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# SPONGES FROM THE GULF OF MEXICO[1]

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ABSTRACT

In 1948, a collection of sponges was made by the Marine Laboratory of the University of Miami in the eastern Gulf of Mexico. Twenty-two stations were studied, at depths from 6 to 20 meters, in the area between Dry Tortugas and the northeastern part of the Gulf. The collection comprises 52 species in 41 genera, all within the class Demospongea. Of these, 11 species are new: *Myrmekioderma styx, Thalyseurypon vasiformis, Dictyociona adioristica, Echinostylinos unguiferus, Axinella polycapella, Homaxinella waltonsmithi, Prianos tierneyi, Spirastrella coccinopsis, Prostylissa spongia, Scolopes megastra,* and *Unimia trisphaera.* The new name *Neamphius* is provided to replace the preoccupied generic name *Amphius.* The new genus *Unimia* is described, with *U. trisphaera* n.sp. as type species. The genus *Darwinella* is removed from the Aplysillidae to the Darwinellidae. *Xestospongia calyx* (Schmidt) and *X. halichondrioides* (Wilson) are synonymous with *X. muta* (Schmidt). *Tenacia micropunctata* Burton (not collected in the Gulf), incorrectly transferred earlier to *Thalyseurypon,* should be placed in the genus *Eurypon.* It is suggested that: *Dictyociona clathrata* and *D. terraenovae* (neither collected in the Gulf) be transferred to the genus *Thalysias;* the order Halichondrina be dropped and most or all of its families removed to the Poecilosclerina; the genus *Paracordyla* be dropped in synonymy to *Scolopes; Stelletta tuberosa* Hentschel (not collected in the Gulf) receive the new name *Myriastra hentscheli.* Additional description is provided for a number of species. An analysis of the sponge collection by stations is included.

A collection of sponges was made in the autumn of 1948 by the staff of the Marine Laboratory of the University of Miami.[2] Especial mention should be made of the field work of J. Q. Tierney and Charles Dawson in amassing and preserving this collection. Where notes as to color in life are available, the reference is to this work.

The area from which the specimens were collected is at the east end of the Gulf of Mexico, just west of the peninsula of Florida, and extends from the northwestern portion of the State of Florida southward to the Dry Tortugas. Within this area 22 stations were studied, at depths from 6 to 20 meters, but chiefly between 11 and 15 meters. Professional sponge divers were employed to collect at each station as nearly as possible a complete selection of the fauna and flora there present.

This study was made in behalf of the Florida State Board of Con-

1 Contribution No. 85 from the Marine Laboratory, University of Miami.

2 Specimens in the museum of this institution are denoted by numbers preceded by the designation ML.

servation as a result of the condition of the commercial sponge industry. In 1939-1940, commercial sponges were swept by an epidemic which reduced them to approximately 5 percent of their previous numbers. After 1940, the commercial fishermen collected the survivors of the epidemic so assiduously that by 1948 very few remained. The 22 stations here treated would normally have yielded, prior to 1939, very numerous specimens of *Spongia* and *Hippiospongia*. In 1948, on the contrary, most of these stations yielded no specimens of these, the commercial genera; and no station yielded large, profitable numbers of marketable sponges. The present article thus is concerned chiefly with noncommercial sponges.

The collection includes 52 species, in 41 genera. Of these, one genus and 11 species are here treated as new. None are of the class Calcispongea, probably because the (usually small) calcareous sponges were overlooked by the divers; none are of the class Hyalospongea, because these occur only in deep water, in the Gulf of Mexico chiefly at depths greater than 500 meters. Thus the entire collection is within the class Demospongea.

## Order KERATOSA (or KERATOSIDA) Bowerbank

### Family SPONGIIDAE Gray

### Genus *Spongia* Linné

*Spongia zimocca* Schmidt subspecies *barbara* Duch. Mich.

This is the well-known commercial variety known as the "yellow" sponge. It was certainly taken at station 21, 6.5 meters depth, 27 October 1948 (ML 4:183). If, as the records indicate, not one was found at any of the other 21 stations, this is evidence of the drastic extent to which the sponge disease epidemic, followed by intensive collecting, had depleted the area.

*Spongia graminea* Hyatt

This is the well-known commercial variety called the "grass" sponge. It too was certainly taken at station 21, 8 meters depth, 27 October 1948 (ML 4:138 and ML 4:181). These are both poor specimens of a variety which at best is of inferior commercial quality.

*Spongia* sp. (?)

Notes indicate that at stations 6 and 13 there were taken "wire" sponges. These are not now represented by specimens. Wire sponges may be of several species; the term is vernacular, referring to coarse, inferior quality of skeleton.

Genus *Hippiospongia* de Laubenfels

*Hippiospongia lachne* de Laubenfels

This is the well-known commercial variety called the "sheepswool" sponge. It is represented in the collection by ML 4:139, taken at station 22, depth 14.5 meters, 28 October 1948; and by ML 4:242, taken at station 18, depth 14.5 meters, 11 October 1948. It may be observed that the collecting was done by a man accustomed to diving for commercial sponges, and that such a man would be most familiar with "sheepswools" and most alert to find any of this variety that might be present.

*Hippiospongia gossypina* (Duch. Mich.) de Laubenfels

This is the well-known commercial variety called the "velvet" sponge. It is represented in the collection by ML 4:182, taken at station 22, depth 14.5 meters, 28 October 1942.

Genus *Aulena* Lendenfeld

*Aulena columbia* de Laubenfels

This is a little-known genus and only the third record for the species; therefore, it may here be described in some detail.

It is represented in the collection by ML 4:147 (USNM 23392)[3], taken at station 20, depth 12.5 meters, 26 October 1948.

It is a mass, chiefly amorphous but somewhat lobate, 11 cm. high, and 12 by 14 cm. laterally. The color of the exterior is chiefly pale drab, but some portions are darker, almost black. The interior is altogether pale drab. The consistency is spongy.

The surface must be described as conulose. Other specimens of this genus have possessed instead surfaces tuberculate, or even villous. Yet to the author this specimen had immediately the appearance of an *Aulena*. This is attributable, in part, to the oscules (3 to 6 mm. in original diameter), which close by iris-type membranes. This is a marked difference from the oscules of *Spongia* and *Hippiospongia* which *Aulena* otherwise resembles. The very numerous pores are microscopic, probably all under 60 microns in diameter.

The ectosome is a very thin organic dermis, about 10 microns thick, over fairly extensive subdermal cavities. The endosome has the unique structure of *Aulena*. The inhalant and exhalant canals (prosochetes and apochetes) are never small, but are all so large that the rest of the tissue is reduced to thin sheets about 30 microns thick. In these the flagellate chambers appear like holes, 30 microns in diameter.

[3] Refers to U. S. National Museum catalog number.

The skeleton consists of a fibrous reticulation. The fibers are extremely like those of *Spongia,* with clear secondaries and debris-filled, rather uncommon primaries (ascending fibers), but in *Aulena* they are some 60 microns in diameter, as compared to 20 microns in *Spongia.* The meshes are also correspondingly coarse. It may be that many of the commercial sponges of the poor quality termed "wire" sponges were *Aulenas.* Doubtless other genera were also lumped into this category.

The species *columbia* was described by de Laubenfels (1936, page 13) from two specimens dredged on 25 and 26 June 1932 near Loggerhead Key and thus near the location of this third specimen.

Genus *Ircinia* Nardo

*Ircinia fasciculata* (Pallas) de Laubenfels

This is often known colloquially as the "stinker" sponge, but all species of *Ircinia* have the identical sulfurous odor and also the peculiar microscopic filaments which render their flesh the toughest, most leathery of all sponges. This, often incorrectly known as *variabilis,* is the brown, amorphous and lobate species, with dark oscules and the smallest conules.

It is represented in the collection by ML 4:050, taken at station 4, depth 14.5 meters, 25 September 1948; and ML 4:204, taken at station 19, depth 18 meters, 24 October 1948. Notes indicate that it was also taken at stations 13, 14, 20 and 22, these four not now being represented by specimens.

*Ircinia campana* (Lamarck) de Laubenfels

This is the bell- or vase-shaped *Ircinia,* more or less reddish, with medium-sized conules (see: de Laubenfels, 1936, plate 8, opposite page 20).

It is represented in the collection by ML 4:062, taken at station 10, depth 12.5 meters, 30 September 1948; and ML 4:194, taken at station 8, depth 14 meters, 29 September 1948. Notes indicate that it was also taken at stations 5, 6, 7, 11, 13, 14, 17, 19, 20, and 21, these ten not now being represented by specimens.

*Ircinia strobilina* (Lamarck) de Laubenfels

This is the cake-shaped *Ircinia,* dark grey to black, with the coarsest conules. It is called "loggerhead" in the Bahamas, but is not identical with sponges elsewhere called by that name.

It is represented in the collection by ML 4:066, taken at station 11, depth 11 meters, 1 October 1948; and by ML 4:243, taken at

station 10, depth 12.5 meters, 30 September 1948. Notes indicate that it was also taken at stations 6, 8, 13, 15, 16, 17 and 19, but these seven are not now represented by specimens.

Obviously sponges of the genus *Ircinia* withstood the sponge epidemic excellently.

Genus *Verongia* Bowerbank

*Verongia fistularis* (Pallas) de Laubenfels

This is the tubular, bright yellow *Verongia* that turns black and hard upon dying. It is represented in the collection by ML 4:070, taken at station 16, depth 22 meters, 3 October 1948.

*Verongia aurea* (Hyatt) de Laubenfels

This is much like the preceding, but not hollow; the two may really be conspecific. It is represented in the collection by ML 4:192, taken at station 19, depth 18 meters, 24 October 1948.

*Verongia lacunosa* (Lamarck) de Laubenfels

This is the tubular *Verongia* with deep horizontal-convoluted folds on its surface, not as yellow in life, nor quite as black upon preservation as the preceding. It has long been known, incorrectly, as *Verongia archeri*. It is represented in the collection by ML 4:195, taken at station 16, depth 20 meters, 3 October 1948.

*Verongia longissima* (Carter) de Laubenfels

This is the long, thin, ramose *Verongia*, not bright yellow in life nor quite black after death. It is represented in the collection by ML 4:149, taken at station 8, depth 14 meters, 29 September 1948. Notes indicate that it was also taken at stations 14, 19, and 20, but these three are not now represented by specimens.

Family DYSIDEIDAE Gray

Genus *Dysidea* Johnston

*Dysidea fragilis* (Montagu) Johnston

This is the common grey or lavender *Dysidea*, described in detail by de Laubenfels (1936, July 27; 1950, May 22). It is represented in the collection by ML 4:205, taken at station 10, depth 12.5 meters, 30 September 1948. Notes indicate that it was also taken at station 5; this is not now represented by a specimen.

*Dysidea crawshayi* de Laubenfels

This is the orange colored, conulose sponge that may eventually need a genus of its own, because of its peculiar chemical properties,

concerning especially the elements fluorine and nickel. It was first described by de Laubenfels (1936, page 28), and it was later described in more detail by de Laubenfels (1950, page 26). It is represented in the collection by ML 4:226 (USNM 23393), taken at station 7, depth 14 meters, 28 September 1948.

Genus *Ianthella* Gray

*Ianthella ardis* de Laubenfels

This interesting species was first described from the Dry Tortugas area by de Laubenfels (1936, page 31), where it was erroneously identified as being *Ianthella basta.* It was described in detail and given the name *ardis,* by de Laubenfels (1950, page 31). It is massive, conulose, more-or-less greenish in life, turning black after dying. There are cells inside the hollow fibers.

It is represented in the collection by ML 4:199, taken at station 14, depth 12 meters, 2 October 1948, and by ML 4:241, taken at station 16, depth 20 meters, 3 October 1948.

Family APLYSILLIDAE Vosmaer

Genus *Aplysilla* F. E. Schulze

*Aplysilla sulfurea* F. E. Schulze

The species *sulfurea* is bright yellow in life; so was the specimen now under discussion. However, *sulfurea* usually turns black after dying and this specimen has turned dull red. The species *glacialis* has also been reported from the West Indian region (de Laubenfels, 1950, page 36) and is rosy red in life, but it fades upon preservation. The present specimen, except for color, might be either *glacialis* or *sulfurea,* but appears more like *sulfurea.* The identification is tentative.

It is represented in the collection by ML 4:212 (USNM 23394), taken at station 4, depth 14.5 meters, 25 September 1948.

Family DARWINELLIDAE Vosmaer

Genus *Darwinella* Müller

*Darwinella mülleri* Max Schulze

This genus is so rare and interesting that this discovery of a specimen of it warrants description.

It is represented in the collection by ML 4:203 (USNM 23395), taken at station 20, depth 12.5 meters, 26 October 1948.

