

REPORT ON A COLLECTION OF HYDROIDA FROM THE
CARIBBEAN REGION, INCLUDING AN ANNOTATED
CHECKLIST OF CARIBBEAN HYDROIDS

by

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With 41 text-figures

INTRODUCTION

The present report deals with a collection of Hydroids from the Zoological Museum, Munich, German Federal Republic (Zoologische Sammlung des Bayerischen Staates, München), collected during various expeditions in the Caribbean region. I have thought it advisable to include in this report an annotated checklist of all Hydroids that in the course of time have been recorded from the Caribbean region. The geographical boundaries of that region are discussed below.

I want to express my sincere gratitude to Dr. W. Engelhardt and Dr. H. Fechter of the Zoological Museum, Munich, who have placed the valuable material at my disposal. All the material is now preserved in the Zoological Museum, Munich; some duplicates are present in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.

LIST OF THE SPECIES

- Family Halocordylidae. — *Halocordyle disticha* (Goldfuss, 1820).
Family Clavidae. — *Turritopsis nutricula* (McCrary, 1856).
Family Bougainvilliidae. — *Garveia humilis* (Allman, 1877).
Family Eudendriidae. — *Eudendrium carneum* Clarke, 1882.
Family Haleciidae. — *Halecium reflexum* Stechow, 1919.
Family Campanulariidae. — *Campanularia (Clytia) noliformis* McCrary, 1858; *Campanularia (Clytia) cylindrica* (L. Agassis, 1862); *Laomedea (Phialidium) pelagica* (Van Breemen, 1905); *Laomedea (Phialidium) tottoni* Leloup, 1935; *Laomedea (Obelia) bicuspadata* (Clarke, 1875); *Laomedea (Obelia) longicyatha* (Allman, 1877); *Laomedea (Obelia) congdoni* Hargitt, 1909.
Family Campanulinidae. — *Cuspidella humilis* Hincks, 1866.

Family Lafoeidae. — *Acryptolaria* spec.; *Hebella scandens* (Bale, 1888) var. *contorta* Marktanner-Turneretscher, 1890; *Hebella venusta* (Allman, 1877).

Family Syntheciidae. — *HinckSELLA cylindrica* (Bale, 1888) var. *pusilla* Ritchie, 1910; *Synthecium tubiTHECA* (Allman, 1877).

Family Sertulariidae. — *CnidoscYPHUS marginatus* (Allman, 1877); *ThyroscYPHUS longicaulis* Spletstösser, 1929; *Idiellana pristis* (Lamouroux, 1816); *Diphasia digitalis* (Busk, 1852); *Dynamena crisioides* Lamouroux, 1824; *Dynamena quadridentata* (Ellis & Solander, 1786); *Sertularella cylindricHECA* (Allman, 1888); *Sertularella speciosa* Congdon, 1907; *Sertularella parvula* (Allman, 1888); *Sertularia inflata* (Versluys, 1899); *Sertularia turbinata* (Lamouroux, 1816).

Family Plumulariidae. — Subfamily Halopterinae: *Halopteris carinata* Allman, 1877; *Halopteris diaphana diaphana* (Heller, 1868); *Monostaechas quadridentis* (McCrary, 1857). Subfamily Plumulariinae: *Plumularia setacea* (Linnaeus, 1758). Subfamily Aglaopheniinae: *Aglaophenia* (?) *mercatoris* Leloup, 1937; *Aglaophenia* (?) *allmani* Nutting, 1900; *Aglaophenia apocarpa* Allman, 1877; *Aglaophenia latecarinata* Allman, 1877; *Aglaophenia rhynchocarpa* Allman, 1877; *Aglaophenia tridentata* Versluys, 1899; *Gymnangium longicauda* (Nutting, 1900); *Lytocarpus clarkei* Nutting, 1900; *Lytocarpus racemiferus* Allman, 1883; *Lytocarpus furcatus* Nutting, 1900; *Lytocarpus philippinus* (Kirchenpauer, 1872).

HALOCORDYLIDAE Stechow, 1921

Halocordyle disticha (Goldfuss, 1820)

Pennaria disticha Goldfuss, 1820: 89.

Pennaria cavolinii Ehrenberg, 1834: 297; Allman, 1872: 364, text-fig. 80.

?*Globiceps tiarella* Ayres, 1854: 193.

?*Eucoryne elegans* Leidy, 1855: 136, pl. 10 fig. 1-5.

Pennaria gibbosa L. Agassiz, 1860: 15, fig. 1, 2; 1862: 278, 344.

Pennaria symmetrica Clarke, 1879: 239, pl. 1 fig. 2, 3.

Pennaria pacifica Clarke, 1907: 5, pl. 1.

Localities. — Kingston, Jamaica; Kükenthal & Hartmeyer, 1907. Many 10 to 12 cm high colonies. Hydrocauli blackish brown, side-branches light horny coloured. Hydranths well preserved and with gonophores in all stages of development.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15.i.1907. Some 40 mm high colonies with young gonophores.

Barbados; Kükenthal & Hartmeyer, 15.ii.1907. Some beautifully fixed, 30 mm long fragments. No gonophores.

La Guaira, Venezuela; E. Hentschel, 8.xii.1922. Some 10 to 25 mm long fragments. Hydranths badly preserved and without gonophores.

Puerto Cabello, Venezuela; E. Hentschel, 9.i.1923, on piles of jetty. One 80 mm high colony and some fragments Well preserved hydranths with gonophores.

Colon, Panama; E. Hentschel, 31.xii.1932, on piles of jetty. Badly preserved fragments of 50 mm height. Few hydranths with gonophores are present.

Limon, Costa Rica; E. Hentschel, 14.ix.1922-9.xii.1922, attached to ropes.

A large number of about 50 mm high colonies with very young gonophores. Very dirty sample with many algae and detritus.

Description. — The present material is characterized by monosiphonic blackish brown hydrocauli. The side-branches, of a horny, at times almost white colour, are alternately arranged; they support one terminal hydranth and a variable number of secondary hydranths arranged along the adcauline side of the branch and placed on basally ringed pedicels. In the well-preserved hydranths the whorl of filiform, basal tentacles is distinct; about 12 to 14 tentacles are present, some of which may be distinctly swollen at the end. The capitate tentacles number 6 to 8, the apical four are more or less arranged in one whorl.

Gonophores are present in all stages of development, though apparently none of the gonophores is mature, judging from the condition of the sexual products. The largest gonophores (in the Kingston material) measure 750 μ and have four very distinct tentacular bulbs and four radial canals; they are attached to the body of the hydranth just above the insertion of the basal tentacles by means of a fairly strong ectodermal filament.

Remarks. — The preserved material gives no indications whether or not the gonophores are set free as reduced medusae, though this seems very likely. This would be an interesting species in which to study the development of the gonophores under experimental conditions. The differences between the typical form of this species and *H. disticha* var. *australis* (Bale, 1884) have repeatedly been discussed (Pennycuik, 1959: 160) and appear to be very slight.

Geographical distribution. — *H. disticha* is widely distributed in the tropical parts of the Atlantic, Pacific and Indian Oceans, penetrating (probably as *H. disticha* var. *australis*) in subtropical and temperate waters. In the eastern tropical Atlantic it is particularly widely distributed, being recorded from Florida Keys, Tortugas, Cuba and the Caribbean Sea by Deevey (1954), and from Puerto Cabello, Venezuela, by Leloup (1937). A further discussion of its distribution was published elsewhere (Vervoort, 1941: 192, 193; 1946a: 291; 1959: 217). The species is extremely common in Piscadera Bay, Curaçao.

CLAVIDAE McCrady, 1857

Turritopsis nutricula (McCrady, 1856)

Oceania (Turritopsis) nutricula McCrady, 1856: 55, pl. 4 fig. 1-10.

Turritopsis nutricula - McCrady, 1857: 127, pl. 8 fig. 1; Fraser, 1944: 37, pl. 2 fig. 6; Russell, 1953: 115, pl. 5 fig. 1-5, pl. 29 fig. 1-3, text-fig. 54-56.

Dendroclava dohrni Weismann, 1883: 26, pl. 12 fig. 6-9.

Turritopsis dohrni - Stechow, 1923: 53; Mammen, 1963: 35, fig. 4.

Localities. — Port and Schottegat, Curaçao; E. Hentschel, 11.xii.1922. Many 5 mm high colonies on algae. One separate, larger colony of 15 mm height. Gonophores in all stages of development are present.

Colon, Panama; E. Hentschel. Grown in the course of 13 days on experimental plates. About 5 mm high colonies on algae, with many young gonophores.

Description. — The shape of the colonies of this species is quite characteristic. The hydrocaulus is polysiphonic and branched; the side-branches are irregularly placed. The finer ramifications are tubiform, the diameter of the tube is constant over its whole length. These ramifications are adnate with the original branch for some distance; finally they fuse completely. The distal part of the tube is free and terminates abruptly under the pedicel. The periderm of the hydrocaulus and branches is composed of two distinct layers; there is an inner, firm layer and an outer, apparently much softer layer. The inner layer may be slightly wrinkled, especially that of the side-branches; the soft outer layer is usually incrustated with detritus.

The hydranths are spindle-shaped, basally narrowing considerably into a short pedicel. There are 12 to 16 short, filiform tentacles scattered over the body of the hydranth. In contracted condition they are apically swollen. The gonophores, many of which are present, are to be found on the finer ramifications at a considerable distance under the hydranth. They develop into free, clavid medusae. In the farthest advanced stages in the present material the buds are still incompletely developed, though the marginal tentacles, protruding into the subumbrellar cavity, can be observed.

Remarks. — I have followed Stechow (1923: 53) in the assumption that *Turritopsis nutricula* (McCrary, 1856) and *T. dohrni* (Weismann, 1883) are synonyms.

Geographical distribution. — The hydroid of this species is widely distributed in tropical and subtropical parts of the Atlantic, Indian and Pacific Oceans. It appears to penetrate into temperate waters along the east coast of the United States (Fraser, 1944). The distribution of the medusa seems to be much wider and also includes the temperate Atlantic and the southern North Sea, where the hydroid has not yet been discovered. Mayer (1940: 144) gives as the distribution of the medusa along the American east coast: "coast of Cuba to the southern coast of New England. Very common in the Bahamas and at Tortugas". Stechow (1919) records the hydroid from Charlotte Amalia, St. Thomas, West Indies; Deevey (1954) records the hydroid from the Florida Keys, the Caribbean Sea and the eastern tropical Pacific Ocean.

BOUGAINVILLIIDAE Allman, 1876

Garveia humilis (Allman, 1877)

Bimeria humilis Allman, 1877: 8, pl. 5 fig. 3, 4; Congdon, 1907: 467, fig. 6; Bennett, 1922: 243; Fraser, 1943: 86; Fraser, 1944: 49, pl. 5 fig. 17; Deevey, 1954: 269; Leloup, 1960: 225.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Some 3 to 7 mm high colonies on algae. No gonophores.

Colon, Panama; E. Hentschel. Grown in the course of 13 days on experimental plates. Colonies of 3 to 5 mm on algae. Gonophores in all stages of development are present.

La Guaira, Venezuela; E. Hentschel, 8.xii.1922. Many 3 to 5 mm high colonies on *Halocordyle disticha* (Goldfuss). Hydranths badly preserved. Many gonophores are present.

Puerto Cabello, Venezuela; E. Hentschel, 9.i.1923. Several 5 mm high colonies on *Halocordyle disticha* (Goldfuss). Some gonophores present.

Description. — The small colonies or the hydranths directly rise from a fine network of thin hydrorhiza fibers, creeping on *H. disticha*. The solitary hydranths have a pedicel of about 3 mm length, with coarse, slightly wrinkled periderm; in the colonies the primary pedicel is usually lengthened and carries laterally arranged secondary pedicels, supporting secondary hydranths. As in the primary pedicels, the secondary pedicels have coarse periderm. The pedicels gradually widen into the pear-shaped hydranths; the periderm continues for some distance in the basal part of the hydranth but it gradually thins out and does not reach the tentacular base. There are 12 to 14 fairly long, smooth, filiform tentacles, completely devoid of periderm and arranged in a single, closely fitting whorl around the conical hypostome. In some cases the basal part of the secondary pedicel is ringed rather than wrinkled, though the ring may be vague.

The gonophores occur in small number (2 or 3) on the thin part of the pedicel under the hydranth. I could not study the gonophore in detail, the material being too badly preserved for sectioning, but the gonophores are sessile and probably cryptomedusoid in the female sex. The female gonophores in the present colonies (the only sex present) contain a single large egg.

In all the present specimens the periderm is densely incrustated with detritus and has a dark brown colour.

Remark. — There can be no doubt that *Bimeria humilis* belongs in the genus *Garveia* Wright, 1859, characterized by sessile gonophores and nude tentacles. Congdon's description of this species (Congdon, 1907: 467) seems to suggest that some kind of covering must have been present on the

tentacles of his Bermuda specimens, but as his observation was made with complete hydranths and is not supported by sections, it needs, I think, further proof.

Geographical distribution. — *G. humilis* was originally described from Tortugas, where it was found in shallow waters (Allman, 1877). Additional records are from Bermuda, 0-10 fms. (= 0-18 m) depth (Congdon, 1907; Bennett, 1922); off Orange Key, Bahamas and Maguaripe Bay, Trinidad (Fraser, 1943, 1944) whilst Deevey (1950, 1954) also records the species from the northwestern Gulf of Mexico and the Caribbean Sea.

EUDENDRIIDAE Hinck, 1868

Eudendrium carneum Clarke, 1882

Eudendrium carneum Clarke, 1882: 137, pl. 7 fig. 10-17; Wallace, 1909: 136; Fraser, 1944: 64, pl. 8 fig. 36; Deevey, 1954: 269; Vannucci, 1954: 101, pl. 1 fig. 1-9, pl. 2 fig. 8, pl. 4 fig. 2-5; Millard, 1959a: 302, fig. 1.

Eudendrium cunninghami Kirkpatrick, 1910: 127, pl. 7 fig. 1-3.

Localities. — Puerto Cabello, Venezuela; E. Hentschel, 9.i.1923, on piles of jetty.

Limon, Costa Rica; E. Hentschel, 19.xii.1922, on piles of jetty.

Description. — The material from Puerto Cabello consists of some monosiphonic, slightly branched, 8 to 10 mm high colonies on an unrecognizable hydroid. They are completely sterile and will not be discussed here.

The colonies from Limon are 10 to 35 mm high, with many male and female gonophores occurring on separate colonies. The colonies are arboriform, with branches in all directions, rising irregularly from the polysiphonic hydrocaulus; some of the larger branches also are polysiphonic. The thick, brown periderm is irregularly wrinkled throughout, but at the basal part of the pedicels distinct rings may be present: at times they may extend along the whole length of the pedicel. In the present material the hydranths are fully extended and there is no evidence for the presence of a pseudo-hydrotheca as described for this species by Millard (1959a: 302). The periderm terminates suddenly under each hydranth, curving slightly inwards. The hydranths are large, 550 to 650 μ long and have 22 to 30 filiform tentacles; the maximal diameter of the hydranth is 275 to 335 μ .

The female gonophores in these specimens are mature; they occur in groups of 2 or 3 at the end of completely reduced hydranths. They are composed of a large embryo or planula, covered by the rests of a distinctly bifid spadix, the whole sheathed in a hyaline mass, covered by thin, transparent periderm. The gonophores have a length of 385 μ and a diameter of 300 μ .

The male gonophores are distinctly young and borne in a whorl on the body of a much reduced blastostyle without mouth or tentacles. Each gonophore is a club-shaped body with two constrictions, dividing the gonophore into three chambers. Each chamber produces two lateral masses of spermatocytes; in the terminal chamber the formation of these spermatocytes has only just started.

The condition of the material does not permit of a detailed study of the nematocysts; these have been described by Millard (1959a: 303).

Remarks. — My material agrees with that described by Vannucci (1954) and Millard (1959a).

Geographical distribution. — *E. carneum* has been recorded from along the Atlantic coast of North America, from the Woods Hole area southwards to Tortugas (Wallace, 1909) and the Caribbean Sea ($18^{\circ} 19' 10''$ N, $65^{\circ} 19' 40''$ W, N of Culebra Island, Puerto Rico, Fraser, 1944; Deevey, 1954). It has also been observed along the coasts of Brazil (Vannucci, 1954), at St. Helena (Kirkpatrick, 1910, as *E. cunninghami*) and in Durban Bay and the Morrumbene Estuary, South Africa (Millard, 1959a). The species was also recorded from the eastern, tropical Pacific by Deevey (1954).

HALECIIDAE Hincks, 1868

Halecium reflexum Stechow, 1919 (fig. 1)

Halecium reflexum Stechow, 1919: 37, fig. G, H.

Locality. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Separate hydrophores and small colonies rising from a hydrorhiza creeping on *Acryptolaria* spec. No gonothecae.

Description. — The hydrophores rise directly from short apophyses on the hydrorhiza, or small colonies of 2 to 3 mm height are produced by the development of internodes on the primary hydrophores. The primary hydrophores are vase-shaped structures, basally with some very indistinct rings or a few undulations of the periderm; their sides are nearly parallel but widen slightly at the base of the primary hydrotheca. There is a distinct diaphragm separating hydrophore and hydrotheca; the hydrotheca is shallow and has a widely flaring margin. There is a row of fine puncta some distance below the hydrothecal border. Many of the primary hydrothecae have renovated; the secondary or tertiary hydrophores are of greatly varying lengths.

The small colonies develop by the formation of an article or a new hydrophore from a primary hydrophore just below the diaphragm. The resulting hydrophore may renovate several times, it may develop a new

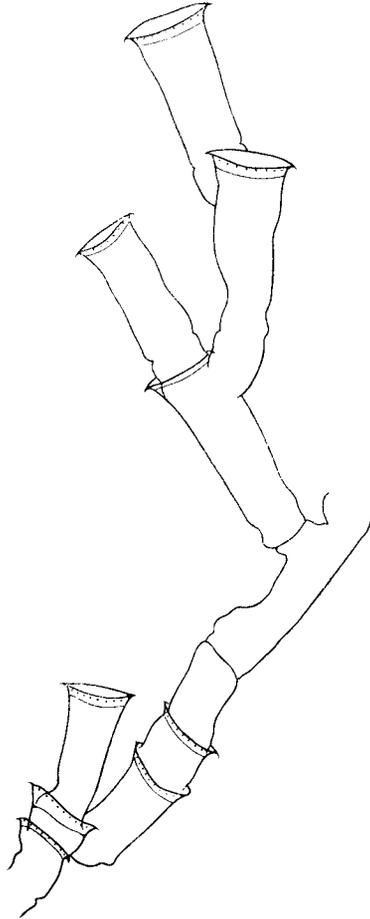


Fig. 1. *Halecium reflexum* Stechow. St. Thomas, Sound. Fragment of a small colony with normal and renovated hydrophores. $\times 75$.

hydrophore in the above described fashion, or ultimately produce short internodes. Both hydrophores and articles are short, with wrinkled periderm rather than with annulations or rings.

No gonothecae have been observed.

Measurements (in microns):

Hydrophore, length from origin on previous hydrophore	175-400
diameter	95-110
Primary hydrotheca, length diaphragm-margin	13-30
diameter at margin	120-165
diameter at diaphragm	110-120

Remarks. — The few specimens in the collection have the mode of growth characteristic of *Halecium nanum* Alder, 1859, and the hydrothecae of *H. tenellum* Hincks, 1861. They differ from *H. nanum* by the strongly flaring, everted hydrothecal margin. From *H. tenellum* they differ by the straggling mode of growth, brought about by the irregular formation of secondary hydrophores or internodes; the latter being short and irregularly wrinkled. My specimens (fig. 1) closely approach those described and figured by Ralph (1958: 340, fig. 11 f, g) as *Halecium* (?) *tenellum*, which in turn agree closely with Stechow's description of *Halecium reflexum*, particularly his growth-form A (Stechow, 1919: 37, fig. G). Stechow's species is based on sterile specimens; the gonothecae have never been described. Growth-forms of *H. tenellum* that approach *H. reflexum* fairly closely, have been described by Leloup, 1952, fig. 77 B 1; the latter may turn out to be identical with *H. tenellum* after the discovery of the gonosome.

Geographical distribution. — *H. reflexum* has so far only been recorded from the Mediterranean, where it was found near Villefranche, S. France, on *Sertularella polyzonias* (L.). *H. tenellum* is a cosmopolitan species with a wide distribution in the Caribbean region.

CAMPANULARIIDAE Hincks, 1868

Campanularia (Clytia) noliformis McCrady, 1857 (fig. 2)

Campanularia noliformis McCrady, 1857: 92, pl. 11 fig. 4; Leloup, 1932a: 150; Leloup, 1935: 29; Kramp, 1943: 43.

Clytia noliformis - Fraser, 1912: 359, fig. 19; Nutting, 1915: 57, pl. 11 fig. 7-10; Bennett, 1922: 144; Fraser, 1944: 144, pl. 26 fig. 117; Fraser, 1948: 209; Deevey, 1954: 270.

Clytia simplex Congdon, 1907: 471, fig. 14, 15; Stechow, 1912: 352, fig. A.

Clytia volubilis Versluys, 1899: 30; Hargitt, 1909: 373, fig. 4.

Localities. — Monte Christi, Haiti; E. Hentschel, 21.i.1923. Sterile colonies on *Sargassum*.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Sterile colonies on *Sargassum*.

Description. — The pedicels rise from a creeping and intertwining hydro-rhiza on the thallus of *Sargassum*; the hydrorhiza fibres are smooth, or ringed over a short distance. The pedicels are 2 to 3 mm long, with wrinkled or ringed periderm. Usually there are some distinct rings under the hydrotheca and just above the apophysis on the hydrorhiza; the intermediate part of the pedicel may be ringed or wrinkled. There is always a globular segment under each hydrotheca.

The hydrothecae (fig. 2) are tumbler-shaped, only slightly deeper than wide and almost too small to accommodate the large hydranths. The periderm

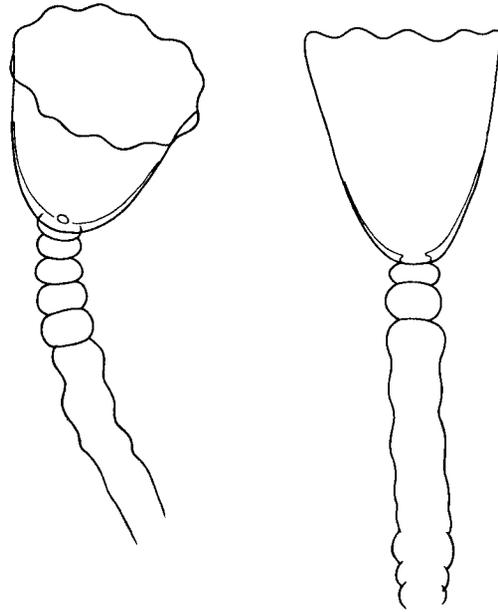


Fig. 2. *Campanularia (Clytia) noliformis* McCrady, St. Thomas, Sound. Two hydrothecae from colony creeping on *Sargassum*. $\times 110$.

of the hydrotheca is firm, increasing in thickness basally and forming a distinct basal chamber without diaphragm. The hydrothecal margin is distinct and undulated in cross-section just under the edge. There are about 12 shallow, rounded teeth of variable height, separated by rounded incisions. The hydranth has 22 to 24 tentacles.

No gonothecae have been observed.

Remarks. — In spite of the absence of gonothecae the material clearly belongs to this characteristic species.

Geographical distribution. — This is a tropical and subtropical species with a very wide distribution in the Atlantic, particularly in the western Atlantic. It also appears to occur in the eastern tropical Pacific (Deevey, 1954). It has been observed throughout the whole Caribbean area (Leloup, 1935; Deevey, 1954), though not exclusively on *Sargassum*. It seems likely that records of *C. volubilis* (Linnaeus, 1758) from the Caribbean refer to the present species.

Campanularia (Clytia) cylindrica (L. Agassiz, 1862) (fig. 3, 4)

Clytia (Platypyxis) cylindrica L. Agassiz, 1862: 306, pl. 27 fig. 8, 9.

Clytia cylindrica - Fraser, 1912: 358, fig. 16; Nutting, 1915: 58, pl. 12 fig. 6, 7; Bennitt, 1922: 247; Fraser, 1944: 134, pl. 23 fig. 106; Fraser, 1948: 206; Vannucci, 1949: 232,

pl. 1 fig. 14; Vannucci, 1950: 84, pl. 1 fig. 2; Deevey, 1954: 270; Vannucci, 1954: 107; Vannucci & Ribeiro, 1955: 69-80, tab. 1.

Laomedea cylindrica - Leloup, 1937: 100, fig. 5.

Localities. — Colon, Panama; E. Hentschel. Grown in the course of 13 days on experimental plates. A 2 to 3 mm high colony, on algae, with *Garveia humilis* (Allman). No gonothecae.

Puerto Barrios, Guatemala; E. Hentschel, 24.xii.1922, on jetty. Colony together with *Laomedea bicuspidata* (Clarke) on an unrecognizable hydroid. One crumpled gonotheca is present.

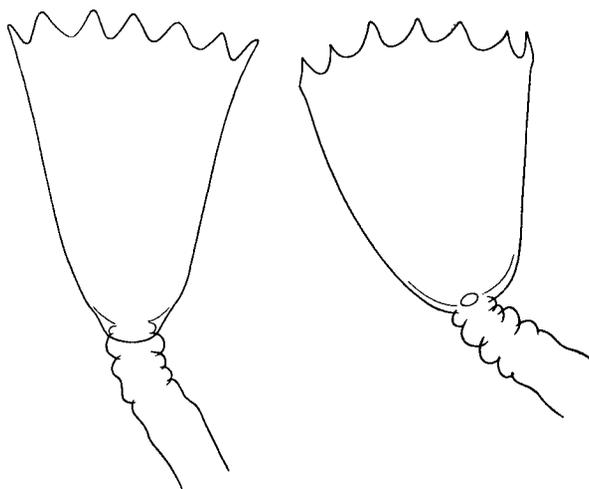


Fig. 3. *Campanularia* (*Clytia*) *cylindrica* (L. Agassiz), Colon, Panama. Two hydrothecae from creeping colony. $\times 75$.

Description. — In the Panama material (fig. 3) the pedicels rise from a dense network of smooth hydrorhiza fibres with brown periderm, growing on algae. The pedicels are 2 to 3 mm long and distinctly ringed at the base and just below the hydrotheca; the rest of the pedicel may be either ringed or wrinkled. Below each hydrotheca there is invariably a globular node. Only few of the hydrothecae in this specimen are fully developed, many are in the process of development. The completely developed hydrothecae are fairly slender, more or less bell-shaped, gradually narrowing basally and there suddenly contracted to form the basal chamber. The contraction is visible in lateral view but it is invisible in oblique view. The hydrothecal margin has 12 triangular teeth, separated by rounded incisions. The hydrothecal cross-section, just under the margin, is slightly wavy. In some of the older hydrothecae the distal portion of the hydrotheca is fragile and easily collapsible. The structure of the diaphragm could not be observed.

The Guatemala material (fig. 4) consists of an older colony, judging from the presence of the gonotheca. The hydrothecae, nevertheless, are slightly smaller. There are 9 triangular marginal teeth; the cross-section of the hydrotheca just under the margin is distinctly undulated. There is a distinct, though thin basal diaphragm; the basal chamber is slightly asymmetrical.

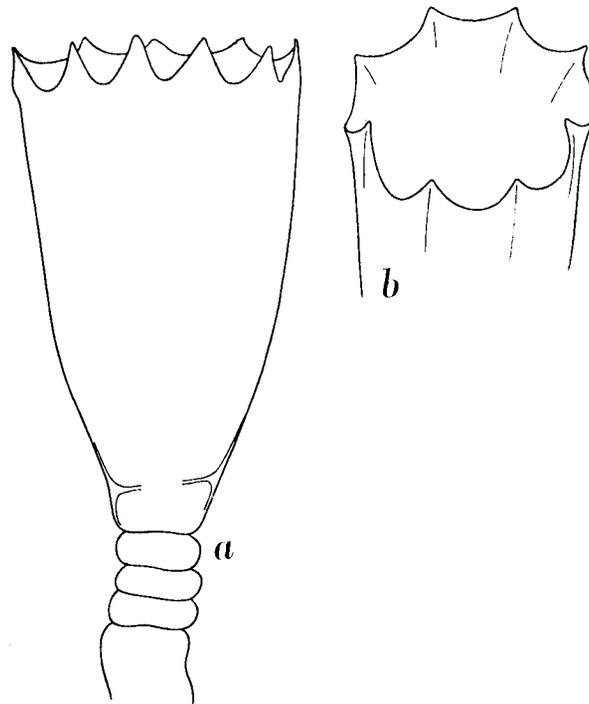


Fig. 4. *Campanularia (Clytia) cylindrica* (L. Agassiz), Puerto Barrios, Guatemala. a, hydrotheca in lateral view; b, oblique view of hydrothecal margin. $\times 175$.

The gonotheca is a cylindrical body, narrowing gradually near the base and placed at the hydrorhiza on a short, ringed stalk. Apically it is distinctly constricted to form a low collar around a circular opening. Some undulations or rings are present, though these may be due to damage. Only rests of the gonophore are visible, showing that a number of free medusae have evidently been produced.

Measurements (in microns):

	Panama	Guatemala
Hydrotheca, total length	495-510	375-400
diameter at margin	325-350	220-250

Remarks. — The Panama material differs from previously described colonies by the shortness of the hydrothecae, which may largely be due to the undoubtedly young state of the colony. The Guatemala material is extraordinary near to *Clytia elsaeoswaldae* Stechow, 1914. The type locality of this species is Charlotte Amalia, St. Thomas. It has recently been redescribed by Vannucci (1946) from the Bay of Santos, Brazil.

Geographical distribution. — *C. cylindrica* is widely distributed along the Atlantic coast of America and in the Caribbean area, ranging from the Woods Hole area in the north to the Rio de Janeiro area in the south (Fraser, 1944; Vannucci, 1954). Additional records are from Bermuda (Bennett, 1922), from the Florida Keys (Deevey, 1954), and from the Caribbean Sea (Deevey, 1954).

Recently Ralph (1957: 822) pointed out the enormous variability of *Campanularia* (*Clytia*) *hemisphaerica* (Linnaeus, 1767) (= *C. johnstoni* Alder, 1856) and mentioned *C. cylindrica* as a probable synonym of *C. hemisphaerica*.

Laomedea (Phialidium) pelagica (Van Breemen, 1905) (fig. 5)

Laomedea gracilis M. Sars, 1851: 138; Kramp, 1929: 41; Kramp, 1935: 115, fig. 49D; Leloup, 1937a: 4, 23, fig. 4; Kramp, 1958: 22, 63, 67, 72; Leloup, 1940: 21; Kramp, 1943: 43; Kramp, 1947: 7; Leloup, 1947: 26, fig. 15.

Laomedea (Phialidium) gracilis - Hummelinck, 1930: 40, fig. 7; Hummelinck, 1936: 52.

Laomedea (Clytia) gracilis - Broch, 1933: 98, fig. 42; Leloup, 1933: 8, 11-15, fig. 3; Vervoort, 1942: 311.

Clytia gracilis - Moore, 1937: 42; Rees, 1952: 6; Millard, 1957: 196; Millard, 1958: 172, fig. 3b, e, g.

Gonothyraea gracilis - Fraser, 1912: 361, fig. 20; Nutting, 1915: 70, pl. 17 fig. 3; Fraser, 1938: 8, 35; Fraser, 1938a: 109; Fraser, 1938b: 32; Fraser, 1944: 148, pl. 26 fig. 121; Fraser, 1948: 212; Deevey, 1954: 270.

Campanularia (Clytia) pelagica Van Breemen, 1905: 205, fig. 18.

Clytia (Campanularia) pelagica - Künne, 1937: 144, 148, 152, 154, 156, 160, 162.

Campanularia pelagica - Leloup, 1932: 1.

Laomedea (Phialidium) pelagica - Hummelinck, 1930: 37, fig. 6; Vervoort, 1946: 285, fig. 126; Vervoort, 1949: 157; Vervoort, 1959: 313, fig. 55 b, c.

Laomedea pelagica - Hummelinck, 1954: 161.

Locality. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A small colony with some gonothecae on *Cnidoscypus marginatus* (Allman).

Description. — The 3 to 5 mm long pedicels arise from a creeping hydro-rhiza. They are unbranched, have some basal rings and a few rings directly under the hydrotheca; the rest of the pedicel is smooth. The hydrothecae (fig 5a) are slender, very slightly narrowing basally; the extreme basal part is rounded, with a shallow constriction in the region of the basal chamber. There are 10 to 12 rounded, triangular teeth, separated by semicircular incisions; the incised portion of the hydrothecal wall is curved outward.

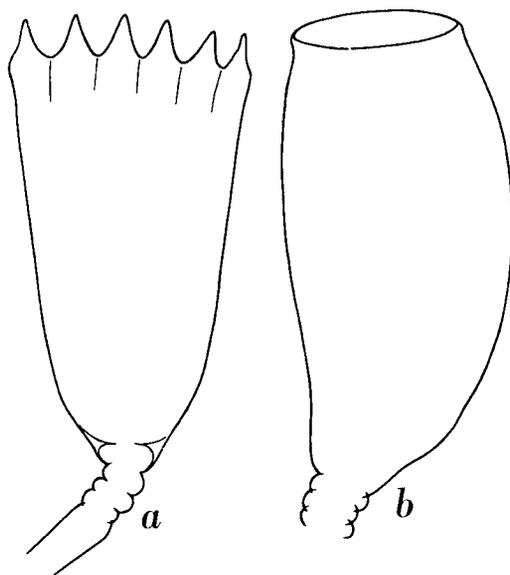


Fig. 5. *Laomedea* (*Phialidium*) *pelagica* (Van Breemen), St. Thomas, Sound. a, hydrotheca, lateral view; b, gonotheca. $\times 75$.

Consequently the hydrothecal margin is wavy on cross-section just under the margin. There is a distinct diaphragm, attached to the hydrothecal walls by means of a circular chitinized strip. There are no striae or longitudinal stripes on the hydrotheca.

The shape of the gonothecae can best be described by reference to figure 5b. They are smooth-walled, cylindrical structures with one side of the walls distinctly produced. The apical portion is flattened and a circular lid is visible. They are attached to the hydrorhiza by means of a short, ringed stalk.

Measurements (in microns):

Hydrotheca, total length	820-830
diameter at margin	320-340
Gonotheca, total length	880-900
maximal diameter	395-400

Remarks. — *L. pelagica* has recently been united with *Campanularia johnstoni* Alder, 1856, into one species, *Clytia hemisphaerica* (Linnaeus, 1767) by Millard (1966). Millard based her conclusion largely on an investigation into the variability of *Clytia* (= *Campanularia*) *johnstoni* by Ralph (1957: 820). Ralph, after the inspection of much material from along the entire coast of New Zealand, reached the conclusion that in *C. johnstoni* there is a correlation between geographical latitude and the size and shape of marginal teeth in the hydrotheca and the annulation of the gonotheca. I can

fully corroborate her conclusion that *Clytia compressa* Totton (1930: 146, fig. 6) should fall within the synonymy of *C. johnstoni*; probably there are several more species that, on account of Ralph's results, should be united with *C. johnstoni*, as e.g., *Campanularia raridentata* Alder (1862: 315, pl. 14 fig. 5). I can also follow Millard in her conclusion that the proper name for *C. johnstoni*, now the identity of its medusa is firmly established, is *Clytia* (or *Campanularia*) *hemisphaerica* (Linnaeus, 1767). But in my opinion it is going too far to include in *C. hemisphaerica* also *Laomedea gracilis* M. Sars, 1851 (= *Campanularia pelagica* Van Breemen, 1905). I have seen a large material of both species, which are quite common in the North Sea area — *C. gracilis* almost exclusively as pelagic colonies, *C. johnstoni* usually as fixed colonies, but occasionally also pelagically — and I have never seen any intermediates. The slender, gradually narrowing hydrotheca of *L. pelagica* is quite characteristic; the undulating cross-section of the hydrotheca has never been observed in *C. johnstoni*; the gonothecae are invariably smooth. Furthermore, the possibility that two species of medusae are included in the one generally indicated as *Phialidium hemisphaericum* (Linnaeus, 1767) cannot be altogether neglected (cf. Russell, 1953: 290, 293). I prefer, therefore, to keep *L. pelagica* and *C. johnstoni* separate.

Geographical distribution. — The species is probably widely distributed along the Atlantic coasts of tropical America, penetrating into subtropical and even temperate regions in the north (Fraser, 1944). Deevey (1954) records the species from the Florida Keys, the Caribbean Sea and the north-western Gulf of Mexico. It has also been found in the tropical eastern Pacific (Fraser, 1948).

***Laomedea* (*Phialidium*) *tottoni* Leloup, 1935 (fig. 6)**

Clytia fragilis Congdon, 1907: 470, fig. 13; Nutting, 1915: 62, pl. 15 fig. 1; Bennett, 1922: 247; Fraser, 1944: 137, pl. 24 fig. 109; Deevey, 1954: 270.

Laomedea tottoni Leloup, 1935, p. 26, fig. 11, 12.

Localities. — St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Single hydrothecae rising from a stolon creeping on *Idiellana pristis* (Lamouroux). One larger colony on *Syntheceum tubithecum* (Allman). No gonothecae.

Cartagena, Colombia; E. Hentschel, 2.i.1923, on jetty. Three fragments of about 8 mm height, monosiphonic and without gonothecae. One of the colonies with *Cuspidella humilis* Hincks.

