AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS

ANARE RESEARCH NOTES 5

A Guide to the Hydromedusae of the Southern Ocean and Adjacent Waters

David O'Sullivan

ANTARCTIC DIVISION
DEPARTMENT OF SCIENCE AND TECHNOLOGY

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Species found south of the Subtropical Convergence will be dealt with in detail. Those occurring in more northerly waters but likely to be encountered on Antarctic voyages are included in identification keys.

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CONTENTS

FIGURES

MAPS

A GUIDE TO THE HYDROMEDUSAE OF THE SOUTHERN OCEAN AND ADJACENT WATERS

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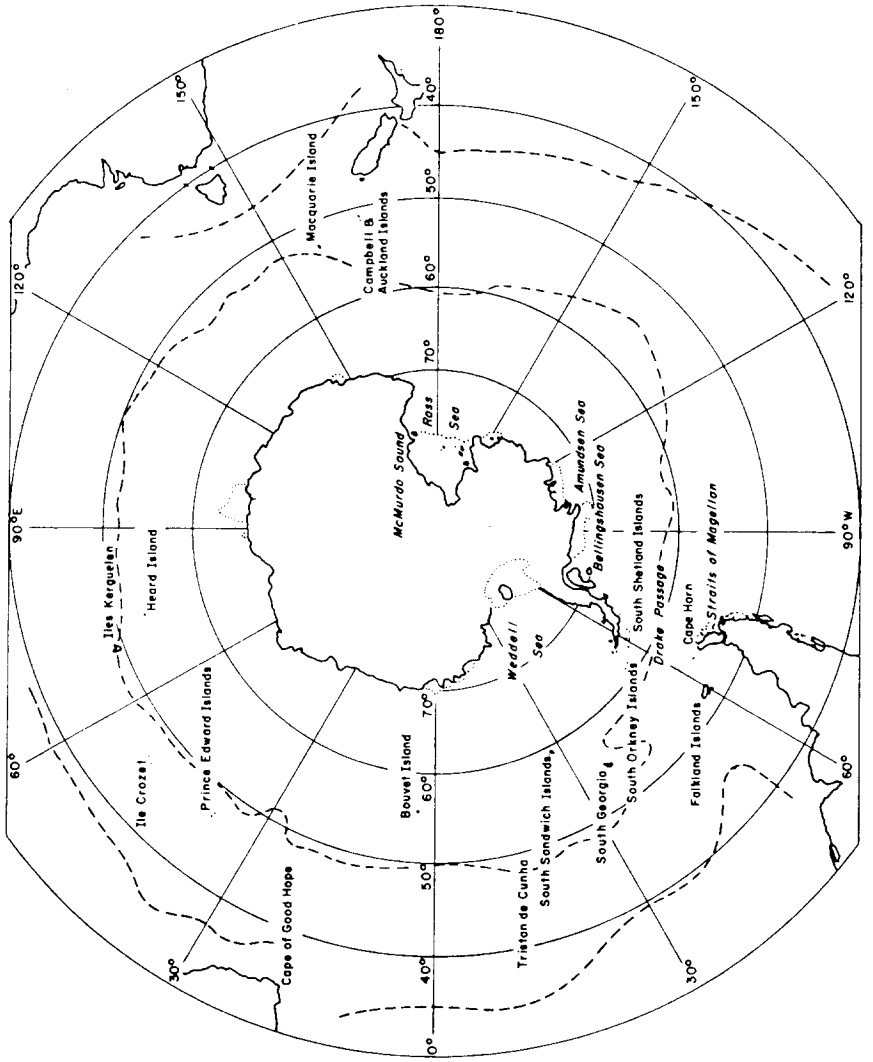
ABSTRACT

A total of 66 (including 3 doubtful) species of Hydromedusae have been found in the Southern Ocean. For each valid species the synonymy, vertical and horizontal distribution, and the diagnostic characters are given together with an illustration and a map of geographical distribution. Species not found in the Southern Ocean but which occur in adjacent waters are included in the keys.



Map showing places mentioned in text.

1. INTRODUCTION

The phylum Cnidaria, or Coelenterata, includes the familiar hydras, jellyfish, sea anemones, and corals. Jellyfish fall into two classes, the Scyphozoa (or Scyphomedusae) in which the medusa is the dominant and conspicuous individual in the life cycle, and the Hydrozoa (or Hydromedusae) which display either the polypoid (hydroid) or medusoid structure or pass through both forms in their life cycle (Barnes, 1974). The Hydromedusae consists of seven orders: Anthomedusae, Leptomedusae, Limnomedusae, Narcomedusae, Trachymedusae, Pteromedusae and Siphonophora (including Condrophora) but only the first six orders will be considered here. Although many Hydromedusae have a sessile hydroid stage in their life cycle, only the pelagic or medusoid stage will be dealt with in this handbook.

This handbook contains brief diagnoses of the Southern Ocean Hydromedusae families and genera with a detailed description of the species. The Southern Ocean includes all that ocean which lies between the Subtropical Convergence and the Antarctic Continent. This area can be divided into 2 zones, the Subantarctic and the Antarctic which are separated by the Antarctic Convergence. Keys for the identification of the species from this area which may be considered as valid are given; doubtful or obsolete species are just mentioned. Species found in waters adjacent to the Southern Ocean (south of 30° South) are also included in the keys. The regions they have been found in are given in brackets: (Au) for southern Australia; (NZ) for New Zealand; (Pa) for southern Pacific Ocean; (SAm) for South America; (At) for southern Atlantic Ocean; (SA) for southern Africa; (In) for Indian Ocean; and (Co) for cosmopolitan in adjacent waters.

The family and generic diagnosis and species diagnostic characters were taken from Kramp (1959, 1961, 1965, 1968) except where stated otherwise. Most of the keys were assembled from information in Kramp (1961). In the synonomy only incorrect records from the Southern Ocean are given. For each species a distribution map has been given. On these maps symbols represent the location where a species has been found. In some cases they are only approximate as the author has specified a general area rather than an exact position. A question mark next to a symbol indicates that the identification was tentative or that subsequent workers have questioned the validity of the identification. The positions of the Subtropical Convergence and the Antarctic Congergence are from Lomakina (1966).

A complete bibliography up to 1910 may be found in A.G. Mayer: Medusae of the World. Vol. I-II, 1910. A new complete bibliography for the period 1910 to 1959 is given in P.L. Kramp: Synopsis of the Medusae of the World, Journal of the Marine Biological Association of the United Kingdom. Vol. 40, Plymouth, 1961. Maas (1906) lists the medusae previously recorded from Antarctic Regions. Kramp (1953) gives a useful review of previous work on Australian Hydromedusae.

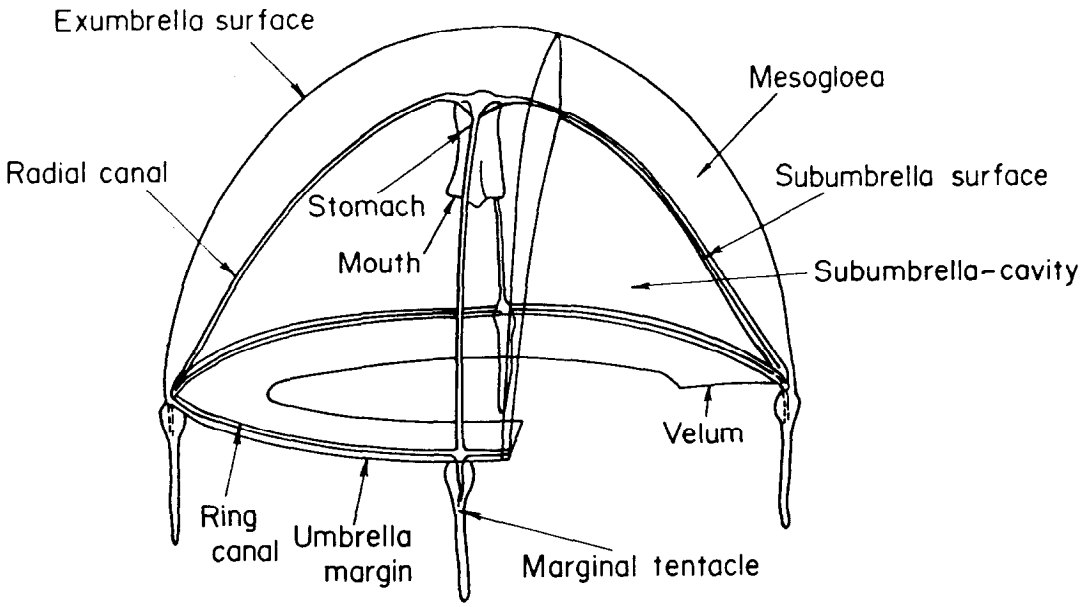


Figure 1. Diagram of a medusa with one quadrant cut away.

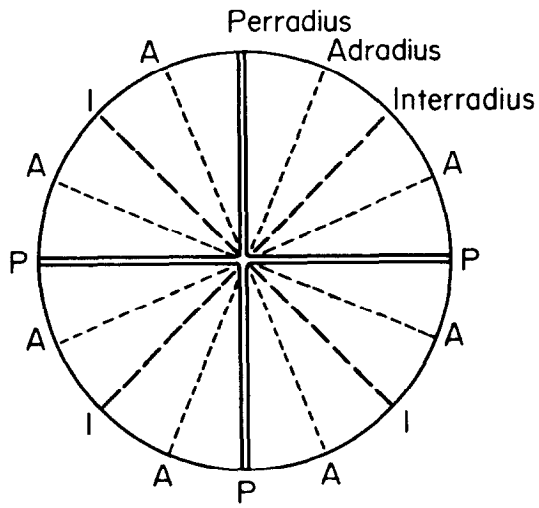


Figure 2. Diagram to define the radii of a medusa: P. perradii, these are the radii on which the four primary radial canals lie; I. interradii; A. adradii.

2. THE STRUCTURAL CHARACTERS OF MEDUSAE (after Russell, 1953)

The basic structure of the hydromedusa type may be summarized as follows, the terms underlined being those used in the descriptions of species in this handbook.

The main body of the medusa (Figure 1) consists of a gelatinous swimming bell or umbrella. The outer convex surface of the umbrella is the exumbrellar surface, and the inner concave surface is the subumbrellar surface. The cavity bounded by the subumbrellar surface is the subumbrellar cavity. The marginal end of the umbrella is the umbrella margin. From the centre of the subumbrellar surface hangs the hollow stomach, terminating distally in the mouth. Four hollow radial canals run from the stomach just beneath the subumbrellar surface to join a continuous hollow circular canal or ring canal, which runs round the umbrella margin. On the umbrella margin, at each of the four points where a radial canal joins the ring canal, is a contractile marginal tentacle. Finally, the opening of the subumbrellar cavity is partially closed by a continuous horizontal shelf, the velum, which is situated just inside the umbrella margin.

For purposes of descriptive orientation the umbrella is divided into radial planes (Figure 2). The four planes meeting at right angles at the summit of the umbrella in which the four radial canals lie are perradial. Intermediate between these four perradial planes, or perradii, and bisecting the four equal sectors or quadrants are four similar planes meeting at right angles at the umbrella summit, the interradial planes or interradii. The four perradii and four interradii thus divide the umbrella into eight equal sectors or octants. These eight sectors may be again equally divided by eight adradial planes or adradii; each adradius is thus situated midway between a perradius and an interradius, and the umbrella is divided into sixteen sectors.

This is the essential plan of a hydromedusa, and the specific differences are based on the form, or numbers, of the chief structures mentioned above together with additional characters such as the presence or absence of sense organs or marginal cirri. These latter structures will be defined below, where some characters of the medusa are considered independently.

The umbrella, or swimming bell, is typically bell-shaped. It shows, however, considerable variation in form from species to species. The umbrella also varies considerably in its degree of solidity. This solidity is imparted by the presence of the jelly or mesogloea. In some species the jelly is much thickened at the summit or apex of the umbrella which may be drawn out into a rounded or pointed cone of varying size. Such a thickening at the summit of the umbrella is known as an apical projection or process. In most Hydromedusae the margin of the umbrella is entire, but in the Narcomedusae it may be divided by peronial grooves so that the margin is lobed.

The size of the umbrella in adult medusae varies from a diameter of 1 or 2 mm to as much as 20 cm. The size is to a certain extent related to the umbrella shape. In small medusae the umbrella is generally bell-shaped, with increase in size the umbrella becomes progressively more flattened through a hemispherical shape to that of a saucer. As a general rule the Anthomedusae are bell-shaped and the Leptomedusae more flattened. Among the Limnomedusae and Trachymedusae both bell-shaped and flattened medusae may be found. The Narcomedusae are usually bell-shaped or hemispherical. The Pteromedusae are usually of an elongate bipyramidal form.

The velum forms a horizontal shelf around the aperture of the subumbrellar cavity, leaving a central circular aperture, the velar opening. In some medusae, especially in certain Trachymedusae and Limnomedusae, the velum is very strongly developed and it may hang downwards like a curtain round the umbrella margin.

The stomach, which hangs down from the centre of the subumbrellar surface, is essentially a simple sac. At the distal end of the stomach is the mouth, which opens to the exterior. The stomach may be cylindrical or fusiform, and it may be large in proportion to the umbrella, especially is this so in the Anthomedusae. The jelly at the summit of the subumbrellar cavity has a cone-shaped thickening projecting downwards into the cavity, to the end of which the stomach is attached. This thickening of the jelly is know as the peduncle. The portion of the medusa which hangs down in the subumbrellar cavity like the clapper of a bell is commonly called the manubrium.

The mouth is the opening of the stomach to the exterior, the actual margin of this opening forming the mouth lips. The structure of the mouth and of its lips is a character of great importance in the classification of the Anthomedusae. In many species the mouth opening itself is circular, but arising from the outer surface of the stomach a short distance above the mouth there are four perradial oral tentacles each terminating in a cluster of nematocysts; these oral tentacles may be simple and undivided or they may be dichotomously branched.

The gonads are of considerable value as diagnostic characters. Their position for instance, forms one of the principal distinguishing characters between the Anthomedusae and Leptomedusae. The gonads may be situated on the walls of the stomach or on the radial canals. Hydromedusae generally have separate sexes, but hermaphroditism does sometimes occur, e.g. in the creeping medusa Eleutheria. Asexual budding is a common feature among medusae, especially in the Anthomedusae. The medusa buds are usually formed either on the stomach walls or from the bases of the marginal tentacles.

The marginal tentacles, whose main function is the capture of prey, show great diversity of form. They can be solid or hollow. It is very common for a marginal tentacle to be dilated at its base next to the umbrella margin; this dilated portion is called the tentacle bulb.

Cirri are small tentacular-like organs situated on the umbrella margin between the true marginal tentacles. They are always much smaller than the marginal tentacles and never have swollen basal bulbs. They are solid, and have a core of a single row of endoderm cells.

Two kinds of sense organs are found, ocelli and statocysts. There may perhaps be a third, the cordylus, but its function is not yet known.

Ocelli are organs for light reception. They are most common and best developed in the Anthomedusae. Exteriorly they appear as round or oblong spots of black, chocolate brown, or red pigment. The ocellus usually consists of a small mass of pigmented ectoderm cells lining a pit on a protuberance and associated with nerve cells. Ocelli are usually situated on the basal bulbs of the marginal tentacles. They may be on the outer side of the marginal tentacle bulb, i.e. abaxial or they may be on the inner side, ie. adaxial.

The so-called statocysts are possibly organs of orientation. They are not found in the Anthomedusae, but occur in many Leptomedusae and Limnomedusae, and in all Trachymedusae and Narcomedusae. Statocysts are of two kinds: marginal vesicles are small hollows or pits in the velum which may remain open or completely closed; sensory clubs are small tentacle-like structures growing out from the umbrella margin. In some Narcomedusae tracks of cells with bristles run up over the exumbrella from the cushions from which the sensory clubs arise, these are known as otoporpae.

Cordyli are marginal club-like structures occurring in Leptomedusae of the family Laodiceidae. Their function is not known, although it has been thought to be sensory. Structures somewhat similar in appearance to cordyli are found in certain Anthomedusae of the family Tiarannidae. They differ, however, in that they usually contain nematocysts, especially at the distal end. They are often not so typically club-shaped as a true cordylus.

3. LIFE HISTORY (after Russell, 1953)

Hydromedusae may be divided into three categories according to their life histories:

1. Those with a fixed hydroid or a free-swimming hydroid stage.
2. Those with direct development.
3. Those with a parasitic stage (hydroid) in their life history.

MEDUSAE WITH A FIXED OR A FREE-SWIMMING HYDROID

Fixed hydroid stages occur among the Anthomedusae, the Leptomedusae, and the Limnomedusae. The eggs, which may be fertilized on the medusa or in the sea after shedding, develop into planulae which give rise to the hydroids. When the primary polyp is fully developed feeding begins and new polyps may be developed to form a colony. When the colony is fully grown fresh medusae are produced. The average length of life of the majority of free-swimming medusae is probably in the neighbourhood of two months.

MEDUSAE WITH DIRECT DEVELOPMENT

As far as is known, direct development, without the intervention of a true hydroid stage, only occurs in the Trachymedusae and the Narcomedusae. Such medusae are essentially oceanic in habitat. As in other medusae a planula is developed. The planula does not attach to any substratum but itself develops tentacles, and becomes transformed directly into a free-swimming medusa.

MEDUSAE WITH A PARASITIC STAGE IN THEIR LIFE HISTORY

While a number of hydroids may live epiphytically on other animals there are some which are apparently true parasites. As far as known at present none of the Southern Ocean medusae have truely parasitic hydroids.

4. COLLECTING AND PRESERVATION (after Russell, 1953)

Medusae are delicate organisms and in order to collect them with the least damage it is always advisable to use a tow-net which has an enamelled or galvanized bucket, or even a glass jam-jar, tied at its end. The medusae are thus still in water while the net is being untied after its removal from the sea. The condition of the medusae also depends on the quantity of other plankton organisms contained in the catch, and it is desirable to use a mesh which will allow the passage of all organisms below the size of the medusae required.

When the net has been lifted, the contents of the catch should be poured immediately into large glass vessels and diluted with pure sea water. Sometimes it will be necessary to divide the catch among a number of jars. The living medusae should then be removed with pipette or glass dipping tube into another vessel of pure sea-water. If the specimens are not required for examination on the spot it is essential that they should be shielded from direct sunlight when being taken to the laboratory, and that they should be kept as cool as possible.

Specimens brought into the laboratory alive are very suitable for making excellent preserved material. For specimens not required for detailed histological examination the best preservative is 5% formalin in sea-water. It is not usually necessary to use any narcotizing reagents* to preserve the specimens in a fully expanded condition. The medusae should be placed in a small vessel and left for a few minutes until swimming actively. Strong formalin may then be squirted in by a pipette, and it is essential to keep the water and the medusae moving and well stirred. This is best done by continually squirting, with the pipette under water, on the medusae themselves. This should be continued until a short time after the medusae show no spontaneous movements. It will be found that the action of the stream of water over the specimens has drawn the tentacles out until well expanded, and the umbrella is also kept from contracting by the jets which strike occasionally on the subumbrellar surface. When there are a large number of specimens to be preserved the majority will be found in excellent condition if strong formalin is poured into the jar and the water is kept gently stirred for a short time with a glass rod.

When satisfied that the medusae are dead and when there is no further sign of movement or contraction of the tentacles when the water is allowed to come to rest, the specimens may be bottled off in tubes of 5% formalin in sea-water. It is always advisable to keep the specimens in formalin in sea-water rather than in fresh water.

Always avoid the use of alcohol as a preservative (except for nematocysts), unless formalin is unobtainable, since it causes shrinkage and contraction of the specimens. When the umbrella is much shrunk the proportional sizes of stomach, marginal tentacles, etc., appear altogether different, and it becomes difficult to reconcile the appearance of such specimens with published drawings of well-preserved or living medusae. If whole plankton catches are to be preserved, it cannot be too strongly emphasized that the catch should be preserved immediately it has come on board. Crowded together as they are many of the animals quickly die, and delicate organisms are also liable to damage by the depredations of the more hardy or by contact with crustacean spines.

*A 7.5% isotonic solution of magnesium chloride gives good results as a narcotic.

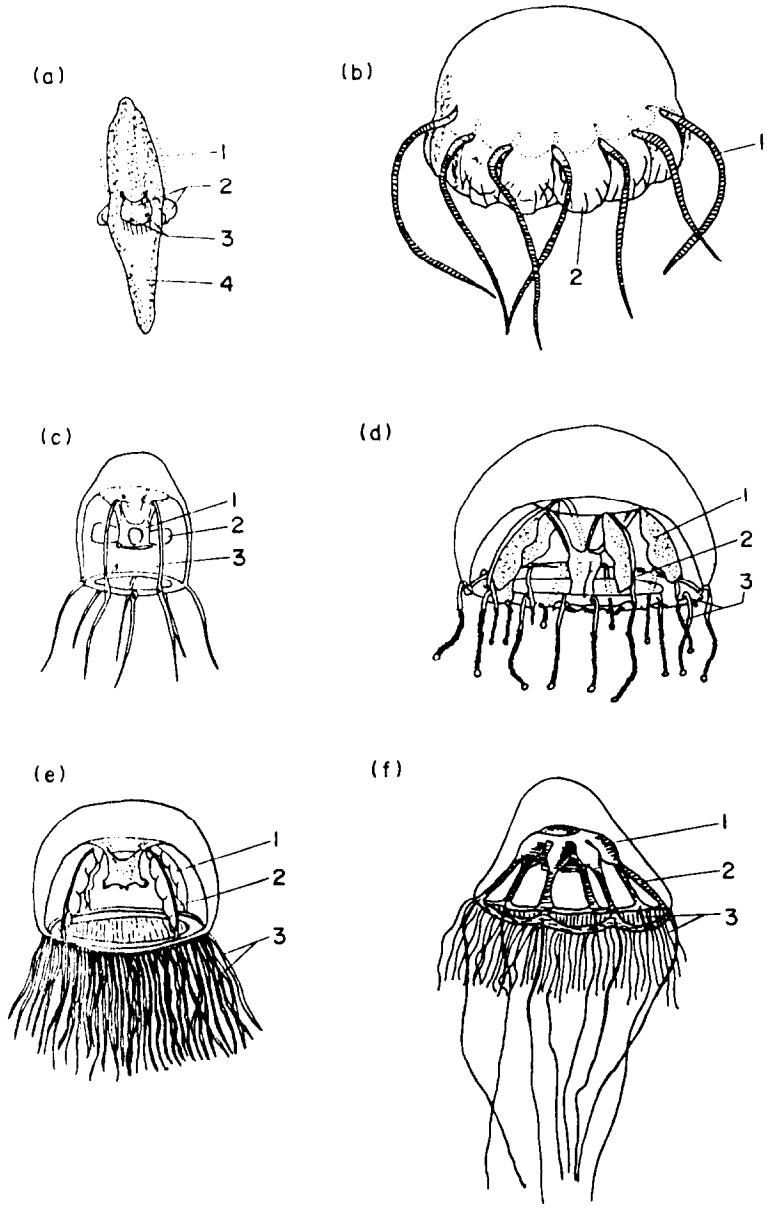


Figure 3. Diagnostic characters of each of the orders of Hydromedusae.
(a) Tetraplatia (1) bell, (2) swimming flaps, (3) statocysts, (4) manubrium
(b) Pegantha martagon (1) marginal tentacle, (2) intertentacular lappet
(c) Podocoryne tenuis (1) stomach, (2) gonad, (3) radial canal
(d) Gossea brachymera (1) gonad, (2) radial canal, (3) tentacle rings
(e) Phialella falklandica (1) gonad, (20 radial canal, (3) marginal tentacles
(e) Haliscera racovitzae (1) gonad, (2) radial canal, (3) marginal tentacles.

5. KEY TO ORDERS OF HYDROMEDUSAE:

(Figure 3)

1a) No tentacles present, margin of umbrella divided into four flaps (Figure 3a) ..... PTEROMEDUSAE
b) Tentacles present 2

2a) Margin of umbrella divided into intertentacular lappets, tentacles spring from umbrella some distance above margin (Figure 3b) ..... NARCOMEDUSAE
b) Umbrella margin entire, tentacles are usually marginal or nearly so 3

3a) Gonads borne on stomach only, tentacles on bell are few in number and short (Figure 3c) ..... ANTHOMEDUSAE
b) Gonads borne on other areas 4

4a) Gonads borne on radial canals only, or on both stomach and radial canals, usually 2 rings of tentacles, one at bell margin and one slightly above (Figure 3d) ..... LIMNOMEDUSAE
b) Gonads borne on radial canals only, one ring of tentacles 5

5a) Numerous marginal tentacles (Figure 3e) ..... LEPTOMEDUSAE
b) Generally few tentacles, some may be placed a little above bell margin (Figure 3f) ..... TRACHYMEDUSAE

6. ORDER ANTHOMEDUSAE

Hydromedusae with considerable variation in form, with umbrella usually deep bell-shaped; with gonads almost invariably situated on stomach, very rarely extending perradially on subumbrella; with or without ocelli; without statocysts. Hydroids always athecate.

6.1 KEY TO FAMILIES:

1a) Mouth simple and tubular 2
b) Mouth with four lips 9

2a) Reduced medusae with four permanently rudimentary tentacles (Au)..... PENNARIIDAE
b) Medusae with one or more well-developed tentacles 3

3a) With oral tentacles ..... BOUGAINVILLIDAE
b) Without oral tentacles 4

4a) Marginal tentacles simple 5
b) Marginal tentacles branched or with stalked nematocyst capsules 7

5a) Marginal tentacles in four groups ..... MARGELOPSIDAE
b) Marginal tentacles solitary 6

6a) Tentacle bulbs with abaxial ocelli ..... CORYNIDAE
b) Tentacle bulbs without ocelli ..... TUBULARIIDAE

7a) Marginal tentacles unbranched, but with stalked capsules containing nematocysts (Au) ..... ZANCLEIDAE
b) Marginal tentacles branched 8

8a) Marginal tentacles bifurcating ..... ELEUTHERIIDAE
b) Marginal tentacles with several branches (NZ) ..... CLADONEMATIDAE

9a) Mouth has four lips with clusters of nematocysts 10
b) Mouth has four simple or folded lips without clusters of nematocysts 12

10a) Lips with continuous row of nematocyst clusters along margin (Au, NZ) ..... CLAVIDAE
b) Lips elongated to form tentacles each with one or a few nematocyst clusters 11

11a) Marginal tentacles solitary ..... HYDRACTINIIDAE
b) Marginal tentacles in eight groups ..... RATHKEIDAE

12a) With simple, pointed oral tentacles inserted above mouth opening, marginal tentacles in groups ..... RUSSELLIIDAE
b) Without oral tentacles, marginal tentacles solitary .. 13

13a) With marginal cordylus-like structures ..... TIARANNIDAE
b) No marginal cordylus-like structures 14

14a) Marginal tentacles with basal swelling, without terminal nematocyst cluster ..... PANDEIDAE
b) Marginal tentacles without basal swelling, with terminal cluster of nematocysts ..... CALYCOPSIDAE

6.2 FAMILY CORYNIDAE

Anthomedusae with a simple circular mouth; with four radial canals; with gonads completely surrounding the manubrium; with 2 to 4 hollow marginal tentacles; with ocelli on the abaxial side of the tentacle bulbs. Representatives of only one genus, Sarsia, are found in the Southern Ocean although Dicodonium dissonema Haeckel has been found off Australia (Mayer, 1910).

Genus Sarsia Lesson 1843

Corynidae with four similar, perradial tentacles; with gonads forming a single continuous ring or cylinder surrounding the manubrium; 18 valid, 5 doubtful and 2 indeterminable species (Sarsia minima von Lendenfeld and Sarsia radiata von Lendenfeld, both from south-eastern Australia - von Lendenfeld 1884).

Key to species:

Jelly fairly thin, tentacles long (NZ,SAm) ..... S. eximia (Allman)
Jelly thick, tentacles fairly short ..... S. gracilis Browne

Sarsia gracilis Browne 1902

Figure 4, Map 1

Diagnostic Characters (Browne & Kramp, 1939):

Adult: Umbrella with cylindrical umbrella, nearly twice as high as broad, with moderately thick walls, and a quadrangular margin
Gonads surround nearly whole length of manubrium
Manubrium a cylindrical tube
Velum is very broad and has two small circular openings.
Tentacles four, about twice the length of the umbrella, end in knob containing nematocysts
Ocellus on the basal bulb of each tentacle
Colour manubrium, gonads and basal bulbs of tentacles of a pale yellow-brown; ocelli bright reddish brown (specimen in formalin)
Size 5 mm high, 3 mm wide.

Earliest Stage: Umbrella, bell-shaped, just a little higher than broad; exumbrella covered with scattered nematocysts
Manubrium a cylindrical tube, about half the length of the umbrella cavity
Tentacles short, with a large terminal cluster of nematocysts
Ocellus at the base of each tentacle
Size 1 mm high, 0.75 mm wide.

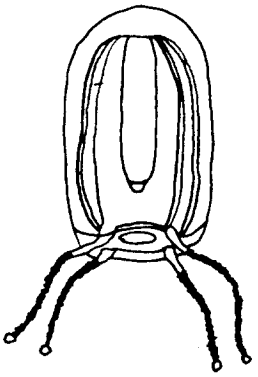
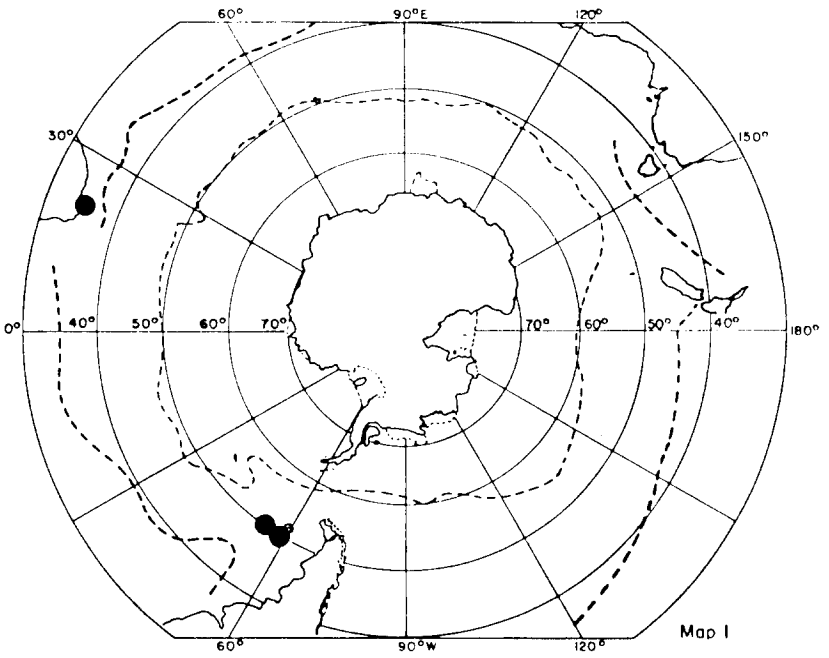


Figure 4. Sarsia gracilis.



Map 1. Distribution of Sarsia gracilis.

Mayer (1910) indicated the possiblity of Sarsia gracilis being a young Slabberia, but the finding of several sexually mature specimens at the Falkland Islands meant this supposition could not hold (Browne & Kramp, 1939). Mayer (1910) also suggested that the hydroid Syncoryne sarsii described by Hartlaub (1905) from southern Terra del Fuego may be the stock of this medusa. It is probable, but there is no absolute proof that the Sarsia liberated from the Syncoryne develop into the adult form taken in nets (Browne & Kramp, 1939). The characteristic features of this species is the presence of a prominent knob of nematocysts in the terminal end of each tentacle (Browne & Kramp, 1939).

6.3 FAMILY TUBULARIIDAE

Anthomedusae with a simple circular mouth; with four radial canals; with manubrium not extending beyond umbrella margin; with gonad completely surrounding manubrium; with four or fewer marginal tentacles, usually hollow; without ocelli on marginal bulbs, 10 genera of which 5 are found in the Southern Ocean or in adjacent waters.

Key to genera:

1a) Exumbrella with longitudinal tracks of nematocysts 2
b) Exumbrella without nematocyst tracks 3

2a) With 2 or 4 tentacles; 8 tracks of nematocysts (SA) ..... Ectopleura
b) With one tentacle, or a cluster of 2 or 3 arising from a common bulb; 5 tracks of nematocysts ..... Hybocodon

3a) One tentacle, ending in a large knob of nematocysts (SA) . Paragotoea
b) Tentacles without a large terminal knob 4

4a) Three shorter rudimentary tentacles and a long one, differing from the others in structure ..... Euphysora
b) One to four tentacles of equal structure, though sometimes of unequal length (Au,SAm) ..... Euphysa

Genus Hybocodon L. Agassiz 1862

Tubulariidae without pointed apical process to umbrella; with or without exumbrellar nematocyst tracks; with umbrella at oblique angle; with one simple or compound marginal tentacular bulb with one to three tentacles; remaining three perradial bulbs rudimentary; asexual budding from tentacle base; two nematocyst tracks from tentacular bulb, one from each of the rudimentary bulb; 3 valid species.

Key to species:

With five lines of nematocysts (NZ)..... H. prolifer L.Agassiz

Umbrella with scattered nematocysts ..... H. unicus (Browne)

Hybocodon unicus (Browne 1902)

Figure 5, Map 2

(Amphicodon unicus Browne, 1902)

Diagnostic Characters (Browne & Kramp, 1939; Kramp, 1968):

Umbrella bell shaped, margin slightly oblique
Nematocysts not arranged in lines, scattered over exumbrella
Manubrium mounted on a short peduncle, cylindrical, nearly as long as the umbrella cavity
Gonad surrounds the tube-like manubrium
Tentacle solitary, situated between two rudimentary basal bulbs, 3 perradially situated bulbs without tentacles.
Medusa bulbs not present
Colour gonads and basal bulbs of a pale yellowish brown (preserved in formalin)
Size 3 mm high, 2 mm wide.

