ISSN 2538-1016; 27

NEW ZEALAND
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 167

The Fauna of the Ross Sea

PART 4

Mysidacea by OLIVE S. TATTERSALL

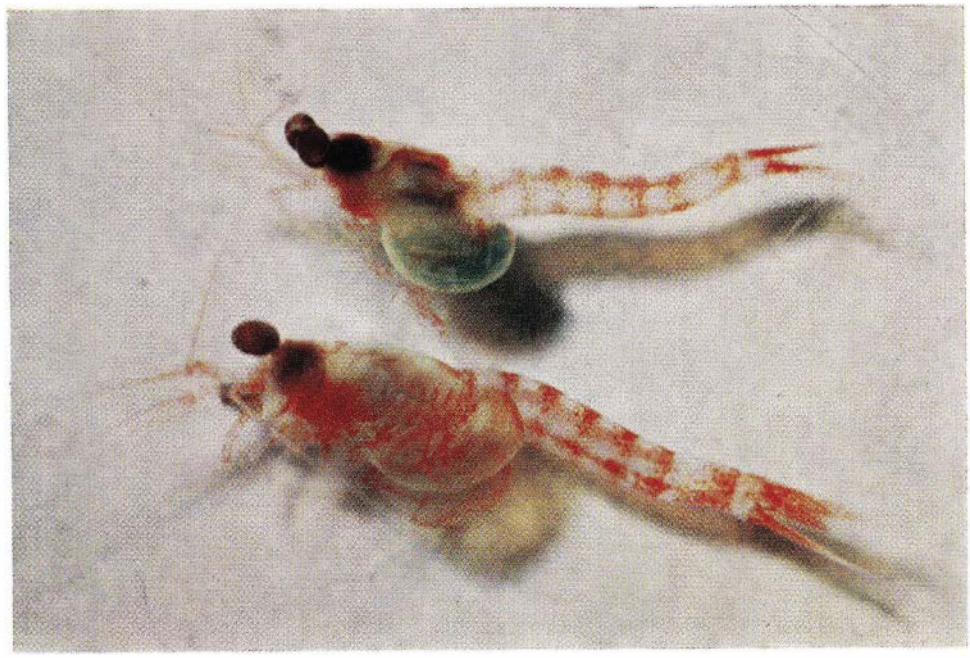
Sipunculoidea by S. J. EDMONDS

New Zealand Oceanographic Institute
Memoir No. 27

1965

THE FAUNA OF THE ROSS SEA

PART 4



Photograph: J. H. Dearborn.

Mysids taken in McMurdo Sound, Antarctica. The species is tentatively identified from the photograph as *Mysidetes posthon* Holt and Tattersall.

NEW ZEALAND
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 167

The Fauna of the Ross Sea

PART 4

Mysidacea by OLIVE S. TATTERSALL

Sipunculoidea by S. J. EDMONDS

New Zealand Oceanographic Institute

Memoir No. 27

Price 10s.

1965

Inset 1

This publication should be referred to as:
N.Z. Dep. sci. industr. Res. Bull. 167

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1965

FOREWORD

Each summer season, since 1956–57, the New Zealand Oceanographic Institute has undertaken one or more research cruises in the Antarctic, initially as part of the International Geophysical Year programmes and their extensions, and latterly as part of the New Zealand Antarctic Research Programme.

The major efforts of the 1958–59 and 1959–60 seasons were devoted to an oceanographic survey of the Ross Sea in which, as well as associated hydrological information, sediment samples, plankton, and fish, substantial collections of benthic animals were obtained.

Each of these expeditions was led by J. S. Bullivant. In 1958–59 he was assisted by D. G. McKnight and A. G. Macfarlane of the Institute staff and N. A. Powell of Antarctic Division, D.S.I.R.; John Reseck, jun. (Long Beach State College, California) and Dr R. K. Dell (Dominion Museum, Wellington) were co-workers. In 1959–60, G. A. Harlen and E. C. French of Antarctic Division, D.S.I.R., assisted. Further small collections were made in 1960–61 by G. A. Harlen, A. E. Gilmour, and S. C. Watts of the Institute staff and C. E. Devine, D. W. Farmer, and M. R. Gregory of Antarctic Division, D.S.I.R.

The cooperation of the New Zealand Naval Board and of the Commanding Officer and ship's company of HMNZS *Endeavour* is gratefully acknowledged. The Antarctic Division has materially assisted the field and laboratory work by the secondment of staff and provision of equipment.

The biological material has been sorted and preserved under the supervision of J. S. Bullivant. Additional material was collected by zoologists of Stanford University operating under the United States Antarctic Research Programme. Their cooperation, and particularly the assistance given by Mr John Dearborn, has enabled an effectively wider range of material to be examined.

The preliminary technical editing of the manuscript has been carried out by Mrs P. M. Cullen. Miss G. L. Smith (Information Service, D.S.I.R.) has been responsible for final editing.

Further results of examinations of these collections will be published as studies of other groups are concluded.

J. W. BRODIE,

Director,

N.Z. Oceanographic Institute.

CONTENTS

MYSIDACEA OF THE ROSS SEA by Olive S. Tattersall

	Page
Abstract	9
Introduction	9
Acknowledgments	10
Stations at which Mysids were taken	11
Systematics	14
Tribe ERYTHROPINI	14
Genus *Amblyops*	14
Tribe LEPTOMYSINI	16
Genus *Mysidetes*	16
Tribe MYSINI	23
Genus *Antarctomysis*	23
References	25

SIPUNCULOIDEA OF THE ROSS SEA by S. J. Edmonds

Abstract	27
Introduction	27
Previous Work	27
Species Collected	28
Station Details and Species taken at each Station	28
Descriptions of Species	29
1. *Golfingia margaritacea capsiformis* (Baird)	29
2. *Golfingia andersonni* (Théel)	30
3. *Golfingia ohlini* (Théel)	31
4. *Golfingia* sp.	32
References	33
Index	34

Mysidacea of the Ross Sea

By Olive S. Tattersall,
Pendeen, Sinah Lane, Hayling Island, Hants, England

Abstract

A list of the stations at which mysids were collected is given with data of their exact location, the depth of the hauls and the type of gear used. Only five species are represented in the material. Three of these are well known and have a circumpolar distribution in the Antarctic and the colder waters of the Southern Oceans. One species, *Amblyops tattersalli* Zimmer, is very rare and has hitherto been known only from two isolated individuals. It is here figured and additional notes of its morphology are given. The fifth species belongs to the genus *Mysidetes* and is new to science. It is fully described and figured and a synopsis of the genus is given together with a key for the identification of its species. A table is given showing the geographical distribution of all the species of Mysidacea that have been recorded from the Antarctic and Southern Oceans.

INTRODUCTION

The present collection of mysids from the Ross Sea area were obtained by Mr J. S. Bullivant during the New Zealand Oceanographic Institute Antarctic cruises on HMNZS *Endeavour* in the 1958–59 and 1959–60 seasons, and by Mr John H. Dearborn of Stanford University. These specimens extend and supplement an earlier collection of Mysidacea from the waters of the Ross Sea that was made by Mr Dearborn. My report on these (Tattersall 1961) was in press when the present material became available. Three of the species recorded in that paper are represented in the present collection – *Mysidetes posthon* Holt and Tattersall, *Antarctomysis maxima* (Holt and Tattersall), and *Antarctomysis ohlinii* Hansen. These are well known from all Antarctic waters and from the colder waters of the Southern Oceans.

Mysids were collected at 25 stations in the Ross Sea and five species are represented. Two of these are extremely interesting – *Amblyops tattersalli* Zimmer, hitherto known only from two isolated individuals (one, the type, from off Kaiser Wilhelm Land and the other from the Ross Sea, very near to the station at which the present specimens were collected) and *Mysidetes antarctica*, which is new to science.

As the genus *Mysidetes* is almost exclusively confined to the very cold waters of the southern hemisphere a list of its species is given below, together with a table showing their geographical distribution and a key for their identification.

Many of the captures in the present collection were made in fish traps at, or very close to, the bottom, and unfortunately many of the specimens are in a very damaged condition. Most of the Stanford University stations at which collections were taken are situated far south in McMurdo Sound where conditions for the capture of mysids are particularly difficult. Dredging or trawling or horizontal tow-netting near the bottom, the most effective methods of capturing mysids, were impossible owing to the sea-ice cover. Most of the collecting was done by a most ingenious method. A hole was cut with a chain saw through the ice which was up to 16 ft in thickness, and the aperture kept open artificially. A prefabricated, warmed and insulated building was erected over the hole and

used as a semi-permanent station, which drifted with the ice throughout the summer months. Large wire fish traps were suspended at various depths in the water or on the bottom and vertical hauls were made regularly from the bottom to the surface. The New Zealand Oceanographic Institute stations at which mysids were collected extend over the southern and western portions of the Ross Sea. Various types of dredge and trawl were used.

In the list of stations that is given in this report the times at which hauls were made are given in local time which is 12 hours ahead of G.M.T.

ACKNOWLEDGMENTS

I am greatly indebted to Mr J. S. Bullivant, New Zealand Oceanographic Institute, D.S.I.R., New Zealand, and to Dr John H. Dearborn of the Department of Biological Sciences, Stanford University, California, for the opportunity of examining this interesting collection and for furnishing me with much detailed and clear information as to the habitat in which the animals were living. Their meticulous care in this respect is most gratifying.

STATIONS AT WHICH MYSIDS WERE TAKEN

New Zealand Oceanographic Institute Stations

Sta. A448, 10 Jan 1959, 77° 27′S, 172° 22′E, 1500–2400 h, depth 752 m. Bottom, mud. Small Agassiz trawl.
Antarctomysis maxima (Hansen in MS) (Holt and Tattersall).

Sta. A450, 11 Jan 1959, 76° 42′S, 179° 44′E to 76° 36′S, 179° 53′E, depth 472–318 m. Bottom, muddy sand. Small Agassiz trawl.
Mysidetes posthon Holt and Tattersall.

Sta. A459, 16 Jan 1959, 75° 17′S, 172° 20′E, 534–549 m. Bottom, mud. Gear, pipe-dredge from Agassiz trawl.
Antarctomysis maxima (Hansen in MS) (Holt and Tattersall).

Sta. A460, 17 Jan 1959, 75° 38′S, 168° 32′E, 1430–1915 h, depth 415–430 m. Bottom, gritty mud.
Antarctomysis maxima (H. and T.).

Sta. A464, 22 Jan 1959, 73° 20′S, 174° 00′E, 369–384 m, 0030–0800 h. Bottom, sand and pebbles.
Antarctomysis maxima (H. and T.).

Sta. A466, 24 Jan 1959, 78° 26′S, 174° 50′W, 2105–2120 h, 569–0 m. N.70 Net, vertical haul.
Antarctomysis probably *maxima*. Specimen very juvenile.

Sta. A530, 8 Feb 1960, 74° 03′ 30″S, 179° 21′E to 74° 05′S, 179° 19′E, 1818–2000 h, 271–267 m. Bottom, muddy sand.
Pleon only of *Mysidetes* sp.

Sta. A534, 16 Feb 1960, 77° 36′ 42″S, 166° 08′E to 77° 36′S, 166° 12′E, 2305–2330 h, 380–366 m. Devonport dredge.
Antarctomysis maxima (H. and T.).
Mysidetes sp. probably *posthon* Holt and Tattersall.

Sta. A537, 17 Feb 1960, 77° 30′S, 165° 12′E to 77° 34′ 48″S, 165° 19′E, 0830–0915 h, 574–543 m. Bottom, mud and gravel. Cast of Knudsen reversing bottles, vertical haul.
Antarctomysis ohlinii Hansen.

Sta. A538, 17 Feb 1960, 77° 30′ 36″S, 164° 37′E, 1740–1800 h, 269–248–256 m. Devonport dredge. Bottom, sand and stones.
Antarctomysis maxima (Holt and Tattersall).
Antarctomysis ohlinii Hansen.
Mysidetes species, too damaged for identification.

Stanford University Stations

Sta. 377, 6 Feb 1957. Contents of stomach of Weddell seal (No. 54) killed off C. Armitage, McMurdo Sound.
Almost entirely fragments of *Antarctomysis ohlinii* Hansen with some of *Antarctomysis maxima* (Hansen in MS) (Holt and Tattersall).

Sta. 258–317 inclusive, Scott Base, C. Armitage, McMurdo Sound. Sea bed under Bay Ice, depth 123 m. Bottom of small rocks, gravel, bryozoa, and sponge debris.

Sta. 258, 19 Mar 1957. SFL.
Mysidetes posthon Holt and Tattersall. Colour note in tube.

Sta. 285, 14 Apr 1957. Fish trap.
Mysidetes posthon H. and T.

Sta. 293, 17 Apr 1957. Fish trap.
Mysidetes posthon H. and T.

Sta. 300, 20 Apr 1957. Fish trap.
Mysidetes sp. probably *posthon* H. and T.

Sta. 313, 26 Apr 1957. Fish trap.
Mysidetes posthon H. and T.

Sta. 317, 27 Apr 1957. Fish trap.
Mysidetes posthon H. and T.
Mysidetes antarctica n.sp.

Sta. 79, 5 Feb 1958, 77° 51′S, 166° 34′E. Near Hut Pt. anchorage, Ice edge; depth 125–165 m. Gear, beam trawl.
Mysidetes sp. probably *posthon* H. and T.

