. Dorsum of pleon with slight carina above each uropod. First article of first antenna not concealed by cephalon. Uropods not extending to posterior margin of pleon. Antero-lateral borders of fourth peraeonal somite not projected forward.

Measurements: Holotype female, length 2.5 mm., width pleon 0.75 mm.

Type locality: South Atlantic, type only, L.G.O. Biotrawl No. 52, cat. no. I-31.

Distribution: Known from type locality.

Affinities: This species appears closely related to *H. tricornis*, from which it differs in having a longer cephalic projection and in having the pleon set in from the peraeon.

Haploniscus tropicalis, new species

Figure 12 H-I

Synonyms: None.

Diagnosis: Frontal border of cephalon excavated, entire. Flagellum of first antenna with four articles. Pleon set in from peraeon. Lateral border of fourth peraeonal somite not produced forward, lateral edges blunt. First article of first antenna not concealed by cephalon dorsally. Uropod not extending to postero-lateral margin of pleon.

Measurements: Holotype immature female length 1.5 mm., width pleon 0.5 mm.

Type locality: North Atlantic, Caribbean, holotype only, L.G.O. Biotrawl No. 100, cat. no. I-65.

Distribution: Also taken from L.G.O. Biotrawl No. 101, one female with oostegites, cat. no. I-66.

Affinities: Closely related to *H. excisus* Richardson, from which it differs in having shorter uropods and a narrower pleon.

Haploniscus rugosus, new species

Figure 13 A-C

Synonyms: None.

Diagnosis: Frontal border of cephalon almost transverse, with a bifid medial projection. Flagellum of first antenna with six articles. Pleon set in from peraeon. Lateral border of fourth peraeonal somite not produced forward, lateral edges blunt. First article of first antenna not concealed by cephalon dorsally. Uropod extending to posterior lateral margin of pleon. Dorso-lateral areas of peraeon tuberculate. Carina and tubercles located above uropodal insertion.

Measurements: Length female holotype 3.1 mm., width pleotelson 1.1 mm., plus five juvenile paratypes.

Type locality: South Atlantic, types from L.G.O. Biotrawl No. 53, cat. no. I-8.

Distribution: One male and one female also collected from L.G.O. Biotrawl No. 14, cat. no. I-9.

Affinities: This species is unique in having a bifid frons and a tuberculate peraeon.

Haploniscus ovalis, new species

Figure 13 D-G

Synonyms: None.

Diagnosis: Frontal margin of cephalon straight, entire. Flagellum of first antenna with four articles. Pleon set in from peraeon. Antero-lateral areas of peraeonal somite 4 not produced forward, lateral borders convex. First article of first antenna concealed dorsally by cephalon. Uropods not extending to posterior margin of pleon.

Measurements: Holotype male length 2.0 mm., width pleotelson 0.5 mm., allotype length 2.1 mm., width pleotelson 0.6 mm., plus six female, one fragmentary male paratype.

Type locality: South Atlantic, types, L.G.O. Biotrawl No. 12, cat. no. I-12.

Distribution: Known only from type locality.

Affinities: Closely related to *H. armadilloides* Hansen, from which it differs in lacking the median projection on the cephalon.

Haploniscid Fragments

Fragmentary specimens of species of indeterminable *Haploniscus* were obtained from the following L.G.O. stations: 12, five fragments; 18, one fragment; 22, one fragment; 49, one fragment; 51, five fragments; 52, one female crushed; 208, one fragment; 218, one female crushed; 229, one related closely to *H.*

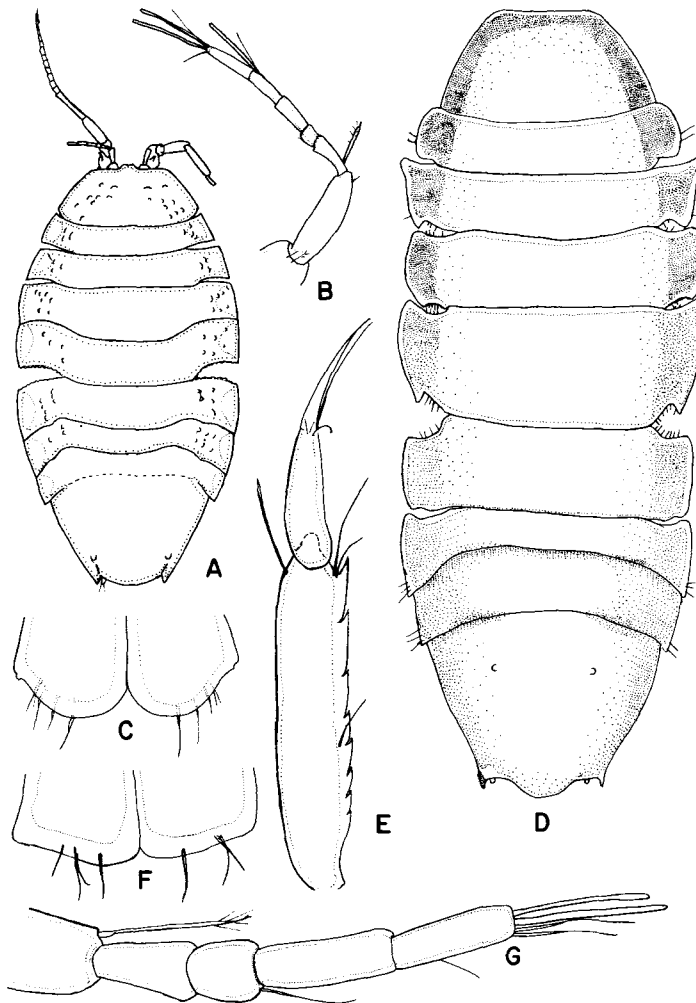


Figure 13. A-C: *Haploniscus rugosus*, n. sp. A: female holotype dorsal view; B: first antenna; C: male first pleopod. D-G: *Haploniscus ovalis*, n. sp. D: male holotype dorsal view; E: third pereopod; F: first pleopod; G: first antenna.

parallelus; 231, one female crushed possibly related to *H. minutus*; 232, one female fragment related to species in L.G.O. Biotrawl No. 229.

ANTENNULONISCUS, new genus

Type species: *Haploniscus dimeroceras* Barnard, 1920, pp. 406-408, Pl. XVII, Figs. 4-7.

Generic diagnosis: Haploniscidae with the third article of the peduncle of the second antenna much longer than wide. First five peraeonal somites always distinct.

Composition: In addition to the new species described herein and the type, none other is yet known in this genus.

Depth distribution: The species of this genus vary in depth from 1280 meters (bathyal) to 5843 meters (abyssal).

A KEY TO THE SPECIES OF ANTENNULONISCUS

- 1. Postero-lateral angles of pleon not projecting beyond medial margin *ornatus*, n. sp.

- 1. Postero-lateral angles of pleon projecting beyond medial margin 2
- 2. Frontal border excised but with slight medial convexity *dimeroceras* (Barnard)
- 2. Frontal border convex, with pronounced medial projection 3
- 3. Lateral borders of peraeonal somites 5-7 inclusive continuous *armatus*, n. sp.
- 3. Lateral border of peraeonal somites 5-6 inclusive produced outward *rostratus*, n. sp.

Antennuloniscus dimeroceras (Barnard)

Figure 14 A-B

Synonyms: *Haploniscus dimeroceras* Barnard, 1920, pp. 406-408, Pl. XVII, Fig. 4-7.

Diagnosis: Frontal border excised, with even slight median convexity. Pleon set in from lateral border of peraeon. Flagellum of first antenna with six articles. Postero-lateral angles of pleon projecting beyond medial margin. Dorsum of pleon with a pair of tubercles halfway from distal margin. Sympod of male first pleopods separate at apex. First article of

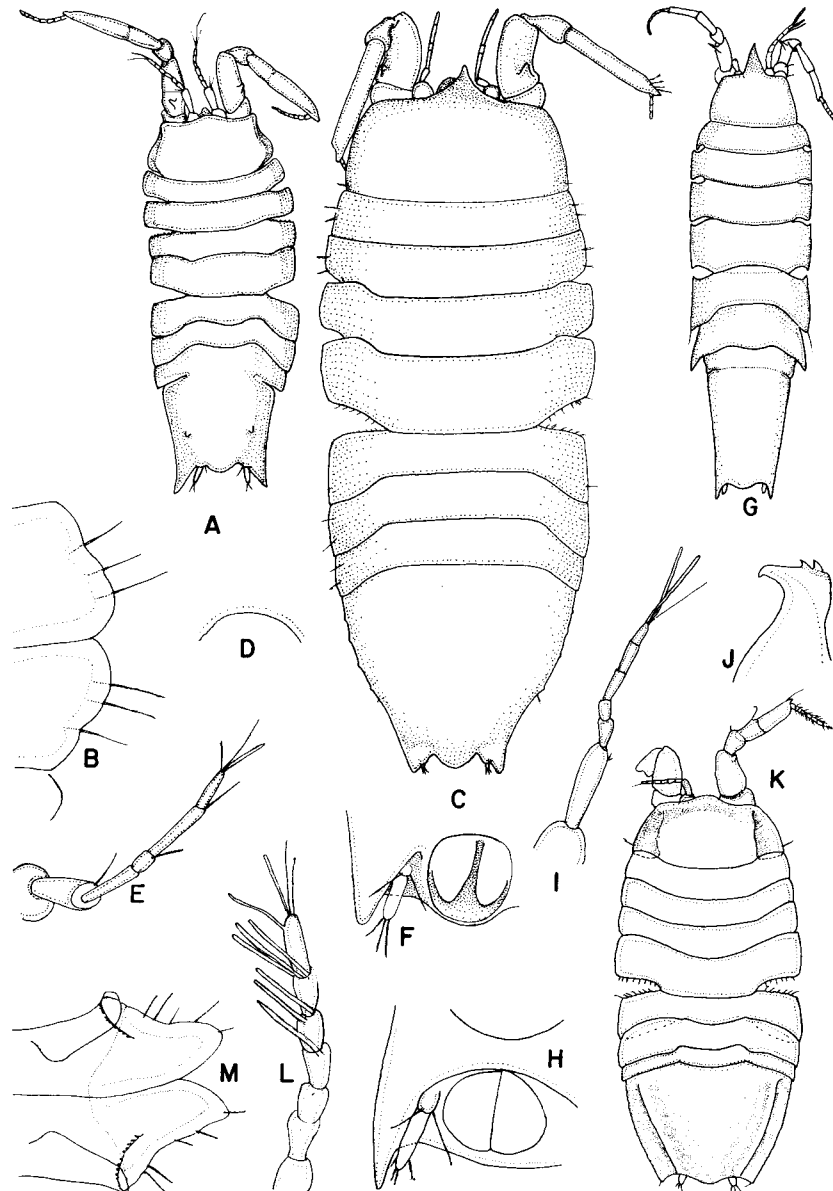


Figure 14. A-B: *Antennuloniscus dimeroceas* (Barnard), male length 2.2 mm., width pleon 0.6 mm. A: dorsal view male; B: first pleopod. C-F: *Antennuloniscus armatus*, n. sp. C: dorsal view; D: apex of pleon; E: first antenna; F: anus and uropod. G-J: *Antennuloniscus rostratus*, n. sp. G: dorsal view type female; H: anus and uropod; I: first antenna; J: cephalic horn. K-M: *Antennuloniscus ornatus*, n. sp. K: dorsal view male type; L: first antenna flagellum; M: first pleopod.

first antenna not concealed by cephalon. Uropods not extending to postero-lateral margin of pleon. Antero-lateral borders of fourth peraeonal somite not produced forward.

Measurements: Length 2.5 mm., width 1.0 mm., (Barnard, op. cit., 408).

Type locality: 34° 25' S., 17° 55' E., 700 fathoms. Bottom green mud. Several males and females, S.S. Pieter Faure, 20 August 1903 (S.A.M. No. A 4069).

Distribution: South Atlantic, L.G.O. Biotrawl No. 14, three females, cat. no. I-40; L.G.O. Biotrawl No. 22, three males, eight females, cat. no. I-39; L.G.O. Biotrawl No. 23, one female, cat. no. I-38; L.G.O.

Biotrawl No. 54, eight males, nineteen females, cat. no. I-37; L.G.O. Biotrawl No. 212, one female, cat. no. I-60, North Atlantic, L.G.O. Biotrawl No. 231, one female, cat. no. I-52.

Affinities: The excised frontal border of the cephalon sets this species apart from the others.

Antennuloniscus armatus, new species

Figure 14 C-F

Synonyms: None.

Diagnosis: Frontal borders convex, with sharp, elongate, median spine. Lateral margins of pleon

and peraeon continuous. Flagellum of first antenna with four articles. Postero-lateral angles of pleon extending beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods not extending to posterior border of pleon.

Measurements: Length 2.6 mm, width pleon 0.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 51, one female, cat. no. I-34.

Distribution: Known also from L.G.O. Biotrawl No. 52, one male, two female, cat. no. I-35.

Affinities: This species appears most closely related to *A. rostratus*, from which it differs mainly in having the lateral margins of the peraeon and pleon continuous.

Antennuloniscus rostratus, new species
Figure 14 G-J

Synonyms: None.

Diagnosis: Frontal border convex with a sharp upcurved spine medially. Lateral margin of pleon peraeon continuous. Flagellum of first antenna with five articles. Postero-lateral angles of pleon extending beyond medial margin. Dorsum of pleon smooth. First article of first antenna not concealed by cephalon. Uropods not extending to postero-lateral border of pleon.

Measurements: Holotype female length 3.3 mm., width pleon 0.55 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, three females, cat. no. I-36.

Distribution: Known only from type locality.

Affinities: The long and broad rostrum of this species is distinctive; also the lateral border of the sixth peraeonal somite is produced outward from that of the seventh.

Antennuloniscus ornatus, new species
Figure 14 K-M

Synonyms: None.

Diagnosis: Frontal margin of cephalon convex. Pleonal and peraeonal lateral margins continuous. Flagellum of first antenna with six articles. Postero-lateral angles of pleon not projecting beyond medial pleonal margin. Dorsum of pleon with ridge near each lateral margin. First article of first antenna not concealed by cephalon. Rami of male first pleopod separated at apex. Uropods extending to posterior margin of pleon. Antero-lateral borders of fourth peraeonal somite not produced forward.

Measurements: Holotype male length 1.9 mm., width pleon 0.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 47, two males, cat. no. I-33.

Distribution: Also known from L.G.O. Biotrawl No. 201, one male, cat. no. I-223.

Affinities: The dorsal elevation of the cephalon and the carinae on the pleon separate this species from all the others. Its nearest known relative is possibly *A. dimeroceras* (Barnard), a species also known from the South Atlantic.

Genus: HYDRONISCUS Hansen

Type species: *Hydroniscus abyssi* Hansen, 1916

Diagnosis: Haploniscidae with the pleon and last three peraeonal somites fused into a solid piece. Uropoda extremely reduced or entirely absent. Third article of peduncle of first antenna longer than wide but lacking the angulate projection characterizing *Haploniscus*.

Composition: The genus contains three species, two from the North Atlantic and one from the South Atlantic. They are markedly different from one another. According to Wolff (1960), Birstein has found a species of *Hydroniscus* in the North Pacific.

A KEY TO THE SPECIES OF
HYDRONISCUS

1. Uropoda present *ornatus*, n. sp.
1. Uropoda absent 2
2. Rostrum pointed *abyssi* Hansen
2. Rostrum blunt *quadrifrons*, n. sp.

Hydroniscus ornatus, new species
Figure 15 A-H

Synonyms: None.

Diagnosis: *Hydroniscus* with distinct pointed postero-lateral angles projecting laterally from pleon. Single-jointed uropoda present, not extending beyond posterior margin of pleon. Flagellum of first antenna with four articles, that of second with 12 articles.

Measurements: Holotype male length 3.5 mm., width pleon 1.7 mm., allotype female length 4.0 mm., width pleon 1.75 mm.

Type locality: South Atlantic, types plus three female paratypes from L.G.O. Biotrawl No. 51, cat. no. I-43.

Distribution: Known also from L.G.O. Biotrawl No. 217, one female, cat. no. I-211, in the South Atlantic.

Affinities: *Ornatus* is possibly closely related to *quadrifrons*, from which it differs in having a rounded rostrum and in having very pronounced postero-lateral angles on the pleon.

Hydroniscus quadrifrons, new species
Figure 15 I-M

Synonyms: None.

Diagnosis: *Hydroniscus* with minute postero-lateral angles on pleon. Quadrate single-jointed uropods

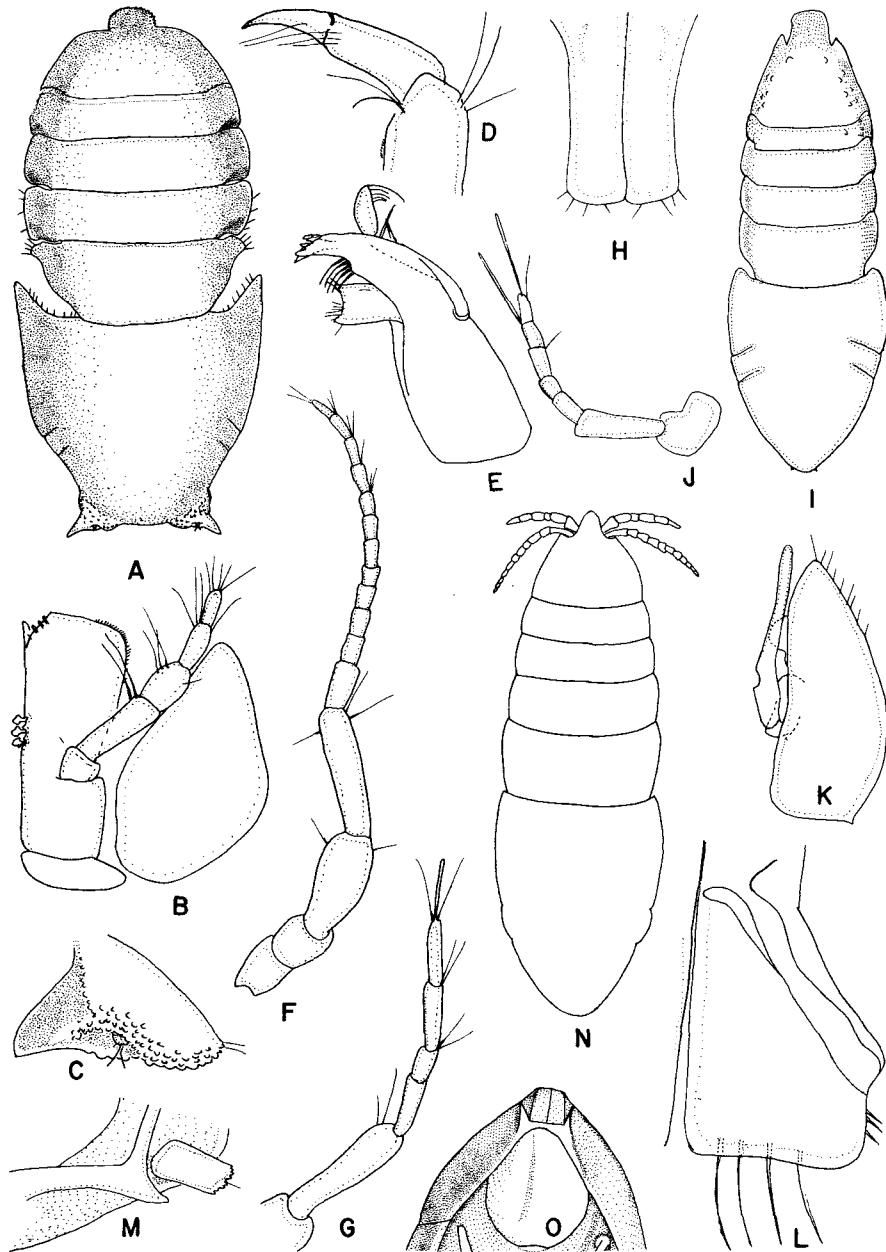


Figure 15. A-H: *Hydroniscus ornatus*, n. sp. A: dorsal view female allotype; B: maxilliped; C: dorsal view uropod; D: first peraeopod; E: mandible; F: second antenna; G: first antenna; H: first pleopod. I-M: *Hydroniscus quadrifrons*, n. sp. I: dorsal view male holotype; J: first antenna; K: second pleopod; L: first pleopod; M: uropod. N-O: *Hydroniscus abyssi* Hansen (after Hansen, 1916). N: dorsal view female; O: pleon and anus.

present. Flagellum of first antenna with five articles. Dorsum of cephalon tuberculate, rostrum blunt at apex.

Measurements: Male holotype length 2.7 mm., width pleon 1.0 mm., allotype length 3.2 mm., width pleon 1.1 mm., and four male and six female paratypes.

Type locality: North Atlantic, L.G.O. Biotrawl No. 231, types, cat. no. I-51.

Distribution: Also known from L.G.O. Biotrawl No. 214, one female, cat. no. I-53; L.G.O. Biotrawl No. 229, one male and one fragment, cat. no. I-58; L.G.O. Biotrawl No. 232, one fragment, cat. no. I-55; L.G.O. Biotrawl No. 233, one male, one frag-

ment, cat. no. I-56; L.G.O. Biotrawl No. 234, three males, cat. no. I-57.

Affinities: This species is related to *H. abyssi* Hansen, from which it differs in having a blunt rostrum and in having uropods, and to *ornatus*, from which it differs in having a blunt rostrum.

Hydroniscus abyssi Hansen
Figure 15 N-O

Synonyms: *Hydroniscus abyssi* Hansen, 1916, p. 33, Pl. II.

Diagnosis: *Hydroneiscus* with a spearpoint-shaped pleon lacking lateral projections. Uropoda absent. Flagellum of first antenna with five articles, that of second antenna with nine articles.

Measurements: Female holotype length 2.8 mm.

Type locality: North Atlantic, *Ingolf* Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters. One female specimen.

Distribution: An abyssal species known only from type locality.

Family: ISCHNOMESIDAE

Type genus: *Ischnomesus* Richardson, 1908a.

Diagnosis: Paraselloidea with head and first peraeonal somite joined. Eyes lacking. Mandibles generally lacking palp, molar expanded, lacinia and setae row present. Antennae shorter than body. All peraeopods simple walking legs; dactyl with at least one terminal claw, never three. Uropoda terminal uniramous. Fifth peraeonal somite generally much longer than wide. Last two articles of maxillipedal palp narrow, others as wide as endite. Pleon with one-two distinct separated somites. Anus widely separated from branchial chambers.

Composition: This family contains *Ischnomesus*, *Haplomesus*, *Heteromesus*, and *Stylomesus*. The genus *Ischnosoma* was replaced by *Ischnomesus*, and the genus *Rhabdomesus* was subsequently found to be a synonym of *Ischnomesus* (see Wolff, 1956). Like Haploniscidae, the family is characteristically abyssal but contains shallow water representatives as well. The absence of a mandibular palp is not a constant characteristic of the family: a triarticulate palp is present in *I. simplissimus*, but only a rudimentary seta remains in *I. paucispinis* and nothing at all in the remaining species.

A KEY TO THE GENERA OF THE ISCHNOMESIDAE (Modified after Wolff, 1956)

- 1. Uropoda with a single article 2
- 1. Uropoda with two articles 3
- 2. Pleon and three posterior peraeonal somites fused into a single piece. Third article of first antenna markedly elongate *Haplomesus*
- 2. Pleon and two posterior peraeonal somites fused into a single piece. Third article of first antenna minute *Heteromesus*
- 3. First pleonal somite separate from pleotelson *Ischnomesus*
- 3. First pleonal somite fused with pleotelson *Stylomesus*

Genus: ISCHNOMESUS Richardson, 1908a

Synonyms: *Ischnosoma* G. O. Sars, 1868. *Rhabdomesus*, Richardson, 1908a, p. 81. *Ischnomesus* Richardson 1908a, p. 81.

Type species: *Ischnosoma bispinosum* G. O. Sars, 1868.

Diagnosis: Ischnomesidae with a distinctly two-jointed pleonal somite. Uropoda with two articles.

Remarks: The genus may be indistinctly split into two groups on the basis of the fundamental structure of the male first and second pleopods. Unfortunately,

these characteristics are not known for all species and therefore have not been used in the key. To the most primitive group belong those species in which the stylus of the male second pleopod is shorter than the exopod and the lateral projections of each ramus at the apex of the first pleopod are quite evident. To this group belong the species *I. bispinosum*, *I. paucispinis*, *I. multispinis*, *I. spärcki*, *I. decemspinus*, *I. bidens*, etc.

A secondarily derived group has a long semi-coiled stylus which inserts into depressions on the interior surface of the sympod of the male first pleopod. The lateral expansions of the sympod are generally coalesced with the sympod, giving the apex a blunt appearance under low magnification. To this group belong the remaining species, *I. caribbicus*, *I. bruuni*, *I. bacilloides*, *I. wolffi*, etc.

<i>Depth distribution:</i>	<i>Meters</i>
1. <i>bispinosum</i> (G. O. Sars)	94-1100
2. <i>bacillopsis</i> Barnard	1280-1280
3. <i>armatus</i> Hansen	2702-2702
4. <i>bacilloides</i> (Beddard)	2652-2652
5. <i>profundus</i> Hansen	3521-3521
6. <i>spärcki</i> Wolff	6660-7000
7. <i>bruuni</i> Wolff	6960-7000
8. <i>bacillus</i> (Beddard)	3292-3292
9. <i>andriashevi</i> Birstein	4000-6560

Nine new species may be added to the list of known species. All are considered in the following key.

A KEY TO THE SPECIES OF ISCHNOMESUS

- 1. Dorsum of pleon with stout spines 2
- 1. Dorsum of pleon smooth, lacking spines 4
- 2. Postero-medial margin of pleon with spines *magnificus*, n. sp.
- 2. Postero-medial margin of pleon entire, lacking spines 3
- 3. Lateral borders of pleon each with only three spines *multispinis*, n. sp.
- 3. Lateral borders of pleon each with more than ten spines *spärcki* Wolff
- 4. Sixth peraeonal somite with a long lateral spine on either side 5
- 4. Sixth peraeonal somite without a lateral spine on either side 8
- 5. Lateral spine of fifth peraeonal somite directed posteriorly at about 20° angle to peraeonal axis 16
- 5. Lateral spine of fifth peraeonal somite directed more laterally, about perpendicular from peraeonal axis 6

- 6. Posterior margin of seventh peraeonal somite with a medial projection *bacilloides* (Beddard)
- 6. Posterior margin of seventh peraeonal somite entire medially 7
- 7. Lateral spine of sixth peraeonal somite directed at a 45° angle from peraeonal axis *wolffi*, n. sp.
- 7. Lateral spine of sixth peraeonal somite directed at a 75° angle from peraeonal axis *bruuni* Wolff
- 8. Pleon with postero-lateral angles projecting beyond medial margin *bidens*, n. sp.
- 8. Pleon lacking projecting postero-lateral angles 9
- 9. Fifth peraeonal somite with long lateral spine 10
- 9. Fifth peraeonal somite without lateral spines 12
- 10. Dorsum of fourth peraeonal somite with spines at anterior part *decemspinus*, n. sp.
- 10. Dorsum of fourth peraeonal somite smooth, without spines 11
- 11. Pleonal lateral borders strongly convex *elegans*, n. sp.
- 11. Pleonal lateral borders subparallel *bacillus* (Beddard)
- 12. Lateral border of pleon each with a stout seta and three small setae *paucispinis*, n.sp.
- 12. Lateral borders of pleon lack stout setae 13
- 13. First peraeonal somite with a stout antero-lateral spine 14
- 13. First peraeonal somite without a stout antero-lateral spine *simplissimus*, n. sp.
- 14. Postero-lateral margin of pleon without angles, entire and smooth 17
- 14. Postero-lateral margin of pleon with distinct postero-lateral angles 15
- 15. Pleon with a pair of minute projections anterior to uropodal insertion (postero-lateral angles) *caribbicus*, n. sp.
- 15. Pleon without a pair of projections anterior to postero-lateral angles *profundus* Hansen
- 16. Pleon constricted in front of uropods *armatus* Hansen
- 16. Pleon not constricted in front of uropods *bacillopsis* (Barnard)
- 17. Hand of first peraeopod about as wide as long *bispinosum* (G. O. Sars)
- 17. Hand of first peraeopod three times longer than wide *andriashevi* Birstein

Ischnomesus profundus Hansen

Figure 16 A-D

Synonyms: *Ischnomesus profundus* Hansen, 1916, pp. 56-57, Pl. 4; — Wolff, 1956, pp. 88-89, Fig. 1.

Diagnosis: *Ischnomesus* with lateral spines on first peraeonal somite only, other somites lacking lateral spines. Pleon with sharp postero-lateral angles at uropods; posterior margin convex and lacking spines or setae. Male first pleopods with pronounced lateral extensions at apex (uropods lost). (From Hansen, op. cit., illustration and description.)

Measurements: Male length 4.0 mm. (Hansen, op. cit.)

Type locality: North Atlantic, south of Davis Strait, *Ingolf* Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temperature 1.3° C. type only (Hansen, op. cit.).

Distribution: Known only from type locality.
Affinities: This species appears to be related to the Caribbean species *I. caribbicus*, n. sp., from which it differs in lacking pleonal projections anterior to the uropodal insertion.

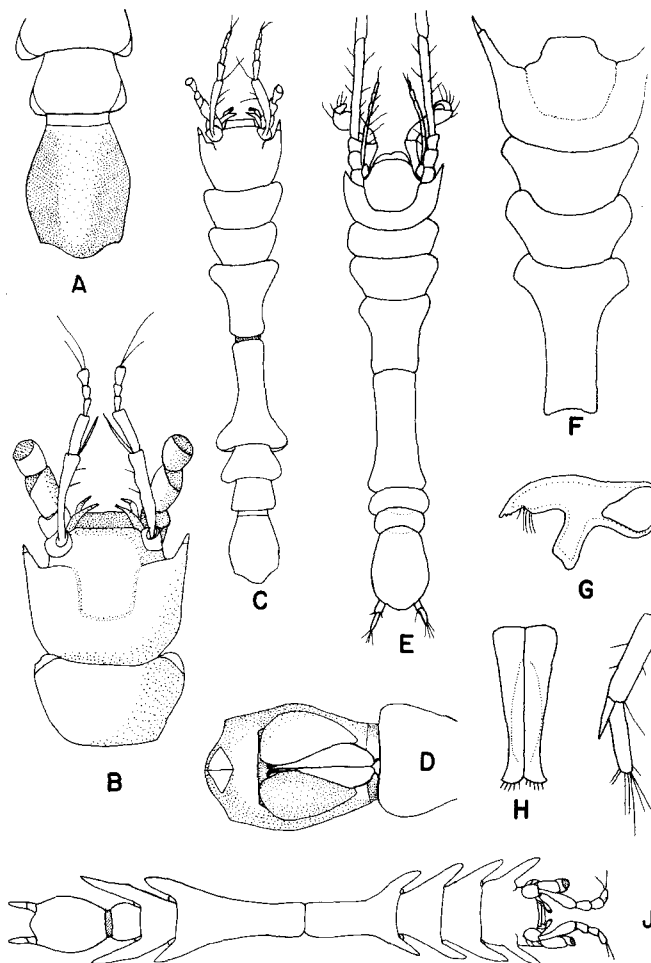


Figure 16. A-D: *Ischnomesus profundus* Hansen (after Hansen, 1916). A: dorsal view posterior; B: dorsal view head; C: dorsal view male; D: ventral view pleon. E-I: *Ischnomesus bispinosum*, (G. O. Sars) (after G. O. Sars, 1896). E: dorsal view female; F: dorsal view head and anterior thoracic segments, male; G: mandible; H: first pleopod; I: uropod. J: *Ischnomesus armatus* Hansen (after Hansen, 1916), dorsal view male.

Ischnomesus bispinosum (G. O. Sars)

Figure 16 E-I

Synonyms: *Ischnosoma bispinosum* G. O. Sars, 1865, p. 34; — 1897, pp. 123-124, Pl. 52; Hult, 1941, pp. 62-66, Figs. 16-18, and references (incomplete).

Diagnosis: *Ischnomesus* with a spine on lateral border of first peraeonal somite only; dorsal spine lacking. Pleon pyriform, without postero-lateral angles. Lateral projections on apex of male first

pleopods scarcely evident, endite of male second pleopod short, not coiled. Uropoda biramous (derived from Sars' illustrations, 1897; this may be an error in illustration).

Measurements: Adult female length 3 mm., male length 2.5 mm. (G. O. Sars, 1897, p. 124).

Type locality: Christiania Fjord, Norway.

Distribution: Lofoten, Norway, Ireland, to Gulf of Naples in the Mediterranean (Hult, 1941, p. 65), depth range 90 to 1100 meters.

Affinities: The smooth spineless pleon of this species sets it apart from the others as a fundamentally more primitive species.

Ischnomesus armatus Hansen

Figure 16 J

Synonyms: *Ischnomesus armatus* Hansen, 1916, pp. 59–60, Pl. 4;—Wolff, 1956, pp. 89–90, Fig. 2.

Diagnosis: *Ischnomesus* with lateral spines on peraeonal somites 1–6 inclusive. Lateral spines of first four somites directed acutely forward, those of somites 5 and 6 directed acutely hindward. Pleon constricted above uropods, lateral and posterior margins smooth and lacking setae or spines. Lateral projection at apex of male first pleopods joined with sympod. (From Hansen, op. cit.)

Measurements: Length male 4.8 mm. (Hansen, op. cit.)

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two males (Hansen, op. cit.).

Distribution: Known also from the North Atlantic from L.G.O. Biotrawl No. 234, one male, cat. no. I-68.

Affinities: This species appears related to the South Atlantic *I. bacillopsis* (Barnard), from which it differs in having the pleon constricted in front of the uropods.

Ischnomesus caribbicus, new species

Figure 17 A–B

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral spines on first peraeonal somite only. Dorsal spines lacking. Pleon with distinct sharp but small angles above uropodal insertion. Medial posterior margin of pleon truncated, smooth, lacking spines or setae. Lateral projection at apex of male first pleopod largely joined to sympod, distal margin with nine setae.

Measurements: Length holotype male 7.8 mm., width pleon 0.9 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 100, type only, cat. No. I-72.

Distribution: Known only from type locality.

Affinities: This species appears to be most nearly related to *I. profundus* Hansen, from which it differs in having a minute angle projecting anterior in front of each uropodal insertion.

Ischnomesus simplissimus, new species

Figure 17 C–F

Synonyms: None.

Diagnosis: *Ischnomesus* lacking lateral or dorsal spines on peraeonal or pleonal somites. Mandible with triarticulate palp, last article minute and with a single apical seta. Pleon margins smooth, lacking angles, setae, or spines, apex pointed.

Measurements: Female holotype length 9.1 mm., width pleon 1.1 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, one holotype female and one paratype female, cat. no I-98.

Distribution: Taken also at L.G.O. Biotrawl No. 53, eight fragmentary females, cat. no. I-99.

Affinities: The presence of a triarticulate mandibular palp sets this species apart; otherwise it is distinct in lacking a stout antero-lateral spine from the first peraeonal somite.

Ischnomesus multispinis, new species

Figure 17 G–H

Synonyms: None.

Diagnosis: *Ischnomesus* with dorsal spines on all body somites. First, third, fourth, and fifth somites with lateral spines. Pleon with three spines on either side, dorsum with a pair of spines. Sympodal apex with lateral projections directed caudad; rami separated at apex. Posterior margin of pleon without spines or setae.

Measurements: Injured male holotype length 7.4 mm., width pleon 0.7 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 107, holotype only, cat. no. I-77.

Distribution: Known only from type locality.

Affinities: By virtue of the three spines on each lateral margin of the pleon this species is most closely related perhaps to *I. spärcki* Wolff, from which it differs in having fewer lateral pleonal spines. The apex of the male pleopods also indicates the affinity between the two.

Ischnomesus wolffi, new species

Figure 18 A–C

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral spines on peraeonal somites 1–6 inclusive. Those of somites 5 and 6 projecting posteriorly. Pleon with postero-lateral angles at uropod insertion, otherwise smooth,

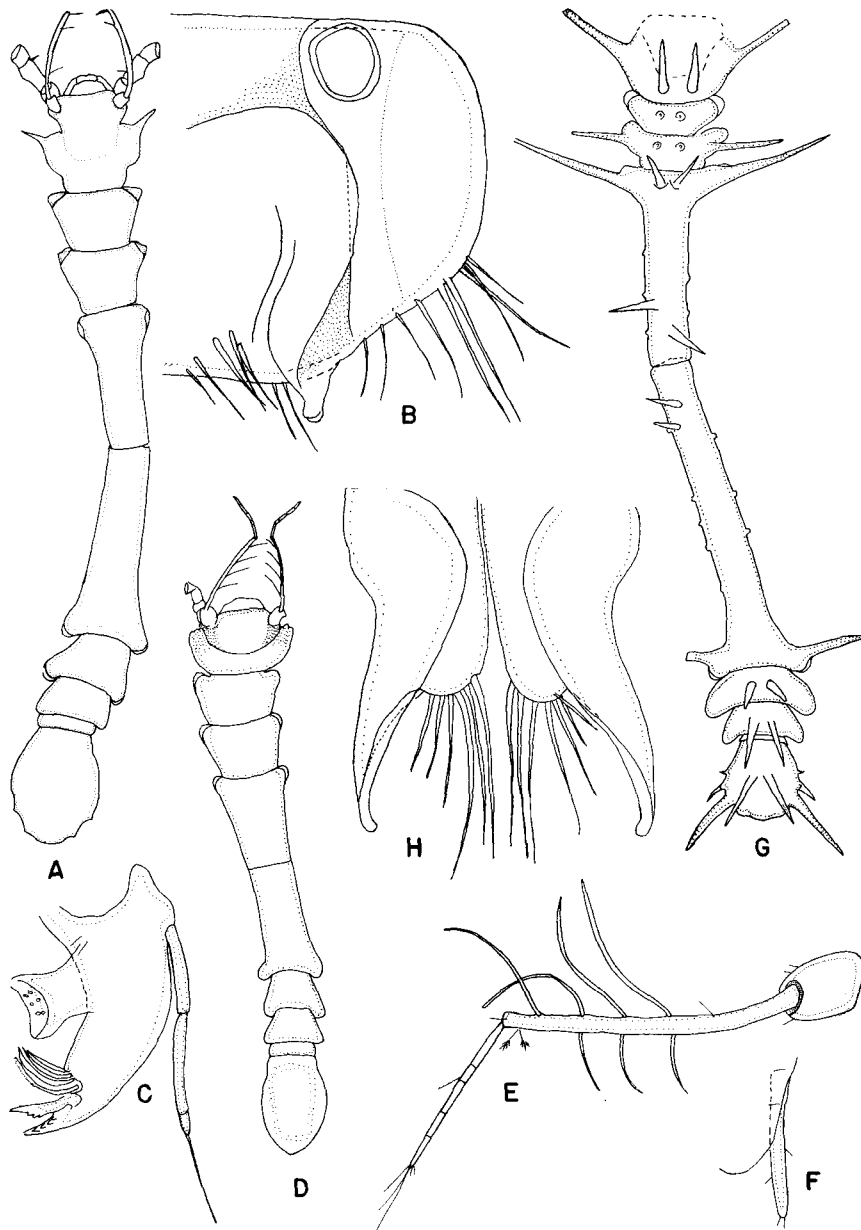


Figure 17. A–B: *Ischnomesus caribbicus*, n. sp. A: dorsal view male holotype; B: first pleopod. C–F: *Ischnomesus simplissimus*, n. sp. C: mandible holotype; D: dorsal view female holotype; E: first antenna; F: paratype uropod. G–H: *Ischnomesus multispinis*, n. sp. G: dorsal view male holotype; H: first pleopod.

entire; posterior margin broadly convex, smooth. Lateral projection of first male pleopod largely coalesced with sympod, apex of each with six setae.

Measurements: Holotype fragment male length 5.8 mm., width pleon 1.1 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, type only, cat. no. I-96.

Distribution: Known also from L.G.O. Biotrawl No. 18, six fragmentary males, cat. no. I-45.

Affinities: This species appears most closely related to the Pacific species *I. bruuni* Wolff, from which it differs in having the lateral spines of the

sixth peraeonal somite less laterally projecting—that is, at a 45° angle instead of a 75° angle from the peraeonal axis.

Ischnomesus magnificus, new species

Figure 18 D

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral and dorsal spines on fifth peraeonal somite (other anterior somites missing). Sixth and seventh peraeonal somites lacking lateral spines but having small dorsal spines. Pleon with seven spines on each side, 16

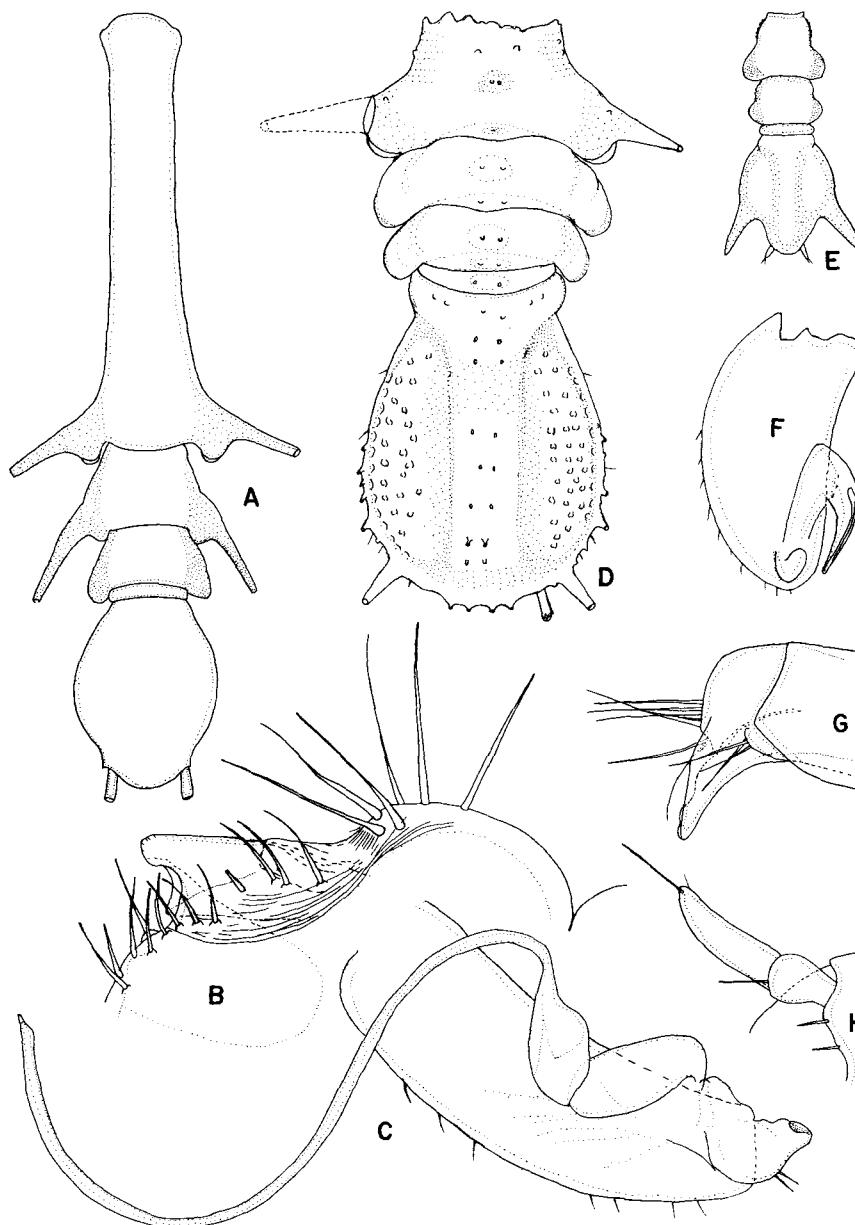


Figure 18. A-C: *Ischnomesus wolffi*, n. sp. A: dorsal view male holotype fragment; B: apex male pleopod; C: second male pleopod. D: *Ischnomesus magnificus*, n. sp., dorsal view female holotype fragment. E-H: *Ischnomesus bidens*, n. sp. E: dorsal view male holotype fragment; F: second male pleopod; G: male first pleopod; H: uropod.

dorsal spines, and four terminal spines. Pleopods missing.

Measurements: Female holotype fragment, length pleonal somites: first, 0.5 mm.; second, 4.5 mm.; peraeonal somites: sixth, 1.2 mm.; seventh, 1.05 mm.; width pleon 3.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type only, cat. no. I-91.

Distribution: Known only from type locality.

Affinities: This highly spinous species most nearly resembles *I. spärcki* Wolff, but differs from it in having spines on the distal border of the pleon. The species is obviously among the largest of the known asellotes.

Ischnomesus bidens, new species

Figure 18 E-H

Synonyms: None.

Diagnosis: *Ischnomesus* with angular postero-lateral projections on pleon, extending to postero-medial margin of pleon. Sympod of male first pleopod with acute lateral projection at apex. Endite of male second pleopod short, not projecting beyond apex of exopod. Sixth and seventh peraeonal somites without dorsal or lateral spines. Dorsum of pleon smooth, without spines.

Measurements: Holotype male fragment, length 1.8 mm., width of pleotelson 1.0 mm.

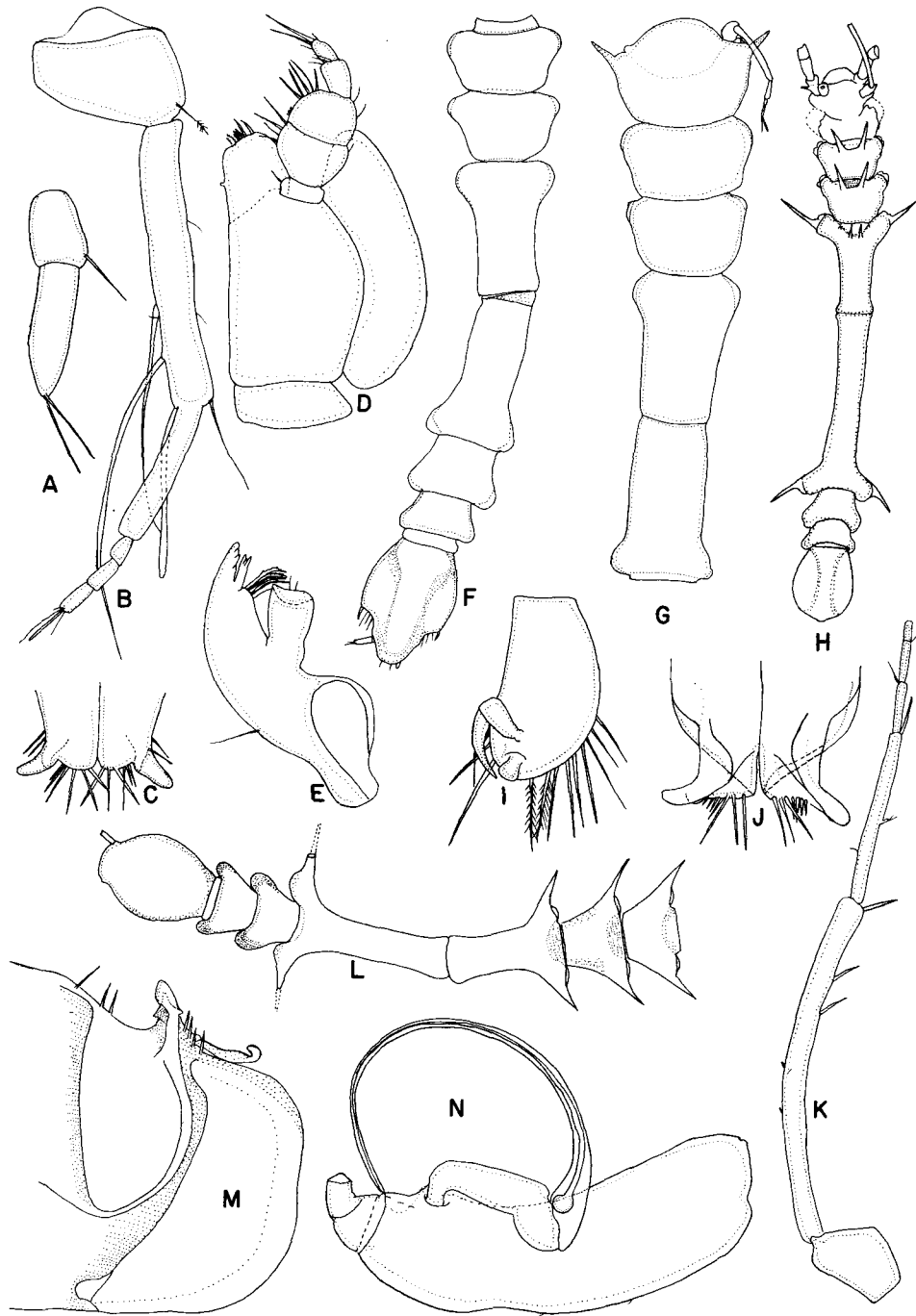


Figure 19. A-G: *Ischnomesus paucispinis*, n. sp. A: uropod; B: first antenna; C: first male pleopod; D: maxilliped; E: mandible; F: dorsal view male holotype minus cephalon; G: dorsal view male paratype fragment. H-K: *Ischnomesus decemspinus*, n. sp. H: dorsal view male holotype; I: second male pleopod; J: first male pleopod; K: first antenna. L-N: *Ischnomesus elegans*, n. sp. L: dorsal view male holotype; M: first male pleopod; N: second male pleopod.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type plus one male paratype fragment, cat. no. I-95.

Distribution: Known only from type locality.

Affinities: This species is unique in having the postero-lateral angles of the pleon projecting beyond the medial distal border. Otherwise it belongs with

the group of species lacking a lateral spine from the sixth pereaonal somite.

Ischnomesus paucispinis, new species

Figure 19 A-G

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral spines only on first peraeonal somite. Dorsal spines lacking. Pleon with stout setae on either side of pronounced postero-lateral angle, three smaller setae follow, apex with two minute setae. Lateral projections at apex of male first pleopod well developed, apex each with six stout setae.

Measurements: Holotype male fragment length 4.3 mm. (minus cephalon), width pleon 0.65 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, holotype and one male fragment, cat. no. I-93.

Distribution: Known only from type locality.

Affinities: The stout setae on the lateral margin of the pleon distinguish this species from the others, as does the fact that the fifth peraeonal somite lacks lateral spines.

Ischnomesus decemspinus, new species
Figure 19 H-K

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral spines on peraeonal somites 4-5 inclusive; somites 2-4 each with a pair of dorsal spines. Pleon ovoid, smooth, devoid of spines, setae, or sharp postero-lateral angles. Lateral projections at apex of first male pleopod well developed, apex of each with seven stout setae.

Measurements: Male holotype length 8.4 mm., width pleon 0.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 14, type and one fragment, cat. no. I-44.

Distribution: Known only from type locality.

Affinities: The fact that the dorsal surface of the fourth peraeonal somite has spines sets this species apart from the majority, plus the fact that the fifth peraeonal somite has long lateral spines.

Ischnomesus elegans, new species
Figure 19 L-N

Synonyms: None.

Diagnosis: *Ischnomesus* with lateral spines on peraeonal somites 2-5 inclusive. Dorsal spines lacking. Pleon with sharp postero-lateral angles at uropods, margins entire and smooth, posterior margin truncated and smooth. Lateral projection at apex of male first pleopod largely joined to sympod, distal margin without setae.

Measurements: Holotype male length 10.01 mm. (minus cephalon), width pleon 1.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 214, type only, cat. no. I-76.

Distribution: Known only from type locality.

Affinities: This species is closely related to *I. bacillus* (Beddard), but has the pleonal border swollen and not subparallel.

Ischnomesus species indeterminate

Unidentifiable fragments of *Ischnomesus* were collected at L.G.O. Biotrawl no. 12, eleven fragments; 18, five fragments; 52, two fragments; 53, three fragments; 98, one fragment; 217, one fragment; 220, one fragment; 233, one fragment.

Genus: HAPLOMESUS Richardson

Synonyms: *Haplomesus* Richardson, 1908a, p. 81; — Hansen, 1916, p. 59; — Wolff, 1956, p. 87.

Type species: *Ischnosoma quadrispinosa* G. O. Sars, 1879, p. 435.

Diagnosis: *Ischnomesidae* with third article of first antennae elongate, two and a half times or more longer than the fourth. Pleon with a single somite only. Uropoda with a single article. Fifth to seventh peraeonal somites fused with pleon.

Remarks: Eight species, all from the Atlantic and Pacific, are presently known from this genus:

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>quadrispinus</i> (G. O. Sars)	510	4150
2. <i>angustus</i> Hansen	698	2137
3. <i>insignis</i> Hansen	698	2707
4. <i>tenuispinis</i> Hansen	698	3474
5. <i>modestus</i> Hansen	—	2258
6. <i>brevispinis</i> Birstein	5510	5690
7. <i>cornutus</i> Birstein	6471	6571
8. <i>orientalis</i> Birstein	4000	4150

Additionally, three new species are described in this paper from abyssal depths of the North and South Atlantic.

A KEY TO THE SPECIES OF HAPLOMESUS

1. Third peraeonal somite with lateral spines 2
1. Third peraeonal somite without lateral spines 5
2. Fourth peraeonal somite with lateral spines *modestus* Hansen
2. Fourth peraeonal somite without lateral spines 3
3. Apex of pleon medially incised *bifurcatus*, n. sp.
3. Apex of pleon truncated or curved not medially incised 4
4. Dorsum of pleon medially with paired carinae *ornatus*, n. sp.
4. Dorsum of pleon medially with a single swelling *quadrispinus* (G. O. Sars)
5. Fourth peraeonal somite with lateral spines 6
5. Fourth peraeonal somite without lateral spines 8
6. Dorsum of pleon with at least one pair of stout spines near midline *tenuispinis* Hansen
6. Dorsum of pleon without paired stout spines 7
7. Lateral spines of first and fourth peraeonal somites massive, longer than wide *insignis* Hansen
7. Lateral spines of first and fourth peraeonal somites short, no longer than wide *tropicalis*, n. sp.
8. Posterior border of pleon trilobed *angustus* Hansen
8. Posterior border of pleon with one median lobe only *gorbunovi* Gurjanova*

* More probably this species belongs in the genus *Stylomesus*.

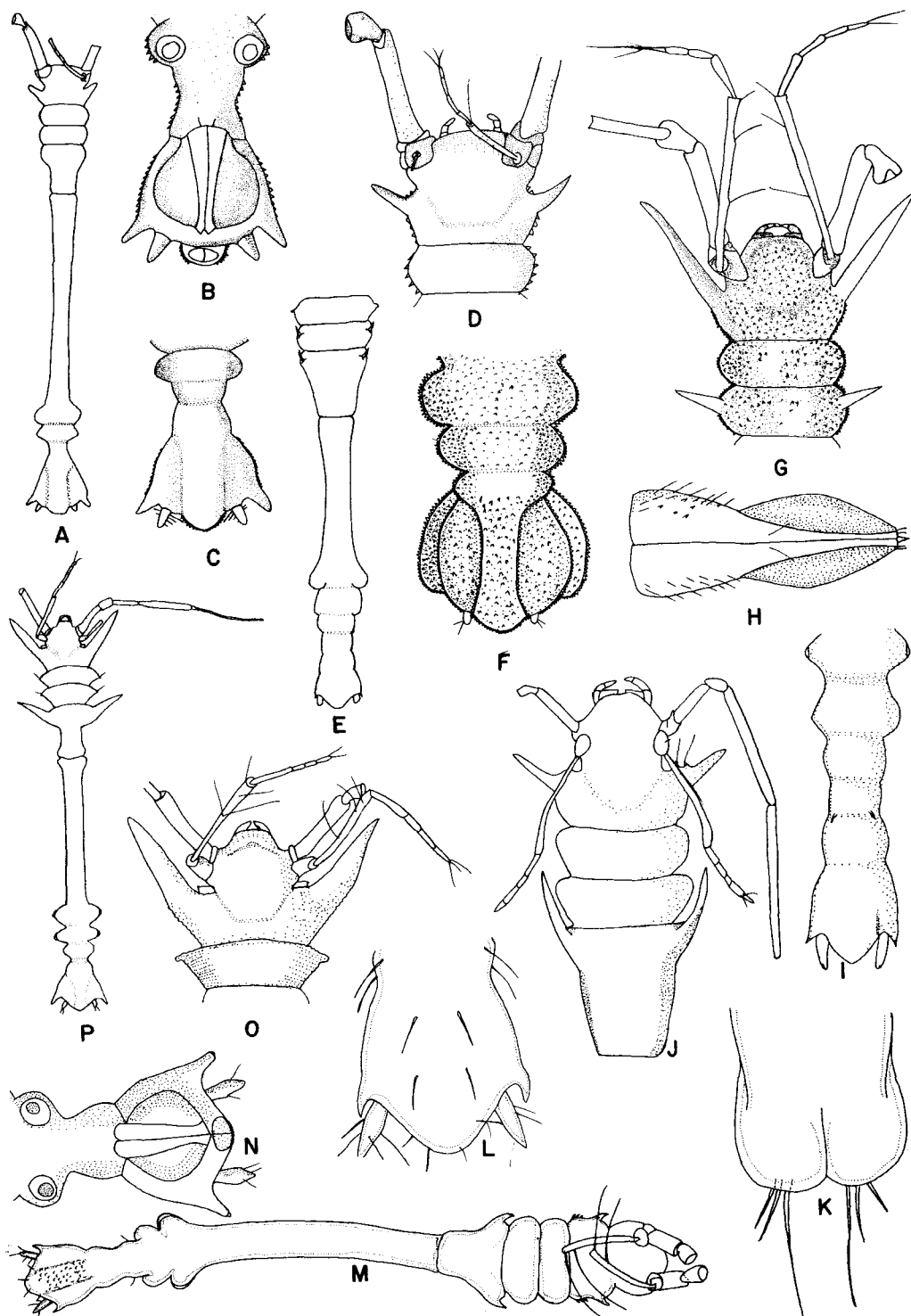


Figure 20. A-D: *Haplomeses angustus* Hansen. A: dorsal view immature male; B: ventral view male pleon; C: dorsal view male pleon; D: dorsal view head of male. E: *Haplomeses modestus* Hansen, dorsal view mutilated female. F-H: *Haplomeses quadrispinosus* (G. O. Sars). F: ventral view male pleon from *Ingolf* Sta. 36; G: dorsal view male cephalon from *Ingolf* Sta. 36; H: ventral view median lamella of male abdominal operculum from *Ingolf* Sta. 36. I-J: *Haplomeses tenuispinis* Hansen. I: dorsal view fragment of mutilated female from *Ingolf* Sta. 22; J: dorsal view of cephalon of female from *Ingolf* Sta. 24. K-M: *Haplomeses tropicalis*, n. sp. K: apex of male pleopod; L: dorsal view of male pleon and uropods; M: dorsal view male holotype. N-P: *Haplomeses insignis* Hansen. N: ventral view male pleon; O: dorsal view male cephalon; P: dorsal view male.