Description. — The hydrocauli are broken up into slender internodes, slightly shorter than the hydrothecae; the pedicels of the hydrothecae

originate from the end of each internode; the next internode springs from a short apophysis. The hydrocaulus is thus sympodially built and gracefully curved in zig-zag fashion. The internodes are ringed basally and apically. The hydrothecae are placed on short, slender, completely ringed pedicels; the number of rings varies between 6 and 8. The hydrothecae (fig. 6) are deeply tumbler-shaped, the walls gently narrowing near the base and only slightly contracted at the region of the basal chamber. There are 12 to 14 acute marginal teeth, separated by deep, semicircular incisions. There is a fine line running downwards from the apex of each tooth. A close inspection of the margin shows that this fine line is brought about by a sharp fold of the hydrothecal wall at each marginal tooth. The cross-section of the hydrotheca

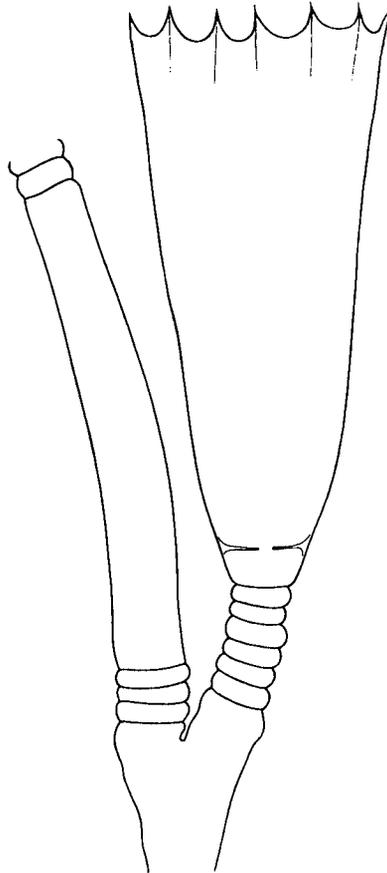


Fig. 6. *Laomedea (Phialidium) tottoni* Leloup, Cartagena, Colombia. Part of colony with a single hydrotheca. $\times 75$.

just under the margin, therefore, is scalloped. The basal chamber is large; the diaphragm is straight and thin.

No gonothecae have been observed.

Measurements (in microns):

	St. Thomas	Cartagena
Hydrotheca, total length	400-410	915-975
diameter	185-190	325-375

Remarks. — The specimen from St. Thomas is only doubtfully referred to this species. It may represent a young colony. The hydrothecae, though much smaller than those of the Cartagena specimen, have the same shape. This species is characterized by the hyaline periderm and the very delicate hydrothecae. The hydrothecal margin is very easily damaged and complete thecae are scarce. In several hydrothecae the distal part has collapsed just above the contracted hydranth. In many complete thecae the retracted hydranth produces a slight swelling. The species is very near to *Obelia striata* Clarke (1907: 9, pl. 6, 7); this Pacific species appears to have the same structure of the hydrothecal margin, the number of teeth being 14 to 16.

Geographical distribution. — The species has exclusively been found in the western Atlantic, where it appears to be rare. It has been found at Bermuda (Congdon, 1907; Bennitt, 1922), off Cape Hatteras (Nutting, 1915), Mayaguez harbour, Puerto Rico (Nutting, 1915) and Dry Tortugas (Leloup, 1935).

Laomedea (Obelia) bicuspidata (Clarke, 1875) (fig. 7)

Obelia bicuspidata Clarke, 1875: 58, pl. 9 fig. 1; Fraser, 1912: 361, fig. 21; Nutting, 1915: 80, pl. 20 fig. 5, 6; Fraser, 1944: 153, pl. 27 fig. 125; Deevey, 1954: 270; Vannucci, 1954: 108, pl. 2 fig. 2-7, 9, 10; Millard, 1958: 174; Millard, 1959: 249.

Gonothyrax bicuspidata - Stechow, 1919: 50; Vannucci, 1946: 556, pl. 3 fig. 23; Vannucci, 1949: 235; Vannucci, 1951a: 110, 116.

Laomedea bicuspidata - Leloup, 1937: 99, fig. 4; Leloup, 1937a: 4, 20; Leloup, 1940: 20; Vervoort, 1946: 344, fig. 10a, b; Leloup, 1947: 23, fig. 14; Hummelinck, 1954: 161; Leloup, 1960: 227.

Laomedea (Obelia) bicuspidata - Hummelinck, 1936: 53, fig. 8; Hamond, 1957: 295, 312, fig. 20, 21; Vervoort, 1959: 315.

Obelia bidentata Clarke, 1875: 58, pl. 9 fig. 2.

Campanularia (?) *spinulosa* Bale, 1888: 756, pl. 12 fig. 5-7.

Laomedea spinulosa var. *minor* Leloup, 1935: 26.

Obelia (?) *oxydentata* Stechow, 1914: 131, fig. 7.

Obelia (?) sp. Clarke, 1907: 10, pl. 5 fig. 5-7.

Localities. — La Guaira, Venezuela; E. Hentschel, 8.xii.1922. Many up to 15 mm high, irregularly branched, bushy colonies on algae. Gonotheca present.

Puerto Barrios, Guatemala; E. Hentschel, 24.xii.1922. Creeping, sterile

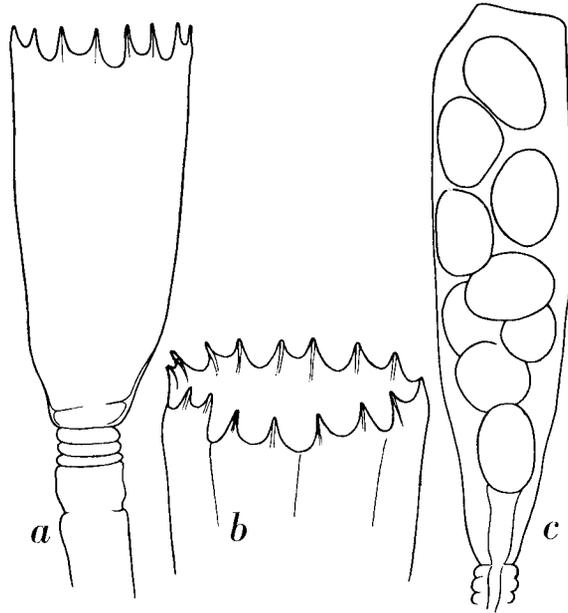


Fig. 7. *Laomedea (Obelia) bicuspidata* (Clarke). a, b, Puerto Barrios, Guatemala; a, hydrotheca; b, hydrothecal margin. c, La Guaira, Venezuela, gonotheca. a, c, $\times 110$; b, $\times 175$.

colony on unrecognizable hydroid, together with *Campanularia (Clytia) cylindrica* (L. Agassiz). Height about 3 mm.

Description. — The following description is mainly based on the specimens from La Guaira. The colonies are small, with mainly monopodially built hydrocaulus, polysiphonic in its lower parts. The branching of the colonies is very irregular; the hydrocauli form a densely intertwining network. The hydrothecae (fig. 7a) in this species are quite characteristic. They are deeply tumbler-shaped, the basal portion distinctly contracted at the region of the basal chamber. The margin (fig. 7b) has about 10 large teeth, separated by deep, hollowed incisions. Each tooth is provided with two smaller teeth, separated by a less deep, semi-circular incision; the resulting teeth are fairly acute and internally provided with a highly characteristic, triangular, chitinized strip, projecting into the cavity of the hydrotheca. The hydrothecal margin, at the level of the deep incisions between the primary teeth, is curved outward, so that the hydrothecal border, at a cross-section just under the edge, is wavy rather than polygonal. The diaphragm is thin; the basal chamber slightly oblique.

The gonothecae (fig. 7c) occur in the axil of the hydrothecae-bearing branches and are elongated, cylindrical structures, placed on short, ringed

pedicels. They narrow very gradually basally; apically they are cut off straight and provided with a circular lid; no collar has been observed. The gonophores develop into a large number of medusae. All developmental stages of the gonophores are present.

Measurements (in microns):

	La Guaira	Puerto Barrios
Hydrotheca, total length	295-335	335-350
diameter	150-175	150-160
Gonotheca, total length	675-810	
diameter	135-245	

Geographical distribution. — The species is widely distributed in the tropical, subtropical and temperate Atlantic, Indian and Pacific Oceans (Vervoort, 1959; Leloup, 1960). Along the American east coast it occurs from the Long Island region down south to the Santos region at the Brazilian coast (Fraser, 1944; Vannucci, 1946). It is widely distributed over the Gulf of Mexico and in the Caribbean area (Leloup, 1935, as *Laomedea spinulosa* var. *minor*; Deevey, 1954).

Laomedea (Obelia) longicyatha (Allman, 1877) (fig. 8)

Obelia longicyatha Allman, 1877: 10, pl. 7 fig. 4, 5.

Clytia longicyatha - Billard, 1907: 338; Fraser, 1912: 359, fig. 18; Nutting, 1915: 58, pl. 12 fig. 4; Fraser, 1943: 88; Fraser, 1944: 142, pl. 25 fig. 114; Deevey, 1954: 270.

Laomedea longicyatha - Leloup, 1935, p. 20; Vervoort, 1946: 343.

Locality. — Colon, Panama; E. Hentschel. Grown in the course of 13 days on experimental plates. Fragments of 4 mm height. Monosiphonic, sympodial colony with 6 hydrothecae. No gonothecae are present.

Description. — The fragment consists of a sympodially built, monosiphonic hydrocaulus. The hydrothecae are alternately arranged on short, ringed pedicels. The general shape of the hydrothecae (fig. 8a) resembles *L. bicuspidata* (Clarke), but here the thecae are much larger and slenderer. There are 14 or 15 big, marginal teeth, separated by deep rounded incisions, the bottom of which is curved outwards (fig. 8b). Each large tooth has an apical, semi-circular incision; the marginal teeth are fairly long and bluntly pointed. Each small tooth has a large, internal carina; the attachment of this carina to the internal thecal wall is visible as a fine line. The basal chamber is very asymmetrical because of the oblique position of the operculum.

No gonotheca have been observed.

Measurements (in microns):

Hydrothecae, total length	580-620
diameter	200-245

Geographical distribution. — *L. longicyatha* is widely distributed through the tropical Atlantic, Indian and Pacific Oceans, though apparently only

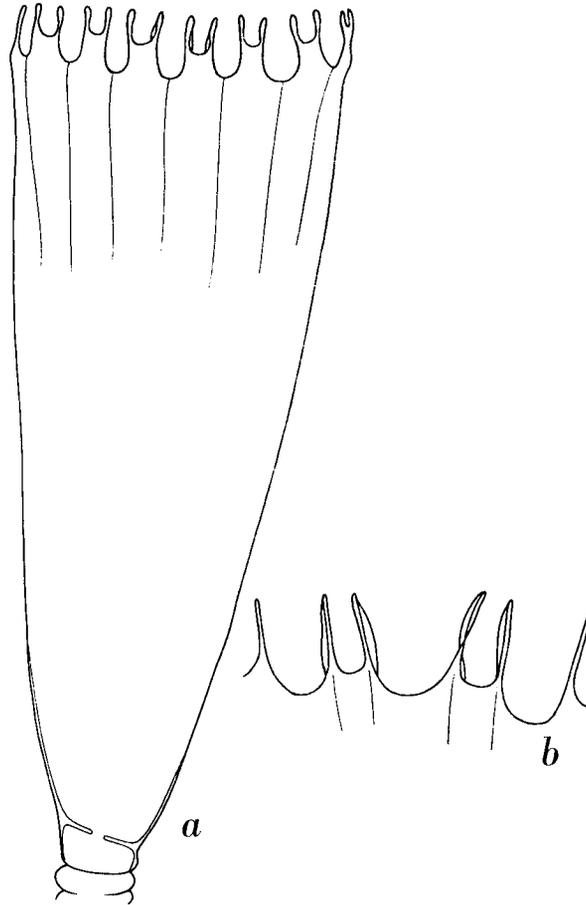


Fig. 8. *Laomedea (Obelia) longicyatha* (Allman), Colon, Panama. a, hydrotheca; b, hydrothecal margin. a, $\times 175$; b, $\times 320$.

occurring at isolated localities and nowhere in large numbers (Billard, 1907; Vervoort, 1946). It has been recorded from various localities in the temperate Atlantic, particularly along the American east coast, where it penetrates as far north as the Woods Hole area (Fraser, 1944). From the western, tropical Atlantic a number of localities are known (Fraser, 1944); these are summarized by Deevey (1954) as follows: Florida Keys; Tortugas; northwestern Gulf of Mexico, and the Caribbean Sea. Additional records are known from the tropical eastern Pacific. The species is probably distributed throughout the Caribbean area, from the Florida region in the north to

the Panama region in the south. It has not been observed along the Brazilian coast.

Laomedea (Obelia) congdoni Hargitt, 1909

Obelia hyalina Clarke, 1879: 241, pl. 4 fig. 21; Nutting, 1895: 30, 88; Versluys, 1899: 30; Congdon, 1907: 468, fig. 7-9; Fraser, 1912: 363, fig. 24; Nutting, 1915: 76, pl. 18 fig. 6, 7; Bennitt, 1922: 249; Fraser, 1943: 89; Fraser, 1944: 160, pl. 28 fig. 131; Deevey, 1954: 270.

Obelia congdoni Hargitt, 1909: 375.

Laomedea sargassi - Leloup, 1935: 24; Leloup, 1937: 101.

Locality. — La Guaria, Venezuela; E. Hentschel, 8.xii.1922. Some 10 to 12 mm high colonies with gonothecae, removed from larger hydroid or from algae.

Remarks. — The specimens of this species in the collection are in bad shape. Though some of the hydrothecae have the characteristic conical appearance, the hydrothecal margin is damaged in others. The gonothecae are present in two forms: there are gonothecae with a flattened top provided with a circular opening, surrounded by a shallow collar; other gonothecae have a uniformly rounded apex. I believe the first type to represent the mature gonothecae; in these the production of free medusae is in full swing.

Geographical distribution. — This species is widely distributed in the western, tropical Atlantic, particularly in the Caribbean region, where it preferably occurs on *Sargassum*. It is also found, however, on all kinds of fixed objects in the littoral zone. Deevey (1954: 270) summarizes the distribution in the western tropical Atlantic as follows: Florida Keys, Cuba and Caribbean Sea. The present locality fits into the general picture of its distribution.

CAMPANULINIDAE Hincks, 1868

Cuspidella humilis Hincks, 1866 (fig. 9)

Cuspidella humilis Hincks, 1866: 298; Hincks, 1868: 209, pl. 39 fig. 4; Fraser, 1912: 364; Fraser, 1944: 169, pl. 30 fig. 141; Deevey, 1954: 270.

Localities. — St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Some hydrothecae on *Synthecium tubihecum* (Allman). No gonothecae.

Cartagena, Colombia; E. Hentschel, 2.i.1923, on jetty. Creeping colonies on *Laomedea tottoni* Leloup. No gonothecae.

Description. — The hydrothecae (fig. 9) rise directly from a creeping stolon. There is no pedicel, but the basal part of the hydrotheca is distinctly constricted and sometimes slightly undulated. The general shape of the hydrothecae is glass-shaped, the basal portion is more or less rounded or almost cylindrical, with a constriction at the extreme basal part. The hydro-

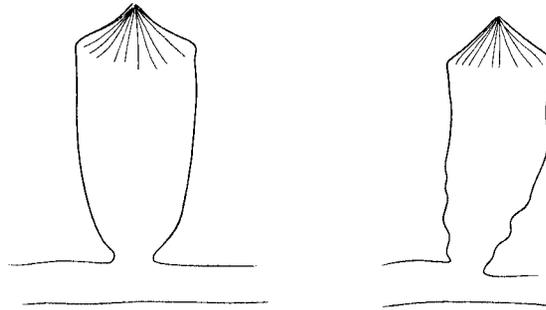


Fig. 9. *Cuspidella humilis* Hincks, Cartagena, Colombia. Two hydrothecae from creeping colony. $\times 175$.

theca is closed by the hyaline apical part of the theca, folding over the thecal aperture as a low, conical roof. There are apparently sharply triangular, thickened strips in that part of the hydrotheca, connected by the unthickened, hyaline part of the theca. The closing membrane sometimes folds very irregularly. The hydrothecal border bulges very slightly at the extreme margin when the membrane closes. Nearly all hydrothecae have a contracted hydranth.

No gonothecae have been observed.

Measurements (in microns):

Hydrotheca with closed operculum, total length	140-200
maximal diameter	75-95

Geographical distribution. — Though this species has mainly been recorded from the boreal and temperate Atlantic, its distribution is probably much wider, including the subtropical and tropical Atlantic and Pacific Oceans. Fraser (1944) records the species from Beaufort, North Carolina. The present record further extends the known distribution of this species in the Caribbean area.

LAFOEIDAE Hincks, 1868

***Acryptolaria* spec.**

Locality. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Two fragments of 15 and 20 mm length, covered with *Halecium reflexum* Stechow. No gonosome.

Remarks. — Though the specimens can be recognized as a species of *Acryptolaria*, the condition of the hydrothecae is very bad. Further identification, therefore, is impossible.

Five species of *Acryptolaria* are known to occur in the Caribbean region,

viz., *A. abies* (Allman, 1877); *A. conferta* (Allman, 1877) (= *A. tortugasensis* Leloup, 1935); *A. elegans* (Allman, 1877); *A. longithecata* (Allman, 1877), and *A. pulchella* (Allman, 1888) (vide Deevey, 1954: 270).

Hebella scandens (Bale, 1888) var. ***contorta*** Marktanner-Turneretscher, 1890 (fig. 10)

Hebella contorta Marktanner-Turneretscher, 1890: 215, pl. 3 fig. 17a, b.

Hebella calcarata var. *contorta* - Bale, 1915: 253; Leloup, 1937a: 4, 26, fig. 17; Vervoort, 1946a: 305.

Hebella scandens var. *contorta* - Vervoort, 1959: 239, fig. 14.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer 15-19.i.1907. Many hydrothecae rising from a stolon creeping on *Dynamena crisioides* Lamouroux. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Many

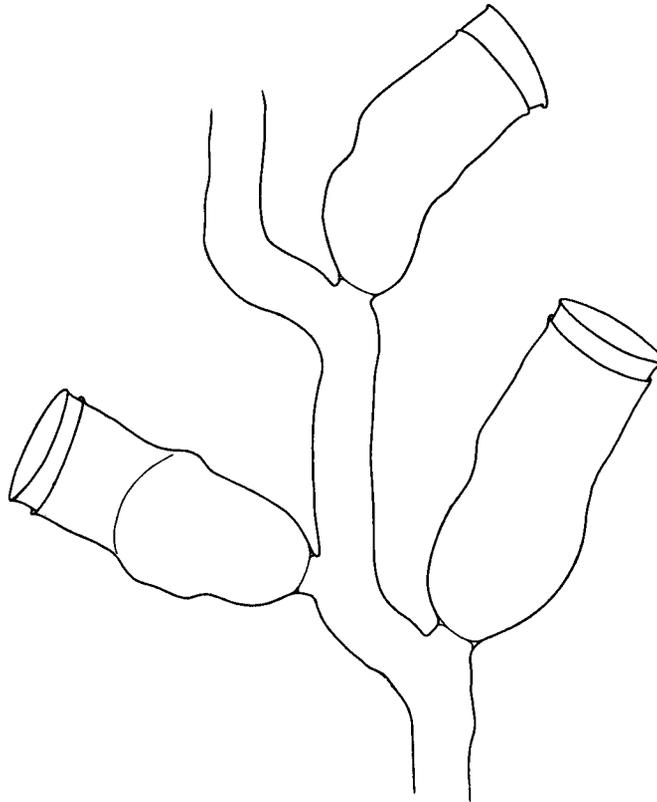


Fig. 10. *Hebella scandens* (Bale) var. *contorta* Marktanner-Turneretscher, St. Thomas, Sound. Three hydrothecae from creeping colony. $\times 75$.

hydrothecae rising from a stolon creeping on *Dynamena crisioides* Lamouroux and *Laomedea* spec. No gonothecae.

Description. — The hydrothecae rise from a fairly thick, smooth-walled stolon, firmly attached to the hydrocauli and hydrothecae of *Dynamena crisioides*; they are alternately directed left and right. The hydrothecae (fig. 10) are more or less tubiform, with a curious twist of the wall at about half the length of the theca, usually accompanied by an internal peridermal ridge. The basal part of the hydrotheca is more or less distinctly rounded; the stalk is very short. There is a distinct diaphragm in each theca; no puncta could be observed. The number of renovations is restricted; usually there are one or two. Amongst the distorted hydrothecae there are more or less normal or only slightly twisted hydrothecae, that have a much larger number of renovations.

Measurements (in microns):

	Gulf of Guinea (Atlantide Exp.)	St. Thomas
Hydrotheca, length of primary theca	420-470	405-540
diameter at aperture	155-170	135-150
maximal diameter	150-180	175-215

Remarks. — The present material agrees perfectly with colonies described previously from the Gulf of Guinea (Vervoort, 1959: 239).

Geographical distribution. — *H. scandens* var. *contorta* has chiefly been recorded from the waters of the Malay Archipelago (Nutting, 1927, as *Hebella spiralis*; Leloup, 1937a; Vervoort, 1946a). A previous Atlantic record is from the Gulf of Guinea, 10° 22' N, 16° 22' W (Vervoort, 1959), where it was found on *Idiellanc pristis* (Lamouroux). This seems to be the first record from the Caribbean region, though *Hebella calcarata* (L. Agassiz, 1862), a species probably identical with *H. scandens* (Bale, 1888), is quite common in that area (Deevey, 1954).

Hebella venusta (Allman, 1877) (fig. 11)

Lafoea venusta Allman, 1877: 11, pl. 6 fig. 3, 4; Clarke, 1879: 239, 241, 243; Nutting, 1895: 88, fig. 2b; Jäderholm, 1903: 270, 274; Ritchie, 1909: 260, 263; Ritchie, 1910: 800, 815, pl. 76 fig. 5, 6; Bennitt, 1922: 249; Fraser, 1943: 91; Fraser, 1944: 227, pl. 47 fig. 212; Deevey, 1954: 270.

Hebella venusta - Leloup, 1935: 15, fig. 5; Leloup, 1937: 97, 117.

Hebella westindica Stechow, 1921a: 227; Stechow, 1921b: 897; Stechow, 1923: 135.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. A small colony creeping on *Thyroscyphus ramosus* Allman. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Beautifully developed colony on *Thyroscyphus ramosus* Allman. No gonothecae.

Description. — The hydrothecae (fig. 11) arise from a fine and smooth,

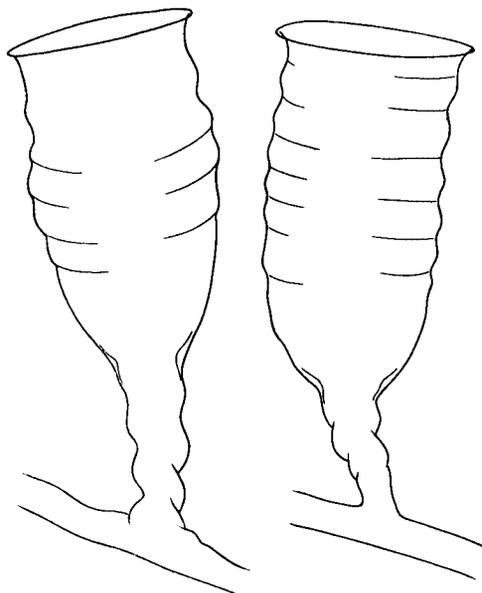


Fig. 11. *Hebella venusta* (Allman), St. Thomas, Sound. Two hydrothecae from creeping colony. $\times 75$.

creeping hydrorhiza; they are usually, but not exclusively, to be found in the axil between hydrothecae and axis of the host. The hydrothecae have a distinct pedicel, about half as long as the theca, and with some indistinct spiral twists. The hydrothecae are deeply vase-shaped, narrowing basally into the pedicel but only scarcely or imperceptibly rounded. The walls of the hydrotheca are distinctly undulated; in some of the hydrothecae the undulations are so deep, that almost ringed thecae result. The hydrothecal margin is distinctly everted; the aperture is rounded. The hydranths are attached to the hydrothecal wall at the base of the theca; here a distinct peridermal ring is visible. The empty hydrothecae have no trace of a diaphragm.

Measurements (in microns):

Hydrotheca, length, peridermal ring - margin	595-610
diameter	295-365
Pedicel, length	200-270
diameter	80-95

Remarks. — The species has been left in the genus *Hebella* pending the discovery of the gonosome. There is no diaphragm in this species, as is commonly found in the species of *Hebella*.

Geographical distribution. — The species is widely distributed in the

tropical and subtropical western Atlantic: Loggerhead Key, between Florida and Cuba (type locality, Allman, 1877); off Zoblos Island (Clarke, 1879); off Antigua, Antilles (Jäderholm, 1903); Dry Tortugas (Leloup, 1935); off Bahama Islands (Nutting, 1895, fide Leloup, 1935: 17; Fraser, 1943); off Bermuda (Ritchie, 1909a; Bennitt, 1922); off West Florida (Ritchie, 1909a; Fraser, 1943); Maguaripe Bay, Trinidad (Fraser, 1943); West Indies, without further locality (Stechow, 1921 a, b, 1923, as *H. westindica*), and off Venezuela (Leloup, 1937). The species has also been obtained at the Mergui Archipelago in the Indian Ocean (Ritchie, 1910a). The bathymetrical distribution extends from 4 to 150 fms. (= 7.5-275 m).

SYNTHECIIDAE Marktanner-Turneretscher, 1890

Hincksella cylindrica (Bale, 1888) var. **pusilla** Ritchie, 1910 (fig. 12)

Sertularella cylindrica var. *pusilla* Ritchie, 1910a: 817, pl. 77 fig. 9.

Synthecium cylindricum var. *pusilla* - Leloup, 1935: 31, fig. 14; Leloup, 1940: 3, fig. 2.

Hincksella cylindrica var. *pusilla* - Vervoort, 1959: 247, fig. 19b, c.

Synthecium (?) *gracile* Fraser, 1937: 2, pl. 1 fig. 2; Fraser, 1943: 91; Fraser, 1944: 234, pl. 48 fig. 217; Deevey, 1954: 270.

Locality. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Some 3 to 8 mm long colonies on an unrecognizable hydroid. No gonothecae.

Description. — The hydrocauli are borne on long apophyses, rising from a smooth stolon with thick, brown periderm. The hydrocauli are broken up into short internodes; the septa are slightly oblique and completely obliterated in the lower parts of some hydrocauli. Each internode supports one hydrotheca; the hydrothecae are alternately directed left and right. All hydrocauli are unbranched and have no secondary tubes.

The hydrothecae (fig. 12) are tubiform and slightly curved. About one third of the adcauline thecal wall is adnate. The hydrothecal aperture is circular and very slightly everted. The number of renovations is reduced, one or two being occasionally present. The abcauline hydrothecal wall has a distinct bent in the basal part of the theca. The distal part of the hydrothecal wall is thin and collapsible.

No gonothecae have been observed.

Measurements (in microns):

	West Indies (Leloup, 1935)	St. Thomas	<i>S. gracile</i> (Fraser, 1937)
Internodes, length	300-400	285-365	
diameter at node	100	65-75	
Hydrotheca, length of primary theca	400-500	435-475	500-600
diameter at opening	180-200	175-190	200

Remarks. — The present specimens agree well with the Atlantide material (Vervoort, 1959). The drawing published by Leloup (1935, fig. 14) was

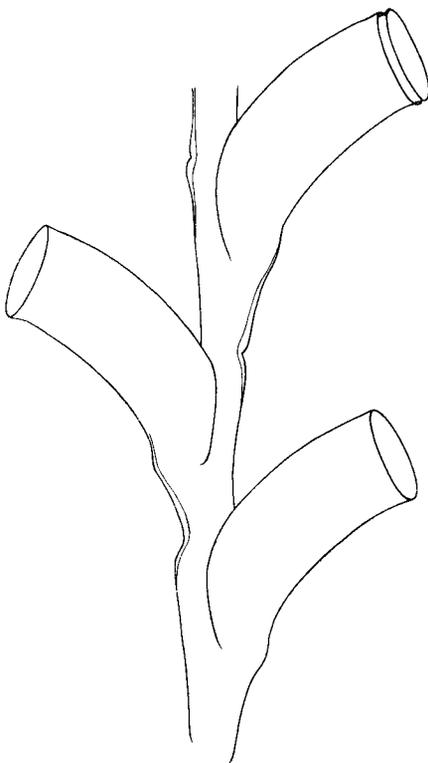


Fig. 12. *Hincksella cylindrica* (Bale) var. *pusilla* Ritchie, St. Thomas, Sound. Monosiphonic fragment of larger colony. $\times 75$.

made after a specimen with partly collapsed and slightly compressed hydrothecae; some of the hydrothecae in my material have the same shape.

Geographical distribution. — *H. cylindrica* var. *pusilla* was originally described from the Mergui Archipelago, Indian Ocean (type locality; Ritchie, 1910a); additional Pacific material has been recorded by Leloup (1940, cf. Vervoort, 1959) from Sagami Bay. In the Caribbean region the species has been recorded from Tortugas (Fraser, 1943) from $18^{\circ} 30' 30''$ N, $66^{\circ} 23' 05''$ W, north of Puerto Rico (Fraser, 1937, as *Syntheceium gracile*), from Curaçao and from Aruba (Leloup, 1935). In the eastern Atlantic it has been observed in the Gulf of Guinea (Vervoort, 1959). The species occurs on other hydroids and on *Sargassum*. The bathymetric distribution extends from 3 to 40 fms. (= 5.5 to 75 m).

Syntheceium gracile Fraser, 1937, is certainly identical with the present variety. Fraser's description of this species, though short, contains nothing that contradicts this; his drawing (pl. 1 fig. 2) is schematic but distinctly

shows the shape of the hydrothecae; the articles in Fraser's specimen were as short as those in Leloup's.

Synthecium tubitheca (Allman, 1877) (fig. 13)

Sertularia tubitheca Allman, 1877: 24, pl. 16 fig. 5, 6.

Synthecium tubithecum - Stechow, 1913: 126; Jäderholm, 1919: 14; Jarvis, 1922: 345; Nutting, 1927: 221; Leloup, 1935: 33; Fraser, 1943: 91; Fraser, 1944: 237, pl. 49 fig. 222; Vannucci, 1950: 86, pl. 1 fig. 4; Vannucci, 1951: 83; Vannucci, 1951a: 106, 107, 113, 144; Deevey, 1954: 270.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Several colonies of 15 mm height on *Idiellana pristis* (Lamouroux). No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Six monosiphonic colonies of 8 to 30 mm height. No gonothecae.

Description. — The colonies are attached to other hydroids by means of a small bundle of smooth hydrorhiza fibres with thick, brownish periderm. The basal part of the hydrocaulus is athecate and not divided into internodes; the thecate part of the hydrocaulus is divided into long and slender internodes (fig. 13a) by means of straight septa, that are only visible in the younger parts of the colony. The length of the internodes varies greatly. The side-branches have an opposite arrangement; they arise from the internode beneath the pair of hydrothecae. Each internode has one pair of hydrothecae, placed in its upper (distal) part, which in that region is slightly swollen. The hydrothecae (fig. 13b) are tubiform, with the proximal portion distinctly narrowing; the apical part curves away from the internode at an angle varying between 70° and 90°. The adnate part of the hydrotheca is slightly longer than the free part of the adcauline wall; the two hydrothecae of a pair do not touch. The hydrothecal aperture is slightly everted and circular; one or two renovations of the hydrothecal aperture regularly occur. The presence of hydranths shows that the colonies were captured alive. No gonothecae have been observed.

Measurements (in microns):

Hydrocaulus, length of internode	945-1,750
diameter at node	110-200
Hydrotheca, length free part adcauline wall	335-400
length adnate part adcauline wall	470-500
length abcauline wall	410-510
diameter at opening	215-230
distance between two thecae of a pair	55-120

Geographical distribution. — This species is widely distributed over the tropical parts of the Atlantic, Indian and Pacific Oceans (Stechow, 1913; Leloup, 1935); in the western tropical Atlantic it is quite common and it has

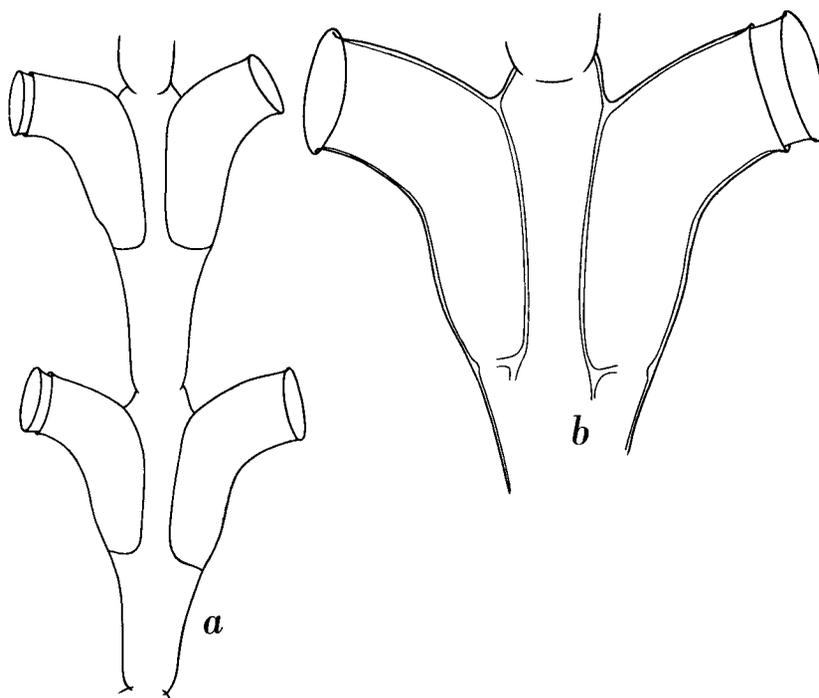


Fig. 13. *Synthecium tubithecum* (Allman), St. Thomas, Savannah Passage. a, fragment of colony; b, pair of hydrothecae. a, $\times 40$; b, $\times 75$.

been recorded from a large number of localities distributed over the whole of the Caribbean region (Fraser, 1944; Deevey, 1954). Its bathymetrical distribution seems to extend from superficial waters down to 100 fms. (= 182 m) at least.

SERTULARIIDAE Hincks, 1868

Cnidoscyphus marginatus (Allman, 1877) (fig. 14)

Obelia marginata Allman, 1877: 9, pl. 6 fig. 1, 2.

Cnidoscyphus marginatus - Spletstösser, 1929: 88, 125, fig. 83-88; Leloup, 1937: 101, 117; Vervoort, 1959: 248, fig. 20.

Lytoscyphus marginatus - Leloup, 1935: 31.

Campanularia marginata - Nutting, 1915: 44, pl. 6 fig. 5-7; Bennett, 1922: 246; Fraser, 1943: 88; Fraser, 1944: 124, pl. 22 fig. 97; Deevey, 1954: 270.

Campanularia insignis Allman, 1888: 19, pl. 9 fig. 1, 2; Congdon, 1907: 468, fig. 10-12.

Localities. — Meteor Exped., Sta. 254a, $2^{\circ} 27' S$, $38^{\circ} W$; E. Hentschel. Several 80 mm high hydrocauli with side-branches, well preserved hydrotheca and hydranths. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Several hydro-

cauli of 80 mm height with some side-branches. Well preserved hydranths are present. No gonothecae. Covered with *Hebella venusta* (Allman).

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Two fragments of 5 and 12 m length. Condition bad. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, i.1907. Many fragments of a 80 mm high colony. Hydrothecae in fair condition. No gonothecae.

Remarks. — This species was accurately described by Spletstösser (1929: 88); additional details were recorded by Vervoort (1959: 249). The present specimens (fig. 14) differ from the Atlantide colonies by the greater length of the internodes, that are gracefully curved in zigzag fashion in the side-branches. The colonies, consequently, are of a more delicate appearance. The periderm has a light horny-brown colour.

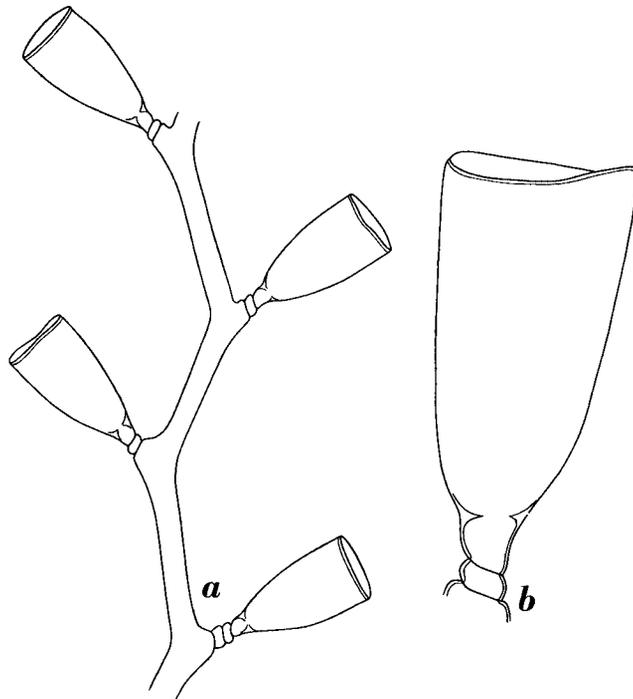


Fig. 14. *Cnidoscypus marginatus* (Allman), Meteor Exped., Sta. 254a. a, monosiphonic fragment of colony; b, hydrotheca. a, $\times 20$; b, $\times 55$.

Geographical distribution. — *C. marginatus* is widely distributed over the whole of the tropical western Atlantic, being particularly common in the Caribbean region, where it is found from just below the surface down

to a depth of some 440 fms. (= 800 m) (Fraser, 1944). The distribution in the Caribbean region is discussed by Fraser (1944: 125) and Deevey (1954: 270). The species has recently been found off tropical West Africa (Vervoort, 1959).

Thyroscyphus ramosus Allman, 1877 (fig. 15)

Thyroscyphus ramosus Allman, 1877: 11, pl. 6 fig. 5, 6; Allman, 1888: 24, pl. 12 fig. 2, 2a; Versluys, 1899: 31; Wallace, 1909: 137; Spletstösser, 1929: 54, 124, fig. 46-51; Leloup, 1932a; 158; Fraser, 1943: 91; Fraser, 1944: 182, pl. 33 fig. 157; Deevey, 1954: 270; Vervoort, 1959: 250, fig. 21.

Localities. — St. Marc, Haiti; E. Hentschel, 15.i.1923, on jetty. Many well preserved, 60 to 80 mm high, pinnate colonies with female gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Several 80 mm high colonies and many fragments. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Several fragments of 20 to 30 mm length. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Several 60 mm high colonies and many fragments. No gonothecae.

St. John, Virgin Is., south coast; Kükenthal & Hartmeyer, 11.i.1907. Four unbranched hydrocauli of 60 to 90 mm length. Hydrothecae directly on hydrocaulus. No gonothecae.

Barbados, Oystin (= Oyster?) Bay, 21.ii.?. One colony of 60 mm height and some fragments. No gonothecae. Hydrothecae well preserved.

La Guaira, Venezuela; E. Hentschel, 8.xii.1922. A large number of 10 to 20 high fragments, many with female gonothecae. Hydrothecae in bad condition; hydranths absent.

