Benthic shallow-water hydroids (Cnidaria, Hydrozoa) of the coast of São Sebastião, Brazil, including a checklist of Brazilian hydroids

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Key words: Cnidaria; Hydrozoa; systematics; distribution; South American fauna; Atlantic; Brazil.
The paper presents the results of a general survey of the hydroid fauna of the coastal region of the São Sebastião Channel, São Paulo State, Brazil. Intensive collecting in the intertidal and infralittoral zones, from 1984 to 1992, led to the discovery of many species, some of which are small and inconspicuous. Out of 59 species of hydroids (17 athecate and 42 thecate) described and illustrated, three are new records for the Atlantic Ocean, six for the western South Atlantic, and 21 for the Brazilian coast. The medusa stage of *Asyncoryne ryniensis* and the cnidome of 24 species are described for the first time. The paper also contains a synopsis of the hydroids recorded from the Brazilian coast, the list now including 107 species. Pseudostenotele nematocysts, recently described, were found in three species of Haleciidae (*Halecium dichotomum, H. tenellum, Ophiodissa* spec.), in four species of Halopteriddidae (*Halopteris constricta, H. diaphana, H. buskii, Monostaechas quadridens*) and in four Plumulariidae (*Monotheca margaretta, Plumularia floridana, P. strictocarpa, Ventromma halecioides*).

Contents

Introduction

Despite being one of the most common invertebrate groups of intertidal and sublittoral regions, hydroids are poorly known in Brazilian waters. Indeed, the coastline of eastern South America was considered by Cornelius (1992) to be one of the least studied regions on earth, with few data on the occurrence and distribution of hydroids (see Appendix for a checklist of hydroids from the Brazilian coast).

The only comprehensive hydroid studies in Brazil were carried out by Dr Marta Vannucci, who published papers dealing mostly with the benthic forms (Vannucci Mendes, 1946; Vannucci, 1949, 1950, 1951a, b, 1954), and later, with planktonic forms (Vannucci, 1957, 1963). In the years following Vannucci's research there was an emphasis on the study of medusae (Moreira, 1973; Navas-Pereira, 1980), and a few papers on hydroids were published (Mayal, 1973, 1983; Narchi & Hebling, 1975; Moreira et al., 1978, 1979; da Silveira & Migotto, 1984, 1991, 1992; Migotto & da Silveira, 1987; Pires et al., 1992; Marques, 1993).

The hydroid fauna of São Sebastião, on the coast of São Paulo State, in particular was poorly known. Vannucci (1949, 1951a, 1954) recorded only 16 species of thecate hydroids from that area. Later on, Moreira et al. (1978, 1979), da Silveira & Migotto (1984, 1991), Migotto & da Silveira (1987) and Marques (1993) added 12 species to the list.

The present paper is a survey of the hydroid fauna of the São Sebastião region, excluding the Eudendriidae that were studied by Marques (1993). Careful collecting in the intertidal and infralittoral zones led to the discovery of many species, some of which are small and inconspicuous, and unrecorded before from the Brazilian coast or even from the Atlantic.

Study Site

The São Sebastião Channel, located on the northern coast of São Paulo State (Brazil) at 23°50′ S, lies between the continent and the Ilha de São Sebastião (fig. 1); it is 25 km long, about ten km wide at the entrances and two km wide in the central region, with a maximal depth of 50 m (Castro Filho, 1985). At Ponta do Jarobá and the Centro de Biologia Marinha of the Universidade de São Paulo, surface water temperatures varied from 17 °C during winter (average 21 °C) to 31 °C in summer (average 26 °C) and salinities varied from 29 to 36‰ (average 33‰) during 1979-1991. Tides are semi-diurnal, with a mean amplitude of about 0.6 m. The climate is tropical, with a dry season during the winter. Annual rainfall reaches 2,500 mm and mean air temperature is 24.4 °C. The margins of the channel are lined with small sandy beaches and rocky shores composed mainly of large boulders and rock faces, with smooth or moderately steep slopes down to 4-10 m depth.

Zoogeographically the region is a part of the Paulista Province, a transitional

zone between the tropical and temperate western South Atlantic (Palacio, 1982).

As São Sebastião harbors a port and is Brazil's biggest maritime oil terminal, there is intense traffic of cargo vessels and oil tankers. Several episodes of crude petroleum and fuel oil spills occurred during this study. Ship traffic could be responsible for the introduction of exotic species, as already documented in other parts of the world.

Material and Methods

The organisms were collected at 25 sites in the São Sebastião Channel and surroundings, between 1984 and 1993 (fig. 1). Most of these localities were surveyed more than twice, and six of them were visited monthly during 1988: Praia de Cigarras, Praia de São Francisco, Ponta do Araçá, Praia do Zimbro, Ponta do Jarobá and Ponta do Baleeiro.

Samples were hand-collected during the low spring tides or by snorkeling and SCUBA diving, usually in shallow water (1-6 m, exceptionally 10-25 m). Besides the hydroid colonies removed directly from rocks, other substrates such as algae, shells, pebbles, ropes, and wood were collected and examined under the stereomicroscope. Most of the specimens were kept in the laboratory. The animals were anesthetized in a 1:1 solution of 7.5% magnesium chloride and seawater, and preserved in 4% formaldehyde in seawater. Newly released medusae were fixed or, when necessary for the identification of the species, maintained in Petri dishes or small bowls for several days; the water was changed daily and the animals were fed nauplii of *Artemia salina* or live zooplankton.

Permanent slides of specimens stained with Paracarmin, Orange G, or Methylene Blue were prepared. For thecates, non-permanent skeleton slides cleared with sodium hypochlorite were also used.

The cnidome was studied by interference-contrast light microscopy in squashed preparations of fresh material, to which distilled water or saliva was added to induce nematocyst discharge. Only capsules of undischarged nematocysts were measured. The nematocyst nomenclature employed is that of Weill (1934), Mariscal (1974) and Millard (1975), except for the Campanulariidae, where it is based on the terminology of Östman (1979a, 1983a, 1983b).

The hydroids were compared with those from the collections of the Nationaal Natuurhistorisch Museum (National Museum of Natural History), Leiden and The Natural History Museum, London. Samples of each species were deposited in the collections of these museums, and in those of the Royal Ontario Museum, Toronto and in the Museu Nacional, Rio de Janeiro. The registration numbers appear in the 'examined material' sections. Only the abbreviations of the name of the collectors, other than the author, appear as data of each batch. The measurements and details of the cnidome presented in each description refer only to the material from the region of São Sebastião listed in the 'examined material' sections, unless otherwise stated. The material in the Nationaal Natuurhistorisch Museum, Leiden, is now preserved in ethanol 70%.

Unfortunately, all the material deposited by Dr Marta Vannucci at the Instituto Oceanográfico (Universidade de São Paulo) was lost, including the type material.

However, about 200 microslide preparations, here called "Vannucci's Collection", remained in the possession of Dr Denise Navas Pereira, who kindly put those at my disposal for the present study. Although several microslides had no labels or incomplete data, the majority of the samples containing more than three species, the examination of this material helped the preliminary identification of many species and was important to evaluate and update some of Dr Vannucci's records and descriptions. Only the microslides containing specimens considered important for taxonomic or distributional aspects are listed in the 'examined material' sections.

[Editorial note: Some of the material discussed below has subsequently been used by Dr Peter Schuchert, Basel, Switserland, for a revision of the leptolid family Halopteridídae. This material is indicated as follows: 'See edit. note on p. 7'. Dr Schucherts revision will later be published in Zool. Verh. Leiden].

Abbreviations

ACM = Adriano Colares da Mota;
AM = Private collection of the author;
BMNH = The Natural History Museum (British Museum, Natural History), London;
CGT = Cláudio Gonçalves Tiago;
CV = Cláudia Vieitas;
FLS = Fábio Lang da Silveira;
IBUSP = Instituto de Biociências, Universidade de São Paulo;
JMO = Joseilto M. de Oliveira;
MAM = Moisés A. da Mota;
MNRJ = Museu Nacional, Rio de Janeiro;
RMNH = Nationaal Natuurhistorisch Museum (Rijksmuseum van Natuurlijke Historie), Leiden;
RMR = Rosana M. Rocha;
ROMIZ = Royal Ontario Museum, Toronto;
VC = Vannucci's Collection;
USNM = United States National Museum, Smithsonian Institution, Washington, D.C.

Results and Discussion

Fifty-nine species of hydroids - 17 athecates and 42 thecates - were represented in the collections (Table 1). With the inclusion of *Turritopsis nutricula, Leuckartiara octona* and *Zanclea costata,* that were recorded before only as medusae, 21 species constitute new records for the Brazilian coast. Of these, *Asyncoryne ryniensis* and *Halopteris buskii* are recorded for the first time from the Atlantic Ocean; *Bimeria vestita, Bougainvillia rugosa, Corydendrium parasiticum, Amphinema rugosum, Scandia mutabilis, Nemalecium lighti* and the hydroid stage of *Turritopsis nutricula* from the South Atlantic, and *Cladocoryne floccosa, Cladonema radiatum, Halecium dichotomum* and *H. dyssymetrum,* from the western South Atlantic. Only 21 of the 59 species were found in the São Sebastião area before.

Most of the species (62%) are widely distributed in the Atlantic, Indian and Pacific Oceans; only 13 (22%) are endemic to the Atlantic: *Bougainvillia rugosa, Stylactaria*

hooperii, Amphinema rugosum, Coryne producta, Cladonema radiatum, Lytocarpia tridentata, Monotheca margaretta, Diphasia tropica, Sertularella conica, S. cylindritheca, Thyroscyphus ramosus, Clytia hummelincki and *Orthopyxis sargassicola*. All species are known from tropical and subtropical waters, 59.6% also penetrate temperate waters and only 17.5% sub-polar or polar waters. Considering their distribution in the western Atlantic, 42 species (72%) are typical for the Caribbean Province, one for the Patagonian Province, and 8 (14%) are present in both provinces. Although the area is regarded as part of the Paulista Province (Palacio, 1982), the hydroid fauna of shallow waters around São Sebastião is, therefore, typically tropical.

The number of species recorded from São Sebastião totals 66, considering two species not found in the present survey but recorded in the area before (*Dipurena reesi* Vannucci, 1956 and *Serehyba sanctisebastiani* da Silveira & Migotto, 1984) and five species of Eudendriidae studied by Marques (1993). All these are typical shallow water species, basically occurring in intertidal waters or at depths of 1-6 m. Therefore, additions to the hydroid fauna are likely to occur as all collections were made in waters of 25 m depth or less; the hydroid fauna of waters deeper than 25 m and the benthic fauna of the continental shelf and slope of the region being completely unknown.

The species encountered most frequently were: *Turritopsis nutricula, Cladocoryne floccosa, Halocordyle disticha, Nemalecium lighti, Hebella scandens, Aglaophenia latecarinata, Lytocarpia tridentata, Macrorhynchia philippina, Halopteris diaphana, H. buskii, Ventromma halecioides, Dynamena crisioides, D. quadridentata, D. disticha, Sertularia loculosa, S. marginata, S. turbinata, Clytia hemisphaerica, C. linearis, Obelia dichotoma* and *Orthopyxis sargassicola*.

Table 2 summarizes nematocyst data of 50 species, of which 24 had their cnidome studied for the first time: *Hebella scandens, Halecium delicatulum, H. tenellum, Aglaophenia latecarinata, Lytocarpia tridentata, Halopteris constricta, H. diaphana, H. buskii, Monostaechas quadridens, Monotheca margaretta, Plumularia floridana, P. strictocarpa, Diphasia tropica, Dynamena dalmasi, D. disticha, D. crisioides, D. quadridentata, Idiellana pristis, Sertularia loculosa, S. marginata, S. rugosissima, S. turbinata, Thyroscyphus ramosus* and *Orthopyxis sargassicola*.

The cnidome of these thecates includes two to four types of nematocysts. The small microbasic mastigophore (= microbasic b-mastigophore or b-rhabdoid), which occurs in the coenosarc and hydranth, especially in the tentacles, of all species of thecates studied, is the most abundant. Being 4.5-9.5 µm long and 1.5-4.0 µm wide, it is, in light microscopy, morphologically similar in all species. In the Campanulariidae it corresponds to the 'A and B-type' of Östman (1979a, 1983a, 1983b), later named pseudomicrobasic b-mastigophore by Östman (1988), because there is no real shaft at the base of the tubule, as was revealed by scanning electron microscopy. Also, the cnidome of the Campanulariidae usually comprises one or two types of isorhizae and/or another type of microbasic mastigophore.

Besides a small microbasic mastigophore, the species of Haleciidae and those of the suborder Plumulariida studied have a large nematocyst, usually restricted to the hydranth body, coenosarc or nematophores. In all sertulariids this is another microbasic mastigophore, ranging from 7.5-20.0 µm in length and 2.5-11.5 µm in diameter, with a variable morphology among the species, with the exception of *Dynamena*

quadridentata and *Thyroscyphus ramosus*, which have a holotrichous isorhiza and a macrobasic mastigophore, respectively.

The large microbasic mastigophore of the Aglaopheniidae is very long and thin (5.5 to 14 times longer than broad, reaching a length of more than 100 μm in some species), slightly curved and grouped in bundles in the nematophores; these nematocysts are probably responsible for the stings experienced by humans. Among the species of Halopteridídae, Plumulariidae and Haleciidae studied, the large nematocyst is of the pseudostenotele type, recently described by Bouillon et al. (1986) and so far only known for a few Haleciidae, with the exception of *Halecium delicatulum* and *H. dyssymetrum* where the large nematocyst is a microbasic mastigophore and a holotrichous isorhiza, respectively. *Plumularia floridana* has a second type of large nematocyst, an undetermined isorhiza.

Systematic part

Family Bougainvilliidae Lütken, 1850

Bimeria vestita Wright, 1859
(figs 2a-b)

Bimeria vestita; Calder, 1988: 21.

Material.— São Sebastião, Praia das Cigarras, 7.ix.1994, on *Sertularia marginata*, intertidal, without gonophores, RMNH Coel. 23101; 4.x.1994, on *S. marginata*, intertidal, with gonophores, AM894.— Ponta do Araçá, 14.iii.1988, on *Sargassum* sp., intertidal, without gonophores, AM22; 21.x.1988, on *Sargassum* sp., intertidal, without gonophores, ROMIZ B1241.— Ponta do Jarobá, 21.x.1988, on *Sargassum* sp., without gonophores, RMNH Coel. 18801.— Itanhaém, v.1946, on *Dynamena crisioides*, with gonophores, microslide n° 23, VC.— Santos, Ilha Porchat, without gonophores, microslide n° 53, VC.

Description.— Colonies up to 10 mm high, with branching and creeping hydrorhiza (fig. 2a). Hydrocaulus monosiphonic, about 80 μm wide; perisarc usually annulated at the base of main and secondary branches. Hydranths (fig. 2b) with 14-16 filiform tentacles in 2 close whorls around the conical hypostome. Tentacles about 560 μm long. Pseudohydrotheca encircling the base of each tentacle and the hypostome. Gonophores spherical to pear-shaped, 320-350 μm high and 240-260 μm in diameter, completely invested with perisarc.

Nematocysts (in μm)

microbasic eurytele	7.0-7.5 × 4.0-4.5
desmoneme	4.5-5.0 × 3.0-3.5

Remarks.— The general features of the polyps, including the cnidome, agree with previous descriptions of the species, being most similar to those described by Calder (1988) and Millard (1975) regarding the size of the colony and the few branches. Hirohito (1988) described much larger colonies with abundant branches. I found branched and fertile colonies in slides of VC from Santos and Itanhaém (State of São Paulo).

In São Sebastião *B. vestita* was found only on the base of the alga *Sargassum* sp. The species also grows on rocks and frequently on the hydrocaulus of other hydroids (Picard, 1951; Millard, 1975; Wedler & Larson, 1986; Calder, 1988).

Known range.— No previous records for Brazil; it was first recorded for the South Atlantic at Mar del Plata, Argentina, by Genzano & Zamponi (1992). Elsewhere: Pacific, Indian and Atlantic Oceans (Calder, 1988).

Bougainvillia rugosa Clarke, 1882
(figs 2c-d)

Bougainvillia rugosa; Mayer, 1910: 171; Vannucci & Rees, 1961: 84; Kramp, 1961: 82; Calder, 1971: 36.

Material.— São Sebastião, Praia do Cabelo Gordo, 12.x.1985, on ceramic settling-plates, with gonophores, part of a large colony collected on 10.x.1985, AM29, RMNH Coel. 23162; 10.x.1985, newly released medusae, AM24; 6.xi.1985, on shipworm collecting device, 2 m, without gonophores, FLS, AM30, RMNH Coel. 23163; 29.i.1987, AM31; 30.i.1987, AM32; 30.iv.1987, AM33, on ceramic settling-plates, with gonophores; 18.ii.1992, on ceramic settling-plates, with gonophores, part kept in the laboratory, ROMIZ B1242, RMNH Coel. 18802; 18.ii.1992, newly released medusae, RMNH Coel. 23102; 19.ii.1992, one day old medusae, AM26; 20.ii.1992, 2 days old medusae, AM27, RMNH Coel. 23164; 21.ii.1992, 3 days old medusae, AM28.

Description.— Colony erect, up to 16 cm high, irregularly and profusely branched. Stem and main branches polysiphonic, perisarc dark brown. Hydranths (fig. 2c) 600-1200 µm high and 120-176 µm wide, with 4-15 filiform tentacles in a single whorl around the conical hypostome. Medusa buds arising from pedicels on inferior part of hydranth, invested by perisarc. Newly released medusae 440- 540 µm high, 360-520 µm wide, with 4 radial canals, ring canal, and 4 tentacular bulbs. Manubrium short, with 4 unbranched perradial oral tentacles and 4 interradial gonads. Tentacular bulb with 3-4 tentacles and 2-3 adaxial ocelli; 2 at the base of the 2 most external tentacles, and another, smaller, on the base of one of the other 2 tentacles. Marginal tentacles filiform, about 400 µm long. Medusae are about 1040-1100 µm high and 1080-1100 µm wide 24 hours after liberation, with thicker mesoglea and mature gonads (fig. 2d). Eggs 110-120 µm with an outer envelope bearing numerous small nematocysts. In the laboratory, most medusae had already spawned 48 hours after liberation, without changes in the number of oral and marginal tentacles or in the general shape of the umbrella.

Nematocysts (in µm)

Hydranth tentacles	
microbasic eurytele	7.0-7.5 × 3.8-4.0
desmoneme	4.5-5.0 × 2.5-3.0
Medusa	
oral and marginal tentacles, and egg envelope	
microbasic eurytele	6.0-7.5 × 3.5-4.5
marginal tentacles	
desmoneme	4.5-5.0 × 3.0-4.0

Remarks.— *Bougainvillia rugosa* is one of the few species of the genus in which the medusae are sexually mature at liberation and never develop branched oral tentacles.

The species was found on experimental plates and other artificial substrates. Calder (1971) also cites Porifera, bivalve shells and decapod carapaces as substrates for this species.

Known range.— No previous records for Brazil; this is the first record for the South Atlantic. Elsewhere: Chesapeake Bay to the Caribbean Sea (Calder, 1971).

Family Clavidae McCrady, 1859

Corydendrium parasiticum (Linnaeus, 1767) (fig. 2e)

Corydendrium parasiticum; Calder, 1988: 6.

Material.— São Sebastião, Ponta do Baleeiro, 8.xi.1988, on rock, 6 m, without gonophores, RMNH Coel. 18804, ROMIZ B1243.— Naples, Zoological Station, 2 colonies without gonophores, BMNH 1893.5.30.15.— Port Foad, Suez Canal, 18.ix.1980, small colonies with gonophores, F.A. Shouks; S.J. Moore det., BMNH 1981.11.4.8.

Description.— Colonies erect, up to 5 cm high. Hydrocaulus polysiphonic. Branches alternate, about 400 µm wide, adnate to the main stem and free only at their extremity. Hydranth long, tubular, up to 3200 µm high and 600 µm wide, with conical hypostome and scattered filiform tentacles. Gonophores have not been observed.

Nematocysts (in µm)

Hydranth	
desmoneme	5.0-5.5 × 3.5-4.0
microbasic eurytele	8.5-9.5 × 4.0-5.0

Remarks.— I found *C. parasiticum* only once, on a rocky bottom at a depth of 6 m. Part of the colony was kept alive in laboratory for two weeks, growing but not developing gonophores. In Colombia *C. parasiticum* "... is found in extremely dark spots in the rocky littoral" (Bandel & Wedler, 1987).

My specimens conform with the descriptions of Millard (1975) and Calder (1988). The types and dimensions of the nematocysts are also similar to those given by these authors. Calder (1988), basing his opinion on that of other authors, considered *C. dendriforme* and *C. sessile* junior synonyms of *C. parasiticum*.

Known range.— No previous records for Brazil; this is the first record for the South Atlantic. Elsewhere: North Atlantic, Pacific and Indian Oceans (Calder, 1988; Hirohito, 1988).

Turritopsis nutricula McCrady, 1859 (figs 3a-c)

Turritopsis nutricula; Calder, 1988: 8.

Material.— São Sebastião, Farol dos Moleques, 14.v.1987, on rock, without gonophores, NMRJ 2137.— Praia do Cabelo Gordo, 15.ii.1985, on *Perna perna*, without gonophores, AM90; 9.v.1985, on shipworm collecting device, with gonophores, RMNH Coel. 23165, ROMIZ B1244; 23.v.1985, 14 days old medusae reared from hydroid kept in the laboratory; 23.v.1985, on ceramic settling-plates, without gonophores, RMR, AM93, RMNH Coel. 23166; 14.ii.1986, 2 months old medusa reared from hydroid kept in the laboratory; 28.v.1986, on ceramic settling-plates, with gonophores, AM96; 15.iv.1987, newly released medusae, 20 and 23 days old medusae reared from hydroid kept in the laboratory; 6.v.1987, 43 days old medusae reared from hydroid kept in the laboratory; 10.v.1986, on shipworm collecting device, with gonophores, AM94; 11.v.1986, on pilings, with gonophores, AM95; 27.iv.1987, on ceramic settling-plates, with gonophores, CGT, AM97; 15.ii.1988, on *P. perna*, without gonophores, AM98; 28.x.92, on sponge, 1.5 m, without gonophores, AM99.— Ponta do Baleeiro, 23.ii.1985, on rock, with gonophores, AM100; 7.iii.1985, on sponge, with gonophores, AM101, RMNH Coel. 23167; 11.iii.1985, newly released medusae from hydroid kept in the laboratory; 18.ii.1988, on barnacles and rocks, 1 m, with gonophores, RMNH Coel. 18805; 18.ii.1988, newly released medusae.— Ponta do Jarobá, 23.iii.1987, on *Codium intertextum*, 1.5 m, with gonophores, AM105.— Ilha de Itaçucê, 15.iii.1985, on *C. intertextum*, 1 m, with gonophores, AM89.— Praia de Toque-Toque Grande, 28.iv.1985, on rock, with gonophores, AM106; 6.v.1985, on rock, *P. perna* and barnacles, 1.5 m, with gonophores, AM107; 6.iii.1988, on rocks, *P. perna* and barnacles, 1.5 m, with gonophores, AM108.— Praia de Toque-Toque Pequeno, on *Astraea phoebia*, 1 m, with gonophores, AM109.

Description.— Colonies erect, up to 18 mm high. Hydrocaulus monosiphonic or polysiphonic, irregularly branched. Branches 140-200 µm high, adnate to hydrocaulus for a variable distance. Hydranth (fig. 3a) terminal, milky white, fusiform to cylindrical, with 12-20 filiform tentacles. Tentacles scattered over body of hydranth. Medusae buds on distal part of hydrocaulus, near hydranth. Newly liberated medusae (fig. 3b) 360-480 µm high and 360-440 µm wide, with 4 radial canals, ring canal, and 8 marginal filiform tentacles: 4 perradial and 4 interradial. Manubrium cylindrical, with nematocyst batteries along rim of mouth. Medusae raised in the laboratory at 23-24° C reached 1.0 mm and bore 12 tentacles in seven days (fig. 3c). Eleven and 13 days old medusae had 16 and 20 tentacles, respectively. Gonads were present in 42 days old specimens, that measured about 1.6 mm and bore 29 marginal tentacles; the manubrium became cross-shaped in transverse section and the rim of the mouth had a row of 34 nematocyst knobs. The oldest medusa kept in the laboratory was 2 months old, 3.0 mm high and 2.6 mm wide, and bore 53 tentacles and 76 nematocyst knobs around the mouth.

Nematocysts (in µm)

Hydranth	
desmoneme	6.0-8.0 × 4.0-5.0
microbasic eurytele	9.0-13.0 × 3.0-4.0
Medusa	
desmoneme	4.5-6.0 × 3.0-4.0

Remarks.— The presence of monosiphonic or polysiphonic hydrocauli seems to be due to the size of the colonies: small colonies are usually monosiphonic and large colonies tend to be polysiphonic. Calder's (1988) consideration that *Turritopsis dohrnii* (Weismann, 1883) is polysiphonic and from deeper waters and *T. nutricula* is monosiphonic and from shallow waters can be contested by the finding of mono- and poly-

siphonic forms in shallow waters of São Sebastião and other places (Wedler & Larson, 1986; Hirohito, 1988, among others). According to Bandel & Wedler (1987) the species occurs in illuminated and shaded areas of shallow to deeper waters, and the size of the colonies increases with depth.

The material from São Sebastião differs from that described by Calder (1988) in the size of the nematocysts: both types, desmonemes and microbasic euryteles, being considerably larger. In São Sebastião, *T. nutricula* is usually found along shallow, vertical rock walls where it forms dense mats on the green alga *Codium intertextum*, barnacles, mussels and sponges.

Known range.— No previous records for Brazil exist; this is the first record of the hydroid stage from the South Atlantic. Elsewhere: Atlantic, Indian and Pacific Oceans (Millard, 1975; Calder, 1988).

Family Hydractiniidae L. Agassiz, 1862

Stylactaria spec.
(fig. 3d)

Material.— São Sebastião, Ponta do Baleeiro, 26.xi.1985, on barnacles, 2 m, with gonophores, RMNH Coel. 23103.

Description.— Polymorphic and stolonal colonies growing on the shell of a barnacle. Hydrorhiza reticulate, anastomosing, with thin perisarc and chitinous spines (fig. 3d). Spines conical, 290-350 µm high and 150-155 µm wide at the base. Tentaculozooids up to 4400 µm long and about 25 µm in diameter when fully extended; nematocysts concentrated on dilated distal end. Gastrozooids up to 2400 µm high and 250 µm wide, with 8-20 filiform tentacles (425-550 µm long). Female gonozooids up to 1300 µm high and 120 µm wide, with 2-5 filiform tentacles and 1-2 gonophores located at about halfway the body length below the tentacles. Gonophores eumedusoid, almost spherical, containing 4 eggs, with 4 radial canals and a ring canal but without marginal tentacles. Male gonophore not seen. Hypostome of gastrozooids and gonozooids dome-shaped, densely covered with nematocysts.

Nematocysts (in µm)

gonozooid/gastrozooid	
tentacles and hypostome- microbasic eurytele	7.5-9.0 × 2.5-3.0
tentacles - desmoneme	6.0-6.5 × 2.5-3.0
dactylozooid - microbasic eurytele	8.0-8.8 × 3.2-4.0

Remarks.— This species is assigned to the genus *Stylactaria* because the stolon is covered with perisarc and polymorphic zooids are present. Despite several differences in size and in general morphology of colony and gonophores, the present species has similarities with *Stylactaria claviformis* (Bouillon, 1971), especially in the shape of gastrozooids and gonozooids and in the dense cover of the hypostome with nematocysts. The presence of eumedusoids without tentacles corresponds with *Stylactaria inermis* (Allman, 1872: 305) and *S. multigranosi* Namikawa (1991: 806-812), and distin-

guishes it from most of the species of the genus. *Stylactaria multigranosi* and *S. inermis*, however, do not have spines while in the latter tentaculozooids are absent, thus distinguishing those species from the present material. Due to the scarcity of specimens it is impossible to know whether or not the gonophores are fixed, and to estimate the development of planulae within those gonophores. Thus, its specific identity still has to be determined. The only other species of the family Hydractiniidae recorded from Brazilian waters is *Stylactaria hooperii*, a species usually found on the shells of the gastropod *Cerithium*; it also has free eumedusoids.

Stylactaria hooperii (Sigerfoos, 1899)

Stylactis hooperii Sigerfoos, 1899: 801.
Stylactis hooperi; Moreira et al., 1979: 679; Wedler & Larson, 1986: 92 [incorrect subsequent spelling].
Stylactaria arge; Calder, 1988: 33.
Stylactaria hooperii; Namikawa, 1991: 809.

Material.— Ilhabela, Barra Velha, 20.iv.1985, on empty shell of *Siratus senegalensis*, 4 m, with gonophores, AM138.— São Sebastião, Ponta do Baleeiro, 26.xi.1985, on barnacles, 2 m, with gonophores, AM155.— Ponta do Jarobá, 16.iii.1985, on *Cerithium atratum*, 2 m, with gonophores, AM145; 28.iii.1985, on *Cymatium partenopeum*, 2.5 m, with gonophores, AM146; 14.ix.1986, on *C. atratum*, 6 m, with gonophores, FLS, AM147, RMNH Coel. 23168; 22.ix.1986, on *C. atratum*, 2 m, with gonophores, FLS, AM148, RMNH Coel. 23169; 21.x.1986, on *C. atratum*, with gonophores, AM150, RMNH Coel. 23171; 22.ii.1989, on *C. atratum*, with female gonophores, AM151; 24.ii.1989, on *C. atratum*, with gonophores, RMNH Coel. 18808: 13.iii.1992, on *C. atratum*, with gonophores, ROMIZ B1247; 17.iii.1992, AM153; 2.iv.1992 on *C. atratum*, with gonophores, AM154, RMNH Coel. 23172; 24.iii.1992, AM137; 25.iii.1992, AM139; 31.iii.1992, AM140; 1.iv.1992, AM141, newly released medusae.— Baía do Araçá, 10.iii.1992, AM142, RMNH Coel. 23170; 18.iii.1992 on *C. atratum*, intertidal, with gonophores, JMO, MNRJ 2139.

Description.— Polymorphic and stolonal colonies growing on gastropod shells, especially those of *Cerithium atratum*. Hydrorhiza reticulate, with thin perisarc and chitinous spines. Spines 300-550 µm high and 145-160 µm wide at the base. Gastrozooids up to 2550 µm high and 350 µm wide, with round hypostome and 8-16 filiform tentacles. Gonozooids up to 2400 µm high and 250 µm wide, with 6-12 filiform tentacles and 1-4 medusa buds. Tentacles of gastrozooid 525-1025 µm long; those of gonozooids 400-550 µm. Eumedusoids sexually mature at liberation and short-lived, with 4 radial canals, cylindrical manubrium and 8 rudimentary marginal bulbs. Male medusoids 740-880 µm high and 480-550 µm wide; female medusoids 854-1125 µm high and 720-1050 µm wide.

Nematocysts (in µm)

Gastrozooid	
microbasic eurytele	7.5-10.5 × 2.5-4.0
desmoneme	5.0-6.0 × 2.5-3.0
Gonozooid	
microbasic eurytele	9.0-10.5 × 4.0-4.5
desmoneme	5.5-8.5 × 3.0-3.5
Medusoid - microbasic eurytele	7.5-8.5 × 3.0-3.5

Remarks.— In São Sebastião, *S. hooperii* is usually found on shells of the gastropod *Cerithium atratum*, but seldom on living gastropods (see also Moreira et al., 1979). The colonies are easily kept in laboratory either on the host shell or isolated on glass slides.

I agree with Namikawa (1991) in considering, at least provisionally, *S. hooperii* distinct from *Stylactaria arge* (Clarke, 1882). The latter differs from the first by the absence of spines and by development of the planulae within the gonophores. The specimens described by Calder (1988) are thus more similar to the concept of *S. hooperii*.

Known range.— São Sebastião (Moreira et al., 1979) is the previous record from Brazil. Elsewhere: east coast of the USA and the Caribbean (Wedler & Larson, 1986; Calder, 1988). The distribution may be much wider considering that *Cerithium atratum* and *Cerithium litteratum*, main substrates of the species, are found from the southern coast of the USA to the States of Santa Catarina and Bahia (Brazil), respectively (Rios, 1985).

Family Pandeidae Haeckel, 1879

Amphinema rugosum (Mayer, 1900)
(figs 2f-g)

Stomotoca rugosa Mayer, 1900: 32; 1910: 112.
Amphinema rugosum; Rees & Russell, 1937: 67; Russell, 1953: 183; Kramp, 1959: 13; Wedler & Larson, 1986: 96.

Material.— São Sebastião, Ponta do Baleeiro, 19.iii.1992, on barnacles, 1.5 m, with gonophores, RMNH Coel. 18806, ROMIZ B1245.— Ponta do Jarobá, 28.v.1992, on barnacles, 1 m, with gonophores, AM157.

Description.— Colonies erect, growing from a creeping hydrorhiza about 40 µm wide (fig. 2f). Hydrocaulus about 1.5 mm high, annulated and narrow at the base (36-44 µm wide), gradually widening towards the distal end (about 135 µm wide). Hydranths orange-red, up to 500 µm high and 200 µm wide, with one whorl of 7-10 filiform tentacles. Gonophores (fig. 2f) bud either from hydrorhiza or hydrocaulus, on pedicels 130-150 µm long and 40-57 µm wide. Newly released medusae (fig. 2g) about 425 µm high and 475 µm wide, with 4 radial canals, ring canal, 2 opposite perradial bulbs with tentacles alternating with 2 small opposite perradial bulbs without tentacles. Some medusae with discrete interradial projections indicating the points of growth of rudimentary marginal bulbs. Manubrium cylindrical and short.

Nematocysts (in µm)

Hydranth	
microbasic eurytele	7.0-7.5 × 3.0
desmoneme	4.0-4.5 × 2.0-2.5
Newly released medusa	
microbasic eurytele	5.5-7.5 × 2.0-2.5
desmoneme	4.0-4.5 × 2.5

Remarks.— The rare records of the polypoid stage of *Amphinema rugosum* are by Mayer (1900), Rees & Russell (1937) and Wedler & Larson (1986). Rees & Russell (1937) concluded that *Amphinema dinema* (Péron & Lesueur, 1809) differs from *A. rugosum* in the following features: 1) lack of annulated perisarc, 2) gonophores borne only on the stolon, and 3) newly liberated medusae without apical projection and apical canal. The specimens from São Sebastião are in accordance with the available descriptions of the polyp stage. The newly liberated medusae, however, lack apical projections and are in this aspect more similar to *A. dinema*. However, the apical projection was absent in the newly liberated medusae of *A. rugosum* described by Mayer (1900); it developed later, after c. 8 days. According to Werner (1963) the formation of the apical projection may depend on environmental factors, at least in *Amphinema ocellata*, and this could be valid for other Pandeidae.

Russell (1938) mentioned only euryteles in the cnidome of the medusae, bigger (8-9 µm in length) than those found in the present material.

Known range.— There are no previous records for Brazil, this is the first record for the South Atlantic. Elsewhere: England (Rees & Russell, 1937), Atlantic coast of the USA (Mayer, 1910) and Caribbean (Mayer, 1910; Wedler & Larson, 1986).

Leuckartiara octona (Fleming, 1823)
(fig. 3e-g)

Leuckartiara octona; Hirohito, 1988: 106.

Material.— São Sebastião, Ponta do Jarobá, 18.ii.1985, on *Strombus pugilis*, 1.5 m, with gonophores, AM168; 18.ii.1985, newly released medusa from hydroid kept in the laboratory, RMNH Coel. 23104; 23.ii.1985, on *S. pugilis*, 3 m, with gonophores, AM159; 6.iii.1985, on *S. pugilis*, 2-3 m, with gonophores, RMNH Coel. 18807; 11.iii.1985, newly released medusae from hydroid kept in the laboratory, AM160; 17.iii.1985, 7 days old medusae from hydroid kept in the laboratory, AM161; 20.iv.1985, one day old medusae reared from hydroid kept in the laboratory, AM162; 14.vi.1986, newly released medusae from hydroid kept in the laboratory, AM163, RMNH Coel. 27313; 24.ii.1989, 2 days old medusae reared from hydroid kept in the laboratory, AM164; 24.ii.1989, 3 days old medusae reared from hydroid kept in the laboratory, AM165, RMNH Coel. 27315; 3.iii.1989, on *S. pugilis*, 2-3 m, with gonophores, ROMIZ B1246; 9.ii.1990, one day old medusae reared from hydroid kept in the laboratory, AM166; 7.ii.1990, on *S. pugilis*, 3 m, with gonophores, MNRJ 2136; 9.ii.1990, 2 days old medusae reared from hydroid kept in the laboratory, AM167, RMNH Coel. 27314; 10.iii.1992, on *Cerithium atratum*, 2-3 m, without gonophores, AM172.

Description.— Colonies erect, small, up to 9.0 mm high, growing on gastropod shells. Main stem and lateral branches with terminal hydranths (fig. 3e). Pseudohydrotheca up to base of tentacles, 250-320 µm high and 195-305 µm wide, usually encrusted with detritus. Hydranth 345-600 µm high and 80-210 µm wide, with conical hypostome and a whorl of 6-12 filiform tentacles. Gonophores on pedicels arising from hydrocaulus and hydrorhiza, completely invested with perisarc. Newly released medusa (fig. 3f) 1200-1400 µm high and 1000-1100 µm wide, with four radial canals, ring canal, and 4 marginal bulbs, 2 of which with long filiform tentacles; 1 abaxial red ocellus in each of the other 2 marginal tentacles. Manubrium short, square in cross section. Nematocysts scattered over exumbrellar surface. In laboratory and at 24°C, 24 hours old medusae were about 1500-1600 µm high and 1100-1200

μm wide, and started to develop the other two perradial marginal tentacles and the apical process. After 72 hours, 4 interradial bulbs developed, the apical process became long and conical, and the umbrella was about 2.0-2.2 mm high and 1.6-1.8 mm wide. Six days old medusae (fig. 3g) had well developed interradial bulbs, with abaxial ocelli, and were 2.5- 3.0 mm high, with tentacles as long as 80 mm when fully relaxed. The interradial tentacles were well formed after 14 days. The oldest specimen lived 22 days, measuring 4.0 mm high, with 8 marginal tentacles and developing gonads.

Nematocysts (in μm)

Hydranth	
microbasic eurytele	6.5-7.0 × 2.5
desmoneme	4.5 × 2.5
Medusa	
microbasic mastigophore	7.0-4.0 × 3.0-4.0

Remarks.— In spite of the examination of many possible hosts and other substrates, in São Sebastião *L. octona* was found strictly on the gastropod *Strombus pugilis*, usually around the aperture of the shell. The reared medusae developed in a way very similar to the description of Russell (1953). This author, however, mentioned the presence of ocelli only after the four-tentacled stage. Russell (1938) found microbasic euryteles in the medusa besides microbasic mastigophores, in this respect differing from Weill's (1934) observations and the present results.

Known range.— Previous records for Brazil are from off Rio Grande do Sul State (Navas-Pereira, 1981, medusa stage); this is the first record of the hydroid stage for Brazilian waters. Elsewhere: worldwide (Millard, 1975).

Family Cladocorynidae Allman, 1872

Cladocoryne floccosa Rotch, 1871
(figs 4a-b)

Cladocoryne floccosa; Warren, 1908: 284; Brinckmann-Voss, 1970: 69; Millard & Bouillon, 1974: 11; 1975: 2; Millard, 1975: 65; Wedler & Larson, 1986: 81; Yamada & Kubota, 1987: 37; Hirohito, 1988: 52.

Material.— São Sebastião, Praia do Zimbro, 18.vii.1988, on *Sargassum* sp., intertidal, without gonophores, MNRJ 2160; 8.ix.1988, on *Sargassum* sp., intertidal, with gonophores, AM43, RMNH Coel. 23173; 11.ii.1992, on *Sertularia marginata*, intertidal, without gonophores, kept in the laboratory until 21.ii.1992, AM44; 24.x.1992, on rock, intertidal, without gonophores, ACM, AM45.— Ponta do Araçá, 16.iv.1988, on *Sargassum* sp., intertidal, without gonophores, AM46; 21.iv.1988, on *Sargassum* sp., intertidal, with gonophores, kept in the laboratory until 15.v.1988, AM47; 26.iv.1988, on *S. marginata*, intertidal, without gonophores, AM48, RMNH Coel. 23174; 29.vi.1988, on hydrocaulus and hydrorhiza of *S. marginata*, intertidal, without gonophores, ROMIZ B1248; 29.vi.1988, on *Sargassum* sp., intertidal, without gonophores, RMNH Coel. 18809; 14.vii.1988, on hydrocaulus and hydrorhiza *S. marginata*, intertidal, without gonophores, AM52; 14.vii.1988, on *Sargassum* sp., intertidal, with gonophores, AM53; 9.ix.1988, on decapod, intertidal, without gonophores, AM54; 22.x.1988, on hydrocaulus of *Aglaophenia latecarinata*, intertidal, without gonophores, AM55, RMNH Coel. 23175; 22.x.1988, AM56,

RMNH Coel 23176; 21.x.1988, on *S. marginata*, intertidal, without gonophores, AM57.— Ponta do Baleeiro, 18.viii.1988, on *Hypnea spinella*, 6 m, with gonophores, AM58.— Ponta do Jarobá, 3.x.1992, on *Sargassum* sp., 1 m, without gonophores, AM59.— Praia das Cigarras, 16.vi.1988, AM60, 4.x.1994, on *S. marginata*, intertidal, without gonophores, AM895.— Murray Island, Torres Straits, on *Idiellana pristis*, A. C. Haddon, BMNH 1890.3.24.114-120.

Description.— Colonies erect. Hydrocaulus about 0.5-1.6 mm high and 100-160 µm wide, smooth or corrugated, annulated at the base, rarely branched. Hydranth (fig. 4a) reddish, 0.5-1.2 mm high, with a single whorl of capitate oral tentacles and 2-4 irregular whorls of capitate, branched aboral tentacles. Hypostome milky white. Aboral tentacles 400-700 µm long, with stalked capitula in 2 lateral, aboral rows and 1 oral row; oral capitula seldom smaller and sometimes lacking. Gonophores (fig. 4b) cryptomedusoid, between aboral tentacles, 400-430 µm high and 280-300 µm wide, without ring and radial canals and with nematocysts on exumbrellar margin. Aboral tentacles gradually regressing with development of gonophores (fig. 4b).

Nematocysts (in µm)

Hydranth	
aboral and oral tentacles	
stenotele (small)	6.0-9.0 × 4.5-6.0
stenotele (large)	10.0-10.5 × 8.0-9.0
column - macrobasic eurytele	37.0-50.0 × 17.5-23.0

Remarks.— *Cladocoryne floccosa* was usually found on the thalli of *Sargassum* sp. and on the hydrocaulus of *Sertularia marginata* and *Aglaophenia latecarinata*. In the laboratory colonies developed gonophores in a few days; the aboral tentacles regressed, as described by Behner (1914), as the gonophores matured.

The macrobasic euryteles and the small stenoteles of the material from São Sebastião are smaller than those mentioned by Millard (1975). The macrobasic euryteles are scattered around the base of the aboral and oral tentacles, not in distinct aboral and oral groups as described by Bouillon (1974).

Known range.— There are no previous records from Brazil; this is the first record for the western South Atlantic. Elsewhere: circumtropical and circumsubtropical, occasionally in temperate waters (Millard, 1975).

Family Zancleidae Russell, 1953

Asyncoryne ryniensis Warren, 1908 (figs 4c-d)

Asyncoryne ryniensis Warren, 1908: 285; Bouillon, 1974: 114; Millard, 1975: 63; Millard & Bouillon, 1975: 2; Yamada & Kubota, 1987: 36; Hirohito, 1988: 51.

Material.— São Sebastião, Farol dos Moleques, 8.ii.1985, on rock, 8 m, without gonophores, AM21; 19.v.1987, hydroid without gonophores kept in the laboratory, AM1; 14.viii.1987, AM2; 25.ix.1987, hydroid with gonophores kept in the laboratory, AM4; 26.ix.1987, AM5; 5.x.1987, AM7; 28.ix.1987, newly released medusae reared in the laboratory from hydroid, RMNH Coel. 23106; 3.xii.1987, hydro-

id with gonophores kept in the laboratory and newly released medusae, AM810; 13.viii.1987, AM11; 23.x.1988, hydroid without gonophores kept in the laboratory, RMNH Coel. 23105; 30.vi.1988, 6 days old medusae, AM12; 11 days old medusae, AM13; 17 days old medusae, AM14; 21 days old medusae, AM15; 30.ix.1988, 8 days old medusae, AM17; 9 day-old-medusae, AM18.

Description.— Colonies up to 7.0 mm high, with hydranths on unbranched, short hydrocaulus, arising from a creeping hydrorhiza. Hydranth (fig. 4c) with single oral whorl of 4-6 capitate tentacles and 27-45 scattered, moniliform aboral tentacles. Oral tentacles about 0.4 mm long; aboral tentacles about 1.2 mm long. Medusae bud in clusters from proximal half of hydranth body, among aboral tentacles. Newly released medusae 530-577 µm high and 468-560 µm wide, with four radial canals, ring canal, and 2 opposite, perradial marginal bulbs with tentacles. Manubrium short, cylindrical. Marginal tentacles solid, bearing numerous spherical cnidophores on abaxial surface. Cnidophores stalked, about 21 µm in diameter and with 2-4 nematocysts. Nematocysts scattered over exumbrellar surface and concentrated in four perradial bulges above tentacular bulbs. Twenty- one days old medusae (fig. 4d) were 1440-1520 µm high and 1400-1430 µm wide, with developing gonads; shape of umbrella and of lateral bulges did not significantly change, except for the development of a small apical projection and thickening of the mesoglea.