Browne (1902) described this species from a single specimen taken from Stanley Harbour, Falkland Islands as Amphicodon unicus. It has since been found in the same area by Browne & Kramp (1939). The hydroid Hybocodon chilensis Hartlaub, from the coast of Chile, may be the stock of H. unicus (Hartlaub, 1905; Mayer, 1910).

Genus Euphysora Mass 1905

Tubulariidae with three short or rudimentary tentacles and one long tentacle which differs from the others not only in size, but also in structure. The structure of the main tentacle is very different between the species, the genus may, therefore, be designated as rather artificial; 7 species, of which two are found in the Southern Ocean.

Key to species:

1a) With only 1 tentacle, very long and thin, with several bifurcated lateral branches ..... E. gigantea Kramp
b) With one long and 3 small or rudimentary tentacles 2

2a) Principal tentacle long, 4 terminal branches each with a knob of nematocysts, opposite this is a fairly long filiform tentacle ..... E. furcata Kramp
b) Principal tentacle unbranched, with an adaxial row of nematocysts (SAm?) ..... E. bigelowi Maas

Euphysora gigantea Kramp 1957a

Figure 6, Map 3

Diagnostic Characters:

Umbrella globular, jelly very thick, bell cavity narrow, about half as high as the umbrella
Manubrium cylindrical or slightly barrel-shaped, less than two-thirds as long as bell cavity

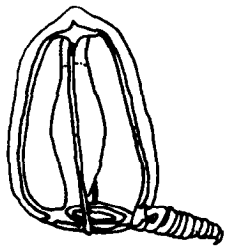
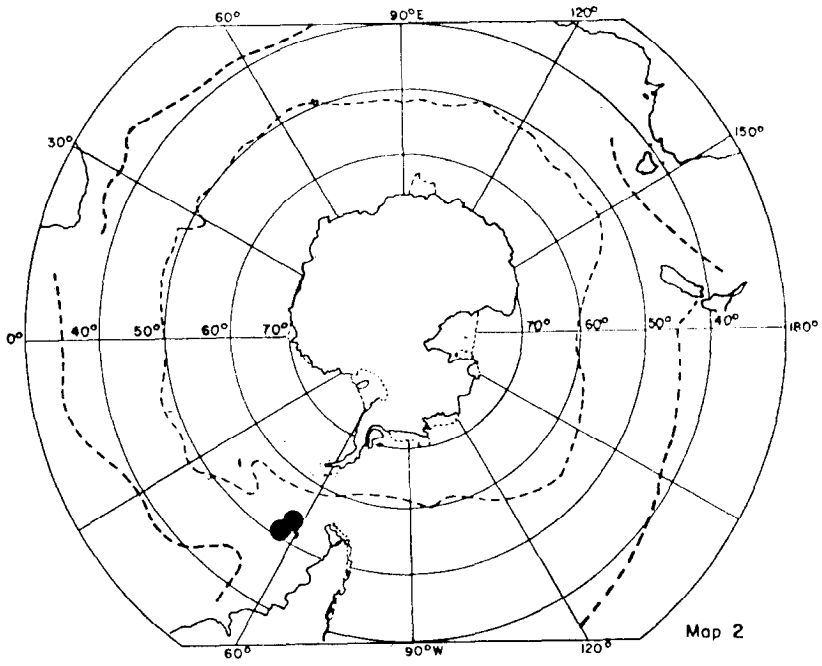


Figure 5. Hybocodon unicus.



Map 2. Distribution of Hybocoden unicus.

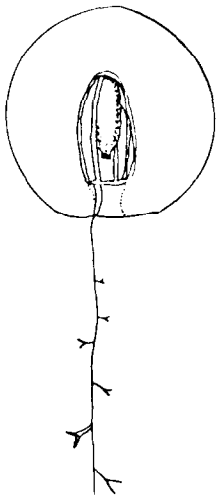
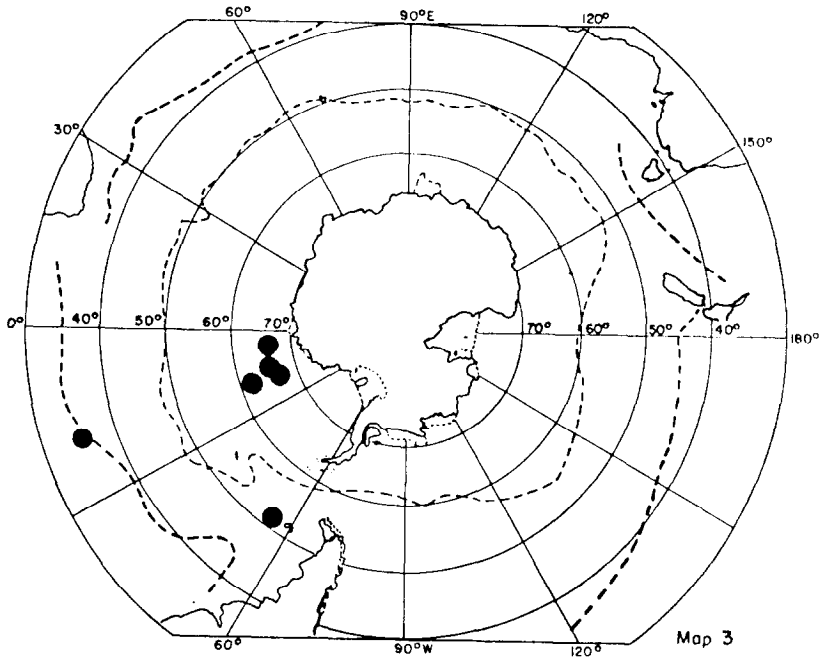


Figure 6. Euphysora gigantea.



Map 3. Distribution of Euphysora gigantea.

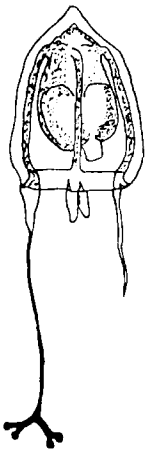
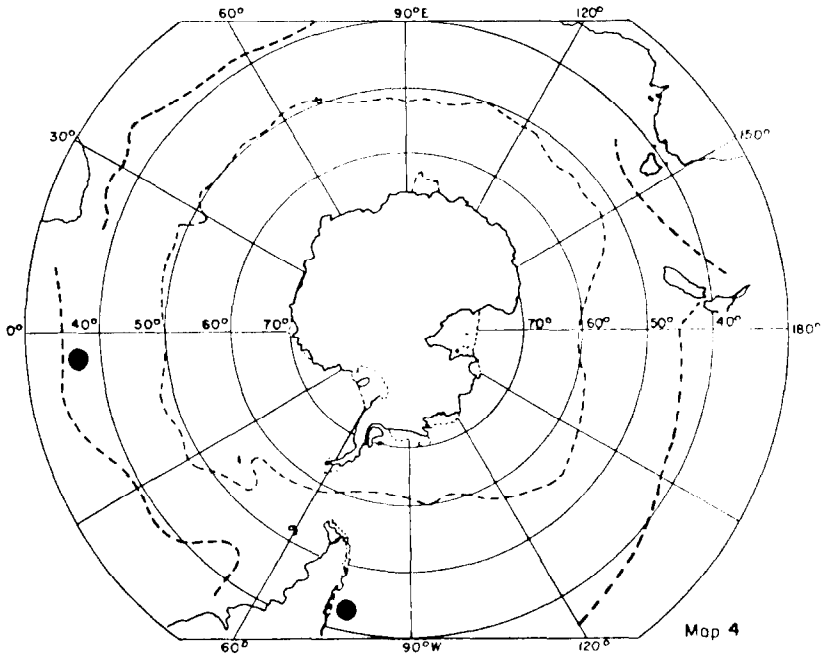


Figure 7. Euphysora furcata.



Map 4. Distribution of Euphysora furcata.

Gonad completely encircles manubrium
Mouth simple, circular
Radial Canals and Ring Canal moderately broad, without vacuolated endoderm cells
Tentacle solitary, with a well-developed conical basal bulb, very long and thin carrying several bifurcated lateral branches separated by long intervals.
Size up to 28 mm high and wide.

This is an Antarctic species as most of the specimens were taken in deep water south of the Antarctic Convergence, but one specimen was found further north at a depth of less than 1000 m in the Antarctic intermediate water which flows northwards below the warmer Subantarctic water (Kramp, 1957a).

Euphysora furcata Kramp 1948

Figure 7, Map 4

Diagnostic Characters:

Umbrella with pointed apex and fairly thin walls
Stomach barrel-shaped, two-thirds the length of the bell cavity, with broad, conical apical chamber
Gonad encircling whole length of stomach
Radial canals thick, with large endoderm cells
Tentacle main one long, twice bifurcated, with 4 knobs of nematocysts; opposite this is a fairly long, filiform tentacle, 2 lateral tentacles, short and conical
Size up to 8 mm high, 6.5 mm wide.

This species has been taken south of the Subtropical Convergence in the Atlantic Ocean by Kramp (1957a) and also from off the coast of Chile (Fagetti & Fischer, 1964).

6.4 FAMILY MARGELOPSIDAE

Anthomedusae without exumbrellar nematocyst tracks; with simple circular mouth, without oral tentacles; with gonads completely surrounding stomach; with four radial canals; with solid, moniliform tentacles in perradial clusters on margin, or at different levels on exumbrella; without ocelli. Hydroids, where known, aberrant pelagic tubularians. Three genera, of which one has representatives in the Southern Ocean; Pelagohydra mirabilis Dendy has been found off New Zealand by Dendy (1902) and Percival (1938).

Genus Margelopsis Hartlaub 1897

Margelopsidae with four perradial clusters of tentacles on bell margin. Only one species is found in the Southern Ocean.

Margelopsis australis Browne 1910

Figure 8, Map 5

(Margelopsis gibbesi Thiel, 1938)

Diagnostic Characters:

Umbrella almost globular
Manubrium cylindrical, almost as long as bell cavity
Gonad a globular swelling around middle portion of manubrium
Marginal bulbs 4, very small, each with two small tentacles placed one behind the other
Size 1 to 3 mm high and wide.

Thiel (1938) suggests that the four species of this genus: Margelopsis australis, M. gibesi (McCrady), M. haeckeli (Hartlaub) and M. hartlaubi Browne are probably synonymous, but Kramp (1961) keeps them separate. According to Vanhoffen (1912) the tentacles are not moniliform. This species is found in the Indo-Pacific and Atlantic Sectors of the Antarctic and is apparently circumpolar (Kramp, 1968).

6.5 CODONIA incertae sedis

The families Corynidae, Tubulariidae, Margelopsidae, and Pennariidae have formerly been united within one family, the Codonidae, established by Haeckel (1879) and still retained by Hartlaub in Nordisches Plankton (1907-1917). The Codonidae were characterised as Anthomedusae with a simple mouth opening without oral lappets or oral tentacles, with one or more ring-shaped gonads surrounding the stomach, with four simple radial canals, and with simple, unbranched marginal tentacles. The four families, into which the Codonidae are now divided, establish one large group of related forms, which may be regarded as a superfamily Codonida. Some imperfectly known or degenerate medusae may be designated as species with uncertain affinities but presumably related to the Codonida. They have been described under the following generic names: Microcampana Fewkes (only known from California), Pachycordyle Weismann (tropical), and Propachycordyle Thiel.

Genus Propachycordyle Thiel 1931

Codonida with bell-shaped body; manubrium short, spherical; gonads in the ectoderm; four radial canals, ring canal and velum are present; tentacles, tentacle bulbs and ocelli are lacking; 1 species.

Propachycordyle canalifera Thiel 1931

Map 6, (no figure available)

Diagnostic Characters:

Umbrella with thin walls
Velum broad
Manubrium one-quarter as long as bell cavity
Size up to 20 mm high, 1.5 mm wide.

This medusa has only been found once by Thiel (1931) in the Weddell Sea who considered it to be an intermediate form between Pachycordyle and Amalthaea.

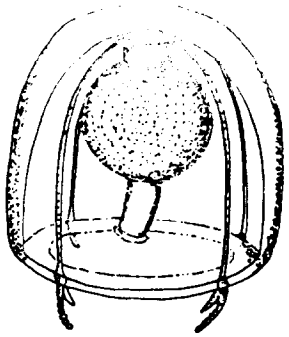
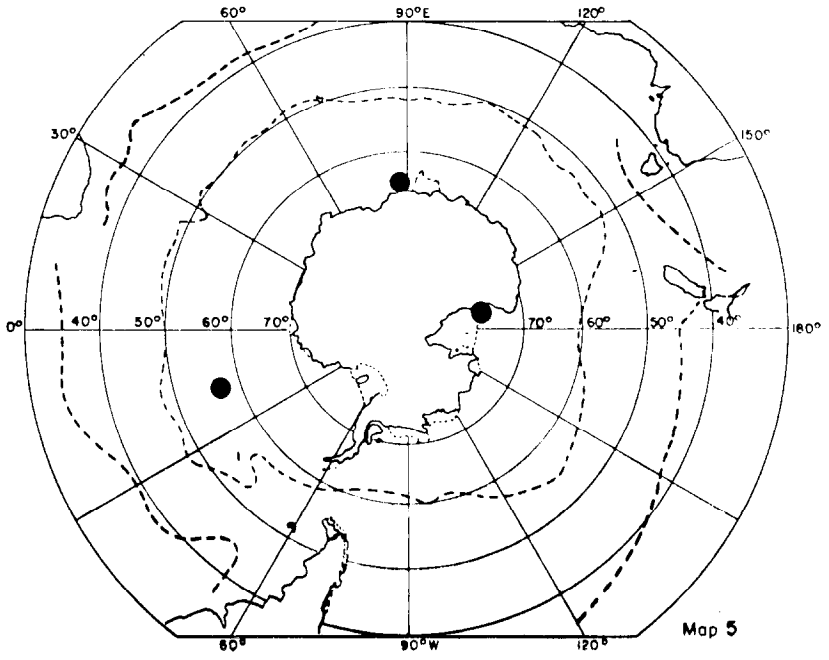
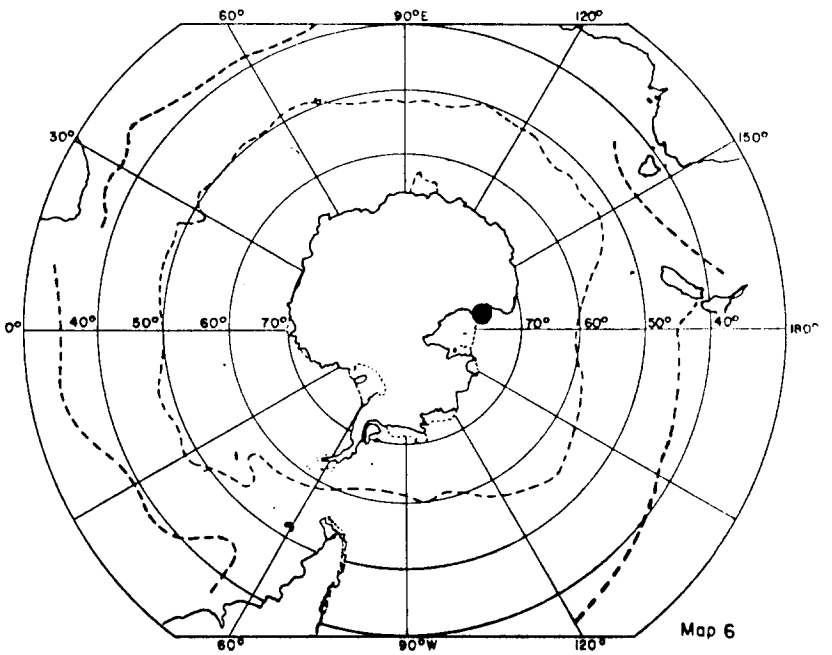


Figure 8. Margelopsis australis.



Map 5. Distribution of Margelopsis australis

(No figure available)



Map 6. Distribution of Propachycordyle canalifera.

6.6 FAMILY ELEUTHERIIDAE

Creeping Anthomedusae with continuous or broken thickened ring of nematocysts around umbrella margin; with simple circular mouth without oral tentacles; with variable number of radial canals which may or may not branch; with gonads or subumbrella surface or in special dorsal brood pouch; with variable number of hollow, bifurcating marginal tentacles, each furnished with an organ of adhesion; with abaxial ocelli; velum well developed; 2 genera but only one has representatives in the Southern Ocean.

Genus Staurocladia Hartlaub 1917

Eleutheriidae without a brood pouch above stomach; gonads well developed, in ectodermal interradial pockets around stomach; sexes separate; asexual budding may occur; with six or more radial canals; with numerous marginal tentacles, increasing in number with age, bifurcated, lower-branch with a terminal adhesive disc and upper branch with one terminal and several other clusters of nematocysts. The distinction between the species is uncertain (see Kramp, 1959); 10 possible species of which 6 are found in the Southern Ocean and adjacent waters. These species are distinguished by various characters of more or less doubtful taxonomic value (Kramp, 1968).

Gilchrist (1918) distinguished the southern species of Eleutheria in a new genus Cnidonema which in turn was changed to Staurocladia by Browne & Kramp (1939). Browne and Kramp (1939) gave a comprehensive discussion of the similarities and differences between the species; Gilchrist (1918) as well as Briggs (1920) divided the species known up to 1920 into two groups according to the position of the clusters of nematocysts on the upper branch of the tentacles. In S. charcoti (Bedot) S. hodgsoni (Browne) and S. kerguelensis (Gilchrist) the clusters of nematocysts (excluding the terminal one) are placed on the lateral side of the tentacles, whereas in S. vallentini (Browne), S. capensis (Gilchrist) and S. haswelli (Briggs) they are median in position, placed on the upper (aboral) and lower (oral) sides of the tentacle. Although there are certain characteristic differences between S. capensis, S. haswelli and S. vallentini which makes one hesitate to unite them in the present state of our knowledge, future investigations of more extensive material from various localities will probably prove that the former two are identical with S. vallentini (Browne & Kramp, 1939).

Key to species:

1a) Aboral side of tentacles with clusters of nematocysts (Au) ..... S. haswelli (Briggs)
b) Nematocyst clusters on upper branch of tentacles . 2

2a) Nematocyst clusters all lateral in position 4
b) Nematocyst clusters median in position 3

3a) 2, seldom 3, nematocysts clusters on upperside of tentacle, one on underside (SA) ..... S. capensis (Gilchrist)
b) 3 nematocyst clusters on upperside of tentacles, 1 or 2 on underside alternately placed ..... S. vallentini (Browne)

4a) Lateral clusters 5-6 pairs; marginal ring of nematocyst discontinuous ..... S. hodgsoni (Browne)
b) Up to 8 or 9 pairs of lateral clusters; marginal ring of nematocysts (where described) continuous . 5

5a) Upper branch of tentacle with 9 pairs of nematocysts clusters, laterally situated, and a terminal cluster — S. charcoti (Bedot)

b) Upper branch with up to 8 pairs of nematocyst clusters, laterally placed ..... S. kerguelensis (Gilchrist)

Staurocladia charcoti (Bedot 1908)

Map 7, (no figure available)

(Wandelia charcoti Bedot, 1908)
(Eleutheria charcoti Browne, 1910)
(Cnidonema charcoti Gilchrist, 1918)

Diagnostic Characters:

Radial Canals about 10, branched
Tentacles about 35, upper branches with about 9 pairs of nematocyst clusters, laterally situated
Terminal cluster present
Size 1 mm high, 4 mm wide.

In the original description of a specimen from Graham Land, Antarctica, the radial canals are branched, but this is not stated with certainty; it is not stated whether the ring of nematocysts around the umbrella is continuous or interrupted (Kramp, 1959). Vanhoffen (1911) pointed out that it was doubtful that branches of the radial canals are present.

Staurocladia hodgsoni (Browne, 1910)

Figure 9, Map 8

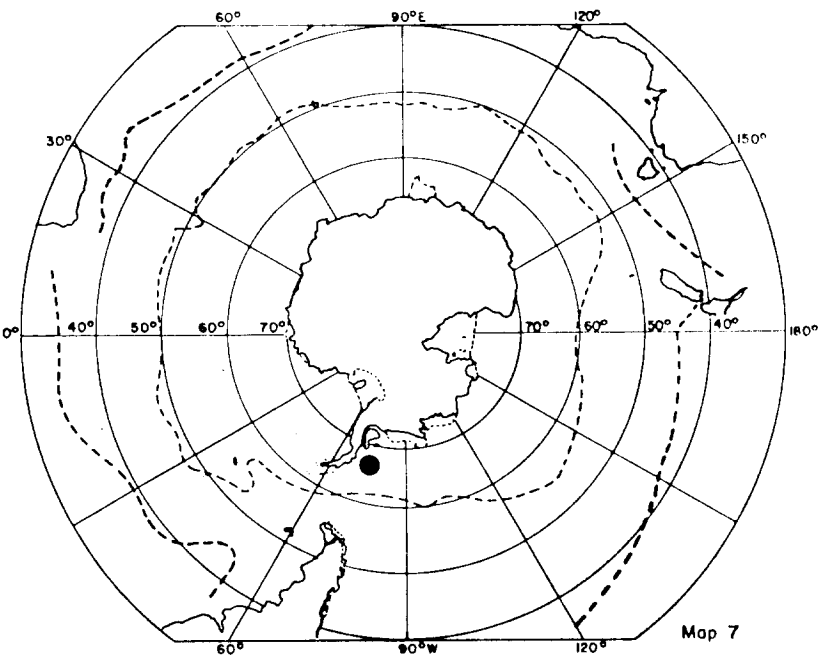
(Eleutheria hodgsoni Browne, 1910)
(Cnidonema hodgsoni Gilchrist, 1918)

Diagnostic Characters:

Radial canals 6 to 11
Tentacles 20 to 32, upper branch when stretched about as long as lower branch
Nematocysts not in a continuous ring, but in patches on the basal portion of the tentacles, 5 to 6 lateral clusters on upper branches
Size 1.5 to 2 mm wide.

Kramp (1959) discusses the validity of this species: the interrupted nematocyst ring is very characteristic of this species in contrast to all the other species of Staurocladia, and has been found in all specimens examined. This is the only character by which it might perhaps be distinguished from S. charoti, and unfortunately nothing is known about the structure of the nematocyst ring in that species. It seems very probable that these two species are identical. In S. kerguelensis (Gilchrist) from Kerguelen Island, which is a very similar species, the nematocyst ring is expressly stated to be continuous, so it must accordingly be kept separate, at least provisionally. Vanhoffen (1911) doubts if the ring of nematocysts is segmented in places.

(No figure available)



Map 7. Distribution of Staurocladia charcoti.

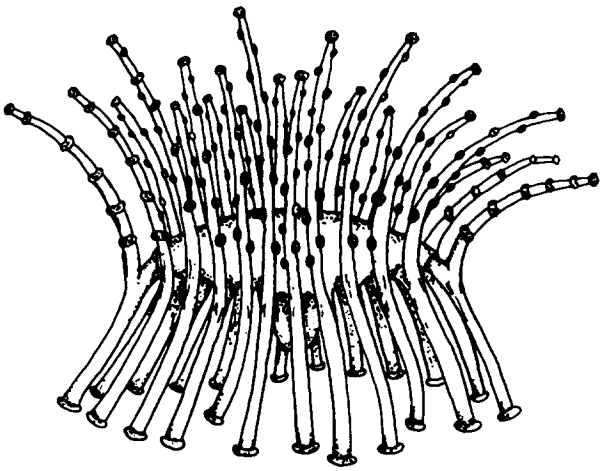
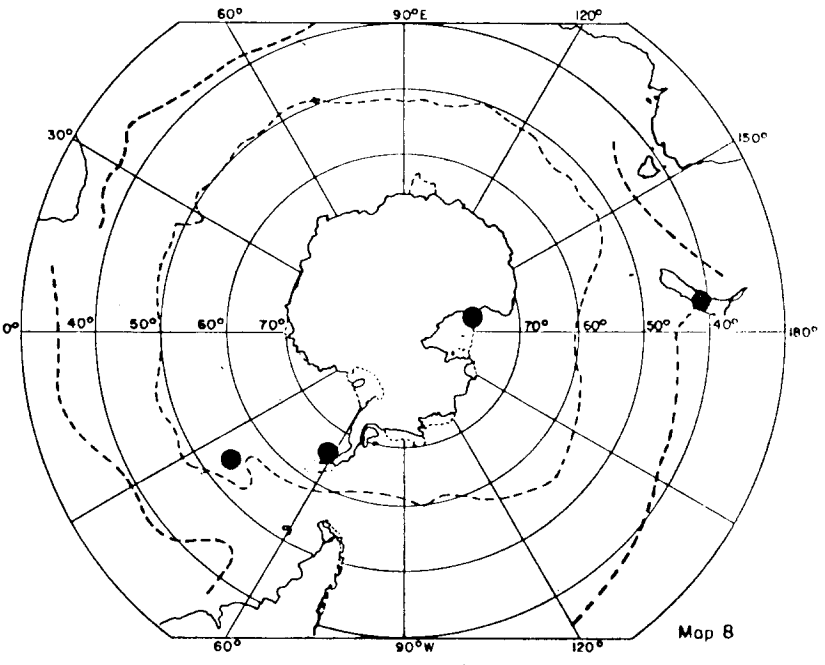


Figure 9. Staurocladia hodgsoni.



Map 8. Distribution of Staurocladia hodgsoni.

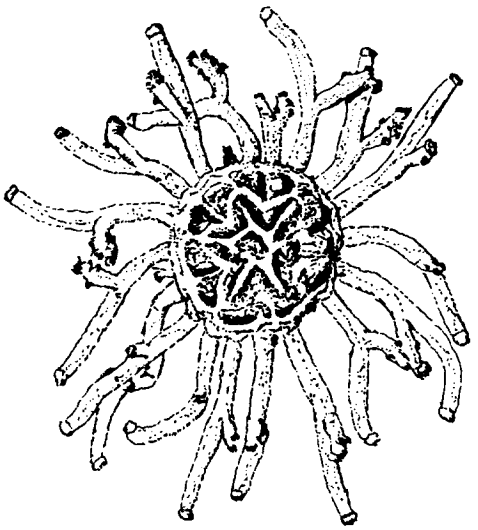
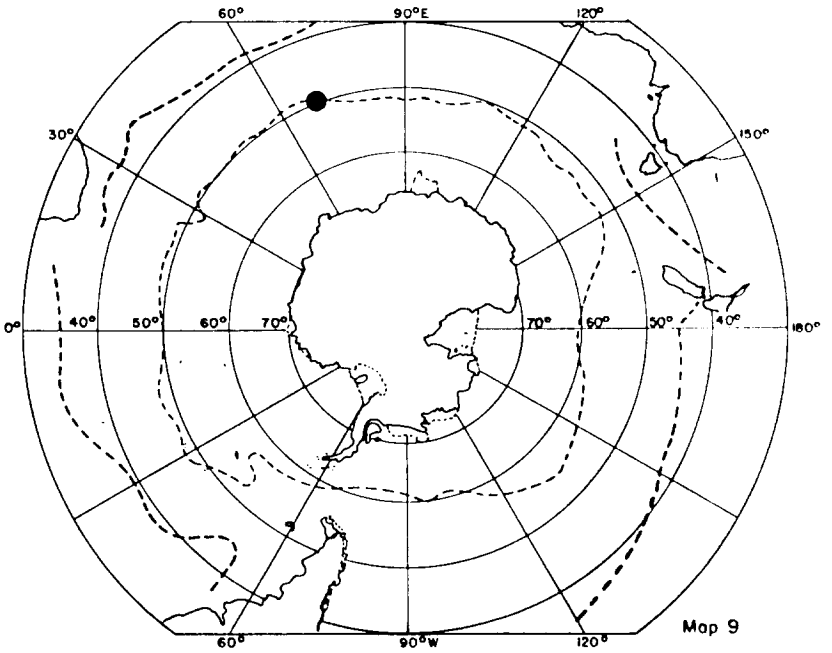


Figure 10. Staurocladia kerguelensis.



Map 9. Distribution of Staurocladia kerguelensis.

Staurocladia kerguelensis (Gilchrist 1918)

Figure 10, Map 9

(Eleutheria valentini Vanhoffen, 1911, 1912; Lengerich, 1920, 1922, 1923)
(Cnidonema kerguelensis Gilchrist, 1918)

Diagnostic Characters:

Radial Canals 6 to 10
Tentacles 20 to 60, upper branch shorter than lower branch.
Nematocyst Clusters up to 8 pairs, laterally placed, marginal ring is continuous.
Size diameter up to 5.5 mm, commonly 1+0 mm

The internal anatomy of Staurocladia kerguelenis has been studied by Muller (1911), Vanhoffen (1911) and by Lengerich (1920). It has been found around Kerguelen Island by numerous workers (see Kramp, 1961).

Staurocladia vallentini (Browne 1902)

Figure 11, Map 10

(Eleutheria vallentini Browne, 1902)
(Cnidonema vallentini Gilchrist, 1918; Ralph, 1947)

Diagnostic Characters (Browne & Kramp, 1939):

Umbrella circular, about twice as broad as high
Stomach tube conical and small
Gonads occupying the whole of the upper part of the umbrella, above and around stomach
Tentacles 24, divided into two branches, the upper branch with clusters of nematocysts, the lower with a terminal adhesive disc
Ocelli on extreme margin of umbrella, one opposite each tentacle
Colour the living medusa is pure white, with the exception of the bases of the tentacles which were tinged in red; ocelli reddish brown (in formalin)
Size 3 mm in width, 2 mm in height.

As pointed out above, Staurocladia capensis and S. haswelli may be synonymous with S. vallentini. A single specimen from Bermuda, described by Weil (1937), as S. vallentini, was in a very young stage of development and cannot be stated with certainty (Kramp, 1959). Ralph (1947) suggested that all the southern species of Staurocladia are probably synonymous with S. vallentini.

6.7 FAMILY HYDRACTINIIDAE

Anthomedusae with mouth having four simple or branching lips armed with terminal clusters of nematocysts; with four radial canals; with gonads either only on interradial walls of stomach, or on proximal portions of radial canals as well; with 4, 8 or more solid marginal tentacles; with or without ocelli; 2 genera of which one has representatives in the Southern Ocean.

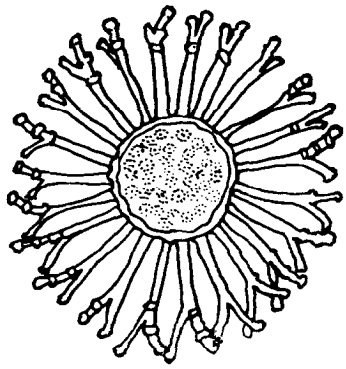
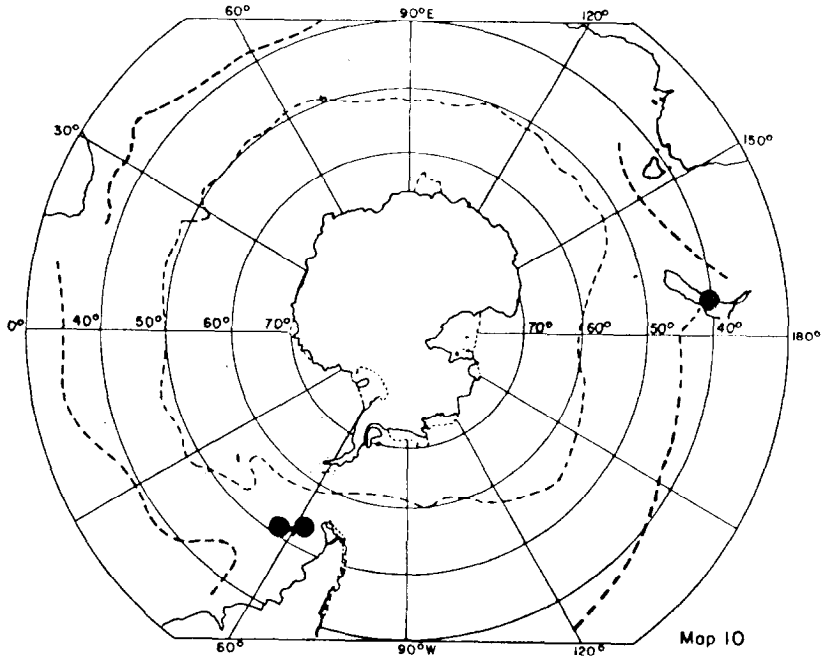


Figure 11. Staurocladia vallentini.



Map 10. Distribution of Staurocladia vallentini.

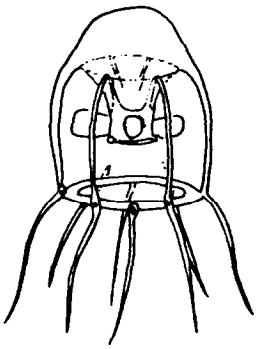
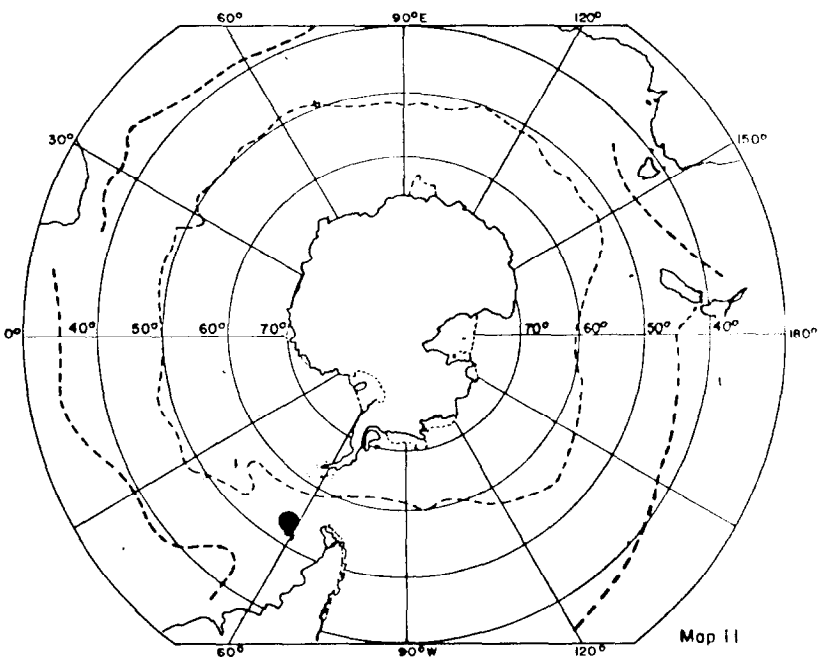


Figure 12. Podocoryne tenuis.



