New species of marine Demospongiae from Brazil.*

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ABSTRACT

Fourteen new species of marine Demospongiae are described from Brazil, namely *Anchinoe ramosus, Aplysina pergamentacea, Callyspongia laboreli, Crelloxea spinosa, Didiscus oxeata,Echinodictyum dendroides, Halichondria braziliensis, Perissinella fosteri, Prianos grayi, Rhabdastrella fibrosa, Rhizochalina nodulosa, Spheciospongia symbiotica, Stylaxinella bistyla,* and *Stylaxinella braziliensis, Crelloxea* is established as a new genus in the family Crellidae.

RESUMO

São descritas quatorze espécies novas de Demospongiae marinhas do Brasil, a saber: *Anchinoe ramasus, Aplysina pergamentacea, Callyspongia laboreli, Crelloxea spinosa, Didiscus oxeata,Echinodictyum dendroides, Halichondria braziliensis, Perissinella fosteri, Prianos grayi, Rhabdastrella fibrosa, Rhizochalina nodulosa, Spheciospongia symbiotica, Stylaxinella bystilla* and *Stylaxinella braziliensis. Crelloxea* é proposto como um gênero novo da família Crellidae (Porifera).

MATERIAL AND METHODS

The new species of Demospongiae described in this report are based on alcohol-preserved specimens in the Foster an Laborel collections of the Yale Peabody Museum (YPM), New Haven, Connecticut.

Foster's material was taken in a single dredge station off Recife, Pernambuco (PE), (07°38.5S, 34°37'W), at a depth of 27m. Specimens were associated with coral and calcareous debris.

Laborel's material was taken in the course of his coral reef survey (LABOREL, 1969), by shore collecting, scuba diving, and dredging. Specimens cited in the present report came from the Archipelago of Fernando de Noronha, localities near Recife, and sites along the coast of Bahia. Several specimens lack precise locality data, due to disintegration of labels.

I referred previously to the new species, using only generic designations, in my zoogeographic discussion of Brazilian marine Demospongie (HECHTEL, 1976). Two species have an altered generic placement in the present paper, namely *Adocia* sp. (to *Rhizochalina*) and *Verongia* sp. b (to *Aplysina*). The latter transfer is based on the revisions of WIEDENMAYER (1977) and VAN SOEST (1978). I have not formaly described *Auletta* sp., in the hope of obtaining more complete material. *Verongia* sp. a may be conspecific with *Aplysina lacunosa* (Pallas), as revised by VAN SOEST (1978).

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Skeletal measurements were taken from randomly selected fibers and spicules. Spicule data are presented as ranges and means of measured samples, taken from specimens in the order cited under material. The number of measured lengths and diameters is given in parentheses (i.e., nu.lenghts/nu, diameters, or nu. lengths/nu. shaft diameters/nu. head diameters).

SYSTEMATIC SUMMARY

Order KERATOSA
Family APLYSINIDAE
Aplysina pergamentacea, sp. n.

Order HAPLOSCLERIDA
Family HALICLONIDAE
Callyspongia laboreli, sp. n.
Prianos grayi, sp. nov.

Family NEPHELIOSPONGIIDAE
Rhizochalina nodulosa, sp. n.

Order POECILOSCLERIDA
Family ANCHINOIDAE
Anchinoe ramosus, sp. n.
Echinodictyum dendroides, sp. n.

Family CRELLIDAE
Crelloxea spinosa, gen. nov., sp. n.

Order HALICHONDRIDA
Family HALICHONDRIIDAE
Halichondria braziliensis, sp. n.

Order AXINELLIDA
Family AXINELLIDAE
Perissinella fosteri, sp. n.
Stylaxinella bistyla, sp. n.
Stylaxinella braziliensis, sp. n.

Order HADROMERIDA
Family LATRUNCULIDAE
Didiscus oxeata, sp. n.

Family SPIRASTRELLIDAE
Spheciospongia symbiotica, sp. n.

Order C H O R I S T I D A
Family ANCORINIDAE
Rhabdastrella (*Aurorella*) *fibrosa*, sp. n.

RESULTS AND DISCUSSIONS

Order K E R A T O S A Grant **sensu** DE LAUBENFELS (1936)
Family APLYSINIDAE Hyatt **sensu** VAN SOEST (1978)
Genus *Aplysina* Nardo **sensu** WIEDENMAYER (1977)

Aplysina pergamentacea sp.n.
(Fig. 1)

HECHTEL, 1976, as *Verongia* sp. b.

T y p e m a t e r i a l: holotype YPM 9004 and paratype YPM 9005, Piedade, near Recife, PE. See LABOREL (1969, map, fig. 23).

E x t e r n a l: YPM 9004 is a compressed ax-shaped sponge, with maximum dimensions of 7 (ht.)x5.8x0,8cm. Its narrow base is caked with debris. One surface has a torn longitudinal ridge, suggesting the existence of another lamella. YPM 9005 is an apical fragment, 1.5 (ht.)x4.5x1.2cm, which does not match the torn outline of the holotype. Both pieces are dull reddish-brown, compressible and resilient. Broad lateral surfaces are microtuberculate, with conules under 0.25mm in height and less than 0.5mm apart. Conules are blunt and joined occasionally to neighbors by low ridges. Narrow apical and lateral surfaces are very sparsely conulose. Oscules are confined to rims and immediately adjacent areas. They form two irregular rows on YPM 9005, and one to two apical rows along the convex lateral rim of the holotype. Singly scattered ostia, 30-100µm in span, are less than 0.25mm apart at the edges of rims and in adjacent conulose areas. Pores are rarely detectable between oscules ortoward the base of lateral surfaces.

A n a t o m y: the specimens are compact, with canals seldom greater than 100µm in span. Pigment cells, about 9 × 7µm, are common in the flesh, particularly at the periphery. Flagellated chambers are 15-25µm in span. The skeleton is a coarse fibroreticulation, with rectangular to polygonal meshes, 300-1000µm in maximum span. Fibers are golden, laminated, and provided with a narrow pith. Fiber diameters (35)46-81.4 ± 18.5-129; 46-67 ± 8.2-82µm. Pith as a % of fiber diameter (35) 8-19.2 ± 6.4-33; 14-23.3 ± 4.7-33%

The species is characterized by its spongy consistency, compressed lamellate form, and marginal oscules. The name reflects a similarity in habitus

to *Callyspongia pergamentacea* (Ridley). It would be interesting to compare my material with a Pandean pipe *Aplysina* reported by CARTER (1882), if that specimen is still extant (see WIEDENMAYER, 1977).

Aplysina capensis CARTER, 1881, reported from Brazil by DE LAUBENFELS (1956), has a foliate lettuce-like habitus. It differs from *A. pergamentacea* in having scattered oscules and broadly-pithed fibers (CARTER, 1881; LENDENFELD, 1889). In addition, CARTER reported occasional sand grains in the pith of his South African material, which casts doubt on its generic position.

Order H A P L O S C L E R I D A Topsent, 1928
Family HALICLONIDAE de Laubenfels, 1932, **sensu** WIEDENMAYER (1977)

Genus *Callyspongia* Duchassaing and Michelotti, 1864, ***sensu*** DE LAUBENFELS (1936)

Callyspongia laboreli, sp. n.
(Figs. 2-3)

T y p e m a t e r i a l: holotype YPM 8944 and paratype 8945 A-D, on a reef patch, Abrolhos Reef, off Bahia, 10-15 m. See LABOREL (1969, map, fig. 45).

E x t e r n a l: the material consist of five pieces of a single (?) light tan, resilient, easily torn conulose sponge. The holotype has two conical vases, 8(ht.)x4.3cm and 7(ht.)x3x2cm, joined by a broad solid bridge that bears an exhalant opening. YPM 8945 A has three hollow elevations arising from a thick solid base, with the largest elevation 7(ht.)x3x2.5cm. YPM 8945 B consists of two cylindrical tubes, 6 and 4.5cm in height, joined by a narrow basal junction. YPM 8945 C and D are small fistulose fragments. The surface in all pieces is uplifted into prominent conical conules, 2-5mm in basal diameter, 2-10mm in height, and 4-8mm apart. Apical conules are particularly well developed, and grade into solid digitations that reach a maximum height of 2.5cm. The oval cloacal openings, 1.5-2.5cm in span, are essentially terminal but may be surmounted by high conules and solid projections. The cloacae are 0.8-6cm in depth, and extend nearly to the base of vasiform regions. Their walls are smooth and are pierced by exhalant openings, 2-3mm in diameter. Stout endosomal fibers are visible beneath the outer skin, particularly in condensed columns below conules.