Nematocysts (in µm)

Hydranth	
oral tentacles	
stenotele (large)	26.0-28.5 × 22.5-24.5
stenotele (small)	8.0-8.5 × 6.0-7.0
aboral tentacles	
stenotele (large)	25.5-29.0 × 23.0-25.0
stenotele (small)	9.0-10.0 × 6.5-7.0
hydrorhiza and polyp	
macrobasic eurytele	15.0-19.0 × 11.5-13.0
Medusa	
exumbrellar surface	
microbasic eurytele	7.0-8.0 × 6.0-7.0
exumbrellar bulges	
stenotele	16.0-22.0 × 13.0-17.5
tentacles	
macrobasic eurytele	9.0-10.0 × 6.0-7.0

Remarks.— I collected *A. ryniensis* only once: a small colony on a rock about 8 m deep. In August, 1987 another colony was accidentally brought to an aquarium and was kept for several months, producing numerous medusae. Rearing the medusae was not easy, principally because they had difficulty in capturing the small copepod nauplii offered as food. Only a few reached maturity.

Asyncoryne ryniensis was described from a small colony with immature gonophores (Warren, 1908). Bouillon (1974) confirmed Warren's supposition that the species has free medusae. Petersen (1990), however, quoting Bouillon (1974), considered the genus *Asyncoryne* as having four-tentacled medusae; however, there is no comment on the number of tentacles in Bouillon's (1974) brief description of the newly

released medusa. The cnidome of the species given by Bouillon (1974: 140) is in accordance with the present results.

Known range.— No previous records for Brazil are known, this is the first record from the Atlantic. Elsewhere: Indian Ocean - South Africa (Warren, 1908; Millard, 1975) and Seychelles (Bouillon, 1974; Millard & Bouillon, 1975); Pacific Ocean - Japan (Yamada & Kubota, 1987; Hirohito, 1988).

Zanclea costata Gegenbaur, 1856[1]
(figs 5a-c)

Zanclea costata; Russell, 1953: 99; Vannucci, 1957: 45; Navas-Pereira, 1981: 246.

Material.— São Sebastião, Praia do Zimbro, 28.iii.1989, on red algae, 1 m, with gonophores, AM173; 13.iv.1989, newly released medusae, AM174, 20.iv.1989, AM175; 28.iv.1989, AM176; 2.v.1989, hydroids with gonophores kept in the laboratory, AM177; 14.xii.1989, 15 days old medusae reared from hydroid kept in the laboratory, AM178; 44 days old medusae reared from hydroid kept in the laboratory, AM179; 48 days old medusae reared from hydroid kept in the laboratory, AM180; 50 days old medusae reared from hydroid kept in the laboratory, AM181; 52 days old medusae reared from hydroid kept in the laboratory, AM182.

Description.— Colonies with hydranths on unbranched hydrocaulus arising from a creeping hydrorhiza. Hydrocaulus smooth, corrugated or irregularly annulated, about 60-70 µm wide proximally and 90-110 µm distally, usually short but up to 1.6 mm high. Hydranth (fig. 5a) up to 2.6 mm high and 1.5 mm wide, with an oral whorl of 4-7 capitate tentacles and up to 45 scattered aboral capitate tentacles. Medusae bud in clusters from proximal half of hydranth body, among aboral tentacles. Newly released medusae (fig. 5b) 380-420 µm high and 380-512 µm wide, with 4 radial canals, ring canal, and 2 opposite perradial marginal bulbs with tentacles and 2 opposite, smaller non-tentacular bulbs. Manubrium short, smooth, with nematocysts around the mouth. Marginal tentacles solid, with numerous stalked cnidophores on abaxial surface. Cnidophores oval, 16-21 µm long, with 3-5 nematocysts. Exumbrella with 4 perradial nematocyst patches above the tentacular bulbs, of varied shape and size. Fifteen days old medusae reared in the laboratory about 1800 µm high and 1600 µm wide, with apical projection and interradial gonads. Some medusae lived for up to 53 days (fig. 5c) and did not change significantly in relation to the latter, except in the size.

Remarks.— Russell (1953), after finding planktonic medusae with primordia of the second pair of tentacles, considered *Zanclea implexa* a junior synonym of *Z. costata*. According to this author young medusae have two tentacles and mature medusae four. Cultivated medusae, however, never developed the second pair of tentacles (Browne, 1905; Russell & Rees, 1936; present results). For Weill (1934) the fact that there are immature medusae with four tentacles and smaller than mature medusae with two tentacles was a strong argument in favour of the taxonomic value of tenta-

[1] Dr Calder (pers. comm.) despite considering *Zanclea alba* from Bermuda conspecific with *Zanclea costata* (Calder, 1988: 69), now thinks that the two should be treated as different species until the taxonomic confusion on the issue is resolved.

cle number. On the other hand, Brinckmann-Voss (1970) asserted that "often one finds medusae from the plankton with maturing gonads but only two tentacles; these specimens will grow the second pair of tentacles after a few days". However, she did not explain if this conclusion is an inference based on specimens collected from the plankton in different stages of development or whether the four-tentacled stage was obtained after rearing immature medusae collected from the plankton.

Nematocysts	
Hydranth	
hydrocaulus and hydrorhiza	
macrobasic eurytele	17.0-18.0 × 8.0-9.5
tentacles and hydrorhiza	
stenotele (large)	10.0-12.0 × 9.0-9.5
stenotele (small)	6.0-6.5 × 4.5-5.0
Medusa	
tentacles	
macrobasic eurytele	8.5-10.0 × 4.5-5.0
manubrium and exumbrella	
stenotele	8.0-9.5 × 6.0-7.5

Acrochordium Meyen, 1834 and *Mnestra* Krohn, 1853 are senior synonyms of *Zanclea* Gebenbaur, 1856. Calder (1988), aiming at nomenclatural stability, proposed to validate the generic name *Zanclea*, but retained the species-group name *album*, used in the binomen *Acrochordium album*. However, the ICZN conserved the generic and specific names of *Zanclea costata* Gegenbaur, 1856, suppressing the generic names *Acrochordium* and *Mnestra*, for the purposes of the Principle of Priority (Opinion 1752).

Known range.— Previous records for Brazil are from Trindade Island and the Rio Grande do Sul and Espírito Santo States (Vannucci, 1957, medusa stage); this record from São Sebastião is the first of the hydroid stage from the Brazilian coast. Elsewhere: uncertain (see Petersen, 1990: 141).

Family Corynidae Johnston, 1836

Coryne producta (Wright, 1858)
(figs 5d-g)

Stauridium productum; Hartlaub, 1895: 142
Stauridiosarsia producta; Russell, 1953: 64; Kramp, 1961: 33.
Sarsia (Stauridiosarsia) producta; Mayer, 1910: 65; Vannucci, 1949: 223.
Sarsia producta; Brinckmann-Voss; 1970: 67.
Coryne producta; Petersen, 1990: 210.

Material.— São Sebastião, Ponta do Baleeiro, 28.ix.1987, on mussels and barnacles, 1 m, with gonophores, RMNH Coel. 23107; 10.iii.1992, on *Perna perna*, 0.5 m, with gonophores, AM112; 3.iv.1992, on *P. perna*, 0.5 m, without gonophores, MNRJ 2138.— Ponta do Jarobá, 20.xii.1991, on *P. perna*, 0.5 m, without gonophores; 6.i.1992, on *P. perna*, 0.5 m, with gonophores, part kept in the laboratory released medusae, AM113, RMNH Coel. 23177; 12.v.1992, on *P. perna* and barnacles, 1 m, with gonophores, AM117; 9.iii.1992, on *P. perna*, 1 m, with gonophores, AM115; 18.iii.1992, on *P. perna*, part kept in the

laboratory; 13.i.1992, AM896; 17.i.1992, AM897; 3.i.1993, AM898; 4.i.1993, AM899; 5.i.1993, AM900, newly released medusae; 18.i.1992, newly released medusae, RMNH Coel. 23108.

Description.— Colonies with hydranths on unbranched hydrocaulus arising from a creeping hydrorhiza. Hydrocaulus smooth or corrugated, short, 400-800 µm high and 200-240 µm wide. Hydranth (fig. 5d) milky white with reddish hypostome, up to 3.2 mm high and 0.15-0.2 mm wide. One oral whorl of usually 4, rarely 3 or 5, capitate tentacles, and 10-15 capitate tentacles scattered or arranged in 2 or 3 irregular verticils on aboral part of body. One or two medusae buds occur on hydranth among aboral capitate tentacles. Newly released medusa (fig. 5f) 800-950 µm high and 800-920 µm wide, 4 radial canals, ring canal, 4 reddish perradial tentacular bulbs with tentacles, and nematocysts scattered over exumbrella. Manubrium cylindrical, short, with nematocysts around the mouth. Tentacles solid, moniliform, with distal swelling. One abaxial dark-red ocellus on each tentacular bulb. Adult medusae (fig. 5g), reared in the laboratory, were 3.1 mm high and 2.5 mm wide, with gonads completely encircling the manubrium, and without exumbrellar nematocysts. Mature eggs 100-110 µm in diameter. The medusae started to pulsate hours before liberation. Cultivated at 24°C they reached maturity and spawned when 10-12 days old.

Nematocysts (in µm)

Hydranth	
capitate tentacles	
stenotele (large)	19.0-20.0 × 15.0-16.0
stenotele (small)	9.5-11.0 × 6.5-9.0
Medusa	
exumbrella	
stenotele	13.0-15.0 × 11.0-12.5
manubrium and tentacles	
stenotele	9.5-11.5 × 6.0-10.5
tentacles	
desmoneme	6.5-7.5 × 4.0- 5.0

Remarks.— *Coryne producta* may have an aboral whorl of three to four filiform tentacles. The specimens from São Sebastião do not normally have these tentacles although they developed in some hydranths of colonies kept in the laboratory. According to Brinckmann-Voss (1970), in *Dipurena ophiogaster* Haeckel, 1879, the "filiform tentacles are often absent or reduced ... always present in regenerated hydroids kept in culture". Brinckmann-Voss (1970) also reported a species of *Sarsia* (= *Coryne* sensu Petersen, 1990) which she suspected to be *C. producta*, although the hydranths did not have filiform tentacles. The aboral filiform tentacles may be either present or absent in other Corynidae, such as *Coryne filiformis* (Rees, 1936: 135) and *Sarsia striata* Edwards, 1983.

Medusae from São Sebastião do not have the apical canal described by some authors. According to Russell (1953) and Brinckmann-Voss (1970), the adult medusae of *C. producta* and *Sarsia eximia* are almost indistinguishable.

Known range.— Previous Brazilian records are from Santos (Vannucci, 1949). Elsewhere: Atlantic Ocean (Brinckmann-Voss, 1970).

Family Cladonematidae Gegenbaur, 1856

Cladonema radiatum Dujardin, 1843
(figs 4e-g)

For synonymy: see Calder (1988: 67).

Material.— São Sebastião, Ponta do Jarobá, 15.ii.1985, on *Strombus pugilis*, 2.5 m, without gonophores, AM80; 14.iv.1985, newly released medusae from hydroid kept in the laboratory, RMNH Coel. 23109; 12.xi.1985, AM61; 13.xi.1985, AM62; 28.xi.1985, hydroids kept in the laboratory, AM64; 16.i.1986, newly released medusae from hydroid kept in the laboratory, AM65; 25.vii.1986, 18 days old medusae reared from hydroid kept in the laboratory, AM66; 8.x.1986, hydroids without gonophores kept in the laboratory, AM68; 19.ii.1987, 45 days old medusae reared from hydroid kept in the laboratory, AM69-70; 10.iv.1987, hydroids with gonophores kept in the laboratory, AM71; 6.v.1987, 15 days old medusae reared from hydroid kept in the laboratory, AM72; 13.v.1987, hydroids without gonophores kept in the laboratory, AM73; 13.v.1987, newly released medusae, AM74; 11.iv.1988, 2 days old medusae reared from hydroid kept in the laboratory, AM76; 19.iv.1988, hydroid with gonophores kept in the laboratory, AM78; 18.v.1988, 41 days old medusae reared from hydroid kept in the laboratory, AM79.— Plymouth, 10.v.1898, 3 polyps without gonophores, E. T. Browne, BMNH 1948.10.1.1989.

Description.— Colonies with hydranths on hydrocaulus arising from a creeping hydrorhiza. Hydrocaulus smooth, 50-70 µm wide, of variable length. Hydranth (fig. 4e) up to 1.4 mm high, with 1 oral whorl of 4, seldom 5, capitate tentacles, and 1 aboral whorl of 4, seldom 3, filiform tentacles. Capitate tentacles 0.2-0.5 mm long, with a terminal knob of nematocysts about 70 µm wide. Filiform tentacles solid, without nematocysts, 100-320 µm long and tip slightly swollen. Medusae bud on short stalks arising between oral and aboral tentacles. Each hydranth with 1-9 buds in different stages of development. Newly released medusae (fig. 4g) 312-468 µm high and 420-546 µm wide, with ring canal, 8-11 radial canals (usually 9) and corresponding marginal bulbs and tentacles. Manubrium cylindrical, as long as bell margin. Each tentacular bulb with a reddish ocellus in abaxial position and 1 adaxial adhesive organ with nematocysts. Marginal tentacles moniliform, unbranched. Adult medusae (fig. 4f) with the same number of radial canals and tentacles, up to 2.1 mm high and 2.6 mm wide, 6 short oral capitate tentacles and 6 gonads around the manubrium; marginal tentacles much branched, up to 5 mm long, and with 7-8 adhesive organs in 2 opposite longitudinal rows along the adaxial surface of each bulb. Manubrium projecting out off bell margin for about $^1/_3$ of its length. At 27°C the gonads were well formed in about 10 days after liberation, and the umbrella attained about 3 mm in diameter; at 25°C this stage was reached in 14 to 16 days.

Remarks.— *Cladonema radiatum* from São Sebastião fits the descriptions of the polyp and newly released medusae given by Russell (1953), Brinckmann-Voss (1970) and Calder (1988). The nematocysts also agree with the data presented by Brinckmann & Petersen (1960). The well-developed medusae, however, differ from those described by Russell (1953) and Brinckmann-Voss (1970) in the following details: a) each tentacle has seven or eigth adhesive organs instead of two or three, b) the manubrium extends beyond the umbrellar margin, c) they bear six oral tentacles, instead of four or five, and d) the radial canals are seldom branched.

Nematocysts (in μm)

Hydranth	
oral tentacles and hydrorhiza	
stenotele (large)	17.0-19.0 × 10.0-11.0
stenotele (small)	12.0-14.0 × 7.0-8.0
hydrorhiza	
macrobasic mastigophore	11.0-16.0 × 4.0-5.0
Medusa	
oral and aboral tentacles	
stenotele (large)	15.0-16.0 × 9.0-10.0
stenotele (small)	9.0-12.0 × 6.5- 7.0
desmoneme	6.0- 7,5 × 3.0-4.0

Pires (1985) found a similar species in an aquarium of the Museu Nacional, Rio de Janeiro. The medusae greatly resembled those from São Sebastião, especially in number and disposition of the adhesive organs, and the number of oral tentacles and radial canals. The hydranth, though, in addition to the first four tentacles around the mouth, developed another four.

The nominal species of *Cladonema* are morphologically similar, several of them being considered conspecific recently (see Calder, 1988). *Cladonema radiatum* is a variable species, and it is possible that even the species considered valid today turn out to be conspecific. As Brinckmann-Voss (1970) already noted, *Cladonema* "is reported very often to be brought into the laboratories or aquaria 'accidentally'". In such cases the descriptions are based on clones and certainly do not reflect the natural variability of the species.

Known range.— The are no previous records from Brazil; this is the first record for the western South Atlantic. Elsewhere: Atlantic Ocean (Calder, 1988).

Family Tubulariidae Fleming, 1828

Ectopleura dumortierii (Van Beneden, 1844)

Ectopleura dumortieri; Migotto & da Silveira, 1987: 100; Petersen, 1990: 159 [incorrect subsequent spelling].

Material.— São Sebastião, Ponta do Jarobá, 14.iv.1987, with gonophores, released medusae in laboratory, AM908.— Ponta do Baleeiro, 18.viii.1988, on rock, 6 m, with gonophores, RMNH Coel. 23110.

Remarks.— In addition to the description of Migotto & da Silveira (1987) it must be noted that the hydrocaulus of the specimens studied here had the four entodermal canals diagnostic for the species, as also described by Petersen (1990). Therefore, the assumption of this author that the medusae from Brazil could belong to another species of *Ectopleura* seems unfounded.

Known range.— Previous records from Brazil are Cananéia (Vannucci, 1957) and São Sebastião (Migotto & da Silveira, 1987). Elsewhere: Atlantic Ocean, Mediterranean Sea, Japan (Petersen, 1990).

Ectopleura warreni (Ewer, 1953)

Ectopleura warreni; Migotto & da Silveira, 1987: 101.

Material.— São Sebastião, Ponta do Jarobá, 17.vii.1988, on nylon rope, with gonophores, AM909.— Petrobrás' Pier, 18.viii.1990, on *Perna perna*, 1 m, with gonophores, ACM, AM910.— Praia das Calhetas, 22.vii.1994, on rock, 4 m, with gonophores, RMNH Coel. 23111.

Known range.— Previous records from Brazil are Rio Grande do Sul, São Paulo and Rio de Janeiro States (Migotto & da Silveira, 1987) and Paraná State (Haddad, 1992). Elsewhere: Atlantic and Indian Oceans.

Zyzzyzus warreni Calder, 1988

Tubularia solitaria Warren, 1906: 83.
Zyzzyzus solitarius; Millard, 1975: 39; Migotto & da Silveira, 1987: 104.
Zyzzyzus warreni; Petersen, 1990: 182.

Material.— São Sebastião, Ponta do Jarobá, 10.vi.1989, on sponge, without gonophores, AM911; 6.x.1989, on ceramic settling-plates, with gonophores, AM912; 13.v.1991, on sponge, with gonophores, AM913; 18.ii.1992, on the hydrocaulus of *Eudendrium* sp., without gonophores, AM914.— Farol dos Moleques, on rock, 4 m, with gonophores, AM915.

Remarks.— Calder (1988) replaced the name *Tubularia solitaria* Warren, 1906, a junior primary homonym of *Tubularia solitaria* Rapp, 1829, by the new name *Zyzzyzus warreni* Calder, 1988. Petersen (1990) re-examined the Bermuda material identified by Calder as *Z. warreni* and concluded it belonged to a new species subsequently described as *Zyzzyzus calderi* Petersen, 1990.

The species of *Zyzzyzus* are almost exclusively epizoic on sponges. The growth of species of *Zyzzyzus* on the hydrocaulus of *Eudendrium* was also reported by Calder (1988) from the Bermudas.

Known range.— Previous records from Brazil are from São Sebastião (Migotto & da Silveira, 1987). Elsewhere: Atlantic Ocean and Sagami Bay (Petersen, 1990).

Family Pennariidae McCrady, 1859

Pennaria disticha Goldfuss, 1820

Pennaria disticha; Gibbons & Ryland, 1989: 389.
Halocordyle disticha; Calder, 1888: 56; da Silveira & Migotto, 1991.
For further synonymy: see Calder (1988).

Material.— São Sebastião, Praia do Zimbro, 18.x.1988, on rock, intertidal, without gonophores, AM118, RMNH Coel. 27317.— Ilha de Itaçucê, 5.iii.1988, on rock, 1-2 m, with gonophores, AM119, RMNH Coel. 27316.— Petrobrás' Pier, 18.vii.1990, on *Perna perna*, 1 m, with gonophores, JMO, AM120.— Ponta do Baleeiro, 12.ii.1985, AM121, RMNH Coel. 27319; 7.iii.1985, on rock, 1.5 m, with gonophores, AM122.— Ponta do Jarobá, 10.i.1984, on ceramic settling-plates, 2.5 m, with gonophores, FLS, MNRJ 554; 17.i.1984, on ceramic settling-plates, without gonophores, AM132; 17.iv.1984, on ceramic settling-plates, 2 m, with gonophores, FLS, AM133; 21.viii.1985, on rock, 1 m, without gono-

phores, AM123, RMNH Coel. 27318; 10.v.1986, on ceramic settling-plates, 2.5 m, with gonophores, AM134; 8.ix.1986, on nylon rope, with gonophores, FLS, AM135; 12.iv.1988, AM124; 14.iv.1988, on rock, 1 m, without gonophores, AM125.— Praia das Cigarras, 15.vi.1988, on rock, intertidal, without gonophores, AM126, RMNH Coel. 27320; 16.vi.1992, on rock, intertidal, with gonophores, AM127.— Praia de Toque-Toque Grande, 28.iv.1985, AM128, 6.iii.1988, on rock, 2 m, with gonophores, RMNH Coel. 23112; 7.iii.1988, newly released medusae, AM130.

Remarks.— *Pennaria disticha* is one of the most common hydroids in São Sebastião, mainly in shallow, exposed places on rocky surfaces subject to bi-directional currents. The nomenclature of the species was recently reviewed by Gibbons & Ryland (1989) who considered the name *Halocordyle* invalid.

Known range.— Previous records for Brazil are from Espírito Santo State (Souza, 1987), Trindade Island and Rio de Janeiro State (Vannucci, 1950, 1951a), Paraná and São Paulo States (Vannucci, 1954), Santa Catarina, São Paulo and Rio de Janeiro States (Migotto & da Silveira, 1987; da Silveira & Migotto, 1991), and Fernando de Noronha Archipelago (Eston et al., 1986; Pires et al., 1992). Elsewhere: circumtropical and circumsubtropical.

Family Lafoeidae Hincks, 1868

Hebella scandens (Bale, 1888)
(figs 6a-b)

Hebella scandens; Millard, 1975: 182.
Hebellopsis scandens; Calder, 1991: 43.
Hebellopsis sinuosa Vannucci, 1949: 237.
Hebellopsis besnardi Vannucci, 1950: 85.
Lafoea cylindrica; Jäderholm, 1903: 274.

Material.— Ilhabela, Praia de Garapocaia, 11.viii.1987, intertidal, with gonophores, AM417.— Praia do Veloso, 4.x.1988, intertidal, with gonophores, ROMIZ B1249.— São Sebastião, Praia do Zimbro, 23.ii.1988, intertidal, with gonophores, AM420.— Ponta do Araçá, 26.vi.1987, AM421; 14.iii.1988, intertidal, without gonophores, AM422; 16.iv.1988, intertidal, with gonophores, AM424, RMNH Coel. 27324; 21.iv.1988, on *Dynamena crisioides*, intertidal, with gonophores, AM425; 21.iv.1988, newly released medusae, AM907, RMNH Coel. 27323; 29.iv.1988, newly released medusae, AM426, RMNH Coel. 27321; 14.vii.1988, AM429; 29.vi.1988, AM428; 14.vii.1988, intertidal, without gonophores, AM423; 22.x.1988, intertidal, without gonophores, MNRJ 2156; 21.xi.1988, AM431; 14.i.1992, intertidal, with gonophores, AM432, RMNH Coel. 27325.— Praia das Cigarras, 10.viii.1987, intertidal, with gonophores, AM433; 3.xi.1987, AM434; 19.v.1988, intertidal, without gonophores, AM435; 10.ix.1988, intertidal, with gonophores, AM436; 10.x.1988, intertidal, with gonophores, RMNH Coel. 18810.— Praia de São Francisco, 10.viii.1987, intertidal, without gonophores, AM437, RMNH Coel. 27322. All material listed above on *Sertularia marginata*.— Ilha do Francês: microslide n° 48 labelled '*Hebellopsis sinuosa*', VC.— Guarujá: microslide n° 83, VC.— Itanhaém, microslide n° 83, VC.— Atlantide Exp. Stn 85, 5°37'N, 0°38'E, 30.i. 1946, on *Sertularella cylindritheca*, without gonophores, RMNH Coel. 1266.

Description.— Colony stolonal. Hydrorhiza growing on hydrocaulus and hydrocladia of sertulariid hydroids. Hydrotheca pedicellate, arising directly from hydrorhiza, usually between hydrothecae of the sertulariid substrate (fig. 6a). Hydrotheca cylindrical, with straight or curved walls, basal diaphragm and smooth perisarc. Rim circular and slightly everted. Hydranth white, 500-565 μm high and 32-48 μm wide

when fully extended, with 9-13 tentacles (190-250 μm long) and conical hypostome. Gonotheca on short pedicel, conical, with straight or waved walls. Newly released medusae 620-680 μm high and about 600 μm wide, with 4 radial canals, ring canal, 4 perradial marginal bulbs, 2 of which opposite and with long filiform tentacles, and 4 smaller interradial atentaculate bulbs. Manubrium short, without tentacles. Exumbrella with scattered nematocysts. Three days old medusae (fig. 6b) 860-900 μm high and 640-680 μm wide, with slightly bigger tentacular bulbs and ocelli at the base of the tentacles.

Nematocysts (in μm)

Hydranth	
microbasic mastigophore	5.0-7.5 × 2.0-3.0
Medusa	
exumbrella - microbasic mastigophore	11.0-13.5 × 5.0-6.0
tentacles - microbasic mastigophore	4.5-5.0 × 1.5-2.0

Measurements

Hydrotheca	
diameter at rim	144-180 μm
diameter at diaphragm	80-130 μm
depth	344-560 μm
diameter of pedicel	42-60 μm
length of pedicel	40-106 μm
Gonotheca	
width at rim	288-352 μm
length	880-960 μm
diameter of pedicel	56-64 μm
length of pedicel	72-80 μm

Remarks.— I agree with Calder (1991) in considering *Hebellopsis sinuosa* Vannucci, 1949 and *Hebellopsis besnardi* Vannucci, 1950 conspecific with *Hebella scandens*. After examining the material from VC identified as *H. scandens* (microslides n° 37 and 45 labelled '*Hebella scandens*'), I confirm Calder's (1991) assumption that Vannucci (1949, 1951a) identified this material incorrectly, and that it is similar to the newly described *Hebellopsis communis* Calder, 1991.

Specimens from São Sebastião generally live epizootically on *Sertularia marginata*, in a relatively fixed pattern: the hydrorhiza grows on the front of the hydrocaulus of its host and branches at the level of each hydrocladium. The hydrothecae are alternately placed left and right, in the space between each hydrothecal pair of the sertulariid, usually turned backwards. This type of growth gives the hydrotheca a characteristic "S" shape, while those that grow on the athecate part of the hydrocaulus of the sertulariid usually have straight walls.

Known range.— Previous records for Brazil are from Ilha do Francês (Vannucci, 1949, as *Hebellopsis sinuosa*), Banco Jaseur (Vannucci, 1950, as *Hebellopsis besnardi*), Cabo Frio (Jäderholm, 1903, as *Lafoea cylindrica*), and São Sebastião. Elsewhere: Atlantic, Indian and Pacific Oceans.

Scandia mutabilis (Ritchie, 1907)
(fig. 6c)

Scandia mutabilis; Millard, 1975: 188; Calder, 1991: 45.

Material.— Ilhabela, Praia do Veloso, 4.x.1987, on *Sertularia marginata*, intertidal, without gonophores.— Praia do Zimbro, 30.iv.1987, on *Dynamena crisioides*, intertidal, without gonophores.

Description.— Colony stolonal, growing on the hydrocaulus of other hydroids. Hydrotheca pedicellate, arising from the hydrorhiza. Pedicel annulated. Hydrotheca cylindrical, slightly wider towards the rim. Gonotheca not seen.

Measurements

Hydrotheca	
diameter at rim	600-710 µm
diameter at diaphragm	176-224 µm
depth	960-1340 µm
diameter of pedicel	128-160 µm
length of pedicel	224-448 µm

Remarks.— This is a provisional identification due to the scarcity of material and the lack of gonophores. The hydrothecae are similar to those described by Calder (1991), especially with regard to their cylindrical shape; however, they are not as long, conforming better with the measurements given by Millard (1975).

Known range.— There are no previous records from Brazil. This is the first record for the South Atlantic. Elsewhere: Atlantic, Indian and Pacific Oceans (Calder, 1991).

Family Haleciidae Hincks, 1868

Halecium bermudense Congdon, 1907
(figs 7a-c)

Halecium bermudense Congdon, 1907: 472; Leloup, 1937:1993; Vannucci, 1949: 227; Calder, 1991: 17.

Material.— São Sebastião, Praia do Cabelo Gordo, 21.i.1984, on ceramic settling-plates, without gonophores, AM332; 8.iv.1984, on ceramic settling-plates, with female gonophores, ROMIZ B1251; 30.iv.1984, on ceramic settling-plates, 2.5 m, without gonophores, AM334; 2.x.1984, 2.5 m, with female gonophores, FLS, AM335, RMNH Coel. 27331; 7.x.1985, on shipworm collecting device, without gonophores, AM336, RMNH Coel. 27330; 10.v.1986, on ceramic settling-plates, without gonophores, ROMIZ B1250.— Ponta do Baleeiro, 06.iii.1988, on rock, 5 m, without gonophores, RMNH Coel. 23113; 22.vii.1988, AM338, 10.ix.1989, on rock, 6 m, without gonophores, AM339; 20.xi.1989, on rock, 4 m, with male gonophores, AM340; 27.viii.1991, on rock, 1 m, with gonophores, AM341.— Ponta do Jarobá, 29.i.1987, on barnacles, without gonophores, AM342.— Bermuda, Harrington Sound, entrance to Old Mill Race, 5.xii.1989, 1 m, on bivalve, coll. & det. D.R. Calder.

Description.— Colonies erect, up to 13 cm high. Hydrocaulus usually polysiphonic, divided into internodes by transverse nodes, and with irregular branches

(fig. 7a). Each internode with sessile primary hydrotheca near its distal end. Branches arising just below the primary hydrotheca. Secondary hydrotheca pedicellate. Hydrotheca shallow, with delicate diaphragm and rim not everted. Hydranth milky white, long, without intertentacular web. Defensive, very long and thin polyps (fig. 7c) (nematophores), arising from a theca similar to a hydrotheca, present on branches and main stem, scarce, more abundant at the base of the colony. Female gonotheca (fig. 7b) ovoid, laterally compressed, with 2 modified polyps that gradually degenerate during development of the gonangium. Male gonotheca cone-shaped, elongated, arising from the hydrocaulus or within the hydrothecae.

Nematocysts (in µm)	
microbasic mastigophore	5.5-6.0 x 1.5-2.0
pseudostenotele	10.0-11.5 x 4.5-5.5
Measurements	
Internode	
length	290-600 µm
diameter at node	75-150 µm
Length of pedicel	95-150 µm
Hydrotheca	
length	17-37 µm
diameter at rim	122-145 µm
diameter at diaphragm	100-137 µm
Hydranth	
length	480-620 µm
number of tentacles	14-20
length of tentacles	250-260 µm
Female gonotheca	
length	1250-1620 µm
maximal width	620-810 µm
Male gonotheca	
length	850-1050 µm
maximal width	180-250 µm
Nematophore	
maximal length when fully extended	1320-1920 µm
diameter of column	36-80 µm
number of tentacles	13-16

Remarks.— The majority of the colonies examined have defensive polyps never described for the species. These nematophores usually perform contracting, coiling movements, reacting immediately to touch. They are not very common and even absent in some specimens, but the colony has to be anesthetized for them to be noticed. The best technique to find the nematophores is to examine living colonies under a stereomicroscope. This situation is similar to that described by Hirohito (1971) for the special dactylozooids seen in colonies of *Clathrozoon wilsoni* in vivo. I also observed nematophores in *H. bermudense* from Bermuda, in a density even greater than in colonies from São Sebastião.

The nematocysts agree in size and form with Calder's (1991) description. I identified as a pseudostenotele, however, the large nematocyst considered by this author to be a microbasic eurytele.

Known range.— Previous records for Brazil are from off Rio de Janeiro and Espírito Santos States (Vannucci, 1949). Elsewhere: Atlantic and Pacific Oceans (Calder, 1991).

Halecium delicatulum Coughtrey, 1876
(figs 6d-e)

Halecium delicatulum; Blanco, 1968: 203; Vervoort, 1972a: 27; 1972b: 341; Millard, 1975: 145; Rees & Vervoort, 1987: 25; Gili et al., 1989: 78; Genzano, 1990: 38.

Material.— São Sebastião, Costão Barequeçaba/Baleeiro, 17.iv.1991, on rock, intertidal, without gonophores, AM344.— Ponta do Baleeiro, 8.x.1987, on *Barbatia candida* and sponge, infralittoral, without gonophores, RMNH Coel. 18811; 11.v.1988, on rock, without gonophores, AM346; 23.vi.1988, on *B. candida*, 2-6 m, with gonophores, AM347; 22.vii.1988, on *Leptogorgia* sp., 6 m, without gonophores, AM348, RMNH Coel. 27327; 29.vii.1988, on rock, intertidal, with gonophores, AM349, RMNH Coel. 27326; 30.vii.1988, on rock, intertidal, with gonophores, MNRJ 2157; 23.ix.1988, on Bryozoa, intertidal, without gonophores, AM351; 20.xi.1989, on rock, 4 m, with gonophores, AM352; 27.viii.1991, on rock, 1 m, with gonophores, ROMIZ B1252.— Ponta do Jarobá, 7.vii.1988, on rock, infralittoral, without gonophores, AM353.— Antarctica, Palmer Archipelago, Stn AH 4-70, 25.i.1969, RMNH Coel. 7508.

Description.— Colony erect, monosiphonic, irregularly branched, up to 20 mm high; only some colonies had incipient polysiphonic hydrocauli. Hydrocaulus divided into internodes by transverse nodes, with an apophysis near the distal end supporting a hydrothecal pedicel (fig. 6d). Primary pedicel not separated from internode by node or constriction. Hydrotheca with strongly everted margin, and with a pseudodiaphragm that is usually thicker on the adcauline side. Secondary hydrotheca pedicellate, often without pseudodiaphragm. Male gonotheca (fig. 6e) oval, smooth, with a short stalk, arising from the base of the primary pedicels.

Nematocysts (in µm)	
large microbasic mastigophore	8.0-9.0 × 3.0-3.5
small microbasic mastigophore	6.0-6.5 × 2.0
Measurements	
Diameter of hydrorhiza	100-140 µm
Internode	
length	550-960 µm
diameter at node	90-120 µm
Primary pedicel	
length	150-220 µm
diameter	88-100 µm
Secondary pedicel	
length	150-340 µm
diameter	72-80 µm
Hydrotheca	

length	24-50 μm
diameter at rim	100-175 μm
diameter at diaphragm	92-127 μm
length from margin to pseudodiaphragm	58-87 μm
Hydranth	
length	480-690 μm
number of tentacles	16-18
Male gonotheca	
length	650-850 μm
diameter	320-400 μm

Remarks.— *Halecium delicatulum* has a wide geographical distribution, and ranges bathymetrically from intertidal to abyssal depths. In São Sebastião the species was found from the intertidal to about 6 m depth. I only found male colonies; one of them spawned in the laboratory (Ponta do Baleeiro, 20 January, 1989).

The present material is similar to the "small form" described by Millard (1975) and to that studied by Vervoort (1972b) and deposited in RMNH. According to Millard (1975), the form of growth is also varied: "from luxuriant, heavily-fascicled colonies to small unfascicled ones". The majority of my colonies were monosiphonic, only a few were partly polysiphonic.

Known range.— Previously recorded from Brazil by Souza (1987): Espírito Santo. Elsewhere: circumglobal in tropical and subtropical seas (Rees & Vervoort, 1987). From along the Atlantic coast of South America (Patagonia) it was recorded by Allman (1888, as *H. flexile*), Blanco (1968), Vervoort (1972a) and Genzano (1990).

Halecium dichotomum Allman, 1888
(figs 6f-g)

Halecium dichotomum Allman, 1888: 13; Millard, 1966: 466, 1975: 147.
Halecium corrugatissimum Trebilcock, 1928: 7; Ralph, 1958: 329.

Material.— São Sebastião, Ponta do Baleeiro, 11.v.1988, on rock and *Musculus lateralis*, 4 m, with gonophores, AM355, RMNH Coel. 27332; 18.v.1988, on rock, 6 m, with gonophores, AM356; 22.vii.1988, on rock, 6 m, without gonophores, AM357, RMNH Coel. 27333; 18.viii.1988, on rock, 4 m, without gonophores, MNRJ 2158; 8.xi.1988, on rock, 6 m, with gonophores, ROMIZ B1253; 15.vii.1988, on rock, intertidal, without gonophores, RMNH Coel. 18812.— Praia de São Francisco, 16.vi.1992, on *Galaxaura* sp., intertidal, with gonophores, AM361.— South Africa, Cape of Good Hope, 10-20 fms, H.M.S. Challenger, det. Allman, schizoholotype, BMNH 1888.11.13.9.

Description.— Colonies erect, monosiphonic or polysiphonic, up to 25 mm high. Hydrocaulus smooth or irregularly annulated, divided into internodes by distinct nodes. Internodes with a sessile primary hydrotheca at their distal end. Usually 2, occasionally 1-3, branches arising from a curved apophysis just below the primary hydrotheca, which give a characteristic dichotomous or trichotomous aspect to the colony (fig. 6f). Hydrotheca shallow and broad, with straight walls everted at the margin. A distinct ring of desmocytes is present just above the diaphragm. Hydranths long, milky white. Gonotheca annulated, arising from inside hydrothecae or in the position of a branch; female gonotheca (fig. 6g) with 2 lateral hydranths and c. 3 eggs.

Nematocysts (in µm)	
pseudostenotele	12.0-13.0 × 7.0-7.5
microbasic mastigophore	6.5-7.5 × 1.7-2.0
Measurements	
Internode	
length	400-600 µm
diameter at node	92-128 µm
Secondary pedicel	
length	180-330 µm
Hydrotheca	
length	25-50 µm
diameter at rim	138-207 µm
diameter at diaphragm	112-137 µm
Hydranth	
length	240-300 µm
diameter	96-198 µm
length of tentacle	276-312 µm
number of tentacles	18-28
Gonotheca	
length	620-880 µm
diameter	290-528 µm
number of annulations	10-17

Remarks.— According to the original description and to Ralph (1958), *Halecium corrugatissimum* Trebilcock, 1928, differs from *H. dichotomum* only by the strong annulations on the internodes of the latter. This character, however, is within the range of variation obtained by Millard (1966, 1975) for *H. dichotomum*.

Ralph (1958) also considered the possibility of *H. speciosum* Nutting, 1901 and *H. dichotomum* being conspecific. Nutting's (1901) description and illustrations are imprecise, and a well-founded conclusion depends on the study of type material (which, according to Dr F. M. Bayer, is not in the coelenterate collection of the NMNH as is most of the material from the Harriman Alaska Expedition).

In the material from West Africa provisionally identified as *Halecium* cf. *dichotomum* by Gili et al. (1989), the primary hydrothecae are not sessile, diverging from the definition of the species; the absence of gonothecae precludes further considerations on its status.

Known range.— This is the first record for the Brazilian coast. Elsewhere: Indian and Atlantic Oceans: South Africa (Allman, 1888; Millard, 1975), and New Zealand (Trebilcock, 1928; Ralph, 1958, as *H. corrugatissimum*).

Halecium dyssymetrum Billard, 1929
(figs 7d-f)

Halecium dyssymetrum Billard, 1929: 307; Leloup, 1935: 8; Millard, 1975: 150.
Endothecium dyssymetrum; Calder, 1991: 15.

Material.— São Sebastião, Praia das Cigarras, 3.vii.1987, on rock, intertidal, with gonophores, AM362; 10.viii.1987, on rock, intertidal, without gonophores, MNRJ 2162; 6.x.1987, on rock, intertidal, with

gonophores, ROMIZ B1254, RMNH Coel. 27329l; 3.xi.1987, on ascidians and sponges, intertidal, with gonophores, AM365; 10.ix.1988, on rock, intertidal, without gonophores, RMNH Coel. 18813; 24.ix.1988, on rock, intertidal, without gonophores, AM367, RMNH Coel. 27328; 16.vi.1992, on rock, intertidal, with gonophores, AM368; 4.x.1994, on rock, among *Sertularia marginata*, intertidal, with gonophores, AM903.— Praia de São Francisco, 10.ix.1988, on rock, intertidal, without gonophores, AM369; 24.x.1988, on rock, intertidal, without gonophores, AM370.— Ponta do Baleeiro, 24.iii.1994, 5 m, without gonophores, AM904.— Tortugas, Loggerhead Key, 22.vi.1925, small colonies without gonophores, P. Wagenaar Hummelinck, RMNH Coel. 270.

Description.— Colonies erect, up to 26 mm high. Hydrocaulus monosiphonic, geniculate, seldom branched, divided into internodes by distinct nodes. Internodes without annulations and with distal sessile primary hydrotheca. Hydrotheca alternately placed in one plane, deep, and without everted margin; diaphragm prominent, thicker on adcauline side (fig. 7d). Secondary or tertiary hydrothecae usually present, pedicellate, slightly larger than the primaries. Hydranths (fig. 7e) large, bright yellow, with conical hypostome and 22-26 tentacles with an intertentacular web at the base, comprising about 25% of the tentacle length. Gonotheca arising from within the hydrotheca; female gonotheca (fig. 7f) with a distal spherical acrocyst for the incubation of eggs through the planula stage. Planula 1500-1650 µm long and 240-300 µm wide, yellow.

Nematocysts (in µm)	
Tentacles	
microbasic mastigophores	6.0-7.0 × 2.0
Hydranth body, gonangium	
holotrichous isorhiza	20.0-23.0 × 6.5-8.5

Measurements	
Diameter of hydrorhiza	210-240 µm
Internode	
length	520-780 µm
diameter at node	80-190 µm
Primary hydrotheca	
length	105-190 µm
diameter at rim	200-290 µm
diameter at diaphragm	150-190 µm
Secondary and tertiary pedicels	
length	330-490 µm
Secondary hydrotheca	
length	110-215 µm
diameter at rim	225-320 µm
diameter at diaphragm	160-200 µm
Hydranth	
length	720-1020 µm
diameter	160-204 µm
length of tentacles	480-660 µm
Gonotheca	
length	1000-1700 µm
diameter	350-420 µm
diameter of acrocyst	740-760 µm

Remarks.— *Halecium dyssymetrum* is characterized by its thickened diaphragm. Leloup (1935) examined the holotype and did not observe significant differences with his material, except for the smaller size of the latter. After examination of the specimens deposited in RMNH by that author, I can confirm their similarity to the available descriptions of the species, contradicting the opinion of Vervoort (1968) that Leloup's specimens differ from the original description.

Calder (1991) was the first to describe the male gonotheca. The large nematocysts "of an undetermined category (possibly haplonemes)" from hydranth and gonophore mentioned by Calder (1991) were seen in exploded condition in fresh material and identified as holotrichous isorhizas; I also confirm Calder's supposition that the smaller nematocysts are microbasic mastigophores. The female gonotheca has remained undescribed in previous studies.

In São Sebastião the species was found intertidally, on horizontal rock walls, in protected places, and in the infralittoral (5 m) on rocks subject to sedimentation.

Known range.— There are no previous records from Brazil; this is the first record for the western South Atlantic. Elsewhere: Pacific (Billard, 1929), Indian (Millard, 1975) and Atlantic Oceans (Leloup, 1935; Millard, 1975).

Halecium tenellum Hincks, 1861
(fig. 6h)

For synonymy: see Cornelius (1975b: 409) and Calder (1991: 22).

Material.— São Sebastião, Farol dos Moleques, 14.v.87, on *Spondylus americanus*, with gonophores, AM371.— Ponta do Araçá, 16.iv.1988, on *Sargassum* sp., intertidal, with gonophores, AM372.— Ponta do Baleeiro, 14.v.87, on calcareous algae, intertidal, without gonophores, AM374; 8.x.1987, on *Lophogorgia punicea* and on calcareous algae, without gonophores, ROMIZ B1255; 27.iii.1992, on *Perna perna*, 1 m, without gonophores, AM376; 3.iv.1992, on *Schizoporella unicornis*, 2 m, without gonophores, AM377.— Ponta do Jarobá, 9.iii.1992, on *P. perna*, 1 m, without gonophores, RMNH Coel. 23114.— South Africa, Galathea Exp. Stn 188, off Durban, 2.ii.1951, 495 m, 1 microslide, without gonophores, RMNH Coel. 3756.

Description.— Colonies erect or stolonal, up to 2.0 mm high, monosiphonic, with irregular branching. Internodes with a distal sessile primary hydrotheca and a laterally curved apophysis supporting the next internode. Secondary hydrotheca pedicellate. Hydrotheca shallow, with distinct diaphragm, and everted margin. Hydranths long, milky white, without intertentacular web. Gonotheca arising from hydrorhiza; oval in the female, elongated in the male.

Nematocysts (in μm)

Pseudostenotele	12.0-13.0 × 5.0-7.0
Microbasic mastigophore	5.0- 6.0 × 1.5-2.0

Measurements

Diameter of hydrorhiza	80-92 μm
Internode	
length	380-800 μm

diameter at node	64-112 μm
Pedicel	
length	200-360 μm
diameter	96-104 μm
Hydrotheca	
length	25-60 μm
diameter at rim	108-232 μm
diameter at diaphragm	80-158 μm
Hydranth	
length	480-2360 μm
diameter	104-144 μm
number of tentacles	20-23
length of tentacles	280-480 μm
Male gonotheca	
length	400-560 μm
diameter	64- 80 μm
Female gonotheca	
length	700-720 μm
diameter	290-330 μm

Remarks.— Calder (1991), basing this opinion partly on Hamond (1957) and Cornelius (1975b), doubted many of the records of *H. tenellum*, especially those from high latitudes, as according to his opinion the species is largely temperate and tropical in its distribution. Since the majority of these records are based on infertile specimens and since juvenile colonies of many other species are similar to those of *H. tenellum*, this supposition may be correct.

The material from São Sebastião has larger hydrothecae than those described by Millard (1957), Vervoort (1959) and Calder (1991), but the features of the female gonotheca concur with the available descriptions (Millard, 1975, fig. 50F).

In São Sebastião *H. tenellum* formed small and delicate, inconspicuous colonies, growing on calcareous substrates (bivalve shells and encrusting algae). This report describes, for the first time, the hydranth and cnidome of the species.

Known range.— This is the first record from the Brazilian coast. Elsewhere: worldwide in temperate and tropical waters (Calder, 1991).

Ophiodissa spec.
(fig. 7g)

Material.— São Sebastião, Ponta do Jarobá, 9.vi.1988, on barnacles, 1 m, without gonophores, AM414; 19.vii.1988, on rock, without gonophores, AM415.— Praia de Toque-Toque Grande, 11.vii.1991, on *Perna perna*, intertidal, without gonophores, JMO, AM916.