Remarks. — For a description of this species I refer to Spletstösser (1929: 124) and Vervoort (1959: 250). The West Indian material differs from the West African colonies by the slightly greater diameter of the hydrothecae, which as a result are less slender. Many of the hydrothecae are renovated and have no closing apparatus. The periderm on the hydrothecae is fairly strong and thick; it forms a distinct ring in the basal part of the hydrotheca and thins out gradually along the hydrothecal walls. Just under the primary hydrothecal margin it forms a slightly elevated though distinct ring (fig. 15b).

The female gonothecae originate from the apophysis bearing the hydrotheca; they face one side of the colony and are pressed against the hydrotheca (fig. 15a). In my material they are in bad condition, though the acrocysts can at times be observed. In outline the gonothecae are inverted cones, gradually narrowing basally. The apical portion consists of a circular lid, which is not

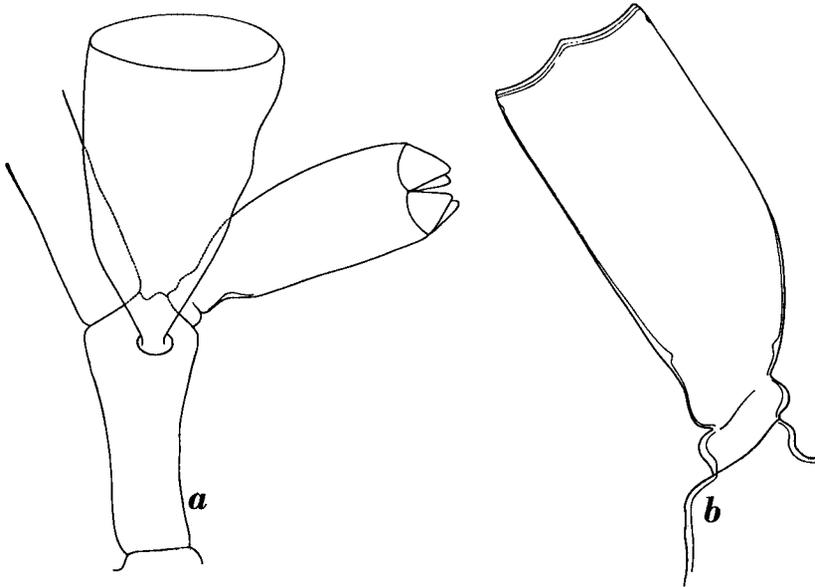


Fig. 15. *Thyroscyphus ramosus* Allman, La Guaira, Venezuela. a, fragment of colony with gonotheca; b, hydrotheca. a, $\times 30$; b, $\times 55$.

shed, but develops an opening through which the acrocysts can be protruded.

Measurements (in microns):

	West Africa (Vervoort, 1959)	La Guaira, Venezuela
Internode, length	1,450-1,800	1,280-1,350
diameter across node	270-450	335-410
Hydrotheca, length (diaphragm-margin)	1,080-1,320	875-945
length (apophysis-margin)	1,500-1,700	1,080-1,175
diameter at aperture	430-450	445-485
maximal diameter	530-540	475-540
Gonotheca, length		1,350
maximum diameter		1,015

The West African specimens have a much slenderer and longer hydrotheca. The present measurements agree with those given by Spletstösser (1929: 57) for West Indian specimens, viz., 900-1,160 μ hydrothecal length and 420-500 μ maximal diameter.

Geographical distribution. — *T. ramosus* is almost exclusively restricted to the Caribbean region; it has been recorded from south of Sand Key (type locality; Allman, 1877), from the Florida Reefs (Fraser, 1944), from Tortugas (Wallace, 1909), off Morro Castle, Cuba (Nutting, 1895), off Orange Key, Bahamas (Fraser, 1944), off Culebra Isl., Puerto Rico

(Fraser, 1944), off Sombrero Isl., Lesser Antilles (Fraser, 1944), St. Eustatius, Lesser Antilles (Van Gernerden-Hoogeveen, 1965), off St. Barthélemy, Lesser Antilles (Jäderholm, 1903), Maguaripe Bay, Trinidad (Fraser, 1943), Testigos Is. (Versluys, 1899), La Guaria, Venezuela (Van Gernerden-Hoogeveen, 1965), and Bahia, Brazil (Allman, 1888). Leloup (1932) mentions specimens from the Gulf of Mannar, Ceylon; West African specimens are mentioned by Vervoort (1959).

Thyroscyphus longicaulis Splettstösser, 1929 (fig. 16)

Thyroscyphus longicaulis Splettstösser, 1929: 49, fig. 43-45.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. About 15 colonies of 20 to 40 mm height on a sponge and some fragments. No gonothecae; hydranths badly preserved.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Four fragments

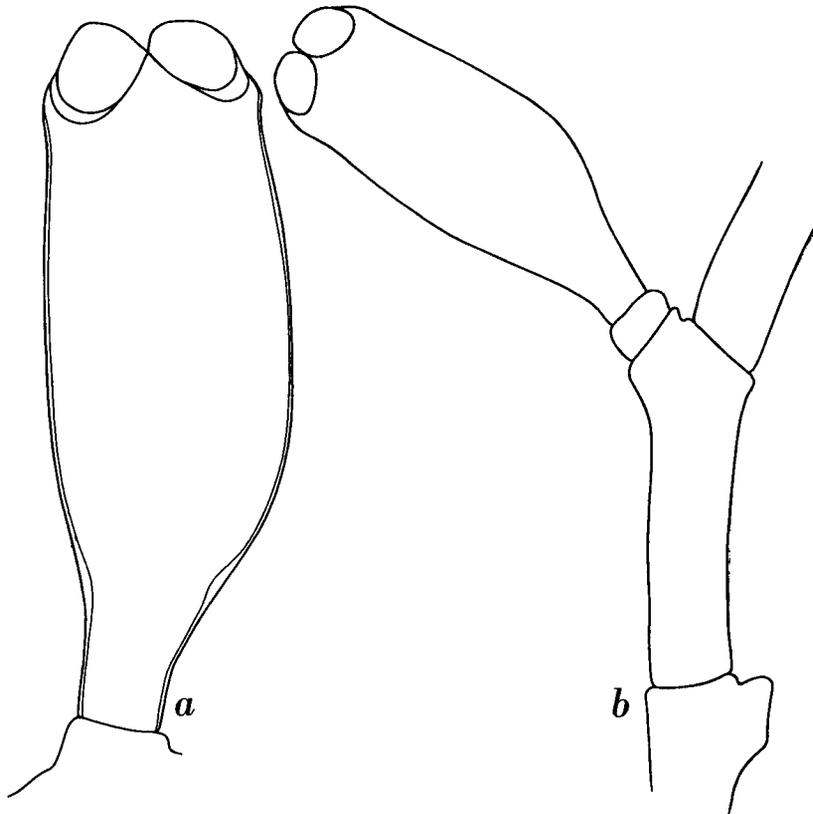


Fig. 16. *Thyroscyphus longicaulis* Splettstösser, St. Thomas, Sound. a, hydrotheca; b, fragment of colony. a, $\times 40$; b, $\times 25$.

of 10 to 15 mm length. No gonothecae. State of preservation very bad.

Remarks. — This species can be distinguished from *T. ramosus*, which it resembles, by the long and slender, stalked hydrothecae with deeply incised hydrothecal margin (fig. 16a). The hydrothecal periderm is thin and the thecae collapse easily. There is a slight thickening of the periderm in the basal part of the theca, forming a distinct ring. The hydranth is attached to the hydrothecal wall by means of a ring-shaped, ectodermal membrane (Spletstösser, 1929, fig. 44). The plates of the closing mechanism are very thin.

No gonothecae are present; they have in fact never been described.

Measurements (in microns):

Internode, length	1,600-2,240
diameter across node	350-385
Hydrotheca, length apophysis-margin	2,080-2,175
diameter at aperture	670-700
maximal diameter	760-800

The hydrotheca, in undamaged condition, is distinctly inflated at the border. Usually the hydrothecae are attached directly to the apophysis, but sometimes there is a short intermediate segment, probably representing the pedicel of a broken hydrotheca.

The hydrothecae are slightly larger than those mentioned by Spletstösser (1929: 51; 1,500-1,610 μ), but his measurements probably have been taken from the peridermal thickening onwards.

Geographical distribution. — The species is only known to occur at St. Thomas, West Indies. Though the exact locality is not mentioned by Spletstösser, his holotype originated from Kükenthal and Hartmeyer's St. Thomas' collection, so that the present material can be referred to as paratypes.

Idiellana pristis (Lamouroux, 1816)

Idia pristis Lamouroux, 1816: 200.

Idiella pristis - Leloup, 1935: 37, fig. 19-21; Deevey, 1954: 270; Vervoort, 1959: 252; Leloup, 1960: 229.

Idiellana pristis - Cotton & Godfrey, 1942: 234; Van Gemerden-Hoogeveen, 1965: 16; Ralph, 1961: 766, fig. 5 c-e.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. One colony of 30 mm height. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Many 30 to 120 mm high colonies on Alcyonaria, Porifera and coral fragments. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, i.1907. Five colonies of 30 to 50 mm height. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Eight colonies of 15 to 60 mm height, no gonothecae.

Remarks. — This is a well known species; the present material agrees with Atlantic colonies described by Van Gemerden-Hoogeveen (1965: 16). The attachment of some colonies to other hydroids, described by Leloup (1935: 38, fig. 19-21) and also observed by Vervoort (1959: 253) and Van Gemerden-Hoogeveen (1965: 17), is also present here; colonies are attached to individuals of the same species as well as to colonies of *Diphasia digitalis* (Busk).

Geographical distribution. — *Idiellana pristis* is widely distributed over the tropical Indian, Pacific and Atlantic Oceans (Vervoort, 1959). In the Caribbean area it is quite common; its distribution there has been discussed by Van Gemerden-Hoogeveen (1965).

Diphasia digitalis (Busk, 1852) (fig. 17)

Sertularia digitalis Busk, 1852: 387, 393.

Diphasia digitalis - Deevey, 1954: 270; Pennycuik, 1959: 191; Vervoort, 1959: 254, fig. 22.

Desmoscyphus longithecus Allman, 1877: 26, pl. 14 fig. 3-6.

Desmoscyphus acanthocarpus Allman, 1888: 73, pl. 35 fig. 2.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Two fragments of 30 mm length.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A very large number of 30 to 70 mm high colonies, partly growing on *Idiellana pristis* (Lamouroux), and many fragments. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Two colonies of 40 mm length and some fragments. No gonothecae.

Remarks. — I have little to add to the descriptions of this well known species. Small colonies occur abundantly on the hydrocauli of *Idiellana pristis*. Some of these young colonies are no more than 10 mm high and are composed of an erect hydrocaulus and some short side-branches. The hydrocauli in the young colonies are broken up into internodes; the septa are incomplete and straight. In the lower parts of the young colonies the hydrothecae are nearly opposite, and frontally and backwardly are separated by a considerable portion of the internode (fig. 17b). In higher parts of the hydrocauli they gradually shift frontally, becoming adnate for about two thirds of the frontal, adcauline wall; backwards they are separated by the internode (fig. 17a). The hydrothecae, in these young colonies, are more or less quadrangular in cross-section below the margin; in some the quadrangular condition of the hydrotheca is even more distinct by the presence of two sharp folds running downward for some distance over the frontal part

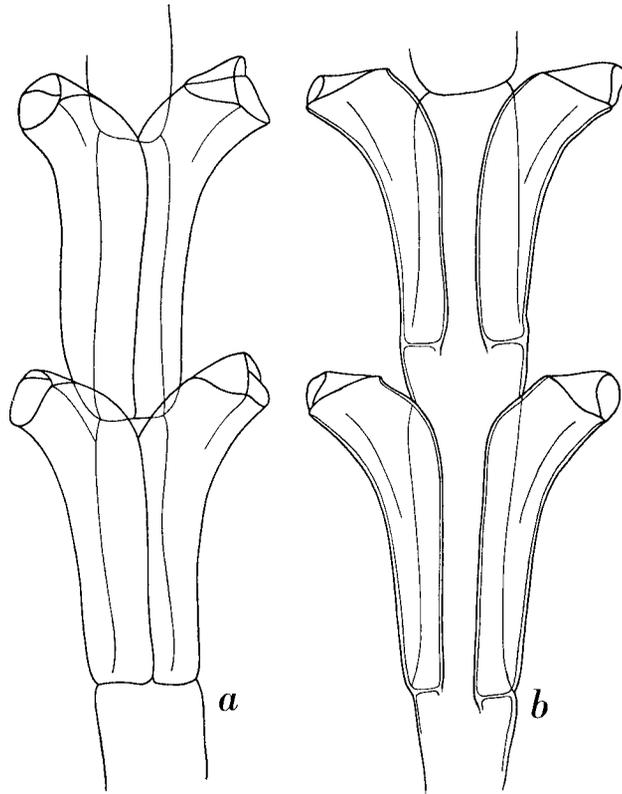


Fig. 17. *Diphasia digitalis* (Busk), St. Thomas, Sound. Details of a very young colony; a, upper portion; b, lower portion. $\times 40$.

of the hydrotheca. The angularity of the hydrothecae gradually disappears in the higher parts of such young colonies.

No gonothecae have been observed.

Geographical distribution. — The species is widely distributed in tropical parts of Atlantic, Pacific and Indian Oceans; in the western tropical Atlantic, including the Caribbean region, it occurs from Florida southwards to the Bahia region (Vervoort, 1959). It seems to prefer slightly deeper waters, occurring preferably between 5 and 50 m depth.

***Dynamena crisioides* Lamouroux, 1824 (fig. 18)**

Dynamena crisioides Lamouroux, 1824: 613, pl. 90 fig. 11, 12; Pennycuik, 1959: 192; Vervoort, 1959: 260, fig. 27a, b; Leloup, 1960: 228; Van Gemerden-Hoogeveen, 1965: 21, fig. 6.

Dynamena crisioides typica Vannucci, 1946: 557, pl. 3 fig. 24, 25.

Thuiaria crisioides - Deevey, 1954: 270.

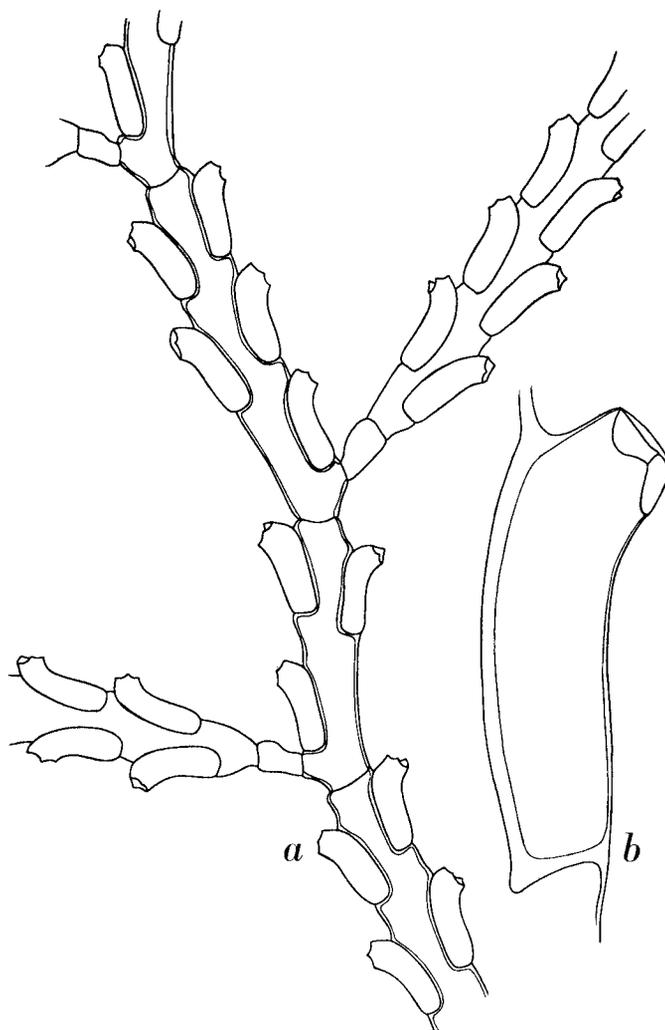


Fig. 18. *Dynamena crisioides* Lamouroux, Cartagena, Colombia. a, fragment of a colony; b, cauline hydrotheca. a, $\times 25$; b, $\times 125$.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. One colony with hydrorhiza fibres, 22 m high. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Five colonies, varying between 15 and 35 mm height, with hydrorhiza fibres. No gonothecae. Partly covered with *Hebella scandens* var. *contorta* Marktanner-Turneretscher.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Six

colonies between 30 and 90 mm height, with hydrorhiza fibres. No gonothecae. Partly covered with *Hebella scandens* var. *contorta* Marktanner-Turneretscher and *Dynamena quadridentata* (Ellis & Solander).

St. John, Virgin Is., south coast; Kükenthal & Hartmeyer, 11.1.1907. Four colonies of 40 to 60 mm height. No gonothecae.

Cartagena, Colombia; E. Hentschel, 2.1.1923. A very large number of 20 to 45 mm high colonies, on lamellibranchs. No gonothecae.

Description. — All colonies are composed of an unbranched hydrocaulus with alternately arranged side-branches. The hydrocaulus has a basal, athecate part rising from the hydrorhiza fibres, separated from the thecate part by an oblique septum. The internodes of the hydrocaulus are separated by straight nodes, sometimes very indistinct in the thicker hydrocauli. Each internode has a basal apophysis, an axillary hydrotheca and one or two pairs of hydrothecae. The side-branches are divided into internodes of greatly variable length, bearing two to five pairs of sub-opposite hydrothecae. Each side-branch has a basal, short internode without hydrothecae. In some colonies the hydrocaulus is gracefully curved in zig-zag fashion between the side-branches, in others it is straight and rigid (fig. 18a).

The hydrothecae are deeply sunken into the internodes, only a small portion being free. The free part is curved outwards fairly sharply (see fig. 18b). There are three marginal teeth of equal size; the closing apparatus is composed of a basal flap and two movable triangular upper flaps.

No gonothecae have been observed.

Measurements:

	Cartagena	Gulf of Guinea (Atlantide, St. 48; Vervoort, 1959)	West Indies (Van Gernerden- Hoogeveen, 1965)
Hydrocaulus, length internode	1,360-1,950	1,260-1,510	1,325-1,640
diameter across node	160-240	250-325	155-345
Side-branch, length of internode	1,520-2,320	630-1,450	1,215-1,810
diameter across node	160-240	110-150	110-170
Hydrotheca, length adnate part			
adcauline wall	400-440	420-430	470-560
length free part			
adcauline wall	120-200	90-120	80-125
length abcauline wall	360-400	340-350	310-375
diameter at aperture	120-145	140-155	125-155

Geographical distribution. — The range of this species, which is widely distributed over the tropical and subtropical parts of the Atlantic, Indian and Pacific Oceans, has been discussed by Van Gernerden-Hoogeveen (1965: 24). Localities in the Caribbean region, where the species is quite

common, are specified by Deevey (1954) and Van Gernerden-Hoogeveen (1965).

Dynamena quadridentata (Ellis & Solander, 1786) (fig. 19)

Sertularia quadridentata Ellis & Solander, 1786: 57, pl. 5 fig. G.

Pasythea (Sertularia) quadridentata - Lamouroux, 1812: 183.

Pasythea quadridentata - Fraser, 1912: 372, fig. 36; Deevey, 1954: 270.

Dynamena quadridentata - Leloup, 1932a: 160; Leloup, 1934: 13; Vervoort, 1946: 308.

Dynamena quadridentata f. *typica* Vannucci, 1946: 559, pl. 3 fig. 27, 28, 31; Vervoort, 1949: 241; Vannucci, 1950: 87; Vannucci, 1951a: 107, 108, 110, 112, 115, 117.

Pasythea nodosa Hargitt, 1908: 114, fig. 13-15.

Dynamena quadridentata var. *nodosa* - Leloup, 1935: 43, fig. 25; Millard, 1958: 186, fig. 6b; Van Gernerden-Hoogeveen, 1965: 27.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A large number of 3 mm high colonies, rising from a stolon creeping on algae. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 21.i.1907. Several 4 to 5 mm high colonies rising from a stolon creeping on *Dynamena crisioides* Lamouroux. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Many up to 8 mm high colonies from a stolon creeping on algae. Gonothecae are present.

St. Thomas, Sound; Kükenthal & Hartmeyer, i.1907. Several 3 to 5 mm high colonies on algae. No gonothecae.

St. Thomas; Kükenthal & Hartmeyer, 1907. A large number of 3 to 5 mm high colonies on algae. No gonothecae.

Remarks. — I have not attempted to distinguish between the species and its variety *nodosa* Hargitt, 1908; all transitions between the two appear to be present in the present material. There are no peridermal septa or rings in the hydrocaulus; the apophyses on the hydrocaulus are short and are separated from the thecate internode by means of oblique hinge-joints. Usually there are no intermediate internodes, though a single atehcate internode may be present between two successive thecate internodes in some colonies; they are invariably separated by means of oblique joints. The number of pairs of hydrothecae of the thecate internodes varies between one and six; the highest number is present in the colonies from Savannah Passage, the only fertile colonies (fig. 19a, d). All hydrothecae in the present material have distinct ab- and adcauline intrathecal teeth; the hydrothecal margin is not thickened (fig. 19b, c). The closing mechanism is intact on nearly all hydrothecae and well preserved hydranths show that the material was living when collected.

The gonothecae (fig. 19d) are barrel-shaped and borne, by means of a

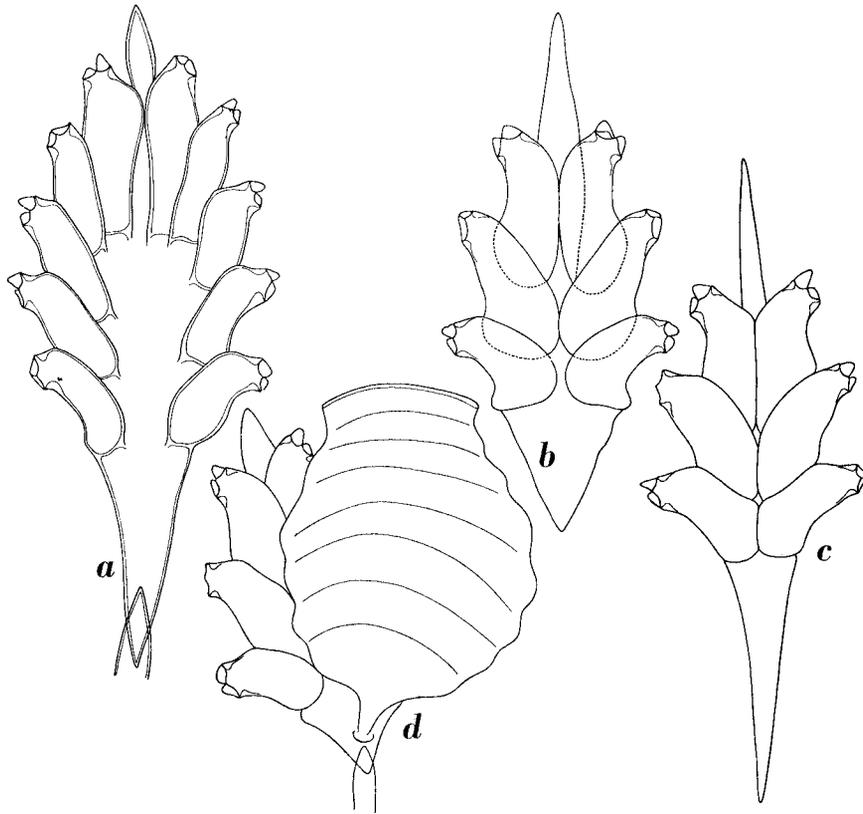


Fig. 19. *Dynamena quadridentata* (Ellis & Solander), St. Thomas, Savannah Passage. a, fragment of colony with five pairs of hydrothecae, frontal view; b, fragment of colony with three pairs of hydrothecae, view from the back; c, fragment of colony with three pairs of hydrothecae, frontal view; d, fragment of colony with gonotheca. $\times 75$.

short stalk, on the basal thecate internode just under the lower pair of thecae. There are 7 to 8 elevated, rounded ribs; the circular opening is thickened and closed by means of a tightly fitting operculum.

For a complete description of Caribbean material of this well known species I refer to Van Gernerden-Hoogvee (1965: 29).

Geographical distribution. — *D. quadridentata* is widely distributed over tropical, subtropical and warm-temperate parts of the Atlantic, Pacific and Indian Oceans. In the western Atlantic it occurs from the Woods Hole region southwards to the Brazilian coast (Hargitt, 1908; Deevey, 1954; Van Gernerden-Hoogvee, 1965). It is quite common in the Caribbean region, occurring preferably on floating algae.

Sertularella cylindritheca (Allman, 1888) (fig. 20)

Sertularia cylindritheca Allman, 1888: 59, pl. 29 fig. 1, 1a; Versluys, 1889: 36, fig. 5.

Sertularella cylindritheca - Hartlaub, 1900: 77, fig. 49, 50; Nutting, 1904: 87, pl. 19 fig. 4; Billard, 1906: 183; Billard, 1931: 676, fig. 2; Fraser, 1943: 92; Fraser, 1944: 259, pl. 54 fig. 244 a, b, pl. 55 fig. 244 c; Fraser, 1946: 79, 298; Vannucci, 1951 a: 107, 113, 114; Vervoort, 1959: 266, fig. 30, 31; Leloup, 1960: 229.

Sertularelloides mercatoris Leloup, 1937: 101, fig. 6; Buchanan, 1957: 366, fig. 17 a, b.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Six fragments of 8 to 15 mm length. Three colonies of 50 to 80 mm length. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Six fragments of 8 to 15 mm length. No gonothecae.

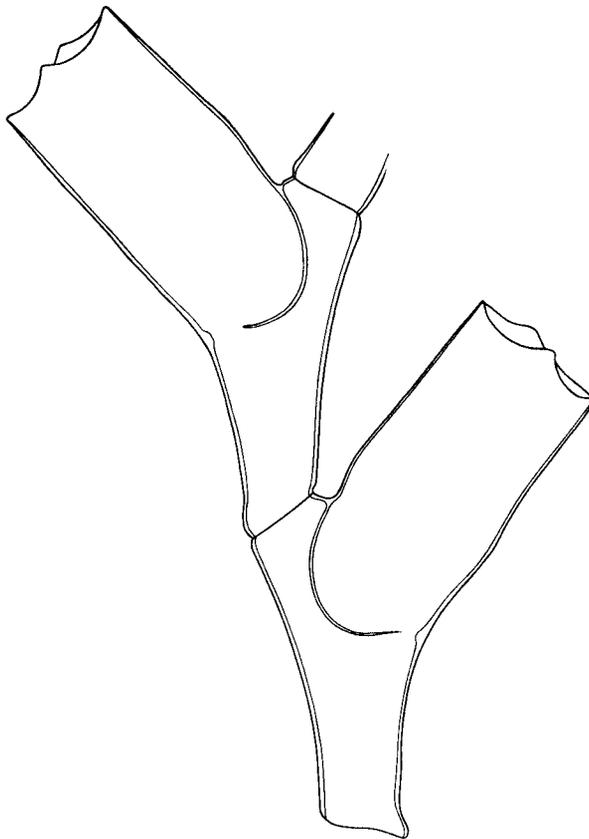


Fig. 20. *Sertularella cylindritheca* (Allman), St. Thomas, Sound. Fragment of colony with two hydrothecae. $\times 25$.

St. Thomas, south coast and Sound; Kükenthal & Hartmeyer, i.1907. One small, 30 mm high colony and three fragments. No gonothecae.

Remarks. — This species has recently been completely redescribed after West African material (Vervoort, 1959: 266); the West Indian material agrees with the description in every detail. Some of the colonies have well preserved hydranths and in these the attachments of the hydranth to the hydrothecal wall is very distinct. Many hydrothecae show secondary or tertiary renovations. In spite of the firm appearance of the colonies the hydrothecae are very brittle and easily damaged.

Measurements (in microns):

	St. Thomas	Gulf of Guinea (Vervoort, 1959)
Internodes, length in side-branches	1,650-2,000	1,600-1,800
diameter across node	360-400	360-540
Hydrotheca, length adcauline wall	1,160-1,360	1,580-1,620
length abcauline wall	1,200-1,320	1,530-1,800
diameter at base	650-720	490-540
diameter at aperture	680-840	600-840

Geographical distribution. — The species is known to occur both in the western and eastern tropical Atlantic. West Atlantic localities are: off Bahia (type locality, Allman, 1888), Testigos Islands, 11-80 m depth (Ver-sluis, 1889), Trinidad (Nutting, 1904; Fraser, 1943, 1944), Guadeloupe (Leloup, 1960) and French Guiana (Leloup, 1960). Along the West African coast the species occurs from Cape Spartel in the north to the Rio d'Oro region in the south, at depths varying between 9 and 80 m (Billard, 1906; 1936; Vervoort, 1959; Leloup, 1937; Buchanan, 1957; the latter two authors as *Sertularelloides mercatoris*).

***Sertularella speciosa* Congdon, 1907 (fig. 21)**

Sertularella speciosa Congdon, 1907: 476, fig. 24-28; Bennett, 1922: 250; Fraser, 1943: 92; Fraser, 1944: 272, pl. 59 fig. 262; Deevey, 1954: 270.

Locality. — St. John, Virgin Is., south coast; Kükenthal & Hartmeyer, 11.1.1907. Two colonies, 35 and 40 mm height. No gonothecae.

Description. — Pinnate colonies composed of a thick, polysiphonic main stem and alternately arranged side-branches. The hydrocaulus is monosiphonic in the upper part of the colony and there it is composed of internodes, separated by very slightly oblique septa. Each internode has a short apophysis in its upper part, bearing an axillary hydrotheca; in addition there are two more hydrothecae, one basally at the same side as the apophysis and one on the opposite side, which occupies an intermediate position (fig. 21a). The axillary hydrotheca is shorter than the remaining hydrothecae.

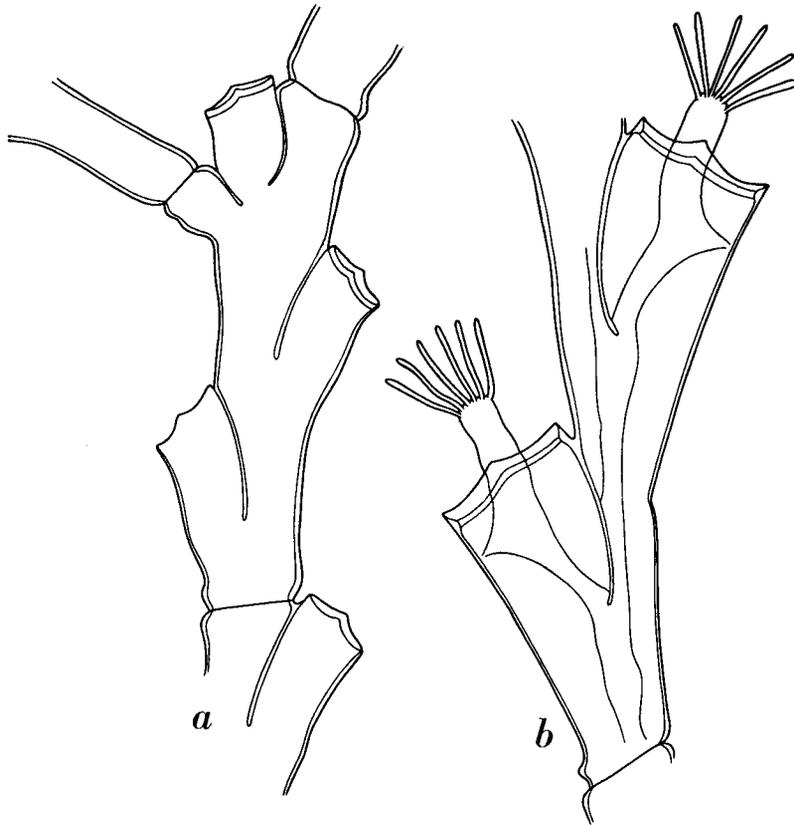


Fig. 21. *Sertularella speciosa* Congdon, St. John, Virgin Is. a, fragment of colony; b, two hydrothecae with their hydranths. a, $\times 40$; b, $\times 75$.

The apophyses alternately point left and right. The side-branches are also divided into internodes; these are longer and slenderer than the stem internodes, and generally bear three to six hydrothecae.

The hydrothecae are alternately arranged and completely sunken into the internode, only a very small part of the adcauline thecal margin is continued into the internode as a shield-shaped peridermal lamella, at the base of which the hydranth is attached (fig. 21b). The abcauline hydrothecal margin is perfectly straight. The hydrothecal margin has four low, fairly sharp points. The extreme hydrothecal margin is very thin and perfectly hyaline, but some distance below the margin there is a distinct, thickened peridermal ridge. The closing apparatus is composed of four hyaline, triangular plates. It is easily damaged and has not been observed in perfect condition on any of the hydrothecae.

As stated above the hydranths are attached to the end of the peridermal plate forming the continuation of the adcauline hydrothecal wall. The body of the hydranth is also attached to the internal side of the abcauline wall, some distance below the internal, peridermal thickening. At the place of attachment the body wall of the hydranth is stretched and the cavity in the hydranth forms a pointed, sack-shaped expansion (fig. 21b).

No gonothecae have been observed.

Measurements (in microns):

Stem internode, length	1,640-1,800
diameter across node	240-320
Side-branch internode, length	1,520-3,240
diameter across node	200-280
Hydrotheca, total depth	360-440
diameter at margin	200-320

Remarks — This species is very near to *Sertularella diaphana* (Allman, 1885: 145, pl. 18 fig. 1-3), with which it has been synonymized by Stechow (1925: 226). Though the two species undoubtedly are closely related, I hesitate to unite them because of incomplete information about the gonothecae of *S. speciosa*. Furthermore, I have only very poor material of *S. diaphana* available for comparison.

Geographical distribution. — This species was originally described from Bermuda, 32° 20' 30" N, 64° 42' 10" W, at the opening of an underground passage connecting Harrington Sound and Castle Harbor (Congdon, 1907). Two additional records by Fraser (1943, 1944) are from Key West, Florida, 24° 24' N, 82° 24' 30" W (depth 34 fms. = 62 m) and off Montserrat Island, Lesser Antilles, 16° 41' 54" N, 62° 13' 34" W (depth 88 fms. = 160 m). The present record, St. John, Virgin Islands, confirms the occurrence of this species in the Caribbean region.

***Sertularella parvula* (Allman, 1888) (fig. 22)**

Calamphora parvula Allman, 1888: 29, pl. 10 fig. 3, 3a.

Sertularella parvula - Hartlaub, 1900: 49, 50, 52, 54, 62, 113, fig. 30; Billard, 1910: 9.

Thyroscyphus intermedius Congdon, 1907: 482, fig. 33-36; Bennett, 1922: 251; Fraser, 1944: 181, pl. 33 fig. 156.

Thyroscyphus intermedius f. *peculiaris* Leloup, 1935: 33, fig. 15-17.

Locality. — St Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Three hydrothecae and a gonotheca rising from a stolon creeping on *Dynamena crisioides* Lamouroux.

Description.— The hydrothecae are 525 μ long and have a maximum diameter of 250 μ ; they are placed on 150 μ long, indistinctly wrinkled pedicels (fig. 22). The three hydrothecae present are perfectly symmetrical and separated from the pedicel by means of an almost complete septum,

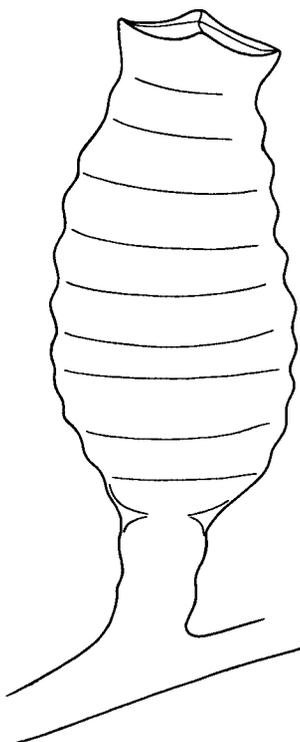


Fig. 22. *Sertularella parvula* (Allman), St. Thomas, Sound. Hydrotheca from creeping colony. $\times 125$.

perforated to permit the passage of the coenosark. The fusiform hydrotheca has 8 to 9 distinct annulations that do not have the character of ribs. The aperture is perpendicular to the length axis of the hydrotheca and has four low, rounded teeth. The operculum is composed of four flaps of triangular shape. Interiorly the hydrotheca has five distinct, rounded teeth or keels, that are only visible when looking into the theca; they are invisible from the outside.

The gonotheca is slightly distorted, but its general outline is egg-shaped, attached to the hydrorhiza by means of a short stalk. There are some indistinct annulations; the small, circular opening is surrounded by four low, rounded knobs.

Remarks. — The present material agrees completely with that described by Leloup (1935) as *Thyroscyphus intermedius* f. *peculiaris*. In my opinion this is a distinct *Sertularella*; it does not agree at all with the characters of the genus *Thyroscyphus* as redefined by Spletstösser (1929: 4). I believe

this species to be identical with Allman's *Calamphora parvula*, from which it differs only by the presence of slightly longer pedicels. The presence of four knobs on the gonotheca (instead of three as in *T. intermedius*) or the absence or presence of intrathecal teeth, can hardly be considered as sufficient grounds to separate the two species, whilst a certain degree of variability in the length of the hydrothecal pedicel can only be expected. I see no reason to retain a separate genus *Calamphora* for such species of *Sertularella* that have separate hydrothecae rising from their hydrorhiza, besides the normally built colonies. The occurrence of such solitary hydrothecae has been established e.g., in *Sertularella tenella* (Alder, 1856).

For the time being I have kept separate the two species *Sertularella solitaria* Nutting (1904: 89, pl. 20 fig. 10, 11) and *Sertularella campanulata* Warren (1908: 300, pl. 47 fig. 21, 22). *S. solitaria* is a very badly known species, characterized by the presence of long and slender, fully ringed hydrothecae, placed on long pedicels. *S. campanulata* has recently been redescribed by Leloup (1937: 33, fig. 22, as *Thyrosocyphus campanulatus*); it comes very near to toothless specimens of *C. parvula*, though the apical part of the hydrotheca is less narrowed in *C. campanulata*. I would not be surprised if the three species turned out to be conspecific.