TABLE 1: Mysidacea Recorded From Antarctic and Southern Oceans

Species	Ross Sea	Antarctic Ocean	Weddell Sea	Bellinghausen Sea	Grahamland and Palmer Archipelago	S. Orkneys = O S. Shetlands = S	South Georgia	Falkland Is.	Magellan Strait	Kerguelen I.	Ice Edge
Chalaraspidum alatum = *Chalaraspis alata* (W.-Suhm) 1875										+	
Gnathophausia gigas W.-Suhm, 1873 = *G. drepanephora* H. and T.			+	+			+	+			
Eucopia australis Dana 1852 = *E. major* Hansen, 1910		+		+	+	+	+				66° 12′S 149° 44′E 64° 20′S 89° 27′E
„ *unguiculata* (W.-Suhm) 1875 = *E. hanseni* Nouvel 1942		+		+			+				
„ *grimaldii* Nouvel 1942							+	+			
Hansenomysis antarctica Holt and Tattersall 1906	+	+		+	+						66° 02′S 89° 58′E
„ *falklandica* O. S. Tattersall 1955								+	+		
„ *angusticauda* O. S. Tattersall 1961	+	+			+						
Boreomysis inermis (W.-Suhm) as *Petalophthalmus* 1874 = *B. scyphops* G. O. Sars 1885 = *B. distinguenda* Hansen 1908			+			+	+			+	Crozet Is.
„ *rostrata* Illig 1906							+	+	+		
„ *sibogae* Hansen 1910							+				
„ *plebeja* Hansen 1910							+			+	
„ *brucei* W. M. Tattersall 1913		+	+		+	+	+				67° 02′S 139° 54′E
„ *atlantica* Nouvel 1942							+				
Pseudomma sarsi (W.-Suhm in MS) G. O. Sars 1884						+	+	+		+	
„ *belgicae* (Hansen in MS) Holt and Tattersall 1906	+	+			+		+				71° 19′S 87° 37′W 81° 25′S 165° 39′E
„ *armatum* Hansen 1913	+	+				+	+				
„ *antarcticum* Zimmer 1914					+						65° 15′S 80° 0′E
„ *calmani* O. S. Tattersall 1955								+			
„ *schollaertensis* O. S. Tattersall 1955					+						
„ *longicaudum* O. S. Tattersall 1955					+						
„ *magellanensis* O. S. Tattersall 1955									+		
„ *minutum* O. S. Tattersall 1955								+			
Amblyops tattersalli Zimmer 1914	+	+									66° 02′S 89° 38′E
„ *antarctica* O. S. Tattersall 1955	+	+									75° 56′S 178° 35·5′W

TABLE 1: Mysidacea Recorded From Antarctic and Southern Oceans—*continued*

Species	Ross Sea	Antarctic Ocean	Weddell Sea	Bellingshausen Sea	Grahamland and Palmer Archipelago	S. Orkneys = O S. Shetlands = S	South Georgia	Falkland Is.	Magellan Strait	Kerguelen I.	Ice Edge
Amblyops nr. *kempi* O. S. Tattersall 1955									+		
Amblyopsoides obtusa O. S. Tattersall 1955								+	+		
Paramblyops brevirostris O. S. Tattersall 1955					+						
				Circumpolar South of 50°S to Ice Edge							
Dactylamblyops hodgsoni H. and T. 1906 = *D. arcuata* Illig 1906	+	+		+	+	+	+	+			+
„ *antarctica* Hansen 1913							+				
Euchaetomera zurstrasseni (Illig) 1906		+	+	+		+	+	+			+
Mysidopsis acuta Hansen 1913							+	+	+		
				Circumpolar South of 49°S to Ice Edge							
Mysidetes posthon Holt and Tattersall 1906	+	+			+	S		+			+
„ *kerguelensis* (Illig) 1906 as *Metamysidella*							+			+	
„ *crassa* Hansen 1913								+			
„ *brachylepis* W. M. Tattersall 1923	+	+				S	+				
„ *microps* O. S. Tattersall 1955							+	+			
„ *macrops* O. S. Tattersall 1955							+	+			
„ *intermedia* O. S. Tattersall 1955								+	+		
„ *patagonica* O. S. Tattersall 1955								+	+		
„ *anomala* O. S. Tattersall 1955									+		
„ *dimorpha* O. S. Tattersall 1955					?		+				
„ *antarctica* n. sp.	+	+									
Neomysis patagona Zimmer 1907								+	+		
„ *monticellii* Colosi 1924								+	+		
				Circumpolar South of 55°S to Ice Edge							
Antarctomysis maxima (Hansen in MS) (H. and T.) as *Mysis* 1906	+	+			+	O S	+				+
„ *ohlinii* Hansen 1908	+	+				S	+				
Arthromysis magellanica (Cunningham) as *Macropsis* 1871									+		

Sta. 98, 12 Feb 1958, 76° 07′S, 168° 10′E. Franklin Island Cruise; depth 188–194 m. Gear, beam trawl.
Mysidetes posthon H. and T.

Sta. 100, 23 Feb 1958, 77° 38′S, 166° 20′E. Cape Evans; depth 110 m. Gear, beam trawl.
Mysidetes sp. probably *posthon* H. and T.

Tressler Oceanographic Station. 77° 53′S, 166° 44′E. S. of C. Armitage, McMurdo Sound. April 1960–10 March 1961; 565–585 m. Hole cut through ice; insulated, prefabricated building erected over hole. Station moved 300 ft with drift of ice during the year. Bottom, gravel, small rocks, ectoproct, and sponge debris.

1 June 1960. In large wire fish-trap, 560 m.
Antarctomysis ohlinii Hansen.

3 June 1960. In large wire fish-trap, 560 m.
Antarctomysis ohlinii Hansen.

9 Aug 1960. In large wire fish-trap, 560 m.
Amblyops tattersalli Zimmer.

23 Dec 1960. In wire fish-trap, 585 m.
Antarctomysis ohlinii Hansen.
Amblyops tattersali Zimmer.

Sta. 61B. 77° 51′ 59·6″S, 166° 43′ 14″E. SE of C. Armitage, McMurdo Sound.
9 Apr 1961–3 Jan 1962. 278–290 m. Hole cut in ice with chain saw. The Station moved several hundred feet with the ice during the year. Bottom, sponge-coelenterate complex.
24 July 1961.
Mysidetes posthon Holt and Tattersall.
8 Sep 1961.
Mysidetes posthon Holt and Tattersall.

Sta. 61D, 77° 51′ 57·3″S, 166° 41′ 17″E. S. of C. Armitage, McMurdo Sound.
10 May 1961–3 Nov 1961, 128–136 m. Hole cut in ice. The Station moved with the ice several hundreds of feet during the year.
5 June 1961. Surface dip net. Fragments of *Mysidetes* sp. probably *posthon* Holt and Tattersall.
29 June 1961. Half metre net.
Mysidetes posthon Holt and Tattersall.
29 June 1961. SN 60¼ metre net.
?*Mysidetes posthon* Holt and Tattersall.
16 July 1961. Surface, dip net.
Mysidetes posthon Holt and Tattersall.
Mysidetes posthon Holt and Tattersall. Fish Trap.
19 July 1961. Surface, dip net.
Mysidetes posthon Holt and Tattersall.

SYSTEMATICS

Tribe ERYTHROPINI

Genus **Amblyops** G. O. Sars

Amblyopsis G. O. Sars, 1869, p. 328 (in M. Sars 1869).
Amblyops G. O. Sars, 1872, vol II, p. 3.

M. Sars (1869, p. 262) instituted a new species for a specimen captured off Lofoden and placed it in the genus *Pseudomma* under the name *Pseudomma abbreviatum.* Later in the same year G. O. Sars decided that the form of the eyeplates differed too profoundly from that in the genus *Pseudomma* to permit of its inclusion in that genus and erected a new genus, *Amblyopsis* for it. In 1872 he changed this name to *Amblyops* as *Amblyopsis* was pre-occupied for a genus of fishes and the species became *Amblyops abbreviata* (M. Sars).

Since that date this species has been recorded on a number of occasions from the colder deep waters of the north-eastern Atlantic and the generic and specific characters have been more clearly defined. At the present date the genus contains eight species and two records as "*Amblyops* sp." – one from the Antarctic and the other from the north-western Pacific. All the known species are bathypelagic.

Two species, *A. tattersalli* Zimmer (1914, p. 390) and *A. antarctica* O. S. Tattersall (1955, p. 106) are known only from the Antarctic; one, *A. durbani* O. S. Tattersall (1955, p. 105) from deep water in the western Indian Ocean, off Durban, and the others from the colder regions of the Northern Hemisphere.

Since the number of captures have, with the exception of the type species *abbreviata*, been few and the members of the species are very rare, I give herewith a list of the principal generic characters that are at present accepted, in order to aid workers in the identification of individuals:

1. *Anterior margin of carapace:* short, leaving the eyes wholly uncovered except in *brachylepis* in which they are partially covered in dorsal view; broadly rounded or produced to form a very short triangular rostrum.

2. *Antennular peduncle:* short and very robust, with second segment very short and third segment large with the outer proximal region swollen. Outer distal angle of first segment produced.

3. *Antenna:* scale large and usually broad with outer margin unarmed (rarely with a few small

serrations at the distal end), terminating in a strong tooth, which may bear one or two small supplementary teeth on its inner face; apex rounded, usually shorter than the tooth, but in *antarctica* it is subequal with it. In *durbani* it is very slightly longer and in *tattersalli* it is quite clearly longer; small distal suture present. *Peduncle* usually composed of four (or sometimes three) segments with the second small and uptilted to lie in a different plane from the other two or three and articulated with the ventral side of the third segment a little distance from its proximal margin so that in dorsal view the distal segment overrides the penultimate and may completely obscure it. In lateral view the peduncle appears distorted.

4. *Eyes:* rudimentary, without visual elements or pigment; in the form of two separate immovable plates which are contiguous in the median line; well developed ocular papilla present on the dorsal surface near the middle of each eyeplate at the anterior end. Surface smooth or minutely hispid, without lateral serrulations.

5. *Pseudobranchial lobes of male pleopods:* in the form of large oval or triangular plates. *Fourth pleopods* of male usually with some modification of the setae.

6. *Uropods: Endopods* much shorter than exopods and more slender; with or without one or two slender spines on the inner distal region of the statocyst.

7. *Telson:* linguiform with apex broadly rounded (except in *A. tenuicauda* Tattersall) or truncate; lateral margins armed on the posterior two-thirds of their length with a close-set row of evenly graduated spines which become progressively longer posteriorly and merge with the two or three pairs of apical spines to form a continuous series. A pair of median setae present.

Amblyops tattersalli Zimmer (Figs. 1–4)

Amblyops tattersalli Zimmer, 1914, p. 390, figs.
Amblyops tattersalli, W. M. Tattersall, 1923, p. 285.

Locality

Tressler Oceanographic Station: 9 Aug 1960, one ovigerous female 29 mm; 23 Dec 1960, one immature male 23·5 mm, one ovigerous female 28 mm.

Remarks

The present specimens agree very closely with the published descriptions and figures of the species except in the form of the fourth pleopod of the male. The only male specimen is damaged and has lost one of the fourth pleopods and both the fifth. The remaining fourth pleopod is extraordinarily distorted and aberrant but I am of the opinion that its condition is traumatic.* When recording an adult female of 30 mm from McMurdo Sound, Tattersall recorded that the eyeplates were minutely hispid. Zimmer did not mention this character and I have failed to find it in any of the present material.

*Zimmer's type was an adult male but he made no comment on the pleopods.

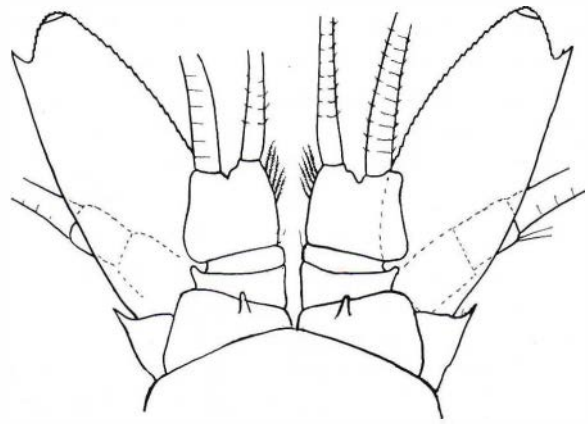


FIG. 1. *Amblyops tattersalli* Zimmer. Anterior end of adult female in dorsal view (× 10).

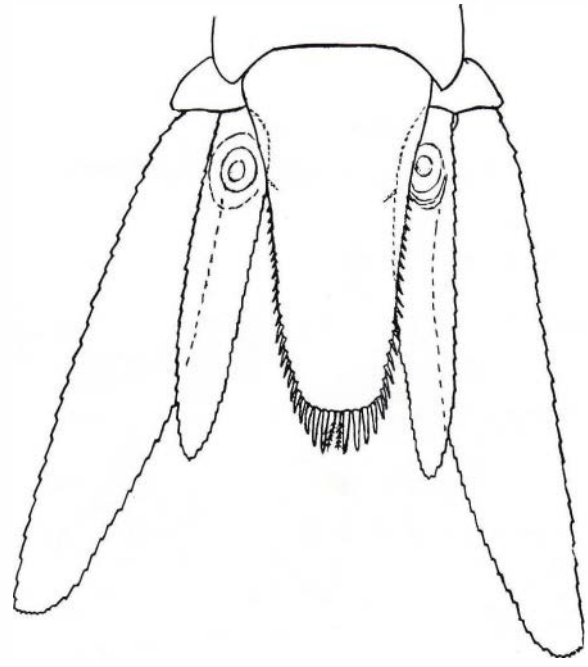


FIG. 2. *Amblyops tattersalli* Zimmer. Telson and uropods of adult female in dorsal view (× 10).

A. tattersalli may be distinguished from *A. antarctica* (figs. 5–7), the only other species of the genus known from the Antarctic, as follows:

1. *Size:* adults of both sexes are from 28 to 29 mm in length but in *antarctica* the types were "nearly mature" at 13·2 mm.