It is a ramose sponge, reaching a height of 12 cm. The numerous branches (more than 20) are about 1 cm. in diameter but quite irregular in shape and size; many are hollow. Field notes indicate that the color in life was "reddish tan" and that portions of the sponge

appeared to be diseased. The preserved sponge is pale drab. The consistency is softly spongy, easily torn.

The surface is conulose, each conule little more than a protruding fiber-end; they are 0.5 mm. high and 1 to 2 mm. apart. There is an organic dermis about 10 microns thick. The pores are closed. The oscules may be represented by the 2 to 7 mm. diameter apertures at the apices of the hollow branches. The flagellate chambers are conspicuous, 50 to 60 microns in diameter.

The skeleton includes a basic mass of dendritic fibers but with many anastomoses between them, so that a definite reticulation results. The larger fibers contain scattered bits of foreign debris; some grains of sand in the fibers are so large that the spongin merely ties them together.

There are numerous spicules made of spongin, as characteristic of the genus *Darwinella*. These are nearly always triaxons with rays about 15 by 500 to 600 microns in dimension, but a few of them are tetraxons, instead.

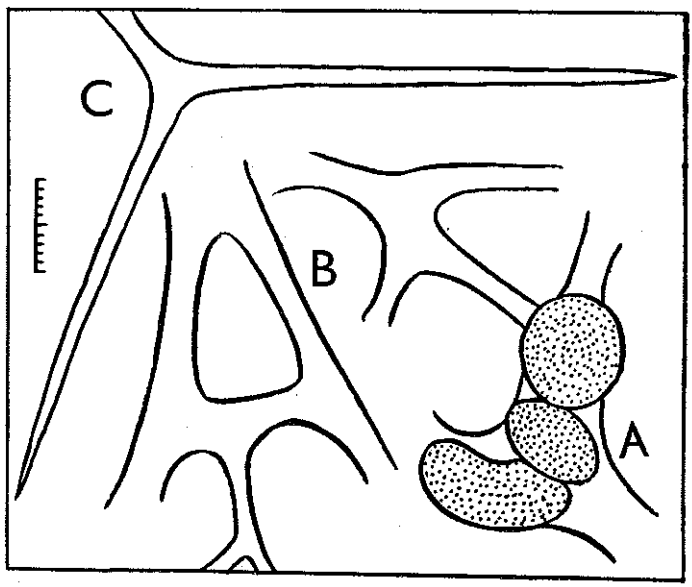


FIGURE 1. *Darwinella müilleri*. A: A small portion of a fiber that contains foreign debris. B: Two portions of the commoner clear fiber, illustrating size and pattern. C: A portion of one of the spicules made of spongin. These are camera lucida drawings, matching the enclosed scale, which shows 100 microns divided into 10-micron units.

This species was described by Max Schulze (1865, page 5) from the Mediterranean region. It was later recorded from Australia by Carter (1885, page 202), then from Bermuda by de Laubenfels (1950, page 38), in each case noted as rare. A report is here made for the first time of the discovery of the species as a thin crust on a mangrove root at Garden Cove, Key Largo, Florida, 9 July 1952. As more specimens accumulate, it may prove necessary to divide the genus into several species.

*Darwinella* has been put, always with reservations, in the same family with *Aplysilla.* This family was named by Vosmaer in Bronn's "Thierreich." In some of the printings (made in 1886), he called it Darwinellidae, because *Darwinella* was the oldest genus in the family. In other printings of the same reference (made in 1883), he had it instead as Aplysillidae. This was defended by de Laubenfels (1948, page 163) because of the fact that *Darwinella* might need removal from the family. The time has now come for such removal. The present specimen is the most ample yet found and reveals two significant characteristics: the tendency to incorporate foreign debris in some fibers, and the tendencies for fibers to anastomose to yield reticulate skeletons. Therefore, we need to recognize a distinctive family for the genus. The name may, however, be ascribed to Vosmaer as of 1886, but amended to exclude all the other genera that were placed in Aplysillidae by de Laubenfels (1948, page 163). Thus the Aplysillidae now includes only *Aplysilla, Chelonaplysilla, Pleraplysilla,* and *Psammaplysilla.*

The family Aplysillidae is characterized thus: Keratosa with fibers of concentrically laminated spongin; these fibers are dendritic, with no anastomoses, or at most an occasional apparently accidental junction. They do not contain foreign debris. The flagellate chambers tend to be very large, often about 50 to 60 microns in diameter.

The family Darwinellidae may be characterized thus: Keratosa with fibers of concentrically laminated spongin; these fibers are chiefly dendritic, but do exhibit fairly frequent anastomoses, yielding reticulations. They sometimes contain foreign debris. There are also present spicules made of spongin, often triactinellid in shape, but sometimes tetractinellid or even polyactinellid.

Order HAPLOSCLERINA (or HAPLOSCLERIDA) Topsent

Family HALICLONIDAE de Laubenfels

Genus *Haliclona* Grant

*Haliclona rubens* (Pallas) de Laubenfels

This common, red, ramose *Haliclona* was redescribed in detail by de Laubenfels (1936, page 40). It is represented in the collection by ML 4:196, taken at station 13, depth 19 meters, 2 October 1948. Notes indicate that it was also taken at station 13; this is not now represented by a specimen.

*Haliclona viridis* (Duch. Mich.) de Laubenfels

This common, incrusting, massive or ramose green *Haliclona* was redescribed in detail by de Laubenfels (1936, page 42). It is represented in the collection by ML 4:151, taken at station 8, depth 14 meters, 29 September 1948, and ML 4:213 (USNM 23396), taken at station 21, depth 6.5 meters, 27 October 1948. It is probably also represented by small specimens growing on the surfaces of large specimens of other genera. *Haliclona viridis* often grows on other sponges.

Genus *Neopetrosia* de Laubenfels

*Neopetrosia longleyi* de Laubenfels

This is an abundant West Indian species, brittle and internally pale, externally ranging from drab, to yellow green, to olive green. It is repent and ramose, with conspicuous oscules. It was redescribed in detail by de Laubenfels (1936, page 44). It is represented in the collection by ML 4:078, taken at station 6, depth 12 meters, 27 September 1948.

Genus *Xestospongia* de Laubenfels

*Xestospongia muta* (Schmidt) de Laubenfels

This is a species that warrants redescription and reconsideration. It is represented in the collection by ML 4:223 (USNM 23397), taken at station 13, depth 19 meters, 2 October 1948.

According to field notes, the specimen was a cup or vase 20 cm. high and 15 cm. in diameter. Portions of this occur in the collection, preserved in alcohol. The bulk of the specimen appears to be missing but may later be found. The walls of the vase were 4 cm. thick. The central concavity was described as being only 6 cm. deep. The color in life was given in the field notes as externally pink, internally yellow. The alcoholic specimen is dark walnut brown, slightly paler internally

than externally. The consistency is firm, somewhat brittle, as characteristic of *Xestospongia.*

The surface is uneven but not hispid. The pores cannot now be perceived. Oscules were represented, according to field notes, by a number of small openings on the bottom of the concavity. There is no dermal specialization. The interior is packed with spicules, rather outlining chambers and canals than forming elongate tracts. The spicules are diactines, varying from oxeas to strongyles, sizes about 15 by 300 microns.

Schmidt (1870, page 44) described sponges as *Schmidtia calyx* and *Schmidtia muta.* The former was vasiform with thinner spicules. The latter was massive, with thicker spicules. The descriptions are tantalizingly brief, but the proper genus is clearly *Xestospongia,* as observed by de Laubenfels (1950, page 51). Wilson (1902, page 389) described a similar massive sponge from Puerto Rico as *Petrosia halichondrioides.* It was set apart by its dark brown color in preservative. It was transferred to *Xestospongia* by de Laubenfels (1950, page 51).

In Bermuda, there was a large, macerated vasiform sponge, described by de Laubenfels (1950, page 49) as *Xestospongia calyx* (Schmidt).

The Gulf of Mexico sponge of the present collection for the first time reveals the color in life. It turns dark brown after death, and therefore it seems evident that *halichondrioides* should fall in synonymy to *muta.* The present sponge has the thicker spicules of *muta* but tends in the direction of the shape of *calyx.* It is here suggested that this variation falls within the normal range of the species, exactly as it does in the genus *Spheciospongia.* Certainly in the latter genus, and probably in *Xestospongia,* thick-walled vases may result from an accumulation of foreign debris on a top which originally was only slightly concave. The periphery continues to grow vertically, while growth of the center is inhibited. Therefore, the species *calyx* should also be dropped in synonymy to the species *muta.*

### Genus *Dasychalina* Ridley and Dendy

### *Dasychalina cyathina* de Laubenfels

This has been known hitherto only from beachworn, macerated specimens; therefore, a redescription may be appropriate.

This is represented in the collection by ML 4:206 (USNM 23398), taken at station 14, depth 12 meters, 2 October 1948. Notes indicate

that it was also taken at stations 13 and 16; these are not now represented by specimens.

It is a vase 19 cm. high and 10 cm. in diameter, with walls chiefly about 1 cm. thick, but tapering to a fairly sharp upper rim. Many fibers project above the rim, giving it an erect, stiff fringe. The color in alcohol is nearly black. Is this brought about by other sponges that were with it, or by post-mortem alterations of various kinds? No data as to the color in life is available. This is especially regrettable because the species (as already noted) has been known previously only from beachworn specimens. The blackish color is quite unexpected within the genus, is rare in the family, and may well be artificial or post-mortem. The consistency is stiffly spongy.

The surface is conulose, with conules 1 to 2 mm. high, 2 to 4 mm. apart. The pores seem to be closed, but the oscules, or (better) the apopores, opening into the cloaca are 1 to 2 mm. in diameter and about 4 mm. apart, center to center. The ectosome is somewhat fleshy but scarcely, if at all, set off from the micro-cavernous enclosure.

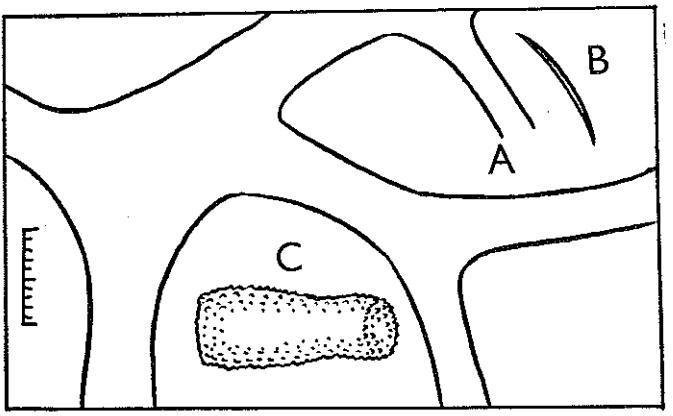


FIGURE 2. *Dasychalina cyathina.* A: Camera lucida drawing of a portion of the fibrous skeleton. B: Camera lucida drawing of one of the spicules. A and B match the enclosed scale which shows 100 microns with 10-micron subdivisions. C: Free-hand sketch of the entire sponge, x 1/9.

The skeleton consists of spongin fibers often 60 microns in diameter, but some are larger, even up to 120 microns, forming an irregular reticulation, with meshes at least 300 microns in diameter. The spicules are oxeas usually 5 by 150 microns; smaller ones are probably developmental. A few are as large as 7 by 200 microns.

These spicules are common both loose in the flesh and also embedded in the fibers—at least seven per cross section of any fiber.

This species was described by de Laubenfels (1936, page 45) from the Dry Tortugas, on the basis of a macerated beachworn specimen. The skeleton of the present specimen is very much like that of the type specimen, even in details.

Family DESMACIDONIDAE Gray

Genus *Iotrochota* Ridley

*Iotrochota birotulata* Higgin

This is the fairly common West Indian ramose sponge that not only emits a purple exudate, but also is dark purple in life, with a yellow-green surface sheen. It was described at length by de Laubenfels (1936, page 49).

It is represented in the collection by ML 4:207, taken at station 14, depth 12 meters, 2 October 1948. Notes indicate that it was also taken at station 16 but this is not now represented by a specimen.

Genus *Fibulia* Carter

*Fibulia massa* Carter

Sponges of the genus *Fibulia* are even more chemically irritating than those of the notorious genus *Tedania*. They resemble wet loaves of bread. They were described by de Laubenfels (1936, page 51). The various species of *Fibulia* are separated for differences in the microsclere content and are closely inter-related. Probably the commonest species is *nolitangere* Duchassaing and Michelotti. The present specimen, however, has the strongyles, raphides and sigmas which characterize the species *massa*.

It is represented in the collection by ML 4:210 (USNM 23399), taken at station 7, depth 14 meters, 28 September 1948. Notes indicate that a *Fibulia* was also taken at station 8 but this is not now represented by a specimen, and the species therefore cannot be determined.