Description.— Colonies stolonal, with upright pedicels arising from the hydrorhiza. Each pedicel has a distal primary hydrotheca. Hydrotheca shallow, with delicate diaphragm and everted margin. Nematothecae irregularly placed, either on the hydrorhiza or on the hydrothecal pedicel. Hydranth long, base of tentacles with large pseudostenotele nematocysts. Nematophores long, usually with distal end swollen, also with pseudostenoteles. Gonophores have not been observed.

Nematocysts (in μm)	
Base of tentacles and tip of nematophore	
pseudostenotele	24.0-26.0 × 10.5-11.5
Tentacles	
microbasic mastigophores	5.5-8.5 × 1.5-3.0

Measurements	
Diameter of hydrorhiza	48-55 μm
Pedicels	
length	280-440 μm
diameter	76-88 μm
Hydrotheca	
length	28-50 μm
diameter at rim	137-160 μm
diameter at diaphragm	104-120 μm
Nematotheca	
length	102-106 μm
diameter at rim	60-62 μm
Hydranth	
length	640-800 μm
number of tentacles	15-16
length of tentacles	200-250 μm

Remarks.— The measurements of this material are similar to those given by Cornelius (1975b) for *Ophiodissa mirabilis* (Hincks, 1866); the present colonies seem to be young as appears from their small size and lack of gonophores. According to Cornelius (1975b) established colonies are erect and polysiphonic, up to 50 mm high while younger colonies are stoloniferous.

Known range.— This is the first record of the genus for the Brazilian coast.

Nemalecium lighti (Hargitt, 1924)
(figs 7h-i)

For synonymy: see Calder (1991: 27).

Material.— Ilhabela, Ilha das Cabras, 17.xi.1987, on rock, 3 m, without gonophores, MNRJ 2163.— Parcel da Praia Grande, 14.iii.1988, on rock and *Schizoporella unicornis*, 2 m, without gonophores, AM380.— Praia de Siriúba, 11.viii.1987, on rock, intertidal, without gonophores, AM381.— São Sebastião, Farol dos Moleques, 14.v.87, on rock, without gonophores, ROMIZ B1256.— Praia do Cabelo Gordo, 10.i.1984, on ceramic settling-plates, with gonophores, AM383; 8.v.1984, AM384; 10.v.1986, AM385; 28.v.1986, on ceramic settling-plates, without gonophores, AM386; 8.ix.1986, on *Perna perna*, without gonophores, FLS, AM387; 8.vi.1989, AM388; 6.viii.1989, on *P. perna*, without gonophores, AM389; 6.x.1989, on ceramic settling-plates, 1.5 m, without gonophores, AM390, RMNH Coel. 27338.— Ponta do Araçá, 13.v.87, AM391; 5.x.1987, AM392, RMNH Coel. 27335; 14.iii.1988, on rock, intertidal, without gonophores, AM393.— Ponta do Baleeiro, 28.vi.1985, on ceramic settling-plates, without gonophores, RMR, AM394; 27.viii.1985, AM395; 8.x.1987, on rock, without gonophores, AM396; 8.iii.1988, on rock and *Mussis millia hispida*, 3 m, without gonophores, RMNH Coel. 18814; 11.v.1988, on rock, infralittoral, without gonophores, AM398, RMNH Coel. 27341; 20.xi.1989, on rock, 4 m, without gonophores, AM399, RMNH Coel. 27339; 15.iii.1990, on rock, with gonophores, AM400;

17.v.91, on rock, 0.5 m, with gonophores, AM401; 6.vi.1991, on rock, 1.5 m, without gonophores, AM402.— Ponta do Jarobá, 20.xii.1983, on rock, 1-2 m, without gonophores, AM403; 26.xi.1985, on sponge and Bryozoa, without gonophores, AM404, RMNH Coel. 27337; 14.ix.1986, AM405; 30.iv.1987, AM406, RMNH Coel. 27334; 7.vii.1988, on sponge and rock, 2 m, without gonophores, AM407; 22.xi.1988, on *M. hispida*, 2 m, without gonophores, AM408.— Praia das Cigarras, 28.iv.1987, AM409; 24.ix.1988, on rock, intertidal, without gonophores, AM410, RMNH Coel. 27336.— Praia de São Francisco, 8.viii.1987, on rock, intertidal, without gonophores, AM411; 19.v.1988, on rock, intertidal, with gonophores, AM412; 15.vii.1988, on rock, intertidal, without gonophores, AM413.— Curaçao, Netherlands Antilles, Piscadera Inner Bay, 10.xii.1973, several male colonies, RMNH Coel. 10396.

Description.— Colonies erect, up to 54 mm high. Hydrocaulus monosiphonic or polysiphonic, divided into internodes by transverse nodes, and with irregular branches (fig. 7h). Each internode with sessile primary hydrotheca near its distal end. Branches arising just below the primary hydrotheca. Secondary hydrotheca pedicellate. Hydrotheca shallow, with delicate diaphragm and rim not everted. Hydranth milky white, long, usually with 2 curved finger-like nematodactyls, armed with pseudostenoteles. Male gonothecae (fig.7i) cone-shaped, arising from the hydrocaulus or within the hydrothecae. Female gonothecae were not seen.

Nematocysts (in µm)	
Nematodactyl and coenosarc	
pseudostenotele	37.0-39.0 × 15.0-17.0
Tentacles	
microbasic mastigophore	7.0-8.0 × 2.0-2.5

Measurements	
Internode	
length	280-780 µm
diameter at node	95-175 µm
Secondary pedicel	
length	72-325 µm
diameter at base	96-144 µm
Hydrotheca	
length	17-52 µm
diameter at rim	122-205 µm
diameter at diaphragm	117-192 µm
Hydranth	
length	640-1360 µm
number of tentacles	21-24
length of tentacle	240-560 µm
Male gonotheca	
length	1300-1900 µm
diameter	385-800 µm

Remarks.— *Nemalecium lighti* is a common species in the region of São Sebastião, forming milky white, bushy colonies on moderately exposed rocks. The presence of nematodactyls defines the species, especially after the redescriptions of Bouillon (1986) and Calder (1991). However, I did not find the pseudodiaphragm observed by

Bouillon (1986) and I suppose Calder did not either, because it is not mentioned in his description. The measurements of the pseudostenoteles of the specimens from São Sebastião are closer to those given by Bouillon (1986) and Bouillon et al. (1986) (40 - 42 × 12 -14 μm) than to those described by Calder (1991) (26.6 - 29.1 × 12.3 - 13.3 μm).

Known range.— The are no previous records from Brazil, this being the first record for the South Atlantic. Elsewhere: Atlantic, Pacific and Indian Oceans (Calder, 1991).

Family Aglaopheniidae Marktanner-Turneretscher, 1890

Aglaophenia latecarinata Allman, 1877
(figs 8a-d)

Aglaophenia late-carinata Allman, 1877: 48, addenda; Vannucci Mendes, 1946: 586; Vannucci, 1949: 255; Millard, 1958: 213; Mayal, 1983: 8.
Aglaophenia latecarinata; Ritchie, 1909: 98; Millard, 1975: 409; Vervoort, 1968: 72; Pires et al., 1992: 5.

Material.— Ilhabela, Praia de Siriúba, 11.viii.1987, on algae and rocks, intertidal, with gonophores, ROMIZ B1260.— Praia de Garapocaia, 11.viii.1987, on *Sargassum* sp., intertidal, with gonophores, RMNH Coel. 18817.— Praia de Jabaquara, 11.viii.1987, intertidal, without gonophores, AM444, RMNH Coel. 23197.— Praia do Curral, 4.xi.1987, on *Sargassum* sp., 1-2 m, with gonophores, AM445.— Praia do Veloso, 4.xi.1987, on *Sargassum* sp., intertidal, with gonophores, AM446, RMNH Coel. 23178.— São Sebastião, Baía do Araçá, 2.x.1986, on *Sargassum* sp., intertidal, without gonophores, AM488; 26.viii.1988, on red algae, intertidal, without gonophores, AM449.— Praia do Zimbro, 18.xi.1986, AM450; 15.i.1987, AM451; 2.vi.1987, AM455; 22.iv.1988, on *Sargassum* sp., 1.5 m, with gonophores, JMO, AM456; 18.iii.1987, on *Sargassum* sp., intertidal, with gonophores, AM452; 30.iii.1987, AM453; 30.iv.1987, AM454; 18.vii.1988, AM457; 17.viii.1988, AM458; 8.ix.1988, on *Sargassum* sp., intertidal, without gonophores, AM459; 18.xi.1988, on *Sargassum* sp., intertidal, with gonophores, BMNH 1989.8.4.12..— Costão do Navio, 31.iii.1987, on red algae, 5-20 m, without gonophores, AM461.— Ponta do Araçá, 2.x.1986, on *Sargassum* sp., intertidal, with gonophores, MNRJ 2148; 16.x.1986, on *Sargassum* sp. and *Dictyota* sp., intertidal, without gonophores, AM463; 15.v.87, on red algae, intertidal, without gonophores, AM464; 26.vi.1987, AM465; 5.x.1987, on *Sargassum* sp., intertidal, without gonophores, AM466; 14.iii.1988, on *Sargassum* sp., intertidal, with gonophores, AM467; 15.iii.1988, on *Sargassum* sp. and red algae, intertidal, with gonophores, AM468; 16.iv.1988, AM469; 21.iv.1988, AM470; 15.v.1988, AM471; 14.vi.1988, on *Sargassum* sp., intertidal, with gonophores, AM472; 29.vi.1988, AM473; 14.vii.1988, AM474; 9.ix.1988, on *Sargassum* sp., intertidal, without gonophores, AM476; 26.viii.1988, on red algae, intertidal, without gonophores, AM475; 22.x.1988, on red algae, intertidal, with gonophores, AM477; 21.xi.1988, on *Sargassum* sp., intertidal, with gonophores, AM478.— Ponta do Jarobá, 16.vi.1986, on *Dictyota* sp., without gonophores, AM479; 18.vi.1986, on *Dictyota* sp., 1 m, without gonophores, AM480, RMNH Coel. 23179; 18.vi.1986, 2 m on rock, AM483, RMNH Coel. 23180; 4.vii.1986, on *Dictyopteris* sp., 1 m, without gonophores, AM481; 8.ix.1986, on rock, 0.5 m, without gonophores, FLS, AM482; 23.iv.1987, on rock, 2 m, with gonophores, AM484; 13.v.1987, on rock, 1 m, without gonophores, AM485, RMNH Coel. 23181; 13.vii.1987, intertidal, without gonophores, AM486, RMNH Coel. 23182; 29.vii.1987, on rock, 1.5 m, without gonophores, AM487; 11.iv.1988, on red algae, 2 m, without gonophores, AM488; 9.vi.1988, on *Galaxaura* sp., 2 m, without gonophores, AM489; 7.vii.1988, on rock, infralittoral, without gonophores, AM490.— Praia das Cigarras, 4.viii.1986, intertidal, with gonophores, AM492, RMNH Coel. 23184; 10.viii.1987, AM493; 3.xi.1987, on *Sargassum* sp., intertidal, with gonophores, AM494; 3.xi.1987, on red algae, intertidal, with gonophores, AM495; 4.viii.1988, on *Dictyopteris* sp., intertidal, with gonophores, AM496; 9.ix.1988, on sponge and red algae, 2 m, without gonophores, AM491, RMNH Coel. 23183; 24.ix.1988, on *Sargassum*

sp., intertidal, without gonophores, AM497, RMNH Coel. 23185.— Praia de São Francisco, 10.viii.1987, on red algae, intertidal, without gonophores, AM498, RMNH Coel. 23186.— Praia de Toque-Toque Grande, 1.ii.1987, on algae, with gonophores, AM498.— Gulf of Mexico, on *Sargassum*, 4 microslides, BMNH 1886.2.19.34.

Description.— Colonies erect, up to 38 mm high. Hydrocaulus monosiphonic, brown, unbranched. Unsegmented part of hydrocaulus with a series of frontal nematothecae, separated from rest of hydrocaulus by 2 deep oblique hinge-joints. Distal part of hydrocaulus divided into internodes by oblique nodes. Each internode with 1 hydrocladium and 3 nematothecae (2 laterals and 1 mesial) and a small pseudonematotheca (fig. 8a). Hydrocladia white, alternate and unbranched. Hydrotheca (fig. 8b) with 9 marginal cusps, an abcauline mesial carina extending from near the base of the mesial nematotheca to the margin, where it forms an external cusp, and a well developed intrathecal septum in lower third of hydrotheca; mesial nematotheca gutter-shaped, usually short, projecting up to level of intrathecal septum; lateral nematothecae reaching rim of hydrotheca (fig. 8c). Colonies dioecious, usually with 1-2 corbulae per stem, taking the place of first and second basalmost hydrocladia. Corbulae (fig. 8d) short, with alternate nematocladia bearing a series of nematothecae along the external rim; nematocladia not completely fused, with oval apertures between 2 nematothecae. Female corbulae with 4-6 gonangia, red when mature, seen by transparency through the nematocladia; the slow-moving planulae also red, settling in 3-4 days on the fronds of the brown alga *Sargassum* sp. in the laboratory. The primary hydranth is formed after about 24 hours. Hydranth white, column short (length: 220-240 µm; diameter: 50-60 µm), cylindrical, hypostome conical to dome-shaped, about 120 µm high; tentacles 144-240 µm long, with 14-18 axial endodermal cells each.

Remarks.— The species occurs mainly on the brown alga *Sargassum* sp., but it is also present on other macroalgae and on rocks. The colonies growing on rocks are usually longer and have shorter hydrocladia than the epiphytic forms; the stems of colonies on rocks are usually straight while those on algae are curved.

Aglaophenia latecarinata is easily distinguished from other species of the genus with eigth marginal cusps by the peculiar median hydrothecal carina. Vervoort (1968), however, remarks that in some specimens from the Caribbean the carina is scarcely visible. The material from São Sebastião also varies in the development of the marginal cusps and carina; the corbulae are smaller, with fewer nematocladia than those described by Millard (1975), which may reach a length of 10 mm and bear up to ten pairs of nematocladia.

Known range.— Previous records for Brazil are from São Paulo, Paraná, Rio de Janeiro and Espírito Santo States (Vannucci Mendes, 1946, Vannucci, 1949), as well as from Fernando de Noronha Archipelago (Pires et al., 1992). The record of Mayal (1983) from the coast of Pernambuco is doubtful since the hydrotheca is described as having only 6 marginal cusps and the carina is presumably absent since there is no reference to it. Elsewhere: tropical and subtropical regions of the Atlantic and Indian Oceans (Vervoort, 1968).

Nematocysts (in µm)	
Nematotheca	
microbasic mastigophore	28.0-37.5 × 3.5-5.0
Tentacles	
microbasic mastigophore	5.0-5.5 × 2.0

Measurements	
Diameter of hydrorhiza	130-150 µm
Hydrocaulus	
diameter at oblique node	170-240 µm
length of non-segmented part	1100-5000 µm
Hydrocladium	
length of the longest	700-2750 µm
number of hydrothecae of the longest	7-12
Hydrotheca	
length	175-290 µm
diameter at rim	162-212 µm
diameter at intrathecal septum	130-160 µm
Number of tentacles	8-10
Mesial nematotheca	
total length	175-242 µm
length of the free part	25-62 µm
diameter at rim	22-40 µm
Lateral nematotheca	
total length	62-137 µm
length of free part	25- 60 µm
diameter at rim	22-40 µm
Corbula	
length	1440-1980 µm
diameter	900-1080 µm
number of pairs of nematocladia	7-9
number of nematotheca in each nematocladium	9-10

Macrorhynchia philippina (Kirchenpauer, 1872)
(figs 8e-f)

Macrorhynchia philippina; Vannucci Mendes, 1946: 587; Vannucci, 1949: 256; Gravier, 1970; Calder, 1983: 23; Rees & Vervoort, 1987: 177; Ryland & Gibbons, 1991: 177.
Lytocarpus philippinus; Nutting, 1900: 122; Van Gemerden-Hoogeveen, 1965: 74; Vervoort, 1968:1988.

Material.— Ilhabela, Ilha das Cabras, 16.x.1959, on rock, with gonophores, E. Marcus coll., IBUSP.— Praia do Curral, 4.xi.1987, on rock, 1 m, without gonophores, MNRJ 2151.— São Sebastião, Costão Barequeçaba/Baleeiro, 24.iv.1986, on rock, 1.5 m, with gonophores, AM578.— Ilha de Itaçucê, 5.vi.1988, on rock, with gonophores, ROMIZ B1262.— Ponta do Baleeiro, 18.viii.1985, AM580; 8.x.1987, on rock, 6-8 m, without gonophores, AM582, RMNH Coel. 23187; 18.ii.1987, on rock, with gonophores, AM581.— Ponta do Jarobá, iv.1986; 13.vi.1986, AM584; 1.x.1986, AM586; 14.iv.1987, AM590; 7.vii.1988, AM594; 22.xi.1988, AM591; 11.iv.1988, on rock, 0.5 - 2.0 m, with gonophores, AM593; 29.viii.1986, on rock, 15 m, with gonophores, AM585; 3.xi.1986, AM587, RMNH Coel. 23188; 9.i.1987, AM588, RMNH Coel. 23189; 29.i.1987, AM589; 9.ix.1988, on rock, 2 m, with gonophores, AM595; 23.iv.1987, on rock, with gonophores, RMNH Coel. 18821; 23.iv.1987, newly released medu-

soids, AM901, RMNH Coel. 23190; 24.iv.1987, on rock, 1.5 m, with gonophores, BMNH 1989.8.4.13.28.— Praia de Toque-Toque Grande, 1.ii.1987, on rock, 3 m, with gonophores, AM597, RMNH Coel. 23191.— Saya de Malha Bank, Indian Ocean, 150 fms, J. S. Gardiner, BMNH 1923.2.15.170.

Description.— Colonies erect, up to 12 cm high. Main stem polysiphonic; terminal branches usually monosiphonic. Polysiphonic part composed of a main axial tube, with nematothecae and alternating hydrocladia, and peripheral tubes, without thecae and hydrocladia, that give rise to the lateral branches. Unsegmented basal part of lateral branches with a series of frontal nematothecae, separated from rest of hydrocaulus by a deep, oblique furrow, and followed by several internodes, divided by oblique nodes; each internode with a hydrocladium and 3 nematothecae (2 laterals and 1 mesial) and 1 pseudonematotheca. Hydrocladia alternate and unbranched. Hydrotheca with a well developed abcauline intrathecal septum and 3 marginal cusps, 2 large, triangular laterals, and a mesial cusp, smaller than the other two (fig. 8e). Mesial nematotheca long and tubular, with 2 apertures to the exterior, 1 terminal and 1 in the axil with the hydrothecal wall. Lateral nematotheca tubular, reaching slightly above hydrothecal rim. Phylactocarp with one normal basal hydrothecate internode followed by one in which the hydrotheca is replaced by a gonotheca; the

Nematocysts (in μm)

Whole colony, specially nematophores, except tentacles	
large microbasic mastigophore	97.0-101.0 × 7.0-7.5
median microbasic mastigophore	22.0- 30.0 × 4.0-5.5
Whole colony, specially on tentacles	
small microbasic mastigophore	5.0- 6.0 × 2.0
Medusoid - microbasic mastigophore	7.5- 9.0 × 2.0-2.5

Measurements

Length of the longest hydrocladium	3400-4750 μm
Number of hydrothecae of the longest hydrocladium	12-17
Hydrotheca	
length	237-275 μm
diameter at rim	150-172 μm
Number of tentacles	10
Mesial nematotheca	
total length	200-287 μm
length of the free part	75-125 μm
diameter at rim	12-22
Lateral nematotheca	
total length	127-162 μm
diameter at rim	15-22 μm
Gonotheca	
length	1000-1300 μm
diameter	700-1000 μm
Medusoid	
length	900-1100 μm
maximal diameter	540-700 μm
diameter at aperture	380-460 μm

rest of the branch is composed of a series of internodes, each with 2-3 nematothecae (fig. 8f). Gonotheca oval, laterally compressed, giving rise to medusoids. Medusoid without ring- and radial canals, mouth and tentacles; gametes spawned before or during the release of the medusoid.

Remarks.— *Macrorhynchia philippina* is easily distinguished from other species of the genus by the abcauline intrathecal septum, which protrudes into the interior of the hydrotheca, forming a distinct platform. The large microbasic mastigophores reported by Gravier (1970) are smaller than those studied here. *M. philippina* is one of the few Plumularioidea that release a medusoid; this phenomenon was first described by Gravier (1970).

Known range.— Previous records from Brazil are São Paulo and Rio de Janeiro States (Vannucci Mendes, 1946; Vannucci, 1949, 1954) and Bahia State (Nutting, 1900). Elsewhere: circumglobal in tropical and subtropical parts of all oceans (Rees & Vervoort, 1987).

Lytocarpia tridentata (Versluys, 1899)
(figs 8g-k)

Aglaophenia tridentata Versluys, 1899: 47; Stechow, 1923: 252; Picard, 1951: 114; Vervoort, 1968: 76.
Aglaophenia contorta Nutting, 1900: 96; Bedot, 1921: 339; Vannucci Mendes, 1946: 583; Vannucci, 1951a: 1991.
Thecocarpus contorta; Totton, 1926.

Material.— Ilhabela, Ilha das Cabras, 17.xi.1987, on rock, 3 m, with gonophores, AM563.— Praia do Curral, 4.xi.1987, on rock, 2-4 m, with gonophores, AM564.— São Sebastião, Praia do Cabelo Gordo, 29.vii.1988, on rock, intertidal, without gonophores, AM565.— Costão do Navio, 31.iii.1987, on rock, 5-20 m, with gonophores, AM566, RMNH Coel. 23192.— Ponta do Araçá, 16.x.1986, on rock, intertidal, with gonophores, AM567, RMNH Coel. 23193; 5.x.1987, on rock, intertidal, without gonophores, AM568, RMNH Coel. 23194.— Ponta do Baleeiro, 8.x.1987, AM569; 22.vii.1988, on rock, 6-8 m, without gonophores, AM670; 8.ix.1988, on rock, 6 m, with gonophores, BMNH 1989.8.4.14; 8.xi.1988, on rock, 6 m, with gonophores, RMNH Coel. 18816, ROMIZ B1261.— Ponta do Jarobá, 4.vii.1986, on rock, with gonophores, AM572, RMNH Coel. 23195; 4.vii.1986, on rock, without gonophores, AM573.— Praia das Cigarras, 10.viii.1987, on rock, intertidal, with gonophores, MNRJ 2165.— Praia de Toque-Toque Grande, 1.ii.1987, on rock, without gonophores, AM575, RMNH Coel. 23196.— off Rio de Janeiro, 2 colonies with gonophores, J. S. Gardiner, BMNH 1889.4.20.7.

Description.— Colonies erect, up to 18 cm high. Hydrocaulus monosiphonic, yellow to light brown, unbranched. Unsegmented part of hydrocaulus without hydrothecae and nematothecae, separated from rest of hydrocaulus by 2 deep oblique hinge-joints. Distal part of hydrocaulus divided by transverse nodes, sometimes indistinct, into regular internodes. Each internode with 1 hydrocladium, 3 nematothecae (2 axillaries and 1 inferior) and a small pseudonematotheca on the frontal side (fig. 8g). Hydrocladia white, alternate and unbranched, divided into internodes by oblique nodes. Each hydrocladial internode with 1 hydrotheca and 3 nematothecae: 2 laterals and 1 mesial (fig. 8i). Hydrotheca (fig. 8h) with 2 shallow lateral cusps, 1 prominent and strong median cusp, and a short intrathecal septum. Mesial nematotheca gutter-shaped, not reaching hydrothecal margin; lateral nematothecae curved and projecting above rim of hydrotheca. Colonies dioecious; up to 4 corbulae

per stem, each with 11-20 pairs of ribs. Basal part of ribs (figs 8j-k) with reduced hydrotheca and 5 nematothecae. Female corbulae with fused nematocladia, nematothecae only on distal margin. Male corbulae not completely fused; nematocladia narrow, with nematothecae on both margins.

Nematocysts (in μm)

Nematotheca	
large microbasic mastigophore	28.5-35.0 × 4.0-5.0
Tentacles	
small microbasic mastigophore	5.0- 6.0 × 2.0-2.5

Measurements	
Diameter of hydrorhiza	220-240 μm
Hydrocaulus	
diameter at oblique node	- μm
length of non-segmented part	5000-16000 μm
Hydrocladium	
length of the longest	5200-6800 μm
number of hydrothecae of the longest	17-24
Hydrotheca	
length	262-342 μm
diameter at rim	150-178 μm
diameter at intrathecal septum	122-152 μm
Number of tentacles	10
Mesial nematotheca	
total length	225-300 μm
length of the free part	80-132 μm
diameter at rim	20-37 μm
Lateral nematotheca	
total length	95-152 μm
length of free part	25-55 μm
diameter at rim	22-37 μm
Corbula	
length	4800-8000 μm
diameter	1100-1600 μm
number of pairs of nematocladia	7-13

Remarks.— In the original description, Versluys (1899) provisionally referred the species to the genus *Aglaophenia* because corbulae were lacking. Vervoort (1968), despite noticing the reduced hydrotheca on the nematocladia, diagnostic of the genus *Thecocarpus* Nutting, 1900, kept the species in the genus *Aglaophenia*. *Aglaophenia contorta* Nutting, 1900, considered a junior synonym of *A. tridentata* by Stechow (1923), had already been referred to *Thecocarpus* by Totton (1926), the first to examine specimens with corbulae. Later on, Rees & Vervoort (1987) validated the conclusion of Stechow (1923) that *Lytocarpia* Kirchenpauer, 1872, has precedence over *Thecocarpus*.

Known range.— Previous records for Brazil are from Santo Amaro Island, São Sebastião Island (Vannucci Mendes, 1946) and Rio de Janeiro (Totton, 1926). Elsewhere: Atlantic Ocean.

Family Halopteridídae Millard, 1962

Halopteris constricta Totton, 1930
(figs 9a-c)

Halopteris constricta Totton, 1930: 217; Ralph, 1961b: 43; Blanco, 1973: 76; Vervoort & Vasseur, 1977: 68; Park, 1990: 83-84, fig. 5.

Material.— São Sebastião, Praia do Cabelo Gordo, 3.xi.1992, on *Codium decorticatum*, 1.5 m, with gonophores, ROMIZ B1257, MNRJ 2169.— Praia das Cigarras, 24.ix.1988, on rock, intertidal, without gonophores, AM502, RMNH Coel. 27402.— Ponta do Jarobá, 3.xi.1992, on *C. decorticatum* and test panels, with gonophores, RMNH Coel. 18815.

Description.— Colony erect, up to 15 mm high. Hydrocaulus monosiphonic, white, unbranched. Hydrorhiza with tubular nematothecae. Unsegmented part of hydrocaulus without hydrocladia and with a series of frontal nematothecae, separated from rest of hydrocaulus by a deep oblique hinge-joint. Distal to this, hydrocaulus divided by nodes into athecate and thecate internodes (fig. 9a). Thecate internode with proximal oblique node and distal transverse node, followed by 2 athecate internodes, the first short, without nematotheca and the second long, with 1-4 frontal nematothecae (usually 3 in basal internodes and 1-2 in distal ones). Thecate internode with 1 hydrotheca, 1 lateral apophysis, and 3 nematothecae: 2 laterals and 1 mesial (fig. 9b). First thecate internode usually with opposite hydrocladia, remaining hydrocladia alternate. All hydrocladia unbranched, with 1-2 short basal, athecate internodes (short intersegments) without nematothecae, followed by 1 long athecate internode (long intersegment) usually with 2 nematothecae (rarely 1), and 1 thecate internode similar to those of the main stem. Next internodes with pattern of the main stem, but long intersegments usually with only a single nematotheca; division into short and long intersegments not always distinct. Hydrotheca slightly broader than deep, with everted rim. Lateral nematothecae on short apophyses, projecting up to level of hydrothecal rim. All nematothecae 2-chambered and apparently movable, except those on hydrorhiza and the mesial nematotheca of thecate internodes. Gonotheca (fig. 9c) on hydrocladia or main stem, placed on pedicel with 2 segments, arising just below hydrotheca, obovate, truncated on distal end and with 2 basal nematothecae; aperture usually upright.

Nematocysts (in µm)

pseudostenotele	20.0-22.0 × 8.0-9.0
microbasic mastigophore	6.0- 6.5 × 2.0

Measurements

Hydrorhiza	
diameter	80-88 µm
nematothecae, length	90-110 µm
nematothecae, diameter at rim	38-40 µm
Hydrocaulus	
diameter at oblique node	80-104 µm

length non segmented part	1400-2400 µm
length thecate internodes	336-608 µm
diameter thecate internodes	80-100 µm
length long intersegments	296-650 µm
diameter long intersegments	56-120 µm
nematothecae long intersegments	
length	66-80 µm
diameter at rim	34-46 µm
Hydrocladium	
length of the longest	600-2200 µm
number of hydrothecae of the longest	3-4
length of the basal athecate internode	288-384 µm
diameter of the basal athecate internode	40-56 µm
length long intersegments	216-288 µm
length of the thecate internode	296-360 µm
diameter of the thecate internode	56-64 µm
Hydrotheca	
length	140-160 µm
diameter at rim	144-177 µm
Mesial nematotheca	
length	62-70 µm
diameter at rim	40-52 µm
Lateral nematotheca	
length	70-80 µm
diameter at rim	40-52 µm
Gonotheca	
length	520-560 µm
diameter	176-208 µm

Remarks.— Vervoort & Vasseur (1977) examined the holotype (BMNH) and confirmed the absence of an axillary nematotheca in the axil of the hydrocladia, as described by Ralph (1961b) for New Zealand specimens. Besides Ralph (1961b), Blanco (1973) also reports colonies with secondary hydrocladia. The present material agrees with that described by Ralph (1961b) in the presence of opposite hydrocladia on the basal internode, a feature not reported by other authors. Although Totton (1930), Ralph (1961b) and Park (1990) described only one nematotheca on the long intersegments, this number is quite variable. Blanco (1973) reports one or two, and Vervoort & Vasseur (1977), "invariably two", on the stem or in the hydrocladia. The present material usually has two, but occasionally as many as four of those nematothecae.

Known range.— This is the first record from the Brazilian coast. Elsewhere: Atlantic and Indian Oceans. In the South Atlantic it was first recorded for Argentina (Golfo San Matias) by Blanco (1973).

Halopteris diaphana (Heller, 1868)
(figs 9d-e)

Antenella diaphana diaphana; Van Gemerden-Hoogeveen, 1965: 49 [in part].
Halopteris diaphana; Ryland & Gibbons, 1991: 528; Pires et al., 1992: 5.

Halopteris diaphana diaphana; Vervoort, 1968: 58.
Plumularia alternata Nutting, 1900: 62.
Schizotricha diaphana; Vannucci, 1949: 251.
Schizotricha billardi Vannucci, 1951a: 88; 1954: 118.
Thecocaulus diaphanus; Vannucci Mendes, 1946: 576.

Material.— Ilhabela, Praia de Siriúba, 11.viii.1987, on rock, intertidal, without gonophores, AM503, RMNH Coel. 27401.— Praia de Garapocaia, 11.viii.1987, on rock, intertidal, without gonophores, AM504.— São Sebastião, Baía do Araçá, 29.vi.1988, AM505; 14.vii.1988, on rock, intertidal, without gonophores, AM506.— Ponta do Araçá, 13.v.1987, on rock, intertidal, without gonophores, MNRJ 2145; 5.x.1987, on rock and algae, intertidal, without gonophores, AM508, RMNH Coel. 27396; 16.iv.1988, on *Sargassum* sp., intertidal, without gonophores, AM509; 14.vii.1988, AM510; 22.x.1988, on rock, intertidal, without gonophores, AM511.— Ponta do Baleeiro, 28.vii.1987, on rock, intertidal, without gonophores, AM512; 24.iii.1994, on rock, 4 m, without gonophores, AM906.— Praia das Cigarras, 10.viii.1987, on rock, intertidal, without gonophores, ROMIZ B1258; 3.xi.1987, AM514; 22.xi.1988, on rock, intertidal, without gonophores, AM515; 12.viii.1991, on rock, intertidal, with gonophores, RMNH Coel. 18818 (see edit. note on p. 7).— Praia de São Francisco, 8.viii.1987, AM517; 15.vii.1988, AM521; 27.viii.1988, AM522; 10.viii.1987, on rock and red algae, intertidal, with gonophores, AM518, RMNH Coel 27400; 10.ix.1988, on rock, intertidal, without gonophores, AM523; 19.v.1988, AM519; 30.vi.1988, on rock, intertidal, with gonophores, AM520, RMNH Coel. 27394; 16.vi.1992, on *Galaxaura* sp., intertidal, with gonophores, AM524 (see edit. note on p. 7).

Description.— Colony erect, up to 23 mm high. Hydrocaulus monosiphonic, white, unbranched. Basal part of hydrocaulus without hydrocladia and with a series of frontal nematothecae, separated from rest of hydrocaulus by a deep, oblique hinge-joint. Distal to this hinge-joint, hydrocaulus divided by nodes into regular, thecate internodes; proximal node oblique and distal transverse. Cauline internode (fig. 9d) with 1 hydrotheca, 1 lateral apophysis, and 4-6 nematothecae: 2 laterals, 1 mesial, 1-2 median superior, and 1 in axil of hydrocladium; this last nematotheca may be lacking. Sometimes, specially in more distal parts of hydrocaulus, the distal part of thecate internodes split off by development of a transverse or slightly oblique node, forming a short athecate internode, which carries the superior nematotheca. Hydrocladia alternate and unbranched, with one short basal athecate internode without nematotheca, followed by a long athecate internode (intersegment) with 1 nematotheca and a thecate internode, placed alternately. Thecate internode with 1 hydrotheca and 3 nematothecae: 2 laterals and 1 mesial. Hydrotheca as broad as deep; rim slightly everted. All nematothecae 2-chambered. Lateral nematothecae immovable, on short apophysis, not projecting above the hydrothecal margin; median inferior nematotheca immovable, not reaching base of hydrotheca. Hydranth transparently white with 16-18 tentacles (180-240 µm long); hypostome conical, bright milky white. Gonotheca (fig. 9e) on hydrocladia or main stem, just below hydrotheca, cylindrical, truncated at the distal end, with 2-3 basal nematothecae.

Nematocysts (in µm)

Pseudostenotele	19.0-22.0 × 6.0-8.5
Microbasic mastigophore	5.5- 7.0 × 1.5-2.5

Measurements

Diameter of hydrorhiza	190-225 µm

Hydrocaulus	
diameter at oblique node	180-190 µm
length non segmented part	4550-5000 µm
length internodes	420-600 µm
diameter internodes	110-165 µm
Hydrocladium	
length of the basal athecate internode	300-330 µm
diameter of the basal athecate internode	90-100 µm
length intersegments	200-290 µm
diameter intersegments	90-100 µm
length of the thecate internode	320-360 µm
diameter of the thecate internode	80-90 µm
Hydrotheca	
length	222-258 µm
diameter at rim	222-258 µm
Mesial nematotheca	
length	62-75 µm
diameter at rim	45-60 µm
Lateral nematotheca	
length	92-100 µm
diameter at rim	70-77 µm
Gonotheca	
length	460-800 µm
diameter	185-350 µm

Remarks.— *Halopteris diaphana* is a variable species and is frequently confused with several similar species. It lacks the superior reduced nematotheca behind the hydrotheca, as found in *H. polymorpha* and *H. buskii*. The specimens from Tortugas recorded by Van Gemerden-Hoogeveen (1965: 51) seem to be incorrectly identified, as they differ from any known description of the species by the presence of a "small, reduced but bithalamic nematotheca" in the axil behind the hydrotheca (in this aspect similar to *H. buskii*) and the presence of athecate internodes with four to six nematothecae alternating with the hydrothecate internodes of the stem.

The species is said to have branched and unbranched forms (Leloup, 1935, Vervoort, 1959). The description of Vervoort (1959) of the unbranched form, as *Antennella diaphana* f. *siliquosa*, however, has deviating features (lateral nematothecae with poorly developed chambers, athecate internode with two nematothecae instead of one, and gonotheca with two to four nematothecae) and may not be referable to *H. diaphana*.

The present material agrees with the description of Vervoort (1968), even in the number of superior nematothecae (up to three) of the cauline hydrothecae, one of those located in the axil of the apophysis. Ryland & Gibbons (1991) report two superior nematothecae on the stem internodes, remarking on the absence of this axillary nematotheca.

Vannucci (1949) and Ryland & Gibbons (1991) report secondary hydrocladia, but their occurrence is rare.

In São Sebastião, *H. diaphana* is very common on algae and rocks, usually in shallower places than the closely resembling *H. buskii*, a species also common in the region.

Known range.— Previous records from Brazil include Santos, São Sebastião Island, Rio de Janeiro (Vannucci Mendes, 1946; Vannucci, 1949, 1950, 1951a) and Fernando de Noronha Archipelago (Vannucci, 1954; Pires et al., 1992). Elsewhere: widely distributed in tropical and temperate waters (Ryland & Gibbons, 1991).

Halopteris buskii (Bale, 1884)
(figs 9f-h)

Halopteris buskii; Rees & Vervoort, 1987: 119; Ryland & Gibbons, 1991: 527.
Heterotheca buskii; Hirohito, 1974: 30.

Material.— Ilhabela, Parcel da Praia Grande, 3.iii.1987, on rock, 3 m, without gonophores, AM525.— Praia do Curral, 4.xi.1988, on rock, 1-2 m, with gonophores, AM526.— São Sebastião, Costão do Navio, 31.iii.1987, on rock, 5-20 m, with gonophores, AM527.— Farol dos Moleques, 14.v.1987, on rock, without gonophores, AM528.— Ponta do Baleeiro, 8.x.1987, on rock, 6-8m, with gonophores, AM529 (see edit. note on p. 7); 8.iii.1988, on rock, 5 m, without gonophores, AM530; 11.v.1988, on rock, infralittoral, with gonophores, RMNH Coel. 18819 [labelled *Halopteris polymorpha* (Billard, 1913)]; 23.vi.1988, AM532; 22.vii.1988, on rock, 6 m, without gonophores, AM533, RMNH Coel 27399; 18.viii.1988, on rock, 6 m, with gonophores, ROMIZ B1259, MNRJ 2142; 8.xi.1988, on rock, 6 m, with gonophores, AM535; 27.viii.1991, on calcareous algae, intertidal, without gonophores, AM536.— Ponta do Jarobá, 4.vii.1986, AM537; 16.vii.1986, 2 m, on rock, with gonophores, AM538, RMNH Coel. 27398; 29.viii.1986, on rock, 1.5 m, with gonophores, AM539, RMNH Coel. 27395; 23.iv.1987, on rock and algae, with gonophores, AM540, RMNH Coel. 27397; 13.v.1987, on rock, 1 m, without gonophores, AM541; 11.iv.1988, on rock and algae, 1-2 m, with gonophores, AM542; 22.xi.1988, on *Galaxaura* sp. and rock, 1.5 m, with gonophores, released planulae in the laboratory, AM543; 28.i.1992, on rock, 1.5 m, with gonophores, AM544.— Microslide n° 185 labelled *'Schizotricha billardi,* I. S. Sebastião', VC.

Description.— Colony erect, up to 30 mm high. Hydrocaulus yellowish, monosiphonic, unbranched. Proximal part of hydrocaulus without hydrocladia and with a series of frontal nematothecae, separated from rest of hydrocaulus by a deep, oblique hinge-joint. Distal to this hinge-joint, hydrocaulus divided by nodes into thecate internodes; proximal node oblique, distal transverse. Internode with 1 hydrotheca, 1 lateral apophysis, and 5-7 nematothecae: 2 laterals, 1 mesial and 2-4 superiors (fig. 9f). Hydrocladia unbranched and alternate, except in first internode, which usually bears 2 opposite hydrocladia; with 1-2 short basal athecate internodes without nematotheca followed by an athecate internode (intersegment) with 1 nematotheca, and a thecate internode, placed alternately. Node between thecate and athecate internodes sometimes not well marked. Thecate internode with 1 hydrotheca and 3-5 two-chambered nematothecae: 2 laterals and 1 mesial, and 1-2 reduced median superiors in axil immediately behind free adcauline wall of hydrotheca. Hydrotheca (fig. 9g) deeper than broad, with straight walls. Lateral nematothecae on long apophyses, projecting beyond level of hydrothecal margin, movable, with shallow distal chamber; mesial nematotheca not reaching base of hydrotheca, immovable, short. Median superior nematotheca small, sessile, distinction between chambers indistinct. Hydranth white, transparent, with conical hypostome and 16-17 tentacles (500-720 μm long). Gonotheca (fig. 9h) on hydrocladia or main stem, just below hydrotheca, cylindrical, truncated at distal end, with 1-3 basal nematothecae. Planulae released in the laboratory yellowish, moving slowly near bottom of culture dishes; some settled and developed primary polyps.

Nematocysts (in µm)	
Pseudostenotele	18.0-21.5 × 7.5-9.0
Microbasic mastigophore	6.0- 7.0 × 2.0
Measurements	
Hydrorhiza diameter	155-185 µm
Hydrocaulus	
diameter at oblique node	140-220 µm
length non-segmented part	9500-17000 µm
length thecate internodes	325-600 µm
diameter thecate internodes	110-180 µm
Hydrocladium	
length of longest	2175-3500 µm
number of hydrothecae of the longest	4-7
length of basal athecate internode	137-320 µm
diameter of basal athecate internode	50-77 µm
length intersegments	150-200 µm
diameter intersegments	50-70 µm
length of thecate internode	240-440 µm
diameter of thecate internode	52-75 µm
Hydrotheca	
length	162-237 µm
diameter at rim	180-205 µm
Mesial nematotheca	
length	50-87 µm
diameter at rim	35-60 µm
Lateral nematotheca	
length	75-125 µm
diameter at rim	50-82 µm
Gonotheca	
length	800-910 µm
diameter	310-450 µm

Remarks.— The material from São Sebastião generally agrees with the descriptions of Hirohito (1974), Rees & Vervoort (1987) and Ryland & Gibbons (1991), though it has slender stems and hydrocladia. One of the most common variations in my material is the frequent fusion of the intersegment with the thecate internode of the hydrocladia.

The specimens from French Polynesia described by Vervoort & Vasseur (1977) basically differ from existing descriptions of the species in two aspects: the hydrothecae have an abcauline marginal cusp, and the apophyses and lateral nematothecae are long and slender, the latter projecting a considerable distance beyond the rim of the hydrotheca.

Halopteris polymorpha (Billard, 1913) is similar to *H. buskii* in the shape of colony and hydrotheca, the number and distribution of nematothecae, and the arrangement of internodes; in the latter, however, the reduced nematotheca in the axil of the hydrocladial hydrothecae has only one chamber (Billard, 1913; Millard & Bouillon, 1973; Millard,1975; Hirohito, 1983 and Ryland & Gibbons, 1991). As noted by Ryland & Gibbons (1991), *H. polymorpha* and *H. buskii* resemble each other and are quite vari-

able; I agree with these authors that "the lateral nematothecae, used by Billard to separate the two species, are too variable to provide a good diagnostic character" (Ryland & Gibbons, 1991: 531).

In São Sebastião *H. buskii* co-occurs with *H. diaphana*, from which it can be easily distinguished in the field by its yellowish color (due to the association with zooxanthellae). A slide from Vannucci's Collection labelled *'Schizotricha billardi'* (= *H. diaphana*) contains specimens of *H. buskii* instead of *H. diaphana*, leading to the assumption that Vannucci may have misidentified *H. buskii*.

Known range.— There are no previous records for Brazil. This is also the first record from the Atlantic. Elsewhere: Pacific and Indian Oceans.

Monostaechas quadridens (McCrady, 1859)
(fig. 9i)

Monostaechas quadridens; Ritchie, 1909: 91; Vervoort, 1968: 61; Millard, 1975: 365; Calder, 1983: 17.
Monostaechas fisheri; Vannucci, 1949: 252.
Monostaechas fisheri var. *simplex* Billard, 1913: 16.

Material.— Ilhabela, Ponta da Sela, 17.i.1985, on the hydrocaulus of *Serehyba sanctisebastiani*, 18 m, FLS, RMNH Coel. 23115.— São Sebastião, Ponta do Baleeiro, 8.x.1987, on rock, 6-8 m, with gonophores, MNRJ 2168.

Description.— Colonies up to 20 mm high, monosiphonic, with hydrocladia arising directly from the hydrorhiza. Hydrocladia sympodially branched in one plane; some colonies dichotomously divided at the base, giving rise to 2 sympodia. Each hydrocladium with a long basal athecate internode, separated from distal thecate part by an oblique hinge-joint, and with 1 apophysis located on posterior surface of internode, just below terminal hinge-joint supporting next hydrocladium. Athecate basal internode with variable number of nematothecae, usually 5-6 pairs in 2 parallel rows on frontal aspect of internode. Hydrothecate part of hydrocladium with alternate thecate and athecate internodes (intersegments). Thecate internode with oblique node proximally and transverse node distally, 1 hydrotheca and 4 nematothecae: 1 mesial, 2 laterals, and 1 median superior. Mesial nematotheca 2-chambered, probably immovable; lateral nematothecae on short pedicels, movable, with distal chamber shallow and broad, not reaching hydrothecal margin; median superior nematotheca sessile, one-chambered and scale-shaped, in axil behind free part of adcauline wall of hydrotheca. Intersegment with 2 movable nematothecae on its frontal side. Hydrotheca without intrathecal septum, partially adnate to front of hydrocladia. Gonotheca borne on a distinct pedicel, just below hydrotheca, pear-shaped, with two 2-chambered nematothecae near its base.

