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Some new or little-known sponges from the Great Barrier Reef of Australia

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INTRODUCTION

The sponges here dealt-with were collected in shallow waters by divers and made available to me for study by the Heron Island Research Station (Queensland, Australia).

Each specimen has received a register number (R.N.) which refers to my files and preparations.

Colour notations indicated as C.C. refer to Séguy's code.

The collection has been deposited in the Museum of Natural History of Genoa (MSNG).

CALCAREA

CALCINEA

LEUCETTIDA

LEUCETTIDAE

Leucetta microraphis (Haeckel)

Fig. 1

Leucetta primigenia microraphis Haeckel, 1872, II: 118

OCCURRENCE

Wistari Reef (Capricorn Group), NE reef slope, depth 12 m, 18 June 1979. R.N. HER.46.

Heron Reef, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.12.

Wistari Reef (Capricorn Group), outer slope, depth 12 m, 18 June 1979, coll. L. Owens. R.N. HER.56.

Heron Island, NW reef slope, depth 13 m, 23 August 1980, coll. N.L. Bruce. R.N. HER.97.

DESCRIPTION

The specimens do not appear entire; the largest one, HER.97, measures 13 x 8 x 5 cm. They all consist of a plate 5 to 10 mm thick, irregularly folded, surrounding an ample internal cavity. The outer surface may be folded, ridged or beset with roundish prominences up to 1 cm high, without regularity. The surface appears smooth, only harsh to the touch. The sponge is to be handled with care, as its spicules readily and painfully penetrate the skin. The consistency is firm, incompressible, rather brittle. The colour of all the specimens, preserved in spirit, is middle brown. The colour of HER.12, observed in the field, is reported as grey-green underside, light green with blue tips above.

The rays of the larger triacts reach 2000 x 160 μm. Among the smaller triacts (actines regular, up to 200 μm long) some develop a fourth rudimentary actine, curved or contort.

Fig. 1. *Leucetta microraphis*, specimen HER.12 (fresh).

Leucetta chagosensis Dendy

Leucetta chagosensis Dendy, 1913: 10

OCCURRENCE

Heron Reef, northern shore, depth 8-12 m, 25 April 1979. R.N. HER.8.

DESCRIPTION

In life the sponge was yellow with some brown tinge, lobate, 4 x 5 cm. In the preserved state it is shapeless, much contracted, firm, fragile, with a smooth surface.

The larger triacts are rare; their actines are up to 540 μm long, 55 μm thick at the base. The smaller triacts, equiangular and equiradiate as the former ones, have actines up to 160 μm long; a fourth, rudimentary actine is sometimes present.

CALCARONEA

SYCETTIDA

SYCETTIDAE

Sycon arboreum (Haeckel)

Fig. 2

Sycandra arborea Haeckel, 1872: 331.

OCCURRENCE

Heron Reef, NW end of northern shore, depth 7-10 m, 25 April 1979. R.N. HER.17.

DESCRIPTION

From a narrow base branching digitations arise with apical, fringed oscules, giving to the entire sponge a hemispherical outline. The sponge is 1.5 cm high, 3.5 cm across, the cylindrical digitations are 3-4 mm thick. The consistency is firm, the colour, pink in life, is presently cream. The surface is minutely tessellated, smooth. The oscules, closed in this preserved material, were certainly very narrow in life; their fringe is about 0.5 mm high. In every detail, including the characteristic shape of the dermal diacts, this specimen agrees with Haeckel's description and figure (1872, II: 331; Pl. 53, Fig. 1).

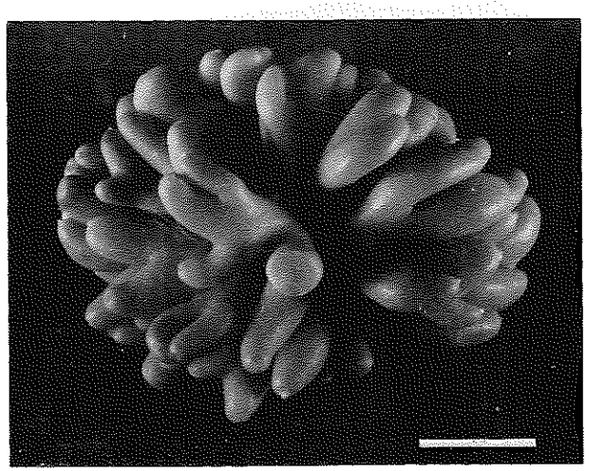


Fig. 2. *Sycon arboreum*, specimen HER.17 (preserved). Scale: 1 cm.