Map 11. Distribution of Podocoryne tenuis.

Genus Podocoryne M. Sars 1846

Hydractiniidae with four or more simple marginal tentacles, not in groups, with 4 or 8 simple or slightly branched mouth-arms which are dilations of the mouth-rim; 11 species of which only one is found in the Southern Ocean, although Podocoryne carnea M. Sars has been found off South Africa and Chile (Mayer, 1910; Kramp, 1952).

Podocoryne tenuis (Browne 1902)

Figure 12, Map 11

(Dysmorphosa tenuis Browne, 1902)

Diagnostic Characters:

Umbrella somewhat conical with a slight constriction below thickened apex
Stomach cubical, on a well developed peduncle about as long as itself
Mouth with four short lips each with a cluster of nematocysts, but not prolonged as mouth arms
Medusa-buds on interradial sides of stomach
Marginal tentacles 8, of equal size
Ocelli not present
Colour stomach, medusa buds and basal bulbs of tentacles are pale yellow (in formalin, Browne & Kramp, 1939)
Size 2 mm high, 1.5 mm wide

Podocoryne minuta (Mayer) bears a great resemblence to P. tenuis and it is possible that the two species are identical; P. minuta is however, much smaller, only 0.3 mm high whereas P. tenuis attains a height of 2 mm, provisionally, therefore it will be advisable to regard them as separate species (Browne & Kramp, 1939).

6.8 FAMILY RATHKEIDAE

Anthomedusae which have a mouth with four lips elongated to form oral arms complete with terminal and usually also lateral clusters of nematocysts; with or without medusa-buds on stomach walls; with four (rarely eight) radial canals; with solid marginal tentacles arranged in eight groups; without ocelli; 2 genera.

Genus Rathkea Brandt 1837

Rathkeidae with four radial canals with marginal tentacles arranged in eight groups (four perradial and four interradial); the four corners of the mouth drawn out so as to form oral arms with clusters of nematocysts; five species of which two are found in the Southern Ocean.

Key to species:

Oral arms with two side branches, each with a terminal cluster of nematocysts ..... R. antarctica (Uchida)

Oral arms do not branch, each with 7 to 11 clusters of nematocysts arranged in a double row and always with a single terminal cluster ..... R. formosissima (Browne)

Rathkea antarctica Uchida 1971

Figure 13(a),(b), Map 12

Diagnostic Characters (Uchida, 1971):

Umbrella bell short-pyriform, laterally compressed
Tentacles 2.5 mm long and grouped in 8 clusters, 4 in the perradii and 4 in the interradii, the perradial tentacles are always 3 in number, while interradial tentacles number one or two, solid and filamentous
Ring canal narrow
Velum well developed
Radial canals narrow and 4 in number, each connected with the ring canal
Manubrium suspended from the subumbrella by well-developed peduncle in bell cavity, four-sided and terminates in oral tentacles
Oral tentacles give rise to a pair of side branches starting from the part a little terminal from midway of the length
Medusa bulbs interradial, arranged in 2 series (a large and a small one)
Size 1.7 mm high, 2 mm wide.

This species was described from a single specimen taken from 92 m in Ongul Strait, Enderby Land (Uchida, 1971).

Rathkea formosissima (Browne 1902)

Figure 14, Map 13

(Lizzia formosissima Browne, 1902; Hartlaub, 1911)

Diagnostic Characters (Browne & Kramp, 1939):

Adult: Umbrella bell-shaped, a little higher than broad, with a slight transverse constriction level with the top of the subumbrella cavity and a solid mass of jelly above it
Stomach small, somewhat cubical, about as long as broad and situated on a broad peduncle about as long as the stomach
Mouth with a plain simple margin, quadrangular in shape
Oral arms 4, each with 7 to 11 clusters of nematocysts arranged in a double row with always a single terminal cluster
Gonads on stomach, 4 interradial roundish swellings or masses
Medusa buds may be present on stomach, interradially situated
Tentacles 5 in each perradial group and 3 in each interradial group
Colour stomach brownish, compound basal bulbs dark brown or black (in formalin)
Size umbrella 3 mm in height, 2.5 mm in width.

Early Stage: Umbrella bell-shaped, almost as high as broad, without a solid mass of jelly above the umbrella cavity, thin walls
Stomach small, on a broad but very short peduncle
Oral arms each with 3 to 5 clusters of nematocysts, arranged in a double row and always with a single terminal cluster
Medusa buds on stomach, interradial, usually 4
Gonads not developed
Tentacles, 3 or more in each perradial group and 3 in each interradial group
Size umbrella 1-2 mm in height and width.

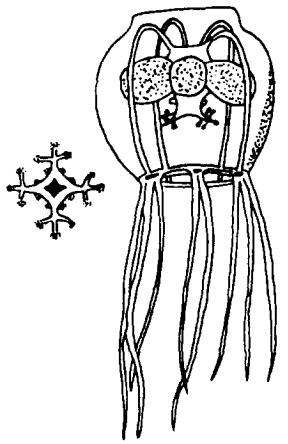
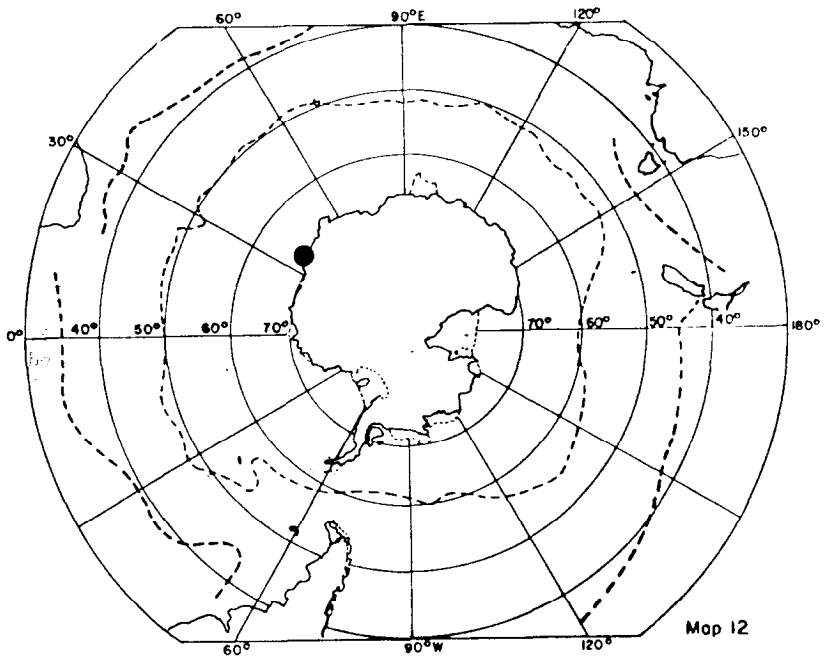


Figure 13. Rathkea antarctica. (Left: oral view of manubrium showing arrangement of oral tentacles).



Map 12. Distribution of Rathkea antarctica.

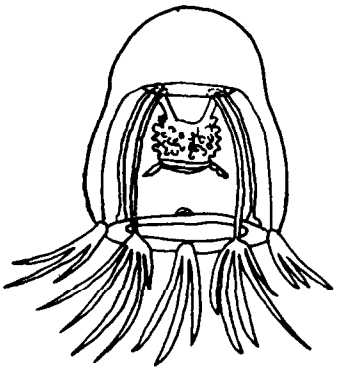
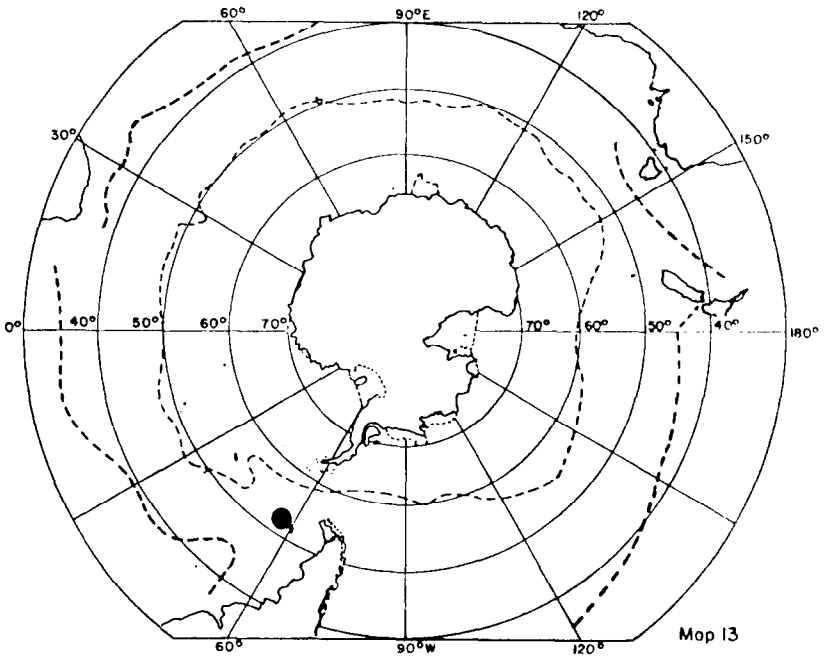


Figure 14. Rathkea formosissima.



Map 13. Distribution of Rathkea formosissima.

This species is very close to Rathkea octopunctata (M.Sars) differing only in shape of oral arms: in R. formosissima the oral arms are simple and undivided and have a terminal cluster of nematocysts, while in R. octopunctata their terminal end is bifurcated and carries two clusters of nematocysts (Browne & Kramp, 1939). Kramp (1957a) compares this species with R. africana Kramp and R. rubence Nair.

6.9 FAMILY BOUGAINVILLIIDAE

Anthomedusae with simple tubular mouth with simple or dichotomously branching oral tentacles inserted above the mouth opening; with four radial canals; gonads interradial or adradial, or completely surrounding stomach; with two, four or more solitary marginal tentacles, or with four or eight large marginal bulbs each with a group of solid tentacles, with or without ocelli; hydroids with a single whorl of filiform tentacles; 7 genera of which only 2 have representatives in the Southern Ocean.

Key to genera:

Marginal tentacles in 8 groups ..... Koellikerina
Marginal tentacles in 4 groups ..... Bougainvillia

Genus Koellikerina Kramp 1939

Bougainvilliidae with eight groups of marginal tentacles, all alike in structure; with four oral tentacles dichotomously branched; marginal tentacles with or without adaxial ocelli; most of the specific characters are variable, (see Kramp 1965 for discussion); seven species of which only one is represented in the Southern Ocean fauna.

Koellikerina maasi (Browne 1910)

Figure 15, Map 14

(Kollikeria maasi Browne, 1910; Vanhoffen, 1912)

Diagnostic Characters:

Umbrella has no peduncle; walls very thick, particularly at apex
Stomach large and cross shaped
Gonads 4 masses covering nearly whole of the interradial walls of stomach, separated perradially, smooth
Oral tentacles with short, thick trunks, divided 7 to 8 times
Marginal bulbs triangular with 5 to 7 tentacles, decreasing in length from the median one toward both sides
Ocelli not present
Size 10 mm high, 9 mm wide.

This species has been found from widely spaced locations around the Antarctic continent. Vanhoffen (1912) discusses the species of Koellikerina.

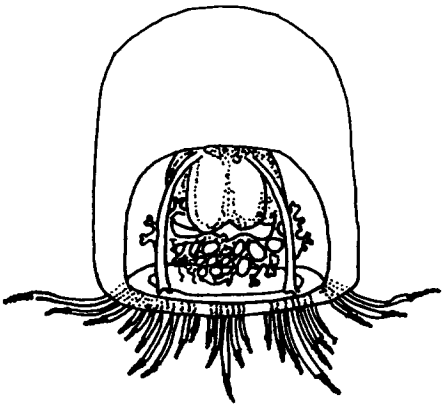
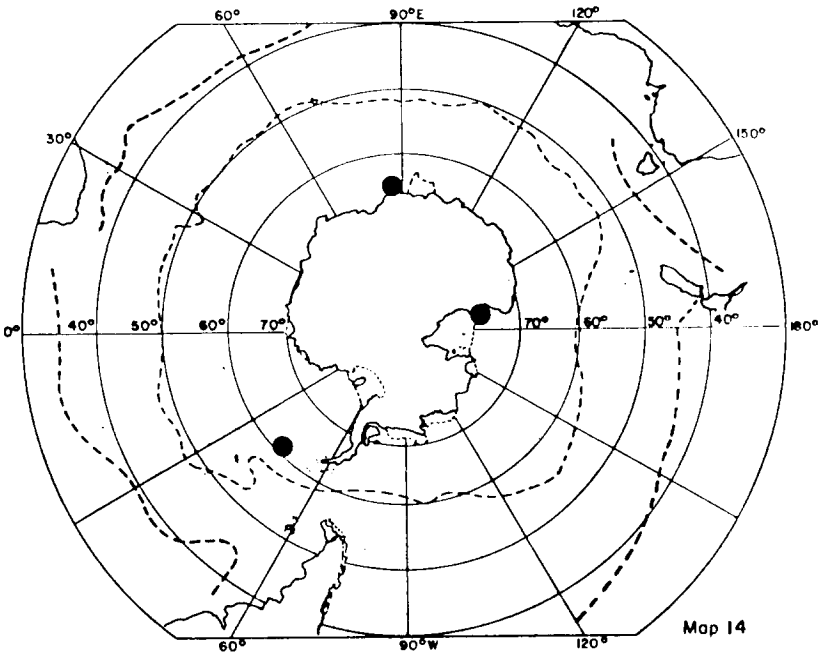


Figure 15. Koellikerina maasi.



Map 14. Distribution of Koellikerina maasi.

Genus Bougainvillia Lesson 1836

Bougainvilliidae with four radially placed clusters of marginal tentacles, the tentacles of each cluster being all of one kind and similar in structure; with four perradial, dichotomously branching oral tentacles; 16 species of which one is found in the Southern Ocean and three in adjacent waters:

Key to species:

1a) With a well developed, distinct, gelatinous gastral peduncle ..... B. macloviana Lesson
b) Peduncle absent or weakly developed 2

2a) Gonads eight, adradial (Au,NZ) ..... B. fulva Agassiz & Mayer
b) Gonads four, interradial 3

3a) Stomach particularly broad and flat, quadrangular; marginal bulbs with 10 to 13 tentacles; oral tentacles divided 5 to 6 times immediately from base (SA) ..... B. platygaster (Haeckel)
b) Stomach not particularly flat; basal trunk of oral tentacles fairly long (Au)..... B. ramosa (van Beneden)

Bougainvillia macloviana Lesson 1843

Figure 16, Map 15

(Cyanea bougainvillii Lesson, 1830)
(Hippocrene macloviana Haeckel, 1879; Pratt, 1898; Browne, 1902, 1908; Vanhoffen 1911, 1912, 1913b).
(Hippocrene sp. Benham, 1909)

Diagnostic Characters:

Umbrella cylindrical, with fairly thick walls and rounded top
Manubrium on a broad conical peduncle
Oral tentacles with very short trunk, divided 5 to 7 times
Gonads extending along perradial lobes of stomach upwards on peduncle
Marginal bulbs V-shaped, each with 35 to 65 tentacles in a double row
Colour stomach, gonads and compound basal bulbs pale yellow (in formalin or alcohol), ocelli black (Browne & Kramp, 1939)
Size 15 mm high, 13 mm wide.

Browne & Kramp (1939) discussed the names of this genus: the hydroid for this species was described from Kerguelen Island under the name of Perigonimus maclovianus by Vanhoffen (1909), who was also inclined to regard the small polyp described by Hartlaub (1911) as Bougainvillia superciliaris, as belonging to the genus Periogonimus. Vanhoffen therefore proposed to remove the corresponding medusae from the genus Bougainvillia and only retain this generic name for the medusae derived from hydroids of the same name. For maclovianus and superciliaris he re-introduced the generic name Hippocrene. As pointed out by Stechow (1919) and Kramp (1928) there is, however, no reason to refer the hydroids of these two species of Perigonimus, they are much more like the other Bougainvillia hydroids. Moreover the name Hippocrene was preoccupied in 1817 by Obien for Mollusca.

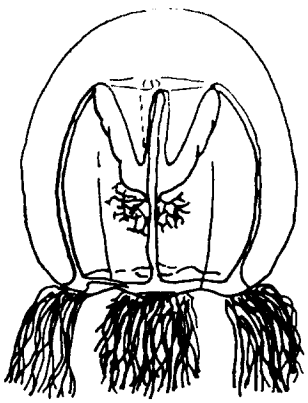
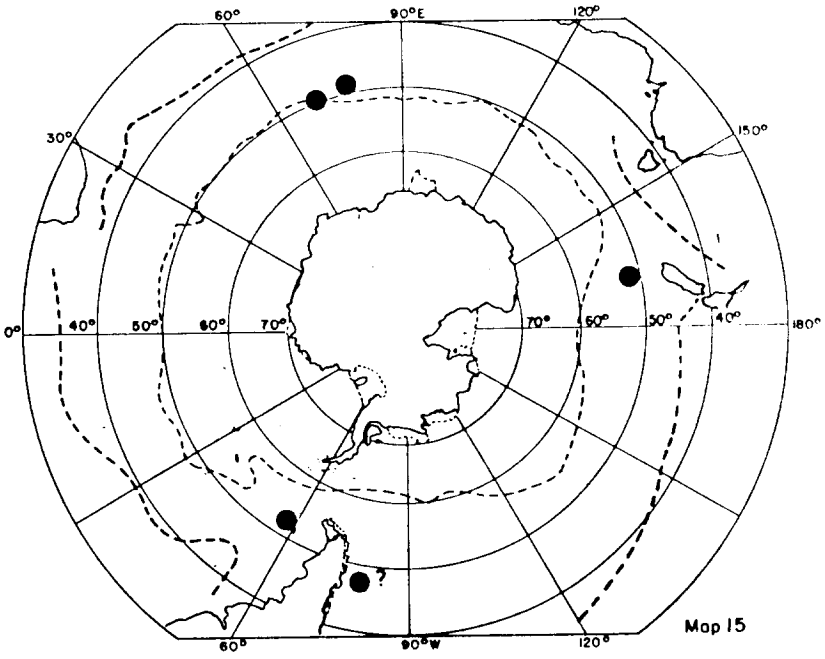


Figure 16. Bougainvillia macloviana.



Map 15. Distribution of Bougainvillia macloviana.

Further description and additional remarks on the morphology are given by given by Vanhoffen (1912), Kramp (1928) and Browne & Kramp (1939). Bougainvillia macloviana is strictly neritic (Kramp 1957b) and probably has a circumpolar distribution in the Subantarctic and Antarctic (Kramp 1968). It is also found in the North Sea and this is probably caused by transport of the hydroids on ships (Kramp, 1959).

6.10 FAMILY PANDEIDAE

Anthomedusae with umbrella with or without an apical projection; large stomach usually without a peduncle; mouth with four simple or crenulated lips; with four radial canals, rarely with centripetal canals; with simple or folded gonads on stomach walls; with hollow marginal tentacles with tapering, conical bulbs, often laterally compressed; tentacles without terminal nematocyst knob; with or without rudimentary tentacles, warts or tentaculae; with or without abaxial ocelli.

This is the largest of the families of Anthomedusae with 24 genera; it was formerly called Tiaridae, but since the generic name Tiara was found to be preoccupied, the family was named after the oldest valid genus Pandea. The modern division into genera is mainly due to Hartlaub's revision in "Nordisches Plankton" (1913). For determination of genera and species a careful examination is necessary, and identification of young stages is particularly difficult (Kramp, 1968).

Key to genera:

1a) Tentacles with stalked nematocyst knobs in greater part of their length ..... Zanclonia
b) Tentacles without stalked nematocyst knobs 2

2a) With only two well developed tentacles when adult ..... Amphinema
b) With four or more well developed tentacles when adult 3

3a) With 4 or 8 large tentacles and several small, solid, cirrus-like marginal appendages ..... Halitiara
b) Without marginal cirri 4

4a) Gonads reticulate, with isolated interradial pits, with or without additional folds 5
b) Gonads without isolated interradial pits, folds only 6

5a) Gonads altogether reticulate, without surrounding folds .... Pandea
b) Gonads combined folds and pits (Au,NZ,SA) ..... Neoturris

6a) Gonads interradial, horse-shoe shaped, with diverging folds connected by an interradial traverse bridge 7
b) Gonads more or less irregular folds, mainly vertical, without a transverse bridge; stomach very broad, cruciform, with perradial lobes closely connected with radial canals; large and small tentacles alternating ..... Annatiara

7a) With well developed mesenteries (SAm,SA) ..... Leuckartiara
b) Without mesenteries ..... Halitholus

Genus Amphinema Haeckel 1879

Pandeidae with never more than two opposite, perradial tentacles; with marginal warts or tentaculae; no gastric peduncle; stomach with broad base, sessile; mouth with four simple tips; gonads adradial or interradial or extending along radial canals; six species of which only one has representatives in the Southern Ocean but Amphinema rugosum (Mayer) has been found north of New Zealand (Kramp, 1959).

Amphinema rubra (Kramp 1957a)

Figure 17, Map 16

(Merga rubra Kramp, 1957a)

Diagnostic Characters (Kramp, 1957a):

Umbrella has a slender and pointed apical projection, walls are fairly thick.
Stomach is about three-fifths as long as the height of the bell cavity and very broad.
Gonads completely covering interradial walls of stomach.
Radial canals 4, fairly narrow.
Ring canal fairly narrow.
Marginal tentacles 2, with very large conical basal bulbs.
Ocelli not seen
Tentaculae (or rudimentary tentacles) slender and tenon-like, solid, two of them are opposite to two of the radial canals, the others are interradial, one in each quadrant.
Colour stomach deep reddish brown.
Size 7 mm high, 4.5 mm wide.

This species differs from species of the genus Merga by the interradial position of the gonads, by the rudimentary tentacles being developed into tentaculae, and by the possession of an apical chamber above the stomach Kramp (1957a), so Kramp (1959) referred it to Amphinema.

Genus Annatiara Russell 1940

Pandeidae with several tentacles of two sizes, regularly alternating; manubrium short and broad, cruciform, the four lobes closely connected with the proximal halves of the four radial canals; gonads interradial, with several folds; mouth very broad, cruciform, with folded rim; one species.

Annatiara affinis (Hartlaub 1913)

Figure 18, Map 17

Diagnostic Characters:

Umbrella dome shaped, no apical projection
Manubrium very broad, cruciform, its 4 perradial lobes in the entire length closely connected with the radial canals
Mouth very wide, cruciform, with folded margin
Gonads in irregular, vertical folds

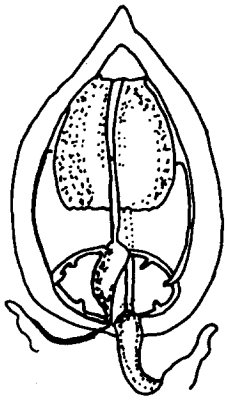
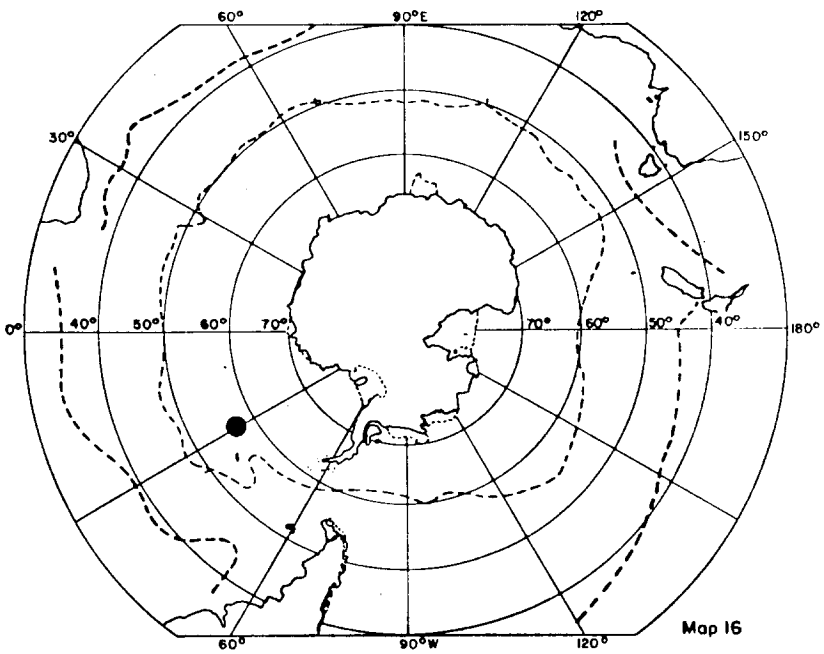


Figure 17. Amphinema rubra.



Map 16. Distribution of Amphinema rubra.

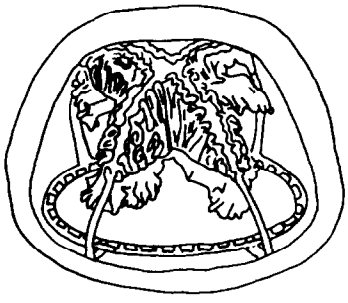
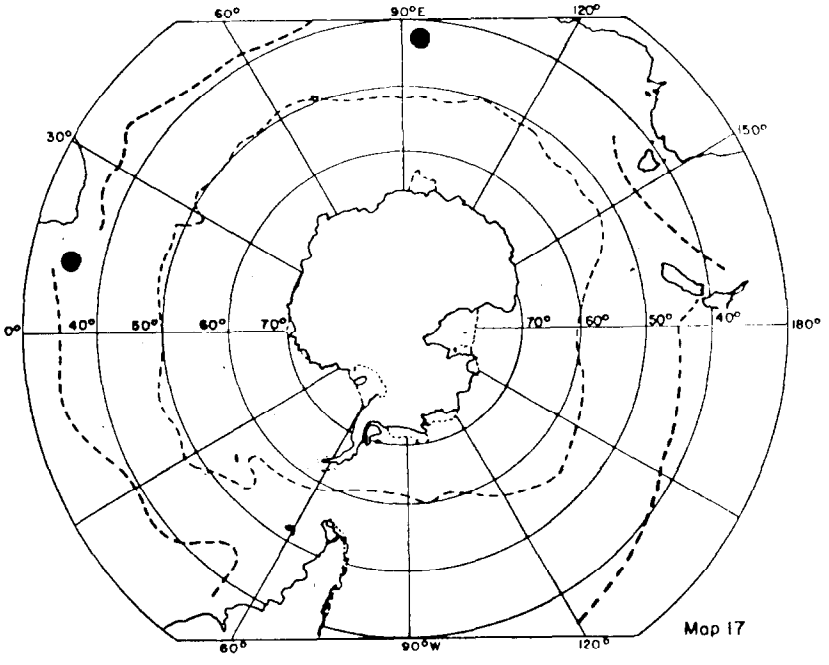


Figure 18. Annatiara affinis.



Map 17. Distribution of Annatiara affinis.

Tentacles about 32, primary, with laterally compressed basal bulbs, alternating with minute ones (? rudimentary)
Ocelli not present
Size 12 mm high, 14 to 15 mm wide.

This species is bathypelagic and is found in the 'warm deep waters' of the Subantarctic (Kramp, 1957b).

Genus Halitholus Hartlaub 1913

Pandeidae with large dome-like apical projection; manubrium cubical; gonads more or less horse-shoe shaped, folded; mouth rim fairly crenulated; radial canals comparatively narrow, not or very faintly jagged; no mesenteries; four or more tentacles, 3 species of which only one is found in the Southern Ocean.

The genus Halitholus is distinguished from Leuckartiara and Neoturris by the complete absence of mesenteries connecting the upper parts of the perradial edges of the manubrium with radial canals (Browne & Kramp, 1939).

Halitholus intermedius (Browne 1902)

Figure 19, Map 18

(Tiara intermedia Browne, 1902)

Diagnostic Characters (Browne & Kramp, 1939):

Adult: Umbrella bell shaped, little broader than high, with a large conical crown
Manubrium broad and massive, cross shaped in transverse section, about half to two thirds the length of the umbrella cavity
Mouth large, with 4 lips and the margin slightly folded
Gonads on the sides of the perradial lobes of the stomach, and in small horizontal folds
Radial canals fairly narrow and with smooth edges
Tentacles usually eight (4 perradial and 4 interradial)
Adradial bulbs 8, without tentacles
Eradial bulbs variable number (up to 16), minute
Ocellus on the abaxial side of every tentacula bulb and on the adradial bulb
Colour manubrium, gonads and basal bulbs pale yellow, ocelli dark brown or reddish brown (in formalin)
Size 9 to 10 mm high (including the crown) and 7 mm wide.

Early stage: Umbrella broader than high, with a small, pointed crown
Manubrium small, pyramidal, cross shaped in transverse section
Mouth with 4 small, distinct lips not folded
Gonads not visible
Tentacles 3, opposite, perradial, each with an ocellus
Perradial bulbs 2 large rounded, but without tentacles each with an ocellus
Interradial bulbs 4, very small
Size 1 mm high (including crown), 1.25 mm width (smallest specimen observed).

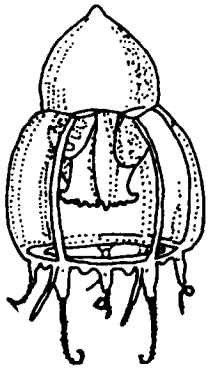
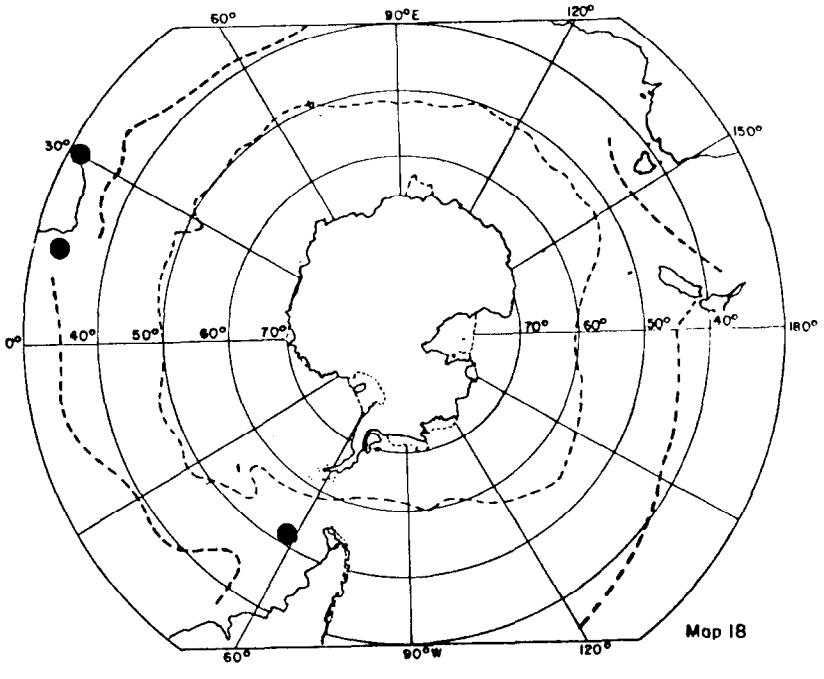


Figure 19. Halitholis intermedius.



Map 18. Distribution of Halitholus intermedius.

Browne & Kramp (1939) discussed the validity of this species: Hartlaub (1905 and 1913) is inclined to think that 'Tiara intermedia' Browne is identical with Leuckartiara octona, because the hydroid of this latter, Perigonimus repens, occurs at Tierra del Fuego and has also been found at the Falkland Islands. The investigations of the adult medusa show, however, that it belongs to Halitholus and not to Leuckartiara. On the other hand the Perigonimus described by Hartlaub (1905) may not be P. repens, but another species of Perigonimus, possibly the hydroid of Halitholus intermedius.

Genus Halitiara Fewkes 1882

Pandeidae with four radial canals; with four large hollow perradial tentacles, and several intermediate solid tentacles or tentaculae; no ocelli; gonads interradial, not folded; mouth with a simple cruciform opening; 1 recognised species.

Halitiara sp. Uchida 1971

Figure 20, Map 19

A single young specimen was found at Syowa Station in 9 m. It was allied to Halitiara formosa Fewkes which is the only species of the genus but it is distinguished from the latter by the bell form and the more or less four sided manubrium as well as by the geographical distribution. Definite identification of the species must be reserved until more specimens in the well developed stages become available (Uchida, 1971).

Genus Pandea Lesson 1843

Pandeidae with or without apical projection; gonads reticulate at first in the adradiii and eventually encircling the stomach, forming complex network; lips wide and folded; long mesenteries; radial canals ribbon like; with more than 8 tentacles; two valid and one doubtful species, (Pandea minima (von Lendenfeld) from south-eastern Australia - von Lendenfeld, 1884).