Geographical distribution. — The type locality of *S. parvula* is East Moncoeur Island, Bass Strait, Australia, 38 fms. (= 68.5 m) depth (Allman, 1888). Additional records (as *T. intermedius*) are from Mangrove Bay, Bermuda, 32° 18' 10" N, 64° 51' 30" E, on eel grass (Congdon, 1907), from Bonaire, Netherlands Antilles, on *Sargassum* (Leloup, 1935), and from 8 miles S.W. of St. Nicolaas Bay, Aruba, Netherlands Antilles, 23-24 fms. (Fraser, 1947). *S. campanulata* has been recorded from off the Natal coast, S. E. Africa (Warren, 1908), from the Gulf of Mannar, Ceylon (Gravelly, 1927), from several localities along the coast of Vietnam (Leloup, 1937) and from the Queensland coast (Pennycuik, 1959). *S. solitaria* was originally described from between Eleuthera and Little Cat Island, Bahamas (Nutting, 1904); subsequent records are from off Martinique, 14° 28' 40" N, 61° 06' 08" W, 357 fms. (= 633 m) depth and from north of Culebra Island, near Puerto Rico, 18° 19' 10" N, 65° 19' 40" W, 10 fms. (= 18 m) depth (Fraser, 1944).

Sertularia inflata (Versluys, 1899 (fig. 23, 24)

Desmoscyphus gracilis Allman, 1888: 71, pl. 34 fig. 2-2c.

Desmoscyphus inflatus Versluys, 1899: 42, fig. 11-13.

Sertularia inflata - Fraser, 1944: 283, pl. 61 fig. 271; Deevey, 1954: 270; Vervoort, 1959: 281, fig. 39-41; Van Gemerden-Hoogveen, 1965: 45, fig. 18-22.

Sertularia versluysi Nutting, 1904: 53, pl. 1 fig. 4-9; Congdon, 1907: 481; Wallace, 1909: 137; Fraser, 1912: 375, fig. 40; Bennett, 1922: 251.

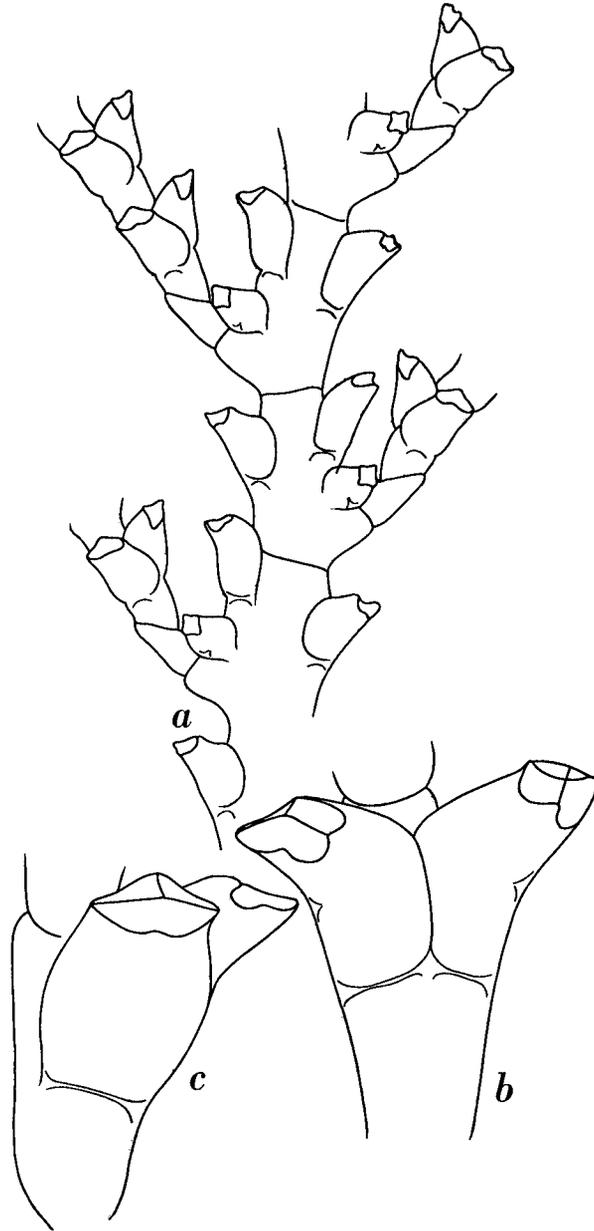


Fig. 23. *Sertularia inflata* (Versluys), Puerto Colombia, Colombia. a, fragment of colony; b, pair of hydrothecae, frontal view; c, pair of hydrothecae, lateral view. a, $\times 40$; b, c $\times 125$.

Localities — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A very large number of 10 to 15 mm high, pinnate colonies on algae. Some gonothecae are present.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Three pinnate fragments of 6, 10 and 17 mm length. No gonothecae.

Puerto Colombia; E. Hentschel, 13.xii.1922, from jetty. Many 20 mm high pinnate colonies rising from dense network of hydrorhiza fibres on barnacles. Gonothecae are present.

Puerto Limon, Costa Rica; E. Hentschel, 1922. A single pinnate fragment of 15 mm height taken from sample with Bryozoa and *Eudendrium* spec. No gonothecae.

Description. — The colonies consist of a monosiphonic hydrocaulus and alternately arranged side-branches. The hydrocauli rise from an apophysis on a dense network of brown hydrorhiza fibres; the athecate part of the hydrocaulus, a few millimeters long, may have some straight septa, but it is invariably separated from the thecate part by a sharp, oblique hinge-joint. The thecate part is either straight or bent in zig-zag fashion; usually it is straight in the basal parts of the bigger colonies and twisted in the higher parts or in the young colonies. It is divided into internodes by means of straight septa, that may become very obscure in the lower parts of the colonies. Each internode has a basal apophysis and three hydrothecae, one of which is axillary. The axillary hydrotheca is considerably displaced and coalescent with part of the apophysis; there is one hydrotheca immediately above the axillary hydrotheca and one on the opposite side in intermediate position (fig. 23a). The apophyses are alternately arranged and directed obliquely forward; the side-branches curve backwards and give the colonies a graceful appearance. The cauline hydrothecae have the same general appearance as those of the side-branches.

Each side-branch has a basal athecate internode; it is short and separated from the first thecate internode by means of a sharp, oblique hinge-joint. The rest of the side-branch is divided into regular, thecate internodes by means of straight septa, obscure in the lower parts of the colonies. Each internode has a pair of hydrothecae, turned towards the frontal aspect of the colony, where they are contiguous for a considerable part of the adcauline margin (fig. 23b). Backwards they are separated by the full breadth of the internode. The shape of the hydrothecae can best be seen from fig. 23b, c; the basal part of the theca is slightly though distinctly swollen. The coalescent part of the adcauline wall is about as long as the free part, which curves smoothly outwards. The abcauline wall is slightly indented at about half its length; at this place there is an internal chitinized ridge projecting into

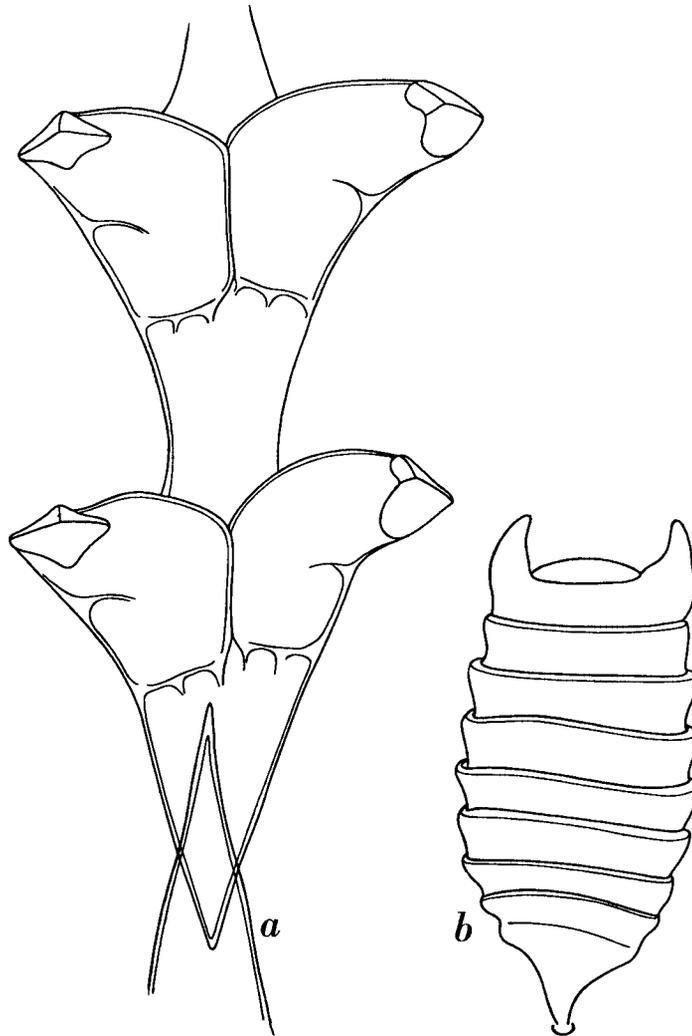


Fig. 24. *Sertularia inflata* (Versluys), St. Thomas, Sound. a, fragment of colony with two pairs of hydrothecae. b, gonotheca. a, $\times 125$; b, $\times 40$.

the interior of the theca (fig. 24a). The asymmetry of the lateral teeth of the hydrothecal margin is distinct; the abcauline tooth is scarcely visible and the adcauline tooth is only slightly larger.

The gonothecae (fig. 24b) occur on the hydrocaulus, where they are inserted just above the axillary hydrothecae. Each gonotheca is egg-shaped, with 8 well marked annulations, each annulation being marked by a circular,

peridermal thickening. At the apex there is a fairly narrow, circular opening, closed by a circular lid, surrounded by two large, erect points.

Measurements (in microns):

	Puerto Colombia	Gulf of Guinea (Vervoort, 1959)
Hydrocaulus, diameter	270	235-435
Side-branch, diameter	148	145-180
distance between 2 consecutive pairs of hydrothecae	110-240	220-290
Hydrotheca, length abcauline wall	215-245	250-300
length adnate part adcauline wall	245-275	325-360
length free part adcauline wall	95-110	90-110
length contiguous part	200-210	230-275
diameter at margin	90-110	125-145
maximal diameter across pair	510-525	485-525
Gonotheca, total length	1,400-1,600	1,260-1,350
maximal diameter	750-920	800-900

Remarks. — The specimens described above agree perfectly with colonies described from the Gulf of Guinea (Vervoort, 1959) and from the Lesser Antilles (St. Kitts, St. Eustatius and St. Martin; Van Gemerden-Hoogeveen, 1965).

Geographical distribution. — This species is widely distributed over the tropical Atlantic. Because of frequent confusion with *S. turbinata* (Lamouroux, 1816) and *S. marginata* (Kirchenpauer, 1864) the exact limits of its distribution cannot now be stated, though it seems likely that the species also occurs in the tropical Pacific and Indian Oceans. In the Caribbean region it seems to be quite common in the littoral zone, occurring on algae, Porifera, Bryozoa, etc. (Van Gemerden-Hoogeveen, 1965).

***Sertularia turbinata* (Lamouroux, 1816) (fig. 25)**

Dynamena turbinata Lamouroux, 1816: 180.

Sertularia turbinata - Leloup, 1935: 50; Fraser, 1944: 290, pl. 62 fig. 278; Deevey, 1954: 270; Pennycuik, 1959: 198; Vervoort, 1959: 275, fig. 35, 36; Van Gemerden-Hoogeveen, 1966: 38.

Desmoscyphus brevicyathus Versluys, 1899: 40, fig. 9, 10.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A large number of 10 to 15 mm high colonies on hydrocauli of *Lytocarpus furcatus* Nutting. No gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. Several 8 to 10 mm high hydrocauli from a stolon creeping on an unidentifiable hydroid. No gonothecae.

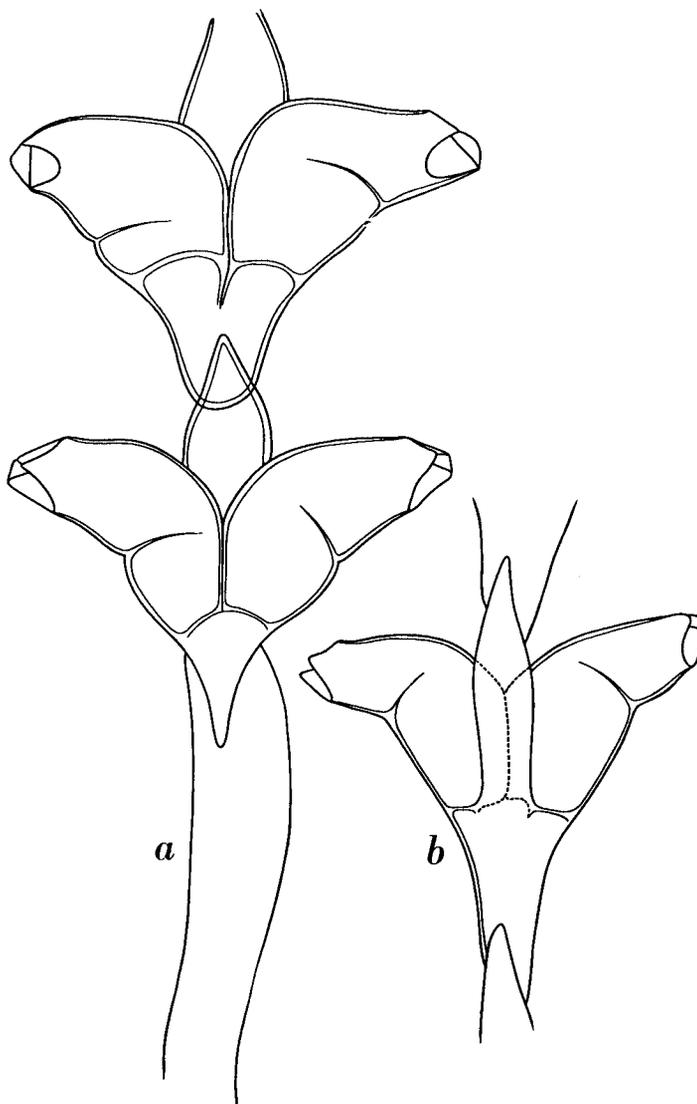


Fig. 25. *Sertularia turbinata* (Lamouroux), St. Thomas, Sound. a, fragment of colony with two pairs of hydrothecae in frontal view; b, pair of hydrothecae, seen from the back. $\times 75$.

Description. — The material growing on *Lytocarpus* agrees with colonies from the Gulf of Guinea described previously (Vervoort, 1959: 275). The stolon gives rise to long, athecate apophyses, separated from the thecate internodes by means of an oblique hinge-joint. All internodes are separated

by oblique septa and carry one, exceptionally two pairs of hydrothecae. The shape of the hydrothecae can best be judged from fig. 25, the place of the internal septum is marked on the abcauline thecal wall by means of a distinct indentation. The free part of the adcauline wall is smoothly curved; the length of the contiguous part varies considerably. The lateral hydrothecal teeth are of almost equal size. The pairs of hydrothecae are only slightly displaced towards the frontal part of the stems; on the back they are separated by a thin strip of the internode.

The colonies on the unidentifiable hydroid are young; here the internodes are fairly long and in the basal part of the colonies the hydrothecae do not touch. The periderm of these colonies is thin.

Measurements (in microns):

	St. Thomas	West Indies (Van Gernerden-Hoogee- veen, 1965)
Hydrocaulus, length internode	505-575	545-1,015
diameter at node	100-120	75-110
interval between two consecutive pairs	310-340	450-765
Hydrotheca, length adnate part adcauline wall	220-275	250-285
length contiguous part adcauline wall	110-195	0-250
length free part adcauline wall	210-245	155-220
length abcauline wall	230-245	140-235
diameter at opening	110-130	105-140
maximum diameter across pair	615-660	465-705

Geographical distribution. — This species is distributed over the tropical Indian, Pacific and Atlantic Oceans (Billard, 1925; Vervoort, 1959). The distribution in the Atlantic in general and in the Caribbean region in particular is discussed by Van Gernerden-Hoogeeveen (1965). It is a common form in the Caribbean region, occurring alongside *S. inflata* and *S. marginata* (Kirchenpauer, 1864) on various objects in the littoral zone.

PLUMULARIIDAE Hincks, 1868

Halopterinae Millard, 1962

Halopteris carinata Allman, 1877 (fig. 26)

Halopteris carinata Allman, 1877: 33, pl. 19 fig. 3-7; Nutting, 1895: 224; Nutting, 1900: 86, pl. 17 fig. 7-9; Wallace, 1909: 137; Stechow, 1926: 106; Fraser, 1943: 95; Fraser, 1944: 360, pl. 78 fig. 351; Deevey, 1954: 271.

Localities. — Tortugas, Bird Key reef; Kükenthal & Hartmeyer, 1907. Five colonies of 5 to 13 cm height. No gonothecae.

Tortugas, S. W. Channel; Kükenthal & Hartmeyer, 1907. A colony of 11 cm height, basally covered by a sponge, and a colony of 9 cm height on a worm tube. No gonothecae. Three separate colonies of 40, 50 and 80 mm height.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. A very large number of up to 15 cm high colonies with gonothecae. On Bryozoa and Porifera. Several juvenile colonies on algae.

St. Thomas, Sound; Kükenthal & Hartmeyer, 18.i.1907. One colony of 50 mm height and some fragments. Empty gonothecae are present.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Six colonies of 15 to 100 mm height. No gonothecae.

St. Thomas; Kükenthal & Hartmeyer, 1907. Two colonies of 80 mm height and some fragments. No gonothecae.

Description. — Unbranched, monosiphonic main stems rise from a tangled mass of hydrorhiza fibres. The hydrocauli are inserted on a long apophysis rising from the hydrorhiza, the basal part of the hydrocaulus has no cauline hydrothecae and no apophyses or hydroclades, but one or two frontal rows of trumpet-shaped nematothecae. It is divided into athecate internodes by means of straight septa; each internode bearing 8 to 10 nematothecae. The first thecate internode is separated from the basal part of the hydrocaulus and the following thecate internode by means of very oblique hinge-joints; the remaining thecate internodes are separated by means of only very slightly oblique, normal septa. The cauline hydrothecae are cup-shaped; though the margin is slightly produced frontally there is no longitudinal carina as in the hydrocladial hydrothecae. Each cauline hydrotheca has a pair of flanking, immovable nematothecae, placed on long apophyses coalescent with the hydrothecal wall and not projecting above the hydrothecal margin (fig. 26a). The unpaired, infrahydrothecal nematotheca is to be found a considerable distance under the hydrotheca. Each hydrotheca is slightly displaced by the presence of a short apophysis, alternately directed right and left and supporting the hydroclades. There are, on each thecate stem internode, four additional, trumpet-shaped nematothecae, dispersed over the frontal side of the internode above the insertion of the hydrotheca. The aperture of these nematothecae is sometimes deeply scooped out; there is always a thin septum in each nematotheca.

The hydroclades may be as long as 10 mm and have 10 to 12 hydrothecae. Normally they are divided into hydrothecate internodes by means of oblique septa; the first internode is athecate and short; it has a basal straight septum and a distal oblique septum and carries a single, fixed nematotheca identical with the unpaired infracalcine nematotheca of the thecate inter-

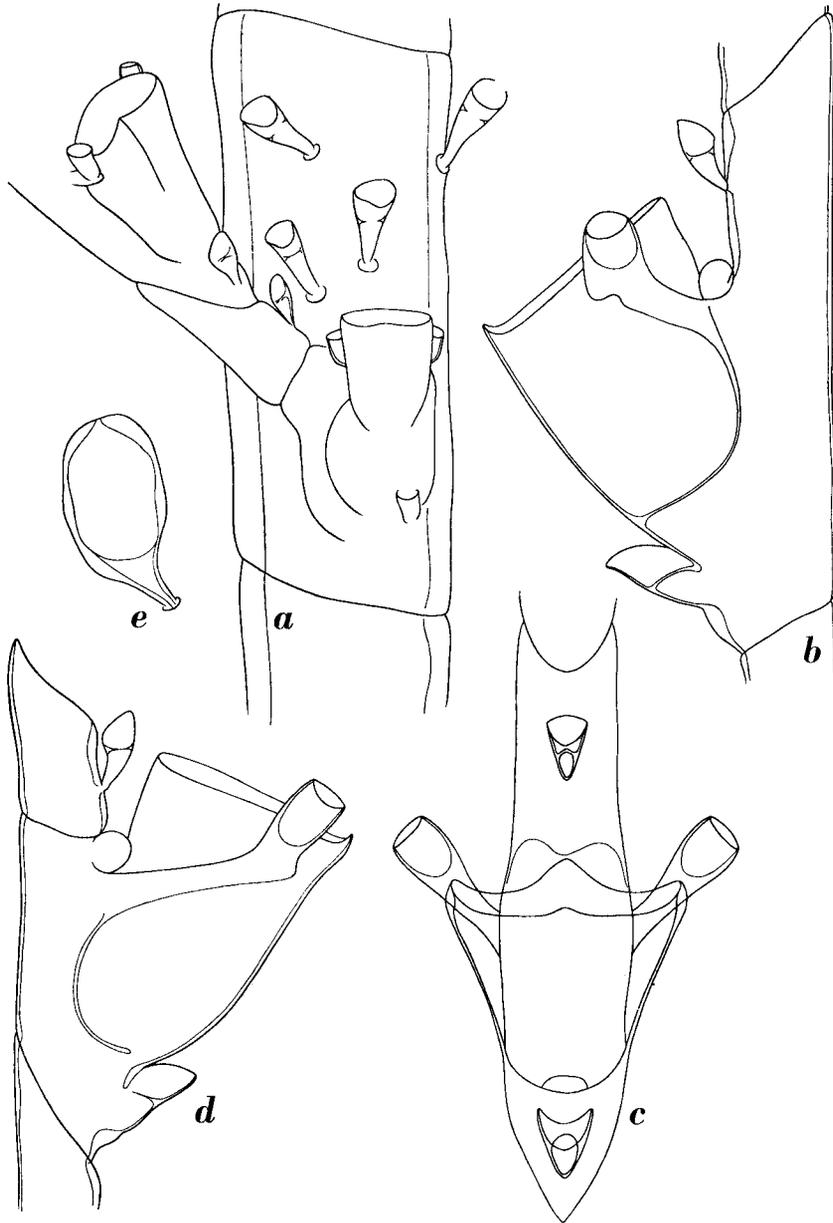


Fig. 26. *Halopterus carinata* Allman. a-c, Tortugas; a, fragment of hydrocaulus with apophysis and basal part of hydroclade; b, hydrocladial internode, lateral view; c, hydrocladial internode, frontal view. d, e, St. Thomas, Sound; d, hydrocladial internode, lateral view; e, gonotheca. a, $\times 90$; b-d, $\times 145$; e, $\times 55$.

nodes. The thecate internodes have one hydrotheca, an unpaired infracalycine nematotheca, a pair of lateral nematothecae and a pair of strongly reduced nematothecae in the axil of the apophyses supporting the lateral nematothecae (fig. 26 b-d).

The hydrothecae are more or less cup-shaped, with slightly diverging walls. The plane of the opening is almost perpendicular to the length axis of the hydrothecae and the more or less circular opening is slightly produced frontally, where it forms a short tooth as the continuation of a frontal ridge or carina running longitudinally over the hydrotheca. The hydrothecal wall, as also appears from fig. 26 c, d, is fairly thick, even slightly increasing in diameter near the hydrothecal edge. About half the adcauline wall is free from the internode.

The infracalycine nematotheca is fixed, with deeply scooped-out margin and with a thin septum at half its length. It reaches as far as the hydrothecal floor.

The lateral nematothecae are peculiarly developed. They are placed at the end of long, slender apophyses, completely coalescent with the hydrothecal wall. The nematotheca itself is cup-shaped and firmly attached to the slightly swollen end of the apophysis; it projects above the hydrothecal wall by about half its length. The length of the apophyses varies considerably in various colonies, so that the lateral hydrothecae may be found at about the middle of the hydrothecal margin or almost at the end (fig. 26b, d). There is a pair of much reduced, scale-shaped nematothecae at the axil of the apophyses, one on each side. These are not mentioned in the descriptions by Allman (1877), Nutting (1900) and Fraser (1944), but though reduced they are distinctly visible in both lateral and frontal aspects.

There is an unpaired, movable nematotheca above the hydrotheca; the opening of this nematotheca is deeply scooped out and it has a thin septum. In some colonies this pleurocalycine nematotheca is placed on a separate small internode, separated from the hydrothecate internode by means of a straight septum.

Gonothecae (fig. 26e) are borne by the colonies from St. Thomas. They are curved, oval structures, borne on short pedicels inserting on the thecate internodes of the hydrocladia; each gonotheca springs from the elevation supporting the hydrotheca laterally to the infracalycine nematotheca. In this material all gonothecae are young and apparently male, containing a single mass of developing spermatocytes. No aperture could be detected and no nematothecae have been observed.

Measurements (in microns):

	St. Thomas
Hydrocaulus, length internode	440-550
diameter	265-310
length cauline hydrotheca	200-210
diameter	185-200
length cauline nematotheca	130-165
diameter	55-70
Hydroclade, length internode, including athecate part, if present	385-495
diameter	65-100
total depth hydrotheca	260-270
diameter	185-200
length free part adcauline wall	85-90
length infracalycine nematotheca	75-85
diameter	30-35
length supracalycine nematotheca	65-70
diameter	30-35
Gonotheca, length	460-530
diameter	240-255

Remarks. — The shape of the hydrotheca in the present specimens differs in several respects from Allman's original account of this species, particularly his figures of the hydrothecae in frontal aspect (1877, pl. 19 fig. 6) are different from mine (fig. 26). Allman's drawing was probably made from slightly distorted specimens, the distortion being probably caused by pressure of the cover glass. On the other hand, the lateral nematothecae in this species are of such characteristic appearance, that there can be no doubt about the identity.

Geographical distribution. — This species is exclusively Caribbean, preferably occurring in deeper water. The species was originally described from off Carysfort Reef, Florida, at 35 fms. (= 63 m) depth (Allman, 1877). Additional specimens are known from off Montserrat, 16° 41' 54" N, 62° 13' 24" W, at 88 fms. (= 160 m) depth (Fraser, 1943), from between Eleuthera and Little Cat Island, Bahamas, 3-13 fms. (= 5.5-23.5 m) depth (Nutting, 1895), from off Tortugas, including Garden Key (Wallace, 1909; Stechow, 1926), and from Bahia Honda, Colombia (Fraser, 1947). To these localities the island of St. Thomas can now be added.

Halopteris diaphana diaphana (Heller, 1868) (fig. 27)

Anisocalix diaphana Heller, 1868: 42, pl. 2 fig. 5.

Plumularia diaphana - Bennitt, 1922: 254; Fraser, 1944: 342, pl. 73 fig. 331; Deevey, 1954: 271.

Schizotricha diaphana - Leloup, 1932a: 163; Vannucci, 1949: 251.

Antennella diaphana - Leloup, 1934: 15; Leloup, 1935: 52; Leloup, 1937a: 45.

Thecocalus diaphanus - Vannucci, 1946: 576, pl. 5 fig. 46, 47.

Antennella diaphana f. *typica* Broch, 1933: 24.

Antennella diaphana diaphana - Van Gemerden-Hoogeveen, 1965: 49, fig. 23-28.

Plumularia alternata Nutting, 1900: 62, pl. 4 fig. 1, 2; Congdon, 1907: 484; Wallace, 1909: 137; Fraser, 1912: 381, fig. 48.

Localities. — Tortugas, Loggerhead Key, beach at ebb tide; Hartmeyer, 8.ii.1907. Twelve colonies of 8 to 10 mm height, without gonothecae.

Kingston, Jamaica; Kükenthal & Hartmeyer, 1907. Many colonies of 10 to 15 mm height at the base of a large colony of *Halocordyle disticha* (Goldfuss). No gonothecae.

Puerto Colombia, jetty; E. Hentschel, 3.i.1923. Several 10 mm high, monosiphonic colonies without gonothecae.

Description. — All colonies are monosiphonic and are composed of a slightly bent hydrocaulus rising from a long apophysis on the hydrorhiza. There are some basal, short internodes, separated by straight septa and bearing some nematothecae. The remainder of the hydrocaulus is broken up into internodes separated by oblique septa. Each internode has a hydrotheca, an apophysis and 5 or 6 nematothecae (fig. 27a). The apophyses, supporting the hydroclades, are alternately directed left and right, so that a plume-shaped colony results. The hydrotheca is similar to that of the hydroclades and is described below. All nematothecae are trumpet-shaped structures, with the opening deeply scooped out at the adcauline side. Two are found besides the cauline hydrotheca, one some distance under the hydrotheca, one (usually) at the axil of the apophysis and one or two on the distal part of the internode. This distal portion may even be split off by the formation of a straight node and form a separate internode. The remainder of the hydroclade is divided into thecate and athecate internodes. The first is an athecate internode with basal straight and distal oblique septum; it has one immovable nematotheca. The following thecate internode has a basal oblique and a distal straight septum. The hydrotheca (fig. 27b, c) is cup-shaped, with almost parallel walls and slightly everted margin. The abcauline wall is about 2 to 2.5 times the length of the (free) adcauline margin; the walls of the hydrotheca are only slightly thickened. The unpaired nematothecae are immovable and bithalamic. The adcauline part of the aperture is very deeply scooped out. The pleurohydrothecal nematothecae are placed on short apophyses; they are trumpet-shaped and do not project above the hydrothecal margin. The adcauline part of the margin is scooped out to a variable degree. The pleurohydrothecal nematothecae are movable. There is no reduced nematotheca in the axil of the hydrotheca.

No gonothecae are present.



Fig. 27. *Halopteris diaphana diaphana* (Heller). a, b, Tortugas; a, fragment of colony; b, hydrocladial internodes. c, Puerto Colombia, Colombia, hydrocladial internodes. a, $\times 75$; b, c, $\times 175$.

Measurements (in microns):

	Puerto Colombia	Klein Bonaire (Van Gemberden- Hoogeveen, 1965)
Hydroclade, distance between two oblique nodes	340-405	465-530
length athecate internode	150-205	230-315
Hydrotheca, length abcauline wall	200-210	185-220
length free part adcauline wall	65-80	75-95
total height	215-225	200-220
diameter at margin	210-230	230-250

Remarks. — Caribbean material of this species has been very accurately described by Van Gemberden-Hoogeveen (1965); my material agrees best with her account of the specimens from Aruba, Curaçao and Bonaire (and some other Caribbean localities), that have no reduced nematotheca behind the hydrotheca. There is some variability, in my material, in the length of the athecate internodes, the depth of the hydrotheca and the length of the pleurohydrothecal nematothecae. In the material from Puerto Colombia the hydrothecae are very deep and the athecate internodes extremely short.

Geographical distribution. — This species is widely distributed over the tropical and subtropical parts of the Atlantic, Pacific and Indian Oceans (Stechow, 1919; Leloup, 1932a; Vervoort, 1959; Van Gemberden-Hoogeveen, 1965), occurring both in the typical, plumose form or in the unbranched form (*Halopteris diaphana siliquosa* (Hincks, 1877)). In the Caribbean region this species, usually as the plumose form, is very common and widely distributed (Van Gemberden-Hoogeveen, 1965); the present records are from an area from which it was previously known.

Monostaechas quadridens (McCrary, 1857) (fig. 28)

Plumularia quadridens McCrary, 1857: 199.

Monostaechas quadridens - Nutting, 1900: 75, pl. 13 fig. 1-4; Nutting, 1901: 365; Wallace, 1909: 137; Fraser, 1912: 380, fig. 46; Stechow, 1925: 252; Leloup, 1937: 108, fig. 10; Fraser, 1943: 95; Fraser, 1944: 334, pl. 71 fig. 323; Deevey, 1954: 271.

Monostaechas quadridens f. *stechowi* Leloup, 1935a: 2, fig. 2, 3.

Monostaechas dichotoma Allman, 1877: 37, pl. 22 fig. 1-5.

Monostaechas fisheri var. *simplex* Billard, 1913: 16, fig. 7.

Localities. — Tortugas, Bird Key reef; Kükenthal & Hartmeyer, 1907. Several up to 25 mm high, dichotomously branched hydrocauli, basal parts covered by a sponge. No gonothecae.

Tortugas, S.W. channel, 10-12 fms. (18-21.5 m) depth; Kükenthal & Hartmeyer, 1907. Several small, 10 mm high colonies on a sponge. No gonothecae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. A 20 mm long fragment of a larger colony, with gonothecae.

St. Thomas, Sound; Kükenthal & Hartmeyer, i.1907. One 20 mm long fragment of a large colony, with many gonothecae.

St. Thomas, south coast; Kükenthal & Hartmeyer, i.1907. One 30 mm high colony, dichotomously branched. No gonothecae.

St. Thomas; Kükenthal & Hartmeyer, 1907. Four fragments of larger colonies, 10 to 15 mm long, dichotomously branched and richly bearing gonothecae.

Description. — All colonies have the characteristic structure inherent to the genus *Monostaechas*. The hydrocauli are monosiphonic; the side-branches originate from opposite, short apophyses; the original hydrocaulus, becoming thecate, continues for some distance, being split up into thecate and atecate internodes. The side-branches may repeat the system of ramification several times or may form scorpioid sympodia. It is not unusual to find the hydrocaulus immediately forming these scorpioid sympodia, without the branching described above. The type of branching referred to above is usually described as being dichotomous, though strictly speaking it is not, as the original stem continues after the side-branches have been produced.

The scorpioid sympodia are formed in the following fashion. The original branch basally has an atecate internode of variable length, bearing 2 to 5 movable, two-chambered nematothecae in a single row. Terminally it curves at an almost right angle to form the thecate branch, being separated from the atecate part by an oblique hinge-joint. The apophysis on which the next branch is borne lies in a direct line with the length axis of the atecate part of the preceding branch. The secondary branch has the same structure as the primary branch, the tertiary as the secondary and primary, etc. The process is repeated several times, resulting in the formation of a flabellate, scorpioid sympodium of variable size. The hydrothecate part of each branch is divided into thecate and atecate internodes (fig. 28a). The first internode of the thecate part is invariably thecate and has an oblique, basal hinge-joint and a straight terminal septum, separating the thecate and the atecate internodes. The thecate internode has a cup-shaped hydrotheca, an unpaired infracalycine nematotheca, a pair of pleurohydrothecal nematotheca and a much reduced nematotheca in the axil of the adcauline hydrothecal wall and the article. The hydrotheca, in my specimens, is cup-shaped, with a slightly convex distinctly thickened abcauline wall and a circular opening (fig. 28b). It is decidedly wider than deep. The infracalycine nematotheca is movable, with a deeply scooped-out aperture and a distinct septum. The pleurohydrothecal nematothecae are placed on scarcely discernable apophyses;

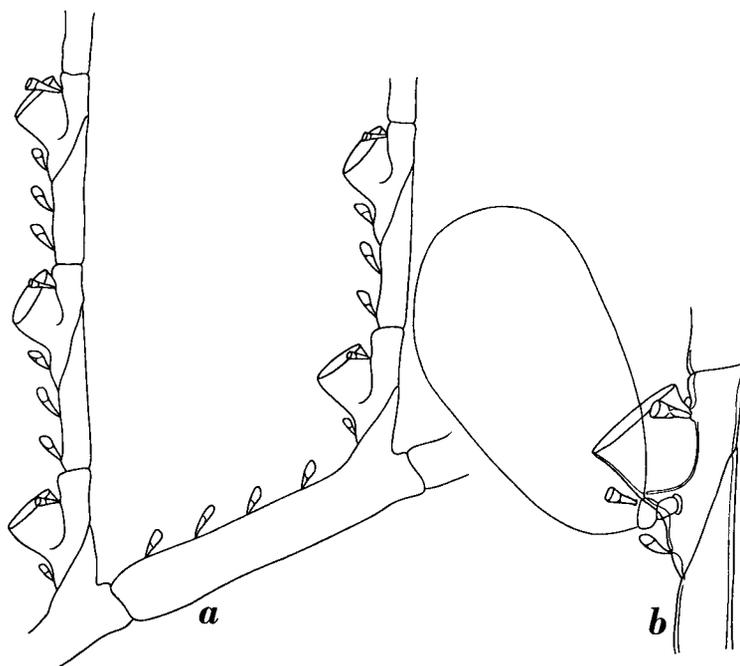


Fig. 28. *Monostaechas quadridens* (McCrary), St. Thomas, Sound. a, fragment of colony; b, hydrothecate internode with gonotheca. a, $\times 55$; b, $\times 90$.

they are trumpet-shaped and two-chambered with almost circular aperture, projecting slightly beyond the hydrothecal margin. The nematotheca behind the hydrotheca is very small and greatly reduced. The athecate internode has two nematothecae of the same type as the infracalycine nematotheca, but slightly larger.

Gonothecae occur on several colonies; they are large, ovoid structures, placed on a short, two-segmented pedicel. At the place of insertion of the pedicel on the gonotheca the latter is slightly curved and carries a pair of nematothecae, comparable with the pleurocalycine nematothecae. The gonothecae are attached to the process of the thecate internode which bears the hydrotheca (fig. 28b).

Measurements (in microns):

	St. Thomas
Basal hydrocladial internode, length	985-1,525
diameter	200-270
Thecate internode, length	400-475
diameter at node	120-165

Hydrotheca, total depth	165-215
diameter	240-250
Infracalycine nematotheca, length	95-120
maximal diameter	50-57
Pleurohydrothecal nematotheca, length	120-135
maximal diameter	40-55
Athecate internode, length	445-610
diameter at node	130-140
nematotheca, length	105-190
nematotheca, maximal diameter	55-70
Gonotheca, length	945-1,015
diameter	475-515

Geographical distribution. — The species occurs in the tropical parts of Atlantic and Pacific Oceans (Stechow, 1925), though many of the records from the tropical Pacific may refer to *Monostaechas fisheri* Nutting (1905: 952, pl. 5 fig. 3, pl. 12 fig. 8). The differences between these two species, if present, are not quite clear. In the Caribbean region *M. quadridens* is a very common and widely distributed species; its distribution there is summarized by Deevey (1954): Florida Keys, Tortugas, Yucatan, Gulf of Mexico, Caribbean Sea. The present localities are in the area specified above.

Plumulariinae Kühn, 1913

Plumularia setacea (Linnaeus, 1758) (fig. 29)

Sertularia setacea Linnaeus, 1758: 813.

Plumularia setacea - Nutting, 1900: 56, pl. 1 fig. 1-4; Wallace, 1909: 137; Bennett, 1922: 256; Fraser, 1944: 352, pl. 76 fig. 342; Deevey, 1954: 271; Vervoort, 1966: 142, fig. 43.