Nematocysts (in µm)	
Pseudostenotele	14.5-17.0 × 5.0-5.5
Microbasic mastigophore	6.5-7.0 × 2.0
Measurements	
Diameter of hydrorhiza	190-200 µm

Hydrocaulus	
diameter at oblique node	220-270 µm
Hydrocladium	
length of the longest	7500-9250 µm
number of hydrothecae of longest	11-15 µm
length of basal athecate internode	1000-1500 µm
diameter of basal athecate internode	190-240 µm
length intersegments	400-540 µm
diameter intersegments	110-175 µm
length of thecate internode	400-600 µm
diameter of thecate internode	110-180 µm
Hydrotheca	
length	200-218 µm
diameter at rim	275-325 µm
Mesial nematotheca	
length	115-128 µm
diameter at rim	70-80 µm
Lateral nematotheca	
length	80-93 µm
diameter at rim	65-80 µm
Athecate internode nematotheca	
length	94-140 µm
diameter	55-78 µm
Gonotheca	
length	600-660 µm
maximal diameter	420-600 µm
aperture diameter	300-320 µm

Remarks.— Most authors consider *Monostaechas fisheri* Nutting, 1905 distinct from *M. quadridens*, but few discuss their differences. Vervoort (1968) mentioned that there is no clear distinction between the species and Stechow (1925) proposed that *M. fisheri* should be relegated to the synonymy of *M. quadridens*. Nutting (1905) did not comment on the differences between his species and *M. quadridens*, and from his brief description and incomplete illustration it is quite difficult to comprehend the differences between the two (even the gonotheca is said to be "as in *M. quadridens*"). I consider as possible differences: 1) the flaring hydrothecal rim in *M. fisheri*, and 2) the 2-chambered superior nematothecae (as in Nutting's illustration of that species). Vannucci's description (1949) of *M. fisheri*, however, clearly conforms with the current conception of *M. quadridens* (cf. Vervoort, 1968; Millard, 1975; Calder, 1983).

Known range.— Previous records from Brazil are from off Espírito Santo State (Vannucci, 1949) and Abrolhos Archipelago, Bahia State (Ritchie, 1909). Elsewhere: tropical waters of the Atlantic and Pacific Oceans (Vervoort, 1968).

Family Kirchenpaueriidae Stechow, 1921

Ventromma halecioides (Alder, 1859)
(figs 10a-c)

Ventromma halecioides; Stechow, 1923: 220; Leloup, 1935: 51; Rees & Thursfield, 1965: 156; Hirohito, 1974: 45, Cornelius & Garfath, 1980: 286; Vervoort (1993a: 551).

Plumularia halecioides; Vannucci, 1949: 255; Van Gemerden-Hoogeveen, 1965: 64; Cooke, 1975: 102.
Plumularia inermis Nutting, 1900: 62; Vannucci Mendes, 1946: 581.
not *Plumularia halecioides;* Vervoort, 1967: 45.

Material.— São Sebastião, Baía do Araçá, 18.vi.1987, on rock, intertidal, without gonophores, AM545, RMNH Coel. 27388; 5.x.1987, on rock, intertidal, without gonophores, AM546, RMNH Coel. 27391; 16.x.1987, on rock, intertidal, without gonophores, AM547; 14.iii.1988, on rock, intertidal, without gonophores, MNRJ 2147; 29.vi.1988, on rock, intertidal, without gonophores, ROMIZ B1263; 14.vii.1988, on rock, intertidal, without gonophores, RMNH Coel. 18820 [labelled *Kirchenpaueria halecioides* (Alder, 1859); 9.ix.1988, on rock, intertidal, without gonophores, AM551, RMNH Coel. 27393; 21.xi.1988, on rock, intertidal, without gonophores, AM552, RMNH Coel. 27390.— Farol dos Moleques, 14.v.1987, on rock, infralittoral, with gonophores, AM553.— Ponta do Araçá, 23.vi.1988, on rock, intertidal, without gonophores, AM554; 26.viii.1988, on rock, intertidal, without gonophores, AM555; 22.x.1988, on rock, intertidal, without gonophores, AM556.— Ponta do Baleeiro, 28.vii.1987, on rock, intertidal, without gonophores, AM557.— Ponta do Jarobá, 26.vi.1987, on *Halodule emarginata*, 1.5 m, without gonophores, AM558.— Praia de São Francisco, 8.viii.1987, on rock, intertidal, without gonophores, AM559, RMNH Coel. 27392; 10.viii.1987, on rock, intertidal, without gonophores, AM560; 27.viii.1988, on rock, intertidal, without gonophores, AM562, RMNH Coel. 27389.— Bonaire, Netherlands Antilles, 2.xi.1930, 2 microslides, with gonophores, RMNH Coel. 1641.— Philippines, Telban Cove, 30.ix.1967, Doty-Si Project, 1 microslide, without gonophores, RMNH Coel. 5019.

Description.— Colonies up to 30 mm high, polysiphonic at the base, and with alternate hydrocladia. Polysiphonic part with one main tube and 1-2 secondary ones. Some hydrocladia branched. Main stem divided into internodes by transverse nodes. Each internode with a lateral apophysis on its superior third, and 1 nematotheca just above apophysis, without 'mamelon'. Hydrocladia with short athecate basal internode, without nematothecae, followed by long internodes, each with 1 hydrotheca and 2 nematothecae: 1 inferior and 1 superior (fig. 10a). There may be ahydrothecate and anematothecate internodes interposed between normal thecate internodes. Hydrotheca (fig. 10b) completely adnate (except some), shallow and broad, not capable of accommodating the contracted hydranth. Hydranth long, milky white, divided into 2 parts by a transverse constriction; hypostome conical. Gonotheca (fig. 10c) at base of colony, with 8-11 transverse annulations, without nematothecae.

Nematocysts (in μm)

Pseudostenotele	10.5-12.5 × 5.5-6.5
Microbasic mastigophore	5.5-6.0 × 2.0-2.5

Measurements	
Diameter of hydrorhiza	85-100 μm
Hydrocaulus	
length internode	380-470 μm
diameter internode	70-112 μm
Hydrocladium	
length of longest	2500-3000 μm
number of hydrothecae of longest	1-5
length of basal athecate internode	60-125 μm
diameter of basal athecate internode	55-65 μm
length intersegments	290-325 μm
diameter intersegments	52-60 μm

length of thecate internode	350-600 µm
diameter of thecate internode	40-60 µm
Hydrotheca	
length	75-107 µm
diameter at rim	95-118 µm
Inferior nematotheca	
length	37-60 µm
diameter at rim	15-17 µm
Superior nematotheca	
length	27-55 µm
diameter at rim	10-12 µm
Hydranth	
length	276-340 µm
length of tentacles	266-300 µm
number of tentacles	18-20
Gonotheca	
length	979-1400 µm
diameter	540-540 µm

Remarks.— The delicate colonies of *V. halecioides* were found on rocks or algae in protected places, being common in tide pools.

Some recent authors refer this species to the genus *Ventromma* Stechow, 1923, because of the presence of nematophores with nematotheca, instead of the genus *Kirchenpaueria* Jickeli, 1883, which has naked sarcostyles; this point of view has been followed here. Bouillon (1985), however, considered *Ventromma* a junior synonym of *Kirchenpaueria*. I agree with Vervoort (1993a) that the "genera of Kirchenpaueriidae Millard (1962) are in need of critical redefinition", and further discussion depends on a revision of the family.

Plumularia halecioides from the Golf of Aqaba, described by Vervoort (1967), has a pair of lateral nematothecae, in this aspect differing from all descriptions of the species. His description and illustrations fit those of *P. strictocarpa* or *P. setacea*, but the lack of a gonangium makes it impossible to reach a conclusion.

The column of the hydranth of *V. halecioides* is divided in the middle by a conspicuous transverse constriction, seen in fixed and live colonies, delimiting two regions apparently similar to those of *Nemalecium lighti*.

Known range.— Previous records for Brazil are from São Sebastião Island (Vannucci, 1949). Elsewhere: Atlantic, Indian and Pacific Oceans.

Family Plumulariidae Hincks, 1868

Monotheca margaretta Nutting, 1900
(fig. 11a-c)

Monotheca margaretta Nutting, 1900: 72.
Monotheca margaretta f. *typica* Vannucci Mendes, 1946: 578; Vannucci, 1949: 250, 1951a: 89.
Plumularia margaretta; Leloup, 1935: 54; Van Gemerden-Hoogeveen, 1965: 69.

Material.— Ilhabela, Praia do Veloso, 4.xi.1987, on *Sertularia marginata*, intertidal, without gono-

phores, AM600.— São Sebastião, Baía do Araçá, 14.vii.1988, on *Sargassum* sp., intertidal, without gonophores, RMNH Coel. 18822, ROMIZ B1264.— Praia do Zimbro, 18.xi.1986, on *Sargassum* sp., without gonophores, AM602; 26.iii.1987, on red algae, without gonophores, AM603.— Costão do Navio, 31.iii.1987, on *Sargassum* sp., 5-20 m, with gonophores, AM604, RMNH Coel. 27386.— Ponta do Jarobá, 11.iv.1988, on red algae, 1-2 m, without gonophores, AM605; 9.ix.1988, on *Sargassum* sp., 2 m, without gonophores, AM606.— Praia de São Francisco, 15.vii.1988, on *Sargassum* sp., intertidal, without gonophores, AM607; 24.x.1988, on algae, intertidal, with gonophores, AM608, RMNH Coel. 27387.

Description.— Colonies up to 12 mm high. Hydrorhiza with long tubular nematothecae. Hydrocaulus monosiphonic, unbranched, divided into regular internodes by transverse nodes. Internode with long lateral apophysis near distal end, and 3-5 nematothecae: 1 median and 2-4 in axil of apophysis (fig. 11a). Hydrocladia with 1 basal athecate internode and 1 thecate internode. Thecate internode with 1 hydrotheca and 3 nematothecae: 2 laterals and 1 mesial (fig. 11b). Abcauline side of hydrothecal wall concave and rim slightly everted. Lateral nematothecae on long apophysis and projecting beyond hydrothecal margin. All nematothecae 2-chambered and movable. Gonotheca (fig. 11c) borne near base of first hydrocladium, with 7-8 transverse annulations, truncated distally and tapering at the base.

Nematocysts (in μm)

Nematophores and hydrorhiza - pseudostenotele	11.0-12.0 × 4.0-4.5
Whole colony - microbasic mastigophore	5.5- 6.0 × 2.5-3.0

Measurements	
Hydrorhiza	
diameter	60-68 μm
nematothecae, length	69-72 μm
nematothecae, diameter at rim	18-23 μm
Hydrocaulus	
diameter of internode	217-300 μm
length of internode	45-57 μm
Hydrocladium	
length of basal athecate internode	37-100 μm
diameter of basal athecate internode	30-50 μm
length of thecate internode	187-250 μm
diameter of thecate internode	37-45 μm
Hydrotheca	
length	110-137 μm
diameter at rim	122-162 μm
Mesial nematotheca	
length	55-100 μm
diameter at rim	27-40 μm
Lateral nematotheca	
length	40-75 μm
diameter at rim	27-40 μm
Gonotheca	
length	684-710 μm
diameter at distal end	405-580 μm

Remarks.— *Monotheca pulchella* (Bale, 1882) is very similar to *M. margaretta*, from which it basically differs by having a smooth gonotheca, without annulations. *Monotheca margaretta* superficially resembles *Monotheca obliqua*, but this species has a convex or straight abcauline hydrothecal wall and only a single nematotheca in the hydrocladial axil (Millard, 1975; Ryland & Gibbons, 1991). Also, both *M. pulchella* and *M. obliqua* were not reported to have nematothecae on the hydrorhiza. The arrangement and shape of the gonotheca and hydrotheca of the present material agree with the descriptions of Leloup (1935) and Van Gemerden- Hoogeveen (1965). A small difference is that Van Gemerden-Hoogeveen mentioned the presence of two nematothecae on the hydrocladial axil, while my material has two to four.

The species is found on a variety of living substrates such as algae, phanerogams, and other hydroids.

Known range.— Previous records for Brazil are from Paraná (Vannucci Mendes, 1946; Haddad, 1992), Santos, São Sebastião Island, Rio de Janeiro and Espírito Santo (Vannucci Mendes, 1946, Vannucci, 1949). Elsewhere: Atlantic Ocean; the only record for the Pacific is that of Fraser (1938) from off Ecuador.

Plumularia floridana Nutting, 1900
(figs 10d-f)

Plumularia floridana Nutting, 1900: 59; Vannucci Mendes, 1946: 582; Vannucci, 1949: 254; Vervoort, 1968: 109; Calder, 1983: 20.

Plumularia alicia Torrey, 1902: 75; 1904: 37.

Plumularia pennycuikae Millard & Bouillon, 1973: 85; Millard, 1975: 398; Hirohito, 1983: 70; Ryland & Gibbons, 1991: 533.

Material.— São Sebastião, Ponta do Baleeiro, 8.x.1987, on rock, *Pinctata imbricata* and *Crassostrea rhizophorae*, 3 m, with gonophores, RMNH Coel. 23116.

Description.— Colony up to 21 mm high, monosiphonic, unbranched. Hydrocaulus with short basal part, irregularly divided by 1-3 transverse nodes, without hydrocladia and nematotheca; distal part regularly divided into internodes by transverse nodes. Internodes with a lateral apophysis near distal end and with 2-3 nematothecae: 1 median opposite to apophysis and 1-2 in axil between apophysis and internode (fig. 10d). Hydrocladia in one plane, alternate, with short basal internode without hydrotheca or nematotheca, articulating with rest of hydrocladium by means of a transverse node; rest of hydrocladium with alternate thecate and athecate internodes (intersegments) (fig. 10e). Thecate internode with 1 hydrotheca and 3 nematothecae: 2 laterals and 1 mesial; proximal node oblique and distal transverse. Intersegment short, with 1 nematotheca; proximal node transverse and distal oblique. Hydrotheca with everted rim; abcauline wall straight or slightly concave, adcauline wall strongly concave. All nematothecae 2-chambered and movable. Gonotheca (fig. 10f) small, oval to almost spherical, inserting in axil between hydrocladial apophysis and internode, with 1 egg.

Remarks.— *Plumularia pennycuikae* differs from *P. floridana* by the presence of two axillary nematothecae, instead of one; except for this, both nominal species are identical. Comparing the descriptions of Torrey (1902, 1904) for *P. alicia* with that of *P.*

Nematocysts (in µm)	
Nematophores and coenosarc - pseudostenotele	8.5-10.0 × 4.0-4.5
Whole colony - microbasic mastigophore	4.5-5.0 × 2.0
Nematophores, hydranth, coenosarc - isorhiza	8.0-9.0 × 2.0-2.5
Measurements	
Diameter of hydrorhiza	100-120 µm
Hydrocaulus	
diameter at base	120-130 µm
length internode	310-345 µm
diameter internode	80-130 µm
length of nematothecae	65-80 µm
Hydrocladium	
length of longest	2100-2400 µm
number of hydrothecae of longest	5-6
length of basal athecate internode	125-137 µm
diameter of basal athecate internode	50-55 µm
length intersegments	150-175 µm
diameter intersegments	32-50 µm
length of thecate internode	230-275µm
diameter of thecate internode	32-50 µm
Hydrotheca	
length	150-172 µm
diameter at rim	135-137 µm
Mesial nematotheca	
length	42-53 µm
diameter at rim	25-30 µm
Lateral nematotheca	
length	50-73 µm
diameter at rim	25-30 µm
Gonotheca	
length of pedicel	27-33 µm
diameter	100-124 µm

pennycuikae it is impossible to distinguish one from the other, both having two axillary nematothecae. The specimens from São Sebastião have one or two of such nematothecae, this last situation being more common in the proximal internodes. However, the cauline nematothecae are small and one of those is often hidden by the opaque perisarc of the internode.

The variation in the number of stem nematothecae is well known among Plumulariidae. Ryland & Gibbons (1991), for instance, report the presence of up to 4 nematothecae on each stem internode of *P. pennycuikae*: two axillaries, one inferior and one inferior and opposite. I think therefore that there is no reason to keep the three species separate.

Known range.— Previous records for Brazil are from Santos (SP) and Rio de Janeiro (Vannucci Mendes, 1946; Vannucci, 1949). Elsewhere: Atlantic, Indian and Pacific Oceans.

Plumularia strictocarpa Pictet, 1893
(figs 10g-i)

Plumularia strictocarpa; Billard, 1913: 34; Vannucci, 1949: 254; Millard & Bouillon, 1973: 88; Millard, 1975: 402; Ryland & Gibbons, 1991: 535.
Plumularia strictocarpa var. *japonica*; Stechow & Uchida, 1931: 565; Yamada, 1959: 79.
Plumularia compacta Thornely, 1900: 457.
Plumularia sargassi; Van Gemerden-Hoogeveen, 1965: 66.

Material.— Ilhabela, Ilha das Cabras, 17.xi.1987, on *Sargassum* sp., 3 m, without gonophores, AM609.— São Sebastião, Farol dos Moleques, 14.v.1987, on rock, without gonophores, MNRJ 2144.— Ponta do Baleeiro, 27.viii.1991, on rock, intertidal, with gonophores, AM611, RMNH Coel. 27403.— Ponta do Jarobá, 7.v.1986, on artificial substrate, without gonophores, CJ, AM612; 3.i.1992, on *Schizoporella unicornis*, 2 m, without gonophores, AM613; 20.xi.1992, on *S. unicornis*, 2 m, without gonophores, RMNH Coel. 18823, ROMIZ B1265.

Description.— Colonies up to 11 mm high, monosiphonic, unbranched. Hydrocaulus with short basal part without hydrocladia and nematothecae; distal part divided into internodes by transverse nodes. Internode with 1 lateral apophysis near distal end and 1-2 nematothecae, 1 median, opposite to apophysis, and 1 in axil between internode and apophysis (fig. 10g). Hydrocladia on one plane, alternate, with a short basal internode without thecae and with a transverse internal septum, which articulates with rest of hydrocladium by a transverse node; rest of hydrocladium with thecate internodes (intersegments) and athecate internodes, alternately arranged. Hydrothecate internode with distal internal septum, 1 hydrothecae, and 3 nematothecae: 2 laterals and 1 mesial (fig. 10h). Intersegment short, with 1 nematotheca and usually 2 internal septa. Hydrothecae completely adnate to internode, with abcauline wall straight. Gonotheca (fig. 10i) large, inserting on basal internodes, borne on short and curved pedicel, replacing a hydrocladium.

Remarks.— As noted by Billard (1913) and Millard (1975), it is practically impossible to distinguish *Plumularia setacea* (Linnaeus, 1758) from *P. strictocarpa* in the absence of gonothecae. According to Ryland & Gibbons (1991), the same remark is valid in relation to *Plumularia warreni* Stechow, 1919. In the absence of gonothecae, the identification of *P. setacea* when based on the thickness of the cauline perisarc, as suggested by Vervoort & Vasseur (1977), is not reliable because *P. strictocarpa* may also have thickened perisarc. *Plumularia setacea* and *P. strictocarpa*, recorded by Vannucci Mendes (1946) and Vannucci (1949, 1950), may be based on incorrect identifications because these were based on infertile material. On the other hand, Vannucci's (1951a: 86-87, fig. 15-16) description and illustrations of *Plumularia lagenifera* Allman, 1886, from São João da Barra, Rio de Janeiro, in many aspects, including features of the gonotheca and hydrotheca, differ from the descriptions of Ritchie (1909) and Millard (1975) and perfectly agree with that of *P. setacea*. The examination of microslide n° 189 (VC, labelled *'Plumularia lagenifera'*, with three male colonies) corroborates this assumption.

Known range.— Previous records for Brazil are from off Espírito Santo State (Vannucci, 1949). Elsewhere: Atlantic, Indian and Pacific Oceans.

Nematocysts (in μm)	
Nematophores and coenosarc - pseudostenotele	12.5-14.0 × 5.5-6.5
Whole colony - microbasic mastigophore	6.0-6.5 × 2.0
Measurements	
Diameter of hydrorhiza	90-144 μm
Hydrocaulus	
diameter at base	112-130 μm
length of internode	280-440 μm
diameter of internode	65-120 μm
Hydrocladium	
length of longest	2100 μm
number of hydrothecae of longest	4
length of basal athecate internode	62-100 μm
diameter of basal athecate internode	45-65 μm
length intersegments	162-240 μm
diameter intersegments	45-50 μm
length of thecate internode	285-390 μm
diameter of the thecate internode	40-52 μm
Hydrotheca	
length	60-78 μm
diameter at rim	80-92 μm
Mesial nematotheca	
length	55-67 μm
diameter at rim	25-37 μm
Lateral nematotheca	
length	62-70 μm
diameter at rim	35-38 μm
Hydranth	
length	280-300 μm
length of tentacles	240-290 μm
number of tentacles	15-19
Gonotheca	
length	1080 μm
diameter	600 μm

Family Sertulariidae Lamouroux, 1812

Diphasia tropica Nutting, 1904
(fig. 11d)

Diphasia tropica Nutting, 1904: 110; Van Gemerden-Hoovegeen, 1965: 17; Calder, 1991: 88.
Diphasiella ornata Vannucci, 1949: 239.

Material.— São Sebastião, Praia do Zimbro, 26.v.1988, on *Thyroscyphus ramosus*, intertidal, without gonophores, AM614, RMNH Coel. 23198; 17.vi.1988, on *T. ramosus*, intertidal, without gonophores, AM615; 18.vii.1988, on *T. ramosus*, intertidal, without gonophores, AM616.— Ponta do Araçá, 29.vi.1988, on *Galaxaura* sp., tide pool, with gonophores, RMNH Coel. 18824, ROMIZ B1266.— Praia das Cigarras, 3.xi.1987, on *Sertularia marginata*, intertidal, without gonophores, AM618, RMNH Coel.

23199.— Microslide n° 3 labelled '8.est.23, *Diphasiella ornata*', VC.— Microslide n° 7 labelled '10.est.3, *Diphasiella*', VC.— Microslides 28 and 30 labelled '*Diphasiella ornata*', VC.

Description.— Colonies erect, up to 5 mm high. Hydrocaulus monosiphonic, unbranched. Basal part of hydrocaulus athecate, separated from thecate part by an oblique hinge-joint. Internodes with a pair of opposite hydrothecae, separated from each other by oblique hinge-joints. A short athecate internode may occur interposed between 2 thecate internodes. Pair of hydrothecae adnate to front of hydrocladium for $^2/_3$ to $^1/_2$ of their length; adcauline walls of pair contiguous for about half of their length, except those from the basal pairs, which rarely touch. Hydrothecae (fig. 11d) deep, narrow at the base, gradually expanding toward the aperture; perisarc with up to 5 longitudinal ribs and many transversal ridges, sometimes indistinguishable. Hydrothecal rim with 2-3 cusps. Gonothecae (fig. 11d) oval, with numerous irregularly distributed curved spines.

Nematocysts (in µm)	
Large microbasic mastigophore	7.5-8.0 × 2.5-3.0
Small microbasic mastigophore	5.0-5.5 × 1.5-2.0

Measurements	
Diameter of hydrorhiza	90-110 µm
Hydrocaulus	
length hydrorhiza/oblique node	450-700 µm
diameter at hinge-joint	50-60 µm
Hydrotheca	
length between 2 consecutive pairs	160-350 µm
length of abcauline wall	336-600 µm
length adnate part	328-560 µm
length contiguous part	0-560 µm
length free part	150-320 µm
diameter at rim	190-216 µm
diameter at base of pair	175-256 µm
Gonotheca	
length	744-824 µm
maximal diameter	360-480 µm
diameter at aperture	40-58 µm

Remarks.— Van Gemerden-Hoogeveen (1965) described the great variability of *D. tropica*, noting that the hydrothecal orifice can have a maximum of five cusps and that not a single rim is identical. Therefore, she considered *Diphasiella ornata* Vannucci, 1949 conspecific with *D. tropica*, even though the first was described as having four marginal cusps and being quadrangular in cross section. Besides those differences, both species are identical even in features of the gonotheca. I was able to find a much more pronounced variation in the hydrothecal rim than that inferred by Vannucci's (1949) description, re-examining the preserved material in the microslides of VC.

Known range.— Previous records for Brazil are from off Espírito Santo State (Vannucci, 1949). Elsewhere: Atlantic Ocean (Calder, 1991).

Dynamena crisioides Lamouroux, 1824
(figs 11e-g)

Dynamena crisioides; Calder, 1991: 89; Pires et al., 1992: 6
Dynamena crisioides f. *typica* Vannucci Mendes, 1946: 557; Vannucci, 1949: 243; 1954: 115.
For synonymy: see Calder (1991: 89).

Material.— Ilhabela, Praia de Siriúba, 11.viii.1987, on rock, intertidal, without gonophores, MNRJ 2153.— Praia de Garapocaia, 11.viii.1987, on rock, intertidal, without gonophores, AM622, RMNH Coel. 27369.— São Sebastião, Baía do Araçá, 26.vi.1987, on rock, intertidal, without gonophores, AM623.— Praia do Zimbro, 30.iv.1987, AM624; 23.ii.1988, AM625; 24.x.1988, AM626; 18.xi.1988, on rock, intertidal, without gonophores, AM627.— Costão do Navio, 31.iii.1987, 5 m, AM628.— Ponta do Araçá, 28.v.1987, AM629, RMNH Coel. 27362; 23.vi.1987, AM630; 15.v.1988, on rock, intertidal, with gonophores, AM635; 5.x.1987, AM631; 16.iv.1988, AM633, RMNH Coel. 27364; 14.vi.1988, AM636, RMNH Coel. 27368; 14.vii.1988, AM637; 9.ix.1988, AM638; 22.x.1988, AM639; 21.xi.1988, on rock, intertidal, without gonophores, AM640; 14.iii.1988, on rock, intertidal, without gonophores, RMNH Coel. 18825; 21.iv.1988, on rock, intertidal, with gonophores, AM634.— Ponta do Baleeiro, 28.vii.1987, AM641; 23.ix.1988, on rock, intertidal, without gonophores, AM642.— Ponta do Jarobá, 13.vii.1987, on rock, intertidal, without gonophores, AM643.— Praia das Cigarras, 28.iv.1987, AM644; 3.xi.1987, AM647; 19.v.1988, AM648, RMNH Coel. 27365; 30.vi.1988, AM650; 24.ix.1988, on rock, intertidal, with gonophores, AM654, RMNH Coel. 27367; 10.viii.1987, AM645; 6.x.1987, AM646, RMNH Coel. 27366; 15.vii.1988, AM651; 27.viii.1988, AM652; 10.ix.1988, AM653, RMNH Coel. 27361; 22.xi.1988, on rock, intertidal, without gonophores, AM655; 16.vi.1988, on rock, intertidal, without gonophores, ROMIZ 1267.— Praia de São Francisco, 8.viii.1987, AM656; 30.vi.1988, AM658; 27.viii.1988, on rock, intertidal, without gonophores, AM659, RMNH Coel. 27363; 16.vi.1992, on rock, intertidal, with gonophores, AM661; 23.xi.1988, on rock, intertidal, with gonophores, BMNH 1989.8.4.6.

Description.— Colonies erect, up to 32 mm high, bright or dark yellow. Hydrocaulus monosiphonic, divided by transverse nodes, and with alternate hydrocladia. Basal part of hydrocaulus athecate; remaining part thecate. Each thecate internode with lateral apophysis near proximal node, 1 axillary hydrotheca, and a pair of sub-opposite hydrothecae near distal node (fig. 11e). Hydrocladium divided into internodes by transverse nodes; basal internode short, athecate, remaining internodes with 1-3 pairs of sub-opposite hydrothecae. Hydrotheca (fig. 11f) deep, tubular, with or without intrathecal cusps near orifice; rim with 3 cusps, 2 laterals and a smaller, abcauline cusp. Hydranth (fig. 11f) without abcauline caecum. Gonotheca (fig. 11g) vase-shaped, smooth, borne on a short pedicel at the base of stem hydrothecae.

Nematocysts (in µm)

Large microbasic mastigophore	18.0-20.0 × 7.5-8.5
Small microbasic mastigophore	7.0-7.5 × 2.0

Measurements	
Diameter of hydrorhiza	240-300 µm
Hydrocaulus	
length hydrorhiza/oblique node	750-1525 µm
diameter at hinge-joint	210-325 µm
hydrotheca	
length of abcauline wall	370-500 µm
length adnate part adcauline wall	350-400 µm

length free part adcauline wall	110-250 µm
diameter at rim	120-170 µm
Hydrocladium	
total number	5-13
length of longest	7200-10000 µm
number of hydrothecae of longest	16-23
length of apophysis	220-550 µm
diameter of apophysis	187-200 µm
hydrothecae	
length of abcauline wall	350-440 µm
length adnate part adcauline wall	410-520 µm
length free part adcauline wall	60-230 µm
diameter at rim	100-155 µm
Number of tentacles of hydranth	21
Gonotheca	
length	1470-2000 µm
maximal diameter	450-750 µm
diameter at aperture	250-325 µm

Remarks.— *Dynamena crisioides* is common in the upper mid-littoral where it may conspicuously colonize vertical rock walls in partially protected places. In São Sebastião it was found only on rocks, but Masunari (1983) recorded it on the red alga *Amphiroa beauvoisii* in Santos (SP). Vannucci Mendes (1946) erroneously identified specimens of *Idiellana pristis* as *Dynamena crisioides* f. *gigantea* Billard, 1924.

Known range.— Previous records from Brazil are Santos, Itanhaém, Rio de Janeiro, Pernambuco (Vannucci Mendes, 1946; Vannucci, 1954) and Fernando de Noronha Archipelago (Vannucci, 1954; Pires et al., 1992). Elsewhere: worldwide (Gibbons & Ryland, 1989).

Dynamena dalmasi (Versluys, 1899)
(figs 11h-i))

Desmocyphus dalmasi Versluys, 1899: 38
Dynamena dalmasi; Calder, 1991: 92.
Sertularia rathbuni; Ritchie, 1909: 83.
For synonymy: see Calder (1991).
Material.— Ilhabela, Ponta da Sela, 17.i.1985, on the hydrocaulus of *Serehyba sanctisebastiani*, 20 m, without gonophores, FLS, RMNH Coel. 23117.

Description.— Colonies erect, up to 50 mm high. Hydrocaulus monosiphonic, unbranched or rarely branched. Athecate basal part smooth and straight, separated from remainder by an oblique hinge-joint. Thecate part divided into internodes by transverse, sometimes indistinct, nodes. Each internode with a pair of opposite hydrothecae. Hydrotheca (figs 11h-i) adnate to frontal side of hydrocaulus; adcauline walls of the pair (fig. 11h) not contiguous, except those of distalmost pairs (fig. 11i), that may touch frontally. Abcauline wall concave; almost straight in distal pairs. Hydrothecal rim with 2 large lateral cusps and a smaller abcauline cusp; 2 internal cusps near rim, of which abcauline best developed. Operculum composed of 2 valves, adcauline valve smallest and usually divided. Gonotheca not seen.

Nematocysts (in µm)	
Large microbasic mastigophore	22.5-26.0 × 9.5-10.5
Small microbasic mastigophore	4.0- 5.0 × 1.5-2.5
Measurements	
Diameter of hydrorhiza	160-190 µm
Hydrocaulus	
length hydrorhiza/oblique node	2050-2200 µm
diameter at hinge-joint	140-160 µm
Hydrotheca	
length between 2 consecutive pairs	300-460 µm
length of abcauline wall	300-340 µm
length adnate part adcauline wall	290-330 µm
length contiguous part adcauline wall	0-150 µm
length free part adcauline wall	135-190 µm
diameter at rim	95-110 µm
diameter at base of pair	200-300 µm
Number of tentacles	14-16

Remarks.— The specimens from São Sebastião are similar to those described by Versluys (1899) and Vervoort (1959); those described by Calder (1991) have longer internodes. Only Ritchie (1909) described the gonothecae; these are oval, with c. six indistinct transverse annulations.

Known range.— Previous records for Brazil are from the Abrolhos Archipelago (Ritchie, 1909, as *Sertularia rathbuni* Nutting, 1904). Elsewhere: Atlantic and Pacific Oceans (Calder, 1991).

Dynamena disticha (Bosc, 1802)
(figs 12a-e)

Dynamena disticha; Vannucci Mendes, 1946: 562; Vannucci, 1949: 242; 1950: 87; 1951a: 84; Pires et al., 1992: 6; Haddad, 1992: 47.
For synonymy: see Calder (1991).

Material.— Ilhabela, Praia de Siriúba, 11.viii.1987, on *Gigartina acicularis*, intertidal, with gonophores, AM664, RMNH Coel. 27374.— São Sebastião, Baía do Araçá, 15.v.1988, on *Holothuria grisea*, intertidal, without gonophores, JMO, AM665.— Praia do Cabelo Gordo, 17.vi.1988, on *Sargassum* sp., intertidal, with gonophores, AM666.— Praia do Zimbro, 18.xi.1986, on *Sargassum* sp., 1.5 m, with gonophores, JMO, AM667; 26.iii.1987, on *Sargassum* sp., intertidal, with gonophores, RMNH Coel. 18826; 2.vi.1987, on *Sargassum* sp., intertidal, without gonophores, JMO, AM669; 18.vii.1988, on *Lytocarpia tridentata*, intertidal, without gonophores, AM670; 17.viii.1988, AM671; 8.ix.1988, AM672; 18.xi.1988, on *Sargassum* sp., intertidal, without gonophores, AM673.— Costão do Navio, 31.iii.1987, on barnacles, 5-20 m, without gonophores, AM674.— Ilha de Itaçucê, 5.iii.1988, on rock and *Sargassum* sp., 1.5 m, without gonophores, AM675; 5.vi.1988, on *Sargassum* sp. and on red algae, with gonophores, AM676, RMNH Coel. 27370.— Ponta do Araçá, 13.v.1987, AM677; 16.iv.1988, AM679, RMNH Coel. 27377; 21.iv.1988, AM680; 14.vii.1988, AM683; 22.x.1988, on *Sargassum* sp., intertidal, without gonophores, AM684; 14.iii.1988, on *Sargassum* sp., in tide pool, without gonophores, AM678, RMNH Coel. 27380; 15.v.1988, on *Sargassum* sp. and *Gigartina teedii*, intertidal, without gonophores, AM681; 29.vi.1988, on *Sargassum* sp. and *Galaxaura* sp., in tide pool, without gonophores, AM902.— Ponta do Baleeiro, 8.x.1987, on

Crassostrea rhizophorae, intertidal, without gonophores, AM685; 30.xi.1987, on rock, 4 m, without gonophores, AM686; 18.viii.1988, on *Hypnea spinella*, 6 m, without gonophores, AM687.— Ponta do Jarobá, 14.iv.1987, on *Sargassum* sp., with gonophores, AM688, RMNH Coel. 27378; 29.vii.1987, on calcareous algae, 1.5 m, with gonophores, AM689, RMNH Coel. 27372; 9.vi.1988, on *Galaxaura* sp. and on *Dictyopteris* sp., 2 m, without gonophores, AM690; 7.vii.1988, AM691, RMNH Coel. 27371; 10.vii.1988, AM692; 19.vii.1988, on *Galaxaura* sp., 2 m, without gonophores, AM693; 19.vii.1988, on sponge, 2 m, without gonophores, AM694.— Praia das Cigarras, 10.viii.1987, AM695; 6.x.1987, AM697; 30.vi.1988, AM701; 24.ix.1988, on *Sargassum* sp., intertidal, with gonophores, AM706; 10.viii.1987, on pebble, intertidal, without gonophores, AM696; 3.xi.1987, AM698, RMNH Coel. 27379; 19.v.1988, AM699, RMNH Coel. 27373; 16.vi.1988, AM700; 15.vii.1988, AM702; 10.ix.1988, AM705; 24.ix.1988, AM707, RMNH Coel. 27375; 22.xi.1988, on *Sargassum* sp., intertidal, without gonophores, AM709; 10.ix.1988, on *Sargassum* sp., intertidal, with gonophores, BMNH 1989.8.4.5; 24.x.1988, on *Sargassum* sp. and *Pinctata imbricata*, intertidal, with gonophores, AM708.— Praia de São Francisco, 8.viii.1987, on rock, intertidal, without gonophores, AM710, RMNH Coel. 27376; 10.viii.1987, on red algae, intertidal, without gonophores, ROMIZ B1268; 30.vi.1988, on *Sargassum* sp., intertidal, without gonophores, AM712; 27.viii.1988, on *Galaxaura* sp., intertidal, without gonophores, MNRJ 2154; 10.ix.1988, on *Galaxaura* sp., intertidal, without gonophores, AM714; 24.x.1988, on *Sargassum* sp., intertidal, with gonophores, AM715; 16.vi.1992, on *Galaxaura* sp., intertidal, with gonophores, AM716.— Praia de Toque-Toque Grande, 31.x.1988, on barnacles, 1-2 m, without gonophores, AM717.

Description.— Colonies erect, up to 12 mm high. Hydrocaulus monosiphonic, unbranched, divided into internodes by, usually indistinct, oblique nodes. Internodes with a pair of opposite hydrothecae on distal end, adnate to frontal side of hydrocaulus. Adcauline walls of pair of hydrothecae contiguous, except those of basalmost pair, that do not touch (fig. 12a). Hydrotheca cylindrical, proximal ones (fig. 12a) broader and more curved than distal ones (fig. 12b). Hydrothecal rim with 3 cusps, 2 large and lateral and 1 adcauline, small cusp. Perisarc usually thicker near

Nematocysts (in µm)	
Large microbasic mastigophore	22.0-26.0 × 9.0-10.0
Small microbasic mastigophore	7.0- 6.0 × 2.0- 2.5

Measurements	
Hydrocaulus	
length hydrorhiza/oblique node	400-1240 µm
diameter at hinge-joint	60-175 µm
Hydrotheca	
length between 2 consecutive pairs	80-325 µm
length of abcauline wall	154-400 µm
length adnate part adcauline wall	220-450 µm
length contiguous part adcauline wall	150-320 µm
length free part adcauline wall	120-340 µm
diameter at rim	105-140 µm
diameter at base of pair	190-380 µm
Number of tentacles	19-23
Gonotheca	
length	900-1400 µm
maximal diameter	600-800 µm
diameter at aperture	280-480 µm
number of annulations	0-8

margin, sometimes forming intrathecal cusps. Operculum (fig. 12c) composed of 2 valves, adcauline valve smaller than abcauline and usually divided in the middle. Hydranth (fig. 12d) long, yellowish. Gonotheca (fig. 12e) oval, smooth or with transverse annulations, borne on a short pedicel on hydrorhiza or hydrocaulus.

Remarks.— Although Picard (1958) considered *Dynamena cornicina* McCrady, 1852 and *D. disticha* (Bosc, 1802) conspecific, most authors continued to use the binomen *D. cornicina* to refer to this well known species. I follow Calder (1991) and adopt the name *D. disticha*. The colony can be branched or unbranched, but the branched form does not occur in the Atlantic, being common in the Indian and Pacific Oceans (Billard, 1925; Millard, 1975; Gibbons & Ryland, 1989). The ramifications reported by Vannucci Mendes (1946) are rare and originate from the interior of hydrothecae, not being borne on a distinct apophysis, in a way quite different from the characteristic ramifications so far described. Nevertheless, Calder (1991) doubted the validity of considering regularly branched and unbranched colonies as variations of the same species. Millard (1975), however, reported unbranched and branched hydrocauli arising from the same hydrorhiza in colonies from South Africa.

Dynamena disticha is one of the most common hydroids in the shallow waters of São Sebastião, present on several kinds of substrate, mainly brown and red algae.

Known range.— Previous records for Brazil are from Paraná State (Haddad, 1992), Santos, São Sebastião Island, Cabo de São Tomé, Espírito Santo State (Vannucci Mendes, 1946; Vannucci, 1949, 1950, 1951a,), Abrolhos Archipelago (Ritchie, 1909), off Pernambuco (Mayal, 1973) and Fernando de Noronha Archipelago (Pires et al., 1992). Elsewhere: Atlantic, Indian and Pacific Oceans.

Dynamena quadridentata (Ellis & Solander, 1786)
(figs 12f-g)

Dynamena quadridentata; Calder,1991: 96.
Dynamena quadridentata f. *typica* Vannucci Mendes, 1946: 559; Vannucci, 1949: 241.
Dynamena quadridentata f. *flabellata* Vannucci Mendes, 1946: 561; Vannucci, 1949: 242.
For synonymy: see Calder (1991)

Material.— São Sebastião, Praia do Zimbro, 22.iv.1988, AM719; 26.v.1988, AM720; 17.vi.1988, on *Thyroscyphus ramosus*, intertidal, AM722; 17.vi.1988, on *Galaxaura* sp., intertidal, BMNH 1989.8.4.7; 17.vi.1988, AM723; 18.vii.1988, on *Sargassum* sp., intertidal, MNRJ 2150; 18.xi.1988, on *Sargassum* sp., intertidal, AM723; 10.i.1992, on *Sargassum* sp., 1 m, RMNH Coel. 18827.— Ponta do Araçá, 21.iv.1988, on *Sargassum* sp. and red algae, intertidal, AM726; 10.i.1992, on *Sargassum* sp., 1 m, AM727, RMNH Coel. 27382.— Ponta do Jarobá, 9.vi.1988, on *Galaxaura* sp., 2 m, AM728, RMNH Coel. 27381.— Praia de São Francisco, 30.vi.1988, on *Sargassum* sp., intertidal, ROMIZ B1269; 10.ix.1988, on *Sargassum* sp., intertidal, AM730.— Praia de Toque-Toque Grande, 7.iv.1989, on *Perna perna*, 1 m, MAM, AM731.

Description.— Colonies erect, up to 5 mm high. Hydrocaulus monosiphonic, unbranched, divided into internodes by oblique nodes; basal athecate part short, separated from remaining part by an oblique hinge-joint. Internodes with groups of 1-5 pairs of opposite hydrothecae (figs 12f-g), adnate to frontal face of hydrocaulus. Adcauline walls of pair of hydrothecae contiguous for a variable extension. Hydrotheca cylindrical; proximal pairs strongly curved, abcauline wall convex, with a basal bulge; distal pairs less curved and adcauline wall almost straight. Usually 2 intrathe-

cal cusps near rim, 1 abcauline and 1 adcauline. Rim with 3 cusps, 2 laterals and a small median abcauline cusp. Operculum composed of 2 valves, abcauline smallest and usually divided in the middle. Gonotheca not seen.

Nematocysts (in µm)

Coenosarc and hydranth - holotrichous isorhiza	22.5-26.0 × 9.0-10.0
Tentacles - microbasic mastigophore	5.0-6.5 × 2.0

Measurements	
Diameter of hydrorhiza	136-160 µm
Hydrocaulus	
length hydrorhiza/oblique node	200-760 µm
Hydrotheca	
length between 2 consecutive pairs	240-680 µm
length of abcauline wall	160-288 µm
length adnate part adcauline wall	240-360 µm
length contiguous part adcauline wall	112-292 µm
length free part adcauline wall	40-176 µm
diameter at rim	64-88 µm
diameter at base of pair	168-304 µm

Remarks.— The form *flabellata* described by Vannucci Mendes (1946) was distinguished by the flabellate arrangement of the hydrothecae and the presence of a fourth, abcauline, marginal cusp. Six microslides of VC labelled *'Dynamena quadridentata* f. *flabellata'* were examined; four of them (n° 43, 51, 92 and 93) contained specimens similar to those described here, but two (n° 3 and 5) have material similar to *Dynamena heterodonta* (Jarvis, 1922). These latter bear several basal internodes with only one pair of hydrothecae, hydrocauli with only one internode are quite common; the hydrocaulus is longer and thinner than in the specimens from São Sebastião. Due to the position of the material it was impossible to ascertain the presence of the abcauline cusp described by Vannucci Mendes: apparently she misinterpreted the abcauline intrathecal cusp. It is possible therefore that *Dynamena quadridentata* f. *heterodonta* (Jarvis, 1992) (cf. Vannucci, 1951a: 83-84, pl. 2 figs 11-12) refers to *D. heterodonta* (Jarvis, 1922), a species similar to *D. quadridentata* but considered distinct by Billard (1925), Vervoort & Vasseur (1977) and Calder (1991).

Known range.— Previous records for Brazil are from São Paulo, Rio de Janeiro and Espírito Santo States (Vannucci Mendes, 1946; Vannucci, 1949, 1950). Else where: Atlantic, Indian and Pacific Oceans.

Idiellana pristis (Lamouroux, 1816)
(figs 12h-i)

Idia pristis; Allman, 1888: 85.
Idiella pristis; Stechow, 1919: 106; Vervoort, 1946: 306; 1959: 252.
Idiellana pristis; Van Gemerden-Hoogeveen, 1965: 16; Vervoort, 1993b: 188.
Dynamena crisioides f. *gigantea*; Vannucci Mendes, 1946: 558.

Material.— São Sebastião, Ponta do Baleeiro, 18.ii.1987, on rock, 5 m, without gonophores, ROMIZ B1270; 8.x.1987, AM736; 23.vi.1988, AM740; 22.vii.1988, AM741; 30.xi.1987, on rock, 6-8 m, without gonophores, AM737, RMNH Coel. 27385; 8.iii.1988, AM738; 11.v.1988, on rock, 5 m, without gonophores, AM739, RMNH Coel. no. 27383; 18.viii.1988, on rock, 6 m, without gonophores, MNRJ 2149; 23.x.1988, on rock, in tide pool, without gonophores, RMNH Coel. 18828; 8.xi.1988, on rock, 6 m, without gonophores, BMNH 1989.8.4.8.— Ponta do Jarobá, 6.x.1987, on *Lophogorgia punicea*, 3 m, without gonophores, AM745, RMNH Coel. 27384.— Off Bahia, H.M.S. Challenger, several colonies without gonophores, BMNH 1888.11.13.64.

Description.— Colonies erect, up to 10 cm high, arising from a creeping hydrorhiza. Hydrocaulus monosiphonic, unbranched; basal athecate part separated from remainder by 1 or more transverse hinge-joints. Thecate part divided into internodes by sometimes indistinct oblique nodes, alternately bent left and right. Each internode with an apophysis near proximal end, 1 axillary hydrotheca and 1 pair of non-contiguous alternate hydrothecae (fig. 12h). Apophyses long, arising alternately from opposite sides of hydrocaulus. Hydrocladia unbranched, not divided into internodes or with transverse nodes at long and irregular intervals, composed of groups of pairs of sub-opposed, contiguous and imbricate hydrothecae. Hydrotheca elongate, tubular, strongly curved outwards; rim delicate, with 2 lateral projections and without internal cusps. Operculum consisting of 1 large adcauline valve. Hydranth without abcauline caecum. Gonotheca (fig. 12i), large, cylindrical, with longitudinal ridges and circular aperture, arising from hydrocaulus. Some colonies show auto-epizoism, creating the impression of a branched hydrocaulus.