Key to species:

Radial canals smooth, apical projections on umbrella (Au,NZ,SAm,SA) ..... P. conica (Quoy & Gaimard)
Radial canals jagged, no apical projection ..... P. rubra Bigelow

Pandea rubra Bigelow 1913

Figure 21, Map 20

Diagnostic Characters (Kramp, 1957a):

Umbrella with fairly thin walls, no apical projection
Manubrium wide, half as long as bell cavity, mouth cruciform, very complexly folded
Gonads close net-work on entire interradial areas
Tentacles up to 24, with large conical bulbs, not laterally compressed
Colour subumbrella, manubrium, velum and tentacles deep brownish red
Size up to 75 mm high and wide

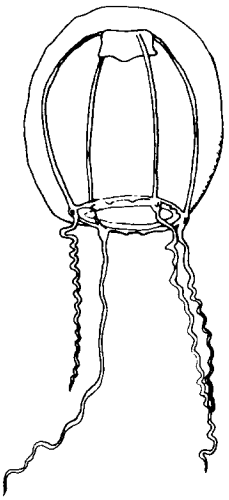
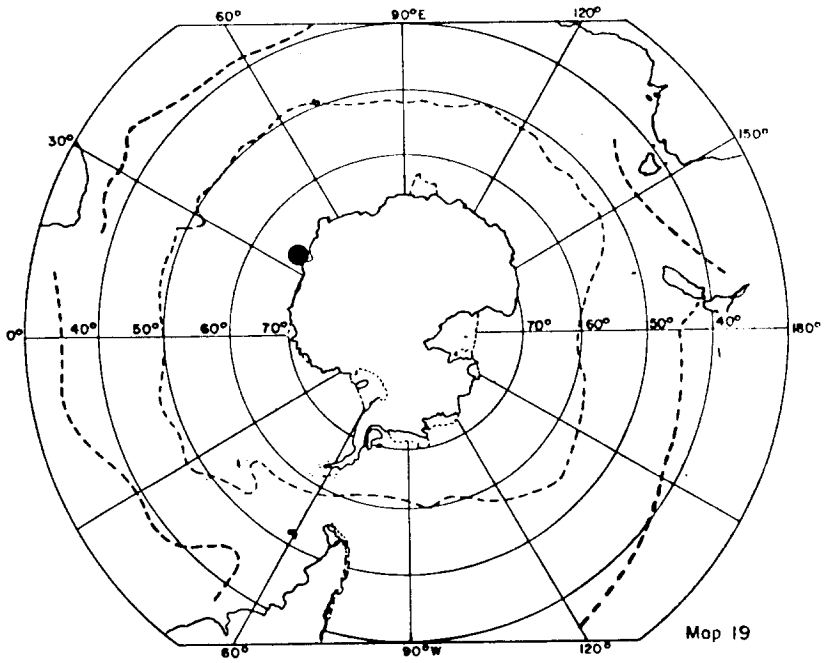


Figure 20. Halitiara sp.



Map 19. Distribution of Halitiara sp.

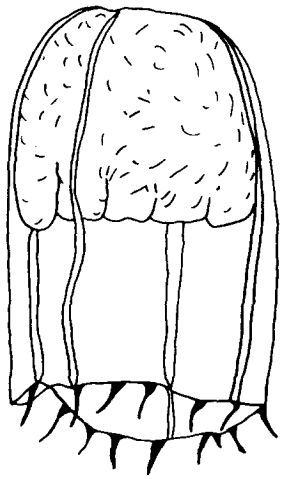
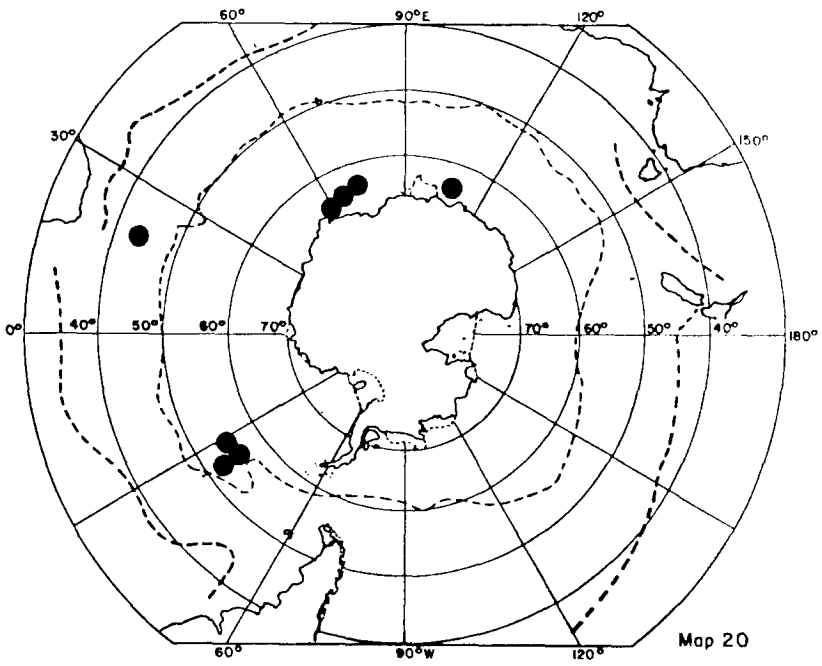


Figure 21. Pandea rubra.



Map 20. Distribution of Pandea rubra.

This is a bathypelagic medusa and is found in the 'warm deep waters' of the Antarctic (Kramp, 1957b).

Genus Zanclonia Hartlaub 1913

Pandeidae with long transversal diverticula on both sides of four radial canals; with several tentacles provided with numerous stalked nematocyst knobs on their adaxial side; one species.

Zanclonia weldoni (Browne 1910)

Figure 22, Map 21

(Catablema weldoni Browne, 1910; Vanhoffen, 1912)

Diagnostic Characters:

Umbrella bell shaped, with thick walls and a rounded summit
Mouth large with folded lips
Gonads in 8 longitudinal rows of transverse folds
Radial canals 4, broad with about 20 pairs of long diverticula at right angles to the radial canal
Tentacles 24 to 32, long, each with an adaxial series of filaments with nematocysts.
Size up to 30 mm high.

Hartlaub (1913) referred this species to the genus Zanclonia. This species has a circumpolar distribution in the Antarctic (Kramp, 1968). It is neritic, but it can be found in deep water, presumably transported there by currents from shallower areas (Kramp, 1949).

Genus Dissonema Haeckel 1879

Pandeidae with two opposite tentacles; without marginal clubs; cirri sometimes present; with abaxial ocelli; gonads extend from the manubrium outwards along the radial canals.

Dissonema gaussi Vanhoffen 1912

This species, found off Wilhelm II Land, was not described but Vanhoffen (1912) compared it with Dissonema saphenella Haeckel (a species found off the coast of Australia) and Amphinema turrida (Mayer). Hartlaub (1913) points out that this is a doubtful species and is probably not a Dissonema.

6.11 FAMILY CALYCOPSIDAE

Anthomedusae without apical projection; without gastric peduncle; mouth with four simple or crenulated lips; with simple or folded gonads on stomach walls; with four or eight simple or branched radial canals; with or without centripetal canals; with eight or more hollow marginal tentacles without basal swellings and each terminating in a large nematocyst cluster; with or without rudimentary or dwarf tentacles; without (rarely with) ocelli; 6 genera of which two are found in the Southern Ocean.

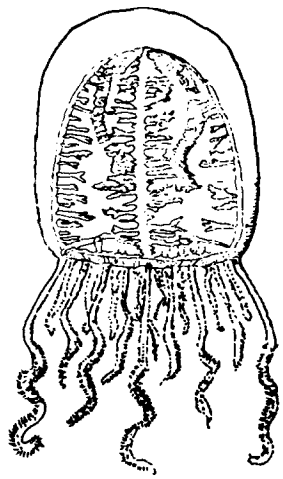
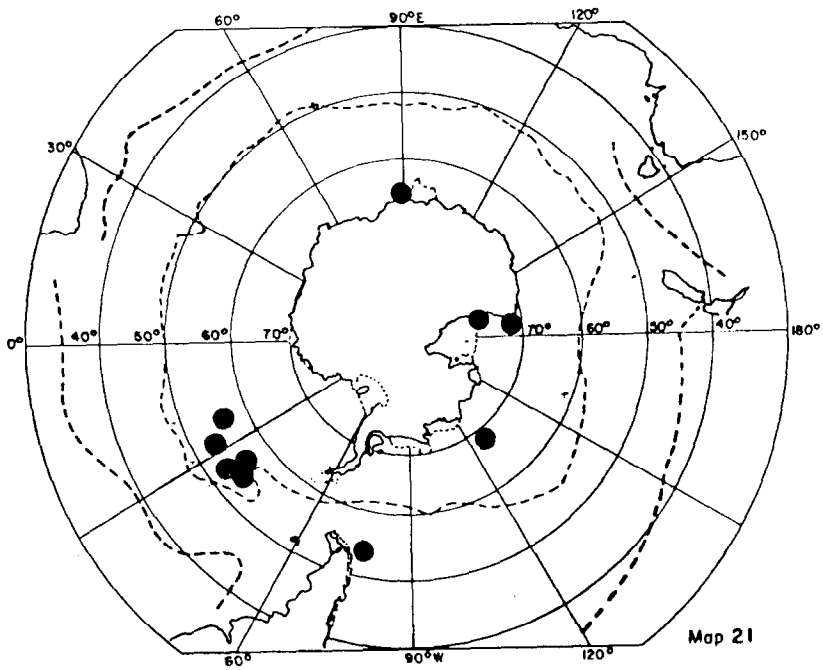


Figure 22. Zanclonia weldoni.



Map 21. Distribution of Zanclonia weldoni.

Key to genera:

1a) With centripetal canals, blind or joining base of stomach ..... Calycopsis
b) Without centripetal canals 2

2a) Radial canals simple unbranched, gonads smooth (SA) ..... Heterotiara
b) Radial canals branched, gonads folded ..... Bythotiara

Genus Calycopsis Fewkes 1882

Calycopsidae with primarily four unbranched radial canals and with four or more centripetal canals arising from the ring canals, blind or joining the cruciform base of the stomach; gonads transversely folded, frequently forming eight adradial rows of deep transverse furrows; basal portion of tentacles adnate to umbrella margin; all tentacles hollow, nematocysts only in the terminal knob; 10 species of which 4 are found in the Southern Ocean or adjacent waters. Hamond (1974) reported some unidentified specimens of Calycopsis from south-eastern Australia.

Key to species:

1a) Gonads in pockets; one interradial centripetal canal in each quadrant; 8 to 16 tentacles ..... C. borchgrevinki (Browne)
b) Gonads in exterior folds 2

2a) Marginal lobes between tentacles with well marked exumbral papillae; 2 centripetal canals in each quadrant; 8 to 12 tentacles (SA) ..... C. papillata Bigelow
b) Marginal lobes without well marked papillae 3

3a) Numerous centripetal canals, 7 or more in each quadrant, most of them joining base of stomach or upperpart of neighbouring canals; 16 to 32 tentacles (SA) ..... C. chuni Vanhoffen
b) One centripetal canal in each quadrant, blind; 8 long and several small tentacles (SA) ..... C. bigelowi Vanhoffen

Calycopsis borchgrevinki (Browne 1910)

Figure 23, Map 22

(Sibogita borchgrevinki Browne, 1910)

Diagnostic Characters:

Umbrella rounded
Gonads in pockets, embedded in the walls of the stomach, not in the exterior folds.
Centripetal canals 4, interradial, blind or joining base of stomach.
Tentacles between 8 and 16
Size 20 mm high, 15 to 18 mm wide

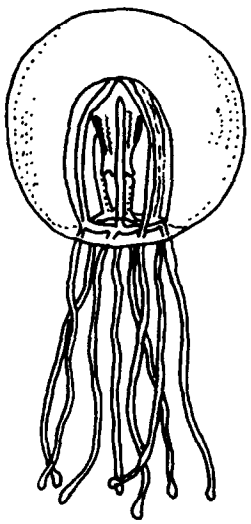
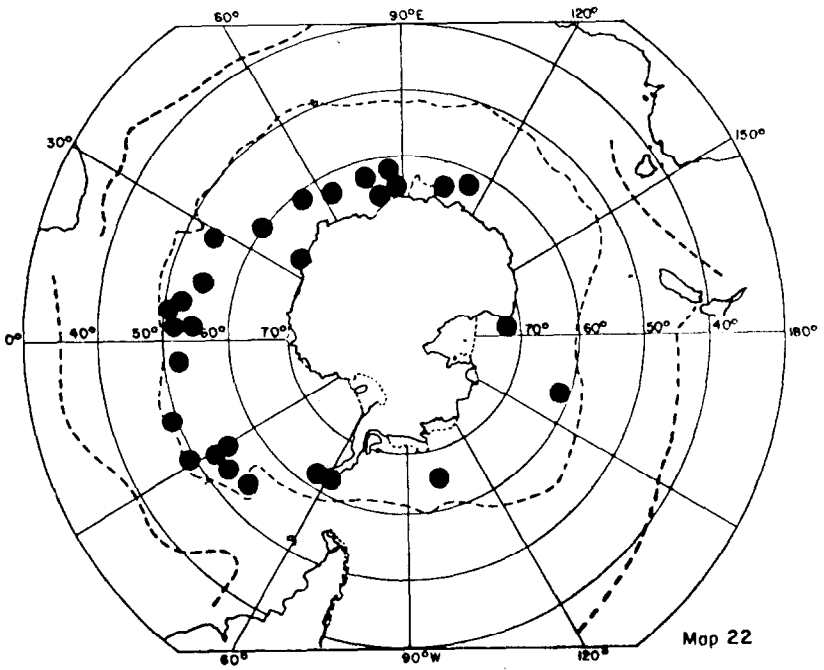


Figure 23. Calycopsis borchgrevinki.



Map 22. Distribution of Calycopsis borchgrevinki.

Vanhoffen (1911) considered Browne's specimen of S. borchgrevinki a juvenile of Calycopsis typa Fewkes, but retained the specific name for a number of specimens from the ice-barrier between Bouvet Island and Enderby Land, Antarctica (Kramp, 1961).

This species has a circumpolar distribution in the Antarctic and Subantarctic (Kramp, 1957a, 1959, 1968). It is presumably a meroplanktonic or neritic medusa with a longevity sufficient to allow it to be carried rather far away from its place of origin (Kramp, 1949). It has a very extensive vertical distribution (Kramp, 1957b).

Genus Bythotiara Gunther 1903

Calycopsidae with four narrow, simple or bifurcate radial canals; without centripetal canals; gonads with transverse furrows; with or without secondary tentacles; 3 species of which 2 are found in the Southern Ocean or adjacent waters.

Key to species:

With bifurcate radial canals; with secondary tentacles (SA,At) ..... B. murrayi Gunther
With four simple radial canals; without secondary tentacles ..... B. drygalskii Vanhoffen

Bythotiara drygalskii Vanhoffen 1912

Map 23, (no figure available)

Diagnostic Characters:

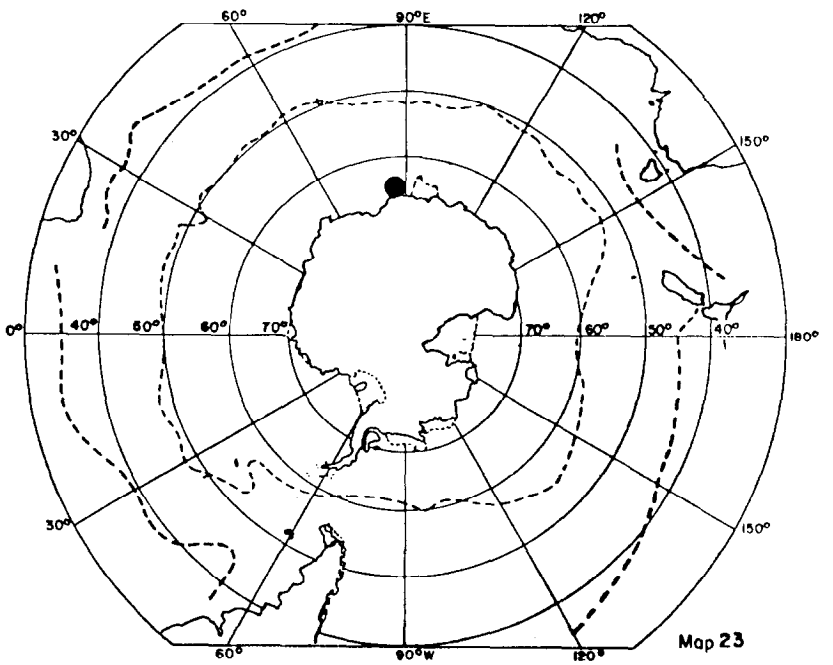
Stomach small
Gonads 8, adradial with transverse folds
Radial canals 4, unbranched
Tentacles 4, perradial.

This species has only been found once, off Wilhelm II Land by Vanhoffen (1912).

6.12 FAMILY RUSSELLIIDAE

Anthomedusae with unbranched oral tentacles without terminal clusters of nematocysts, situated above the mouth opening, mouth with simple perradial lips; with groups of hollow, marginal tentacles without basal swellings, partly sunk into narrow fissures of the umbrella margin; with adaxial ocelli; 1 genus.

(No figure available)



Map 23. Distribution of Bythotiara drygalskii.

Genus Russellia Kramp 1957a

Russelliidae with an apical projection; with cruciform stomach mounted upon a peduncle; with four pointed oral tentacles; with eight smooth, adradial gonads; with four radial canals; with eight groups of marginal tentacles, each group with one large and two small tentacles, the basal part of the large tentacle sunk into a deep furrow of the umbrella margin; with an adaxial ocellus at the base of the free portion of the tentacles; monospecific genus.

Russellia mirabilis Kramp 1957a

Figure 24, Map 24

Diagnostic Characters:

Umbrella with a large apical projection
Stomach about half as long as bell cavity
Gonads adradial, occupying entire length of stomach
Mouth quadrangular, with very short perradial lips
Oral tentacles four, perradial, inserted above mouth, finger shaped, pointed, with scattered nematocysts along entire length.
Tentacles four perradial and four interradial, their basal part deeply sunk into a narrow fissure between two prominent lobes of the umbrella margin, and each flanked by a pair of small tentacles.
Size 15 mm high, 9 mm wide.

This species exhibits an extensive vertical distribution being found in the slope and neritic areas of the Antarctic (Kramp, 1968) and in the West Indies (Kramp, 1959).

6.13 FAMILY TIARANNIDAE

Anthomedusae without apical projection and without gastric peduncle; with large, cruciform stomach; mouth with simple or folded lips; with four radial canals; with folded gonads on the walls of the stomach and its perradial lobes; with numerous hollow marginal tentacles with conical basal bulbs; with hollow marginal spindle-shaped cordylus like stuctures with nematocysts at distal end; without ocelli; 3 genera of which 2 are found in the Southern Ocean.

The cordylus like structures are particularly characteristic of the Tiarannidae, which forms an intermediate family between the Pandeidae in the Anthomedusae and the Laodiceidae in the Leptomedusae (Kramp, 1959).

Key to genera:

Gonads lateral folds ..... Tiaranna
Gonads sac-like invaginations ..... Chromatonema

Genus Tiaranna Hartlaub 1913

Tiarannidae in which the gonads are lateral folds on both sides of the perradial stomach lobes and connected in the interradii; 1 valid species and 4 doubtful.

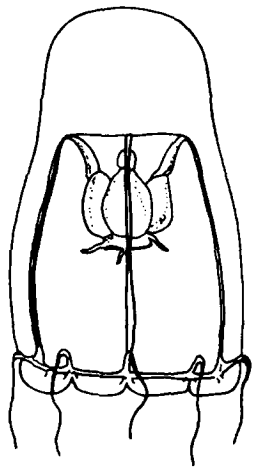
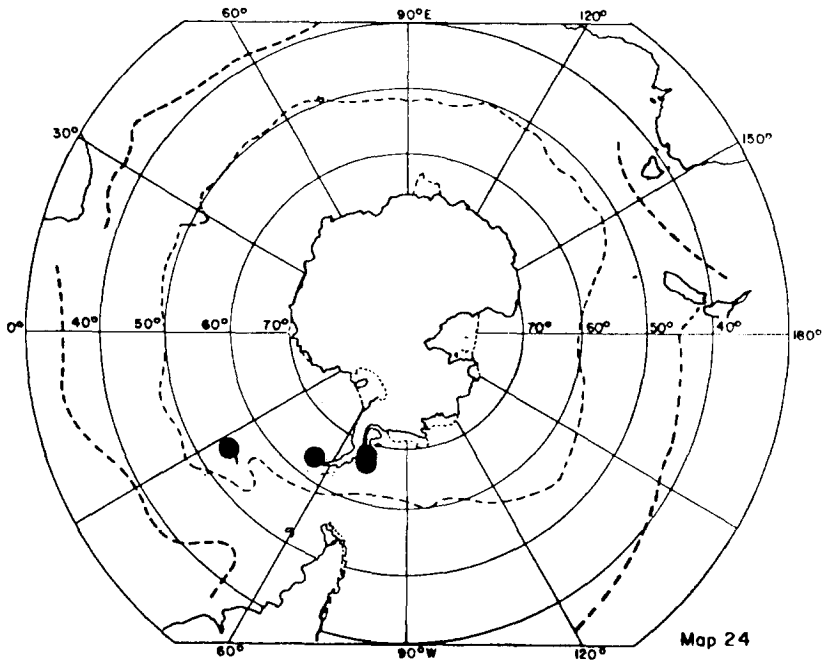


Figure 24. Russellia mirabilis.



Map 24. Distribution of Russellia mirabilis.

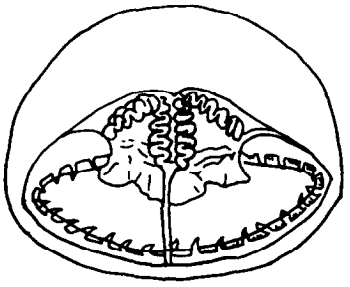
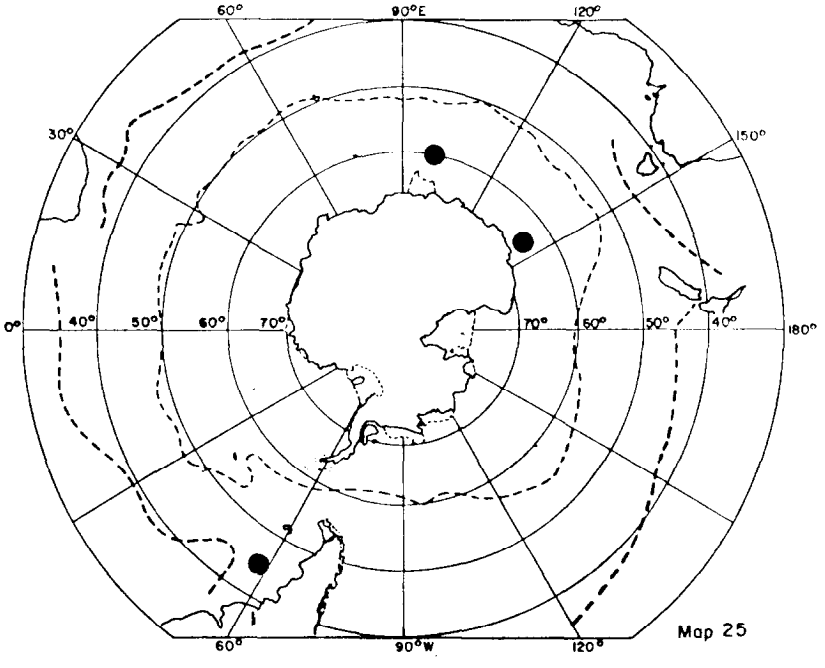


Figure 25. Tiaranna rotunda.



Map 25. Distribution of Tiaranna rotunda.

Tiaranna rotunda (Quoy & Gaimard 1827)

Figure 25, Map 25

Diagnostic Characters:

Umbrella apex evenly rounded, jelly thick
Manubrium broad, cruciform, perradial edges of stomach in their entire length connected with subumbrella
Mouth with four large, slightly crenulated lips
Gonads in regular transverse folds on interradial walls of stomach extending outwards along the perradii
Tentacles from 16 to 28, with conical bulbs, between successive tentacles are 2 to 3 minute spindle shaped cordylus-like appendages with distal bundle of nematocysts
Size 20 mm wide, somewhat less in height.

This species has been found in the deep and intermediate strata of the Antarctic (Kramp, 1968).

Genus Chromatonema Fewkes 1882

Tiarannidae in which the gonads constitute eight series of sac-like invaginations from the surface of the perradial stomach lobes, separated in the interradii; 3 species which are all probably synonymous.

Chromatonema rubrum Fewkes 1882

Figure 26, Map 26

(Ptychogena aurea Vanhoffen, 1912)

Diagnostic Characters:

Umbrella with thick jelly, apex evenly rounded
Manubrium broad quadrangular, with four perradial lobes extending for half or two thirds the distance towards bell margin
Mouth with 4 short, slightly crenulated lips
Gonads 10 to 16, sac like, on each side of each stomach lobe
Tentacles 20 to 24 with conical bulbs between successive tentacles, 2 (rarely only 1) minute cordylus-like appendages with distal bundle of nematocysts
Size up to 27 mm wide, 22 mm high.

Two other species Chromatonema erythrogonon (Bigelow) and C. hertwigi (Vanhoffen) are probably identical with C. rubrum and it seems very likely that Ptychogena aurea (Vanhoffen) belongs to this species (Kramp, 1957a).

The Discovery collections show that Chromatonema rubrum is widely distributed in the deep sea round half the circumference of the Antarctic Ocean (Kramp, 1957a). It is predominantly bathypelagic, being taken in the 'warm deep water' between the Antarctic surface water and the Antarctic bottom water (Kramp, 1957b).

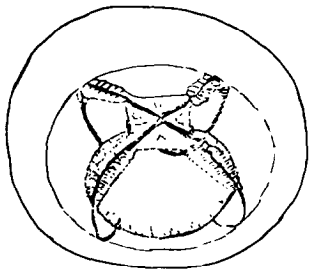
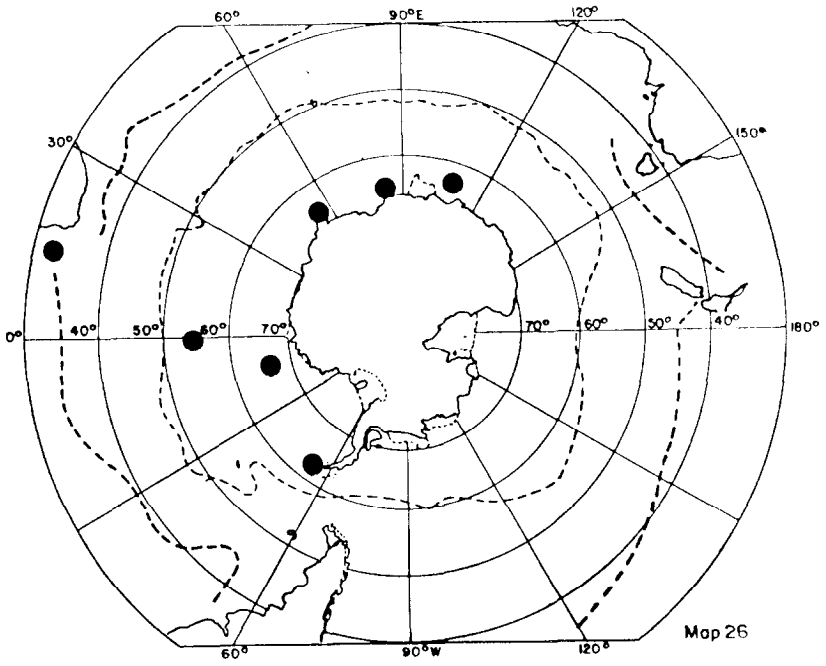


Figure 26. Chromatonema rubrum.



Map 26. Distribution of Chromatonema rubrum.

7. ORDER LEPTOMEDUSAE

Hydromedusae with umbrella usually hemispherical or flattened; with gonads on radial canals; marginal sense organs, when present, in form of cordyli or marginal vesicles of ectodermal origin; occasionally with ocelli; 12 families of which 9 are found in the Southern Ocean or adjacent waters.

7.1 KEY TO FAMILIES OF LEPTOMEDUSAE:

1a) With marginal cordyli ..... LAODICEIDAE
b) With marginal vesicles; without cordyli 2

2a) Marginal vesicles open ..... MITROCOMIDAE
b) Marginal vesicles closed 3

3a) With a distinct gastric peduncle 4
b) Without a distinct gastric peduncle 5

4a) With numerous marginal vesicles; gonads restricted to umbrella portion of radial canals; tentacle bulbs usually with excretory pores (Au,NZ,SA) ..... EIRENIDAE
b) Marginal vesicles usually eight, if more, the gonads extend from bell margin down along the peduncle almost to the stomach; no excretory pores (Au,NZ,SA) ..... EUTIMIDAE

5a) Stomach very broad; with many radial canals; tentacle bulbs with excretory pores ..... AEQUOREIDAE
b) Stomach narrow; with (normally) 4 to 8 radial canals .. 6

6a) Tentacle bulbs with excretory pores; 4 to 8 radial canals (SA) ..... PHIALUCIIDAE
b) Without excretory pores; 4 radial canals 7

7a) Tentacle bulbs with lateral cirri or marginal cirri between tentacles (Au,NZ,SA) ..... LOVENELLIDAE
b) Without cirri 8

8a) Gonads divided into two lateral parts by median groove; 8 marginal vesicles ..... PHIALELLIDAE
b) Gonads completely surrounding radial canals; 8 or more marginal vesicles ..... CAMPANULARIIDAE

7.2 FAMILY LOADICEIDAE

Leptomedusae with marginal cordyli; with four to eight or more simple or branched radial canals; with hollow marginal tentacles; with or without marginal cirri; without marginal vesicles; with or without ocelli; 7 genera.

Key to genera:

1a) With 6 or more radial canals (SA,NZ) ..... Toxorchis
b) With 4 radial canals 2

2a) Radial canals open grooves forming large cruciform mouth ..... Staurophora
b) Radial canals closed 3

3a) Some or all tentacle bulbs with adaxial ocelli ..... Laodicea
b) No ocelli ..... Ptychogena

Genus Laodicea Lesson 1843

Laodiceidae with four simple radial canals; with simple wavy gonads; with or without marginal cirri, with adaxial ocelli; 5 species. The limitation of the species was discussed by Kramp (1953). The species belonging to this genus have been revised by Browne (1907), Mayer (1910) and Kramp (1919).

Key to species:

1a) Stomach with large perradial lobes; about 50 tentacles ..... L. pulchra Browne
b) Stomach with short perradial lobes 2

2a) With 8 tentacles and 8 very large marginal clubs (Au) L. fertilis (von Lendenfeld)
b) With numerous tentacles 3

3a) With up to 180 tentacles, no basal spur (SA, Au) ..... L. indica Browne
b) With 200 to 300 tentacles with abaxial basal spur (SA) ..... L. undulata (Forbes & Goodsir)

Laodicea pulchra Browne 1902

Figure 27, Map 27

Diagnostic Characters (Browne & Kramp, 1939):

Umbrella flatly curved, nearly twice as broad as high
Stomach very large with 4 perradial lobes extending nearly to the margin of the umbrella
Mouth with 4 large, slightly folded lips
Gonads extending from near the centre of the stomach to within a short distance of the ring canal, forming a series of short folds along the lobes of the stomach, where these are attached to the subumbrella
Tentacles about 50, without a basal spur
Cirri absent
Sensory clubs (cordyli) generally 3 or 4 between every 2 tentacles, and each situated on a small bulb
Adaxial ocellus usually present at the base of every bulb with a tentacle or a cordylus

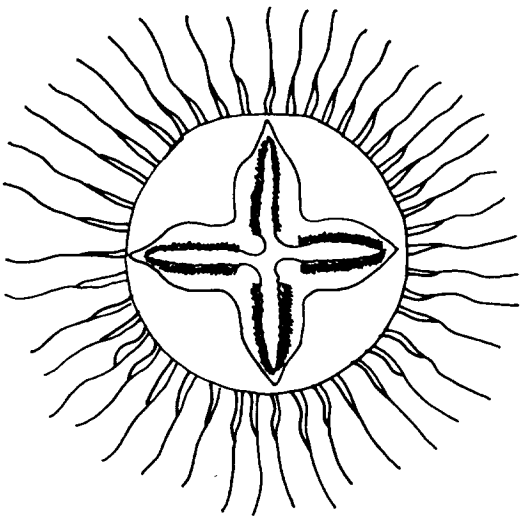
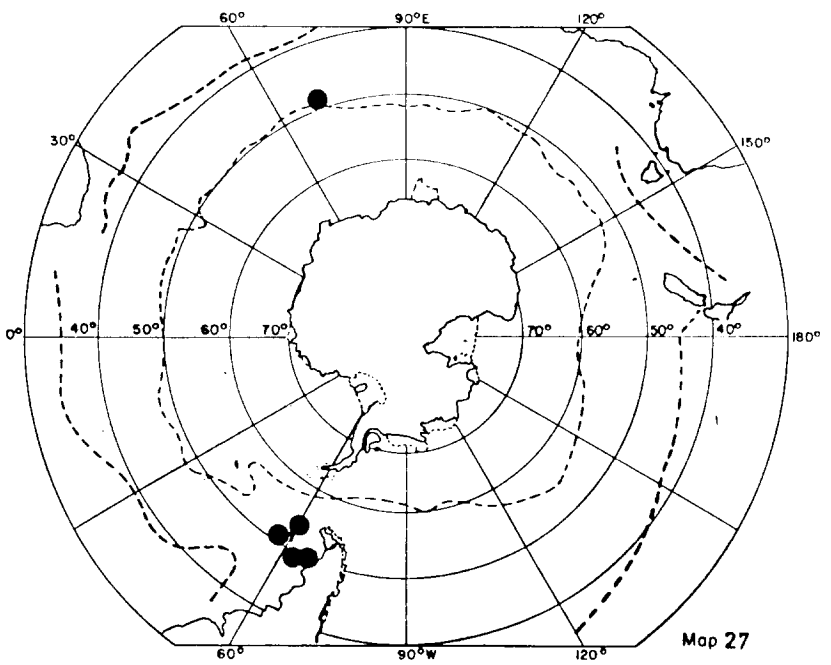


Figure 27. Laodicea pulchra.



Map 27. Distribution of Laodicea pulchra.

Colour stomach, gonads and basal bulb of tentacles of a pale yellowish colour (in formalin), ocelli black
Size 25 mm wide and 15 mm high.

Further descriptions and information on the stages of Laodicea pulchra are given by Browne and Kramp (1939). They point out that L. pulchra differs rather considerably from the other species of the genus in appearance, in the shape of the mouth, and in the structure of the tentacles, particularly of their basal parts. It bears a considerable resemblance to the more primitive species of Ptychogena, P. californica Torrey and P. crocea Kramp & Damas, but the presence of ocelli on the basal bulbs separates it from the genus Ptychogena. It is a neritic medusa (Kramp, 1957b).