REMARKS

Sycon arboreum is often regarded as a junior synonym of *S. gelatinosum*. It is here considered as a valid species as it seems of no advantage to disregard the not irrilevant differences pointed out by Haeckel. It may be further observed that *Sycandra arborea* was recorded from East Australia, as the present specimen, while *S. alcyoncellum* (= *gelatinosum*) came from West Australia and Java.

DEMOSPONGIAE

TETRACTINOMORPHA

SPIROPHORIDA

TETILLIDAE

Cinachyra tenuiviolacea sp. n.

Fig. 3, 4

OCCURRENCE

Heron Reef, NW end of northern shore, depth 12 m, 26 April 1979. R.N. HER.21.

HOLOTYPE

MSNG 46926.

DESCRIPTION

The sponge is globose, abouth 10 cm in diameter. The colour in life was light violet (C.C. 39), it is drab in the preserved state. The specimen is in bad conditions of preservation. In the centre the sponge is very dense, tough, the skeleton consisting of radiating densely-set spicular tracts together with many spicules in confusion. The radiating structure is not conspicuous to the nacked eye. More externally the radiating bundles become more evident. This part of the sponge is macerated in large part. The outer part of the sponge is fleshy, with a skeletal frame consisting of very dense, parallel, tangentially oriented oxeas, not different from the interior ones. This structure — in the preserved specimen — appears as deriving from a curving in a tangential direction of the radial tracts. A cortex is not distinguishable. The surface is smooth, not hispid, free from sand — which also lacks in the interior. Vestibular pits are not recognizable in the preserved specimen, but they appear widely scattered, 3 to 7 mm wide, covered by a membrane, in a photograph taken on the field.

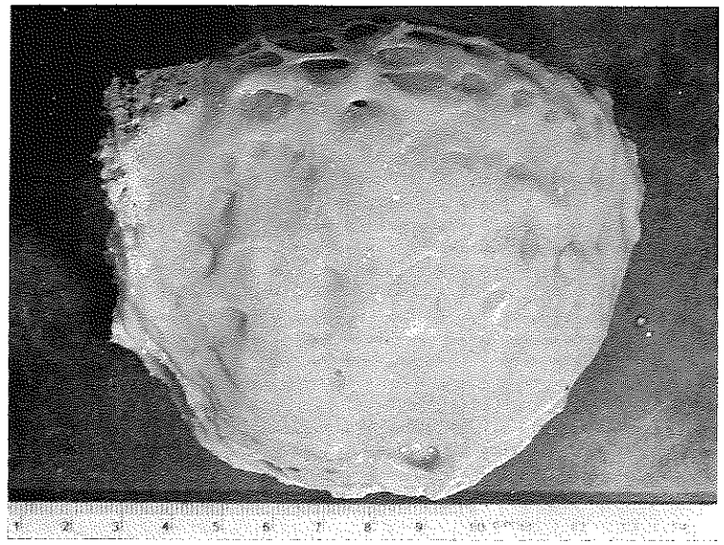


Fig. 3. *Cinachyra tenuiviolacea* sp. n., specimen HER.21 (fresh).

Spicules. 1) Oxeas straight, measuring 1500-2500 x 13-25 μm. 2) Anatriaenes with a rhabdome of uncertain length, 4 to 8 μm thick, an atrophic cladome 15-23 μm wide, clads rounded, only 4 to 7 μm long. These spicules are found in the radial tracts, not in the ectosome. 3) Sigmaspires very thin, with a chord of 9-14 μm.

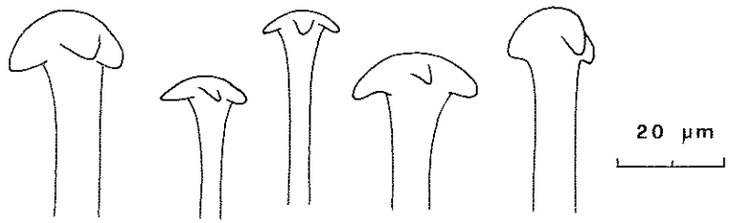


Fig. 4. *Cinachyra tenuiviolacea* sp. n. Cladomes of the anatriaenes.