2. *Anterior margin of carapace* is slightly produced in the median line but in *antarctica* it is evenly arcuate (fig. 1).

3. *The third segment of the antennular peduncle* is stouter and the proximal outer margin more convex than in *antarctica.*

4. *The apex of the antennal scale* extends well beyond the tooth terminating the outer margin but in *antarctica* it is subequal in length (fig. 1).

5. *The ocular papilla* is much more developed, extending forward as a prominent process.

6. *The uropods* are much longer with the exopods extending for half their length beyond the apex of the telson but in *antarctica* for only one-fifth of their length; a long slender spine is present on the inner side of the statocyst but none has been recorded in *antarctica* (fig. 2).

7. *Telson:* broad and linguiform with apex slightly convex, armed with stout spines, larger than the lateral ones; in *antarctica* it is triangular with narrow apex armed with spines of about the same size as the lateral ones.

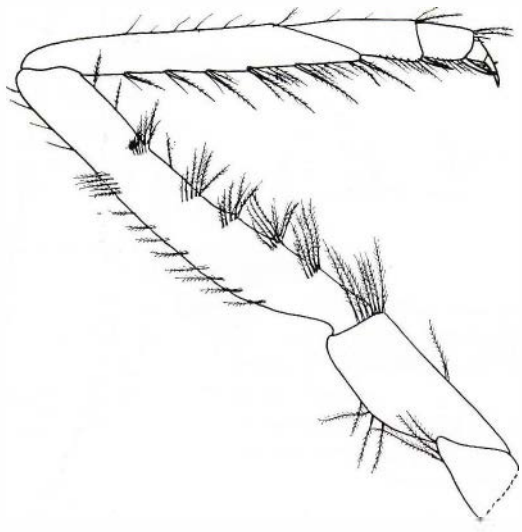


FIG. 3. *Amblyops tattersalli* Zimmer. Fourth thoracic endopod of adult female (× 15).

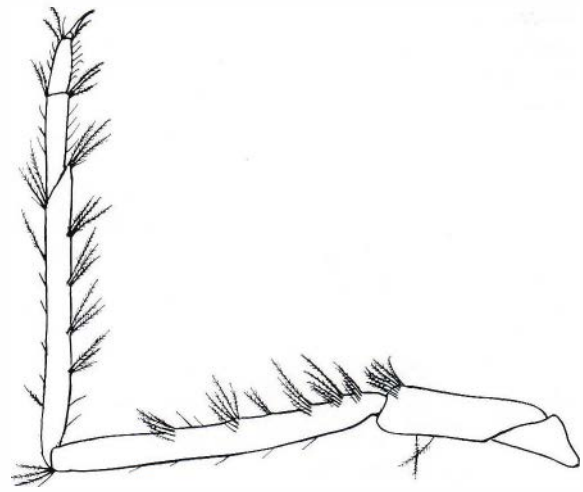


FIG. 4. *Amblyops tattersalli* Zimmer. Eighth thoracic endopod of adult female (× 15).

Distribution

The type, an adult male, was taken by the German Antarctic Expedition at the bottom (385 m) off Kaiser Wilhelm Land. The only other record is of an adult female captured by the *Discovery* at the bottom 547 m) in McMurdo Sound very near to the station at which the present specimens were taken.

Tribe LEPTOMYSINI

Genus **Mysidetes** Holt and Tattersall, 1905.

Mysideis (*pars*) Holt and Tattersall, 1905, p. 127.
Mysidetes Holt and Tattersall, 1906, (a) p. 39; (b) p. 10.
Metamysidella Illig, 1906, p. 210.
Mysidetes, Tattersall, 1908, p. 32.

Remarks

The genus *Mysidetes* was instituted by Holt and Tattersall for the reception of a species, *M. farrani*, based on specimens collected in deep water off the west of Ireland. This species has since been recorded on a number of occasions off the N. E. Atlantic Slope, the Mediterranean and off the north-east of the Canary Is. in depths of 400–1800 m. It is the only species of the genus known from the Northern Hemisphere.

Since its foundation, 11 more species have been referred to the genus—all from the colder waters of the Southern Hemisphere. None has been recorded north of 48°S. Two species, *M. posthon* Holt and Tattersall (1906, p. 10) and *M. brachylepis* W. M. Tattersall (1923, p. 288) were originally captured from the Ross Sea area. A third species, *M. hanseni* Zimmer (1914, p. 403), at present known only from the type specimen, an adult

male, captured off Kaiser Wilhelm Land, may reasonably be expected to occur in the Ross Sea.

Mysidetes can be distinguished from all other genera of the tribe Leptomysini by three main characters as follows:

1. By the form of the male pleopods, which are all reduced to simple uniramous, setiferous, unsegmented plates as in the female. A well developed pseudobranchial lobe is borne at the proximal end of the inner margin of each pleopod and this is often so prominent that it could appear as if the appendage were biramous, but close examination shows that there is no trace of any articulation present.

2. By the variable number of sub-segments—three in *M. farrani*, but from six to eight in all the southern genera—into which the carpopropodus of the third to the eighth thoracic endopods is divided.

3. The very long, tubular genital organ of the male. These organs are borne, as in all mysids, on the bases of the eighth thoracic appendages. In *Mysidetes* they stretch forward and lie side by side close to the ventral surface of the thoracic region, hidden by the thoracic endopods. In several species they extend as far forward as the region of the mouth, but in *M. kerguelensis* Illig and in *M. antarctica* n.sp. (figs. 5–6) they are enormously lengthened and extend forward beyond the apex of the antennal scale.

A similar elongated form of male genital organ is found in two other genera of the Mysidacea: *Heteromysis* of the tribe Heteromysini of the subfamily Mysinae, and *Mysidella* of the subfamily Mysidellinae. Curiously enough, in both these genera the male pleopods are reduced to simple unsegmented plates as in *Mysidetes* and in all three also the antennal scale is setose all round and the apex of the telson is cleft. They can readily be distinguished from one another, however, by the form of the third and the first thoracic endopods respectively. In *Heteromysis* the carpopropodus of the *third* thoracic endopod is greatly enlarged (especially in the male), strongly armed with stout spines on its inner margin and is not secondarily divided. The short dactylus, bearing a strong nail, folds down upon the armature of the inner margin of the carpopropodus to form a powerful sub-chela. In some species the propodus itself bends over to form a strong prehensile sub-chela with the merus. In *Mysidella* the carpopropodus of the *first* thoracic endopod is expanded on its inner distal margin to form a strong cutting edge. In *Mysidetes* there is no special modification of these endopods.

Since the genus *Mysidetes* is so strongly represented in the Antarctic and the cold waters of the Southern Oceans it may be of use to workers in these areas to recapitulate the accepted definition of the genus as follows:

1. *Carapace:* short, usually produced anteriorly into a very short rounded or triangular rostrum which leaves the eyes wholly uncovered except in *brachylepis*.

2. *Antennules:* short and stout, with the second segment very short; outer distal angle of first segment produced into a finger-like process, usually tipped with a few setae.

3. *Antennnae: Sympod* armed on outer distal angle with one or two strong spines; *Scale* relatively small and short in southern forms; setose all round; distal articulation present. *Peduncle* three segmented, short, and of normal form.

4. *Eyes:* well-developed with large cornea usually globular; wider than the eyestalk.

5. *Third to the eighth thoracic endopods:* long and slender with the carpopropodus secondarily divided into 6–8 subsegments (3 in *farrani*). Nail long and slender.

6. *Genital organ of the male:* very long, usually slender and cylindrical with apex rounded or, rarely, truncate.

7. *Pleopods:* in both sexes rudimentary, reduced to simple uniramous setose plates.

8. *Uropods:* with the exopod larger and much broader than endopod; inner margin of endopod armed with varying number of spines, usually arranged in a close regularly graduated row but may be fewer and unevenly placed.

9. *Telson:* cleft; lateral margins armed throughout or, more frequently, on the distal region only. Cleft armed with small teeth; no median setae.

Geographical Distribution of the species of the genus Mysidetes

farrani (H. & T.). Atlantic Slope off W of Ireland; Bay of Biscay; N of Canaries; Mediterranean. 450–1100 m.

posthon H. & T. Ross Sea, circumpolar S of 49°S. 200–810 m.

kerguelensis (Illig). Off Kerguelen I.; South Georgia. 58–273 m.

crassa Hansen. N and W of Falkland Is.; South Sandwich Is.; Patagonian Shelf. 105–298 m.

brachylepis W. M. Tatt. McMurdo Sound (457 m); South Georgia; South Shetlands; Falkland Is. 132–525 m.

hanseni Zimmer. N of Kaiser Wilhelm Land 66° 2′S, 89° 38′E. 200–250 m.

microps O. S. Tatt. South Georgia; Palmer Archipelago; N of Falkland Is. 100–250 m.

intermedia O. S. Tatt. Off Falkland Is.; Magellan Strait. 105–170 m.

macrops O. S. Tatt. South Georgia; N and NE of Falkland Is. 200–400 m.

patagonica O. S. Tatt. N of Falkland Is.; Magellan Strait; Patagonian Shelf. 14–300 m.

anomala O. S. Tatt. Magellan Strait. 300–0 m and 40–0 m.

dimorpha O. S. Tatt. Around South Georgia (11 stations); one station in Palmer Archipelago. 18–40 m; fragments taken 100–270 m.

antarctica n.sp. McMurdo Sound, Ross Sea, fish trap under ice 16 ft thick.

Key for the Identification of Species of the Genus *Mysidetes*

1 Apical lobes of telson broadly rounded and armed around the apex with regularly graduated spines ..... 2.

Apical lobes of telson truncate or narrowly rounded; each armed distally with one large spine, flanked on its inner side by one or two smaller spines ..... 4.

2 Lateral margins of telson armed throughout with small spines which are evenly graduated proximally, but arranged in series in the middle and distal regions. No spines on endopod of uropod. Telson cleft to one-tenth of its length ..... **Mysidetes hanseni** Zimmer

Lateral margins of telson unarmed proximally; armed distally with a close row of regularly graduated spines increasing in size distally and continuing around the apex of each telson lobe. Cleft deep. Inner margin of endopod of uropod armed with a close row of regular spines. Penis short for the genus ..... 3.

3 Antennal scale more than six times as long as broad. Spines on outer distal angle of sympod of antennal scale equal in size. Spines arming distal end of apical lobes of telson extending to the distal end of the cleft only; cleft one-third of the telson in depth, armed with many very small teeth ..... **Mysidetes patagonica** O. S. Tattersall

Antennal scale nearly eight times as long as broad; dorsal spine on the sympod larger than the ventral. Spines arming the distal third of lateral margins of telson unusually large and strong, extending around the apical lobes and half-way along cleft; cleft slightly less than one-quarter of length of telson. Both rami of uropods very long ..... **Mysidetes anomala** O. S. Tattersall

4 Margins of telson armed throughout; spines on base equal or graduated, small or absent in "waist" region; arranged in series distally ..... 5.

Proximal region of lateral margins of telson unarmed ..... 8.

5 Antennal scale extending well beyond distal margin of antennular peduncle. Uropods considerably longer than telson. Cleft of telson narrow; nearly one fourth of telson in depth ..... 6.

Scale subequal in length to antennular peduncle or very slightly longer. Cleft of telson widely open; one-fifth, or less, of telson in depth ..... 7.

6 Rostrum extending to proximal third of first segment of antennular peduncle, with margins nearly straight and carapace without "shoulders". Scale four to five times as long as broad; only one spine on outer distal angle of sympod of antenna. 26–28 small regular spines on endopod of uropod. Penis long, tubular, slender, extending to second thoracic sternum ..... **Mysidetes posthon** W. M. Tattersall

Rostrum extending just beyond base of antennular peduncle, with margins deeply concave and carapace with "shoulders". Scale more than six times as long as broad. Endopod of uropod armed with eight irregularly spaced delicate spines. Penis long and massive (with deep groove along inner surface) extending forward far beyond the distal end of the male lobe of the antennular peduncle; apex truncate ..... **Mysidetes antarctica** n.sp.

7 Apex of rostrum acutely pointed with deeply concave margins. Antennal and antennular peduncles subequal in length; scale five times as long as broad. Eyes cylindrical; cornea small, not wider than stalk. Cleft of telson widely open; one-twelfth of length of telson in depth. Spines arming endopod of uropod delicate and irregularly spaced. Ventral spine on sympod of antenna longer than the dorsal ..... **Mysidetes microps** O. S. Tattersall

Apex of rostrum short, obtuse with concave margins. Antennal peduncle shorter than antennular; scale six times as long as broad. Eyes globular with large cornea, much wider than stalk. Telson cleft moderately open, one-sixth of the telson in depth. Spines arming endopod of uropod arranged in close row and evenly graduated. Dorsal spine on sympod of antenna longer than the ventral. Marked sexual dimorphism in seventh and eighth thoracic endopods ..... **Mysidetes dimorpha** O. S. Tattersall

8 Spines arming lateral margins of telson arranged in series. Scale very slightly longer than antennular peduncle ..... 9.

Spines arming lateral margins of telson regularly graduated, increasing in size distally ..... 11.