Nematocysts (in µm)

Hydranth and coenosarc - large microbasic mastigophore	24.5-27.0 × 10.5-12.0
Tentacles - small microbasic mastigophore	6.0- 8.0 × 2.0- 2.5

Measurements	
Hydrocaulus	
length hydrorhiza/oblique node	2600-3600 µm
diameter at hinge-joint	376-720 µm
hydrotheca	
length of abcauline wall	350-600 µm
length adnate part adcauline wall	450-600 µm
length free part adcauline wall	80-200 µm
diameter at rim	80-140 µm
Hydrocladium	
total number	18-54
length of longest	10,000-14,400 µm
number of hydrothecae of longest	40-64
length of apophysis	250-375 µm
diameter of apophysis	200-375 µm
hydrotheca	
length of abcauline wall	450-700 µm
length adnate part adcauline wall	460-700 µm
length free part adcauline wall	100-200 µm
diameter at rim	100-120 µm

Gonotheca	
length	1480-1700 μm
maximal diameter	1120-1160 μm
diameter at aperture	600-680 μm

Remarks.— In São Sebastião *I. pristis* occurs on rocks, usually below five m; only occasionally is it found in shallower places. Specimens of *I. pristis* from Santos were incorrectly identified by Vannucci Mendes (1946) as *Dynamena crisioides* f. *gigantea* Billard, 1924. Her figure 26 clearly depicts a part of a hydrocladium identical with that of *I. pristis*. Also, slide VC n° 62 (without collecting data), with a infertile colony of *I. pristis*, is labelled *D. crisioides* f. *gigantea*.

Known range.— Previous records for Brazil are from Bahia State (Allman, 1888; Vervoort, 1946) and Santos (Vannucci Mendes, 1946, as *Dynamena crisioides* f. *gigantea*). Elsewhere: circumtropical, occasionally in temperate waters (Millard, 1975).

Sertularella conica Allman, 1877
(figs 12j-k)

Sertularella conica; Calder, 1991: 99.
Sertularella inconstans; Vannucci Mendes, 1946: 569; Vannucci, 1949: 243.

Material.— São Sebastião, Ponta do Araçá, 21.iv.1988, on *Dynamena crisioides*, intertidal, with gonophores, AM746.

Measurements

Hydrotheca	
length of abcauline wall	400-448 μm
length adnate part adcauline wall	136-152 μm
length free part adcauline wall	272-352 μm
diameter at rim	184-228 μm
maximal diameter	240-256 μm
number of transversal annulations	4-5
Gonotheca	
length	720 μm
maximal diameter	600 μm
diameter at aperture	240 μm
number of transverse annulations	7-9

Remarks.— I have nothing to add to Calder's (1991) description of Bermuda material. The present specimen is a small colony, 2.7 mm high, unbranched, and with four hydrothecae and one gonotheca (see measurements). The specimens from Bermuda were larger and occasionally branched.

According to Calder (1991), the description of *S. inconstans* Billard, 1919, a western Pacific species, by Vannucci (Vannucci Mendes, 1946; Vannucci, 1949) corresponds to that of *S. conica*, and I agree. *Sertularella conica* is also similar to *Sertularella tenella* (Alder, 1856), and the two are distinguished basically by the number of annulations on the gonotheca. The latter was recorded for Brazil (Cabo Frio) by Jäderholm (1903).

Known range.— Previous records for Brazil are from Santos (Vannucci Mendes, 1946) and São Sebastião Island (Vannucci, 1949). Elsewhere: Atlantic Ocean (Calder, 1991).

Sertularella cylindritheca (Allman, 1888)
(fig. 13a)

Sertularia cylindritheca Allman, 1888: 59.
Sertularella cylindritheca; Nutting, 1904: 87; Vervoort, 1959: 266; 1968: 43; 1972b: 8; Gili et al., 1989: 100; Pires et al., 1992: 7.
Sertularia catena; Mayal, 1983: 7.

Material.— São Sebastião, Costão do Navio, 31.iii.1987, on rock, 20 m, with gonophores, RMNH Coel. 18829, BMNH 1989.8.4.9, MNRJ 2164.— Off Bahia, H.M.S. Challenger, type series, several colonies, BMNH 1888.11.13.47.— West coast of Africa, Atlantide Exp. Stn 70, 15.i.1946, 60-65 m, RMNH Coel. 1268; Stn 85, 30.i.1946, 50 m, RMNH Coel. 1303.

Description.— Colonies erect, up to 28 mm high. Hydrocaulus monosiphonic, divided into internodes by transverse or slightly oblique nodes. Internodes with a hydrotheca near their distal end. Hydrothecae alternately placed, cylindrical, only in part adnate to hydrocaulus. Branches arising from hydrocaulus just below a hydrotheca. Some damaged hydrothecae are completely renovated, giving the impression that they are supported by a short and broad apophysis or pedicel. Rim quadrangular, with 4 short cusps. Operculum composed of 4 valves. Gonothecae cylindrical, arising just below a hydrotheca, with 4 marginal cusps; perisarc with very weak annulations.

Nematocysts (in µm)	
Large microbasic mastigophore	23.0-25.5 × 6.0-7.5
Small microbasic mastigophore	7.5- 9.0 × 2.5-3.5
Measurements	
Diameter of hydrorhiza	310-440 µm
Hydrocaulus	
length of internode	1100-1300 µm
diameter at node	190-210 µm
Hydrotheca	
length of abcauline wall	1410-1450 µm
length of adcauline wall	1050-1100 µm
diameter at rim	550-690 µm
diameter at base	600-650 µm
Gonotheca	
length	1860-2100 µm
maximal diameter	760-880 µm
diameter at aperture	560-650 µm

Remarks.— The present material differs from the type series by having thinner internodes. Though not being described, the type series also has hydrothecal reno-

vation. Most of the material from West Africa described by Gili et al. (1989) has a short pedicel like structure supporting the hydrotheca. The situation is similar in the material from São Sebastião, where regeneration of the hydrotheca on the basal part of a damaged hydrotheca occurs.

Mayal's (1983) description of *Sertularella catena* (Allman, 1888) agrees with that of *S. cylindritheca*. Besides other differences, *S. catena* has an undulated adcauline hydrothecal wall and is polysiphonic at least in the lowest part of the axis (Vervoort, 1993b), characters not referred to in her description. *S. catena* is also a deep-water species; in Bermuda it occurs at depths of about 500-800 m (D. Calder, pers. comm.).

Known range.— Previous records for Brazil are from Bahia (Allman, 1888), from off Pernambuco (Mayal, 1973) and the Fernando de Noronha Archipelago (Pires et al., 1992). Elsewhere: Atlantic Ocean.

Sertularia distans (Lamouroux, 1816)
(figs 13b-e)

Sertularia distans; Mayal, 1983: 6; Pires et al., 1992: 6; Haddad, 1992: 47.
Sertularia heterodonta Ritchie, 1909: 79.
Sertularia gracilis Thornely, 1904: 116.
Sertularia erasmoi Vannucci Mendes, 1946: 565, Vannucci, 1949: 245.
Sertularia minuscula Vannucci, 1949: 246, 1950: 88.
Tridentata distans; Calder, 1991: 105.
For synonymy: see Calder (1991).

Material.— São Sebastião, Praia do Zimbro, 18.vii.1988, on *Thyroscyphus ramosus*, intertidal, without gonophores, AM748; 17.viii.1988, on red algae, intertidal, without gonophores, AM749; 8.ix.1988, AM750; 18.xi.1988, on *Sargassum* sp., intertidal, with gonophores, AM751.— Ponta do Araçá, 21.iv.1987, on red algae, intertidal, with gonophores, AM752; 16.iii.1988, on *Sargassum* sp., intertidal, with gonophores, ROMIZ B1272; 14.vi.1988, on *Sargassum* sp., intertidal, without gonophores, AM754; 14.vii.1988, on *Sargassum* sp., intertidal, with gonophores, AM755; 14.viii.1988, on algae, intertidal, with gonophores, MNRJ 2161.— Praia de Maresias, 18.ii.1988, on red algae, 2 m, with gonophores, AM756.— Praia de São Francisco, 8.viii.1987, RMNH Coel. 23118; 10.ix.1988, on red algae, intertidal, without gonophores, AM763, RMNH Coel. 27344; 19.v.1988, AM758; 27.viii.1988, AM761, RMNH Coel. 27342; 24.x.1988, AM764, RMNH Coel. 27343; 23.xi.1988, on red algae, intertidal, with gonophores, AM765; 30.vi.1988, on *Sargassum* sp., intertidal, without gonophores, AM759; 15.vii.1988, on *Sargassum* sp., intertidal, with gonophores, AM760; 27.viii.1988, on red algae, intertidal, without gonophores, RMNH Coel. 18830; 16.vi.1992, on *Galaxaura* sp., intertidal, without gonophores, AM766.— Microslides n° 2 labelled '15.est, *Sertularia erasmoi*'; n° 3 labelled '8.est.23, *Sertularia minuscula*'; n° 10 labelled '*Sertularia minuscula*'; n° 12 labelled 'est.10, *Sertularia erasmoi*'; n°13 labelled 'Ilhabela, iv.49, *Sertularia erasmoi*'; n° 17 labelled 'Ilha do Francês, *Sertularia erasmoi*'; n° 25 labelled '*Sertularia minuscula*'; n° 33 labelled 'Guarujá, iv.42, *Sertularia erasmoi*'; n° 48 labelled 'Ilha do Francês, *Sertularia erasmoi*'; n° 51 labelled 'est.10, *Sertularia minuscula*'; n° 54 labelled 'Ilhabela, iv.49, *Sertularia erasmoi*'; n° 69-70 labelled '*Sertularia erasmoi*'; n° 90 labelled 'Ilha Porchat, 4-41, *Sertularia erasmoi*', VC.— Cananéia, Ponta de Itacurussá, 21.x.1956, J. P. Carvalho, BMNH 1956.10.22.4.— Bahia, Abrolhos, Scottish National Antarctic Exp. Stn 81, 20.xii.1902, on *Codium* sp., 36 fms, 6 branches on microslide, BMNH 1964.8.7.167.

Description.— Colonies erect, up to 5.8 mm high, with 15 pairs of hydrothecae. Hydrocaulus monosiphonic, unbranched; basal athecate part separated from remainder by 1-2 oblique hinge-joints. Thecate part of hydrocaulus divided by transverse or

oblique nodes into internodes, each with a pair of opposite hydrothecae. Hydrotheca (figs 13b-c) of varied shape, usually narrower at the aperture and with free part of adcauline wall straight; adcauline wall adnate over half its length. Adcauline walls of pair contiguous for a variable distance, except those of the first pair that usually do not touch. One or 2 abcauline intrathecal cusps near the rim are present; formation of the adcauline cusp less frequent, but usually there is a thickening of the perisarc. Floor of hydrotheca with projections of perisarc in direction of internode and occasionally into the hydrothecal cavity. Rim of hydrotheca with 2 lateral cusps and a smaller adcauline cusp. Operculum composed of 2 valves, adcauline flap usually divided in the middle. Gonotheca (fig. 13d) elongate, oval, with circular orifice; borne on short pedicels at base of proximalmost hydrotheca (first to third pair).

Nematocysts (μm)	
Coenosarc - large microbasic mastigophore	13.0-14.0 × 3.5-4.0
Coenosarc and tentacles - small microbasic mastigophore	5.0- 5.5 × 2.0-2.5

Measurements	
Diameter of hydrorhiza	80-125 μm
Hydrocaulus	
length hydrorhiza/oblique node	320-440 μm
diameter at hinge-joint	37-75 μm
Hydrotheca	
length between 2 consecutive pairs	140-250 μm
length of abcauline wall	150-230 μm
length adnate part adcauline wall	112-167 μm
length contiguous part adcauline wall	0-152 μm
length free part adcauline wall	82-152 μm
diameter at rim	52-90 μm
diameter at base of pair	142-200 μm
Gonotheca	
length	820-880 μm
maximal diameter	400-450 μm
diameter at aperture	240-270 μm

Remarks.— *Sertularia distans* is one of the most common species in São Sebastião, especially on Rhodophyta and *Sargassum* sp.

The confusion around the binomina *Dynamena distans* Lamouroux, 1816 and *Sertularia distans* Lamouroux, 1816 was clarified by Calder (1991).

Sertularia erasmoi Vannucci Mendes, 1946, is indistinguishable from *S. distans*, as already mentioned by Mayal (1983). Specimens of VC have the intrathecal cusps and the internal projections of perisarc characteristic of *S. distans*, but these are not mentioned in Vannucci's descriptions. Mayal (1983) also did not mention the intrathecal cusps. Despite the absence of the abcauline intrathecal cusp in my material, some of the VC colonies also have this type of cusp. This is in accordance with Billard (1925), who described the presence of one to four internal cusps near the rim of the hydrotheca.

The similarity between *Sertularia minuscula* Vannucci, 1949 and *S. erasmoi* (= *S. distans*) was already noted by Vannucci in the discussion of the original description of the first named species. In slides of VC I observed the following details: a) there is no abcauline marginal cusp as stated in the original description; b) there may be one to four intrathecal cusps, not a fixed number of three; c) although there are some colonies with long and slender internodes and hydrothecae, there are also intermediates between this extreme form and the typical *S. distans*, and d) several specimens show additional growth of the hydrotheca, giving these a slimmer appearance. Although the material from São Sebastião does not have reduplication of the hydrothecal margin, it was mentioned by other authors (for instance Ritchie, 1909, as *S. heterodonta*).

According to Bouillon (1985), the cnidome of *S. distans* has only basitrichous nematocysts, which does not agree with the present results. Because of the confusion between *Sertularia gracilis* Hassall, 1848 and *S. distans*, it is possible that the cnidome referred to by Bouillon (1985) is actually that of the first named species.

Known range.— Previous records from Brazil are Paraná State (Haddad, 1992), Santos, Rio de Janeiro and Espírito Santo States (Vannucci Mendes, 1946; Vannucci, 1949, 1950), Bahia (Ritchie, 1909), off Pernambuco State (Mayal, 1973), and Fernando de Noronha Archipelago (Pires et al., 1992). Elsewhere: Atlantic, Indian and Pacific Oceans.

Sertularia loculosa Busk, 1852
(figs 13f-i)

Sertularia loculosa Billard, 1926: 512; Vannucci Mendes, 1946: 564; Vannucci, 1949: 245.
Sertularia ligulata Thornely, 1904: 116; Billard, 1925: 117; Millard, 1958: 193; Vervoort, 1959: 277; Millard & Bouillon, 1973: 74; Hirohito, 1983: 22; Gibbons & Ryland, 1989: 420.
Sertularia turbinata; Bale, 1913: 124; Ritchie, 1910: 821; Jarvis, 1922: 341.
Sertularia sp. Spracklin, 1982: 246.
Not *Sertularia loculosa* Bale, 1884: 91; Thornely, 1904: 118; Warren, 1908: 306; Jarvis, 1922: 340; Billard, 1925: 117.

Material.— Ilhabela, Parcel da Praia Grande, 14.iii.1988, on calcareous algae, intertidal, without gonophores, RMNH Coel. 23119.— São Sebastião, Praia do Zimbro, 18.vii.1988, on *Sargassum* sp., intertidal, without gonophores, AM768.— Costão do Navio, 31.iii.1987, on *Amphiroa* sp., 5-20 m, with gonophores, AM769.— Costão Barequeçaba/Baleeiro, 22.i.1987, on rock, 1.5 m, with gonophores, MNRJ 2166.— Ponta do Baleeiro, 10.iv.1991, on *Laurencia* sp., 1.5 m, with gonophores, AM771; 17.iv.1991, on *Laurencia* sp., 1 m, without gonophores, AM772.— Praia das Cigarras, 24.x.1988, on *Sargassum* sp., intertidal, without gonophores, AM773.— Praia de São Francisco, 17.viii.1988, on red algae, intertidal, without gonophores, AM774; 27.viii.1988, on *Gigartina teedii*, intertidal, without gonophores, AM775, RMNH Coel. 27353; 24.x.1988, on *Gigartina acicularis*, intertidal, without gonophores, AM776, RMNH Coel. 27354; 16.vi.1992, on *Galaxaura* sp., intertidal, with gonophores, AM777.— Praia de Toque-Toque Grande, 1.ii.1987, on rock, with gonophores, AM778, RMNH Coel. 27355; 6.iii.1988, on *Perna perna* and barnacles, 2 m, with gonophores, RMNH Coel. 18831; 6.iii.1988, on barnacles and rock, 2 m, with gonophores, ROMIZ B1273.— Australia, Bass Strait, 'Rattlesnake', 45 fms, 3 small branches without coenosarc on microslide, holotype of *S. loculosa*, BMNH 1913.4.22.1.— Percy Island, 'Rattlesnake', 15.v.1848, several fragments without coenosarc on 3 microslides, BMNH 99.7.1.6541.— Seychelles, Amirante Islands, 22-85 fms, colonies without coenosarc, coll. J. S. Gardiner, BMNH 1939.7.3.2.— Sri Lanka, a fragment on microslide, R. Thornely, type of *S. ligulata*, BMNH 1907.8.24.5.— Borneo, Borneo bank, Siboga Exp. Stn 79, several colonies, with 2 labels "*Sertularia ligulata* Billard det 11.X.23" and "*Sertularia loculosa* Billard corr. 1926", RMNH Coel. 233.— W. coast of Africa, off Guinea, Atlantide

Exp. Stn 45, 30-34 m, 1 microslide, as *S. ligulata*, RMNH Coel. 1304; Stn 145, 25-60 m, 1 microslide, RMNH Coel. 1262.— Burma, Mergui Archipelago, Doubtless Bay, as *S. turbinata*, BMNH 1964.8.7.1969.— Zanzibar, as *S. turbinata*, det. Jarvis, BMNH 1923.2.15.324, 1923.2.15.11.

Description.— Colonies erect; hydrocaulus monosiphonic, branched or unbranched, divided into internodes by indistinct transverse nodes. Each internode with a pair of opposite hydrothecae (figs 13f-h). Unbranched colonies up to 9 mm high, with 15 pairs of hydrothecae; branched ones up to 35 mm high, with 64 pairs of hydrothecae. Basal athecate part of hydrocaulus separated from remainder by an oblique hinge-joint. Hydrotheca with abcauline intrathecal septum and internal thickening of perisarc where septum fuses with abcauline wall; abcauline wall almost straight, free adcauline wall short. Rim with 2 lateral cusps and a smaller adcauline cusp. Operculum composed of 2 valves: 1 large abcauline flap and a smaller adcauline. Basal hydrotheca (fig. 13g) shorter and broader than distal ones (fig. 13h), with a characteristic truncated appearance. Gonotheca (fig. 13i) barrel-shaped, annulated, borne below hydrotheca. Hydranth with abcauline caecum, about 17-18 tentacles, and adcauline ligula. From the distalmost pair of hydrothecae onwards, the stem usually develops irregular, tendril-like structures, forming a long athecate internode with a large flabelliform structure at the distal end.

Nematocysts (in μm)

Ligula - large microbasic mastigophore	9.0-10.0 × 2.5-3.0
Tentacles - small microbasic mastigophore	5.5- 6.0 × 2.0-2.5

Measurements	
Diameter of hydrorhiza	120-180 μm
Hydrocaulus	
length hydrorhiza/oblique node	200-800 μm
diameter at hinge-joint	95-200 μm
Hydrotheca	
length between 2 consecutive pairs	150-525 μm
length of abcauline wall	180-375 μm
length adnate part adcauline wall	210-425 μm
length contiguous part adcauline wall	185-350 μm
length free part adcauline wall	100-260 μm
diameter at rim	80-140 μm
diameter at base of pair	150-240 μm
Hydranth	
number of tentacles	17-18
length of ligula	170-208 μm
diameter of the ligula	20-24 μm
Gonotheca	
length	900-1100 μm
maximal diameter	560-650 μm
number of annulations	5-6

Remarks.— The tendrils may give rise to a new colony by attachment of the terminal flabelliform structure to a substrate and subsequent detachment from the orig-

inal colony. Sometimes new pairs of hydrothecae are formed at the distal end of the tendril before detachment, creating a curious situation: two pairs of hydrothecae in inverted position. The tendrils were already observed by Thornely (1904), Jarvis (1922), Vannucci Mendes (1946) and Gibbons & Ryland (1989), and may be a dispersal mechanism, common in this species.

In live colonies the ligula projects between the opercular valves when the hydranth is contracted; when it is extended the ligula stays in the interior of the hydrotheca.

As elucidated by Calder (1991), Bale (1884) identified specimens of *S. turbinata* Lamouroux, 1816 as *S. loculosa* Busk, 1852. This mistake was repeated by subsequent authors. Billard (1925), basing himself on Bale's descriptions and illustrations, concluded that *S. loculosa* was conspecific with *S. turbinata*. Later, Billard (1926), after exchanging letters with Bale, recognized his error and concluded that "... il y a donc lieu de conserver le *S. loculosa* Busk, qui est, en effect, différent du *S. turbinata* (Lamx.); mais par suite du maintien de l'espéce de Busk, le *S. ligulata* Thornely tombe en synonymie...". The following authors, however, with the exception of Vannucci Mendes (1946), overlooked Billard (1926) and continued to follow Billard (1925), considering *S. loculosa* a junior synonymy of *S. turbinata*. Calder (1991), without mentioning Billard (1926), reached the same conclusion.

The type of *S. loculosa* deposited in BMNH (microslides of three small stems without coenosarc and ligula) was examined. The hydrotheca has the shape characteristic of the species, confirming the conclusions of Billard (1926) and Calder (1991).

The material from Zanzibar identified by Jarvis (1922) as *S. turbinata* was ascribed by Billard (1925) to *S. ligulata*. Millard (1958), however, after re- examining a sample of Jarvis' material, concluded that it did not belong to either of these species. After the examination of Jarvis' material deposited in BMNH, I reached the opposite conclusion: the hydrothecae have an intrathecal septum, even though it can be very thin and difficult to be seen; also, several hydranths have a ligula.

The specimens described by Vervoort & Vasseur (1977) differ from most descriptions by having the free part of the hydrotheca longer, conferring a distinct aspect to the colonies. However, besides having a ligula, the other characters of the hydrotheca are similar to the typical *S. loculosa*.

The adcauline valve of the operculum is nearly always inconspicuous, especially in lateral view; this explains Ritchie's (1910, as *S. turbinata*) incorrect conclusion that the operculum has only one valve.

Known range.— Previous records for Brazil are from Santos, Santo Amaro Island and Itanhaém (Vannucci Mendes, 1946). Elsewhere: circumtropical.

Sertularia marginata Kirchenpauer, 1864
(figs 14a-c)

Sertularia marginata; Vannucci Mendes, 1946: 567; Pires et al., 1992: 7.
Sertularia marginata f. *typica* Vannucci, 1949: 248, 1951a: 84.
Sertularia marginata f. *laxa* Vannucci, 1949: 248, 1950: 88, 1951a: 84.
Sertularia inflata; Mayal, 1973: 34.
Tridentata marginata; Calder, 1991: 107.

Material.— Ilhabela, Parcel da Praia Grande, 14.iii.1988, on rock, intertidal, with gonophores, AM781, RMNH Coel. 27350.— Praia de Garapocaia, 11.viii.1987, on rock, intertidal, without gonophores, AM782.— Praia de Jabaquara, 11.viii.1987, on rock, intertidal, without gonophores, AM783.— Praia do Veloso, 4.xi.1987, on rock, intertidal, without gonophores, AM785.— São Sebastião, Praia do Zimbro, 26.iii.1987, AM786; 23.ii.1988, AM788; 8.ix.1988, on rock, intertidal, without gonophores, AM792; 30.iv.1987, AM787; 22.iv.1988, AM789; 18.xi.1988, on rock, intertidal, with gonophores, AM793; 17.vi.1988, on rock and red algae, intertidal, with gonophores, AM790; 17.viii.1988, on algae, intertidal, without gonophores, AM791.— Costão do Navio, 31.iii.1987, on rock, 5 m, with gonophores, AM794.— Praia do Cabelo Gordo, 8.ix.1986, on *Perna perna*, intertidal, without gonophores, AM795.— Ponta do Araçá, 26.vi.1987, AM796; 14.iii.1988, AM798; 16.iv.1988, AM799; 29.vi.1988, AM803; 14.vii.1988, AM804; 10.i.1992, on rock, intertidal, with gonophores, AM807; 5.x.1987, AM797, RMNH Coel. 27352; 15.v.1988, AM800, RMNH Coel. 27348; 14.vi.1988, AM801; 22.x.1988, AM805; 21.xi.1988, on rock, intertidal, without gonophores, AM806.— Ponta do Baleeiro, 9.i.1987, on rock, 1 m, without gonophores, RMNH Coel. 18833; 28.vii.1987, on rock, intertidal, without gonophores, AM809.— Ponta do Jarobá, 13.vii.1987, on rock, intertidal, without gonophores, AM810, RMNH Coel. 27349.— Praia das Cigarras, 6.x.1987, AM813, RMNH Coel. 27346; 15.vii.1988, AM818, RMNH Coel. 27351; 27.viii.1988, AM819; 10.ix.1988, AM820; 24.x.1988, on rock, intertidal, without gonophores, AM822; 28.iv.1987, on rock, intertidal, with gonophores, ROMIZ B1275; 10.viii.1987, AM812; 3.xi.1987, AM814; 19.v.1988, AM815, RMNH Coel. 27347; 16.vi.1988, AM816; 30.vi.1988, AM817, RMNH Coel. 27345; 24.ix.1988, on rock, intertidal, with gonophores, AM821.— Praia de Maresias, 18.xi.1988, on red algae, 2 m, with gonophores, AM823.— Praia de São Francisco, 10.viii.1987, AM824; 30.vi.1988, on rock, intertidal, without gonophores, AM825; 24.x.1988, AM826; 16.vi.1992, on rock, intertidal, with gonophores, AM827.— Praia de Toque-Toque Grande, 1.ii.1987, on rock, with gonophores, BMNH 1989.8.4.10.

Description.— Colonies erect, up to 32 mm high. Hydrocaulus monosiphonic, divided into internodes by transverse nodes, and with alternate hydrocladia. Basal athecate part of hydrocaulus separated by an oblique hinge-joint. Stem internodes with a hydrocladial apophysis near proximal end, an axillary hydrotheca, and a pair of sub-opposite hydrothecae at the distal end (fig. 14a). Stem hydrothecae adnate to frontal side of hydrocaulus, not contiguous, except those from distal end where adcauline hydrothecal walls may touch. Basal part of hydrocladia with athecate internode articulating by means of an oblique hinge- joint; thecate internodes divided by oblique nodes, each with a pair of opposite, contiguous hydrothecae. Hydrotheca (fig. 14b) inflated, strongly curved, with intrathecal septum and internal thickening of perisarc near rim. Rim with 2 pointed lateral cusps and 1 smaller, adcauline cusp. Operculum composed of 2 valves, adcauline valve smallest and usually divided in the middle. Hydranth white, with abcauline caecum, 450-500 µm high and 36-48 µm wide when extended; hypostome dome-shaped, and with 20-22 tentacles, 135-180 µm long. Gonotheca (fig. 14c) cylindrical, with strong annulations and 2 distal spines.

Nematocysts (in µm)	
Large microbasic mastigophore	11.0-13.0 × 3.5-4.0
Small microbasic mastigophore	5.0- 6.0 × 2.0
Measurements	
Diameter of hydrorhiza	180-260 µm
Hydrocaulus	

length hydrorhiza/oblique node	1400-11,690 µm
diameter at hinge-joint	180-200 µm
hydrotheca	
length of abcauline wall	160-280 µm
length adnate part adcauline wall	168-280 µm
length contiguous part adcauline wall	0-248 µm
length free part adcauline wall	80-184 µm
diameter at rim	88-136 µm
Hydrocladia	
length of longest	2600-6700 µm
number of hydrothecae of longest	14-32
hydrotheca	
distance between consecutive pairs	96-160 µm
length of abcauline wall	208-372 µm
length adnate part adcauline wall	184-266 µm
length contiguous part adcauline wall	120-266 µm
length free part adcauline wall	88-192 µm
diameter at rim	64-120 µm
diameter at base of pair	136-240 µm
Gonotheca	
length	1320-1600 µm
maximum diameter	620-960 µm
diameter at aperture	340-860 µm
number of annulations	6-8
maximum number per hydrocaulus	18

Remarks.— This is a well known species, described and illustrated by several authors such as Millard (1975) and Calder (1991). I follow Ralph (1961a), Millard (1975) and Calder (1983, 1991) in considering *Sertularia inflata* (Versluys, 1890) conspecific with *Sertularia marginata* Kirchenpauer, 1864. In São Sebastião *S. marginata* is one of the most common species in the intertidal zone and shallow infralittoral. It is usually found in dense mats on rocks, but also on algae. The epizoic hydroid *Hebella scandens* is frequently found on *S. marginata*.

Known range.— Previous records for Brazil are from Paraná State (Vannucci Mendes, 1946; Haddad, 1992), Santos, São Sebastião Island (Vannucci Mendes, 1946; Vannucci, 1951a), Rio de Janeiro and Espírito Santo States and Trindade Island (Vannucci, 1949, 1950, 1951a), off Bahia (Allman, 1888, as *Desmoscyphus pectinatus*), off Pernambuco State (Mayal, 1973) and Fernando de Noronha Archipelago (Pires et al., 1992). Elsewhere: circumtropical and circumsubtropical.

Sertularia rugosissima Thornely, 1904
(figs 14d-e)

Sertularia rugosissima Thornely, 1904: 118; Jäderholm, 1919: 15; Yamada, 1959: 70; Yamada & Kubota, 1987: 40.

Sertularia hupferi Broch, 1914: 34; Millard & Bouillon, 1973: 72; Cooke, 1975: 99; Gibbons & Ryland, 1989: 419.

Sertularia subtilis Fraser, 1937: 3; Cooke, 1975: 99; Flórez González, 1981: 125; 1983: 120.

Geminella subtilis Vannucci Mendes, 1946: 572; Vannucci, 1954: 116.

Sertularia sp. Pires et al.,1992: 7.

Material.— São Sebastião, Praia de São Francisco, 19.v.1988, on *Galaxaura* sp., intertidal, without gonophores, RMNH Coel. 18832; 30.vi.1988, on *Galaxaura* sp., intertidal, without gonophores, AM831; 15.vii.1988, on red algae, intertidal, without gonophores, ROMIZ B1274; 27.viii.1988, on red algae, intertidal, without gonophores, AM833, RMNH Coel. 23200.— Microslides n° 52 labelled 'Ilha Porchat, *Geminella subtilis*' and n° 56 labelled 'Santos, *Geminella subtilis*', VC.— Sri Lanka, Herdman Collection, 1 microslide, type of *S. rugosissima*, BMNH 1907.8.27.6.— Puerto Rico, Johnson-Smithsonian Deep Sea Exped., 1933, 10 fms, USNM 43288.

Description.— Colonies up to 7.8 mm high. Hydrocaulus monosiphonic, unbranched. Athecate part of hydrocaulus separated from remainder by an oblique hinge-joint; thecate part divided into internodes by oblique nodes. Internodes with pair of opposite hydrothecae adnate to frontal side of hydrocaulus. Adcauline walls of pair of hydrothecae contiguous, except those of proximal pair that usually do not touch (fig. 14d). Basal hydrotheca (fig. 14d) strongly curved and broad, free adcauline wall at an angle of about 75° with axis of hydrocaulus; distal hydrotheca (fig. 14e) less curved and broad, free adcauline wall at an angle of about 45° with axis of hydrocaulus. Hydrotheca without intrathecal septum, with a basal bulge, and with transverse annulations, of which the majority is incomplete and united into a longitudinal ridge parallel to the contiguous wall. Distal part of hydrotheca not annulated; with an abcauline internal cusp near the rim and with only a slight thickening of perisarc on the other side. Rim with 2 pointed lateral cusps and a smaller adcauline cusp. Operculum composed of 2 valves; adcauline flap small and usually divided. Hydranth with abcauline caecum. Gonotheca not seen.

Nematocysts (in µm)	
Large microbasic mastigophore	9.5-10.5 × 3.5-4.0
Small microbasic mastigophore	4.5- 5.0 × 2.0

Measurements	
Diameter of hydrorhiza	75-180 µm
Hydrocaulus	
length hydrorhiza/oblique node	250-400 µm
diameter at hinge-joint	85-135 µm
Hydrotheca	
distance between 2 consecutive pairs	200-362 µm
length of abcauline wall	242-287 µm
length adnate part adcauline wall	180-262 µm
length contiguous part adcauline wall	0-225 µm
length free part adcauline wall	137-260 µm
diameter at rim	90-130 µm
diameter at base of pair	250-347 µm
number of annulations	7-13

Remarks.— *Sertularia rugosissima* Thornely, 1904, was the first species of *Sertularia* described with annulated hydrothecal perisarc. Three more nominal species with this same character were described later on: *Sertularia hupferi* Broch, 1914, *Sertularia subtilis* Fraser, 1937 and *Geminella subtilis* Vannucci Mendes, 1946.

Table 1. Comparison of the variability of certain morphological characters of *Sertularia rugosissima* Thornely, 1904, based on previous descriptions and on new samples.

	A	B	C	D	E	F	G	H	I
Hydrotheca									
distance between 2 pairs (μm)	208-216	—	—	288-416	240	—	—	—	200-362
length adcauline wall (μm)	171-225	—	—	240-248	166-203	—	—	140-290	242-387
adnate adcauline length (μm)	156-178	180-200	180-200	115-175	225-255	—	175-225	150-270	180-262
free adcauline length (μm)	141-165	200-220	200-270	230-250	200-275	—	125-200	110-200	137-260
contiguous adcauline length (μm)	100-104	—	—	160	75-130	—	75-145	—	0-225
diameter at rim (μm)	62-68	100	90-100	75-95	100-130	160	40-70	60-100	90-130
diameter at base of pair (μm)	159-168	—	—	—	—	—	—	—	250-347
number of annulations	13	20	20	11-14	8-12	10-12	20	14	7-13
Gonotheca									
length (μm)	—	1200-1400	—	1177	—	—	—	—	—
maximum diameter (μm)	—	800	700	799	—	—	—	—	—
number of annulations	—	10-12	10-12	9	—	—	—	—	—

A = *Sertularia subtilis* Fraser, 1937 - measurements taken from the holotype
B = *S. subtilis* - measurements given by Flórez González (1981)
C = *S. subtilis* - measurements given by Cooke (1975)
D = *Geminella subtilis* Vannucci Mendes, 1946 - taken from slides of Vannucci's Collection
E = *Sertularia rugosissima* Thornely, 1904 - measurements taken from the holotype
F = *S. rugosissima* - measurements given by Jäderholm, 1919
G = *S. hupferi* - measurements given by Gibbons & Ryland, 1989
H = *S. hupferi* - measurements given by Millard & Bouillon, 1973
I = present material

When Broch described *S. hupferi* and Fraser, *S. subtilis*, they did not include a differential diagnosis nor did they compare their descriptions with that of species with annulated hydrothecal perisarc described earlier, leading towards the assumption that they were ignorant of the existence of such descriptions. The differences between these species, therefore, are not clear nor do we know how the authors thought they differed. Only some authors compared the various species, but none, except Thornely (cf. Cornelius, 1979: 308) who referred *S. hupferi* to *S. rugosissima*, proposed a formal synonymy.

When Vannucci Mendes (1946) erected *G. subtilis*, she compared it with the original descriptions of *S. rugosissima* and *S. subtilis*, but made no reference to *S. hupferi*. She considered as diagnostic of her species a three-valved operculum and the presence of a small adcauline marginal cusp, both other species having been described as possessing an operculum composed of two valves and having two marginal cusps.

Most of the confusion regarding these four similar nominal species is due to inaccurate descriptions and illustrations that are based on few specimens only. This has already been noticed by Gibbons & Ryland, 1989, when commenting on the original description of *S. rugosissima*. These descriptions, however, do not reflect even part of their phenotypical variation. The examination of the material available (types of *S. rugosissima* and *S. subtilis*, and slides of *G. subtilis* from VC) allowed the clarification of several important details. Because I could not find the holotype of *S. hupferi*, my comparison is based on the original description by Broch (1914), which is quite good.

This procedure made it clear that the original descriptions of these species, except that of *S. hupferi*, failed to recognize at least two important systematic characters: a) the abcauline internal cusp and b) the adcauline marginal cusp. The number of valves of the operculum is usually too variable and not always correctly described. In most species of *Sertularia* the adcauline valve is often divided (three-valved operculum), but may remain undivided (two-valved operculum). I think, therefore, that at least in this case it cannot be used as a distinctive character. Furthermore, the dimensions of the hydrotheca and gonotheca in the descriptions are very similar (Table 1) and I assume that any particular discrepancy is due to the fact that those figures were based on a few measurements only and represent only a fraction of the variability displayed by the species.

All this leads to the conclusion that *S. subtilis*, *S. hupferi* and *G. subtilis* are conspecific with *S. rugosissima*.

Known range.— Previous records for Brazil are from Paraná State, Santos (Vannucci Mendes, 1946) and Rio de Janeiro (Vannucci, 1954). Elsewhere: Indian Ocean [Sri Lanka (Thornely, 1904) and Seychelles (Millard & Bouillon, 1973)]; Pacific Ocean [Japan (Jäderholm, 1909; Yamada & Kubota, 1987), Marshall Islands (Cooke, 1975), Fiji (Gibbons & Ryland, 1989)]; Atlantic Ocean [Ghana (Broch, 1914), Puerto Rico (Fraser, 1937), Colombia (Flórez González, 1981, 1983)].

Sertularia turbinata (Lamouroux, 1816)
(figs 14f-g)

Sertularia turbinata; Billard, 1926: 512; Vannucci, 1949: 244; Gibbons & Ryland, 1989: 425.
Geminella ceramensis; Vannucci Mendes, 1946: 570.
Sertularia drachi Vannucci, 1949: 247.
Tridentata turbinata; Calder, 1991: 110.

Material.— Ilhabela, Praia de Siriúba, 11.viii.1987, on *Galaxaura* sp., intertidal, AM836.— Praia de Garapocaia, 11.viii.1987, on red algae, intertidal, MNRJ 2159.— Praia do Veloso, 4.xi.1987, on rock, intertidal, AM838, RMNH Coel. 27358.— São Sebastião, Praia do Cabelo Gordo, 17.vi.1988, on *Sargassum* sp., intertidal, AM839; 7.i.1992, on *Halodule emarginata*, 1 m, AM840.— Praia do Zimbro, 30.iv.1987, AM841, RMNH Coel. 27360; 17.vi.1988, AM842; 8.vii.1988, on *Sargassum* sp., intertidal, AM843.— Costão do Navio, 31.iii.1987, on *Amphiroa* sp., 5-20 m, AM844.— Farol dos Moleques, 14.v.1987, on rock, 2 m, AM845.— Ilha de Itaçucê, 6.iii.1988, on rock and *Amphiroa fragilissima*, 1.5 m, AM846.— Ponta do Araçá, 16.iv.1988, AM847; 21.iv.1988, AM848; 14.vi.1988, AM850; 29.vi.1988, AM851, RMNH Coel. 27359; 14.vii.1988, AM852; 10.i.1992, on *Sargassum* sp., intertidal, AM854; 15.v.1988, on *Sargassum* sp. and red algae, intertidal, AM849, RMNH Coel. 27356; 26.viii.1988, on red algae and *Sargassum* sp., intertidal, RMNH Coel. 18837.—Praia das Cigarras, 10.vi.1987, AM855, RMNH Coel. 27357; 30.vi.1987, AM856; 24.x.1988, on *Sargassum* sp., intertidal, AM859; 10.viii.1987, on *Sargassum* sp., intertidal, BMNH 1989.8.4.11; 15.vii.1988, on *Sargassum* sp., intertidal, ROMIZ B1276.— Praia de Toque-Toque Grande, 7.iv.1989, on *Perna perna*, intertidal, AM860. All material listed above without gonophores.— Microslides n° 47 labelled 'Guarujá, 4-41, *Geminella ceramensis*', and n° 67 labelled *'Geminella ceramensis'*, VC.— South Africa, Isipingo, 1 microslide with colonies on algae, without gonophores, as *S. loculosa*, BMNH 1922.3.6.39.— Sierra Leone, 1954, 1 microslide, coll. R. Lowe, BMNH 1986.5.30.1989.— Bahamas, Andros Island, on Porifera, coll. G. Wagner, det. P. F. S. Cornelius, BMNH 1981.10.19.1a/1d.

Description.— Colonies erect, up to 25 mm high. Hydrocaulus monosiphonic, unbranched. Athecate part of hydrocaulus separated from remainder by an oblique

hinge-joint; thecate part divided into internodes by oblique or transverse nodes. Each thecate internode with a pair of opposite hydrothecae; usually 8-15 pairs, but as many as 35 in the largest stems. Hydrothecae adnate to frontal face of hydrocaulus; adcauline walls of pair of hydrothecae contiguous, except those of proximal pair that usually do not touch. Hydrotheca of varied shape; basalmost curved and broad (fig. 14f), with thicker perisarc and adcauline wall at right angle with axis of stem; distal ones longer (fig.14g), with thinner perisarc, and adcauline wall at an acute angle to axis of stem. Hydrotheca with intrathecal septum and perisarc of abcauline and adcauline walls thickened near rim, not forming a distinct cusp. Rim with 2 pointed lateral cusps and 1 small adcauline cusp. Gonotheca not seen.

Nematocysts (in µm)	
Large microbasic mastigophore	9.5-11.0 × 3.0-4.0
Small microbasic mastigophore	5.5- 6.5 × 2.0-2.5
Measurements	
Diameter of hydrorhiza	140-200 µm
Hydrocaulus	
length hydrorhiza/oblique node	300-1990 µm
diameter at hinge-joint	56-176 µm
Hydrotheca	
length between 2 consecutive pairs	168-560 µm
length of abcauline wall	200-408 µm
length adnate part adcauline wall	200-344 µm
length contiguous part adcauline wall	0-320 µm
length free part adcauline wall	152-296 µm
diameter at rim	104-200 µm
diameter at base of pair	200-408 µm

Remarks.— The synonymy of *S. turbinata* was recently reviewed by Calder (1991) (see also discussion of *S. loculosa*). I examined a slide of VC with material labelled *Geminella ceramensis*, and confirm Calder's (1991) hypothesis that it is identical with *S. turbinata*. On the other hand, the sertulariid identified by Mayal (1983) as *S. turbinata* does not have an intrathecal septum, and can not be referred to that species.

Known range.— Previous records from Brazil are Paraná State (Haddad, 1992), Santos, Rio de Janeiro and Espírito Santo (Vannucci Mendes, 1946; Vannucci, 1949). Elsewhere: Atlantic, Indian and Pacific Oceans.

Thyroscyphus ramosus Allman, 1877
(figs 15a-b)

Thyroscyphus ramosus Allman, 1877: 11; Splettstösser, 1929: 54; Vervoort, 1959: 250; Van Gemerden-Hoogeveen, 1965: 15.

Material.— Ilhabela, Ilha das Cabras, 24.viii.1987, on rock, without gonophores, CV, AM862, RMNH Coel. 23401.— São Sebastião, Praia do Zimbro, 7.i.1987, on rock, with gonophores, JMO, AM863; 19.ii.1987, on rock, without gonophores, JMO, AM864; 26.iii.1987, AM865; 26.v.1987, on rock, with gono-

phores, RMNH Coel. 23120; 9.iv.1987, on rock, with gonophores, ROMIZ B1277; 23.ii.1988, AM 868; 22.iv.1988, AM869, RMNH Coel. 23402; 17.vi.1988, AM872; 18.vii.1988, AM873; 8.viii.1988, AM874; 17.viii.1988, AM875, RMNH Coel. 23403; 8.ix.1988, AM876, RMNH Coel. 23404; 18.xi.1988, on rock, without gonophores, AM877; 8.x.1987, on rock, without gonophores, RMNH Coel. 18834. All material listed above collected in the intertidal zone.— Ponta do Baleeiro, 1.ix.1987, on rock, 2 m, without gonophores, AM878.— Bahia, H.M.S. Challenger, 10-20 fms, 2 vials and 2 microslides, BMNH 1888.11.13.16.— Caribbean, Andros Island, 1981, G. Warner, det P.F.S. Cornelius, BMNH 1981.10.19.3.— Sierra Leone, off Freetown, Atlantide Exp. Stn 141, 9.iv.1946, 15 m, 1 microslide, RMNH Coel. 1298.— Venezuela, La Guaira, 8.xii.1922, 1 microslide, with gonophores, E. Hentschel, RMNH Coel. 3580.

Description.— Colonies erect, up to 20 cm high. Hydrocaulus monosiphonic, irregularly branched, divided into internodes by oblique nodes, alternately bent left and right (fig. 15a). Each internode with a distal apophysis supporting a pedicellate hydrotheca. Pedicel short, spirally twisted. Hydrothecae alternate, long, subcylindrical, with abcauline wall slightly convex. Diaphragm oblique, thickened where it fuses with the hydrothecal wall, especially on abcauline side. Rim with 4 shallow cusps; operculum composed of 4 valves. Perisarc thickened near rim, forming an internal annulus. Hydranth long, white or yellowish, with 20-28 tentacles, and without caecum. Gonotheca (fig. 15b) conical, smooth, borne on internode just below hydrotheca.

Nematocysts (in μm)

Hydranth and coenosarc - macrobasic mastigophore	23.0-25.0 × 10.0-11.5
Tentacles - microbasic mastigophore	8.0- 9.5 × 3.0-4.0

Measurements	
Hydrocaulus	
length of internode	1160-2920 μm
diameter at node	320-1040 μm
number of annulations of pedicel	0-4
Hydrotheca	
length margin/apophysis	1200-1800 μm
length margin/diaphragm	800-1320 μm
diameter at rim	360-520 μm
maximal diameter	400-760 μm
Gonotheca	
length	1720-2000 μm
maximal iameter	800-880 μm
number of annulations	2-4

Remarks.— Although *T. ramosus* is a conspicuous species, it was found at only 2 places in the area studied. On Zimbro Beach, large colonies were abundant on a vertical wall of the rocky coast, near the sandy bottom. The locality is moderately exposed to waves and the colonies are subject to constant abrasion and emersion during the spring tides. Despite being frequently covered by coarse sand, the colonies thrive and were found throughout the study.

I examined the material from Bahia described by Allman (1888) and deposited in BMNH; it has slightly longer hydrothecae and shorter pedicels than the present material.