Genus Ptychogena A. Agassiz 1865

Laodiceidae with four radial canals giving rise to lateral diverticula in which the gonads are placed; stomach with funnel-shaped perradial lobes; without cirri; without ocelli; 5 species of which only one occurs in the Southern Ocean.

Ptychogena antarctica Browne 1907

Figure 28, Map 28

Diagnostic Characters:

Umbrella slightly convex, jelly very thick
Stomach wide with funnel-shaped perradial lobes almost to terminal portions of gonads
Gonads on nearly whole length of radial canals, in 10 to 15 lateral folds on either side, each of them further divided into 2 to 5 lamellar folds, not attached to subumbrella
Tentacles about 300, and as many cordyli with a few nematocysts.
Size 60 to 100 mm wide.

Ptychogena antarctica was provisinally described by Vanhoffen (1911) and was accepted as a valid species by Kramp (1957a). It has only been found off the Antarctic continent.

Another species, P. aurea was described by Vanhoffen (1912) from specimens taken off Wilhelm II Land. It was considered a doubtful species by Kramp & Damas (1925) and Kramp (1957a) considered it to probably be synonymous with Chromatonema rubrum Fewkes.

Genus Staurophora Brandt 1838

Laodiceidae with four radial canals which for the greater part of their length are open grooves forming a large cruciform mouth; gonads in branched diverticula from the lateral walls of the cruciform mouth; with adaxial ocelli; no cirri; 1 valid and 1 doubtful species.

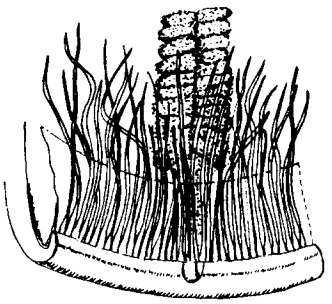
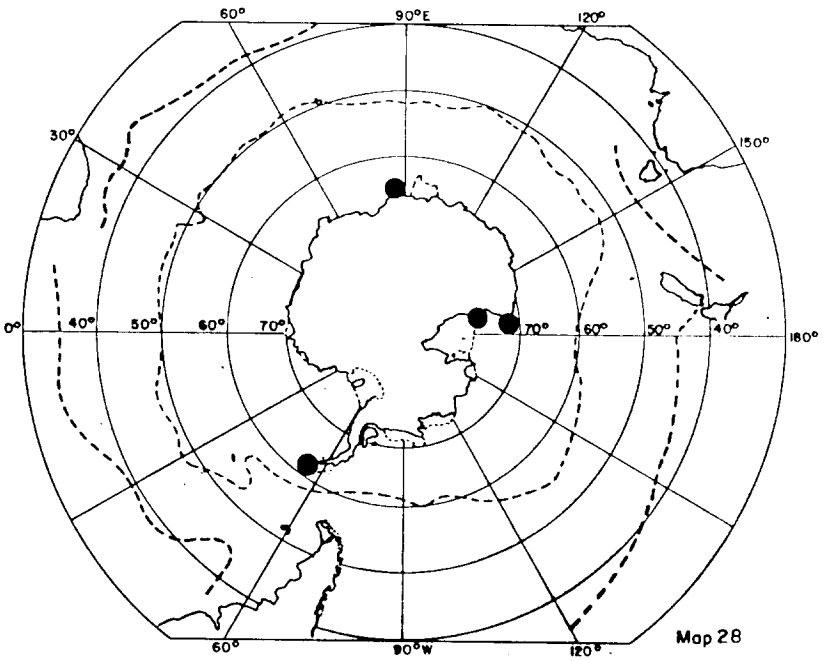


Figure 28. Ptychogena antarctica (section of bell).



Map 28. Distribution of Ptychogona antarctica.

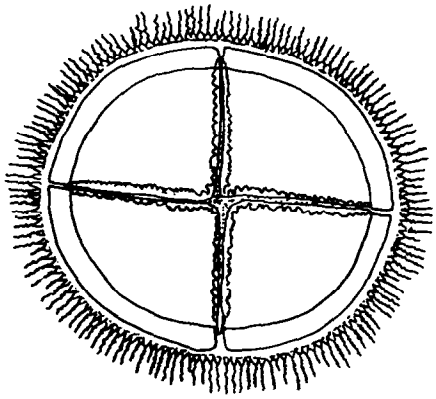
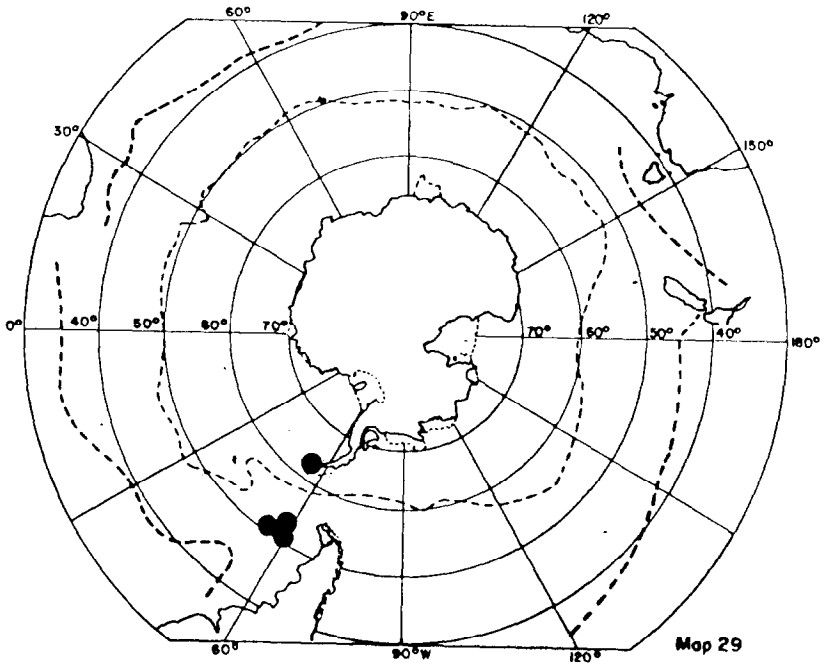


Figure 29. Staurophora mertensi.



Map 29. Distribution of Staurophora mertensi.

Staurophora mertensi Brandt 1838

Figure 29, Map 29

(Staurophora falklandica Browne, 1908)

Diagnostic Characters:

Umbrella flatter than a hemisphere
Tentacles short, up to 4400, all with adaxial ocellus, alternating with club shaped cordyli without nematocysts
Size 100 to 200 mm wide.

This is a bipolar species and it is now possible to state with certainty that Staurophora falklandica Browne is identical with S. mertensi (Kramp, 1957a).

7.3 FAMILY MITROCOMIDAE

Laodiceidae with open marginal vesicles; with base of stomach attached to subumbrella along edges of radial furrows; with gonads on radial canals separated from stomach; with hollow marginal tentacles; with or without marginal cirri; with or without ocelli; 10 genera. A revision of the genera and species is given by Kramp (1932).

Key to genera:

1a) With a large black ocellus at the base of each marginal tentacle (In) ..... Tiaropsidium Torrey
b) Without ocelli 2

2a) With about 12 to 16 radial canals ..... Halopsis A.Agassiz
b) With 4 radial canals 3

3a) Without marginal cirri, 8 marginal vesicles ..... Cosmetirella Browne
b) With marginal cirri ..... Mitrocomella Haeckel

Genus Halopsis A.Agassiz 1863

Mitrocomidae with more than eight radial canals; with numerous marginal vesicles; without ocelli; with spirally coiled marginal cirri; 1 species only.

Halopsis ocellata A.Agassiz 1863

Figure 30, Map 30

Diagnostic Characters:

Umbrella about 4 times as wide as high
Stomach broad and flat
Mouth with 4 fairly short lips

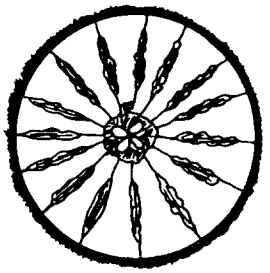
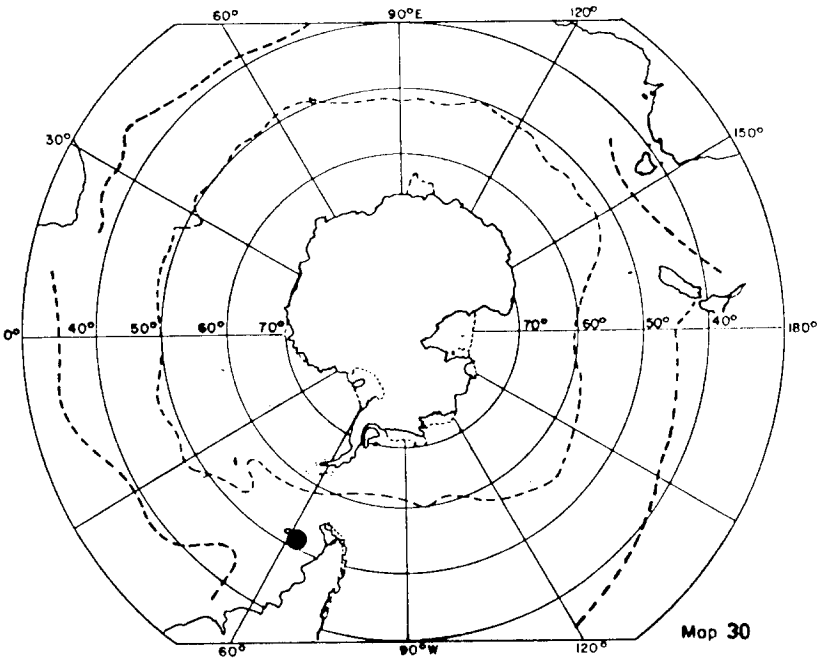


Figure 30. Halopsis ocellata.



Map 30. Distribution of Halopsis ocellata.

Radial canals between 12 and 16 in 4 groups
Gonads linear, sinuous, along about two-thirds of radial canals
Tentacles up to 450
Spiral cirrus one between successive tentacles
Marginal vesicles about 80 with many concretions
Size 50 to 65 mm wide.

This species has only been found in the Southern Ocean by Kramp (1957a).

Genus Cosmetirella Browne 1910

Mitrocomidae with four radial canals; with eight marginal vesicles without ocelli; without marginal ciriri; 1 species only.

Cosmetirella davisi (Browne 1902)

Figure 31, Map 31

(Tiaropsis davisii Browne, 1902)
(Cosmetirella simplex Browne, 1910; Vanhoffen, 1912 in part, 1920)
(C. kerguelensis Vanhoffen, 1912 in part)
(Philalla falklandica Vanhoffen, 1911).

Diagnostic Characters:

Umbrella almost hemispherical
Stomach small, lips somewhat folded
Gonads linear, sinuous, along half to two-thirds of radial canals.
Tentacles number very variable, up to 180
Marginal vesicles with several concretions (=lithocysts)
Size up to 60 mm wide.

Tiaropsis davisii Browne, Cosmetirella simplex Browne, C. kerguelensis Vanhoffen and Phialella falklandica Vanhoffen are synonymous with C. davisi (Kramp 1932). Specimens of this medusa taken in Subantarctic regions generally attain a larger size (Kramp, 1968), and attain a larger number of tentacles than specimens from true Antarctic seas (Kramp, 1949). It has a circumpolar distribution in Antarctic and Subantarctic waters (Kramp, 1957a) and is a neritic medusa belonging to the upper strata (Kramp, 1949).

Genus Mitrocomella Haeckel 1879

Mitrocomidae with four radial canals; with 8, 12 or 16 marginal vesicles without ocelli; with spirally coiled marginal cirri; 6 species of which only 1 occurs in the Southern Ocean.

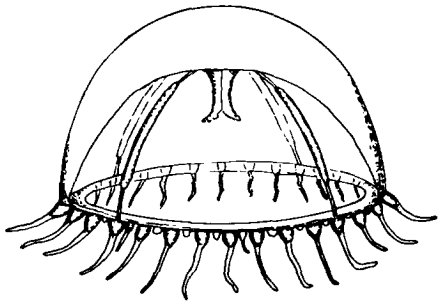
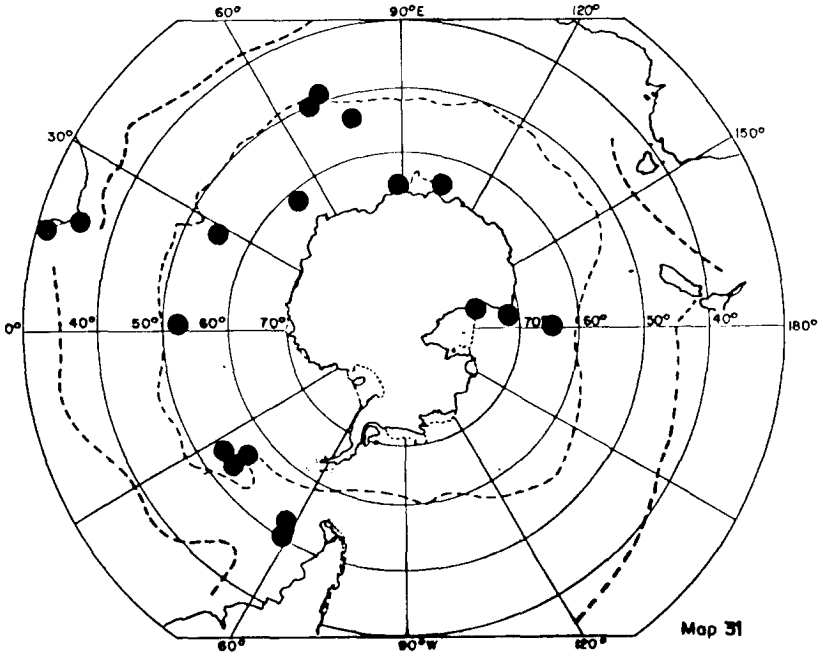


Figure 31. Cosmetirella davisi.



Map 31. Distribution of Cosmetirella davisi.

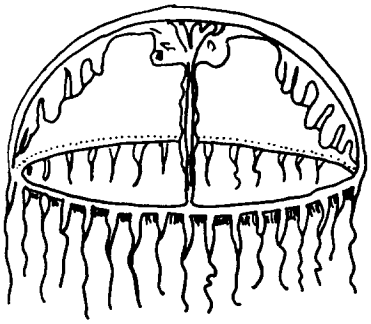
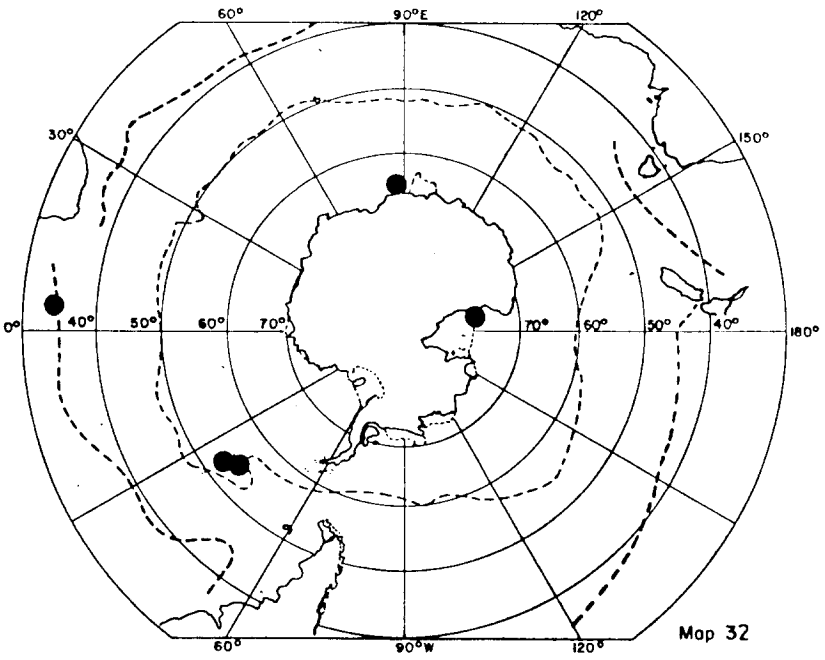


Figure 32. Mitrocomella frigida.



Map 32 Distribution of Mitrocomella frigida.

Mitrocomella frigida (Browne 1910)

Figure 32, Map 32

(Cosmetira frigida Browne, 1910; Vanhoffen, 1912)

Diagnostic Characters:

Umbrella almost hemispherical, with thin walls
Stomach short and broad
Gonads along greater part of radial canals, leaving both ends free, hanging down in large vertical folds
Tentacles between 32 and 72
Cirri about 8 between successive tentacles
Marginal vesicles 8
Size 13 to 17 mm diameter.

It is interesting that this Antarctic species has been taken at a considerable distance west of the Cape of Good Hope, evidently under the cooling influence of the Benguela Current (Kramp, 1957a). This strictly neritic species may have a circumpolar distribution in the Antarctic coastal areas (Kramp, 1948).

7.4 FAMILY CAMPANULARIIDAE

Leptomedusae with normal or reduced velum; with small stomach, without a peduncle; with normally four simple radial canals; with gonads completely surrounding radial canals, separated from stomach; with hollow, rarely solid, marginal tentacles; without marginal or lateral cirri; with closed marginal vesicles; without ocelli; 5 genera of which 3 have representatives in the Southern Ocean and adjacent waters.

Key to genera:

1a) With normal manubrium and tentacles 2
b) Without manubrium, without tentacles; exumbrella with meridinal ridges; abortive medusa (Au,NZ) ..... Eucopella

2a) Tentacles solid; 8 marginal vesicles ..... Obelia
b) Tentacles hollow; with numerous vesicles when adult ..... Phialidium

Genus Obelia Peron & Lesueur 1809

Figure 33, Map 33

Campanulariidae with reduced velum; with solid marginal tentacles; with eight adradial lithocysts situated on the inner side of the basal bulbs of eight of the tentacles; no marginal cirri; a sac-like gonad on each of the four radial canals.

As a rule it is impossible to distinguish the medusae of the various species of Obelia from each other. The genus is almost cosmopolitan (Kramp, 1959)... see Table 1 for Southern Ocean Records and Kramp (1961) for other records.

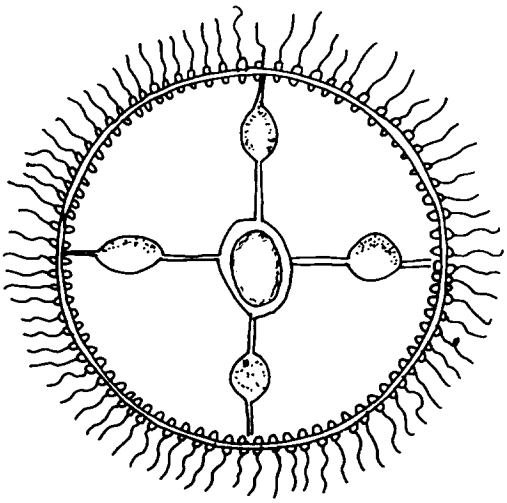
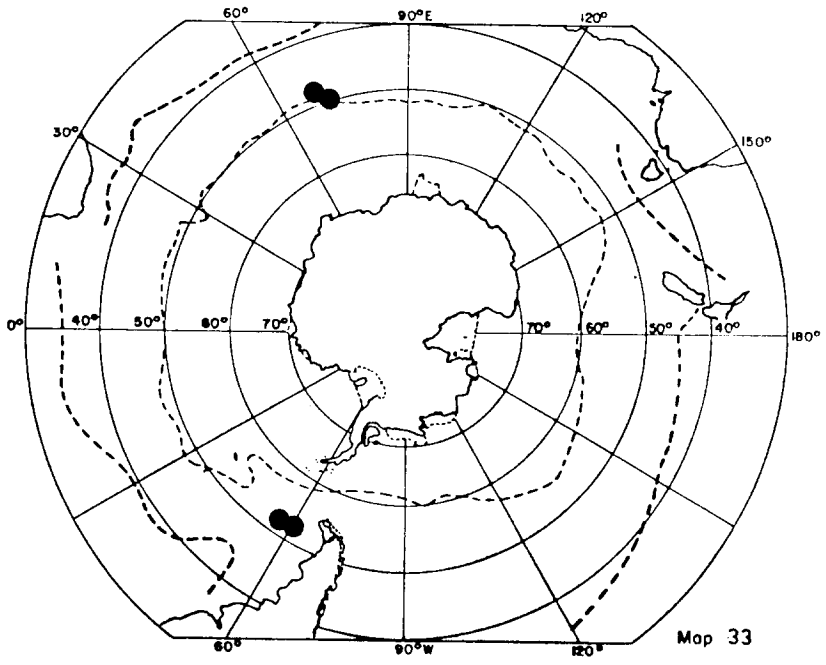


Figure 33. Obelia sp.



Map 33. Distribution of Obelia.

Diagnostic Characters:

Umbrella flat, jelly thin
Velum rudimentary
Stomach short, with quadrangular base
Mouth with 4 short, simple lips
Gonads round, sac-like, on middle of radial canals
Tentacles numerous, short, solid, somewhat stiff, with axial core of single row of endoderm cells, each with a small basal bulb and a short prolongation of endoderm into mesogloea of umbrella margin
Lithocysts 8, adradial, each situated on underside of basal bulb of marginal tentacle, each with one concretion
Size up to 6 mm wide.

Table 1. The Southern Ocean species of Obelia (medusae)

Author	Species	Localities
Mayer (1910)	O. geniculata	Kerguelen Is, Falkland Is.
Vanhoffen (1911)	O. geniculata	Kerguelen Is.
Browne & Kramp (1939)	O. multicia	Falkland Is.
	O. diaphana	Falkland Is.

Genus Phialidium Leuckart 1856

Campanulariidae with normal velum; with hollow marginal tentacles; with numerous marginal vesicles; 25 species of which 5 occur in the Southern Ocean or adjacent waters.

Key to species:

1a) Subumbrella iridescent; 16 large and 16 small tentacles ..... P. iridescens Maas
b) Subumbrella not irridescent 2

2a) Stomach large, globular; 4 prominent lips (NZ) P. malayense Kramp
b) Stomach fairly narrow 3

3a) Marginal vesicles about twice as numerous as tentacles plus bulbs (Au,NZ,Pa,SA,In) ..... P. hemisphaericum Lamarck
b) Marginal vesicles in about same number as tentacles plus bulbs 4

4a) Gonads on less than half the distal part of radial canals, about 32 tentacles (SAm) ..... P. lomae Torrey
b) Gonads along distal half to three quarters of radial canals; 60 to 85 tentacles ..... P. simplex Browne

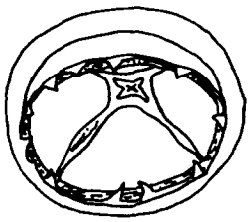
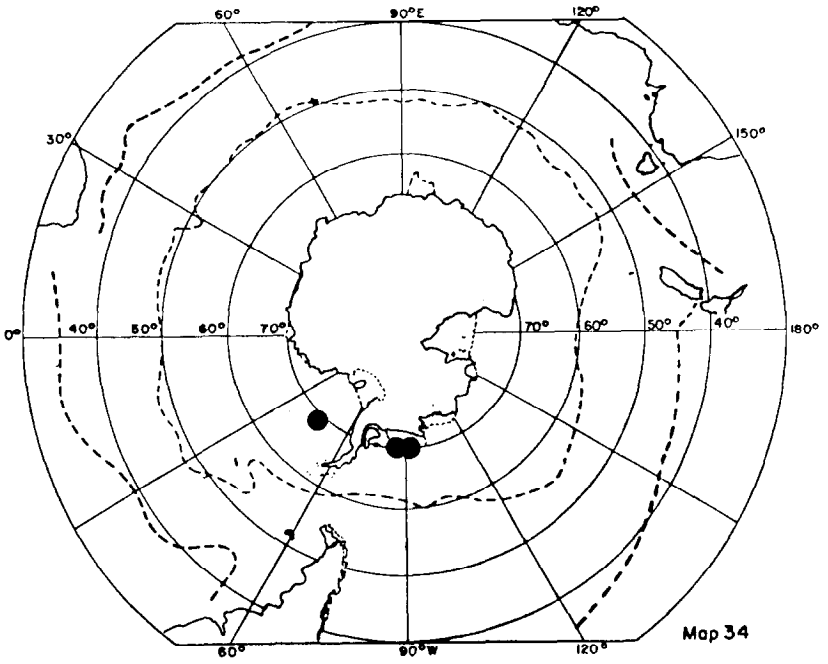


Figure 34. Phialidium iridescens.



Map 34. Distribution of Phialidium iridescens

Phialidium iridescens Maas 1906

Figure 34, Map 34

Diagnostic Characters:

Umbrella somewhat globular, jelly fairly thick, subumbrella iridescent
Stomach wide, quadrangular
Mouth with four small, complexly folded lips
Gonads spindle-shaped, along middle portion of radial canals
Tentacles 16 well developed with broad, conical bases, and 16 smaller ones, large and smaller ones not regularly alternating.
Statocyst number and structure unknown
Size 4 to 5 mm wide.

Phialidium iridescens was thought to be probably synonymous with Cosmetirella simplex by Vanhoffen (1912). Kramp (1932) regarded it as a doubtful species but provisionally referred it to Phialidium in 1959.

Phialidium simplex Browne 1902

Figure 35, Map 35

Diagnostic Characters:

Umbrella watch-glass shaped, twice to three times broader than high
Stomach short with 4 large, fimbricated lips
Gonads along distal half to three-quarters of radial canals, linear, slightly folded.
Tentacles 60 to 85, with globular bulbs, and a few young bulbs.
Statocyst 1 between successive tentacles, each with 1 concretion
Radial canals 3 or 6
Colour stomach, gonads, and basal bulbs of tentacles pale yellow (in formalin)
Size up to 22 mm wide, 10 mm high.

Browne & Kramp (1939) give a good description of the development of the medusae and of the abnormal specimens encountered.

7.5 FAMILY PHIALELLIDAE

Leptomedusae with small stomach; without peduncle; with four simple radial canals; with gonads with median groove, on radial canals, separated from stomach; with hollow marginal tentacles; without excretory pores; without marginal or lateral cirri; with eight closed marginal vesicles usually two or more concretions; without ocelli; 1 genus. Hydroids, where known, with hydranth without webs, hydrotheca with operculum.

Genus Phialella Browne 1902

Phialellidae with characters of family; 8 species of which 2 are doubtful. A discussion of the generic name is given by Browne & Kramp (1939).

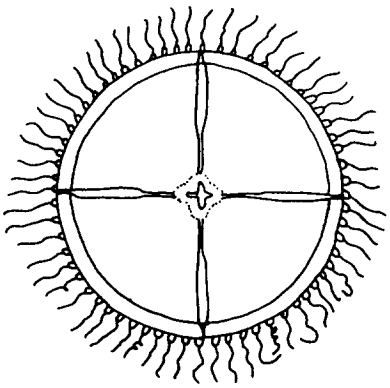
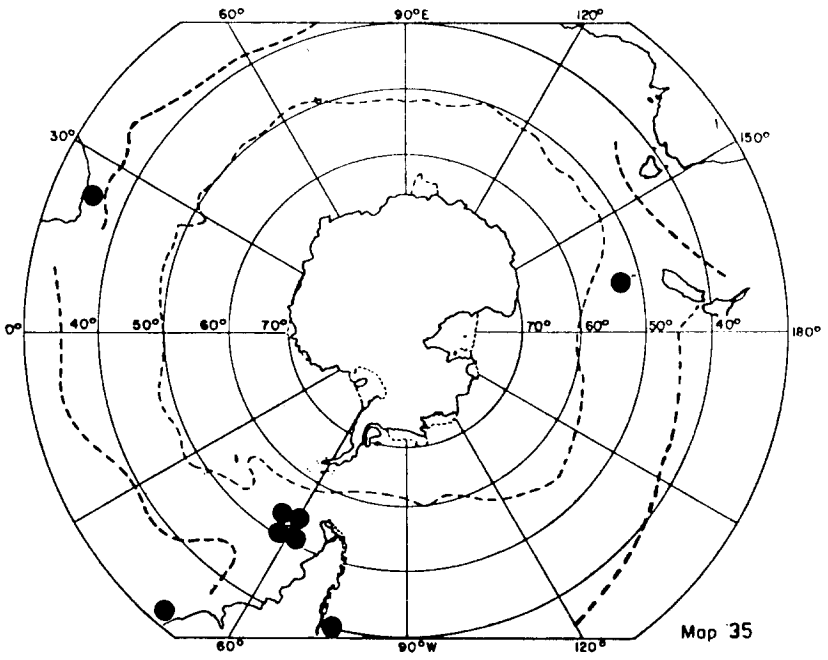


Figure 35. Phialidium simplex.



Map 35. Distribution of Phialidium simplex.

Key to species:

Gonads along almost entire length of radial canals, hanging down in wavy folds; about 60 tentacles .... P. falklandica Browne

Gonads elongated, oval, in distal third of radial canals; 16 to 32 tentacles (NZ) ..... P. quadrata (Forbes)

Phialella falklandica Browne 1902

Figure 36, Map 36

(Phialella sp. Benham, 1909)
(Europe falklandica Mayer, 1910)
(non Phialella falklandica Vanhoffen, 1911)

Diagnostic Characters:

Umbrella semi-globular, thick walls, little broader than high
Stomach short and quadrangular
Mouth with 4 lips and a fimbricated margin
Gonads hanging down in wavy folds, occupying nearly the whole length of the 4 radial canals, not touching the stomach and not extending quite down to the margin of the umbrella
Tentacles 60 to 70, with large basal bulbs
Statocysts on broad, cushion-like bulbs, with 2 or more concretions
Colour stomach, gonads, and basal bulbs pale yellow (in formalin)
Size 12 mm wide, 11 mm high.

Browne & Kramp (1939) discussed the synonomy of this species: the medusa recorded by Vanhoffen (1911) as Phialella falklandica from Kerguelen Island and the surrounding area really belongs to Cosmetirella davisi. It seems probable, on the other hand, that specimen described by Vanhoffen (1913b) under the name of P. falklandica were correctly identified; they were found in various localities along the coasts of South America. The excellent description and figures of a Phialella from the Auckland and Campbell Islands south of New Zealand by Benham (1909) leave no doubt of its identity with P. falklandica.

7.6 FAMILY AEQUOREIDAE

Leptomedusae with very broad stomach; without peduncle; with many simple or branched radial canals; with excretory pores; with gonads on radial canals separated from stomach, longitudinally divided; with hollow marginal tentacles; without marginal or lateral cirri; with closed marginal vesicles; with or without ocelli; 3 genera of which 2 are represented in the Southern Ocean or adjacent waters.

Key to genera:

With branched radial canals (Au,SA) ..... Zygocianna
With simple radial canals ..... Aequorea

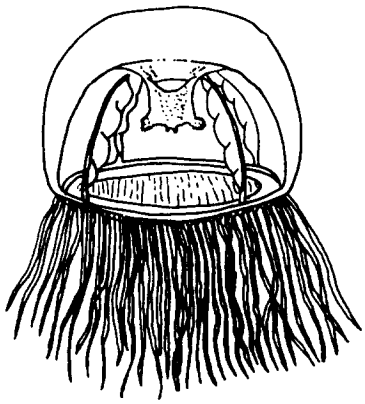
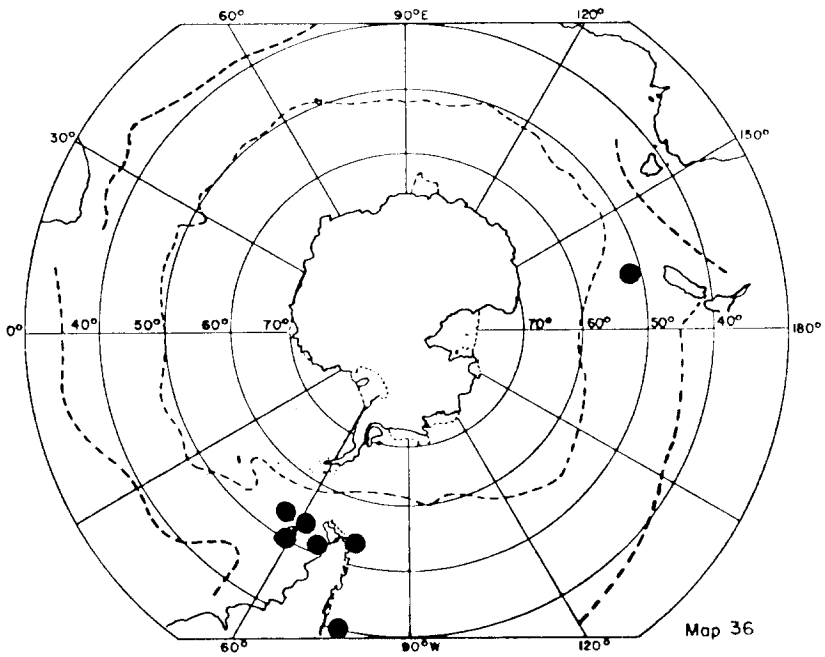


Figure 36. Phialella falklandica.



Map 36. Distribution of Phialella falklandica.

Genus Aequorea Peron & Lesueur 1809

Aequoreidae with numerous simple radial canals; subumbrella without rows of papillae. The numerous species need a revision; most of them are very variable, and the numbers of radial canal, and marginal organs usually given are only approximate (Kramp, 1959).