A n a t o m y: the ectosome is an intergrading double network of spongin fibers. Pauci-to multispicular coarse fibers are 15-60, commonly 20-30 µm in

diameter. They outline irregularly polygonal or triangular meshes, 200-400µm in span. The fine dermal network has uni-and bispicular fibers, 5-15 µm in diameter, with interstices 40-100µm in span. Endosomal fibers are 30-300, typically 80-200µm in diameter. They are packed with spicules, and cemented by a spongin film. The fibers outline a coarse network of oval, circular or rectangular meshes, with spans of 100µm to several mm (commonly 200-500 µm). The skeleton is condensed in conules and their descending skeletal columns, where parallel longitudinal fibers are typically 80-250 µm apart. The flesh of both skin and endosome contains a few scattered megascleres and pale spherular cells, 9-12µm in diameter.

S p i c u l e s: strongyles, ranging to oxeas, nearly straight to slightly curved. In YPM 8944 and 8945 A, 90% of the spicules have tapered but definetely rounded ends. The remainder are oxeote or near oxeote, with mucronate, hastate, or irregular apices. In YPM 8945 B, nearly 1/2 of the spicules are oxeote.

S p i c u l e a n a l y s e s: diactinal spicules, lenhgts (50)71-87.4 ±8.1-110;69-77. 5 ± 5.3-94; 74-88.8 ± 7.6-104µm. Widths 0.8-1.6µm.

Callyspongia laboreli is characterized by a distinctive assemblage of features, including a highly conulose surface, partially fistulose habitus, and predominantly strongylote spicule complement. It would be placed in *Spinosella* Vosmaer if WIEDNMAYER'S revision (1977) becomes accepted.

Spicule-packed endosomal fibers are unusual but not unknown in *Callyspongia*. For example, similar fibers occur in *C. fibrosa* (RIDLEY & DENDY, 1886), originally described from Bahia, Brazil (possibly the type locality) and the Philippines. All subsequent reports of *C. fibrosa* are from the Pacific (cf. LINDGREN, 1898; WILSON, 1925; LÉVI, 1961; BERGQUIST, 1969). *C. fibrosa* further resembles *C. laboreli* in having a spinose surface and a variable proportion of strongylote spicules.

C. fibrosa differs from *C. laboreli* in having a decidedly ramose form, with scattered exhalant openings. Its oscules are broad, and have shallow bowl-shaped depressions rather ten deep cloacae. The spicules are typically thicker (2-6µm) than in *C. laboreli*. The and mesh dimensions do not agree in detail. For exemple, RIDLEY and DENDY described the dermal skeleton as including multispicular primary fibers, 100µm in span, and delicate unispicular secondaries.

Genus *Prianus* Gray, 1867
Prianus grayi, sp.n.
(Fig.4)

Type material: holotype YPM 9008, Fernando de Noronha, Laborel collection.

External: the material consists of numerous fragments, possibly from a single sponge. The largest piece has dimensions of 3(ht.)x3x2cm. The fragments are light brown and crumbly, and have a microhispid to microtuberculate surface. The two largest pieces have an apical oscule, 5mm in span, and one specimen has two additional lateral vents.

Anatomy: the skeleton consists of a unispicular reticulation, which grades into a coarse network of loose tracts. The tracts are 30-80, occasionally 100 µm in span, and 200-600 µm apart. Meshes of the unispicular network seldom exceed 50 µm in span. Spongin occurs at skeletal nodes, and may extend along spicules and tracts as a cementing film. The skeleton ends at the surface without specialization. Ostia could not be detected in the dermal membrane. The flesh is compact, with canals seldom larger than 150µm in span. A few thin developing spicules lie freely in the flesh.

Spicules: Strongyles, slightly to strongly curved, rarely straight (100/50) 201-333.7 ± 44.3-433 x 3.5-6.9 ± 1.6-10 µm. The region of maximum shaft curvature may be central or eccentric. The apices of mature spicules are clearly strongylote, but ends of developing spicules may be narrow-blunt.

P. grayi is congeneric with *Reniera cratera* SCHMIDT, 1862, known from the Mediterranean Sea and West Africa. TOPSENT (1925) considers *R. cratera* to be a senior synonym of the briefly described *R. amorpha* SCHMIDT, 1864, which is the type species of *Prianus* GRAY, 1867. *R. cratera* has an isodictyal reticulation of elongate strongyles, with spongin-coated nodes (SCHMIDT, 1862; TOPSENT, 1925; LÉVI, 1957). *Prianus* therefore is a haplosclerid sponge, albeit one with unusually large spicules. Several authors (BURTON, 1956; LÉVI, 1957; SARA & SIRIBELLI, 1960) place *R. cratera* in *Haliclona,* s.1., while GRIESSINGER (1971) and PULITZER-FINALE (1977) retain it in *Reniera.* I prefer to maintain a separate genus for the few species of *Reniera* like sponges with a predominance of strongyles. *Prianus grayi* differs from *P. craterus* in having its strongyles partly grouped into multispicular tracts. The spicules of *P. grayi* are longer and thinner than those of most specimens of *P. craterus,* although their maximum lenght is equalled by the Ischian specimen of PULITZER-FINALE (1977). There is no sign of the conspicuos fistules found in most specimens of *P. craterus.*

DE LAUBENFELS used *Prianus* for *Hymeniacidon* like sponges with a confused feltwork of diactinal, mostly strongylote spicules. His species, *P. problematicus* (1930, 1932), *P. tierneyi* (1953), *P. phalox*, *P. melanos* and *P. osiris* (1954) should be transferred to *Strongylodesma* LÉVI, 1969.

Family NEPHELIOSPONGIIDAE Clarke **sensu** WIEDENMAYER (1977)

Genus *Rhizochalina* Schmidt, 1870 **sensu** DE LAUBENFELS (1936)

Rhizochalina nodulosa, sp.n.
(Figs. 5-6)

HECHTEL, 1976 as *Adocia* sp.

Type material: holotype YPM 5705 Recife, PE, 27m, Foster Collection.

External: the specimen is dome-shaped, with a narrow base of attachment to a coral. It is 8cm in height and 14cm in maximum span. Above the base, the margin is ringed by an irregular fringe of solid nodules and cylindrical to volcano-shaped projections, 0.5-2cm in lenght and 0.5-1cm in diameter. In alcohol, the exterior is reddish brown to drab, and the interior a dull yellow. The sponge is only slightly compressible, aside from the thinner marginal projections. Algae and calcareous debris cover considerable parts of the surface, particularly near the base. Uncovered areas are minutely wrinkled.

Conspicuos oscules, 2-6mm in span, occur on the dome-shaped upper surface, mostly at apices of projections. Cloacae may extend inward for several cm, and often contain brittle stars. Some of the marginal projections have lateral or subapical depressions, which may be closed oscules.

Anatomy: the dermal skeleton is bound closely to that of the endosome. It is an irregular network of oxeas and raphidiform spicules, placed singly and in loose clusters. Spongin occurs at network nodes, in varied amounts.

The endosomal skeleton includes an irregular network of thin uni-to biserial fibers, and a coarse reticulation of multiserial ones. Thick fibers are 20-210 µm in span, and typically 200-400 µm apart. In deeper parts of the sponge, they grade into broad spiculiferous sheets of spongin. Raphidiform spicules are present, particularly in thin fibers, but are less common than in the ectosome. Interstitial spicules are rare. Marginal projections are supported by multispicular longitudinal fibers, 160-265 µm in span, linked to each other and to the surface by thin connectives.

Spicules: oxeas and raphidiform oxeas.

Oxeas, slightly curved, nearly isodiametric, typically with short blunt terminal tubercles, (100/35) 13.6-182.7 + 21 - 221x3.5 - 4.5 ± 0.6 - 5.9µm. Apices are sometimes hastate or stair-stepped. Less than 5% of the spicules are styles or strongyles. Ectosomal spicules seldom exceed 190µm in lenght.

Raphidiform oxeas, possibly developmental stages, mostly ectosomal, slightly curved, typically hastate, but occasionally with terminal tubercles, (25/-) 71-84.8 ± 7.5- 99x1.6, rarelv 2.4µm.

Rhizochalina nodulosa is characterized by its external form, well-developed spongin, and oxeas with modified apices. Some spicules resemble those of *Strongylophora amphioxa* DE LAUBENDELS (1950), from Bermuda, an otherwise very different sponge, without fistules, and with a confused architecture.

Tubercle-tipped and mucronate spicules do occur as variants in other species of *Rhizochalina,* including *R. fistulosa* (BOWERBANK, 1873). *R. fistulosa* is a wide-ranging species, kown from Australian waters, the Indian Ocean, and the Azores. RIDLEY & DENDY (1887) reported a possible Brazilian specimen, (with the geographical location rendered uncertain by a labelling error). Some specimens of *R. fistulosa* resemble mine in having a category of smaller ectosomal spicules, which, moreover, are no more than half the lenght of endosomal ones (cf. RIDLEY, 1884; TOPSENT, 1904).

R. fistulosa differs from my specimen in having long thin fistules, little spongin, and a pronunced bast-like subsurface layer. Its oxeas are gradually pointed to hastate, rather than irregularly-tipped, and are typically more robust than in my sponge (cf. RIDLEY & DENDY, 1887; TOPSENT, 1904).