Locality. — Crux Bay, St. John, Virgin Is.; Kükenthal & Hartmeyer, 11.i.1907. Several 15 to 20 mm high colonies at the base of *Lytocarpus furcatus* Nutting.

Description. — Each colony consists of a monosiphonic hydrocaulus, rising from thin hydrorhiza fibres. The hydrocauli are broken up into short internodes by means of straight septa. Each internode has a terminal apophysis; the various apophyses are alternately directed left and right. Each apophysis has a reduced nematotheca (mamelon), one movable nematotheca close to the mamelon and one or two nematothecae dispersed over the internode; their shape is like those of the hydroclades (fig. 29a). The hydroclades are fairly short; they are heteromerously segmented and have 5 to 6 hydrothecate internodes. The first hydrocladial internode is a short supporting article without thecae and with a distinct, incomplete septum; it is separated from the following, hydrothecate internode by means of an oblique septum. The

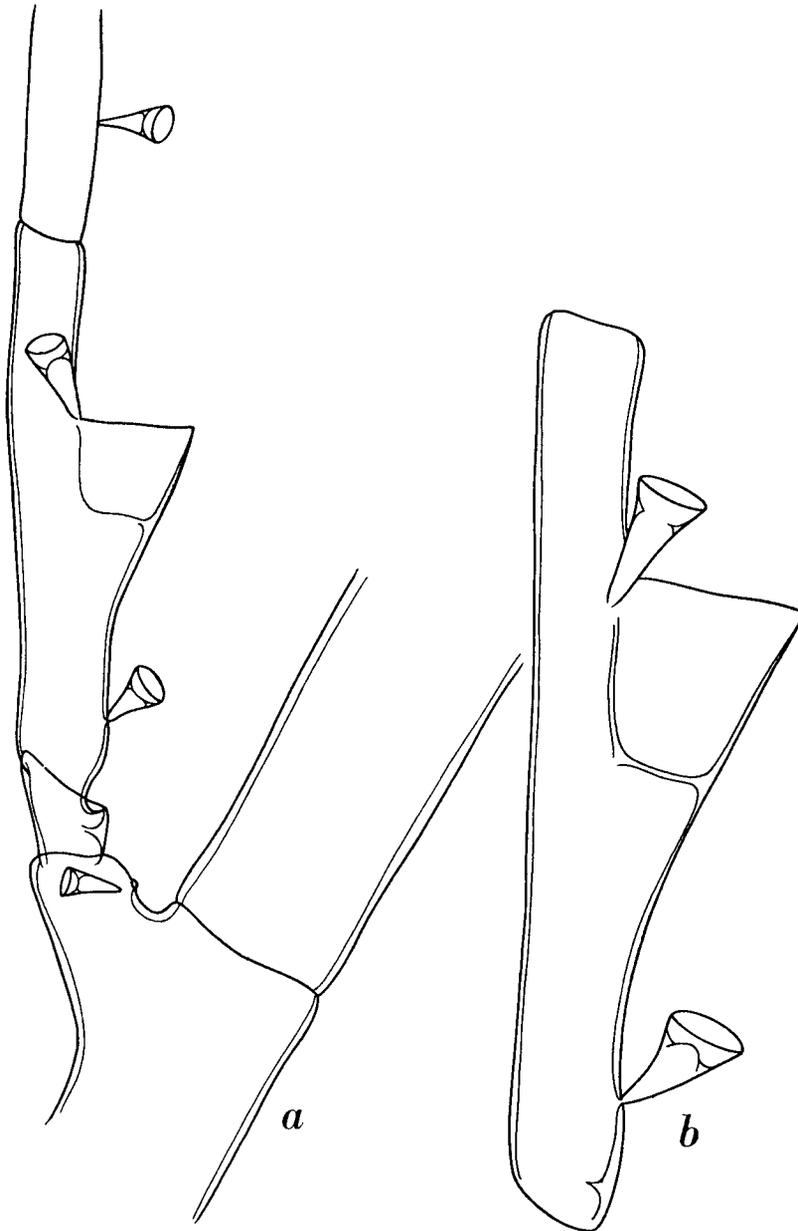


Fig. 29. *Plumularia setacea* (Linnaeus), Crux Bay, St. John, Virgin Is. a, fragment of hydrocaulus with hydroclade; b, hydrocladial internode. a, $\times 175$; b, $\times 265$.

athecate internodes are short and separated from the thecate internodes by means of straight septa; they have only one single nematotheca. The thecate internodes have the usual cup-shaped hydrotheca, of which the adcauline wall is completely fused with the article (fig. 29b). There is one infracalycine nematotheca and a pair of pleurohydrothecal nematothecae, projecting far above the hydrothecal margin. All nematothecae are trumpet-shaped, slightly flaring at the diaphragm and with almost circular aperture.

No gonothecae have been observed.

Measurements (in microns):

	St. John
Stem internode, length	420-540
diameter at node	160-190
distance between two consecutive apophyses	300-350
Hydroclade, length proximal internode	95-110
length thecate internode	375-390
length athecate internode	210-215
diameter at node	55-60
Hydrotheca, total depth	80-85
diameter at aperture	95-100
Pleurohydrothecal nematotheca, length	65-70
diameter at margin	42-45
Unpaired nematotheca, length	52-55
diameter at margin	40-43

Geographical distribution. — *P. setacea* is a cosmopolitan species, with an exceedingly wide distribution in the boreal, temperate and tropical parts of Atlantic, Indian and Pacific Oceans (Vervoort, 1966). The species is widely distributed in the Caribbean region; localities there have been listed by Fraser (1944) and are summarized by Deevey (1954). The present locality completely fits into the distributional picture.

Aglaopheniinae Stechow, 1911

Aglaophenia (?) mercatoris Leloup, 1937 (fig. 30)

Aglaophenia (?) *mercatoris* Leloup, 1937: 113, fig. 15; Fraser, 1944: 382, pl. 83 fig. 371; Deevey, 1954: 271.

Locality. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. One more or less complete colony of 90 mm height and a fragment of a hydrocaulus of about 60 mm height with some hydroclades. No corbulae.

Description. — This species has been accurately described by Leloup (1937); his description has been translated and published by Fraser (1944). In the best preserved specimen the hydrocaulus has a basal thickness of

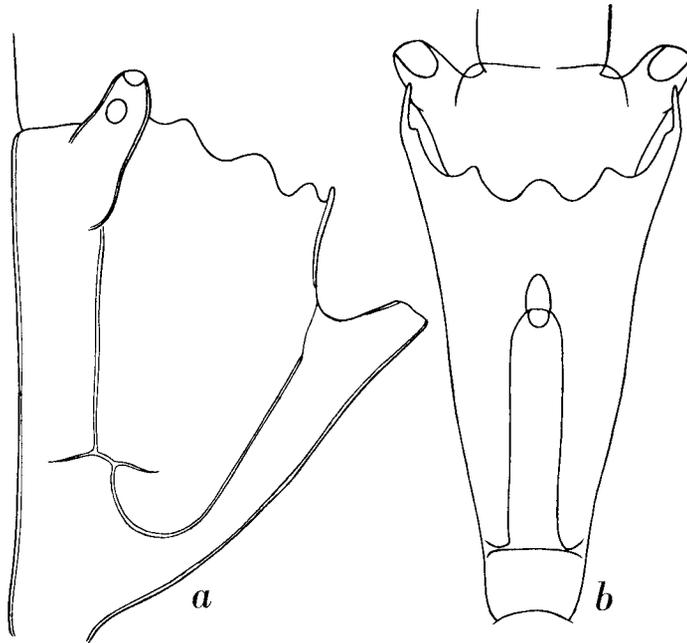


Fig. 30. *Aglaophenia* (?) *mercatoris* Leloup, St. Thomas, Sound. a, hydrotheca in lateral view; b, hydrotheca in frontal view. $\times 175$.

about 2 mm; the stem is slightly curved and the side-branches occur alternately in two rows along the frontal part of the hydrocaulus; each side-branch may again be branched in the same fashion, etc. The short hydroclades are found along the finer ramifications and have the structure described by Leloup. The basal internode of each hydroclade has a slightly smaller hydrotheca with a larger median nematophore and very distinctly asymmetrical pleurohydrothecal nematothecae, though the asymmetry of the lateral nematothecae is not so distinct as in Leloup's specimen. In the remaining internodes of each hydroclade the asymmetry of the pleurohydrothecal nematothecae gradually disappears distally. The hydrothecal aperture is distinctly oblique; the margin is undulated, forming three pairs of very low, rounded marginal teeth and a rounded median tooth. The lateral nematothecae are tubular and project above the hydrothecal margin; the apical aperture is circular (fig. 30). In addition there is a rounded internal opening, communicating with the interior of the hydrotheca. The median nematotheca is slightly larger than has been figured by Leloup (1937, fig. 15 b), with a slightly larger free portion, though not projecting above the hydrothecal margin. The apical aperture is more or less circular; there is a second, oval aperture in the axil of nemato-

theca and abcauline hydrothecal wall. The interior of the hydrotheca has a short, thin, straight septum; the internode has a single septum at that place. Some internodes have the indication of a second internodal septum at the base of the lateral nematothecae.

No gonosome has been observed.

Remarks. — It seems to me that this species is very near to *Aglaophenia* (?) *allmani* Nutting, 1900, of which species the gonosome is also unknown. *A. allmani*, though it has been recorded more often than *A. mercatoris*, has never been completely redescribed. A certain amount of variability is known to occur in the hydrothecae of this species (cf. Ritchie, 1909) and I would not be surprised if the two species, after the inspection of a more copious material, should prove to be identical.

Measurements (in microns):

	St. Thomas	Tampa Bay (Leloup, 1937)
Internodes, length	325-380	± 400
diameter at node	65-80	± 100
Normal hydrotheca, total depth	270-300	± 300
diameter at aperture	165-190	± 180
Length free part median nematotheca	50-55	
diameter at aperture	25-30	
Length normal lateral nematotheca	85-100	
diameter at aperture	22-25	

Geographical distribution. — The species was originally described from Tampa Bay, Florida, 8 to 10 fms. (= 13.5-18 m) depth (Leloup, 1937); a single colony was found. The present specimens were obtained at St. Thomas at an unknown depth.

***Aglaophenia* (?) *allmani* Nutting, 1900 (fig. 31)**

Aglaophenia ramosa Allman, 1877: 39, pl. 23 fig. 1-4; Fewkes, 1881: 127.

Aglaophenia allmani Nutting, 1900: 100, pl. 22 fig. 2, 3; Ritchie, 1909: 93, fig. 10; Nutting, 1919: 115; Leloup, 1935: 57; Fraser, 1943: 93; Fraser, 1944: 365, pl. 79 fig. 353; Van Gemerden-Hoogeveen, 1965: 78, fig. 43.

Localities. — St. John, Virgin Is., south coast; Kükenthal & Hartmeyer, 11.1.1917. One hydrocaulus of 10 cm height with three side-branches. No corbulae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.1.1907. One very young colony of 25 mm height, composed of only two branches. No corbulae.

Description. — The structure of the colony from St. John is much the same as that of *A. mercatoris* Leloup, with the exception of the fact that

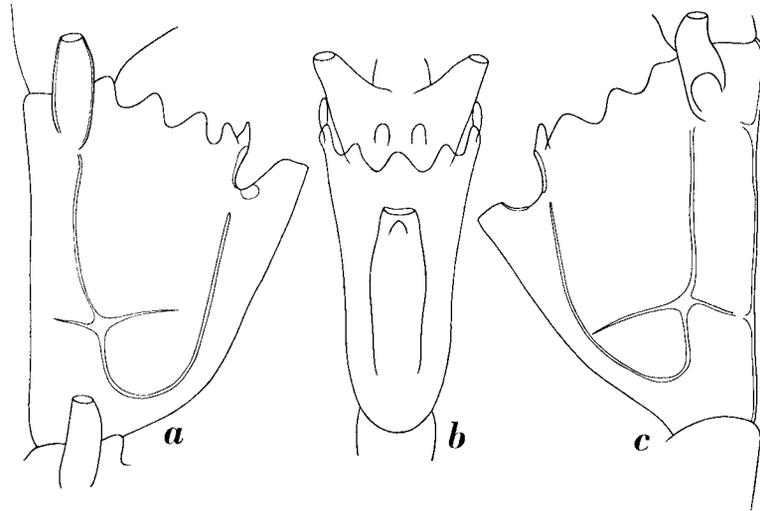


Fig. 31. *Aglaophenia* (?) *allmani* Nutting. a, b, St. John, Virgin Is.; a, hydrotheca in lateral aspect; b, hydrotheca in frontal aspect. c, St. Thomas, Savannah Passage, hydrotheca in lateral aspect. $\times 135$.

the present colony is less profusely branched and no asymmetry of the lateral nematothecae of the hydroclades has been observed. The first hydrotheca of the hydrocladia, moreover, does not seem to be smaller than the remaining hydrothecae.

The general shape of the hydrothecae approaches that observed in *A. mercatoris* fairly closely; the hydrothecae are deep, narrowing gradually near the bottom. The plane of the aperture is distinctly oblique; the seven marginal teeth are deeper than in *A. mercatoris*, but still very distinctly rounded. The median nematotheca is longer than in *A. mercatoris*, adnate to the abcauline hydrothecal wall for the greater part of its length; the apex nearly reaching the hydrothecal border in some hydrothecae, slightly overlapping that border in other hydrothecae (fig. 31). In addition to the circular apical aperture there is an oval aperture in the axil of nematotheca and abcauline hydrothecal border. Hydrothecal and internodial septa are in the same position as in *A. mercatoris* but slightly firmer. The lateral nematothecae are large and funnel-shaped, projecting above the hydrothecal border by at least half their length.

In the young colony from St. Thomas the aperture of the hydrotheca is a trifle more oblique, while the marginal teeth are lower and more rounded (fig. 31c). The median nematotheca is shorter, particularly the free part, and approaches the type usually observed in this species and figured by

Van Gernerden-Hoogveen (1965, fig. 43). These hydrothecae have an almost complete, slightly oblique internal septum.

Measurements (in microns):

	St. John	Tortugas (Van Gernerden-Hoogveen, 1965)
Hydrocladial internode, length	335-375	390-410
diameter at node	80-95	
Hydrotheca, length	295-325	340-410
diameter at aperture	150-190	185-205
Median nematotheca, total length	280-290	290-315
length of free part	65-95	
Lateral nematotheca, length	135-175	155-190
diameter at apex	25-30	

Remarks. — This species is more variable than has generally been recognized. At first I hesitated to identify the present specimens as *A. allmani*, but I have noticed that Ritchie (1909: 94, fig. 10) already observed variability in the length of the median nematotheca (particularly its free part and the free portion of the adcauline hydrothecal wall) and the length and position of the lateral nematothecae. My material is connected through Ritchie's material with the usually described colonies, that have a very short free part of the median nematotheca. In the colony from St. John in particular, the length of that free part of the median nematotheca is subjected to a great deal of variation.

Geographical distribution. — Van Gernerden-Hoogveen (1965) has cited all localities from which the species has been recorded, ranging from Florida in the north to the Abrolhos bank off the Brazilian coast in the south, occurring at depths varying from 3.5 to 172 m. *A. allmani* exclusively occurs in the Caribbean region and the present localities, though new, completely fit into the distributional pattern.

***Aglaophenia apocarpa* Allman, 1877 (fig. 32)**

Aglaophenia apocarpa Allman, 1877: 41, pl. 24 fig. 5-9; Clarke, 1879: 247; Fewkes, 1881: 127; Nutting, 1895: 179; Nutting, 1900: 93, pl. 18 fig. 9-11; Bedot, 1921: 43, pl. 6 fig. 45-47; Bedot, 1921a: 338; Fraser, 1944: 367, pl. 79 fig. 355.

Aglaophenia lophocarpa Allman, 1877: 41, pl. 24 fig. 1-4; Nutting 1895: 89; Nutting, 1900: 92, pl. 18 fig. 6-8; Wallace, 1909: 137; Bennitt, 1922: 252; Stechow, 1923: 250; Deevey, 1954: 271.

Aglaophenia elegans Nutting, 1900: 94, pl. 19 fig. 3, 4.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Two plumes of 15 mm height, rising from a fragment of a sponge. No corbulae.

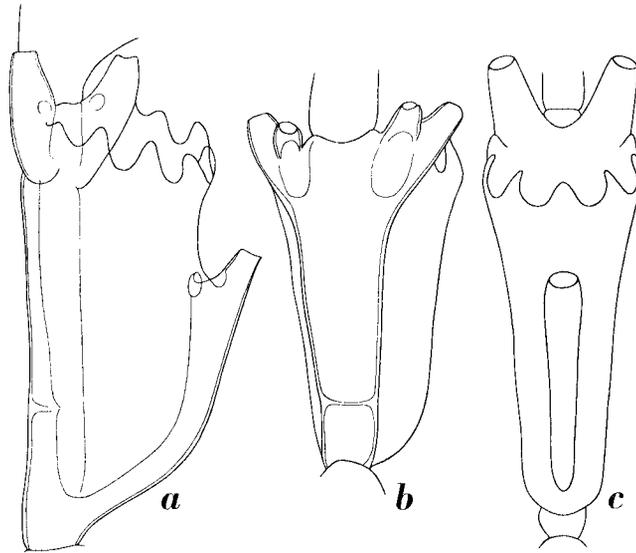


Fig. 32. *Aglaophenia apocarpa* Allman, Barbados. a, hydrotheca in lateral view; b, basal hydrotheca from hydroclade, posterior view; c, hydrotheca, frontal aspect. $\times 135$.

Barbados; Kükenthal & Hartmeyer, 22.ii.1907. Two slightly branched colonies of 60 mm height, with basal hydrorhiza fibres. No corbulae.

Meteor Sta. 254a, about $2^{\circ} 27.7' S$, $38^{\circ} W$, off the N.E. coast of Brazil; E. Hentschel. Three unbranched colonies of 55 mm height. No corbulae.

Remarks. — The name used for the species, *A. apocarpa*, is that used by the first scientist (Bedot, 1921) who recognized the synonymy between *A. apocarpa*, *A. lophocarpa* and *A. elegans*. Though there is a striking difference in the appearance of the colonies from Barbados (branched) and from Meteor Sta. 254a (unbranched), there is no difference in the shape of the hydrothecae. It seems to have escaped the attention that in this species the basal hydrotheca of a hydroclade differs from the remaining hydrothecae. It is shorter and has a wider median nematotheca. The lateral nematothecae of the basal hydrotheca each have a double funnel, as appears quite distinctly in posterior view (fig. 32b). The normal hydrothecae are particularly slender, with seven deep though rounded teeth, strongly curved inwards (fig. 32a, c). The section through the hydrotheca just below the margin is undulated; the plane of the aperture is distinctly oblique. The lateral nematothecae are funnel-shaped and project far above the hydrothecal border. The median nematotheca covers about two thirds of the abcauline hydrothecal wall; it has a short free part.

No corbulae have been observed.

Measurements (in microns):

	Barbados
Internode, length	435-475
diameter at node	55-80
Hydrotheca, total depth	360-375
diameter at aperture	135-200
Median nematotheca, length free part	65-75
diameter at aperture	27-35
Lateral nematotheca, total length	150-175
diameter at aperture	25-35

Geographical distribution. — This species occurs in deeper waters (55-365 m) throughout the Caribbean region (Florida region, Allman, 1877; Fewkes, 1881), off Havana, Cuba (Clarke, 1879; Nutting, 1900), off Bermuda (Bennitt, 1922), and north of Puerto Rico (Fraser, 1944). According to Deevey (1954) it has also been found in the eastern tropical Pacific; I have been unable to trace that record. Two of the present records entirely fit into the distributional pattern outlined above; the third (Meteor Sta. 254a) considerably extends the known distribution of this species in southerly direction along the coast of South America.

***Aglaophenia latecarinata* Allman, 1877 (fig. 33)**

Aglaophenia latecarinata Allman, 1877: 56; Allman, 1885: 151, pl. 23 fig. 5, 6; Leloup, 1935: 57; Leloup, 1940: 22; Fraser, 1943: 94; Fraser, 1944: 378, pl. 82 fig. 368; Vannucci, 1946: 586, pl. 7 fig. 60-64, 68, 69; Leloup, 1947: 34; Vannucci, 1949: 255; Vannucci, 1951a: 108, 110, 111, 112, 114, 117; Vervoort, 1959: 309, fig. 54; Van Gemerden-Hoogeveen, 1965: 76.

Aglaophenia minuta Fewkes, 1881: 132; Nutting, 1900: 96 pl. 21 fig. 1-3; Congdon, 1907: 483; Bennitt, 1922: 252.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, i.1907. A tuft of about 10 plumes, basally covered by a sponge. No corbulae.

St. Thomas; Kükenthal & Hartmeyer, 1907. Three plumes of 10, 30 and 35 mm height. No corbulae.

Frederiksted, St. Croix; Kükenthal & Hartmeyer, 1907. Top part of a plume, 18 mm long, without corbulae.

Remarks. — In the present material, the variability in the development of the marginal teeth of the hydrotheca and the shape of the median hydrothecal carina, is considerable; in some specimens the median carina is scarcely visible. Variability of this type has already been noticed by Millard (1958) and Vervoort (1959); in Caribbean material it has been mentioned by Van Gemerden-Hoogeveen (1965).

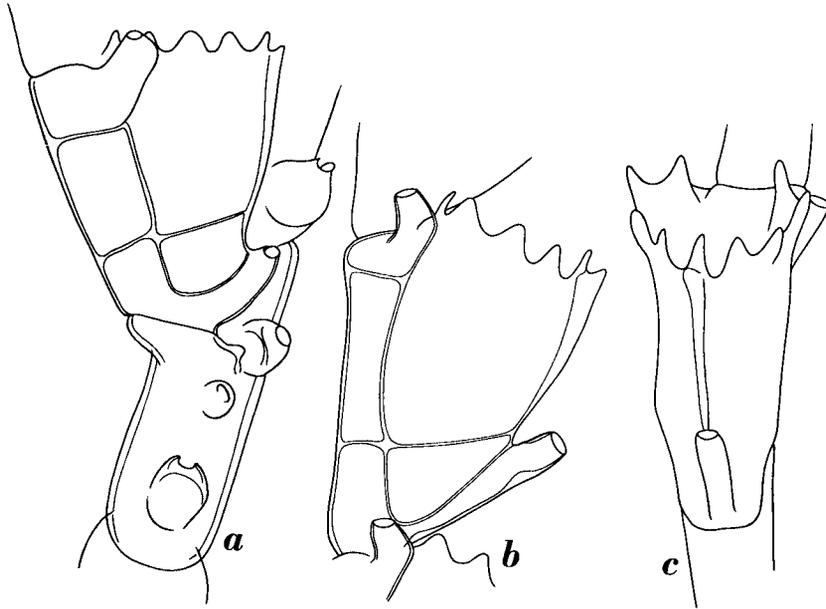


Fig. 33. *Aglaophenia latecarinata* Allman, St. Thomas, Sound. a, internode from hydrocaulus with apophysis; b, hydrotheca, lateral view; c, hydrotheca, frontal view. $\times 135$.

The hydrocaulus, in this species, is divided into short internodes by slightly oblique septa. Each internode has a very short apophysis with an axillary and a reduced basal nematotheca (fig. 33a). In addition there is a large, rounded nematotheca on the basal part of each internode. The apophyses are alternately directed left and right. As mentioned by Van Gernerden-Hoogeven (1965), the first hydrocladial internode has a very short median nematotheca with gutter-shaped opening. The hydrothecal diaphragm in all my specimens is straight or very slightly oblique (fig. 33b).

Geographical distribution. — *A. latecarinata* is widely distributed in tropical and subtropical parts of Atlantic and Indian Oceans (Millard, 1958; Vervoort, 1959; Van Gernerden-Hoogeven, 1965); it is particularly common in the Caribbean region, occurring from the Gulf of Mexico southwards to the Santos region at the Brazilian coast (Deevey, 1954; Vannucci, 1946, 1949). The present localities fully fit into the distributional pattern.

***Aglaophenia rhynchocarpa* Allman, 1877 (fig. 34)**

Aglaophenia rhynchocarpa Allman, 1877: 40, pl. 23 fig. 5-8; Nutting, 1895: 89; Nutting, 1900: 90, pl. 18 fig. 1, 2; Wallace, 1909: 137; Nutting, 1919: 115; Fraser, 1944: 387, pl. 84 fig. 377; Deevey, 1954: 271.

Aglaophenia cylindrata Versluys, 1899: 49, fig. 19-21; Jäderholm, 1903: 297, pl. 14 fig. 2; Ritchie, 1909a: 261; Bennitt, 1922: 252; Fraser, 1944: 370, pl. 80 fig. 360.

Localities. — St. John, Virgin Is., south coast; Kükenthal & Hartmeyer, 11.i.1907. About 10 unbranched plumes of 40-50 mm height, basally covered by Bryozoa. No corbulae are present.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. About 10 colonies composed of 10-15 mm high plumes, on *Idiellana pristis* (Lamouroux). No corbulae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. A large number of 15-20 mm high plumes on stems of *Lytocarpus furcatus* Nutting. No corbulae are present.

Description. — The colonies from St. John, which are fully mature, are very graceful, forming fine plumes of a very regular, oval shape with long hydroclades. The hydrocaulus is indistinctly divided into internodes, these are only visible in the younger parts of the hydrocaulus; in the older parts there is an occasional vertical septum. The hydroclade-bearing part of the hydrocaulus is separated from the basal part by two very oblique nodes, enclosing a short intermediate article with a single nematotheca. The internodes normally have an apophysis and a triplet of nematothecae; one axillary, one facing the other side of the internode and a reduced nematotheca on the apophysis (fig. 34c). All are more or less rounded, with a circular opening and communicating through a large, round aperture with the interior of the internode. The apophyses are short and are alternately directed left and right. The hydroclades which they support are 10 to 15 mm long; they are divided into internodes by means of straight septa. Each internode has a large, deep hydrotheca, set at a distinct angle with the length axis of the internode. The plane of the aperture is slightly oblique; there are 9 marginal teeth (four pairs and one abcauline, unpaired tooth), the shape of which can best be judged from fig. 34a. The abcauline wall of each hydrotheca is produced into a sharp carina, that appears to be hollowed and terminates in a bifid, blunt point. There is a very prominent, oblique septum in the hydrotheca. The median nematotheca is short, covering slightly more than one third of the abcauline hydrothecal wall; the free part too is short and has a circular opening. There is a large oval aperture near the axil of the median nematotheca and the hydrothecal wall. The lateral nematothecae do not project above the hydrothecal margin; the last tooth of the margin is slightly thickened and attached to the nematotheca. There are four internodal rings or septa; one at the base of the lateral nematothecae, one at the place of attachment of the hydrothecal septum, one halfway between the two septa mentioned above and one in the basal part of the internode.

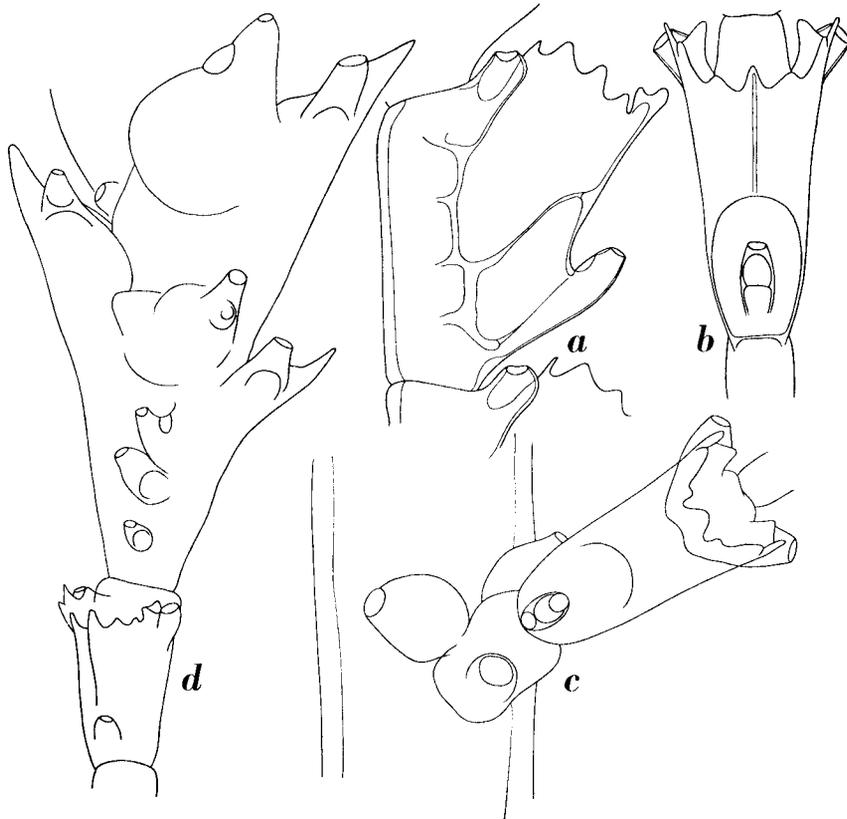


Fig. 34. *Aglaophenia rhynchocarpa* Allman, St. John, Virgin Is. a, hydrotheca, lateral view; b, hydrotheca, frontal view; c, apophysis on hydrocaulus, frontal view; d, basal part of corbula, oblique view. a-c, $\times 135$; d, $\times 95$.

The corbula is a slender structure, 4 mm long, replacing one of the upper hydroclades and borne on a short pedicel formed by an internode with a single hydrotheca (fig. 34d). The rhachis of the corbula has 10 pairs of slender ribs, each terminating in a short, blunt point and carrying a large nematotheca. The upper surface of the corbula is closed by means of rounded, plate-like structures set with large nematothecae. The last pair of ribs is fused to form a rounded structure with two large nematothecae pointing forward. No gonothecae have been observed.

Remarks. — I have little doubt that *A. rhynchocarpa* Allman and *A. cylindrata* Versluys are identical; the differences in the shape of the corbulae can be explained as sexual differences. The corbulae in my material agree closely with those described for *A. cylindrata* and probably represent the female sex.

Measurements (in microns):

	St. John
Hydrocladial internode, length	270-310
diameter at node	80-95
Hydrotheca, total depth	280-300
diameter at aperture	150-165
Median nematotheca, length free part	55-68
diameter at aperture	25-30
Lateral nematotheca, length	120-125
diameter at aperture	20-25

Geographical distribution. — *A. rhynchocarpa* is restricted to the western tropical Atlantic, where it mainly, though not exclusively, occurs in the Caribbean region. It has been observed off Bermuda (Ritchie, 1909a), at Key West, Florida (Allman, 1877), off Tortugas (Wallace, 1909), 23° 11' N, 82° 19' W, and off Havana, Cuba (Nutting, 1900), north and west of Puerto Rico (Fraser, 1944), north of Culebra Island (Fraser, 1944), near Anguilla (Jäderholm, 1903), off Barbados (Nutting, 1910), and off Testigos Islands (Versluys, 1899). It occurs at depths varying between 5.5 and 365 m.

Aglaophenia tridentata Versluys, 1899 (fig. 35)

Aglaophenia tridentata Versluys, 1899: 47, fig. 16-18; Billard, 1907: 376; Bedot, 1921a: 342; Stechow, 1923: 252; Fraser, 1944: 391, pl. 85 fig. 380; Piccard, 1951: 114; Deevey, 1954: 270.

Aglaophenia contorta Nutting, 1900: 96, pl. 20 fig. 5-7; Billard, 1907: 390; Wallace, 1909: 96; Bedot, 1921a: 339; Vannucci, 1946: 583, pl. 6 fig. 56-59, 70; Vannucci, 1951: 91; Vannucci, 1951a: 108, 110, 112, 114, 117.

Thecocarpus contorta - Totton, 1926: 210-22, fig. a, b.

Localities. — St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.i.1907. Seven colonies of 3 to 6 cm height and some fragments. No basal parts are present. No corbulae.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. Five colonies, 5-10 cm height, with basal parts and some corbulae.

Description. — The colonies are composed of a thick, monosiphonic main stem and a terminal plume of hydroclades. The hydrocaulus has a longitudinal row of large, cup-shaped nematothecae; division into internodes is only visible in the very young parts of the colony. The upper third of the hydrocaulus has a row of apophyses, that alternately point left and right and support long, gracefully curved hydroclades of 10 to 15 mm length. Each apophysis has a triplet of nematothecae, one axillary, one basally and a reduced, rounded nematotheca on the apophysis. The hydroclades are divided into short internodes by means of straight septa. Each internode has a hydrotheca of characteristic appearance, a pair of lateral nematothecae and a median



Fig. 35. *Aglaophenia tridentata* Versluys, St. Thomas, Savannah Passage. a, hydrotheca, lateral view; b, hydrotheca, frontal view; c, basal part of gonohydroclade. a, b, $\times 135$; c, $\times 90$.

nematotheca. The hydrotheca is distinctly curved, with the swollen basal portion supporting a large, median nematotheca (fig. 35a). This median nematotheca has a large free portion, almost reaching the end of the median hydrothecal tooth. Length and width of this median nematotheca vary slightly. The hydrothecal margin is produced into a pair of blunt lateral teeth and a very strong, thickened median tooth. The plane of the aperture makes an angle of about 45° with the length axis of the internode. There is a distinct lip in the basal part of the hydrothecal cavity to support the hydranth. The lateral nematothecae are slightly curved and project above the hydrothecal margin; the opening is deeply scooped out on the adcauline side. There is no internal septum in these nematothecae; they correspond through a large hole with the interior of the internode (fig. 35b). The median nematotheca has a circular terminal opening and a large oval opening in its axil with the abcauline hydrothecal wall.

The structure of the corbula has been described by Nutting (1900), Totton (1926), Vannucci (1946) and Picard (1951). In my specimens some of the colonies have as many as three corbulae on each colony. These 10-15 mm long structures replace a hydroclade and are attached to the stem by means of a short pedicel. This pedicel is divided into internodes, each bearing a

hydrotheca with the corresponding lateral and median nematothecae. As many as three hydrothecal internodes may precede the corbula. The rhachis of the corbula has a number of large apophyses, supporting the gonohydroclades, 10 to 15 pairs of which are present. Each gonohydroclade has a basal portion with a reduced hydrotheca and a triplet of nematothecae; it continues as an elongated, triangular blade, set along the margins with small, cup-shaped nematothecae (fig. 35c). The narrow basal parts of the gonohydroclades are free, so that the gonothecae inside the corbula can be observed. The broader, distal part of each gonohydroclade is slightly twisted, the various gonohydroclades overlap each other imbricately. The median part of each gonohydroclade has a distinct carina; from the base of each nematotheca slightly raised striae run in the direction of this carina and give the gonohydroclade a furrowed appearance.

Remarks. — I have retained this species in the genus *Aglaophenia* mainly for the sake of convenience; by the presence of a (reduced) hydrotheca at the base of each gonohydroclade it approaches various species of *Thecocarpus* Nutting, 1900, very closely.

Measurements (in microns):

	St. Thomas, Savannah Passage
Hydrocladial internode, length	245-300
diameter at node	150-175
Hydrotheca, total depth	285-300
diameter at margin	135-150
Median nematotheca, length free part	110-135
diameter at aperture	27-32
Lateral nematotheca, total depth	80-95
diameter at aperture	25-35

Geographical distribution. — This species has originally been described from Testigos Islands (Versluys, 1899), but it has since been recorded from off Key West and off Marco, Florida (Nutting, 1900), from Isla do São Amaro, near Santos, Brazil (Vannucci, 1946). Additional records are from the Bissagos Islands, off Portuguese Guinea, West Africa (Billard, fide Picard, 1951) and from off Conakry, French West Africa (Picard, 1951). It is usually recorded from shallow waters (up to 10 m depth).

Gymnangium longicauda (Nutting, 1900) (fig. 36)

Halicornaria longicauda Nutting, 1900: 127, pl. 33 fig. 4, 5; Fraser, 1937: 5, pl. 2 fig. 8; Fraser, 1944: 413, pl. 91 fig. 402; Vervoort, 1959: 298, fig. 48.

Locality. — St. Thomas, Savannah Passage; Kükenthal & Hartmeyer,

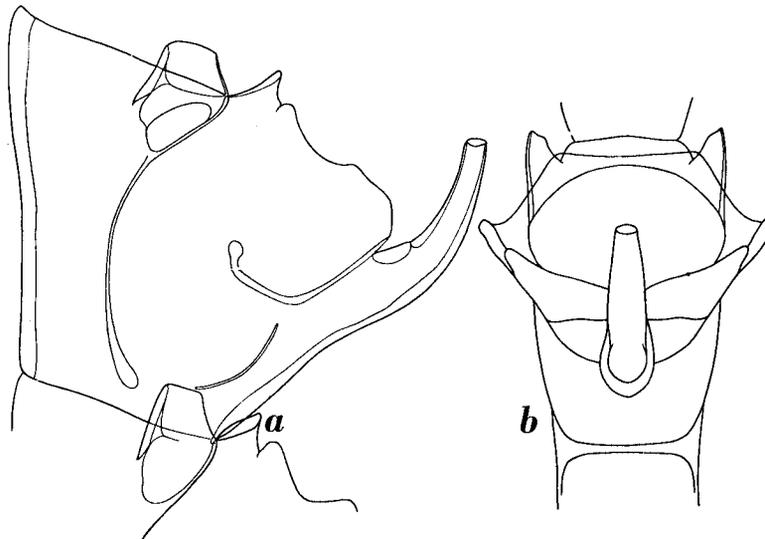


Fig. 36. *Gymnangium longicauda* (Nutting), St. Thomas, Savannah Passage. a, hydrotheca, lateral view; b, hydrotheca, frontal view. $\times 135$.

24.i.1907. About ten 15 to 25 mm high plumes rising from a hydrorhiza creeping on stems of *Lytocarpus clarkei* Nutting. No gonothecae.

Remarks. — I have recently redescribed this species from African material (Vervoort, 1959: 298). On comparison with the present material I noticed the following differences.

1. The lateral nematothecae in the West Indian material are distinctly curved upwards, the upward turned part narrowing considerably; the margin is deeply scooped out at the adcauline side. There are distinct signs of a beginning division of the nematotheca in an upper and lower chamber by the presence of an (incomplete) septum. In the African material the lateral nematothecae are cup-shaped, without any sign of division, though some nematothecae have a slightly turned up margin. Nutting's type material, as far as his drawings can be trusted, seems to agree better with the African than with the West Indian material in this respect.