Haplomesus angustus Hansen

Figure 20 A-D

Synonyms: *Haplomesus angustus*. Hansen, 1916, pp. 61-62, Pl. V.

Diagnosis: *Haplomesus* with lateral spines on the first peraeonal somite only. Uropoda longer than wide. Pleon with pronounced postero-lateral angles dorsum without carinae.

Measurements: Juvenile male 4.8 mm. long. Full-grown males 9-12 mm. Length presumed (Hansen, op. cit.).

Type locality: North Atlantic, south of Denmark Strait, *Ingolf* Station 18, latitude 61° 44' N., longitude 30° 29' W., 1135 fathoms (2137 meters), temperature 3.0° C. (Hansen, op. cit.).

Distribution: Also found by *Ingolf* Station 125, latitude 68° 08' N., longitude 16° 02' W., 729 fathoms (1373 meters), temperature -0.8° C. This species was not represented in *Vema* collections, which appear to lie too far south of the distributional area of the species. Gorbunov (1946, p. 123) reports this species in the Arctic from 698 meters.

Affinities: This species superficially resembles *S. gorbunovi* Gurjanova from the Arctic; however, the postero-medial margin of the pleon is trilobed rather than a single lobe as in the latter.

Haplomesus modestus Hansen

Figure 20 E

Synonyms: *Haplomesus modestus*. Hansen, 1916, pp. 65-66, Pl. V.

Diagnosis: *Haplomesus* with lateral spines on somites 2, 3, and 4 and probably also on 1. Pleon without projecting postero-lateral angles, dorsum smooth and lacking spines or carinae. Uropoda not much longer than wide and not extending beyond posterior margin.

Measurements: 1.8 mm., fragment (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 1199 fathoms (2258 meters), temperature 2.4° C., one mutilated female specimen (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: The presence of lateral spines on peraeonal somites 2-4 inclusive distinguishes this species from the others that are known.

Haplomesus quadrispinosus (G. O. Sars)

Figure 20 F-H

Synonyms: *Ischnosoma quadrispinosum* G. O. Sars, 1879, p. 435; — 1885, p. 126, Pl. II. *Haplomesus quadrispinosus* (G. O. Sars), Richardson, 1908a, p. 81; — Hansen, 1916, pp. 59-61, Pl. II.

Diagnosis: *Haplomesus* with lateral spines on the first and third peraeonal somites only. Uropoda short, no longer than wide. Peraeon and pleon markedly tuberculate. Pleon without postero-lateral angles, dorsum with a single medial swelling. Apex of male first pleopods without lateral projections and with three terminal setae.

Measurements: Three males, largest 5 mm. (after Hansen, op. cit.).

Type locality: West of Norway, latitude 67° 56' N., longitude 4° 11' E., 1423 meters, temperature -1.4° C (Hansen, op. cit.).

Distribution: North Atlantic. The *Ingolf* collected it at nine stations:

Davis Strait: Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., two specimens; Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two specimens.

South of Davis Strait: Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temperature 1.3° C., one specimen.

North of the Faeroes: Station 139, latitude 63° 36' N., longitude 7° 30' W., 1322 meters, temperature -0.6° C., two specimens.

East of Iceland: Station 102, latitude 66° 23' N., longitude 10° 26' W., 1412 meters, temperature -0.9° C., five specimens.

Northeast of Iceland: Station 120, latitude 67° 29' N., longitude 11° 32' W., 1666 meters, temperature -1.0° C., one specimen; Station 119, latitude 67° 53' N., longitude 10° 19' W., 1902 meters, temperature -1.0° C., one specimen.

South of Jan Mayen: Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temperature -1.0° C., five specimens; Station 116, latitude 70° 05' N., longitude 8° 26' W., 699 meters, temperature -0.4° C., one specimen.

The species was not represented in the Lamont collections. Gorbunov (1946, p. 123) records it from 510 and 698 meters in the Arctic, and Birstein (1960, p. 15) cites it from the North Pacific at 4000-4150 meters.

Affinities: This species resembles the new species *ornatus* considerably, but lacks paired carinae on the dorsum of the pleon.

Haplomesus tenuispinis Hansen

Figure 20 I-J

Synonyms: *Haplomesus tenuispinis* Hansen, 1916, pp. 64-65, Pl. V.

Diagnosis: *Haplomesus* with lateral spines on peraeonal somites 1 and 4 only. Pleon with pronounced postero-lateral angles, dorsum with paired stout spines. Uropoda longer than wide and extending beyond the posterior border of the pleon.

Measurements: 3.1 mm. long (estimated, Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' 1199 fathoms (2258 meters), temperature 2.4° C. (Hansen, op. cit.).

Distribution: Also taken from North Atlantic, south of Davis Strait, *Ingolf* Station 22, latitude 58° 10' N., longitude 48° 25' W., 1845 fathoms (3474 meters), temperature 1.4° C. (perhaps a distinct species) (Hansen, op. cit.). Also reported by Gorbunov (1946, p. 123) from 698 meters in the Arctic.

Remarks: A specimen, female fragment, with an additional pair of stout spines on the dorsum of the seventh peraeonal somite was captured by *Vema* at

L.G.O. Biotrawl No. 231, cat. no. 231. It may represent a distinct species. The spines (actually stout setae) on the pleon distinguish this species from the others.

Haplomesus tropicalis, new species
Figure 20 K-M

Synonyms: None.

Diagnosis: *Haplomesus* with lateral spines on first and fourth peraeonal somites in male, and on first only in female. Pleon with sharp incurved posterolateral angles, dorsum without stout spines or carinae; apex convex. Uropoda longer than wide styliform, extending beyond apical margin of pleon. Male

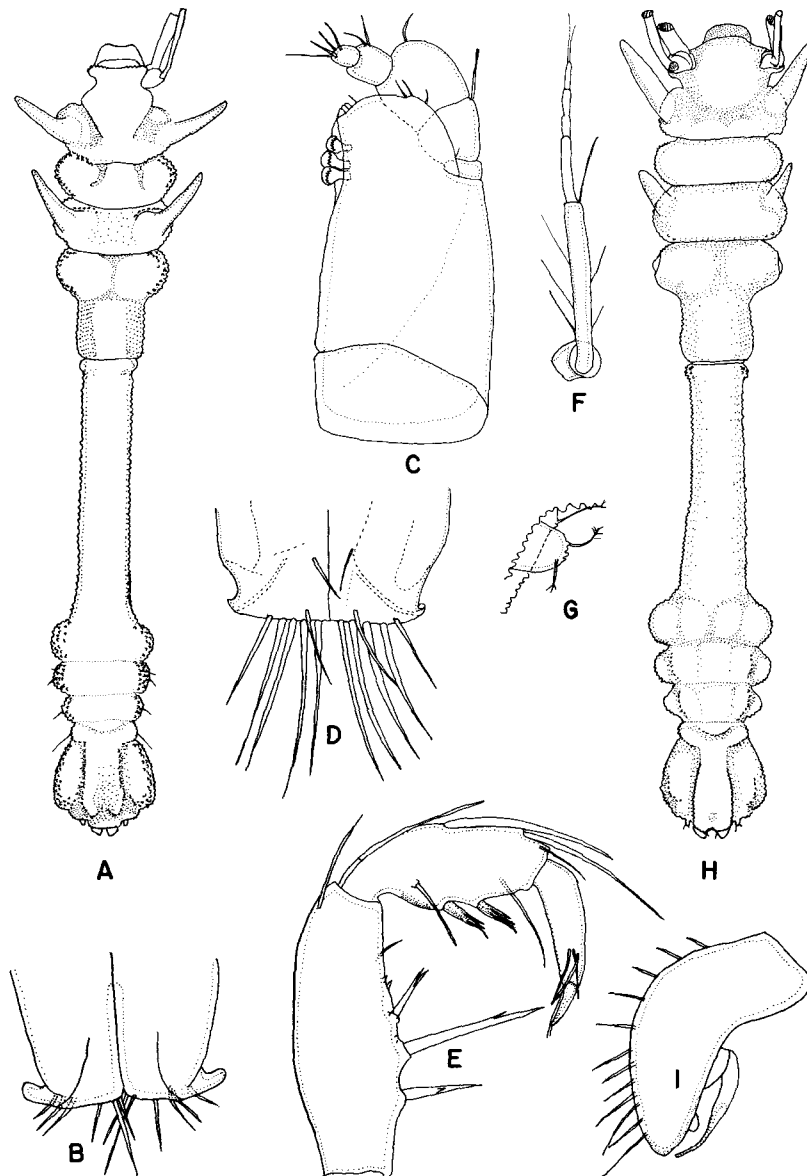


Figure 21. A-B: *Haplomesus ornatus*, n. sp. A: dorsal view male holotype; B: first pleopod. C-I: *Haplomesus bifurcatus*, n. sp. C: maxilliped; D: first male pleopod; E: first male paraeopod; F: first antenna; G: male uropod; H: dorsal view male holotype; I: second male pleopod.

pleopods each with simple rounded apex bearing three setae.

Measurements: Male holotype length 3.1 mm., width pleon 0.2 mm. Allotype length 4.1 mm., width pleon 0.4 mm.

Type locality: North Atlantic, Mediterranean, L.G.O. Biotrawl No. 76, holotype and allotype, cat. no. I-105.

Distribution: Also taken at L.G.O. Biotrawl No. 95, one male fragment, cat. no. I-106, Caribbean.

Affinities: This species appears most closely related to *H. insignis* Hansen, from which it differs in having much smaller lateral body spines.

Haplomesus insignis Hansen
Figure 20 N-P

Synonym: *Haplomesus insignis* Hansen, 1916, p. 63, Pl. V.

Diagnosis: *Haplomesus* with massive lateral spines on peraeonal somites 1 and 4 only. Pleon with pronounced postero-lateral angles, dorsum without stout setae or carinae. Uropoda longer than wide and extending beyond posterior margin of pleon.

Measurements: Male 4.5 mm. long (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, Ingolf Station 36, latitude 61° 50' N., longitude 56° 21' W., 1435 fathoms (2702 meters), temperature 1.5° C. (Hansen, op. cit.).

Distribution: Taken also by *Vema* at L.G.O. Biotrawl No. 234, one anterior fragment, cat. no. I-69. Reported by Gorbunov (1946, p. 123) from 698 meters in the Arctic.

Affinities: This species appears to be related to *H. tropicalis*, but has much more massive lateral body spines.

Haplomesus ornatus, new species
Figure 21 A-B

Synonyms: None.

Diagnosis: *Haplomesus* with lateral spines on peraeonal somites 1 and 3 only. Peraeon strongly tuberculate. Apex of pleon truncated, postero-lateral angles lacking, dorsum with paired medial carinae. Apex of male pleopods each with blunt lateral process and six setae.

Measurements: Holotype male length 6.8 mm., width pleon 0.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 18, one male and one male fragment, cat. no. I-49.

Distribution: Also from L.G.O. Biotrawl No. 52, one male, cat. no. I-47, and L.G.O. Biotrawl No. 214, two fragments, cat. no. I-78.

Affinities: This species is near to the North Atlantic *I. quadrispinosis* (G. O. Sars), but has carinae on the dorsum of the pleon which the latter lacks.

Haplomesus bifurcatus, new species
Figure 21 C-I

Synonyms: None.

Diagnosis: *Haplomesus* with lateral spines on peraeonal somites 1 and 3 only. Peraeon strongly tuberculate. Pleon without pronounced postero-lateral angles; apex incised, dorsum with mid-central swelling with deep pit. Uropoda minute, as wide as long and not extending to apex of pleon. Male first pleopods each with minute lateral projections and six setae.

Measurements: Holotype male length 5.0 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, holotype and one male fragment paratype, cat. no. I-48.

Distribution: Known only from type locality.

Affinities: This species resembles *H. ornatus*, but the indentation of the posterior border of the pleon distinguishes it.

Genus: HETEROMESUS Richardson

Synonyms: *Heteromesus* Richardson, 1908a, p. 81; — Hansen, 1916, p. 66; — Wolff, 1956, p. 141.

Type species: *Ischnosoma thomsoni* Beddard.

Diagnosis: Ischnomesidae with the third article of the first antenna minute. Pleon with a single somite only. Uropoda with a single article. Sixth and seventh peraeonal somites fused with pleon.

Composition: Thirteen species of this genus are known. Additionally, one new one is described in this paper. They are bathyal to abyssal in depth distribution and are known from only the Arctic, the North Atlantic (including the Caribbean), and the North Pacific (four species).

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>thomsoni</i> (Beddard)	3750	3750
2. <i>spinus</i> (Beddard)	1829	1829
3. <i>greeni</i> (Tattersall)	364	700
4. <i>spinescens</i> Richardson	2155	3337
5. <i>granulatus</i> Richardson	713	3235
6. <i>dentatus</i> Hansen	1505	1505
7. <i>longiremis</i> Hansen	698	2707
8. <i>schmidtii</i> Hansen	956	956
9. <i>frigidus</i> Hansen	698	1435
10. <i>similis</i> Richardson	—	2995
11. <i>gigas</i> (Birstein)	6560	8430
12. <i>scabriusculus</i> (Birstein)	5450	5450
13. <i>robustus</i> (Birstein)	5450	5817

A KEY TO THE SPECIES OF
HETEROMESUS^a

It is not easy to provide a key to the species of *Heteromesus* because entire specimens are not yet known for all the species. The following key therefore is incomplete but probably useful.

- 1. Pleon with spines or spine-like projections at the lateral margins 2
- 1. Pleon without spines or spine-like projections at lateral margins 5
- 2. Posterior border of pleon with a pair of spine-like projections *thomsoni* (Beddard)
- 2. Posterior border of pleon without spine-like projections 3
- 3. Posterior border of pleon medially excised *bifurcatus*, n. sp.
- 3. Posterior border of pleon rounded 4
- 4. First peraeonal somite laterally with two spines *similis* Richardson
- 4. First peraeonal somite laterally with only one spine *dentatus* Hansen
- 5. Uropoda over five times longer than their greatest width *longiremis* Hansen
- 5. Uropoda considerably less than five times longer than wide 6
- 6. Lateral borders of first peraeonal somite with one spine each 7
- 6. Lateral borders of first peraeonal somite with 2-3 spines 8
- 7. Uropoda only two times as long as wide *granulatus* Richardson
- 7. Uropoda four times as long as wide *schmidtii* Hansen
- 8. Lateral border of first peraeonal somite with three spines each *spinosus* (Beddard)
- 8. Lateral border of first peraeonal somite with two spines each 9
- 9. Uropoda curving toward midline of pleon *frigidus* Hansen
- 9. Uropoda straight 10
- 10. Last peduncular article of second antenna without a spine in distal inner extremity *greeni* (Tattersall)
- 10. Last peduncular article of second antenna with a prominent spine at distal inner extremity *spinescens* Richardson

^a Birstein's three species not included; these are deep Pacific species.

Heteromesus longiremis Hansen

Figure 22 A-B

Synonyms: *Heteromesus longiremis* Hansen, 1916, pp. 68-69, Pl. VI.

Diagnosis: *Heteromesus* having pleon smooth laterally, lacking spines. Uropoda over five times as long as wide.

Measurements: Length mutilated female specimen 3.5 mm. (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, Ingolf Station 36, latitude 61° 50' N., longitude 56° 21' W., 2707 meters, temperature 1.5° C., type only.

Distribution: Known only from type locality.

Affinities: The very long uropods and the lack of lateral spines on the pleon distinguish this species from the others.

Heteromesus bifurcatus, new species

Figure 22 C

Synonyms: None.

Diagnosis: *Heteromesus* with a single spine (curved

toward apex) on each side of the pleon. Apex of pleon medially incised. Uropoda about three times as long as wide. Last free peraeonal somite without spines at postero-lateral border.

Measurements: One female fragment 3.5 mm. long. width pleon 0.5 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 94, type only, cat. no. I-107.

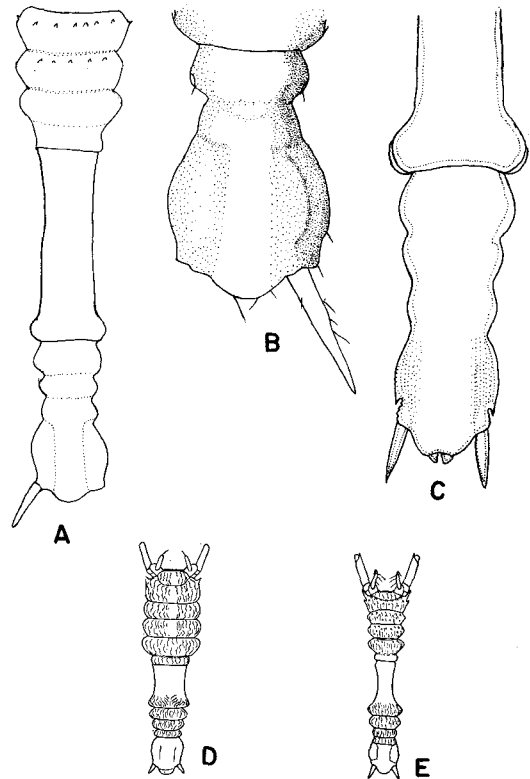


Figure 22. A-B: *Heteromesus longiremis* Hansen. A: dorsal view mutilated female; B: dorsal view mutilated male. C: *Heteromesus bifurcatus*, n. sp., dorsal view female fragment. D: *Heteromesus granulatus* Richardson, dorsal view female. E: *Heteromesus spinescens* Richardson, dorsal view male.

Distribution: Known only from type locality.

Affinities: This species is very close to *H. dentatus* Hansen, from which it differs in having the apex of the pleon incised.

Heteromesus granulatus Richardson

Figure 22 D

Synonyms: *Heteromesus granulatus* Richardson, 1908a, pp. 82-83, Figs. 14-17.

Diagnosis: *Heteromesus* with spines lacking from lateral border of pleon, apex of pleon rounded, entire, lacking spine-like projections. Uropoda only about twice as long as wide.

Measurements: None available.

Type locality: North Atlantic, *Albatross* Station 2547, south of Martha's Vineyard, 713 meters, 41 females, four males, cat. no. 38969 U.S.N.M., Washington (Richardson, op. cit.).

Distribution: Known also from *Albatross* Station 2572, southeast of Georges Bank, 3235 meters, two males, one female; *Albatross* Station 2571, southeast of Georges Bank, 2479 meters, one male; *Albatross* Station 2208, south of Block Island, 2155 meters, one male, six females; *Albatross* Station 2078, off Georges Bank, 912 meters, one female (Richardson, op. cit.).

Affinities: This species appears closely related to *H. schmidtii* Hansen, but has much shorter uropods.

Heteromesus spinescens Richardson
Figure 22 E

Synonyms: *Heteromesus spinescens* Richardson, 1908a, pp. 83–84, Fig. 18.

Diagnosis: *Heteromesus* with pleon lacking lateral spines, apex rounded, entire, lacking spine-like projections. Uropoda less than five times as long as wide, not bent toward midline. Lateral border of first peraeonal somite with two spines. Last peduncular article of first antenna with a prominent spine at distal extremity (Richardson, op. cit. illustration.).

Measurements: None available.

Type locality: North Atlantic, *Albatross* Station 2105, off Virginia, 2557 meters, one male, cat. no. 38970 U.S.N.M., Washington (Richardson, op. cit.).

Distribution: Also taken from *Albatross* Station 2714, south of Martha's Vineyard, 3337 meters, two females; *Albatross* Station 2208, south of Block Island, 2155 meters, two females *Albatross* Station 2084, off Georges Bank, 2361 meters, one female; *Albatross* Station 2571, southeast of Georges Bank, 2479 meters, five females.

Affinities: This species seems related to *H. greeni* (Tattersall) and differs from it in having the long spine in the inner angle of the last peduncular article of the second antenna.

Heteromesus similis Richardson
Figure: none available

Synonyms: *Heteromesus similis* Richardson, 1911, pp. 531–532.

Diagnosis: *Heteromesus* with spines at lateral border of pleon, posterior border entire, rounded, without spine-like projections or excisions. First peraeonal somite laterally with two spines.

Measurements: None available.

Type locality: *Talisman* Station 31, northeast of San Miguel in the Azores, 22 August 1883, 2995 meters, one fragment.

Distribution: Known only from type locality.

Affinities: This species is perhaps related to *H. dentatus* Hansen, from which it differs in having two spines instead of one at the lateral margin of the first peraeonal somite.

Genus: *STYLOMESUS* Wolff

Synonyms: *Stylomesus* Wolff, 1956, pp. 87–88, 97.

Type species: *Rhabdomesus inermis* Vanhöffen, Wolff, 1956, pp. 87–88, 97.

Diagnosis: Ischnomesidae having uropods with two articles. Seventh peraeonal somite fused with pleon. Third article of first antenna more than twice as long as fourth.

Composition: Wolff (1956) put only *inermis* in this genus. The species *S. inermis* was collected by the German South Polar Expedition (1901–1903) in the Antarctic Indian Ocean northwest of the *Gauss* station from a depth of 2450 meters. Four additional new species are described in this paper. Birstein (1960) described four abyssal species from the North Pacific, and Gurjanova (1946) described one from the Arctic.

A KEY TO THE SPECIES OF
STYLOMESUS^a

1. Pleon composed of three fused somites 2
1. Pleon composed of two fused somites 4
2. Apex of male first pleopod with lateral projections 6
2. Apex of male first pleopod without lateral projections 3
3. Inner margin of uropodal peduncle spinulate *spinulosus*, n. sp.
3. Inner margin of uropodal peduncle smooth *simplex*, n. sp.
4. Uropodal peduncle just extending to end of pleon *inermis* (Vanhöffen)
4. Uropodal peduncle extending beyond end of pleon by about one-half its length 5
5. Dorsum of pleon strongly granulate, without central depression *granulosus*, n. sp.
5. Dorsum of pleon smooth with central transverse depression *elegans*, n. sp.
6. Apex of pleon between uropods triangulate *regularis*, n. sp.
6. Apex of pleon between uropods evenly rounded 7
7. Lateral margin of male first pleopods with two distinct lobes at distal half *productus*, n. sp.
7. Lateral margin of male first pleopods with one distinct lobe at distal half *simulans*, n. sp.

^a Following species not included:

1. *gorbunovi* (Gurjanova)
2. *wolffi* Birstein
3. *menziesi* Birstein
4. *gracilis* Birstein
5. *pacificus* Birstein.

Stylomesus inermis (Vanhöffen)
Figure 23

Synonyms: *Rhabdomesus inermis* Vanhöffen, 1914, pp. 560–561, Fig. 88. *Stylomesus inermis* (Vanhöffen), Wolff, 1956, pp. 87, 97–99.

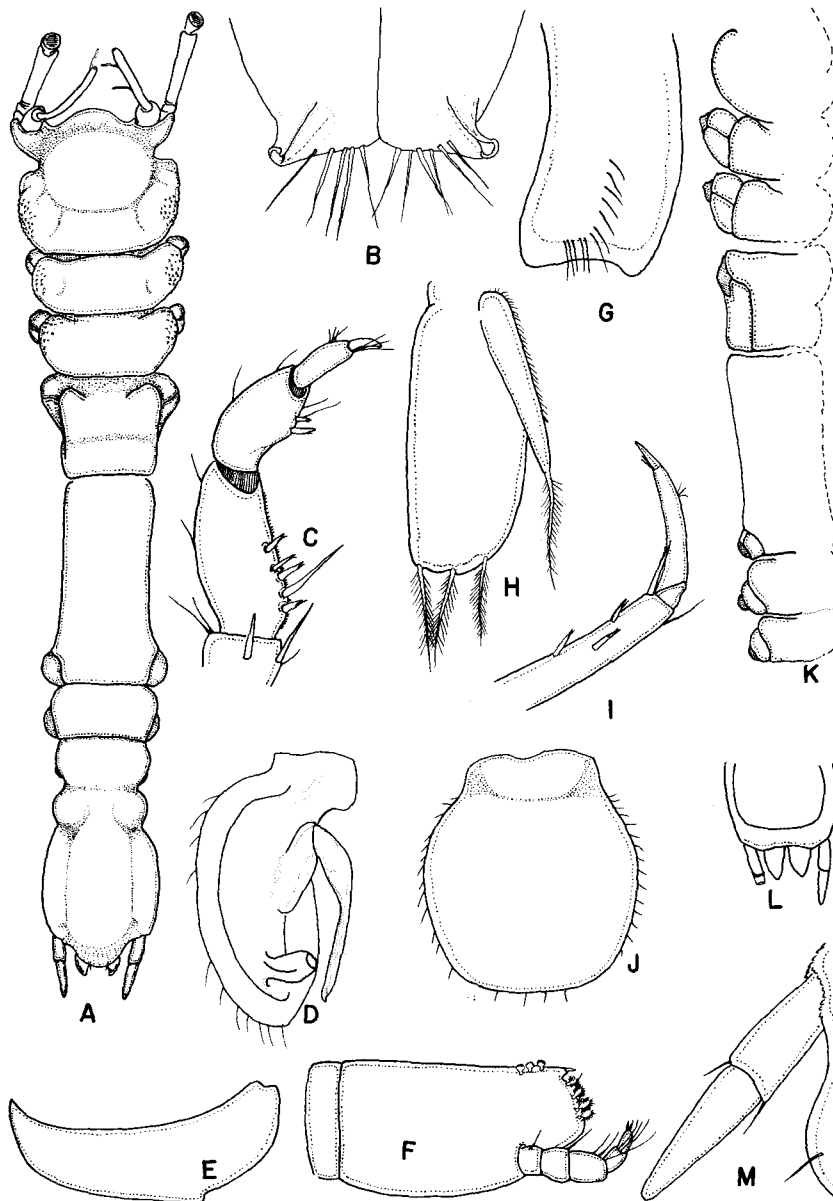


Figure 23. *Stylomesus inermis* (Vanhöffen). A: dorsal view female 5.8 mm. long, width pleon 0.8 mm.; B: first male pleopod; C: first paraeopod; D: second male pleopod; E: maxillipedal molar; F: maxilliped; G: mandibular molar; H: second female pleopod; I: sixth paraeopod; J: female operculum; K: lateral view female; L: female anus and uropods; M: male uropod.

Diagnosis: *Stylomesus* without lateral spines on peraeonal or pleonal somites. Body granulate. Pleon with lateral swellings indicating only one coalesced somite. First article of uropod extending to apex of pleon. Apex of male pleopods with slight lateral process and each with six apical setae.

Measurements: 5.1 mm. total length; width somite one is 0.9 mm. (Wolff, op. cit.).

Type locality: Antarctic Indian Ocean, near Gauss Station, latitude 65° 31' S., longitude 85° 17' E., 2450 meters (Wolff, op. cit.).

Distribution: This species was collected by *Vema* from the South Atlantic Ocean at: L.G.O. Biotrawl

No 12, three female, two male, one fragment, cat. no. I-71; L.G.O. Biotrawl No. 210, one female, one fragment, cat. no. I-70; L.G.O. Biotrawl No. 214, three female, three fragments, cat. no. I-75.

Affinities: The pleon of this species has only two fused somites. Because the uropodal peduncles are short, the species is distinguished from *granulosus* and *elegans*, both of which have longer uropodal peduncles.

Stylomesus granulosus, new species

Figure 24 A-C

Synonyms: None.

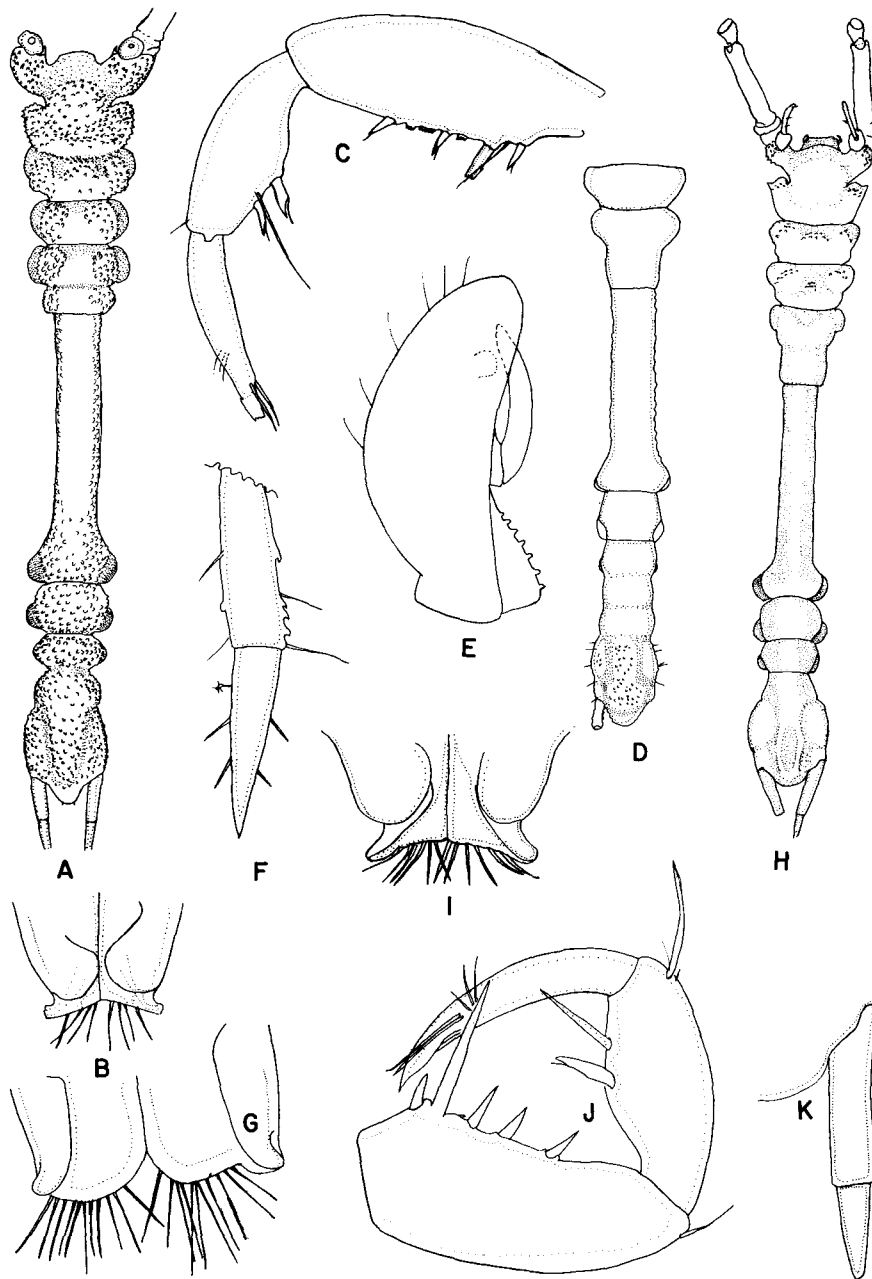


Figure 24. A-C: *Stylomesus granulatus*, n. sp. A: dorsal view male holotype; B: first male pleopod, C: first male paraeopod. D-G: *Stylomesus spinulosus*, n. sp. D: dorsal view fragment female holotype; E: second pleopod male paratype; F: uropod male; G: first pleopod male. H-K: *Stylomesus elegans*, n. sp. H: dorsal view male holotype; I: first pleopod male; J: first male paraeopod; K: male uropod.

Diagnosis: *Stylomesus* without lateral spines on pereaeon or pleon. Body strongly granulate. Pleon with lateral swellings indicating only one coalesced somite. First article of uropoda extending beyond apex of pleon by one-half its length. Apex of male first pleopods with short truncated lateral processes and each with four apical setae.

Measurements: Male holotype length 8.9 mm., width pleon 1.1 mm., female allotype length 7.2 mm., width pleon 0.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No.

51, types plus one male and four fragmentary paratypes, cat. no. I-101

Distribution: Known only from type locality.

Affinities: This species is allied with *S. elegans*, from which it differs in lacking a central transverse depression from the dorsum of the pleon

Stylomesus spinulosus, new species
Figure 24 D-G

Synonyms: None.

Diagnosis: *Stylomesus* without lateral spines on peraeon or pleon. Body strongly granulate. Pleon with lateral swellings indicating two coalesced somites. First article of uropoda marginally spinulose and extending to apex of pleon. Apex of male first pleopods with short blunt lateral processes, each apex with 10–11 setae.

Measurements: Female holotype fragment length 3.0 mm., width pleon 0.35 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, holotype and three fragmentary paratypes, cat. no. I-102.

Distribution: Known only from type locality.

Affinities: This species appears most closely related to *S. simplex*, from which it differs in having the inner margin of the uropodal peduncle spinulate.

Stylomesus elegans, new species
Figure 24 H–K

Synonyms: None.

Diagnosis: *Stylomesus* with a short lateral spine on first peraeonal somite; other somites and pleon without lateral spines. Pleon with lateral swellings indicating only one coalesced somite. First article of uropod extending beyond apex of pleon by one-half its length. Second article shorter than first. Apex of male pleopods with blunt lateral processes; six setae at apex.

Measurements: Holotype male length 7.2 mm., width pleon 1.1 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 51, type only, cat. no. I-100.

Distribution: Also taken from the North Atlantic, L.G.O. Biotrawl No. 208, one pleon fragment, cat. no. I-220.

Affinities: This species resembles *granulosus* most closely, but has a depressed area on the dorsum of the pleon.

Stylomesus regularis, new species
Figure 25 A–D

Synonyms: None.

Diagnosis: *Stylomesus* without lateral spines on peraeon, pleon with three fused somites. Margin of uropoda spinulate. Uropodal peduncle extending slightly beyond apex of pleon. Dorsum of pleon without central depressed area. Apex of male first pleopod with lateral expansions and with eight setae.

Measurements: Holotype male length 5.75 mm, with pleon 0.6 mm., allotype length 6.0 mm., width pleon 0.55 mm., plus cephalon fragment.

Type locality: South Atlantic, L.G.O. Biotrawl No. 218, types only, cat. no. I-219.

Distribution: Found only at type locality.

Affinities: This species is related to *S. simulans* and *S. productus*, from which it differs in having a triangular pleonal apex between the uropods.

Stylomesus simplex, new species
Figure 25 E–J

Synonyms: None.

Diagnosis: *Stylomesus* without lateral spines on pleon. Body with few granules. Pleon with lateral swellings indicating two coalesced somites. First

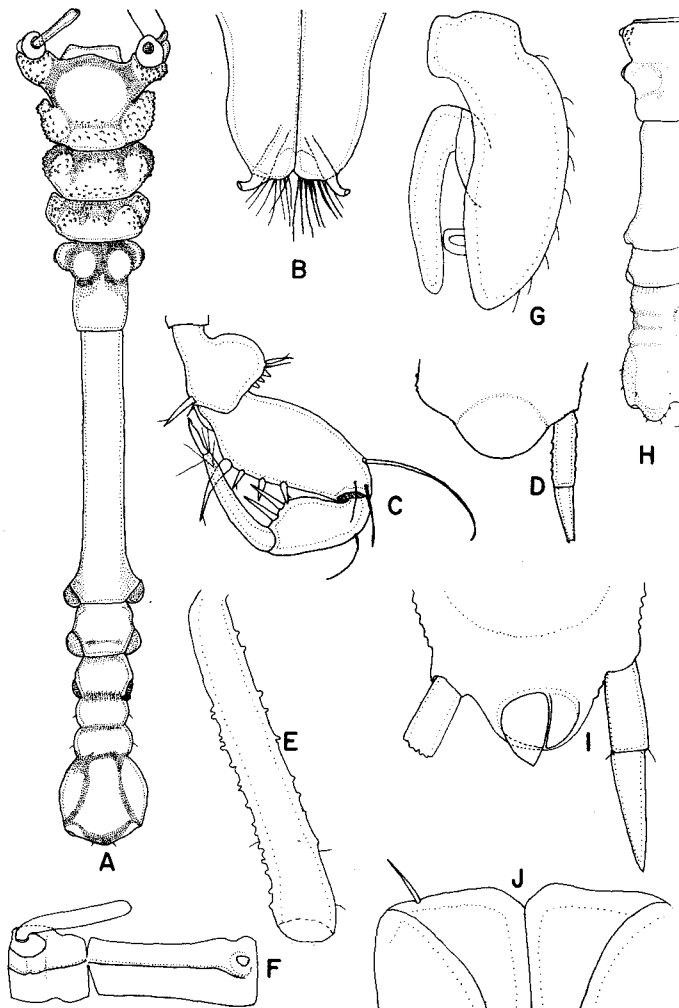


Figure 25. A–D: *Stylomesus regularis*, n. sp. A: dorsal view male holotype; B: first male pleopod; C: male gnathopod; D: ventral view uropod female allotype. E–J: *Stylomesus simplex*, n. sp. E: fourth male paracopod; F: lateral view male holotype; G: second male pleopod; H: dorsal view male holotype (minus cephalon); I: ventral view female pleon; J: first male pleopod.

article of uropod extending to apex of pleon; margin smooth. Apex of male pleopods without lateral processes and each with a single apical seta.

Measurements: Male holotype (minus cephalon) length 3.0 mm., width pleon 0.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type and one female allotype fragment, cat. no. I-73.

Distribution: Known also from the South Atlantic, from L.G.O. Biotrawl No. 53, one female, cat. no. I-204, and from L.G.O. Biotrawl No. 212, one female, cat. no. I-74.

Affinities: This species is close to *S. spinulosus*, from which it differs in lacking spines from the uropodal peduncle.

Stylomesus productus, new species
Figure 26 A-C

Synonyms: None.

Diagnosis: *Stylomesus* with three fused pleonal somites. Uropodal peduncle extending far beyond apex of pleon. Dorsum of pleon with two pits, one at apex, one in front of apex. Apex of male first pleopod with seven setae and lateral expansions. Lateral margin male first pleopods with two large swellings just behind apex. Seventh peraeonal somite not separated from pleon.

Measurements: Length last six somites (inclusive of pleon) 3.0 mm., width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 214, type male fragment only, cat. no. I-214.

Distribution: Known only from type locality.

Affinities: This species is near to *S. simulans*, but differs in having an additional lobe along the lateral border of the male first pleopods at its distal half.

Stylomesus simulans, new species
Figure 26 D-F

Synonyms: None.

Diagnosis: *Stylomesus* with three fused pleonal somites. Uropodal peduncle just extending beyond apex of pleon. Dorsum of pleon with two pits, one at apex, one in front of apex. Apex of each male first pleopod with seven setae and lateral expansions. Lateral margins male first pleopod with only one swelling just behind apex. Seventh peraeonal somite fused with pleon.

Measurements: Length male last five somites 1.9 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 214, type only, cat. no. I-243.

Distribution: Known only from type locality.

Affinities: This species resembles *S. productus*

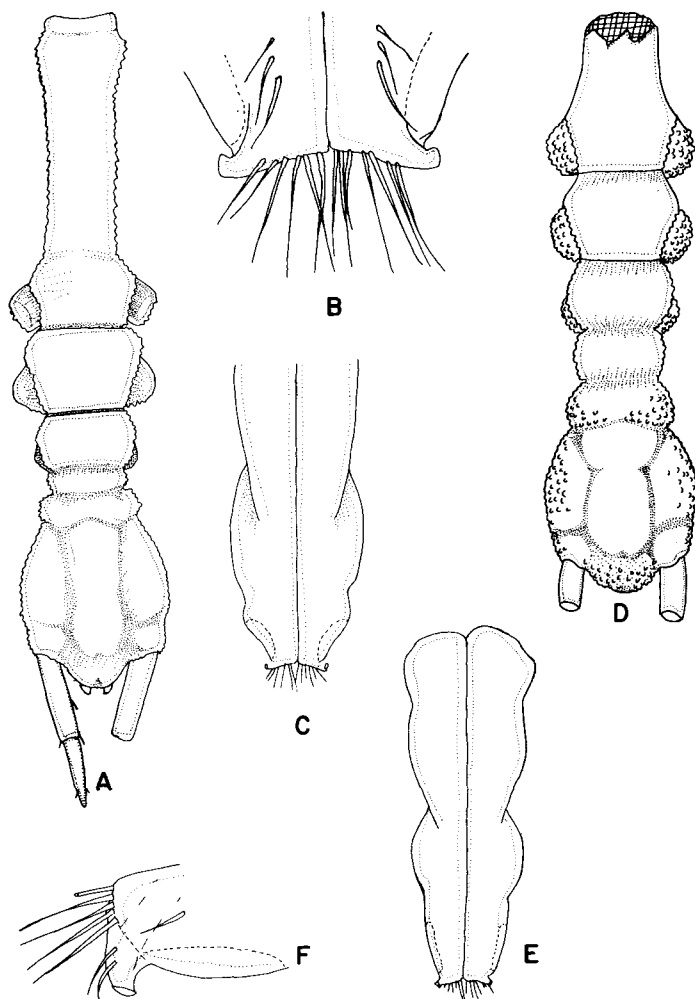


Figure 26. A-C: *Stylomesus productus*, n. sp. A: dorsal view male (minus cephalon); B: first male pleopod; C: male pleopod. D-F: *Stylomesus simulans*, n. sp. D: dorsal view male fragment; E: first male pleopod; F: first male pleopod.

rather closely, but has only one lobe instead of two along lateral margin of the male first pleopods at its distal half.

Stylomesus species indeterminable

Indeterminate species of *Stylomesus* were taken in L.G.O. Biotrawl No. 12, two fragments, and L.G.O. Biotrawl No. 47, two fragments.

Family: MACROSTYLIDAE

Type genus: *Macrostylis* G. O. Sars, 1863.

Diagnosis: Paraselloidea with free first peraeonal somite. Mandible with pointed molar bearing setae at apex; palp lacking. First three articles of maxillipedal palp as wide as endite, last two narrow, small. Uropoda styliform; uniramous. First pair of antennae shorter than peduncle of second pair of antennae.

All peraeopods ambulatory. Pleon consisting of a single somite only. Anus separated from branchial chamber.

Composition: This family contains only one genus, *Macrostylis*. It is quite possible that *Pseudomesus* Hansen should be referred to this family, and in that event the Pseudomesidae should be canceled. I have not

seen specimens of *Pseudomesus* and therefore hesitate to make that assignment.

Genus: MACROSTYLIS G. O. Sars, 1863

Type species: *Macrostylis spinifera* G. O. Sars, 1863, p. 15.

Diagnosis: Macrostylidae with the fourth peraeopods shorter than the others. Uropoda elongate. First three peraeonal somites almost fused into a single unit.

Composition: Although Wolff (1956) correctly indicates that ten species are known from the genus, he omitted *M. spinifera* from his key to the species. In depth the species range from the shallow water of Christiania Fjord to the floor of the Philippine trench at 10,000 meters. Here eight additional species are described from the abyssal Atlantic, where previously only one abyssal species was known.

The uropods are terminal and two-jointed in *Macrostylis*, and above them there is often a deep notch in the dorsum of the pleon. The uropoda are not dorsal in insertion as shown by Wolff, 1956, p. 100, Fig. 13, but terminal.

THE KNOWN SPECIES OF MACROSTYLIS

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>spiniceps</i> Barnard	—	1280
2. <i>longipes</i> Hansen	—	1412
3. <i>subinermis</i> Hansen	1090	1902
4. <i>longiremis</i> (Meinert)	149	218
5. <i>elongata</i> Hansen	—	1591
6. <i>hadalis</i> Wolff	—	7270
7. <i>galathea</i> Wolff	9820	10,000
8. <i>latifrons</i> Beddard	—	3749
9. <i>abyssicola</i> Hansen	3229	3521
10. <i>spinifera</i> G. O. Sars	4	1761

A KEY TO THE SPECIES OF MACROSTYLIS

- 1. Apical margin of pleon with conspicuous setae 2
- 1. Apical margin of pleon without conspicuous setae 8
- 2. Postero-lateral margins of fourth peraeonal somite pointed and projecting 3
- 2. Postero-lateral margins of fourth peraeonal somite evenly rounded 4
- 3. Uropodal peduncle longer than pleon *hirsuticaudis*, n. sp.
- 3. Uropodal peduncle not as long as pleon 5
- 4. Postero-lateral angles of peraeonal somites 5-7 with a stout seta 6
- 4. Postero-lateral angles of peraeonal somites 5-7 without stout spine *longipes* Hansen
- 5. Peduncle of uropods longer than greatest width of pleon *spinifera* (G. O. Sars)
- 5. Peduncle of uropods shorter than greatest width of pleon *longiremis* (Meinert)
- 6. Fourth somite of peraeon narrower than third and fifth somites *setifer*, n. sp.

- 6. Fourth peraeonal somite as wide as third and fifth 7
- 7. Postero-lateral angles of cephalon sharply pointed *caribbicus*, n. sp.
- 7. Postero-lateral angles of cephalon evenly rounded *subinermis* Hansen
- 8. Medial apex of pleon emarginate *bifurcatus*, n. sp.
- 8. Medial apex of pleon convex or truncated, never bifurcated 9
- 9. Apex of pleon truncated *truncatex*, n. sp.
- 9. Apex of pleon pointed or rounded 10
- 10. Cephalon wider than peraeon with postero-lateral angles projecting *spiniceps* Barnard
- 10. Cephalon not wider than peraeon, postero-lateral angles not projecting beyond peraeonal margin 11
- 11. Pleon with bulbous swellings at uropod insertion making the pleon appear constricted cephalad of uropods *vemae*, n. sp.
- 11. Pleon not swollen laterally in front of uropod insertion 12
- 12. First and second peraeonal somites subequal in length 13
- 12. First peraeonal somite much shorter or longer than second 14
- 13. Cephalon quadrate in shape, as wide in front as behind *abyssicola* Hansen
- 13. Cephalon narrower in front than behind 15
- 14. First peraeonal somite much shorter than second *minutus*, n. sp.
- 14. First peraeonal somite much longer than second *hadalis* Wolff
- 15. Cephalon narrower than peraeon 17
- 15. Cephalon as wide as peraeon 16
- 16. Postero-lateral angles of cephalon rounded, lacking setae *galathea* Wolff
- 16. Postero-lateral angles of cephalon pointed with stout seta at apex *bipunctatus*, n. sp.
- 17. Pleon with statocysts *elongata* Hansen
- 17. Pleon without statocysts *latifrons* Beddard

Macrostylis truncatex, new species

Figure 27 A-C

Synonyms: None.

Diagnosis: Cephalon narrower in front than rear, front rounded. Fourth peraeonal somite as wide as third and fifth, lateral borders rounded. First peraeonal somite slightly longer than second. Uropodal peduncle not longer than pleon width; dorsum of pleon with a pair of carinae in front of uropods, pits and sensory organs lacking, apical border truncated lacking plumose setae. Apex of male first pleopods simple, rounded, without stout spines or lateral projections but with nine setae. First antenna with five-articles (male).

Measurements: Holotype male length 3.5 mm., width pleon 0.6 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 246, one male, cat. no. I-117.

Distribution: Known only from type locality.

Affinities: The truncated nature of the pleonal apex distinguishes this species.

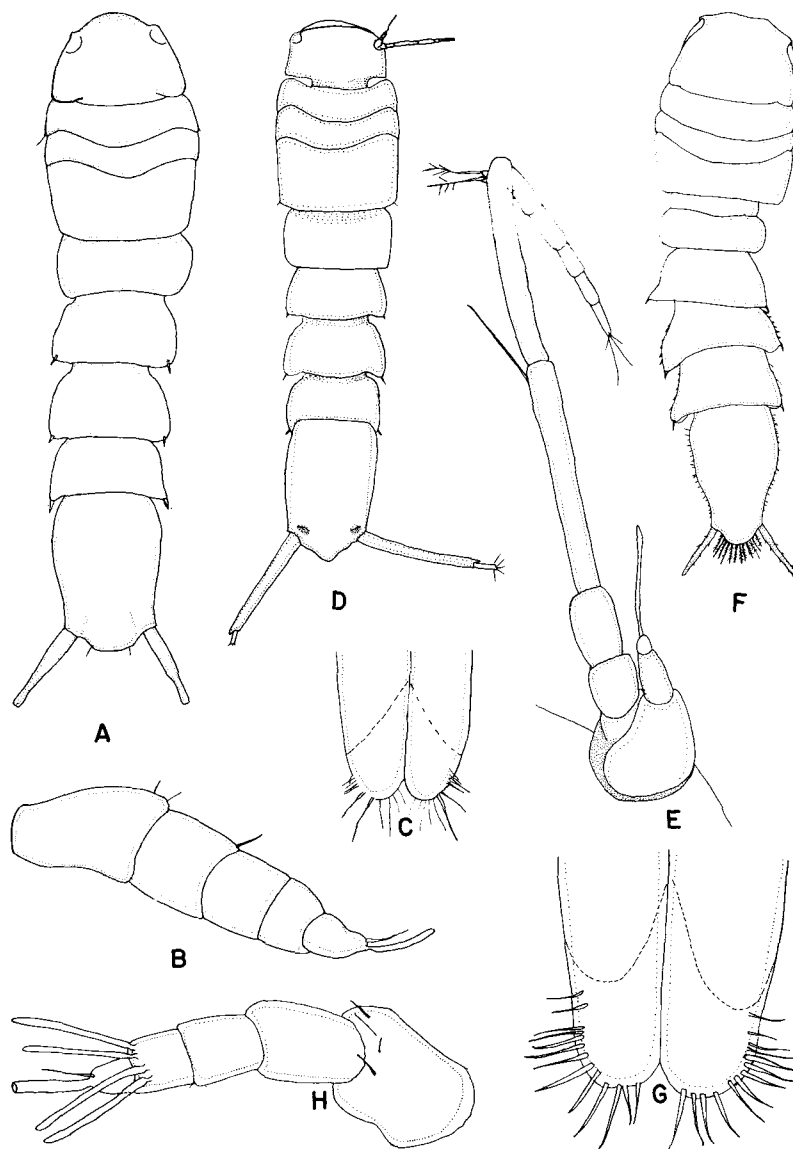


Figure 27. A-C: *Macrostylis truncatex*, n. sp. A: dorsal view holotype; B: first antenna; C: first male pleopod. D-E: *Macrostylis abyssicola* Hansen. D: dorsal view female (3.9 mm.); E: first and second antenna. F-H: *Macrostylis setifer*, n. sp. F: dorsal view male holotype; G: first male pleopod; H: first antenna.

Macrostylis abyssicola Hansen

Figure 27 D-E

Synonyms: *Macrostylis abyssicola* Hansen, 1916, pp. 77-79, Pl. VII.

Diagnosis: Cephalon quadrate. Peraeonal somite 4 slightly narrower than 3 but not narrower than 5; lateral borders rounded slightly. First and second peraeonal somites subequal in length. Uropoda as long as pleon; peduncle produced at apex and five times as long as second article. Dorsum of pleon with pits above uropods; plumose setae absent, apex produced, convex. Apex male first pleopods simple. First antenna with only three articles (female).

Measurements: Female without marsupium 3.1 mm., male 2.4 mm. (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 37, latitude 60° 17' N., longitude 54° 05' W., 3229 meters, temperature 1.4° C., three specimens.

Distribution: Also collected south of Davis Strait, *Ingolf* Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temperature 1.3° C., about ten specimens, and south of Davis Strait at *Ingolf* Station 22, latitude 58° 10' N., longitude 48° 25' W., 3474 meters, temperature 1.4° C., six specimens, and from the South Atlantic from L.G.O. Biotrawl No. 23, two females, cat. no. I-120.

Affinities: The quadrate shape of the cephalon distinguishes this species.

Macrostylis setifer, new species
Figure 27 F-H

Synonyms: None.

Diagnosis: Cephalon narrower in front than rear, front slightly emarginate. Fourth peraeonal somite narrower than third and fifth, lateral borders rounded. First peraeonal somite slightly longer than second. Uropodal peduncle shorter than width of pleon. Dorsum of pleon lacking pits or sensory organs,

lateral borders not constricted, apex produced, convex, with at least 12 plumose setae. Apex of male pleopods simple, rounded, lacking stout spines or lateral projections, apex with 13 setae. First antenna with five articles (male).

Measurements: Holotype male length 6.1 mm., width pleon 1.1 mm.

Type locality: North Atlantic, L.G.O. Biobrawl No. 234, type only, cat. no. I-113.

Distribution: Known only from type locality.

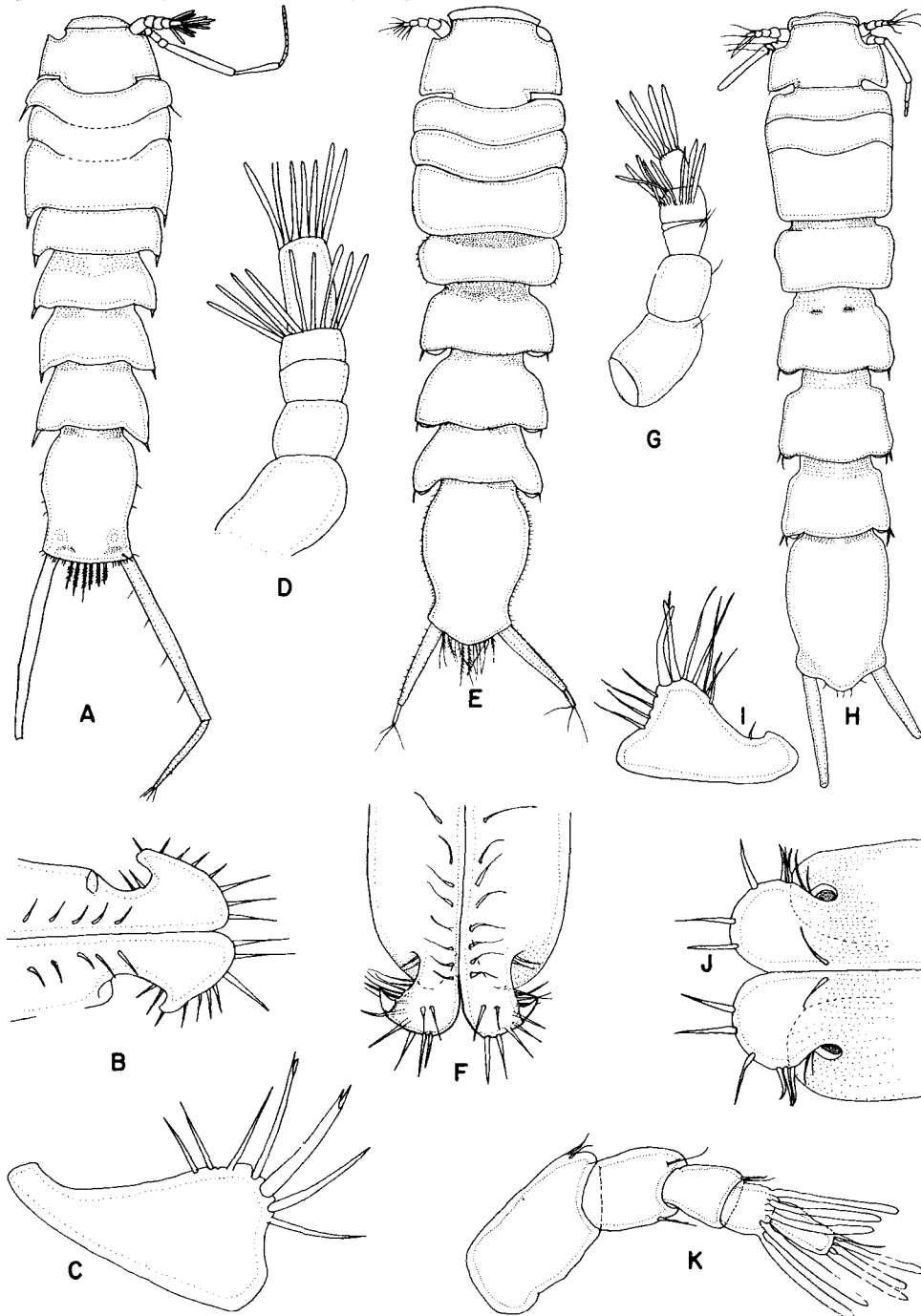


Figure 28. A-D: *Macrostylis hirsuticaudis*, n. sp. A: dorsal view male holotype; B: first male pleopod; C: third paraeopod; D: first antenna. E-G: *Macrostylis caribbicus*, n. sp. E: dorsal view male holotype; F: first pleopod; G: first antenna. H-K: *Macrostylis vema*, n. sp. H: dorsal view male holotype; I: third paraeopod; J: first pleopod; K: first antenna.