9 Rostrum very short but partially covering eyes; apex forming angle of 130°. Scale less than three times as long as broad, with both margins convex. Eyes globular, cornea not wider than stalk. Telson one and a half times as long as broad at the base; cleft open, less than one-quarter of length of telson in depth; spines arming lateral margins of telson very obscurely in series in immature specimens. Penis extending only to third thoracic sternum ..... **Mysidetes crassa** Hansen

Rostrum short, leaving eyes wholly uncovered; apex acutely pointed forming an angle of 55°. Scale four times as long as broad; outer margin straight. Eyes globular with very large cornea, much wider than stalk and extending well beyond lateral margins of carapace. Telson twice as long as broad at base; cleft narrow, nearly one-third of the length of the telson in depth. Penis extending to mouth region ..... **Mysidetes macrops** O. S. Tattersall

Rostrum in form of moderately long triangle with apex rounded and margins making an angle of about 48°; extending to proximal region of eyestalks. Scale four and a half times as long as broad; outer margin very slightly convex. Eyes pyriform with large kidney-shaped cornea broader than stalk; set close together and not extending beyond lateral margins of carapace. Telson more than twice as long as broad at the base; cleft to nearly one-third of length ..... **Mysidetes intermedia** O. S. Tattersall

10 Rostrum short, leaving eyes wholly uncovered. Scale longer than antennular peduncle. Eyes large, with cornea extending partially beyond lateral margins of carapace. Uropods longer than telson ..... 11.

Rostrum produced as a triangle extending to the distal margins of the eyes. Scale three times as long as broad; shorter than antennular peduncle. Eye-stalks minutely hispid; cornea not extending beyond lateral margins of carapace. Endopod of uropod equal in length to telson. Telson more than twice as long as broad; lateral margins straight; cleft one-third of length of telson; apical lobes armed distally with one large spine flanked on its inner side by one smaller spine .....
Mysidetes brachylepis W. M. Tattersall

11 Rostrum short with acute apex and slightly concave lateral margins. Scale subequal in length to antennular peduncle; outer margin slightly convex. Endopod of uropod armed with about 11 delicate spines. Telson less than twice as long as broad, cleft to one-quarter of its length; lateral margins straight; apical lobes armed distally with one large spine flanked on inner side by two equal smaller ones. Penis extremely long, curving and slender, extending in large males to beyond the distal end of the antennular peduncle. Endopod of uropod armed with about 11 slender spaced spines.
Mysidetes kerguelensis (Illig)

Carapace very short, only slightly more than half as long as the pleon. Rostrum triangular with apex narrowly rounded. Scale longer than antennular peduncle; outer margin straight; spines on sympod almost obsolete. Telson tapering considerably distally with cleft shallow and armed with few teeth. Apical lobes armed distally with one very long spine flanked on inner side by one shorter one. Endopods of uropods extending beyond apex of telson by nearly half their length. (Northern Hemisphere.) .....
Mysidetes farrani (Holt and Tattersall)

Mysidetes posthon Holt and Tattersall

Mysidetes posthon Holt and Tattersall, 1906. p. 10.
Mysidetes posthon, Tattersall, 1908, p. 33, figs.
Mysidetes posthon, Zimmer, 1914, p. 402, figs.; *Mysidetes similis* p. 402, figs.; *Mysidetes illigi*, p. 403, figs.
Mysidetes posthon, Tattersall, 1923, p. 287.
Mysidetes posthon, O. S. Tattersall, 1955, p. 142.

Occurrence

Sta. 258. One immature female with oostegites just appearing. Colour note given – "Mouth area, raspberry; ventral side of thorax, pink; dorsal area of carapace, dark red-brown".

Sta. 285. Four damaged males, 19–22 mm, one juv. male, 12 mm; one immature female, 20 mm; two damaged juv. females.

Sta. 293. One ovigerous female, 22 mm, marsupium in two separate compartments with five embryos in one and the other empty.

Sta. 300. One adult female with empty marsupium, 22·5 mm.

Sta. 313. One slightly immature female, 21 mm.

Sta. 317. One adult male, 22 mm; one immature male, 20 mm; 47 small juv.

Sta. 79. One immature male, 15 mm.

Sta. 98. Two adult females (empty marsupium), damaged, estimated length, 22–23 mm.

Sta. 100. One juv. male; two adult females (empty); fragments.

Sta. A530. Pleon only of adult.

Sta. A534. One very damaged immature female.

Sta. 61D. 5 June 1961. Fragments and small juv. 3–5 mm ? *posthon*.
29 June 1961. ½ m net, one adult female, 23 mm; one juv., two pleons.
29 June 1961. S.N 24, 60¼ m net, fragments, probably *M. posthon*.
29 June 1961. One adult ovigerous female, 23 mm; 58 juv. 10–12 mm, sexual characters just appearing.
16 July 1961. Surface. Six juv. with sexual characters just appearing.
Fish trap. One adult female (in two pieces) estimated length 22 mm.

Sta. 61B. 24 July 1961. One adult (empty) female in two pieces, estimated length 23·5 mm.
8 Sept 1961. One adult (empty) female, in three pieces, estimated length, 21 mm.

Remarks

It has been recorded by earlier workers that specimens of *Mysidetes posthon*, in common with so many other forms, attain a considerably greater size before sexual maturity is reached than do members of the species living in more northerly waters. This observation is fully borne out by the present collection from the cold waters of McMurdo Sound, the farthest south at which they have been captured.

Females 20–21 mm long are definitely immature, with small oostegites. Ovigerous females and adult males measure from 22–25 mm. In waters around South Georgia adults are mature and breeding at a length of 15–16 mm (O. S. Tattersall, 1955).

The two ovigerous females in the present material exhibit a formation of the marsupium that I have not previously observed in this genus, though it has been recorded in species of the genus *Heteromysis*. The two large oostegites, borne respectively on the seventh and eighth thoracic appendages, do not interlock with those of the opposite side to form the usual single marsupial pouch, but are rolled inward upon themselves to form two separate chambers. These lie side by side beneath the posterior thoracic somites, with their outer surfaces touching in the median line. The two chambers are not completely sealed off from one another. The outer lateral margins of the

oostegites are not joined in any way with the tissues of the ventral surface of the body although they touch them. If a needle is gently inserted between the two chambers, they can be pressed apart and can clearly be seen to be separate from one another.

In the specimen from Station 293 there are five developing embryos in one of the chambers but the other chamber is empty. In the specimen taken at Station 61D (19.7.61) there are five very advanced embryos in each chamber.

The coloured photograph given as a frontispiece to this work are almost certainly *M. posthon*, but in the absence of males a definite identification is impossible.

Distribution

This species has a circumpolar distribution and is by no means uncommon at suitable depths. It has been recorded from the Antarctic and all the Southern Oceans. The present records extend its known geographical distribution slightly to the southward. The most southerly record was from the Bay of Whales, 75° 56·2′S by *Discovery*. The most northerly record known is from off Kerguelen Island at "about 49° S". It would appear to be gregarious in habit, especially when young and to live for the most part at or very near the bottom in depths of 200–450 m.

Mysidetes antarctica n.sp. (figs. 5–7)

Occurrence

Sta. 317. 27 April 1959. Pram Point, McMurdo Sound: Fish trap under ice 16 ft thick. Captured together with two adult males of *Mysidetes posthon* H. & T. and many juveniles, probably *posthon*. 1 adult male, 15 mm. (Type).

Type

The type is lodged with N.Z. Oceanographic Institute, Reg. No. 14.

Description

General form: slender and graceful; *carapace*, with the rostrum extremely short leaving the eyes completely exposed; lateral margins uptilted so that the rostrum appears to be more acutely pointed than it actually is; antero-lateral angles rounded and produced to form well-marked "shoulders" (fig. 5, 6). Lateral margins of carapace almost straight; posterior margin deeply emarginate leaving the median region of the last three thoracic somites exposed in dorsal view (figs. 5–6).

Pleon: relatively long, with the sixth somite almost as long as the fourth and fifth together.

Antennules: short and robust and of the form usual in the genus; prolongation from the outer margin of the first segment well-developed. Male lobe very long and slender, longer than the third segment of the peduncle, bearing only a few setae, but I think that they may have been broken off for the specimen is not in good condition (figs. 5–6).

Antennae: with the *scale* lanceolate, relatively slender, about eight times as long as broad, extending to the level of the distal end of the male lobe of the antennule; *peduncle* slender, two-thirds as long as the scale and extending almost to the distal margin of the antennular peduncle; outer distal angle of the *sympod* produced into a long acute spine. A second smaller spine is present on the outer margin at about the middle of its length. A well-marked acute protuberance rises from the distal dorsal margin of the sympod above the central region of the base of the antennal scale (fig. 5).

Eyes: globular, moderately large with the cornea extending completely beyond the lateral margins of the carapace when the eyes are turned outward, pigment black (figs. 5–6).

Mandibular palp: unusually robust for such a slender animal (fig. 6).

Thoracic appendages: as far as can be seen without dissection the first and second pairs are of the normal form found in the genus; the endopod of the second pair is particularly long and slender.

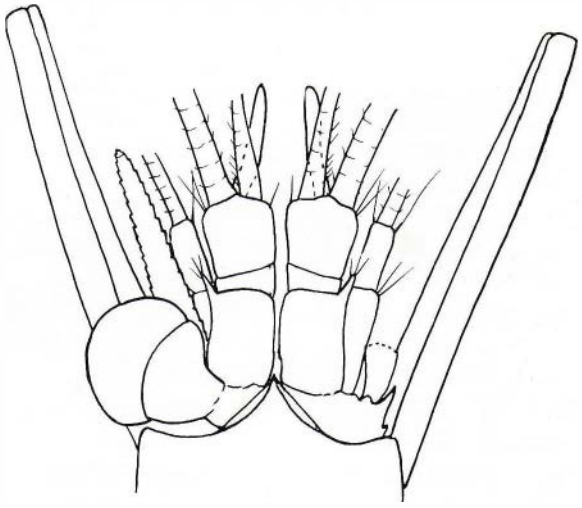


FIG. 5. *Mysidetes antarctica* n.sp. Adult male in lateral view (× 12·5).

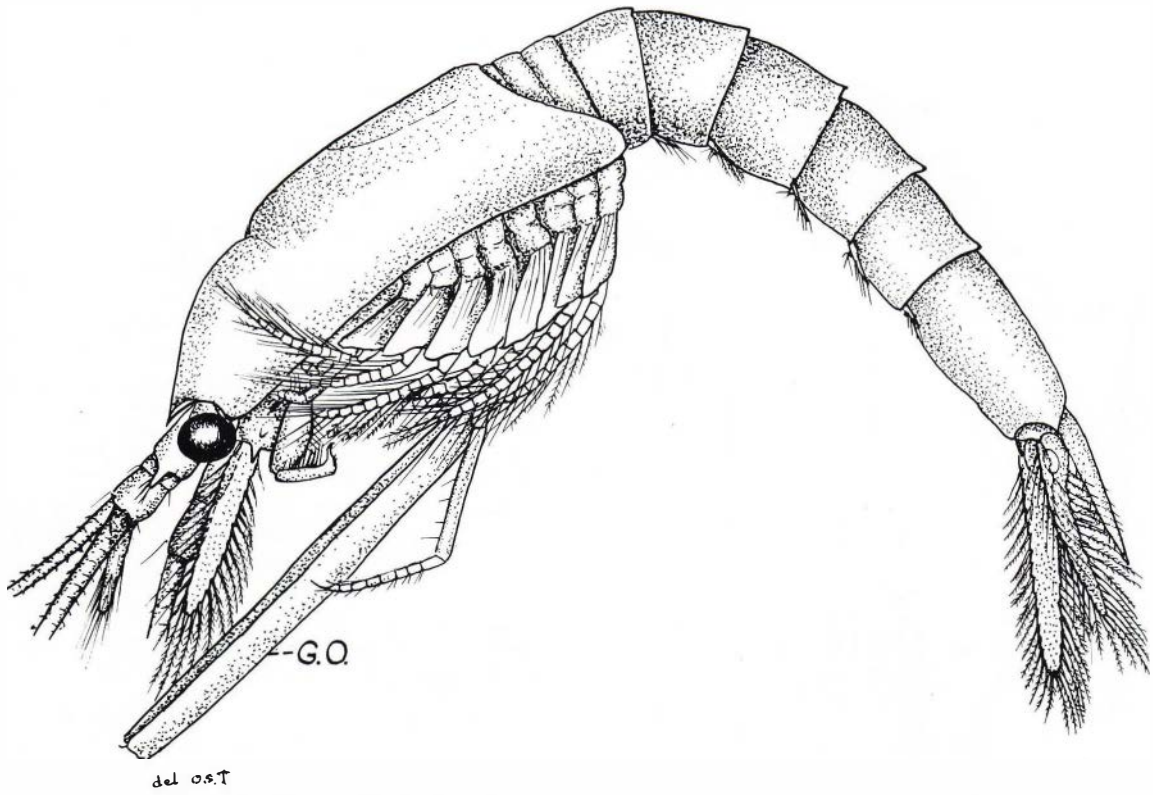


FIG. 6. *Mysidetes antarctica* n.sp. Anterior end of adult male in dorsal view (× 15).

Of the remaining thoracic appendages only two endopods are present in the specimen—the fourth on the left side and the sixth on the right. In each of these the carpopropodus is divided into eight sub-segments and is very delicate, long and curved.

Genital organ of the male: relatively enormous, very stiff and strong. It appears to be deeply grooved along its inner surface. The distal end is truncate and not expanded. This appendage is so long, extending forward considerably beyond the distal end of the male lobe of the antennule, that it completely dominates the appearance of the animal (figs. 5–6).

Pleopods: very small and delicate, reduced to simple setose plates; pseudo-branchial lobes well developed; fifth pair considerably smaller than the fourth (fig. 5).

Uropods: Endopods extending for one-quarter of their length beyond the apical lobes of the telson; inner margins armed with eight very slender spines which are increasingly spaced distally; distal spine situated three-fifths of the length of the margin from its proximal end. *Exopods* long and slender; slightly bowed outward at the distal third of their length; extending for nearly one-third of their length beyond the distal end of the telson (fig. 7).

Telson: two and a half times as long as broad at the base; lateral margins armed at the base with a close row of seven subequal spines; distal to these there is a short unarmed region. Rather more than the distal two-thirds of the margin armed with a close row of spines which are arranged in series of larger spines with groups of two or three smaller spines in the spaces between them. The large spines are unusually long and strong. Apical lobes armed distally with a very long spine flanked on its inner side by a smaller spine of about half its length.