In external form, *R. nodulosa* resembles the specimen of *R. putridosa* (Lamarck) figured by RIDLEY & DENDY (1887). RIDLEY and DENDY regarded some fistule fragments from Bahia, Brazil as conspecific with their Australian material. Their specimens of *R. putridosa* differ from my sponge in having uniformly hastate, sharp-ended oxeas. Lamarck's type specimen of *R. putridosa,* as redescribed by TOPSENT (1933), differs from mine in having a complex triple bast layer and typically hastate oxeas. *R. putridosa* has slighly thicker oxeas than *R. nodulosa,* and apparently has no spongin.

Order POECILOSCLERIDA Topsent, 1928
Family ANCHINOIDAE Topsent, 1928
Genus *Anchinoe* Gray, 1867 sensu STEPHENS (1921)

Anchinoe ramosus, sp.n.
(Figs. 7-8)

Type material: holotype YPM 8969, Santo Antonio Bank, Bahia, 60m, Laborel collection.

External: the holotype has a small encrusting base and two cylindrical upgrowths, 3 x 0.6 and 13 x 0.7 x 0.3cm. It has a light brown surface and a dull yellowish-brown interior. The sponge is compressible, resilient, and rubbery, and has a smooth to microtuberculate surface. A thin (30-50 µm) skin is easily separable from underlying tissues. Oscules are numerous, flush with the surface, and generally under 0.5mm in span. Dermal pores, less than 100 µm in span, overlie small subdermal cavities, and render much of the surface punctiform.

Anatomy: the ectosome contains tangentially-oriented tornotes, which are scattered single or in loose clusters, and numerous arcuate isochelas of two size classes. The endosome is a fibroreticulation, with fibers 30-120 and meshes typically 150-300 µm in span. Spongin cements the coring tornotes and forms a peripheral film or a well-developed fiber sheath. Numerous acanthostyles are embedded basally in the sheaths, and project outward at right angles to fiber axes. The flesh contains scattered tornotes, sparsely scattered isochelas, and considerable debris. The debris includes sand, foraminifera, and foreign spicules such as diancistras and grapnels. The interior is traversed by numerous canals, all under 1mm in span.

Spicules: acanthostyles, tornotes of varied form, arcuate isochelas of two size categories.

Acanthostyles, echinating, straight, sharply pointed, (50/35) 49-68.5 + 14.5-115 x 3.5-3.9 ± 0.7-6 µm. Except for the apical 8-12 m, the shaft is covered by numerous small conical spines, wich are 0.8-1.5 µm in height. Longer spicules generally have lower and more sparsely scattered spines.

Tornotes, thin, straight, occasionally slighly curved, generally tapered toward the ends, (50/35) 138-166.8 ± 8.7-188x 1.5-1.8 ± 0.5-3 µm. A majority of the spicules are substrongyles or strongyles, with round or narrow-blunt ends. The apices of an individual spicule are often unequal in diameter. Twenty parcent of the spicules are stylote, with one apex narrowing abruptly to a point over a distance of 2-3 µm. Tornotes exhibit a similar range of form and size in all parts of the sponge.

Isochelas, arcuate, large (35) 18-21.4 ± 1.4-23 x 1.5 µm (shaft). The spicules have a large tooth gap, which is about four times clad length.

Isochelas, arcuate, small, (35) 10-11.7 ± 0.7-13 x 0.8 µm (shaft). The spicules are similar in form to the larger isochelas, end have a tooch gap three to four times clad length. A few palmate isochelas, 13-16 µm in lenght, occur in strews and some sections. They are regarded as foreign inclusions, in view of their sporadic occurrence and low numbers.

Anchinos ramosus is clearly congeneric with *Hymeniacidon perarmatus* Bowerbanck, 1866, the type species of *Anchinoe* Gray, 1867. Both species contain smooth diactines as dermal, auxiliary and skeletal coring spicules. Their spicule complement is completed by arcuate isochelas and acanthostyles, with the latter arising from the substsatum or fibers. *A. ramosus* is characterized within the genus by its ramose habitus, short acanthostyles, and predominantly strongylote diactines. *A. tenacior* Topsent, 1925 from the Mediterranean, has strongylote megascleres, but differs in having two sizes of acanthostyles and a coriaceous dermis.

A. ramosus is also congeneric with a sponge identified by BURTON (1954) as *Phorbas amaranthus* Duchassaing and Michelotti, 1864. Burton's specimen, from the Mosquito Bank, off Honduras, differs from *A. ramosus* in having a massive form, oxeote tornotes, and two sizes of acanthostyles. Burton found his material comparable with a preparation from the type of *P. amaranthus*. If his account is correct, *Anchinoe* is a junior synonym of *Phorbas*. However, DE LAUBENFELS (1936) also had access to the type, and described the megasclere complement of *P. amaranthus* as including two sizes of oxeas and echinating acanthoxeas. In view of the conflicting accounts, I prefer to retain *Anchinoe* as the generic designation for my material.

Genus *Echinodictyum* Ridley, 1881

Echinodictyum dendroides, sp.
(Figs. 9-10)

T y p e m a t e r i a l: holotype YPM 8946 on limestone in slightly brackish estuary, Maria Farinha, near Recife, PE, intertidal and paratype YPM 8962, Santo Agostinho, near Recife, See LABOREL (1969, map figs. 18, 27).

E x t e r n a l: the shrub-shape specimens consist of branching and anastomosing fleshy columns, which arise from a thin basal plaque. The larger specimen, YPM 8946, has overall dimensions of 7 (ht.)x6x3.5cm. Individual columns are compressed and 1-3mm in span. Their anastomoses outline a network of gaps, which reach several mm in maximum span. Peripheral columns

extend 1-7, typically 2-3mm beyond the level of outermost connectives. Both specimens are pale yellow to pale tan, and slightly compressible. Column surfaces are microphispid and microtuberculate. The few possible oscules are flush with the surface and under 0.5mm in diameter.

A n a t o m y: the fibroreticulate skeleton has oval and irregular meshes, 200-300 µm in maximum (longitudinal span. Primary fibers are oriented longitudinally and linked by anastomoses, conncetive fibers, and single spicules. Primaries are 100-300 and secondaries 50-100µm in diameter. Fibers are packed with oxeas, cemented by conspicuos spongin, and echinated abundantly by acanthotylostyles. Echinators typically have bases embedded in spongin, and stand at right angles to fiber surfaces. Peripheral fibers terminate in narrow tufts of projecting oxeas. Elongate styles are scattered sparsely in the skeleton, without any obvious relationship to the surface tufts. Most are embedded basally in fibers, but some seem independet of the fibroreticulation. The flesh contains a few oxeas and a considerable amount of coarse sand.

S p i c u l e s: acanthotylostyles, oxeas, styles.

Acanthotylostyles, straight, entirely spined, with a well-developed head, no neck, and a narrow-blunt apex. Shaft spines are conical, often recurved, and, under 1.2 µm in height. Basal spines may be conical or tuberculose. Long spicules generally are thinner and have lower, less frequent spines than short ones.

Oxeas, varied in lenght, straight to moderately curved, often with a slight curve or bend, with hastate or subhastate apices. Five percent of the spicules have narrow-blunt or round apices. Few oxeas (5%, 7%) are greater than 450 µm, and only 12% of these spicules in YPM 8962 are over 300 µm iin lenght.

Styles, elongate, stightly curved, isodiametric over most of their lenght, and then gradually pointed. Ten to fifteen percent of the spicules are substylostylote. About 20% are greater than 400 µm in length.

S p i c u l e a n a l y s e s: acanthotylostyles, lengths (100)87-111.8 ± 11.133; 83; 83-101 ± 9.7-120 µm. Shaft widths, (35) 7-8.5 ± 0.9-10; 6-7.1 ± 0.9-9 µm. Head widths (35)9-12 ± 1.4-14; 7-10.1 ± 1.6-14 µm.

Oxeas, lengths (100)175-321.4 ± 107.1-742; 150-256.5 ± 90.9-656 µm. Widhts (35)5-9.9 ± 2.3-15; 4.2-7.6 ± 2.2-12 µm.

Styles, lengths (14)325-708.6 ± 327-5-1257; (25)351-833.3 ± 344-1494 µm. Widths (14)7-12.7 ± 2.8-16; (25)3.5-9.7 ± 4.4-17 µm.

Echinodictyum dendroides is characterized by its combination of elongate oxeas, acanthotylostylote echinators, and individually placed elongate styles. In most species, the echinators are acanthostyles and the elongate styles (if present) are grouped into surface bundles. Three species of *Echinodictyum* occur in tropical or South Atlantic waters. *E. lugubre* and *E. pennata* (DUCHASSAING DE FONBRESSIN & MICHELOTTI, 1864), from the Antilles, are poorly known, but differ clearly from *E. dendroides* in having a purple color, *E. pennata* differs further in having terminally flattened lobes and also, according to WIEDENMAYER (1977), very flexuous oxeas. *E. macroxifera* Lévi (1969), from the Vema Seamount in the South Atlantic, differs in having fibers with few corers, many scattered oxeas, and small acanthostylote echinators.