Key to the species of Aequorea:

1a) Same number of radial canals as tentacles (SAm) ..... A. globosa (Eschscholtz)
b) With differing numbers of tentacles and radial canals 2

2a) More than 3 times as many tentacles as radial canals ..... A. coerulescens (Brandt)
b) Less, usually much less than 3 times as many tentacles as radial canals..... 3

3a) With at least half as many tentacles as radial canals; umbrella saucer-shaped, gradually thinner towards margin (Au,NZ,SAm,SA) ..... A. aequorea (Forskal)
b) With about 6 to 10 or more times as many radial canals than tentacles; umbrella more or less biconvex 4

4a) Tentacle bulbs broad, with abaxial keel and prominent adaxial excretory papilla (Au,SAm,SA) A. macrodactyla (Brandt)
b) Tentacle bulbs with long lateral extensions, without keel and without excretory papilla (SA,Au) ..... A. pensilis (Eschscholtz)

Aequorea coerulescens (Brandt 1838)

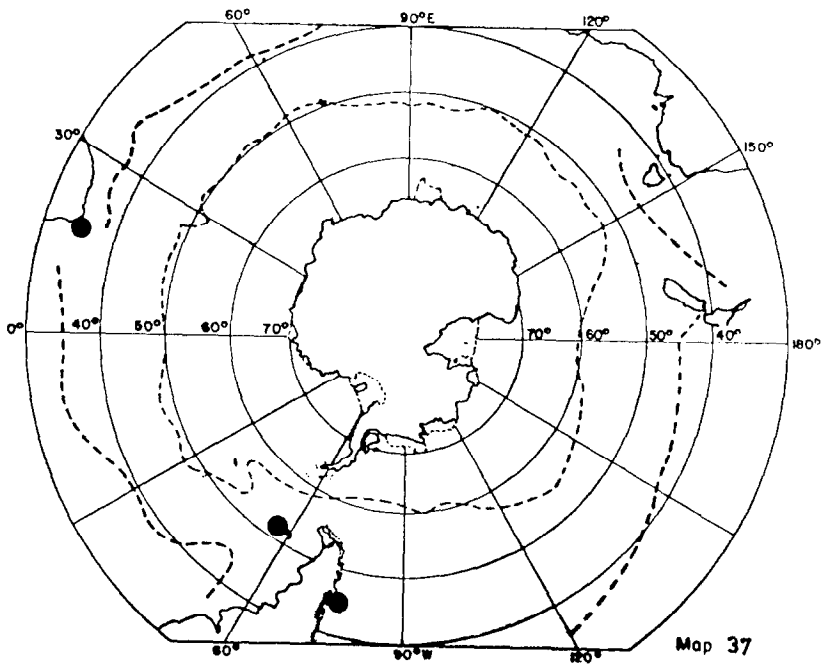
Map 37, (no figure available)

Diagnostic Characters:

Umbrella low and thick
Stomach about half as wide as umbrella
Radial canals about 100
Tentacles 3 to 6 times as many as radial canals, and numerous small bulbs.
Tentacle bulbs elongated, laterally compressed, with prominent excretory papillae
Statocysts *numerous, crowded*
Colour bell is opalescent, transparent, gelatinous, somewhat crystalline; canals with gonads are deep ivory yellow, otherwise they show as opaque creamy lines (Boone, 1938).
Size up to 145 mm wide, usually 60 to 80.

This species has been found off the Falkland Islands (Kramp, 1957a), off southwest Africa (Ranson, 1949) and off Valparaiso, Chile (Boone, 1938).

(No figure available)



Map 37. Distribution of Aequorea coerulescnes.

8. ORDER LIMNOMEDUSAE

Hydromedusae with alternating generations: the sexual generation is a velar medusa with hollow tentacles; the gonads either on the stomach wall with or without perradial lobes extending along the radial canal, or on the radial canals only; if statocysts are present, they are internal and provided with an endodermal axis; the asexual generation is a sessile polyp with power of vegetative propagation; four families of which three are found in the Southern Ocean.

8.1 KEY TO FAMILES OF LIMNOMEDUSAE:

1a) With gonads on radial canals only; with internal statocysts; without ocelli ..... OLINDIADIDAE
b) With gonads on stomach walls, usually extending along radial lobes of stomach; usually without statocysts . 2

2a) With 4 simple radial canals; tentacle bulbs with abaxial ocelli ..... MOERISIIDAE
b) With 4 or 6 or more radial canals generally branched; without ocelli ..... PROBOSCIDACTYLIDAE

8.2 FAMILY OLINDIADIDAE

Limnomedusae with internal marginal vesicles; with gonads on radial canals; with simple, unbranched radial canals; without ocelli, 11 genera. Polyps, where known, very small with or without tentacles.

Key to genera:

1a) Statocysts in elongated vesicles enclosed in velum, fresh water only (Au,SAm) ..... Craspedacusta
b) Statocysts spherical, enclosed in mesoglea of umbrella margin 2

2a) With centripetal canals (Au) ..... Olindias
b) Without centripetal canals 3

3a) Tentacles in groups on bell margin, without adhesive pads ..... Gossea
b) Tentacles not in groups 4

4a) Some or all tentacles with adhesive pads ..... Vallentinia
b) All tentacles without adhesive pads, on bell margin . Aglauropsis

Genus Gossea L. Agassiz 1862

Olindiadidae with four radial canals; without centripetal canals; with one kind of tentacles arranged in groups, without adhesive pads; 3 species of which only 1 is found in the Southern Ocean.

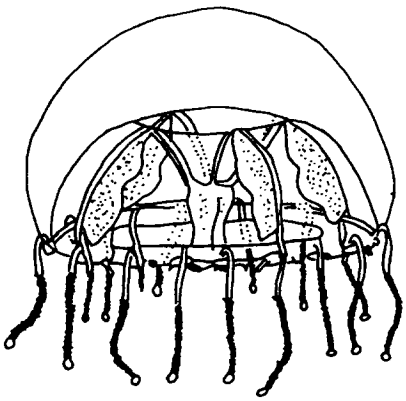
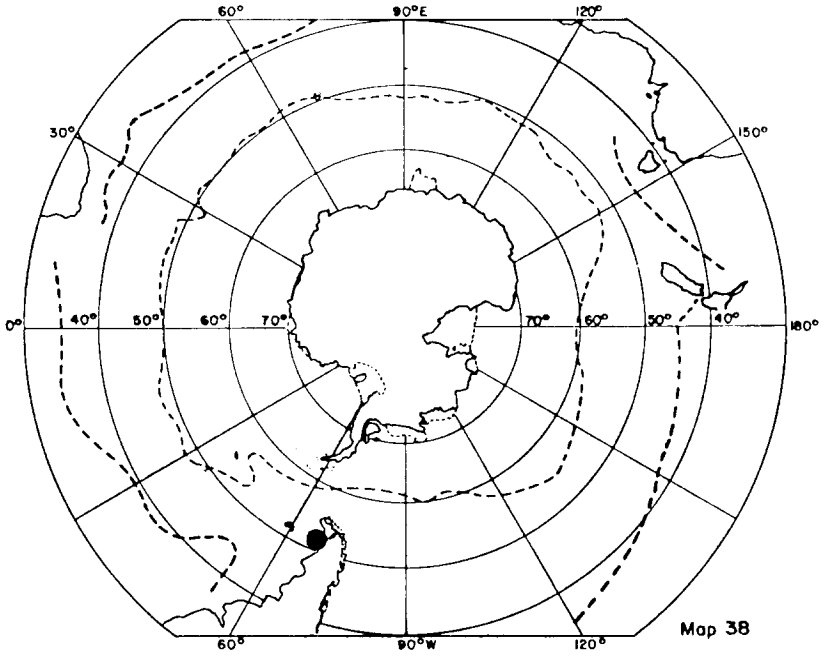


Figure 37. Gossea brachymera.



Map 38. Distribution of Gossea brachymera.

Gossea brachymera Bigelow 1909

Figure 37, Map 38

Diagnostic Characters:

Umbrella dome shaped, jelly thick and rigid
Stomach small, on a short, broad peduncle
Mouth with 4 short lips with nematocysts
Gonads extending from base of peduncle almost to ring canal, wavy, distal ends sac-like, pendent
Statocysts 8, enclosed in the perradial and interradial nematocyst pads
Size up to 20 mm wide.

While the specimens found by Kramp (1957a) near the eastern entrance to the Strait of Magellan agree with the previous descriptions they are larger than any seen before and also have a much larger number of tentacles.

Genus Vallentinia Browne 1902

Olindiadiidae with four radial canals, without centripetal canals, with 4-8 large hollow tentacles with a terminal adhesive pad, and numerous evenly distributed tentacles without adhesive pad but with numerous rings of nematocysts; with 16 or more statocysts; 3 species, of which one is found in the Southern Ocean.

Vallentinia falklandica Browne 1902

Figure 38, Map 39

Diagnostic Characters (Browne & Kramp 1939):

Umbrella bell-shaped, about one and a half times as high as broad
Stomach short, about one-third the length of the umbrella cavity, not situated on a peduncle
Mouth with 4 short simple lips, the mouth rim provided with nematocysts
Radial canals 4
Gonads situated on the radial canals in the upper half of the umbrella cavity, a little way below the stomach, oval and sac-like
Tentacles 4, large perradial with scattered nematocysts and with terminal adhesive discs, and 24 smaller ones (6 in each quadrant, evenly distributed) with transverse bands of nematocysts
Statocysts 16, vesicular, enclosed inside the margin of the umbrella, each with a single statolith
Velum very broad
Colour gonads and stomach pale yellow (in formalin)
Size umbrella 3 mm high, 2 mm wide.

Maas (1906) thought it to be a larval form. Mayer (1910) suspected that it may be an immature stage of Olindias. Browne & Kramp (1939) thought Vallentinia falklandica to be a well defined species and the genus quite distinct from Olindias.

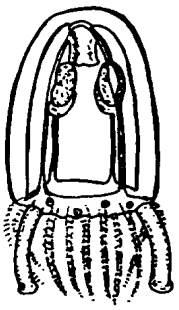
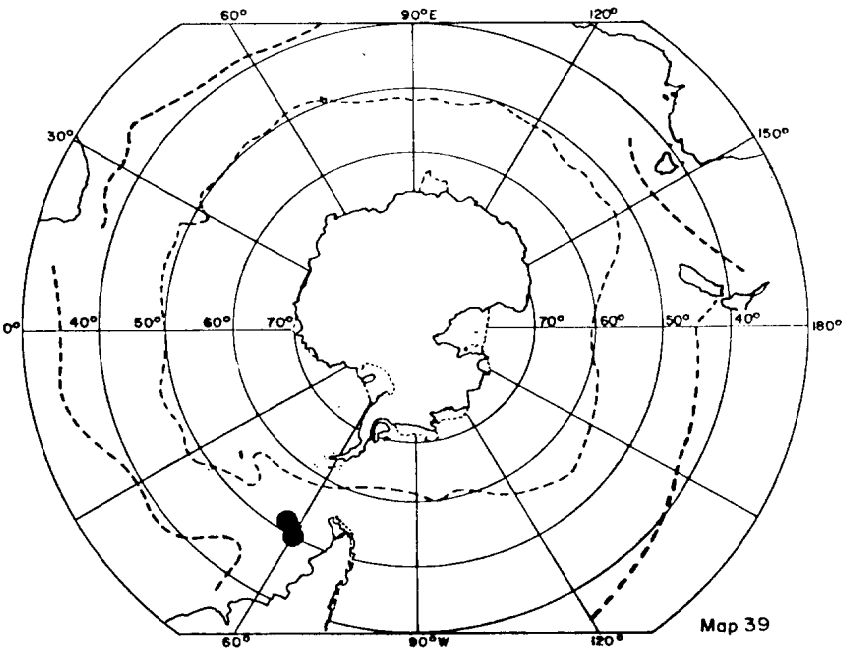


Figure 38. Vallentinia falklandica.



Map 39. Distribution of Vallentinia falklandica.

Genus Aglauropsis F. Muller 1865

Olindiadidae with four radial canals; with numerous tentacles of one kind, without adhesive pads, not arranged in groups; with numerous enclosed, marginal statocysts. The type species Aglauropsis agassizi F. Muller 1865, was never properly described, but Browne (1902) adopted the generic name for his new species A. conanti.

Aglauropsis conanti Browne 1902

Figure 39, Map 40

Diagnostic Characters (Browne & Kramp 1939):

Umbrella bowl-shaped, with an inverted margin, a little broader than high, gelatinous substance thick
Stomach somewhat cone-shaped, about half to two thirds the length of the umbrella cavity
Mouth with 4 large, perradial lips, having a folded margin with a band of nematocysts
Radial canals and ring canal very broad
Gonads occupying nearly the whole length of the radial canals, but separated by a short space from the stomach and also from the ring canal, transversely divided into lobes
Tentacles very numerous, about 200, closely packed in 2 or 3 alternating rows around the margin
Statocysts internal, adjoining the ring canal, about 50 or more each with a single statolith
Colour stomach, gonads and basal bulbs pale yellow (in formalin or alcohol)
Size about 22 mm wide, 14 mm high.

8.3 FAMILY MOERISIIDAE

Limnomedusae usually without marginal vesicles; with gonads on the stomach wall and in radial lobes of stomach extending outwards along the radial canals; with 4 simple, unbranched radial canals; tentacle bulbs, with abaxial ocelli; 5 genera of which one has representatives in the Southern Ocean. Hydroids, where known, small, with hollow tentacles.

Genus Tiaricodon Brown 1902

Moerisiidae with four perradial tentacles; stomach with four perradial lobes extending along a broad, gelatinous peduncle; mouth with four distinct lips; 1 species only. Browne & Kramp (1939) discuss the position of this genus.

Tiaricodon coeruleus Browne 1902

Figure 40, Map 41

(Corynitus (?) coeurlea Mayer, 1910)
(Tiaricodon caeruleus Vanhoffen, 1913b)

Diagnostic Characters (Browne & Kramp, 1939):

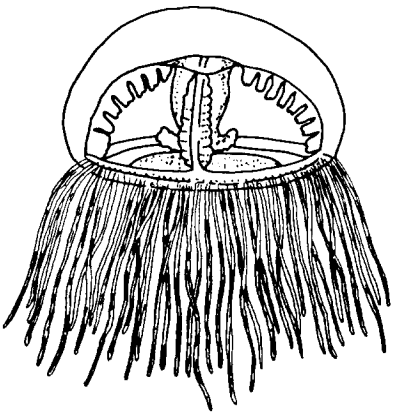
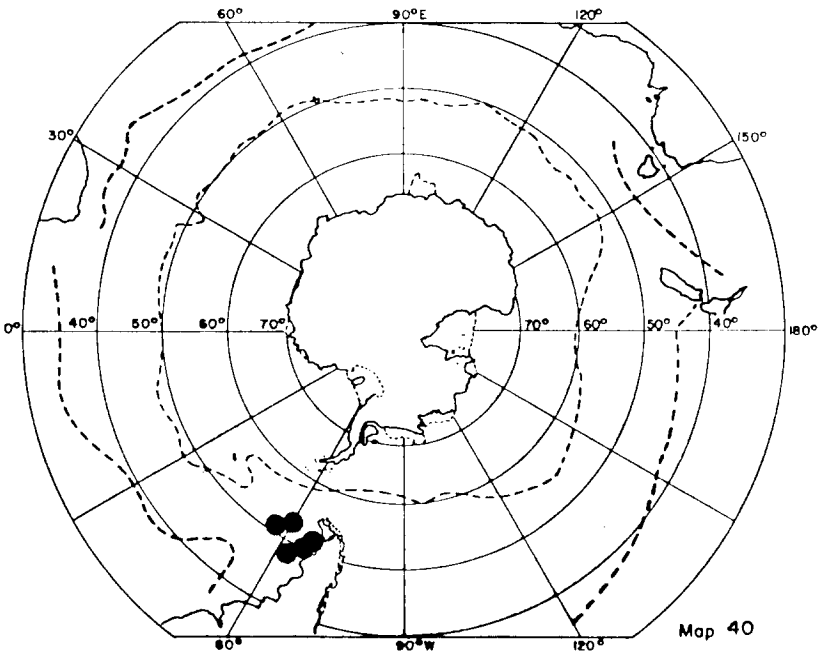


Figure 39. Aglauropsis conanti.



Map 40. Distribution of Aglauropsis conanti.

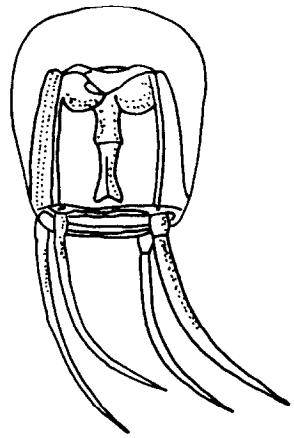
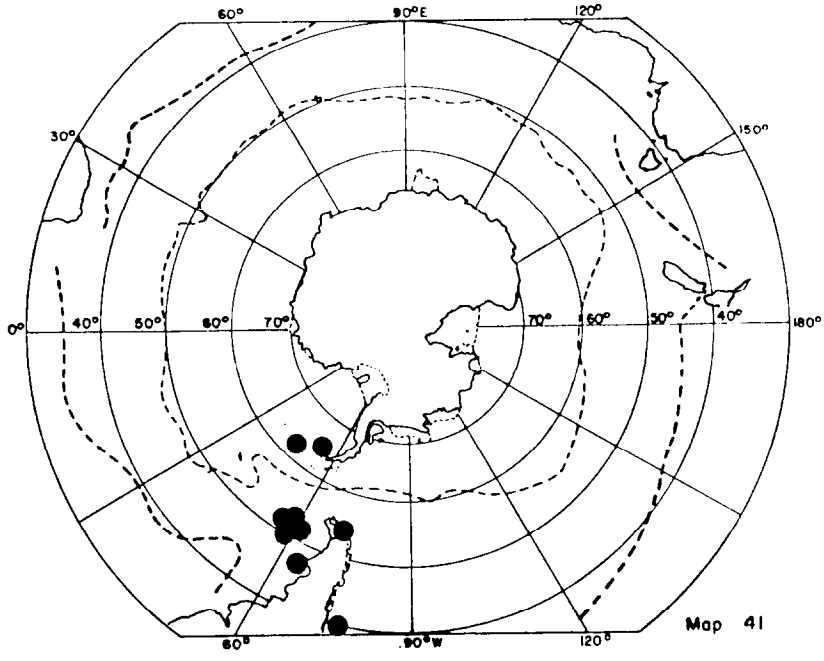


Figure 40. Tiaricodon coeruleus.



Map 41. Distribution of Tiaricodon coeruleus.

Adult: Umbrella bell-shaped, with a rounded summit, about as high as broad, gelatinous substance thick, especially at the apex
Exumbrella smooth and not covered with nematocysts
Velum narrow
Stomach a quadrangular tube extending down nearly to the velum, and situated on a short, broad peduncle, forming four large perradial, saclike lobes
Mouth with 4 perradial lips, about as wide as the stomach; margin crenulated, with small warts containing nematocysts
Gonads surrounding the basal part of the stomach and extending over the peduncle along the 4 perradial lobes of the stomach
Tentacles 4, perradial, fairly stout and tapering to a point
Nematocyst clusters in the distal part of tentacles forming distinct traverse bands
Basal bulbs large, cylindrical, a little longer than broad
Ocellus one on the outer (abaxial) side of the base of each tentacle
Colour stomach, gonads, and basal bulbs pale yellow (in formalin), ocelli reddish brown (radial canals, gonads, manubrium, and tentacles bright blue when alive)
Size 25 mm high, 24 mm wide.

Early Stage: Umbrella bell-shaped
Velum broad
Stomach quadrangular, without perradial lobes and not mounted on a peduncle, about one-third the length of the umbrella cavity
Mouth with 4 short lips, scarcely visible
Gonads not developed
Tentacles short and stout, with large globular or cylindrical basal bulbs
Size 1 mm high, 0.75 mm wide.

The early stages resemble a little Sarsia, but can be distinguished by the structure of the tentacles and basal bulbs and by the quadrangular shape of the stomach (Brown & Kramp, 1939). This is a neritic medusa (Kramp 1948).

8.4 FAMILY PROBOSCIDACTYLIDAE

Limnomedusae without statocysts; stomach usually 4 or 6 or more radial lobes extending along the proximal portions of the radial canals; gonads surround stomach and extending on to basal lobes, rarely interradial on stomach and extending on to basal lobes, rarely interradial on stomach wall alone; radial canals generally branched; tentacle bulbs without ocelli; 2 genera of which one is found in the Southern Ocean.

Genus Proboscidactyla Brandt 1835

Proboscidactylidae with clusters of nematocysts on the exumbrella between the tentacles, with gonads extending on to radial lobes of stomach; with four or six or more branched radial canals; usually without a ring canal. The great number of species which have been described must be considerably reduced; all of them are very variable (Kramp, 1959).

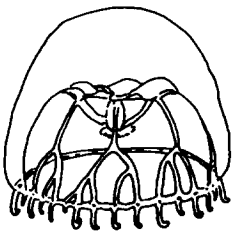
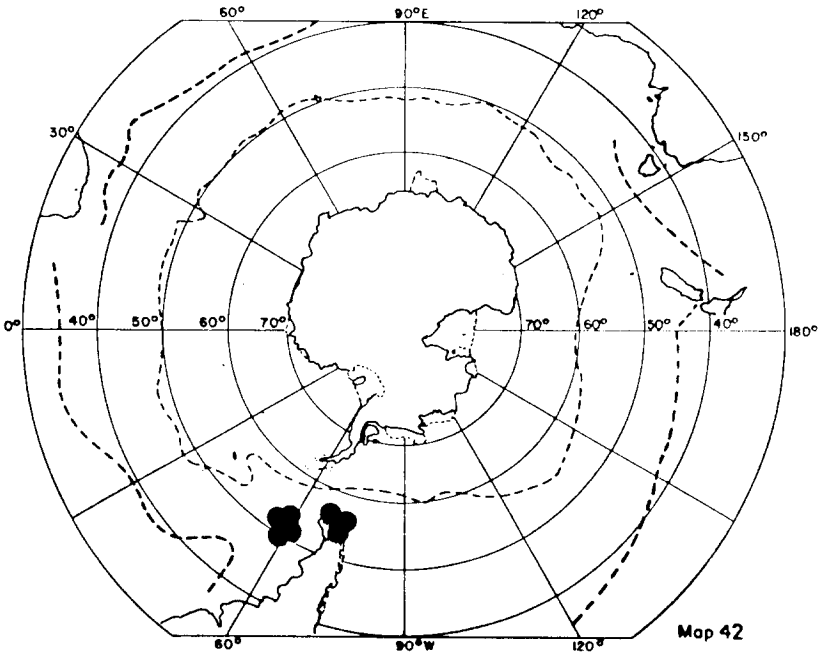


Figure 41. Proboscidactyla mutabilis.



Map 42. Distribution of Proboscidactylidae mutabilis.

Proboscidactyla mutabilis (Browne 1902)

Figure 41, Map 42

Diagnostic Characters (Browne & Kramp 1939):

Umbrella slightly conical in shape, with a broad round summit, about as broad as high, margin slightly inverted
Stomach small, with 6 or 8 lobes
Mouth with a closely folded margin
Radial Canals 6 or 8 main ones, each with 3 or more branches, all running to the margin of the umbrella
Gonads surrounding the stomach and the lobes of the stomach
Tentacles 24-44
Colour stomach and gonads yellowish brown, basal bulbs of tentacles dark brown or black (in formalin)
Size 6 mm high, 6 mm wide.

Browne & Kramp (1939) give a further description and notes on the structure, developmental stages and variation with the species.

9. ORDER TRACHYMEDUSAE

Hydromedusae with umbrella margin entire and not divided into lobes; with thickened marginal nematocyst ring; with radial canals; with gonads usually confined to radial canals; with solid marginal tentacles, or with both solid and hollow tentacles, situated on the margin of the umbrella; with sensory clubs with endodermal axis which may be free or enclosed; 5 families.

9.1 KEY TO FAMILIES OF TRACHMEDUSAE:

1a) Numerous tentacles arranged in groups, most of them with a terminal adhesive disc; stomach broad with eight radial lobes ..... PTYCHOGASTRIIDAE
b) Tentacles without adhesive discs 2

2a) With centripetal canals and with flattened, leaf-shaped gonads (Au,SAm,SA) ..... GERYONIIDAE
b) Without centripetal canals 3

3a) With 4 radial canals ..... PETASIDAE
b) With 8, rarely more, radial canals 4

4a) With broad, circular stomach and broad radial canals . HALICREATIDAE
b) Stomach and radial canals narrow ..... RHOPALONEMATIDAE

9.2 FAMILY PTYCHOGASTRIIDAE

Trachymedusae with marginal tentacles grouped into more or less well defined clusters; some tentacles with adhesive discs; with eight radial canals; stomach eight-lobed, with eight mesenterial partitions; gonads on the sides of the eight lobes or on radial canals adjacent to stomach lobes; with free sensory clubs; 2 genera, 1 of which is found in the Southern Ocean.

Genus Ptychogastria Allman 1878

With the characters of the family; 2 valid and one doubtful species. Ptychogastria asteroides (Haeckel) has not been reported from the Southern Ocean or adjacent waters.

Ptychogastria antarctica (Haeckel 1879)

(Pectis antarctica Haeckel, 1879)

This species from Kerguelen Island is doubtful and probably does not belong to Ptychogastria (Kramp, 1968).

Ptychogastria polaris Allmann 1878

Figure 42, Map 43

Diagnostic Characters:

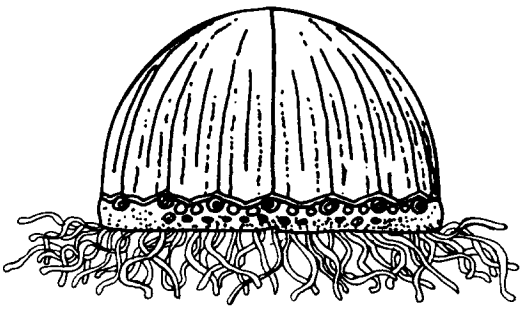
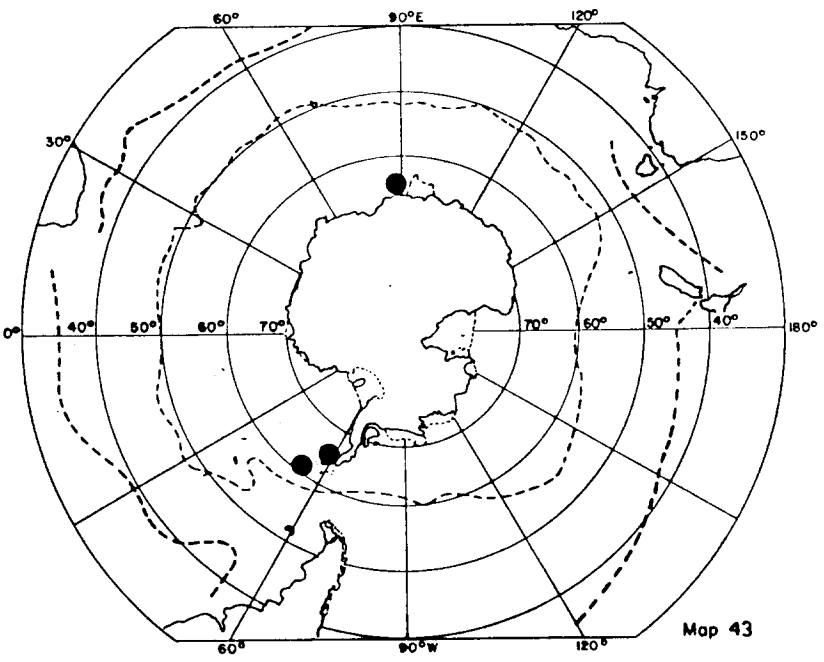


Figure 42. Ptychogastria polaris.



Map 43. Distribution of Ptychogastria polaris.

Umbrella hemispherical or somewhat conical, exumbrella with 16 radiating ridges
Velum very wide
Stomach about half as long as bell cavity, eight-rayed above
Mouth with 4 lips
Gonads 16, separated along the side of the 8 stomach lobes
Tentacles solid, about 48 clusters, each cluster with 3 filiform tentacles and numerous tentacles with adhesive organs.
Statocysts 16
Size 18 to 22 mm wide.

This medusa is usually attached to the bottom of the sea by its suckers bearing tentacles but occassionally it swims toward the surface (Kramp, 1959). It is a slope species and should be reckoned among the neritic forms (Kramp, 1969). It is a bipolar species and has a circumpolar distribution in the Arctic and Subarctic but in Antarctic seas it has been found in two widely separated areas (Kramp, 1957a).

9.3 FAMILY PETASIDAE

Trachymedusae with four radial canals; well developed manubrium; marginal tentacles not in clusters, solid, with a terminal, club-shaped knob of nematocysts; with free sensory clubs; 2 genera of which one is found in the Southern Ocean.

Genus Petasus Haeckel, 1879

Petasidae with marginal tentacles regularly arranged at equal intervals; 1 certain and 3 doubtful species, but only 1 doubtful species has been reported from the Southern Ocean.

Petasus digonimus (Haeckel 1879)

Figure 43, Map 44

(Dipetasus digonimus Haeckel, 1879)

Diagnostic Characters (Kramp, 1961):

Gonads 2 on middle one-third of 2 opposite radial canals
Tentacles 2
Statocysts 4.

This doubtful species was found at Kerguelen Island (Kramp, 1968).

9.4 FAMILY HALICREATIDAE

Trachymedusae with wide, circular stomach; with broad radial canals; with numerous marginal tentacles of different sizes, but all structurally alike and arranged in a single series; each tentacle divisible into a soft flexible proximal and a stiff, spine-like distal region; with free sensory clubs; with neither peduncle nor proboscis; four genera.

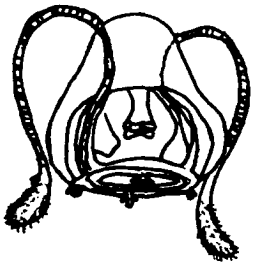
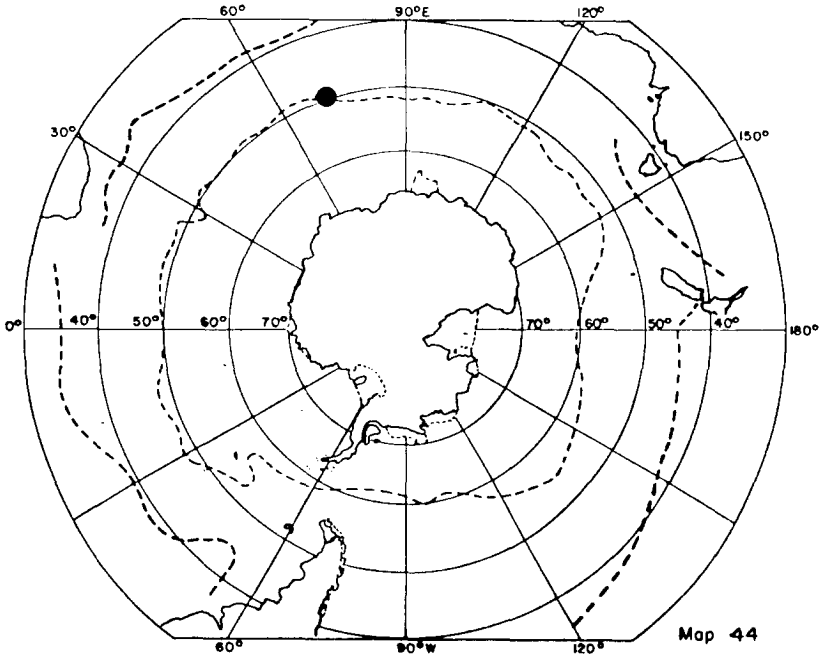


Figure 43. Petasus digonimus.



Map 44. Distribution of Petasus digonimas.

Key to genera:

1a) With about 16 or more radial canals ..... Halitrephes
b) With 8 radial canals 2

2a) With tentacles arranged in 16 groups ..... Botrynema
b) With tentacles in a continuous row 3

3a) With perradial gelatinous papillae on exumbrella ..... Halicreas
b) Without exumbrella papillae ..... Haliscera

Genus Halitrephes Bigelow 1909

Halicreatidae with several (16 or more) radial canals; with a continuous row of tentacles; without papillae on exumbrella; 1 species only.

Halitrephes maasi Bigelow 1909

Figure 44, Map 45

(Halitrephes valdiviae Vanhoffen, 1912; Kramp, 1948; Blackburn, 1955)
(H. medius Kramp 1948)

Diagnostic Characters:

Umbrella low, rounded, jelly fairly thin, soft and flaccid
Stomach circular
Radial canals 16 to 30 broad, ribbon-like, some may be bifurcated
Gonads shape unknown
Tentacles 100 to 300
Statocysts number unknown
Size up to about 100 mm wide.

Halitrephes valdiviae and H. medius are synonymous with H. maasi (Kramp 1957a). This species is bathypelagic being commonest below 200 m (Blackburn, 1955).

Genus Botrynema Browne 1908

Halicreatidae with eight radial canals; with 16 groups of tentacles (two groups containing many tentacles in a single row in each octant) and eight solitary perradial tentacles; 2 species of which 1 is found in the Southern Ocean.