Genus *Xytopsues* de Laubenfels

*Xytopsues griseus* (Schmidt) de Laubenfels

A detailed description of this curious sponge was given by de Laubenfels (1950, page 75). The present specimen resembles that from Bermuda in amazing detail, even to being packed with algae, probably of the genus *Jania*. This species is represented in the collection by ML 4:224 (USNM 23424), taken at station 15, depth 17 meters, 3 October 1948.

Family CALLYSPONGIIDAE de Laubenfels

Genus *Callyspongia* Duch. Mich.

*Callyspongia vaginalis* (Lamarck) de Laubenfels

This is the abundant, tube-shaped West Indian sponge. It was discussed by de Laubenfels (1936, page 56). The genus *Patuloscula* was also accepted as valid; this is no longer the accepted opinion. It must be dropped in synonymy to *Callyspongia*. The species described on page 56 (loc. cit.) is not *plicifera* but *procumbens; plicifera* is characterized by walls that are curiously and conspicuously horizontally folded. *Callyspongia vaginalis* is represented in the present collection by ML 4:185, taken at station 10, depth 12.5 meters, 30 September 1948; and by ML 4:240, taken at station 14, depth 12 meters, 2 October 1948. Notes indicate that two additional specimens were taken at station 14, two at station 16, others at stations 17 and 20.

Order POECILOSCLERINA (or POECILOSCLERIDA) Topsent

Family PHORBASIDAE de Laubenfels

Genus *Myrmekioderma* Ehlers

*Myrmekioderma styx* new species

The holotype of this species is USNM 23400. The paratype (a portion of the holotype) is ML 4:211, taken at station 10, depth 12.5 meters, 30 September 1948.

This is an amorphous sponge, exceedingly lumpy, 7 cm. high and 14 cm. in diameter. Field notes indicate that in life it was orange, with a whitish appearance at the surface; this latter is caused by the abundance of spicules there, and in some cases by foreign debris. The consistency is mediocre.

The surface is extremely irregular, but there are hundreds of hemispherical lumps or tubercles, 3 mm. in diameter. These and the color are very characteristic of the genus *Myrmekioderma*. There are several saucer-shaped depressions 12 mm. in diameter. Field notes indicate that these showed many apertures in the freshly collected specimen and may be regarded as pore areas. Some, however, may have been exhalant. There are coarse pits here and there; some of these may represent the oscules, but they appear rather to be the locations from which foreign objects have been removed. The ectosome is an organic dermis, blending into the underlying endosome. The latter is dense but contains many canals about 6 mm. in diameter. There are spicular tracts present, but there is no definite reticulation.

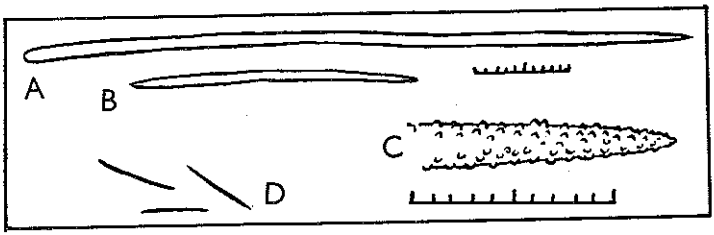


FIGURE 3. *Myrmekioderma styx*. Camera lucida drawings. A: Style. B: Oxea. These match the upper scale, which shows 100 microns divided into 10-micron units. C: One end of the oxea. D: Raphides. C and D match the lower scale, which shows 50 microns subdivided into 5-micron units.

The megascleres are of two sorts. Firstly, there are smooth monaxons, usually styles, but sometimes approaching oxeote or strongylote shape. These are about 12 by 700 microns. Secondly, there are abundant oxeas 10 by 330 microns, covered with minute tubercles; they might be termed acanthoxeas, but are different from the ordinary spicule type so named. The microscleres are raphides or trichodragmas, 0.3 by 20 microns; these are especially abundant at the immediate surface.

This species is distinctive for the sort of microsclere present, but especially for the grouping of pores in rounded shallow depressions. In other species of the genus, the pores are distributed along the bottoms of the valleys which separate the distinctive convexities of the surface.

## Family COELOSPHAERIDAE Hentschel

### Genus *Rhizochalina* Schmidt

### *Rhizochalina hondurasensis* (Carter) de Laubenfels

The specimen now under consideration is not typical of the species to which it is assigned; therefore, a description of it is warranted.

This is represented in the collection by ML 4:209 (USMN 23401), taken at station 16, depth 20 meters, 3 October 1948.

It is hemispherical, 11 cm. high and 9 by 20 cm. in lateral measurement. It is said to have been brown in life but now it is nearly black. The consistency is stiff and somewhat crumbling, yet the dermis and fibers are tough.

The surface is irregular. The pores, now closed, seem to have been about 100 microns in diameter and abundant. The oscules are represented by thin walled tubes, 3 mm. in diameter. Of these, there is

one per 2 square cm. over most of the sponge's convex surface. These tubes are usually about 20 mm. high. The ectosome is a felted mass of chiefly horizontal spicules and is about 30 microns thick, very dense. The endosome is cavernous; the many spherical cavities (which are about 1 mm. diameter) represent the meshes in a three dimensional reticulation of fibers that are about 100 microns thick. The flesh is thinner than the fibers and chiefly coats them. Thus, there is a very high ratio of cavity to solid or semi-solid substance. It is typical of the genus *Rhizochalina* that the interior should be even more coarsely cavernous, even a single large cavity. That such is not the case for the present specimen may be due to the fact that it is exceptionally old, past maturity.

Family MICROCIONIDAE Hentschel

Genus *Thalyseurypon* de Laubenfels

*Thalyseurypon vasiformis* new species

The holotype of this species is USNM 23403. The paratype is ML 4:232, taken at station 21, depth 6.5 meters, 27 October 1948.

It is vase-shaped, 14 cm. high, 12 cm. in diameter at the rim. The base of attachment was 5 cm. in diameter. The walls taper from a basal thickness of 3 cm. to a fairly sharp rim. The color of the exterior is very dark drab, almost black; the interior is also very dark drab. Field notes indicate that these were also the colors in life. The consistency is flexible and compressible.

The surface is described in field notes as being "slippery" in life. It is smooth in most places, but coarsely lumpy, with some patches quite villous; the latter appearance may be the result of foreign objects becoming attached to the growing surface. The pores and oscules are not visible to the unaided eye.

The ectosome shows organic specialization only and is not sharply marked off from the endosome. The latter is cavernous, with many fibers that form only a vague reticulation, and are chiefly in confusion. The fibers are often a little more than 200 microns in diameter. They contain spongin but chiefly are packed with spicules.

The skeleton comprises the above mentioned fibers and spicules. The abundant type is a large, smooth tylostyle, often about 11 by 700 microns. Some are as large as 13 by 900 microns. Much smaller ones may be juveniles. These spicules fill the fibers, and some are loose in the flesh. A second type of megasclere is an acanthotylostyle, about 5 by 105 microns; this sort occurs chiefly as echinating the fibers. A

long and careful search was made for microscleres. Three sigmas were finally found, but from so large a volume of sponge that it must be seriously doubted that they are proper to it.

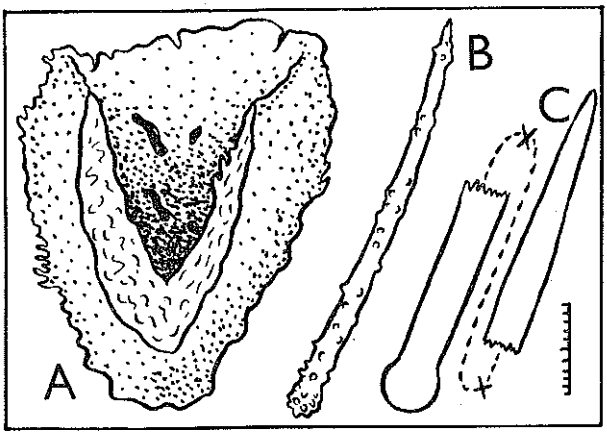


FIGURE 4. *Thalyseurypon vasiformis.* A: Free-hand sketch of the sponge (with a section cut out), x 1/3. B: Camera lucida drawing of one of the echinating spicules. C: Camera lucida drawing of the head and of the point of one of the tylostyles. The central portion is not shown. B and C match the enclosed scale, which shows 100 microns divided into 10-micron units.

This species, as indicated by the specific name which has been selected, is sharply characterized by its vase-like shape.

In 1936 (page 107), de Laubenfels transferred *Tenacia micropunctata* Burton to *Thalyseurypon;* this was not correct. The species should rather be transferred to the genus *Eurypon.*

## Genus *Dictyociona* Topsent

### *Dictyociona adioristica* new species

The holotype of this species is USNM 23403. The paratype is ML 4:214, taken at station 8, depth 14 meters, 29 September 1948.

The specimen appears ramose, but it may have been an encrustation detached in such a manner as to yield this appearance. The greatest measurement is about 20 mm., the thickness, 2 to 5 mm. The color in life was bright red, and the consistency is mediocre.

The surface is velvety smooth, with only very thin organic specialization. The pores and oscules are closed. There are vague tracts of relatively large tylostyles with spines only on their heads; these mega-

scleres are about 15 to 330 microns. The tracts are echinated by smaller acanthotylostyles, 8 by 82 microns in dimensions. Intermediates occur. The microscleres include abundant palmate isochelas 12 microns long. Toxas are also to be expected, but search has not so far revealed them.

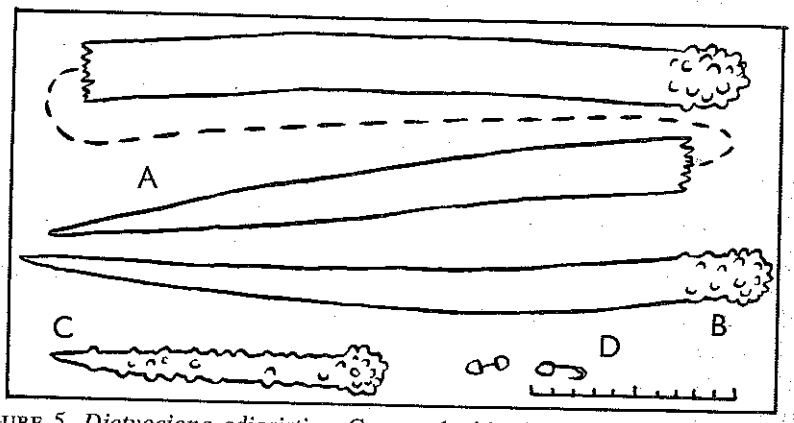


FIGURE 5. *Dictyociona adioristica.* Camera lucida drawings. A: Principal megasclere type, in two installments; the entire tylostyle shows. B: Intermediate type. C: Echinating acanthotylostyle. D: Two palmate isochelas. All these correspond to the enclosed scale, which shows 50 microns divided into 5-micron units.

The species *adioristica* is much like many others of the genus. In the following outline, however, there are cited only some of the respects wherein *adioristica* differs from the other species to which it is compared. All the species now in *Dictyociona* are considered.

*D. acanthotoxa* (Ireland) has megascleres half as thick but twice as long. It not only has toxas, but these are peculiarly spined.

*D. asodes* (California) is distinctly yellow in color, and some of its chelas are only 3 microns long.

*D. clathrata* (Australia) is not a proper *Dictyociona,* and should be transferred to *Thalysias.*

*D. discreta* (Chile and Argentina; the genotype) not only has toxas (a small difference) but has some special dermal smooth tylostyles.

*D. ditoxa* (Ireland) has no spicules that are obviously echinating, and it has two kinds of toxas.

*D. heterotoxa* (Arctic) also has these two kinds of toxas, and, like *D. acanthotoxa,* has very long, very thin megascleres.

*D. microchela* (Ireland) lacks obvious echinating spicules and has very small chelas.

*D. oxneri* (Azores) has a second type of chela, very peculiar.

*D. pyramidalis* (Australia) has peculiar tornotes.

*D. tenuissima* (Ireland) has extremely large megascleres (21 by 1500 microns) and very long toxas (550 microns).

*D. terraenovae* (New Zealand) should be transferred to *Thalysias.*

Family OPHLITASPONGIIDAE de Laubenfels

Genus *Mycale* Gray

*Mycale angulosa* (Duch. Mich.) de Laubenfels

This common species was redescribed in detail by de Laubenfels (1936, page 114). The color varies with ecologic placement from grey to dark red. The convenient recognition mark is the extremely cavernous structure, like a froth of bubbles often nearly a centimeter in diameter. The spiculation of tylostyles with palmate anisochelas is distinctive.

It is represented in the collection by ML 4:197, taken at station 13, depth 19 meters, 2 October 1948; and by ML 4:239, taken at station 11, depth 11 meters, 1 October 1948. Notes indicate that it was also taken at stations 8 and 16; these are not now represented by specimens.