Affinities: The fact that the fourth peraeonal somite is narrower than the third and fifth sets this species apart from *M. caribbicus* and *M. subinermis*.

Macrostylis hirsuticaudis, new species
Figure 28 A–D

Synonyms: None.

Diagnosis: Cephalon narrower in front than behind, front straight. Peraeonal somite 4 slightly narrower than 3 but as wide as 5, postero-lateral angles sharp, each with a stout seta. First and second peraeonal somites subequal in length. Uropodal peduncle much longer than length of pleon and twice as wide as pleon. Dorsum of pleon with pits in front of uropods, sensory organs present, apex almost straight bearing at least six plumose setae. Apex of male first pleopods laterally without stout spines, lateral part recurved, apex with eight setae. First antenna with five articles (male).

Measurements: Holotype male length 2.7 mm., width pleon 0.5 mm., allotype length 3.2 mm., width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 22, types plus two male and two female paratypes, cat. no. I-197.

Distribution: Known only from type locality.

Affinities: This species is allied to *M. longiremis*, Meinert but has uropoda longer than the pleon not shorter.

Macrostylis caribbicus, new species
Figure 28 E–G

Synonyms: None.

Diagnosis: Cephalon narrower in front than behind, front slightly convex. Peraeonal somite 4 as wide as 3 and 5, lateral borders rounded. First and second peraeonal somites subequal in length. Uropodal peduncle not as long as width of pleon. Dorsum of pleon without pits or sensory organs, lateral borders constricted in front of uropods; apical margin with 16 plumose setae. Apex of male first pleopods with stout spine laterally and five apical setae. First antenna with six articles (male).

Measurements: Male holotype length 4.8 mm., width pleon 0.9 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 98, type, cat. no. I-118.

Distribution: Known only from type locality.

Affinities: This species is close to *M. subinermis* Hansen except that the postero-lateral angles of the cephalon are sharp and pointed, not rounded.

Macrostylis vema, new species
Figure 28 H–K

Synonyms: None.

Diagnosis: Cephalon narrower in front than behind, front straight. Peraeonal somite 4 as wide as 3 and 5 and with rounded sides. First and second peraeonal somites subequal in length. Uropodal peduncle longer than width of pleon. Dorsum of pleon without dorsal pits or sensory organs; lateral border constricted in front of uropods; apical border convex and produced and lacking plumose setae. Apex of male first pleopods lacking lateral projections or stout spines, each rounded and with eight apical setae. First antenna with five articles.

Measurements: Male holotype length 3.9 mm., width pleon 0.6 mm., allotype length 3.8 mm., width pleon 0.7 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 231, types and two male and two female paratypes, cat. no. I-110.

Distribution: Known also from L.G.O. Biotrawl No. 229, one female, cat. no. I-116.

Affinities: The bulbous swelling of the pleon in front of the uropods distinguishes this from a group of species lacking the swollen lateral border.

Macrostylis bifurcatus, new species
Figure 29 A–E

Synonyms: None.

Diagnosis: Cephalon quadrate, front slightly emarginate. Peraeonal somite 4 slightly narrower than 3 but as wide as 5. First and second peraeonal somites subequal in length. Peduncle of uropoda longer than width of pleon. Dorsum of pleon with slight pits above uropods. Apex of male first pleopods without stout lateral spine but with spoon-shaped lateral projections and each with five apical setae. Pleonal lateral margin not constricted in front of uropods. First antenna with five articles (male). Apex of pleon with deep medial incision; plumose setae lacking.

Measurements: Holotype male length 2.7 mm., width pleon 0.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 51, type, cat. no. I-188.

Distribution: Known also from L.G.O. Biotrawl No. 52, one male, cat. no. I-187.

Affinities: The bifurcated nature of the apex of the pleon sets this species apart from the others.

Macrostylis minutus, new species
Figure 29 F–G

Synonyms: None.

Diagnosis: Cephalon narrower in front than behind, front with three lobes. Peraeonal somite 4 narrower than 5 but not narrower than 3, lateral margins rounded. First peraeonal somite shorter than second. Uropodal peduncle as long as pleon. Dorsum of pleon with slight pits above uropods and

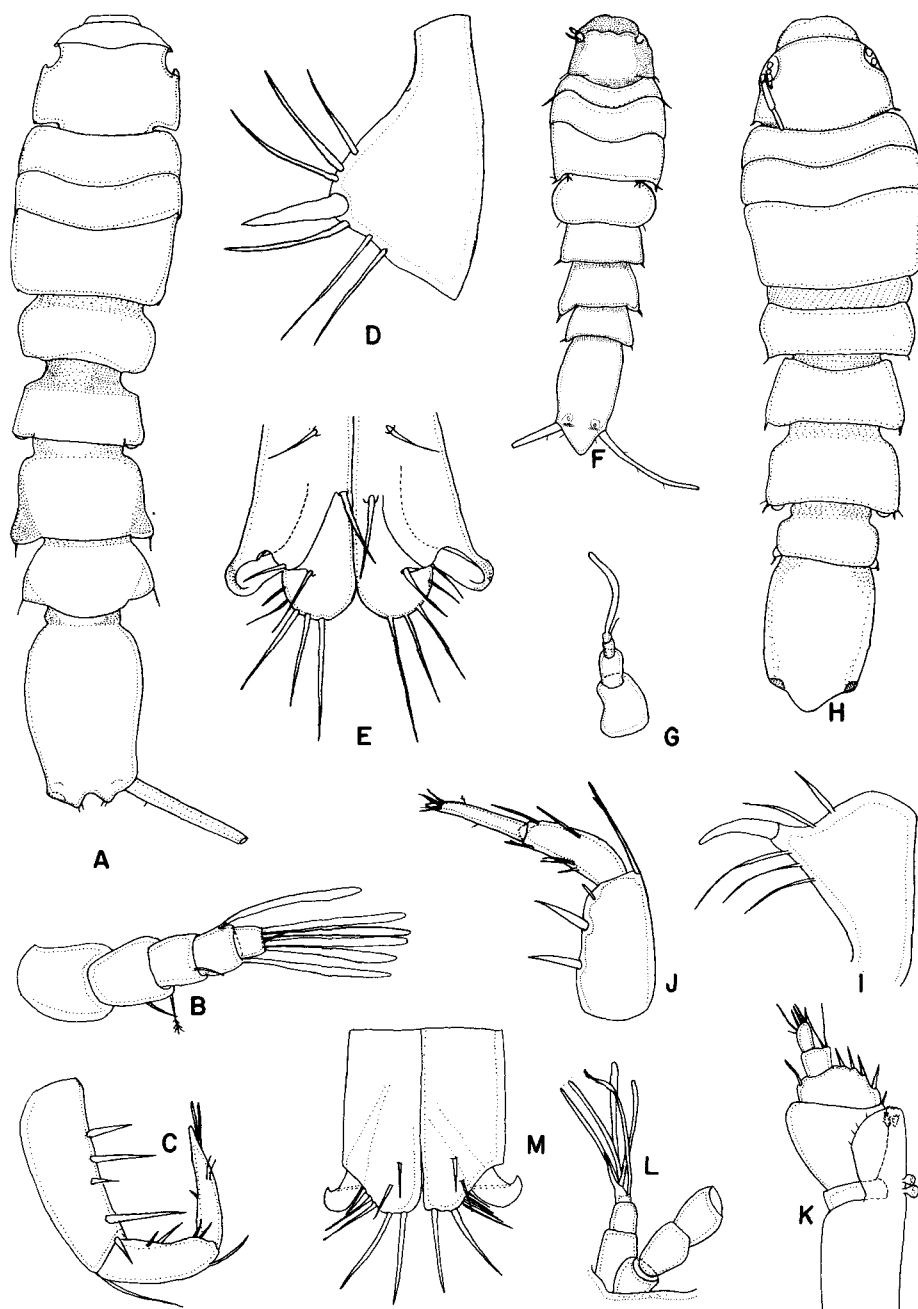


Figure 29. A-E: *Macrostylis bifurcatus*, n. sp. A: dorsal view male holotype; B: first antenna; C: first paraeopod; D: fourth paraeopod; E: apex of male first pleopod. F-G: *Macrostylis minutus*, n. sp. F: dorsal view female holotype; G: female first antenna. H-M: *Macrostylis bipunctatus*, n. sp. H: dorsal view male holotype; I: third paraeopod; J: first paraeopod; K: maxilliped; L: first and second antenna; M: apex first pleopod.

with sensory organ. Pleonal lateral margin not constricted in front of uropods; hind margin produced pointed, devoid of plumose setae. First antenna with four articles (female).

Measurements: Holotype female length 2.5 mm., width pleon 0.4 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 234, two female paratypes, cat. no. I-114.

Distribution: Known also from L.G.O. Biotrawl No. 231, ten females, cat. no. I-115, and L.G.O. Biotrawl No. 232, one female, cat. no. I-111.

Affinities: This species resembles the Pacific *M. hadalis* Wolff except that the first peraeonal somite is shorter than the second, rather than longer.

Macrostylis bipunctatus, new species
Figure 29 H-M

Synonyms: None.

Diagnosis: Cephalon narrower in front than rear, front rounded. Peraeonal somite 4 as wide as somites 3 and 5. First and second peraeonal somites subequal

in length; postero-lateral angles acute. Uropoda missing. Dorsum of pleon with pits above uropodal insertion. Apex of male first pleopods each with a stout recurved spine at lateral margin and six apical setae. Apex of pleon devoid of plumose setae. Pleonal lateral margin entire, not constricted in front of uropods; apical margin convex devoid of plumose setae. First antenna with only three articles (male).

Measurements: Holotype male length 2.5 mm., width pleon 0.4 mm., allotype female length 2.1 mm., width pleon 0.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, types plus three fragments, cat. no. I-119.

Distribution: Taken also from the South Atlantic

at L.G.O. Biotrawl No. 51, one female, two fragments, cat. no. I-51; L.G.O. Biotrawl No. 52, sixteen specimens, cat. no. I-198; L.G.O. Biotrawl No. 53, one male, cat. no. I-189; and L.G.O. Biotrawl No. 217, one female (with statocysts, and perhaps a distinct species).

Affinities: This species is closely allied to *M. galathea* Wolff, but has the postero-lateral angles of the cephalon pointed, not rounded.

Macrostylis species indeterminable

Indeterminate species of *Macrostylis* were taken from L.G.O. Biotrawl no. 53, three fragments.

Family : NANNONISCIDAE

Type genus: *Nannoniscus* G. O. Sars.

Diagnosis: Peraeopods not modified (flattened) for swimming but with plumose setae. Uropoda with peduncle, usually biramous. Peraeonal somites all of similar length; first free from cephalon. Maxillipedal palp with last two articles narrow; others equal width of endite. Dactyl of peraeopods with two terminal claws. Molar process of mandible reduced to a short setiferous lobe.

Composition: This family contains *Nannoniscus* Richardson, *Austroniscus* Vanhöffen, and *Nannoniscoides* Hansen. These are distinguished from one another in the following key:

A KEY TO THE GENERA OF NANNONISCIDAE

- | | |
|--|-----------------------|
| 1. First antenna with a bulbous organ attached to distal article | <i>Nannoniscus</i> |
| 1. First antenna normal, without bulbous organ | 2 |
| 2. Last two peraeonal somites incompletely fused | <i>Nannoniscoides</i> |
| 2. Last two peraeonal somites entirely separated | <i>Austroniscus</i> |

The first two genera are represented by abyssal species. It is highly probable that *Nannoniscella* Hansen, 1916, is a synonym of *Austroniscus* Vanhöffen, 1914.

Genus: NANNONISCOIDES Hansen, 1916

Type species: *Nannoniscoides angulatus* Hansen, 1916, pp. 86-87, Pl. VIII.

Diagnosis: *Nannoniscidae* with last two peraeonal somites incompletely fused. Pleon with single somite. Uropoda biramous. First antenna normal, without a bulbous organ attached to last article.

This genus contains only the type, from 702 fathoms in the North Atlantic, and the new abyssal species described herein from the South Atlantic.

Nannoniscoides hirsutus, new species

Figure 30

Synonyms: None.

Diagnosis: *Nannoniscoides*, with a laterally serrated pleon. Body hirsute and densely reticulate. Cephalon three times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles with a stout seta on second somite, none on first or third. First peraeonal somite wider than cephalon; last two peraeonal somites pointed at lateral border. Uropodal endopod slightly shorter than exopod. Antero-lateral processes of cephalon not reaching frontal border. Apex of male first pleopods with tubular lateral expansion and each apex with three setae.

Measurements: Holotype male length 1.2 mm., width pleon 0.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type only, cat. no. I-122.

Distribution: Known only from type locality.

Affinities: This species may be distinguished from *N. angulatus* Hansen by the fact that the first peraeonal somite is wider than the cephalon, not narrower.

Genus: NANNONISCUS G. O. Sars, 1869

Type species: *Nannoniscus oblongus* G. O. Sars

Synonyms: *Nannoniscus* G. O. Sars, 1869; — Hansen, 1916, pp. 87-89.

Diagnosis: *Nannoniscidae* with last two peraeonal somites incompletely fused. Pleon with a single somite. Uropoda biramous. First antenna short, with a bulbous organ attached to last article.

This genus contains 15 described species. Twelve of these were described by Hansen (op. cit.); Vanhöffen (1914) described two species, and G. O. Sars described one.

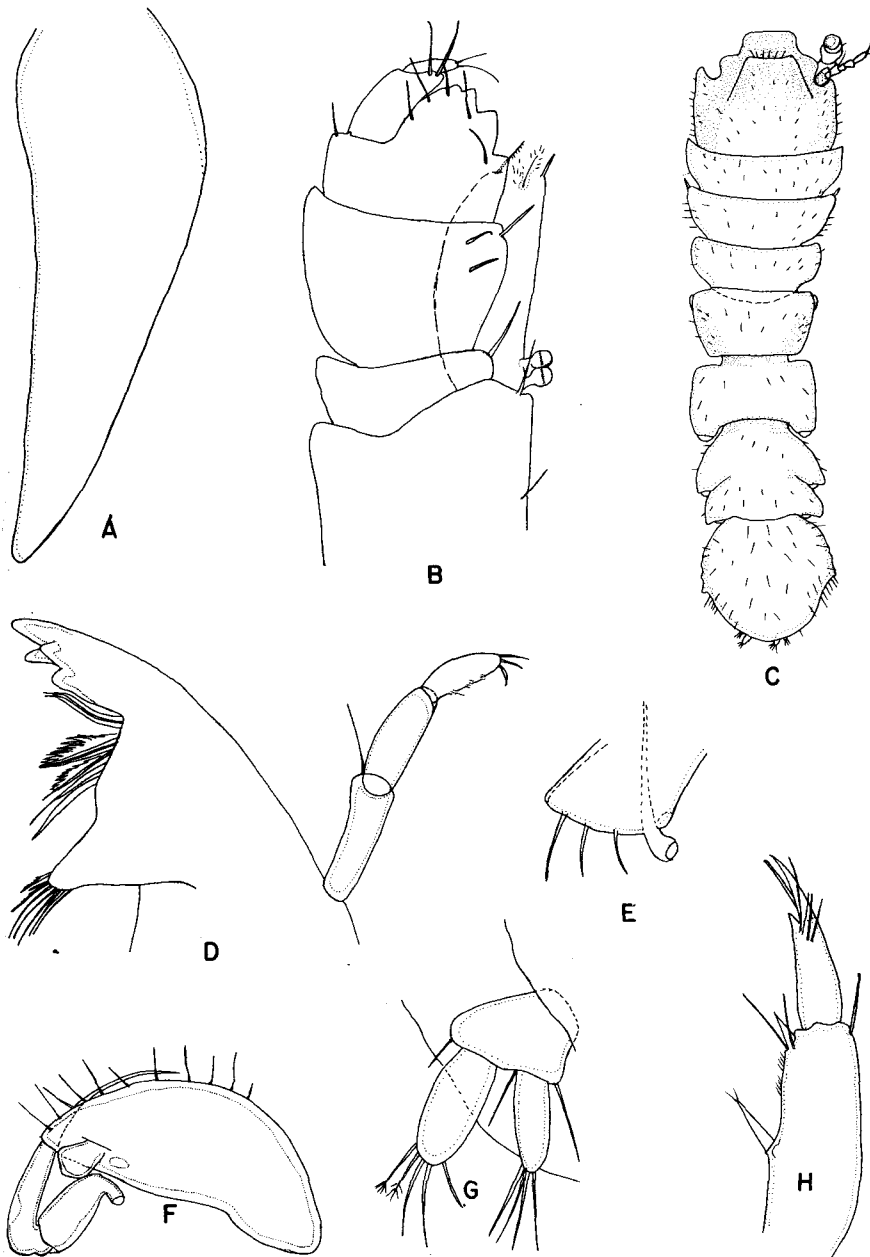


Figure 30. *Nannoniscoides hirsutus*, n. sp. A: maxillipedal epipode; B: maxilliped; C: dorsal view male holotype; D: mandible; E: first pleopod; F: male second pleopod; G: uropod and anus; H: first paraeopod.

It is impossible at this date to construct a satisfactory key to all of the species, and the reader is referred, therefore, to the following key modified from Hansen (op. cit.), in which he treats all known species except *australis* and *bidens* of Vanhöffen. The structure of the appendages of these southern species is not yet known. Here three of Hansens abyssal species, one of G. O. Sars's, and two apparently new abyssal species are described.

A KEY TO THE SPECIES OF
NANNONISCUS
(Modified from Hansen, 1916)

- | | |
|--|--|
| 1. Abdominal operculum of female with an acute process on lower surface | 2 |
| 1. Abdominal operculum of female without tubercle or process on lower surface | 6 |
| 2. Antero-lateral angles of first peraeonal somite terminating in a spine, those of second with a short fine seta | <i>simplex</i> Hansen and <i>australis</i> Vanhöffen |
| 2. Antero-lateral angles of first peraeonal somite without a terminal spine but with or without a fine seta, those of second with a real spine | 3 |
| 3. First or second peraeonal somites not one-half as broad again as sixth somite | 4 |
| 3. First and second peraeonal somites more than one-half as broad again as sixth somite | <i>laticeps</i> Hansen |
| 4. Lateral margin of pleon convex or straight | 5 |
| 4. Lateral margin of pleon concave just outside base of uropods | <i>analis</i> Hansen |
| 5. Antennal squama as long as the diameter of third peduncular article | <i>oblongus</i> G. O. Sars |

- 5. Antennal squama shorter than the diameter of third peduncular article *arcticus* Hansen
- 6. Second article of first antenna with process short, leaving the fourth article uncovered 7
- 6. Second article of first antenna with long process overlapping the fourth article 12
- 7. Posterior ventral area of peraeon without any process 8
- 7. Posterior ventral area of peraeon with one or two large recurved acute processes 9
- 8. Antennular vesicle two and a half to three times as long as broad *inermis* Hansen
- 8. Antennular vesicle pyriform not one-half as long again as broad *aequiremis* Hansen
- 9. With only one recurved process 10
- 9. With two processes *armatus* Hansen and *laevis*, n. sp.
- 10. Postero-lateral margin of pleon without incision or tooth 11
- 10. Postero-lateral margin of pleon with an incision and a conspicuous angle or tooth *minutus* Hansen and *bidens* Vanhöffen and *camayae*, n. sp.
- 11. First peraeopod without stout setae on inferior margin of (fifth article) propod *plebejus* Hansen
- 11. First peraeopod with two stout setae on inferior margin of (fifth article) propod *crassipes* Hansen
- 12. Anterior margin of front of cephalon nearly half as wide as cephalon width *spiniornis* Hansen
- 12. Anterior margin of front of cephalon less than one-half as wide as cephalon *affinis* Hansen

LIST OF THE SPECIES OF NANNONISCUS

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>oblongus</i> G. O. Sars	225	1505
2. <i>simplex</i> Hansen	1070	1505
3. <i>arcticus</i> Hansen	75	699
4. <i>analisis</i> Hansen	—	2258
5. <i>laticeps</i> Hansen	—	552
6. <i>reticulatus</i> Hansen	—	552
7. <i>inermis</i> Hansen	—	2258
8. <i>aequiremis</i> Hansen	—	885
9. <i>plebejus</i> Hansen	—	1505
10. <i>minutus</i> Hansen	—	1096
11. <i>armatus</i> Hansen	—	3521
12. <i>spiniornis</i> Hansen	—	2465
13. <i>affinis</i> Hansen	—	1505
14. <i>australis</i> Vanhöffen	—	385
15. <i>bidens</i> Vanhöffen	—	385
16. <i>caspicus</i> G. O. Sars	intertidal	
17. <i>crassipes</i> Hansen	?225	468

Nannoniscus inermis Hansen
Figure 31 A-C

Synonyms: *Nannoniscus inermis* Hansen, 1916, pp. 98-99, Pl. IX.

Diagnosis: *Nannoniscus* with cephalon a little more than four and a half times as broad as the distance between the anterior ends of the cephalic keels.

Antero-lateral angles of first somite of peraeon without spine; second and third with spine. Tubercle or process lacking from female operculum, which has a straight distal margin. Uropodal endopod almost twice as long as exopod. Pleon without teeth.

Measurements: Female with marsupium length 3.3 mm.

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C. (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: This species seems most nearly related to *N. aequiremis* Hansen, differing from it in having a more elongate antennular vesicle.

Nannoniscus armatus Hansen
Figure 31 D-E

Synonyms: *Nannoniscus armatus* Hansen, 1916, pp. 102-103, Pl. X.

Diagnosis: *Nannoniscus* with cephalon four times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of first and third somites without spines on setae. Tubercle or process lacking from female operculum, which has a convex distal margin. Uropodal exopod considerably less than one-half the length of endopod. Pleon without teeth.

Measurements: Juvenile length 1.6 mm.

Type locality: North Atlantic, south of Davis Strait, *Ingolf* Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temperature 1.3° C. (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: This species is closely related to *N. laevis*, n. sp., differing from it only in having a narrower frontal area on the cephalon and blunt lateral borders to the seventh peraeonal somite rather than angular ones.

Nannoniscus analis Hansen
Figure 31 F-H

Synonyms: *Nannoniscus analis* Hansen, 1916, pp. 95-96, Pl. VIII-IX.

Diagnosis: *Nannoniscus* with cephalon four times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of first and third somites with no spines but frequently with a short seta; second with a distinct long spine. Operculum with a highly raised strong acute process. Uropodal endopod not twice as long as exopod. Pleon without teeth.

Measurements: Large specimen length 2.6 mm.

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C. (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: The concave nature of the pleonal

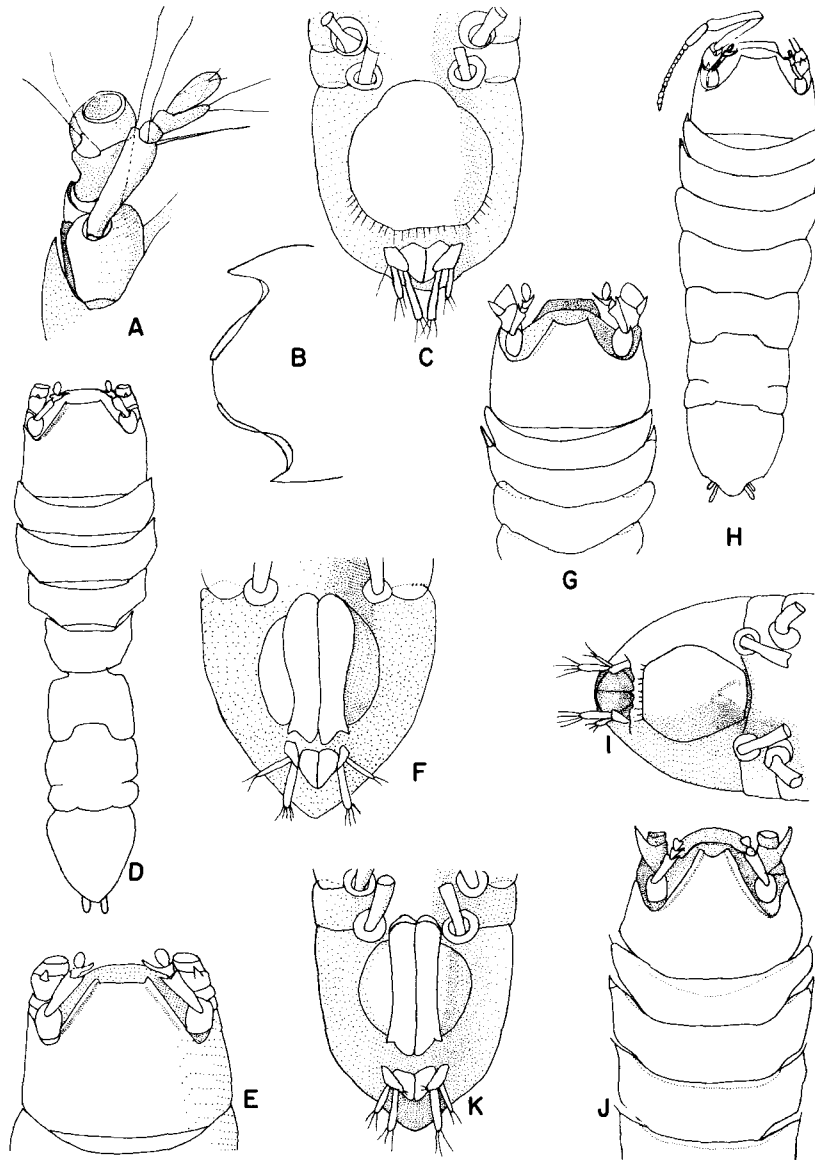


Figure 31. A–C: *Nannoniscus inermis* Hansen. A: anterior left part of head with antennula and antenna of female; B: outline of anterior of head of female; C: abdomen and two posterior thoracic segments of female. D–E: *Nannoniscus armatus* Hansen. D: dorsal view female; E: dorsal view head of female. F–H: *Nannoniscus analis* Hansen. F: abdomen of male; G: dorsal view of male anterior; H: dorsal view of female. I–K: *Nannoniscus oblongus* G. O. Sars. I: ventral view of uropods, anus, and abdomen of female; J: dorsal view of female; K: ventral view of uropods, anus, and abdomen of male.

lateral margins distinguishes this species from the others.

Nannoniscus oblongus G. O. Sars
Figure 31 I–K

Synonyms: *Nannoniscus oblongus* G. O. Sars, 1870, p. 164; — 1897, p. 119, Pl. 50 (female only); — Hansen, 1916, pp. 92–94, Pl. VIII.

Diagnosis: *Nannoniscus* with cephalon as much as seven times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles with stiff spine or seta on first, second, and third somites. Operculum with a large medial spine

and with distal margin semi-circular. Uropodal exopod shorter than endopod. Pleon without teeth.

Measurements: Largest male 2.2 mm. (Hansen, op. cit.).

Type locality: Off the Lofoten Islands, at Skraaven, in depths ranging from 225 to 468 meters (Hansen, op. cit.).

Distribution: North Atlantic: Davis Strait, *Ingolf* Station 32, latitude 66° 35' N., longitude 56° 38' W., 599 meters, temperature 3.9° C.; west of Iceland, *Ingolf* Station 98, latitude 65° 38' N., longitude 26° 27' W., 260 meters, temperature 5.9° C.; southwest of Iceland, *Ingolf* Station 78, latitude 60° 37' N.,

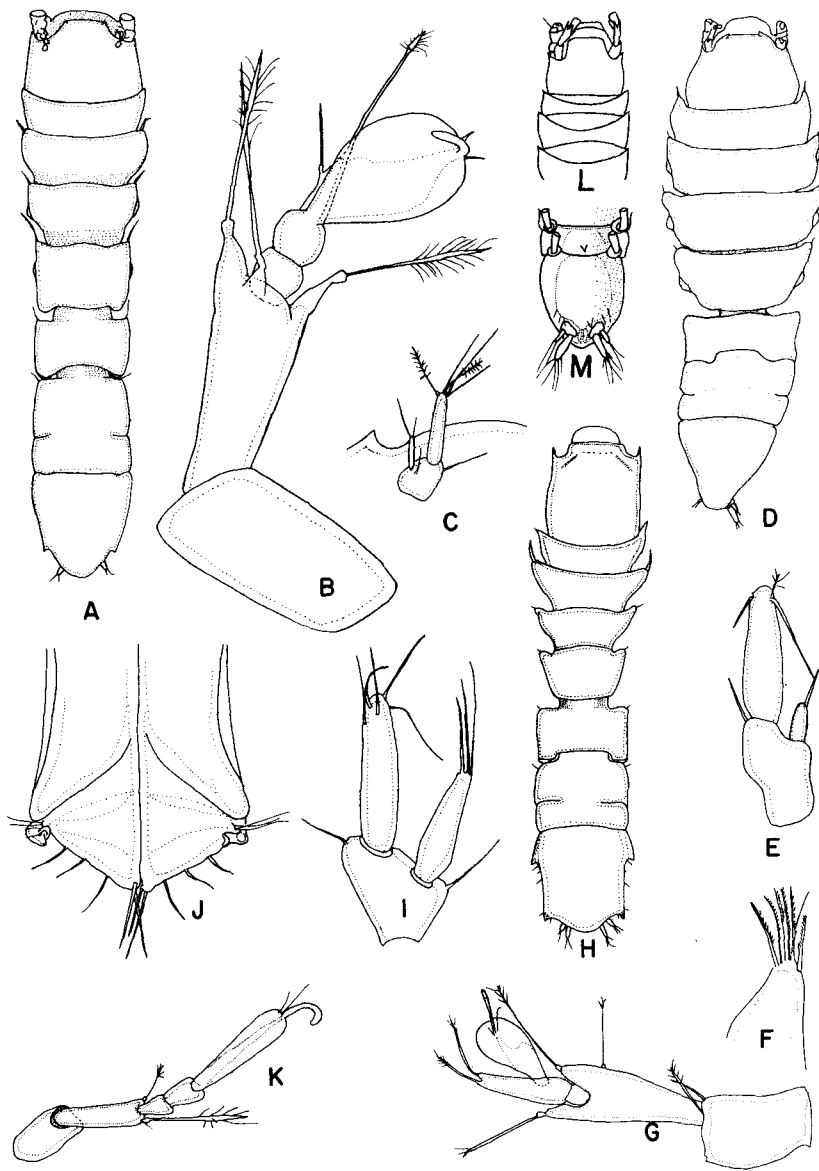


Figure 32. A-C: *Nannoniscus camayae*, n. sp. A: dorsal view female holotype; B: first antenna holotype; C: uropod. D-G: *Nannoniscus laevis*, n. sp. D: dorsal view female holotype; E: uropod; F: mandibular molar process; G: first antenna. H-K: *Nannoniscus primitivus*, n. sp. H: dorsal view male holotype; I: uropods; J: first male pleopod; K: first antenna. L-M: *Nannoniscus spinicornis*, Hansen. L: dorsal view anterior; M: Ventral view posterior.

longitude 27° 52' W., 1505 meters, temperature 4.5° C. South Atlantic: L.G.O. Biotrawl No. 212, one female, cat. no. I-123.

Nannoniscus camayae, new species
Figure 32 A-C

Synonyms: None.

Diagnosis: *Nannoniscus* with cephalon three times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of first peraeonal somite without spines or setae; second and third with setae. Operculum without projected spines but with a pair of depressions on either side of midline.

Fourth article of first antenna extending to one-third the length of vesicle. Uropodal exopod one-half the length of endopod. Pleon with a single tooth on each lateral margin.

Measurements: Female holotype length 4.1 mm., width pleon 0.7 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 100, type only, cat. no. I-121.

Distribution: Known only from type locality.

Affinities: Closely related to *N. minutus* Hansen and *N. bidens* Vanhöffen. It differs from *minutus* and *bidens* in lacking the stout spine at the antero-lateral angle of the first peraeonal somite.

Nannoniscus laevis, new species

Figure 32 D-G

Synonyms: None.

Diagnosis: *Nannoniscus* with cephalon three times as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of first peraeonal somite with a stout seta; second and third with a fine seta. Operculum without projecting spines. Peraeon with two stout recurved spines ventrally. Fourth article of first antenna extends beyond antennal vesicle. Pleon without teeth on lateral margins.

Measurements: Holotype female length 3.2 mm., width pleon 0.6 mm.

Type locality: South Atlantic L.G.O. Biotrawl No. 53, type and three female paratypes, cat. no. I-125.

Distribution: Known only from type locality.

Affinities: The blunt lateral borders of the seventh peraeonal somite distinguish this species from its nearest relative, *N. armatus* Hansen.

Nannoniscus primitivus, new species

Figure 32 H-K

Synonyms: None.

Diagnosis: *Nannoniscus* with cephalon twice as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of first peraeonal somite sharply pointed but without spines; second with stout spine, third with weak seta. Second article of first antenna without distal spine-like projections and third not extending beyond start of vesicle. Uropodal exopod two-thirds the length of endopod.

Measurements: Holotype male length 1.8 mm., width pleon 0.3 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 97, type only, cat. no. I-178.

Distribution: Known only from type locality.

Affinities: This species is unique in the primitive structure of the first antenna and its vesicle. The spines on the pleon are probably secondary sexual characteristics.

Nannoniscus spinicornis Hansen

Figure 32 L-M

Synonyms: *Nannoniscus spinicornis* Hansen, 1916, pp. 104-105, Pl. X, Figs. 2a-2g.

Diagnosis: *Nannoniscus* with cephalon twice as broad as the distance between the anterior ends of the cephalic keels. Antero-lateral angles of the first three peraeonal somites only slightly produced, acute, but without spines or setae. Second and third articles of first antenna with spine-like projections which extend to middle of vesicle. Uropodal exopod one-half the length of endopod.

Measurements: Length of female specimen, 1.5 mm. (Hansen, 1916, p. 104).

Type locality: North Atlantic, South of Jan Mayen, Ingolf Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temp. -1.0° C., one female specimen (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: This species is close to *N. affinis* Hansen, from which it differs in having a wider frontal area to the cephalon.

Nannoniscus species indeterminable

Damaged specimens of *Nannoniscus* were taken from L.G.O. Biotrawl No. 16, three specimens, and L.G.O. Biotrawl No. 107, one female.

Family: EURYCOPIDAE

Type genus: *Eurycope*, G. O. Sars.

Diagnosis: Paraselloidea with peracopods 5-7 inclusive paddle-like, modified for swimming and bearing dactyls. Cephalon (usually) separated from first peraeonal somite. Pleon with one or two somites. Uropoda uni-biramous; peduncle not flattened and not bearing pulmose setae.

Composition: This family contains *Eurycope*, *Storothyngura*, *Syneurycope*, *Munnopsurus*, and *Acanthocope*. The genera, except for *Munnopsurus*, are represented in the Atlantic abyss and are distinguished from one another in the following key.

A KEY TO THE GENERA OF THE EURYCOPIDAE

- 1. Uropoda biramous 2
- 1. Uropoda uniramous *Acanthocope*

- 2. Mandibular incisor reduced to a simple single tooth *Munnopsurus*
- 2. Mandibular incisor toothed, normal 3
- 3. Pleon with lateral spines *Storothyngura*
- 3. Pleon without lateral spines 4
- 4. Inner margin of maxillipedal palp articles with denticles *Syneurycope*
- 4. Inner margin of maxillipedal palp articles without denticles *Eurycope*

A LIST OF THE KNOWN ABYSSAL SPECIES OF EURYCOPE

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>hanseni</i> Ohlin	520	2669
2. <i>incisa</i> Gurjanova	2380	2380
3. <i>abyssicola</i> Beddard	3886	3886
4. <i>complanata</i> Bonnier	950	2702

Species	Depth Range (Meters)	
	Least	Greatest
5. <i>furcata</i> G. O. Sars, Hansen	150	2258
6. <i>murrayi</i> Walker, Hansen	>1000	>2700
7. <i>nodifrons</i> Hansen (not Wolff, 1956)	2702	2702
8. <i>parva</i> Bonnier, Hansen	872	2702
9. <i>producta</i> G. O. Sars, Hansen, Hult	72	2087
10. <i>scabra</i> Hansen	2486	2486
11. <i>spinifrons</i> Gurjanova	308	3000
12. <i>ovalis</i> Vanhöffen	3423	3423
13. <i>galathea</i> Wolff	6960	7000
14. <i>vicarius</i> Vanhöffen		3423
15. <i>sarsii</i> Beddard		2514
16. <i>madseni</i> Wolff	6960	7000

Genus: EURYCOPE G. O. Sars

Type species: *Eurycope cornuta* G. O. Sars, 1864, p. 5; — 1897, pp. 145–146, Pl. 64; — Richardson, 1905, p. 491 and references.

Diagnosis: Eurycopidae without spines on body or spine-like extensions on pleon. Frontal area of cephalon with pronounced keels dorsally. Uropoda biramous. Mandibular incisor and lacinia toothed, molar strong, normal, truncate at apex. Pleon with one somite only. Maxillipedal palp articles without denticles on inner margin.

Composition: This genus contains 41 species, about half of which are abyssal, but the exact number of species is uncertain. Some of the earlier species have been transferred to *Storothyngura*, *Acanthocope*, and *Munnopsurus*, Key characteristics for many of the species are not known, and the construction of a functional key is therefore impossible at present. The majority of the species live in relatively shallow water only.

Additionally, three new species are described herein and *E. antarctica* Vanhöffen is added to the abyssal fauna. Beddard's species, *sarsii*, *abyssicola*, and *spinosa*, are too imperfectly known to be included in this key, and this comment applies also to *E. galathea* Wolff. It is highly doubtful that *E. nodifrons* Hansen occurs in the Pacific hadal depths as reported by Wolff (1956). Differences are clear in the maxilliped, shape of the posterior peraeonal somites, and the pleon. The specimen should be reexamined.

A KEY TO THE ABYSSAL SPECIES OF EURYCOPE

1. With peraeonal somites 5–6 fused along midline 2
1. With peraeonal somites 5–6 entirely separated 5
2. Discrete frontal area lacking from cephalon *antarctica* Vanhöffen
2. Discrete frontal area present on cephalon 3
3. Frontal area very broad, close to one-half the width of cephalon 4
3. Frontal area narrow, less than one-fifth the width of cephalon *furcata* G. O. Sars
4. Female operculum with recurved spine directed toward apex of pleon *ovaloides*, n. sp.

4. Female operculum with recurved spine directed toward head *parva* Bonnier
5. Pleon incised medially at apex *incisa* Gurjanova
5. Pleon not incised medially 6
6. Frons of cephalon well defined 8
6. Frons of cephalon not well defined 7
7. Pleon ovoid longer than wide *scabra* Hansen
7. Pleon shield-shaped, as wide as long *nodifrons* Hansen
8. Uropodal exopod one-seventh the length of endopod *murrayi* (Walker)
8. Uropodal exopod one-third to one-half or more than the length of endopod 9
9. Frons of cephalon with stout spines or seta on margin 10
9. Frons of cephalon without stout setae 13^a
10. Pleon with a spine on each postero-lateral border *spinifrons* Gurjanova
10. Pleon without spines at postero-lateral border 11
11. Frontal area with three to five stout setae on each side of apex 12
11. Frontal area with one stout seta on each side at apex *nodosa*, n. sp.
12. Frontal area with three spines on each side of apex *gaussi* Wolff
12. Frontal area with five spines on each side of apex *producta* G. O. Sars
13. Antero-lateral angles of pleon spine-like and projecting *acutitelson*, n. sp.
13. Antero-lateral angles of pleon not spine-like and projecting 14
14. Apex of frontal area of cephalon around one-fifteenth the width of the cephalon 15
14. Apex of frontal area of cephalon around one-third the width of the cephalon 16
15. Apex of frontal area deeply incised with medial part concave *complanata* Bonnier
15. Apex of frontal area incised but with distal part (apical incision) straight *vicarius* Vanhöffen, *hanseni* Ohlin
16. Apex of pleon blunt *madseni* Wolff
16. Apex of pleon rounded *ovalis* Vanhöffen

^a *Ovalis* is placed here due to Wolff's (1956) redescription in which setae are not mentioned, even though Vanhöffen (1914) showed setae.

Eurycope antarctica Vanhöffen
Figure 33 A–B

Synonyms: *Eurycope antarctica* Vanhöffen, 1914, pp. 589–590.

Diagnosis: *Eurycope* with apex of frontal area rounded, around one-third the width of cephalon, lacking stout setae. Apex of pleon pointed. Inner distal margin of male second pleopod without vermiform appendage. Peraeonal somites 5–6 fused along midline. Uropodal exopod about one-half the length of endopod.

Measurements: Mature female 3.0 mm. long (Vanhöffen, op. cit.).

Type locality: Antarctic *Gauss* station, 66° 15' S., 80° 19' E., 385 meters, 135 specimens (Vanhöffen, op. cit.).

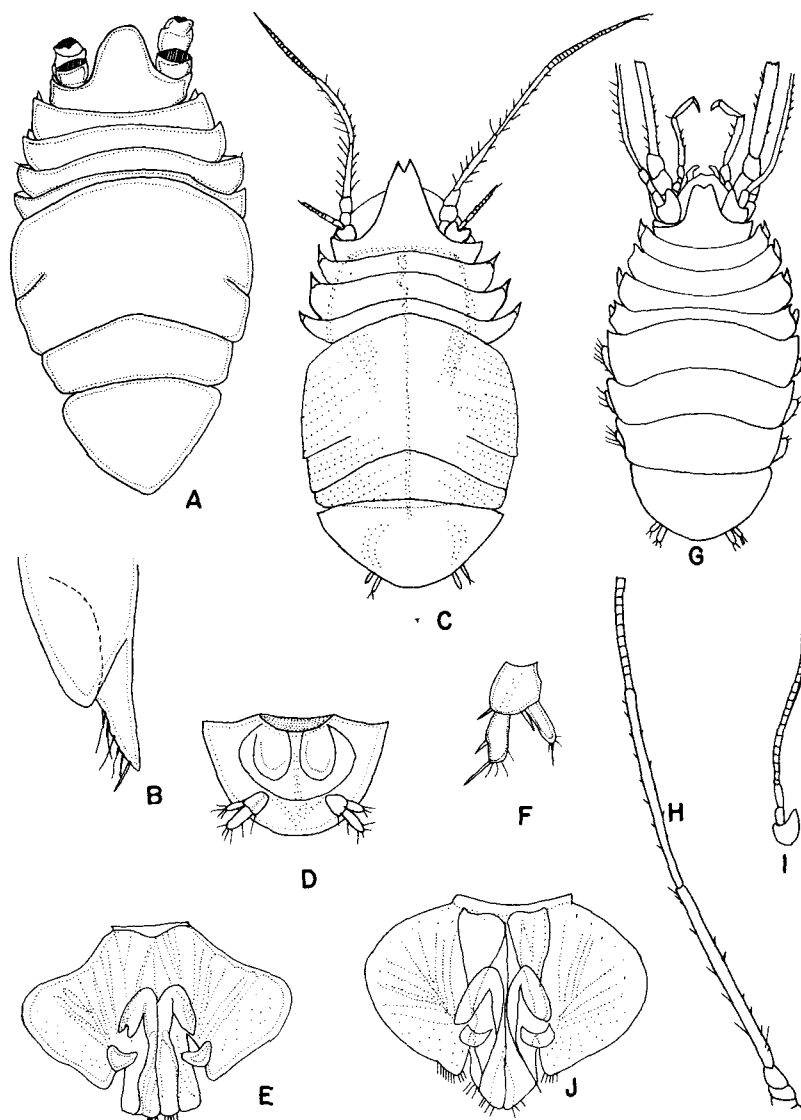


Figure 33. A-B: *Eurycope antarctica* Vanhöffen. A: dorsal view male length 1.8 mm., width 0.6 mm.; B: apex of first male pleopod. C-F: *Eurycope furcata* G. O. Sars. C: dorsal view female; D: ventral view uropods; E: first and second male pleopods; F: uropods female. G-J: *Eurycope producta* G. O. Sars. G: dorsal view female; H: second antenna; I: first antenna; J: first and second male pleopods.

Distribution: Also taken from South Atlantic Ocean, L.G.O. Biotrawl No. 201, three males, three females, cat. no. I-233.

Eurycope furcata G. O. Sars
Figure 33 C-F

Synonyms (incomplete): *Eurycope furcata* G. O. Sars, 1870, p. 165; — 1898, p. 148; — Gurjanova, 1933, p. 425; — Hansen, 1916, p. 151; — Hult, 1941, pp. 109-110.

Diagnosis: *Eurycope* with apex of frontal area deeply incised without stout setae, about one-tenth the width of cephalon. Pleon with acute antero-lateral angles, apex evenly rounded, without postero-lateral spines. Inner distal margin of male second pleopod without vermiform appendage. Peraeonal somites 5-6

fused along midline. Uropodal exopod slightly shorter than endopod.

Measurements: Adult female scarcely attaining 2 mm., (G. O. Sars, 1898, p. 149).

Type locality: Lofoten Islands at Skraaven, 100-200 fathoms, sandy clay (G. O. Sars, 1898, p. 149).

Distribution: West coast of Norway to Davis Strait and off west coast of Greenland from c. 150 meters to 2258 meters (Hult, 1941, p. 109). It was taken by the *Ingolf* at two stations (Hansen, 1916, p. 151): Station 24, Davis Strait, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., one specimen; Station 78, southwest of Iceland, latitude 60° 37' N., longitude 27° 52' W., 1505 meters, temperature 4.5° C., two specimens. It was not collected by *Vema*.

Eurycope producta G. O. Sars
Figure 33 G-J

Synonyms (incomplete): *Eurycope producta* G. O. Sars, 1868, p. 113; — 1898, p. 146; — Gurjanova, 1933; p. 424; — 1938, p. 334; — Hansen, 1916, p. 147; — Stephensen, 1917, p. 298; — Tattersall, 1905, p. 75; — Hult, 1941, pp. 107-109.

Diagnosis: *Eurycope* with apex of frontal area convex, without stout setae, about one-fifth the width of cephalon. Pleon without spines or incisions, apex broadly rounded. Inner distal margin of male second pleopod without vermiform appendage. Peraeonal somites 5-6 entirely separated. Uropodal rami nearly equal in length.

Measurements: Adult female 3 mm. length (G. O. Sars, 1898, p. 146).

Type locality: Norwegian coast from Christiania Fjord to Vadsö (G. O. Sars, 1898, p. 146).

Distribution: Eurybathial arctic-boreal Norway, south and east of Greenland, south and southwest of Iceland (Hult, op. cit., pp. 108-109). The *Ingolf* collected the species from three stations: Station 25, Davis Strait, latitude 63° 30' N., longitude 54° 25' W., 1096 meters, temperature 3.3° C., two specimens; Station 78, southwest of Iceland, latitude 60° 37' N., longitude 27° 52' W., 1505 meters, temperature 4.5° C., three specimens; Station 138, northwest of the Faeroes, latitude 63° 26' N., longitude 7° 56' W., 887 meters, temperature -0.6° C., one specimen. The maximum depth, according to Hult (op. cit.), is 2087 meters and the minimum 72 meters. It was not collected by *Vema*.

Eurycope vicarius Vanhöffen
Figure 34 A-G

Synonyms: *Eurycope vicarius* Vanhöffen, 1914, pp. 586-587, Figs. 116-117; — Wolff, 1956, pp. 130-132.

Diagnosis: *Eurycope* with apex of frontal area convex, without stout setae, around one-tenth the width of cephalon. Pleon without spines or incisions, apex rounded. Inner distal margin of male second pleopod without vermiform appendage. Peraeonal somites 5-6 entirely separated. Uropodal exopod about one-third the length of endopod.

Measurements: 1.6 mm., 2.5 mm., 3 mm., 3.5 mm., 4.5 mm., and 9 mm. length of six specimens (Vanhöffen, op. cit., p. 587). Wolff's (op. cit.) female lectotype was 8.8 mm. long and 2.8 mm. wide.

Type locality: Antarctic continent, 3423 meters, 3 April 1903, *Gauss* (Vanhöffen, op. cit.).

Distribution: Antarctic 3423 meters (Vanhöffen) and taken by *Vema* from the South Atlantic, L.G.O. Biotrawl No. 201, seven females, cat. no. I-234. The specimen from *Gauss* Station at 385 meters has been subsequently described as *E. gausii* by Wolff (1956, op. cit.).

Eurycope complanata Bonnier
Figure 34 H-L

Synonyms: *Eurycope complanata* Bonnier, 1896, p. 601, Pl. 34; — Hansen, 1916, pp. 145-146, Pl. 13.

Diagnosis: *Eurycope* with apex of frontal area lacking spines, apex sharply concave, around one-eleventh the width of cephalon. Pleon without spines or incisions, apex pointed. Inner distal margin of male second pleopod with pronounced vermiform appendage. Peraeonal somites 5-6 entirely separated. Uropodal exopod one-third shorter than endopod.

Measurements: Male 5 mm. long (Bonnier, op. cit.)

Type locality: North Atlantic, Bay of Biscay, latitude 44° 17' N., longitude 4° 38' W., 950 meters (Hansen, op. cit.).

Distribution: North Atlantic. Taken by *Ingolf* at Station 24, Davis Strait, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., four specimens, and Station 36, Davis Strait, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two specimens; and by *Vema* from L.G.O. Biotrawl No. 7, one male and four fragments, cat. no. 135.

Eurycope murrayi Walker
Figure 34 M

Synonyms (incomplete): *Munnopsis*(?) *murrayi* Walker, 1903, p. 227, Pl. 18; — Tattersall, 1905, pp. 27, 73; — 1911, p. 190 (ref. Hansen, 1916). *Munneurycope tjalfiensis* Stephensen, 1913, p. 99, Figs. 6-8; — 1915, p. 23, Figs. 12-13. *Eurycope murrayi* Walker, Hansen, 1916, pp. 137-140, Pl. 12.

Diagnosis: *Eurycope* with frontal area probably obsolete. Pleon without projecting spines or incisions, apex rounded. Peraeonal somites 5-6 entirely separated. Uropodal exopod around one-tenth the length of the endopod.

Measurements: Length varies from about 7 mm. to a little over 8 mm., male (Stephensen, 1915, p. 24).

Type locality: West of Ireland between 350 and 1710 fathoms (Hansen, 1916, p. 139).

Distribution: Taken in the North Atlantic from the following places: West of Cape Farewell: *Tjalfje*, latitude 60° 07' N., longitude 48° 26' W., 2000 meters wire out, one specimen (Stephensen, 1915).

South of Iceland: *Thor* latitude 61° 34' N., longitude 19° 05' W., 1800 meters wire out, four specimens, *Thor*, latitude 61° 30' N., longitude 17° 08' W., 1800 meters wire out, fourteen specimens; *Thor*, latitude 62° 47' N., longitude 10° 03' W., 1500 meters wire out, two specimens.

Southwest of the Faeroes: *Thor*, latitude 60° 00' N., longitude 10° 35' W., 1000 meters wire out, three specimens; *Thor*, latitude 59° 52' N., longitude 9° 53' W., 1500 meters wire out, five and a half

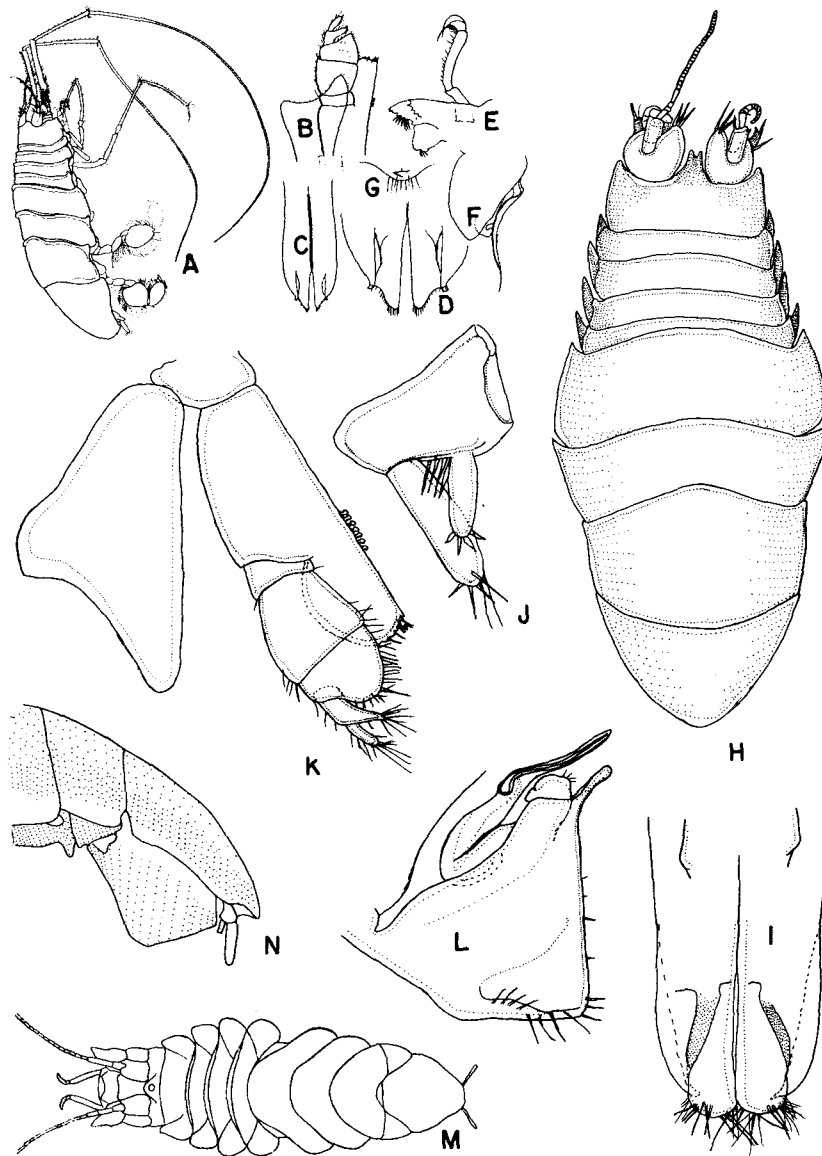


Figure 34. A-G: *Eurycope vicarius* Vanhoeffen. A: lateral view; B: maxilliped; C: first pleopod; D: first pleopod. E: mandible; F: second male pleopod; G: apex of female operculum. H-L: *Eurycope complanata* Bonnier. H: dorsal view male; I: first male pleopod; J: uropod; K: maxilliped and maxillipedal epipod; L: second pleopod. M: *Eurycope murrayi* Walker, dorsal view. N: *Eurycope parva* Bonnier, ventro-lateral view of abdomen.

specimen (Hansen, 1916, p. 139). Hansen (1916) cites other finds.

This species was not collected by *Vema*.

Eurycope parva Bonnier
Figure 34 N

Synonyms: *Eurycope parva* Bonnier, 1896, p. 60, Pl. 33; — Hansen, 1916, pp. 149–150, Pl. 13.

Diagnosis: *Eurycope* with a broad blunt frontal area apex lacking spines and about one-half the width of cephalon. Pleon without spine incisions or projections. Peraeonal somites 5–6 fused along midline. Female operculum with recurved spine directed toward

cephalon and located at distal end of operculum. Uropodal exopod scarcely one-third as long as endopod. (After Hansen, op. cit.).

Measurements: Male 3 mm. long (Hansen, op. cit.).

Type locality: North Atlantic, Bay of Biscay, latitude 44° 17' N., longitude 4° 38' W., 950 meters (Hansen, op. cit.).

Distribution: Taken by *Ingolf* at Station 36, Davis Strait, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two specimens; and by *Thor* from southwest of the Faeroes, latitude 61° 15' N., longitude 9° 35' W., 872–970 meters, one female (Hansen, op. cit.). This species was not captured by the *Vema*.

Eurycope nodifrons Hansen
Figure 35 A-C

Synonyms: *Eurycope nodifrons* Hansen, 1916, pp. 140-141, Pl. 13. ? Wolff, 1956, pp. 123-125.