2. The hydrothecal margin, in the West Indian material, has two pairs of distinct marginal teeth; in the African material there seems to be only one pair. Nutting's figures are not quite clear in this respect; his drawing of the hydrotheca in lateral aspect (1900, pl. 33 fig. 4) seems to show two pairs of teeth, his figure of the frontal hydrothecal aspect (1900, pl. 33 fig. 5) only one pair. A great deal of variability in this respect is usually met with in the species of *Gymnangium* and allied genera.

3. The median nematotheca, in the West Indian material, is long and distinctly curved inwards; there is a large, circular hole near its axil with the abcauline hydrothecal wall. In the African material this nematotheca has the shape of a straight spur, with a very small opening at its axil with the abcauline hydrothecal wall. In Nutting's material the median nematotheca is distinctly curved.

I hesitate to consider the above listed differences of sufficient value for specific distinction, the more so since no gonothecae were found on the African material.

Measurements (in microns):

	St. Thomas	Gulf of Guinea (Vervoort, 1959)
Hydroclade, distance between two consecutive hydrothecae	325-340	300-325
diameter	145-175	75-90
Hydrotheca, total length	280-300	220-240
diameter at aperture, lateral	200-210	200-220
idem, frontal	240-255	200-210
Median nematotheca, length free part	110-135	120-140

Geographical distribution. — $9^{\circ} 32' N$, $79^{\circ} 55' W$., off Colon, 34 fms. (= 62 m) (Nutting, 1900), $18^{\circ} 24' 30'' N$, $65^{\circ} 38' 30'' W$, north of Puerto Rico, 9 fms. (= 16.5 m) (Fraser, 1937), $18^{\circ} 19' 10'' N$, $65^{\circ} 10' 40'' W$, north of Culebra Island, 10 fms. (= 18 m) (Fraser, 1944), $9^{\circ} 20' N$, $14^{\circ} 15' W$, off French Guinea, 32 m depth (Vervoort, 1959). The present record extends the distribution of this species in the Caribbean region.

Lytocarpus clarkei Nutting, 1900 (fig. 37)

Lytocarpus clarkei Nutting, 1900: 124, pl. 32 fig. 5-7; Bedot, 1921a: 320; Bennett, 1922: 254; Fraser, 1944: 416, pl. 92 fig. 406; Deevey, 1954: 271; Vervoort, 1959: 302, fig. 50.

Locality. — St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1807. Five complete colonies of 25 cm height and a large number of fragments. The colonies are profusely branched and have many phylactocarpia with gonothecae.

Remarks. — This interesting species has recently been redescribed after material from the Cape Verde Islands (Vervoort, 1959). The present material differs from the African material in a few points of minor importance.

1. The lateral nematothecae are slightly longer in my material and project above the hydrothecal border for about one third of their length; they have a circular opening (fig. 37a).

2. The marginal teeth of the hydrotheca are slightly more rounded in the

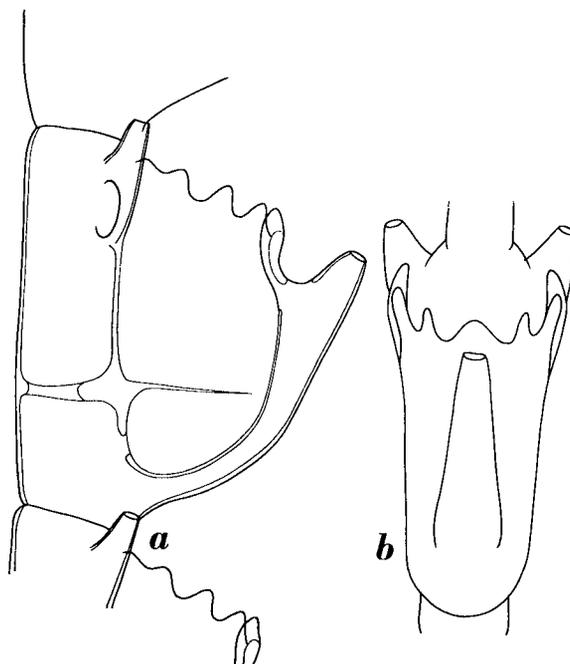


Fig. 37. *Lytocarpus clarkei* Nutting, St. Thomas, Savannah Passage. a, hydrotheca, lateral view; b, hydrotheca, frontal view. $\times 135$,

present material; the median tooth is more prominent and thickened frontally.

In all other points, including the structure of the phylactocarpia, there is complete conformity.

Measurements (in microns):

	St. Thomas	Cape Verde Is. (Vervoort, 1959)
Hydrocladia, diameter in highest parts	175-215	180-210
distance between two consecutive apophyses	390-400	450-540
Hydrocladial internode, length	335-350	360-410
diameter	105-120	90-105
Hydrotheca, total length	280-300	300-320
diameter, lateral	150-175	150-175
diameter, frontal	165-180	180-200
Mesial nematotheca, length free part	55-80	75-120
diameter at opening	25-30	
Gonotheca, diameter	300-350	630-720

Geographical distribution. — The species is known to occur at the following western Atlantic localities: off Havana, Cuba, $23^{\circ} 10' - 23^{\circ} 11' N$, $82^{\circ} 18' - 82^{\circ} 21' W$ (Nutting, 1900), off Yucatan, $22^{\circ} 18' N$, $87^{\circ} 04' W$ (Nutting, 1900), off Little Cat Island, Bahamas (Nutting, 1900), off Challenger Bank, Bermuda (Bennett, 1922), and north of Puerto Rico, $18^{\circ} 30' 30'' N$, $66^{\circ} 23' 05'' W$ (Fraser, 1944). It has been recorded from the Cape Verde Islands at $16^{\circ} 50' N$, $25^{\circ} 04' W$ (Vervoort, 1959). The present record extends the distribution of this species in the Caribbean region. The bathymetrical distribution is from 23.5 to 360 m depth.

Lytocarpus racemiferus Allman, 2883 (fig. 38, 39)

Lytocarpus racemiferus Allman, 1883: 41, pl. 13; Nutting, 1900: 126, pl. 31 fig. 1-3.

Locality. — St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.i.1907. One large colony of about 25 cm height with thick, broken hydrocaulus. Many phylactocarpia are present.

Description. — The colony occurs at the same locality as *L. clarkei*, from which it can be distinguished at a glance by the very light, horny colour and the totally different structure of the colony. There is a very thick, erect hydrocaulus, about 4 mm thick at the base and provided with many side-branches that may rebranch repeatedly. All side-branches, however, occur at the frontal side of the colony; the branched part of the hydrocaulus is curved backward. In the finer ramifications that are monosiphonic, the division into internodes is still distinct; but it becomes obliterated very soon. The arrangement of the hydrocladia and apophyses is just as in *L. clarkei*: each internode having a more or less distal apophysis, the various apophyses alternately directed left and right. Each apophysis has a triplet of nematothecae viz., one axillary, one a small distance under the apophyses, and one on the apophysis, the latter being rounded and reduced. The remaining nematothecae are cup-shaped and widened at the apex. The hydroclades are gracefully curved backward and form fine-looking plumes with the smallest side-branches; they do not occur on the main stem and its primary ramifications, in contrast with Allman's figure (1883, pl. 13 fig. 1). In the hydroclades the division into internodes is distinct; each internode carries a hydrotheca, a pair of lateral nematothecae and an unpaired median nematotheca.

The hydrotheca is fairly deep and set at a slightly oblique angle with the length axis of the internode (fig. 38a). The hydrothecal border has three pairs of low teeth, separated by rounded incisions, and a slightly thickened median tooth. There is a slightly oblique septum in the bottom of the hydrotheca, not reaching the abcauline hydrothecal wall, and an incomplete

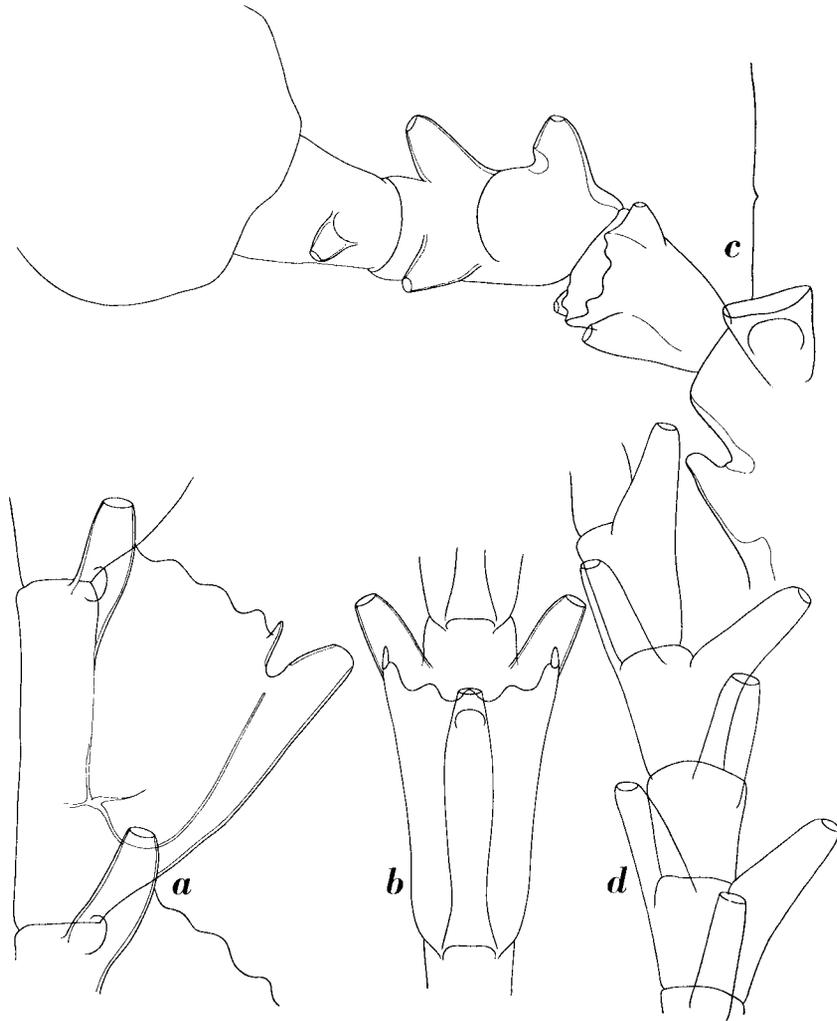


Fig. 38. *Lytocarpus racemiferus* Allman, St. Thomas, Savannah Passage. a, hydrotheca, lateral view; b, hydrotheca, frontal view; c, basal part of phylactocarp; d, distal part of phylactocarp. a, b, $\times 135$; c, d, $\times 90$.

septum in the internode at the same level. The median nematotheca reaches exactly as far as the end of the median tooth of the hydrothecal border; it leaves only a small part of the abcauline hydrothecal wall free. The free part of the median nematotheca is short. It has a circular aperture and a large oval opening in its axil with the abcauline hydrothecal wall.

The lateral nematothecae project above the hydrothecal border by about half their length; they are tubular with a circular aperture. A large, oval

opening is visible in the basal part of the nematotheca through which they correspond with the interior of the internode.

There are many phylactocarpia in the present colony; they replace the proximal 3 to 5 pairs of hydroclades of certain plumes, without forming a pseudocorbula. Each phylactocarp is a 5 to 6 mm long structure that can directly be compared with a hydroclade; each originating from an apophysis on the hydroclade-bearing stems. The phylactocarpia are divided into internodes, the first of which is a normal internode, bearing a hydrotheca, a pair of lateral nematothecae and an unpaired, median nematotheca (fig. 38c). It is followed by 8 to 10 internodes that bear large, round gonothecae on a very short stalk. Each of these internodes has three large, conical nematothecae: one basal and two (forming a pair) on the distal part of the internode. There is a curved slit between proximal and distal nematothecae, from which the stalk of the gonotheca, one for each internode, protrudes. The gonothecae are large, lenticular structures, circular in lateral view, ellipsoid in top view. The gonotheca-bearing part of the phylactocarp is very straight and rigid; the various phylactocarpia diverge strongly from the axis of the plume. The remaining internodes of each phylactocarp bear either a pair of large, funnel-shaped nematothecae or only a single nematotheca (fig. 38d); they alternate regularly and form a slightly curved apical appendage to the phylactocarp.

Measurements (in microns):

Hydrocladial internode, length	270-300
diameter at node	80-110
Hydrotheca, total depth	255-285
diameter, lateral	150-160
idem, frontal	160-165
Median nematotheca, length free part	55-65
diameter at aperture	27-30
Lateral nematotheca, total length	108-112
diameter at apex	27-30
Gonotheca, diameter	270 × 550
height	600-675

Remarks. — This is a very rare species, which has only been described by Allman; Nutting's description is a repetition of that by Allman, he does not seem to have studied Allman's type. The present account differs from Allman's description and figures in the following points.

1. According to Allman's figure hydroclades also occur on the main stem and the larger ramifications; this is not so in my specimens.
2. Allman's figure of the hydrotheca (1883, pl. 13 fig. 2, 3) shows fairly

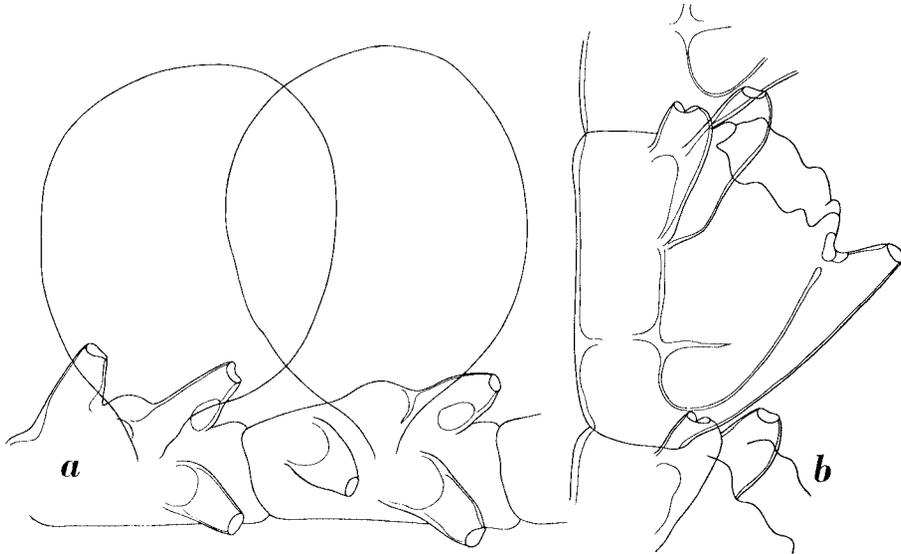


Fig. 39. *Lytocarpus racemiferus* Allman, Challenger Exped., off Bahia, schizoholotype. a, basal part of phylactocarp; b, hydrotheca, lateral view. a, $\times 90$; b, $\times 135$.

large marginal teeth, separated by deep, rounded incisions. In my specimen the teeth are much lower and very broadly rounded.

3. No hydrothecate article is figured by Allman at the base of each phylactocarp; he figures an intermediate article without any thecae at all. I feel convinced that the hydrothecate article must have been present in Allman's type as it is in every species of *Lytocarpus* in which the gonosome is sufficiently well known. The hydrotheca, however, is easily overlooked if the phylactocarp is viewed backwards.

4. The distal internodes of each phylactocarp figured by Allman have a triplet of nematothecae: a distal pair of nematothecae and a single basal nematotheca. In my specimen in the single nematotheca and the pair are placed on separate articles.

Through the kindness of Dr. W. J. Rees, British Museum (Natural History) I have been able to study a fragment of Allman's holotype of *Lytocarpus racemiferus* (B.M. 1888.11.13.88), dredged off Bahia, Brazil, at 10-20 fms. (= 18-36 m) depth. The fragment (schizo-holotype, now present in the Rijksmuseum van Natuurlijke Historie, Leiden) consists of a 10 mm long hydroclade with some phylactocarpia. There appear to be no consistent differences in the structure of the hydrothecae; some variability in the height of the marginal teeth of the hydrothecae being distinctly present (fig 39b). The two phylactocarpia studied each have a very distinct basal

hydrothecate internode, bearing a normally developed hydrotheca. In the distal part of these two phylactocarpia some of the more proximal internodes have disappeared, so that some internodes have a triplet of nematothecae; in the more distal part the structure is as described above.

I have no doubt whatever about the conspecificity of the material.

Geographical distribution. — Allman's type was obtained off Bahia, Brazil. The presence of this species in the Caribbean region (St. Thomas) has now been established.

Lytocarpus furcatus Nutting, 1900 (fig. 40)

Lytocarpus furcatus Nutting, 1900: 125, pl. 32 fig. 12-15; Jäderholm, 1903: 300; Fraser, 1944: 418, pl. 92 fig. 408.

Localities. — Crux Bay, St. John, Virgin Is; Kükenthal & Hartmeyer, 11.1.1907. One large, strongly ramified colony of about 20 cm height. Hydrocaulus basally about 5 mm thick and covered with Bryozoa. Empty phylactocarpia are present.

St. Thomas, Sound; Kükenthal & Hartmeyer, 15-19.1.1907. Six large colonies between 10 and 30 cm height. Many phylactocarpia with gonothecae are present.

St. Thomas, Savannah Passage; Kükenthal & Hartmeyer, 24.1.1907. One large, 15 cm high colony with phylactocarpia and gonothecae; many fragments.

Description. — The colonies of this species very closely resemble those of *L. clarkei*; they have the same mode of ramification and the same dark, horny colour of the periderm. The principal differences are found in hydrothecae and phylactocarpia, discussed below.

The hydrothecae are slightly more swollen basally than in *L. clarkei*; there are three pairs of deeply cut marginal teeth and a smaller median tooth. Each marginal tooth is gutter-shaped; the hydrothecal margin, just under the insertion of the teeth, is strongly undulated (fig. 40a). The median tooth is low and rounded; it has a thickened shield along the abcauline hydrothecal wall. The median nematotheca is almost as in *L. clarkei*, with a fairly short free part, a round aperture and a large hole in the axil between nematotheca and abcauline hydrothecal wall. The cavity of the hydrotheca has one straight septum in its basal portion; the internode has a strong septum at the same level. The lateral nematothecae are bifurcated; consequently each nematotheca has two apertures, each placed at the end of a short funnel (fig. 40b); the length of the funnels varies greatly; there are some thecae that have a bifurcated nematotheca on one side and a "normal" nematotheca on the other side.

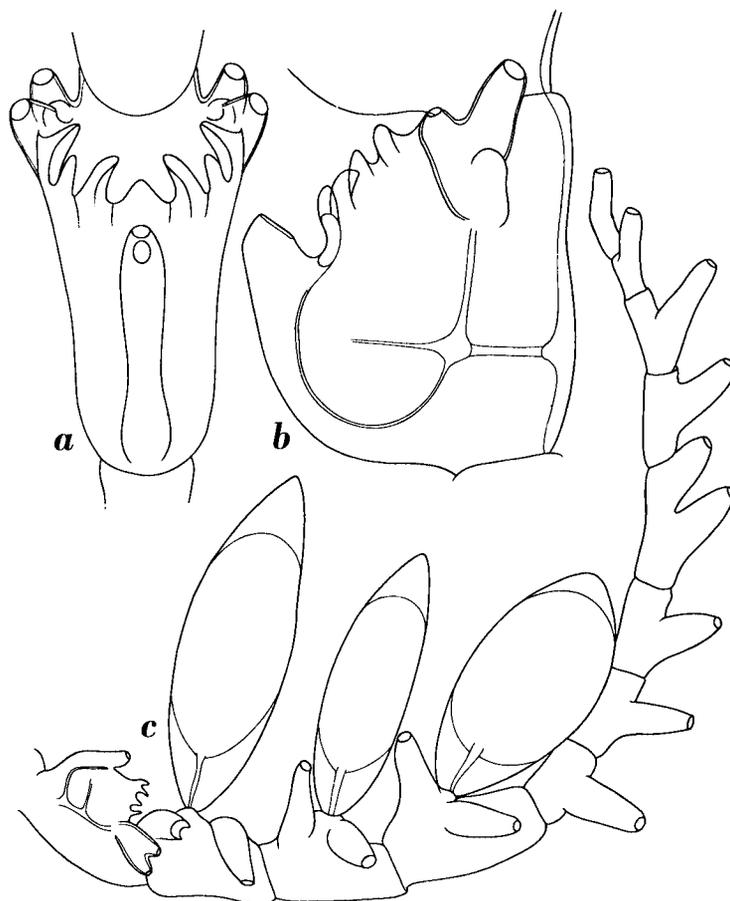


Fig. 40. *Lytocarpus furcatus* Nutting. a, b, Crux Bay, St. John, Virgin Is.; a, hydrotheca, frontal view; b, hydrotheca, lateral view. c, St. Thomas, Sound, phylactocarp. a, b, $\times 135$; c, $\times 90$.

The phylactocarpia have a hydrothecate article at the base, followed by 4 to 6 articles that each bear a single large gonotheca. These gonotheca-bearing articles have three long, funnel-shaped nematothecae each; the two distal nematothecae form a more or less distinct pair. There is a shallow apophysis with a slit through which the pedicel of the gonotheca protrudes (fig. 40c). There are 8 to 10 additional articles, each bearing one, or occasionally two, large, funnel-shaped nematothecae. The phylactocarpia are found at the base of otherwise normal plumes, where they may occur in as many as 15 pairs. They are strongly curved inwards and form very

distinct pseudocorbulae. The gonothecae, which occur in large numbers, are big, lenticular structures.

Measurements (in microns):

	St. Thomas
Hydrocladial internode, length	310-325
diameter at node	95-110
Hydrotheca, total depth	240-245
diameter, lateral	160-175
diameter, frontal	160-180
Median nematotheca, length free part	65-75
diameter at aperture	35-40
Lateral nematotheca, maximal length	135-150
diameter at apex	35-38
Gonotheca, diameter	270 × 400
height	675

Geographical distribution. — This species was originally described from shallow waters between Little Cat Island and Eleuthera, Bahamas (Nutting, 1900). There is one additional record from St. Barthélemy, Lesser Antilles, 18-20 fms. (= 32.5-36 m) depth (Jäderholm, 1903). The present records extend the distribution of this species in the Caribbean region.

Lytocarpus philippinus (Kirchenpauer, 1872) (fig. 41)

Aglaophenia philippina Kirchenpauer, 1872: 29, 45, pls. 1, 2, 7 fig. 26.

Lytocarpus philippinus - Nutting, 1900: 122, pl. 31 fig. 4-7; Congdon, 1907: 484, fig. 37; Wallace, 1909: 137; Smallwood, 1910: 137; Fraser, 1912: 379, fig. 45; Bennitt, 1922: 254; Leloup, 1937: 48; Fraser, 1944: 419, pl. 93 fig. 410; Vervoort, 1946a: 329; Deevey, 1954: 271; Van Gemerden-Hoogeveen, 1965: 74, fig. 42.

Macrorhynchia philippinus - Vannucci, 1946: 587, pl. 6 fig. 71, pl. 7 fig. 65.

Localities. — Puerto Cabello, Venezuela, piles of jetty; E. Hentschel, 3.i.1923. One fragment of 20 mm length with some phylactocarpia.

Puerto Cabello, Venezuela, jetty; E. Hentschel, 9.i.1923. A large number of about 10 cm high, branched colonies and many fragments. Many phylactocarpia are present.

Description. — The colonies consist of strongly and irregularly branched hydrocauli that may basally have a diameter of 3 to 4 mm. Hydroclades are found along the finer ramifications, forming more or less distinct plumes. The arrangement of the apophyses and nematothecae along the monosiphonic, finer ramifications is much the same as in *L. clarkei*; the apophyses are short and provided with three nematothecae, one a reduced nematotheca on the apophysis, one an axillary nematotheca and one a nematotheca some distance under the apophysis. In the very young parts of the

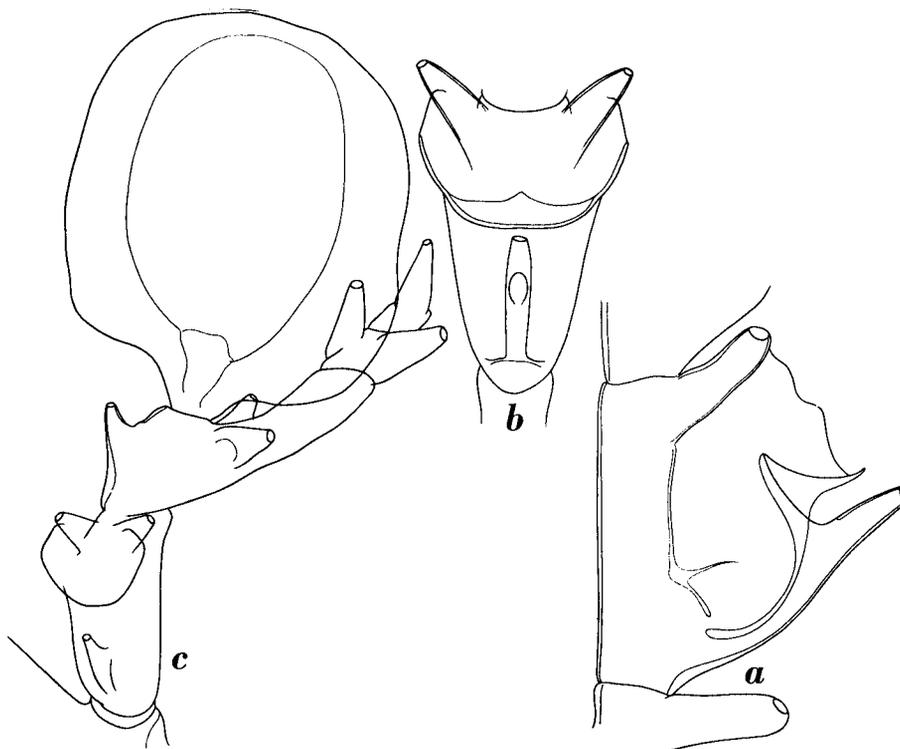


Fig. 41. *Lytocarpus philippinus* (Kirchenpauer), Puerto Cabello, Venezuela. a, hydrotheca, lateral view; b, hydrotheca, frontal view; c, basal part of phylactocarp. a, b, $\times 135$; c, $\times 90$.

colony the hydrocauli may be divided into internodes, each bearing one apophysis, but this division becomes easily obliterated in the older parts.

The hydroclades are not particularly long and have 10 to 15 internodes, separated by straight septa; the hydrothecae on the internodes are closely packed. Each internode has one hydrotheca, a pair of lateral nematothecae and one median nematotheca. The hydrotheca has a distinct, inwardly projecting lip at the abcauline wall, surrounded by a shield-shaped thickening of that wall (fig. 41a). The hydrothecal margin has two pairs of low, rounded teeth and a thickened median tooth. The lateral nematothecae are tube-shaped and project just above the hydrothecal border. The free part of the median nematotheca is fairly long and projects for a small distance above the hydrothecal margin. It has a circular aperture and a large oval opening in its axil with the abcauline hydrothecal wall. The hydrothecal cavity has an inwardly projecting lip in its basal part; there are no internodial septa or rings.

The phylactocarpia occur distributed over the whole of the colony, usually in the lower parts of the plumes, where they replace several hydrocladia. They do not form pseudocorbulae. Each phylactocarp originates from a normal apophysis and has basally a normal, hydrothecate internode with hydrotheca, paired nematothecae, and unpaired median nematotheca. This internode is followed by one or more gonotheca-bearing internodes (fig. 41c). These internodes are comparable with the hydrothecate internodes on which the hydrotheca has been replaced by an apophysis and of which the distal part is lengthened. The gonothecae, borne on the apophyses, are large, disc-shaped structures, containing a single large egg or a globular mass of spermatocytes, surrounded by a large, membranaceous ring. The number of gonothecae on each phylactocarp is one or two. The terminal articles of each phylactocarp alternately bear a pair of nematothecae or a single large nematotheca; two to four of such articles may be present.

Measurements (in microns):

Hydroclades, length of internodes	270-300
diameter at node	65-80
Hydrotheca, total depth	210-225
diameter at aperture	135-150
Lateral nematotheca, total length	95-110
diameter at aperture	20-25
Median nematotheca, length free part	95-110
diameter at aperture	25-30
Gonotheca, diameter	704 × 875
thickness	150-200

Remarks. — In am inclined not to attach too much importance to the "Atlantic" and the "Pacific" forms distinguished by Billard (1913). In the material at my disposal now, the hydrothecae usually have both an internal, adcauline lip and a narrowing at the base. The internal lip is not visible in many thecae, but there it may be obscured by the presence of the large hydranth.

Geographical distribution. — This species is widely distributed in the tropical parts of the Atlantic, Pacific and Indian Oceans (Ritchie, 1910; Billard, 1913; Stechow, 1923; Vervoort, 1941); in the Caribbean area it is a common form, occurring from the Florida region southwards to the Santos region in Brazil (Van Gernerden-Hoogeveen, 1965). The present locality fits into the distributional pattern.

CHECKLIST OF HYDROIDS FROM THE CARIBBEAN SEA AND THE GULF OF MEXICO ¹⁾

The region under consideration includes the Lesser Antilles, the Bahama Is., the Strait of Florida, the Gulf of Mexico coasts of the United States and Mexico, the Greater Antilles, the Caribbean Sea coasts of British Honduras, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, and Trinidad and Tobago.

The species are arranged systematically, the data under the various headings are arranged in chronological order. Data by Deevey (1954) are only mentioned if their origin could not be traced.

Tubulariidae

Ectopleura grandis Fraser, 1944. — Fraser, 1944: 93, Barataria, Imbale and East Bays, La., U.S.A. Deevey, 1950: 338, north of Key West, Fla., U.S.A.; Palacios, Texas, U.S.A.

Tubularia cristata McCrady, 1857. — A. Agassiz, 1865: 194, Florida, U.S.A. (doubtful record).

Tubularia crocea (L. Agassiz, 1862). — Fraser, 1944: 98, Lake Worth, off Palm Beach, Fla., U.S.A. (doubtful record). Fraser, 1946: 144, Louisiana coast and Daytona Beach, Fla., U.S.A. Deevey, 1950: 339, Port Aransas, Texas, U.S.A.

Cladocorynidae

Cladocoryne pelagica Allman, 1876. — Fraser, 1947: 4, Tortuga Isl., 2-5 fms.

Halocordylidae

Halocordyle disticha (Goldfuss, 1820). — L. Agassiz, 1862: 278, 374, Jeremi, Haiti; Key West, Fla., U.S.A. Clarke, 1879: 240, Bahia Honda, Colombia; Cuba. Jäderholm, 1903: 264, St. Barthélemy; Key West, Fla., U.S.A. Mayer, 1910: 25, West Indies and Bermuda to the Gulf of Maine. Stechow, 1919: 7, Charlotte Amalia harbour, St. Thomas. Fraser, 1933: 262,

¹⁾ The following species, insufficiently described by Pourtalès (1869) have not been included: *Antennularia triseriata* (off Sand Key, Fla., U.S.A., 100 fms.), *Thoa pulchella* (off Sand Key, 100 fms., off Havana, Cuba, 270 fms.), *Thoa siphonata* (off Havana, Cuba, 270 fms.) and *Tubularia crinis* (off Sand Key, 100 fms.).

In a provisional report on hydroids from Piscadera Bay, Curaçao, by Miss R. A. van der Bilt, Zoological Laboratory, University of Utrecht, two species are illustrated and mentioned that are certainly Caribbean, viz., *Tiaropsis muticirrata* (M. Sars, 1835) and *Campanulina acuminata* (Alder, 1857).

Tablot and Key West, Fla., U.S.A. Fraser, 1943: 87, Key West, Fla., U.S.A. Fraser, 1944: 85, Jeremi, Haiti; Dry Tortugas, Fla., U.S.A.

Corynidae

Syncoryne eximia (Allman, 1859). — Deevey, 1950: 335, Port Aransas, Texas, U.S.A.; Lake Worth inlet and Daytona Beach, Fla., U.S.A.

Syncoryne mirabilis (L. Agassiz, 1862). — Stechow, 1919: 3, Gulf of Mexico, 22° 47' N, 86° 10' W, on *Sargassum*. Deevey, 1954: 269, Florida Keys, Fla., U.S.A.

Cladonemidae

Cladonema mayeri Perkins, 1906. — Perkins, 1906: 118, Fort Jefferson moat, Dry Tortugas, Fla., U.S.A., low tide.

Zanclidae

Zanclaea costata Gegenbaur, 1856. — Mayer, 1910: 35, Tortugas, Fla., U.S.A. (doubtful record). Fraser, 1947: 3, Bahia de Caledonia, Colombia. Deevey, 1950: 349, Port Aransas, Texas, U.S.A.

Zanclaea gemmosa McCrady, 1857. — Wallace, 1909: 139, Tortugas, Fla., U.S.A., on floating *Sargassum*. Mayer, 1910: 88, Tortugas, Fla., U.S.A., on floating *Sargassum*; medusa West Indies to southern coast of New England (Maine). Fraser, 1943: 86, Tortugas, Fla., U.S.A.

Clavidae

Cordylophora lacustris (Allman, 1844). — Fraser, 1944: 35, Gatun Locks, Panama Canal. Deevey, 1954: 269, northwestern Gulf of Mexico (Texas, Louisiana); Caribbean Sea. Fincher, 1955: 91, Mississippi Sound, U.S.A.

Turritopsis fascicularis Fraser, 1943. — Fraser, 1943: 76, 86, off Alligator Reef, 24° 41' 45" N, 80° 27' 45" W, 118 fms. Deevey, 1954: 269, Florida Keys, Fla., U.S.A.

Turritopsis nutricula (McCrady, 1856). — See present paper, p. 5.

Bougainvilliidae

Bougainvillia caroliniensis (McCrady, 1857). — Mayer, 1910: 166, Tortugas. Fraser, 1943: 51, Bayou des Gettes, East Bay and Basin Cove, South Harpswell, all localities in Louisiana, U.S.A.; Bayou Rigaud, La., U.S.A.

Bougainvillia inaequalis Fraser, 1944. — Fraser, 1944: 51, off Pass à Loutre, 5 miles NE, 15 fms.; East Bay, La., U.S.A. Fraser, 1945: 22, Front Beach, Grand Isle, La., U.S.A. Deevey, 1950: 337, off Sabine Passage and off Freeport, La., U.S.A.; Aransas Bay, Texas, U.S.A.

Bougainvillia longicirra Stechow, 1914. — Stechow, 1914: 121, Charlotte Amalia, St. Thomas.

Bougainvillia robusta (Fraser, 1938). — Fraser, 1943: 87, off Montserrat, 16° 41' 54" N, 62° 13' 24" W, 88 fms.

Bougainvillia rugosa Clarke, 1882. — Stechow, 1912: 27, Charlotte Amalia, St. Thomas. Fraser, 1944: 53, Bayou Mussell and Pass Sortie, La., U.S.A.

Bougainvillia superciliaris L. Agassiz, 1862. — Rodriguez, 1963: 214, Lake Maracaibo, Venezuela.

Garveia franciscana (Torrey, 1902). — Fraser, 1943: 76, 86, Louisiana coast (as *Bimeria tunicata* Fraser). Deevey, 1950: 335, Corpus Christi; off Freeport; Houston ship channel; Galveston Bay; Sabine Passage (all along the coasts of Texas), and Bayou Chene Fleuri and Lake Pontchartrain, La., U.S.A. Crowell & Darnell, 1955: 516-518, Lake Pontchartrain, La., U.S.A. Fincher, 1955: 91, Mississippi Sound, U.S.A. (as *Bimeria tunicata*).

Garveia gracilis Clarke, 1876. — Fraser, 1943: 86, Maguaripe Bay, Trinidad.

Garveia humilis (Allman, 1877). — Allman, 1877: 8, Tortugas, Fla., U.S.A., in shallow waters. Fraser, 1943: 86, off Orange Key, Bahamas; Maguaripe Bay, Trinidad. Deevey, 1950: 335, east and west coasts of Florida. Doubtful records also from Palacios, Texas and Grand Isle, La., U.S.A.

Hydractinia echinata Fleming, 1828. — Deevey, 1950: 337, buoy off Key West, Fla., U.S.A., 200 ft.; Corpus Christi Channel and Corpus Christi region, Texas, U.S.A. Fincher, 1955: 91, Mississippi Sound, U.S.A.

Podocoryne carnea M. Sars, 1846. — Deevey, 1950: 337, doubtful record from Corpus Christi Channel, Texas, U.S.A.

Eudendriidae

Eudendrium album Nutting, 1898. — Fraser, 1944: 62, two miles W of Cape Romano, Fla., U.S.A.

Eudendrium attenuatum Allman, 1877. — Allman, 1877: 6, SSW of Tortugas, 60 fms.

Eudendrium carneum Clarke, 1882. — See present paper, p. 8.

Eudendrium distichum Clarke, 1879. — Clarke, 1879: 241, ten miles N of Zoblos island, SW of Key West, Fla., U.S.A., 24° 08' N, 82° 51' W, 339 fms.

Eudendrium exiguum Allman, 1877. — Allman, 1877: 6, off Florida reef, U.S.A., 98 fms. Leloup, 1937: 93, Tampa Bay, Fla., U.S.A. Fraser, 1943: 87, SW of Sand Key, Fla., U.S.A. 24° 20' 30" N, 81° 58' 30" W, 125 fms.; off Sand Key, Fla., U.S.A. 120-152 fms. Fraser, 1944: 68, N of Puerto Rico,

18° 30' 30" N, 66° 23' 05" W, 40 fms. Fraser, 1947: 3, seven miles N of Margarita Isl., 17-22 fms.

Eudendrium eximium Allman, 1877. — Allman, 1877: 5, off Florida Reef, Fla., U.S.A., 43 fms. Leloup, 1937: 93, Tampa Bay, 8-10 fms. Fraser, 1943: 87, off Alligator Reef, Fla. U.S.A., 24° 41' 45" N, 80° 27' 45" W, 118 fms.

Eudendrium fruticosum (Allman, 1877). — Allman, 1877: 6, off Key West, Fla., U.S.A., 135 fms.

Eudendrium gracile Allman, 1877. — Allman, 1877: 7, off Double Headed Shot Key, 24° N, 80° 20' W, 2-4 fms.

Eudendrium hargitti Congdon, 1907. — Wallace, 1909: 136, Tortugas, Fla., U.S.A.

Eudendrium laxum Allman, 1877. — Allman, 1877: 7, off Sand Key, Fla., U.S.A., 100 fms. Fraser, 1943: 87, S of Marquesas Isl., 24° 17' 30" N, 83° 11' 15" W, 140 fms. Fraser, 1947: 3, three miles N of Coche Isl., 21-22 fms.