Genus *Echinostylinos* Topsent

*Echinostylinos unguiferus* new species

The holotype of this species is USNM 23404. The paratype is ML 4:215. This species was taken at station 10, depth 12.5 meters, 30 September 1948.

This sponge may be described as ramose, but the branches anastomose and are much more irregular than is true of most sponges so designated. The whole reaches a height of about 8 cm. and nearly as great a diameter. The basis of attachment is about 2 cm. in diameter. The branches are very irregular and lumpy, but they are under 1 cm. in greatest diameter. The sponge was bright red in life. Its consistency is mediocre.

The surface is velvety smooth, with only very thin organic specialization. The pores and oscules are closed. The endosome is full of exceptionally large flagellate chambers, often as much as 85 microns in diameter.

The skeleton comprises numerous smooth styles usually 13 by 100 microns to 12 by 145 microns. These make up tracts so vague that it

is not profitable to assign measurements to them. A second sort of megasclere is a smooth tylostyle, 5 by 90 microns. Spicules of this sort are scattered between the vague tracts of styles and might even be regarded as echinating them. They also abound at the surface, where they are often placed with their points outward. The fairly abundant microscleres may be described as arcuate chelas, but they have exceptionally sharp-pointed clads and are emphatically unguiferate. There is a larger size range, 20 microns in chord measurement, and a smaller category 10 microns in chord measurement. The latter may be chelas with reduced clads, or, on the other hand, they may be described as sigmas.

This species is unique within the genus for the unguiferate nature of its chelas, hence the specific name.

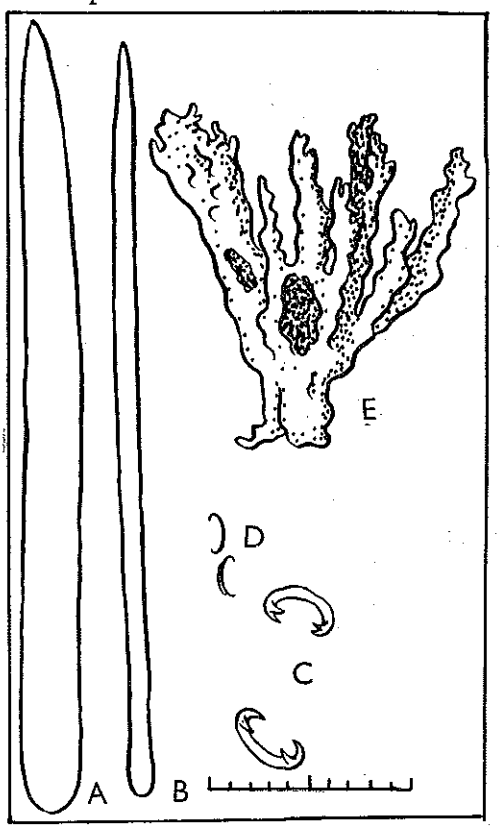


FIGURE 6. *Echinostylinos unguiferus.* A: Principal style. B: Supplementary tylostyle. C: Unguiferate arcuate isochela. D: Sigmas or reduced chelas. A, B, C, and D are camera lucida drawings, and match the enclosed scale, which shows 50 microns divided into 5-micron units. E: Free hand sketch of a portion of the sponge, x 1/3.

## Order (?) HALICHONDRINA Vosmaer

This order is not at all firmly established, but rather is open to severe criticism. It seems evident that many of its members are Ophlitaspongiidae merely deprived of microscleres; this shows affinity to the order Poecilosclerina. On the other hand, the Halichondridae, type family of the order, approach the Haliclonidae so closely that separation in the field is sometimes impossible. Yet *Haliclona* is in the order Haposclerina. These three orders blend together, with connecting intermediates of such complexity that at least a three dimensional diagram would be necessary to represent the relationships. It is here suggested that the order Halichondrina should be dropped and that most or all of its families be merged with those of the Poecilosclerina.

### Family AXINELLIDAE Ridley and Dendy

### Genus *Axinella* Schmidt

### *Axinella polycapella* new species

The holotype of this species is USNM 23405. The paratype (a portion of the holotype) is ML 4:202, taken at station 9, depth 13 meters, 29 September 1948. Notes indicate that it was also taken at stations 1, 4, 5, 6, 10, 11, 13, 18, 19, 20, 21 and 23; these twelve are not now represented by specimens. This is obviously an exceptionally abundant sponge in the eastern Gulf of Mexico, or else one that divers were especially likely to notice and be inclined to collect.

It is pronouncedly ramose. The type specimen was 60 cm. tall, and field notes indicate that yet taller ones occur, up at least to 75 cm. The branches are each about 1.5 cm. in diameter. The color is said to be bright red or orange-red in life. The consistency is stiffly spongy.

The surface is punctiform and hispid so that it is like velvet. The pores must have been about 300 microns in diameter, and situated one per square mm. of surface. The oscules are 1 to 2 mm. in diameter, about 1 cm. apart, and each is typically surrounded by a stellate pattern of radiating grooves. The dermis is protoplasmic, thin, and easily lost. The endosome contains a dense, flexible tough axis, whose diameter is about one third of that of the entire branch; in it the fibers run lengthwise. In the extra-axial region, there are plumose tracts perpendicular to the axis, and to the surface of the sponge. The tracts, and especially the fibers of the axis, contain spongin.

The spiculation of this sponge consists almost entirely of oxeas, about 7 by 234 to 11 by 215 microns. A few styles can be found, however, with dimensions about 7 by 178 microns.

Schmidt (1862, page 62) described *Axinella polypoides* from the Mediterranean. In 1870 (page 61), having specimens from the Gulf of Mexico (which must have been of the species now under discussion), he identified them, too, as being *polypoides*. There is certainly close relationship, but the Mediterranean sponge is yellow, where the American one is red; the Mediterranean form has abundant styles whereas these spicules are rare in the sponge from the Gulf of Mexico. Therefore, albeit with some hesitation, the latter is here treated as being a distinct species.

The following quotation concerning *Axinella polycapella* is from a report by J. Q. Tierney. He says:

"The commercial sponge divers of the Gulf of Mexico use these sponges as scouring pads; they are used to clean the glass face plates and metal parts of the diving helmet, and are rubbed over the inner surface of the face plate before the diver descends in order to prevent fogging of the glass by moisture. The author has dived in gear so treated, and no fogging at all was noticed. The spongers also use the sponges to polish bright work on board their vessels, and even use them as toothbrushes. Except for a slight 'fishy' taste, such an experience is not unpleasant, and the sponge removes stains from the teeth. Copper and bronze are quickly brought to a shining lustre when polished with this sponge."

Genus *Homaxinella* Topsent

*Homaxinella rudis* (Verrill) de Laubenfels

The specimen now under consideration is not typical of the species to which it is assigned; therefore, a description of it is warranted.

It is represented in the collection by ML 4:060 (USNM 23406), taken at station 4, depth 14.5 meters, 25 September 1948.

This is a ramose sponge with only a few (dichotomous) branchings. It reaches a height of 30 cm. and the branches are about 1.3 cm. in diameter. The color in alcohol is a pale yellowish-drab. No information as to appearance in life is available. The consistency is firm but flexible.

The surface is roughly punctiform; doubtless the pores were at the bottoms of the myriad little pits. The locations of the otherwise invisible oscules are revealed by occasional stellate patterns of radiating grooves. There is a very thin dermis, mostly lost. The endosome in-

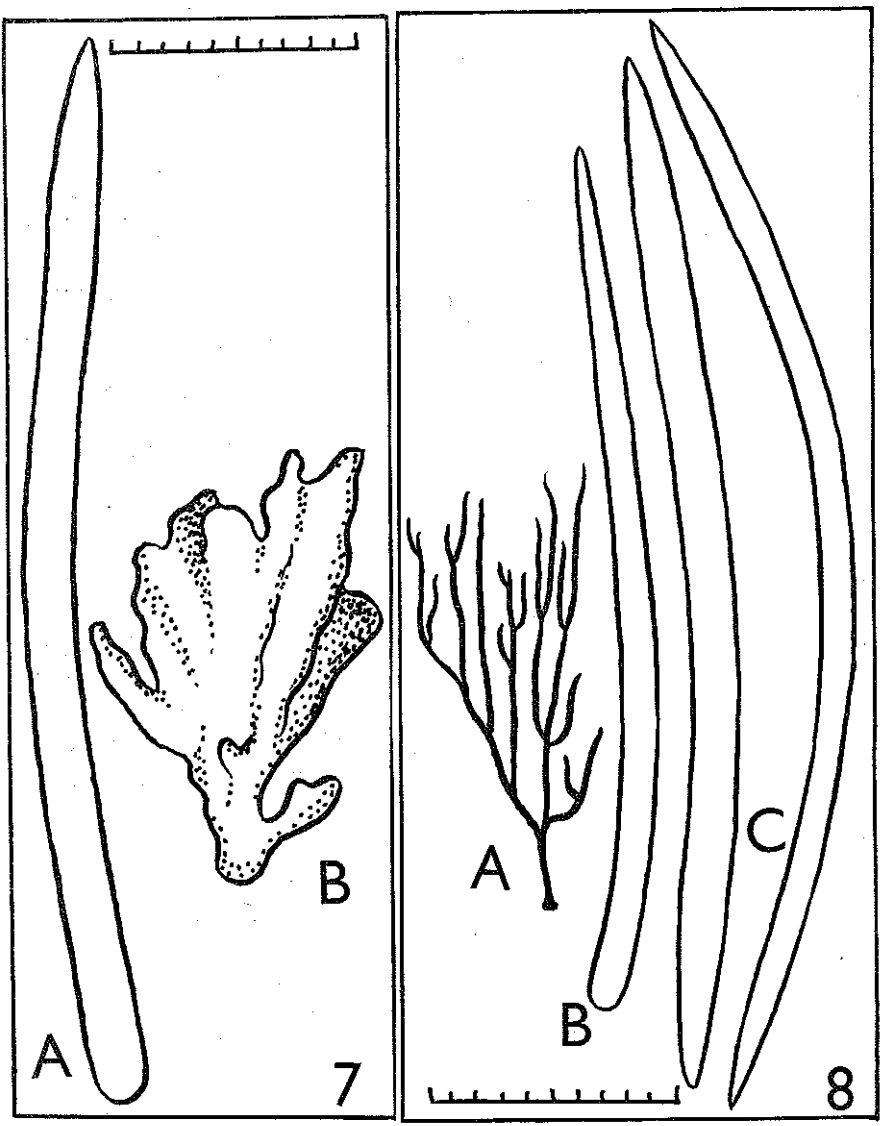


FIGURE 7. *Homaxinella waltonsmithi.* A: Camera lucida drawing of one of the spicules. This matches the enclosed scale, which shows 50 microns with 5-micron subdivisions. B: Free-hand sketch of part of the sponge, x 3/5.

FIGURE 8. *Axinella polycapella.* A: Freehand sketch of a part of a specimen, x 1/11. B: Camera lucida drawing of one of the styles. C: Camera lucida drawings of two of the oxeas. B and C match the enclosed scale, which shows 50 microns divided into 5-micron units.

cludes a rather dense axis, whose diameter is about a third of that of the entire branch. In it the fibers or spicular tracts run predominantly lengthwise. Around it, they stand erect, perpendicular to it and to the surface of the sponge.

The spicules are of one sort only: smooth, often somewhat bent styles, 20 by 300 microns in dimensions.

This specimen is here identified with hesitation. Verrill (1907, page 297 or 341; two printings of the identical article have different pagination) described *Axinella rudis* from Bermuda. His description is so vague and omits so much of importance, that it could easily include the present specimen. He specified Bermuda, however, and there is an abundant species at that place which, more nearly than any other, fits Verrill's *A. rudis*. This is a *Homaxinella* and it was redescribed by de Laubenfels (1950, page 87). The present Gulf of Mexico specimen has spicules twice as thick as those of the Bermuda specimens of *rudis,* and a surface far less complex. It thus approaches two species of *Homaxinella,* the one described as *Axinella arborescens* by Ridley and Dendy (1886, page 479) from Australia, and the other described as *Axinella tenuidigitata* by Dendy (1905, page 189) from the Indian Ocean. The surmise is here advanced that the present specimen may be a deeper-water form of the species which is abundant in Bermudian shallow water, but it may be an occidental representation of one or both of the Australo-Indian Ocean sponges.

*Homaxinella waltonsmithi* new species

The holotype of this species is USNM 23407. The remainder of the same specimen is ML 4:072. This species was taken at station 20, depth 12.5 meters, 26 October 1948.