Diagnosis: *Eurycope* with obsolete frontal area. Pleon without spines or incisions, apex broadly rounded. Peraeonal somites 5-6 entirely separated (uropoda missing).

Measurements: Length 5 mm. (Hansen, op. cit. p. 140).

Type locality: North Atlantic, *Ingolf* Station 36, Davis Strait, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., one specimen (Hansen, op. cit.).

Distribution: Known only from type locality.

Eurycope hanseni Ohlin
Figure 35 D-E

Synonyms: *Eurycope hanseni* Ohlin, 1901, p. 34, Fig. 7; — Hansen, 1916, pp. 144-145, Pl. 13.

Diagnosis: *Eurycope* with frontal area having an indented margin, setae lacking, and only about one-fifteenth the width of cephalon. Pleon without spines or incisions, apex broadly rounded. Inner distal margin of male second pleopod without vermiform appendage. Peraeonal somites 5-6 entirely separated. Uropodal exopod almost as long as endopod.

Measurements: Female length 10 mm. (Hansen, op. cit.).

Type locality: (Probably) North Atlantic, latitude 77° 52' N., longitude 3° 5' W., 2669 meters; and latitude 76° 36' N., longitude 12° 10' E., 1708 meters (Hansen, op. cit.).

Distribution: Also taken by *Ingolf* from Station 105, east of Iceland, latitude 65° 34' N., longitude 7° 31' W., 1435 meters, temperature -0.8° C., three specimens, small; Station 102, east of Iceland, latitude 66° 23' N., longitude 10° 26' W., 1412 meters, temperature -0.9° C., one specimen; Station 113, south of Jan Mayen, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temperature -1.0° C., four specimens; Station 118, south of Jan Mayen, latitude 68° 27' N., longitude 8° 20' W., 1996 meters, temperature -0.1° C., one specimen (Hansen, op. cit.). This species was not captured by the *Vema*. Gurjanova (1946) and Gorbunov (1946) record it from many Arctic positions to 2500 meters.

Eurycope incisa Gurjanova
Figure 35 F-L

Synonyms: *Eurycope incisa* Gurjanova, 1946a, pp. 278-280, 295, Fig. 10.

Diagnosis: *Eurycope* with obsolete frontal area. Pleon with deep concave medial incision. Peraeonal

somites 5-6 entirely separated. Uropodal exopod one-third the length of endopod.

Measurements: Length 10 mm. (?) (Gurjanova, op. cit., p. 279).

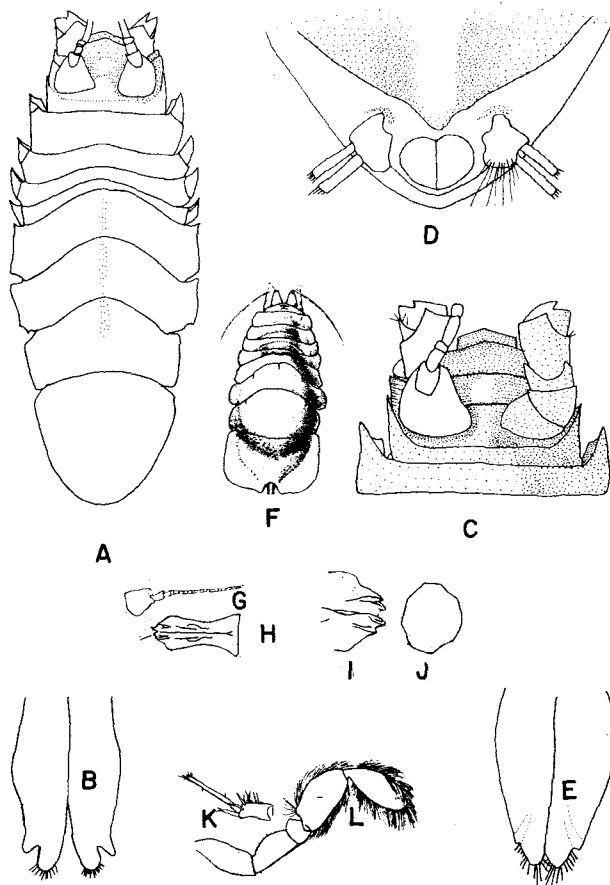


Figure 35. A-C: *Eurycope nodifrons* Hansen. A: dorsal view; B: first pleopod; C: dorsal view cephalon. D-E: *Eurycope hanseni* Ohlin. D: ventral view uropods and anus; E: first pleopod. F-L: *Eurycope incisa* Gurjanova. F: dorsal view; G: first antenna; H: pleopod; I: male operculum; J: female operculum; K: uropod; L: peraeopod.

Type locality: Arctic Ocean, *Sadko* Station 10, latitude 80° 02' N., longitude 3° 19' E., 2380 meters (Gurjanova, op. cit. p. 293).

Distribution: Known only from type locality. This species was not taken by *Vema*.

Eurycope acutitelson, new species
Figure 36 A-E

Synonyms: None.

Diagnosis: *Eurycope* with apex of frontal area devoid of spines, about one-sixth the width of cephalon. Pleon with antero-lateral angles sharp, spine-like, projecting, apex evenly rounded. Inner distal angle of male second pleopod without vermiform appendage. Peraeonal somites 5-6 entirely separated. Uropodal exopod one-half the length of endopod.

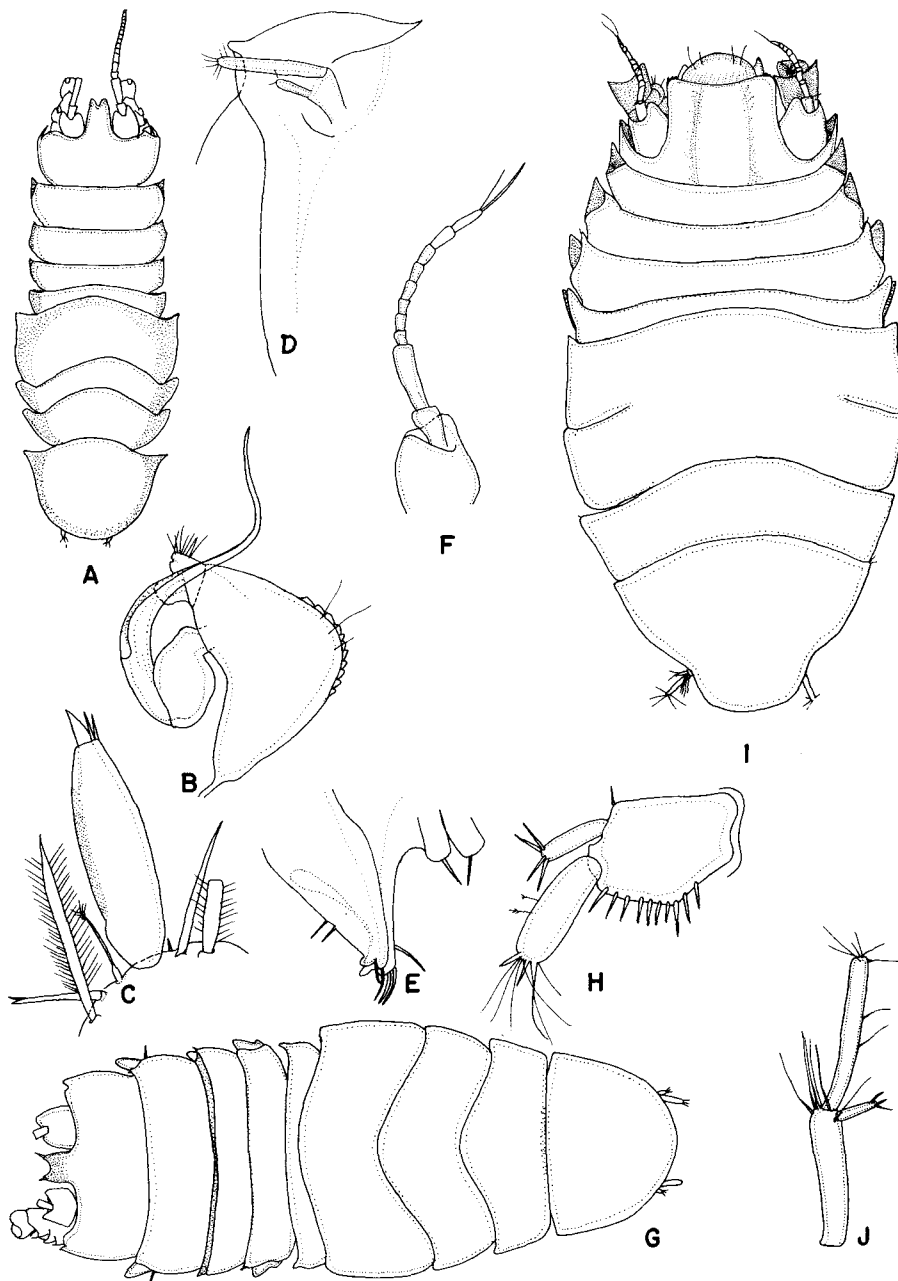


Figure 36. A-E: *Eurycope acutitelson*, n. sp. A: dorsal view male holotype; B second pleopod; C: sixth peraeopod; D: lateral view pleotelson; E: male pleopod. F-H: *Eurycope nodosa*, n. sp. F: first antenna; G: dorsal view female holotype; H: uropod. I-J: *Eurycope ovaloides*, n. sp. I: dorsal view gravid female holotype; J: uropod.

Measurements: Holotype male length 3.4 mm., width pleon 1.0 mm., allotype length 3.2 mm., width pleon 0.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, types plus six male and six female paratypes, cat. no. I-138.

Distribution: Known only from type locality.

Affinities: This species is unique in its sharp pleonal antero-lateral borders.

Eurycope nodosa, new species
Figure 36 F-H

Synonyms: None.

Diagnosis: *Eurycope* with broad frontal apex bearing a stout seta on each side and being around one-seventh the width of cephalon. Pleon shield-shaped, apex evenly rounded, lacking spines or incisions. Peraeonal somites 5-6 completely separated. Uropodal exopod about one-half the length of endopod.

Measurements: Female holotype length 4.6 mm., width pleon 1.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type and one female paratype, cat. no. I-137.

Distribution: Known only from type locality.

Affinities: This species is allied to *gaussi* Wolff from the Antarctic, from which it differs in having fewer setae on the frontal area.

Eurycope ovaloides, new species
Figure 36 I-J

Synonyms: None.

Diagnosis: *Eurycope* with broad frontal area bearing three spines on each side and being around one-half the width of cephalon. Pleon without spines or projections, apex rounded. Peraeonal somites 5-6 fused on midline. Uropodal exopod about one-third the length of endopod.

Measurements: Gravid female holotype length 4.3 mm., width pleon 1.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 14, type and one female paratype, cat. no. I-127.

Distribution: Known only from type locality.

Affinities: This species is allied to *ovalis* Vanhoeffen, from which it differs in having only three spines on either side of the frontal area and in having the frontal margin of the frontal area nearly straight and not deeply incised.

Eurycope species indeterminable

Fragments of *Eurycope* were common and were taken from L.G.O. Biotrawl No. 1, ten fragments; no. 9, one female fragment; no. 12, three fragments; no. 16, several fragments; no. 49, three fragments; no. 51, two fragments of two species; no. 52, fourteen

miscellaneous fragments; no. 53, fifty-two fragments; no. 94, two fragments; no. 101, one fragment; no. 201, four fragments; no. 218, three fragments; no. 231, four fragments; no. 233, one fragment; no. 234, six fragments; no. 237, one female fragment.

Genus: STORTHYNGURA Vanhoeffen

Synonyms: *Storthyngura* Vanhoeffen, 1914, p. 583; — Hansen, 1916, p. 132; — Wolff, 1956, p. 112.

Diagnosis: Eurycopidae with biramous uropoda. Dorsum of body provided with spines. Pleon laterally with spine-like projections. Front of cephalon well defined. Last three peraeonal somites immovable but usually with indications of separation. Coxal plates visible in dorsal view on peraeonal somites 2-4 inclusive. Pleon separated from peraeon.

Type species: *Storthyngura elegans* Vanhoeffen, 1914, p. 584, Fig. 114. Unfortunately, Vanhoeffen (op. cit.) did not select a type, and not all of the species cited by him actually belong to the genus.

Composition: Of the 13 species cited by Wolff (1956) one does not belong to *Storthyngura* but belongs instead to *Acanthocope*—viz., *A. atlantica* (Beddard). This error was continued by Birstein (1957). The 18 known species are shown in the accompanying list.

Prior to this monograph only two species, *S. magnispina* (Richardson) and *S. truncata* (Richardson), were known from the abyss of the Atlantic. Six new species from the Atlantic abyss are described herein. The species range in depth from 400 to 7000 meters.

A LIST OF THE DESCRIBED SPECIES OF STORTHYNGURA

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>elegans</i> Vanhoeffen	3423	3423
2. <i>pulchra</i> Hansen	2490	2690
3. <i>novaezelandiae</i> (Beddard)	2012	2012
4. <i>magnispinis</i> (Richardson)	2258	2702
5. <i>truncata</i> (Richardson)	2788	3225
6. <i>fragilis</i> (Beddard)	2305	2305
7. <i>benti</i> Wolff	5230	7000
8. <i>furcata</i> Wolff	5850	6770
9. <i>caribbea</i> (Benedict)	1256	1256
10. <i>herculea</i> Birstein	6475	8100
11. <i>tenuispinis tenuispinis</i> Birstein	7246	7246
12. <i>tenuispinis kurilica</i> Birstein	7210	7230
13. <i>brachycephala</i> Birstein	5670	5680
14. <i>chelata</i> Birstein	5345	6860
15. <i>bicornis</i> Birstein	6156	6207
16. <i>vitjazi</i> Birstein	7305	8430
17. <i>robustissima</i> Monod, Stephensen 1947	400	750
18. <i>intermedia</i> (Beddard)	5670	5670

A KEY TO THE SPECIES OF STORTHYNGURA

- 1. Pleon with pointed apex 2
- 1. Pleon with truncated, rounded, or indented apex 9

2. Dorsum of cephalon with spines	3
2. Dorsum of cephalon without spines	7
3. Dorsum of pleon with spines	4
3. Dorsum of pleon without spines	5
4. Second peraeonal somite dorsally with a transverse row of three spines <i>tripispinosa</i> , n. sp.	
4. Dorsum of second peraeonal somite with one medial spine	20
5. Cephalon with three dorsal spines	6
5. Cephalon with two dorsal spines <i>bicornis</i> Birstein'	
6. Second peraeonal somite with two spines in row at midline <i>pulchra</i> (Hansen)	
6. Second peraeonal somite with one medial spine <i>chelata</i> Birstein	
7. Dorsum of pleon with spine	8
7. Dorsum of pleon without spine <i>novaezelandiae</i> (Beddard)	
8. Dorsum of 3-4 peraeonal somites each with one medial spine <i>symmetrica</i> , n. sp.	
8. Dorsum of 3-4 peraeonal somites each with two spines in longitudinal row <i>caribbea</i> (Benedict)	
9. Dorsum of cephalon with spines	10
9. Dorsum of cephalon without spines	11
10. Apex of pleon indented <i>vemae</i> , n. sp.	
10. Apex of pleon rounded <i>digitata</i> , n. sp.	
11. Apex of pleon incised medially	12
11. Apex of pleon truncated or rounded, not incised medially	14
12. Dorsum of pleon without spines <i>elegans</i> Vanhöffen	
12. Dorsum of pleon with spines	13
13. With one spine <i>furcata</i> Wolff	
13. With three spines	21
14. Dorsum of pleon with spines	15
14. Dorsum of pleon without spines	17
15. With three or more spines	16
15. With one or two spines	18
16. With three spines <i>tenuispinis kurillica</i> Birstein	
16. With four spines <i>tenuispinis tenuispinis</i> Birstein	
17. Lateral spines peraeon longer than wide	22
17. Lateral spines peraeon broader than long <i>herculea</i> Birstein	
18. With two spines on pleon dorsum	19
18. With one spine on pleon dorsum <i>birsteini</i> , n. sp.	
19. Apex of pleon rounded <i>snanoi</i> , n. sp.	
19. Apex of pleon straight <i>truncata</i> (Richardson)	
20. Dorsum of pleon with three spines in longitudinal row <i>robustissima</i> Monod	
20. Dorsum of pleon with two spines in longitudinal row <i>benti</i> Wolff	
21. Spines at pleonal apex sharp <i>brachycephala</i> Birstein	
21. Spines at pleonal apex blunt <i>magnispinis</i> (Richardson)	
22. Apex of pleon straight <i>vitjazi</i> Birstein	
22. Apex of pleon evenly rounded <i>intermedia</i> (Beddard)	

Storothyngura digitata, new species

Figure 37 A-C

Synonyms: None.

Diagnosis: *Storothyngura* with spines on dorsum of cephalon and pleon. Cephalon with four spines, two on each side of midline. Peraeonal somites 1-4 each with a transverse row of three spines, somites 5-7 with transverse row of two spines. Pleon with four spines;

lateral border spinulate, apical border rounded, spinulate. Uropodal exopod one-half the width of endopod and two-thirds as long as endopod. Endopod longer than peduncle. Spine of body not tapering, as wide at distal as proximal end.

Measurements: Female holotype length 5.8 mm., width pleotelson 1.2 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 212, type only, cat. no. I-143.

Distribution: Known only from type locality.

Affinities: This species is related to *S. vemae*, but the blunt nature of the body spines makes it distinctive.

Storothyngura truncata (Richardson)

Figure 37 D

Synonyms: *Eurycope truncata* Richardson, 1908a, pp. 67-69, Fig. 1; — Richardson, 1908b, p. 84, Fig. 20, *Storothyngura truncata* (Richardson), Vanhöffen, 1914.

Description: "Body oblong-ovate, a little more than twice as long as wide. Dorsal surface smooth.

"The head is wider than long, and is produced anteriorly in a truncate process which extends between the basal articles of the first pair of antennae. On either side of the median process there is a slight double emargination. The eyes are wanting. The first pair of antennae have the basal article large and dilated. There is a large and conspicuous spine on the inner margin. The second and third articles are small and feeble, and of equal length. The flagellum extends to the end of the fourth article of the peduncle of the second antennae, and is composed of about seven articles. The second antennae have the basal article short and furnished with a long, conspicuous spine on the outer margin. The second article is about twice as long as the first, and is furnished on the anterior margin with one long spine. The third article is about as long as the second, and has two spines, one on the outer and one on the inner margin. The fourth article is short, and is not furnished with any spines. The last two articles of the peduncle and the flagellum are missing. The mandibles have a well developed palp and molar process.

"The first four segments of the thorax are about equal in length. The antero-lateral angles of the first segment are drawn out on either side in one long, sharp epimeral spine. The lateral margins of the second segment are drawn out on either side in one long, sharp spine and one small spine just back of it, both epimeral. The lateral margins of the third and fourth segments are produced on either side in three spines, two small spines and one long, sharp median one, a little curved anteriorly. The last two spines are epimeral. The last three segments have the lateral margins produced on either side in one long, sharp spine directed anteriorly. The fifth and sixth segments

are of nearly equal length in the median dorsal line. The seventh segment is nearly twice as long as either of the preceding segments.

"The abdomen is composed of one segment. Near the base of the segment the lateral margin is produced on either side in one long, sharp spine directed anteriorly. Below these spines the lateral margins are almost straight to about the middle of the segment, where there is an abrupt indentation on either side. This indentation is followed by two long, sharp spines, one on either side, directed posteriorly. Below these two spines the lateral margins slightly converge to a truncate extremity. Just within the two indentations of the lateral margin are indications of two tiny tubercles on the dorsal surface. The uropods are placed on either side of the truncate extremity just below the second lateral spine. They are small and feeble and consist of a basal article and two branches of nearly equal length.

"All the four anterior pairs of legs are missing. The three posterior pairs are similar, natatory, with the merus much enlarged and both the merus and propodus furnished with long, plumose hairs.

"The operculum of the female is furnished with a small spine about the middle." (Richardson, 1908a.)

Measurements: None available.

Type locality: North Atlantic, off Martha's Vineyard, U.S. Bureau Fish. *Albatross*, 1525 fathoms (2788 meters) (Richardson, *op. cit.*).

Distribution: North Atlantic, off Martha's Vineyard, 2788 meters (Richardson, 1908a, p. 69); south-east of Georges Bank (Richardson, 1908a); and *Albatross Station* 2572, off Georges Bank, 3225 meters (Richardson, 1908b, p. 84).

Affinities: This species is most closely related to the Atlantic *S. nanoi* described later, but it differs in having the pleonal apex markedly produced beyond the postero-lateral angles.

Storthyngura magnispinis (Richardson)

Figure 37 E

Synonyms: *Eurycope magnispinis* Richardson, 1908b, pp. 84-86, Fig. 21; — Hansen, 1916, pp. 132-134, Pl. 12, Figs. 3a-n.

Description: "Body oblong-ovate, about twice as long as wide. Head with the front produced in the middle in a rostrum with the extremity truncate and the sides incurved; on either side of the rostrum the frontal margin has a double excavation; the antero-lateral angles are acute. The eyes are absent. The first pair of antennae have the basal article large and armed with one long spine; the two following articles are subequal in length and are small; the flagellum is lost in the only specimen. The first article of the peduncle of the second antennae is short, and is furnished on the outer margin with a single spine;

the second article is a little longer than the first and is unarmed; the third article is a little longer than the second and is armed with two spines, one on the outer and one on the inner margin; the antennae are broken at the end of the fourth article.

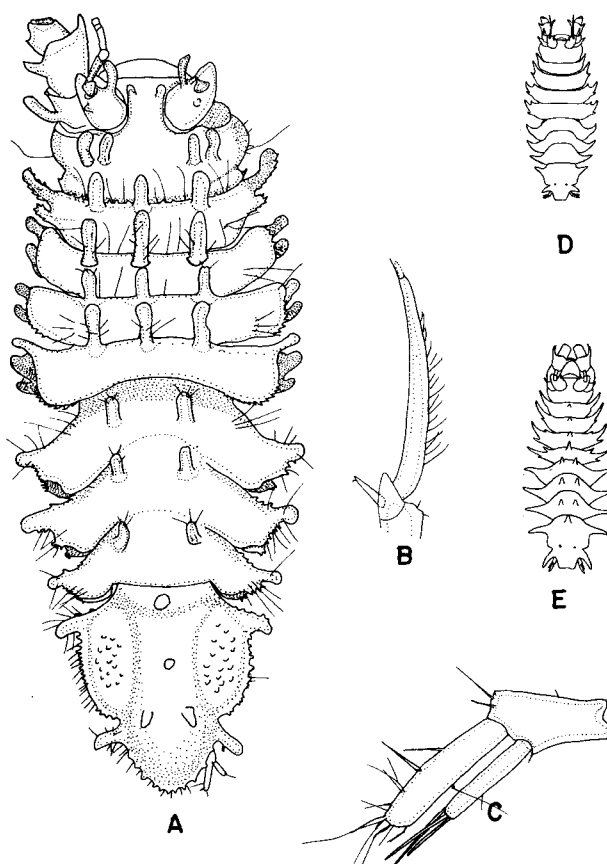


Figure 37. A-C: *Storthyngura digitata*, n. sp. A: dorsal view female holotype; B: sixth pereopod; C: uropod. D: *Storthyngura truncata* (Richardson), dorsal view. E: *Storthyngura magnispinis* (Richardson), dorsal view.

"The first segment of the thorax has the antero-lateral angles produced in one long spine on either side, directed anteriorly; the second segment has the lateral margin produced in one long anterior spine directed anteriorly and one small posterior one on either side; the third and fourth segments have the lateral margin produced on either side in three spines, two small ones on either side of one long one directed anteriorly; the last three segments have the lateral margins produced on either side in a single long spine, directed anteriorly in the fifth and sixth segments and a little posteriorly in the seventh segment.

"The abdomen has the lateral margin produced on either side at the base in one long spine directed a little posteriorly; below these spines, the lateral margins are nearly parallel to about the middle of the segment, where there is an abrupt incision; below this incision is a single long spine, directed posteriorly;

below these spines the lateral margins of the segment converge slightly to a truncate extremity. The uropoda have the basal article short; the inner branch is about twice as long as the basal article; the outer branch is a little more than half the length of the inner branch.

"The first four segments of the thorax are each armed on the dorsal surface in the median longitudinal line with a single spine on the anterior margin, the spine on the fourth segment being the longest and very prominent; on the three following segments there are two long spines, one on each side of the median longitudinal line on each segment, those on the sixth and seventh segments being nearer the middle transverse line of the segment. The abdomen

has one long median spine near the base, and two rudimentary spines or tubercles on the dorsal surface, just opposite the incisions in the lateral margins." (Richardson, 1908b.)

Measurements: None available.

Type locality: Off Nantucket Shoals, U.S. Bureau Fish. Albatross, Station 2043, 2680 meters.

Distribution: North Atlantic, off Nantucket Shoals (Richardson, 1908b). Ingolf Station 24, 2258 meters. See also Hanson (1916).

Affinities: This species appears to be related to the Pacific species *S. brachycephala* Birstein, from which it differs in having the apical pleonal spines blunt (almost not spines at all) rather than sharp.

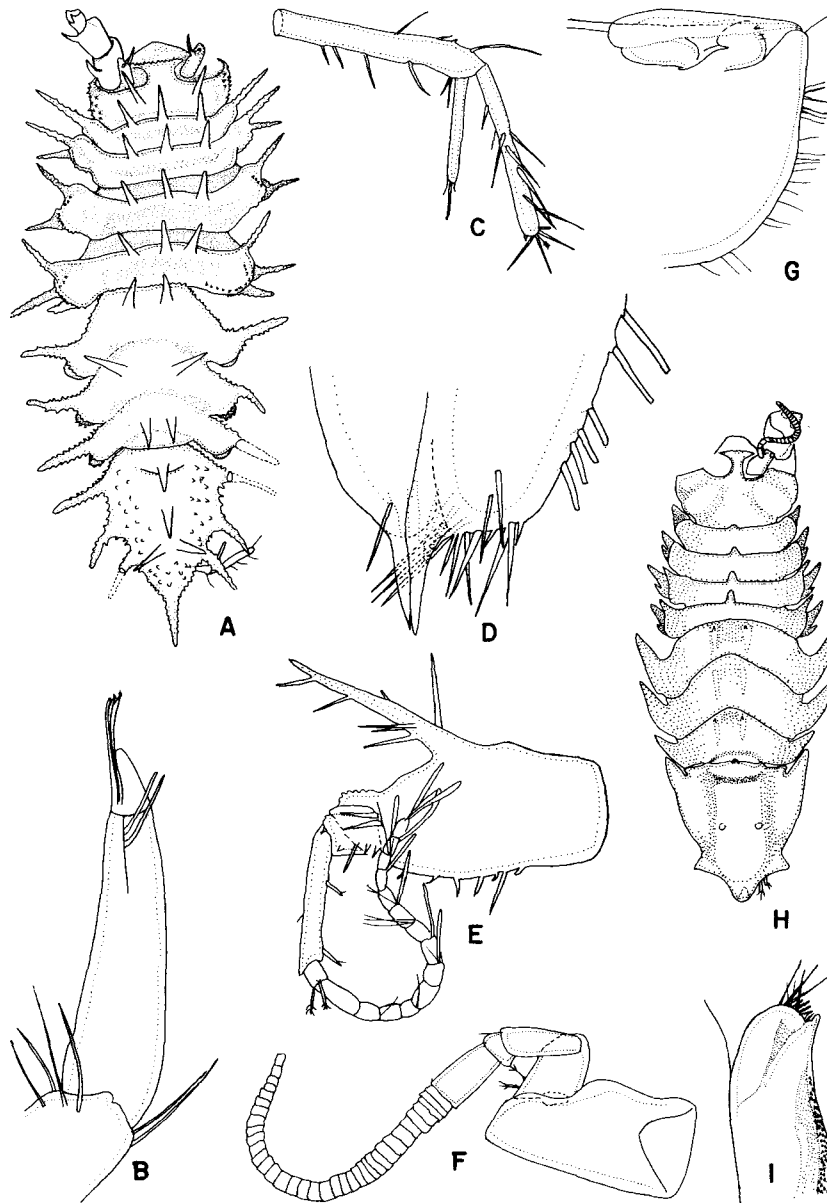


Figure 38. A-E: *Storthyngura triplispinosa*, n. sp. A: dorsal view female holotype; B: first pereopod; C: uropod; D: apex of male pleopod; E: first antenna. F-I: *Storthyngura symmetrica*, n. sp. F: first antenna; G: second male pleopod; H: dorsal view male holotype; I: first male pleopod.

Storthyngura triplispinosa, new species

Figure 38 A-E

Synonyms: None.

Diagnosis: *Storthyngura* with spines on dorsum of cephalon and pleon. Cephalon with two spines, one on either side of midline. Peraeonal somites 1-4 with three spines in transverse row, somites 5-7 each with two spines in transverse row. Pleon with four dorsal spines and six lateral spines, apex pointed, terminating in a long spine. Uropodal exopod as wide as endopod and two-thirds its length, peduncle as long as endopod. Spines of body tapering to a point.

Measurements: Holotype female length 14.5 mm., width pleon 4.0 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 51, type only, cat. no. I-149.

Distribution: Also found in L.G.O. Biotrawl No. 14, one female, cat. no. I-240; L.G.O. Biotrawl No. 53, fourteen females, one male, cat. no. I-150; and L.G.O. Biotrawl No. 212, one male, one female, cat. no. I-144.

Affinities: The transverse row of three spines on the dorsum of the second peraeonal somite distinguishes this species from the others.

Storthyngura symmetrica, new species

Figure 38 F-I

Synonyms: None.

Diagnosis: *Storthyngura* without spines on dorsum of cephalon but with spines on dorsum of pleon. Pleonal somites 1-4 each with an antero-medial spine, somites 5-7 each with a pair of spines. Pleon with three spines, lateral border with four spines, apex pointed and recurved under pleon; postero-lateral spines broader than long, antero-lateral spines directed toward cephalon.

Measurements: Holotype male length 6.5 mm., width pleon 2.0 mm., allotype length 18.5 mm., width pleon 5.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, types plus two male and five female paratypes, cat. no. I-146.

Distribution: Known only from type locality.

Affinities: The short wide postero-lateral spines on the pleon distinguish this species from the group of species bearing spines on the body and pleon.

Storthyngura vemae, new species

Figure 39

Synonyms: None.

Diagnosis: *Storthyngura* with spines on dorsum of cephalon and pleon. Dorsum of cephalon with a spine on either side of midline. Dorsum of pleon with

three spines. Peraeonal somites 1-4 each with a single spine antero-medially, somites 5-7 each with a pair of spines medially. Pleon with four lateral blunt spines, apex bilobed and spinulate at margin. Uropodal endopod widest at distal end and longer than peduncle. Lateral projections of body blunt.

Measurements: Male holotype length 3.5 mm., width pleon 0.8 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 9, type plus one fragmentary paratype, cat. no. I-148.

Distribution: Known only from type locality.

Affinities: This species resembles *S. digitata*, but has pointed rather than blunt spines and the apex of the pleon is convex rather than rounded.

Storthyngura birsteini, new species

Figure 40 A-B

Synonyms: None.

Diagnosis: *Storthyngura* with spines on dorsum of peraeon and pleon, none on cephalon. Peraeonal somites 2-4 each with a single dorsal spine at midline of anterior margin; somites 5-7 each with a pair of dorsal spines at midline. Pleon with a single spine on mid-dorsal line of anterior part. Apex of pleon broadly rounded, not produced beyond the sharp postero-lateral angles. Uropodal exopod and endopod about equal in width, exopod one-third shorter than endopod, which is equal to peduncle in length.

Measurements: Female holotype length 21.5 mm., width pleon 7.8 mm., and one juvenile female paratype and three fragments.

Type locality: South Atlantic, L.G.O. Biotrawl No. 202, types only, cat. no. I-230.

Distribution: Known only from type locality.

Affinities: The absence of spines from the dorsum of the cephalon and the rounded pleonal apex ally this species to *S. truncata* Richardson, from which it differs significantly in the presence of dorsal spines on the body and of one dorsal spine not two, on the pleon.

Storthyngura snanoi, new species

Figure 40 C-E

Synonyms: None.

Diagnosis: *Storthyngura* without spines on dorsum of cephalon and with a pair of spines on dorsum of pleon. Peraeonal somites 1-4 each with an antero-medial spine, somite 5 with a pair of spines, somites 6-7 without spines. Pleon with four lateral projections, apex evenly rounded, not extending beyond uropods. Uropodal endopod widest at distal end; it is twice the length of exopod and is longer than peduncle.

Measurements: Female holotype length 3.2 mm., width pleon 0.6 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 95, type only, cat. no. I-145.

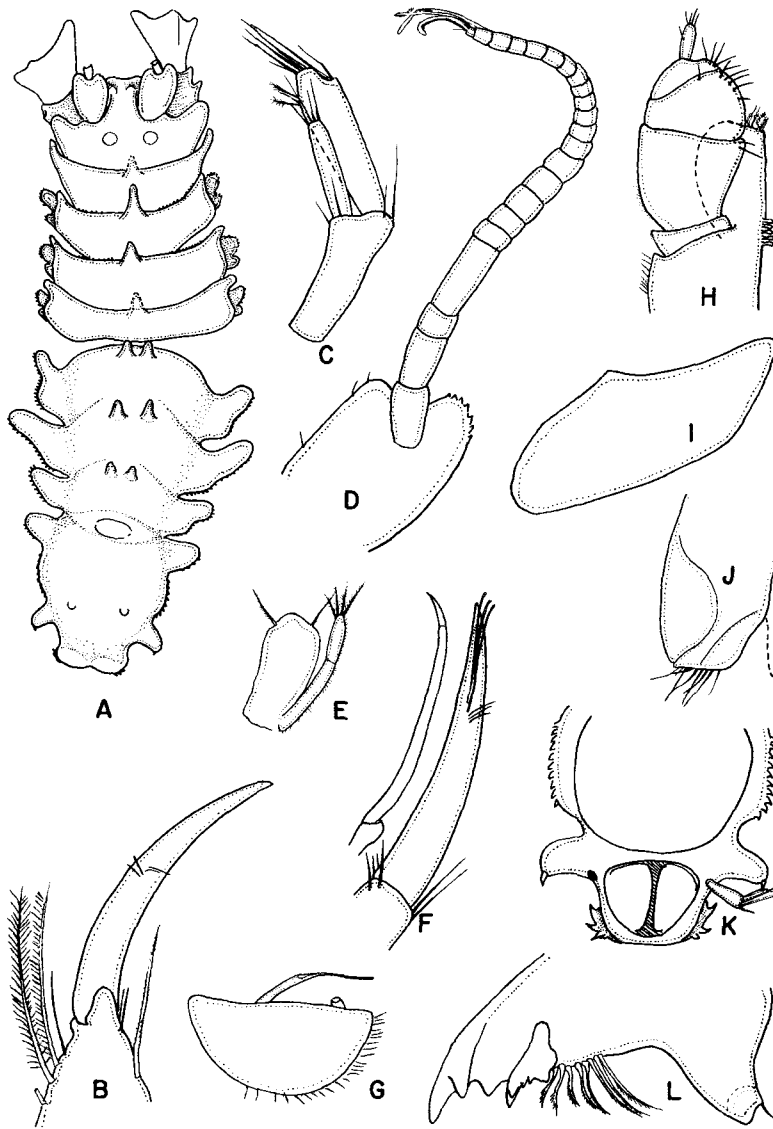


Figure 39. *Storthyngura vema*, n. sp. A: dorsal view male holotype; B: sixth pereopod; C: uropod; D: first antenna; E: third pleopod; F: first pereopod; G: second pleopod; H: maxilliped; I: maxillipedal epipod; J: first pleopod; K: ventral view anus and uropod; L: mandible.

Distribution: Known only from type locality.

Affinities: This species is close to *S. truncata* Richardson, from which it differs in having the pleonal apex rounded, not straight.

Storthyngura species indeterminable

Fragments of *Storthyngura* were taken from L.G.O. Biotrawl No. 47, one female fragment, and L.G.O. Biotrawl No. 214 one juvenile related to *S. symmetrica*.

Genus: SYNEURYCOPE Hansen

Synonyms: *Syneurycope* Hansen, 1916, pp. 130–131; — Menzies, 1956a, pp. 5–6; *Ilychthonos* Barnard, 1920, pp. 414–415.

Diagnosis: Eurycopidae with pleon consisting of (one? or) two somites. Last three peraeonal somites fused into a solid piece. Uropoda biramous. Coxal plates visible in dorsal view on peraeonal somites 2–4 inclusive. Third article of maxillipedal palp with characteristic denticles along inner margin. Lateral border of pleon without spine-like extensions. (Modified from Menzies, 1956a, p. 5, with corrections.)

Type species: *Syneurycope parallela* Hansen, 1916, pp. 131–132.

Composition: The species belonging to this genus are all markedly attenuate. Three described species are known from bathyal to abyssal depths.

<i>parallela</i> Hansen	3474 meters
<i>hanseni</i> Menzies	5104–5122 meters
<i>capensis</i> Barnard	1280 meters

Here two additional new abyssal species are described from the South Atlantic abyss.

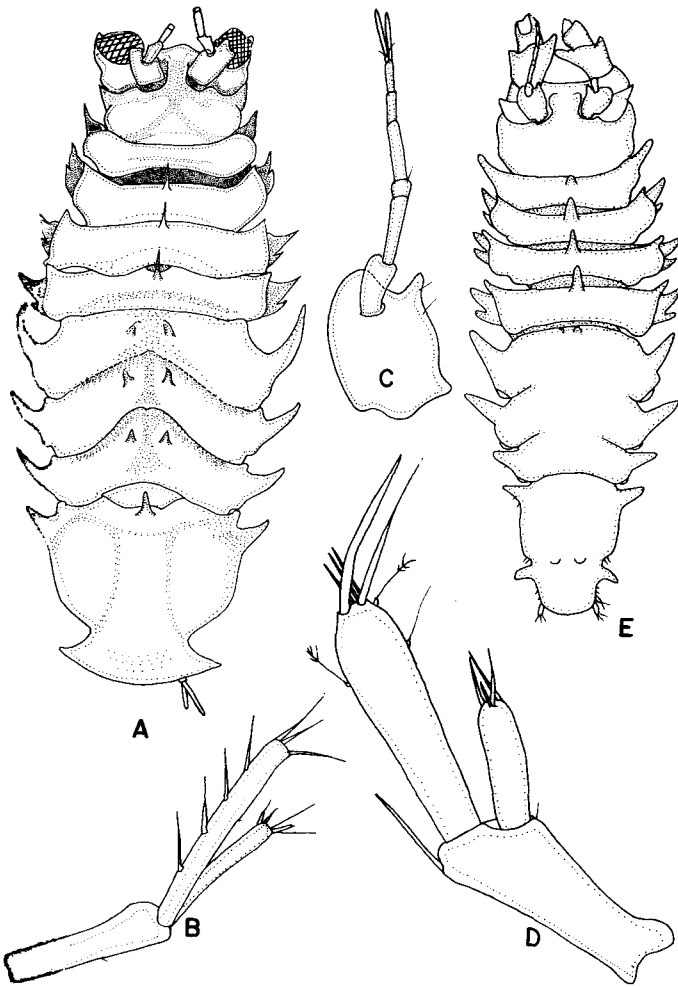


Figure 40. A-B: *Storthyngura birsteini*, n. sp. A: dorsal view female holotype; B: uropod. C-E: *Storthyngura snanoi*, n. sp. C: first antenna; D: uropod; E: dorsal view female holotype.

A KEY TO THE SPECIES OF SYNEURYCOPE
(Modified from Menzies, 1956a, p. 6)

- 1. Dorsum of cephalon with spines . . . *multispina*, n. sp.
- 1. Dorsum of cephalon without spines 2
- 2. Mandibular palp small, unarmed 4
- 2. Mandibular palp well developed with 3-4 setae on apical article 3
- 3. Maxilliped with coupling hooks . . . *parallela* Hansen
- 3. Maxilliped without coupling hooks *hanseni* Menzies
- 4. First peraeonal somite fused with cephalon *heezeni*, n. sp.
- 4. First peraeonal somite separated from cephalon *capensis* (Barnard)

Syneurycope heezeni, new species
Figure 41 A-E

Synonyms: None.

Diagnosis: *Syneurycope* with cephalon and first

peraeonal somite fused. Dorsum of cephalon smooth, frontal margin between first antennae concave. Maxilliped without coupling hooks. Mandibular palp without setae on apical article. Fifth peraeopods with paddle-shaped terminal articles. Exopod of uropod one-fourth as long as endopod. First pleonal somite completely separated from pleon.

Measurements: Holotype female length 4.5 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 200, types and one female paratype, cat. no. I-227.

Distribution: Found also at L.G.O. Biotrawl No. 201, two females, two fragments, cat. no. I-229, and L.G.O. Biotrawl No. 220, one female, cat. no. I-228.

Affinities: This species is unique in having the cephalon fused with the first peraeonal somite.

Syneurycope parallela Hansen
Figure 41 F

Synonyms: *Syneurycope parallela* Hansen, 1916, pp. 131-132, Pl. 12.

Diagnosis: *Syneurycope* without spines on dorsum of head. First pleonal somite clearly separated from pleotelson. Maxilliped with three coupling hooks. Uropodal exopod one-fifth the length of endopod.

Measurements: Length female 3.7 mm. (Hansen, op. cit. p. 131).

Type locality: North Atlantic, southwest of Cape Farewell, Ingolf Station 22, latitude 58° 10' N., longitude 48° 25' W., 3474 meters, temperature 1.4° C., one specimen (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: Related to *S. hanseni* Menzies but with coupling hooks on the maxilliped.

Syneurycope hanseni Menzies
Figure 42 A-D

Synonyms: *Syneurycope hanseni* Menzies, 1956a, pp. 6-7, Fig. 2.

Diagnosis: *Syneurycope* without spines on dorsum of cephalon. First pleonal somite incompletely separated from pleon. Maxilliped without coupling hooks. Uropodal exopod one-third the length of endopod. Mandibular palp well developed, terminal article setiferous. Outer lobe at apex of male first pleopod longer than inner lobe.

Measurements: Male length 3.75 mm., width second peraeonal somite 0.65 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 1, type only, cat. no. 11758 A.M.N.H.

Distribution: Known only from type locality.

Affinities: This species is related to *S. parallela* Hansen, from which it differs in lacking coupling hooks.

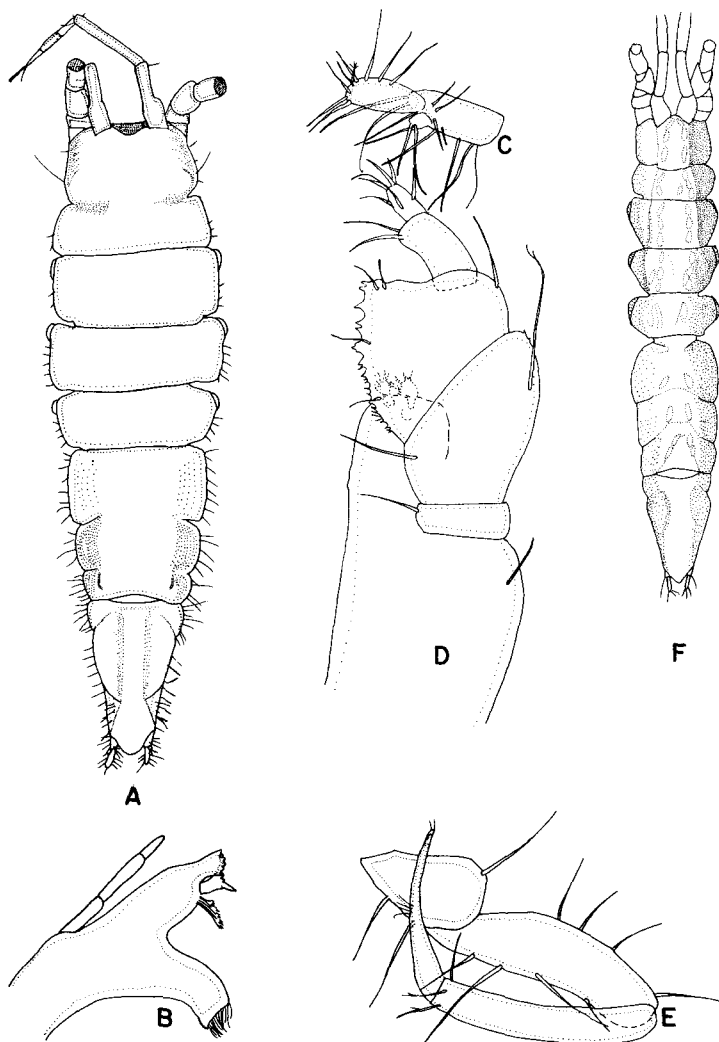


Figure 41. A–E: *Syneurycope heezeni*, n. sp. A: dorsal view female holotype; B: mandible; C: uropod; D: maxilliped; E: gnathopod. F: *Syneurycope parallela* Hansen, dorsal view male.

Syneurycope multispina, new species

Figure 42 E–K

Synonyms: None.

Diagnosis: *Syneurycope* with a row of four to six spines in longitudinal row on either side of midline of dorsum of cephalon. First pleonal somite completely separated from pleotelson. Maxilliped without coupling hooks. Mandibular palp well developed, apical article setiferous. Outer lobe at apex of male first pleopod shorter than inner lobe.

Measurements: Holotype male length 4.3 mm., width pleon 0.6 mm., female allotype length 4.2 mm., width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, types plus one female paratype.

Distribution: Known only from type locality.

Affinities: This species is unique in having spines on the dorsum of the cephalon.

Genus: ACANTHOCOPE Beddard

Synonyms: *Acanthocope* Beddard, 1885, p. 922; — Beddard, 1886, pp. 78–79; — Menzies, 1956a, p. 2.

Diagnosis: Eurycopidae with uniramous uropoda. Dorsum of body spinous. Pleon with lateral spine-like projections. Front of cephalon well defined. Last three peraeonal somites immovable. Pleon with a single somite. Coxal plates not visible in dorsal view on peraeonal somites 2–4 inclusive. Pleon completely fused with peraeon.

Type species: *Acanthocope spinicauda* Beddard.

Composition: Four species are known from *Acanthocope*. These are as follows:

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>spinicauda</i> Beddard	3290	3290
2. <i>acutispina</i> Beddard	2650	2650
3. <i>atlantica</i> (Beddard)	1646	1646
4. <i>spinosissima</i> Menzies	1169	1169

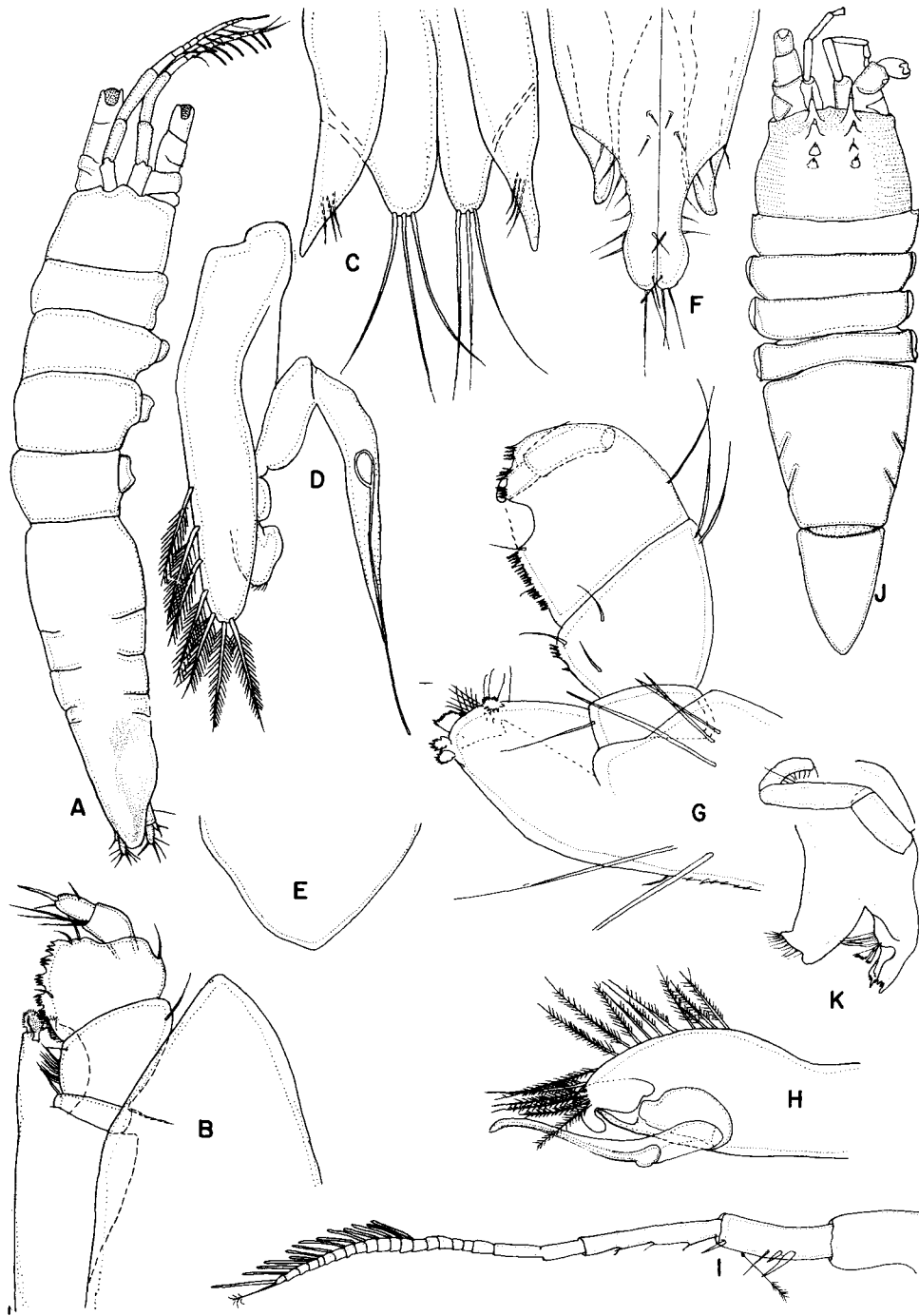


Figure 42. A-D: *Syneurycope hanseni* Menzies. A: dorsal view male; B: maxilliped; C: first pleopod; D: second pleopod. E-K: *Syneurycope multispina*, n. sp. E: apex of pleotelson; F: apex of first male pleopod; G: maxilliped; H: second pleopod; I: first antenna; J: dorsal view male holotype; K: mandible.

The genus ranges from 1169 meters to 3290 meters. Only two species were known previously from the Atlantic; none was abyssal. Here three additional new species are described.

A KEY TO THE SPECIES OF ACANTHOCOPE

- 1. Body with dorsal spines 2
- 1. Body without dorsal spines *acutispina* Beddard

- 2. Pleon with dorsal spine(s) 3
- 2. Pleon without dorsal spine(s) 4
- 3. Pleon with one dorsal spine *spinicauda* Beddard
- 3. Pleon with two dorsal spines *atlantica* (Beddard)
- 4. First three peraeonal somites dorsally each with a median spine 5
- 4. First three peraeonal somites dorsally without spines 6
- 5. Flagellum of first antenna with over 20 articles. Frons of cephalon convex *annulatus*, n. sp.



Figure 43. *Acanthocope argentinae*, n. sp. A: dorsal view female holotype; B: anus and uropods; C: second peraeopod; D: mandible; E: seventh peraeopod; F: maxilliped; G: maxillipedal epipod; H: first antenna.

- 5. Flagellum of first antenna with six articles. Frons of cephalon concave on margin *argentinae*, n. sp.
- 6. Fourth peraeonal somite dorsally with long medial spine *unicornis*, n. sp.
- 6. Fourth peraeonal somite dorsally without spine *spinosissima* Menzies

Acanthocope argentinae, new species

Figure 43

Synonyms: None.

Diagnosis: Cephalon and pleon lacking dorsal spines. Single short medial spine on dorsum peraeonal somites 1-4 inclusive, fifth with a pair of spines. Flagellum of first antenna with five articles only.

Measurements: Female holotype length 3.6 mm., width pleotelson 1.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type only, cat. no. I-155.

Distribution: Known only from type locality.

Affinities: This species is closest to *A. annulatus*,

from which it differs in having the frons of the cephalon concave.

Acanthocope unicornis, new species

Figure 44 A

Synonyms: None.

Diagnosis: *Acanthocope* without spines on dorsum of cephalon or pleon. Only fourth peraeonal somite with dorsal spine at midline extending as far as the frons of cephalon. Flagellum of first antenna with four articles only.

Measurements: Female holotype length 5.4 mm., width pleotelson 1.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 18, type only, cat. no. I-152.

Distribution: Known only from type locality.

Affinities: Related to *A. spinosissima*, from which it differs in having a long spine on the fourth peraeonal somite.

Acanthocope annulatus, new species

Figure 44 B-C

Synonyms: None.

Diagnosis: *Acanthocope* lacking spines from dorsum of cephalon and pleon. First four peraeonal somites each with a short medial spine dorsally, fifth with a pair of spines dorsally at midline. Flagellum of first antenna with over 20 articles. Lateral border of cephalon sharply spinulate.

Measurements: Female holotype length 3.2 mm., width pleotelson 1.0 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type only, cat. no. I-156.

Distribution: Known only from type locality.

Affinities: Closest to *A. argentinae*, from which it differs in having the frons of the cephalon convex.

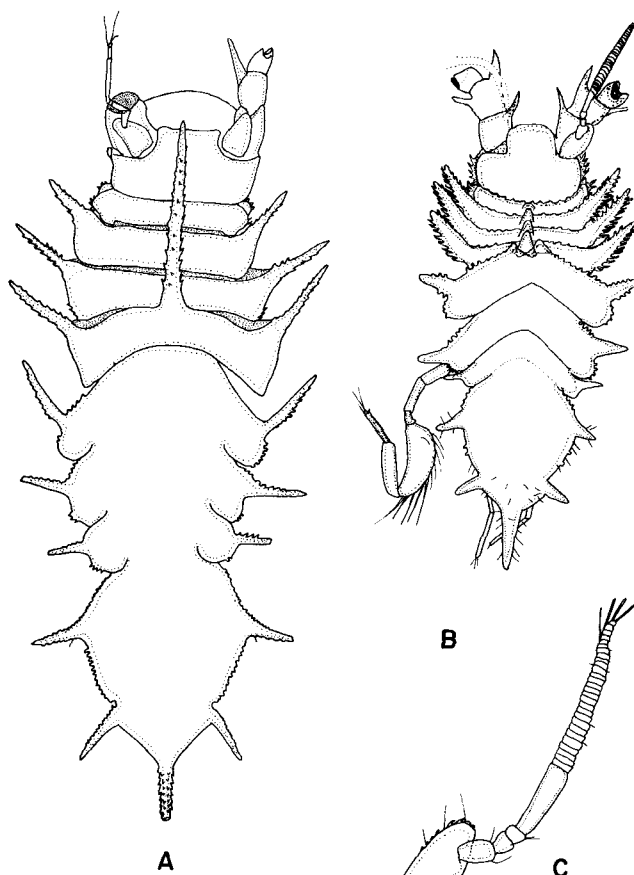


Figure 44. A: *Acanthocope unicornis*, n. sp., dorsal view female holotype. B-C: *Acanthocope annulatus*, n. sp. B: dorsal view female holotype; C: first antenna.

Acanthocope species indeterminable

Fragments of *Acanthocope* were collected from L.G.O. Biotrawl No. 18, two females; No. 94, two females; and No. 96, one female.

Family: ILYARACHNIDAE

Type genus: *Ilyarachna* G. O. Sars.

Synonyms: *Mesostenus* G. O. Sars, 1864, p. 211. *Ilyarachna* G. O. Sars, 1869, p. 44; — 1899, p. 134; — Hansen, 1916, p. 121; — Hult, 1936, p. 12, — Wolff, 1956, p. 106. *Aspidarachna* G. O. Sars, 1899, p. 140; — Hansen, 1916, p. 121; — Hult, 1936, p. 12. *Echinozone* G. O. Sars, 1899, p. 139; — Hansen, 1916, p. 128; — Hult, 1936, p. 12. (incomplete list).

Diagnosis: Paraselloidea with only peraeopods 5-6 inclusive paddle-like. Peraeopods 7 walking legs. Pleon with one or two somites. Cephalon with first antennae not separated by a pronounced frontal area. Mandible with reduced setiferous molar; incisor reduced to a simple lobe. Uropoda with flattened

peduncle bearing plumose setae. Uropoda uni-biramous.

Composition: The family contains two presently recognized genera, *Ilyarachna* G. O. Sars and *Pseudarachna* G. O. Sars.

In *Pseudarachna* the mandible lacks a palp and the uropoda are uniramous and only the fifth pair of peraeopods is paddle-like (Vanhöffen, 1914, p. 593); no abyssal species are known. In *Ilyarachna* a mandibular palp is present, the uropoda are uni-biramous, and the 5-6 pair of peraeopods are paddle-like; there are several abyssal species.