Botrynema brucei Browne 1908

Figure 45, Map 46

(? Halicreas glabrum Vanhoffen 1902)

Diagnostic Characters:

Umbrella apical jelly is very thick and terminates in a distinct and sharply defined knob
Stomach wide, circular and short
Gonads oval, on proximal or central halves of radial canals
Tentacles 11 to 12 in each of the 16 groups

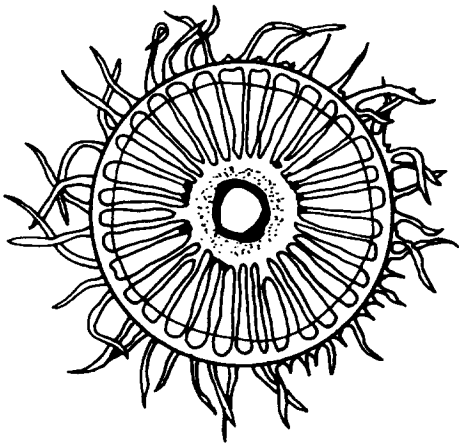
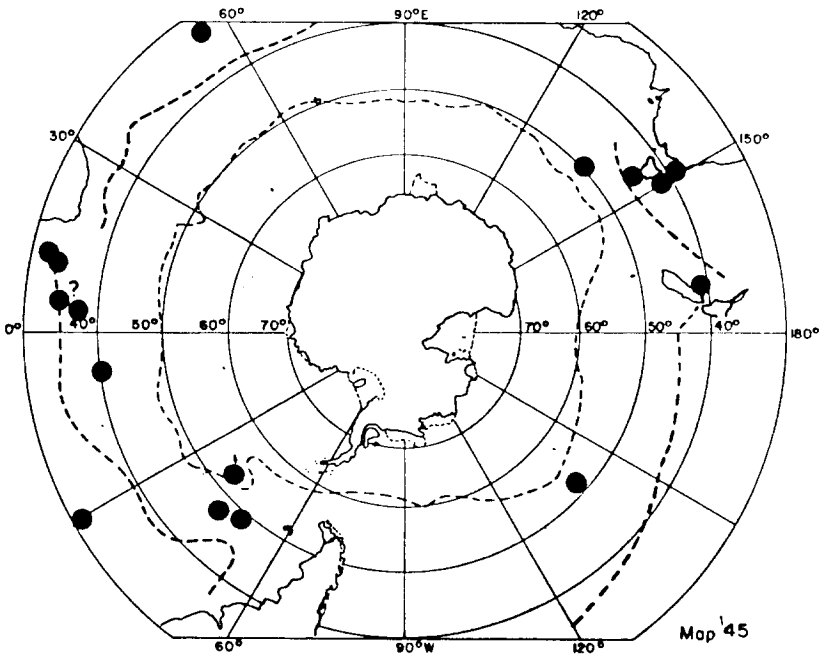


Figure 44. Halitrephes maasi.



Map 45. Distribution of Halitrephes maasi.

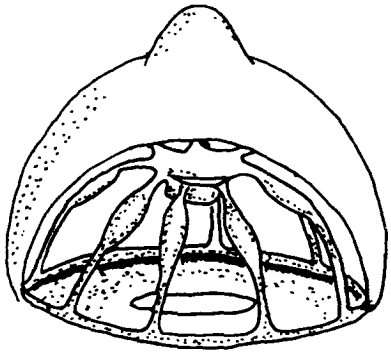
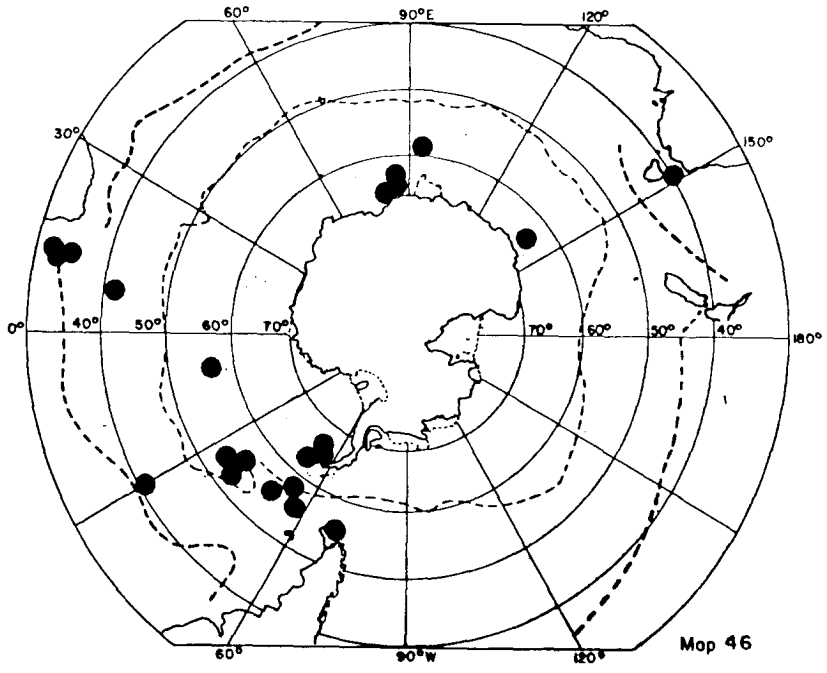


Figure 45. Botrynema brucei.



Map 46. Distribution of Botrynema brucei.

Statocysts usually 3 in each interadial space and 1 to 2 on either side of the solitary perradial tentacles
Size up to 25 mm wide.

This bathypelagic species is widely distributed in the Indian and Atlantic Oceans (Kramp, 1959). Halicreas glabrum Vanhoffen is probably identical with Botrynema brucei (Kramp, 1957a).

Genus Halicreas Fewkes 1882

Halicreatidae with eight radial canals; with a continuous row of tentacles; with perradial gelatinous papillae on the exumbrella; 15 species only one of which is found in the Southern Ocean.

Halicreas minimum Fewkes 1882

Figure 46, Map 47

(Halicreas papillosum var antarcticum Browne, 1908)

Diagnostic Characters:

Umbrella thick, disc-like, with a small conical apical projection of varying size
Gelatinous papillae 8 clusters above margin
Mouth a wide circular opening
Radial canals 8, broad and band-like
Ring canal broad
Gonads flattened, extending along almost entire length of canals
Tentacles very numerous, up to 640
Statocysts 3 to 4 in each octant
Size 30 to 40 mm wide.

This species is mainly abyssal and is cosmopolitan except in Arctic waters and in the Mediterranean (Kramp, 1968).

Genus Haliscera Vanhoffen 1902

Halicreatidae with eight radial canals; with a continuous row of tentacles; without papillae on exumbrella; 1 obsolete and 3 valid species of which 2 are found in the Southern Ocean.

Key to species:

Bluntly conical apical projection; gonads on middle portion of radial canals ..... H. conica Vanhoffen
Apex evenly rounded; gonads along proximal half to two-fifths of the radial canals ..... H. racovitzae (Maas)

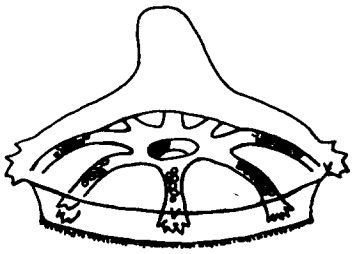
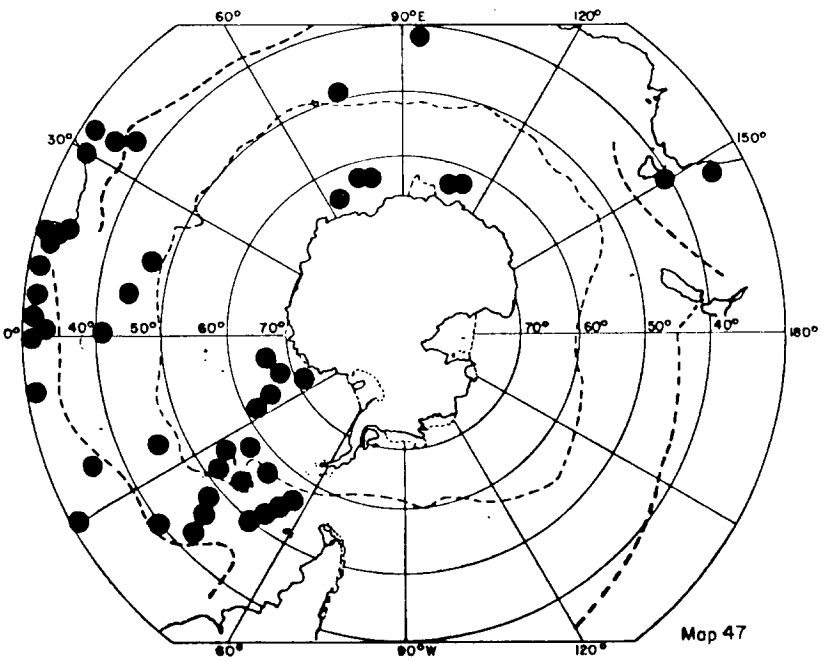


Figure 46. Halicreas minimum.



Map 47. Distribution of Halicreas minimum.

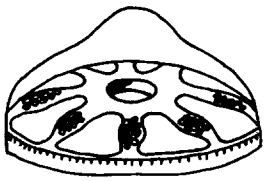
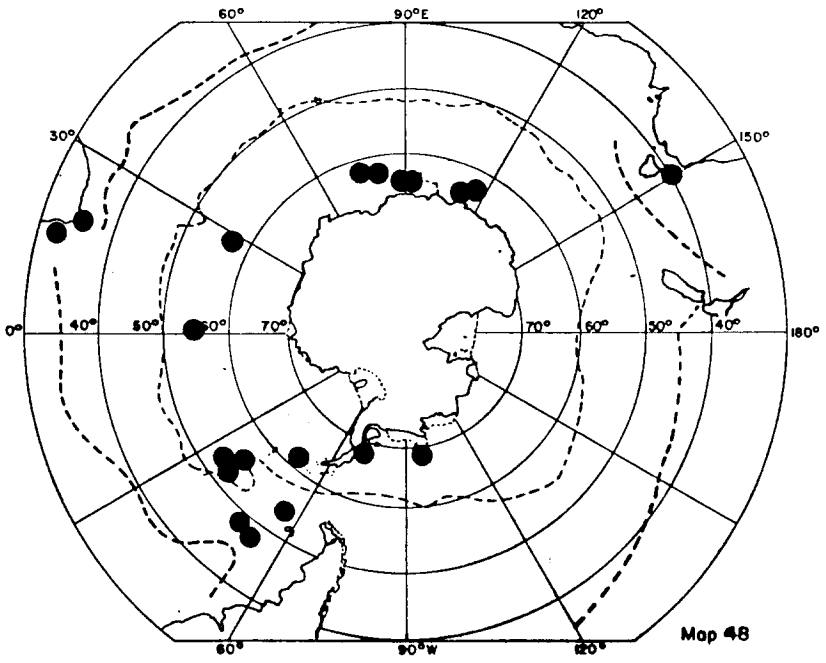


Figure 47. Haliscera conica.



Map 48. Distribution of Haliscera conica.

Haliscera conica Vanhoffen 1902

Figure 47, Map 48

(Halicreas album incl. racovitzae and conica Thiel, 1936)

Diagnostic Characters:

Umbrella with a thick, bluntly conical apical projection
Gonads oval, on middle portions of the 8 broad radial canals
Tentacles 8-9, base of each surrounded by a broad thickening of the marginal nematocyst tissue
Statocysts 2 in each octant
Size up to 18 mm wide.

Owing to the rigidity of the jelly the conical shape of the umbrella of this species may be recognised even in badly preserved specimens (Kramp, 1959). This bathypelagic species has a circumpolar distribution in Antarctic waters (Kramp, 1968).

Haliscera racovitzae (Maas 1906)

Figure 48, Map 49

(Homoeonema racovitzae Maas, 1906)
(Halicreas racovitzae Mayer, 1910; Thiel, 1931,1935)
(Ha. album and conica Thiel, 1935)

Diagnostic Characters:

Umbrella almost hemispherical, moderately thick jelly, flaccid, apex evenly rounded
Gonads along proximal half to two-fifths of the radial canals, close to stomach
Stomach a truncated cone
Tentacles 6
Statocyst 2 in each octant
Size 8 mm wide, 4 mm high

Bathypelagic in Antarctic and Subantarctic waters (Kramp, 1968).

9.5 FAMILY RHOPALONEMATIDAE

Trachymedusae with narrow stomach with or without peduncle; usually with eight rarely more, radial canals; without centripetal canals; with gonads on radial canals; with marginal tentacles evenly distributed, sometimes of two kinds, each tentacle of uniform stucture throughout; with free rarely enclosed, marginal sensory club; 14 genera of which 12 are found in the Southern Ocean and adjacent waters.

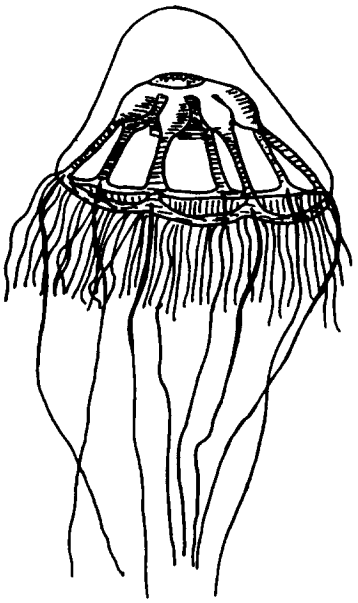
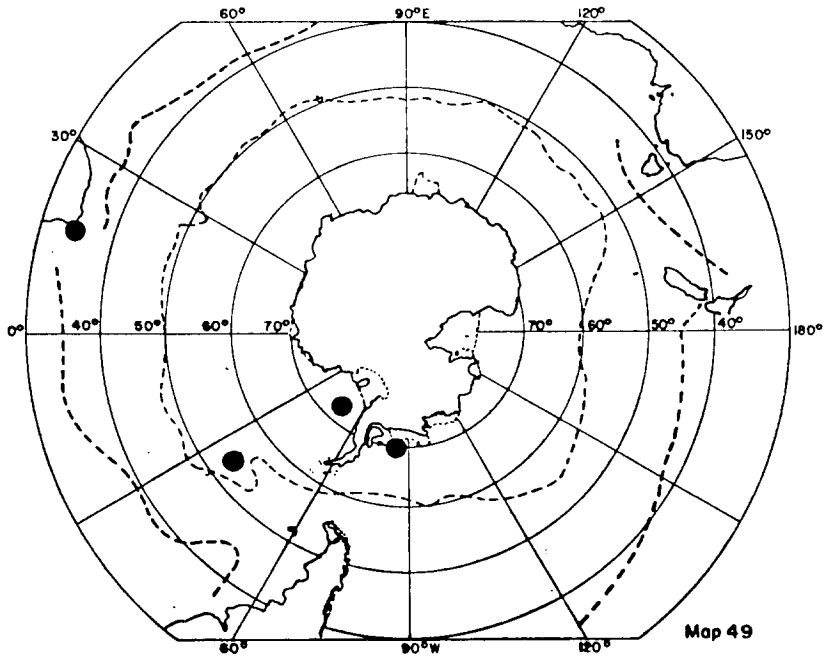


Figure 48. Haliscera racovitzae.



Map 49. Distribution of Haliscera racovitzae.

Key to genera:

1a) Without a gastric peduncle (one Pacific species of Crossota may have a short peduncle) 2
b) With a gastric peduncle 8

2a) With only 4 gonads, pendent; 8 radial canals; 4 large and about 24 small tentacles (NZ,SA) ..... Tetrorchis
b) With 8 (rarely more) gonads 3

3a) With 8 long, club-shaped and up to 24 small cirrus-like tentacles; gonads elongated, along radial canals Rhopalonema
b) With tentacles all of one kind 4

4a) With gonads adjacent to stomach (sometimes also eight small gonads free of stomach); very numerous tentacles ..... Arctapodema
b) Gonads separated from stomach 5

5a) Exumbrella with numerous meridional furrows; gonads sausage shaped, pendent; very numerous tentacles .... Crossota
b) Exumbrella smooth; gonads not pendent 6

6a) With only 8 tentacles; gonads globular, distal (Au,SA) ..... Sminthea
b) With 32 or more tentacles; gonads linear 7

7a) With 32 tentacles successively developed (Au,NZ,SAm,SA) ..... Colobonema
b) With 48 or more tentacles of equal size ..... Pantachogon

8a) Peduncle short, conical (in young specimens almost invisible) 9
b) Peduncle long, slender 10

9a) With only two, pendent gonads (Au) ..... Persa
b) With 8 globular or oval gonads ..... Amphogona

10a) Gonads linear, on peduncle only (SA) ..... Ransonia
b) Gonads sausage-shaped, pendent 11

11a) Gonads attached to peduncle (Au) ..... Aglaura
b) Gonads attached to subumbrella portions of radial canals (Au) ..... Aglantha

Genus Rhopalonema Gegenbaur 1856

Rhopalonematidae without a gastric peduncle; with gonads along the eight radial canals separated from stomach; with tentacles of two kinds; radial canals and inter- and adradial cirri; with enclosed marginal statocysts; 2 species.

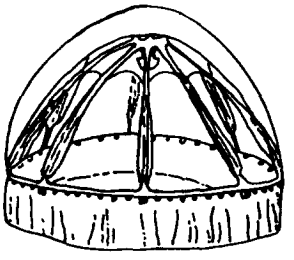
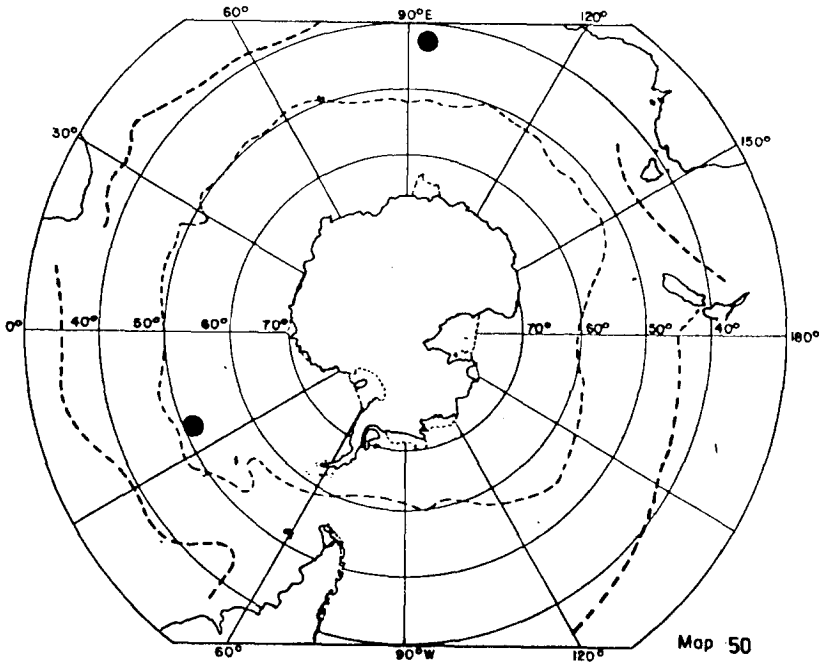


Figure 49. Rhopalonema funerarium.



Map 50. Distribution of Rhopalonema funerarium.

Key to species:

Umbrella with a distinct apical knob; gonads oval, along middle 1/3 of radial canals; statocysts close behind tentacles and cirri ..... R. velatum Gegenbaur

Umbrella without an apical knob; gonads along distal 2/3 of radial canals; statocysts in middle of the spaces between tentacles and cirri ..... R. furnerarium Vanhoffen

Rhopalonema funerarium Vanhoffen 1902

Figure 49, Map 50

Diagnostic Characters:

Umbrella somewhat conical, without an apical projection
Stomach narrow, elongated, hardly reaching velar opening
Gonads linear, extending along distal two-thirds of radial canals
Tentacles 8 radial, 8 interradial and 16 adradial cirrus-like, very small tentacles each with a globular terminal knob
Statocysts 32, in middle of the spaces between tentacles and cirri
Velum very broad
Size up to 17 mm wide, 14 mm high.

This species is found in the deep and intermediate layers of all the oceans but seems to be fairly rare (Kramp, 1957a). It seems to avoid the deep sea of the Antarctic region proper (Kramp, 1957b).

Rhopalonema velatum Gegenbaur 1856

Figure 50, Map 51

Diagnostic Characters:

Umbrella somewhat flatter than a hemisphere, with a conical apical thickening
Stomach narrow, elongated, reaching almost to velar opening
Mouth with 4 short simple lips
Gonads linear or oval, extending along middle one-third of radial canals
Tentacles 8, radial, club-shaped
Statocyst 1, close beside each of the radial tentacles and the interradial cirri
Velum very broad
Size 8 to 10 mm wide.

This medusa is widely distributed in the warm parts of all oceans and mainly belongs to the upper strata, though it may be met with at considerable depths (Kramp, 1948).

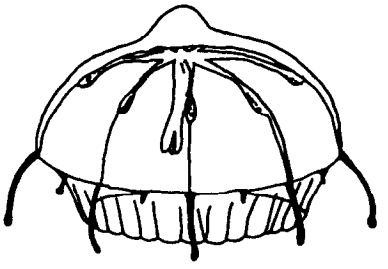
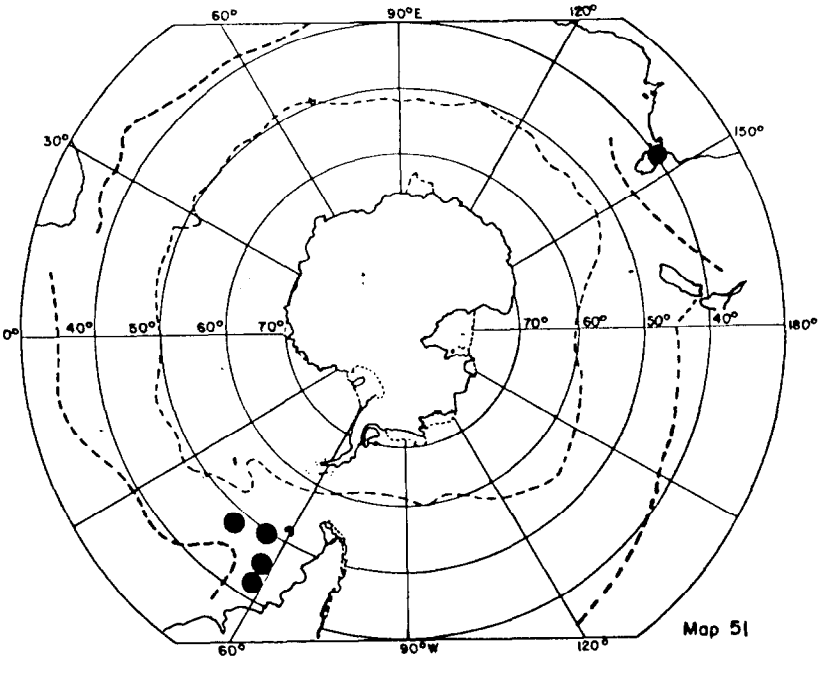


Figure 50. Rhopalonema velatum.



Map 51. Distribution of Rhopalonema velatum.

Genus Arctapodema Dall 1907

Rhopalonematidae without a gastric peduncle; with gonads on radial canals adjacent to stomach; with eight narrow radial canals; with numerous tentacles all alike in a single row; with free club-shaped marginal statocysts; 5 species of which 2 are doubtful. Browne & Kramp (1939) discuss the genera and species.

Key to the species of Arctapodema:

1a) With 4 interradial gonads encircling stomach but interrupted in the perradial corners ..... A. antarctica (Vanhoffen)
b) With 8 gonads 2

2a) Gonads extending from radial lobes of stomach outwards on proximal parts of radial canals, small gonads on radial canals separated from stomach ..... A. ampla (Vanhoffen)
b) Gonads on radial canals near base of stomach . A. australis (Vanhoffen)

Arctapodema antarctica (Vanhoffen 1912)

Figure 51, Map 52

(Isonema antarcticum Vanhoffen, 1912)
(Arctapodema antarcticum Kramp, 1957a)

Diagnostic Characters:

Umbrella hemispherical, fairly thin jelly
Stomach tubular
Gonads 4, interradial, encircling base of stomach but interrupted in the 4 perradial corners, no gonads on the radial canals
Tentacles about 120
Statocysts unknown
Colour stomach red in adult
Size up to 16 mm wide.

This species belongs to the deep layers (Kramp, 1957a).

Arctapodema ampla (Vanhoffen 1902)

Figure 52, Map 53

(Homoeonema amplum Vanhoffen, 1902)
(Isonema amplum Maas, 1906; Vanhoffen, 1912)
(Arctapodema tetragonia Vanhoffen 1912)
(Arctapodema amplum Kramp, 1957a)

Diagnostic Characters:

Umbrella somewhat flatter than a hemisphere, thin jelly, thicker at apex
Stomach short, urn-shaped, with 8 radial lobes
Mouth 4 simple lips

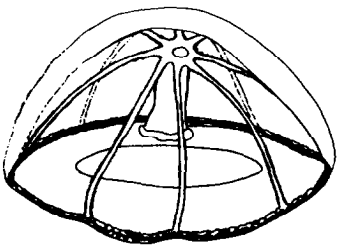
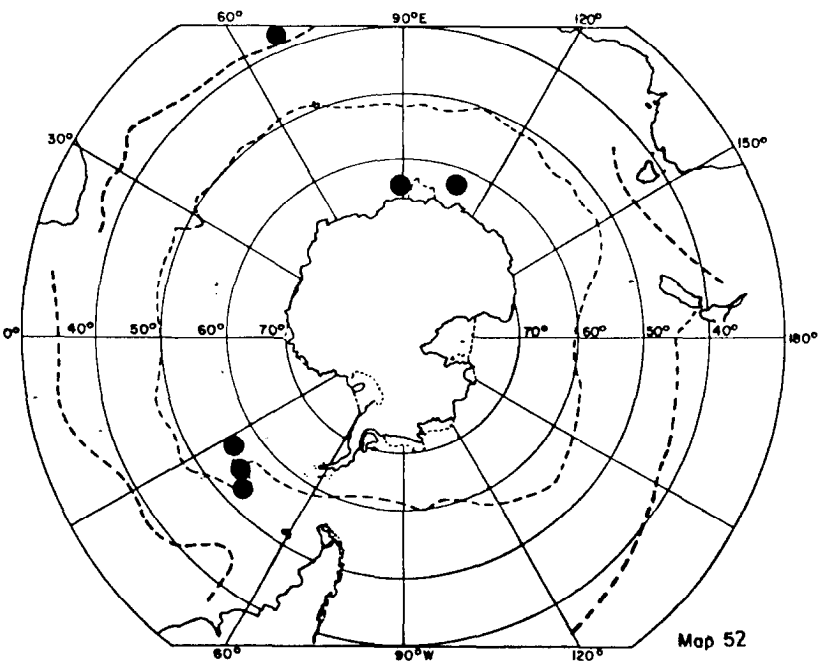


Figure 51. Arctapodema antarctica.



Map 52. Distribution of Arctapodema antarctica.

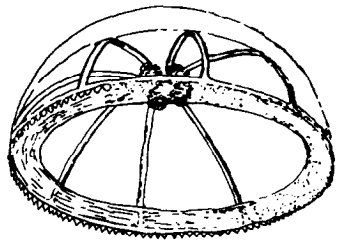
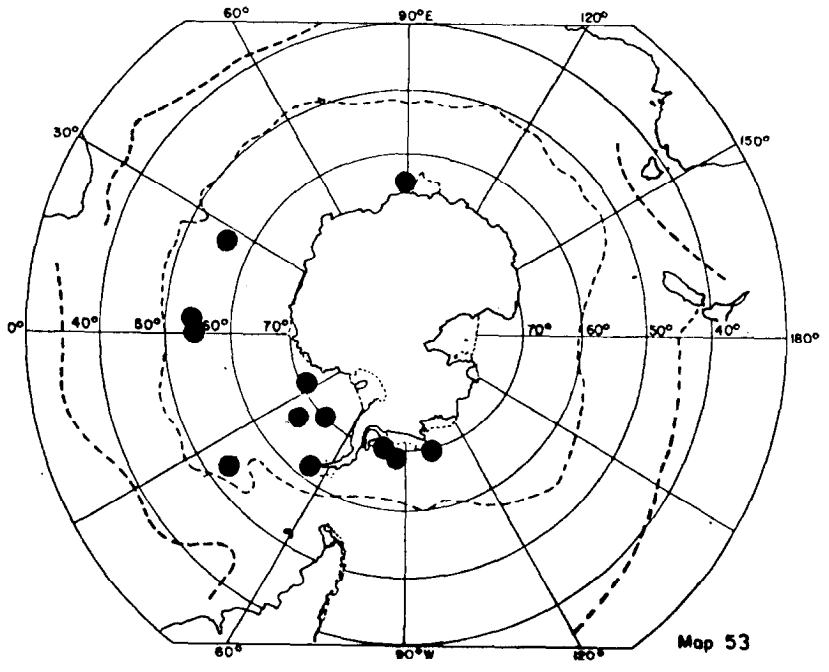


Figure 52. Arctapodema ampla.



Map 53. Distribution of Arctapodema ampla.

Gonads 8, swollen, adjacent to gastral lobes, may be of unequal size, and some may be radially divided into 2 halves, small additional gonads may also appear in pairs on the radial canals at a short distance from the gastral lobes
Tentacles about 100
Statocysts 4-8 marginal
Size up to 15 mm wide.

Possibly Arctapodema tetragonia (Vanhoffen) is identical to A. ampla (Kramp, 1961). This species is found in the intermediate and deep layers of the Atlantic and Indian sectors of the Antarctic (Kramp, 1957a).

Arctapodema australis (Vanhoffen 1912)

Figure 53, Map 54

(Isonema australe Vanhoffen, 1912)
(Arctapodema australe Kramp, 1957a)

Diagnostic Characters:

Umbrella with thin jelly
Stomach short and broad, with 16 radial folds, 4 lips
Gonads 8, globular or club-shaped, pendent, on the radial canals near base of stomach
Tentacles about 112
Statocysts unknown
Colour stomach violet, canals and tentacles wine-red, gonads yellow
Size up to 23 mm wide, 16 mm high.

A species described by Vanhoffen (1902), Arctapodema macrogaster, is possibly synonymous with A. australis (Kramp, 1961). This species is found in the intermediate and deep waters of the southern Indian Ocean and the Indian sector of the Antarctic (Kramp, 1968).

Genus Crossota Vanhoffen 1902

Rhopalonematidae with or without a short gastric peduncle; with numerous meridional furrows on the exumbrella; with eight or more radial canals; with pendent, sausage-shaped gonads on radial canals; with numerous densely crowded tentacles all alike; with free club-shaped statocysts; 5 species of which one has representatives in the Southen Ocean.

Crossota brunnea Vanhoffen 1902

Figure 54, Map 55

Diagnostic Characters:

Gastric Peduncle not present
Stomach bottle-shaped, short with 8 large deep longitudinal fissures, and above them 8 similar small invaginations
Mouth with 4 small lips
Radial canals 8

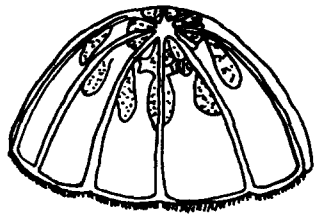
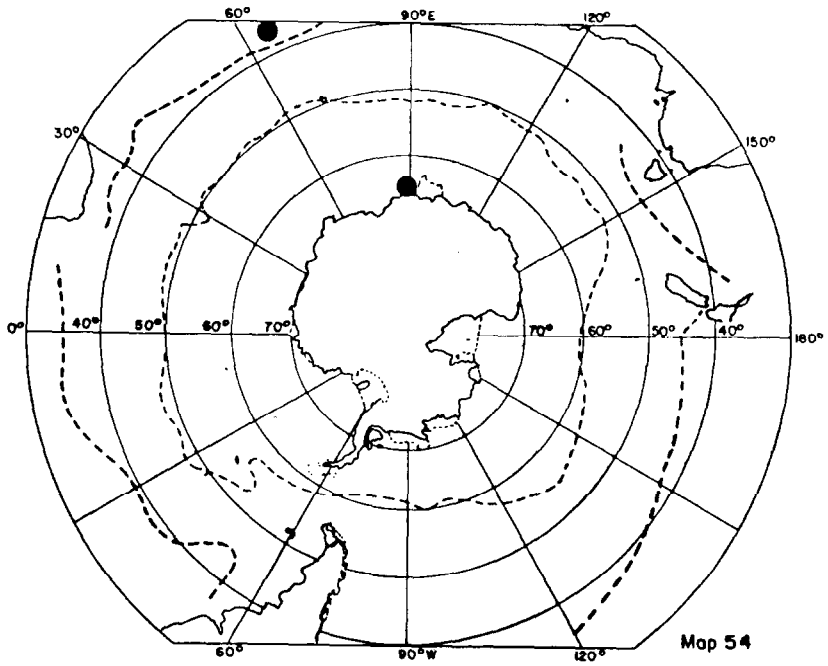


Figure 53. Arctapodema australis.



Map 54. Distriubtion of Arctapodema australis.

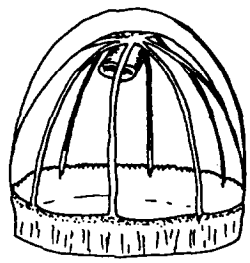
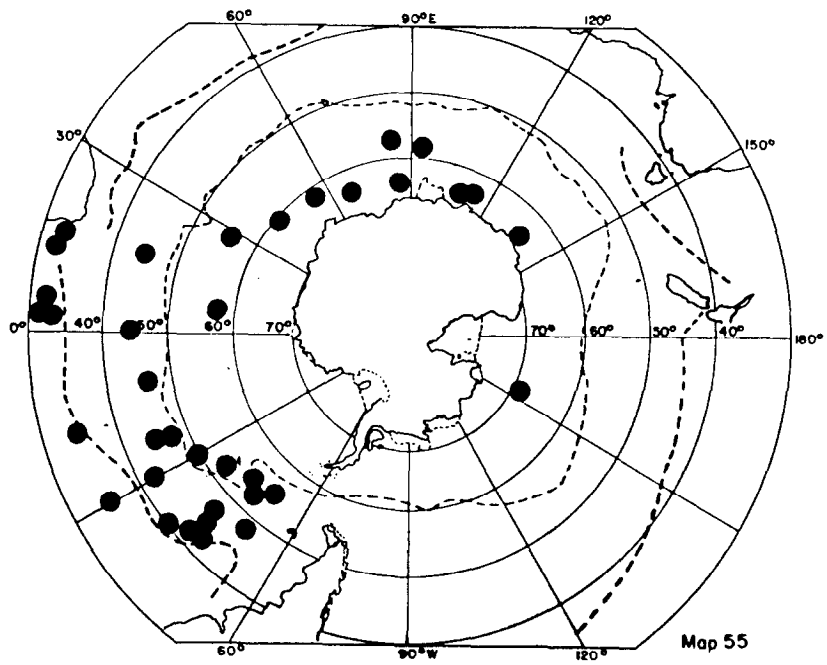


Figure 54. Crossota brunnea.



Map 55. Distribution of Crossota brunnea.

Gonads on radial canals near base of stomach
Tentacles 600 or more, very densely crowded
Statocysts number unknown
Size up to about 30 mm wide and 22 mm high.