Cleft: nearly one-quarter of the length of the telson; widely open with the lateral margins straight and armed with 12–13 regular teeth on each side (fig. 7).

Length of adult male 15 mm.

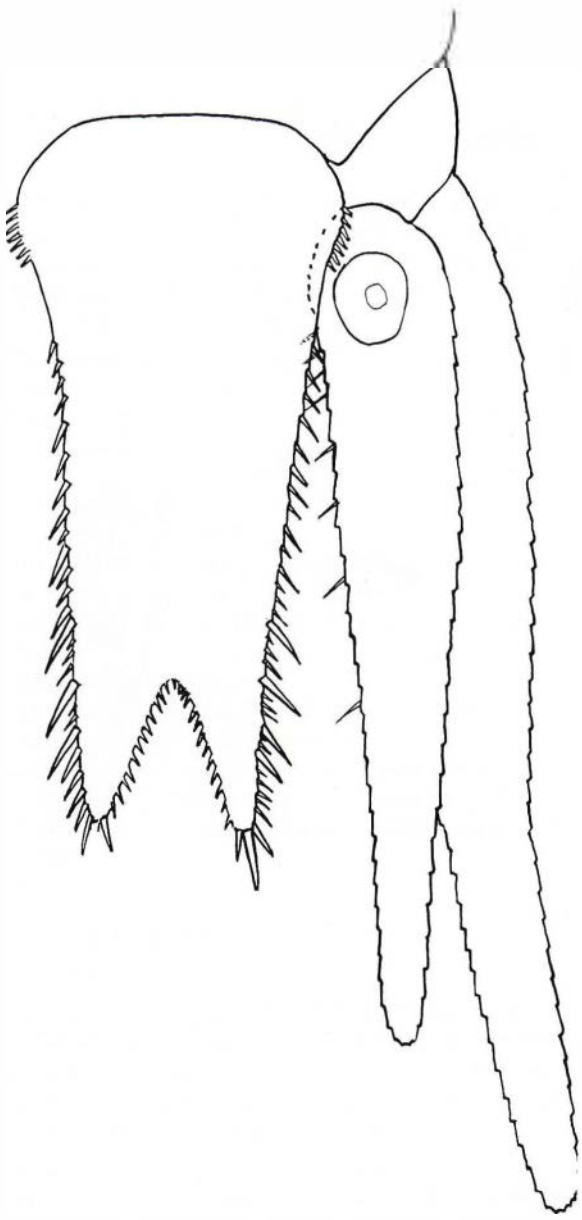


FIG. 7. *Mysidetes antarctica* n.sp. Telson and right uropod of adult male in dorsal view (× 45).

Remarks

This unique specimen is damaged, having lost the right eye and right antennal scale. Since the proportions of the parts of the anterior end, the form and armature of the telson and uropods and, particularly, of the external genital organ, are sufficiently distinctive to ensure ready identification, it has not been dissected and no description of mouth parts and thoracic appendages is given.

This species resembles *Mysidetes posthon* in many of its characters, notably in the shape and proportions of the telson. It differs from this species in the relatively much longer endopods and exopods of the uropods with the fewer spines arming the inner margins of the endopods and in the presence of an unarmed gap in the armature of the lateral margins of the telson. The specimen appears to be fully adult and I do not think that this gap is a sign of immaturity. This new species can be distinguished from all other known species by the truly enormous development of the male genital organs. In all the known species of the genus these organs are well developed and more or less produced – extending forward side by side between the bases of the thoracic appendages. Their length varies considerably in the various species. In *patagonica* and *anomala* they are of the usual cylindrical form but are not so long as the first segment of the exopod of the eighth thoracic appendage; in *hanseni* they extend forward only to the fourth thoracic somite; in *crassa* and *brachylepis*, to the third; in *dimorpha*, to the second and in *posthon*, *microps*, *macrops*, *intermedia*, and *farrani*, to the first thoracic somite or to the region of the mouth.

In *kerguelensis*, however, they were described by Illig–1930, p. 473, as follows: "Geradezu monströs ist bei *M. kerguelensis* das männliche Genitalorgan ausgebildet. Es ist so lang, dass es, an der unteren Brustseite nach vorn geklappt fast bis zur Oberlippe reicht." In the collections of the *Discovery* immature specimens of this species had genital organs reaching to the mouth parts but in a number of adults they extended far forward beyond the anterior margin of the antennular peduncle. (O. S. Tattersall, 1955, p. 143.) The organs were transparent, delicate, and sinuous, curving outward and then inward to form a graceful arch.

In the present specimens they are even longer relatively than in *kerguelensis* and, moreover, they are straight, very stiff, and robust with their distal ends truncate and not at all expanded. The whole organs are so large that they completely dominate the appearance of the animal especially in lateral view.

There are no females in the present material but the male can be distinguished by the very narrow antennal scale, the small globular eyes, the especially slender thoracic endopods, the few slender spines arming the inner margins of the endopods of the uropods, by the very long rami of the uropods and by the arrangement of the spines arming the lateral margins of the telson, with the seven equal spines on the basal region, the unarmed region separating them from the more distal series, the length of the large spines in this distal series and the enormous penis.

Tribe MYSINI

Genus **Antarctomysis** Coutière

Antarctomysis Coutière, 1906, p. 1.

Remarks

In 1906 Holt and Tattersall described an immature male specimen collected in 1902 by the *Discovery* in the Ross Sea (77° 25′ 40″S, 165° 39′ 6″E). This specimen resembled the definitions published for the genus *Mysis* so remarkably closely in many respects that they founded a new species, *Mysis maxima*, for their specimen. At the same time they noted that the form of the pleopods differed from the definition of these organs given for the genus *Mysis*, but they did not feel justified in instituting a new genus on such very limited material.

Later in the same year, Coutière, after examining adult specimens of the species collected by the Charcot Expedition to the Antarctic, founded the present genus *Antarctomysis* and referred his own and the *Discovery* specimen to it. Since that time a second species, *A. ohlinii* Hansen, has been added to the genus and both species have proved to be widely spread in all Antarctic waters and in the colder regions of the Southern Ocean. As these species form such a dominant part of the Mysidacea recorded from these areas it might be helpful to recapitulate the definition of the genus, adding to it some characters which have been added to it by later workers.

1. *Anterior end of the carapace:* produced to form a short, triangular rostrum, with an obtusely pointed apex in adults (more acute in immature specimens), leaving the eyes almost completely uncovered.

2. *Antenna:* scale lanceolate, very long and narrow, setose all round, apex acutely pointed small distal suture present. *Sympod* armed on the anterior ventral surface with a long, slender, ventrally-directed spine on the outer region just behind the base of the scale in both species. A second similar spine present on the *inner* side at the base of the peduncle in *maxima* but not in *ohlinii*.

3. *Eyes:* large and very well developed with the cornea wider than the stalk.

4. *Mouth parts and thoracic appendages:* almost precisely as in the genus *Mysis*.

5. *Marsupium:* composed of three pairs of oostegites of which the most anterior is much the smallest.

6. *Pleopods of the female:* all rudimentary and reduced to simple setose unsegmented plates. *In the male, first and second pairs* as in the female; *third pair* normal, biramous, natatory, with both rami many-segmented and armed with normal plumose setae; *fourth pair* biramous; endopod normal; exopod greatly elongated, reaching to the distal end of the telson in adults; many-segmented; armed distally with two extremely long plumose setae and a smaller one proximal to them; *fifth pair* biramous, with both rami multi-articulate and normal; exopod slightly longer than endopod.

7. *Uropods:* inner margin of endopod armed from statocyst to apex with many spines arranged in series of larger spines with smaller spines in the spaces between them.

8. *Telson:* long and relatively narrow; deeply cleft; lateral margins armed throughout with many small regular spines; apical lobes armed distally with one larger spine; cleft armed throughout with close-set teeth; no median setae.

9. *Size:* adults of both sexes attain a length of more than 50 mm, in very cold waters but may become sexually mature at less than 35 mm in warmer waters around South Georgia.

10. Well developed sternal processes are present on the third to eighth thoracic sterna of males of all ages and of immature females.

It is easy to identify males of this genus by the form of their pleopods. In *Mysis*, with which the genus agrees so closely in many of its characters, the first, second and fifth pairs are all reduced as in the female and the endopods of both the third and fourth pairs are in the form of a single unsegmented segment. Apart from the sexual differences the two genera may be distinguished as follows:

In *Mysis* the apex of the short rostrum is less acutely pointed; the outer distal angle of the sympod of the antenna is produced into an acute tooth and there are no long ventrally directed spines as in *Antarctomysis;* The antennal scale, except in *M. mixta* and *M. stenolepis*, where it resembles that of *Antarctomysis*, is relatively shorter and less acutely pointed in species of *Mysis;* there are no records of sternal processes on the thoracic sterna in *Mysis*; finally the spines arming the inner margin of the endopod of the uropod in species of *Mysis* are usually very few, not arranged in series and they do not extend to the apex of the endopod.

The two species of *Antarctomysis* have the same wide geographical distribution in Antarctic and cold temperate waters. They are both mesoplanktonic, gregarious in habit in moderate depths, and appear mostly to frequent the bottom levels or to live actually on the bottom. Specimens captured in upper levels or surface waters are generally very juvenile.

Although the two species resemble one another very closely in size, general appearance, and the details of their appendages, they may be distinguished from one another by the form of the eyes. In *maxima* the cornea is very large and extends over the whole of the distal region of the eyestalk and over the outer distal region as well so that they look both forward and outward. In *ohlinii* the cornea is relatively smaller and occupies only the distal region of the eyestalk so that when the eyes are directed forward they do not look sideways at all. The slope of the lateral margins of the rostrum is different in the two species. In *maxima* it is almost vertical in lateral view and the antero-lateral angles of the carapace lie immediately below the line of the insertion of the eyes but in *ohlinii* it slopes backward obliquely and the anterolateral angles lie well behind the insertion of the eyes.

One of the easiest means of distinguishing these species is by the presence of two strong spines on the ventral anterior margin of the sympod of the antenna, one on the outer region and one on the inner in *maxima*, whereas in *ohlinii* the inner distal region is smoothly rounded and lacks a spine. There are also certain differences in the form of the sternal processes.

It is very helpful if collectors could make notes of the disposition of chromatophores and of the colour of specimens when first captured. These data are frequently most valuable in the identification of species.

Both species of this genus have been recorded as forming the food of penguins, seals, and of whales.

Antarctomysis maxima (Hansen in MS) (Holt & Tattersall)

Mysis maxima (Hansen in MS) Holt and Tattersall, 1906, p. 11.
Antarctomysis maxima, Hansen, 1908, p. 13, figs.
Antarctomysis maxima, Tattersall, 1908, p. 36, figs.; 1913, p. 872; 1918, p. 12; 1923, p. 301.
Antarctomysis maxima, Hansen, 1913, p. 19.
Antarctomysis maxima, Zimmer, 1915, p. 203, figs.
Antarctomysis maxima, Hardy and Gunther, 1935, p. 201, figs.
Antarctomysis maxima, O. S. Tattersall, 1955, p. 173.
Antarctomysis maxima, O. S. Tattersall, 1961, p. 567.

Occurrence

Sta. 377. Many fragments but mostly of *A. ohlinii*.

Sta. A448. One male (in two pieces), 46 mm (estimated length).

Sta. A459. Three adult males (largest 61 mm); two adult females, 51 mm; three juv., immature females 40 mm (with very small oostegites).

Sta. A460. Five adult males, 52–65 mm; one juv., 46 mm; 13 adult females (4 ovigerous), 55–61 mm; one immature female, 50 mm.

Sta. A464. One adult male, 56 mm; anterior end of immature male.

Sta. A466. One very young female, 10 mm.

Sta. A534. One immature female, 30 mm.

Sta. A538. Two immature females – too damaged to estimate length.

Remarks

A. maxima is gregarious in habit and is common in the Antarctic and in the colder waters of the Southern Oceans. It has been recorded, often in considerable numbers, by all the principal Antarctic Expeditions from far south in the Ross Sea to the seas around South Georgia and the Falklands. Only one record of the species north of 49°S has been made – that of four immature specimens off St Paul de Loanda, West Africa. Since the species is so markedly a cold water form, it may be that these individuals had been carried north in the cold waters of the Benguela Current.

A maxima grows to a considerable size for mysids, especially in colder waters, and adults of over 50 mm in length are not uncommon.

Antarctomysis ohlinii Hansen

Antarctomysis sp. Tattersall, 1908, p. 36, figs.
Antarctomysis ohlinii Hansen, 1908, p. 13; 1913, p. 20, figs.
Antarctomysis ohlinii, Tattersall, 1923, p. 300.
Antarctomysis ohlinii, Rustad, 1930, p. 21.
Antarctomysis ohlinii, O. S. Tattersall, 1955, p. 177.
Antarctomysis ohlinii, O. S. Tattersall, 1961, p. 570.

Occurrence

Sta. 377. Contents of the stomach of a Weddell seal captured in McMurdo Sound, Ross Sea. Almost the whole sample consisted of broken fragments of *Antarctomysis* and where it was possible to identify these, they appeared to be *A. ohlinii* with a very few *A. maxima*, and many fragments of euphausids.

Sta. A537. One adult male, 59 mm estimated length; specimen in two pieces.

Sta. A538. One juvenile and the posterior end of one adult.

Remarks

This species closely resembles *A. maxima* in appearance, size, geographical distribution, and habits. The characters whereby they may be distinguished have already been enumerated above. The present records are within the known geographical range for the species and do not add materially to our knowledge of it.