This is a flabellate, or palmate sponge, attaining a vertical measurement of 11 cm., and nearly as great a width. The width cannot be easily expressed in centimeters, because of the somewhat convoluted shape. The stem is nearly round, about 1 cm. in diameter. Most of the fan is about 6 mm. thick, but in some folds or ridges it is perhaps twice that. The upper edge is irregular, with some projections that are almost digitate. The color in life was bright orange-red; in alcohol it is pale drab. The consistency is spongy.

The surface is smooth to the naked eye, but with the microscope it is seen to be hispid. The apertures are all closed; doubtless they were very small.

The skeleton comprises a distinct axial region in contrast to a peripheral portion. The axis is about a third of the total thickness, but is

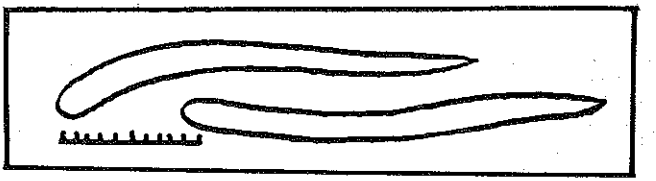

FIGURE 9. *Homaxinella rudis.* Camera lucida drawing of spicules. The enclosed scale shows 100 microns with 10-micron subdivisions.

more than a third where the thickness is greatest and less than a third in the thinner regions. The extra-axial region is often 2 or 3 mm. thick. In the axis, the main lines of spicular tracts are parallel to the surface, that is, they are erect, running up through the sponge from the base. In the extra-axial region, the tracts are perpendicular to the surface, and at the surface they end in erect tufts. These tracts are about 30 to 40 microns in diameter, usually about 4 spicules per cross section. They are often 200 to 230 microns apart, and are connected by single spicules placed like rungs in a ladder, about 200 to 250 microns apart. The spicules are exclusively smooth styles, about 10 by 220 microns.

This species is unique for its beautiful shape and for the smoothness of the surface. The specific name is given in respect to the eminent zoologist, F. G. Walton Smith.

Genus *Higginsia* Higgin

*Higginsia strigilata* (Lamarck) Topsent

This rather common West Indian sponge has long been known as *Higginsia coralloides* Higgin, but Topsent (1932, page 112) has shown that it is conspecific with Lamarck's *Spongia strigilata.* It is an orange or vermilion red sponge of exceedingly complex surface, with tubercles that are in turn tuberculate with tiny hispid tubercles. The species was redescribed (but still as *H. coralloides*) by de Laubenfels (1949, page 17).

It is represented in the collection by ML 4:136 (USNM 23425), taken at station 2, depth 9 meters, 24 September 1948. Notes indicate that a similar sponge, probably of this species, was also taken at station 19, but this station is not now represented by a specimen.

Family HYMENIACIDONIDAE de Laubenfels

Genus *Prianos* Gray

*Prianos tierneyi* new species

The holotype of this species is USNM 23408. The paratype is ML 4:228, taken at station 17, depth 7 meters, 3 October 1948.

It is an elaborate sponge, 20 cm. high and about 10 by 15 cm. in lateral measurement. There are two lobate towers, each with about a dozen or more oscules which are most abundant near the summits; there are also about a dozen lamellate protrusions rising like leaves, or in some cases like buttresses to the towers. These are often about 5 mm. thick and 5 cm. high. Field notes indicate that in life the exterior was "tan" color and the interior, white. The dry specimen, and the fragment in alcohol, are each dark mahogany or purplish externally and pale drab internally. The consistency is woody, or cork-like, resembling greatly that of *Spheciospongia*. In fact, the whole appearance suggests *Spheciospongia*.

The surface is exceptionally smooth. The numerous pores are about 135 microns in diameter, 400 microns apart. The oscules must have been about 5 or 6 mm. at least in diameter. They show indications of both sphincterate and iris-type closure. The ectosome is marked by a layer of cells (now very dark) blending into the endosome gradually. Nearly all the spicules that are right at the surface are perpendicular to it. Otherwise the spicules are packed in utter confusion. There are no definite tracts of spicules, nor fibers, just a cavernous endosome with felted masses of spicules in the dense tissues around the cavities. Many of the latter are as large as 1 cm. in diameter.

The spicules are smooth strongyles, about 9 by 260 microns in dimensions.

The genus *Prianos* was established by Gray (1867, page 520) for *Reniera amorpha* Schmidt 1864, a Mediterranean species of which the original description is not adequate. It was, however, a sponge whose only spicules were strongyles.

Burton (1930, page 512) said that *Reniera cratera* Schmidt 1862, from the same general region, and also ill-known, should be regarded as conspecific. Thus, the type should be called *Prianos craterus*.

The rather common and well known sponge which was called *Desmacidon columella* by Bowerbank (1874, page 243) was transferred to *Prianos* by de Laubenfels (1932, page 62); it may even be conspecific with *P. craterus*.

These European sponges were soft, especially in life, thus much like the genus *Batzella*.

A Californian sponge was named *Prianos problematicus* by de Laubenfels (1930, page 26). It is the closest to the present species. One might even erect a new genus for it and *P. tierneyi*. These two are stiff, and full of spicules, where the European *Prianos* is much more

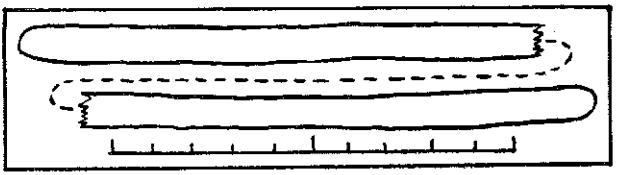

FIGURE 10. *Prianos tierneyi.* Camera lucida drawing of the spicule type (strongyle). The enclosed scale shows 100 microns subdivided into 10-micron units.

fleshy. The new species has the hardest consistency of all and is the least fleshy.

*Prianos problematicus* has a further difference from *tierneyi* in that it has some small (2 by 90 microns) oxeas among its spicules; furthermore, its strongyles are only 8 by 140 microns. Yet to have three genera, one for it, one for *craterus,* and another for *tierneyi,* does not now seem advisable, in spite of the fact that these three species differ in appearance so greatly that they might be in different orders!

The species is named in respect to J. Q. Tierney, with appreciation of his excellent work in amassing and preserving the present collection, and providing valuable field notes. Too many collectors merely toss many diverse species into a container without data as to appearance before preservation.

Genus *Hymeniacidon* Bowerbank

*Hymeniacidon amphilecta* de Laubenfels

This is the second occurrence of this species. A detailed description by de Laubenfels (1936, page 137) was based on a specimen taken in the Dry Tortugas, very close to the location from which the present specimen comes.

It is represented in the collection by ML 4:208, also by USNM 23409. It was taken at station 16, depth 20 meters, 3 October 1948.

Order HADROMERINA (or HADROMERIDA) Topsent

Family CHOANITIDAE de Laubenfels

Genus *Spheciospongia* Marshall

*Spheciospongia vesparia* (Lamarck) Marshall

This is the abundant sponge which is known in the Bahamas as "Manjack" and elsewhere as the "Loggerhead." It becomes larger than any other sponge in the world. Young specimens are erect in-

verted cones with a single large apical oscule. Older specimens contain many symbiont shrimp in large horizontal galleries, imprisoned by a sieve at the outer end.

This species is very widely distributed. It was taken from only a third of the stations, but there may have been specimens too large for the diver to dislodge, hence not collected.

Observations of many hundreds or even thousands of *Spheciospongias* reveal the species *vesparia* as being regularly a dark dull grey-brown externally. It was reported as black by de Laubenfels (1936, page 141), but it is not that dark. On the other hand, Bermuda specimens do merit the term black. Their oscules are fewer and larger, hence they were given the species name *othella* by de Laubenfels (1950, page 94). It is also noted as an additional difference from *S. vesparia* that some Bermuda specimens exhibit streaks of tissue (external as well as internal) that are bright lemon yellow, in sharp contrast to the black bulk of the sponge, blending through green to the black. These streaks might be as large as 1 by 7 cm.

The puzzling situation now arises that the Second Gulf of Mexico Expedition, at station 20 (almost their farthest west station), found a *Spheciospongia* that was entirely bright yellow in life (ML 4:218). It is still pale dull yellow after preservation in alcohol. The spiculation is exactly that of *S. vesparia,* except that the spirasters are more abundant than is usual in *S. vesparia.* It would be very interesting to have specimens of *Spheciospongia* from still farther west in the Gulf. Perhaps there is a yellow race or species in the northern Gulf region.

*Spheciospongia* is represented in the collection by ML 4:218 (USNM 23410), taken at station 20, depth 12.5 meters, 26 October 1948 (not typical); by ML 4:221, taken at station 6, depth 12 meters, 27 September 1948; and by ML 4:068, taken at station 8, depth 14 meters, 29 September 1948. Notes indicate that it was also taken at stations 10, 13, and 21; these three are not now represented by specimens.

### Genus *Spirastrella* Schmidt

### *Spirastrella coccinopsis* new species (?)

The holotype of this provisional species is USNM 23411. The paratype (a portion of the holotype) is ML 4:219, taken at station 20, depth 12.5 meters, 26 October 1948.

This appears to be a massive or amorphous sponge, but it may have been an incrustation on a complex mass of dead organisms which have since disintegrated. A vertical measurement of 7 cm. is reached,

and thicknesses of over 1 cm. Altogether, there is at least a double handful of lumps and irregular pieces. The color in life is given as bright crimson, but the preserved specimen is pale brown. The consistency is stiffly crumbling (friable).

The surface is smooth over the gross lumpiness, and the apertures all appear to be closed. Doubtless they were very small. There is a dense ectosome, nearly 1 mm. thick, densely packed with spirasters. The endosome is cavernous, with spicules chiefly in utter confusion; a faint tendency toward the radiate structure can be noticed. The microscleres are fairly common in the interior, too, and the smaller, perhaps developmental, forms are found only there.

The spicules consist of tylostyles about 13 by 530 microns, thick spirasters 34 microns long, and thinner ones, only 20 microns long.

There are, throughout the oceans of the world, numerous sponges whose spiculation consists of tylostyles and spirasters. It may be that all of these should be in the genus *Spirastrella*. The type of *Spirastrella* is *S. cunctatrix* Schmidt (1868, page 17), an encrusting species, red to violet. There is an abundant West Indian species, *S. coccinea* Duch. and Mich. (1864, page 84), reddish brown in color. This or similar encrusting forms abound throughout the Pacific Ocean.

In the region of the Indian Ocean, East Indies, Australia and the South Pacific, there is a common massive species, brilliant purple in color, named *S. purpurea*. It has been widely assumed that the massive forms were merely older specimens of the species which were encrusting in youth. My field studies in the Pacific region have led me to doubt this. There is a notable lack of intermediate forms. There are small, yet already massive specimens that seem certainly to be the juveniles of the massive ones. It may even be advisable, as done in the family Microcionidae, to erect a special genus for the massive types, leaving only encrusting ones in the proper genus *Spirastrella*. In many parts of the Pacific, and—interestingly—in the whole West Indian region, there has been a lack of records of any except the encrusting type.

Now we have a massive sponge with the *Spirastrella* spiculation. It was collected so far to the west that it is barely on the margin of the West Indian region, yet it is West Indian. Its color in life (red-brown) and dead (pale brown) is like that of *S. coccinea*. It may indeed be an overgrown, aged specimen of *S. coccinea*. On the other hand, it may be an encrusting *S. coccinea* from which the original complex substrate has disappeared. Dead specimens of *S. purpurea* retain their

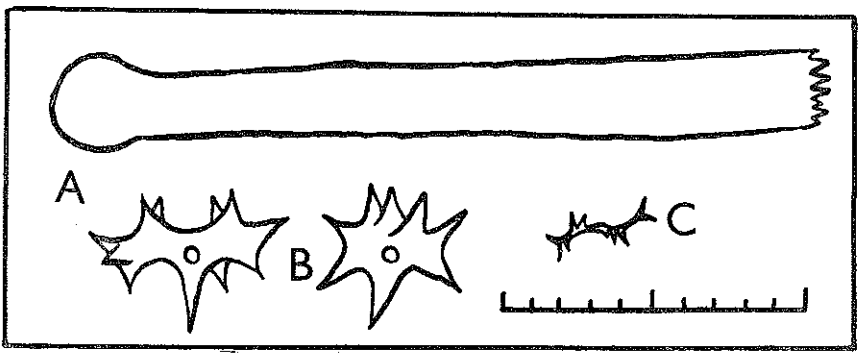


FIGURE 11. *Spirastrella coccinopsis.* Camera lucida drawings of spicules. A: Head only of one of the tylostyles. B: Coarser type of spiraster. C: Thinner, perhaps juvenile spiraster. These all match the enclosed scale, which shows 50 microns with 5-micron subdivisions.

purple color as this does not, yet it may be more closely related to *S. purpurea* than to *S. cunctatrix.*

Obviously, more knowledge about this and related species is much to be desired. Life histories need to be known. The present specimen may be placed elsewhere in some future revision, but in the interval, and for purposes of discussion in such a hypothetical revision, it may receive a convenient appelation, *coccinopsis.*

## Genus *Anthosigmella* Topsent

### *Anthosigmella varians* (Duch. Mich.) de Laubenfels

This species is both common and perplexingly variable in the West Indian region, deserving the specific name. Eventually one becomes able to recognize it by surface texture and consistency, and by the rather large, conspicuous oscules which are surrounded by paler tissue than that found elsewhere. The genus *Anthosigmella* is founded upon a very distinctive kind of microsclere. This is "C" shaped, with knobs along only the convex side. It is obviously a peculiarly modified spiraster. Many specimens of *A. varians* found growing within a few meters of one another, or even different parts of the same sponge, will show the following microsclere content:

1. All the microscleres distinctive (an easy identification.)
2. Most of the microscleres typical spirasters, but some distinctive.
3. All of the microscleres typical spirasters, and few of them.