Known range.— The previous record for Brazil is from off Bahia (Allman, 1888). Elsewhere: Caribbean (Van Gemerden-Hoogeveen, 1965) and West coast of Africa (Vervoort, 1959).

Family Campanulariidae Johnston, 1836

Clytia gracilis (M. Sars, 1850)
(fig. 15c)

Clytia attenuata; Vannucci Mendes, 1946: 548; Vannucci, 1949: 233.
Clytia cylindrica; Vannucci, 1949: 232; 1950: 84; Vannucci & Ribeiro, 1955: 69.
For synonymy: see Calder (1991: 54)

Material.— São Sebastião, Ponta do Baleeiro, 8.x.1987, on *Astraea phoebia*, 1 m, with gonophores, AM183.— Praia do Cabelo Gordo, 30.xi.1985, on ceramic settling plate, 1.5 m, with gonophores, RMR, AM184.

Description.— Colonies monosiphonic, usually erect, up to 15 mm high and irregularly branched. Hydrothecal pedicel unbranched or sympodially branched, with one hydrotheca at the distal end. Pedicel long, with annulations at both extremities. Branches arising from curved and short lateral apophysis. Hydrothecae conical, with transverse diaphragm and rim with triangular cusps. Gonothecae smooth, cylindrical and truncated distally, arising from the internodes on short, annulated pedicels.

Measurements

Diameter of hydrorhiza	84-140 µm
Hydrocaulus	
length of internode	1050-2100 µm
diameter of internode	85-90 µm
Pedicel	
length	875-1560 µm
diameter	60-73 µm
number of distal annulations	2-6
number of proximal annulations	7-10
Hydrotheca	
length	530-700 µm
diameter at rim	265-415 µm
diameter at diaphragm	80-100 µm
number of marginal cusps	10-12
Number of tentacles	20
Gonotheca	
length	850-880 µm
diameter at rim	200-220 µm
maximal diameter	300-440 µm

Remarks.— Some of the material identified by Vannucci & Ribeiro (1955) and Vannucci (1957, 1963) as *Clytia cylindrica* may refer to *C. gracilis*. Slides from VC

labelled *C. attenuata* (= *C. cylindrica*) have colonies of *C. gracilis* and *C. linearis*. *Clytia elsaeoswaldae* Stechow, 1914, also recorded by Vannucci Mendes (1946) and Vannucci (1951a) from Brazilian waters, was considered conspecific with *C. gracilis* by Calder (1991); hydroids from VC, labelled *Clytia elsae-oswaldae*, however, are more similar to the current descriptions of *C. hemisphaerica*.

Vannucci (1958, 1963) found fragments of colonies of *C. cylindrica* in plankton samples, the hydranths having food in the stomach and the gonophores being filled with developing medusae.

Clytia gracilis and *C. hemisphaerica* are similar species, with a confused taxonomy (see Cornelius, 1982 and Cornelius & Östman, 1986). Calder (1991) distinguished them basically by the shape of hydrothecae and gonothecae, as was done previously by other authors. There are, however, other differences between the two species, especially in size and morphology of the nematocysts (Östman, 1979b), in the length/width ratio of the column of the hydranth, and in the number of tentacles (Cornelius, 1987a).

Known range.— Previous records of the medusa stage for Brazil include Trindade Island, Fernando de Noronha Archipelago, Rio de Janeiro and Santa Catarina States (Vannucci, 1957: 59; 1963: 166). Elsewhere: circumglobal.

Clytia hemisphaerica (Linnaeus, 1767)
(figs 15d-f)

For synonymy: see Calder (1991: 57)

Material.— Ilhabela, Praia do Veloso, 4.xi.1987, on *Sertularia marginata*, intertidal, without gonophores, AM185.— São Sebastião, Baía do Araçá, 6.v.1988, on *Zoobotryon*, *Acanthophora spicifera* and rock, intertidal, with gonophores, AM189, RMNH Coel. 27407.— Praia do Zimbro, 22.iii.1988; 8.ix.1988, on *S. marginata*, intertidal, without gonophores, AM187; 17.vi.1988, on *Sargassum* sp., intertidal, with gonophores, AM188.— Costão do Navio, 31.iii.1987, on barnacles, 5-6 m, with gonophores, AM190, RMNH Coel. 27406.— Farol dos Moleques, 14.v.1987, on *Lophogorgia punicea*, infralittoral, with gonophores, AM191, RMNH Coel 27408.— Ilha de Itaçucê, 6.iii.1988, on rock, 1.5 m, with gonophores, AM192.— Praia do Cabelo Gordo, 27.iv.1987, on *Pteria colymbus*, without gonophores, CGT, AM193.— Ponta do Araçá, 21.iv.1988, on *A. spicifera*, intertidal, with gonophores, AM194; 15.v.1988, on *Gigartina teedii*, intertidal, with gonophores, AM195; 29.vi.1988, on rock, intertidal, with gonophores, AM196; 9.ix.1988, on *Carijoa riisei*, intertidal, without gonophores, RMNH Coel. 18835; 22.x.1988, AM198; 10.i.1992, on *Sargassum* sp., intertidal, without gonophores, AM200, RMNH Coel. 27418; 21.xi.1988, on *S. marginata*, intertidal, without gonophores, AM199.— Ponta do Baleeiro, 8.x.1987, on *L. punicea*, 3 m, with gonophores, MNRJ 2141; 12.iv.1988, on *Codium intertextum*, 1 m, with gonophores, AM202; 11.v.1988, on *L. punicea*, 1.5 m, with gonophores, AM203; 11.v.1988, on barnacles, *Madracis* sp. and calcareous algae, infralittoral, without gonophores, AM204; 17.v.1988, on *Eudendrium* sp, infralittoral, with gonophores, AM206; 23.vi.1988, on *L. punicea*, 5-6 m, with gonophores, AM207; 7.vii.1988, on *Crassostrea rhizophorae* and barnacles, infralittoral, with gonophores, AM208; 22.vii.1988, on algae, 6 m, without gonophores, AM209; 30.vii.1988, on calcareous algae, without gonophores, AM210; 18.viii.1988, on *L. punicea*, 6 m, without gonophores, AM211.— Ponta do Jarobá, 29.i.1987, 2.5 m, without gonophores, AM212; 11.iv.1988, AM213; 12.iv.1988, AM215; 14.iv.1988, on *C. intertextum* and on barnacles, 1-2 m, with gonophores, AM217; 11.iv.1988, on *L. punicea*, 1-3 m, with gonophores; 12.iv.1988, on nylon rope, 3 m, with gonophores; 9.vi.1988, on *Galaxaura* sp., 2 m, without gonophores, AM218, RMNH Coel. 27409; 9.vi.1988, on *Macrorhynchia philippina*, 1 m, with gonophores, ROMIZ B1278; 7.vii.1988, on *L. punicea* and *Galaxaura* sp., infralittoral, with gonophores, AM220; 19.vii.1988, on *M. philippina* and *Galaxaura* sp., 2 m, without gonophores, AM221; 9.ix.1988, on *Aglaophenia latecarinata* and *Crepidula plana*, 2 m,

without gonophores, AM222; 3.iii.1989, on *Halodule emarginata*, 2-3 m, with gonophores, AM223.— Praia das Cigarras, 10.ix.1988, AM224; 24.ix.1988, on *Dictyota* sp., intertidal, with gonophores, AM225; 24.ix.1988, on *Sargassum* sp., intertidal, with gonophores, AM226.— Praia de São Francisco, 8.viii.1987, intertidal, without gonophores, AM227; 10.ix.1987, AM228, 10.ix.1988, on *Galaxaura* sp., intertidal, with gonophores, AM230; 30.vi.1988, on *Dynamena crisioides*, intertidal, without gonophores, AM229; 24.x.1988, on *Gigartina acicularis*, and rock, intertidal, without gonophores, AM231.

Description.— Colonies monosiphonic, usually unbranched. Branches (fig. 15d), when present, arising from hydrothecal pedicels on a curved and short lateral apophysis. Pedicel with a varied number of annulations at both extremities. Hydrothecae conical, with transverse diaphragm and rim with pointed triangular cusps.

Nematocysts (in μm)

Hydranth	
Small microbasic mastigophore (A-type)	7.0- 8.0 × 2.0-3.0
Large microbasic mastigophore (B-type)	15.5-17.0 × 3.5-4.0
Medusa	
tentacles	
small microbasic mastigophore (A-type) (specially at tip)	7.0-9.0 × 2.0-2.5
isorhiza	6.0-6.5 × 2.0
large microbasic mastigophore (C-type)	8.5-9.5 × 3.5 -4.0
exumbrella - microbasic mastigophore (D-type)	9.0-9.5 × 3.0-3.5

Measurements

Diameter of hydrorhiza	70-180 μm
Pedicel	
length	690-2600 μm
diameter	85-140 μm
number of distal annulations	3-14
number of proximal annulations	6-18
Hydrotheca	
length	450-820 μm
diameter at rim	270-540 μm
diameter at diaphragm	110-200 μm
number of marginal cusps	12- 16
Hydranth	
number of tentacles	24-29
length of tentacles	810-920 μm
length of column	540-630 μm
diameter of column	100-110 μm
diameter of hypostome	172-253 μm
Gonotheca	
length	750-990 μm
diameter at aperture	180-220 μm
maximal diameter	400-460 μm
Newly released medusae	
length	200-280 μm
diameter	400-460 μm
diameter of aperture	180-220 μm

Hydranths transparent, with milky white, pear-shaped hypostome. Gonothecae (fig. 15e) with weak transverse annulations, cylindrical to ovate and truncated distally, borne on hydrorhiza by means of short, annulated pedicels. Newly released medusae (fig. 15f) hemispherical, with 4 radial canals, ring canal, 4 perradial tentacles, 4 interradial bulbs, and 8 adradial statocysts; tentacles long, with knob of nematocysts at distal end; exumbrella with nematocysts. Three days old medusae kept in laboratory at 23°C saucer-shaped, with 8 tentacles (4 perradials and 4 interradials).

Remarks.— This variable species has several synonyms (Cornelius, 1982; Calder, 1991). The distinction from *C. gracilis* if based on skeletal characters is difficult and has doubtful results. On the other hand, the size of the nematocysts, number of tentacles and length/width ratio of the hydranth column as proposed by some authors as distinctive characters still have to be confirmed with populations of other localities. The number of tentacles of the majority of the material from São Sebastião is within the range found by Cornelius (1987b); the length/width ratio of the hydranth column, however, is greater (5.5:1) than that given by this author (3-4:1). The types of nematocysts in the medusae and polyps agree with the results obtained by Östman (1979a, b) with Swedish material; the dimensions of some nematocysts types, however, are slightly different: the microbasic mastigophore type B of the hydranth is bigger, and both isorhiza and microbasic mastigophore type D of the medusa are smaller than those reported by Östman (1979a, 1979b, respectively). Östman et al. (1987) showed that the size range of the nematocysts considered specific (B-type) in *C. hemisphaerica* hydroids varied greatly between Italian and Swedish populations. Differences in size, consequently, must be taken into account when using nematocysts as taxonomic criteria.

Known range.— Previous records for Brazil include Baía de Sepetiba, Rio de Janeiro (Navas-Pereira, 1980) and off the State of Rio Grande do Sul (Navas- Pereira, 1981) (both medusa stage, as *Phialidium hemisphaericum*); State of Paraná (Haddad, 1992). Elsewhere: circumglobal.

Clytia hummelincki (Leloup, 1935)
(fig. 15g)

Clytia hummelincki; Millard, 1966: 480; 1975: 218; Cornelius, 1982: 82; Calder, 1991: 61; Haddad, 1992: 47.

Material.— São Sebastião, Ponta do Jarobá, 9.iii.1992, on *Perna perna*, 0.5 m, without gonophores, RMNH Coel. 23121.

Description.— Colonies stolonal, monosiphonic and unbranched. Pedicels with a group of basal annuli; sometimes with other groups of annuli distal of basal group. Pedicel with subhydrothecal spherule. Hydrotheca broad, with smooth rim and oblique diaphragm. Hydranth large, with spherical hypostome, and 20-26 tentacles. Gonotheca not seen.

Measurements

Diameter of hydrorhiza	64-80 μm

Pedicel	
length	800-2500 µm
diameter	72-84 µm
number of proximal annulations	8-12
Hydrotheca	
length	204-288 µm
diameter at rim	268-352 µm
diameter at diaphragm	96-144 µm

Remarks.— This comparatively rare species was found only once before in Brazilian waters. Calder (1991) found it once in Bermuda. The diaphragms of the São Sebastião specimens are clearly oblique and not occasionally oblique as described by Calder (1991).

Known range.— The previous record for Brazil is from Paraná State (Haddad, 1992). Elsewhere: Atlantic Ocean (Calder, 1991).

Clytia linearis (Thornely, 1899)
(figs 16 a-b)

For synonymy see Cornelius (1982: 84) and Calder (1991: 62).

Material.— Ilhabela, Parcel da Praia Grande, 14.iii.1988, on calcareous algae, intertidal, with gonophores, RMNH Coel. 18836, MNRJ 2140.— São Sebastião, Costão do Navio, 31.iii.1987, on *Lytocarpia tridentata*, 5-20 m, without gonophores, AM234.— Farol dos Moleques, 14.v.1987, on rock, 4 m, without gonophores, AM235.— Ilha de Itaçucê, 6.iii.1988, on rock, with gonophores, AM236.— Ponta do Araçá, 14.iii.1988, on rock, intertidal, without gonophores, AM237; 16.iv.1988, on rock and *Codium intertextum*, intertidal, with gonophores, AM238; 15.v.1988, on *C. intertextum*, intertidal, without gonophores, AM239.— Ponta do Baleeiro, 19.iii.1985, on ceramic settling-plate, with gonophores, RMR, AM240.— Ponta do Jarobá, 12.iii.1987, on *C. intertextum*, 1 m, with gonophores, ROMIZ B1279; 11.iv.1988, AM242; 12.iv.1988, on *C. intertextum* and on rocks, 1-2 m, with gonophores, AM244; 11.iv.1988, on rock, shells and corals, 1-2 m, with gonophores, AM241, RMNH Coel. 27410.— Praia de Toque-Toque Grande, 6.iii.1988, on *Perna perna* and barnacles, 2 m, with gonophores, AM248.— Italy, Ischia, 28.x.1985, on *Posidonia*, with gonophores, R. G. Hughes, det. P.F.S. Cornelius, BMNH 1985.12.1.9.

Description.— Colonies monosiphonic, usually erect, up to 15 mm high and irregularly branched. Hydrothecal pedicel unbranched or sympodially branched, with 1 hydrotheca at the distal end. Pedicel long, with annulations on both extremities; sometimes annulated throughout. Branches arising from curved and short lateral apophysis. Hydrothecae (fig. 16a) conical, with transverse diaphragm; rim delicate with triangular cusps. Upper part of hydrothecal wall pleated; each pleat originating from apex of each cusp. Gonothecae (fig. 16b) smooth, conical, with apex large and truncated, arising from axil between lateral apophysis and pedicel. Medusa similar to that of *C. hemisphaerica*.

Remarks.— It is curious that this species had not been found before in Brazilian waters, as it is conspicuous and common in the region of São Sebastião. It seems likely that Dr Vannucci identified specimens of *C. linearis* as *C. cylindrica* (see Remarks under *C. gracilis*).

Nematocysts (in μm)	
Hydranth	
small microbasic mastigophore (A-type)	8.0-9.0 × 2.5-3.0
large microbasic mastigophore (B-type)	12.0-13.0 × 3.5-4.0
Medusa	
tentacles	
small microbasic mastigophore (A-type)	6.0-7.5 × 2.0
isorhiza	6.0-6.5 × 1.5-2.0
large microbasic mastigophore (C-type)	8.5-9.5 × 3.5-4.0
exumbrella - microbasic mastigophore (D-type	8.0-9.0 × 2.5-3.0

Measurements	
Diameter of hydrorhiza	120-130 μm
Hydrocaulus	
length internode	700-2000 μm
diameter internodes	150-170 μm
Pedicel	
length	280-1500 μm
diameter	100-140 μm
number annulations	6-27
Hydrotheca	
length	500-800 μm
diameter at rim	260-410 μm
diameter at diaphragm	130-180 μm
number of marginal cusps	10-13
Hydranth	
number of tentacles	24-28
length of tentacles	748-863 μm
length of column	745-920 μm
diameter of column	149-172 μm
diameter of hypostome	172-230 μm
length of hypostome	322-402 μm
Gonotheca	
length	950-1110 μm
diameter at rim	280-330 μm
maximal diameter	330-400 μm
Newly released medusae	
length	260-350 μm
diameter	380-500 μm
diameter of aperture	120-140 μm

The types of nematocysts of the hydranth and medusa agree with those described by Östman et al. (1987) from Italian material, except for the fact that these authors did not report D-type nematocysts in the few medusae studied. The sizes of the other nematocysts are in the range of variation given by these authors, except for the isorhizae from medusa, that are smaller in the specimens from São Sebastião.

Known range.— This is the first record for Brazilian waters. Elsewhere: Atlantic, Indian and Pacific Oceans (Calder, 1991)

Obelia bidentata Clarke, 1875
(fig. 16 c)

Obelia (?) *oxidentata*; Vannucci Mendes, 1946: 555.
Gonothyraea bicuspidata; Vannucci Mendes, 1946: 556.
Obelia bicuspidata Vannucci, 1954: 108.
Obelia bidentata; Jäderholm, 1903: 270; Calder, 1991: 70.

Material.— São Sebastião, Baía do Araçá, 14.iii.1988, on algae, intertidal, without gonophores, MNRJ 2143.— Ponta do Araçá, 14.vii.1988, on Bryozoa, intertidal, without gonophores, AM250.— Praia das Cigarras, 19.v.1988, on *Dynamena crisioides*, intertidal, without gonophores, AM251.— Praia de São Francisco, 16.vi.1992, on *D. crisioides*, intertidal, without gonophores, RMNH Coel. 23122.— Cananéia, Ferryboat, 5.v.1953, several colonies without gonophores, coll. M. Vannucci, as *O. striata*, BMNH 1956.10.22.2.— Cananéia, 26.iii.1953, on buoy chain, M. Vannucci, as *O. striata*, BMNH 1956.10.22.8.

Description.— Colonies monosiphonic, erect. Hydrothecal pedicel unbranched or sympodially branched, with a single hydrotheca at the distal end. Pedicel with annulations; branches arising from curved and short lateral apophysis. Hydrothecae (fig. 16c) campanulate, with transverse diaphragm and bimucronate marginal cusps. Gonothecae not seen.

Nematocysts (in µm)	
microbasic mastigophore (A type)	6.0-6.5 × 2.0-2.5
isorhiza, first type	5.0-6.5 × 1.0-1.5
isorhiza, second type	5.0-5.5 × 2.0
Measurements	
Hydrocaulus	
length internode	350-500 µm
diameter internodes	90-100 µm
Pedicel	
length	100-592 µm
diameter	52-90 µm
number of distal annulations	5-8
number of proximal annulations	3-4
Hydrotheca	
length	352-440 µm
diameter at rim	170-190 µm
diameter at diaphragm	70-100 µm
number of marginal cusps	11-16

Remarks.— This is a species with great phenotypic variation. Cornelius (1975b) reported colonies up to 350 mm high, polysiphonic and with four orders of branching. There is no record from Brazil of colonies attaining that size. The gonotheca of Brazilian specimens was described by Vannucci (1954), who observed the characteristic medusae with about 20 tentacles.

The cnidome of *O. bidentata* comprises a microbasic mastigophore (A-type) and two kinds of isorhizae: one thin and curved (similar to the I_d of *O. dichotoma*) and the other slightly curved and broader.

Known range.— Previous records for Brazil are from Santos (Vannucci Mendes, 1946, as *O. oxidentata* and *Gonothyraea bicuspidata*), Baía de Guanabara (Vannucci, 1949, as *G. bicuspidata*), Cananéia and Ilhabela (Vannucci, 1954, as *O. bicuspidata*), and Cabo Frio (Jäderholm, 1903). Elsewhere: Pacific, Indian and Atlantic Oceans (Calder, 1991).

Obelia dichotoma (Linnaeus, 1758)
(fig. 16 d)

?*Obelia braziliensis*; Vannucci Mendes, 1946: 553; Vannucci, 1949: 231.
?*Obelia commissuralis*; Vannucci, 1951a: 80.
?*Obelia griffini*; Vannucci Mendes, 1946: 552.
?*Obelia hyalina*; Vannucci, 1949: 230.
For additional synonymy see Cornelius (1975b, 1982, 1990) and Calder (1991: 72).

Material.— Ilhabela, Ilha das Cabras, 17.xi.1987, on rock, *Phallusia nigra* and sponge, 3 m, with gonophores, AM253.— Praia de Siriúba, 11.viii.1987, on rock, intertidal, without gonophores, AM254.— Praia de Garapocaia, 11.viii.1987, on red algae, intertidal, with gonophores, AM255.— São Sebastião, Baía do Araçá, 5.x.1987, on wood, with gonophores, AM256, RMNH Coel. 27423.— Praia do Cabelo Gordo, 17.vi.1988, on rock, intertidal AM257; 7.i.1992, on *Halodule emarginata*, 1 m, without gonophores, AM258; 3.i.1992, on decapod, 0.5 m, without gonophores, AM264.— Praia do Zimbro, 17.vi.1988, on *Sargassum* sp., intertidal, without gonophores, AM259.— Costão do Navio, 31.iii.1987, on barnacles, 5-20 m, without gonophores, AM260.— Farol dos Moleques, 14.x.1987, on rocks, 4 m, without gonophores, AM261.— Ponta do Araçá, 26.vi.1987, on *Dynamena crisioides* and algae, intertidal, with gonophores, AM265; 16.iv.1988, on *Sargassum* sp. and *Gigartina acicularis*, intertidal, without gonophores, AM266, RMNH Coel. 27421; 21.iv.1988, on *Sargassum* sp., intertidal, without gonophores, AM267; 29.vi.1988, on rock, intertidal, without gonophores, AM268; 10.i.1992, on rock, 1 m, with gonophores, AM269.— Ponta do Baleeiro, 18.ii.1987, on *Macrorhynchia philippina*, 1.5 m, with gonophores, AM270; 8.x.1987, on barnacles, intertidal, with gonophores, AM271; 30.xi.1987, on rock, 4 m, with gonophores, AM272; 11.v.1988, on *Crassostrea rhizophorae*, infralittoral, without gonophores, AM273; 11.v.1988, on *Eudendrium* sp., infralittoral, without gonophores, AM274; 11.v.1988, on *Lophogorgia punicea*, infralittoral, without gonophores, AM275; 11.v.1988, on calcareous algae, barnacles and *Madracis* sp., infralittoral, with gonophores, AM276; 23.vi.1988, on *P. nigra*, 2 m, with gonophores, AM277; 23.vi.1988, on shells and ascidians, 5-6 m, without gonophores, AM278; 23.vi.1988, on rock, 2 m, without gonophores, AM279; 22.vii.1988, on *Idiellana pristis*, 6 m, without gonophores, AM280; 30.vii.1988, on calcareous algae, intertidal, with gonophores, AM281, RMNH Coel. 27424; 18.viii.1988, on *Lophogorgia punicea*, 6 m, with gonophores, AM282; 28.xi.1989, AM283; 15.iii.1990, on barnacles, intertidal, without gonophores, AM284.— Ponta do Jarobá, 17.xi.83, on *Diopatra cuprea* tube, intertidal, without gonophores, AM285, RMNH Coel. 27422; 19.iv.1985, on ceramic settling-plates, 1 m, with gonophores, RMR, AM286; 29.i.1987, on *C. rhizophore*, 2.5 m, without gonophores, AM287; 29.i.1987, on ceramic settling-plates, 1 m, without gonophores, AM288; 12.xi.1987, on barnacles, intertidal, with gonophores, AM289; 11.iv.1988, AM290; 9.vi.1988, AM291; 9.vii.1988, on barnacles, 1-2 m, with gonophores, AM294; 7.vii.1988, on wood, infralittoral, without gonophores, AM292; 7.vii.1988, on rock, infralittoral, with gonophores, AM293; 19.vii.1988, on sponge, 2 m, without gonophores, AM296; 19.vii.1988, on rock, 2 m, with gonophores, AM295; 9.iii.1992, on *P. perna*, 0.5 m, with gonophores, AM297.— Praia das Cigarras, 10.viii.1987, AM298, RMNH Coel. 27419; 6.x.1987, on rock, intertidal, with gonophores, AM299, RMNH Coel. 27420.— Praia de Barequeçaba, 25.v.1987, on rock, intertidal, without gonophores, AM300; 27.x.1987, on rock, intertidal, with gonophores, AM301.—Praia de Maresias, 18.ii.1988, on red algae, 2 m, with gonophores, AM302.— Praia de São Francisco, 10.viii.1987, AM303; 30.vi.1988, on *Galaxaura* sp., intertidal, without gonophores, AM304.— Praia de Toque-Toque Grande, 1.ii.1987, on nylon rope, 1 m, with gonophores, AM305; 31.x.1988, on *P. perna* and on barnacles, 1-2 m, without gonophores, AM306.

Description.— Colonies erect, up to 25 mm high. Hydrocaulus monosiphonic, unbranched or sympodially branched, with alternate hydrothecae. Internodes annulated basally, with hydrothecal pedicel at the distal end. Pedicel of variable length and with a varied number of annulations. Branch arising from short and curved apophysis lateral to hydrothecal pedicel. Hydrothecae (fig. 16d) campanulate, with oblique diaphragm and smooth rim. Hydranth with spherical hypostome and intertentacular membrane. Gonothecae (fig. 16d) smooth, cylindrical or conical and truncated distally, with aperture on a short tubular neck, arising from the axil of hydrothecal pedicels, or from hydrothecal pedicels, on short, annulated pedicels. Newly liberated medusae 350 µm in diameter, with 23-30 tentacles, 8 statocysts, 4 radial canals, a ring canal, but without gonads.

Nematocysts (in µm)	
Body of hydrant	
isorhiza (I_D type?)	8.0-9.0 × 1.5-2.0
isorhiza (I_d type?)	5.0-8.0 × 1.0-1.5
Tentacles of hydranth	
microbasic mastigophore (A type)	5.0-7.5 × 2.0-2.5
Medusa - microbasic mastigophore	5.0-5.5 × 1.5-2.0

Measurements	
Diameter of hydrorhiza	100-140 µm
Hydrocaulus	
length internode	360-616 µm
diameter internodes	84-136 µm
Pedicel	
length	169-840 µm
diameter	60-100 µm
number annulations	2-16
Hydrotheca	
length	205-400 µm
diameter at rim	172-305 µm
diameter at diaphragm	72-130 µm
Hydranth	
number of tentacles	25-28
length of tentacles	414-632 µm
length of column	129-196 µm
diameter of column	92-104 µm
Gonotheca	
length	616-912 µm
diameter at rim	110-152 µm
maximal diameter	223-320 µm

Remarks.— According to Cornelius (1990: 554) "*O. dichotoma* is among the most morphologically varied of all hydroids..", and was described under many specific names. In Brazil this species was recorded as *Obelia angulosa* by Stechow, 1919, and as *O. brasiliensis*, *O. griffini*, *O. hyalina* and *O. commissuralis* by Vannucci Mendes (1946) and Vannucci (1949, 1951a, 1955a). Although Cornelius (1990) included *O. commissural-*

is McCrady, 1957 in the synonymy of *O. longissima*, after examining slides of Vannucci's Collection, I think that the material studied by Vannucci must be assigned to *O. dichotoma*.

Obelia dichotoma is very similar to *O. longissima*. Until recently both were considered conspecific by some modern authors (see Cornelius, 1982, 1990). Distinction is possible by features of well developed colonies and by the morphology of the nematocysts. According to Östman (1983a, 1983b), *O. dichotoma* has one type of microbasic mastigophores (A-type) and two types of isorhizae (I_D and I_d-types) while *O. longissima* only has two types of microbasic mastigophores (A and F_I-type).

The specimens from São Sebastião are always small and monosiphonic. In some specimens I found, besides the A-type nematocyst, an isorhiza similar to the I_D- type, but no I_d-type; in others there was the typical A-type and an isorhiza similar to the I_d-type. I therefore consider the identification of this material provisional.

Known range.— Previous records for Brazil are from Rio de Janeiro (Stechow, 1919 as *O. angulosa*; Vannucci, 1949, as *O. hyalina*; 1954, as *O. commissuralis*); São Sebastião and Ilhabela (Vannucci, 1949, as *O. griffini*; 1951a, as *O. commissuralis*), Santos (Vannucci Mendes, 1946; Vannucci, 1949, as *O. griffini* and *O. braziliensis*; 1955a, as *O. hyalina*), and Cananéia (Vannucci, 1955a, as *O. hyalina*). Elsewhere: cosmopolitan.

Obelia geniculata Linnaeus, 1758
(fig. 16 e)

Obelia geniculata; Jäderholm, 1903: 270; Vannucci Mendes, 1946: 551; Vannucci, 1949: 232; Blanco, 1964: 162; Haddad, 1992: 47.
For additional synonymy: see Cornelius (1975a: 272).

Material.— São Sebastião, Praia das Cigarras, 16.viii.1988, on *Pterocladia capillacea*, intertidal, without gonophores, AM307.

Description.— Colonies erect, up to 1 mm high. Hydrocaulus monosiphonic, sympodially branched, with alternate hydrothecae. Internodes annulated basally, with hydrothecal pedicel on the distal end. Pedicel of variable length and with a varied number of annulations. Branch arising from short and curved apophysis lateral to hydrothecal pedicel. Hydrothecae (fig. 16e) campanulate, with transverse diaphragm and smooth margin. Perisarc of hydrocaulus and hydrothecae thickened. Gonotheca not seen.

Measurements

Hydrocaulus	
length internode	240-536 µm
diameter internodes	88-128 µm
Pedicel	
length	104-256 µm
diameter	64-92 µm
number of annulations	2-6
Hydrotheca	
length	192-212 µm

diameter at rim	192-240 μm
diameter at diaphragm	88-112 μm

Remarks.— The perisarc of the specimens studied is not as thickened as described by other authors. Vannucci reports similar specimens from other places.

Known range.— Previous records for Brazil are from Paraná State (Vannucci Mendes, 1946; Haddad, 1992), Santos (Vannucci Mendes, 1946), São João da Barra (Vannucci, 1950) and Espiríto Santo (Vannucci, 1949). Elsewhere: cosmopolitan.

Orthopyxis sargassicola (Nutting, 1915)
(figs 16 f-i)

Orthopyxis lennoxensis; Vannucci Mendes, 1946: 544; Vannucci, 1951a: 81.
Orthopyxis crenata; Vannucci, 1954: 111.
Orthopyxis billardi Vannucci, 1954: 112.
For additional synonymy see Calder (1991: 51).

Material.— São Sebastião, Praia do Cabelo Gordo, 25.v.1988, on *Sargassum* sp., 1 m, with gonophores, ROMIZ B1280; 26.v.1988, newly released medusae, AM309.— Praia do Zimbro, 8.ix.81, on *Sargassum* sp., intertidal, with gonophores, AM310; 18.xi.1986, 22.iv.1988, on *Sargassum* sp., 1.5 m, without gonophores, JMO, AM311; 2.vi.1987, on *Sargassum* sp. and *Dictyopteris* sp., with gonophores, BMNH, 1989.8.4.3.; 18.vii.1988, AM314; 18.xi.1988, on *Sargassum* sp., intertidal, without gonophores, AM316; 17.viii.1988, on *Sargassum* sp., intertidal, without gonophores, MNRJ 2167.— Costão do Navio, 31.iii.1987, on *Sargassum* sp., 5-20 m, without gonophores, AM317.— Ponta do Araçá, 14.iii.1988, AM318, RMNH Coel. 27416; 14.i.1992, on rock, intertidal, with gonophores, AM324, RMNH Coel. 27417; 16.iv.1988, AM319; 14.vii.1988, on *Sargassum* sp., intertidal, without gonophores, AM322; 14.vi.1988, on rock and *Sargassum* sp., intertidal, without gonophores, RMNH Coel. 18803; 29.vi.1988, on *Dictyopteris* sp., intertidal, without gonophores, AM321, RMNH Coel. 27413; 9.ix.1988, on *Dictyota* sp., intertidal, without gonophores, AM323, RMNH Coel. 27412.— Ponta do Baleeiro, 8.x.1987, on barnacles, intertidal, without gonophores, AM325.— Ponta do Jarobá, 11.iv.1988, on *Galaxaura* sp. and *Dictyopteris* sp., 1.5 m, without gonophores, AM326; 10.iii.1992, on *Perna perna*, 0.5 m, with gonophores, AM327.— Praia das Cigarras, 10.viii.1987, on *Sargassum* sp., intertidal, without gonophores, AM328, RMNH Coel. 27415; 17.vii.1988, on algae, intertidal, without gonophores, AM329.— Praia de Maresias, 18.ii.1988, on red algae, 2 m, without gonophores, AM330.— Praia de São Francisco, 8.viii.1987, on *Sargassum* sp., intertidal, without gonophores, AM331, RMNH Coel. 27414.

Description.— Colonies stolonal; pedicels arising from creeping hydrorhiza, annulated or sinuous throughout or only at proximal and distal ends. Subhydrothecal spherule present. Hydrotheca (figs 16f-g) campanulate, without diaphragm, with a basal annular thickening; rim with cusps, not very distinct in some hydrothecae. Hydranth transparent; hypostome milky white. Gonotheca (fig. 16h) laterally compressed and with well marked annulations, arising from the hydrorhiza. Perisarc of hydrocaulus, hydrotheca and gonotheca usually thickened. Eumedusoid (fig. 16i) reddish, without tentacles and manubrium, with 4 radial canals, ring canal, 8 adradial marginal statocysts, velum and nematocysts scattered over the exumbrella. Oocytes milky white, spherical, about 160-176 μm in diameter. Spawning occurred during release of medusoid from gonangium or soon after.

Nematocysts (in μm)	
Hydranth	
microbasic mastigophore (A type)	6.5-7.0 × 2.0
microbasic mastigophore (B type)	10.0-11.0 × 2.5-3.0
Medusoid - microbasic mastigophore (B type)	7.5-9.0 × 2.5-3.0

Measurement	
Diameter of hydrorhiza	60-112 μm
Pedicel	
length	568-2070 μm
diameter	64-136 μm
number of annulations	6- 20
Hydrotheca	
length	344-528 μm
diameter at rim	248-440 μm
diameter at diaphragm	80-144 μm
number of marginal cusps	10-14
Hydranth	
number of tentacles	23- 26
length of tentacles	575-690 μm
length of column	290-460 μm
diameter of column	58-80 μm
diameter of hypostome	138-184 μm
length of hypostome	115-150 μm
Gonotheca	
length	920-1280 μm
diameter at rim	620-700 μm
maximal diameter	680-920 μm
Length of eumedusoid	500-720 μm
Diameter of eumedusoid	680-720 μm

Remarks.—Some of my colonies have features intermediate between *O. crenata* and *O. sargassicola*, mainly due to the presence of weakly developed marginal cusps. The medusoids observed are practically identical with those of *O. crenata* as described by Hirohito (1969).

Known range.— Previous records for Brazil are Ilha de Santo Amaro (Vannucci Mendes, 1946, as *O. lennoxensis*), Ilha de São Sebastião (Vannucci, 1951a, as *O. lennoxensis*), Rio de Janeiro (Stechow, 1919) and São João da Barra (Vannucci, 1954, as *O. billardi*). Elsewhere: western Atlantic.

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Table 2. Species of hydroids recorded for the region of São Sebastião.

Species	first record for Brazil	for São Sebastião
Athecatae		
Bimeria vestita Wright, 1859	———	———
Bougainvillia rugosa Clarke, 1882	———	———
Corydendrium parasiticum (Linnaeus, 1767)	———	———
Turritopsis nutricula McCrady, 1859	Vannucci, 1957 (medusa)	———
Stylactaria hooperii (Sigerfoos, 1899)	Moreira et al., 1979	Moreira et al.,1979
Stylactaria sp.	———	———
Amphinema rugosum (Mayer, 1900)	———	———
Leuckartiara octona (Fleming, 1823)	Navas-Pereira, 1981 (medusa)	———
Cladocoryne floccosa Rotch, 1871	———	———
Asyncoryne ryniensis Warren, 1908	———	———
Zanclea costata Gegenbaur, 1856	Vannucci, 1957 (medusa)	———
Coryne producta (Wright, 1858)	Vannucci, 1949 (in aquarium)	———
Cladonema radiatum Dujardin, 1843	———	———
Ectopleura dumortierii (van Beneden, 1844)	Vannucci, 1957, 1963	Migotto & da Silveira, 1987
Ectopleura warreni Ewer, 1953)	Migotto & da Silveira, 1987	Migotto & da Silveira, 1987
Zyzzyzus warreni Calder, 1988	Migotto & da Silveira, 1987	Migotto & da Silveira, 1987
Pennaria disticha Goldfuss, 1820	Migotto & da Silveira, 1987	Migotto & da Silveira, 1987
Thecatae		
Hebella scandens (Bale, 1888)	Jäderholm, 1903	———
Scandia mutabilis (Ritchie, 1907)	———	———
Halecium bermudense Congdon, 1907	Vannucci, 1949	———
Halecium delicatulum Coughtrey, 1876	Souza, 1987	———
Halecium dichotomum Allman, 1888	———	———
Halecium dyssymetrum Billard, 1929	———	———
Halecium tenellum Hincks, 1861	———	———
Ophiodissa sp.	———	———
Nemalecium lighti (Hargitt, 1924)	———	———
Aglaophenia latecarinata Allman, 1877	Vannucci Mendes, 1946	Vannucci, 1949
Macrorhynchia philippina (Kirchenpauer, 1872)	Nutting, 1900	Vannucci, 1949
Lytocarpia tridentata (Versluys, 1899)	Totton, 1926	Vannucci, 1951a
Halopteris constricta Totton, 1930	———	———
Halopteris diaphana (Heller, 1868)	Vannucci Mendes,1946	Vannucci, 1951a
Halopteris buskii (Bale, 1884)	———	———
Monostaechas quadridens (McCrady, 1857)	Vannucci, 1949	———
Ventromma halecioides (Alder, 1859)	Vannucci Mendes, 1946	Vannucci, 1949
Plumularia floridana Nutting, 1900	Vannucci Mendes, 1946	———
Plumularia strictocarpa Pictet, 1893	Vannucci Mendes, 1946	Vannucci, 1949
Monotheca margaretta Nutting, 1900	Vannucci Mendes, 1946	Vannucci, 1949
Diphasia tropica Nutting, 1904	Vannucci, 1949	———
Dynamena crisioides Lamouroux, 1824	Vannucci Mendes, 1946	———
Dynamena dalmasi (Versluys, 1899)	Ritchie, 1909	———
Dynamena disticha (Bosc, 1802)	Vannucci Mendes, 1946	Vannucci, 1951a
Dynamena quadridentata (Ellis & Solander, 1786)	Vannucci Mendes, 194	———
Idiellana pristis (Lamouroux, 1816)	Allman, 1888	———
Sertularella conica Allman, 1877	Vannucci Mendes, 1946	Vannucci, 1949
Sertularella cylindritheca (Allman, 1888)	Allman, 1888	———
Sertularia distans (Lamouroux, 1816)	Ritchie, 1909	Vannucci, 1949
Sertularia loculosa Busk, 1852	Vannucci Mendes, 1946	Vannucci, 1949

Sertularia marginata Kirchenpauer, 1864	Allman, 1888	Vannucci, 1951a
Sertularia rugosissima Thornely, 1904	Vannucci Mendes, 1946	————
Sertularia turbinata (Lamouroux, 1816)	Vannucci Mendes, 1946	————
Thyroscyphus ramosus Allman, 1877	Allman, 1888	————
Clytia gracilis (M.Sars, 1850)	————	————
Clytia hemisphaerica (Linnaeus, 1767)	Vannucci Mendes, 1946	Vannucci, 1951a
Clytia hummelincki (Leloup, 1935)	Haddad, 1992	————
Clytia linearis (Thornely, 1899)	————	————
Obelia bidentata Clarke, 1875	Vannucci Mendes, 1946	Vannucci, 1954
Obelia dichotoma (Linnaeus, 1758)	Vannucci Mendes, 1946	Vannucci, 1949
Obelia geniculata Linnaeus, 1758	Vannucci Mendes, 1946	————
Orthopyxis sargassicola (Nutting, 1915)	Vannucci Mendes, 1946	Vannucci, 1951a
TOTAL : 59	40	21

Table 3. Cnidome of the hydroids from São Sebastião. DE = Desmoneme; IZ = Isorhiza; HEA = Heterotrichous anisorhiza; SMI = Small microbasic mastigophore; LMI = Large microbasic mastigophore; MMA = Macrobasic mastigophore; MIE = Microbasic eurytele; MAE = Macrobasic eurytele; SS = Small stenotele; LS = Large stenotele; PS = Pseudostenotele; - = absent; × = present; ×(M) = present only in the medusa; * = data from Migotto & da Silveira (1987).

Species	DE	IZ	HEA	SMI	LMI	MMA	MIE	MAE	SS	LS	PS
Filifera											
Bimeria vestita	×	-	-	-	-	-	×	-	-	-	-
Bougainvillia rugosa	×	-	-	-	-	-	×	-	-	-	-
Corydendrium parasiticum	×	-	-	-	-	-	×	-	-	-	-
Turritopsis nutricula	×	-	-	-	-	-	×	-	-	-	-
Stylactaria hooperi	×	-	-	-	-	-	×	-	-	-	-
Stylactaria spec.	×	-	-	-	-	-	×	-	-	-	-
Amphinema rugosum	×	-	-	-	-	-	×	-	-	-	-
Leuckartiara octona	×	-	-	×(M)	-	-	×	-	-	-	-
Capitata											
Cladocoryne floccosa	-	-	-	-	-	-	-	×	×	×	-
Asyncoryne ryniensis	-	-	-	-	-	-	×	×	×	×	-
Zanclea costata	-	-	-	-	-	-	-	×	×	×	-
Coryne producta	×(M)	-	-	-	-	-	-	-	×	×	-
Cladonema radiatum	×(M)	-	-	-	-	×	-	-	×	×	-
*Ectopleura dumortierii**	×	-	×	×	-	-	-	-	×	×	-
*Ectopleura warreni**	×	×	×	-	-	-	-	-	×	×	-
*Zyzzyzus warreni**	×	×	-	×	-	-	-	-	×	×	-
*Pennaria disticha**	×	-	-	×	×	-	-	-	×	×	-
Lafoeidae											
Hebella scandens	-	-	-	×	×	-	-	-	-	-	-
Haleciidae											
Halecium bermudense	-	-	-	×	-	-	-	-	-	-	×
Halecium delicatulum	-	-	-	×	×	-	-	-	-	-	-
Halecium dichotomum	-	-	-	×	-	-	-	-	-	-	×
Halecium dyssymetrum	-	×	-	×	-	-	-	-	-	-	-
Halecium tenellum	-	-	-	×	-	-	-	-	-	-	×
Ophiodissa sp.	-	-	-	×	-	-	-	-	-	-	×
Nemalecium lighti	-	-	-	×	-	-	-	-	-	-	×
Aglaopheniidae											
Aglaophenia latecarinata	-	-	-	×	×	-	-	-	-	-	-
Macrorhynchaa philippina	-	-	-	×	×	-	-	-	-	-	-
Lytocarpia tridentata	-	-	-	×	×	-	-	-	-	-	-
Halopteridídae											
Halopteris constricta	-	-	-	×	-	-	-	-	-	-	×
Halopteris diaphana	-	-	-	×	-	-	-	-	-	-	×
Halopteris buskii	-	-	-	×	-	-	-	-	-	-	×
Monostaechas quadridens	-	-	-	×	-	-	-	-	-	-	×
Kirchenpaueriidae											
Ventromma halecioides	-	-	-	×	-	-	-	-	-	-	×
Plumulariidae											
Monotheca margaretta	-	-	-	×	-	-	-	-	-	-	×
Plumularia floridana	-	×	-	×	-	-	-	-	-	-	×
Plumularia strictocarpa	-	-	-	×	-	-	-	-	-	-	×
Sertulariidae											
Diphasia tropica	-	-	-	×	×	-	-	-	-	-	-

Dynamena crisioides	-	-	-	×	×	-	-	-	-	-	-
Dynamena dalmasi	-	-	-	×	×	-	-	-	-	-	-
Dynamena disticha	-	-	-	×	×	-	-	-	-	-	-
Dynamena quadridentata	-	×	-	×	-	-	-	-	-	-	-
Idiellana pristis	-	-	-	×	×	-	-	-	-	-	-
Sertularella cylindritheca	-	-	-	×	×	-	-	-	-	-	-
Sertularia distans	-	-	-	×	×	-	-	-	-	-	-
Sertularia loculosa	-	-	-	×	×	-	-	-	-	-	-
Sertularia marginata	-	-	-	×	×	-	-	-	-	-	-
Sertularia rugosissima	-	-	-	×	×	-	-	-	-	-	-
Sertularia turbinata	-	-	-	×	×	-	-	-	-	-	-
Thyroscyphus ramosus	-	-	-	×	-	×	-	-	-	-	-
Campanulariidae											
Clytia hemisphaerica	-	-	-	×	×	-	-	-	-	-	-
Clytia linearis	-	-	-	×	×	-	-	-	-	-	-
Obelia bidentata	-	×	-	×	-	-	-	-	-	-	-
Obelia dichotoma	-	×	-	×	-	-	-	-	-	-	-
Orthopyxis sargassicola	-	-	-	×	-	-	-	-	-	-	-

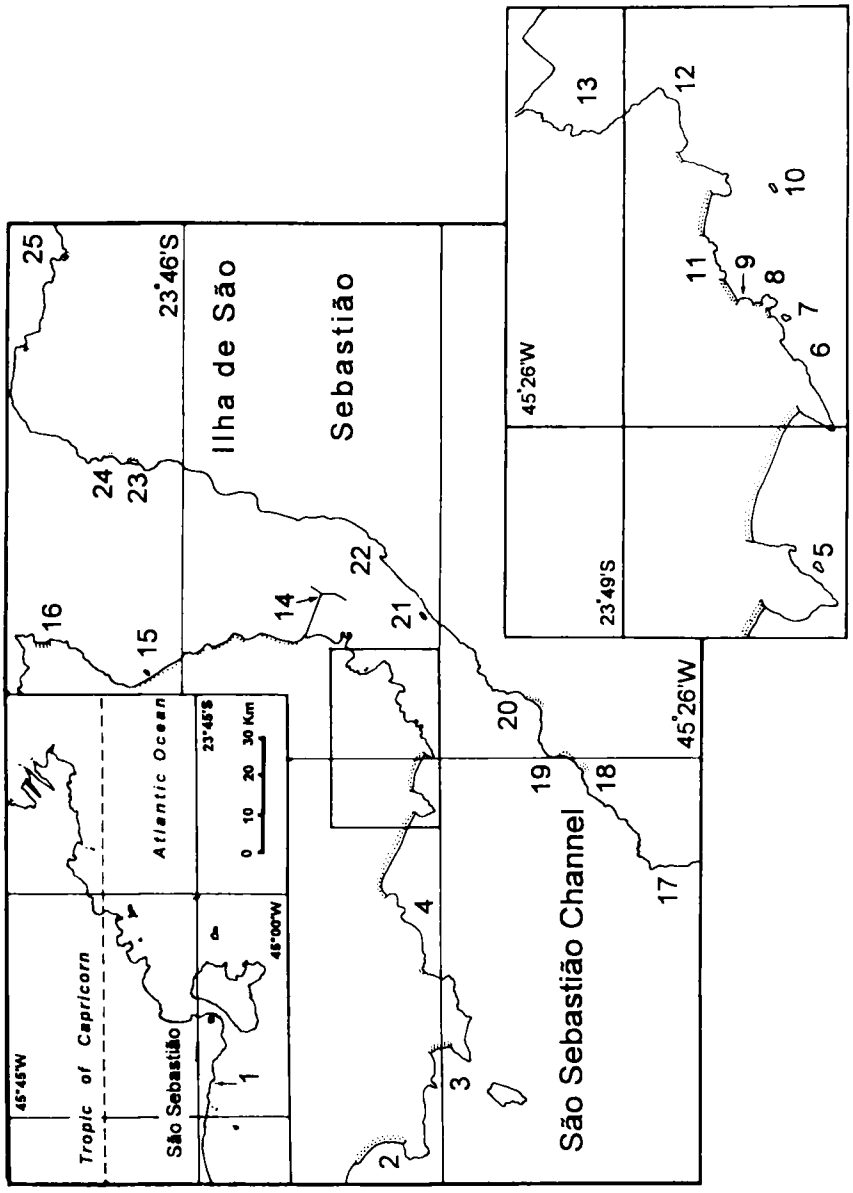

Fig. 1. Collecting sites. 1. Praia de Maresias; 2. Praia de Toque-Toque Pequeno; 3. Praia de Toque-Toque Grande; 4. Costão do Navio; 5. Ilha de Itaçucê; 6. Costão Barequeçaba/Baleeiro; 7. Ponta do Baleeiro; 8. Ponta do Jarobá; 9. Praia do Cabelo Gordo; 10. Farol dos Moleques; 11. Praia do Zimbro; 12. Ponta do Araçá; 13. Baía do Araçá; 14. Petrobrás' Pier; 15. Praia de São Francisco; 16. Praia das Cigarras; 17. Ponta da Sela; 18. Praia do Veloso; 19. Praia do Curral; 20. Parcel da Praia Grande; 21. Ilha das Cabras; 22. Barra Velha; 23 Praia de Siriúba; 24. Praia de Garapocaia; 25. Praia de Jabaquara.