REFERENCES

COLOSI, G. 1924: Euphausiacea e Misidacea raccolti dalla R. Nave "*Vettor Pisani*" nel 1882–1885. *Annu. Mus. zool. Univ. Napoli n.s., 5 (7)*: 1–7, 9 figs.

COUTIÈRE, H. 1906: Crustacés, Schizopodes et Décapodes. Expédition Antarctique Française (1903–1905) commandée par le Dr Jean Charcot. Paris, Masson et Cie, pp. 1–10, 2 pl.

CUNNINGHAM, R. O. 1871: Notes on the reptiles, Amphibia, fishes, Mollusca, and Crustacea obtained during the voyage of HMS *Nassau* in the years 1866–1869. *Trans. Linn. Soc. Lond. (Zool.) 27*: 465–502, 2 pl.

DANA, J. D. 1852: United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles Wilkes U.S.N. Philadelphia, C. Sherman. *13 (1)*: 1–685, 96 pl.

HANSEN, H. J. 1908: Schizopoda and Cumacea. *In* Resultats du voyage du SY *Belgica* en 1897–1899... *Rapports scientifiques, Zool.: 1–20*, 3 pl.

——— 1910: The Schizopoda of the *Siboga* Expedition. *Siboga Exped. 37*: 1–123, 16 pl., 3 figs.

——— 1913: Report on the Crustacea Schizopoda collected by the Swedish Antarctic Expedition, 1901–03. Copenhagen. 1–56, 6 pl.

——— 1921: On some malacostracous Crustacea (Mysidacea, Euphausiacea, and Stomatopoda) collected by the Swedish Antarctic Expeditions. *Ark. Zool. 13 (20)*: 1–7.

HARDY, A. C.; GUNTHER, E. R. 1935: The plankton of the South Georgia whaling grounds and adjacent waters, 1926–27. *Discovery Rep. 11*: 1–456, 193 figs.

HOLT, E. W. L.; TATTERSALL, W. M. 1905: Schizopodous Crustacea from the north-east Atlantic slope. *Sci. Invest. Fish. Br. Ire. 1902–3. (2) app. 4*: 99–151, 10 pl.

——— 1906: Preliminary notice of the Schizopoda collected by HMS *Discovery* in the Antarctic region. *Ann. Mag. nat. Hist. ser. 7, 17*: 1–11.

ILLIG, G. 1906: Bericht über die neuen Schizopodengattungen und-arten der Deutschen Tiefsee Expedition, 1898–99. I. Mysidaceen. *Zool. Anz. 30 (7)*: 194–211, 17 figs.

——— 1930: Die Schizopoden der Deutschen Tiefsee – Expedition. *Wiss. Ergebn. 'Valdivia' 1898–90, 22 (6)*: 400–625, 218 figs.

NOUVEL, H. 1942: Sur la systématique des espèces du genre *Eucopia* Dana 1852 (Crust. Mysidacea). *Bull. Inst. océanogr. Monaco, 818*: 1–8, 10 figs.

RUSTAD, D. 1930: Mysidacea. Scientific Results of the Norwegian Antarctic Expedition, 1927–28 and 1928–29, No. 6. *Skr. norske VidenskAkad.*: 5–28, 3 pl. 19 figs.

SARS, G. O. 1869: Undersögelser over Christianiafjordens Dybands-fauna paa en i Sommeren 1868... *Nyt Mag. Naturv. 16*: 305–62 (Reprint paginated 1–57).

——— 1872: Carcinologiske Bidrag til Norges Fauna I. Monographi over de ved Norges Kyster forekommende Mysider Vol. 2, 1872: 1–34. Christiana.

——— 1876–77: Nye bidrag til Kundskaben Invertebratfauna I. Middehavets Mysider. *Arch. Math. Naturv. 2*: 10–119, 36 pl.

——— 1883: Preliminary notices on the Schizopoda of HMS *Challenger* Expedition. *Förh. VidenskSelsk. Krist. 1883. 7*: 1–43.

——— 1885: Report on the Schizopoda collected by HMS *Challenger* during the years 1873–76. *Rep. voy. Challenger Zool. 13*: 228 pp., 38 pl.

SARS, M. 1869: Forstatte Bemaerkninger over det dyriske Livs Udbredning i Havets dybder. *Förh. VidenskSelsk, Christiania, 1868*: 246–75.

TATTERSALL, O. S. 1955: Mysidacea. *Discovery Rep. 28*: 1–190, 46 pl.

——— 1961: Report on some Mysidacea from the deeper waters of the Ross Sea. *Proc. zool. Soc. Lond. 137 (4)*: 553–71.

TATTERSALL, W. M. 1908: Crustacea VII. Schizopoda. *In* National Antarctic Expedition, 1901–1904, Natural History, London British Museum (Nat. Hist.), Zool., 4: 1–42, 8 figs.

——— 1913: The Schizopoda, Stomatopoda, and non-Antarctic Isopoda of the Scottish National Antarctic Expedition. *Trans. Roy. Soc. Edinb. 49 (4)*: 865–94, 1 pl.

——— 1918: Euphausiacea and Mysidacea. *Sci. Rep. Aust. Antarct. Exped. (Zool. and Bot.) 5*: 1–15, 1 pl.

——— 1923: Crustacea VII. Mysidacea. *Brit. Antarct. 'Terra Nova' Exped. Nat. Hist. Rep. Zool., 10*: 273–304, 4 pl.

WILLEMOES-SUHM, Rudolph von, 1873: *In* Wyville Thomson, Notes from the *Challenger*, VII. *Nature, Lond., 8*: 400–03, 6 figs.

——— 1874: Von der Challenger Expedition: Briefe an C. Th. E. V. Siebold, II. *Zeit. Wiss. Zool., 24*: ix–xxiii.

——— 1875: On some Atlantic Crustacea from the *Challenger* Expedition. *Trans. Linn. Soc. Lond.* (*Zool.*) (2) 1; 23–59, 8 pl.

ZIMMER, C. 1907: Schizopoden. *Ergebn. Hamburg. Magalhaensischen Sammelreise, 8 (2)*: 1–5, 17 figs.

——— 1914: Die Schizopoden der Deutschen Südpol-Exped. 1901–3. *Dtsch Südpol-Exped. Zool., 15 (7)*: 379–409, 4 pl.

——— 1915: Die Systematik der Tribus *Mysini* H. J. Hansen. *Zool. Anz., 46*: 202–16.

Sipunculoidea of the Ross Sea

By S. J. EDMONDS
Department of Zoology, University of Adelaide,
Australia

Abstract

Specimens of sipunculids collected from the Ross Sea by the New Zealand Oceanographic Institute and by the Stanford University Biological Research Group have been examined. None of the species is new, but descriptions are given of three species – *Golfingia margaritacea capsiformis* (Baird), *G. andersonni* (Théel), and *G. ohlini* (Théel). A possible fourth species, *Golfingia* sp. is briefly described, but no specific determination can be made because of difficulty in dissecting the specimens.

INTRODUCTION

This report is based on the study of some sipunculids collected during the New Zealand Oceanographic Institute cruises on HMNZS *Endeavour* to the Antarctic in 1959. The specimens, about 35 in number, were collected by Mr J. S. Bullivant and were sent to me for identification by the Director, New Zealand Oceanographic Institute, DSIR, Wellington. At about the same time I received 15 specimens collected from the Ross Sea during 1958–61 by Mr J. Dearborn, a member of the Stanford University Biological Research Group working in the Ross Sea. The specimens from both collections are referred to in this report.

None of the species was new. As most of the specimens were in a good state of preservation, however, I have taken the opportunity of describing them.

PREVIOUS WORK

Sipunculids have been previously reported from the Ross Sea on at least two occasions. Lanchester (1908) described *Golfingia socia*, and Stephen (1941) reported *Golfingia margaritacea* (Sars) and *Golfingia andersonni* (Théel) from the Ross Sea. Stephen (1941) considered that *G. socia* (Lanchester, 1908) and *G. margaritacea* (Sars, 1851) were synonymous.

Records of sipunculids from Antarctica and Subantarctica are numerous. The chief ones are those of Baird (1868), Selenka *et al.* (1883), Michaelsen (1889), Fischer (1896), Pratt (1898), Shipley (1902), Lanchester (1908), Herubel (1908), Théel (1911), Fischer (1920), Benham (1922), and Stephen (1941), and (1948).

Stephen (1941) gives a list of sipunculids reported from the Antarctic by previous workers and discusses the question of 'bipolarity' amongst the species.

SPECIES COLLECTED

The material examined contained three or possibly four species. A specific name was not given to a few very small specimens of *Golfingia* on account of the difficulty of satisfactorily dissecting the animals.

Golfingia margaritacea (Sars, 1851) *capsiformis* (Baird, 1865)
Golfingia andersonni (Théel, 1911)
Golfingia ohlini (Théel, 1911)
Golfingia sp.

STATION DETAILS AND SPECIES TAKEN AT EACH STATION

ABBREVIATIONS

B.T. – Blake trawl;
D.N. – Naturalist's dredge;
E.P.D. – Emery pattern dredge;
F.G. – Foerst grab;
F.G. – Dietz-La Fond grab;
G.T.H.O. – Two Hayward orange-peel grabs together;
G.T.O.S. – Small orange-peel twin grabs;
T.A.S. – Small Agassiz trawl;
T.P. – Pipe-frame Agassiz trawl;
W.T. – Wire mesh trap.

1. New Zealand Oceanographic Institute Stations

Sta. A448, 77° 27′S, 172° 22′E, 10 Jan 1959, 752 m, mud, T.A.S., G.T.O.S., bottom temp. —1·8°C, 1 mile from Ross Ice Barrier.
Golfingia margaritacea capsiformis (2),
Golfingia andersonni (1)

Sta. A449, 77° 05′S, 177° 12′E, 11 Jan 1959, 363 m, mud, T.A.S., G.T.O.S., bottom temp. —1·7°C, Ross Sea.
Golfingia margaritacea capsiformis (1)
Golfingia sp. (2)

Sta. A459, 75° 17′S, 172° 20′E, 16 Jan 1959, 534–549 m, soft mud, G.T.H.O., T.P., bottom temp. —1·9°C, Ross Sea.
Golfingia margaritacea capsiformis (2)
Golfingia andersonni (6)

Sta. A460, 75° 38′S, 168° 32′E, 17 Jan 1959, 415–430 m, gritty mud, G.T.H.O., G.D., T.P., bottom temp. —1·9°C, Ross Sea.
Golfingia margaritacea capsiformis (2)
Golfingia andersonni (1)

Sta. A461, 73° 32′S, 171° 22′E, 18 Jan 1959, 567–578 m, sandy mud, G.T.H.O., T.P., bottom temp. —2·0°C, Ross Sea.
Golfingia margaritacea capsiformis (2)
Golfingia andersonni (1)

Sta. A466, 78° 26′S, 174° 50′W, 24 Jan 1959, 569 m, mud, G.T.H.O., T.A.S., bottom temp. —1·6°C, Ross Sea.
Golfingia margaritacea capsiformis (1)

Sta. A467, 77° 25′S, 169° 28′E, 26 Jan 1959, 88–183 m, rocks D.N., off C. Crozier, Ross Island.
Golfingia margaritacea capsiformis (1)

Sta. A470, 77° 50′S, 166° 30′E, 4 Feb 1959, 377 m, muddy sand, G.T.H.O., bottom temp. —2·0°C, off Hut Point, Ross Island.
Golfingia margaritacea capsiformis (3)
Golfingia andersonni (3)

Sta. A471, 77° 37′S, 166° 20′E, 6 Feb 1959, 165–69 m, T.A.S., off C. Evans, Ross Island.
Golfingia margaritacea capsiformis (5)
Golfingia sp. (3)

2. Benthic Invertebrate Programme: Stanford University Stations. (Abstract of station data supplied by Mr J. H. Dearborn).

Sta. GLD–10, 75° 06′S, 165° 52′E, 29 Nov 1958, 832 m, rocky with sponges, B.T.4, off Terra Nova Bay, Ross Sea.
Golfingia margaritacea capsiformis (1)

Sta. GLD–13, 74° 39′S, 165° 52′E, 30 Nov 1958, 164 m, sponge-coelenterate complex, B.T.4; off Cape Washington, Ross Sea.
Golfingia ohlini (1)

Sta. G–1, 77° 51′S, 166° 40′E, 11 Jan 1959, 5 m, volcanic gravel and sandy mud, M.P.G., near tip of Cape Armitage, McMurdo Sound.
Golfingia ohlini (2)

Sta. V–1, 77° 50′S, 166° 37′E, 20 Dec 1959, 8–19 m, volcanic gravel and sponge complex.
Golfingia margaritacea capsiformis (4)

Sta. EAD–2, start 77° 39·4′S, 166° 16′E, stop 77° 40·8′S, 166° 16·5′E, 19 Feb 1960, 315 m, sponge complex, B.T. 2, off Inaccessible Island, McMurdo Sound.
Golfingia margaritacea capsiformis (3)

Sta. EAD–3, start 77° 42′S, 166° 19·5′E, stop 77° 43·1′S, 166° 19·1′E, 19 Feb 1960, 351–432 m, sponge complex with some rocks, B.T.2, off Inaccessible Island, McMurdo Sound.
Golfingia ohlini (1)

Sta. CEJ, 77° 38·3′S, 166° 24′E, 27 Jan 1960, 12 m, volcanic gravel and small rocks, E.P.D., F.G., W.T., off Cape Evans, McMurdo Sound.
Golfingia ohlini (1)

DESCRIPTIONS OF SPECIES

1. Golfingia margaritacea capsiformis (Baird) (pl. 1.)

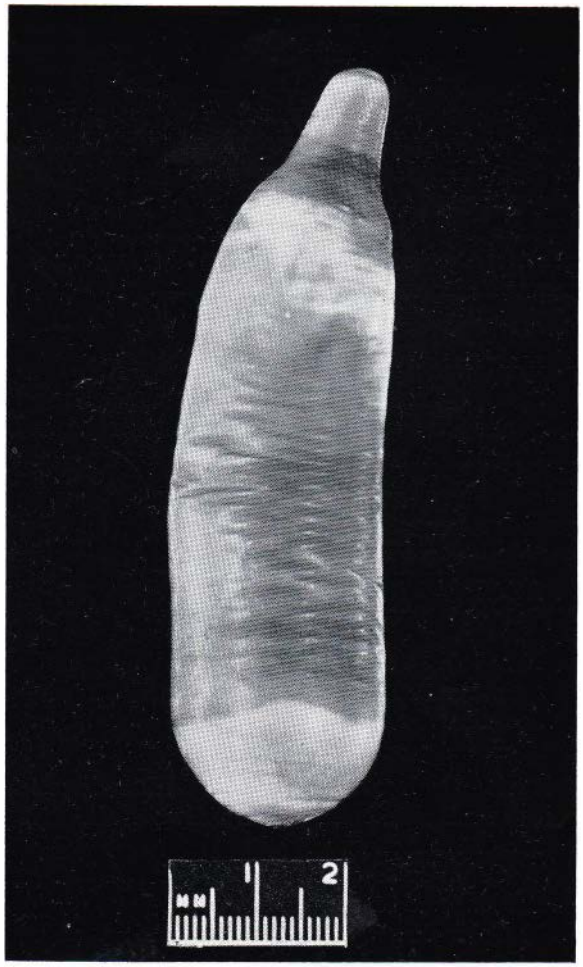
Golfingia Lankester, 1885; Fisher, 1950.
Phascolosoma capsiforme Baird, 1868.
Phascolosoma capsiforme Selenka, de Man & Bülow, 1883.
Sipunculus margaritacea Sars, 1851.
Phascolosoma margaritaceum Stephen, 1941; Stephen, 1948.
Phascolosoma margaritaceum var *capsiforme* Fischer, 1896; Benham, 1922.