4. No microscleres at all. This sort of sponge has often been called *Suberites distortus.*

*Anthosigmella* has been discussed in some detail by de Laubenfels (1949, page 19).

*A. varians* is represented in the collection by ML 4:216 (USNM 23412), by ML 4:217 (USNM 23413), and also by ML 4:222 (USNM 23414). All of these, showing great variation from one another, were taken at station 6, depth 12 meters, 27 September 1948. Notes indicate that yet another specimen, probably of this species, was taken at station 6, and another at station 20; these two are not now represented by specimens.

Family PLACOSPONGIIDAE Gray

Genus *Placospongia* Gray

*Placospongia melobesioides* Gray

This brown ramose sponge, with the hard, polygonal surface plates, has been discussed by de Laubenfels (1936, page 153).

It is represented in the collection by ML 4:200, taken at station 8, depth 14 meters, 29 September 1948.

Family CLIONIDAE Gray

Genus *Cliona* Grant

*Cliona caribboea* Carter

This abundant boring sponge leaves its mark on a considerable percentage of the shells, corals, and other calcareous items of the West Indies. It was doubtless present in its boring stage at many or all of the stations studied.

Unlike most members of the genus, but like the species *celata* (which it closely resembles), *C. caribboea* may grow up out of its burrows to become a large, massive sponge. It is then still recognizable because of the peculiar, soft, collapsible surface papilles, which correspond to those that protrude from the burrows of the still-hidden form. One such massive *Cliona* was collected in 1948.

It is represented in the collection by ML 4:220 (USNM 23415), taken at station 21, depth 6.5 meters, 27 October 1948. This is near the Florida State University station, at Alligator Point, Florida, in the immediate vicinity of which, massive *Clionas* appear to be exceptionally abundant.

*Cliona lampa* de Laubenfels

This *Cliona* has almost the spiculation of the species *vastifica,* but

it has a very different way of excavating. It was described by de Laubenfels (1948, page 110) from Bermuda (where it is superabundant), as permeating the entire substrate rather than merely excavating galleries. Exactly this method of growth is again revealed by the following specimens.

*Cliona lampa* (typical) is represented in the collection by ML 4:141 (USNM 23426), taken at station 22, depth 14.5 meters, 28 October 1948. Notes indicate that it was also taken at station 11, not now represented by specimens.

## Order EPIPOLASIDA Sollas

### Family JASPIDAE de Laubenfels

#### Genus *Prostylissa* Topsent

#### *Prostylissa spongia* new species

The holotype of the species is USNM 23416. The paratype (a portion of the holotype) is ML 4:226, taken at station 6, depth 12 meters, 27 September 1948. This species is also represented in the collection by ML 4:229 (USNM 23417), taken at station 4, depth 14.5 meters, 25 September 1948, and by ML 4:230 (USNM 23418), taken at station 19, depth 18 meters, 24 October 1948. Notes indicate that it was also taken at stations 10 and 17; these are not now represented by specimens.

New species are apt to be species that are uncommon. An abundant sponge, such as *Axinella polycapella* may be described as a new species after careful study, but it is not new in the sense of not having been previously collected. *Prostylissa spongia* appears in so many of the stations of the present collection that it must be astonishingly common. That it has not previously been collected may well be due to its appearance. In the field it looks so much like a *Spongia* that the scientific collector might not regard it as new and different. On the other hand, its texture is so different from that of good commercial sponges that the professional sponge fisher would reject it after touching it. It is interesting to note that the divers of the Second Gulf of Mexico Expedition did collect it. It is here assumed that they regarded these specimens as very inferior examples of *Spongia.*

The type of the species is lobate, an aggregate of eight or nine subglobular units. The other two specimens are simply globular. The type reaches a vertical measurement of 4 cm. and width of 9 cm. The

others are respectively 7 by 12 by 12 cm., and 6 by 9 by 9 cm. The color of the exterior is black, of the interior, drab. The consistency is somewhat spongy.

The surface is conulose, with conules about 2 mm. high and 4 mm. apart. The apertures are closed, but otherwise the resemblance to sponges of the genus *Spongia* is astonishingly great. The thin organic dermis resembles that of *Spongia,* but the endosome lacks the reticulate pattern.

The skeleton consists principally of large, smooth styles, about 30 by 880 microns. Their arrangement is definitely radiate, although (as in all large specimens that are fundamentally radiate) the interior of the sponge may be more or less in confusion. Within 1 to 3 cm. of the surface, the spicules are practically all perpendicular to the surface, with points toward it. There are no fibers and only vague groupings into tracts.

The endosome of this species is quite typical of the genus *Prostylissa,* but the surface is amazing. The species name is selected because of the great extent to which this sponge's ectosome resembles that of the genus *Spongia.*

Genus *Scolopes* Sollas

*Scolopes megastra* new species

The holotype of this species is USNM 23419. The paratype (a portion of the holotype) is ML 4:225, taken at station 7, depth 15 meters, 28 September 1948.

This is a subspherical sponge, about 10 by 13 by 15 cm. The color was drab in life. The consistency is woody.

The surface is exceedingly irregular. Many foreign organisms, including some sponge (*Haliclona viridis*) still adhere to its surface, and evidently others have been detached, leaving pits and scars. Smooth places can be found and may be significant. Apertures of 3 to 5 mm. diameter on some of the convexities may represent oscules. The pores are closed. There is a definite, well-marked organic dermis 20 microns thick. The interior is chiefly confused-cavernous, but traces of radiate structure can be discerned. There are many chambers about 100 microns in diameter; if they are flagellate (which is doubtful), they would be extraordinarily large ones.

The spiculation consists of very large, smooth oxeas, up to at least 55 by 2000 microns. Some thinner ones are probably juveniles. In places, there are many much smaller oxeas, which may constitute a

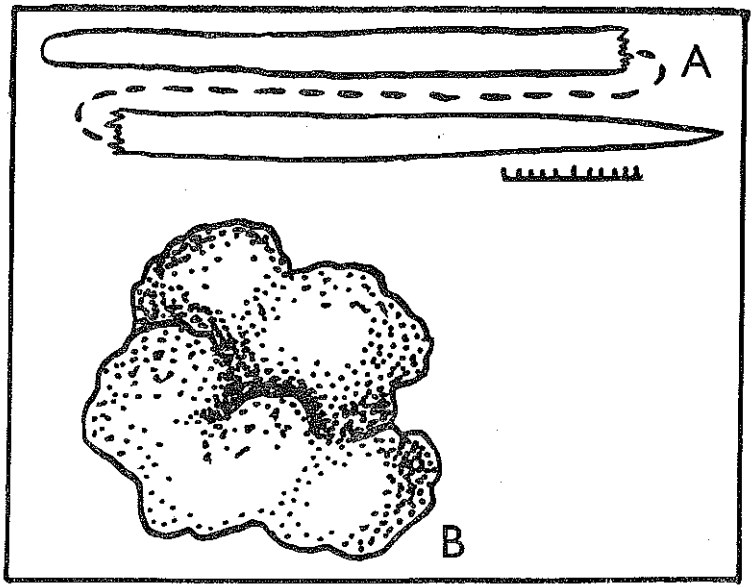


FIGURE 12. *Prostylissa spongia.* A: Camera lucida drawing of one of the spicules, in two installments. The entire spicule is shown. This matches the enclosed scale, which shows 100 microns with 10-micron subdivisions. B: Free-hand sketch of part of the sponge, x 2/3.

second category. On the other hand, some, or all of them, may be derived from the *Haliclona* that grew on the surface of the sponge. The microscleres are peculiar streptasters with strongylote rays, 17 to 22 microns in over-all length.

The genus *Scolopes* was established by Sollas (1888, page 432) for the species *moseleyi,* based on a single specimen from Bahia (now São Salvador), Brazil, latitude 13° S., depth unknown. The present specimen has very similar spiculation, but the microscleres of *S. moseleyi* were only 3 by 7 microns in size. The Brazilian species was extremely hispid or pilose as to surface, which *S. megastra* is not, and it had a much more conspicuous, or even fibrous, cortex than the thin one of *S. megastra.*

The genus *Paracordyla* should be dropped in synonymy to *Scolopes. Paracordyla* was established by Hallman (1912, page 132) for the one species *lignea,* from the coast of New South Wales, based on a single specimen. The present specimen from the Gulf of Mexico is

much like that Australian sponge in appearance and especially in consistency. Both have the very large oxeas and general architecture of the Epipolasida. There are great differences, too. Hallmann's specimen had microxeas, possibly but not certainly present in *megastra,* and its astrose spicules were only 4 microns in greatest dimension and so finely rayed that Hallman found it impossible to figure them. Microscleres most nearly like those of *S. megastra* are found only in sponges certainly or probably in the subfamily Thoosinae of the family Clionidae of the order Hadromerina, especially in a species originally named *Amphius huxleyi.*

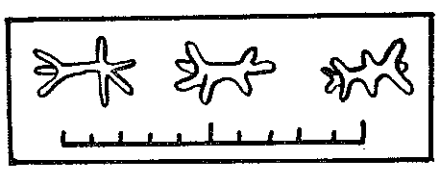

FIGURE 13. *Scolopes megastra.* Camera lucida drawings of representative microscleres. The enclosed scale shows 50 microns with 5-micron subdivisions.

Sollas (1888, page 177) established the genus *Amphius* for the one species *huxleyi,* based on a single specimen from Api in the New Hebrides (South Pacific), depth 130 meters. Its microscleres are extremely similar to those of *S. megastra* except that the terminations to the rays are perhaps slightly more tylote. Like *S. megastra* and unlike *lignea,* the remainder of the spiculation consists only of megoxeas. This sounds as though *S. megastra* were congeneric with *A. huxleyi.* On the other hand, the megascleres of *A. huxleyi* are all small, 7 by 588 microns, and sparse, not at all characteristic of the order Epipolasida. Instead, the whole pattern is characteristic of massive specimens of Thoosinae; furthermore, as already remarked, in the Thoosinae (and practically nowhere else), there occur several genera with microscleres very much like those of *S. megastra.* The species *huxleyi,* like Thoosinae, and unlike epipolasid sponges, is soft, with very small flagellate chambers. Therefore, although not certainly boring, as are the other genera so placed, de Laubenfels (1936, page 156) put it provisionally in the Thoosinae. Another problem, however, arises in regard to it, as follows.

Genus *Neamphius* new name

This genus, of which the type is the sponge described as *Amphius huxleyi* by Sollas (1888, page 178, plate XLII, figures 5 to 11), is here provided with a new name, inasmuch as *Amphius* was previously employed by Gistl in 1834 for a coleopteran. The name is derived from *neo* (new) plus *amphius,* but with the "o" elided for euphony.

Family TETHYIDAE Gray

Genus *Tethya* Lamarck

*Tethya diploderma* Schmidt

This is represented in the collection by two interesting specimens, warranting description. These constitute ML 4:201, taken at station 10, depth 12.5 meters, 30 September 1948.

As usual, each specimen is subspherical. The diameter is about 3 cm. The color in life was lemon yellow. The consistency is cartilaginous. The surface is highly tuberculate, with hemispherical tubercles, about 2 mm. in diameter. There is a tough cortex about 1 mm. thick, and the endosome is pronouncedly radiate. The megascleres are long strongyles, much thicker in the middle than at the ends. These fusiform diacts are found in few other genera. The microscleres include abundant spherasters, 50 to 60 microns in diameter; very abundant eutylasters, with the bulbous tips to their thin rays emphatically spined, total diameter 10 microns; a few oxyeuasters, with rays entirely microspined, diameter 45 microns; also a few smooth-rayed oxyeuasters of which, as a rule, one or more rays have bifurcated tips. These latter are about 50 microns in diameter.