Eudendrium ramosum (Linnaeus, 1758). — Fraser, 1943: 87, Maguaripe Bay, Trinidad.

Eudendrium speciosum Fraser, 1945. — Fraser, 1945: 22, Santa Rosa Sound, Pensacola, Fla., U.S.A.

Eudendrium tenellum Allman, 1877. — Allman, 1877: 8, off Double Headed Shot Key, S of Florida, U.S.A., 471 fms. Fraser, 1943: 87, off Grenada, 11° 48' 15" N, 61° 48' 45" W, 262 fms. Fraser, 1947: 4, two miles SW of Cape La Vela, 21-22 fms.; 3 miles N of Coche Island, 21-22 fms.

Eudendrium tenue A. Agassiz, 1865. — Fraser, 1944: 75, N of Puerto Rico, 18° 24' 30" N, 65° 38' 30" W, 9 fms. Deevey, 1950: 337, Port Aransas, Texas, U.S.A.

Haleciidae

Halecium bermudense Congdon, 1907. — Stechow, 1919: 33, Harbour of Charlotte Amalia, St. Thomas, on algae. Leloup, 1935: 7, off Bonaire; Dry Tortugas, Fla., U.S.A. Leloup, 1937: 93, Tampa Bay, Fla., U.S.A. Fraser, 1944: 188, Tampa Bay, Fla., U.S.A., 7-10 fms.

Halecium capillare (Pourtalès, 1869). — Pourtalès, 1869: 118, five miles SSW of Sand Key, Fla., U.S.A., 90-100 fms. (also mentioned by Allman, 1877: 16).

Halecium filicula Allman, 1877. — Allman, 1877: 270, S of Marquesas, 24° 17' 30" N, 82° 11' 15" W, 140 fms. (Also recorded from that locality by Fraser, 1943: 89). Nutting, 1895: 178, Pourtalès Plateau, Bahamas. Deevey, 1954: 270, Florida Keys, Fla., U.S.A.

Halecium gracile Verrill, 1874. — Fraser, 1944: 194, Gulf of Mexico, near Florida, 26° 47' 30" N, 83° 25' 15" W, 28 fms.

Halecium macrocephalum Allman, 1877. — Allman, 1877: 196, off Sand Key, 120 fms. Nutting, 1895: 223, between Eleuthera and Little Cat Island, Bahamas. Fraser, 1943: 89, off Sand Key, Fla., 120-152 fms. Fraser, 1944: 196, piles of wharf, Tortugas, Fla., U.S.A.

Halecium nanum Alder, 1859. — Jäderholm, 1903: 267, off the Antilles, on *Sargassum*. Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *H. markii*). Stechow, 1919: 36, Gulf of Mexico, 22° 47' N, 86° 10' W, on *Sargassum*. Leloup, 1935: 8, Bonaire; Aruba; between Trinidad and Grenada; Tortugas. Burkenroad, 1939: 24, Gulf Stream, on floating *Sargassum*. Deevey, 1950: 345, Port Aransas, Texas, U.S.A.

Halecium paucinodum (Fraser, 1947). — Fraser, 1947: 8, Bahia de Caledonia, Colombia; 8 miles SW of St. Nicolaas Bay, Aruba, 23-24 fms. (as *Endothecium paucinodum* Fraser).

Halecium reflexum Stechow, 1919. — See present paper, p. 9.

Halecium sessile Norman, 1866. — Wallace, 1909: 137, Tortugas, Fla., U.S.A.(?).

Halecium tenellum Hincks, 1861. — Clarke, 1879: 244, N of Tortugas, 24° 34' N, 83° 16' W, 36 fms. Leloup, 1935: 9, Bonaire; Curaçao; Dry Tortugas, Fla., U.S.A. Leloup, 1937: 96, Tampa Bay, Fla., U.S.A. Fraser, 1944: 203, Tampa Bay, Fla., U.S.A. Fraser, 1947: 9, Tortuga Island, 2-5 fms.

Halecium spec. — Leloup, 1935: 8, S of Loggerhead Key, Fla., U.S.A., 20 ft., on algae (as *H. dyssymmetrum* Billard). The specimens recorded and figured by Leloup (1935, p. 8, fig. 1) seem to differ from those described by Billard as *H. dyssymmetrum* from the East Indies.

Ophiodissa caciniiformis (Ritchie, 1907). — Leloup, 1935: 10, Bonaire.

Ophiodissa gracilis (Fraser, 1914). — Leloup, 1935: 11, Bonaire and Aruba, Netherlands Antilles.

Campanulariidae

Campanularia (*Campanularia*) *hincksii* Alder, 1856. — Nutting, 1915: 37, off Florida coast, U.S.A.

Campanularia (*Clytia*) *coronata* Clarke, 1879. — Clarke, 1879: 242, ten miles N of Zoblos Isl. Nutting, 1915: 51, Great Bahama Bank, Bahamas; Cape Romano, Fla., U.S.A. Leloup, 1935: 18, Aruba; Bonaire. Fraser, 1944: 134, Grand Isle and Pass Christian, La., U.S.A., on floating seaweed. Deevey, 1950: 339, Sabine Passage, Port Aransas and Palacios, all Texas, U.S.A. Fincher, 1955: 92, Mississippi Sound, U.S.A.

Campanularia (*Clytia*) *cylindrica* L. Agassiz, 1862. — Stechow, 1914:

122, Charlotte Amalia Harbour, St. Thomas, on algae attached to boat (as *Thaumantias (Clytia) elsaeoswaldae*). Leloup, 1937: 100, near Tortuguilla Isl., off Venezuela, 8-12 fms. Fraser, 1944: 135, East Bay, La., U.S.A., Gulf coast of Texas. Deevey, 1950: 341, Port Aransas and Palacios, Texas; Grand Isle, La., U.S.A.

Campanularia (Clytia) hummelincki Leloup, 1935. — Leloup, 1935: 19, De Hoop, Bonaire, 0.7 m. Deevey, 1954: 270, Florida Keys: Caribbean Sea.

Campanularia (Clytia) johnstoni Alder, 1856. — Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *Clytia bicophora* L. Agassiz). Leloup, 1937: 97, Gulf Stream off Georgia and Florida; Sargasso Sea. Burkenroad, 1939: 24, Gulf Stream, on floating *Sargassum*. Fraser, 1943: 88, Tortugas, Fla., U.S.A.

Campanularia (Clytia) kincaidi (Nutting, 1899). — Leloup, 1935: 20, Klein Bonaire; Bonaire.

Campanularia (Clytia) macrotheca Perkins, 1908. — Perkins, 1908: 146, creeping on filamentous algae in the moat at Fort Jefferson, Tortugas, Fla., U.S.A. Leloup, 1935: 21, Klein Bonaire; Dry Tortugas.

Campanularia (Clytia) minuta Nutting, 1901. — Wallace, 1909: 137, Tortugas, Fla., U.S.A., doubtful record.

Campanularia (Clytia) noliformis McCrady, 1857. — Wallace, 1909: 137, Tortugas, Fla., U.S.A. Leloup, 1935: 29, Klein Bonaire, 0.8 m depth; Boca Washikemba, Bonaire; Curaçao, many localities; between Trinidad and Grenada. Burkenroad, 1939: 23, 25, Gulf Stream, on floating *Sargassum*. Fraser, 1944: 145, Dry Tortugas, Fla., Grand Isle, La., both U.S.A.; NE of Bahamas, 27° 13' N, 62° 16' W and 23° 57' N, 67° 45' W. Fraser, 1947: 6, Bahia de Caledonia, Colombia, on *Sargassum*; 3 miles N of Coche Isl., 21-22 fms. Deevey, 1950: 341, St. Joseph Isl., Texas, U.S.A.

Campanularia (Clytia) raridentata (Alder, 1862). — Leloup, 1935: 23, Klein Bonaire and Aruba. Deevey, 1954: 270, Florida Keys; Caribbean Sea. This is a very doubtful species which is probably identical with either *Campanularia (Clytia) johnstoni* Alder or *Laomedea (Phialidium) pelagica* Van Breemen.

Campanularia (Clytia) similis Fraser. — Fraser, 1947: 6, three miles N of Coche Isl., 19-33 fms.; Cubagua Isl., shallow water, both islands near Trinidad.

Campanularia (?) *brevicaulis* Nutting 1915. — Nutting, 1915: 43, between Havana and Yucatan, 23° 11' 45" N, 82° 18' 54" W, 194 fms.

Campanularia (?) *certidens* Fraser, 1947. — Fraser, 1947: 4, off Tortuga Isl., 2-5 fms.

Campanularia (?) *macroscypha* Allman, 1877. — Allman, 1877: 11, off

Sand Key, Fla., U.S.A., 120 fms. Fewkes, 1881: 129, between Florida and Cuba, 229 fms. (as *C. insignis* Fewkes). Nutting, 1915: 42, N of Cape Catoche, Yucatan, 22° 28' N, 87° 02' W; 26° 47' 30" N, 83° 25' 15" W, off Charlotte Harbor, Fla., U.S.A., 28 fms. Fraser, 1943: 88, off Alligator Reef, Fla., U.S.A., 24° 41' 45" N, 80° 27' 45" W, 118 fms.

Campanularia (?) *sinuosa* (Leloup, 1935). — Leloup, 1935: 25, Bonaire, on *Sargassum*, about 1 m depth.

Laomedea (*Obelia*) *bicuspidata* Clarke, 1875. — Fraser, 1912: 361, Tampa Bay, Fla., U.S.A., 8-10 fms. Leloup, 1935: 26, Bonaire; Aruba. Leloup, 1937: 98, Tampa Bay, Fla., U.S.A. Fraser, 1944: 154, Grand Isle; Bayou Passage; Bayou de Gettes; Hog Isl; Barataria Bay, all La., U.S.A. Deevey, 1950: 343, Sabine Passage and Port Aransas, Texas; Grand Isle, La., U.S.A. Fincher, 1955: 92, Mississippi Sound, U.S.A. Rodriguez, 1963: 214, Lake Maracaibo, Venezuela (as *Obelia oxydentata* Stechow). Stechow, 1914: 131, Charlotte Amalia, St. Thomas (as *Obelia* (?) *oxydentata* Stechow).

Laomedea (*Obelia*) *commisuralis* McCrady, 1857. — Wallace, 1909: 137, Tortugas, Fla., U.S.A., doubtful record.

Laomedea (*Obelia*) *congoni* Hargitt, 1909. — Clarke, 1879: 241, ten miles N of Zoblos Isl. (as *Obelia hyalina* Clarke). Nutting, 1895: 30, 88, off Morro Castle, Cuba (as *O. hyalina* Clarke). Versluys, 1899: 30, on *Sargassum*, about 30° N, 70° W (as *O. hyalina* Clarke). Leloup, 1935: 24, Bonaire; Aruba (as *L. sargassi*). Fraser, 1943: 89, Eastern Dry Dock, Fla., U.S.A.; Jeremi, Haiti. Fraser, 1944: 161, Florida Strait; off Havana; Key West, Fla., U.S.A., usually on *Sargassum*.

Laomedea (*Obelia*) *dichotoma* (Linnaeus, 1758). — Wallace, 1909: 137, Tortugas, Fla., U.S.A. Stechow, 1914: 130, Harbour of Havana, Cuba. Fraser, 1943: 88, Tortugas, Fla., U.S.A. Deevey, 1950: 343, Sabine Passage; Galveston Bay; Sabine Bank; off Freeport; Matagorda Isl., and Port Aransas, all Texas, U.S.A.

Laomedea (*Obelia*) *equilateralis* Fraser, 1938. — Fraser, 1938: 35, Louisiana coast. Fraser, 1947: 7, Bahia de Caledonia, Colombia.

Laomedea (*Obelia*) *geniculata* (Linnaeus, 1758). — Versluys, 1899: 30, Bahia Honda, Colombia. Fraser, 1943: 88, Maguaripe Bay, Trinidad. Fraser, 1944: 160, Antilles. Deevey, 1950: 343, Sabine Passage, Texas, U.S.A.

Laomedea (*Obelia*) *irregularis* Fraser, 1943. — Fraser, 1943: 77, 89, off St. Kitts, 17° 19' 27" N, 62° 50' 30" W, 250 fms.

Laomedea (*Obelia*) *longicyatha* Allman, 1877. — Allman, 1877: 10, off Florida Reef, U.S.A., 90 fms. Nutting, 1915: 58, off Key West, 5.5 fms.

Leloup, 1935: 20, Aruba, on *Sargassum*. Fraser, 1943: 88, off Dry Tortugas, Fla., U.S.A., 24° 36' 40" N, 83° 02' 20" W, 16 fms.; West of Florida, 20 fms. Fraser, 1944: 142, off the Louisiana coast.

Laomedea (Obelia) obtusidens (Jäderholm, 1904). — Fraser, 1944: 164, Grand Isle, La., U.S.A., shore.

Laomedea (Eulaomedea) amphora (L. Agassiz, 1862). Wallace, 1909: 137, Tortugas, Fla., U.S.A., doubtful record.

Laomedea (Eulaomedea) calceolifera Hincks, 1861. — Wallace, 1909: 137, Tortugas, Fla., U.S.A., doubtful record.

Laomedea (Eulaomedea) flexuosa Hincks, 1861. — Wallace, 1909: 137, Tortugas (?), Fla., U.S.A., doubtful record.

Laomedea (Phialidium) laxa Fraser, 1937. — Fraser, 1937: 1, E coast of Haiti, 19° 10' 35" N, 69° 20' 45" W, 15 fms.

Laomedea (Phialidium) pelagica (Van Breemen, 1905). — Fraser, 1944: 149, two miles W of Cape Romano, Fla., U.S.A.; Bayou Passage; Grande Isle; East Bay, all La., U.S.A. (as *Gonothyraea gracilis* (M. Sars)). Fraser, 1947: 7, one mile SW of Cape la Vela, 10-13 fms.; 3 miles N of Coche Isl., 21-22 fms. (as *Gonothyraea gracilis* (M. Sars)). Fraser, 1947: 6, three miles N of Coche Island, 19-33 fms.; Cubagua Isl. (as *Clytia similis* Fraser, 1947). Deevey, 1950: 343, Sabine Passage, Texas, U.S.A. Fincher, 1955: 92, Mississippi Sound, U.S.A. (as *Obelia gracilis*). Hedgpeth, 1950: 73, Port Aransas, Texas, U.S.A. (as *Gonothyraea gracilis*).

Laomedea (Phialidium) tottoni Leloup, 1935. — Nutting, 1915: 62, Mayaguez Harbour, Puerto Rico, 7 fms. (as *Clytia fragilis* Congdon). Leloup, 1935: 26, Dry Tortugas, Fla., U.S.A., 27 ft. Deevey, 1950: 341, Sabine Passage and Port Aransas, Texas.

Laomedea (?) megalocarpha (Fraser, 1947). — Fraser, 1947: 5, seven miles N of Margarita Isl., 21-22 fms.

Lovenellidae

Lovenella gracilis Clarke, 1882. — Fincher, 1955: 92, off Horn Isl., Mississippi Bay, U.S.A.

Campanulinidae

Cuspidella costata Hincks, 1868. — Deevey, 1954: 270, Florida Keys, U.S.A.

Cuspidella humilis (Alder, 1862). — Deevey, 1950: 345, off Freeport, Texas.

Eucuspidella pedunculata (Allman, 1877). — Allman, 1877: 13, S of Tortugas, Fla., U.S.A., 260 fms.

Lafoeina tenuis G. O. Sars, 1873. — Deevey, 1950: 345, Southern Florida; Bahamas.

Opercularella lacerata (Johnston, 1947). — Leloup, 1935: 12, Bonaire.

Oplorhiza parvula Allman, 1877. — Allman, 1877: 178, S of Marquesas Keys, 296 fms. Deevey, 1954: 270, Florida Keys, U.S.A.

Stegopoma fastigiata (Alder, 1860.) — Leloup, 1935: 13, Tortugas, Fla., U.S.A., 92-94 fms.

Family Lafoeidae

Acryptolaria abies (Allman, 1877). — Allman, 1877: 20, Gulf Stream, exact locality unknown. Fewkes, 1881: 127, Barbados, 94 fms.; Grenada, 154 and 170 fms.; Montserrat, 88 fms.; Santa Cruz Isl., 508 fms. Fraser, 1943: 89, S. of Marquesas, Fla., U.S.A., 24° 17' 30" N, 82° 11' 15" W, 140 fms.; 24° 20' 30" N, 81° 58' 30" W, SW of Sand Key, Fla.; off Sand Key, 120-152 fms., 129 fms.; 24° 17' N, 81° 54' W, off Sand Key, 100 fms.; Sand Key Light, Fla., U.S.A., 119 fms.

Acryptolaria conferta (Allman, 1877). — Allman, 1877: 17, off Cojima, Cuba, 450 fms. Clarke, 1879: 244, off Tortugas, Fla., U.S.A., 25° 23' N, 84° 21' W, 101 fms. Fewkes, 1881: 128, Barbados, 73, 94 and 120 fms.; Dominica, 118 fms. Versluys, 1889: 32, off Testigos Isl., 40 fms. Nutting, 1895: 87, off Havana; off Morro Castle, Cuba, 125-260 fms. Jäderholm, 1903: 275, Antigua, Antilles, 70-200 fms. Leloup, 1935: 13, off Dry Tortugas Fla., U.S.A. (as *A. tortugasensis* Leloup). Fraser, 1943: 90, off Santa Cruz Isl., 17° 37' 55" N, 64° 54' 20" W, 115 fms. Fraser, 1944: 211, off Jacksonville, Fla., 31° 31' N, 79° 38' 30" W, 277 fms. and 30° 58' 30" N, 79° 38' 30" W, 294 fms.; off Havana, 100-200 fms.; Antigua, Antilles, 70-200 fms.

Acryptolaria elegans (Allman, 1877). — Allman, 1877: 20, off Florida Reef, U.S.A., 152 fms. Deevey, 1954: 270, Tortugas; Florida Keys; Caribbean Sea.

Acryptolaria flabellum (Allman, 1888). — Allman, 1888: 40, off Culebra Isl., 18° 38' 30" N, 65° 05' 30" W, 390 fms.

Acryptolaria longitheca (Allman, 1877). — Allman, 1877: 19, off Double Headed Shot Key, 315 fms. Clarke, 1879: 244, off Tortugas, 25° 33' N, 84° 21' W, 101 fms. Fewkes, 1881: 128, Dominica, 76 fms.; Martinique, 334 fms.; Barbados, 103 fms. Fraser, 1943: 212, S of Florida Keys, 24° 18' N, 80° 58' 30" W, 324 fms.; 13° 11' 65" N, 59° 38' 45" W, off Barbados, 73 fms.

Acryptolaria pulchella (Allman, 1888). — Fraser, 1943: 90, SW of Sand Key, Fla., U.S.A., 24° 20' 30" N, 81° 58' 30" W, 125 fms. Fraser, 1944: 213.

off St. Augustine, Fla., U.S.A., 20° 16' 30" N, 79° 36' 30" W, 438 fms.

Eucryptolaria pinnata Fraser, 1938. — Fraser, 1943: 90, off Montserrat, 16° 41' 54" N, 62° 13' 24" W, 88 fms.; 23° 04' 30" N, 82° 34' W, off Havana, Cuba, 230 fms.

Filellum serpens (Hassall, 1852). — Leloup, 1935: 13, Tortugas, 27 ft. and 25 fms. Fraser, 1944: 216, N of Puerto Rico, 18° 31' N, 66° 10' 15" W, 38 fms.; 11° 48' 15" N, 61° 48' 45" W, off Grenada, 262 fms. Fraser, 1947: 9, three miles N of Coche Isl., 21-22 fms. Deevey, 1950: 346, off Freeport, Gulf of Mexico; Houston Ship Channel on Galveston Bay; Sabine Passage, both Texas, U.S.A.

Filellum serratum (Clarke, 1879). — Clarke, 1879: 242, near Havana, Cuba, 292 fms. Fraser, 1943: 90, off Grenada, 11° 48' 15" N, 61° 48' 45" W, 262 fms.

Grammaria elegans Fraser, 1943. — Fraser, 1943: 79, 90, off Santa Cruz Isl., 17° 37' 55" N, 64° 54' 20" W, 115 fms.

Grammaria rigida Fraser, 1943. — Fraser, 1943: 79, 90, off Barbados, 100 fms.

Hebella calcarata (A. Agassiz, 1865). — Stechow, 1923: 135, West Indies (as *H. pusilla* Stechow). Leloup, 1937: 96, Tampa Bay, Fla., U.S.A. Fraser, 1947: 9, Tortuga Isl., 2-5 fms.

Hebella cylindrica (Von Lendenfeld, 1884). — Versluys, 1899: 31, Testigos Isl., 80 m. Jäderholm, 1903: 274, St. Barthélemy, 2 fms., on *Thyroscyphus ramosus*.

Hebella (?) *eximia* Fraser, 1944. — Fraser, 1944: 207, off Dominique, 15° 24' 55" N, 61° 27' 10" W.

Hebella michaelsarsi (Leloup, 1935). — Leloup, 1935: 22, Dry Tortugas, Fla., U.S.A., 45 fms.

Hebella scandens (Bale, 1888) var. *contorta* Marktanner-Turneretscher, 1890. — See present paper, p. 25.

Hebella venusta (Allman, 1877). — See present paper, p. 26.

Lafaea coalescens Allman, 1877. — Allman, 1877: 13, S of Marquesas, 140 fms. Fraser, 1943: 221, S of Marquesas, Fla., U.S.A., 24° 17' 30" N, 82° 11' 15" W, 140 fms.

Lafaea dumosa (Fleming, 1828). — Clarke, 1879: 243, NW of Dry Tortugas, 25° 33' N, 84° 21' W, 101 fms. Allman, 1888: 34, off Sombrero Isl., 18° 24' N, 63° 28' W, 450 fms. Fraser, 1943: 90, off Dominique, 15° 24' 55" N, 61° 27' 10" W, 333 fms.

Lafaea elegans Fewkes, 1881. — Fewkes, 1881: 129, Barbados, 125-180 fms.

Lafaea gracillima (Alder, 1857). — Clarke, 1879: 225, NW of Dry Tortu-

gas, 25° 33' N, 84° 21' W, 101 fms. Fraser, 1943: 90, off Santa Cruz Isl. (= St. Croix), 17° 37' 55" N, 54° 54' 20" W, 115 fms.

Lafoea tenellula Allman, 1877. — Allman, 1877: 12, S of Marquesas, 140 fms. Fraser, 1943: 90, S of Marquesas, Fla., U.S.A., 24° 17' 30" N, 82° 11' 15" W, 140 fms.; 24° 17' N, 81° 54' W, Sand Key Light, Fla., U.S.A. Fraser, 1944: 227, W of Puerto Rico, 18° 14' 18" N, 67° 35' 30" W, 180 fms.

Lictorella convallaria (Allman, 1877). — Allman, 1877: 12, off Florida Reef, 152 fms. Clarke, 1879: 243, off Havana, Cuba, 160-177 fms.; 25° 33' N, 84° 21' W, off Dry Tortugas, 101 fms. Fewkes, 1881: 128, 129, off Barbados, 76 and 94 fms.; off Martinique, 76 fms.; off Guadeloupe, 150 fms. Nutting, 1895: 180, Pourtalès plateau, Bahamas. Fraser, 1943: 97, off Barbados, 13° 05' 50" N, 59° 37' 05" W, 94 fms.; 23° 09' N, 81° 27' 30" W, NE of Havana, Cuba, 190 fms.

Lictorella crassicaulis Fraser, 1943. — Fraser, 1943: 80, 91, off Barbados, 13° 11' 54" N, 59° 38' 45" W, 73 fms.

Scandia mutabilis (Ritchie, 1907). — Stechow, 1919: 79, Gulf of Mexico, 22° 47' N, 86° 10' W, on *Aglaophenia* and *Sargassum*. Leloup, 1935: 17, Aruba. Fraser, 1944: 208, N of Puerto Rico, 18° 30' N, 66° 12' 20" W, 46-56 fms. Deevey, 1954: 270, Tortugas, Caribbean Sea.

Zygophylax chazaliei (Versluys, 1899). — Versluys, 1899: 32, Testigos Isl., 80 m depth. Nutting, 1919: 116, off Barbados, 67-70 fms.

Zygophylax rigida (Fraser, 1940). — Fraser, 1940: 579, in Yucatan Channel, 20° 59' 30" N, 86° 23' 05" W, 130 fms.

Synthechiidae

Hincksella cylindrica (Bale, 1888) var. *pusilla* Ritchie, 1910. — See present paper, p. 28.

Synthecium marginatum (Allman, 1877). — Allman, 1877: 23 off Florida Reef, U.S.A., 324 fms. Jäderholm, 1920: 5, St. Barthélemy, 12-18 fms. Fraser, 1943: 91, S of Florida Keys, 24° 14' 20" N, 80° 59' 40" W, 324 fms.

Synthecium (?) *nanum* Fraser, 1943. — Fraser, 1943: 80, 91, off Dry Tortugas, 24° 36' 40" N, 83° 02' 20" W, 16 fms. Fraser, 1947: 10, two miles SW of Cape la Vela, Colombia, 21-22 fms.

Synthecium (?) *rectum* Nutting, 1904. — Nutting, 1904: 135, near Havana, Cuba, 100-200 fms.

Synthecium robustum Nutting, 1904. — Fraser, 1943: 91, off St. Vincent, 13° 13' 20" N, 61° 18' 45" W, 95 fms.; 11° 48' 15" N, 61° 48' 45" W, off Grenada, 262 fms.; 13° 03' 50" N, 59° 37' 05" W, off Barbados, 94 fms.; 13° 11' 54" N, 59° 38' 45" W, off Barbados, 73 fms.

Synthecium tubithecum (Allman, 1877). — Allman, 1877: 24, Tortugas, Fla., U.S.A., 16 fms. Fewkes, 1881: 128, Barbados, 76 fms. Nutting, 1895: 88, Havana, Cuba (as *Sertularia tubithecum*). Jäderholm, 1903: 237, Anguilla, Antilles, 70-200 fms. Nutting, 1904: 134, off Morro Castle, Cuba, 100-250 fms.; 23° 10' 31" N, 82° 19' 55" W, off Havana, 114 fms.; 26° 47' 30" N, 83° 25' 15" W, off Charlotte Harbour, 28 fms.; 26° N, 82° 57' 30" W, off Charlotte Harbour, Fla., 24 fms.; 25° 04' 30" N, 82° 59' 15" W, N of Dry Tortugas, 26 fms. Leloup, 1935: 33, off Dry Tortugas, Fla., U.S.A. Fraser, 1943: 91: W of Florida, 20 fms. Fraser, 1944: 237, N of Puerto Rico: 18° 31' N, 66° 10' 15" W, 38 fms., 18° 30' N, 66° 12' 30" W, 46-56 fms., 18° 30' 30" N, 66° 23' 05" W, 40 fms.; W of Puerto Rico, 18° 14' 30" N, 67° 25' 30" W, 20-40 fms.

Sertulariidae

Cnidoscypus marginatus (Allman, 1877). — Allman, 1877: 9, Loggerhead Key, Fla., U.S.A., 9 fms. Clarke, 1879: 241, ten miles N of Zoblos Isl. Fewkes, 1881: 128, Sand Key, Fla., U.S.A., on telegraph cable, 15 fms. Nutting, 1895: 87, 223, off Morro Castle, Cuba, 125-260 fms.; ridge between Eleuthera and Little Cat Isl., Bahamas. Versluys, 1896: 125, off Testigos Isl., near Trinidad, 6 fms. Jäderholm, 1903: 269, Anguilla, Antilles, 100-150 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *Campanularia insignis*). Nutting, 1919: 116, off Barbados. Leloup, 1935: 31, Dry Tortugas, U.S.A., 25 fms. Leloup, 1937: 101, Tampa Bay, Fla., U.S.A., 8-10 fms. Fraser, 1943: 88, Salt Key Bank, off Salt Key, Fla.; 24° 36' 40" N, 83° 02' 20" W, off Dry Tortugas, 16 fms.; Eastern Dry Docks; off South Beach, Key West, Fla., 5 fms.; Sombrero Isl.; 26° 16' 10" N, 82° 25' 40" W, W of Florida, 20 fms. Fraser, 1947: 5, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms. Van Gemerden-Hoogeveen, 1965: 14, Curaçao; Bimini; Tortugas.

Thyroscypus longicaulis Spletstösser, 1929. — See present paper, p. 35.

Thyroscypus ramosus Allman, 1877. — See present paper, p. 33.

Diphasia digitalis (Busk, 1852). — Allman, 1877: 26, Key West, shallow water (as *Desmoscypus longithecum*). Nutting, 1904: 110, West Indian region; Florida Keys; 23° 10' 51" N, 82° 19' 03" W, 163 fms.; 23° 10' 36" N, 82° 19' 12" W, 169 fms.; 23° 10' 39" N, 82° 20' 21" W, 213 fms., all off Havana, Cuba. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1944: N of Puerto Rico: 18° 31' N, 66° 10' 15" W, 38 fms., 18° 24' 30" N, 65° 38' 30" W, 10 fms.; N of Culebra Isl., Puerto Rico, 18° 19' 10" N, 65° 19' 40" W, 10 fms.

Diphasia tropica Nutting, 1904. — Nutting, 1904: 110, between Little Cat Isl. and Eleuthera, Bahamas. Leloup, 1935: 37, Aruba. Fraser, 1943:

92, Maguaripe Bay, Trinidad. Van Gernerden-Hoogeveen, 1965: 17, La Guaira, Venezuela; Aruba; Bonaire.

Dynamena cornicina McCrady, 1857. — Clarke, 1879: 245, Yucatan, on algae. Leloup, 1935: 8, NE of Bahamas, $27^{\circ} 13' N$, $62^{\circ} 16' W$ and $23^{\circ} 57' N$, $67^{\circ} 45' W$. Leloup, 1937: 106, Strait Florida, Elbow Bay, U.S.A. Leloup, 1935: 39, Bonaire, Curaçao, and Aruba, on algae and *Sargassum* thrown up on shore. Fraser, 1943: 92, West of Florida, U.S.A., 20 fms. Fraser, 1944: 280, NE of Bahamas. Fraser, 1947: 10, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms. Van Gernerden-Hoogeveen, 1965: 25, Aruba; Klein Bonaire; Blanquilla; Los Frailes; Los Testigos; Trinidad; Tobago; St. Kitts; St. Martin; Tortugas.

Dynamena crisioides (Lamouroux, 1824). — Nutting, 1904: 70, Florida, between Salt Pond and Stock Isl.; Bahama Banks, 3-6 fms. Jäderholm, 1920: 5, St. Thomas. Leloup, 1935: 41, Bonaire; Little Bonaire; Aruba; Curaçao. Leloup, 1937: 107, Martinique. Fraser, 1943: 93, Key West, Fla., U.S.A.; Maguaripe Bay, Trinidad. Fraser, 1947: 12, Bahía de Caledonia, Colombia, shore; 2 miles off Bahía Honda, Colombia, 9 fms. Van Gernerden-Hoogeveen, 1965: 21, Aruba; Curaçao; Klein Bonaire; Bonaire; Tortuga Isl.; Los Frailes; Trinidad; St. Kitts; St. Martin; St. John; Jamaica; New Providence; Bimini; Tortugas.

Dynamena mayeri (Nutting, 1904). — Nutting, 1904: 58, shallow water between Eleuthera and Little Cat Isl., Bahamas; Great Bahama Bank; Gulf of Mexico, 26 fms.; $33^{\circ} 37' 30'' N$, $77^{\circ} 36' 30'' W$, NE of Cape Fear, 14 fms.; off Cape Romanos. Leloup, 1935: 49, Dry Tortugas, Fla., U.S.A. Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum*. Fraser, 1943: 93, Tortugas; between Key Biscayne and Duck Key, Fla., U.S.A.; Maguaripe Bay, Trinidad. Van Gernerden-Hoogeveen, 1965: 30, Tortugas.

Dynamena quadridentata (Ellis & Solander, 1786). — Nutting, 1895: 224, between Eleuthera and Little Cat Isl., Bahamas. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Stechow, 1923: 165, Bahama Canal. Leloup, 1935: 43, Bonaire and Curaçao, on *Sargassum*; Aruba. Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum*. Fraser, 1943: 253, NE of Puerto Rico, $18^{\circ} 51' N$, $64^{\circ} 33' W$, 140 fms. Van Gernerden-Hoogeveen, 1965: 27, Aruba; Curaçao; Bonaire; Tobago; Barbados.

Dynamena tropica Stechow, 1926. — Stechow, 1926: 101, Tortugas, Fla., U.S.A.

Idiellana pristis (Lamouroux, 1816). — Nutting, 1895: 180, Key West, Fla., U.S.A., in shallow water. Leloup, 1935: 37, Tortugas, Fla., U.S.A. Fraser, 1943: 311, off Martinique; $18^{\circ} 31' N$, $66^{\circ} 15' W$, 38 fms.; $18^{\circ} 30' 30'' N$, $66^{\circ} 23' 05'' W$, 40 fms.; $18^{\circ} 30' 24'' N$, $66^{\circ} 04' 15'' W$, 100 fms.;

18° 30' N, 66° 12' 20" W, 46-56 fms.; 18° 23' 35" N, 65° 37' 10" W, 10 fms., all localities N of Puerto Rico. Van Gemerden-Hoogveen, 1965: 16, Tortugas, Fla., U.S.A.

Sertularella amphorifera Allman, 1877. — Allman, 1877: 22, off Double Headed Shot Key, Fla., U.S.A., 471 fms.; Clarke, 1879: 246, off Dry Tortugas, U.S.A., 25° 33' N, 84° 21' W, 101 fms. Hartlaub, 1900: 23, Florida; Cuba. Nutting, 1904: 88, off Yucatan, 20° 59' 30" N, 86° 25' 33" W, 101 fms. Fraser, 1943: 92, off Montserrat, 16° 41' 54" N, 62° 13' 24" W, 88 fms.; 15° 24' 55" N, 61° 27' 10" W, 333 fms.

Sertularella areyi Nutting, 1904. — Nutting, 1904: 83, near Havana, Cuba, 100-200 fms.

Sertularella catena (Allman, 1888). — Allman, 1888: 58, off Culebra Isl., 18° 38' 30" N, 65° 05' 30" W, 390 fms.

Sertularella conica Allman, 1877. — Allman, 1877: 21, SW of Tortugas, Fla., U.S.A., 60 fms. Clarke, 1879: 246, off Key West, U.S.A., 24° 34' N, 83° 16' W, 86 fms. Nutting, 1904: 79, W of Appalachee Bay, Fla., U.S.A., 29° 18' 15" N, 85° 32' W, 25 fms.; 29° 24' 30" N, 88° 01' W, off Mobile, Ala., U.S.A., 35 fms. Leloup, 1935: 44, Dry Tortugas, U.S.A., 4.5-25 fms. Leloup, 1937: 104, Tampa Bay, Fla., U.S.A., 8-10 fms. Fraser, 1944: 259, W of Puerto Rico, 18° 14' 30" N, 67° 25' 30" W, 20-40 fms. Fraser, 1947: 10, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms. Van Gemerden-Hoogveen, 1965: 32, Tortugas, Fla., U.S.A.

Sertularella cylindriotheca (Allman, 1888). — See present paper, p. 43.

Sertularella distans (Allman, 1877). — Allman, 1877: 27, Tortugas, Fla., U.S.A., shallow water. Kirchenpauer, 1884: 25, Tortugas, 60 fms. Nutting, 1895: 179, Pourtalès plateau and between Eleuthera and Little Cat Island, Bahamas. Nutting, 1904: 88, off Havana, 23° 10' 25" N, 82° 20' 24" W, 33 fms.; 20° 59' N, 86° 23' W, off Yucatan, 167 fms.; 25° 04' 30" N, 82° 59' 15" W, off Dry Tortugas, U.S.A., 26 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1944: 260, off Puerto Rico, 18° 30' 30" N, 66° 23' 05" W, 40 fms.

Sertularella formosa Fewkes, 1881. — Fewkes, 1881: 130, Grenada, 170 fms.; Martinique, 357 fms. Nutting, 1895: 88, Havana, Cuba (as *Sertularia integritheca*). Nutting, 1895: 180, Pourtalès Plateau, Bahamas. Versluys, 1899: 37, Testigos Isl., 11 m (as *Sertularia integritheca*). Nutting, 1904: 104, off Havana, Cuba, 100-200 fms., 23° 10' 04" N, 82° 21' 07" W, 29 fms.; 23° 10' 25" N, 82° 20' 24" W, 33 fms., both localities off Havana.

Sertularella gayi (Lamouroux, 1821). — Allman, 1877: 22, no locality specified. Fewkes, 1881: 128, off Dominica, 524 fms.; off Morro light, Cuba, 250-400 fms. (as *S. gayi* var. *robusta* Allman). Nutting, 1904: 78, off

Havana, Cuba, 100-200 fms.; $20^{\circ} 59' N$, $86^{\circ} 53' W$, off Yucatan, 167 fms.; $29^{\circ} 39' N$, $79^{\circ} 49' W$, off Florida, 421 fms. Fraser, 1943: 92, off Sand Key, Fla., U.S.A., 120-150 fms.; $24^{\circ} 20' 30'' N$, $81^{\circ} 58' 30'' W$, SW of Sand Key, 125 fms.; Sand Key light, Fla., U.S.A., 125 fms.; $14^{\circ} 28' 40'' N$, $61^{\circ} 06' 08'' W$, off Martinique, 357 fms.; $23^{\circ} 04' 30'' N$, $82^{\circ} 34' W$, off Havana, Cuba, 230 fms.; $30^{\circ} 27' N$, $79^{\circ} 52' W$, off N. Florida, 250-265 fms.

Sertularella hartlaubi Nutting, 1904. — Nutting, 1904: 104, SE of Jamaica, $17^{\circ} 43' 40'' N$, $75^{\circ} 38' 25'' W$, 52 fms.

Sertularella humilis Fraser, 1943. — Fraser, 1943: 81, 92, Sand Key light house bears northeast by north, three-quarters north 8 mile, 125 fms.

Sertularella intermedia (Congdon, 1907). — Leloup, 1935: 35, Bonaire Fraser, 1947: 8, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms.

Sertularella megastoma Nutting, 1904. — Nutting, 1904: 90, off Yucatan, $20^{\circ} 59' N$, $86^{\circ} 23' W$, 167 fms. Fraser, 1944: 266, W of Puerto Rico, $18^{\circ} 11' 55'' N$, $67^{\circ} 42' 50'' W$.