Details (five specimens dissected)

The size of the specimens varies considerably. Some are small but most are large, stout, cylindrical, or sausage shaped. The length of the trunk is 12–110 mm and the maximum width 5–35 mm. The introvert of all the specimens is wholly or partly invaginated. In this condition it is about a quarter to a third as long as the trunk. No satisfactory information can be given about the tentacles except that they are numerous and when dissected out appear short and finger-like. No hooks, spines, or prominent papillae are present on the surface of the introvert.

To the naked eye the skin looks smooth. It is, however, covered with numerous, flat-conical papillae which, although variable in size, are usually very small. Those in the middle region of the body are smallest and their diameter lies between 0·05 and 0·11 mm. They are circular to elliptical in shape and consist of numerous very small plates. A central pore or canal shows up in many and the body wall between the papillae in most specimens is wrinkled and reticulate. The papillae on the posterior surface of the trunk are largest and about 0·1–0·3 mm in diameter. The skin posteriorly is very much wrinkled between the papillae. The size, shape, and structure of the papillae resembles very closely those of *G. margaritacea* shown in Théel (1905); plates 3 and 4, figs. 31–35).

Four retractors arise in the anterior half of the trunk, two dorsal retractors near the nephridial apertures and two longer ventral retractors more posteriorly. The anterior part of the alimentary canal runs between the two ventral retractors to which it is attached by thin mesenteries. There are usually two and sometimes three fixing muscles. One arises on the left side of the nerve cord (dorsal view) almost between the two ventral retractors and is fixed to the oesophagus. Another arises more anteriorly on the right side of the nerve cord



PL. 1: *Golfingia margaritacea capsiformis.*

and runs to the last whorl of the intestine. A third (found only in one specimen) arises more anteriorly on the right side of the nerve cord and runs to posterior region of the alimentary canal. No fixing muscle was found connected to the alimentary canal in the region of the wing muscle as shown in Théel (1905; plate 12, fig. 174). It is possible that the muscle in Théel's figure might correspond with one of those connected to the posterior region of the alimentary canal in the Ross Sea specimens.

The contractile vessel is single and its surface very much wrinkled. The intestine is long and consists of about 30–40 double spirals. In three of the specimens there was a small white, pointed, intestinal caecum – not the prominent structure shown in Fisher (1952; plate 23, fig. 1). The rectum is very short. The spindle muscle arises under a stout extensive wing muscle and is not fixed posteriorly. There are two short, bulbous nephridia which hang free. The anal aperture lies at about the same level as that of the nephridiopores. Spherical eggs were found in the body cavity of some specimens, the diameter of the largest lying between 0·23 and 0·27 mm.

Systematics

These specimens from the Ross Sea belong to a circumpolar species of *Golfingia* that occurs in Antarctica and Subantarctica. The first record was that of Baird (1868) who described specimens from Falkland Island as *Golfingia capsiformis*. Selenka, de Man and Bülow (1883) re-examined Baird's specimens and remarked that they were very close to *Golfingia margaritacea* (Sars, 1851), a species well known in northern and Arctic waters. Théel (1911) after a careful examination of a large number of specimens came to the conclusion that the Arctic and Antarctic species were both *G. margaritacea*.

During the last hundred years, Antarctic specimens of this sipunculid have usually been identified as one of the following:

(1) *Golfingia capsiformis* (Baird, 1868) by Pratt (1898) and Shipley (1902)
(2) *Golfingia margaritacea* (Sars, 1851) by Théel (1911), Fischer (1920) and Stephen (1941; 1948)
(3) *Golfingia margaritacea* var. *capsiformis* by Fischer (1896) and Benham (1922)

It seems to me that the specimens from the Ross Sea are either a subspecies of *G. margaritacea* viz, *G. margaritacea capsiformis*, or *G. capsiformis*. If they are *G. capsiformis* then a character has to be found which will distinguish the species from *G. margaritacea*. This has not yet been done. Nevertheless, although *G. margaritacea* is a widely distributed species – it is circumpolar in the Arctic (Fisher), 1952; Théel, 1905), it has been found at great depths in other parts of the world (Wesenberg-Lund, 1955) and is said to be a bipolar species (Théel, 1911; Fischer, 1920; Stephen, 1941; Fisher 1952; Wesenberg-Lund 1954) – I find it difficult to lump the specimens from the Ross Sea with the northern forms. They are very stout, the body wall is very thick and there are differences in the number and arrangement of the intestinal fasteners. As they fall within the complex species *G. margaritacea*, it seems to me that Benham was more correct in regarding them as a subspecies, *G. margaritacea capsiformis*.

Lanchester (1908) described *Golfingia socia* from Cape Adare (near the Ross Sea). He states (p. 2) that his species "presents in the main the chief features of the *Ph. margaritaceum* group". The only difference from *G. margaritacea* seems to be in the length of the introvert. Stephen (1941) regarded it as *G. margaritacea* and it is likely that it falls within the synonymy of *G. margaritacea capsiformis*.

Théel (1911), Fischer (1920), and Stephen (1941) considered that *G. antarctica* (Michaelsen, 1889), *G. fusca* (Michaelsen, 1889) and *G. georgiana* (Michaelsen, 1889) – all southern species – were identical with *G. margaritacea*.

Material examined

Twenty-seven specimens from 12 stations; N.Z.O.I. Stations A448, A449, A459, A460, A461, A466, A467, A470; Stanford Stations GLD–10, V–1, EAD–2.

Distribution

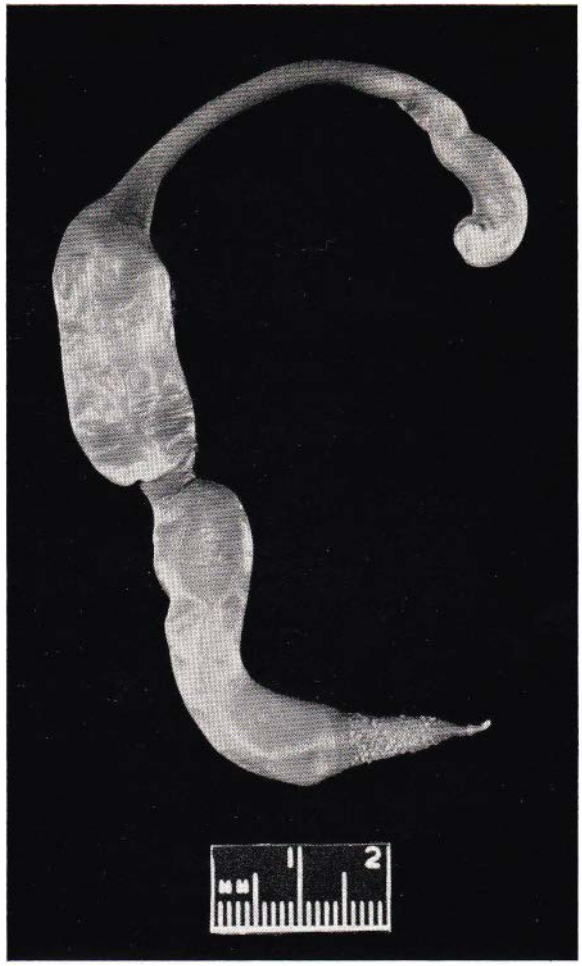
Falkland Islands: Baird (1868), Théel (1911), Pratt (1898), Stephen (1941).
South Georgia: Théel (1911), Stephen (1941).
Graham Land: Théel (1911), Fischer (1896).
Cape Adare: Shipley (1902).
Ross Sea: Lanchester (1908), Stephen (1941).
Commonwealth Bay: Benham (1922).
Off Sabrina Land: Stephen (1948).

2. **Golfingia andersonni** (Théel) (pl. 2)

Golfingia Lankester, 1885; Fisher, 1950.
Phascolosoma andersonni Théel, 1911.
Phascolosoma andersonni Stephen, 1941.

Details (two specimens dissected)

The specimens are long and thin, some are twisted and parts of the trunk of others are much constricted. A feature of the specimens is the form of the posterior extremity of the trunk which usually



PL. 2: *Golfingia andersonni*.

tapers to a sharp point and in some specimens is extended into an appendix-like structure. The surface of the posterior region bears large conical or semi-spherical papillae or 'bladders' (Théel, 1911) just as is shown in fig. 29 of Théel (1911).

The length of the trunk is 70–150 mm and the width, which is very variable, reaches a maximum of about 15 mm. The introvert is slender and about as long as the trunk. It is covered with numerous small papillae and lacks hooks and spines. Anteriorly there are about 20 tentacles.

There are four retractors all of which are slender. The dorsal pair arises more anteriorly than the ventral pair; all four remain separate. The intestine is long and consists of about 30 double spirals. The rectum is short and bears a very small rectal caecum. There is one fastener from the base of the left dorsal retractor (dorsal view) as is shown in fig. 71 of Théel (1911). The nephridia hang free and their external openings are at about the same level as the anal aperture.

Systematics

These specimens correspond in all details with *G. andersonni* Théel (1911) described from South Georgia and Graham Land Region. It is an Antarctic species.

Material examined

Twelve specimens from five stations; Stations A448, A459, A460, A461, A470.

Distribution

Graham Land and South Georgia: Théel (1911). Stephen (1941).

Ross Sea: Stephen (1941).

3. **Golfingia ohlini** (Théel) (pl. 3; fig. 1)

Golfingia Lankester, 1885; Fisher, 1950.
Phascolosoma ohlini Théel, 1911.
Phascolosoma ohlini Fischer, 1920.
Phascolosoma ohlini Stephen, 1941.

Details (two specimens dissected)

The specimens are small, white or pale brown in colour, and pointed posteriorly. The length of the trunk lies between 8 and 22 mm and the maximum width is 3–5 mm. The introvert is 7–15 mm long and its maximum width is 1·5 mm. The body wall is smooth, glistening, and thin. The introvert bears anteriorly about 14–16 tentacles and 3–5 irregular rows of backwardly directed hooks (fig. 1). The papillae on the introvert are conical but those on the trunk more hemispherical in shape. The latter are largest posteriorly.

There are four retractors, a ventral pair placed close together and a dorsal pair placed more

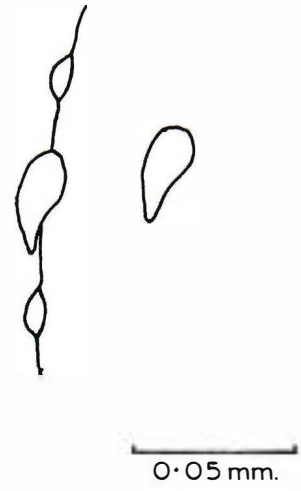


FIG. 1: Introvert hooks and papillae of *Golfingia ohlini*.

PL. 3: *Golfingia ohlini.*

anteriorly. The intestine is relatively much shorter than that of *G. margaritacea capsiformis* and *G. andersonni* and consists of about 15–20 spirals. There is a fastening muscle connected to the rectum. The spindle muscle is not fixed posteriorly.

An intestinal caecum was found in both specimens – a fact not mentioned by Théel in his description of the species.

Systematics

The identification of these specimens is based on their size and shape, the number of tentacles and introvert-retractors and the presence of hooks. These Ross Sea specimens are a little larger than those described by Théel. *G. ohlini* is an Antarctic species.

Material examined

Five specimens from four stations; Stations GLD–13, G–1, EAD–3, CEJ–1.

Distribution

South Georgia: Théel (1911), Stephen (1941).
North of Astrolabe I.: Théel (1911).
Kaiser Wilhelm Land: Fischer (1920).
Falkland Is.: Stephen (1941).
South Shetland Is.: Stephen (1941).

4. **Golfingia** sp.

Golfingia Lankester, 1885; Fisher, 1950.