Because so many species of *Ilyarachna* are imperfectly known, it is impossible at present to draw up a key

LIST OF ILYARACHNA SPECIES

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>abyssorum</i> Richardson	4060	4165
2. <i>affinis</i> Barnard	1280	1280
3. <i>crassiceps</i> Barnard	1280	1280
4. <i>antarctica</i> Vanhöffen	252	3423
5. <i>aries</i> (Vanhöffen)	385	385
6. <i>magnifica</i> (Vanhöffen)	350	385
7. <i>arctica</i> (Hansen)	103	103
8. <i>bicornis</i> Hansen	2702	2702
9. <i>dubia</i> Hansen	1666	1902
10. <i>spinosissima</i> Hansen	2702	3521
11. <i>bergendali</i> Ohlin	21	698
12. <i>longicornis</i> G. O. Sars, Hult	18	2788
13. <i>clypeata</i> G. O. Sars	216	450
14. <i>coronata</i> G. O. Sars	188	1505
15. <i>quadrispinosa</i> Beddard	22	360
16. <i>starokadmoskii</i> Gurjanova	130	780
17. <i>zachsi</i> Gurjanova	105	780
18. <i>fusiformis</i> (Barnard)	1280	1280
19. <i>derjugini</i> Gurjanova	2500	2500
20. <i>acarina</i> Menzies and Barnard	73	1118

to the species. Nevertheless, it may be useful to provide the following groupings of species on the basis of uropodal structure.

A. Uropoda uniramous	B. Uropoda biramous	C. Structure of uropoda unknown
1. <i>longicornis</i>	1. <i>coronata</i>	1. <i>crassiceps</i>
2. <i>denticulata</i>	2. <i>clypeata</i>	2. <i>affinis</i>
3. <i>spinosissima</i>	3. <i>arctica</i>	3. <i>bergendali</i>
4. <i>antarctica</i>	4. <i>magnifica</i>	4. <i>starokadmoskii</i>
5. <i>bicornis</i>	5. <i>aries</i>	5. <i>derjugini</i>
6. <i>dubia</i>	6. <i>quadrispinosa</i>	
7. <i>zachsi</i>	7. <i>abyssorum</i>	

Only five of the species were known from abyssal depths of the Atlantic and Arctic:

1. *abyssorum*
2. *bicornis*
3. *spinosissima*
4. *longicornis* (auct. *hirticeps*?)
5. *derjugini*

Genus: ILYARACHNA G. O. Sars

Ilyarachna abyssorum Richardson, 1911

Figure: None available

Synonyms: None.

Diagnosis: *Ilyarachna* with "corps oblong-ovale environ trois fois plus long que large, 4 millim. 5 × 13 millimètres.

"Tête trois fois plus large que longue, 1 millimètre × 3 millimètres; ses angles antérieurs latéraux sont arrondis et ne forment pas saillie; les parties latérales de la tête ne sont pas dilatées. Yeux absents. Les antennes de la première paire ont l'article basal large et dilaté, avec le bord externe latéral recourbé en

dehors et l'angle externe antéro-latéral saillant au delà de l'angle interne; les second et troisième articles sont petits et étroits, le deuxième étant un peu plus court que le troisième; le flagellum se compose de onze articles. Les antennes de la deuxième paire sont cassées au bout du quatrième article. Les mandibules n'ont pas de palpe.

"Les quatre premiers segments du thorax sont courts et subégaux comme longueur, chacun d'eux ayant environ 1 millimètre; les trois segments qui suivent sont plus larges et croissent graduellement en longueur; le cinquième a 1 millim. 5 de long, le sixième 1 millim. 7⁵ et le septième 2 millimètres. Les épimères sont présents sur les quatre premiers segments; ils s'étendent sur l'entière longueur du bord latéral dans les trois premiers; leurs extrémités antérieures sont très aiguës et forment des processus qui dépassent le bord antérieur des segments; ils semblent partagés en deux parts dont l'une est antérieure et l'autre postérieure. Les épimères du quatrième segment occupent les deux tiers postérieurs du bord latéral; ils sont aigus à leurs extrémités antérieures.

"L'abdomen se compose de deux segments, l'un antérieur court, l'autre terminal large, de forme triangulaire, avec l'apex arrondi. L'abdomen mesure 3 millimètres de long et 3 millimètres de large à la base. Les uropodes consistent en un article basilaire et en deux branches placées près du bord externe latéral du pédoncule; ces dernières sont situées à quelque distance de l'extrémité; la branche interne est postérieure à la branche externe et plus grande quoique ne dépassant pas l'extrémité du pédoncule; la branche externe est menue." (Richardson, 1911, pp. 533-4).

Three specimens collected by *Talisman*, 25 August 1883, Station 135, 4165 meters; two fragments, 24 August 1883, Station 134, 4060 meters, Azores. Not collected by *Vema*.

Ilyarachna bicornis Hansen

Figure 45 A

Synonyms: *Ilyarachna bicornis* Hansen, 1916, p. 125, Pl. 11.

Diagnosis: *Ilyarachna* with uniramous uropoda. Cephalon with a pair of dorsal spines. Proximal margins of peraeonal somites 1-4 inclusive spinulate. Pleon with two somites. (From Hansen, op. cit.)

Measurements: Largest specimen 8.7 mm. (Hansen, op. cit.)

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two specimens.

Distribution: Known only from type locality.

Affinities: Hansen (op. cit.) indicated that this species was close to *I. hirticeps* but differed in head spines.

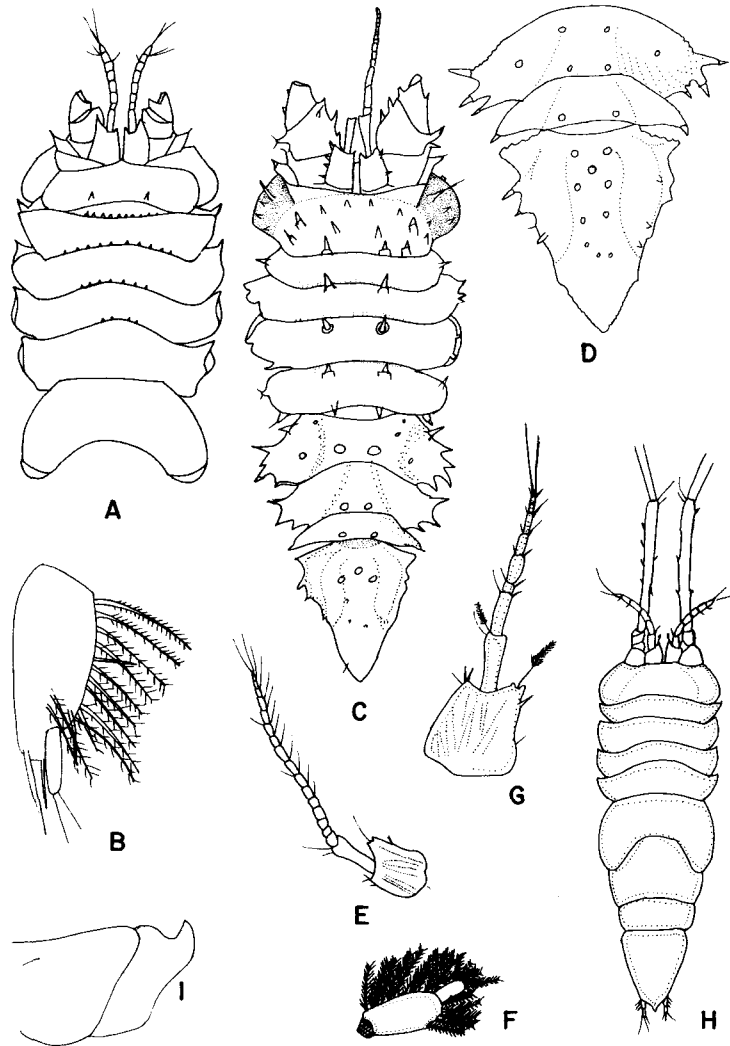


Figure 45. A: *Ilyarachna bicornis* Hansen, dorsal view female anterior. B-D: *Ilyarachna spinosissima* Hansen. B: female uropod; C: dorsal view male; D: dorsal view posterior. E-H: *Ilyarachna longicornis* G. O. Sars. E: male first antenna; F: uropod; G: female first antenna; H: dorsal view female. I: *Ilyarachna derjugini* Gurjanova, second peraeonal somite lateral margin (after Gurjanova, 1946a).

Ilyarachna spinosissima Hansen
Figure 45 B-D

Synonyms: *Ilyarachna spinosissima* Hansen, 1916, pp. 127-128, Pls. 11, 12.

Diagnosis: *Ilyarachna* with uniramous uropods. Cephalon with about 14 spines dorsally. Peraeonal somites 1-4 inclusive with denticles on distal margin, dorsum with a pair of stout spines on somites 1-3 inclusive, with four spines on fourth somite. Lateral borders of somites 5-7 with stout spines; pleon with lateral and dorsal spines; pleon with two somites.

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., one male, one female (Hansen, op. cit.).

Distribution: Taken also from *Ingolf* Station 38, south of Davis Strait, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temperature 1.3° C.

Affinities: This species is close to *I. multispinosa*, from which it differs in having fewer spines on the pleon and at the lateral peraeonal margins.

Ilyarachna longicornis G. O. Sars
Figure 45 E-H

Synonyms: *Ilyarachna longicornis* G. O. Sars, 1864, p. 212; — 1897, p. 136, Pl. LIX; — Hult, 1941, pp. 97-100 and references. *Ilyarachna hirticeps* G. O. Sars; — Hult, 1941, p. 97 and references.

Diagnosis: *Ilyarachna* with uniramous uropods. Cephalon and peraeon smooth, without dorsal spines. Mandibular palp triarticulate. First antenna with nine articles in female and 13 articles in male. Apex of pleon pointed. Frontal margin of cephalon almost straight, width of basal article of first antenna equal to one-seventh the width of cephalon. Pleon with one somite.

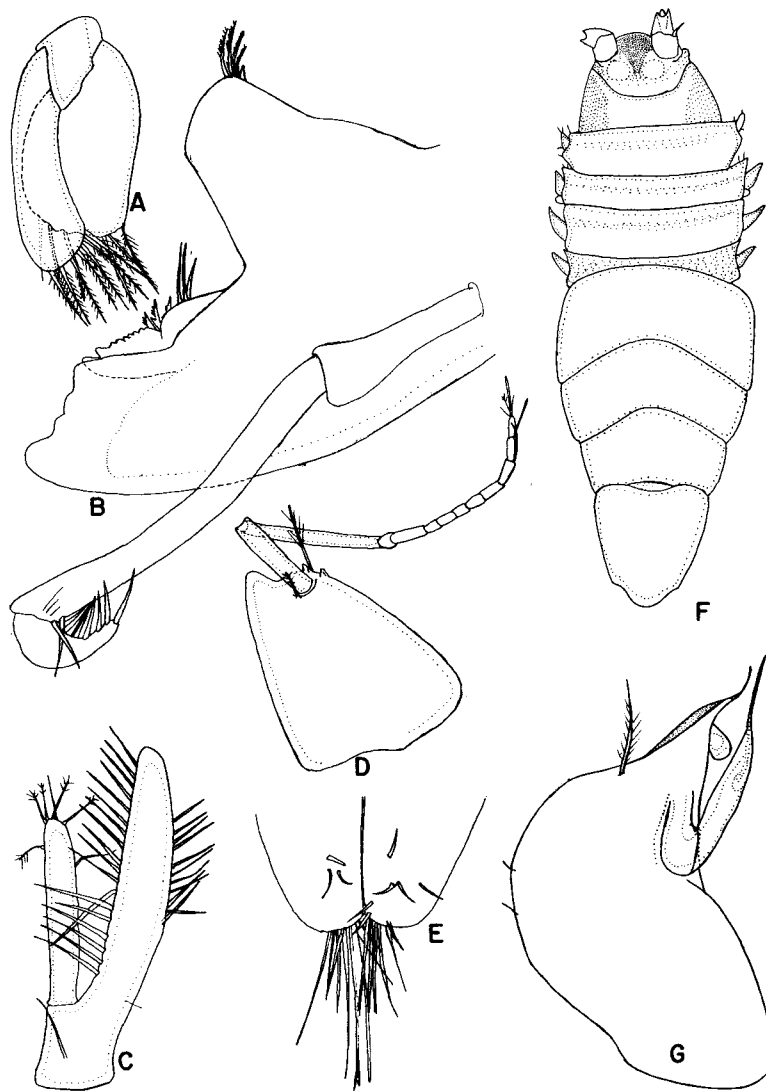


Figure 46. *Ilyarachna nodifronoides*, n. sp. A: third pleopod; B: mandible female allotype; C: uropod female allotype; D: first antenna; E: first pleopod; F: dorsal view male holotype; G: second male pleopod.

Measurements: Adult female length about 3 mm. (Sars, 1897).

Type locality: Skager Rak, Norway (?).

Distribution: Subarctic and Arctic seas, and North Atlantic, panarctic boreal, eurybathic (Hult, op. cit., p. 100). It was taken by the *Ingolf* from 14 stations (Hansen, 1916, p. 124) and by the *Thor* from four stations (Hansen, op. cit.). One *Ingolf* station was abyssal: Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temperature -1.0° C., one specimen. The species was not captured by the *Vema*.

Ilyarachna derjugini Gurjanova
Figure 45 I

Synonyms: *Ilyarachna derjugini* Gurjanova, 1946a, pp. 275-276, 294, Fig. 6.

Diagnosis: *Ilyarachna* with uropodal structure unknown. Cephalon and peraeon devoid of dorsal

spines. Apex of pleon pointed. Coxal plates of second peraeonal somite strongly recurved and pointed. Pleon with one somite (otherwise as in *hirticeps*). (After Gurjanova, op. cit.)

Measurements: Length 4 mm.

Type locality: Arctic Ocean, *Sedov* Station 100, 1938, latitude 81° 10' N., longitude 137° 17' E., 2500 meters (Gurjanova, op. cit. p. 293).

Distribution: Known only from type locality.

Affinities: Closely related to and possibly identical with *I. longicornis* G. O. Sars, as judged from Gurjanova's illustration and the statements by Hult, 1941, p. 97.

Ilyarachna nodifronoides, new species
Figure 46

Synonyms: None.

Diagnosis: *Ilyarachna* with two pleonal somites. Cephalon and peraeon without dorsal spines. Uropod

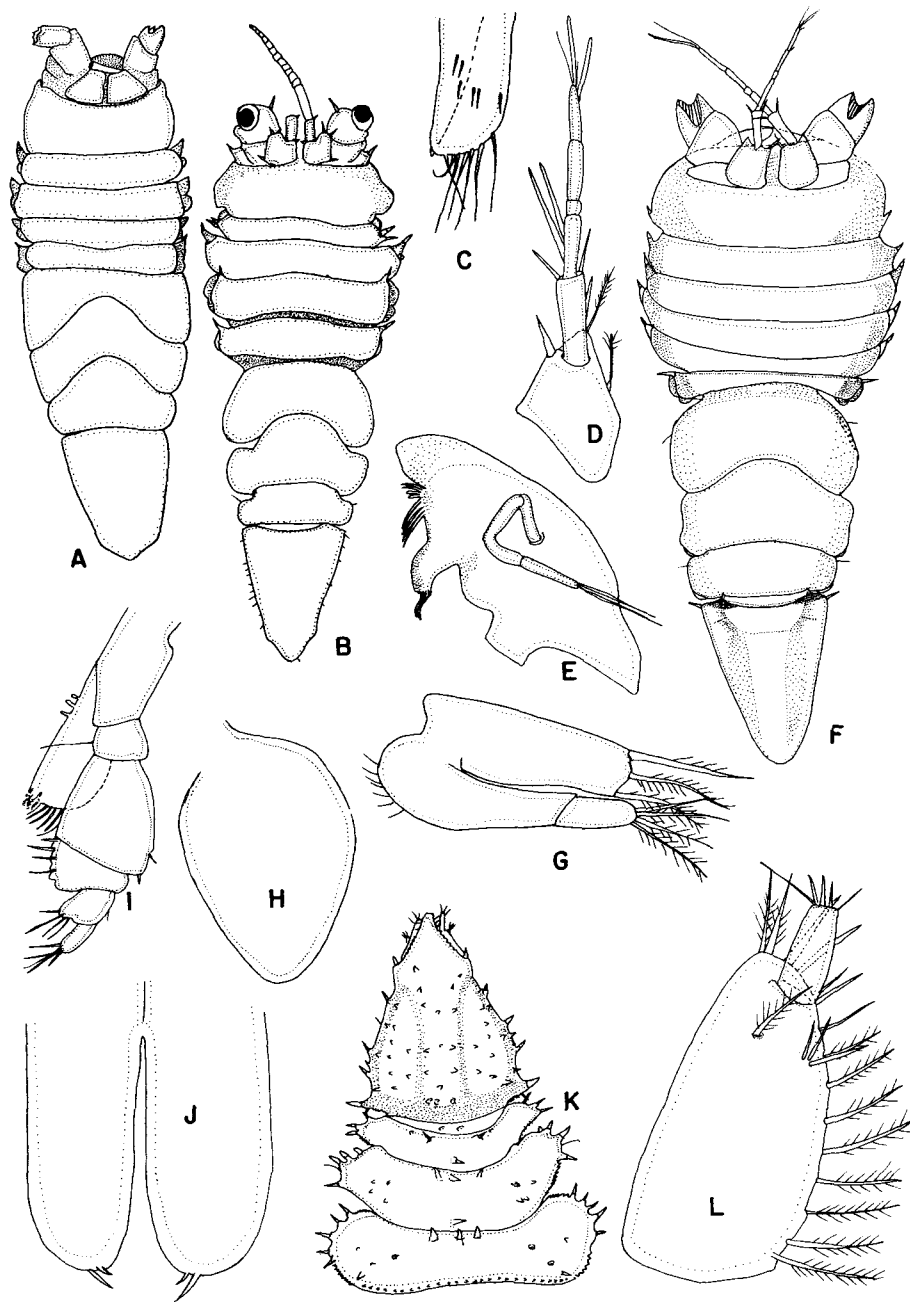


Figure 47. A: *Ilyarachna africana*, n. sp., dorsal view female holotype. B-C: *Ilyarachna spinoafricana*, n. sp. B: dorsal view male holotype; C: first male pleopod. D-I: *Ilyarachna simplex*, n. sp. D: first antenna; E: mandible; F: dorsal view female holotype; G: third pleopod; H: maxillipedal epipod; I: maxilliped. J-L: *Ilyarachna multispinosa*, n. sp. J: male first pleopod; K: dorsal view holotype male fragment; L: uropod.

with single ramus, peduncle produced into a process extending beyond the length of the uropodal ramus. Width of basal article of first antenna about one-fifth the width of cephalon. Apex of pleon evenly rounded.

Measurements: Male holotype length 4.5 mm., width pleon 0.8 mm., allotype female length 7.0 mm., width pleon 1.4 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, types and 13 female, four male paratypes, cat. no. I-52.

Distribution: Known only from type locality.

Affinities: In general shape this species is similar to *Eurycope nodifrons* Hansen, from which it differs in lacking the incisions at the apex of the male first pleopods. The uropoda are *Ilyarachna* type, not *Eurycope*.

Ilyarachna africana, new species

Figure 47 A

Synonyms: None.

Diagnosis: *Ilyarachna* with one pleonal somite. Cephalon, peraeon, and pleon without spines dorsal

or lateral. Uropoda missing. Pleon shield-shaped, apex triangulate. First article of first antenna one-third to one-fourth the width of cephalon. Coxal plate of second somite not curved like a hook.

Measurements: Female holotype length 3.6 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 14, type and one female paratype, cat. no. I-159.

Distribution: Known only from type locality.

Affinities: This species belongs to the smooth body group of *Ilyarachna*. Its wide triangulate basal article of the first antenna is distinctive.

Ilyarachna spinoafricana, new species

Figure 47 B-C

Synonyms: None.

Diagnosis: *Ilyarachna* with two pleonal somites. Cephalon, peraeon, and pleon without dorsal spines. First peraeonal somite laterally with a pair of stout spines. Epimera of second somite not curved and hook-like but bearing a stout seta. Pleon shield-like, apex triangulate. First article of first antenna one-fifth the width of cephalon. Uropodal structure not known.

Measurements: Male holotype length 2.7 mm., width pleon 0.5 mm., allotype length 3.5 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 55, types only, cat. no. I-169.

Distribution: Known only from type locality.

Affinities: Related to *africana* but having stout coxal plate spines lacking from *africana*.

Ilyarachna simplex, new species

Figure 47 D-I

Synonyms: None.

Diagnosis: *Ilyarachna* with pleon of two somites. Dorsum of cephalon, peraeon, and pleon without spines. Antero-lateral angles of pleon with a stout spine, apex of pleon narrowly rounded. Structure of uropod not known. Width of basal article of first antenna about one-fifth the width of cephalon. Cephalon with a spine on each lateral margin. Coxal plates of second peraeonal somite not curved and hook-like.

Measurements: Female holotype length 2.9 mm., width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type only, cat. no. I-53.

Distribution: Known only from type locality.

Affinities: Related to *africana* and *spinoafricana* but with stout seta at antero-lateral angle of pleon.

Ilyarachna multispinosa, new species

Figure 47 J-L

Synonyms: None.

Diagnosis: *Ilyarachna* with two pleonal somites. Peraeon and pleon with dorsal spines. Each lateral border of pleon with five stout two-pointed setae, apex pointed, triangulate, and spinulate. Uropod with a single ramus only, extending beyond apex of peduncle. Seventh peraeonal somite with three to four spines at lateral border and only five on dorsum.

Measurements: Holotype male fragment length 2.4 mm., width pleon 0.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 52, type only, cat. no. I-164.

Distribution: Known only from type locality.

Affinities: This species is related to *I. argentinae* and *I. spinosissima*, from which it differs in the arrangement of the spines on the pleon and peraeon.

Ilyarachna argentinae, new species

Figure 48 A-D

Synonyms: None.

Diagnosis: *Ilyarachna* with pleon of two somites. Peraeon and pleon with many stout two-pointed setae or spines on dorsum and at lateral borders. Each lateral border of pleon with five stout two-pointed setae, apex pointed, triangulate, and spinulate. Uropod with single ramus only extending beyond apex of peduncle. Seventh peraeonal somite with three spines at lateral border and eight on dorsum.

Measurements: Intersex fragment length not known width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type only, cat. no. I-92.

Distribution: Known only from type locality.

Affinities: This species is close to *I. multispinosa*, from which it differs in having more spines on pleon and at lateral borders of the peraeonal somites.

Ilyarachna gurjanovae, new species

Figure 48 E

Synonyms: None.

Diagnosis: *Ilyarachna* with two pleonal somites. Cephalon, peraeon, and pleon with dorsal spines. Uropod with one branch. Each lateral border of pleon with seven stout setae. Dorsum of seventh peraeonal somite with six stout setae, lateral borders with two stout setae. Apex of pleon triangulate, smooth.

Measurements: Female allotype length 3.2 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type and one female paratype, cat. no. I-163.

Distribution: Known only from type locality.

Affinities: This species is a smooth body form, distinguished from the others by its uniramous uropods, by the lack of spines at the antero-lateral border of the pleon, and by the very broad first article of the first antenna.

Ilyarachna triangulata, new species
Figure 49 D-E

Synonyms: None.

Diagnosis: *Ilyarachna* with one pleonal somite. Cephalon, peraeon, and pleon without dorsal spines. Coxal plates at peraeonal somite 2 not recurved and hook-like. Pleon shield-like with acute antero-lateral angles bearing several fine setae. Apex of pleon pointed. Basal article of first antenna about one-fifteenth the width of cephalon. Uropods lost.

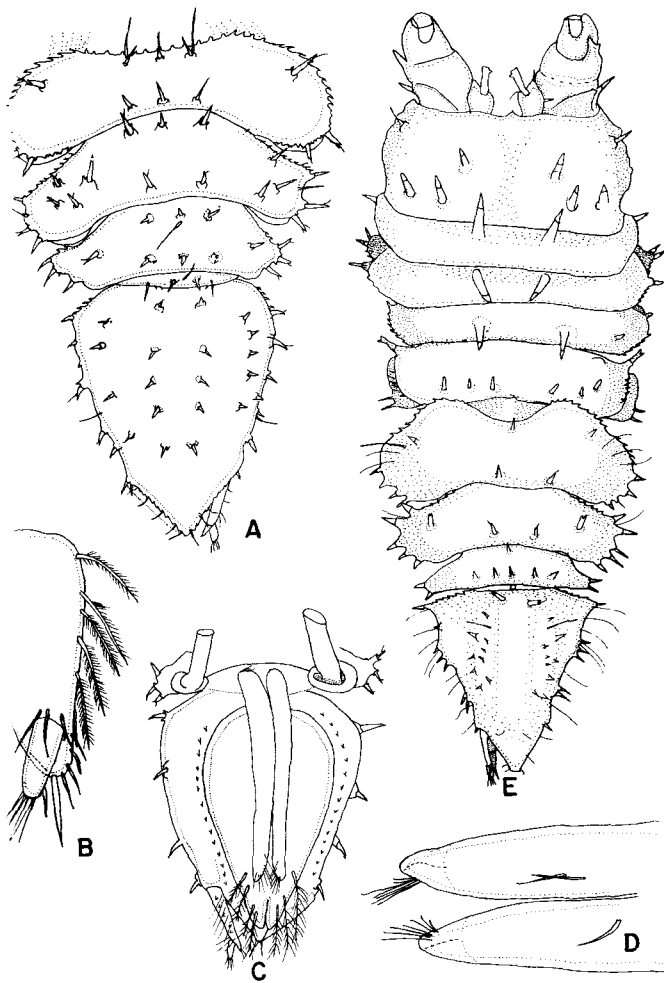


Figure 48. A-D: *Ilyarachna argentiniae*, n. sp. A: intersex fragment; B: uropod; C: ventral view of pleon; D: first male pleopod. E: *Ilyarachna gurjanovae*, n. sp., dorsal view female allotype.

Affinities: This species is related to *I. argentiniae* and *I. multispinosa*, from which it differs in the spines on the dorsum of the pleon and the last peraeonal somite.

Ilyarachna indentifrons, new species
Figure 49 A-C

Synonyms: None.

Diagnosis: *Ilyarachna* with one pleonal somite. Cephalon, peraeon, and pleon devoid of dorsal spines. Uropod with a minute ramus which does not extend to end of peduncle. First article of first antenna one-fourth the width of cephalon. Antero-lateral angles of pleon evenly rounded, apex evenly rounded.

Measurements: Holotype female length 4.4 mm., width pleon 1.0 mm.

Type locality: South atlantic, L.G.O. Biotrawl No. 53, type and 20 fragment paratypes.

Distribution: Known only from type locality.

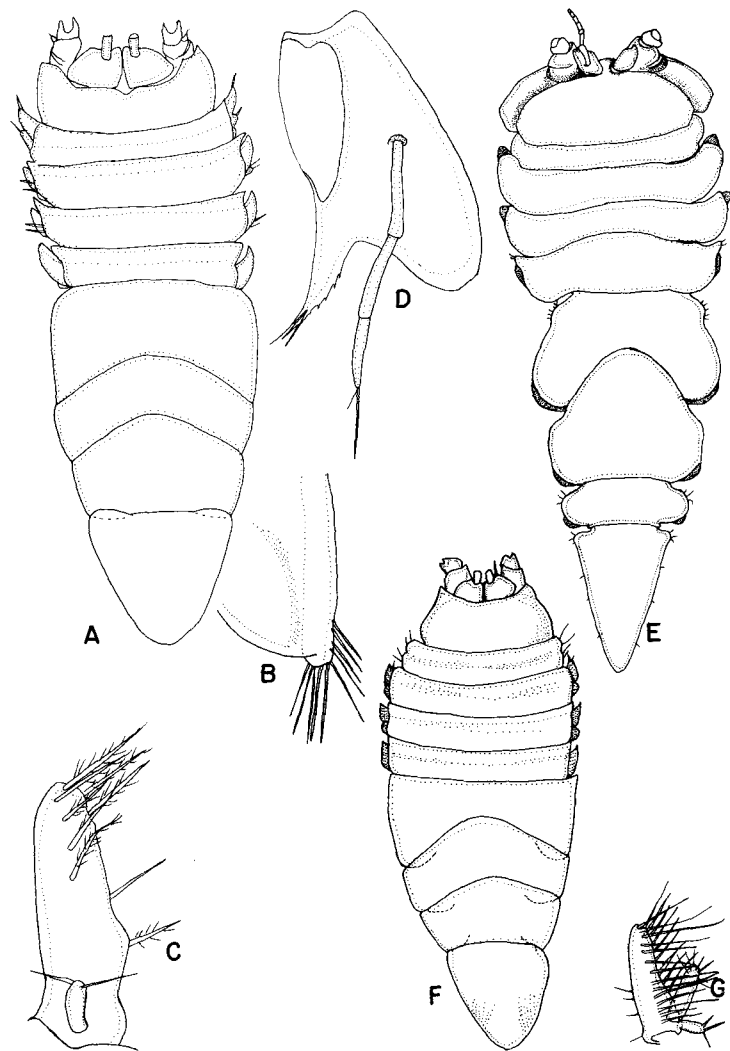


Figure 49. A-C: *Ilyarachna indentifrons*, n. sp. A: dorsal view female holotype; B: first male pleopod; C: uropod. D-E: *Ilyarachna triangulata*, n. sp. D: mandible; E: dorsal view female holotype. F-G: *Ilyarachna scotia*, n. sp. F: dorsal view female holotype; G: uropod.

Measurements: Holotype female length 4.4 mm., width pleon 0.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 14, type and one fragment, cat. no. I-160.

Distribution: Known only from type locality.

Affinities: This species is somewhat similar to *africana*, but has more acute antero-lateral angles to the pleon and proportionally much narrower basal articles to the first antenna; in these respects it also differs from *simplex*. The mandible shows reduction of structure.

Ilyarachna scotia, new species
Figure 49 F-G

Synonyms: None.

Diagnosis: *Ilyarachna* with one pleonal somite. Uropoda biramous, exopod one-third the length of endopod and both much shorter than the peduncle. Cephalon, peraeon, and pleon devoid of dorsal

spines or setae. Coxal plates of second peraeonal somite not hook-like and recurved. Pleon shield-shaped without sharp angles, apex rounded. Basal article of first antenna about one-fifth the width of cephalon.

Measurements: Holotype female length 3.2 mm., width pleon 0.6 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 200, type only, cat. no. I-200.

Distribution: Known only from type locality.

Affinities: Related to *I. indentifrons* but differing in having biramous instead of uniramous uropods.

Ilyarachna species indeterminable

Fragments of *Ilyarachna* were taken at L.G.O. Biotrawl no. 14, one female fragment; no. 54, two fragments; no. 98, one cephalon; no. 107, one crushed; no. 201, four damaged; no. 212, four fragments; no. 218, three fragments; no. 231, five fragments.

Family: DESMOSOMIDAE

Diagnosis: Paraselloidea with cephalon free. All peraeopods except the first modified for swimming, not paddle-like, provided with plumose marginal setae. Mandibles with toothed incisor, lacinia, and setal row, palp triarticulate or lacking, molar reduced to setiferous lobe. First four peraeonal somites with large coxal plates visible in dorsal view. Last three peraeonal somites without coxal plates visible in dorsal view. Pleon with one or two somites. Uropoda uniramous, with quadrate, ventral peduncle. Flagellum of first antenna pauciarticulate, without specialized vesicle or bladder. Frontal region of cephalon well developed.

Composition: The family contains only two genera, *Echinopleura* G. O. Sars and *Desmosoma* G. O. Sars. Only *Desmosoma* contains abyssal species. In *Echinopleura* the fifth peraeonal somite is constricted and longer than wide, whereas it is not constricted in *Desmosoma*.

Genus: DESMOSOMA G. O. Sars

Type species: *Desmosoma lineare* G. O. Sars, 1864, p. 215; — 1899, pp. 125–126.

Synonyms: *Desmosoma* Sars, 1863; — Meinert, 1890; — Bonnier, 1896; — Sars, 1899; — Stephensen, 1915; — Hansen, 1916; — Monod, 1926b; — Nordenstam, 1933; — Hult, 1941. *Eugerda* Meinert, 1890; — Vanhöffen, 1914; — Hult, 1941.

Diagnosis: Desmosomidae with fifth peraeonal somite not constricted and elongated.

Composition: This genus now contains around 25 species and is well represented in polar, shallow water,

and deep sea regions. The known species are shown in the accompanying list. All species except *D. elongatum* Bonnier (illustration not available) and a proposed new one are included in the key. It has been assumed that the uropoda of *D. falklandicum* Nordenstam were biramous. This assumption may have been incorrect, in which case its position in the key would have to be changed.

LIST OF SPECIES OF DESMOSOMA

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>tenuimanum</i> G. O. Sars	11	698
2. <i>latipes</i> Hansen	1094	1094
3. <i>lineare</i> G. O. Sars	50	697
4. <i>elongatum</i> Bonnier	950	950
5. <i>longispinum</i> Hansen	3521	3521
6. <i>simile</i> Hansen	2258	2258
7. <i>gracilipes</i> Hansen	2258	2702
8. <i>politum</i> Hansen	1070	1505
9. <i>coarctatum</i> (Hansen) G.O.S.	24	2702
10. <i>laterale</i> (Hansen)	50	1096
11. <i>armatum</i> G. O. Sars	25	478
12. <i>angustum</i> Hansen, G.O.S.	50	680
13. <i>chelatum</i> Stephensen	25	25
14. <i>insigne</i> Hansen	2702	2702
15. <i>plebejum</i> Hansen	1412	1666
16. <i>australis</i> Nordenstam	64	148
17. <i>brevipes</i> Nordenstam	64	148
18. <i>modestum</i> Nordenstam	125	250
19. <i>falklandicum</i> Nordenstam	16	16
20. <i>polaris</i> Gurjanova	40	510
21. <i>zenkewitschi</i> Gurjanova	65	65
22. <i>reticulata</i> Gurjanova	698	698
23. <i>longimanum</i> (Vanhöffen)	2735	2735
24. <i>filipes</i> Hult	34	1000
25. <i>intermedium</i> Hult	30	2258

A KEY TO THE SPECIES OF
DESMOSOMA

1. Uropoda biramous 2
1. Uropoda uniramous 11
2. Pleon with postero-lateral spines 3
2. Pleon without postero-lateral spines, rounded 8
3. First peraeopod stout, with long stout setae 4
3. First peraeopod weak, without long stout setae *filipes* Hult
4. Fifth peraeonal somite with a stout seta at antero-lateral angles. *coarctatum* (Hansen)
4. Fifth peraeonal somite without a stout seta at antero-lateral angles 5
5. Antero-lateral angles of fifth peraeonal somite sharp *reticulata* Gurjanova
5. Antero-lateral angles of fifth peraeonal somite rounded 6
6. First peraeopod with only one long stout setae on carpus *longimana* (Vanhöffen)
6. First peraeopod with two or more stout setae on carpus 7
7. With two stout setae *laterale* (Hansen)
7. With five stout setae *politum* Hansen
8. First peraeopod stout with four stout setae *zenkewitschi* Gurjanova
8. First peraeopod weak, with no setae or five stout setae 9
9. Lateral border of pleon serrated *intermedium* Hult
9. Lateral border of pleon not serrated 10
10. Coxal plate of second peraeonal somite triangulate *tenuimanum* G. O. Sars
10. Coxal plate of second peraeonal somite rounded *latipes* Hansen
11. Pleon with spine or tooth at postero-lateral angle 12
11. Pleon rounded at postero-lateral margin, no tooth present 17
12. First peraeopod stout, with stout setae 13
12. First peraeopod weak, without stout setae 14
13. First antenna with six articles *birsteini*, n. sp.
13. First antenna with five articles *armatum* G. O. Sars
14. Coxal plates elongate, much longer than wide 15
14. Coxal plates short, about as wide as long 16
15. Lateral borders 6-7 peraeonal somites subcircular *magnispinum*, n. sp.
15. Lateral borders 6-7 peraeonal somites almost straight *longispinum* Hansen
16. Antero-lateral angles of fifth peraeonal somite sharply pointed *simile* Hansen
16. Antero-lateral angles of fifth peraeonal somite rounded *gracilipes* Hansen
17. First peraeopod stout, with stout setae 18
17. First peraeopod weak, without stout setae 22
18. Fourth peraeonal somite with pronounced spine at antero-lateral angle *insigne* Hansen
18. Fourth peraeonal somite without spine at antero-lateral angle 19
19. Fifth peraeonal somite not longer than wide 21
19. Fifth peraeonal somite longer than wide 20
20. Frons of cephalon straight *plebejum* Hansen
20. Frons of cephalon convex *angustum* Hansen^a
21. Postero-lateral angles of peraeonal somites 5-6 rounded *chelatum* Stephensen
21. Postero-lateral angles of peraeonal somites 5-6 sharp *polaris* Gurjanova
22. Fifth peraeonal somite longer than wide 25
22. Fifth peraeonal somite not longer than wide 23

23. Coxal plates elongated and pointed, produced forward at apex *lineare* G. O. Sars
 23. Coxal plates rectangular, or not elongate and pointed 24
 24. First peraeonal somite much shorter than second *brevipes* Nordenstam
 24. First peraeonal somite as long as second *falklandicum* Nordenstam
 25. First peraeonal somite one-half as long as second *modestum* Nordenstam
 25. First peraeonal somite one-third as long as second *australis* Nordenstam
- ^a Ref. G. O. Sars, 1899, suppl. Pl. II, fig. 2.

Desmosoma gracilipes Hansen
Figure 50 A-B

Synonyms: *Desmosoma gracilipes* Hansen, 1916, pp. 113-114, Pl. 11.

Diagnosis: *Desmosoma* with a spine at each postero-lateral angle of the pleon. Frons of cephalon transverse at apex. Coxal plates bilobed and quadrate. First peraeonal somite and second subequal in length. First peraeopod weak, without stout setae. Uropoda uniramous.

Measurements: Female with marsupium length 3.2 mm., male 2.7 mm.

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., five specimens (one male).

Distribution: Also from *Ingolf* Station 36, Davis Strait, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., one specimen (Hansen, op. cit.).

Affinities: This species is close to *D. simile* Hansen, but has the antero-lateral angle of the fifth peraeonal somite rounded, not sharply pointed.

Desmosoma insigne Hansen
Figure 50 C-E

Synonyms: *Desmosoma insigne* Hansen, 1916, pp. 118-120, Pl. 11.

Diagnosis: *Desmosoma* without a spine at each postero-lateral angle of pleon. Frons of cephalon blunt at apex. Coxal plates bilobed and quadrate. First peraeonal somite longer than second. Fourth peraeonal somite as long as wide, with acute antero-lateral angles. First peraeopod stout and with a stout seta on merus. Uropoda uniramous.

Measurements: Female with marsupium length 3.1 mm., male 1.85 mm. (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., six specimens (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: The spines at the antero-lateral margins of the peraeonal somites are distinctive.

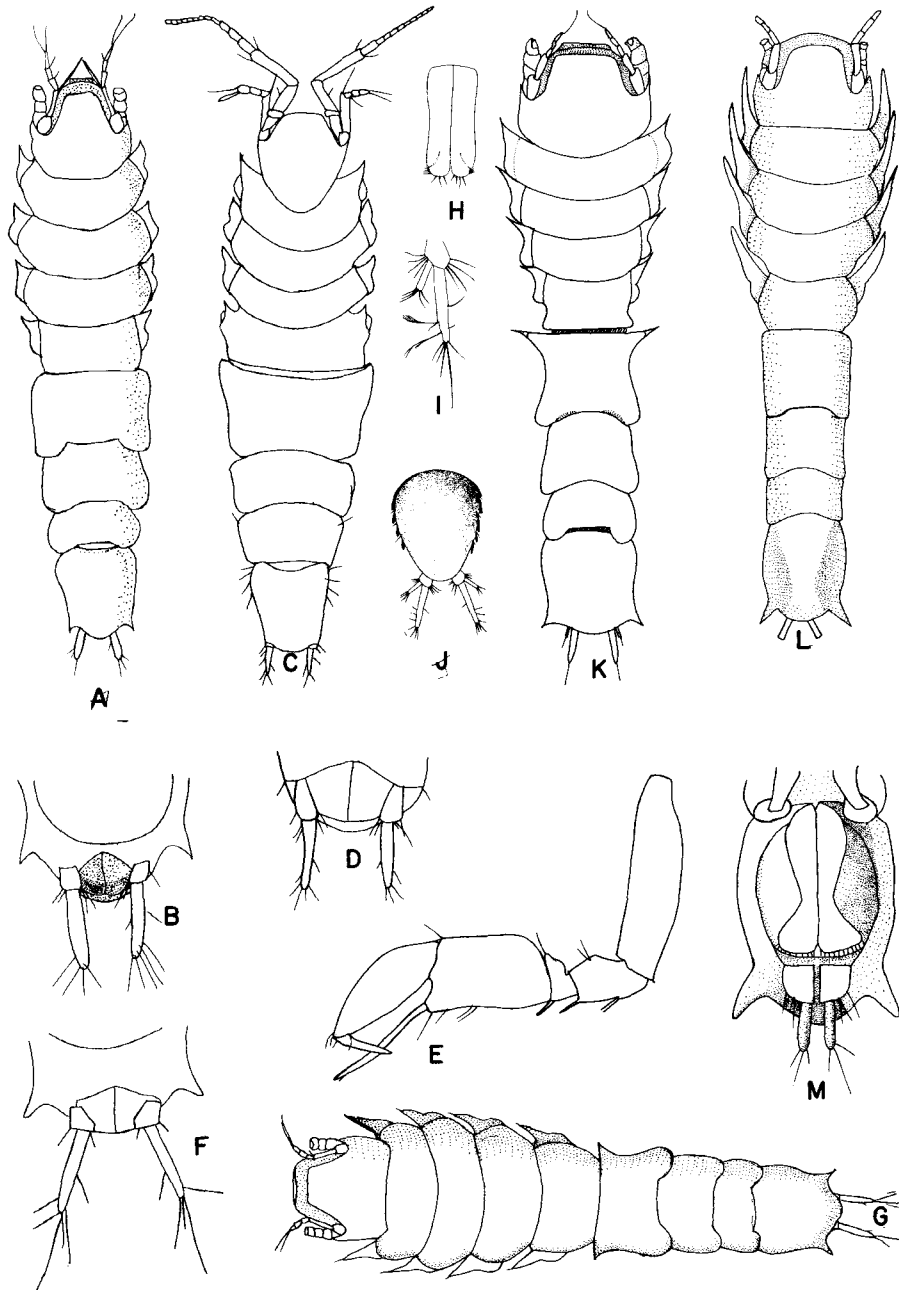


Figure 50. A-B: *Desmosoma gracilipes* Hansen. A: dorsal view ovigerous female; B: uropods of subadult female. C-E: *Desmosoma insigne* Hansen. C: dorsal view of female with marsupium; D: uropods and abdomen of female. E: first peraeopod. F-G: *Desmosoma simile* Hansen. F: uropods and abdomen of female; G: dorsal view of ovigerous female. H-J: *Desmosoma intermedium* Hult. H: first male pleopod; I: uropod; J: male pleotelson. K: *Desmosoma coarctatum* (G. O. Sars), after Hansen, *natator*, dorsal view male. L-M: *Desmosoma longispinum* Hansen. L: dorsal view of male; M: abdomen and uropods of male.

Desmosoma simile Hansen

Figure 50 F-G

Synonyms: *Desmosoma simile* Hansen, 1916, pp. 112-113.

Diagnosis: *Desmosoma* with a long spine at each postero-lateral angle of the pleon. Frons of cephalon transverse at apex. Coxal plates slightly elongate, bilobed. First and second peraeonal somites subequal

in length; fifth with projecting spine-like antero-lateral angles. First peraeopod weak, without stout setae. Uropods uniramous.

Measurements: Ovigerous female length 2.2 mm. (Hansen, op. cit.).

Type locality: North Atlantic, Davis Strait, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., five specimens (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: Close to *gracilipes* but with the antero-lateral angle of the fifth peraeonal somite pointed rather than rounded.

Desmosoma intermedium Hult

Figure 50 H-J

Synonyms: *Desmosoma intermedium* Hult, 1936, pp. 2-6, Figs. 1-21; — 1941, pp. 80-84.

Diagnosis: *Desmosoma* without a spine at each postero-lateral angle of the pleon but with lateral margins serrated. Frons of cephalon concave at apex. Coxal plates triangular and minute, not strongly produced. First peraeonal somite slightly shorter than second. First peraeopod weak without stout setae. Uropoda biramous.

Measurements: None available.

Type locality: Koster Fjord, off Vattenholm, 206 meters, temperature 6.2° C. (Hult, 1936).

Distribution: North Atlantic, Norway, Kattegat, 100 meters to 2258 meters, and *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters.

Affinities: Looking much like *D. elongatum* Bonnier but with uniramous uropods.

Desmosoma coarctatum (Hansen) G. O. S.

Figure 50 K

Synonyms: *Eugerdia coarctata* G. O. Sars, 1899, p. 253, *Desmosoma natator* Hansen, 1916, p. 115; — Gurjanova 1933, p. 418. *Desmosoma coarctatum* (G. O. Sars), Hult 1936, p. 10; — 1941, pp. 86-88 and references.

Diagnosis: *Desmosoma* with a spine at each postero-lateral angle of pleon. Frons of cephalon straight at apex. Coxal plates slightly produced, bilobed. First and second peraeonal somites subequal in length. Fifth with a long spine at each antero-lateral angle. First peraeopod stout, with stout seta. Uropoda uniramous.

Measurements: Female length 2.0 mm., male 1.5 mm. (G. O. Sars, op. cit., p. 253).

Type locality: North Atlantic, Skager Rak, north of Skagen, 125 fathoms (G. O. Sars, op. cit., p. 250).

Distribution: Besides the Skager Rak (Hult, 1941) the species was found at Davis Strait, *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., one specimen (Hansen, op. cit., p. 116).

Affinities: This species is unique in having the stout spines at the antero-lateral angles of the fifth peraeonal somite.

Desmosoma longispinum Hansen

Figure 50 L-M

Synonyms: *Desmosoma longispinum* Hansen, 1916, pp. 111-112, Pl. 10.

Diagnosis: *Desmosoma* with a long spine at each postero-lateral angle of the pleon. Frons of cephalon rounded slightly at apex. Coxal plates elongated, strongly produced forward, over twice as long as wide, and pointed at apex. First and second peraeonal somites subequal in length. First peraeopods weak; without stout setae. Uropods uniramous.

Measurements: Female length 2.1 mm., male 1.8 mm. (Hansen, op. cit.).

Type locality: North Atlantic, south of Davis Strait, *Ingolf* Station 38, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, 4 specimens (Hansen, op. cit.).

Distribution: Known only from type locality.

Affinities: This species is close to *magnispinum* but has the lateral borders of the peraeonal somites 6-7 straight rather than rounded.

Desmosoma striata, new species

Figure 51 A-F

Synonyms: None.

Diagnosis: *Desmosoma* without spines at each postero-lateral border of pleon. Pleon evenly rounded, lacking serrations. Coxal plates bilobed. First and second peraeonal somites subequal in length. First with stout spines at antero-lateral angle. Fifth without spines at antero-lateral angles. Structure of first peraeopod not known. Uropods uniramous.

Measurements: Female with oostegites length 1.4 mm., width pleon 0.2 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 17, type only, cat. no. I-179.

Distribution: Known only from type locality.

Affinities: Because of the absence of the first peraeopods it is difficult to determine the affinities of this species. The stout spines at the first peraeonal somite are distinctive.

Desmosoma magnispinum, new species

Figure 51 G-J

Synonyms: None.

Diagnosis: *Desmosoma* with a pronounced long spine at postero-lateral angle of pleon. Coxal plates much elongated, pointed. First and second peraeonal somites subequal in length. Fifth without spines at antero-lateral angles. Lateral borders of sixth and seventh semicircular. First peraeopod weak, without stout setae. Uropods uniramous.

Measurements: Holotype male length 2.1 mm., width pleon 0.25 mm.

Type locality: North Atlantic, Bay of Panama, L.G.O. Biotrawl No. 103, type only, cat. no. I-176.

Distribution: Known only from type locality.

Affinities: This species is similar to *D. longispinum* Hansen, from which it differs in having semicircular lateral borders to peraeonal somites 6-7.

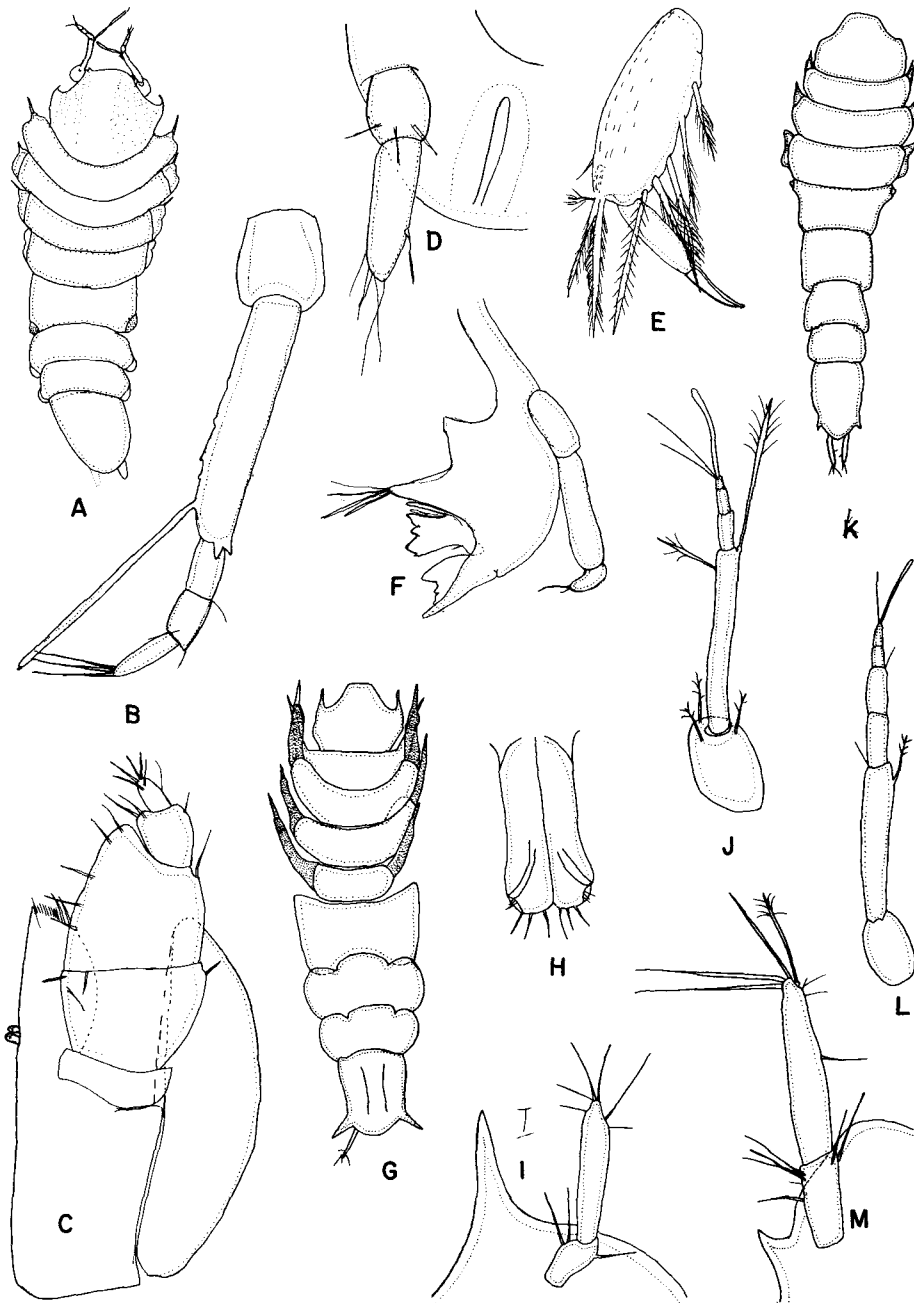


Figure 51. A-F: *Desmosoma striata*, n. sp. A: dorsal view female with oostegites; B: first antenna; C: maxilliped; D: uropod; E: third peracopod; F: mandible. G-J: *Desmosoma magnispinum*, n. sp. G: dorsal view male holotype; H: pleopod ventral view; I: uropod; J: first antenna. K-M: *Desmosoma birsteini*, n. sp. K: dorsal view gravid female holotype; L: first antenna; M: uropod.

Desmosoma birsteini, new species

Figure 51 K-M

Synonyms: None.

Diagnosis: *Desmosoma* with a stout spine at each postero-lateral angle. Coxal plates triangulate and bilobed. First peraeonal somite slightly shorter than second. Fifth without spines at antero-lateral angles. First peracopod stout with long stout seta. Uropods uniramous.

Measurements: Gravid female holotype length 2.3 mm., width pleon 0.3 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 9, holotype only, cat. no. I-170.

Distribution: Known only from type locality.

Affinities: This species is close to *D. armatum* G. O. Sars, from which it differs in having six articles to the first antenna instead of five. The pleonal spines are also more pronounced on *birsteini*.

Desmosoma species indeterminable

Fragments of *Desmosoma* were found at: L.G.O. Biotrawl No. 16, one female; No. 18, one multilated; No. 49, one fragment; No. 231, one fragment.

Family : DENDROTIONIIDAE

Synonyms: Dendrotioniidae Vanhöffen, 1914; — *Dendrotiini* Nordenstam, 1933, pp. 198–199.

Diagnosis: Paraselloidea with free cephalon. All peraeopods ambulatory. Mandibular incisor with teeth, lacinia with teeth, molar expanded, truncated. Maxillipedal palp with narrow subsimilar articles, all less than one-half the width of endite. Uropods with long peduncle, biramous.

Composition: This family contains *Dendrotion* G. O. Sars, a shallow water genus, and the new abyssal genus described herein. I have transferred *Mormomunna* Vanhöffen and *Pseudomunna* Hansen to the Munnidae (p. 172–173.)

A KEY TO THE GENERA OF THE DENDROTIONIIDAE

- 1. Mandible with palp *Dendrotion* G. O. Sars
- 1. Mandible without palp *Dendromunna*, n. gen.

DENDROMUNNA, new genus

Type species: *Dendromunna spinipes*, new species.

Diagnosis: Dendrotioniidae with one pleonal somite. Mandible lacking palp. Coxal plates visible in dorsal view on peraeonal somites 2–6 inclusive. Lateral borders of peraeonal somites expanded into spine-like processes, each process with an apical cluster of spines. Dorsum of body with similar projections. Uropoda biramous, rami shorter than peduncle.

Composition: This genus contains only the type.

Dendromunna spinipes, new species

Figure 52 A–B

Synonyms: None.

Diagnosis: *Dendromunna* with a pair of stout apically spinous spine-like processes on dorsum of peraeonal somites 2–4 inclusive. Uropoda with rami one-sixth the length of the stout peduncle. Eyes

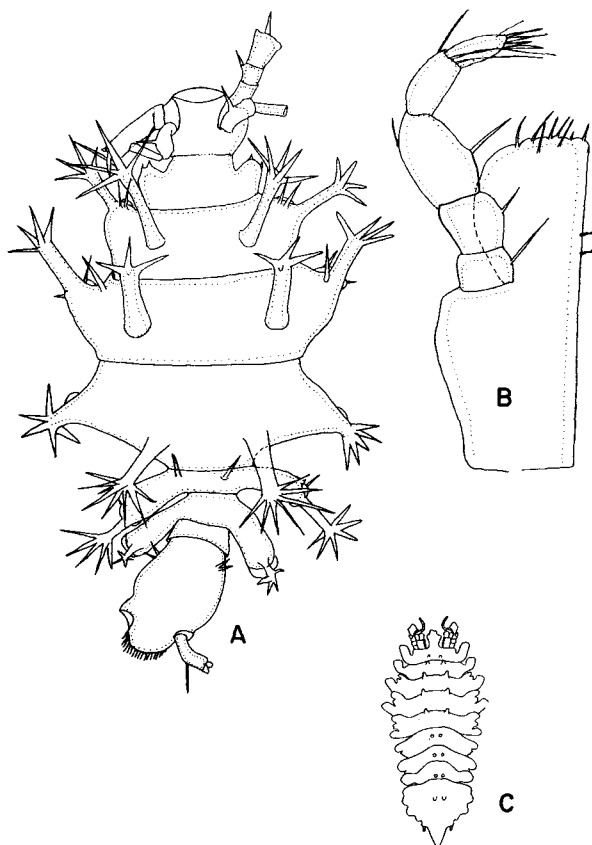


Figure 52. A–B: *Dendromunna spinipes*, n. sp. A: dorsal view female holotype; B: maxilliped. C: *Ianirella lobata* Richardson, dorsal view intersex.

lacking. Frons of cephalon concave. Apex of pleon convex and fringed with setae.

Measurements: Female holotype length 2.0 mm., width pleotelson 0.3 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 54, type only, cat. no. I-182.

Distribution: Known only from type locality.