The most similar Indo-Pacific species is *E. pykii* (Carter, 1879) from Mauritius, which differs in having a purple color and echinators with strongylote apices.

Family CRELLIDAE Hentschel **sensu** TOPSENT (1928)

Genus *Crelloxea,* gen.nn.

Crellidae with dermal and interstitial acanthoxeas and acanthostrongyles, with skeletal oxeas and without microscleres or echinators. Type species, *Crelloxea spinosa,* sp. n.

Crelloxea spinosa, sp. n.
(Fig. 11)

Type material: holotype YPM 9019, tropical Brazil, Laborel collection.

External: the specimen is a soft grayish-drab encrustation, growing over leaves and stems. The sponge attains a maximum thickness of 8mm but seldon exceeds 2mm. The largest piece is 15cm long and as much as 1cm wide. Hispid tubercles and ridges, 1mm in height, give the surface a shaggy appearance. A few small possible oscules are present in depressions between tubercles.

Anatomy: surface peels contain scattered acanthoxeas and acanthostrongyles, along with the ends of skeletal bundles. The endosomal skeleton consists of uni-to paucispicular tracts of oxeas that grade into loose bundles, 30-100 µm span. A film of spongin cements the tracts and bundles. The flesh contains loose oxeas, patchily distributed acanthostrongyles, and very numerous acanthoxeas.

Spicules: acanthoxeas, acnathostrongyles, and oxeas.

Acanthoxeas, nearly straight or slightly curved, fusiform, sharp, finely spined, (50/35)81-109+13.8-140 x 2.3-3.5 ± 0.5-5 µm (total diameter).

Acanthostrongyles, straight to slightly curved, with a maximum width at mid-lenght, and apices of most spicules clearly rounded (50/50)78-99.8 ± 9.9-117 x 6-6.7 ± 0.9-9 µm (shaft diameter). The spines, usually less than 1.2 µm in height, are conical or recurved toward mid-shaft. Spines may be scattered uniformly over the shaft or concentrated at the ends. Less frequently, they are concentrated at tips and middle, or absent from an eccentrically-located region of the shaft. Terminal spines are usually recurved but are occasionally straight, giving a stylote or oxeote form to the spicule. No intermediates are present between the thin acanthoxeas and the various forms of acanthostrongyles.

Oxeas, straight to slightly curved, fusiform, gradually and sharply pointed (100/35) 294-356.4 ± 26.6-407 x 10-17.7 ± 3-24 µm Many spicules have a conspicuos central canal, and a few abnormal ones have an oblique extra spike.

Clelloxea spinosa resembles *Crella* as originally defined by DE LAUBENFELS (1936). *Grella* was established for *Yvesia carnosa* Topsent, 1904, a sponge with acanthoxea and oxeas. However, TOPSENT (1928) reported echinating acanthostyles in his redescription of the sponge, making *Grella* a synonym of *Crella* Gray. The Brazilian sponge differs from *Crella* by the absence of spiny echinators and the presence of acanthostrongyles. In addition, its shaggy surface differs markedly from the complex cribriform surface of *Cribella elegans* Schmidt, 1870, the type species of *Crella*.

Order HALICHONDRIDA Vesmaer **sensu** WIEDENMAYER (1977)
Family HALICHONDRIIDAE Gray **sensu** DE LAUBENFELS (1936)
Genus *Halichondria* Fleming **sensu** DE LAUBELFELS (1936)

Halichondria braziliensis, sp. n.
(Figs. 12-13)

Type material: holotipe YPM 5709 and paratypes YPM 5701, 5704, 9029 9032 A, B, **Recife**, PE, 27m, Foster collection, YPM 8988 A, B, **Recife**, 33m Laborel collection.

External: the sponges are thickly encrusting to massive and cake-shaped. The largest specimen (YPM 5709) has dimensions of 7 (ht.)x15x11cm. YPM 5701, 5709, and 9032 A, B have a few solid projections arising from the general surface, which attain a maximum size of 10x3mm. In alcohol, most specimens have a dull reddish- brown exterior and a pale drab to brown interior. YPM 8988 A, B are pinkish-drab fragments. The sponges are only slightly compressible, but are crumbled easily.

The surface is even to irregular and microhispid. Oscules are few in number and scattered. They reach a maximum size of 1.5x0.5cm in YPM 5709, but are typically less than 1mm in diameter in the smaller specimens. Oscules may be flush or elevated on irregular low mounds. Much of the surface of YPM 5704 is covered by debris.

Anatomy: there is a minimum of dermal specialization. Near the surface, spicules are oriented predominantly toward the surface, and many of them project throug the dermal mebrane However, some peripheral spicules are placed tangentially or obliqualy. Dermal tracts, surface tursts and subdermal cavities are absent. Pores could not be detected. The endosomal skeleton consists of thickly and irregularly strewn spicules of varied size. Loose clusters of spicules occur infrequently near the surface and canal linings, but well defined tracts are absent. Canals are numerous and reach several mm to a cm in span.

Spicules: oxeas, of varied size, slightly to considerably curved, typically with gradually narrowing points. A few spicules are bowed or straight, or have narrow-blunt points. A very small number (less than 2%) are clearly stylote.

Spicules analyses: Oxeas, lenghts (100)341-587 ± 136.5-919;278-466.2 ± 77.7-672; 362-579.6 ± 119.7-803; 326-498.8 ± 86.1-756; 273-532.5 ± 115.4-819; 319-520.2 ± 81.4-680; 299-531.5 ± 113.3-815; 278-529.4 ± 99.9-757 µm. Widths 4.8-11.8 ± 3.8-22; (35)7-8.9 ± 2.8-12; 4.8-11.2 ± 3.2-19; 5.4-10.2 ± 2.9-18; 3.5-10.8 ± 3-16; 5-10.6 ± 3.7-18; 3.5-9.7 ± 3.5-21; 3.5-10.4 ± 3.2-17 µm.

Discussion: YPM 5701 and 9032 B have less elongate spicules than the remaining specimens, but resemble them in external and skeletal features.

Halichondria braziliensis differs from the common West Indian *H. melanadocia* de Laubenfels 1936 by the absence of a tangential dermal reticulation. *H. magniconulosa* Hechtel, 1965, from Jamaica, also has a poorly developed dermal skeleton, but differs from the Brazilian species in having a conulose surface, slender oxeas, and well-developed radial spicule tracts.

Several European and Indo-Pacific species of *Halichondria* have oxeas with a size range similar to that of *H. braziliensis,* but differ in external, cytological or skeletal features. As examples, H. moorei Bergquist, 1961, from New Zealand, has tissues packed with pigment cells; H. *variabilis* Lindgren, 1898, from the China Sea, has endosomal tracts; and *H. tuberculata* Keller, 1891, from the Red Sea, has conules and spicule tracts. *H. agglomerans*

Cabioch, 1968, from the English Channel, has an abundance of internal debris and a well-developed dermal reticulation.

Order AXINELLIDA Bergquist, 1967
Family AXINELLIDADE Carter **sensu** WIEDENMAYER (1977)
Genus *Perissinella* Topsent, 1928

Perissinella fosteri sp. n.
(Figs. 14-15)

Type material: holotype YPM 9009, on rocks, Recife, PE, 30m, and paratype YPM 8984, Recife, harbor, 18m, Laborel collection.

External: the holotype consists of a cylindrical upgrowth, 4(ht.)x1.5x1cm, arising from an oval, thinly encrusting base, 1(ht.)x4x2cm. The base is toughly spongy and light brown, while the projection is pale drab and spongy. YPM 8984 is a dull-orange, compressed lobate sponge, 6.5(ht)x2.4x2cm.In YPM 9009, branching and anastomosing columns terminate in hispid peripheral tufts, 1-5mm in height and 1-1.5mm in basal span. Gaps between inter-tuft junctions reach several mm in span, and may penetrate the entire sponge. The axial region is more compact, althougt separate columns are evident in places. YPM 8984 has low surface tufts, 1-2mm in height, and interior cavities that may be inter-column gaps.

Anatomy: the fleshy columns contain one to many longitudinal primary fibers, which are tipically 50-200 µm in span and 100-600 µm apart. Basally, primaries may expand into broad sheets, up to 0.5mm in span. Primaries are linked by anastomoses and also by secondary fibers, 15-70 µm in diameter. Typical fibers have an abundance of laminated spongin, and are cored sparsely by irregularly oriented tylostyles. Most skeletal spicules protrude outward from fibers for a considerable part of their length, but may retain a thin spongin film. The surface hispidation is due to protruding echinators and compact terminal clusters of coring spicules. In basal sections of YPM 9009, echinators are common only toward the periphery, with internal fibers unechinated or even aspiculous over intervals as great as one mm. No differences in size or form are found between echinators and corers, or between basal and peripheral spicule. The flesh contains a few loose spicules, including developmental stages.