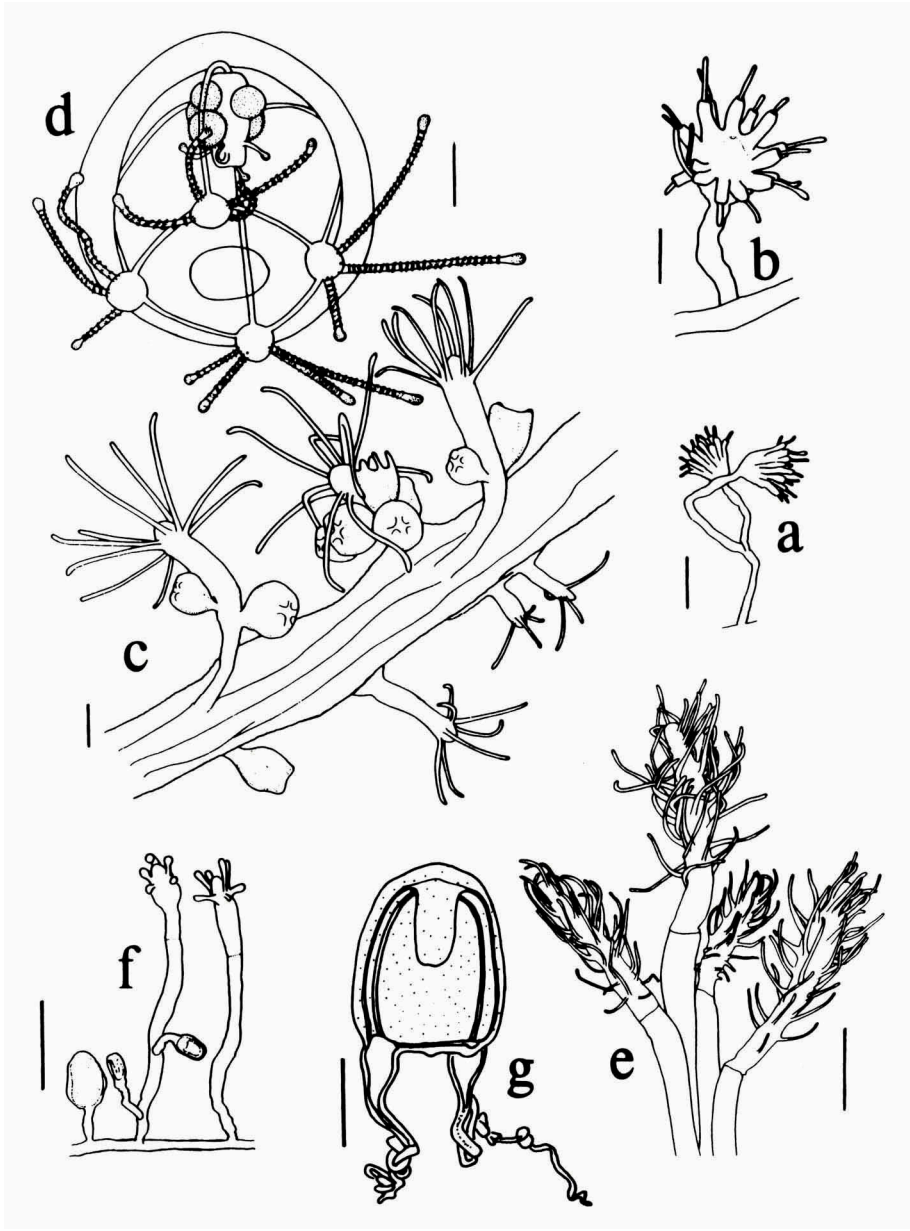

Fig. 2. a-b. *Bimeria vestita* Wright, 1859, a. part of a colony (scale 500 µm), b. part of a colony showing pseudohydrotheca (scale 200 µm); c-d. *Bougainvillia rugosa* Clarke, 1882, c. part of a branch with hydranths with gonophores (scale 200 µm), d. 24-hour-medusa, oral-lateral view (scale 200 µm); e. *Corydendrium parasiticum* (Linnaeus, 1767), distal part of a colony (scale 1000 µm); f-g. *Amphinema rugosum* (Mayer, 1900), f. part of a colony with hydranths and gonophores (scale 400 µm), g. newly released medusa, lateral view (scale 200 µm).

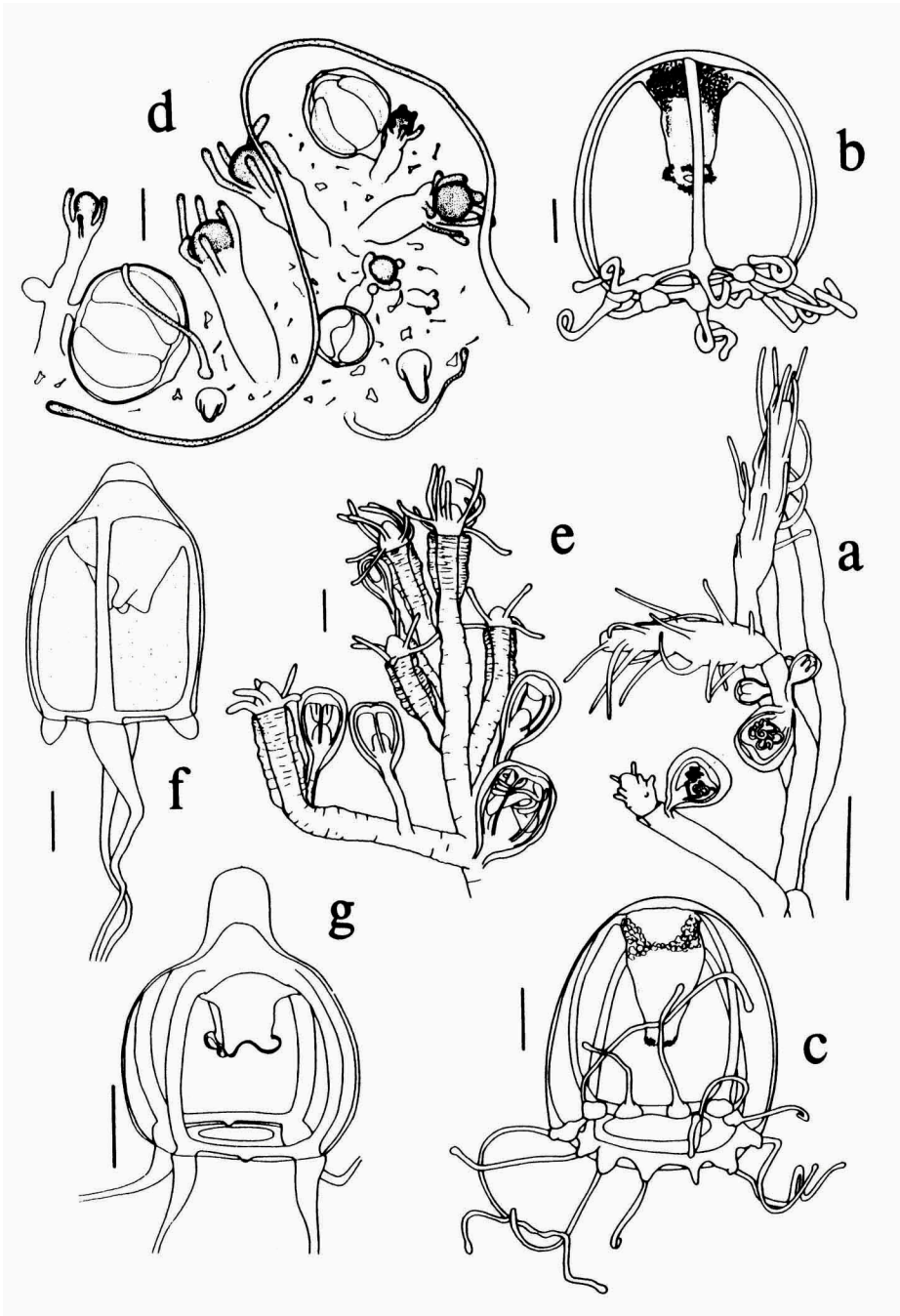

Fig. 3. a-c. *Turritopsis nutricula* McCrady, 1859, a. distal part of a colony with hydranths and gonophores (scale 500 μm), b. newly released medusa, lateral view (scale 100 μm), c. 7-day-old medusa, lateral view (scale 2000 μm); d. *Stylactaria* sp. part of a colony with hydranths, gonophores and one tentaculozooid (scale 200 μm); e-g. *Leuckartiara octona* (Fleming, 1823), e. distal part of a colony with hydranths and gonophores (scale 200 μm), f. newly released medusa, lateral view (scale 200 μm), g. 6-day-old medusa, lateral view (scale 1000 μm).

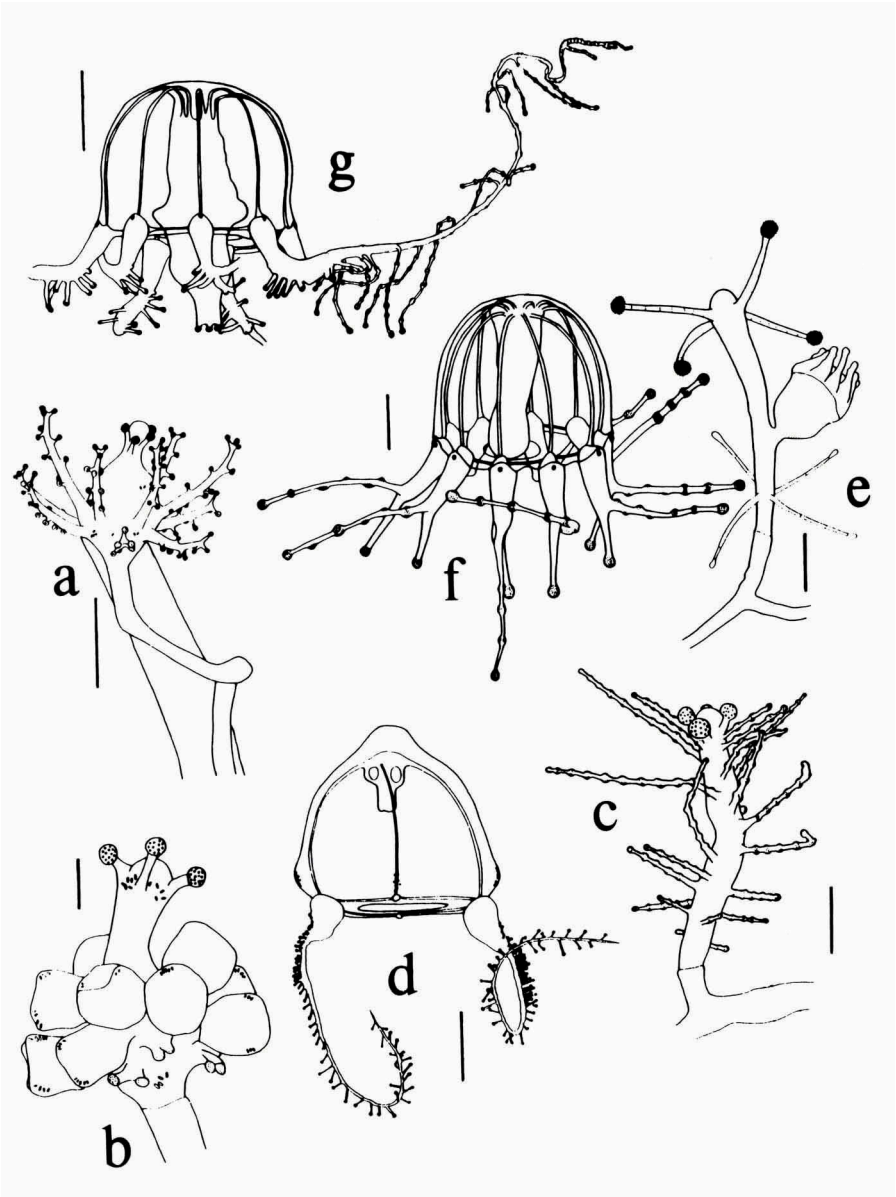

Fig. 4. a-b. *Cladocoryne floccosa* Rotch, 1871, a. hydranth without gonophores on the hydrocaulus of *Sertularia marginata* (scale 500 μm), b. detail of a hydranth with gonophores, note the regression of the aboral tentacles (scale 200 μm); *Asyncoryne ryniensis* Warren, 1908, c. hydranth (scale 500 μm), d. 21-day-old medusa, lateral view (scale 500 μm); e-g. *Cladonema radiatum* Dujardin, 1843, e. hydranth with gonophore (scale 200 μm), f. 24-hour-old medusa, lateral view (scale 200 μm), g. 48-day-old medusa, lateral view (tentacles omited, except one) (scale 500 μm).

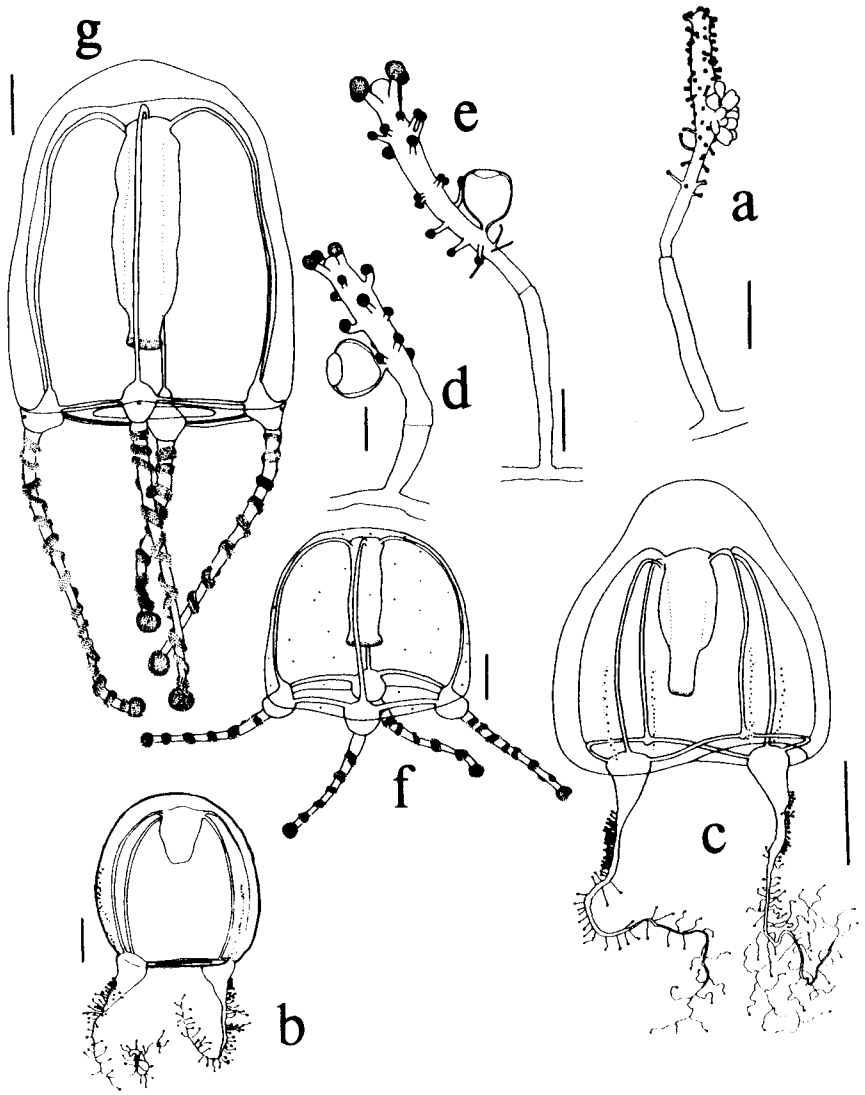

Fig. 5. a-b. *Zanclea costata* Gegenbaur, 1857, a. hydranth with gonophores (scale 500 µm), b. newly released medusa, lateral view (scale 100 µm), c. 53-day-old medusa, lateral view (scale 1000 µm); d-g. *Coryne producta* (Wright, 1858), d. hydranth with gonophore (scale 400 µm), e. hydranth reared in laboratory, note the aboral filiform tentacles (scale 200 µm); f. newly released medusa, lateral view (scale 200 µm), g. 9-day-old medusa, lateral view (scale 500 µm).

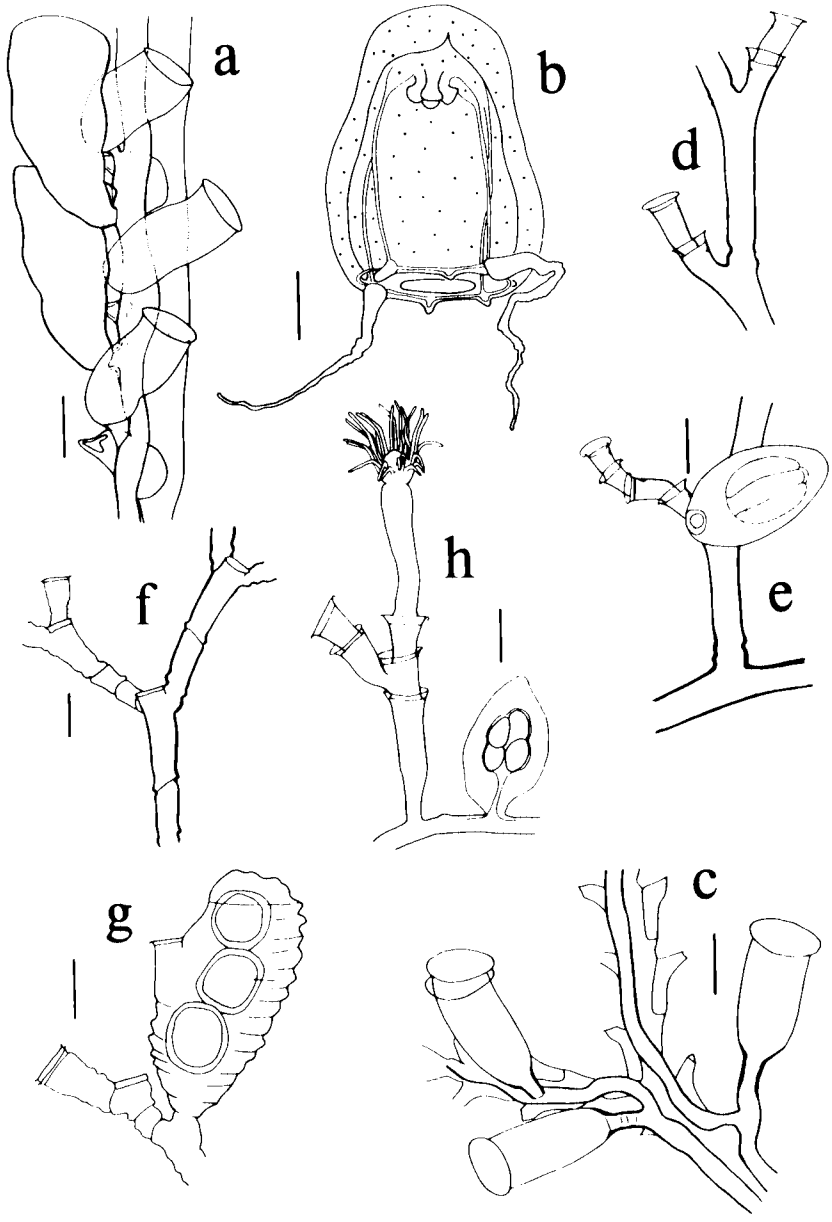

Fig. 6. a-b. *Hebella scandens* (Bale, 1888), a. part of a colony with gonothecae on the hydrocaulus of *Sertularia marginata* (scale 200 µm), b. 3-day-old medusa, lateral view (scale 200 µm); c. *Scandia mutabilis* (Ritchie, 1907), part of a colony on the hydrocaulus of *Dynamena crisioides* (scale 500 µm); d-e. *Halecium delicatulum* Coughtrey, 1876, d. part of stem with hydrothecae (scale 200 µm), e. basal part of stem with one gonotheca (scale 200 µm); f-g. *Halecium dichotomum* Allman, 1888, f. part of stem with hydrothecae (scale 200 µm), g. part of stem with gonotheca (scale 200 µm); h. *Halecium tenellum* Hincks, 1861, part of a colony with gonotheca (scale 200 µm).

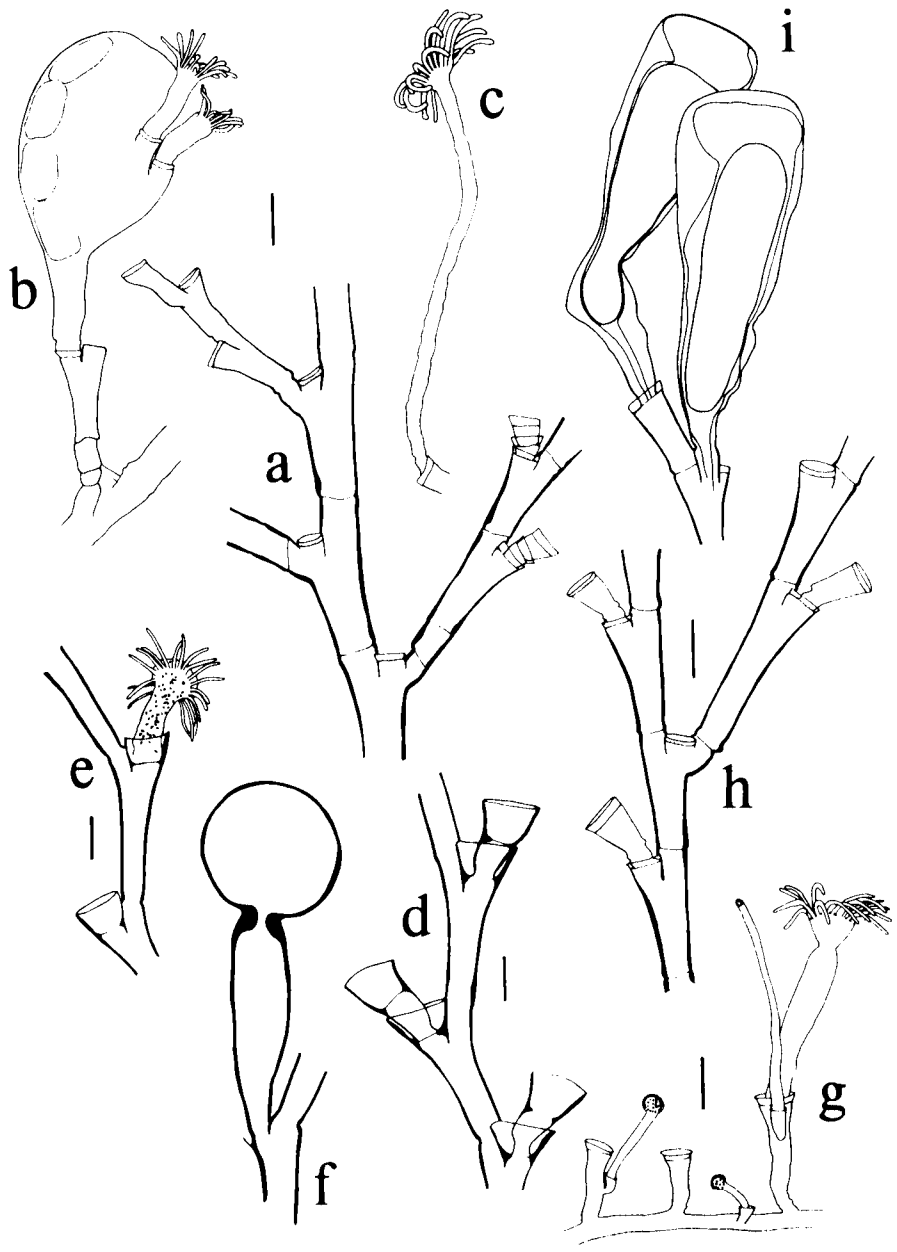

Fig. 7. a-c. *Halecium bermudense* Congdon, 1907 (scales 200 μm), a. part of stem with hydrothecae, b. part of stem with gonotheca, c. nematophore; d-f. *Halecium dyssymetrum* Billard, 1929 (scales 200 μm), d. part of stem with hydrothecae, e. part of stem with hydrothecae and one hydranth, f. gonotheca with acrocyst; g. *Ophiodissa* sp. part of a colony (scale 200 μm); h-i. *Nemalecium lighti* (Hargitt, 1924) (scales 200 μm), h. part of stem with hydrothecae, i. gonothecae.

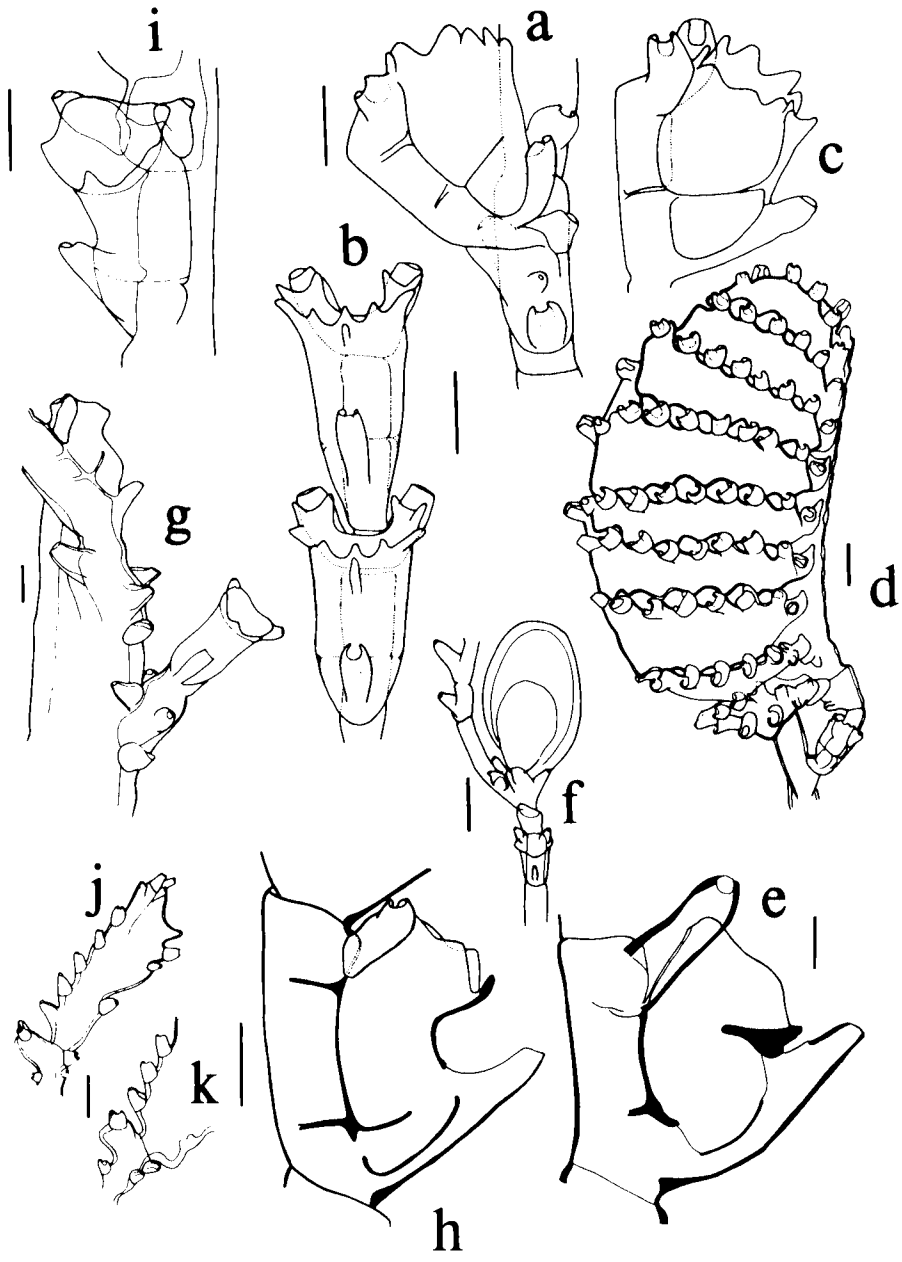

Fig 8. a-d. *Aglaophenia latecarinata* Allman, 1877, a. part of stem (scale 100 µm), b. part of a hydrocladium with 2 hydrothecae, frontal view (scale 100 µm), c. hydrotheca, lateral view (scale 100 µm), d. corbula, lateral view (scale 200 µm); e-f. *Macrorhynchia philippina* (Kirchenpauer, 1872), e. hydrotheca, lateral view (scale 50 µm), f. phylactocarp (scale 200 µm); g-k. *Lytocarpia tridentata* (Versluys, 1899) (scales 100 µm), g. part of stem with basal part of 2 hydrocladium, h. hydrotheca, lateral view, i. hydrotheca, fronto-lateral view, j. basal part of a male nematocladium, k. basal part of a female nematocladium.

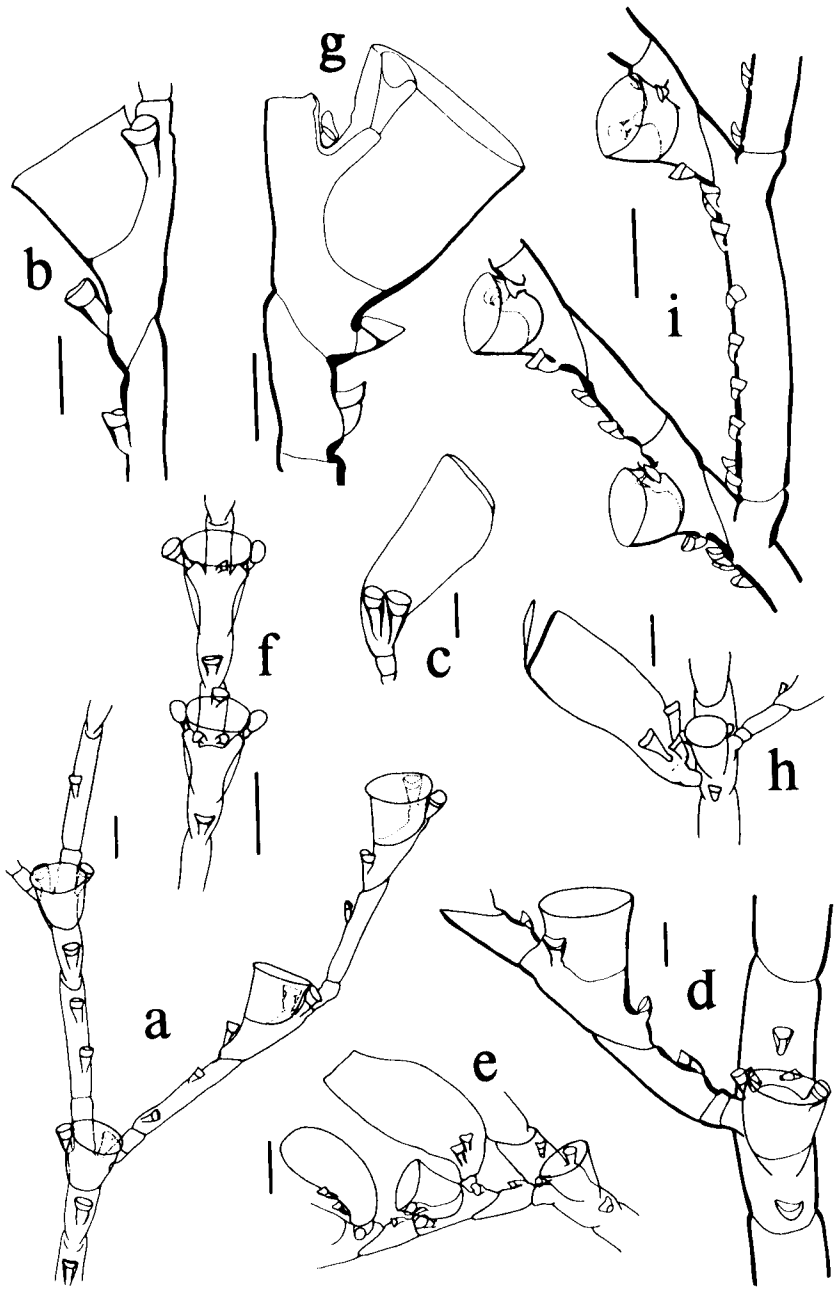

Fig. 9. a-c. *Halopteris constricta* Totton, 1930 (scales 100 µm), a. part of stem, b. hydrotheca, lateral view, c. gonotheca; d-e. *Halopteris diaphana* (Heller, 1868), d. part of stem (scale 100 µm), e. part of stem with gonothecae (scale 200 µm); f-h. *Halopteris buskii* (Bale, 1884), f. part of hydrocladium with 2 hydrothecae, frontal view (scale 100 µm), g. hydrotheca, lateral view (scale 200 µm), h. part of stem with gonotheca (scale 200 µm); i. *Monostaechas quadridens* (McCrady, 1857), part of stem (scale 200 µm).

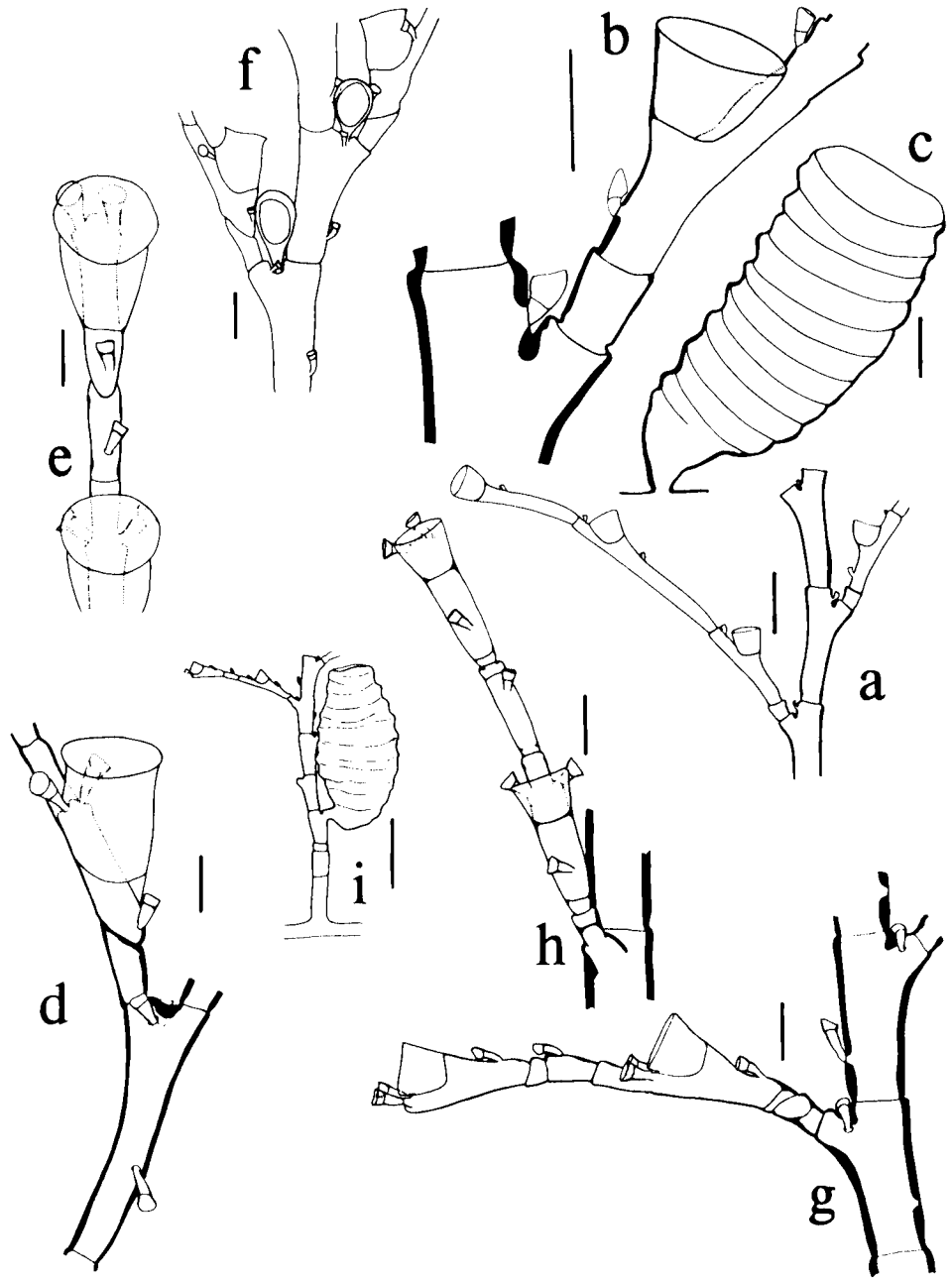

Fig. 10. a-c. *Ventromma halecioides* (Alder, 1859), a. part of stem (scale 200 µm), b. detail of an apophysis and basal part of hydrocladium (scale 100 µm), c. gonotheca (scale 200 µm); d-f. *Plumularia floridana* Nutting, 1900 (scales 100 µm), d. part of stem, e. part of hydrocladium, f. part of stem with gonothecae; g-i. *Plumularia strictocarpa* Pictet, 1893, g. part of stem (scale 100 µm), h. basal part of hydrocladium (scale 100 µm), i. basal part of stem with gonotheca (scale 200 µm).

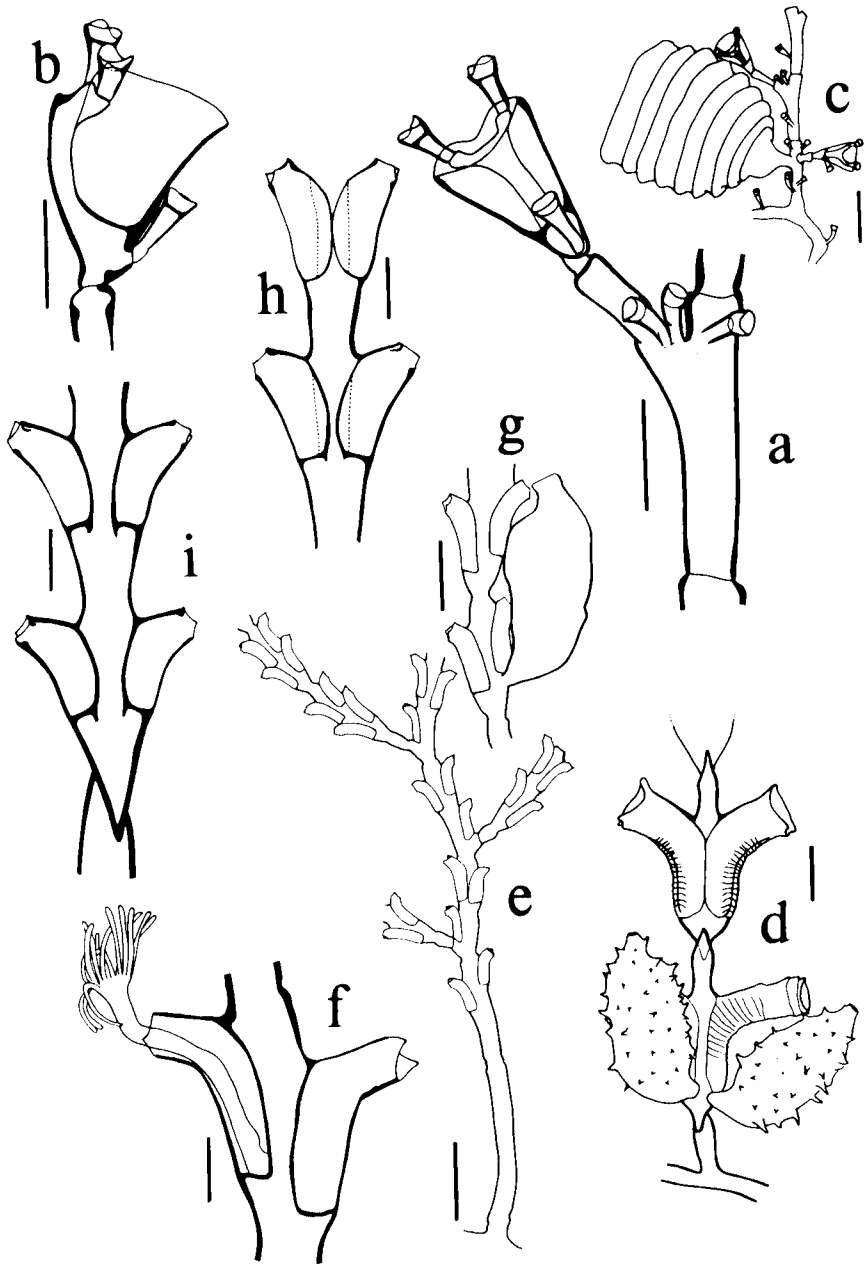

Fig. 11. a-c. *Monotheca margaretta* Nutting, 1900, a. part of stem (scale 100 µm), b. hydrotheca, lateral view (scale 100 µm), c. basal part of stem with gonotheca (scale 200 µm); d. *Diphasia tropica* Nutting, 1900, basal part of stem with gonotheca (scale 200 µm); e-g. *Dynamena crisioides* Lamouroux, 1824, e. basal part of stem (scale 1000 µm), f. pair of hydrothecae with one hydranth (scale 200 µm), g. part of stem with gonotheca (scale 200 µm); h-i. *Dynamena dalmasi* (Versluys, 1899) (scales 200 µm), h. basal part of stem with 2 pairs of hydrothecae, i. distal part of stem with 2 pairs of hydrothecae.