Affinities: Unique.

Family : IANIRELLIDAE

Diagnosis: Paraselloidea with free head, eyes lacking, mandibles normal, molar process well developed, expanded at truncated apex. Antennae shorter than body. First antenna much shorter than second antenna. All peraeopods simple, last six walking legs. Dactyls of last six peraeopods with two claws. Pleon with one somite only. Uropoda uniramous or biramous, peduncle present. Maxillipedal palp with first three articles expanded, as wide as

endite. Anus contained in branchial chambers. (Modified from Menzies, 1956a, p. 11.)

Composition: This family contains at least two related genera, *Ianirella* and *Spinianirella*, and possibly *Rhacura*. The species *Ianirella pusilla* type of *Ianirella* Sayce, being a homonym, deserved a new name, which Richardson (1904, p. 6) suggested as *Heterias*. It does not belong to *Ianirella* Bonnier.

Genus: IANIRELLA Bonnier, 1896

Synonym: Ianirella Bonnier, 1896, p. 587; *not Ianirella* Sayce, 1900, p. 124.

Type species: Ianirella nanseni Bonnier, 1896, p. 587, Pl. 33.

Diagnosis: Same as for the family; coxal plates visible in dorsal view on peraeonal somites 5-7 inclusive. Uropoda with peduncle uniramous.

Composition: The genus contains eight species, all from the Atlantic Ocean. Three are known from abyssal depths, the remainder from bathyal depths. Two additional new abyssal species are described here.

LIST OF THE SPECIES OF IANIRELLA

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>nanseni</i> Bonnier	950	950
2. <i>lobata</i> Richardson	2480	3225
3. <i>spongicola</i> Hansen	913	913
4. <i>laevis</i> Hansen	2258	2702
5. <i>glabra</i> Richardson	946	946
6. <i>vemae</i> Menzies	5104	5122
7. <i>abyssicola</i> Richardson	1205	1205
8. <i>bonnieri</i> Stephensen	1227	1227
9. <i>caribbica</i> Menzies	1169	1169

A KEY TO THE SPECIES OF IANIRELLA

1. Lateral processes on peraeonites rounded *lobata* Richardson
1. Lateral processes on peraeonites pointed 2
2. Body with dorsal spines 8
2. Body without dorsal spines 3
3. Lateral borders of pleon each with five major projections *abyssicola* Richardson
3. Lateral borders of pleon each with three projections 4
4. Rostrum lacking 5
4. Rostrum present 6
5. Frons of cephalon rounded *vemae* Menzies
5. Frons of cephalon bifid *bifida*, n. sp.
6. Rostrum with apical spines 7
6. Rostrum without apical spines *magnifrons*, n. sp.
7. Rostrum with four apical spines *laevis* Hansen
7. Rostrum with three spines *glabra* Richardson
8. Submedian spines of 3-4 peraeonal somite shorter than medial spine 9
8. Submedian spines of 3-4 peraeonal somite longer than medial spine *nanseni* Bonnier
9. Medial spine at front of cephalon as wide as long *spongicola* Hansen
9. Medial spine at front of cephalon much longer than wide 10
10. Pleon with dorsal spines *caribbica* Menzies
10. Pleon without dorsal spines *bonnieri* Stephensen

Ianirella lobata Richardson
Figure 52 C

Synonyms: Ianirella lobata Richardson, 1908, pp. 78-79, Figs. 8-11.

Diagnosis: Ianirella with lateral borders of peraeonal extensions blunt and rounded. Dorsum of cepha-

lon with a pair of spines. Each peraeonal somite and pleon with a pair of dorsal spines. Three lateral projections on each side of pleon; each is rounded, not pointed. Cephalon with rostrum, but spines are lacking from it.

Measurements: None given.

Type locality: North Atlantic, southeast of Georges Bank, *Albatross* Station 2571, 2480 meters, three specimens, cat. no. 38967, U.S.N.M.

Distribution: Southeast of Georges Bank, *Albatross* Station 2572, 3225 meters, and *Albatross* Station 2573, 3186 meters.

Affinities: This species is unique in having rounded lateral borders of the somites.

Ianirella bifida, new species
Figure 53 A-D

Synonyms: None.

Diagnosis: Ianirella with lateral borders of peraeonal extensions sharply pointed. Dorsum of cephalon, peraeon, and pleon without spines. Lateral borders of pleon each with three stout apically spined projections. Apex of pleon bluntly pointed. Cephalon lacks rostrum, but frons has a medial pair of spined projections.

Measurements: Holotype, intersex, length 3.8 mm., width 1.2 mm.

Type locality: South Atlantic, L.G.O. Biotraw, No. 53, type, cat. no. I-183.

Distribution: Known only from type locality.

Affinities: Related to *vemae* but with a bifid frons on the cephalon.

Ianirella laevis Hansen
Figure 53 E-G

Synonyms: Ianirella laevis Hansen, 1916, p. 26, Pl. I

Diagnosis: Ianirella with lateral borders of peraeonal extensions sharply pointed. Dorsum of cephalon, peraeon, and pleon smooth. Lateral borders of pleon each with two stout apically spined projections, apex of pleon pointed. Cephalon with rostrum bearing four stout spines.

Measurements: Largest female length 4.0 mm. (Hansen, op. cit.).

Type locality: North Atlantic, *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., seven specimens.

Distribution: Also known from *Ingolf* Station no. 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., four specimens (Hansen, op. cit.).

Affinities: This species is allied to *I. glabra* Richardson, from which it differs in having four spines, not three, on the apex of the cephalic rostrum.

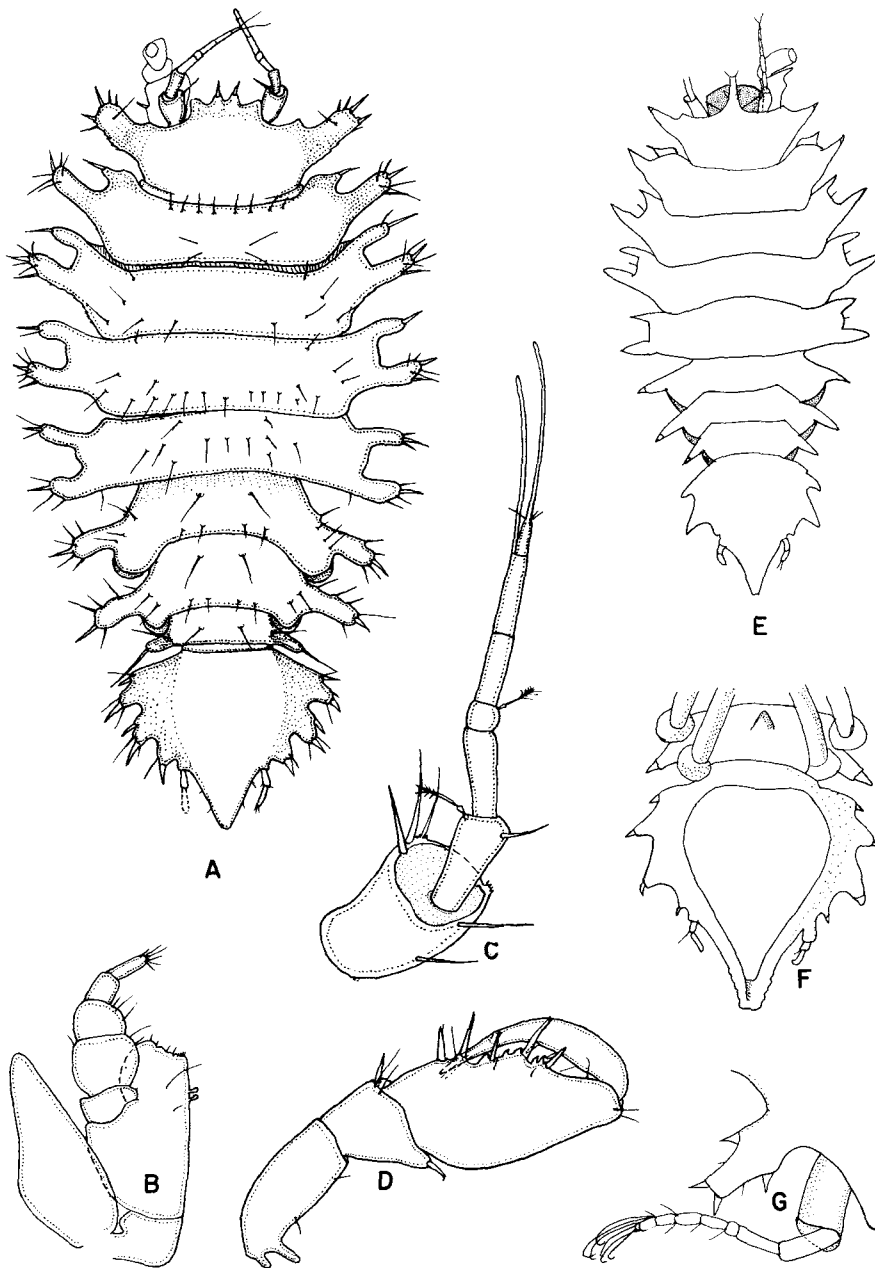


Figure 53. A-D: *Ianirella bifida*, n. sp. A: dorsal view holotype intersex; B: maxilliped; C: first antenna; D: first pereopod. E-G: *Ianirella laevis* Hansen. E: dorsal view female; F: ventral view abdomen; G: anterior of cephalon.

Ianirella vemae Menzies
Figure 54 A-B

Synonyms: *Ianirella vemae* Menzies, 1956a, p. 12, Fig. 5.

Diagnosis: *Ianirella* with lateral borders of pereopod extensions sharply pointed. Dorsum of cephalon and pleon without spines. Lateral borders of pleon each with three stout apically spined projections. Apex of pleon blunt, setiferous. Cephalon lacks rostrum.

Measurements: Holotype, intersex, length 3.3 mm., width at second pereopod somite 1.8 mm. (Menzies, op. cit.).

Type locality: North Atlantic, near Puerto Rico trench, L.G.O. Biotrawl No. 1, 5104-5122 meters, type only, cat. no. 11761, A.M.N.H.

Distribution: Known only from type locality.

Affinities: This species is related to *bifida*, from which it differs in having the frons of the cephalon rounded and not bifid.

Ianirella magnifrons, new species
Figure 54 C-D

Synonyms: None.

Diagnosis: *Ianirella* with lateral borders of pereopod projections pointed. Dorsum of cephalon, pereopod

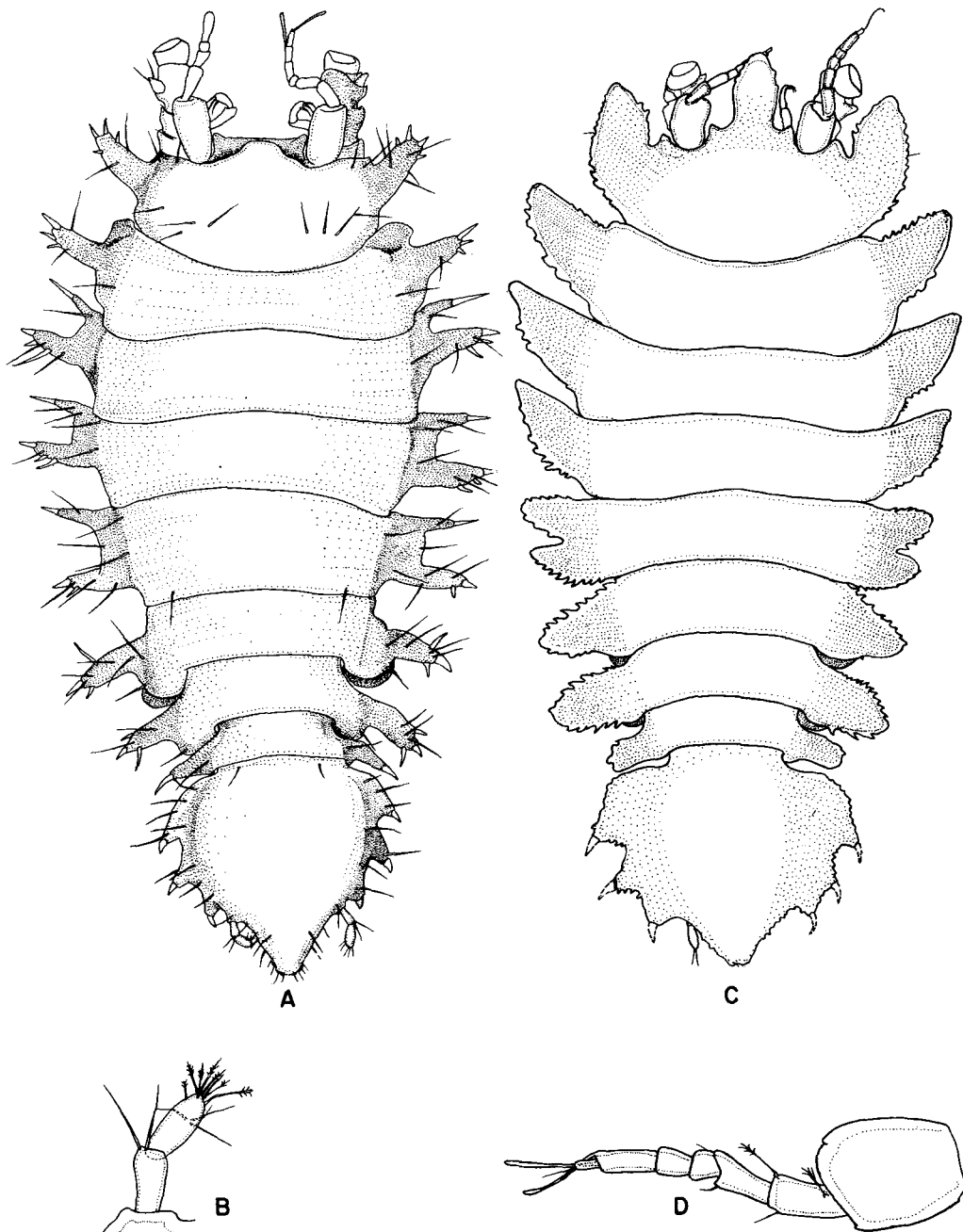


Figure 54. A-B: *Ianirella vema* Menzies. A: dorsal view holotype intersex; B: uropod. C-D: *Ianirella magnifrons*, n. sp. C: dorsal view female intersex; D: first antenna.

and pleon without spines. Lateral borders of pleon each with three stout apically spined projections. Apex of pleon blunt. Cephalon with spatulate-shaped rostrum. Lateral margins of body and pleon spinulate.

Measurements: Female intersex length 3.2 mm., width pleon 1.0 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 51, type only, cat. no. I-184.

Distribution: Known only from type locality.

Affinities: The absence of apical spines on the rostrum distinguishes this species from *laevis* and *glabra*.

SPINIANIRELLA, new genus

Synonyms: None.

Type species: *Spinianirella walfishensis*, new species.

Diagnosis: Ianirellidae with coxal plates visible in dorsal view on pereaeonal somites 3-7 inclusive. Spinous expansions at lateral border of cephalon and pereaeonal somites 1-6 inclusive. Mandibular palp triarticulate. Second from last article of prehensile first pereaeopod longer by one-half than the propodal article and with many stout spines and setae along inferior margin. Pleon with serrated lateral margins, spiniform extensions lacking.

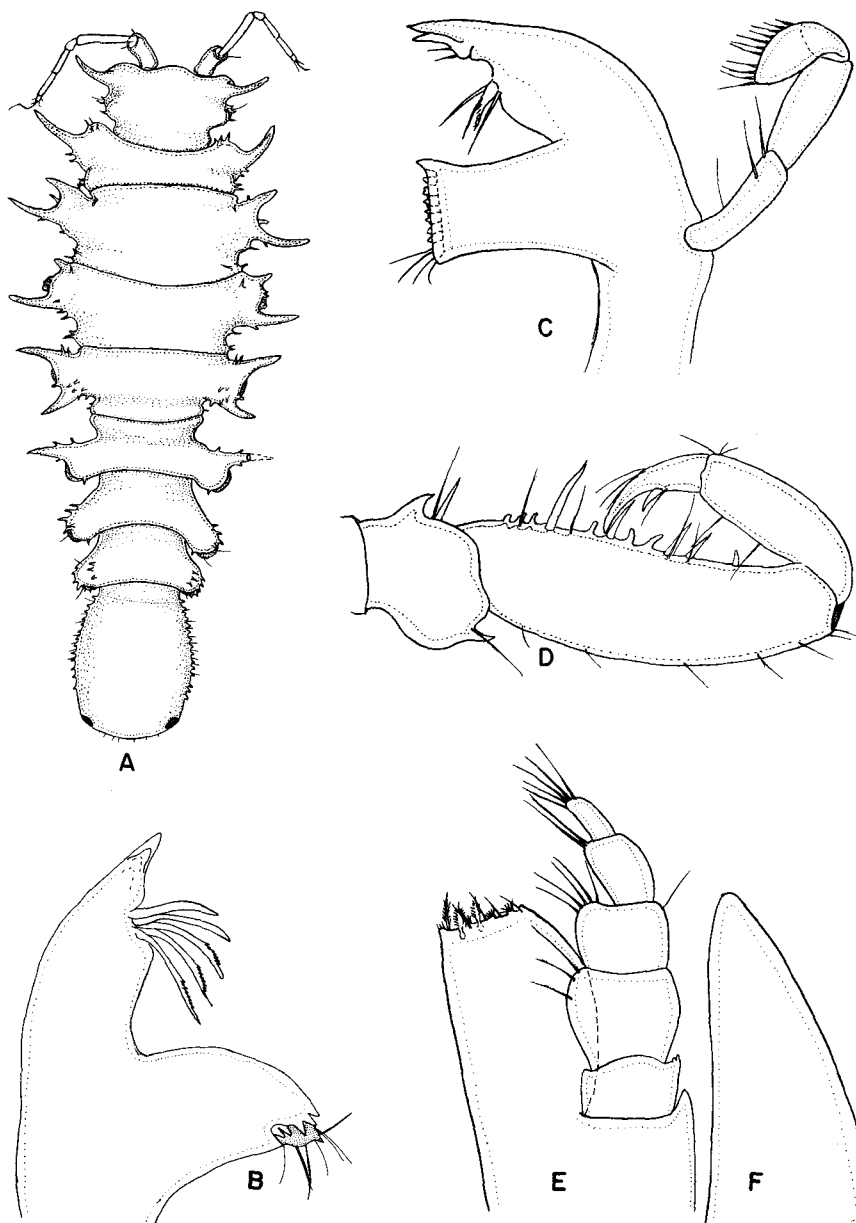


Figure 55. *Spinianirella walfishensis*, n. sp. A: dorsal view female holotype; B: right mandible; C: left mandible of paratype; D: first pereopod; E: maxilliped; F: maxillipedal epipod.

Spinianirella walfishensis, new species
Figure 55

Synonyms: None.

Diagnosis: *Spinianirella* with 13 spines on either side of pleon, apex rounded and smooth. Frons of cephalon evenly convex. Dorsum of body and pleon without spines. First antenna with six articles. Maxilliped without coupling hooks.

Measurements: Holotype female length 5.2 mm., width pleon 0.8 mm.

Type locality: South Atlantic Ocean, L.G.O. Biotrawl No. 16, holotype and one paratype, cat. no. I-192.

Distribution: Found also at L.G.O. Biotrawl No. 54, one female, cat. no. I-199.

Affinities: Unique.

Genus: RHACURA Richardson

Synonyms: *Rhacura* Richardson 1908a, pp. 72-74.

Type species: *Rhacura pulchra* Richardson.

Diagnosis: Ianirellidae (?) with eyes, without coxal plates visible in dorsal view. Cephalon incised laterally. Pleon laterally with several deep incisions. Last two articles of maxillipedal palp narrow; others as wide as endite. Structure of mandibles not known.

Rhacura pulchra Richardson
Figure 56 F

Synonyms: *Rhacura pulchra* Richardson, 1908a, pp. 74–75.

Description: "Body oblong-ovate, about twice as long as wide. Dorsal surface covered with granulations. Head much wider than long, with the front

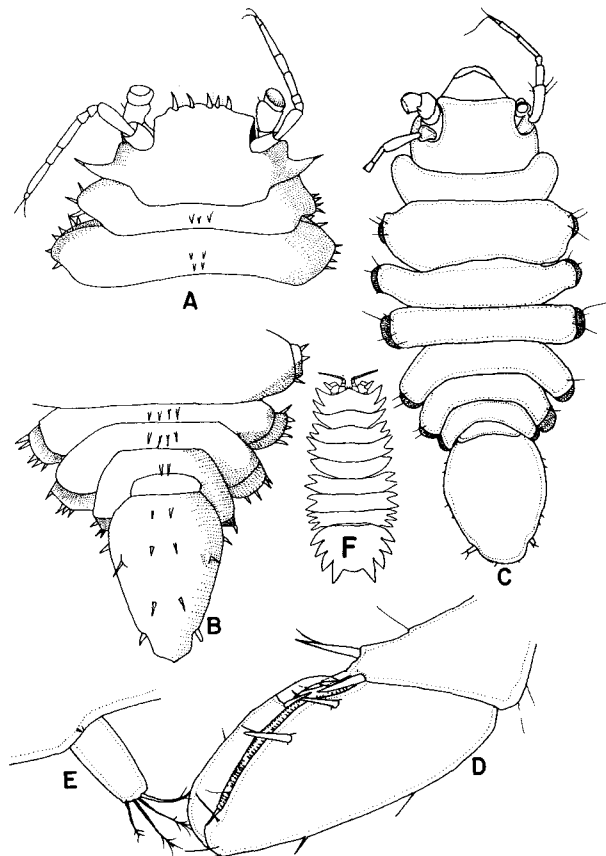


Figure 56. A–B: *Munna (Munna) acanthifera* Hansen. A: dorsal view head; B: dorsal view posterior. C–E: *Munna (Munna) argentiniae*, n. sp. C: dorsal view female holotype; D: first pereopod; E: uropod. F: *Rhacura pulchra* Richardson, dorsal view female (from Richardson, 1906).

produced in the middle in an obtuse triangular process, which does not extend as far as the antero-lateral processes; the lateral margins are drawn out on either side in two acute triangular processes, both

directed anteriorly; the posterior one is slightly narrower than the anterior process. The eyes are minute and are situated closer to the posterior margin than to the anterior margin. The first pair of antennae have the first article of the peduncle largest; the second and third are subequal and are a little shorter than the first; the flagellum is composed of eighteen articles. The second pair of antennae are broken at the fourth article of the peduncle in the only specimen; the third article is furnished with an antennal scale. The maxillipeds have the first three articles of the palp expanded and dilated. The first segment of the thorax has the lateral margins drawn out on either side in one triangular expansion, acute at the extremity and directly anteriorly; the second and third segments have the lateral margins drawn out on either side in two triangular expansions [*sic*], about equal in width, one anterior and the other posterior; the fourth segment has one triangular expansion to the lateral margin on either side; the fifth and sixth segments have the lateral margins drawn out on either side in two triangular expansions of about equal size; the seventh and last segment of the thorax has the lateral margins drawn out in three triangular processes on either side, all of equal size.

"The abdomen has the lateral margins drawn out on either side in four triangular expansions, the last expansion corresponding to the post-lateral expansion in the species of the genus *Iolella*; between the post-lateral expansions is a small rounded lobe. The uropoda are lost in the only specimen.

"The first pair of legs are prehensile, the other six ambulatory in character and furnished with bi-unguiculate dactyli. The margins of the entire body are armed with minute acute spinules.

"The only specimen, a female, was found at Station 2572, steamer *Albatross*, southeast of Georges Bank, at a depth of 1,769 fathoms.

"The type is in the U.S. National Museum, Cat. no. 38964." (Richardson, 1908a, pp. 74–75.)

Measurements: None given.

Type locality: North Atlantic, southeast of Georges Bank, *Albatross* Station 2572, 3225 meters, type only. cat. no. 38964 U.S.N.M.

Distribution: Known only from type locality.

Affinities: Unique. Not collected by *Vema*.

Family : MUNNIDAE

Synonyms: *Munnidae* G. O. Sars, 1899; — Vanhöffen, 1914. *Munnini* Hansen, 1916; — Nordenstam, 1933, pp. 197–198.

Diagnosis: Paraselloidea with cephalon free from pereaeon. All pereaeopods ambulatory. Mandibles with expanded, truncated molar process. Maxilli-

pedal palp with first three articles as broad as endite. Pleon with two somites

Composition: According to Nordenstam, 1933, p. 198, this family (or subgroup, as he called it) contained the following genera: *Munna* Krøyer, 1839; *Paramunna* G. O. Sars, 1866; *Coulmania* Hodgson.

1910; *Notoxenus* Hodgson, 1910; *Austrosignum* Hodgson, 1910; and *Echinomunna* Vanhöffen, 1914. He was uncertain of the status of *Austrurus* Beddard, 1885. These genera, except for *Munna* (one species only), contain only shallow water species. It is probable that the genus *Acanthomunna* Beddard, 1885, also belongs to this family. Here one additional new species is described in *Acanthomunna* and a new genus is described.

A KEY TO THE GENERA OF THE MUNNIDAE
(Modified after Menzies, in press)

- 1. Coxal plates of peraeon not visible in dorsal view . . . 2
- 1. Coxal plates of peraeon visible in dorsal view . . . 3
- 2. Mandible with triarticulate palp 4
- 2. Mandible lacks palp *Coulmania*
- 3. Coxal plates visible in dorsal view on peraeonal somites 2-7 inclusive 5
- 3. Coxal plates visible in dorsal view only on peraeonal somites 5-7 inclusive 6
- 4. Each somite of peraeon with single spine on dorsal surface *Notoxenus*
- 4. Peraeonal somites lack spines *Paramunna*
- 5. Body strongly spinous 7
- 5. Body lacks spines (may have stout setae) *Munna*
- 6. Ocular peduncles short, with ocelli *Austrosignum*
- 6. Ocular peduncles narrow, long, directed out from head as spine-like projections, ocelli lacking *Notoxenoides*, n. genus
- 7. Uropoda insert dorsally, with stout peduncle and stout rami *Acanthomunna*
- 7. Uropoda insert laterally, with rami small and leaf-like *Echinomunna*

Genus: MUNNA Krøyer

Synonyms: *Haliacris* Pfeffer, 1889. *Caecimunna* Richardson, 1908a, p. 79.

Type species: *Munna boeckii* Krøyer, 1839.

Diagnosis: Munnidae with coxal plates visible in dorsal view on peraeonal somites 2-7 inclusive. Body lacking spines. Eyes on short immovable peduncle, preocular lobes generally present. Uropoda lacking peduncle.

Subgenus: MUNNA

Reference: Menzies, in press.

Type species: *Munna boeckii* Krøyer, 1839.

Diagnosis: *Munna* with inferior uropodal ramus rounded in cross-section, lacking recurved apical spines.

Composition: This subgenus contains 14 species (Menzies, op. cit.). Only one species, *Munna (M) acanthifera* Hansen, 1916, is known mainly from below shelf depth (viz., below 200 meters). The subgenus was represented in L.G.O. collections by a single blind abyssal species from the South Atlantic.

Munna (Munna) acanthifera Hansen
Figure 56 A-B

Synonyms: *Munna acanthifera* Hansen, 1916, pp. 40-42, Pl. III.

Diagnosis: *Munna (sensu stricto)* without eyes, cephalon with a triangulate lateral expansion, frons with five stout marginal spines. Epimeral areas strongly spinous. Pleon and peraeon with some stout spines.

Measurements: Length female 3.1 mm., male 2.8 mm.

Type locality: North Atlantic, from the following stations by the *Ingolf* and the *Thor*:

Davis Strait: *Ingolf* Station 32, latitude 66° 35' N., longitude 56° 38' W., 599 meters, temperature 3.9° C., 16 specimens; *Ingolf* Station 35, latitude 65° 16' N., longitude 55° 05' W., 682 meters, temperature 3.6° C., numerous specimens; *Ingolf* Station 27, latitude 64° 54' N., longitude 55° 10' W., 740 meters, temperature 3.8° C., two specimens; *Ingolf* Station 25, latitude 63° 30' N., longitude 54° 25' W., 1096 meters, temperature 3.3° C., ten specimens; *Ingolf* Station 24, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., about 28 specimens.

West of Iceland: *Ingolf* Station 89, latitude 64° 45' N., longitude 27° 20' W., 584 meters, temperature 8.4° C., one specimen.

Southwest of Iceland: *Ingolf* Station 81, latitude 61° 44' N., longitude 27° 00' W., 913 meters, temperature 6.1° C., one specimen; *Ingolf* Station 78, latitude 60° 37' N., longitude 27° 52' W., 1505 meters, temperature 4.5° C., seven specimens.

East of Iceland: *Ingolf* Station 105, latitude 65° 34' N., longitude 7° 31' W., 1435 meters, temperature -0.8° C., two specimens.

North of Iceland: *Ingolf* Station 126, latitude 67° 19' N., longitude 15° 52' W., 552 meters, temperature -0.5° C., eight specimens; *Ingolf* Station 124, latitude 67° 40' N., longitude 15° 40' W., 932 meters, temperature -0.6° C., one specimen.

South of Iceland, *Thor*, latitude 62° 11' N., longitude 19° 36' W., 1899 to 2144 meters, temperature not recorded, three specimens (Hansen, 1916, pp. 41-42).

Affinities: The lateral cephalic spines are unique to this and to *Caecimunna truncata* Richardson, known from 80-390 fathoms off New England.

Munna (Munna) argentinae, new species
Figure 56 C-E

Synonyms: None.

Diagnosis: *Munna (Munna)* without eyes. First antenna with seven articles, last article one-half the length of prior article. Second antenna slightly longer than the body, flagellum with 20 articles. Cephalon as wide as long, preocular lobes absent, frontal margin convex, entire, without setae or spines. Maxilliped with three coupling hooks. Pleotelson pyriform, lateral margins smooth, lacking large setae or spines, a few minute setae along lateral margin. Uropoda inferior

ramus small, superior ramus lacking. Mandibular palp missing.

Measurements: Holotype female length 2.0 mm., width pleotelson 0.45 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 201, holotype only, cat. no. I-217.

Distribution: Known only from type locality:

Affinities: This is the first blind abyssal species of *Munna* known from the South Atlantic. It differs from *M. (M.) acanthifera* Hansen in lacking tri-

angulate expansions at the lateral margin of the cephalon.

Genus: ACANTHOMUNNA Beddard

Synonyms: *Acanthomunna* Beddard, 1886, pp. 102-103; — *Mormomunna* Vanhöffen, 1914, pp. 569-571; *Pseudomunna* Hansen, 1916, pp. 47-48.

Type species: *Acanthomunna proteus* Beddard, 1886, pp. 47-50.

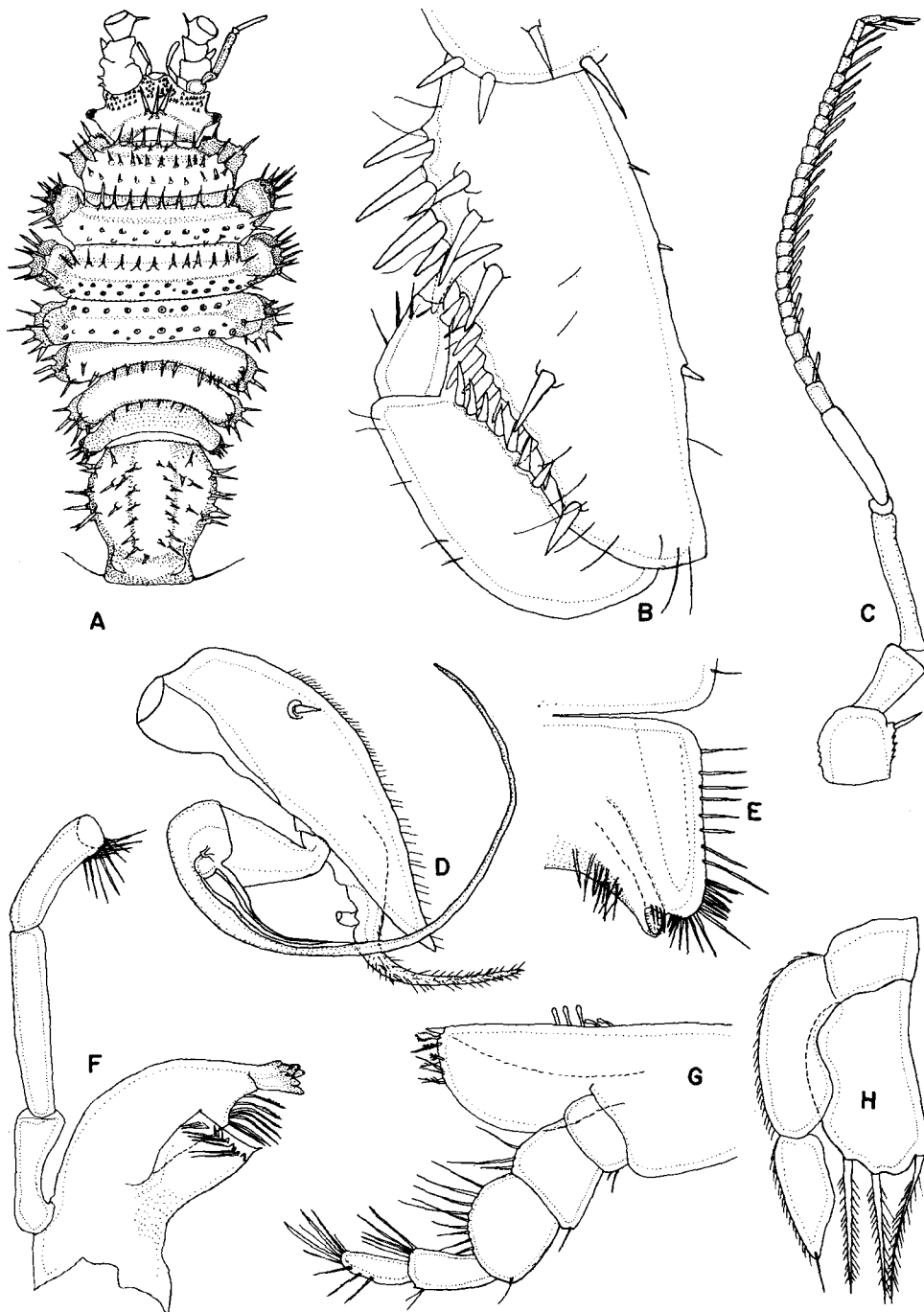


Figure 57. *Acanthomunna beddardi*, n. sp. A: dorsal view male holotype; B: gnathopod; C: first antenna; D: second pleopod; E: first pleopod; F: mandible; G: maxilliped; H: third pleopod.

Diagnosis: Munnidae with eyes. Body covered densely with stout spines. Mandibular palp present, Coxal plates visible in dorsal view on pereaeonal somites 2-7. Endite of second male pleopod curved, appendage pointed and hirsute. Lateral expansion lacking from apex of male first pleopods. First peraeopod stout, dactyl with two claws, other articles with many stout setae on inferior margin. Uropoda massive, with peduncle and biramous and dorsal insertion.

Composition: The dorsal insertion of the massive uropods characterizes this genus, and it is therefore highly probable that *Mormomunna* Vanhöffen and *Pseudomunna* Hansen are synonyms. Hansen did not think so on the basis of the male first pleopods, but even within *Munna* the male first pleopods differ rather markedly. In the species which I have been able to examine I did not find the maxillipedal palp articles as narrow as indicated by Hansen for *hystrix*;

they are nevertheless narrower than other Munnidae. The species range from bathyal to abyssal depths.

LIST OF THE SPECIES OF ACANTHOMUNNA

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>proteus</i>	1281	2011
2. <i>spinipes</i>	385	385
3. <i>hystrix</i>	1505	1505

A KEY TO THE SPECIES OF ACANTHOMUNNA

- 1. Cephalon with spines on dorsum 2
- 1. Cephalon without spines on dorsum 3
- 2. With a central cluster of three spines . . . *beddardi*, n. sp.
- 2. With one spine near each lateral border *proteus* Beddard
- 3. First peraeonal somite with only four spines *spinipes* (Vanhöffen)
- 3. First peraeonal somite with more than six spines *hystrix* (Hansen)

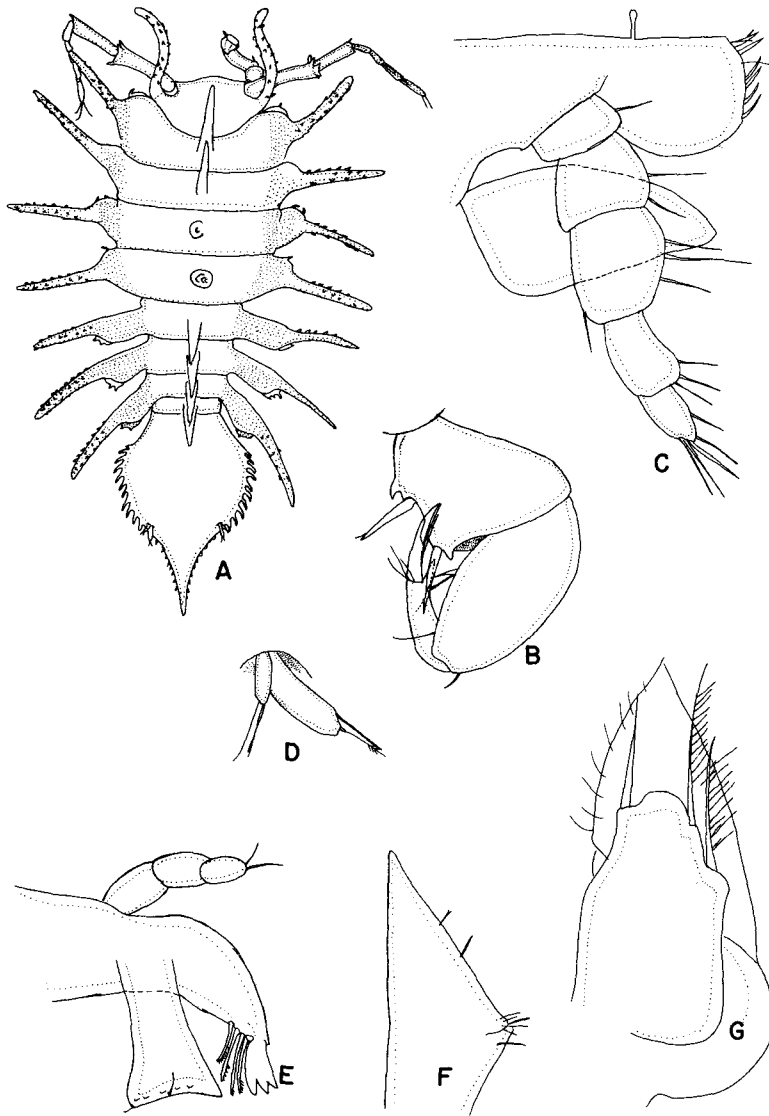


Figure 58. *Notoxenoides abyssi*, n. sp. A: dorsal view male holotype; B: gnathopod; C: maxilliped; D: uropod; E: mandible; F: first pleopod; G: third pleopod.

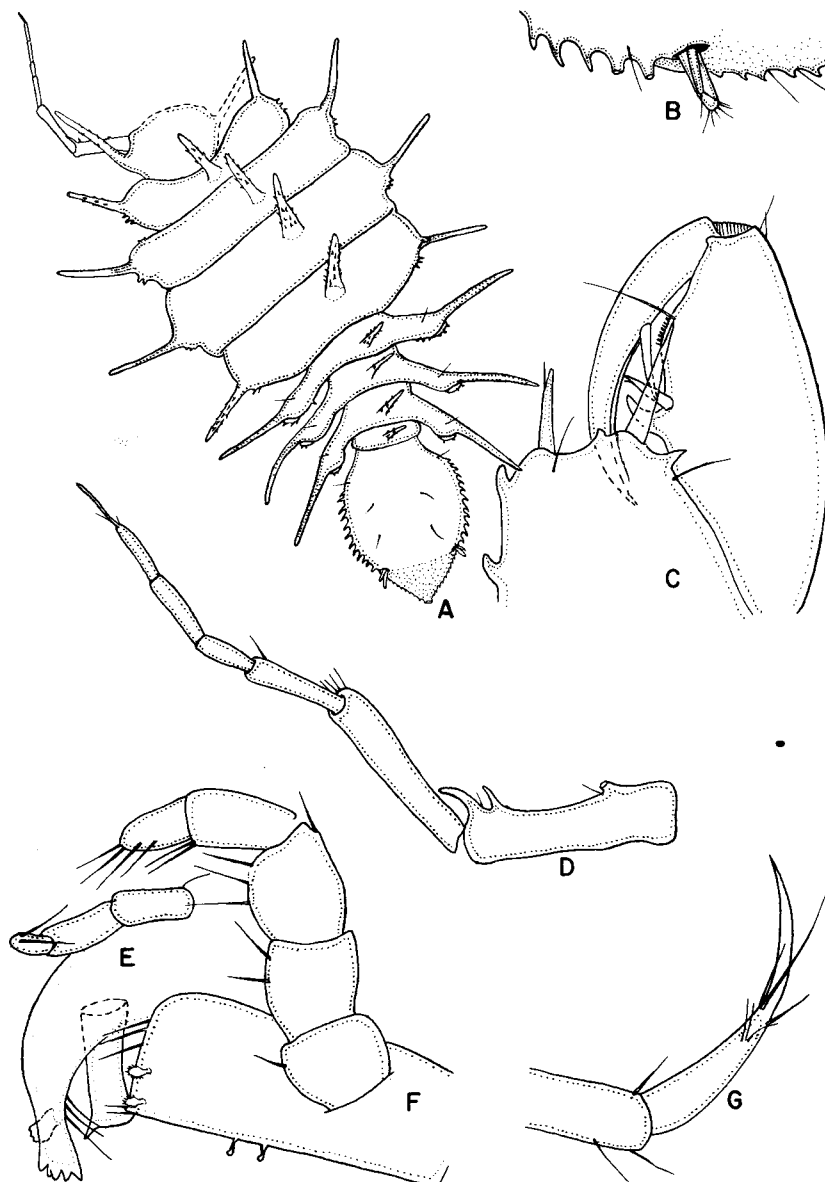


Figure 59. *Notoxenoides vema*, n. sp. A: dorsal view female holotype; B: dorsal view uropod; C: first pereopod; D: first antenna; E: mandible; F: maxilliped; G: third pereopod.

Acanthomunna beddardi, new species
Figure 57

Synonyms: None.

Diagnosis: *Acanthomunna* with bifurcated frons of cephalon and three stout spines in a cluster at midline of dorsum of cephalon. Three transverse rows of stout spines on dorsum of first three pereaeonal somites and one row on somites 5 and 6. Pleon irregularly spinous. Propod with seven stout spines along inferior margin.

Measurements: Male holotype length 5.4 mm., width pleon 1.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type only, cat. no. I-180.

Distribution: Known only from type locality.

Affinities: This species is distinct in having the

central cluster of three spines in the dorsum of cephalon.

NOTOXENOIDES, new genus

Type species: *Notoxenoides abyss*, new species.

Synonyms: None.

Diagnosis: Munnidae with coxal plates evident in dorsal view on pereaeonal somites 5-7 inclusive. Uropoda biramous small, leaf-like, peduncle lacking, insertion lateral. Lateral borders of pereaeonal somites 1-7 inclusive produced into spine-like process, dorsum at midline of each somite with a long spine. Maxillipedal palp narrower than endite. Mandibular palp triarticulate; molar expanded and truncated at apex. Apex of male pleopods triangulate. Ocular

peduncles narrow and curved forward in front of cephalon, ocelli lacking.

Composition: Known from type species and the one other new species described herein. *Pleurogonium pulchrum* Hansen possibly belongs to this genus.

Notoxenoides abyssi, new species
Figure 58

Synonyms: None.

Diagnosis: *Notoxenoides* with a produced, pointed, spinulate pleon. Flagellum of first antenna with four articles. Dorsum of pleon without spines, lateral border spinulate. Propod with only a stout seta on inferior margin. Ocular peduncles projecting in front of cephalon. Second article of peduncle of first antenna with a spine at distal outer margin.

Measurements: Length holotype male 1.9 mm., width pleotelson 0.44 mm., length gravid allotype 2.0 mm., width pleotelson 0.5 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 54, types plus two male and one female paratypes, cat. no. I-181.

Distribution: Known only from type locality.

Affinities: The species resembles *Pleurogonium pul-*

chrum Hansen, 1916, in having the dorsal spines on the body. The mandibles would obviously distinguish the two, but Hansen did not describe them for *pulchrum*. Its nearest abyssal relative is the following new species.

Notoxenoides vema, new species
Figure 59

Synonyms: None.

Diagnosis: *Notoxenoides* with apex of pleon pointed but not strongly produced. Flagellum of first antenna with four articles. Dorsum of pleon without spines, lateral border spinulate. Propod with a curved spine and one stout seta on inferior margin. Ocular peduncles (?) directed laterally. Second article of peduncle of first antenna without spines.

Measurements: Female holotype length 1.8 mm, width at widest point 0.8 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 18, type only, cat. no. I-174.

Distribution: Known only from type locality.

Affinities: Related to *N. abyssi* Menzies and *P. pulchrum* Hansen, but with sharp laterally directed ocular peduncles.

ACANTHASPIDIDAE, new family

Diagnosis: Paraselloidea with free cephalon. Eyes lacking, mandible with tapering yet blunt molar, palp present. Uropod with long peduncle. None of the peraeopods modified for swimming; dactyl of sixth with two claws. Last two articles of maxillipedal palp one-half the width of first three; second ½ the width of endite. Somites of peraeon much wider than long. Pleon with two somites.

Composition: The family probably contains *Jol-anthe* Beddard, *Microprotus* Richardson, and *Katianira* Richardson. *Janthopsis* and *Rhacura* probably belong to the Ianirellidae (Menzies, in press). The family is related to the Ianirellidae, but the maxillipedal palp articles are too narrow and it has two somites to the pleon instead of only one. The very long uropodal peduncle characterizes members of the family.

Genus: ACANTHASPIDIA Stebbing

Type species: *Acanthoniscus typhlops* G. O. Sars, 1879, p. 434.

Synonym: *Acanthoniscus* G. O. Sars, 1879, p. 434, — 1885, p. 119, Pl. X. *Acanthaspidia* Stebbing, 1893, p. 378.

Diagnosis: Acanthaspididae with mandible having triarticulate palp and lacinia and setal row. Uropoda biramous, with long peduncle, insertion terminal. Maxillipedal palp with expanded first three articles all

less than one-half the width of endite. Cephalon without eyes or eye stalks. Peraeonal somites provided with spine-like lateral expansions. Coxal plates visible in dorsal view on somites 5-7 inclusive. Pleonal lateral margin with many spine-like projections.

Composition: The genus contains three species besides the new one described here:

Species	Depth Range (Meters)	
	Least	Greatest
1. <i>typhlops</i> (G. O. Sars)	823	1354
2. <i>decorata</i> (Hansen, 1895)	4000	4000
3. <i>drygalskii</i> Vanhöffen	350	385

A KEY TO THE SPECIES OF
ACANTHASPIDIA

1. Body with a single median row of single spines . . . 2
1. Body with a pair of spines on
midline *drygalskii* Vanhöffen
2. Frons bifid 3
2. Frons with single frontal horn *decorata* Hansen
3. Lateral border fifth peraeonal somite
trifid *typhlops* (G. O. Sars)
3. Lateral border of fifth peraeonal somite
with one large spine and a small one . . . *bifurcata*, n.sp.

Acanthaspidia bifurcata, new species
Figure 60

Synonyms: None.

Diagnosis: *Acanthaspidia* with bifurcating rostrum,

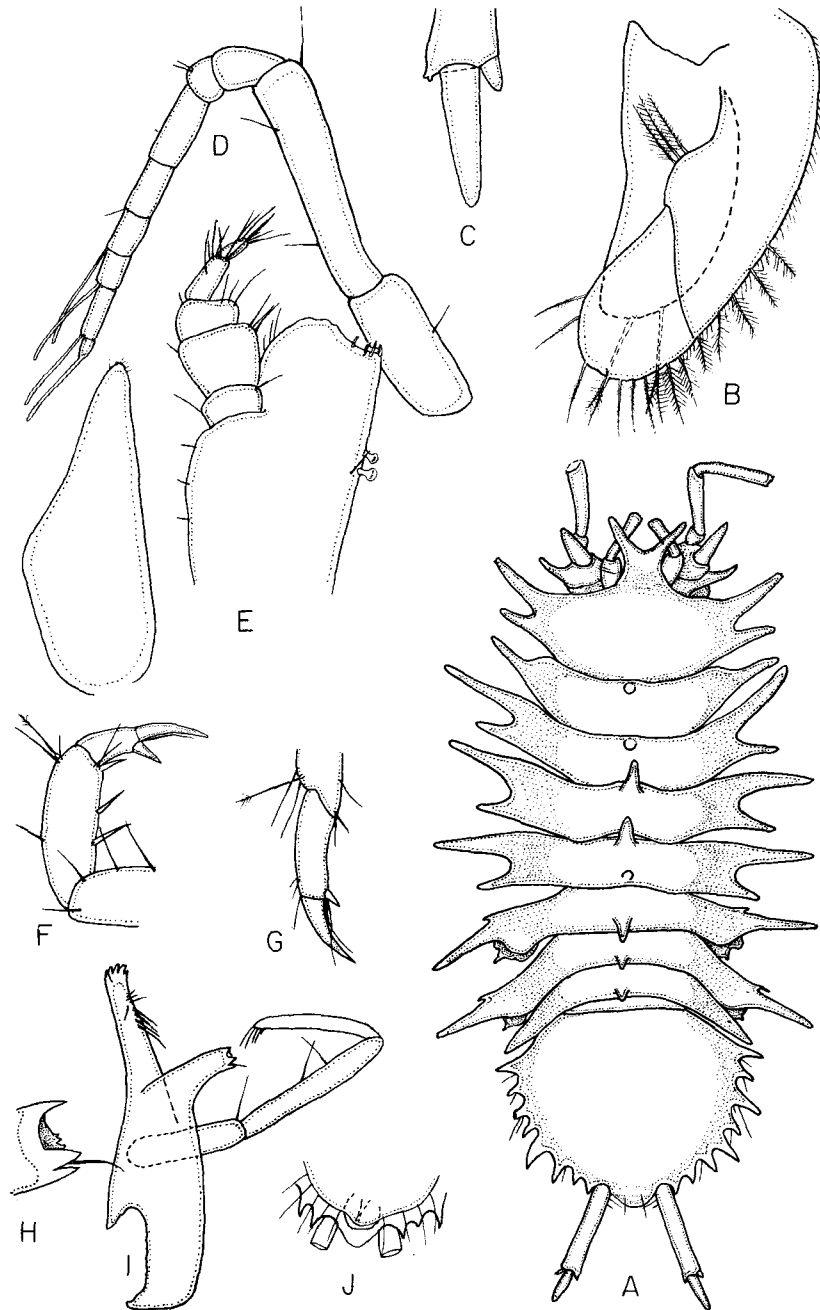


Figure 60. *Acanthaspida bifurcata*, n. sp. A: in toto, type; B: third pleopod of female; C: uropodal rami; D: first antenna; E: maxilliped; F: first peraeopod; G: fifth peraeopod; H: apex of molar of right mandible; I: right mandible; J: ventral surface of pleotelson.

first six peraeonal somites each with a mid-dorsal spine. Last three peraeonal somites with one spine-like lateral expansion and smaller tooth. Each lateral border of pleon with seven spine-like projections alternating in size. Maxilliped with two coupling hooks. Flagellum of first antenna with eight articles.

Measurements: Holotype female length 4.2 mm., width pleotelson 1.5 mm., and one fragmentary female paratype.

Type locality: South Atlantic, L.G.O. Biotrawl No. 16, types only, cat. no. I-216.

Distribution: Known only from type locality.

Affinities: Related to *typhlops* but with fewer peraeonal spine-like lateral extensions.

Acanthaspida decorata Hansen

Figure 61 A

Synonyms: *Acanthaspida decorata* Hansen, 1895, pp. 6-7, Pl. I.

Diagnosis: *Acanthaspida* with mid-frontal projection a simple spine. Each peraeonal somite with a

single mid-dorsal spine except fourth, which has two. Each lateral border of pleon with eight spines; apex concave. Lateral borders of somites 5-7 with only one large spine-like extension. Flagellum of first antenna with ten or more articles.

Measurements: Male length 9.7 mm. (Hansen, op. cit.).

Type locality: Plankton Expedition, North Atlan-

tic, Station 158, latitude 7.5° N., longitude 21.3° W., 4000 meters.

Distribution: Known only from type locality. It was not collected by *Vema*.

Affinities: The simple spine at the frons of the cephalon and the concave apical margin on the pleon distinguish this species.

Family: ABYSSIANIRIDAE Menzies

Synonyms: *Abyssianiridae* Menzies, 1956a, pp. 12-13.

Diagnosis: Paraselloidea with free head. Mandibles normal, molar process expanded and truncated at apex. First antenna shorter than body. Peraeonal somites all of similar length, none fused. Peraeopods 2-7 simple walking legs, two claws on dactyls, not three, no legs modified for swimming. First peraeopod prehensile. Coxal plates rounded, not spiniform, visible in dorsal view. Pleon with two somites. Uropoda biramous, inserting dorsally with short peduncle. Maxillipedal palp with first three articles as wide as endite. (Modified after Menzies, 1956a.)

Composition: Formerly this family contained only the type genus. It is now possible to add one new genus, *Xostylus*, with a single new species. The family is closely allied to the Munnidae through the genus *Austrosignum*, which may ultimately have to be transferred to the Abyssianiridae.

Genus: ABYSSIANIRA Menzies

Synonyms: *Abyssianira* Menzies, 1956a, p. 14.

Type species: *Abyssianira dentifrons* Menzies, 1956a, p. 15.

Diagnosis: Abyssianiridae with coxal plates visible in dorsal view on peraeonal somites 2-7 inclusive. Lateral margins of cephalon flattened and expanded.

Abyssianira dentifrons Menzies

Figure 61 B-H

Synonyms: *Abyssianira dentifrons* Menzies, 1956a, p. 15.

Diagnosis: *Abyssianira* with denticulate body margins. Cephalon expanded, flattened rostrum, and lateral horns. Pleotelson lateral border denticulate, apex rounded. First antenna with six articles, last about one-third shorter than penultimate article. Male first pleopod with three setae at each angle on either side of sympod. Maxilliped with two coupling hooks. Mandible with triarticulate palp, last article with two apical setae. Uropodal exopod one-half the length of endopod.

Measurements: Holotype male length 2.75 mm., width at second peraeonal somite 0.85 mm.

Type locality: North Atlantic, L.G.O. Biotrawl No. 1, type only, cat. no. 11762 A.M.N.H.

Distribution: Also found at South Atlantic, L.G.O. Biotrawl No. 214, one female, cat. no. I-203; L.G.O. Biotrawl No. 12, one male, two females, cat. no. I-90.; L.G.O. Biotrawl No. 51, one fragment, cat. no. I-185.

Affinities: This species is closely allied to *A. argentinensis*, from which it differs in having the apex of the pleon smooth, not spinulate.

Abyssianira argentinensis, new species

Figure 61 I-L

Synonyms: None.

Diagnosis: *Abyssianira* with quadrate pleotelson. First antenna with six articles, last article subequal in length to penultimate article. Propod of first peraeopod with only one stout two-pointed seta. Apex of pleon spinulate. Uropodal exopod two-thirds the length of endopod.

Measurements: Holotype female length 1.5 mm., pleon 0.5 mm.

Type locality: North Atlantic, holotype, L.G.O. Biotrawl No. 207, cat. no. I-218.

Distribution: Known only from type locality.

Affinities: Closely related to *A. dentifrons*, from which it differs in having the apex of the pleon spinulate.

XOSTYLUS, new genus

Type species: *Xostylus parallelus*, new species.

Diagnosis: Abyssianiridae with coxal plates visible in dorsal view on last three peraeonal somites only. Lateral margins of cephalon not flattened and expanded.

Composition: Monotypic.

Affinities: Closely related to *Abyssianira* but resembling the Nannoniscidae in general body shape. The peraeopods are ambulatory and none is modified for swimming; the mandibular molar is stout and truncated at the end.