Spicules: Tylostyles, smooth, round-headed, without necks, and with straight to moderately curved, mostly slightly curved shafts. The region of maximum curvature may be displaced toward the spicule apex. Most spicules

are apically hastate, but 1-2% have narrow-blunt apices. Central canals are often conspicuous and may have a prominent basal enlargement.

Tylostyles, lengts (100) 319-457.3 ± 76.2-675; 330-427.5 ± 44.3-597 µm. Shaft widths (35)7-12 ± 2.5-17; 8-13.8 ± 2.8-18 µm. Head withs (35) 10-15.4 ± 3-22; 12-17 ± 2.3-21 µm.

Discussion: the specimens are referred to *Perissinella* Topsent, 1928, which was established as a subgenus of *Stylotella*. The type species, *P. madeirensis,* from the Madeira Islands, is characterized by pedominantly tylostylote spicules in spongin rich fibers. Unlike *P. fosteri,* it has no echinators, although its spicules may be placed irregularly in fibers. *P. madeirensis* differs further in spicule details and in having a thick aspiculous dermis with conspicuos exhalant canals.

Stylaxinella Vacelet, 1960 resembles *Perissinella* in having a reticulation of spongin-rich fibers, but differs in having stylote, occasionally oxeote spicule, (see below). Both genera are atypical members of the Axinellidae in skeletal structure, and the dermis of *P. madeirensis* is also aberrant. The two genera have at least superficial similarities with the poecilosclerid genera *Ulosa* de Laubenfels, 1936 and *Pandaros* Duchassaing and Michelotti, 1864. sensu de Laubenfels (1936). Information on reproduction would be invaluable in assessing the systematic position of these genera.

Genus *Stylaxinella* Vecelet, 1960

Stylaxinella bistyla, sp.n.
(Figs. 16.17)

Type material: holotype YPM 8994, Recife, PE, 30m, Laborel collection and paratype YPM 5739 A, B, Recife, 27m, Foster collection.

External: the holotype is an irregular cluster of pale yellow, microtuberculate finger-shaped projections, which arise from a common base. The sponge has overall dimensions of 6 (ht.)x6x4cm and a basal area of 2cm^2. Individual projections are 1-3cm in height and 5-8mm in apical diameter. Lateral fusion of digitations results in several thick, terminally bifid lobes, attaining a maximum span of over one cm. YPM 5739 A and B are dark reddish-brown conulose sponges, 2-3 and 3.3cm in height. Conules are blunt, 1-5mm in height, and 1-2mm in apical span. They may be incipient projections. All specimens are firm, compressible and resilient. Apertures include a few os-

cules, 0.5-2 in span and numerous smaller openings that are attributed to maceration.

Anatomy: primary fibers radiate outward to the surface and terminate in compact projecting spicule tufts. Primaries are 40-120 µm in span, pauci-to multispicular, and spongin-sheathed, Skeletal styles may form an axial series or loosely fill the fibers. Apices of strongly curved spicules may project out of endosomal fibers. Secondaries are uni-to trispicular, and 15-30, occasionaly 50 µm in span. They form a series of short ladder-like rungs between primaries. Styles of the elongate category occur singly and sparsely among the smaller skeletal styles, without any obvious localization. The flesh contains some debris and a few thin developing styles.

Spicules: styles, of two size categories.

Styles, short, skeletal, slightly to strongly curved, with gradually pointed apices. The region maximum curvature often is displaced toward spicule base. Skeletal styles in YPM 8994 are conspicuously,fusiform, while those of YPM 5739 A, B are isodiametric to subfusiform.

Styles, elongate, straight to slightly curved, isodiametric over most of their lenght, with gradually pointed apices. The region of maximum curvature is typically in the basal quarter of the shaft.

Spicule analyses: styles, skeletal, lengths (100)242-283.3 ± 18.5-325; (50)206-248.2 ± 18.5-299; 222-263.7 ± 17.5-299 µm. Widths (50)6-13.3 ± 3.5-18; (35)7-8.3 ± 1.2-10;6-9.2 ± 1.8-13 µm Styles, elongate, lengths(35)489-665.4 ± 80.3-850; (20) 484-628.3 ± 70.814; (16) 433-559.3 ± 75.2.706 µm. Widths (35)3.8-8.1 ± 2.3-13;5-6.2 ± 1.4-8;6-7.6 ±1.2-10 µm.

Discussion: YPM 5739 A, B are considered conspecific with the holotype, since they have a similar form and anatomy and a special category of elongate styles. *Stylaxinella bistyla* is considered specifically distinct from *S. brazillensis,* sp. n. although their skeletal styles overlap in dimensions. *S. bistyla* differs in having a digitate rather than massive form, and a special category of elongate styles.

Stylaxinella braziliensis, sp. n.
(Figs. 18-19)

Type material: holotype YPM 5727 Recife, PE,27m, Foster collection and paratypes YPM 8967, 9011, tropical Brazil, Laborel collection.

External: YPM 5727 is thickly encrusting to massive, with maximum dimensions of 3(ht.)x4x7cm. The other samples are amorphous fragments, with a maximum thickness of 3.5cm. YPM 8967 is pale drab, while the other sponges have a dark reddishbrown surface and pale interior. All specimens are easy to tear and crumble. The surface is uneven and microtuberculate. Oscules are few in number, apical, flush with the surface, and 1-4mm in span. YPM 8967 and YPM 5727 have numerous smaller openings, which may be due to maceration.

Anatomy: the skeleton is a fibroreticulation, with irregularly polygonal rectangular and triangular meshes. Primary fibers are 30-50, occasionally 85 µm in span, and one to three spicule lengths apart. They are bi-to polyspicular and have a continuous spongin sheath, which is best developed at intersections and connectives. Terminal spicules project beyond the surface, but do not form well-defined tufts. Connectives are 15-30 µm in span, uni to bispicular, and often enveloped in spongin. They form a series of ladderlike rungs between primaries at the periphery, but build an irregular network deeper in the endosome. The flesh is compact with canals under 0.5mm in diameter. It contains a few scattered spicules, mostly thin developmental forms.

Spicules: styles, elongate, smooth, slightly to moderately curved, with isodiametric shafts, and short, gradually pointed or hastate apices. A few spicules are sharply curved, bent, or sinuous. The region of maximum curvature often is displaced toward the spicule base, and may be adjacent to it. Axial canals are often conspicuous. Abnormalities are rare in YPM 9011 and 5725, but occur in 15% of the spicules in YPM 8967. They include hastate or mucronate bases, shaft spikes, and shaft swellings.

Spicule analyses: styles, lengths (100)231- 282 ± 16.8-315; 237; 301.8 ± 27.8-355; 186-284.6 ± 29.4-335 µm. Widths (35)4.7-8.2 ± 1.7-10.5; 5-6.9 ± 0.9-8; 6-7.4 ± 0.9-9 µm.

Discussion: *Stylaxinella braziliensis* differs from *S. bistyla,* sp. n. in form and spiculation, as discussed previously.

Order HADROMERIDA Topsente **sensu** WIEDENMAYER (1977)

Family LATRUNCULIDAE Topsent, 1928

Genus *Didiscus* Dendy, 1922

Didiscus oxeata, sp. n.
(Figs. 20-21)

Type material: holotype YPM 8968, Bahia, 60m. Laborel collection.

E x t e r n a l: the lobate sponge has dimensions of 2.5 (ht.)x4x2.5cm. It is light tan, soft, and easily crumbled. The cortex, partially torn and incomplete, is papery, easily removed, and under 0.5mm in thickness. Two oval oscules (?), one and three mm in maximum span, are apical in position. The surface is even, rough to the touch and microgranular.

A n a t o my: the cortex has some fibrous tissue and a feltwork of oxeas, 200-300 µm in depth. The oxeas are robust but varied in length. Many superficial megascleres are vertical to the surface but deeper ones may be horizontal or oblique. The hispidating spicules entrap some fine debris. The cortex overlies oval sub-dermal cavities; 0.5-1mm in span and 1-1.5mm in depth. The cavities are separated by pillars, 200-300µm in span, into which the cortical layer extends. Most megascleres in the pillars are vertically or obliquely oriented. Blunt-tipped discordhabds are common in the outer 100 µm of the cortex, with an outer row forming an ectochrote. Ectochrotal chessmen have shafts vertical to the surface, with the small-disked end facing outward.

The endosome has a loose skeletal framework, with long robust oxeas in uni-to paucispicular tracts and in loose bundles up to 100 µm in span. Spongin is present at nodes and may extend along spicules as a thin film. Skeletal meshes are triangular to polygonal in shape. The flesh contains scattered small thick oxeas, thin developmental stages of oxeas, and discordhabds.lunt-tipped and sharply pointed discorhabds occur in about equal number. The flesh also contains scattered debris and spherular cells, 9-14 µm in span, with pale spherules, 2 µm in span.