Sertularella minuscula Billard, 1924. — Leloup, 1935: 45, Bonaire. Van Gemen-den-Hoogeveen, 1965: 34, Bonaire.

Sertularella ornata Fraser, 1937. — Fraser, 1937: 2, W of Puerto Rico, $18^{\circ} 11' 56'' N$, $67^{\circ} 42' 50'' W$, 180 fms.

Sertularella parvula (Allman, 1888). — See present paper, p. 46.

Sertularella pinnigera Hartlaub, 1900. — Allman, 1877: 28, Double Headed Shot Key, Fla., U.S.A., 3-4 fms. (as *Thuiaria pinnata*); Fewkes, 181: 128, off Barbados, 56 fms. (as *Thuiaria pinnata*). Kirchenpauer, 1884: 25, Gulf Stream.

Sertularella quadrata Nutting, 1904. — Nutting, 1895: 88, near Havana, Cuba, 100-200 fms. Nutting, 1904: 80, Gulf of Darien, $9^{\circ} 30' 45'' N$, $76^{\circ} 25' 30'' W$, 155 fms.; $23^{\circ} 10' 51'' N$, $82^{\circ} 19' 03'' W$, 163 fms.; $23^{\circ} 11' 45'' N$, $82^{\circ} 18' 54'' W$, 194 fms.; $23^{\circ} 10' 48'' N$, $82^{\circ} 19' 15'' W$, 121 fms.; $23^{\circ} 10' 41'' N$, $82^{\circ} 18' 24'' W$, 67 fms., the last four localities off Havana, Cuba.

Sertularella sieboldi Kirchenpauer, 1884. — Kirchenpauer, 1884: 49, Cuba.

Sertularella solitaria Nutting, 1904. — Nutting, 1904: 89, between Eleuthera and Little Cat Isl., Bahamas, shallow water. Fraser, 1943: 91, off Martinique, $14^{\circ} 28' 40'' N$, $61^{\circ} 06' 08'' W$, 357 fms.

Sertularella speciosa Congdon, 1907. — Fraser, 1943: 92, off Montserrat, $16^{\circ} 41' 54'' N$, $62^{\circ} 13' 24'' W$, 88 fms.; $24^{\circ} 24' N$, $84^{\circ} 24' 30'' W$, off Key West, Fla., U.S.A., 34 fms.

Sertularella tenella (Alder, 1856). — Nutting, 1904: 83, off Havana, Cuba, $23^{\circ} 10' 36'' N$, $82^{\circ} 19' 12'' W$, 169 fms. Leloup, 1935: 45, Bonaire, Curaçao and Aruba, on algae. Fraser, 1943: 92, off Alligator Reef, Fla.,

U.S.A., 24° 41' 45" N, 80° 27' 45" W, 118 fms. Van Gemerden-Hoogeveen, 1966: 31, Bonaire.

Sertularia dalmasi (Versluys, 1899). — Allman, 1877: 28, in the Gulf Stream (as *Thuiaria sertularioides*). Versluys, 1899: 38, off Tortuga Isl., 45 m. Nutting, 1904: 57, at 29° 28' N, 87° 56' W, 27 fms., as *Sertularia rathbuni* Nutting). Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *S. rathbuni*). Leloup, 1935: 50, off Dry Tortugas, U.S.A., 27 ft. Fraser, 1944: 280, N of Puerto Rico, 18° 31' 15" N, 66° 12' 20" W, 140-200 fms. Fraser, 1947: 19, Tortuga Isl., 2-5 fms.

Sertularia distans (Lamouroux, 1816) var. *gracilis* Hassall, 1852. — Leloup, 1935: 47, Bonaire; Curaçao; Aruba; 32° 07' N, 66° 35' W, NE of Bahamas. Van Gemerden-Hoogeveen, 1965: 36, Aruba; Bonaire; Curaçao; Tobago; Isote Aves; Antigua; Barbuda; St. Kitts; St. Barthélemy; Bimini.

Sertularia exigua Allman, 1877. — Allman, 1877: 24, off Cape Fear, 9 fms. Jäderholm, 1903: 287, Atlantic Ocean off Antilles, on *Sargassum*. Fraser, 1944: 281, two miles W of Cape Romano, Fla., U.S.A. Fraser, 1947: 10, two miles off Bahia Honda, Colombia, 9 fms.; off Tortugas, Fla., U.S.A., 2-5 fms.

Sertularia flowersi Nutting, 1904. — Nutting, 1904: 60, near Havana, Cuba, 150 fms. Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum*.

Sertularia inflata (Versluys, 1899). — Jäderholm, 1903: 286, Caribbean Sea; St. Barthélemy, 10 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *S. versluysii*). Leloup, 1935: 49, Bonaire and Curaçao; Dry Tortugas, south of Loggerhead Key, U.S.A. (as *Sertularia marginata*). Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum* (as *S. versluysi*). Fraser, 1943: 93, between Key Biscayne and Duck Key, Fla., U.S.A.; Key West, Fla., U.S.A.; Salt Key Bank, off Salt Key, Fla., U.S.A.; off Orange Key, Bahamas. Fraser, 1944: 283, Maguaripe Bay, Trinidad; 18° 24' 30" N, 65° 38' 30" W, N of Puerto Rico, 9 fms.; Tampa Bay, Fla., U.S.A.; off Tortuguilla Isl., Venezuela; Gulf coast of Mexico. Fraser, 1947: 11, Tortuga Isl., 2-5 fms. Van Gemerden-Hoogeveen, 1965: 45, St. Kitts; St. Eustatius; St. Martin.

Sertularia marginata (Kirchenpauer, 1864). — Leloup, 1935: 49, Bonaire; Curaçao; Tortugas, U.S.A. Van Gemerden-Hoogeveen, 1965: 39, Curaçao; Bonaire; Isote Aves; Fourche; New Providence; Tortugas.

Sertularia notabilis Fraser, 1947. — Fraser, 1947: 11, Tortuga Isl., 2-5 fms.

Sertularia pourtalesi Nutting, 1904. — Allman, 1877: 25, Tennessee Reef, 21 fms. (as *Sertularia distans* Lamouroux). Clarke, 1879: 246, near Tortugas, 24° 46' N, 83° 16' W, 36 fms. (as *Sertularia distans* Lamouroux). Fewkes, 1881: 128, off St. Vincent, 114 fms. (as *Sertularia distans* Lamou-

roux). Nutting, 1904: 59, off Appalachee Bay, Fla., U.S.A., $29^{\circ} 16' 30''$ N, $85^{\circ} 22' 36''$ W, 26 fms.; $27^{\circ} 04' N$, $83^{\circ} 21' 15''$ W, W of Charlotte Harbour, Fla., U.S.A., 26 fms.; $24^{\circ} 26' N$, $81^{\circ} 48' 15''$ W, SE of Key West, 26 fms.

Sertularia stookeyi Nutting, 1904. — Nutting, 1904: 59, Great Bahama Bank, on floating sea weed. Fraser, 1943: 93, between Key Biscayne and Duck Key, Fla., U.S.A.; Maguaripe Bay, Trinidad. Fraser, 1947: 11, Bahia de Caledonia, Colombia, on floating *Sargassum*; Cubagua Isl., Venezuela, shore.

Sertularia subtilis Fraser, 1937. — Fraser, 1937: 3, N of Puerto Rico, $18^{\circ} 23' 35''$ N, $65^{\circ} 37' 10''$ W, 10 fms.

Sertularia tumida Allman, 1877. — Allman, 1877: 23, Tortugas, Fla., U.S.A., shallow water. Nutting, 1904: 60, Tortugas. Wallace, 1909: 137, Tortugas.

Sertularia turbinata (Lamouroux, 1816). — Nutting, 1904: 60, between Eleuthera and Little Cat Isl., Bahamas; near Spanish Wells, Bahamas. Leloup, 1935: 50, Bonaire; Aruba; Loggerhead Key, Tortugas, U.S.A. Leloup, 1937: 106, Cay Sal Bank, 5-7 fms. Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum* (as *S. brevicyathus*). Fraser, 1944: 290, N of Puerto Rico: $18^{\circ} 27' 35''$ N, $65^{\circ} 33' 35''$ W, 26 fms.; $18^{\circ} 24' 30''$ N, $65^{\circ} 38' 30''$ W, 9 fms.; $18^{\circ} 23' 35''$ N, $65^{\circ} 37' 10''$ W, 10 fms. Fraser, 1947: 11, Bahia de Caledonia, Colombia, on *Sargassum*; Tortuga Isl., 2-5 fms.

Sertularia westindica Stechow, 1919. — Stechow, 1919: 30, Martinique, West Indies, on a sponge. Rodriguez, 1959: 274, Margarita Isl., Venezuela.

Plumulariidae, Halopterinae

Antennella curvitheca Fraser, 1937. — Fraser, 1937: 4, Puerto Rico. Van Gemerden-Hoogveen, 1965: 56, Nevis.

Antennella gracilis Allman, 1877. — Allman, 1877: 38, off Carysfort Reef, 60 fms. Fewkes, 1881: 127, off Barbados, 56 fms.; off Martinique, 96 fms. Nutting, 1895: 88, Havana, Cuba. Nutting, 1900: 77, off Cape Lookout, $34^{\circ} 38' N$, $76^{\circ} 12' W$, 18 fms.; near Havana, Cuba, 150-250 fms. Fraser, 1947: 12, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms.

Antennella quadriaurita Ritchie, 1909. — Stechow, 1919: 113, off Havana. Deevey, 1954: 271, Florida Keys; Cuba.

Antennella secundaria (Gmelin, 1788). — Leloup, 1935: 53, Bonaire and Curaçao, on *Sargassum*; Dry Tortugas, U.S.A., 0-25 fms. Van Gemerden-Hoogveen, 1965: 54, Curaçao; Tortugas; Bimini.

Halopteris carinata Allman, 1877. — Allman, 1877: 33, off Carysfort Reef, 35 fms. Nutting, 1895: 224; 1900: 86, between Eleuthera and Little Cat Isl., Bahamas, 3-13 fms. Wallace, 1909: 137, off Tortugas, Fla., U.S.A.

Stechow, 1926: 106, off Garden Key, Tortugas, U.S.A. Fraser, 1943: 95, off Montserrat, $16^{\circ} 41' 54''$ N, $62^{\circ} 13' 24''$ W, 88 fms. Fraser, 1947: 14, two miles off Bahia Honda, Colombia, 9 fms.

Halopteris catharina (Johnston, 1833). — Burkenroad, 1939: 24, Gulf Stream, on floating *Sargassum*.

Halopteris clarkei Nutting, 1900. — Clarke, 1879: 246, off Havana, Cuba, 175 fms. (as *Plumularia gracilis* Clarke). Nutting, 1900: 61, at $23^{\circ} 11' 45''$ N, $82^{\circ} 17' 54''$ W, 182 fms.

Halopteris diaphana (Heller, 1868). — Nutting, 1900: 62, Barracuda Rocks (as *Plumularia alternata* Nutting). Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *P. alternata* Nutting). Stechow, 1919: 114, Gulf of Mexico, $27^{\circ} 10'$ N, $91^{\circ} 51'$ W (as *P. alternata* Nutting). Fraser, 1943: 95, Maguaripe Bay, Trinidad. Fraser, 1944: 342, Grand Isle, La., U.S.A., on floating *Sargassum*; Tortugas, U.S.A. Fraser, 1947: 13, eight miles S.W. of St. Nicolaas Bay, Aruba, 23-24 fms.; Buccoo Isl.; Tobago Isl., shore. Fincher, 1955: 92, Mississippi Sound, U.S.A., on floating *Sargassum*. For the specimens recorded by Leloup (1935: 52) as *Antenella diaphana* see under *Halopteris tenella* (Verrill.).

Halopteris geminata (Allman, 1877). — Allman, 1877: 32, off Sand Key, U.S.A., 120 fms. Fewkes, 1881: 128, off Barbados, 76 fms. Nutting, 1895: 179, Pourtales Plateau, Bahamas. Nutting, 1900: 61, off American Shoal light, Fla., 70-80 fms.

Halopteris tenella (Verrill, 1874). — Leloup, 1935: 52, Bonaire and Aruba (as *Antenella diaphana*). Fraser, 1944: 358, Louisiana, doubtful record. This species is very near to, and probably identical with, *H. diaphana* (Heller).

Monostaechas quadridens (McCrary, 1857). — A. Agassiz, 1862: 358, Florida ship channel, U.S.A. Allman, 1877: 37, off Pacific Reef, 283 fms. (as *M. dichotoma* Allman). Fewkes, 1881: 128, Yucatan Bank, 50 fms. (as *M. dichotoma*). Nutting, 1900: 75, off Barbados, 76 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Leloup, 1937: 108, Tampa Bay, Fla., U.S.A., 8-10 fms. Fraser, 1943: 95, off Barbados, 100 fms.; $24^{\circ} 36' 40''$ N, $83^{\circ} 02' 20''$ W, off Dry Tortugas, Fla., U.S.A., 16 fms.

Schizotricha dichotoma Nutting, 1900. — Nutting, 1900: 78, Pourtales Plateau, $24^{\circ} 16'$ N, $81^{\circ} 22'$ W, 200 fms. Fraser, 1943: 96, off Sombrero Isl., 240 fms.

Schizotricha longipinna (Nutting, 1900). — Nutting, 1900: 83, off Key West, Fla., U.S.A., $24^{\circ} 16'$ N, $81^{\circ} 22'$ W, 200 fms.

Schizotricha quadricornis (Nutting, 1900). — Nutting, 1900: 82, Havana, Cuba, 150-200 fms. Fraser, 1944: 332, W of Puerto Rico, $18^{\circ} 14' 30''$ N, $67^{\circ} 25' 30''$ W, 20-40 fms.

Plumulariidae, Plumulariinae

Antennopsis distans Nutting, 1900. — Nutting, 1900: 73, at 23° 11' N, 82° 18' W, 115 fms.

Antennopsis hippuris Allman, 1877. — Allman, 1877: 35, off Double Headed Shot Key, Fla., U.S.A., 195 fms.

Antennopsis longicornis Nutting, 1900. — Nutting, 1900: 74, off Havana, 23° 11' N, 82° 20' W, 204 fms.

Antennopsis nigra Nutting, 1900. — Nutting, 1900: 74, off Havana, 23° 11' N, 82° 19' W, 121 fms.

Antennopsis sinuosa Fraser, 1947. — Fraser, 1947: 12, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms.

Callicarpa chazaliei Versluys, 1899. — Versluys, 1899: 44, Tortuga Isl., 45 m. Fraser, 1947: 13, seven miles N of Margarita Isl., 17-22 fms.

Hippurella elegans Fraser, 1937. — Fraser, 1937: 5, N of Puerto Rico, 18° 31' 30" N, 66° 18' 20" W; 18° 24' 45" N, 67° 14' 15" W, W of Puerto Rico, 80-180 fms.; 18° 13' 15" N, 65° 56' 45" W, N of Puerto Rico, 240 fms.

Hippurella longicarpa Nutting, 1900. — Fewkes, 1881: 134, off St. Vincent, Fla., 13° 07' 55" N, 61° 05' 36" W, U.S.A., 124 fms. (as *H. annulata*). The same locality is mentioned by Nutting, 1900: 84.

Nemertesia simplex (Allman, 1877). — Allman, 1877: 34, off Alligator Reef, U.S.A., 86 fms. Nutting, 1900: 70, at 23° 11' N, 82° 20' W, 201 fms.

Plumularia attenuata Allman, 1877. — Allman, 1877: 30, off Boca Grande, 105 fms. Fewkes, 1881: 128, Grenada, 576 fms. Nutting, 1895: 179, Pourtales Plateau, Bahamas. Nutting, 1900: 63, Grenada, 576 fms. Fraser, 1944: 338, off Key West, Fla., U.S.A.

Plumularia caulitheca Fewkes, 1881. Fewkes, 1881: 130, off Grenada, 416 fms.

Plumularia dendritica Nutting, 1900. — Nutting, 1895: 225, Little Cat Isl., Bahamas (as *P. obliqua*). Nutting, 1900: 67, near Little Cat Isl., Bahamas, in shallow waters. Jäderholm, 1920: 8, Anguilla, 50-100 fms.

Plumularia filicula Allman, 1877. — Allman, 1877: 29, off Alligator Reef, U.S.A., 88 fms. Fraser, 1943: 95, off Sombrero Isl., 195 fms.; 24° 18' N, 80° 58' 30" W, off Florida Keys, 152 fms.

Plumularia floridana Nutting, 1900. — Nutting, 1900: 59, two miles W of Cape Romano, Fla., U.S.A. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1944: 345, Grand Isle, La., U.S.A., on *Sargassum*.

Plumularia habereri Stechow, 1909. — Van Gemerden-Hoogeveen, 1965: 60, Curaçao.

Plumularia halecioides (Alder, 1859). — Nutting, 1900: 62, Barracuda Rocks (as *Plumularia inermis* Nutting). Wallace, 1909: 137, Tortugas, Fla.,

U.S.A. (as *P. inermis*). Leloup, 1935: 51, Bonaire; Klein Bonaire; Aruba; Tortugas. Van Gemerden-Hoogeveen, 1965: 64, Curaçao; Klein Bonaire; Bonaire; Tortuga Isl.; Barbuda; St. Kitts; St. Eustatius; St. Martin; St. Croix; St. John; Bimini; Tortugas.

Plumularia macrotheca Allman, 1877. — Allman, 1877: 30, off Cojima, Cuba, 450 fms.

Plumularia margaretta (Nutting, 1900). — Nutting, 1900: 72, near Little Cat Isl., Bahamas. Wallace, 1909: 137, Tortugas, Fla., U.S.A.. Leloup, 1935: 54, Bonaire; Curaçao; Aruba. Burkenroad, 1939: 23: Gulf Stream, on floating *Sargassum*. Fraser, 1944: 348, N of Puerto Rico: 18° 23' 35" N, 65° 37' 10" W, 10 fms., 18° 24' 30" N, 65° 38' 30" W, 9 fms.; N of Culebra Isl., Puerto Rico, 18° 19' 10" N, 65° 19' 40" W, 10 fms. Fraser, 1947: 14, two miles off Bahia Honda, Colombia, 9 fms.

Plumularia megalcephala Allman, 1877. — Allman, 1877: 31, off Alligator Reef, U.S.A., 14 fms. Nutting, 1895: 88, off Havana, Cuba, 125-150 fms.; off Barbados, 50 fms. Nutting, 1900: 57, at 31° 09' N, 79° 33' W, 352 fms. Stechow, 1912: 362, Bahama Channel, 20° 52' N, 79° 35' W. Nutting, 1919: 115, off Barbados, 50 fms. Fraser, 1943: 96, Sand Key light, Fla., U.S.A., 125 fms.

Plumularia paucinoda Nutting, 1900. — Nutting, 1900: 68, at 23° 10' 48" N, 82° 19' 15" W, 121 fms.

Plumularia setacea (Linnaeus, 1758). — Nutting, 1900: 56, Key West, Fla., U.S.A. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Stechow, 1912: 362, Gulf of Mexico, 27° 10' N, 91° 50' W; 23° 14' N, 84° 08' W, NW of Cuba; 24° N, 81° W, Florida Strait; 25° 52' N, 79° 35' W and 26° 14' N, 79° 48' W, both localities in the Bahama Channel.

Plumularia setaceoides Bale, 1881. — Burkenroad, 1939: 24, on floating *Sargassum* in the Gulf Stream. Fraser, 1943: 96, Key West, Fla., U.S.A. Fraser, 1944: 14, Bahia de Caledonia, Colombia, on *Sargassum*.

Plumularia strictocarpa Pictet, 1893. — Leloup, 1935: 55, Bonaire; Curaçao; Aruba. Leloup, 1937: 129, NE of Bahamas, 23° 57' N, 67° 45' W, and 27° 13' N, 62° 16' W. Fraser, 1947: 14, two miles off Bahia Honda, Colombia, 9 fms. Van Gemerden-Hoogeveen, 1965: 66, Aruba; Curaçao; Bonaire; Tobago; St. Kitts.

Plumulariidae, Aglaopheniinae

Aglaophenia allmani Nutting, 1900. — Allman, 1877: 39, Florida Reef, U.S.A., 2-3 fms. (as *A. ramosa* Allman). Fewkes, 1881: 127, St. Vincent, Florida, U.S.A., 95 fms. (as *A. ramosa*). Nutting, 1900: 100, Gulf of Darien, 9° 30' N, 76° 20' W. Nutting, 1919: 15, off Barbados, 33 fms. Leloup, 1935:

57, Dry Tortugas, U.S.A., 0-25 fms. Fraser, 1943: 93, off Barbados, 100 fms.; $17^{\circ} 37' 55''$ N, $64^{\circ} 54' 20''$ W, off Santa Cruz Isl., 115 fms. Fraser, 1947: 14, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms. Van Gemerden-Hoogeveen, 1965: 78, Tortugas, Fla., U.S.A.

Aglaophenia aperta Nutting, 1900. — Nutting, 1900: 95, off Havana, Cuba, $23^{\circ} 12' N$, $82^{\circ} 19' W$, 194 fms.; off Havana, 200 fms.

Aglaophenia apocarpa Allman, 1877. — The records given also include those of *A. lophocarpa* Allman, 1877. Allman, 1877: 41, off Sand Key, 100 fms.; off Tortugas, 68 fms., both Fla., U.S.A. Clarke, 1879: 247, off Havana, Cuba, 175 fms. Fewkes, 1881: 127, off Milligan's Key, 124 fms.; off Sand Key, Fla., 35 fms. Nutting, 1895: 89, Havana, Cuba (as *A. lophocarpa*). Nutting, 1895: 179, Pourtalès plateau, off Florida Keys, U.S.A., 116 fms. Nutting, 1900: 93, at $23^{\circ} 10' N$, $82^{\circ} 21' W$, 29 fms.; Dry Tortugas, 68 fms.; $28^{\circ} 32' N$, $88^{\circ} 06' W$, 1-181 fms.; $29^{\circ} 24' N$, $88^{\circ} 04' W$, 32 fms.; $26^{\circ} 47' N$, $83^{\circ} 25' W$, 28 fms., $26^{\circ} N$, $82^{\circ} 57' W$, 24 fms.; off Havana, Cuba, 200 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1944: 381, N of Puerto Rico, $18^{\circ} 30' N$, $66^{\circ} 12' 20'' W$, 46-56 fms.

Aglaophenia bicornuta Nutting, 1900. — Nutting, 1900: 105, off Havana, Cuba, 150-250 fms.

Aglaophenia (?) *constricta* Allman, 1877. — Allman, 1877: 47, Conch Reef, 30 fms. The same locality is mentioned by Nutting, 1900: 105 and Fraser, 1944: 368.

Aglaophenia cristifrons Nutting, 1900. — Nutting, 1900: 95, off Havana, Cuba, $23^{\circ} 11' N$, $82^{\circ} 19' W$, 163 fms. Fraser, 1943: 93, NE of Havana, Cuba, $23^{\circ} 09' N$, $81^{\circ} 27' 30'' W$, 240 fms.

Aglaophenia curvidens Fraser, 1937. — Fraser, 1937: 3, N of Puerto Rico, $18^{\circ} 27' 35'' N$, $65^{\circ} 33' 35'' W$, 26 fms.

Aglaophenia cylindrata Versluys, 1899. — Versluys, 1899: 49, off Testigos, 40 m. Jäderholm, 1903: 297, Anguilla, Antilles, 100-150 fms. This species is very probably identical with *Aglaophenia rhynchocarpa* Allman 1877.

Aglaophenia dichotoma Kirchenpauer, 1872. — Leloup, 1937: 111, Tampa Bay, Fla., U.S.A., 8-10 fms.

Aglaophenia dubia Nutting, 1900. — Allman, 1877: 42, off Carysfort Reef, 52 fms. (as *A. gracilis*). Clarke, 1879: 248, off Tortugas, $24^{\circ} 43' N$, $83^{\circ} 25' W$, 35 fms. (as *A. gracilis*). Fewkes, 1881: 127, off Martinique, 96 fms. Nutting, 1895: 179, Pourtalès Plateau, Bahamas (as *A. gracilis*). Nutting, 1900: 92, off Florida Keys, U.S.A., 100 fms.; off Havana, Cuba, 150 fms.; off Little Cat Isl., Bahamas, 6 fms.; $26^{\circ} 34' N$, $83^{\circ} 16' W$, 27 fms.; $26^{\circ} 34' N$, $82^{\circ} 58' W$, 24 fms., W of S Fla., U.S.A.

Aglaophenia elongata Meneghini, 1845. — Leloup, 1937: 112, Tampa Bay, Fla., U.S.A., 8-10 fms. Van Gernerden-Hoogeveen, 1965: 79, Tortugas, Fla., U.S.A.

Aglaophenia flowersi Nutting, 1900. — Nutting, 1900: 93, off Sand Key, Fla., U.S.A., 115 fms. Jäderholm, 1903: 294, Antigua, Antilles, 100-150 fms.

Aglaophenia gracillima Fewkes, 1881. — Fewkes, 1881: 131, Martinique, 96 fms. Fraser, 1943: 93, off Martinique, $14^{\circ} 28' 50''$ N, $61^{\circ} 05' 40''$ W, 96 fms.

Aglaophenia insignis Fewkes, 1881. — Fewkes, 1881: 129, 131, off Grenada, 262 fms. Fraser, 1943: off St. Vincent, $13^{\circ} 13' 20''$ N, $61^{\circ} 18' 45''$ W, 95 fms.; $11^{\circ} 48' 15''$ N, $61^{\circ} 48' 45''$ W, off Grenada, 262 fms.

Aglaophenia insolens Fraser, 1943. — Fraser, 1943: 81, 94, Maguaripe Bay, Trinidad.

Aglaophenia latecarinata Allman, 1877. — Allman, 1877: 56, Gulf of Mexico. Versluys, 1899: 47, E of Florida, U.S.A., 30° N, $70'$ W. Nutting, 1895: 54, Bahama Banks (as *A. minuta*). Nutting, 1900: 96, Great Bahama Banks. Jäderholm, 1903: 294, off the Antilles, on Sargassum; $28^{\circ} 46'$ N, $55^{\circ} 10'$ W; $30^{\circ} 25'$ N, $56^{\circ} 09'$ W; $35^{\circ} 18'$ N, $41^{\circ} 00'$ W. Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *A. minuta*). Leloup, 1935: 57, Aruba; Curaçao; Bonaire. Leloup, 1937: 113, Cay Sal Bank; $27^{\circ} 13'$ N, $62^{\circ} 16'$ W, and $23^{\circ} 57'$ N, $67^{\circ} 45'$ W, both localities NE of the Bahamas. Burkenroad, 1939: 23, Gulf Stream, on floating *Sargassum* (as *A. minuta*). Fraser, 1943: 94, Jeremi, Haiti; Eastern Dry Docks, Fla., U.S.A.; Tortugas, Fla., U.S.A. Fraser, 1944: 378, off Hollywood, Miami, Fla., U.S.A.; Front Beach, Grand Isle, La., U.S.A. Fincher, 1955: 92, Mississippi Sound, U.S.A., on floating *Sargassum*. Van Gernerden-Hoogeveen, 1965: 76, Sucre; Chacopata; Aruba; Curaçao; Klein Bonaire; Bonaire; Islote Aves; St. Eustatius; Fourche.

Aglaophenia longiramosa Fraser, 1945. — Fraser, 1945: 21, 22, $29^{\circ} 58'$ N, $88^{\circ} 03'$ W, 16 fms.

Aglaophenia meganema Fraser, 1937. — Fraser, 1937: 382, N of Puerto Rico, $18^{\circ} 24' 30''$ N, $65^{\circ} 38' 30''$ W, 9 fms.

Aglaophenia (?) *mercatoris* Leloup, 1937. — Leloup, 1937: 113, Tampa Bay, Fla., U.S.A., 8-10 fms.

Aglaophenia minima Nutting, 1900. — Nutting, 1900: 98, near Little Cat Isl., Bahamas, in shallow water.

Aglaophenia pelagica Lamouroux, 1816. — A. Agassiz, 1865: 139, Florida; Tortugas; Haiti. This species is probably identical with *A. latecarinata* Allman, 1877.

Aglaophenia perforata Allman, 1885. — Allman, 1885: 150, St. Vincent Isl., Florida, U.S.A.

Aglaophenia perpusilla Allman, 1877. — Allman, 1877: 48, off the Quick sands, Key West, Fla., U.S.A., 34 fms. Nutting, 1895: 225, off Little Cat Isl., Bahamas. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1943: 94, off Key West, Fla., U.S.A., 24° 24' N, 82° 24' 30" W, 34 fms.; Maguaripe Bay, Trinidad.

Aglaophenia pluma pluma (Linnaeus, 1758). — Van Gernerden-Hoogveen, 1965: 89, Bimini.

Aglaophenia (?) *ramulosa* Kirchenpauer, 1872. — Fewkes, 1881: 127, Barbados, 76 and 94 fms.; Montserrat, 88 fms.

Aglaophenia raridentata Fraser, 1944. — Nutting, 1900: 94, off Sand Key, Fla., U.S.A., 70-80 fms. (as *Aglaophenia elegans* Nutting).

Aglaophenia rhynchocarpa Allman, 1877. — Allman, 1877: 40, Key West, Triangle Shoal, 3-4 fms., Fla., U.S.A. Nutting, 1895: 89, Havana, Cuba. Nutting, 1900: 90, at 23° 11' N, 82° 19' W, 169 fms.; off Havana, Cuba, 150-250 fms.; off Barbados, 33 fms. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1944: 387, at 18° 31' N, 66° 10' 15" W, 38 fms.; 18° 30' 24" N, 66° 04' 15" W, 100 fms.; 18° 23' 35" N, 65° 37' 10" W, 10 fms., all three localities N of Puerto Rico; 18° 14' 30" N, 67° 25' 30" W, 20-40 fms., W of Puerto Rico; 18° 19' 10" N, 65° 19' 40" W, N of Culebra Isl., 10 fms.

Aglaophenia rigida Allman, 1877. — Clarke, 1879: 248, ten miles N of Zoblos Isl., 24° 08' N, 82° 51' W, 339 fms. Nutting, 1895: 179, Pourtales plateau, Bahamas. Nutting, 1900: 91, between 22° and 30° N, less than 100 fms.; off Sand Key, Fla., U.S.A., 116 fms.; off Barbados, 33 fms. Fraser, 1944: 389, N of Puerto Rico, 18° 30' 30" N, 66° 23' 05" W, 40 fms.; 5 miles NNE of Pass à Loutre, La., U.S.A., 15 fms. Fraser, 1947: 15, eight miles SW of St. Nicolaas Bay, Aruba, 23-24 fms.

Aglaophenia robusta Fewkes, 1881. — Fewkes, 1881: 132, off Montserrat, 88 fms. Fraser, 1943: 94, off Montserrat, 16° 41' 54" N, 62° 13' 24" W, 88 fms.

Aglaophenia tridentata Versluys, 1889. — Versluys, 1899: 47, off Testigos Isl., 11 m. Nutting, 1900: 96, off Key West, Fla., U.S.A., 5.5 fms.; off Marco, Fla., 2 fms. (as *Aglaophenia contorta* Nutting). Wallace, 1909: 137, Tortugas, Fla., U.S.A. (as *A. contorta*).

Aglaophenoides mammillata (Nutting, 1900). — Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1943: 94, Tortugas, Fla., U.S.A.

Aglaophenopsis hirsuta Fewkes, 1881. — Fraser, 1944: 379, off Sombrero Key, Fla., U.S.A., 240 fms.

Cladocarpus carinatus Nutting, 1900. — Wallace, 1909: 137, Tortugas, Fla., U.S.A.

Cladocarpus compressus Fewkes, 1881. — Fewkes, 1881: 135, off St. Vincent Isl., Fla., U.S.A., 114 fms. Nutting, 1900: 111, off St. Vincent, 13° 06' 36" N, 61° 12' 45" W, 114 fms.

Cladocarpus dolichotheca Allman, 1877. — Allman, 1877: 50, off Pacific Reef, 283 fms. Clarke, 1879: 247, off Tortugas, 24° 08' N, 82° 51' W, 339 fms. Fraser, 1943: 95, off Carysfort Reef, Fla., U.S.A., 25° 11' N, 80° 11' W, 52 fms.

Cladocarpus flexilis Verrill, 1885. — Nutting, 1900: 112, at 29° 28' N, 87° 56' W, 27 fms.; 29° 25' N, 88° 01' W, 35 fms.; 29° 24' N, 88° 04' W, 32 fms., all off Mobile, Fla., U.S.A.

Cladocarpus flexuosus Nutting, 1900. — Nutting, 1900: 114, off Mobile, Fla., U.S.A., 28° 45' N, 88° 16' W, 940 fms.

Cladocarpus longipinna Fraser, 1945. — Fraser, 1945: 21, 22, at 29° 20' N, 88° 16' W, 33 fms.

Cladocarpus obliquus Nutting, 1900. — Nutting, 1900: 113, off Havana, Cuba, 200 fms.

Cladocarpus paradisea Allman, 1877. — Allman, 1877: 53, off Tennessee Reef, 174 fms.; off Samboes Isl., Florida, U.S.A., 123 fms. Nutting, 1895: 180, Pourtalès plateau, Bahamas. Fraser, 1943: 85, off Sombrero Key, 240 fms.; off Sand Key, Fla., 129-132 fms.

Cladocarpus (?) *savignyana* (Kirchenpauer, 1872). — Marktanner-Turneretscher, 1890: 267, Haiti.

Cladocarpus sigma (Allman, 1877). — Allman, 1877: 45, off Aligator Reef, 110 fms. Nutting, 1895: 180, Pourtalès plateau, Bahamas. Nutting, 1900: 111, off Sand Key, Fla., U.S.A., 116 fms.; off Havana, Cuba, 150-200 fms. Fraser, 1943: 95, SW of Sand Key, Fla., U.S.A., 24° 20' 30" N, 81° 58' 30" W, 120 fms.; off Sand Key, 129 fms.

Cladocarpus tenuis Clarke, 1879. — Clarke, 1879: 411, NW of Tortugas, 25° 33' N, 84° 21' W, 101 fms. Jäderholm, 1903: 301, Virgin Isl., Antilles, 200-300 fms. Fraser, 1943: 95, Carriacou, 12° 28' 22" N, 61° 32' 18" W, 163 fms. This record probably refers to some other, undescribed species of *Cladocarpus*.

Cladocarpus ventricosus Allman, 1877. — Allman, 1877: 52, off Sand Key, Fla., U.S.A., 100 fms.

Gymnangium hians (Busk, 1852) var. *balei* Billard, 1913. — Van Gemen-den-Hoogveen, 1965: 70, Tortugas, Fla., U.S.A.

Gymnangium longicauda (Nutting, 1900). — See present paper, p. 78.

Gymnangium sinuosum (Fraser, 1925). — Fraser, 1925: 171, Gulf Stream off Cape Florida, 2.5 miles SSE of Fovey Rock light, 45 fms. Leloup, 1937: 110, Tampa Bay, Fla., U.S.A., 8-10 fms.

Gymnangium speciosum (Allman, 1877). — Allman, 1877: 54, off Double Headed Shot Key, 4-5 fms. Nutting, 1895: 225; 1900: 127, at 25° 05' N, 80° 15' W, 56 fms.; off Little Cat Isl., Bahamas; Nutting, 1919: 115, off Barbados, 50 fms.

Lytocarpus clarkei Nutting, 1900. — Nutting, 1900: 124, at 23° 11' N, 82° 20' W, 122 fms., 192 fms.; 23° 11' N, 82° 21' W, 201 fms.; 23° 10' N, 82° 20' W, 78 fms.; 23° 11' N, 82° 19' W, 121 fms.; 23° 11' N, 82° 20' W, 114 fms.; 23° 11' N, 82° 18' W, 67 fms.; 23° 11' N, 82° 19' W, 157 fms.; 23° 11' N, 82° 20' W, 199 fms.; 23° 11' N, 82° 20' W, 189 fms., all localities off Havana; 22° 18' N, 87° 04' W, 24 fms., off Yucatan. Fraser, 1944: 416, off Little Cat Isl., Bahamas, 13 fms.; 18° 30' 30" N, 66° 23' W, N of Puerto Rico.

Lytocarpus curtus Nutting, 1900. — Nutting, 1900: 125, between Eleuthera and Little Cat Isl., Bahamas.

Lytocarpus furcatus Nutting, 1900. — Nutting, 1900: 125, between Little Cat Isl. and Eleuthera, Bahamas, in shallow waters. Jäderholm, 1903: 300, St. Barthélemy, 18-20 fms.

Lytocarpus grandis (Clarke, 1879). — Clarke, 1879: 248, ten miles N of Zoblos Isl., 24° 08' N, 82° 51' W, 339 fms. Nutting, 1895: 225, off Little Cat Isl., Bahamas (as *Nematophorus grandis*). Versluys, 1899: 51, off Testigos Isl., 80 m. Fraser, 1944: 419, N of Puerto Rico, 18° 30' N, 66° 12' 20" W, 46-56 fms.

Lytocarpus philippinus (Kirchenpauer, 1872). — Nutting, 1900: 122, Jamaica; Panama. Wallace, 1909: 137, Tortugas, Fla., U.S.A. Fraser, 1912: 379, Bogue Sound, Gulf of Mexico. Fincher, 1955: 92, Mississippi Sound, U.S.A. Van Gemerden-Hoogveen, 1965: 74, St. Martin.

Lytocarpus racemiferus Allman, 1883. — See present paper, p. 82.

Lytocarpus ramosus (Fewkes, 1881). — Fewkes, 1881: 136, off St. Vincent, 13° 12' 10" N, 61° 17' 18" W, 95 fms.

Sphaerocystis heteronema Fraser, 1943. — Fraser, 1943: 85, 96, off Orange Key, Bahamas, 9 fms.

Streptocaulus gracilis Fraser, 1937. — Fraser, 1937: 6, N of Puerto Rico, 18° 33' 15" N, 65° 56' 45" W, 240 fms.

Thecocarpus bispinosus (Allman, 1877). — Allman, 1877: 46, off Alligator Reef, 156 fms.; off Tennessee Reef, 200 fms. Fraser, 1943: 96, S of Florida Keys, 24° 14' 20" N, 8° 59' 40" W, 324 fms.

Thecocarpus distans (Allman 1877). — Allman, 1877: 44, off Pacific Reef, 283 fms. Clarke, 1879: 247, Gulf of Mexico, NW of Tortugas, 25° 33' N, 84° 35' W, 539 fms.

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