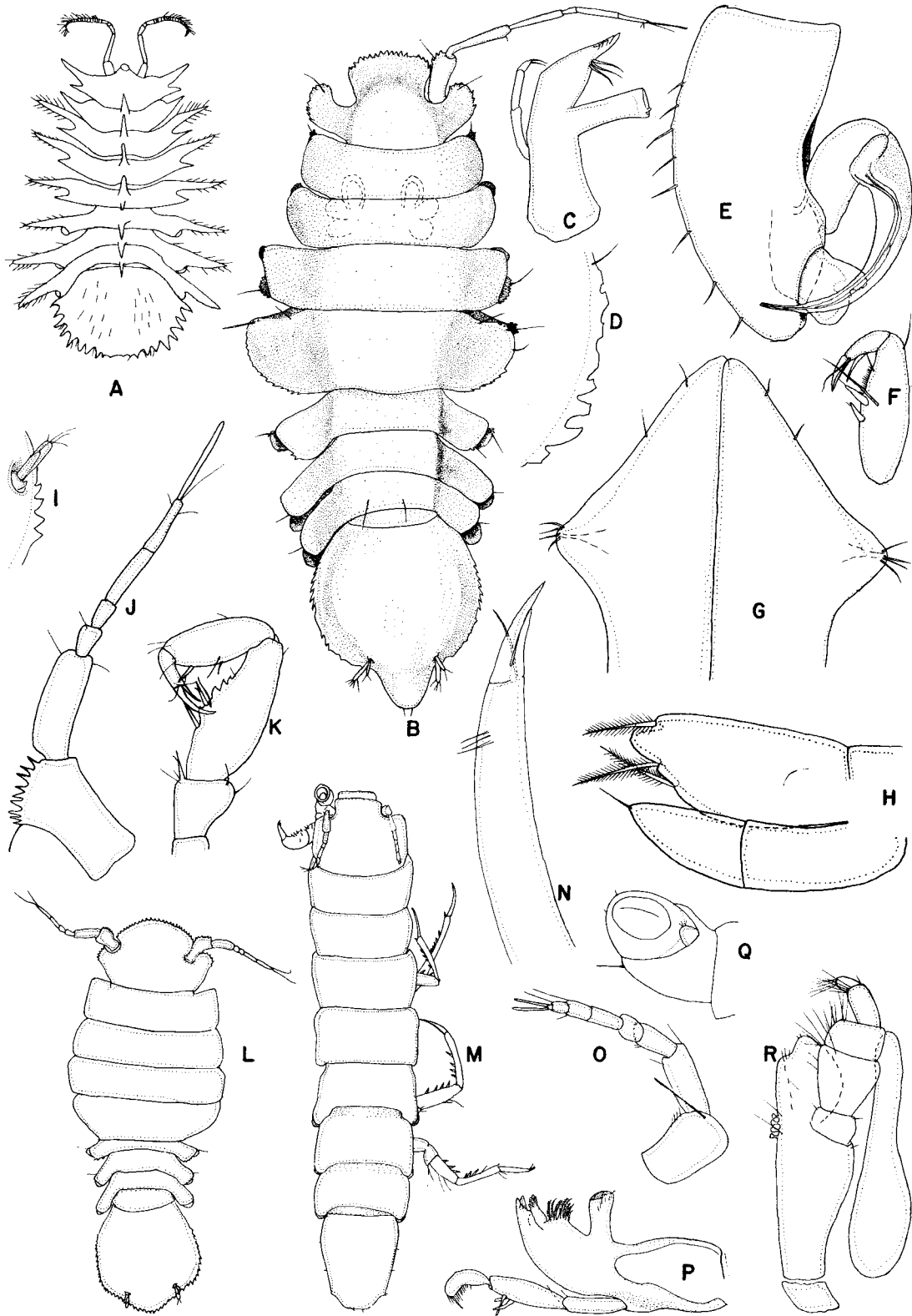


Figure 61. A: *Acanthaspida decorata* Hansen, dorsal view. B-H: *Abyssianira dentifrons* Menzies. B: dorsal view male holotype; C: mandible; D: lateral border of pleotelson; E: second pleopod; F: first peraeopod; G: first pleopod; H: third pleopod. I-L: *Abyssianira argentinensis*, n. sp. I: uropod dorsal view; J: first antenna; K: first peraeopod; L: dorsal view female holotype. M-R: *Xostylus parallelus*, n. sp. M: dorsal view female holotype; N: sixth peraeopod; O: first antenna; P: mandible; Q: second antenna; R: maxilliped.

Xostylus parallelus, new species

Figure 61 M-R

Synonyms: None.

Diagnosis: *Xostylus* with lateral border of pleon smooth, apex curved evenly rounded, devoid of spines. Frons of cephalon straight. Flagellum of first antenna with six articles. Second article of mandibular palp with three characteristic stout spines.

Epipod of maxilliped bottle-shaped; endite with four coupling hooks.

Measurements: Holotype female length 8.1 mm., width pleotelson 1.0 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type cat. no. I-200.

Distribution: Known only from type locality.

Affinities: Unique.

Family: IANIRIDAE

Diagnosis: Paraselloidea with cephalon free. Dactyls of peraeopods 2-7 inclusive with three claws (two major ones and an accessory one). Palp of maxilliped with last two articles narrow, others twice as wide and about equal to width of endite. Peraeopods all ambulatory, first often prehensile, none modified for swimming. Uropoda terminal biramous and with peduncle. Peraeonal somites all of similar length.

Composition: This major heterogeneous family of the Paraselloidea is represented in the main by shallow water genera, viz.: *Ianira*, *Ianiropsis*, *Jaera*, *Caecijaera*, *Janiralata*, *Iathrippa*, etc. Two genera contain abyssal species, *Ianira* (one species only) and a new one described herein.

Type locality: North Atlantic, south of Iceland, Thor, latitude 60° 11' N., longitude 19° 36' W., 1899 to 2143 meters, two specimens (Hansen, op. cit., p.16).

Distribution: Known only from type locality.

Affinities: This species, an eye-bearing abyssal species, shows a close resemblance to *I. maculosa* Leach from the shallow water. It is based only on Hansen's description and not on specimens examined by me. It differs markedly from *maculosa* in having the apex of the male first pleopod trilobed and not simply bilobed (viz., G. O. Sars, 1897, Pl. 40). It was not captured by *Vema*.

Genus: IANIRA Leach

Synonyms: *Ianira* Leach, 1814, p. 434; — Sars, 1897, p. 99. *Henopomus* Krøyer, 1847, p. 366.

Type species: *Ianira maculosa* Leach.

Diagnosis: Ianiridae with two-jointed pleon. Coxal plates visible in dorsal view on peraeonal somites 2-7 inclusive. Mandible with expanded truncated molar, lacinia and setae row present, palp triarticulate. Exopod of third pleopod narrower than endopod. Apex of male first pleopod without lateral expansions. Second antenna with pronounced scale. First antenna shorter than second. Cephalon and pleon without pronounced lateral spine-like projections.

Composition: Only one species in this genus is from the abyss. This is *Ianira maculosa* Leach of Hansen, 1916, which is here described as a new species.

Ianira hanseni, new species

Figure 62 A-B

Synonyms: *Ianira maculosa* Leach, 1814, Hansen, 1916, pp. 14-16, Pl. I.

Diagnosis: *Ianira* with a quadrate cephalon. Eyes removed from lateral border of cephalon. Apex of male first pleopod trilobed. Postero-lateral margin of pleon spinulate.

Measurements: Female length 6.5 mm., male length 7.0 mm. (Hansen).

ABYSSIJAERA, new genus

Type species: *Abyssijaera acarina*, new species.

Diagnosis: Ianiridae with pleon consisting of one somite only. Eyes lacking; mandibular molar reduced to a short spine; palp triarticulate; toothed incisor and lacinia present. Maxillipedal palp with first two articles expanded and as wide as endite. Coxal plates not visible in dorsal view on peraeonal somites.

Composition: Monotypic. Most of the peraeopods were lacking from the single specimen. I am assuming, on the other characteristics and the basis of general similarity of the species to *Jaera*, that most the dactyls of peraeopods 2-7 are triunguiculate. Otherwise I should have to establish a new family for the animal. The genus is closely related to *Jaera*, differing mainly in having one pleonal somite, not two, and in having a much reduced mandibular molar process.

Abyssijaera acarina, new species

Figure 62 C-I

Synonyms: None.

Diagnosis: *Abyssijaera* with lateral margins of pleon each with nine setae, apex rounded, with nine setae. Apex of male first pleopod rounded each with nine setae. Maxilliped with two coupling hooks (uropoda missing).

Measurements: Holotype male length 1.6 mm., width pleon 0.32 mm.

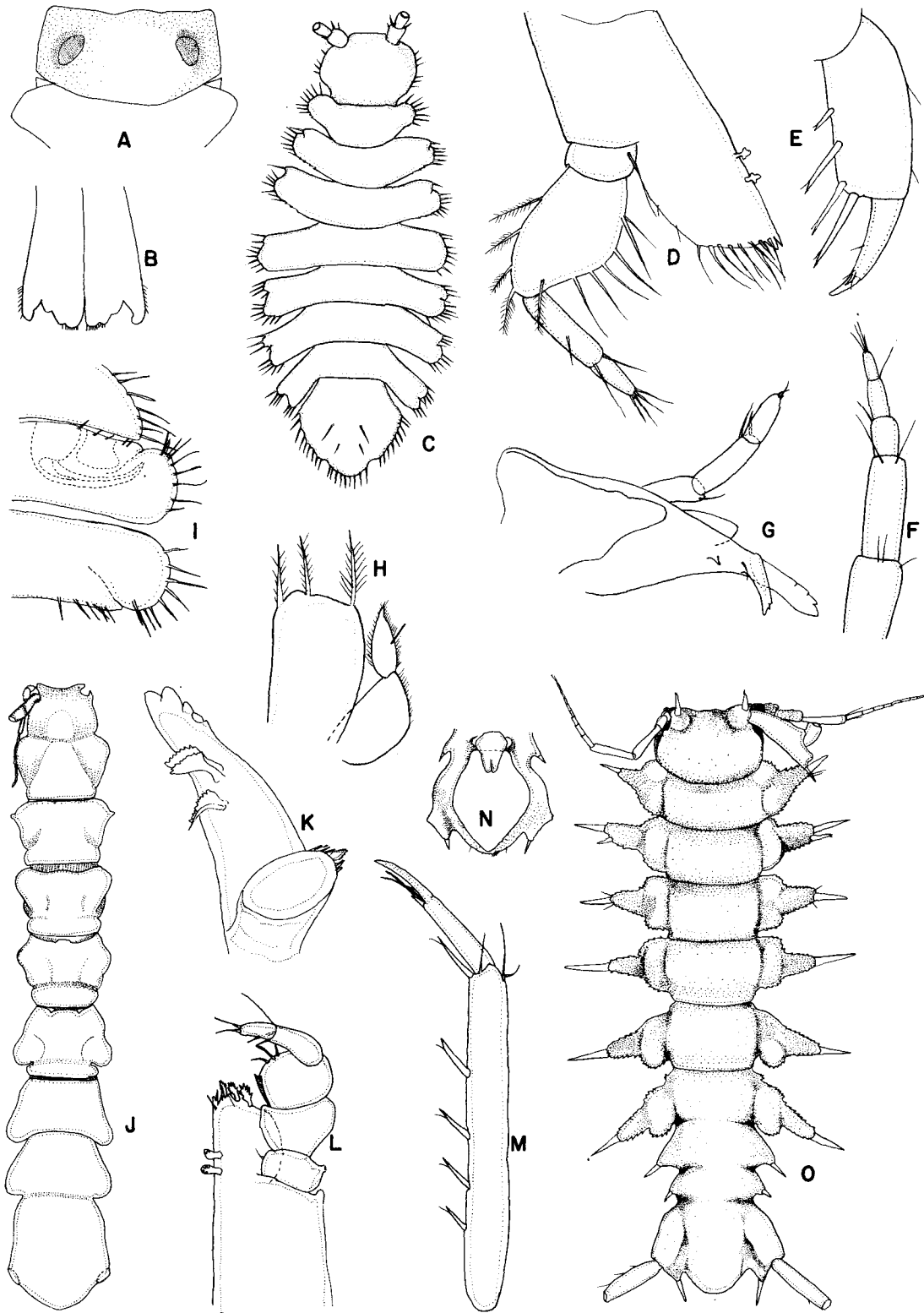


Figure 62. A-B: *Ianira hanseni*, n. sp. A: dorsal view female from latitude 62° 11' N., longitude 19° 36' W., after Hansen; B: distal part of medium lamella of abdomen operculum of male from same location, after Hansen. C-I: *Abyssijaera acarina*, n. sp. C: dorsal view male holotype; D: maxilliped; E: first peraeopod; F: second antenna; G: mandible; H: third pleopod; I: first pleopod. J-M: *Vemathambema elongata*, n. sp. J: dorsal view female holotype; K: mandible; L: maxilliped; M: third peraeopod. N-O: *Echinothambema ophiuroides* Menzies. N: ventral view pleon; O: dorsal view ambisexual holotype.

Type locality: North Atlantic, L.G.O. Biotrawl No. 7, type only, cat. no. I-191.

Distribution: Known only from type locality.
Affinities: Unique.

Family : ECHINOTHAMBEMIDAE Menzies

Synonyms: *Echinothambemidae* Menzies, 1956a, pp. 9-10.

Diagnosis: Paraselloidea with fused or free head, eyes lacking. Mandibles normal, molar process well developed and expanded a truncated apex. Antennae shorter than body, about twice the length of cephalon. All peraeopods simple, 2-7 simple walking legs; dactyl with two terminal claws. Uropoda terminal with peduncle. Last one or two peraeonal somites fused with pleon. First three articles of maxillipedal palp expanded, as wide as endite. Coxal plates lacking. First peduncular article of first antenna much expanded. Anus contained within the branchial chamber.

Composition: Formerly monotypic (Menzies, 1956a, p. 10). A new genus is added here and the diagnosis has accordingly been altered to allow its inclusion.

Genus: ECHINOTHAMBEMA Menzies

Type species: *Echinothambema ophiuroides* Menzies 1956a, p. 11.

Synonyms: *Echinothambema* Menzies, 1956a, pp. 10-11.

Diagnosis: Same as for family. Mandible without palp.

Composition: One abyssal Atlantic species.

Echinothambema ophiuroides Menzies
Figure 62 N-O

Synonyms: *Echinothambema ophiuroides* Menzies, 1956a, p. 11.

Diagnosis: *Echinothambema* with first antenna with six articles, last one-third longer than penultimate article. Lateral borders of peraeonal somites each with expanded and pronounced margin bearing a single stout seta. Body sharply granulate. Maxilliped with two coupling hooks. Cephalon at antero-lateral

margin with a pair of swellings, each bearing a stout seta. Mandibles without a palp.

Measurements: Holotype ambisexual 5.00 mm. long, 1.5 mm. wide.

Type locality: North Atlantic, L.G.O. Biotrawl No. 1, type only, cat. no. 11760 A.M.N.H.

Distribution: Known only from type locality.
Affinities: Unique.

VEMATAMBEMA, new genus

Type species: *Vemathambema elongata*, new species.
Synonyms: None.

Diagnosis: Echinothambemidae with cephalon fused to first peraeonal somite and last somite of peraeon fused to pleon. First article of first antenna not expanded but stout and elongated as long as second.

Composition: Monotypic abyssal.

Affinities: Related to *Echinothambema* in the absence of coxal plates and the fusion of peraeonal somite 7 with the pleon and in the absence of a mandibular palp. Uropoda (missing) probably with peduncle.

Vemathambema elongata, new species
Figure 62 J-M

Synonyms: None.

Diagnosis: *Vemathambema* with smooth pleon, apex rounded, body without spines or setae. Frons of cephalon concave, devoid of spines or setae

Measurements: Holotype female length 5.2 mm width pleon 0.9 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 15, type only, cat. no. I-112.

Distribution: Known only from type locality.
Affinities: Unique.

Family : THAMBEMATIDAE

Diagnosis: Paraselloidea with cephalon free, eyes lacking. Mandibles normal, molar process well developed and expanded at truncated apex. Antennae shorter than body. All peraeopods simple walking legs, dactyls with two terminal claws. Uropod absent. Pleon with one somite only. All peraeonal somites distinct. First three articles of maxillipedal palp as wide as endite. Coxal plates lacking.

Composition: Monotypic. The family resembles the Jaeropsidae in many significant respects, notably in the details of the structure of the maxillipeds and the shape of the front of the head and the antennae structure. The mandibular structure, however, clearly indicates its distinctiveness.

Genus: **THAMBEMA** Stebbing

Type species: *Thambema amicorum* Stebbing, 1912, p. 42; 1913, p. 237.

Synonyms: *Thambema* Stebbing, 1912, p. 42; — 1913, pp. 237–239.

Diagnosis: Same as for the family.

Composition: Monotypic.

Thambema amicorum Stebbing

Figure 63

Synonyms: *Thambema amicorum* Stebbing, 1912, p. 42; — 1913, pp. 237–239, Pl. 26.

Diagnosis: *Thambema* with frons of cephalon convex and even, pleon without spines or serrations, apex evenly rounded. Apex of male first pleopod pointed without lateral expansions. Second article maxillipedal palp wider than third, fourth and fifth very narrow.

Measurements: About 8 mm. (Stebbing, 1913, p. 239).

Type locality: North Atlantic, west of Donegal, Porcupine Station 19, latitude 54° 53' N., longitude 10° 56' W., 2486 meters.

Distribution: Known only from type locality. Not captured by *Vema*.

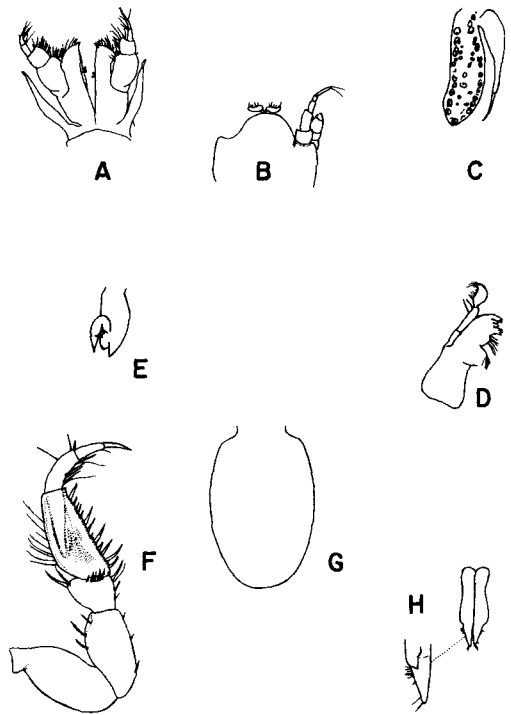


Figure 63. *Thambema amicorum* Stebbing. A: maxillipeds; B: dorsal view cephalon; C: third pleopod; D: mandible; E: second pleopod; F: first gnathopod; G: dorsal view pleon; H: first pleopod.

INCERTAE SEDIS

Genus: **MESOSIGNUM**, new genus

Synonyms: None.

Type species: *Mesosignum kohleri*, new species.

Diagnosis: Paraselloidea with free cephalon. All peraeopods ambulatory. Mandible with a triarticulate palp and a toothed incisor, setal row present, lacinia present, molar tapering to a flat setiferous point. Uropods uniramous, with peduncle, insertion lateral. Maxillipedal palp with narrow articles all of similar width and one-half the width of endite. First male pleopod rounded at apex. Cephalon without eyes or eye stalks. First antenna about twice the length of cephalon. Peraeonal somites, except first provided with spine-like lateral expansions. Coxal plates visible in dorsal view only on somites 5–7 inclusive. Anus separated from branchial cavity.

Remarks: The mandibles of this genus resemble *Pleurosignum* (Pleurogonidae), whereas the maxillipedal palp is like the Dendrotioniidae. The epimeral plates are like *Austrosignum* (Pleurogonidae); whereas the uropods are unique. Assignments of the genus to an existing family is impossible and the establishment of a new one seems not warranted at this time.

Composition: The genus *Mesosignum* contains two species, both abyssal and bathyal; both are new and from the Caribbean.

A KEY TO THE SPECIES OF MESOSIGNUM

1. Apex of pleon rounded *kohleri*, n. sp.
2. Apex of pleon bifurcated by stout spine-like projections *usheri*, n. sp.

Mesosignum kohleri, new species

Figure 64 A–G

Synonyms: None.

Diagnosis: *Mesosignum* with apex of pleon evenly rounded, postero-lateral projections lacking. Frons of cephalon pointed. Antero-lateral spine of second somite only twice the length of postero-lateral spine and not extending forward beyond peduncle of first antenna. Apex of male first pleopod rounded with ten marginal setae.

Measurements: Male holotype length 2.5 mm., width pleotelson 0.35 mm., allotype gravid length 2.3 mm., width pleotelson 0.30 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 96, types plus one male, three female paratypes, cat. no. I-82.

Distribution: L.G.O. Biotrawl No. 94, three males, two females, two juveniles, one fragment, cat. no. I-84; No. 95, three males, cat. no. I-83; No. 97, one female, cat. no. I-85; No. 98, two males, cat. no. I-86.

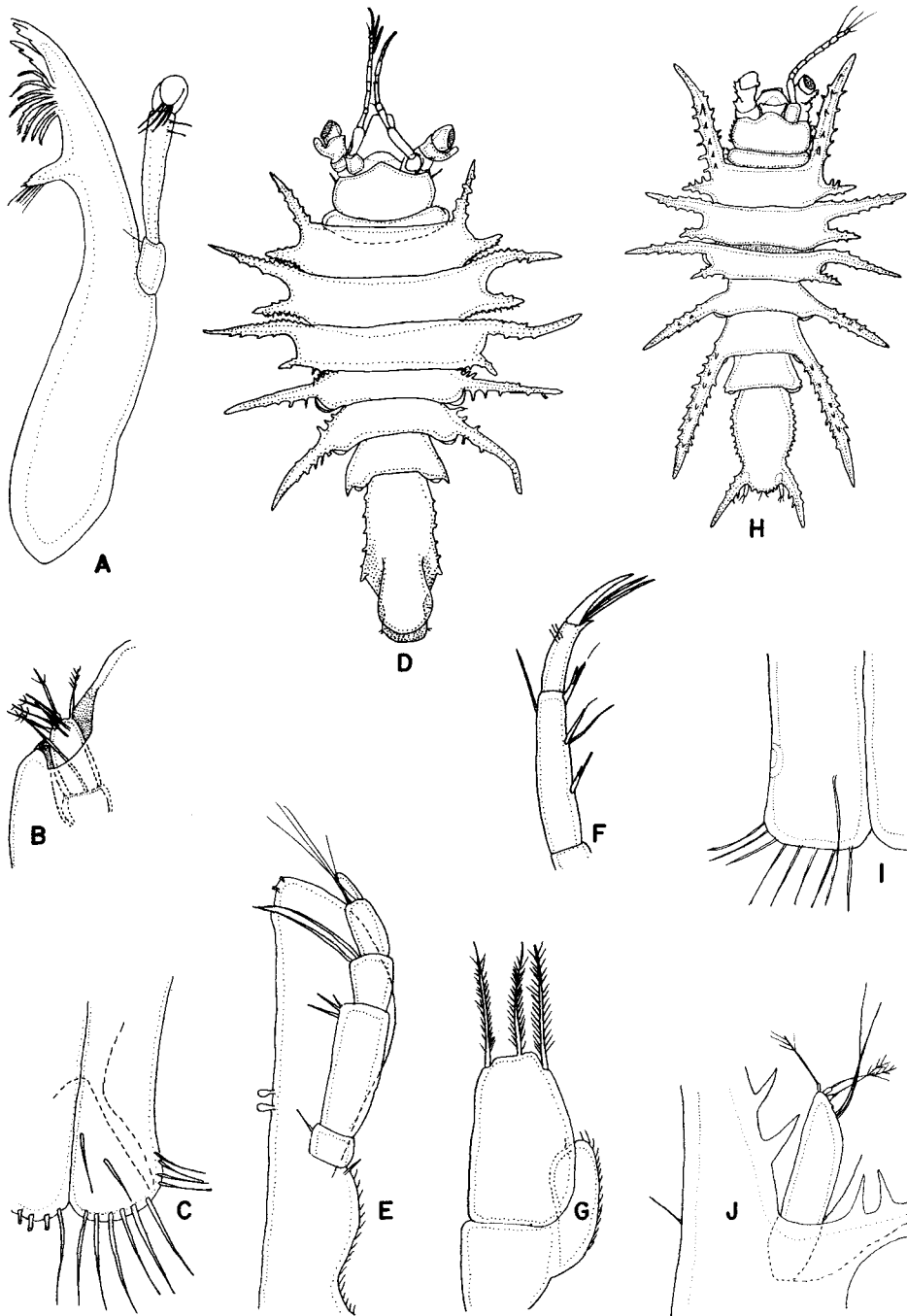


Figure 64. A-G: *Mesosignum kohleri*, n. sp. A: mandible; B: uropod; C: first pleopod; D: dorsal view male holotype; E: maxilliped; F: first peraeopod; G: third pleopod. H-J: *Mesosignum usheri*, n. sp. H: dorsal view male holotype; I: first pleopod; J: uropod.

Affinities: Near to *usherii* but without stout spine at postero-lateral angle of pleon.

Mesosignum usheri, new species

Figure 64 H-J

Synonyms: None.

Diagnosis: *Mesosignum* with stout spinulate postero-lateral spines at apex of pleon. Frons of cephalon evenly rounded. Antero-lateral spine of second peraeonal somite five times the length of postero-lateral spine and extending forward beyond peduncle

of first antenna. Apex of male first pleopod straight, with eight marginal setae.

Measurements: Holotype male length 2.0 mm., width pleotelson 0.3 mm., allotype length 2.1 mm., width pleotelson 0.4 mm.

Type locality: North Atlantic, Caribbean, L.G.O. Biotrawl No. 98, types plus one female, cat. no. I-87-88.

Distribution: Known only from type locality.

Affinities: Near to *kohleri* but with stout spine at postero-lateral angles of pleon.

Tribe : FLABELLIFERA

The three subtribes of the Flabellifera have been reported from the abyss, where each is represented by several species. The subtribes are the Anthuroidea, the Seroloidea, and the Cirolanoidea. It is highly probable that the records of the latter are due to pelagic species caught on the way up.

A KEY TO THE FLABELLIFERAN SUBTRIBES
(From Menzies, in press)

- 1. Individual peraeonal somites longer than wide *Anthuroidea*
- 1. Individual peraeonal somites much wider than long *Seroloidea*
- 2. Peraeon with first somite fused medially with cephalon. First to third pleopoda smaller than operculiform fourth and fifth pairs *Seroloidea*
- 2. Peraeon and cephalon not fused. Pleopods all similar in size *Cirolanoidea*

Family : SEROLIDAE

Diagnosis: Flabellifera with the fourth and fifth pairs of pleopoda large and operculiform, pleopods 1-3 normal, smaller than 4 and 5. Cephalon united medially with first peraeonal somite. Body strongly depressed, much wider than high (thick). Uropoda small, normal, subapical, not arching over pleon. (From Menzies, in press.)

Composition: The serolids have been revised by Nordenstam (1933). The majority of the species have been recovered from shallow water, and although a few abyssal species have been described, only one—*Serolis neaera* Beddard—had been known from the Atlantic abyss. The genus is well represented in Antarctic polar regions, but is yet unknown from the Arctic. In fact, only one species is known from the Northern hemisphere—namely, *Serolis carinata* Lockington (Richardson, 1905). Here five species of abyssal serolids are described from the abyss of the South Atlantic.

Genus: SEROLIS Leach

Subgenus: SEROLIS Nordenstam, 1933

Type species: *Serolis (Serolis) paradoxa* (Fabricius, 1775).

Diagnosis: Uropoda two-branched (biramous, not spiniform). Tergum of seventh peraeonal somite vanished. Tergum of sixth peraeonal somite well demarcated from first abdominal segment in its entire length. Second article of maxillipedal palp cordate. (Modified after Nordenstam, 1933.)

Serolis (Serolis) neaera Beddard
Figure 65 A

Synonyms: *Serolis neaera* Beddard, 1884, pp. 331-332.
Diagnosis: *Serolis* with coxal plates marked off on

peraeonal somites 2-4 inclusive. Third article of maxillipedal palp small. Pleon with apex acute, dorsum with stout wide tooth at proximal end and a

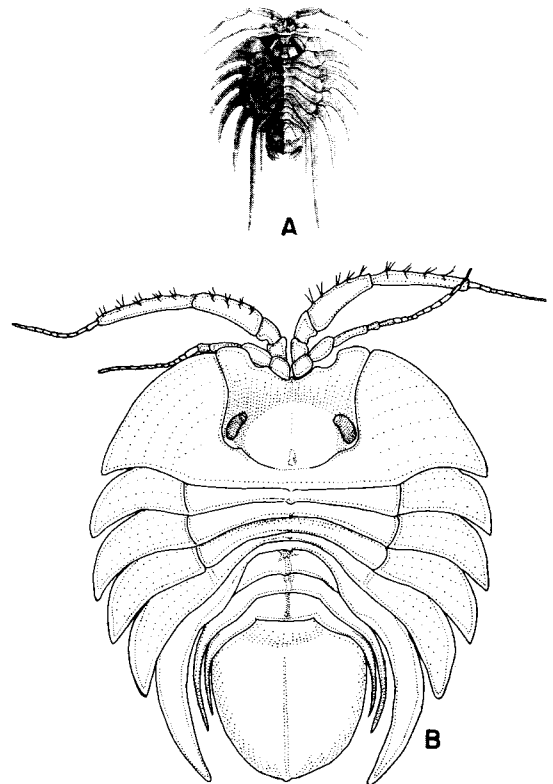


Figure 65. A: *Serolis (Serolis) neaera* Beddard, dorsal view. B: *Serolis (Serolis) margaretae*, n. sp., dorsal view female holotype.

smaller one near midpoint having a tooth on either side and a carina connecting with paired converging carinae near proximal tooth. Second pleonal epimera extending beyond posterior margin of pleon. Uropoda biramous, extending beyond apex of pleon.

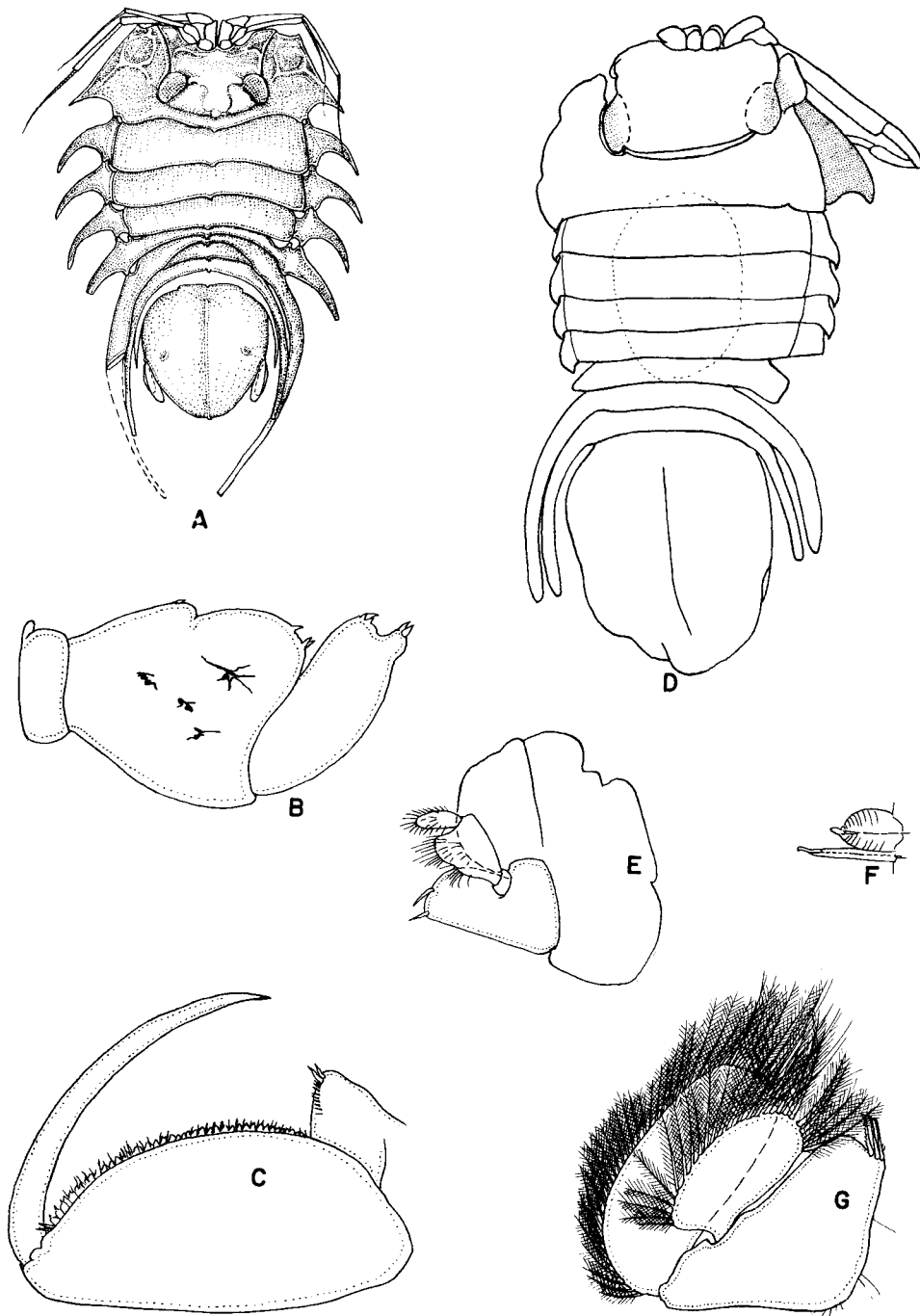


Figure 66. *Serolis (Serolis) macdonnellae*, n. sp. A: dorsal view female holotype; B: maxilliped embryo; C: first peraeopod; D: dorsal view embryo; E: maxilliped; F: peraeopodal seta; G: first pleopod.

Measurements: Largest male length 43 mm., greatest breadth 47 mm; female length 40 mm., greatest breadth 40 mm.

Type locality: South Atlantic, *Challenger* Station 320, 1079 meters, and Station 318, 3731 meters.

Distribution: This species was not captured by *Vema*.

Serolis (Serolis) margaretae, new species
 Figure 65 B

Synonyms: None.

Diagnosis: *Serolis* with coxal plates marked off on peraeonal somites 2–5. Third article of maxillipedal palp small. Uropods biramous. Pleon with sharp pointed median extension of mid-dorsal carina, lateral carinae lacking. First peraeonal somite without spine at antero-lateral border, which is smooth. Eye lobes present, cephalon with low mid-dorsal tubercle at posterior end. Each peraeonal somite with a tubercle near posterior margin at midline. Pleon lacking postero-lateral angles. Epimera of sixth peraeonal somite extending slightly beyond apex of pleon.

Uropodal rami blunt, endopod one-fourth longer than exopod.

Measurements: Female holotype length 8.4 mm., width pleon 3.2 mm., plus three smaller female paratypes.

Type locality: South Atlantic, L.G.O. Biotrawl No. 200, types only, cat. no. I-226.

Distribution: Known only from type locality.

Affinities: The very short uropodal exopod distinguishes this species.

Serolis (Serolis) macdonnellae, new species
Figure 66

Synonyms: None.

Diagnosis: *Serolis* with coxal plates marked off

on peraeonal somites 2-4 inclusive. Third article of maxillipedal palp small. Pleon with sharp median posterior extension of entire mid-dorsal carina; lateral carinae lacking; postero-lateral angles and dorsal sculpture lacking; a pit present on either side of midline dorsally. Cephalon with sharp separated antero-lateral angles; lateral area carinate. Eye lobes present. Uropodal rami blunt, exopod one-fifth shorter than endopod, not extending to pleonal posterior margin.

Measurements: Length holotype female 42 mm., width pleotelson 13 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 49, type only, cat. no. I-193.

Distribution: Known only from type locality.

Affinities: Similar to *S. (S.) glacialis* Beddard but

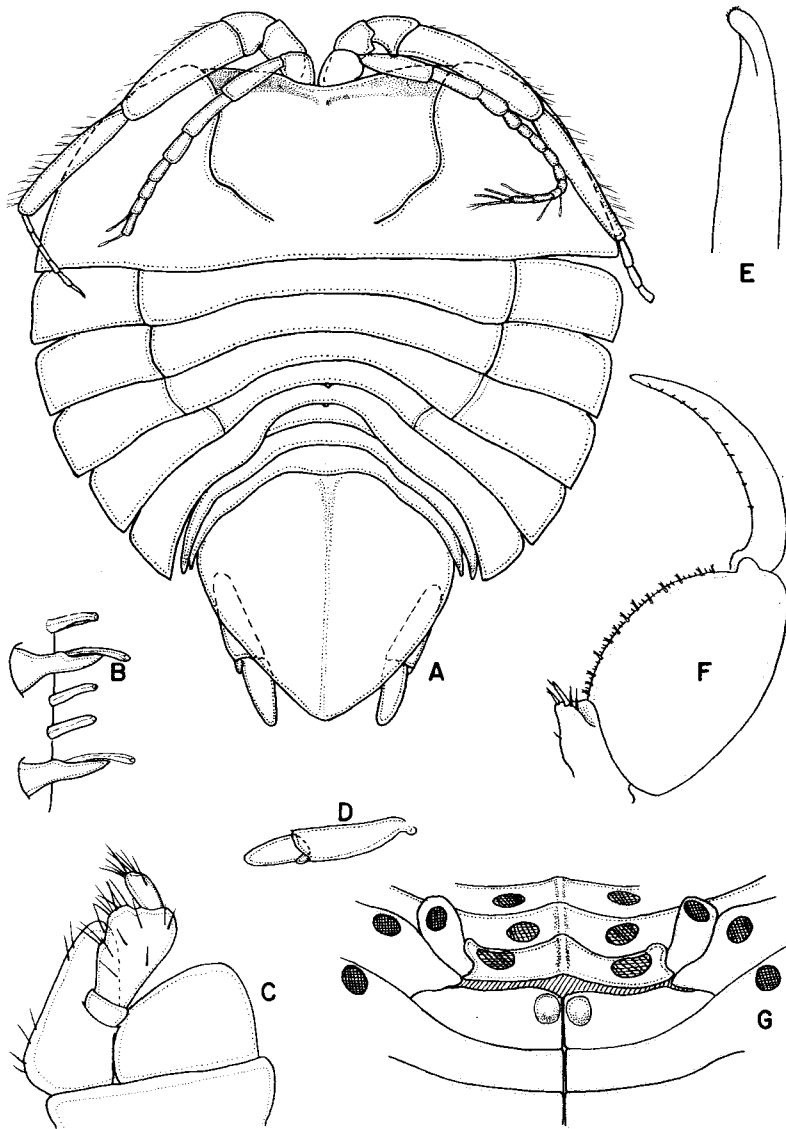


Figure 67. *Serolis (Serolis) vema*, n. sp. A: dorsal view male holotype; B: pereopodal seta; C: maxilliped; D: uropod; E: apex of second pleopod; F: first pereopod; G: ventral view peraeon-pleon.

differing in the sculpture on the dorsum of the pleon.

Serolis (Serolis) vema, new species

Figure 67

Synonyms: None.

Diagnosis: *Serolis* with coxal plates marked off on peraeonal somites 2-5 inclusive. Third article of maxillipedal palp small. Uropoda biramous, exopod minute, endopod thick projecting beyond posterior margin of pleon. Pleon without postero-lateral angles, apex pointed, mid-dorsal carina entire, lateral or transverse carinae lacking. Lateral borders of peraeon not pointed and produced but quadrate. Peraeonal somites 5 and 6 with a small mid-dorsal spine. Flagellum of second antenna shorter than last peduncular article. Flagellum of first antenna with ten articles.

Measurements: Holotype male 4.3 mm., width 1.7 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 12, type only, cat. no. I-89.

Distribution: Also from L.G.O. Biotrawl No. 51, one female, cat. no. I-196.

Affinities: This species is unique, not falling into any of the subgroups mentioned by Nordenstam (1933).

Serolis (Serolis) maryannae, new species

Figure 68

Synonyms: None.

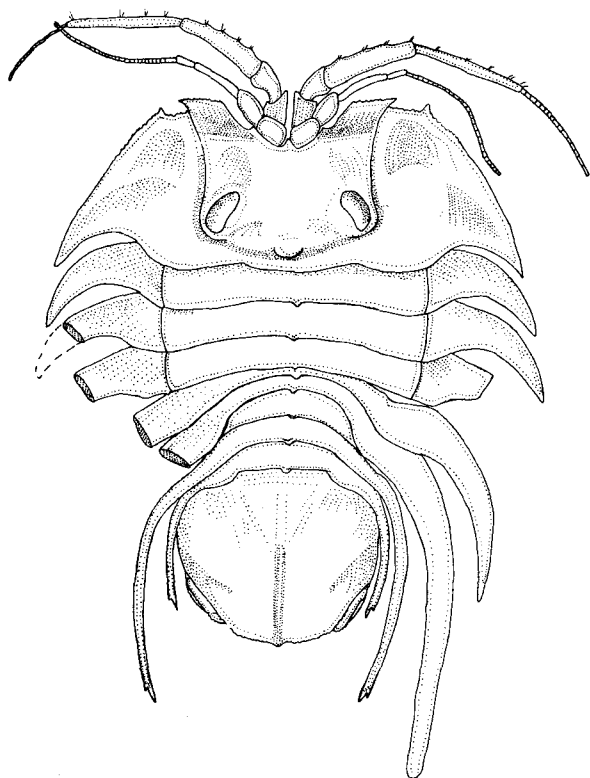


Figure 68. *Serolis (Serolis) maryannae*, n. sp., dorsal view female holotype.

Diagnosis: *Serolis* with coxal plates marked off on peraeonal somites 2-5. Third article of maxillipedal palp small. Uropoda biramous. Pleon with sharp pointed median posterior extension of mid-dorsal carina; lateral carinae lacking. First peraeonal somite with pronounced spine at antero-lateral angle. Eye lobes present, cephalon with mid-dorsal tubercle at posterior end. Each peraeonite except first somite with tubercle at posterior border at midline. Pleon lacking postero-lateral angles. Epimera of sixth peraeonal somite extending beyond apex of pleon by one times its length. Uropodal rami blunt, exopod one-third shorter than endopod, not extending to posterior margin of pleon.

Measurements: Female holotype length 18.8 mm, width pleon 7.2 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 201, type only, cat. no. I-225.

Distribution: Known only from type locality.

Affinities: The serrated pleonal apex of this species is unique. Otherwise the species is very close to *S. (S.) macdonnellae*.

GLABROSEROLIS, new genus

Type species: *Glabroserolis specialis*, n. sp.

Diagnosis: Serolidae with uniramous uropoda. Coxal plates not marked off on any peraeonal somite. First antenna one-half the width of expanded peduncular article of second. Second article of maxillipedal palp quadrate, not cordate. Basipodites of pleopods 1-3 with projecting setiferous inner proximal angles.

Composition: Unique.

Glabroserolis specialis, new species

Figure 69

Synonyms: None.

Diagnosis: *Glabroserolis* with shield-shaped pleon devoid of carinae or postero-lateral angles. Endopod of uropod pointed, one-third longer than peduncle, not visible in dorsal view. Lateral borders of peraeon quadrate, not projecting. Flagellum of second antenna shorter than last peduncular article.

Measurements: Holotype female length 3.3 mm., width pleon 1.95 mm.

Type locality: South Atlantic, L.G.O. Biotrawl No. 53, type and one female, one fragment, cat. no. I-194.

Distribution: Known only from type locality.

Affinities: A unique species in a unique genus. To a certain extent the genus resembles *Spinoserolis* Nordenstam, but it lacks coxal plate demarcation entirely and has the unusually expanded peduncular articles of the second antenna.

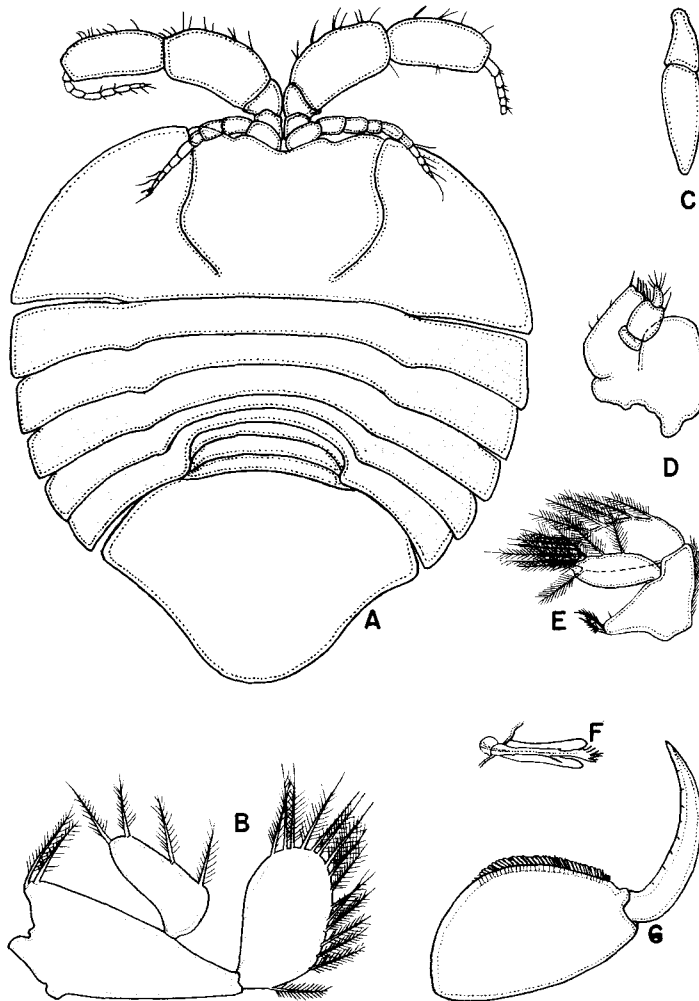


Figure 69. *Glabroserolis specialis*, n. sp. A: dorsal view female holotype; B: first pleopod; C: uropod; D: maxilliped; E: second pleopod; F: peraeopodal seta; G: peraeopod.

Subtribe : ANTHUROIDEA

Anthurids are seldom encountered in the abyss and are principally shallow water representatives. In the Atlantic four species, *Calathura brachiata* (Stimpson, *vide* Hansen, 1916), *Hyssura producta* Norman and Stebbing, *Ananthura abyssorum* (Norman and Stebbing), and *Anthelura truncata* (Hansen). The standard reference is Barnard's synopsis of the group. Here *Pseudanthura lateralis* Richardson is described from 1800 meters and a new species of *Leptanthura* is described from greater depth.

Diagnosis: Flabellifera with the individual peraeonal somites much longer than wide. Generally the uropoda arch over the telsonic somite (in all genera except *Pseudanthura*). The terminal abdominal segment (seventh) is probably a false telson or pseudotelson. First peraeopod generally subchelate.

A KEY TO THE GENERA OF THE ANTHUROIDEA HAVING ABYSSAL SPECIES (After Barnard, 1925)

- 1. Mouth parts adapted for piercing and sucking . . . 2
- 1. Mouth parts adapted for chewing 3
- 2. Uropoda lateral, exopod minute, not inflexed over pleotelson *Pseudanthura*
- 2. Uropoda with exopod inflexed over pleotelson . . . 5
- 3. First pleopod indurated, operculiform *Hyssura*
- 3. First pleopod similar to second, not operculiform . . 4
- 4. Peraeopods 2-3 not large *Anthelura*
- 4. Peraeopods 2-3 very similar to 1, large *Ananthura*
- 5. Maxilliped with three articles *Leptanthura*
- 5. Maxilliped with five articles *Calathura*

Genus: PSEUDANTHURA Richardson

Type species: Pseudanthura lateralis Richardson, 1911, pp. 523-524; — Barnard, 1920, pp. 343-344.

Diagnosis: Eyes absent. Mouth parts adapted for piercing and sucking. Telson not indurated, without statocyst. Maxilliped with four articles (palp with two articles). Peraeopods 4-7 with fifth joint not under-riding the sixth. Uropoda with small, lateral exopod; endopod and peduncle fused. All somites of pleon distinct dorsally and laterally. (Modified after Barnard 1925.)

Composition: The maxilliped in this genus has four articles not three, as indicated by Barnard (1925). The fusion of the uropodal endopod with the peduncle and the minute lateral exopods characterize this genus quite firmly. The genus contains only one species, and it ranges in depth from shallow water (930 meters) into the abyss (3200 meters).

Pseudanthura lateralis Richardson

Figure 70

Synonyms: *Pseudanthura lateralis* Richardson, 1911, pp. 524-525; — Barnard, 1920, pp. 344-345, Pl. XV; — 1925, p. 157.

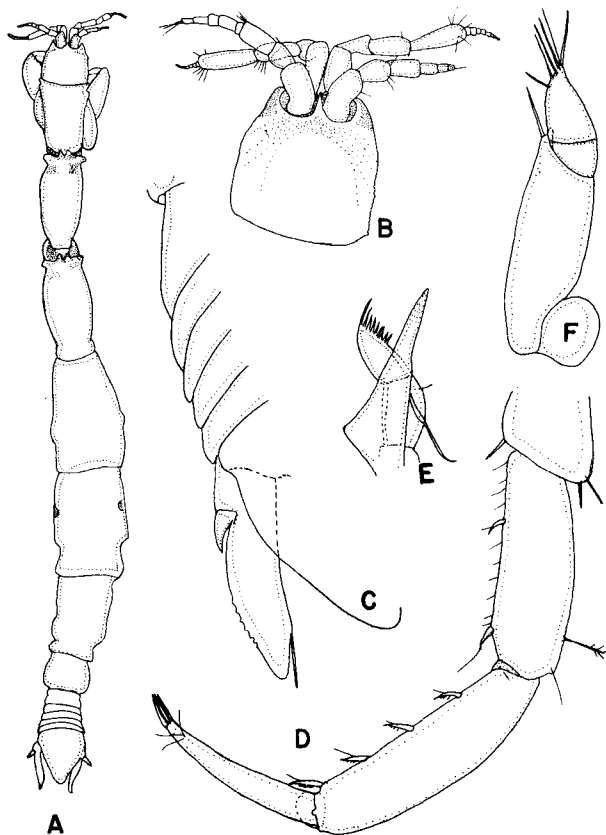


Figure 70. *Pseudanthura lateralis* Richardson, 1911. A: dorsal view male; B: cephalon; C: uropod; D: fifth peraeopod; E: mandible; F: maxilliped.

Diagnosis: *Pseudanthura* with a pair of stout tubercles medially at anterior border of peraeonal somites 3 and 4. Lateral border of uropodal endopod finely serrated. Apex of pleon pointed, without teeth or setae.

Measurements: Male length 16 mm., female length 18 mm. (Barnard, 1920). Richardson gave the length as 20.5 mm.

Type locality: Coast of Soudan between Dakar and Praya, *Talisman* Station 80 (930 meters), Station 83 (1139 meters), and Station 101 (3200 meters) (Richardson, 1911).

Distribution: Near Dakar, West Africa (930-3200 meters) and Cape Point, North Africa, 86° E., distant 43 miles, 1620-1800 meters (Barnard, 1920, p. 345). L.G.O. Biotrawl No. 54.

Remarks: While I am reasonably certain that the species described here is equal to Barnard's specimens, it may not be the same as Richardson's species. Richardson's (1911) description is incomplete and she gave no illustrations. The genus, however, is probably correct.

Genus: CALATHURA Norman and Stebbing, 1886

Type species: Calathura brachiata (Stimpson, 1853).

Diagnosis: Mouth parts piercing and sucking. Eyes absent or feebly developed. Peraeon not strongly keeled dorso-laterally, with dorsal pits; seventh somite short. Pleon with distinct somites. Maxilliped with five articles. Peraeopods 4-7 with fifth joint triangular, under-riding sixth. Pleopod 1 not indurated. Uropods with broad exopod inflexed over telson. (After Barnard, 1925.)

Composition: Restricted to the type species only by Barnard. The genus is known only from the northern hemisphere.

Calathura brachiata (Stimpson)

Figure 71

Synonyms: *Anthura brachiata* Stimpson, 1853, p. 43; — Richardson, 1905, p. 72 and references. *Calathura brachiata* (Stimpson), Norman and Stebbing, 1886, pp. 131-133, Pl. XXVI, Fig. 1; — Richardson, 1905, p. 72 and references; — Hansen, 1916, pp. 183-184, Pl. XV and references; — Barnard, 1925, p. 152. *Paranthura norwegica* Sars, 1873, p. 88. *Paranthura arctica* Sars, 1877, p. 347.

Diagnosis: Single species with generic characteristics sufficient to distinguish it (cf. Barnard, 1925, p. 152). Telson ovate-lanceolate, widest in the middle, apex acute, strongly concave dorsally in a longitudinal section, but plane in transverse section, a short narrow keel at base bearing a very fine median groove, followed by a very shallow ovate depression. (Barnard, op. cit., p. 152.)

Measurements: 45.5 mm. (Barnard, op. cit., p. 152).

Type locality: Duck Island, Bay of Fundy (Hargar, 1880).

Distribution: North Atlantic and Arctic, 5–735 fathoms (Barnard, op. cit., p. 152).

Barnard, from around 300 meters in the South Atlantic; and *Anthelura truncata* (Hansen) from the North Atlantic abyss. Here only the latter will be considered.

Anthelura truncata (Hansen)

Figure 72 A

Synonyms: *Cyathura truncata* Hansen, 1916, p. 182, Pl. XV. *Anthelura truncata* (Hansen), Barnard, 1925, p. 135.

Diagnosis: *Anthelura* with third palpal joint of mandible shorter than first, tipped with a few setae. Maxilliped without inner plate. Antenna 1 with two-jointed flagellum. Peraeopod 1 with fifth joint squarely projecting, palm slightly sinuous. Peraeopods 4–7 with fifth and sixth joints narrow. Telson broadly ovate, widest at basal third, with straight lateral

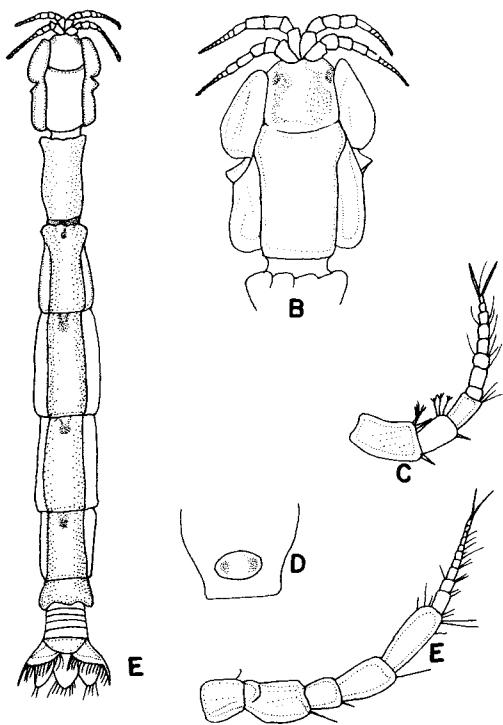


Figure 71. *Calathura brachiata* (Stimpson). A: dorsal view; B: cephalon; C: first antenna; D: statocyst; E: second antenna (Hansen, 1916).

According to Hansen (1916, p. 184), the species was collected at several *Ingolf* stations, and he reports the species from 2488 meters at latitude 48° 38' N., west of Brittany (Norman and Stebbing, 1869, p. 133). It is doubtful that this abyssal record is correct, but without specimens it is impossible to tell.

Genus: ANTHELURA Norman and Stebbing, 1886

Type species: *Anthelura elongata* Norman and Stebbing, 1886.

Diagnosis: Eyes absent. Peraeonal somites without dorsal pits. Pleon distinct at least laterally. Telson not indurated, moderately convex. Antenna 1 typically with brush-like flagellum in male, paucarticulate in female. Antenna 2 with flagellum paucarticulate. Maxilliped five-jointed. Peraeopods 4–7 with fifth joint not overriding sixth. Pleopod 1 not indurated. Exopod inflexed over telson. (After Barnard, 1925.)

Composition: The genus contains the type, from 1332 meters in the North Atlantic; *Anthelura ramipies*

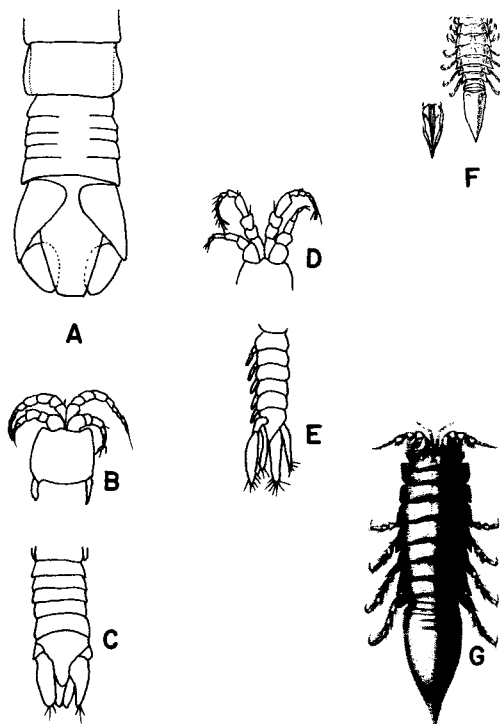


Figure 72. A: *Anthelura truncata* (Hansen), dorsal view of fragment. B–C: *Ananthura abyssorum* (Norman and Stebbing). B: cephalon; C: uropods. D–E: *Hyssura producta* Norman and Stebbing. D: cephalon; E: uropods. F: *Mesidothea magalura polaris* Gurjanova, dorsal view posterior. G: *Mesidothea megalura megalura* (G. O. Sars), dorsal view.

margins and truncate apex, dorsal surface convex. Uropod with endopod ovate, apex rounded, exopod ovate. (After Barnard, 1925.)