S p i c u l e s: oxeas, discorhabds.

Oxeas, straight or slightly curved, with smaller spicules sometimes bent, and shafts gradually narrowing to form sharp apices, (100/50)206-455.3 ± 265.7-1586 x 4.6-12.2 ± 4.4-23µm.

Discorhabds, typical, with straight blunt-tipped shafts and two eccentrically placed disks, (35/35)58-65.1 ± 3.7-74 x 3.5-4.4 ± 0.7-6 µm. Blunt discorhabds occur in both cortex and endosome, Disks are 2-3 µm in thickness and have microspined edges. Disks on a spicule may be straight and vertical to the shaft, or concave in the samer or opposite directions. The smaller (outer) disks are (35) 10-13.1 ± 1.4-16µm in diameter, and (35) 10-13.1 ± 1.6-16µm from the near end of the shaft. Large disks are (35)13-15.9 + 1.4-18µm in diameter and (35)9-9.9 ± 0.9-12µm away from the small disks. The shaft reaches a maximum diameter near the large disk. Small spines, under 1.1µm in height, cover the shaft between the apical end and the small disk, and along the terminal 10 µm of the op-

posite. end. The ramainder of the shaft is usually smooth, and has at most a few scattered spines. A few spicules have abnormal disks, which are reduced to low irregular roughened nodes.

Discorhabds, thin, with oxeote ends, (35/35)55-61.2 ± 2.8-67x1.5-2.5 ± 0.5-3.5μm. Disks are 1.2-1.5 μm in thickness. Small disks are (35)8-10.4 ± 1.2 μm and large disks (35)9-12.7 ± 1.6-15 m in diameter. The interdisk distance is (35)9-11 ± 0.9-13 μm and a tip to small whorl distance is (35)9-12.4 ± 1.8-16 μm. Oxeote chessmen are confined to the endosome, and may be developmental stages of the blunt-tipped ones.

A few strongyles, 138-237x1.2-2.3 μm, occur in the dermal membrane along with debris. Their irregularly enlarged central canals suggest dissolution and I regard them as foreign.

D i s c u s s i o n: *Didiscus oxeota* is the firts member of its genus to be described from tropical American waters, although FAULKNER & SMITH (1970) record a Honduran specimen as *Didiscus* sp. In discorhabd form, the Brazilian sponge resembles *D.styfiferus* Tsurnamal, 1969, from the Israeli Mediterranean and also Madagascar (VACELET & VASSEUR,1971); *D. placospongioides* Dendy, 1922, from the Indian Ocean; and *D. acerata* (Ridley & Dendy, 1887), which probably was taken near Tristan da Cunha in the South Atlantic. *D. styliferus* differs from *D. oxeota* in having styles, tylostyles and small oxeas or strongyles. *D. placospongioides* differs in having a peculiar surface, an auxliar network of aspiculous fibers, echinating tylostyles, and entirely oxeote discorhabds. *D. acerata* differs in having small thick dermal strongyles, short discorhabds and oxeas with ends that are often irregular.

Family SPIRASTRELLIDAE Ridley and Dendy, 1886
Genus *Spheciospongia* Marshall **sensu** DE LAUBENFELS (1936)

Spheciospongia symbiotica, sp. n.
(Fig. 22)

T y p e m a t e r i a l: holotype YPM 9026 and paratypes YPM 5702,5708,A-E,9026 all from Recife, PE, 27m, Foster collection.

E x t e r n a l: all specimens of *Spheciospongia symbiotica* are overgrown basally by a keratose sponge, *Psammaplyssilla* sp. Only oscular regions of *Spheciospongia* are visible externally, usually as hollow, finger-shaped projections.

The visible portions of the holotype of *S. symbiotica* consist of six aperture-bearing projections, 2-3 (ht.) x1cm, and a depressed sieve area, 0.8(dep-

th)x2x1cm. Two projections have a single opening, while the others have 6-10 in an apical or subapical sieve area. The depressed area has four apertures overlyng a cavity that extends several cm into the interior. Apertures are 1-1.5mm in span on projections, and 3-7mm wide in the depression.

YPM 5708 is an assemblage of five fragments (A - E), which do not fit together. They have one to four hollow projetions, with 2-24 openings in apical or subapical sieves. YPM 5702 has two such projections. YPM 5708 B was separated from the overgrowing specimen of *Psammaplysilla*. It extends to the base of the complex as a tapered hollow cone, with walls 2-3mm in thic kness.

All specimens of *S. symbiotica* are spongy, resilient, and smooth-surfaced. Projecting surface are light to reddish brown, while overgrown surfaces and the interior are dull brown. Overgrown surfaces are pierced by singly scattered apertures, 0.5-0.7mm in span and 1-3mm apart, which may equivalent to the intermediate openings of *Spheciospongia vesparia* (Lamarck). They are similar in size and abundance to apertures of the overlying keratose sponge, and at least in some cases are paired with them, suggesting a passage of water between sponges. Cloacal surfaces of *S. symbiotica* are membranous, and marked by numerous depressions, 0.25-0.5mm in span, which are probably closed exhalant apertures. In YPM 5708 B, groups of depressions are enclosed by low ridges.

A n a t o m y: the endosome in compact, with canals seldon greater than 200 µm in span, Microscleres are scattered sparsely in canal linings, and are very rare in the flesh. Coarse debris may be abundant in the flesh, as in YPM 9026. Tylostyles may be scattered individually, clustered into loose bundles, or interlaced in matworks, 80-300 µm in span. The only dermal specializations are and inconspicous ectochrote of streptasters and an abundance of pigment cells, about 9x7 µm, in the peripheral 100 µm. Cloacal surfaces are densely pigmented and nearly aspiculous

S p i c u l e s: tylostyles, streptasters. Tylostyles, and subtylostyles, with round to oval, occasionally trilobed bases, inconspicuous neckes, and hastate to subhastate apices. Shafts are strainght to moderately curved, with a maximum curvature typically in their basal third. In 5-15% of the spicules, bases are weakly tyled or stylote. Stair-stepped and mucronate apices occur, and are frequent in YPM 5708 C and E.

Streptasters, thin, 0-5, usually 2-4 bends and low, blunt spines. The spicules are only 1.2-1.5, rarely 2 µm in overral span. Spines seldom exceed 1 µm and are often less than 0.7 µm in height. Over 90% of the spicules are mul-

tiangulated spirasters, and the remainder are straingth amphiasters and sanidasters. Short spicules usually have few bends, thick shafts, and sparse, mostly terminal spines.

S p i c u l e a n a l y s e s: tylostyles, lenghts (50) 186-264.7 ± 31.9-309; 170-279.1 ± 39.1-335, 155-279.1 ± 45.3-345; 165-270.9 ± 40.2-330; 155-264.7 ± 37.1-319; 201-269.9 ± 21.6-314; 165-285.3 ± 37.1-335 µm. Shaft widths (35)5-6.4 ± 0.9-8; 5-7.4 ± 1.2-9; 6-7.1 ± 0.7-9; 6-7.8 ± 0.9-9; 5-7.1 ± 1.2-9; 6-6.9 ± 0.7-8; 3.5-6.7 ± 0.9-8 µm. Head widths (35)6-7.8 ± 1.2-9 µm; 7-9.4 ± 1.2-12; 6-8.3 ± 0.9-10; 8-9.7 ± 1.2-12; 7-8.5 ± 1.2-10; 7-9.2 ± 0.9-10; 7-8.3 ± 0.9-10.

Streptasters, lenghts (35)12-15.4 ± 3-23;8-14.5 ± 2.8-21; 12-15.4 ± 2.3-22; present; 10-13.6 ± 2.1-18; 9-12.7 ± 1.8-17;8-12.9 ± 2.8-21 µm.

D i s c u s s i o n: the systematic placement of the specimens is obscured by the possible effects of associated sponges on external form and aperture distribution. The assignment to *Spheciospongia* is based on the presence of sieve areas, and the restricted distribution of streptasters.

When dissected free of the keratose sponge, YPM 5708 B resembles young specimens of *Spheciospongia yesparium* (Lamarck), as recorded by DE LAUBENFELS (1949, 1953). The Brazilian sponges certainly differ greatly in habitus from massive woody mature specimens of the West Indian species. They differ further in having thinner streptasters and smaller tylostyles. The tylostyles of *S. yesparium* are larger, having and average size similar to the maximum for *S. symbiotica,* and attaining a length of 400 - 600µm (TOPSENT, 1933, DE LAUBENFELS, 1936).

Spheciospongia othella De Laubenfels, 1950, from Bermuda has small tylostyles, as in *S. symbiotica*. It differs in having enormous oscules, a black color in alcohol, minute streptasters, and numerous tangential megascleres at the periphery. WIEDENMAYER (1977) regards *S. othella* as merely an ecophenotype of *S. vesparium* (Lamarck.)