This specimen is interesting in that it well illustrates the curious asexual reproduction of *Tethya,* which has, of course, long been known to occur. In some regions there is a certain time of the year for it to occur. The surface tubercles grow higher, not greater in diameter. Some protrude until they become stalked, or a spicule-filled stalk may be extruded, and a number of cells may crawl up it. In any case, a juvenile *Tethya* (nearly spherical) then begins to take shape, up on a stalk. This juvenile finally lets go, as it were, and falls, rolls, or is carried away. Presumably some of these detached buds find suitable localities, attach and grow.

It is consistent with this method of reproduction that when making an extended search one may go kilometers without finding any *Tethyas,* and then find a hundred within a few square meters.

The species *diploderma* was established by Schmidt (1870, page 52) for specimens from the West Indies.

## Order CHORISTIDA Sollas

### Family ANCORINIDAE Gray

### *Unimia* new genus

This genus is here established, in the subfamily Theneinae of the family Ancorinidae, to have as its type the following species, *Unimia trisphaera.* As usual in this subfamily, there is a principal spiculation of tetraxons and large oxeas; also both streptasters and euasters occur as microscleres. *Unimia* is noteworthy for its lack of long-shafted triaenes, its only tetraxons being calthrops. It is more especially based upon the peculiar nature of its ectosome, which is an armored cortex densely packed with astrose microscleres. These approach in appearance the sterrasters of *Geodia* but are developed upon an elongate axis, rather than a point of radiation.

The name selected for this genus is based on the first three letters, respectively, of the words "University" and "Miami", thus showing respect to the institution which sponsored the study upon which this report is based.

### *Unimia trisphaera* new species

The holotype of the species is USNM 23420. The paratype (a portion of the holotype) is ML 4:237, taken at station 20, depth 12.5 meters, 26 October 1948.

The sponge was probably spherical in life. As preserved dry, it has collapsed with many deep wrinkles, not as though there had been a single central hollow, but indicating the presence of numerous smaller cavities, which, in the aggregate, represented a large fraction of the original volume. Such extreme shrinkage is very unusual in sponges. The vertical measurement is 7 cm. and the lateral diameter is 11 cm. The color (dry) is a dark mahogany, almost black as to exterior, with a drab interior. No data as to appearance in life are given. There are indications that the field collectors did not regard this specimen as being a sponge.

The surface is smooth-punctiform. The pores, now closed, must have been at least 100 microns in diameter when open, one pore per square mm. About a dozen oscules can be made out, all concentrated within an area of five square cm. on the top of the sponge. Each has a diameter of about 5 cm. and a sharp rim, not raised, but turned inward.

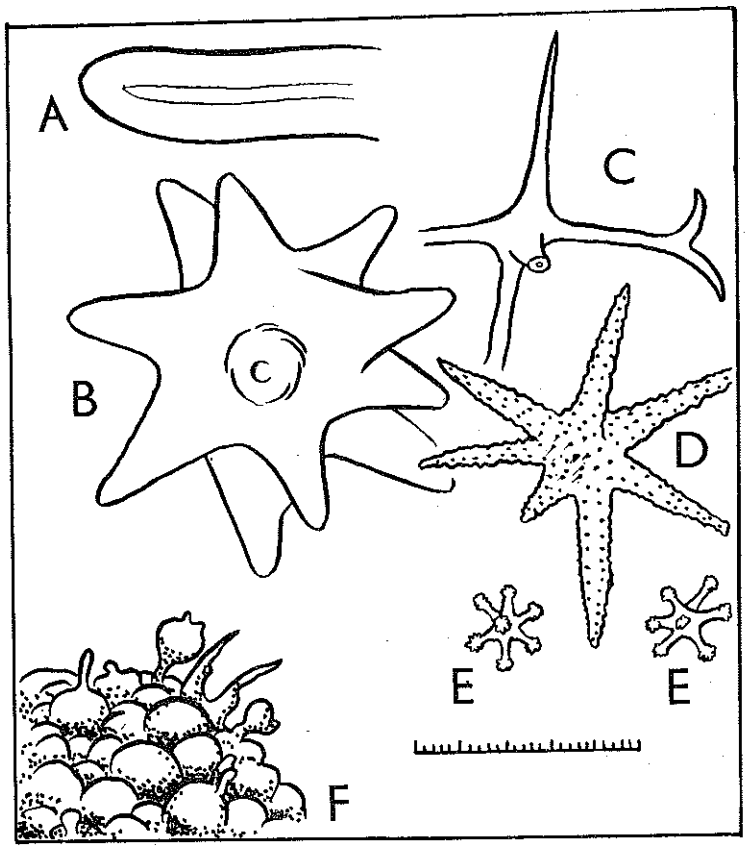


FIGURE 14. *Tethya diploderma.* A: One end of a megasclere. B: Spheraster. C: Oxyeuaster with bifurcated ray. D: Oxyeuaster, microspined. E: Eutylaster. These are camera lucida drawings and match the enclosed scale, which shows 25 microns. F: Freehand sketch of a bit of the surface of this sponge, showing several immature buds, two buds almost ready to leave the parent, and some stalks from which the buds have already left, x 2 2/3.

There is a dense, leathery, contractile cortex, about 1 mm. thick, packed with the peculiar sterraster-like trispaeroid streptasters. The endosome is fundamentally radiate in plan, but as usual in sponges that are so large, the central endosome is in confusion. Near the surface, the spicular tracts are perpendicular to it.

The abundant megascleres are smooth oxeas about 12 by 900 microns. A few calthrops-like tetraxons were found, with all angles of divergence about equal and rays up to 12 by 270 microns. Many of these rays have rounded (stronglote) ends, rather than pointed (oxeote) ends.

There are several kinds of microsclere, all abundant. There are oxyeuasters 12 microns in diameter; these may be juveniles. There are euacanthochiasters, and eutylasters that are also slightly acanthose, up to 24 microns in diameter. There are smooth microxeas which vary through intermediate shapes to microstrongyles. The spicules of this category are 2 by 50 microns. There are numerous streptasters which are obviously juveniles of the dermal spicules; these are often about 80 microns long. Their spines are exceedingly long and sharp, and instead of being at right angles to the axis of the spicule, they radiate from its central point. All intermediates may be found between this and the mature dermal spicules. These latter are

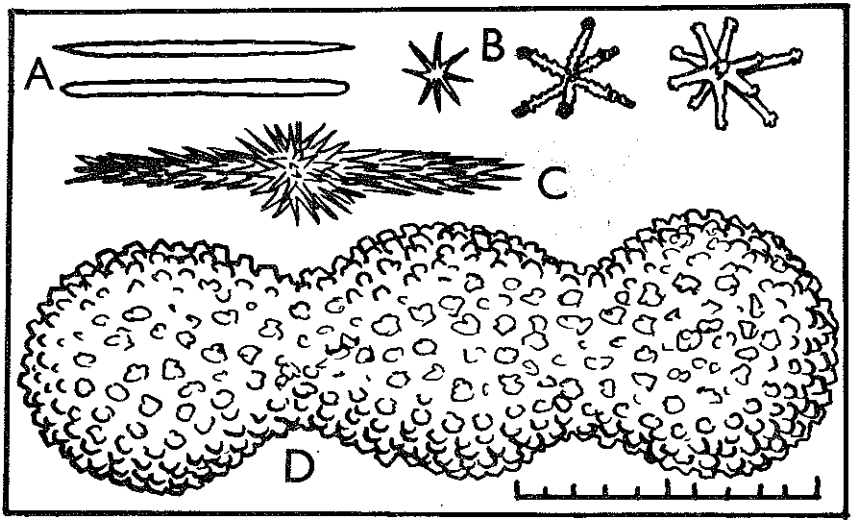


FIGURE 15. *Unimia trisphaera.* Camera lucida drawings of the microscleres. A: Microxea and microstrongyle. B: Various representative shapes of the euasters. C: Juvenile of the dermal spicule. D: Mature dermal spicule. The megascleres are not shown. The spicules shown match the enclosed scale, which shows 50 microns divided into 5-micron units.

about 135 microns long, and the spheres range from 40 to nearly 50 microns in diameter. The spines finally become tuberculate and blunted, exactly as do the spines of the sterrasters of *Geodia*.

The species name of this unique sponge is based on the shape of these dermal spicules.

Genus *Stelletta* Schmidt

*Stelletta grubii* Schmidt

This is represented in the collection by ML 4:233 (USNM 23421), taken at station 20, depth 12.5 meters, 26 October 1952.

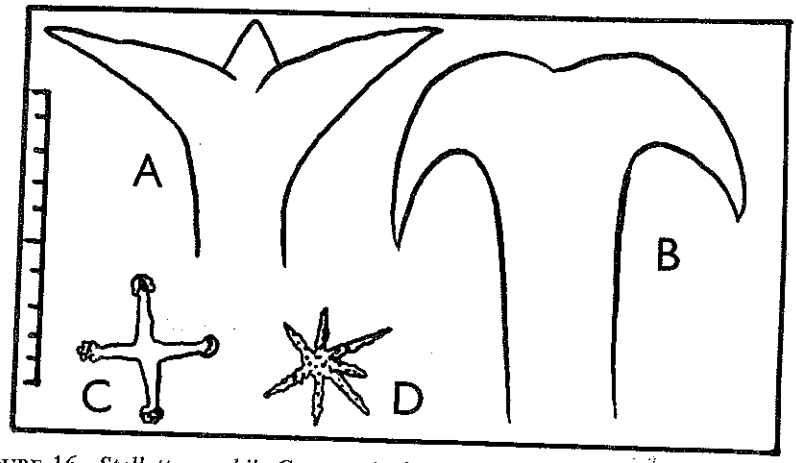


FIGURE 16. *Stelletta grubii*. Camera lucida drawings of spicules. A: Head of plagiotriaene. B: Head (or cladome) of anatriaene. These two match the enclosed scale, which shows 50 microns with 5-micron subdivisions. C: Eutylaster with microspined terminations. D: Oxyeuaster entirely microspined. C and D are magnified twice as much as A and B.

This is a subspherical sponge about 12 cm. in diameter, very pale and almost white, and cartilaginous in consistency. The surface is profusely encumbered with foreign debris, especially the shells of Pelecypoda. The pores and oscules cannot be certainly detected.

There is a dense tough white cortex two mm. thick, within which is a fairly dense but softer endosome, permeated by spicules and spicule tracts in radiate arrangement.

There are fewer oxeas in proportion to the triaenes than is usual. They are about the same size as the rhabds of the triaenes, say 16 by 500 microns. The commonest tetraxon type, perhaps the commonest megasclere of all, is a plagiotriaene. The chord measurement is 60 microns and the rhabd (like that of the plagiotriaene) measures 16 microns in diameter.

The species *grubii* was established by Schmidt (1862, page 46) for Mediterranean sponges.

## Genus *Myriastra* Sollas

### *Myriastra debilis* Thiele

This is represented in the collection by ML 4:235 (USNM 23422), taken at station 19, depth 18 meters, 24 October 1948.

This is a massive sponge about 15 cm. high and 12 cm. in diameter. Its color in life was brown and gray externally and nearly white internally, according to field notes. In alcohol the exterior is dark brown, the interior, ochraceous drab. The consistency is cartilaginous. The surface is extremely lumpy and irregular. Oscules and pores cannot certainly be detected. There is a vague cortex, not outstandingly tough, about 1 mm. thick. The endosome is definitely radiate.

The spicules are predominantly huge oxeas up to at least 70 microns in diameter, and over 2 mm. long. There are also certainly plagiotriaenes with rhabds of about this same size range, chords of the cladome 150 microns in diameter. The microscleres are oxyeuasters, 11 to 14 microns in diameter, all essentially of the same category.

This species was described by Thiele (1900, page 25) from the East Indies. Uliczka (1929, page 29) reported it from the vicinity of the Dry Tortugas. It is remarkable within the genus for having oxyeuasters. Another with oxyeuasters (but these acanthose) is *tuberosa,* described as *Astrella tuberosa* by Topsent (1892, page 44). This is not the same as *Myriastra tuberosa,* described as *Stelletta tuberosa* by Hentschel (1909, page 353); therefore, a new designation is required for the latter. It is here proposed that it receive the new name *Myriastra hentscheli.*

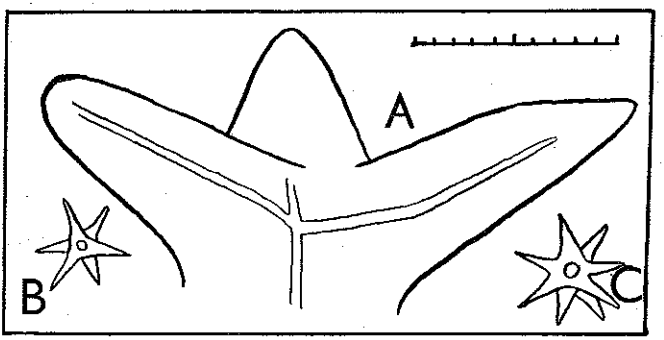


FIGURE 17. *Myriastra debilis.* Camera lucida drawings of spicules. A: Head or cladome of the plagiotriaene, matching the enclosed scale, which shows 50 microns with 5-micron subdivisions. B and C: Oxyeuasters, magnified twice as much as A.