REMARKS

This species appears differentiated from the known members of the genus by its colour, the small size of its oxeas, by the presence, in the choanosome only, of atrophic anatriaenes.

HADROMERIDA

CLIONIDAE

Cliona carteri (Ridley)

Vioa carteri Ridley, 1881: 129

OCCURRENCE

Heron Island, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.47.

DESCRIPTION

The specimen is perforating and partly encrusting a fragment of dead coral. The colour is crimson (C.C. 121), maintained after preservation in formalin and spirit.

The tylostyles are stout, measuring 240-360 x 9-13.5 µm, with regular, almost globose head 13-16 µm in diameter. The spined spirasters are not very abundant, from 13 to 39 µm long and about 1.5 µm thick (spines not included), the longest ones with up to five bends.

REMARKS

This is the first record of *Cliona carteri* from Australian waters, but it is possible that the specimen inadequately described by Carter (1886: 458) from Port Western as *Vioa johnstonii* may belong to this species.

LATRUNCULIIDAE

Didiscus sp.

OCCURRENCE

Heron Island, 4 December 1979. R.N. HER.52.

DESCRIPTION

Several discorhabds characteristic of this genus have been found, as foreign material, in a preparation. The rhabd of the spicule is 30-50 µm long and 2-3 µm thick; the discs are scarcely developed and never well formed, the smaller one is 3-5 µm wide, the larger one 4-9 µm wide. The surface of the spicule is more or less roughened. Both ends of the rhabds are strongylate, but in one case they are sharply pointed.

REMARKS

Among the few described species of *Didiscus* these discorhabds, as to size, shape and variability, are most similar to those of *Didiscus styliferous* Tsurnamal as figured (1969: 343) for Mediterranean specimens.

The genus *Didiscus* had not yet been recorded from the Australian seas. Its geographically nearest occurrence is from Funafuti in the Ellice Islands (Kirkpatrick, 1900: 354).

AXINELLIDA

AXINELLIDAE

Acanthella klethra sp. n.

Fig. 5

OCCURRENCE

Wistari Reef (Capricorn Group), depth 7 m, 24 April 1979. R.N. HER.9.

Heron Island, north reef slope, "Blue Pools" area, depth 15 m, 3 October 1979. R.N. HER.63.

Heron Island, reef slope, 23 August 1980. R.N. HER.94.

HOLOTYPE

(HER.9) MSNG 46927

PARATYPES

(HER.94) MSNG 46928
(HER.63) MSNG 46929

DESCRIPTION

The specimens have a roundish outline, with a narrow base of attachment. HER.9 measures 7 x 5 x 5 cm; its colour, bright orange in life, is pale yellow (C.C.250) after preservation in spirit. HER.63 measures 6 x 3.5 x 3 cm and is pink (C.C.205) after preservation. HER.94 measures 4 x 3 x 5 cm; its colour is a very pale orange (C.C.200). The consistency is firm, resilient, cartilagineous. The structure is clathrous-lamellate, with anastomosing branched lamellae leaving wide spaces between them, terminating in dull prongs.

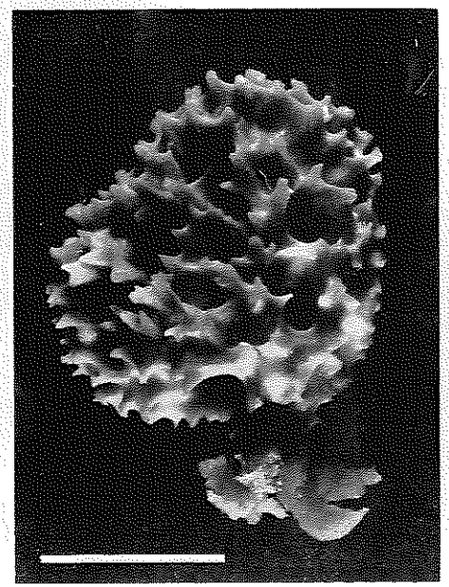


Fig. 5. *Acanthella klethra* sp. n., specimen HER.94 (preserved). Scale: 2 cm.