Order C H O R I S T I D A Sollas **sensu** DE LAUBENFELS (1936)
Family ANCORINIDAE Schimidt **sensu** DE LAUBENFELS (1936)
Genus *Rhabdastrella* Thiele, 1903
Subgenus *Aurorella De* Laubenfels, 1936

Aurerolla De Laubenfels was a replacement for the preoccupied *Aurora* Sollas, and is utilized for Stellettidae with triaenes and a cortical localization or

concentration of spherasters. It is employed here as a subgenus of *Rhabdastrella.* The typical subgenus has a similar anatomy and microsclere complement, but devoid of triaenes.

Rhabdastrella (*Aurorella*) *fibrosa,* sp. n.
(Figs. 23-24)

Type material: holotype YPM 5730 Recife, PE, 27m, Foster collection.

External: the specimen is massive and somewhat compressed, with dimensions of 5(ht.)x4x3cm. The exterior is a light reddish-brown, the oscular rim and surface streaks a dull pinkish-brown, and the interior drab to dull pink. In consistency, the specimen is tough and only slightly compressible. The surface is microtuberculate and rough to the touch.

Most of the flattened apical surface is occupied by a rimmed oscule and rimmed depression, each 7x4mm. The oscule provides exit for a cylindrical cloaca, one cm deep, into which minute exhalant canals open. The depression contains several pits that may be closed oscules. A few possible additional oscules, rimless and one mm in span, occur on lateral surface. Pale streaks extend outward from the apical rims. On one surface, they are nearly flush and end at a rectangular indentation. The indentation, 1 (depth)x1.5x0.8cm, may indicate the position of an object around which the specimen grew. The lateral surface below the indentation has partially fused low ridges, but no streaks. On the opposite surface, streaks extend for 1-2cm onto conspicuous vertical lamellae. The lamellae, 2-3, wide and 0.3-1cm high, converge toward the apex from the specimen base, with some subapical fusion.

Anatomy: the sponge has a two layered cortex, which contains a thickness of 1mm. No skeletal peculiarities are evident beneath the surface streaks. The cortex is transversed by numerous vertical canals, 25-35 µm is span, which extend into the endosome, presumably from ostia. Some sections have small subcortical cavities, 150-200 (ht.)x 100-150 µm.

The outer layer of the cortex is thick and non-fibrous. It is packed with the expanded ends of skeletal bundles, which are composed mainly of thin oxeas. Triaene cladomes occur in a few sections, but may have been displaced from the inner cortex by sectioning. Small euasters are present but rare.

The fibrous inner cortex, 150-200 µm in thickness, is visible to the unaided eye as a white line, nearly 1mm below the surface. Small euasters are scattered in abundance within it, while lumpy spherasters form one to several irregular

and discontinuous basal rows. Skeletal bundles traverse the layer, and triaene cladomes lie just within or below its base.

The endosome is compact, with most canals less than 0.5mm is span. The peripheral mm contains radially placed triaene rhabds and numerous bundles and clusters of oxeas. Bundles are typically 210-315 µm in span, and are composed largely of slender oxeas. The interior of the endosome contains a confused meshwork of predominantly robust oxeas, singly scattered or grouped into loose clusters. Long-rayed euasters are common, particularly in canal linings and the periphery of the endosome.

S p i c u l e s: orthotriaenes, oxeas, thin-rayed euasters of two categories, and spherasters.

Orthotriaenes, with slightly curved or straight rhabds and straight to wavy clads. Rhabds have sharp or narrow-blunt bases, and clads have narrow-blunt tips. Rhabds (35/35)288-718.6 ± 135-966 x 5.11.7 ± 3.7-21 µm. Clads (35/35)62-101.9 ± 24.4-156 x 5-10.4 ± 4-18 µm.

Oxeas, straight to slightly curved, with points gradually tapered or elongate and wedge-shaped, (50/35) 604-903 ± 135-1166x3.5-8.5 ± 2.5-15 µm.

Euasters, small, cortical, with 5-7 rays (35) 4.7-7.1 ± 1.1-10.5µm in total span. When viewed under oil immersion, the rays have a finely roughened surface and truncate non-tylote ends. A centrum may be absent or account for nearly 1/3 of the spicule diameter.

Euasters, large, endosomal, with 5-8 long thin cylindrical rays and a small centrum, total diameter (35)12-17.4 ± 3.5-24 µm. The centrum typically occupies about 1/6 of the total span. When viewed under oil immersion, rays are finely spined, and have narrow but truncate or slightly tylote apices

Spherasters, with very short rays and a large centrum, (50) 19-28.4 ± 4.2-35µm in total span. The centrum typically occupies 4/5 of the spicule diameter. Developmental stages and a few mature spicules have oxeote rays, but most mature spicules have blunt, tubercular ones. Blunt rays are often 2.4-3.5µm in apical span, and some are terminally bifid.

Rhadastrella (*Aurorella*) *fibrosa* is distinguished from other members of its subgenus by the form and size of its euasters, and the restriction of cortical spherasters to an inner fibrous layer. *Rhabdastrella virgula* Boury-Esnault, 1973, described from Brazil at 07°29'S, is a member of the triaeneless typical subgenus, and differs further from *R. fibrosa* in having peculiar spirastral microscleres.

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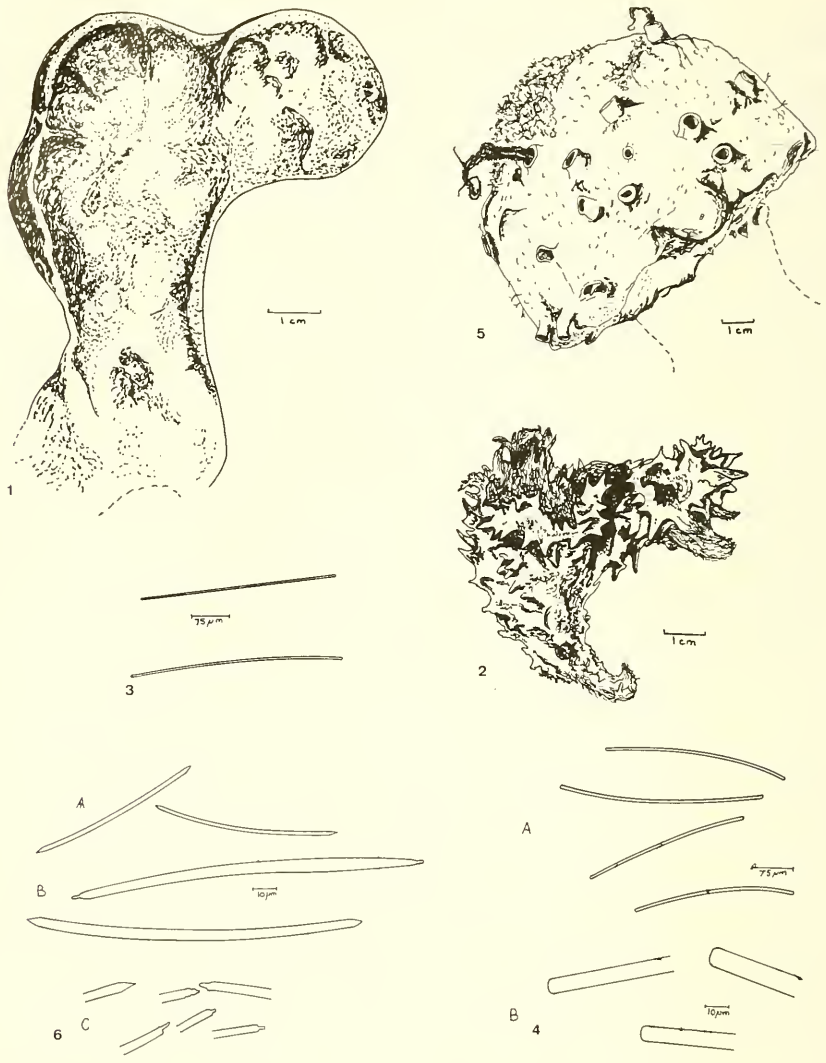
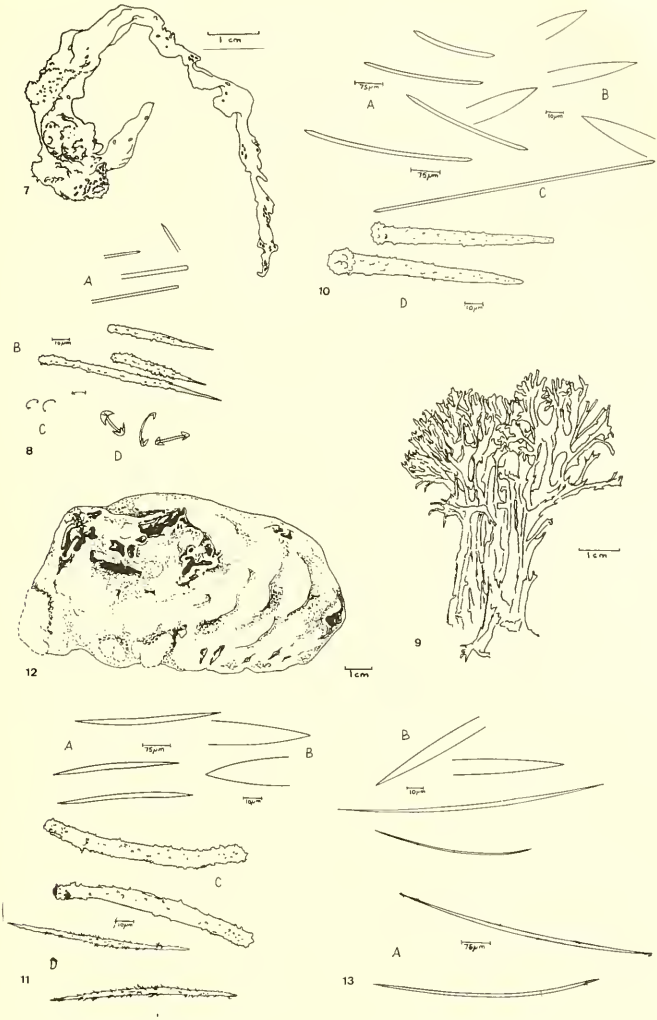
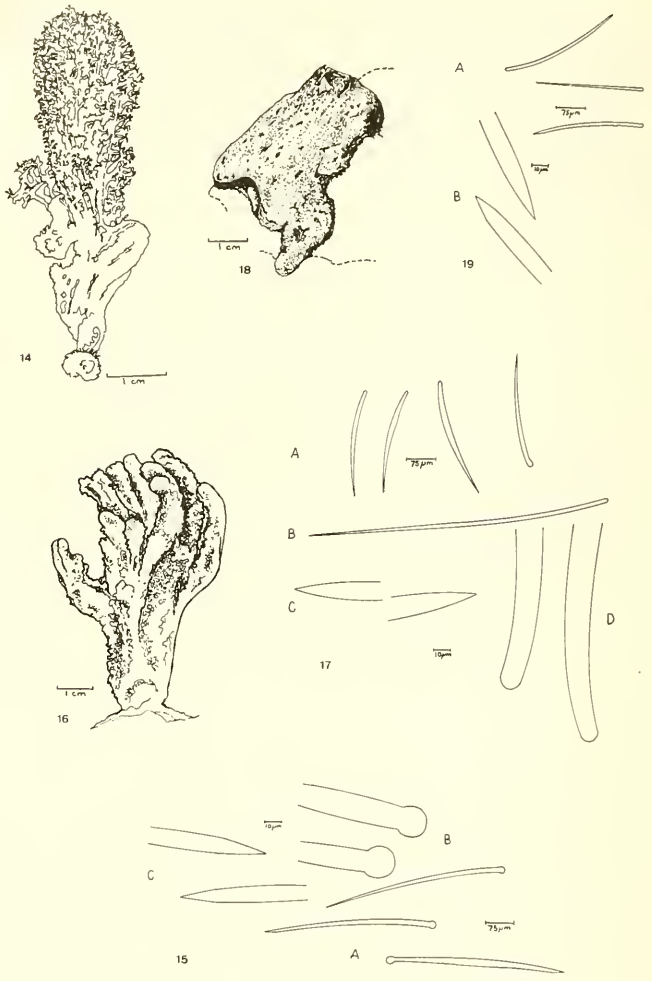