Measurements: To 10 mm. (Hansen, op. cit.).

Type locality: North Atlantic, *Ingolf* Station 24, Davis Strait, latitude 63° 06' N., longitude 56° 00' W., 2258 meters, temperature 2.4° C., five specimens.

Distribution: Also found at *Ingolf* Station 36, latitude 61° 50' N., longitude 56° 21' W., 2702 meters, temperature 1.5° C., two specimens (Hansen, op. cit.).

Genus: ANANTHURA Barnard, 1925

Type species: *Ananthura sulcata* Barnard, 1925, p. 136.

Diagnosis: Anthuroidea with chewing mouth parts. Eyes feeble or absent. Peraeon not dorso-laterally keeled, dorsal pits in one species. Pleonal somites distinct. Telson lenticular in cross-section, somewhat indurated. Mandible with first and third palpal joints subequal, latter with a comb of setae. Maxilliped five-jointed with small inner plate which may not be present in all species. Peraeopods 2 and 3 nearly as large as peraeopod 1. Peraeopods 4-7 with fifth joint short but not underriding sixth. Pleopod 1 not indurated. Uropod with endopod long, subequal to peduncle, exopod closing over telson.

Composition: Besides the bathyal Atlantic type, Barnard (1925) included two additional species, *A. ovalis* Barnard from the Mediterranean and the Atlantic abyssal *Ananthura abyssorum* (Norman and Stebbing), which is here described.

Ananthura abyssorum (Norman and Stebbing)
Figure 72 B-C

Synonyms: *Anthelura abyssorum* Norman and Stebbing, 1886, pp. 127-128, Pl. 27. *Ananthura abyssorum* (Norman and Stebbing), Barnard, 1925, p. 137.

Diagnosis: *Ananthura* with antennal flagella multi-articulate. Palm of first peraeopod with about eight slender spine-like setae. Palm of second pair with three spines and a few setae. Carpus and propod of last peraeopod each furnished with two forked spines on anterior margin. Telson with acute apex and equal in length to uropods. (From Norman and Stebbing, op. cit. p. 127.)

Measurements: Length 9 mm.

Type locality: North Atlantic near entrance of Davis Strait, *Valorous* Station 8, latitude 59° 11' N., longitude 50° 25' W., 3199 meters.

Distribution: Known only from type locality.

Genus: HYSSURA Norman and Stebbing, 1886

Type species: *Hyssura producta* Norman and Stebbing, 1886.

Diagnosis: Anthuroidea without eyes. Mouth part adapted for chewing. Dorso-lateral keels and pits lacking from peraeon. Telson indurated, without statocysts. Antennal flagellum pauci-articulate. Mandible with third palpal joint subequal to first, with comb of setae. Maxilliped five-jointed, with inner

plate. Peraeopods 4-6 with fifth, joint not underriding sixth. Somite 7 without peraeopods. Pleopod 1 not operculiform, not larger than others. Uropods with narrow rami, exopod folding down over telson.

Composition: The genus contains two deep sea species, *producta* and *profunda* Barnard.

Hyssura producta Norman and Stebbing
Figure 72 D-E

Synonyms: *Hyssura producta* Norman and Stebbing, 1886, pp. 128-129, Pl. 25; — Barnard, 1925, p. 137.

Diagnosis: *Hyssura* with narrow cylindrical telson. Endopod of uropod terete, longer than peduncle; exopod very narrow, terete. Peraeopods 4-6 with fourth joint twice as long as broad. (After Barnard, 1925.)

Measurements: Length about one quarter of an inch.

Type locality: North Atlantic, *Valorous* Station 11, latitude 56° 11' N., longitude 37° 41' W., 2651 meters.

Distribution: Known only from type locality.

Genus: LEPTANTHURA G. O. Sars

Type species: *Leptanthura tenuis* (Sars) 1872, Barnard, 1925, p. 150.

Diagnosis: Anthuroidea with piercing and sucking mouth parts, eyes absent. No dorsal pits. Pleon with distinct sutures. Telson shorter than pleon, concave dorsally, thin, not indurated; single statocyst at proximal end. Antenna 1 with brush-like flagellum in male, rudimentary in female. Flagellum antenna 2 rudimentary in both sexes. Mandible with third palpal joint shorter than first, with two apical setae. Maxilliped three-jointed, second joint much the longest. Peraeopods 4-7 with fifth joint underriding sixth. Pleopod 1 not indurated. Uropods with endopod almost as broad as peduncle, exopod broadly oval, meeting at midline and folding down over telson.

Composition: Besides the shallow water type, the genus also contains *affinis* (Bonnier), 1410 meters; *glacialis* Hodgson, 1910, from around 300 meters; *orientalis* Barnard, intertidal?, *thori* Barnard, 952 meters; *laevigata* (Stimpson), from around 200 meters; *truncata* Richardson, 1911, from 888 meters; *chiltoni* (Beddard, 1886), from around 1400 meters; *diemenensis* (Haswell), littoral, and *hendili* Wolff from 6000 meters. Prior to this work an abyssal Atlantic species was unknown.

Leptanthura species
No figure

Two specimens, a male and a female of a species of *Leptanthura*, were found in L.G.O. Biotrawl No. 22. They were too damaged to permit specific identification even though the generic designation was

possible. This record is given here only to indicate that the genus does penetrate the Atlantic abyss; previously only *L. hendili* Wolff from the Pacific was known from abyssal depth.

Subtribe : CIROLANOIDEA

Cirolanid type isopods morphologically retain the greatest number of truly primitive and embryonal characters. Nevertheless, this type is not known for certain from depths exceeding 2000 meters. Two species, both members of the typically pelagic genus *Eurydice*, have been caught in dredge hauls fishing the depths and the surface in the Atlantic. These are: *Eurydice grimaldi* Dollfuss, Stephensen, 1915 (0–2600 meters) and *Eurydice stygia* G. O. Sars, Hansen, 1916 (527–2356 meters).

The greatest depth from which Cirolanoidea are known is 1958 meters, based on the *Challenger* capture of the certainly benthic sphaeromid *Naesicoepea abyssorum* Beddard from the South Pacific. The parasitic *Anilocra meridionalis* Searle, taken from 2000–2500

meters in the South Pacific, should probably be included among the pelagic species.

Anuropus, an exceedingly primitive genus (family: Anuropidae), has been identified as bathypelagic by Menzies and Dow (1958).

Bathynomous is doubtless a truly benthic genus. The greatest depth from which it has been reported is 1719 meters, and the shallowest is 357 meters. It is known mainly from the seas accessory to the oceans—e.g., Gulf of Bengal, Caribbean, South China Sea. Although very primitive, it has not succeeded in penetrating the abyss of the oceans. Perhaps it is best viewed as a relict descendant of the Mesozoic period. It is known as fossil from the Miocene of Japan (Imaizumi, 1953).

Tribe : VALVIFERA

Valviferans are in general alga feeders and are generally restricted to shelf depth, except for the Arcturidae, which contains filter-feeding types. These arcturids are quite common in shallow water, and one species, *Antarcturus spinosus* Beddard, has been reported from the abyss (2516 meters) in the South Atlantic Ocean. Four species of *Antarcturus* are known from

the Antarctic abyss, and one is known from the Indian Ocean abyss. One species was present in the *Vema* collections from the South Atlantic.

Besides the arcturids, *Mesidothea* has one subspecies which penetrates the abyss of the Arctic.

Diagnosis: Isopoda with the uropods valve-like, flexed under the pleotelson as an operculum.

Family : ARCTURIDAE

Diagnosis: Valvifera with biramous uropods. Peraeopods 2–4 directed toward the cephalon, provided with plumose setae, not prehensile. Last three peraeopods clinging or walking appendages.

Composition: Stephensen (1947) has presented a review of the arcturids. The majority of the species are found in cold water and at shallow depths. The poles are typified by their own genera, *Arcturus* from the high northern latitudes and *Antarcturus* from high southern latitudes. Stephensen (op. cit.) has also provided a key to the 30 species of *Antarcturus* known up to 1940.

downward and forward; mouth organs visible in lateral view. Pleon with three somites anterior to pleotelson, which are indistinctly marked off by shallow grooves. Length of pleon not exceeding length of the last five peraeonal somites together. Flagellum of second antenna with four or five articles. First peraeopods prehensile. Antennae as long as or longer than body.

Type species: *Arcturus furcatus* Studer, 1884, pp. 12–15, Pl. I; — Zur Strassen, 1902, p. 686; — Nordenstam, 1933, p. 129.

Genus: ANTARCTURUS Zur Strassen, 1902

Antarcturus species
No figure

Synonyms: *Antarcturus*, Nordenstam 1933, p. 122; — Stephensen, 1940, p. 17.

Diagnosis: First peraeonal somite coalesced with cephalon, yet separated by a shallow groove. Lateral margins of the first peraeonal somite not prolonged

A large fragmentary specimen of a species of *Antarcturus* which is perhaps closely related to *A. glacialis* (Beddard) but with sharper and fewer dorsal spines was collected by *Vema* at L.G.O. Biotrawl No. 214. The animal, with its pleon 9.7 mm. long, was

poorly preserved and description of it is not indicated at this time. It is mentioned here only because of its abyssal nature.

Locality: South Atlantic, L.G.O. Biotrawl No. 214.

Genus: MESIDOTHEA Richardson

Type species: *Mesidothea entomon* (Linnaeus), Richardson, 1905, pp. 347-348.

Diagnosis: Valvifera with uniramous uropoda. First antenna with four articles. Flagellum with a single article. Flagellum of second antenna multi-articulate. Peraeopods 1-3 prehensile without plumose setae. Pleon consisting of five complete somites.

Composition: This genus formerly contained only two species—the blind *sabini* and the eye-bearing type, *entomon*. Gurjanova (1946, pp. 105-44) has provided a review of *Mesidothea*. She states, "A comparative analysis of species and forms of *Mesidothea* makes it possible to establish a continued row of morphological variations from the abyssal *M. megalura megalura* (G. Sars) through the intermediate *M. megalura polaris* Gurjanova, *M. sabini megaluroides* Gurjanova and *M. sabini sabini* to *M. sabini robusta* Gurjanova, and from *M. sibirica* (Birula) to *M. entomon vetterensis* Ekman, through the intermediate Far Eastern and Siberian estuary forms." This statement favors a recent penetration of the abyss by *Mesidothea*.

Mesidothea megalura polaris Gurjanova
Figure 72 F

Synonym: *Mesidothea megalura polaris* Gurjanova, 1946a, pp. 280-281, 295 (English).

Diagnosis: *Mesidothea megalura* with clearly pentagonal pleon, epimera upturned and body more rugose than in subspecies.

Measurements: 56 mm.

Type locality: Arctic Ocean, Sedov Station 100, latitude 81° 10' N., longitude 137° 17' E., 2500 meters one specimen (Gurjanova, op. cit.).

Distribution: Known only from the Arctic Ocean abyss. Not captured by *Vema*.

Mesidothea megalura megalura (G. O. Sars)
Figure 72 G

Synonyms: *Chiridothea megalura* G. O. Sars, 1879, p. 432; — Ohlin, 1901, p. 24, Figs. 4a-d. *Mesidothea megalura* (G. O. Sars), Hansen, 1916, p. 187. *Mesidothea megalura megalura* (G. O. Sars), Gurjanova, 1946a.

Diagnosis: *Mesidothea megalura* with the epimeral plates (coxal plates) not upturned. Body less coarse than *M. megalura polaris* Gurjanova and smaller in size. Pleon spear point-shaped, not pentagonal.

Measurements: Female 52 mm. long (Hansen, op. cit.).

Type locality: North Atlantic, between Norway and Spitzbergen (Hansen, op. cit., p. 187).

Distribution: A cold water abyssal species in the North Atlantic. It was found by the *Ingolf* at Station 112, latitude 67° 57' N., longitude 6° 44' W., 2386 meters, temperature -1.1° C., two specimens; Station 118, latitude 68° 27' N., longitude 8° 22' W., 1996 meters, temperature -1.0° C., four specimens; Station 113, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temperature -1.0° C., seven specimens (Hansen, op. cit.). Not captured by *Vema*.

LIST OF ATLANTIC ABYSSAL BIOLOGICAL TRAWL SAMPLES OF THE LAMONT GEOLOGICAL OBSERVATORY

- L.G.O. Biotrawl No. 1, *Vema-7-1*, 12 November 1955, 5104–5122 meters, latitude 20° 3.2' N, longitude 68° 21.1' W., Antilles Outer Ridge, north of the Puerto Rico Trench, EBTOC, species of isopods captured:
Abyssianira dentifrons Menzies
Echinothambema ophiuroides Menzies
Eurycope (Indeterminable)
Haplomiscus unicornis Menzies
Ianirella vema Menzies
Syneurycope hanseni Menzies
- L.G.O. Biotrawl No. 2, *Vema-7-2*, 1 December 1955, 3425 meters, latitude 11° 16.6' N., longitude 79° 14.4' W., southwestern part of Colombia Abyssal Plain in western Caribbean, EBTOC, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 5, *Theta-1-1*, 8 September 1956, 3028 meters, latitude 27° 05–06' N., longitude 15° 17.9–19.4' W., Upper Continental Rise off the coast of Río de Oro, Africa, EBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 6, *Theta-1-3*, 11 September 1956, 4738 meters, latitude 26° 7–28.9' N., longitude 22° 12.0–12.2' W., northeast corner Cape Verde Abyssal Plain, EBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 7, *Theta-1-4*, 23 September 1956, 5779 meters, latitude 29° 17.6' N., longitude 57° 20.3' W., Abyssal Hills between Nares and Sohm Abyssal Plains, EBT, species of isopods captured:
Abyssijaera acarina, new species
Eurycope complanata Bonnier
- L.G.O. Biotrawl No. 8, *Theta-1-5*, 25 September 1956, 4488 meters, latitude 31° 30.3–33.5' N., longitude 64° 12.5'–65° 15.5' W., Bermuda Apron southeast of Bermuda, EBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 9, *Theta-1-6*, 26 September 1956, 5166 meters, latitude 31° 41–43' N., longitude 68° 08' W., Bermuda Plateau near western edge of Bermuda Rise, EBT, species of isopods captured:
Desmosoma birsteini, new species
Eurycope (Indeterminable)
Storhyngura vema, new species
- L.G.O. Biotrawl No. 10, *Theta-1-7*, 27 September 1956, 5325 meters, latitude 32° 16.4–21.5' N., longitude 69° 08.8–13.4' W., Bermuda Rise near northwest boundary, EBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 11, *Theta-1-8*, 30 September 1956, 2238 meters, latitude 38° 33.1–35.7' N., longitude 72° 32.1–34.4' W., Upper Continental Rise southeast of New York, EBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 12, *Vema-12-1*, 6 April 1957, 5024 meters, latitude 38° 58.5' S., longitude 41° 45' W., northern part of Argentine Rise southeast of Río Grande LBT, species of isopods captured:
Abyssianira dentifrons Menzies
Acanthocope argentinae, new species
Eurycope (Indeterminable)
Haplomesus bifurcatus, new species
Haplomiscus bicuspis (G. O. Sars)
Haplomiscus minutus, new species
Haplomiscus ovalis, new species
Haplomiscus parallelus, new species
Haplomiscus tridens, new species
Haplomiscus (Indeterminable)
Ilyarachna argentinae, new species
Ischnomesus bidens, new species
Ischnomesus magnificus, new species
Ischnomesus paucispinis, new species
Ischnomesus (Indeterminable)
Macrostylis bipunctatus, new species
Nannoniscoides hirsutus, new species
Serolis (*Serolis*) *vema*, new species
Stylomesus inermis (Vanhöffen)
Stylomesus simplex, new species
Stylomesus spinulosus, new species
Stylomesus (Indeterminable)
Xostylus parallelus, new species
- L.G.O. Biotrawl No. 13, *Vema-12-1*, 15 April 1957, 4000 meters, latitude 40° 10' S., longitude 6° 05' W., Eastern Steps of Mid-Atlantic Ridge south-east of Tristan da Cunha, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 14, *Vema-12-2*, 30 April 1957, 3049 meters, latitude 30° 14.9' S., longitude 13° 03' E., Upper Continental Rise southeast of Port Nolloth, Union of South Africa, SBT, species of isopods captured:
Antennuloniscus dimeroceras (Barnard)
Eurycope ovaloides, new species
Haplomiscus princeps, new species
Haplomiscus rugosus, new species
Haplomiscus trituberculatus, new species
Ilyarachna africana, new species
Ilyarachna triangulata, new species
Ilyarachna (Indeterminable)
Ischnomesus decemspinus, new species
Storhyngura triplispinosa, new species
- L.G.O. Biotrawl No. 15, *Vema-12-3*, 2 May 1957, 4935 meters, latitude 28° 25.2' S., longitude 8° 28.5' E., northern end of Orange Abyssal Plain, SBT, species of isopods captured:
Vemathambema elongata, new species
- L.G.O. Biotrawl No. 16, *Vema-12-4*, 3 May 1957, 2970 meters, latitude 25° 33' S., longitude 12° 27' E., Upper Continental Rise off Walvis Bay, South Africa, SBT, species of isopods captured:
Acanthaspida bifurcata, new species
Desmosoma (Indeterminable)

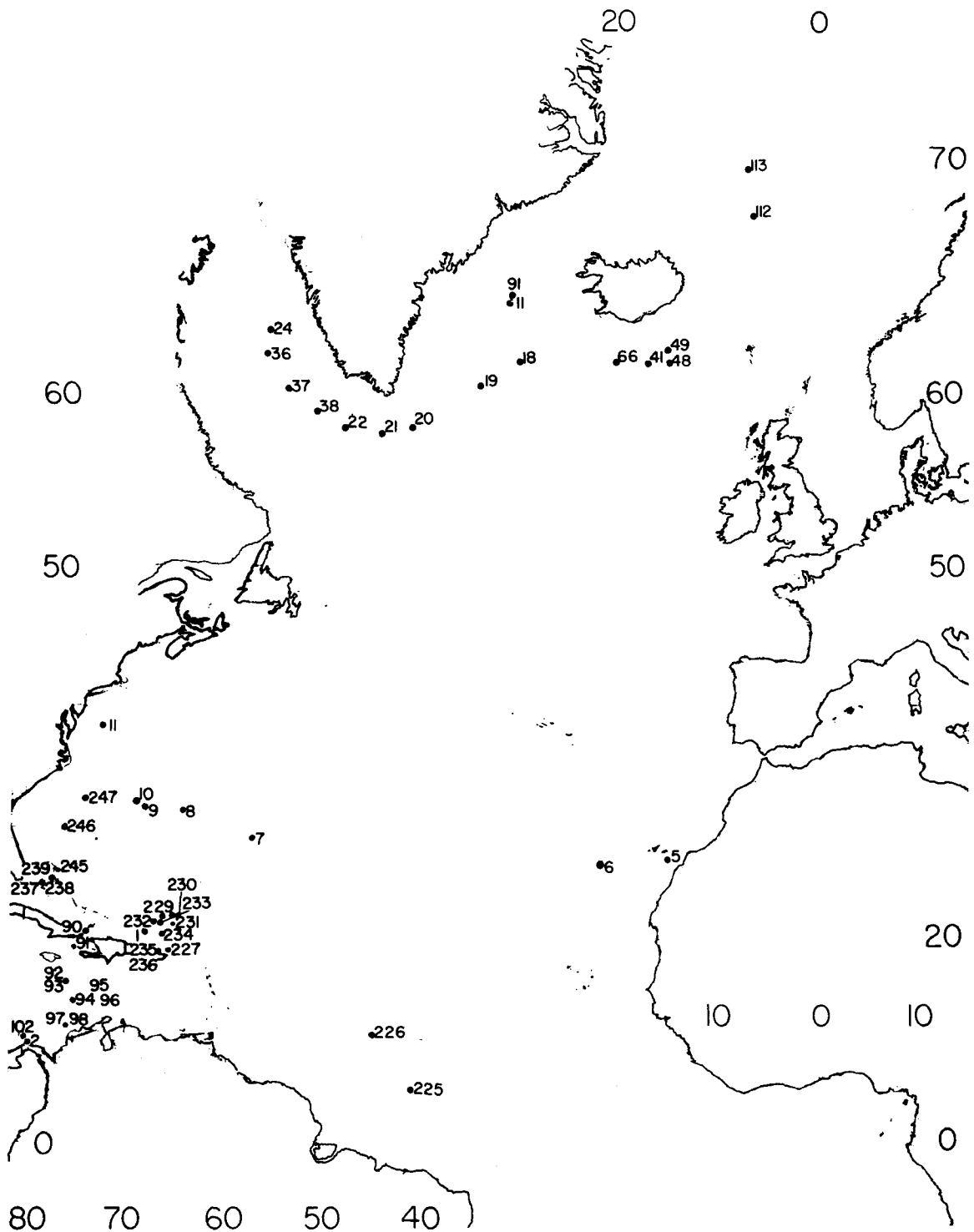


Figure 73. Chart of Lamont Geological Observatory Deep-Sea Biotrawl Stations in the North Atlantic. Stations north of 50° N. are Ingolf stations.

- Eurycope* (Indeterminable)
- Haploniscus percavix*, new species
- Haploniscus spinifer* Hansen
- Nannoniscus* (Indeterminable)
- Spinianirella walfishensis*, new species

L.G.O. Biotrawl No. 17, *Vema*-12-5, 4 May 1957, 126 meters, latitude 24° 18' S., longitude 14° 07.5' E., SBT, species of isopods captured:
Desmosoma striata, new species

L.G.O. Biotrawl No. 18, *Vema*-12-6, 7 May 1957, 4047 meters, latitude 23° 00' S., longitude 08° 11' E., crest of Walvis Ridge Front Range west of Walvis Bay, South-west Africa, SBT, species of isopods captured:
Acanthocope unicornis, new species
Acanthocope (Indeterminable)
Desmosoma (Indeterminable)
Haplomesus ornatus, new species
Haploniscus spinifer Hansen

- Haploniscus* (Indeterminable)
Ischnomesus wolffi, new species
Ischnomesus (Indeterminable)
Notoxenoides vema, new species
- L.G.O. Biotrawl No. 19, *Vema*-12-7, 7 May 1957, 2701 meters, latitude 22° 58.5' S., longitude 07° 00' E., crest of Walvis Ridge west of Walvis Bay, Southwest Africa, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 20, *Vema*-12-8, 9 May 1957, 4945 meters, latitude 22° 41' S., longitude 03° 16' E., lower part of the western flank of Walvis Ridge, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 22, *Vema*-12-10, 21 May 1957, 2997 meters, latitude 5° 53.5' S., longitude 9° 51.5' E., northern wall of Congo Submarine Canyon, Upper Continental Rise, SBT, species of isopods captured:
Antennuloniscus dimeroceras (Barnard)
Haploniscus quadrifrons, new species
Haploniscus (Indeterminable)
Leptanthura species
Macrostylis hirsuticaudis, new species
- L.G.O. Biotrawl No. 23, *Vema*-12-11, 23 May 1957, 3921 meters, latitude 6° 19.3' S., longitude 8° 18.5' E., Congo Cone near active canyon on Lower Continental Rise, SBT, species of isopods captured:
Antennuloniscus dimeroceras (Barnard)
Haploniscus quadrifrons, new species
Macrostylis abyssicola Hansen
- L.G.O. Biotrawl No. 24, *Vema*-12-12, 24 May 1957, 3919 meters, latitude 5° 45' S., longitude 8° 29' E., Lower Continental Rise, north edge of Congo Cone, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 25, *Vema*-12-13, 27 May 1957, 4139 meters, latitude 4° 13.9' S., longitude 0° 18' W., an extension of Cameroun trend in Eastern Steps of Mid-Atlantic Ridge southwest of Annobon Island, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 26, *Vema*-12-15, 1 June 1957, 4707 meters, latitude 1° 52' S., longitude 16° 04.5' W., Eastern Steps of Mid-Atlantic Ridge northeast of Romanche Trench, equatorial Atlantic, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 46, *Vema*-14-22, 6 March 1958, 3705 meters, latitude ±55° 19' S., longitude ±37° 57' W., Archipelagic Apron of Menzies Seamount southwest of South Georgia, eastern Scotia Sea, SBT, species of isopods captured:
 No specimens captured
- L.G.O. Biotrawl No. 47, *Vema*-14-23, 6 March 1958, 3756 meters, latitude 55° 29' S., longitude 37° 57' W., SBT, Archipelagic Apron of Menzies Seamount southwest of South Georgia, eastern Scotia Sea, species of isopods captured:
Antennuloniscus ornatus, new species
Haploniscus tricornis, new species
Storhyngura (Indeterminable)
Stylomesus (Indeterminable)
- L.G.O. Biotrawl No. 48, *Vema*-14-24, 7-8 March 1958, 3473 meters, latitude 56° 37' S., longitude 34° 48' W., Abyssal Hills eastern Scotia Sea southeast of South Georgia Island, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 49, *Vema*-14-25, 9 March 1958, 2741 meters, latitude 56° 43' S., longitude 27° 41' W., western side of the South Sandwich Island arc between Visokoi and Lesokov Islands, SBT, species of isopods captured:
Desmosoma (Indeterminable)
Eurycope (Indeterminable)
Haploniscus (Indeterminable)
Serolis (*Serolis*) *macdonnellae*, new species
- L.G.O. Biotrawl No. 50, *Vema*-14-27, 17-18 March 1958, 3776 meters, latitude 57° 39' S., longitude 13° 32' W., on the scarp which marks the boundary between the Lower Step and the Middle Step of the Mid-Atlantic Ridge east of the South Sandwich Islands, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 51, *Vema*-14-28, 28 March 1958, 4588 meters, latitude 45° 34' S., longitude 06° 02' E., western flank of the Walvis Ridge northwest of Meteor Seamount, SBT, species of isopods captured:
Abyssianira dentifrons Menzies
Antennuloniscus armatus, new species
Eurycope (Indeterminable)
Haploniscus acutus, new species
Haploniscus spatulifrons, new species
Haploniscus tricornis, new species
Haploniscus trituberculatus, new species
Haploniscus tuberculatus, new species
Haploniscus (Indeterminable)
Hydroniscus ornatus, new species
Ianirella magnifrons, new species
Macrostylis bifurcatus, new species
Macrostylis bipunctatus, new species
Serolis (*Serolis*) *vema*, new species
Storhyngura triplispinosa, new species
Stylomesus elegans, new species
Stylomesus granulosus, new species
- L.G.O. Biotrawl No. 52, *Vema*-14-29, 30 March 1958, 4960 meters, latitude 41° 03' S., longitude 07° 49' E., south-western flank of the Schmidt-Ott Rise southwest of Capetown, SBT, species of isopods captured:
Antennuloniscus armatus, new species
Antennuloniscus rostratus, new species
Eurycope acutitelson, new species
Eurycope (Indeterminable)
Haplomesus ornatus, new species
Haploniscus elevatus, new species
Haploniscus parallelus, new species
Haploniscus polaris, new species
Haploniscus telus, new species
Haploniscus tricornoides, new species
Haploniscus (Indeterminable)
Ilyarachna multispinosa, new species
Ilyarachna nodifronoides, new species
Ischnomesus simplissimus, new species
Ischnomesus wolffi, new species
Ischnomesus (Indeterminable)
Macrostylis bifurcatus, new species
Macrostylis bipunctatus, new species
Syneurycope multispina, new species
- L.G.O. Biotrawl No. 53, *Vema*-14-31, 4 April 1958, 4885 meters, latitude 36° 34' S., longitude 14° 08' E., Lower Continental Rise southwest of Capetown, SBT, species of isopods captured:
Acanthocope annulatus, new species
Acanthomunna beddardi, new species
Eurycope nodosa, new species
Eurycope (Indeterminable)
Glabroserolis specialis, new species
Haploniscus bicuspis (G. O. Sars)

- Haploniscus nondescriptus*, new species
Haploniscus percavix, new species
Haploniscus princeps, new species
Haploniscus rugosus, new species
Ianirella bifida, new species
Ilyarachna gurjanovae, new species
Ilyarachna simplex, new species
Ilyarachna indentifrons, new species
Ischnomesus simplissimus, new species
Ischnomesus (Indeterminable)
Macrostylis bipunctatus, new species
Macrostylis (Indeterminable)
Nannoniscus laevis, new species
Storthingura symmetrica, new species
Storthingura triplispinosa, new species
Stylomesus simplex, new species
- L.G.O. Biotrawl No. 54, *Vema*-14-32, 6 April 1958, 1816 meters, latitude 34° 35' S., longitude 17° 31' E., SBT, species of isopods captured:
Antennuloniscus dimeroceras (Barnard)
Dendromunna spinipes, new species
Gnathia albescenoides, new species
Ilyarachna (Indeterminable)
Notoxenoides abyssis, new species
Pseudanthura lateralis Richardson
Spinianirella walfishensis, new species
- L.G.O. Biotrawl No. 55, *Vema*-14-33, 6 April 1958, 706 meters, latitude 34° 26' S., longitude 17° 32' E., SBT species of isopods captured:
Gnathia vema, new species
Haploniscus capensis, new species
Ilyarachna spinoafricana, new species
- L.G.O. Biotrawl No. 76, *Vema*-14-48, 9 July 1958, 2526 meters, latitude 34° 14' N., longitude 24° 10' E., SBT, species of isopods captured:
Haplomesus tropicalis, new species
- L.G.O. Biotrawl No. 90, *Vema*-15-5, 4 November 1958, 3378 meters, latitude 20° 30' N., longitude 73° 16' W., gap between Old Bahama Abyssal Plain and Hispaniola-Caicos Abyssal Plain, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 91, *Vema*-15-6, 5 November 1958, 3897-4080 meters, latitude 19° 26' N., longitude 75° 09' W., south scarp of Clayman Trench, south of Guantanamo Bay, Cuba, SBT, species of isopods captured: none.
- L.G.O. Biotrawl No. 92, *Vema*-15-7, 6 November 1958, 3094-3076 meters, latitude 15° 51' N., longitude 75° 11' W., escarpment west of Colombia Abyssal Plain, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 93, *Vema*-15-8, 6 November 1958, 3071 meters, latitude 15° 51' N., longitude 75° 11' W., escarpment west of Colombia Abyssal Plain, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 94, *Vema*-15-9, 7 November 1958, 4071 meters, latitude 14° 05' N., longitude 75° 25' W., Central part of Colombia Abyssal Plain, SBT, species of isopods captured:
AcanthoCOPE (Indeterminable)
EuryCOPE (Indeterminable)
Heteromesus bifurcatus, new species
Mesosignum kohleri, new species
- L.G.O. Biotrawl No. 95, *Vema*-15-10, 7 November 1958, 4071 meters, latitude 14° 05' N., longitude 75° 25' W., central part of Colombia Abyssal Plain, SBT, species of isopods captured:
Haplomesus tropicalis, new species
- Mesosignum kohleri*, new species
Storthingura snanoi, new species
- L.G.O. Biotrawl No. 96, *Vema*-15-11, 7 November 1958, 4076 meters, latitude 14° 05' N., longitude 75° 25' W., central part of Colombia Abyssal Plain, SBT, species of isopods captured:
AcanthoCOPE (Indeterminable)
Mesosignum kohleri, new species
- L.G.O. Biotrawl No. 97, *Vema*-15-12, 8 November 1958, 2868-2875 meters, latitude 11° 30' N., longitude 75° 50' W., Continental Rise northwest off Cartagena, Colombia, SBT, species of isopods captured:
Mesosignum kohleri, new species
Nannoniscus primitivus, new species
- L.G.O. Biotrawl No. 98, *Vema*-15-13, 8 November 1958, 2875-2941 meters, latitude 11° 30' N., longitude 75° 50' W., Continental Rise northwest off Cartagena, Colombia, SBT, species of isopods captured:
Ilyarachna (Indeterminable)
Ischnomesus (Indeterminable)
Macrostylis caribbicus, new species
Mesosignum kohleri, new species
Mesosignum usheri, new species
- L.G.O. Biotrawl No. 100, *Vema*-15-15, 9 November 1958, 1714 meters, latitude 10° 11' N., longitude 78° 30' W., SBT, species of isopods captured:
Haploniscus tropicalis, new species
Ischnomesus caribbicus, new species
Nannoniscus camayae, new species
- L.G.O. Biotrawl No. 101, *Vema*-15-16, 9 November 1958, 1615-1533 meters, latitude 10° 11' N., longitude 78° 30' W., SBT, species of isopods captured:
EuryCOPE (Indeterminable)
Haploniscus tropicalis, new species
- L.G.O. Biotrawl No. 102, *Vema*-15-17, 10 November 1958, 2076 meters, latitude 10° 13' N., longitude 78° 33' W., Continental Rise north of Colón, Panama, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 103, *Vema*-15-18, 10 November 1958, 1906-1800 meters, latitude 10° 13' N., longitude 78° 33' W., SBT, species of isopods captured:
Desmosoma magnispinum, new species
- L.G.O. Biotrawl No. 107, *Vema*-15-22, 10 November 1958, 975 meters, latitude 09° 46.3' N., longitude 79° 37.5' W., SBT, species of isopods captured:
Ilyarachna (Indeterminable)
Ischnomesus multispinis, new species
Nannoniscus (Indeterminable)
- L.G.O. Biotrawl No. 199, *Vema*-15-115, 14 March 1959, 3275 meters, latitude 55° 18.2' S., longitude 64° 08.6' W., Estados Escarpment south of Staten Island, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 200, *Vema*-15-116, 15 March 1959, 3813 meters, latitude 55° 42.9' S., longitude 64° 21.6' W., Continental Rise south of Staten Island, northwest Scotia Sea, SBT, species of isopods captured:
Ilyarachna scotia, new species
Serolis (*Serolis*) *margaretae*, new species
SyneuryCOPE heezeni, new species
- L.G.O. Biotrawl No. 201, *Vema*-15-117, 15 March 1959, 3839 meters, latitude 55° 31.2' S., longitude 64° 07.5' W., Continental Rise south of Staten Island, northwest Scotia Sea, SBT, species of isopods captured:
Antennuloniscus ornatus, new species
EuryCOPE antarctica Vanhöffen
EuryCOPE vicarius Vanhöffen

- Eurycope* (Indeterminable)
Ilyarachna (Indeterminable)
Munna (*Munna*) *argentinae*, new species
Serolis (*Serolis*) *maryannae*, new species
Syneurycope heezeni, new species
- L.G.O. Biotrawl No. 202, *Vema*-15-118, 16 March 1959, 3776 meters, latitude 55° 44.2' S., longitude 64° 11.5' W., Continental Rise south of Staten Island, northwest Scotia Sea, SBT, species of isopods captured:
Storhyngura birsteini, new species
- L.G.O. Biotrawl No. 203, *Vema*-15-119, 17 March 1959, 3959 meters, latitude 57° 04' S., longitude 61° 25' W., Northern Rift Mountains of the Triton Rift System in the western Scotia Sea south of Burdwood Bank, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 204, *Vema*-15-120, 20 March 1959, 4146 meters, latitude 57° 32.1' S., longitude 55° 09.5' W., Southern Rift Mountains of the Triton Rift System, western Scotia Sea south of Burdwood Bank, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 205, *Vema*-15-121, 22 March 1959, 3963 meters, latitude 54° 45.8' S., longitude 52° 02' W., Abyssal Hills south of the Scotia Ridge east of Burdwood Bank, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 206, *Vema*-15-122, 24 March 1959, 2526 meters, latitude 52° 10.8' S., longitude 49° 04.9' W., south side of Falkland Ridge near the north wall of the Malvinas Chasm, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 207, *Vema*-15-123, 25 March 1959, 2681 meters, latitude 50° 23.2' S., longitude 47° 25' W., central part of Falkland Ridge northeast of the Falkland Islands, SBT, species of isopods captured:
Abyssianira argentinensis, new species
- L.G.O. Biotrawl No. 208, *Vema*-15-124, 26 March 1959, 2738 meters, latitude 49° 35' S., longitude 48° 04.6' W., 200 fathoms below the top of the Falkland Escarpment northeast of the Falkland Islands, SBT, species of isopods captured:
Haplomiscus (Indeterminable)
Stylomesus elegans, new species
- L.G.O. Biotrawl No. 209, *Vema*-15-125, 27 March 1959, 5042 meters, latitude 49° 21.2' S., longitude 47° 44.6' W., lower part of Falkland Escarpment northeast of the Falkland Islands, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 210, *Vema*-15-126, 28 March 1959, 6079 meters, latitude 47° 57.5' S., longitude 48° 03' W., southern part of Argentine Abyssal Plain, SBT, species of isopods captured:
Stylomesus inermis (Vanhöffen)
- L.G.O. Biotrawl No. 211, *Vema*-15-127, 30 March 1959, 5933 meters, latitude 45° 44' S., longitude 50° 45' W., southwest flank of the Argentine Rise southeast of Bahía Blanca, Argentine Republic, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 212, *Vema*-15-128, 31 March 1959, 5843 meters, latitude 44° 53.3' S., longitude 51° 26.5' W., southwest flank of the Argentine Rise southeast of Bahía Blanca, Argentine Republic, SBT, species of isopods captured:
Antennuloniscus dimeroceas (Barnard)
Haplomiscus tridens, new species
Ilyarachna (Indeterminable)
- Nannoniscus oblongus* G. O. Sars
Storhyngura digitata, new species
Storhyngura triplispinosa, new species
Stylomesus simplex, new species
- L.G.O. Biotrawl No. 213, *Vema*-15-129, 31 March 1959, 5849 meters, latitude 44° 54' S., longitude 51° 35.4' W., southwest flank of the Argentine Rise southeast of Bahía Blanca, Argentine Republic, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 214, *Vema*-15-130, 2 April 1959, 5293 meters, latitude 42° 00' S., longitude 45° 01.5' W., Southwest flank of the Argentine Rise southeast of Bahía Blanca, Argentine Republic, SBT, species of isopods captured:
Abyssianira dentifrons Menzies
Antarcturus species
Haplomesus ornatus, new species
Hydroniscus quadrifrons, new species
Ischnomesus elegans, new species
Storhyngura (Indeterminable)
Stylomesus inermis (Vanhöffen)
Stylomesus productus, new species
Stylomesus simulans, new species
- L.G.O. Biotrawl No. 217, *Vema*-15-133, 24 April 1959, 3963–3954 meters, latitude 39° 55.4' S., longitude 42° 38.8' W., north central part of Argentine Rise, SBT, species of isopods captured:
Hydroniscus ornatus, new species
Ischnomesus (Indeterminable)
Macrostylis bipunctatus, new species
- L.G.O. Biotrawl No. 218, *Vema*-15-134, 25 April 1959, 4166–4144 meters, latitude 27° 53.7' S., longitude 39° 26' W., Continental Rise southeast of Rio de Janeiro, SBT, species of isopods captured:
Eurycope (Indeterminable)
Haplomiscus (Indeterminable)
Ilyarachna (Indeterminable)
Stylomesus regularis, new species
- L.G.O. Biotrawl No. 219, *Vema*-15-135, 29 April 1959, 4303–4254 meters, latitude 20° 39' S., longitude 34° 48.5' W., Upper Continental Rise east of Valparaiso, South America, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 220, *Vema*-15-136, 3 May 1959, 3222–3336 meters, latitude 9° 45' S., longitude 34° 24' W., Continental Rise southeast of Recife, Brazil, SBT, species of isopods captured:
Ischnomesus (Indeterminable)
Syneurycope heezeni, new species
- L.G.O. Biotrawl No. 225, *Vema*-15-141, 10 May 1959, 4674–4678 meters, latitude 5° 04' N., longitude 41° 01' W., southeast end of Guiana Abyssal Plain east of the Guianas, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 226, *Vema*-15-142, 14 May 1959, 4932 meters, latitude 10° 31' N., longitude 45° 02' W., intermontane basin floor, western Mid-Atlantic Ridge north of the east-west Vema Trough, east of Trinidad, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 227, *Vema*-15-143, 25 May 1959, 3711–3761 meters, latitude 19° 01' N., longitude 65° 39' W., top of south wall of Puerto Rico Trench north of Arecibo, Puerto Rico, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 229, *Vema*-15-145, 1 June 1959, 5684 meters, latitude 22° 01.5' N., longitude 66° 23.5'

- W., Antilles Outer Ridge, north of Puerto Rico Trench, north of Puerto Rico, SBT, species of isopods captured:
Haploniscus (Indeterminable)
Hydroniscus quadrifrons, new species
Macrostylis vema, new species
- L.G.O. Biotrawl No. 230, *Vema*-15-146, 2 June 1959, 5814–5817 meters, latitude 22° 20' N., longitude 65° 01' W., Southern part of Nares Abyssal Plain north of the Virgin Islands, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 231, *Vema*-15-147, 4 June 1959, 5440–5410 meters, latitude 21° 18.7' N., longitude 65° 13.4' W., Antilles Outer Ridge, north of Puerto Rico Trench, north of Puerto Rico, SBT, species of isopods captured:
Antennuloniscus dimerocheras (Barnard)
Desmosoma (Indeterminable)
Eurycope (Indeterminable)
Haplomesus (Indeterminable), *tenuispinis* Hansen?
Haploniscus (Indeterminable)
Hydroniscus quadrifrons, new species
Ilyarachna (Indeterminable)
Macrostylis minutus, new species
Macrostylis vema, new species
- L.G.O. Biotrawl No. 232, *Vema*-15-148, 6 June 1959, 5172–5163 meters, latitude 21° 35' N., longitude 67° 09' W., Antilles Outer Ridge, north of Puerto Rico Trench, north of Puerto Rico, SBT, species of isopods captured:
Haploniscus (Indeterminable)
Hydroniscus quadrifrons, new species
Macrostylis minutus, new species
- L.G.O. Biotrawl No. 233, *Vema*-15-149, 7 June 1959, 5291–5271 meters, latitude 21° 32' N., longitude 66° 37' W., Antilles Outer Ridge, north of Puerto Rico Trench, north of Puerto Rico, SBT, species of isopods captured:
Eurycope (Indeterminable)
Hydroniscus quadrifrons, new species
Ischnomesus (Indeterminable)
- L.G.O. Biotrawl No. 234, *Vema*-15-150, 11 June 1959, 5477–5494 meters, latitude 20° 21.3' N., longitude 66° 24' W., Antilles Outer Ridge, north of Puerto Rico Trench, north of Puerto Rico, SBT, species of isopods captured:
Eurycope (Indeterminable)
Haplomesus insignis Hansen
- Hydroniscus quadrifrons*, new species
Ischnomesus armatus Hansen
Macrostylis minutus, new species
Macrostylis setifer, new species
- L.G.O. Biotrawl No. 235, *Vema*-15-151, 12 June 1959, 6264 meters, latitude 18° 45.4' N., longitude 66° 30' W., south wall of Puerto Rico Trench north of Fajardo, Puerto Rico, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 237, *Vema*-15-153, 21 June 1959, 2370–2357 meters, latitude 25° 01.5' N., longitude 77° 47' W., floor of the tongue of the ocean west of New Provident Island, SBT, species of isopods captured:
Eurycope (Indeterminable)
- L.G.O. Biotrawl No. 238, *Vema*-15-154, 21 June 1959, 2668–2623 meters, latitude 25° 15' N., longitude 77° 42' W., western end of Northeast Providence Channel (Bahamas) at the entrance to the tongue of the ocean south of the Berry Islands, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 239, *Vema*-15-155, 22 June 1959, 3727 meters, latitude 25° 28' N., longitude 77° 15' W., axis of Northeast Providence Channel (Bahamas) north of Nassau, SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 245, *Vema*-15-161, 4 July 1959, 4759 meters, latitude 26° 11' N., longitude 76° 27.5' W., Blake–Bahama Abyssal Plain near the mouth of the Northeast Providence Channel (Bahamas), SBT, species of isopods captured:
 No specimens captured.
- L.G.O. Biotrawl No. 246, *Vema*-15-162, 8 July 1959, 3963–3950 meters, latitude 30° 30' N., longitude 75° 55' W., Outer Ridge east of the Blake Plateau, SBT, species of isopods captured:
Macrostylis truncatex, new species
- L.G.O. Biotrawl No. 247, *Vema*-15-163, 9 July 1959, 4680 meters, latitude 32° 34' N., longitude 74° 21.5' W., northern end of the Outer Ridge east of the northern part of the Blake Plateau southeast of Cape Hatteras, SBT, species of isopods captured:
 No specimens captured.

LIST OF OTHER ABYSSAL ATLANTIC AND ARCTIC STATIONS FROM WHICH ISOPODS WERE COLLECTED

- Albatross Station 2084, North Atlantic, off Georges Bank, 2361 meters, 40° 16.5' N., 67° 05' 15" W., temp. 40° F., species of isopods captured:
Heteromesus spinescens Richardson
- Albatross Station 2105, North Atlantic, off Virginia, 2557 meters, 37° 50' N., 73° 03.5' W., temp. 41° F. (Richardson, op. cit.), species of isopods captured:
Heteromesus spinescens Richardson
- Albatross Station 2208, North Atlantic, south of Block Island, 2155 meters, 39° 33' N., 71° 16' 15" W., temp. 38.4° F., species of isopods captured:
Heteromesus granulatus Richardson
Heteromesus spinescens Richardson
- Albatross Station 2571, North Atlantic, southeast of Georges Bank, 2480 meters, 40° 09' 30" N., 67° 09' W., temp. 37.8° F. (Richardson, op. cit.), species of isopods captured:
Heteromesus granulatus Richardson
Heteromesus spinescens Richardson
Ianirella lobata Richardson
- Albatross Station 2572, North Atlantic, southeast of Georges Bank, 3235 meters, 40° 29.0' N., 66° 04' W., temp. 37.8° F (Richardson, op. cit.), species of isopods captured:
Haplomiscus excisus Richardson
Heteromesus granulatus Richardson
Ianirella lobata Richardson
Rhacura pulchra Richardson
Storothyngura truncata (Richardson)
- Albatross Station 2573, North Atlantic, southeast of Georges Bank, 3186 meters, 40° 34' 18" N., 66° 09' W., temp. 37.3° F. (Richardson, op. cit.), species of isopods captured:
Ianirella lobata Richardson
- Albatross Station 2714, North Atlantic, south of Martha's Vineyard, 3337 meters, 38° 22' N., 70° 17' 30" W., temp. ? (Richardson, 1908a), species of isopods captured:
Heteromesus spinescens Richardson
- Albatross Station 2043, North Atlantic, Cape May to Nantucket, 39° 49' 00" N., 68° 28' 30" W., 2680 meters, temp. 38.5° F., species of isopods captured:
Storothyngura magnispinis (Richardson)
- Albatross Station 2221, North Atlantic, Cape Hatteras to Nantucket, 39° 05' 30" N., 70° 44' 30" W., 2788 meters, temp. 36.9° F., species of isopods captured:
Storothyngura truncata (Richardson)
- Atlantis Station 15, North Atlantic, c. 40° N., 30° E., species of isopods captured:
Haplomiscus percavix, new species
- Challenger Station 318, South Atlantic, 3731 meters, 42° 38' S., 56° 29' W., species of isopods captured:
Serolis (Serolis) neaera Beddard
- Ingolf Station 18, North Atlantic, south of Denmark Strait, latitude 61° 44' N., longitude 30° 29' W., 1135 fathoms (2137 meters), temp. 3.0° C. (Hansen, op. cit.), species of isopods captured:
Haplomesus angustus Hansen
- Ingolf Station 22, North Atlantic, latitude 58° 10' N., longitude 48° 25' W., 3474 meters, temp. 1.4° C. (Hansen, op. cit.), species of isopods captured:
Haplomiscus spinifer Hansen
Haplomesus tenuispinis Hansen
Macrostylis abyssicola Hansen
Syneurycope parallela Hansen
- Ingolf Station 24, North Atlantic, Davis Strait, latitude 63° 06' N., longitude 56° 00' W., 1199 fathoms (2258 meters), temp. 2.4° C. (Hansen, op. cit.), species of isopods captured:
Anthelura truncata (Hansen)
Desmosoma gracilipes Hansen
Desmosoma intermedium Hult
Desmosoma simile Hansen
Eurycope complanata Bonnier
Eurycope furcata G. O. Sars
Haplomesus modestus Hansen
Haplomesus quadrispinosus (G. O. Sars)
Haplomesus tenuispinis Hansen
Ianirella laevis Hansen
Munna (M.) acanthifera Hansen
Nannoniscus analis Hansen
Nannoniscus inermis Hansen
Storothyngura magnispinis (Richardson)
- Ingolf Station 36, North Atlantic, Davis Strait, latitude 61° 50' N., longitude 56° 21' W., 1435 fathoms (2702 meters), temp. 1.5° C. (Hansen, op. cit.), species of isopods captured:
Anthelura truncata (Hansen)
Desmosoma coarctatum (G. O. Sars)
Desmosoma gracilipes Hansen
Desmosoma insigne Hansen
Eurycope complanata Bonnier
Eurycope nodifrons Hansen
Eurycope parva Bonnier
Haplomiscus spinifer Hansen (?), n. sp. ?
Haplomesus insignis Hansen
Haplomesus quadrispinosus (G. O. Sars)
Heteromesus longiremis Hansen
Ianirella laevis Hansen
Ilyarachna bicornis Hansen
Ilyarachna spinosissima Hansen
Ischnomesus armatus Hansen
Storothyngura magnispinis (Richardson)
- Ingolf Station 37, North Atlantic, Davis Strait, latitude 60° 17' N., longitude 54° 05' W., 3229 meters, temp. 1.4° C., species of isopods captured:
Macrostylis abyssicola Hansen
- Ingolf Station 38, North Atlantic, south of Davis Strait, latitude 59° 12' N., longitude 51° 05' W., 3521 meters, temp. 1.3° C. (Hansen, op. cit.), species of isopods captured:
Desmosoma longispinum Hansen

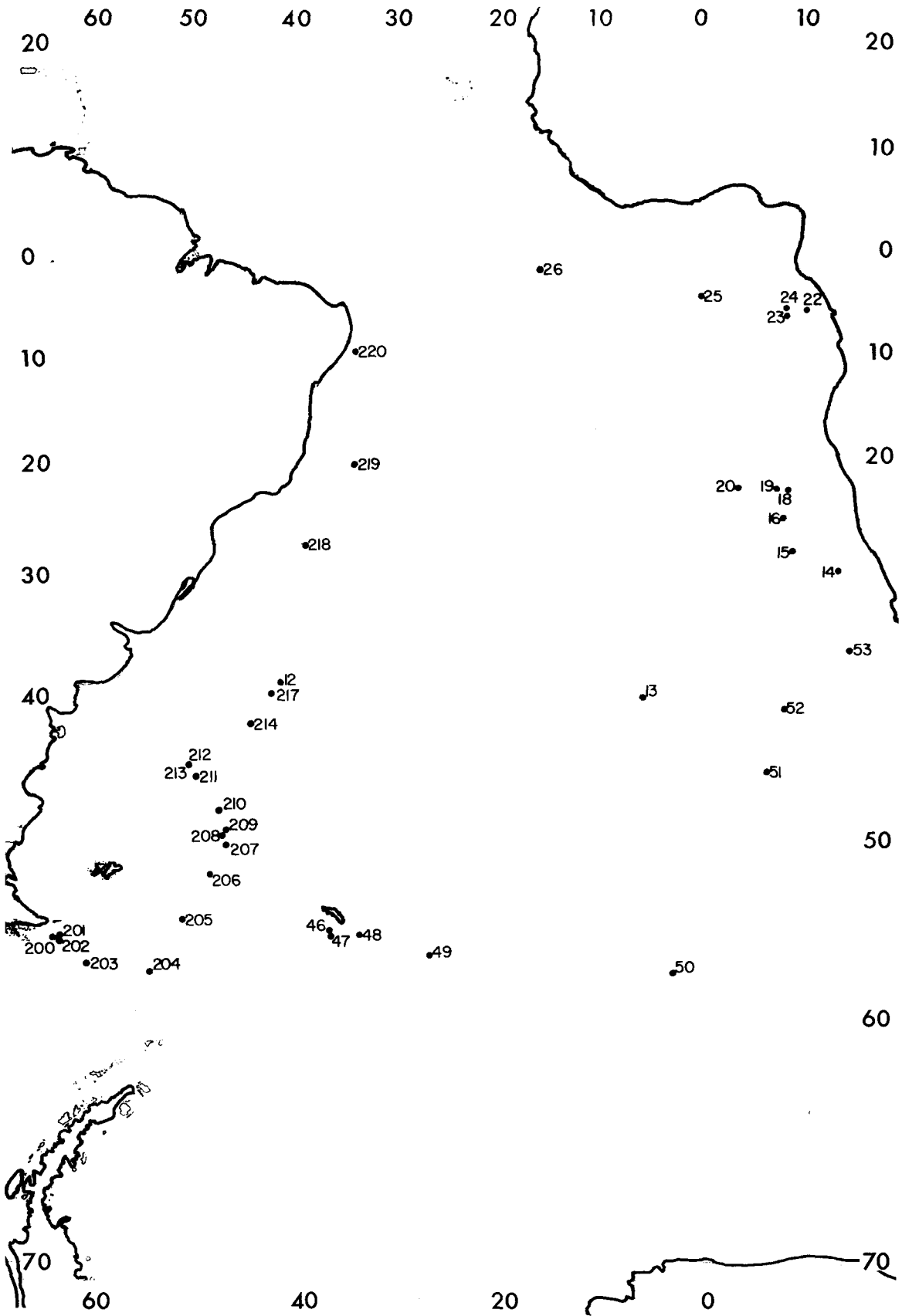


Figure 74. Chart of Lamont Geological Observatory Deep-Sea Biotrawl Stations in the South Atlantic.

- Haplomesus quadrispinosus* (G. O. Sars)
Hydroniscus abyssii Hansen
Ilyarachna spinosissima Hansen
Ischnomesus profundus Hansen
Macrostylis abyssicola Hansen
Nannoniscus armatus Hansen
- Ingolf Station 112, North Atlantic, latitude 67° 57' N., longitude 6° 44' W., 2386 meters, temp. —1.1° C., species of isopods captured:
Mesidothea megalura megalura (G. O. Sars)
- Ingolf Station 113, North Atlantic, south of Jan Mayen, latitude 69° 31' N., longitude 7° 06' W., 2465 meters, temp. —0.1° C. (Hansen, op. cit.), species of isopods captured:
Eurycope henseni Ohlin
Haplomesus quadrispinosus (G. O. Sars)
Haplomiscus bicuspis (G. O. Sars)
Gnathia stygia (G. O. Sars)
Ilyarachna longicornis (G. O. Sars)
Mesidothea megalura megalura (G. O. Sars)
Nannoniscus spinicornis Hansen
- Plankton expedition Station 158, North Atlantic, latitude 7.5° N., longitude 21.3° W., 4000 meters, species of isopods captured:
Acanthaspidia decorata Hansen
- Porcupine Station 19, North Atlantic, west of Donegal, latitude 54° 53' N., longitude 10° 56' W., 2486 meters, species of isopods captured:
Thambema amicorum Stebbing
- Sadko Station 10, Arctic Ocean, latitude 80° 02' N., longitude 3° 19' E., 2380 meters (Gurjanova, 1946a), species of isopods captured:
Eurycope incisa Gurjanova
- Sedov Station 100, Arctic Ocean, latitude 81° 10' N., longitude 137° 17' E., 2500 meters (Gurjanova, op. cit.), species of isopods captured:
Ilyarachna derjugini Gurjanova
Mesidothea megalura polaris Gurjanova
- Talisman Station 31, north of San Miguel in the Azores, 22 August 1883, 2995 meters, species of isopods captured:
Heteromesus similis Richardson
- Talisman Station 76, North Atlantic, latitude 25° 1' N., longitude 19° 15' W., 2638 meters (Monod, 1926a), species of isopods captured:
Gnathia caeca Richardson
- Talisman Station 134, 24 August 1883, 4060 meters, Azores, species of isopods captured:
Ilyarachna abyssorum Richardson
- Talisman Station 135, 25 August 1883, 4165 meters, Azores, species of isopods captured:
Ilyarachna abyssorum Richardson
- Talisman Station 139, coast of Soudan between Dakar and Praya, 3200 meters (Richardson, 1911), species of isopods captured:
Pseudanthura lateralis Richardson
- Thor Station, North Atlantic, south of Iceland, latitude 60° 11' N., longitude 19° 36' W., 1899 to 2143 meters (Hansen, op. cit.), species of isopods captured:
Ianira henseni, new species
Munna (Munna) acanthifera Hansen
- Valorous Station 8, North Atlantic, near entrance of Davis Strait, latitude 59° 10' N., longitude 50° 25' W., 3199 meters, species of isopods captured:
Ananthura abyssorum (Norman and Stebbing)
- Valorous Station 11, North Atlantic, latitude 56° 11' N., longitude 37° 41' W., 2651 meters, species of isopods captured:
Hyssura producta Norman and Stebbing

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