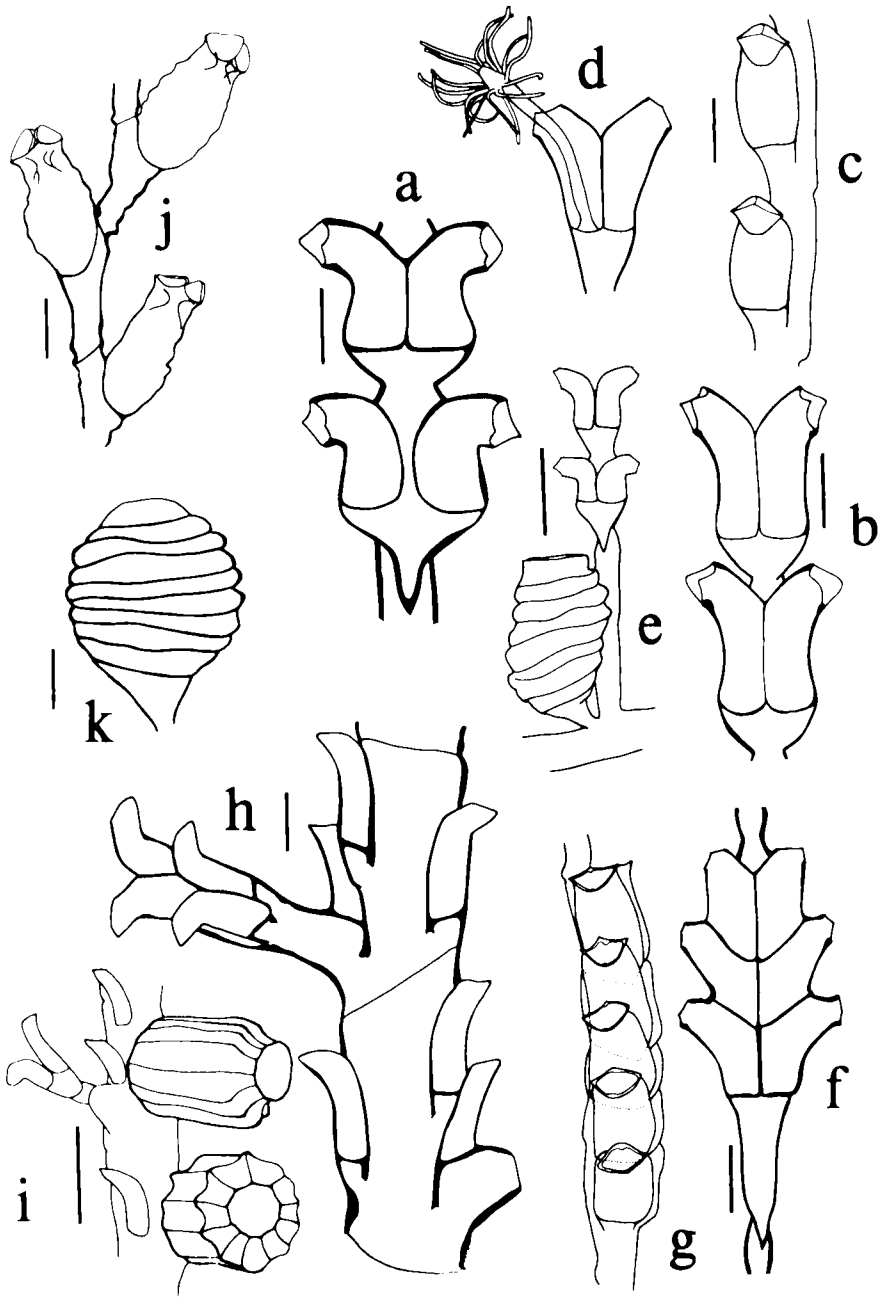

Fig. 12. a-e. *Dynamena disticha* (Bosc, 1802), a. basal part of stem with 2 pairs of hydrothecae (scale 200 µm), b. distal part of stem with 2 pairs of hydrothecae (scale 200 µm), c. two hydrothecae, lateral view (scale 200 µm), d. pair of hydrothecae with one hydranth (scale 200 µm), e. basal part of stem with gonotheca (scale 500 µm); f-g. *Dynamena quadridentata* (Ellis & Solander, 1786) (scale 200 µm), f. group of 3 pairs hydrothecae, frontal view, g. group of 5 pairs of hydrothecae, lateral view; h-i. *Idiellana pristis* (Lamouroux, 1816) (scales 500 µm), h. part of stem, i. basal part of stem with 2 gonothecae; j-k. *Sertularella conica* Allman, 1877 (scales 200 µm), j. part of stem, k. gonotheca.

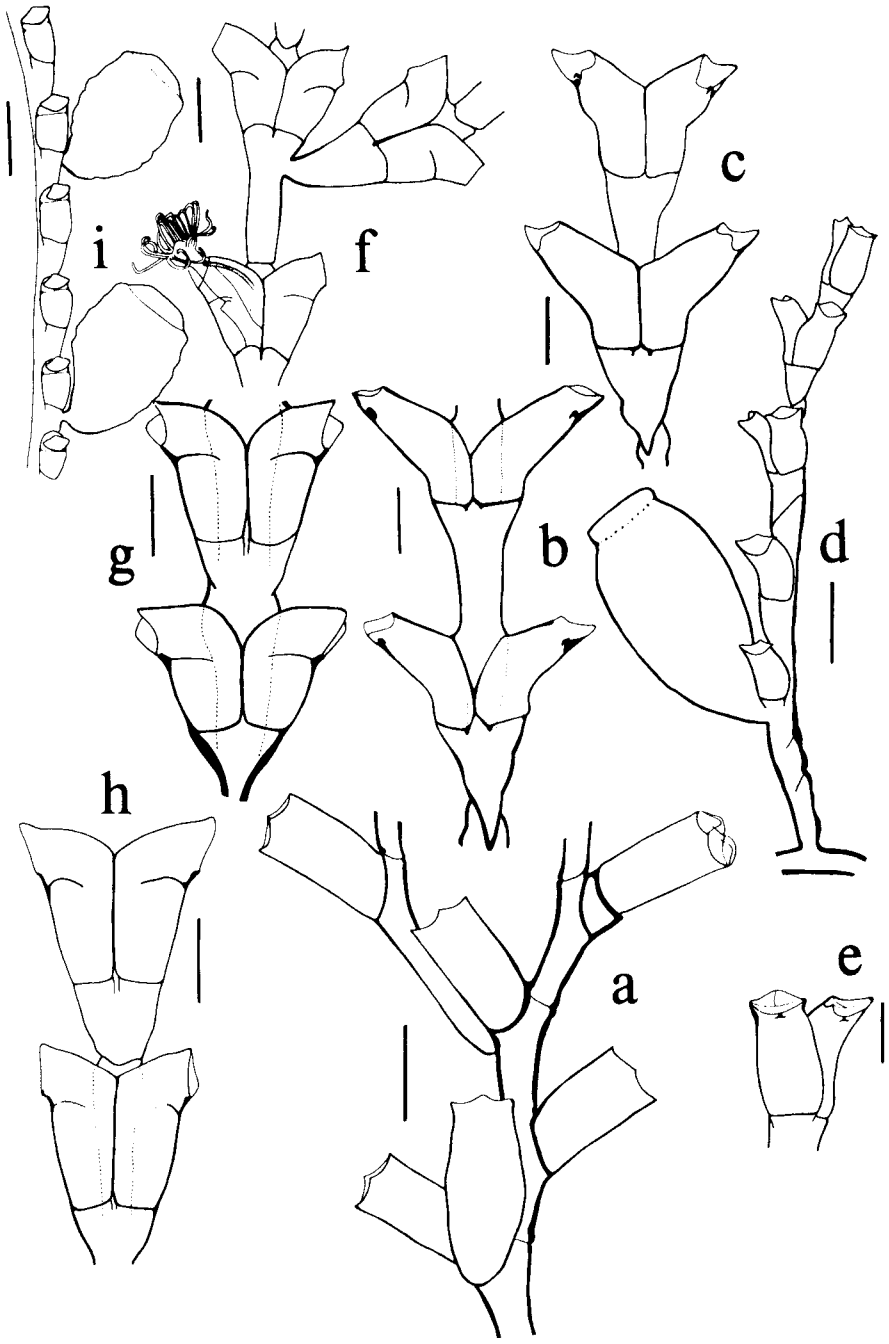

Fig. 13. a. *Sertularella cylindritheca* (Allman, 1888) (scale 1000 µm), part of stem with 5 hydrothecae and one gonotheca; b-e. *Sertularia distans* (Lamouroux, 1816), b. basal part of stem with 2 pairs of hydrothecae (scale 100 µm), c. distal part of stem with 2 pairs of hydrothecae (scale 100 µm), d. stem with gonotheca, lateral view (scale 200 µm), e. pair of hydrothecae, lateral view (scale 100 µm); f-i. *Sertularia loculosa* Busk, 1852, f. stem with branch, note hydranth and ligula (scale 200 µm); g. basal part of stem with 2 pairs of hydrothecae (scale 200 µm), h. distal part of stem with 2 pairs of hydrothecae (scale 200 µm), i. part of stem with 2 gonothecae, lateral view (scale 500 µm).

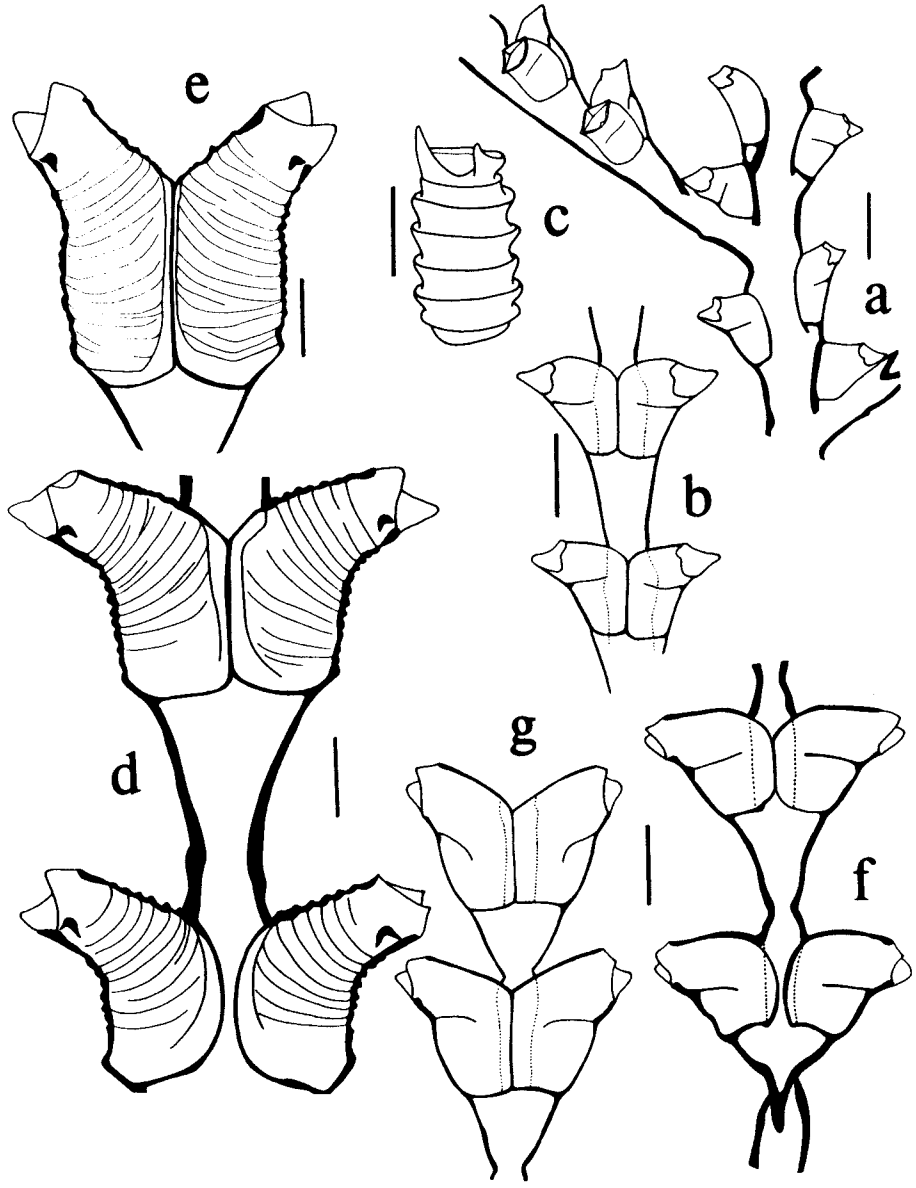

Fig. 14. a-c. *Sertularia marginata* Kirchenpauer, 1864, a. part of stem (scale 200 µm), b. part of hydrocladium with 2 pairs of hydrothecae (scale 200 µm), c. gonotheca (scale 500 µm); d-e. *Sertularia rugosissima* Thornely, 1904 (scales 100 µm), d. basal part of stem with 2 pairs of hydrothecae, e. distal part of stem with one pair of hydrothecae; f-g. *Sertularia turbinata* (Lamouroux, 1816) (scales 200 µm), f. basal part of stem with 2 pairs of hydrothecae, h. distal part of stem with 2 pairs of hydrothecae.

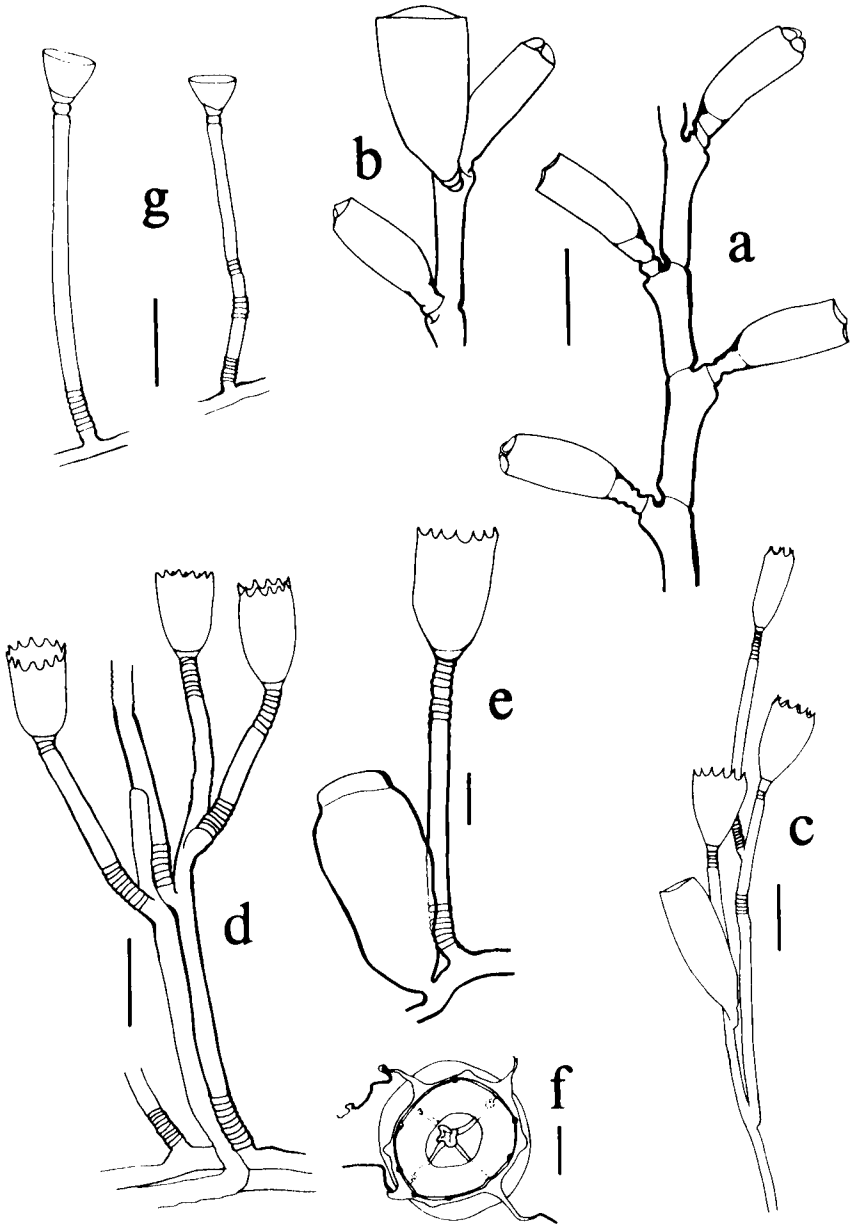

Fig. 15. a-b. *Thyroscyphus ramosus* Allman, 1877 (scale 1000 µm), a. part of stem, b. part of stem with gonotheca; c. *Clytia gracilis* (M. Sars, 1850) (scale 500 µm), part of stem with gonotheca; d-f. *Clytia hemisphaerica* (Linnaeus, 1767), d. part of colony (scale 400 µm), e. part of colony with gonotheca (scale 200 µm), f. 18-hour-old medusa, oral view (scale 200 µm); g. *Clytia hummelincki* (Leloup, 1935), part of colony (scale 400 µm).

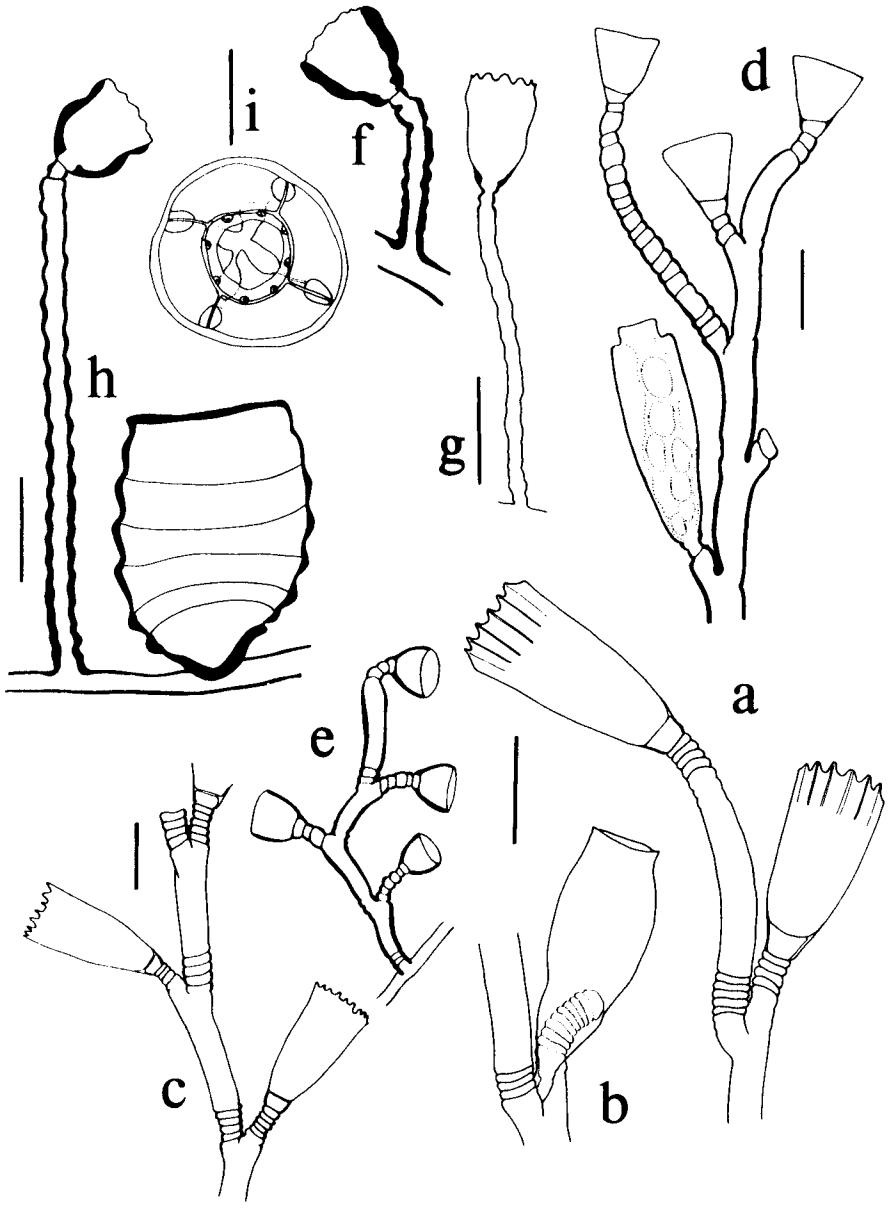

Fig. 16. a-b. *Clytia linearis* (Thornely, 1899) (scale 400 µm), a. part of stem, b. gonotheca; c. *Obelia bidentata* Clarke, 1875, part of stem (scale 200 µm); d. *Obelia dichotoma* (Linnaeus, 1758), part of a stem with gonotheca (scale 100 µm); e. Obelia geniculata Linnaeus, 1758, part of colony (scale 400 µm); f-i. *Orthopyxis sargassicola* (Nutting, 1915) (scales 400 µm), f. part of colony, g. part of colony, note unthickened perisarc, h. part of colony with gonotheca, i. newly released medusa.

Appendix- Checklist of the hydroids from the Brazilian coast

The nominal taxa are listed alphabetically (first column) under their original names of citation. The name in the right column is the possible status of the species, according to authorities such as Millard (1975), Vervoort (1959, 1968, 1993b), Cornelius (1975a,b, 1979, 1982), and Calder (1988, 1991), and/or to my conclusions after examining Vannucci's Collection; a question mark before the name indicates a doubtful status.

Species	Author	Region	State	Possible status
Aglaophenia allmani Nutting, 1900	7	NE	BA	*Macrorhynchia allmani* (Nutting, 1900)
Aglaophenia calamus Allman, 1883	2	NE	BA	*?Aglaophenia calamus* Allman, 1883
Aglaophenia contorta Nutting, 1900	13,17,24	SE,NE	SP,PE	*Lytocarpia tridentata* (Versluys, 1889)
Aglaophenia dubia Nutting, 1900	7	NE	BA	*Aglaophenia dubia* Nutting, 1900
Aglaophenia insignis Fewkes, 1881	24	NE	PE	*Aglaophenia insignis* Fewkes, 1881
Aglaophenia late-carinata Allman, 1877	13,15,24	S, SE,NE	PR,SP,RJ,PE	*Aglaophenia latecarinata* Allman, 1887
Aglaophenia latecarinata Allman, 1877	32,37	SE,NE	FN, SP	*Aglaophenia latecarinata* Allman, 1887
Aglaophenia latirostris Nutting, 1900	4		BR	*?Aglaophenia latirostris* Nutting, 1900
Aglaophenia minima Nutting, 1900	7	NE	BA	*Aglaophenia minima* Nutting,1900
Aglaophenia perforata Allman, 1885	17	SE	SP	*?Aglaophenia latecarinata* Allman, 1877
Aglaophenia rathbuni Nutting, 1900	4,12	NE	BA	*Aglaophenia latecarinata* Allman, 1887
Aglaophenia rigida Allman, 1877	16,18	SE	RJ,SP	*Aglaophenia rigida* Allman, 1887
Amphinema rugosum (Mayer, 1900)	37	SE	SP	*Amphinema rugosum* (Mayer, 1900)
Amphisbetia pulchella (d'Orbigny, 1839)	18	SE	RJ	*?Amphisbetia operculata* (Linnaeus,1758)
Asyncoryne ryniensis Warren, 1908	37	SE	SP	*Asyncoryne ryniensis* Warren, 1908
Bimeria vestita Wright, 1859	37	SE	SP	*Bimeria vestita* Wright, 1859
Bougainvillia rugosa Clarke, 1882	37	SE	SP	*Bougainvillia rugosa* Clarke, 1882
Calicella gabriellae Vannucci, 1951a	17	SE	SP	*Calycella gabriellae* Vannucci, 1951a
Campanularia calceolifera Hincks, 1871	15	SE	RJ, ES	*?Laomedea calceolifera* (Hincks, 1871)
Campanularia hesperia Torrey, 1904	13	SE	SP	*?Campanularia hesperia* Torrey, 1904
Campanularia laevis Hartlaub, 1905	18	SE	RJ	*?Campanularia agas* Cornelius, 1982
Campanularia lennoxensis Jäderholm, 1915	9	SE	RJ	*?Orthopyxis sargassicola* (Nutting, 1903)
Campanularia marginata (Allman, 1877)	15,16,17	SE	RJ, ES	*Thyroscyphus marginatus* (Allman, 1877)
Campanularia ptychocyathus Allman, 1888	3	NE	BA	*?Clytia noliformis;* Calder, 1991c
Cladocoryne floccosa Rotch, 1871	37	SE	SP	*Cladocoryne floccosa* Rotch, 1871
Cladonema radiatum Dujardin, 1843	37	SE	SP	*Cladonema radiatum* Dujardin, 1843
Clytia attenuata (Calkins, 1899)	13,15	SE	SP,RJ	*?Clytia hemisphaerica* (Linnaeus, 1767)
Clytia cylindrica L.Agassiz, 1862	15,16,17, 20	SE	ES,RJ,SP	*?Clytia hemisphaerica* (Linnaeus, 1767)
Clytia elsae-oswaldae Stechow, 1914	13,17	SE	SP	*?Clytia hemisphaerica*(Linnaeus, 1767)
Clytia foleata (McCrady, 1857)	13	SE	SP	*?Clytia noliformis* Calder, 1991c
Clytia gracilis (M.Sars, 1850)	37	SE	SP	*Clytia gracilis* (M.Sars, 1850)
Clytia hemisphaerica (Linnaeus, 1767)	33,37	S, SE	PR,SP	*Clytia hemisphaerica* (Linnaeus, 1767)
Clytia hummelincki (Leloup, 1935)	33,37	S, SE	PR,SP	*Clytia hummelincki* (Leloup, 1935)
Clytia linearis (Thornely, 1899)	37	SE	SP	*Clytia linearis* (Thornely, 1899)
Corydendrium parasiticum (Linnaeus, 1767)	37	SE	SP	*Corydendrium parasiticum* (Linnaeus, 1767)
Corymorpha januarii Steenstrup, 1854	1,35	S, SE	RJ,SP,SC	*Corymorpha januarii* Steenstrup, 1854
Coryne producta (Wright, 1858)	37	SE	SP	*Coryne producta* (Wright, 1858)
Coryne pusilla Gaertner, 1774	33	S	PR	*Coryne pusilla* Gaertner, 1774
Cuspidella humilis (Hincks, 1868)	15	SE	RJ	*Cuspidella humilis* (Hincks, 1868)

Dentitheca crosslandi (Jarvis, 1921)	15	SE	ES	*Dentitheca bidentata* (Jäderholm, 1920)
Desmoscyphus acanthocarpus Allman, 1888	3	NE	BA	*Diphasia digitalis* (Busk, 1852)
Desmoscyphus obliquus Allman, 1888	3	NE	BA	*?Sertularia marginata* (Kirchenpauer, 1864)
Desmoscyphus pectinatus Allman, 1888	3	NE	BA	*Sertularia marginata* (Kirchenpauer, 1864)
Diphasia digitalis (Busk, 1852)	24	NE	PE	*Diphasia digitalis* (Busk, 1852)
Diphasia tropica Nutting, 1904	37	SE	SP	*Diphasia tropica* Nutting, 1904
Diphasiella ornata Vannucci, 1949	15	SE	ES,RJ	*Diphasia tropica* Nutting, 1904
Dipurena reesi Vannucci, 1956	22,25	SE	SP	*Dipurena reesi* Vannucci, 1956
Dynamena cornicina (McCrady, 1858)	13,15,16, 17,32	S,SE,NE	SP,RJ,FN, ES,PR	*Dynamena disticha* (Bosc, 1802)
Dynamena crisioides f. *gigantea* Billard, 1924	13	SE	SP	*Idiellana pristis* (Lamouroux, 1816)
Dynamena crisioides f. *typica* Lamouroux, 1824	13,15,18	SE,NE	SP,RJ,ES, PE,FN	*Dynamena crisioides* Lamouroux, 1824
Dynamena crisioides Lamouroux, 1824	32,33,37	S,SE,NE	FN,PR,SP	*Dynamena crisioides* Lamouroux, 1824
Dynamena dalmasi (Versluys, 1899)	37	SE	SP	*Dynamena dalmasi* (Versluys, 1899)
Dynamena disticha (Bosc, 1802)	37	SE	SP	*Dynamena disticha* (Bosc, 1802)
Dynamena quadridentata (Ellis & Solander, 1786)	37	SE	SP	*Dynamena quadridentata* (Ellis & Solander, 1786)
Dynamena quadridentata flabellata Vannucci Mendes, 1946	13,15	SE	SP,RJ,ES	*Dynamena quadridentata* (Ellis & Solander, 1786)
Dynamena quadridentata heterodonta Jarvis, 1922	17	SE	RJ	*Dynamena quadridentata* (Ellis & Solander, 1786)
Dynamena quadridentata typica (Ellis & Solander, 1786)	13,15,16	SE	SP,RJ,ES	*Dynamena quadridentata* (Ellis & Solander, 1786)
Ectopleura dumortieri (van Beneden, 1844)	23,29,37	SE	SP	*Ectopleura dumortierii* (van Beneden, 1844)
Ectopleura warreni (Ewer, 1953)	29,33,37	S,SE	RS,SP,RJ,PR	*Ectopleura warreni* (Ewer, 1953)
Eudendrium capillare Alder, 1856	18,24,34, 36	SE, NE	SP,PE, PE,FN	*Eudendrium capillare* Alder, 1856
Eudendrium carneum Clarke, 1882	18,34,32, 36	S,SE,NE	SC,SP,BA, ES	*Eudendrium carneum* Clarke, 1882
Eudendrium glomeratum Picard, 1951	34,36	SE	SP	*Eudendrium glomeratum* Picard, 1951
Eudendrium merulum (?) Watson, 1985	34,36	S	SC	*Eudendrium merulum* Watson, 1985
Eudendrium nambuccense Watson, 1985	36	SE	RJ	*Eudendrium nambuccense* Watson, 1985
Eudendrium pocaruquarum Marques, 1993	36	SE	SP	*Eudendrium pocaruquarum* Marques, 1993
Eudendrium ramosum (Linnaeus, 1758)	34,36	SE	SP	*Eudendrium ramosum* (Linnaeus, 1758)
Filellum gabriellae Vannucci, 1949	15,21		?	*Folliculina gigantea* **(Ciliata)**
Geminella ceramensis (Billard, 1924)	13	SE	SP	*Sertularia turbinata* (Lamouroux, 1816)
Geminella subtilis Vannucci Mendes, 1946	13,18	S,SE	PR,SP,RJ	*Sertularia rugossissima* Thornely, 1904
Gonothyrea (?) *nodosa* Stechow, 1914	9	SE	RJ	*?Obelia dichotoma* (Linnaeus, 1758)
Gonothyrea bicuspidata Clarke, 1876	13,15	SE	SP,RJ	*Obelia bidentata* Clarke, 1875
Halecium bermudense Congdon, 1907	15,37	SE	RJ,ES,SP	*Halecium bermudense* Congdon, 1907
Halecium delicatulum Coughtrey, 1876	37	SE	SP	*Halecium delicatulum* Coughtrey, 1876
Halecium dichotomum Allman, 1888	37	SE	SP	*Halecium dichotomum* Allman, 1888
Halecium dyssymetrum Billard, 1929	37	SE	SP	*Halecium dyssymetrum* Billard, 1929
Halecium tenellum Hincks, 1861	37	SE	SP	*Halecium tenellum* Hincks, 1861
Halicornaria longicauda Nutting, 1900	7	NE	BA	*Gymnangium longicauda* (Nutting, 1900)
Halicornaria pennatula (Ellis & Solander, 1786)	24	NE	PE	*?Gymnangium allmani* (Marktanner-Turneretsher, 1890)
Halicornaria plumosa Allman, 1883	2	NE	PE	*Gymnangium allmani* (Marktanner-Turneretscher, 1890)

Halocordyle disticha (Goldfuss, 1820)	29,30,32, 37	S,SE,NE	SP,SC,RJ, FN,ES	*Pennaria disticha* Goldfuss, 1820
Halocordyle fragilis Vannucci, 1951a	17	S,SE	PR,SP	*Pennaria disticha* Goldfuss, 1820
Halocordyle spec.	16	SE	ES,RJ	*Pennaria disticha* Goldfuss, 1820
Halopteris constricta Totton, 1930	37	SE	SP	*Halopteris constricta* Totton, 1930
Halopteris diaphana (Heller, 1868)	32,37	SE,NE	FN,SP	*Halopteris diaphana* (Heller, 1868)
Halopteris buskii (Bale, 1884)	37	SE	SP	*Halopteris buskii* (Bale, 1884)
Hebella scandens (Bale, 1888); Vannucci, 1949	15,16,17, 18	SE	RJ,ES	*?Hebellopsis communis* Calder, 1991
Hebella scandens (Bale, 1888)	33,37	S,SE	PR,SP	*Hebella scandens* (Bale, 1888)
Hebellopsis besnardi Vannucci, 1950	16	SE	RJ	*Hebella scandens* (Bale, 1888)
Hebellopsis sinuosa Vannucci, 1949	15	SE	RJ	*Hebella scandens* (Bale, 1888)
Idia pristis Lamouroux, 1816	3	NE	BA	*Idiellana pristis* (Lamouroux, 1816)
Idiella pristis (Lamouroux, 1816)	12	NE	BA	*Idiellana pristis* (Lamouroux, 1816)
Idiellana pristis (Lamouroux, 1816)	37	SE	SP	*Idiellana pristis* (Lamouroux, 1816)
Kirchenpaueria mirabilis f. *robusta* Stechow, 1923	13,16	SE	SP,RJ	*Pycnotheca mirabilis* (Allman, 1888)
Lafoea cylindrica von Lendenfeld, 1843	6	SE	RJ	*?Hebella scandens* (Bale, 1888)
Leuckartiara octona (Fleming, 1823)	37	SE	SP	*Leuckartiara octona* (Fleming, 1823)
Lytocarpia tridentata (Versluys, 1899)	37	SE	SP	*Lytocarpia tridentata* (Versluys, 1899)
Lytocarpus philippinus (Kirchenpauer, 1872)	4	NE	BA	*Macrorhynchia philippina* (Kirchenpauer, 1872)
Lytocarpus racemiferus Allman, 1883	2	NE	BA	*Macrorhynchia racemifera* (Allman, 1883)
Macrorhynchia philippina (Kirchenpauer, 1872)	13,15,18, 37	SE	SP,RJ	*Macrorhynchia philippina* (Kirchenpauer, 1872)
Monostaechas fisheri Nutting, 1905	15,16	SE	ES,RJ	*Monostaechas quadridens* (McCrady, 1857)
Monostaechas quadridens (McCrady, 1857)	7,37	SE,NE	BA,SP	*Monastaechas quadridens* (McCrady, 1857)
Monotheca margaretta Nutting, 1900	37	SE	SP	*Monotheca margaretta* Nutting, 1900
Monotheca margaretta curta Vannucci Mendes, 1946	13	S,SE	PR,SP	*Monotheca margaretta* Nutting, 1900
Monotheca margaretta typica Nutting, 1900	13,15,16, 17	SE	SP,RJ,ES	*Monotheca margaretta* Nutting, 1900
Nemalecium lighti (Hargitt, 1924)	37	SE	SP	*Nemalecium lighti* (Hargitt, 1924)
Nigellastrum digitale (Busk, 1852)	15			*Diphasia digitalis* (Busk, 1852)
Obelia (?) *oxidentata* Stechow, 1914	13	SE	SP	*Obelia bidentata* Clarke, 1875
Obelia angulosa Bale, 1888	9	SE	RJ	*?Obelia dichotoma* (Linnaeus, 1758)
Obelia bicuspidata Clarke, 1875	18	SE	SP	*Obelia bidentata* Clarke, 1875
Obelia bidentata Clarke, 18756,	37	SE	RJ,SP	*Obelia bidentata* Clarke, 1875
Obelia braziliensis Meyen, 1834	13,15	SE	SP,RJ	*?Obelia dichotoma* (Linnaeus, 1758)
Obelia commissuralis McCrady, 1859	17,18	SE	SP,RJ	*?Obelia dichotoma* (Linnaeus, 1758)
Obelia dichotoma (Linnaeus, 1758)	33,37	S,SE	PR,SP	*Obelia dichotoma* (Linnaeus, 1758)
Obelia geniculata Linnaeus, 1758	13,15,16, 33, 37	S,SE	PR,SP,RJ, ES,SP	*Obelia geniculata* (Linnaeus, 1758)
Obelia griffini Calkins, 1899	13,15,18	SE	SP	*?Obelia dichotoma* (Linnaeus, 1758)
Obelia hyalina Clarke, 1879	15,19	SE	RJ	*?Obelia dichotoma* (Linnaeus, 1758)
Ophiodissa spec.	37	SE	SP	*Ophiodissa* spec.
Orthopyxis billardi Vannucci, 1954	18	SE	RJ	*Orthopyxis sargassicola* (Nutting, 1915)
Orthopyxis clytioides (Lamouroux, 1824)	13	SE	SP	*?Orthopyxis sargassicola* (Nutting, 1915)
Orthopyxis crenata (Hartlaub, 1901)	18	SE	SP	*Orthopyxis sargassicola* (Nutting, 1915)
Orthopyxis lennoxensis Jäderholm, 1903	13,17	SE	SP	*Orthopyxis sargassicola* (Nutting, 1915)
Orthopyxis minuta Vannucci, 1949	15	SE	RJ	*?Orthopyxis sargassicola* (Nutting, 1915)

Orthopyxis sargassicola (Nutting, 1915)	37	SE	SP	*Orthopyxis sargassicola* (Nutting, 1915)
Pennaria fragilis Vannucci, 1951a	18	SE	PR,SP,RJ,ES	*Pennaria disticha* Goldfuss, 1820
Pinushydra chiquitita Bouillon & Grohmann, 1990	31	SE	RJ	*Pinushydra chiquitita* Bouillon & Grohmann, 1990
Plumularia bidentata Jäderholm, 1920	10	NE	PE	*Dentitheca bidentata* (Jäderholm, 1920)
Plumularia floridana Nutting, 1900	13,15,37	SE	SP,RJ,ES,SP	*Plumularia floridana* Nutting, 1900
Plumularia halecioides Alder, 1859	15	SE	SP	*Ventromma halecioides* (Alder, 1859)
Plumularia inermis Nutting, 1900	13,24	SE,NE	SP,PE	*Ventromma halecioides* (Alder, 1859)
Plumularia lagenifera Allman, 1885	17	SE	RJ	*?Plumularia setacea* (Linnaeus, 1758)
Plumularia margaretta (Nutting, 1900)	33	S,SE	ES,PR	*Monotheca margaretta* Nutting, 1900
Plumularia setacea (Ellis, 1755)	13,15,16	SE	SP,RJ,ES	*Plumularia setacea* (Linnaeus, 1758)
Plumularia strictocarpa Pictet, 1893	15,37	SE	RJ,ES,SP	*Plumularia strictocarpa* Pictet, 1893
Plumularia strobilophora Billard, 1913	17	SE	ES	*Plumularia strobilophora* Billard, 1913
Sarsia (Stauridiosarsia) producta (Wright, 1858)	15	SE	SP	*Coryne producta* (Wright, 1858)
Scandia mutabilis (Ritchie, 1907)	37	SE	SP	*Scandia mutabilis* (Ritchie, 1907)
Schizotricha billardi Vannucci, 1951a	17,18	SE,NE	RJ,FN	*Halopteris diaphana* (Heller, 1868)
Schizotricha diaphana (Heller, 1868)	15,16	SE	RJ	*Halopteris diaphana* (Heller, 1868)
Serehyba sanctisebastiani da Silveira & Migotto, 1984	28,29	SE	SP	*Serehyba sanctisebastiani* da Silveira & Migotto, 1984
? *Sertularella areyi* Nutting, 1904	15	SE	ES	*Sertularella areyi* Nutting, 1904
Sertularella catena (Allman, 1888)	24	NE	PE	*Sertularella cylindritheca* (Allman, 1888)
Sertularella conica Allman, 1877	37	SE	SP	*Sertularella conica* Allman, 1877
Sertularella cylindritheca (Allman, 1888)	3,32,37	SE,NE	BA,FN,SP	*Sertularella cylindritheca* (Allman, 1888)
Sertularella diaphana (Allman, 1888)	32	NE	FN	*Sertularella diaphana* (Allman, 1885)
Sertularella inconstans Billard, 1919	13,15,16	SE	SP,RJ	*Sertularella conica* (Allman, 1877)
Sertularella lata (Bale, 1882)	5	NE	PE	*Sertularella diaphana* (Allman, 1885)
Sertularella moluccana (von Campenhausen, 1896)	13	SE	SP	*?Sertularella molukkana* (von Campenhausen, 1896)
Sertularella tenella (Alder, 1857)	5,6	SE	RJ	*?Sertularella conica* Allman, 1877
Sertularia borneensis parvula Vannucci, 1949	15	SE	ES	*?Sertularia turbinata* (Lamouroux, 1816)
Sertularia cornicina (McCrady, 1859)	7,24	SE,NE	BA,PE	*Dynamena disticha* (Bosc, 1802)
Sertularia distans (Lamouroux, 1816)	24,32, 33, 37	S,SE,NE	PE,FN, PR,SP	*Sertularia distans* (Lamouroux, 1816)
Sertularia drachi Vannucci, 1949	15	SE	RJ,ES	*Sertularia turbinata* (Lamouroux, 1816)
Sertularia erasmoi Vannucci Mendes, 1946	13,15	SE	SP	*Sertularia distans* (Lamouroux, 1816)
Sertularia heterodonta Ritchie, 1909	7	NE	BA	*Sertularia distans* (Lamouroux, 1816)
Sertularia inflata (Versluys, 1899)	24	NE	PE	*Sertularia marginata* Kirchenpauer, 1864
Sertularia integritheca Allman, 1888	3	NE	BA	*Sertularella formosa* Fewkes, 1881
Sertularia loculosa Busk, 1852	13,15,37	SE	SP,ES,SP	*Sertularia loculosa* Busk, 1852
Sertularia marginata laxa Vannucci, 1949	15,16,17	SE	RJ,ES	*Sertularia marginata* Kirchenpauer, 1864
Sertularia marginata typica Kirchenpauer, 1864	15,17,18	S,SE	PR,SP,RJ,ES	*Sertularia marginata* Kirchenpauer, 1864
Sertularia marginata Kirchenpauer, 1864	32,33,37	S,SE,NE	FN,ES,PR,SP	*Sertularia marginata* Kirchenpauer, 1864
Sertularia minuscula Vannucci, 1949	15,16	SE	RJ,ES	*Sertularia distans* (Lamouroux, 1816)
Sertularia perpusilla Stechow, 1911	17	SE	RJ	*?Sertularia perpusilla* Stechow, 1911
Sertularia rathbuni Nutting, 1904	7	NE	BA	*Dynamena dalmasi* (Versluys, 1899)
Sertularia rugosissima Thornely, 1904	37	NE	SP	*Sertularia rugosissima* Thornely, 1904
Sertularia turbinata (Lamouroux, 1816)	13,15, 24,37	S,SE	RJ,ES,PE, PR,SP	*Sertularia turbinata* (Lamouroux, 1816)
Solanderia gracilis Duchassaing & Michelin, 1846	27	NE	BA	*Solanderia gracilis* Duchassaing & Michelin, 1846
Stylaster roseus (Pallas, 1766)	32	NE	FN	*Stylaster roseus* (Pallas, 1766)

Stylactaria hooperii (Sigerfoos, 1899)	37	SE	SP	*Stylactaria hooperii* (Sigerfoos, 1899)
Stylactis hooperii Sigerfoos, 1899	26	SE	SP	*Stylactaria hooperii* (Sigerfoos, 1899)
Stylactaria spec.	37	SE	SP	*Stylactaria* spec.
Synthecium tubithecum (Allman, 1877)	16,17, 24	SE,NE	ES,PE	*Synthecium tubithecum* (Allman, 1877)
Thaumantias raridentata (Alder, 1862)	17,18	SE	SP	*?Clytia hemisphaerica* (Linnaeus, 1767)
Thecocarpus contortum (Nutting, 1900)	11	SE	RJ	*Lytocarpia tridentata* (Versluys, 1899)
Thecocarpus laxus Billard, 1913	16	SE	RJ	*?Thecocarpus laxus* Billard, 1913
Thecocaulus diaphanus Heller, 1868	13	SE	SP	*Halopteris diaphana* (Heller, 1868)
Thuiaria hyalina Allman, 1888	3	NE	PE	*Sertularella diaphana* (Allman, 1885)
Thuiaria tubuliformis (Marktanner-Turneretscher, 1890)	5	NE	BA	*Dynamena crisioides* Lamouroux, 1824
Thyroscyphus ramosus Allman, 1877	3,37	SE,NE	BA,SP	*Thyroscyphus ramosus* Allman, 1877
Thyroscyphus torresii (Busk, 1852)	24	NE	PE	*?Thyroscyphus ramosus* Allman, 1877
Thyroscyphus vitiensis Marktanner-Turneretscher, 1890	24	NE	PE	*?Thyroscyphus ramosus* Allman, 1877
Tubularia formosa Hartlaub, 1905	8	SE	RJ	*?Tubularia formosa* Hartlaub, 1905
Turritopsis nutricula McCrady, 1859	37	SE	SP	*Turritopsis nutricula* McCrady, 1859
Vallentinia grabriellae Vannucci Mendes, 1948	14	SE	SP	*Vallentinia gabriellae* Vannucci Mendes, 1948
Ventromma halecioides (Alder, 1859)	37	SE	SP	*Ventromma halecioides* (Alder, 1859)
Zanclea costata Gegenbaur, 1856	37	SE	SP	*Zanclea costata* Gegenbaur, 1856
Zyzzyzus solitarius (Warren, 1906)	29	SE	SP	*Zyzzyzus warreni* Calder, 1988
Zyzzyzus warreni Calder, 1988	37	SE	SP	*Zyzzyzus warreni* Calder, 1988

Authors: 1 = Steenstrup, 1854; 2 = Allman, 1883; 3 = Allman, 1888; 4 = Nutting, 1900; 5 = Nutting, 1904; 6 = Jäderholm, 1903; 7 = Ritchie, 1909; 8 = Stechow, 1912; 9 = Stechow, 1919; 10 = Jäderholm, 1920; 11 = Totton, 1926; 12 = Vervoort, 1946; 13 = Vannucci Mendes, 1946; 14 = Vannucci Mendes, 1948; 15 = Vannucci, 1949; 16 = Vannucci, 1950; 17 = Vannucci, 1951a; 18 = Vannucci, 1954; 19 = Vannucci, 1955a; 20 = Vannucci, 1955b; 21 = Vannucci, 1955c; 22 = Vannucci, 1956; 23 = Vannucci, 1957; 24 = Mayal, 1973; 25 = Moreira et al, 1978; 26 = Moreira et al, 1979; 27 = Belém et al. 1982; 28 = da Silveira & Migotto, 1984; 29 = Migotto & da Silveira, 1987; 30 = da Silveira & Migotto, 1991; 31 = Bouillon & Grohmann, 1990; 32 = Pires et al., 1992; 33 = Haddad, 1992; 34 = Marques & da Silveira, 1991; 35 = da Silveira & Migotto, 1992; 36 = Marques, 1993; 37 = Present study.
Regions: NE = Northeastern; SE = Southeastern; S = Southern.
States: PE = Pernambuco; BA = Bahia; ES = Espírito Santo; RJ = Rio de Janeiro; SP = São Paulo; PR = Paraná; SC = Santa Catarina; RS = Rio Grande do Sul.