The supporting skeleton consists of stout compound fibres best described with the terms proposed by Vosmaer (1912: 310). The funiculi, 10 - 30 μm in diameter, consist of clear spongin with more or less regular outline. Closely set, they run in a tortuous manner, branching, anastomosing, forming irregular meshes 25 - 65 μm wide. The spicules are imbedded in them uni- or pauciserially; in some parts abundant spicules irregularly oriented obscure the reticulated pattern. This dense agglomeration of funiculi forms a funis which is more than 2 mm thick near the base and decreases in thickness as it successively branches. At its very tip the funis shows a plumose arrangement of spicules. Only scattered, rare spicules are observed in the flesh between the funes.

Spicules. Not exactly definable, they may be regarded as fundamentally strongyles — but rarely this form is pure: in general, one or both ends are oxeate, or stepped down, or mucronate. Slightly curved, they are isodiametric, 240-350 x 4-5.5 μm.

Auletta constricta sp. n.

Fig. 6

OCCURRENCE

Heron Reef, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.19.

HOLOTYPE

MSNG 46930

DESCRIPTION

The specimen grows from a short and narrow peduncle; it is 55 mm high, somewhat flattened, reaching 15 x 5 mm at the top, where three relatively wide and deep vents indicate that its fundamental structure is one of vertical tubes laterally fused. The colour in life was orange; it is light brown in the preserved state. The consistency is moderately firm, resilient. The surface is markedly conulose, with close-set, acute conules up to 1 mm high.

The skeleton consists of ascending fibres branching and anastomosing, terminating in the conules, made by abundant spongin with irregular outline, which bounds rather irregularly arranged spicules or is cored by them.

Spicules. 1) Styles moderately curved, with evenly-rounded base and, as a rule, a sharp point. They are between 348 and 423 μm long; their thickness has a wide range, 4-14 μm. 2) Oxeas having about the same size as the styles, slightly asymmetrically bent. They are rare in the preparations, but appear proper.

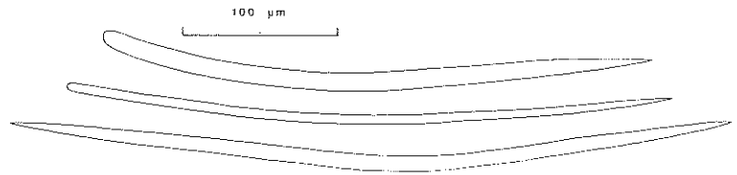
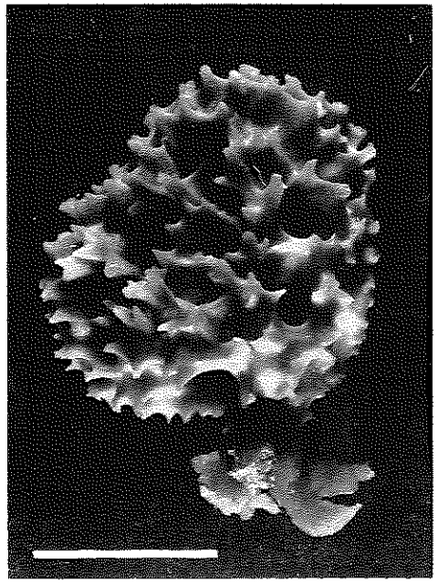


Fig. 6. *Auletta constricta* sp. n. Spicules.

DESCRIPTION

The specimens have a roundish outline, with a narrow base of attachment. HER.9 measures 7 x 5 x 5 cm; its colour, bright orange in life, is pale yellow (C.C.250) after preservation in spirit. HER.63 measures 6 x 3.5 x 3 cm and is pink (C.C.205) after preservation. HER.94 measures 4 x 3 x 5 cm; its colour is a very pale orange (C.C.200). The consistency is firm, resilient, cartilagineous. The structure is clathrous-lamellate, with anastomosing branched lamellae leaving wide spaces between them, terminating in dull prongs.



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Auletta constricta sp. n.

Fig. 6

OCCURRENCE

Heron Reef, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.19.

HOLOTYPE

MSNG 46930

DESCRIPTION

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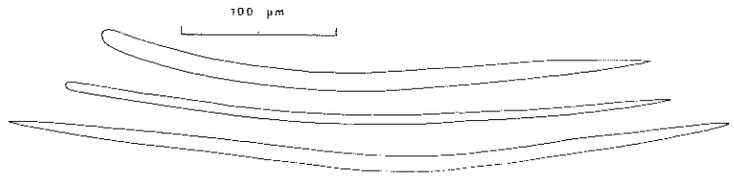

Fig. 6. *Auletta constricta* sp. n. Spicules.