This bathypelagic species is found in all oceans from the Antarctic Continent to slightly north of the Equator (Kramp, 1961). Thiel (1936) has united several different species under the name of Crossota brunnea, and his map of distribution is therefore unreliable (Kramp, 1968).

Genus Pantachogon Maas 1893

Rhopalonematidae without a gastric peduncle; with the apical outlines of the umbrella muscular fields forming an entire circle; with gonads along the eight radial canals separated from the stomach; with 48 or more tentacles all alike; with free, club-shaped marginal statocysts; 3 species.

Key to species:

1a) Umbrella mitre-shaped, with a gelatinous apical projection, 48 tentacles ..... P. militare (Maas)
b) Umbrella without an apical projection; 64 to 120 tentacles 2

2a) With 64 tentacles ..... P. haeckeli Maas
b) With about 120 tentacles ..... P. scotti Browne

Pantachogon militare (Maas, 1893)

(Homoeonema militare Maas, 1893; Thiel, 1931)

Thiel (1931) tentatively identified a medusa from the Weddell Sea as Homoeonema militare. This bathypelagic species has also been found in the Mediterranean and tropical parts of the Atlantic Ocean (Kramp, 1968).

Pantachogon haeckeli (Maas 1893)

Figure 55, Map 56

(Pantachogon rubrum Vanhoffen, 1902)

Diagnostic Characters:

Umbrella bell-shaped, with thin jelly and without an apical projection, with very strong and conspicuous musculature
Stomach short
Mouth with 4 small simple lips
Gonads extending along greater portion of 8 radial canals
Tentacles 64, all alike
Statocysts 64, club-shaped
Velum very broad
Size about 12 mm high and wide.

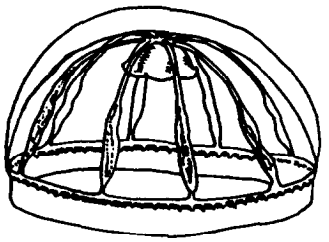
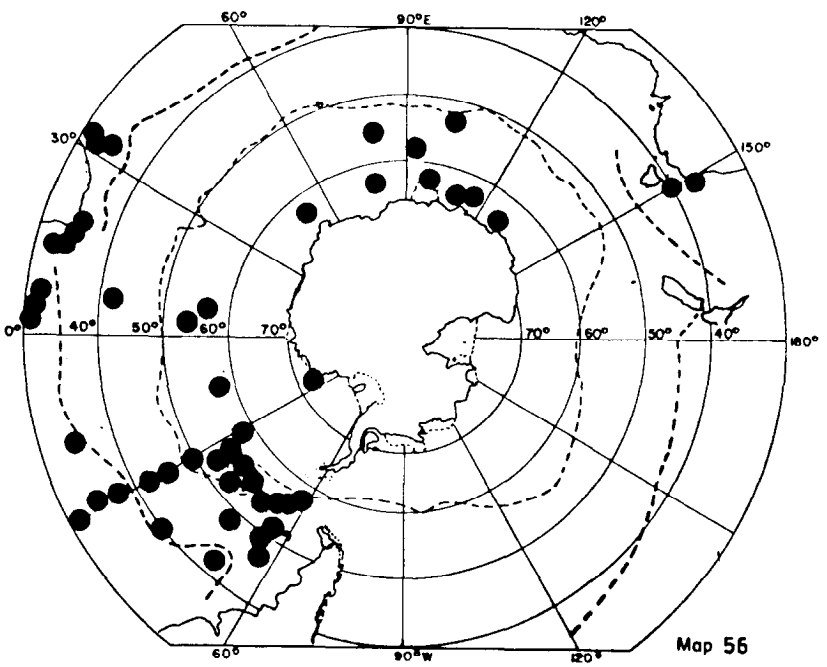


Figure 55. Pantachogon haeckeli.



Map 56. Distriubtion of Pantachogon haeckeli.

This bathypelagic species, commonest below 200 m (Blackburn, 1955), occurs in all oceans except the Mediterranean, Arctic basin and south-east Pacific (Kramp, 1957a). It apparently does not penetrate into the true Antarctic regions, where it is replaced by Pantachogon scotti Browne, which certainly is a distinct species (Kramp, 1948). The distribution map given by Thiel (1936) is unreliable, because the author has included a considerable number of other species, partly belonging to other genera, under the name Pantachogon rubrum (Kramp, 1948).

Pantachogon scotti Browne 1910

Figure 56, Map 57

(Pantachogon rubrum Thiel, 1931)

Diagnostic Characters:

Umbrella a little broader than high, with thin jelly and without an apical projection, with strong musculature
Stomach very small
Mouth with 4 short lips
Gonads linear, extending along proximal two-thirds of the 8 radial canals
Tentacles about 120, all alike
Size about 4 mm wide.

Genus Amphogona Browne 1905

Rhopalonematidae with a short, conical gastric peduncle; exumbrella smooth; with ellipsoidal or sac-shaped, pendent gonads on the eight radial canals; gonads usually of unequal size; with tentacles all alike, not densely crowded; with free club-shaped marginal statocysts; 3 species of which 1 occurs in the Southern Ocean.

Amphogona apicata Kramp 1957a

Figure 57, Map 58

Diagnostic Characters:

Umbrella with thin walls and a bluntly conical apical projection
Stomach small, tubular
Mouth with 4 short, simple lips
Gonads sac-shaped, pendent, near middle points of radial canals
Tentacles about 64
Statocysts unknown
Size up to 7 mm wide, 8 mm high.

This species is bathypelagic in the neighbourhood of the Falkland and South Georgia Islands (Kramp, 1957a).

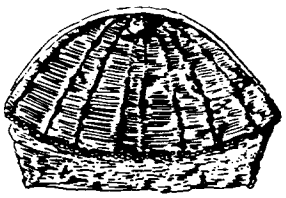
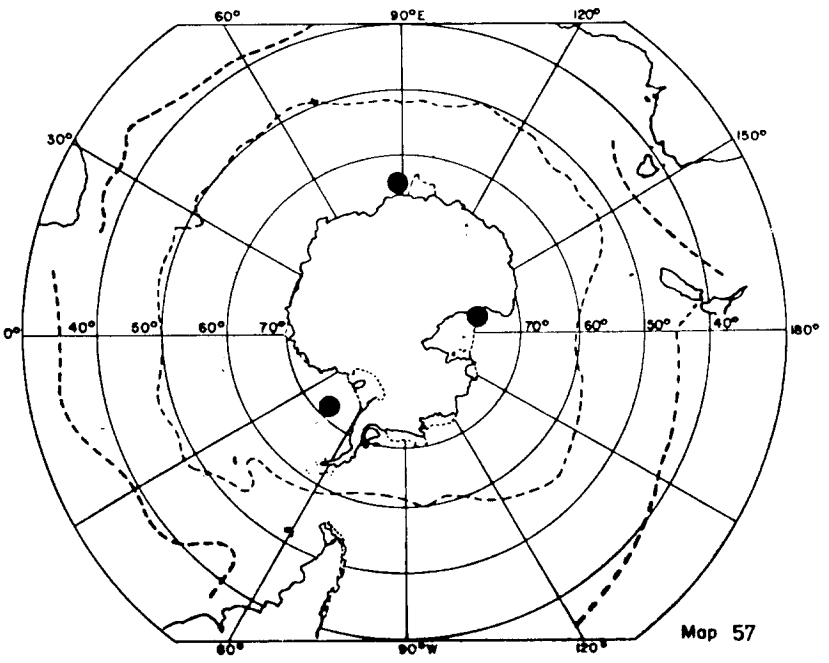


Figure 56. Pantachogon scotti.



Map 57. Distribution of Panatachogon scotti.

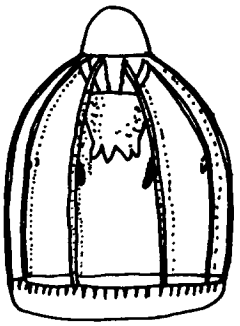
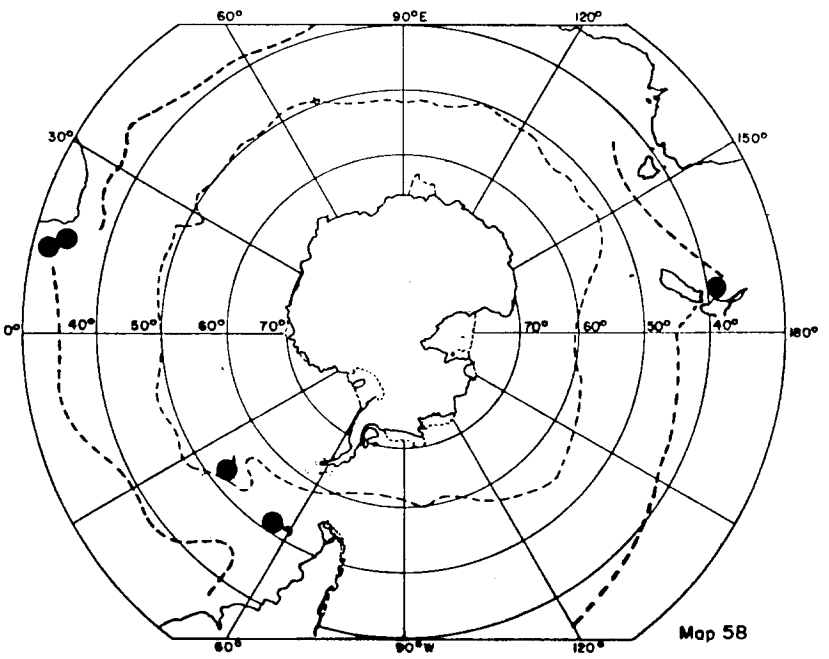


Figure 57. Amphogona apicata.



Map 58. Distribution of Amphogona apicata.

10. ORDER NARCOMEDUSAE

Hydromedusae with sides of umbrella divided by peronial grooves so that umbrella margin may be lobed; stomach broad with entire circular periphery or with peripheral pouches; without radial canals; with or without a peripheral canal system; with gonads on stomach walls; with solid marginal tentacles leaving umbrella some distance above margin, and sometimes small secondary tentacles on margin itself; sense organs free sensory clubs with endodermal axis; 4 families of which 3 are found in the Southern Ocean.

10.1 KEY TO FAMILIES OF NARCOMEDUSAE:

1a) Without stomach pouches ..... SOLMARISIDAE
 b) With stomach pouches 2

2a) Pouches perradial ..... CUNINIDAE
 b) Pouches interradial ..... AEGINIDAE

10.2 FAMILY SOLMARISIDAE

Narcomedusae without stomach pouches, genital products developed either as thickenings or as diverticula in the oral wall of the central stomach; with or without peripheral canal system; with numerous tentacles leaving umbrella at level of periphery of stomach; with or without otoporpae; 2 genera.

Key to genera:

With peripheral canal system and with otoporpae ..... Pegantha
Without peripheral canals sytem and without otoporpae (Au,SA) ..... Solmaris

Pegantha Haeckel 1879

Solmarisidae with gonads forming diverticulae of the margin of the oral wall of the stomach; with peripheral canal system, with otoporpae; 22 species of which 9 are unrecognisable, 6 are doubtful, (revision in Kramp, 1957a).

Key to species:

1a) Exumbrella with deep radiating furrows and elevated ridges; 12 to 16 tentacles; otoporpae long ..... P. triloba Haeckel
 b) Exumbrella smooth with deep radiating furrows 2

2a) Some or all otoporpae long; peripheral canals narrow throughout their length (Au,SAm,SA) ..... P. clara R.P. Bigelow
 b) All otoporpae short; peripheral canals broad, at least in their lateral portions 3

3a) Umbrella highly vaulted, thick; about 16 marginal lappets; lateral portions of peripheral canals broad at base, tapering outwards ..... P. martagon Haeckel

b) Umbrella flat, lenticular; 16 to 26 marginal lappets; peripheral canals very broad throughout (SAm,SA) ..... P. laevis H.B. Bigelow

Pegantha martagon Haeckel 1879

Figure 58, Map 59

Diagnostic Characters:

Umbrella hemispherical or higher; jelly thick, smooth
Marginal lappets about 16, about as long as broad, square or evenly rounded, each with 5 or 7 (or 9) statocysts
Otoporpae short and narrow, about twice as long as the width of the transverse portion of the peripheral canals
Canals transverse portion fairly narrow, lateral portions broad proximally, tapering distally
Gonads simple or irregularly lobed sacs.
Size up to 30 mm wide.

This mainly epipelagic species has a circumpolar distribution in Sub-antarctic waters (Kramp, 1959).

Pegantha triloba Haeckel 1879

Figure 59, Map 60

Diagnostic Characters:

Umbrella hemispherical or somewhat flatter, jelly very rigid, exumbrella with deep radiating furrows from tentacle bases nearly to apex, surrounded by ribs and supplementary ridges
Tentacles 12 to 16
Marginal lappets 12 to 16, ovate, pointed
Statocysts up to 20 on each marginal lappet
Otoporpae long, tapering outwards
Gonads with 2 to 4 lobes projecting into the lappet cavities
Size up to 30 mm wide.

This species mainly occurs in the upper strata (Kramp, 1948).

10.3 FAMILY CUNINIDAE

Narcomedusae with perradial and undivided stomach pouches; with or without peripheral canal system; with tentacles leaving umbrella opposite centre of each stomach pouch, equal in number to that of pouches; pouches not extending beyond points of origins of tentacles; without secondary tentacles on umbrella margin, with or without otoporpae; 2 genera plus one doubtful genus, Cunissa Haeckel.

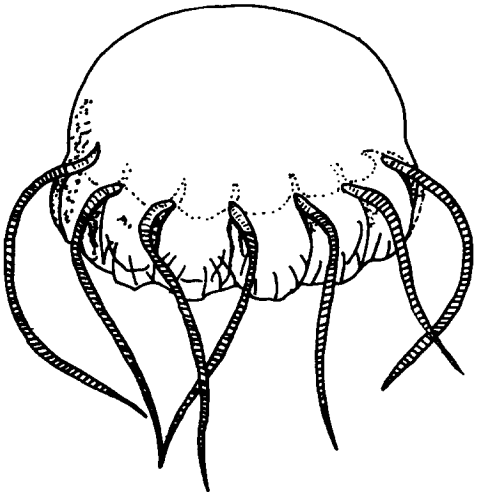
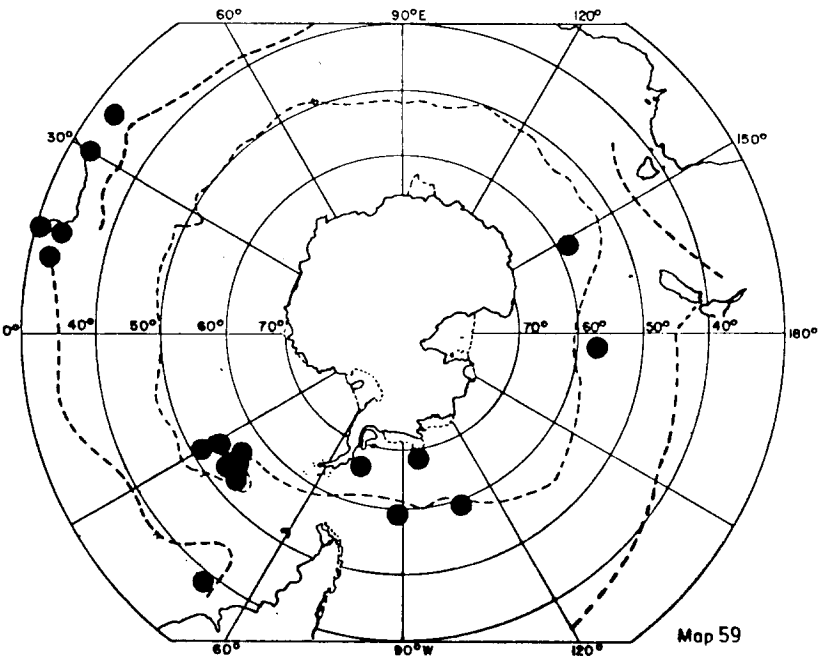


Figure 58. Pegantha martagon.



Map 59. Distriubtion of Pegantha martagon.

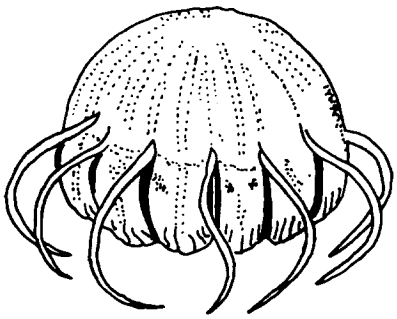
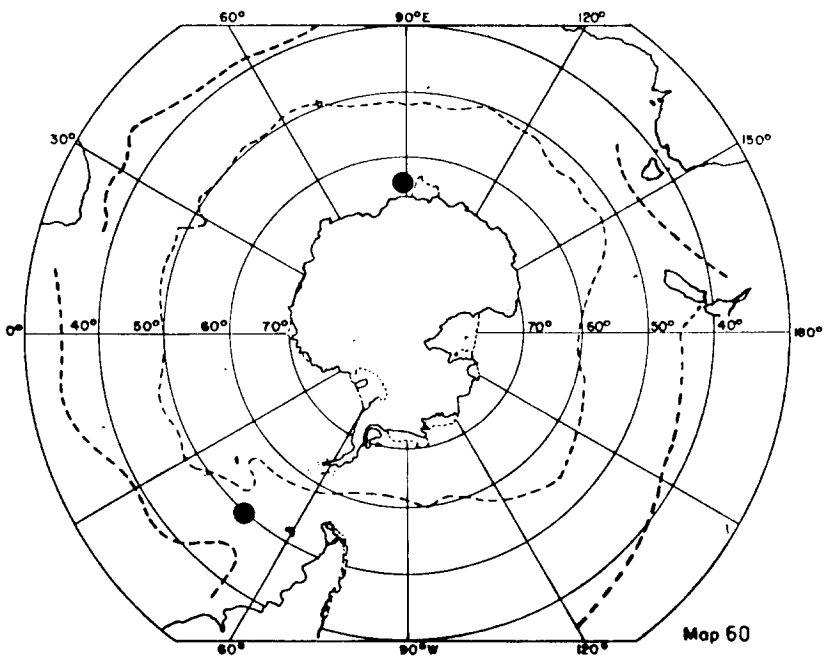


Figure 59. Pegantha triloba.



Map 60. Distribution of Pegantha triloba.

Key to genera:

With otoporpae ..... Cunina
Wihtout otoporpae (Au) ..... Solmissus

Genus Cunina Eschscholtz 1829

Cuninidae with out without peripheral canal system; with otoporpae; 13 species of which 2 are unrecognisable and 3 are doubtful.

Key to species:

1a) With peripheral canals 2
 b) Without peripheral canals 4

2a) Stomach pouches tapering from broad base outwards, separated by wide triangular spaces (SA) ..... C. frugifera Kramp
 b) Stomach pouches with nearly parallel sides 3

3a) Stomach pouches quadratic, more than twice as wide as septa between them; peripheral canals narrow; with 10-14 tentacles (SA) ..... C. globosa Eschscholtz
 b) Stomach pouches elongated, rectangular, hardly broader than spaces between them; lateral portions of peripheral canals very broad; with up to 29 stomach pouches, increasing in number with age ..... C. duplicata Maas

4a) With usually 5 stomach pouches, square; umbrella about 5 mm wide (Au,SA) ..... C. octonaria McCrady
 b) With usually about 12 stomach pouches, increasing with age, square or somewhat rounded distally, umbrella about 14 mm wide (SAm,SA) .. C. peregrina H.B. Bigelow

Cunina duplicata Maas 1893

Figure 60, Map 61

Diagnostic Characters:

Umbrella rather flat and soft
Stomach pouches up to 24, increasing in number with age from 9 in juvenile specimens, tongue-shaped or rectangular, somewhat longer than broad, with parallel sides, separated by spaces of about the same width or somewhat broader; of unequal length
Gonads form a continuous folded band, closely following the edge of the stomach with its pouches
Marginal lappets rectangular, each wall with 2 or 3 statocysts
Otoporpae very small
Peripheral canals and lateral portions remarkably broad, transverse portion narrow
Size up to 58 mm wide.

Kramp (1957a) gives a further description of adult specimens and remarks on the young stages. This is an eurybathic species being found in the uppermost 1000 m (Blackburn, 1955).

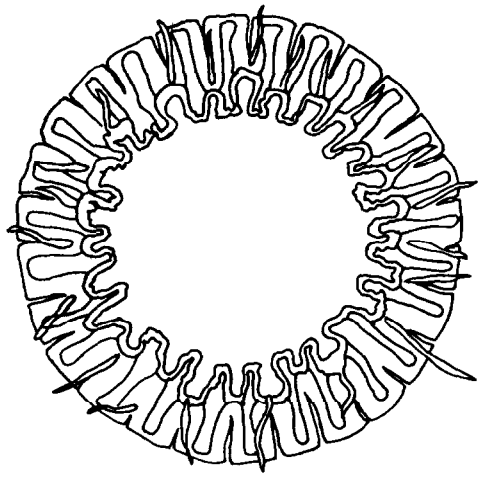
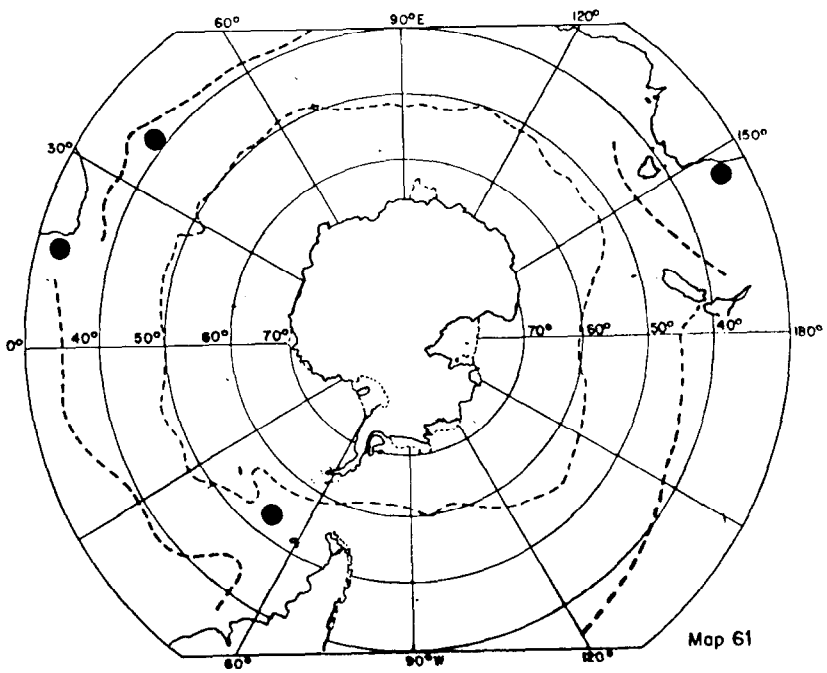


Figure 60. Cunina duplicata.



Map 61. Distribution of Cunina duplicata.

10.4 FAMILY AEGINIDAE

Narcomedusae with interradial divided stomach pouches containing the gonads; with or without peripheral canal system; with primary perradial tentacles leaving umbrella between marginal pouches; pouches extending beyond points of origin of primary tentacles; with or without secondary tentacles on umbrella margin; with or without otoporpae; 5 genera of which 2 are found in the Southern Ocean.

Key to genera:

1a) With only 2 tentacles ..... Solmundella
b) With 4 or more tentacles 2

2a) With 8 (or more) tentacles (Au) ..... Aeginura
b) With 4 to 6 tentacles ..... Aegina

Genus Solmundella Haeckel 1879

Aeginidae with eight stomach pouches; without peripheral canal system; with four peronial grooves; but only two tentacles; with secondary tentacles; without otoporpae; 1 species only.

Solmundella bitentaculata (Quoy & Gaimard 1833)

Figure 61, Map 62

(Solmundella bitentaculata var. mediterranea Maas, 1906; Mayer, 1910)
(Solmundella mediterranea Browne, 1910; Thiel, 1931)

Diagnostic Characters:

Umbrella higher than wide, apical jelly very thick
Stomach broad, lenticular
Stomach pouches rectangular
Tentacles 2 opposite each other, very long, issuing from umbrella near the apex, which is keeled along axis leading to the tentacles
Tentacular peronia 2, deposited in deep grooves
Statocysts usually 8 to 16, but sometimes up to 32
Size up to 72 mm wide, usually much smaller, higher than wide.

This species is circumpolar in the Antarctic (Kramp 1959) and is found everywhere between the surface and depth of about 1000 m, mainly occurring between 100 and 500 m (Kramp, 1957a).

Genus Aegina Eschoscholtz 1829

Aeginidae typically with eight, occassionally 10 or 12 stomach pouches; with peripheral canal systems; with typically four, ocassionally five or six, primary tentacles and same number of peronia; without secondary tentacles; without otoporpae; 1 species only (many synonyms, see Kramp, 1961).

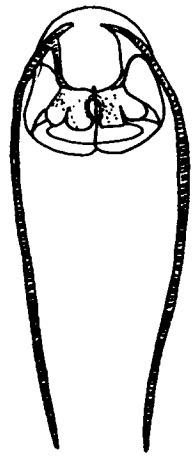
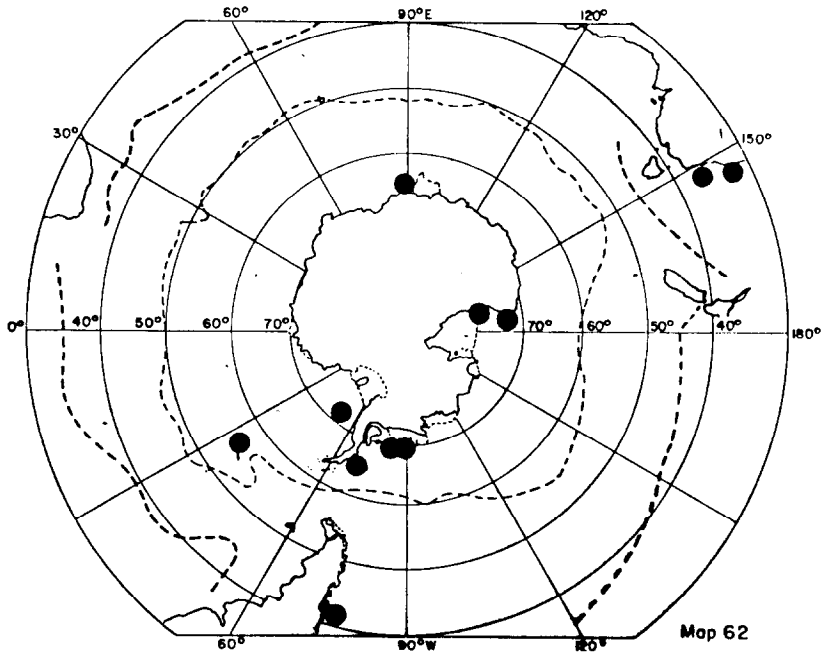


Figure 61. Solmundella bitentaculata.



Map 62. Distribution of Solmundella bitentaculata.

Aegina citrea Eschoscholtz 1829

Figure 62, Map 63

Diagnostic Characters:

Umbrella hemispherical, jelly thick at apex, 5 or 6 rayed specimens can often occur
Stomach large, circular
Stomach pouches typically 8, rectangular, sometimes with a small median notch
Tentacles typically 4, issuing about midway between the apex and margin, a peronial strand for each tentacle base to the margin of the umbrella, dividing the margin into 4 lappets
Statocysts numerous, marginal
Size up to 50 mm wide.

This species is widely distributed in the warm and temperate parts of the oceans (Kramp, 1968). In cold areas it only occurs in deep water, but in the warm areas it may be met with at the surface, though there also it frequently occurs in the deep and intermediate layers (Kramp, 1968).

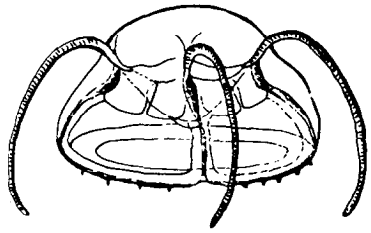
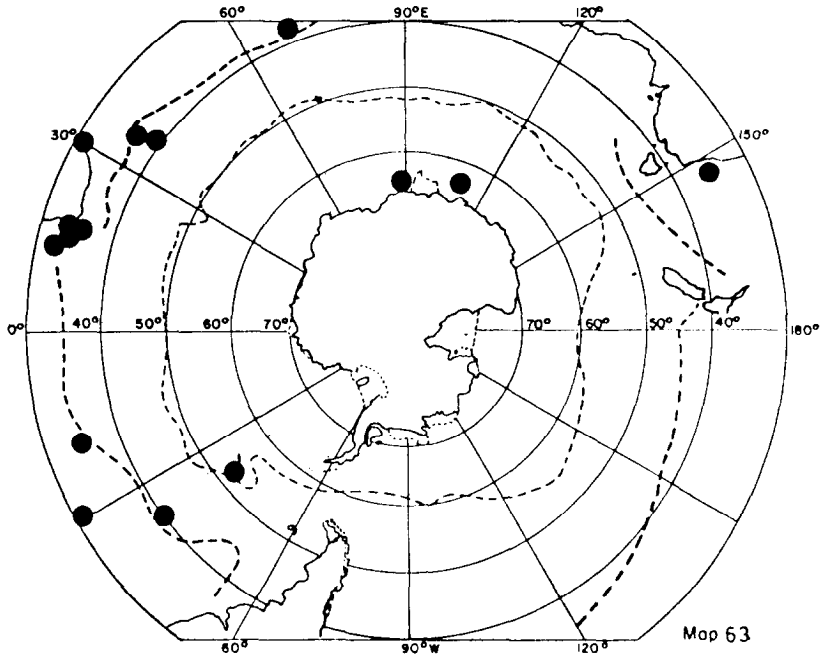


Figure 62. Aegina citrea.



Map 63. Distribution of Aegina citrea.

11. ORDER PTEROMEDUSAE

Trachyline medusae whose body is divisible into aboral and oral halves, separated by a line of tissue lying in the bottom of a constriction, this tissue representing the margin of the umbrella which is divided into four flaps acting as swimming lappets; the subumbrella part of the body is highly reduced and consists of only the manubrium and the tissues on the adoral surfaces of the lappets; without tentacles, but with statocysts on the oral sides of the lappets; statoliths endodermal; gonads of ectodermal origin; development direct, 2 genera of which Tetraplatia has been found in waters adjacent to the Southern Ocean.

Genus Tetraplatia Busch 1851

Pelagic Ptermodeusae of elongate, bipyramidal form with ciliated outer surface; with four gonads, each with an oral and an aboral bilobed portion; with four bilobed swimming lappets, each lobe with a statocyst; two species both of which have been found in waters adjacent to the Southern Ocean: T. chuni Carlgren from South Africa (Carlgren, 1909) and southern Atlantic Ocean (Rees and White, 1957b); and T. volitans Busch from South America (Beyer, 1955) and from southern Atlantic Ocean and southern pacific Ocean (Rees and White, 1957a). Ralph (1959) gives some notes on the genus and Ralph (1960) referred Tetraplatia to the coronate Scyphomedusae.

12. SOURCES OF FIGURES AND MAPS

AUTHOR	FIGURE NUMBER
Bigelow (1909)	3b, 58, 59
Bigelow (1913)	21
Browne (1910)	8, 9, 15, 22, 28
Browne & Kramp (1939)	3e, 5, 11, 27, 33, 36, 40
Haeckel (1879)	47
Kramp (1959)	3c,d, 4, 12, 14, 17, 19, 23, 24, 29, 30, 31, 32, 35, 37, 38, 39, 41, 44, 60, 61
Kramp (1968)	6, 7, 57
Lengerich (1923)	10
Marshall & Williams (1972)	3a
Mayer (1910)	34, 43, 46, 47, 49, 50, 52, 54, 55, 62
Russell (1939-63)	16, 18, 25, 26
Russell (1953)	1, 2, 39, 45
Uchida (1971)	13, 20
Vanhoffen (1912)	3f, 48, 51, 53, 56

AUTHOR	MAP NUMBER
Bedot (1908)	7
Benham (1909)	36
Blackburn (1955)	45, 46, 47, 48, 56, 61, 62, 63
Boone (1938)	37
Browne (1902)	1, 2, 10, 11, 15, 18, 27, 28, 31, 35, 36, 39, 40, 41, 42
Browne (1908)	29, 35, 42, 46, 47
Browne (1910)	5, 8, 13, 14, 21, 22, 28, 31, 32, 57, 62
Browne & Kramp (1939)	1, 2, 10, 11, 13, 15, 18, 27, 31, 33, 35, 36, 39, 40, 41, 42
Fagetti & Fischer (1964)	4
Gilchrist (1918)	9
Haeckel (1879)	44
Hamond (1974)	51
Kramp (1928)	15
Kramp (1932)	31
Kramp (1948)	8, 15, 32, 35, 41, 45, 48, 51, 55, 56, 60
Kramp (1949)	21, 22, 31, 48
Kramp (1957a)	1, 3, 4, 14, 15, 16, 17, 18, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 40, 41, 42, 43, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 58, 59, 61, 62, 63
Kramp (1957b)	9, 15, 17, 20, 22, 26, 27, 31, 47, 48, 50, 55, 56, 63
Kramp (1957c)	31
Kramp (1959)	31
Kramp (1965)	31, 58
Lesson (1830)	15
Maas (1906)	34, 49, 53, 62
Mann & Zapfe (1950)	8
Mayer (1910)	33
Ralph (1947)	10

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2. David O'Sullivan (1982). A guide to the Chaetognaths of the Southern Ocean and adjacent waters.

3. David O'Sullivan (1982). A guide to the Pelagic Polychaetes of the Southern Ocean and adjacent waters.

4. David O'Sullivan (1982). A guide to the Scyphomedusae of the Southern Ocean and adjacent waters.

5. David O'Sullivan (1982). A guide to the Hydromedusae of the Southern Ocean and adjacent waters.

6. Paul J. McDonald(1983). Steam aided curing of concrete in Antarctica.

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