Details (two specimens dissected)

The collection contained five small specimens, the total length of each (that is, trunk and introvert) being less than 11 mm. The body wall is smooth and the longitudinal musculature is continuous. The introvert lacked spines and hooks. The specimens proved difficult to dissect so that little can be said about their internal anatomy. The two dissected specimens possessed four retractor muscles and appeared to be juveniles. They are *Golfingia*, but I have made no specific determination.

Material examined

Five specimens from two stations; Stations A449, A471.

REFERENCES

BAIRD, W. 1868: Monograph of the species of worms belonging to the subclass Gephyrea. *Proc. zool. Soc. Lond. 1868*: 76–114.

BENHAM, W. B. 1922: Gephyrea inermia. *Sci. Rep. Aust. Antarct. Exped. 1911–14. Ser. C, 6, (5)*: 1–23.

FISCHER, W. 1896: Gephyreen. Hamburg Magalhaensische Sammelreise; 1–7.

——— 1920: Gephyreen der antarktischen und subantarktischen Meere. *Dtsch. Sud-Pol. Exped. 16. Zool. 8*: 407–30.

——— 1924: Beiträge zur Kenntnis der Sipunculiden. Uber die verwandtschaftlichen Beziehungen der Arten *Phascolosomum margaritaceum* Sars, *Phasc. hanseni* Dan. und Kor., *Phas. trybomi* Théel. *Zool. Anz. 58*: 69–74.

FISHER, W. K. 1950: The sipunculid genus *Phascolosoma*. *Ann. Mag. nat. Hist., Ser. 12, 3*: 547–52.

——— 1952: The sipunculid worms of California and Baja California. *Proc. U.S. nat. Mus. 102*: 371–450.

HERUBEL, M. A. 1908: Recherches sur les sipunculides. *Mem. Soc. zool. France, 20*: 107–418.

LANCHESTER, W. F. 1908: Sipunculoidea. *Nat. Antarct. Exp. 1901–4, nat. Hist., 4 Zool.*: 1–6.

LANKESTER, E. R. 1885: *Golfingia macintoshii*, a new sipunculid from the coast of Scotland. *Trans. Linn. Soc. Lond. Ser. 2, (2)*: 469–74.

MICHAELSEN, W. 1889: Die Gephyreen von Sud-Georgien nach der Ausbeute der Deutschen Station von 1882–3. *Jb. Hamburg wiss. Anst. 6*: 17–22.

PRATT, E. M. 1898: Contributions to our knowledge of the marine fauna of the Falkland Islands. *Mem. Manchr. lit. phil. Soc. 42 (13)* (this paper was not seen).

SARS, M. 1851: Beretning on en i Sommeren 1849 foretagen zoologisk Reise i Lofoten og Finmarken. *Nyt Mag. Naturv. 6*: 121–211.

SELENKA, E.; de Man, J. G.; Bülow, C. 1883: Die Sipunculiden. Reisen in Archipel der Philippinen von Dr C. Semper, Theil 2, Bd. 4, Abth. 1.

SHIPLEY, A. E. 1902: Gephyrea. *Rep. Coll. nat. Hist. Southern Cross*: 281–285. London, British Museum (Nat. Hist.).

STEPHEN, A. C. 1941: The Echiuridae, Sipunculidae and Priapulidae collected by the ships of the *Discovery* Committee during the years 1926–37. *Discovery Rep. 21*: 237–60.

——— 1948: Sipunculids. *B.A.N.Z. Antarct. Res. Exped. Rep. ser. B., 5*: 213–20.

THÉEL, H. 1905: Northern and Arctic invertebrates in the collection of the Swedish State Museum. 1. Sipunculids. *K. svenska VetenskAkad. Handl. 40 (1)*: 1–130.

——— 1911: Priapulids and Sipunculids dredged by the Swedish Antarctic Expedition, 1901–3. *K. svenska Vetensk-Akad. Handl. 47 (1)*: 1–36.

WESENBERG-LUND, E. 1954: Gephyrea from Chile. *Rep. Lund Univ. Chile Exped. 1948–49*. In *Lunds Univ. Arsskrift. N.F. Avd 2, 19*: 1–24.

——— 1955: Sipunculidae. *Rep. Swed. Deep-Sea Exped. 2 Zool. 15*: 199–201.

INDEX

Amblyops 14
Amblyops abbreviata 14
  antarctica 14, 16
  durbani 14
  nr. *kempi* 13
  sp. 14
  tattersalli 9, 12, 14, 15, 16, figs. 1–4
Amblyopsis 14
Amblyopsoides obtusa 13
Antarctic Ocean 12, 13
Antarctomysis 23
Antarctomysis maxima 9, 11, 13, 23, 24
  ohlinii 9, 11, 13, 14, 23, 24
Antarctomysis sp. 24
Arthromysis magellanica 13
Astrolabe I. 32

Bay of Biscay 17
Bay of Whales 20
Bellingshausen Sea 12, 13
Benguela Current 24
Boreomysis atlantica 12
  brucei 12
  distinguenda 12
  inerma 12
  plebeja 12
  rostrata 12
  scyphops 12
  sibogae 12
Bullivant, J. S. 9, 10, 27

Canary Is. 16, 17
Cape Adare 30
Cape Armitage 11, 28
Cape Crozier 28
Cape Evans 28, 29
Cape Washington 28
Chalaraspidum alatum 12
Chalaraspis alata 12
Charcot Expedition 23

Dactylamblyops antarctica 13
  arcuata 13
  hodgsoni 13
Dearborn, John H. 9, 10, 27, 28
Discovery 20, 22, 23
Durban 14

Endeavour, HMNZS 9, 27
Erythropini 14
Euchaetomera zurstrasseni 13
Eucopia australis 12
  grimaldii 12
  hanseni 12
  major 12
  unguiculata 12

Falkland Is. 12, 13, 17, 18, 24, 30, 32

German Antarctic Expedition 16
Gnathophausia drepanephora 12
  gigas 12
Golfingia 27, 29, 30, 31
Golfingia andersonni 27, 28, 30, 34, pl. 2
  capsiformis 30
  fusca 30
  georgiana 30
  margaritacea 27, 29, 30
  margaritacea capsiformis 27, 28, 29, 30, pls. 1, 2
  ohlini 27, 28, 31, 32, pl. 3, fig. 1
  socia 27, 30
  sp. 27, 28, 32
Grahamland 12, 13, 31

Hansenomysis angusticauda 12
  antarctica 12
  falklandica 12
Heteromysini 17
Heteromysis 17, 19
Hut Point 11, 28

Inaccessible I. 29
Indian Ocean 14
Ireland 16, 17

Kaiser Wilhelm Land 9, 16, 17, 32
Kerguelen I 12, 13, 17, 20

Leptomysini 17

McMurdo Sound 9, 15, 17, 18, 19, 20, 24, 28, 29
Macropsis magellanica 13
Magellan Strait 12, 13, 18
Mediterranean 16, 17
Metamysidella 16
Metamysidella kerguelensis 13
Mysideis 16
Mysidella 17
Mysidellinae 17
Mysidetes 9, 16, 17
Mysidetes anomala 13, 18, 22
  antarctica 9, 13, 17, 18, 20, figs. 5–7
  brachylepis 13, 16, 17, 19
  crassa 13, 17, 18, 22
  dimorpha 13, 18, 22
  farrani 16, 17, 18, 22
  hanseni 16, 17, 18, 22
  illigi 19
  intermedia 13, 18, 22
  kerguelensis 13, 17, 19, 22
  macrops 13, 18, 22
  microps 13, 18, 22
  patagonica 13, 18, 22
  posthon 9, 11, 13, 14, 16, 17, 18, 19, 20, 22
  similis 19
  sp. 11
Mysidopsis acuta 13
Mysinae 17
Mysini 23
Mysis 23
Mysis maxima 23, 24
  mixta 23
  stenolepis 23

Neomysis monticellii 13
  patagona 13
New Zealand Oceanographic Institute 9, 10, 11, 27, 28

Palmer Archipelago 12, 13, 18
Paramblyops brevirostris 12
Patagonian Shelf 17, 18
Petalophthalmus inermis 12
Phascolosoma andersonni 30
  capsiforme 29
  margaritaceum 29, 30
  margaritaceum var. *capsiforme* 29
  ohlini 31
Pram Point 20
Pseudomma 14
Pseudomma abbreviatum 14
  antarcticum 12
  armatum 12
  belgicae 12
  calmani 12
  longicaudum 12
  magellanensis 12
  minutum 12
  sarsi 12
  schollaertensis 12
Ross I. 28
Ross Sea 9, 12, 13, 17, 18, 23, 24, 27, 28, 30, 31

Saint Paul de Loanda 24
Scott Base 11
Sipunculus margaritacea 29
South Sandwich Is. 17
South Georgia 12, 13, 17, 18, 19, 23, 24, 31, 32
South Orkneys 12, 13
South Shetlands 12, 13, 32
Stanford University 9, 11, 27, 28

Terra Nova Bay 28
Tressler Oceanographic Station 14

Weddell Sea 12, 13
West Africa 24

MEMOIRS OF THE NEW ZEALAND OCEANOGRAPHIC INSTITUTE

Memoir No.	*Date*	*Title*	*Citation*
[1]	1955	Bibliography of New Zealand Oceanography, 1949–1953. By N.Z. OCEANOGRAPHIC COMMITTEE	*N.Z. Dep. sci. industr. Res. geophys. Mem. 4.*
[2]	1957	General Account of the Chatham Islands 1954 Expedition. By G. A. KNOX.	*N.Z. Dep. sci. industr. Res. Bull. 122.*
3	1959	Contributions to Marine Microbiology. Compiled by T. M. SKERMAN.	,, *Inf. Ser. 22.*
4	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 1. Decapoda, Brachyura, by R. K. DELL; Cumacea, by N. S. JONES; Decapoda Natantia, by J. C. YALDWYN. (*Published May 1960*)	,, *Bull. 139 (1).*
5	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 2. Archibenthal and Littoral Echinoderms. By H. BARRACLOUGH FELL. (*Published May 1960*)	,, *Bull. 139 (2).*
6	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 3. Polychaeta Errantia. By G. A. KNOX. (*Published May 1960*)	,, *Bull. 139 (3).*
7	1960	Biological Results of the Chatham Islands 1954 Expedition. Part 4. Marine Mollusca, by R. K. DELL; Sipunculoidea, by S. J. EDWARDS. (*Published May 1960*)	,, *Bull. 139 (4).*
8	1961	Hydrology of New Zealand Coastal Waters, 1955. By D. M. GARNER.	,, *Bull. 138.*
9	1962	Analysis of Hydrological Observations in the New Zealand Region 1874–1955. By D. M. GARNER.	,, *Bull. 144.*
10	1961	Hydrology of Circumpolar Waters South of New Zealand. By R. W. BURLING.	,, *Bull. 143.*
11	1964	Bathymetry of the New Zealand Region. By J. W. BRODIE.	,, *Bull. 161.*
12	1965	Hydrology of New Zealand Offshore Waters. By D. M. GARNER and N. M. RIDGWAY.	,, *Bull. 162.*
13	1961	Biological Results of the Chatham Islands 1954 Expedition. Part 5. Porifera: Demospongiae, by PATRICIA R. BERGQUIST; Porifera: Keratosa, by PATRICIA R. BERGQUIST; Crustacea Isopoda: Bopyridae, by R. B. PIKE; Crustacea Isopoda: Serolidae, by D. E. HURLEY; Hydroida, by PATRICIA M. RALPH. (*Published September 1961*)	,, *Bull. 139 (5).*
14	1963	Submarine Morphology East of the North Island, New Zealand. By H. M. PANTIN.	,, *Bull. 149.*
15	In prep.	Marine Geology of Cook Strait. By J.W. BRODIE.	,, *Bull.*
16	1963	Bibliography of New Zealand Marine Zoology 1769–1899. By DOROTHY FREED.	,, *Bull. 148.*

MEMOIRS OF THE NEW ZEALAND OCEANOGRAPHIC INSTITUTE—*continued*

Memoir No.	*Date*	*Title*	*Citation*
17	1965	Studies of a Southern Fiord. T. M. SKERMAN (Ed.)	*N.Z. Dep. sci. industr. Res. Bull. 157.*
18	1961	The Fauna of the Ross Sea. Part 1. Ophiuroidea. By H. BARRACLOUGH FELL. (*Published September 1961*)	„ *Bull. 142.*
19	1962	The Fauna of the Ross Sea. Part 2. Scleractinian Corals. By DONALD F. SQUIRES. (*Published November 1962*)	„ *Bull. 147.*
20	1963	*Flabellum rubrum* (Quoy and Gaimard). By DONALD F. SQUIRES. (*Published December 1963*)	„ *Bull. 154.*
21	1963	The Fauna of the Ross Sea. Part 3. Asteroidea. By HELEN E. SHEARBURN CLARK. (*Published December 1963*)	„ *Bull. 151.*
22	1964	The Marine Fauna of New Zealand: Crustacea Brachyura. By E. W. BENNETT.	„ *Bull. 153.*
23	1963	The Marine Fauna of New Zealand: Crustaceans of the Order Cumacea. By N. S. JONES. (*Published December 1963*)	„ *Bull. 152.*
24	1964	Bibliography of the Oceanography of the Tasman and Coral Seas, 1860–1960. By BETTY N. KREBS.	„ *Bull. 156.*
25	In press	A Foraminiferal Fauna from the Western Continental Shelf, North Island, New Zealand. By R. H. HEDLEY, C. M. HURDLE, and I. D. J. BURDETT.	„ *Bull. 163*
26	1964	Sediments of Chatham Rise. By ROBERT M. NORRIS.	„ *Bull. 159.*

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1965

1,500/7/64—90636 A

R. E. OWEN, GOVERNMENT PRINTER,
WELLINGTON, NEW ZEALAND—1965