Family GEODIIDAE Gray

Genus *Geodia* Lamarck

*Geodia gibberosa* Lamarck

This well known species, with its oscules and pores in the form of saucer-like sieves, and its tough, hard, sterraster-loaded armor, was redescribed in some detail by de Laubenfels (1936, page 172).

It is represented in the collection by ML 4:244, taken at station 8, depth 14 meters, 29 September 1948; ML 4:238, taken at station 10, depth 12.5 meters, 30 September 1948; ML 4:236, taken at station 20, depth 12.5 meters, 26 October 1948; and ML 4:231 (USNM 23423), taken at station 15, depth 17 meters, 3 October 1948. This last was mustard brown in life, according to field notes, and is dark walnut brown in alcohol. This color is unexpected for the species *gibberosa,* and some possibility exists that this is another species. There seems, however, to be little other difference than in color, which might be due to foreign overlay.

Family CRANIELLIDAE de Laubenfels

Genus *Cinachyra* Sollas

*Cinachyra cavernosa* (Lamarck) de Laubenfels

The genus *Cinachyra* is represented in the collection by ML 4:198, taken at station 14, depth 12 meters, 2 October 1948, and by ML 4:234, taken at station 13, depth 19 meters, 2 October 1948.

It is represented in the West Indies, according to Uliczka (1929, page 41), by half a dozen species. These are separated by very slight differences, however, and all may be synonyms of *C. cavernosa.*

As an additional complexity, some specimens which were distorted by their neighbors in life, or damaged in collection, are scarcely to be differentiated from the genus *Craniella.* This applies to both of these present specimens. Each is identified with some hesitation; neither is typical. For further description see de Laubenfels (1949, page 21, and 1936, page 174).

## Analysis by Stations of Sponge Collections

*Sta. 1.* 24 September 1948, depth 5.5 meters, 9.6 kilometers WNW of John's Pass. Lat. 27° 49′ N., Long. 82° 53′ W. The expedition set out southward from Tarpon Springs, Florida, the principal home port of the sponge fishing fleet. Only one sponge species was reported from this first station.

*Axinella polycapella*

*Sta. 2.* 24 September 1948, depth 9 meters, 5.6 kilometers W by N of John's Pass. Lat. 27° 48′ N., Long. 82° 58′ W. This is still near St. Petersburg, Florida, in waters once famous for abundance of commercial sponges. Again only one species was taken.

*Higginsia strigilata* 4:136[4]

*Sta. 3.* 24 September 1948, depth 10 meters, 16 kilometers NW by W of New Pass buoy. Lat. 27° 25′ N., Long. 82° 45′ W. This is about 40 kilometers south of station 2. No sponges at all were taken.

*Sta. 4.* 25 September 1948, depth 14.5 meters, 11 kilometers W of Boca Grande sea buoy. Lat. 26° 40′ N., Long. 82° 27′ W. Five species of sponge were taken.

| | |
|---|---|
| *Ircinia fasciculata* | 4:050 |
| *Aplysilla sulfurea* | 4:212 |
| *Axinella polycapella* | |
| *Homaxinella rudis* | 4:060 |
| *Prostylissa spongia* | 4:229 |

*Sta. 5.* 26 (?) September 1948, depth 11.5 meters, 27 kilometers N by W of Boca Grande buoy. Lat. 26° 23′ N., Long. 82° 14′ W.

*Ircinia campana*
*Dysidea fragilis*
*Axinella polycapella*

*Sta. 6.* 27(?) September 1948, depth 12 meters, 14.4 kilometers W of Big Marco Pass. Lat. 25° 58′ N, Long. 81° 55′ W.

| | |
|---|---|
| *Spongia* sp. ("bastard wire sponge") | |
| *Ircinia campana* | |
| *Ircinia strobilina* | |
| *Neopetrosia longleyi* | 4:078 |
| *Axinella polycapella* | |
| *Anthosigmella varians* | |
| three specimens | 4:216, 4:217, 4:222 |
| *Spheciospongia vesparia* | 4:221 |
| *Prostylissa spongia* | 4:226 |

[4] This number and those below are ML numbers.

*Sta. 7.* 28 September 1948, depth 14 meters, 22.4 kilometers W of Cape Romano whistle buoy. Lat. 25° 40′ N, Long. 81° 55′ W. This is, of all 22 stations, the farthest from the nearest land.

| | |
|---|---|
| *Ircinia campana* | |
| *Dysidea crawshayi* | 4:227 |
| *Fibulia massa* | 4:210 |
| *Scolopes megastra* | 4:225 |

*Sta. 8.* 29 September 1948, depth 14 meters, 5 kilometers W of Smith Shoal light, about 15 kilometers NW by N from Key West, Florida. Lat. 24° 43′ N, Long. 81° 58′ W.

| | |
|---|---|
| *Ircinia campana* | 4:194 |
| *Ircinia strobilina* | |
| *Verongia longissima* | 4:149 |
| *Haliclona viridis* | 4:151 |
| *Fibulia* sp. | |
| *Mycale angulosa* | |
| *Dictyociona adioristica* | 4:214 |
| *Spheciospongia vesparia* | 4:068 |
| *Placospongia melobesioides* | 4:200 |
| *Geodia gibberosa* | 4:244 |

*Sta. 9.* 29 September 1948, depth 13 meters, 6.4 kilometers SW by S of Smith Shoal light. Lat. 24° 41′ N, Long. 81° 58′ W. This is less than 6 kilometers from station 8, yet only one sponge was taken.

| | |
|---|---|
| *Axinella polycapella* | 4:202 |

*Sta. 10.* 30 September 1948, depth 12.5 meters, 17.6 kilometers W of Smith Shoal light. Lat. 24° 42′ N, Long. 82° 07′ W.

| | |
|---|---|
| *Ircinia strobilina* | 4:243 |
| *Ircinia campana* | 4:062 |
| *Dysidea fragilis* | 4:205 |
| *Callyspongia vaginalis* | 4:185 |
| *Myrmekioderma styx* | 4:211 |
| *Echinostylinos unguiferus* | 4:215 |
| *Axinella polycapella* | |
| *Spheciospongia vesparia* | |
| *Tethya diploderma* | 4:201 |
| *Prostylissa spongia* | |
| *Geodia gibberosa* | 4:238 |

*Sta. 11.* 1 October 1948, depth 11 meters, 3 kilometers W of Ellis Rock. Lat. 24° 39′ N, Long. 82° 13′ W. This is very close to station 10.

| | |
|---|---|
| *Ircinia strobilina* | 4:066 |
| *Ircinia campana* | |
| *Mycale angulosa* | 4:239 |
| *Axinella polycapella* | |
| *Cliona lampa* | |

*Sta. 12.* 1 October 1948, depth 6 meters, 13 kilometers E by N of Rebecca Shoal light. Lat. 24° 36′ N, Long. 82° 27′ W. No sponges were collected.

*Sta. 13.* 2 October 1948, depth 19 meters, 3 kilometers WSW of Rebecca Shoal light. Lat. 24° 34′ N, Long. 82° 37′ W.

| |
|---|
| *Spongia* sp. ("wire sponge") |
| *Ircinia fasciculata* |
| *Ircinia campana* |
| *Ircinia strobilina* |

*Haliclona rubens* 4:196
*Dasychalina cyathina*
*Xestospongia muta* 4:223
*Mycale angulosa* 4:197
*Axinella polycapella*
*Spheciospongia vesparia*
*Cinachyra cavernosa* 4:234
and one other, not identified or preserved

*Sta. 14.* 2 October 1948, depth 12 meters, 5 kilometers S of Loggerhead Key light. Lat. 24° 35′ N, Long. 82° 55′ W. This is extremely close to the Dry Tortugas, but the best collecting was formerly considered to be just east of, rather than south of Loggerhead Key.

*Ircinia fasciculata*
*Ircinia campana*
*Verongia longissima*
*Ianthella ardis* 4:199
*Dasychalina cyathina* 4:206
and a second specimen, not preserved
*Callyspongia vaginalis* 4:240
and two other specimens
*Iotrochota birotulata* 4:207
*Cinachyra cavernosa* 4:198

*Sta. 15.* 3 October 1948, depth 17 meters, 14.4 kilometers W of Loggerhead Key light. Lat. 24° 38′ N, Long. 83° 02′ W.

*Ircinia strobilina*
*Xytopsues griseus* 4:224
*Geodia gibberosa* 4:231

*Sta. 16.* 3 October 1948, depth 20 meters, 14.4 kilometers NW by N of Loggerhead Key light. Lat 24° 43′ N, Long. 82° 59′ W. This list of species looks much like the results of a day's collecting near the old Carnegie Institution Laboratory at the Dry Tortugas.

*Ircinia strobilina*
*Verongia fistularis* 4:070
*Verongia longissima* 4:195
*Ianthella ardis* 4:241
*Haliclona rubens*
*Dasychalina cyathina*
*Rhizochalina hondurasensis* 4:209
*Callyspongia vaginalis,* two specimens, not preserved
*Iotrochota birotulata*
*Mycale angulosa*
*Hymeniacidon amphilecta* 4:208

*Sta. 17.* 3 October 1948, depth 7 meters, 5 kilometers N of Loggerhead Key light. Lat. 24° 41′ N, Long. 82° 55′ W. This is the station nearest to the old Carnegie Institution Laboratory.

*Ircinia campana*
*Ircinia strobilina*
*Callyspongia vaginalis*
*Prianos tierneyi* 4:228
*Prostylissa spongia*

*Sta. 18.* 11 October 1948, depth 14 meters, 29 kilometers SE of Ochlockonee

Shoal bell buoy 24. Lat. 29° 39′ N, Long. 83° 56′ W. This is up at the far northeast corner of the Gulf of Mexico.

| | |
|---|---|
| *Hippiospongia lachne* | 4:242 |
| *Axinella polycapella* | |

*Sta. 19.* 24 October 1948, depth 18 meters, 13 kilometers W by N of Laguna Beach. Lat. 30° 16′ N, Long. 86° 04′ W. This is very close inshore, the farthest north and west of all 22 stations.

| | |
|---|---|
| *Ircinia fasciculata* | 4:204 |
| *Ircinia campana* | |
| *Ircinia strobilina* | |
| *Verongia aurea* | 4:192 |
| *Verongia longissima* | |
| *Axinella polycapella* | |
| *Higginsia strigilata* | |
| *Prostylissa spongia* | 4:230 |
| *Myriastra debilis* | 4:235 |

*Sta. 20.* 26 October 1948, depth 12.5 meters, 13 kilometers NE of East Pass sea buoy. Lat. 29° 50′ N, Long. 84° 32′ W. This is close inshore. It yielded the greatest variety of sponges.

| | |
|---|---|
| *Aulena columbia* | 4:147 |
| *Ircinia fasciculata* | |
| *Ircinia campana* | |
| *Verongia longissima* | |
| *Darwinella mülleri* | 4:203 |
| *Callyspongia vaginalis* | |
| *Axinella polycapella* | |
| *Homaxinella waltonsmithi* | 4:072 |
| *Anthosigmella varians* | |
| *Spirastrella coccinopsis* | 4:219 |
| *Spheciospongia vesparia* | 4:218 |
| *Stelletta grubii* | 4:233 |
| *Geodia gibberosa* | 4:236 |
| *Unimia trisphaera* | 4:237 |

*Sta. 21.* 27 October 1948, depth 6.5 meters, 14.4 kilometers NE by N of Ochlockonee Shoal bell buoy 24. Lat. 29° 59′ N, Long. 84° 05′ W.

| | |
|---|---|
| *Spongia zimocca* | 4:183 |
| *Spongia graminea* | 4:138 |
| *Spongia graminea* | 4:181 |
| *Ircinia campana* | |
| *Verongia* sp. | |
| *Haliclona viridis* | 4:213 |
| *Thalyseurypon vasiformis* | 4:232 |
| *Axinella polycapella* | |
| *Cliona caribboea* | 4:220 |
| *Spheciospongia vesparia* | |

*Sta. 22.* 28 October 1948, depth 14.5 meters, 29 kilometers SE of Ochlockonee Shoal bell buoy 24. Lat. 29° 39′ N, Long. 83° 56′ W. This is the same location as station 18.

| | |
|---|---|
| *Hippiospongia lachne* | 4:139 |
| *Hippiospongia gossypina* | 4:182 |
| *Ircinia fasciculata* | |
| *Axinella polycapella* | |
| *Cliona lampa* | 4:141 |

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