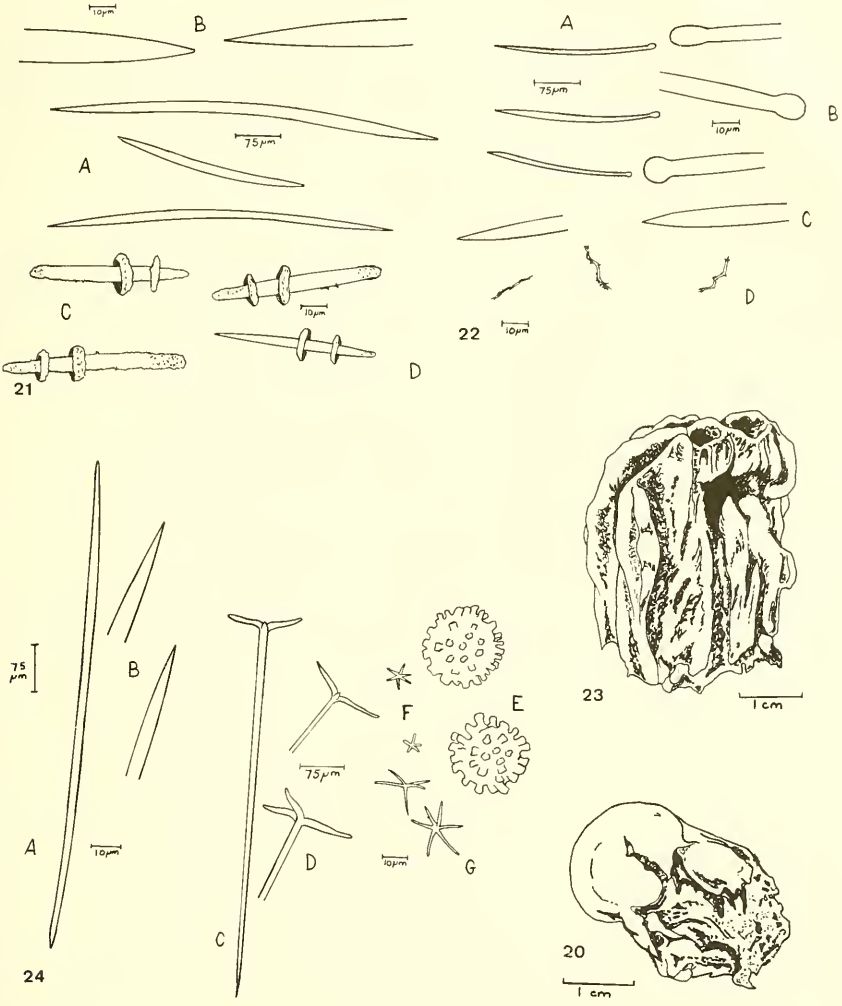
Figs. 1-6: 1. *Aplysina pergamentacea,* sp.n.; holotype YPM 9004; 2-3. *Callyspongia laboreli,* sp.n.: 2. Holotype YPM 8944; 3. Spicules from holotype; 4. *Prianos grayi,* sp. n., spicules from holotype YPM 9008. A. strongyles; B. apices strongyles; 5-6. *Rhizochalina nodulosa,* sp.n.: 5. Holotype YPM 5705; 6. Spicules from holotype. A. slender oxeas; B. robust oxeas; C. apices of robust oxeas.



Figs. 7-13: 7-8. *Anchinoe ramosus,* sp.n.: 7. Holotype YPM 8969; 8. Spicules from holotype. A. apices of tornotes; B. acanthostyles; C. small isochelas. D. large isocheles; 9.10. *Echinodictyum dendroides,* sp.n.: 9. Holotype YPM 8946; 10. Spicules from holotype. A. oxeas; B. apices of oxeas; C. style; D. acanthotylostyles; 11. *Crelloxea spinosa,* gen.n., sp.n., Spicules from holotype YPM 9019. A. oxeas; B. apices of oxeas; C. acanthostrongyles; D. acanthoxeas; 12-13. *Halichondria brasiliensis,* sp.n.: 12. Holotype YPM 5709; 13. Spicules from holotype. A. oxeas; B. apices of oxeas.



Figs. 14-19: 14-15. *Perissinella fosteri,* sp. n.: 14. Holotype YPM 9009; 15. Spicules from holotype. A. tylostyles; B. bases of tylostyles; C. apices of tylostyles; 16-17. *Stylaxinella bistyla,* sp.n.: 16. Holotype YPM 8994; 17. Spicules from holotype. A. skeletal styles; B. elongate styles; C. apices of skeletal styles; D. bases of skeletal styles; 18-19. *Stylaxinella brasiliensis,* sp. n.: 18. Holotype YPM 5727; 19. Spicules from holotype. A. styles; B. apices of styles.



Figs. 20-24: 20-21. *Didiscus oxeata,* sp.n.: 20.Holotype YPM 8968; 21. Spicules from holotype. A. oxeas; B. apices of oxeas; C. discorhabds; D. oxeate discorhabd; 22. *Spheciospongia symbiotica,* sp.n.: Spicules from holotype YPM 9026. A. tylostyles; B. bases of tylostyles; C. apices of tylostyles; D. streptasters; 23-24. *Rhabdastrella* (*Aurorella*) *fibrosa,* sp.n.: 23. Holotype YPM 5730; 24. Spicules from holotype. A. oxea; B. apices of oxeas; C. orthotriaene; D. cladomes of orthotriaenes; E. spherasters; F. small euasters; G. large euasters.