REMARKS

The genus *Auletta* had not been recorded yet from the Australian coasts. The nearest relative of the present species appears to be *Auletta lyrata* (Esper) from Ceylon and the Gulf of Mannar, as described by Dendy (1905: 194).

Phakellia inflexa sp. n.

Fig. 7, 8

OCCURRENCE

Wistari Reef (Capricorn Group), NW, depth 13-20 m, 14 May 1979, coll. L. Thompson. R.N. HER.68.

HOLOTYPE

MSNG 46931

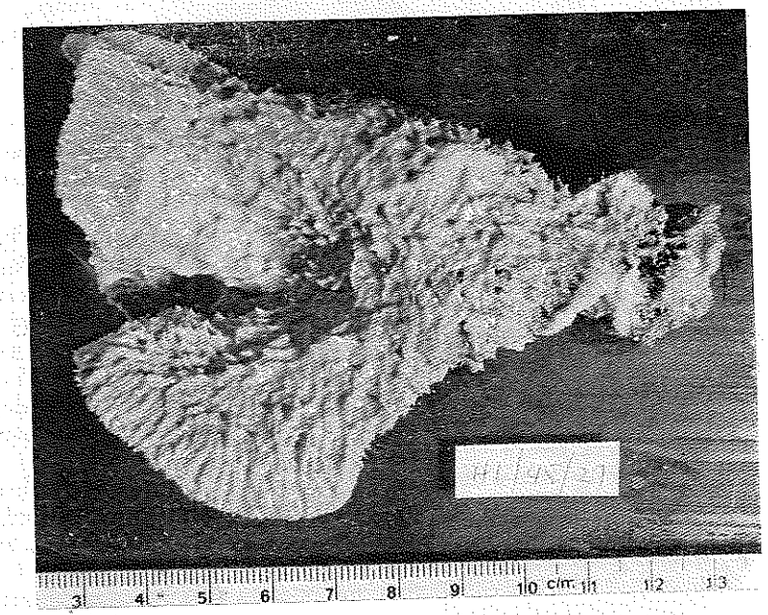

Fig. 7. *Phakellia inflexa* sp. n., specimen HER.68 (fresh).

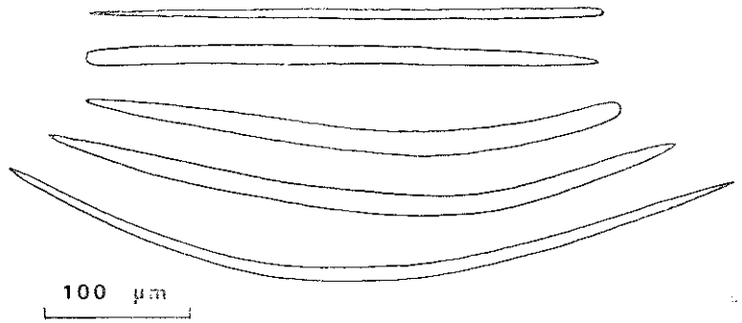

Fig. 8. *Phakellia inflexa* sp. n. Spicules.

DESCRIPTION

The sponge is pedunculate, lamellate. The peduncle is 3 cm high and 2 cm thick. The lamella is strongly rolled up in such a way that the lateral borders meet, without anastomosing. If forced open, it is fan-shaped, about 5 mm thick, 7 cm high and 12 cm wide. The colour in life was bright orange red; in spirit it is light brown. The consistency is firm, resilient. The surface is conulose, the blunt conules — or tubercles — being less than 1 mm high and 1-2 mm apart, sometimes connected by ridges. The ectosome is easily separable, overlaying large subdermal cavities. The pores are scarcely discernible; the oscules, 1-2 mm wide, are numerous on the concave side of the lamella; otherwise, there is little differentiation between the two faces.

Spicules. 1) Styles mostly curved at one third of their length, but also straight, 350-400 x 9-13.5 µm. 2) Oxeas curved, sometimes not quite symmetrically, sometimes slightly bent at the middle, 350-540 x 9-13 µm, not abundant.

CERACTINOMORPHA

HALICHONDRIDA

HALICHONDRIIDAE

Batzella frutex sp. n.

OCCURRENCE

Wistari Reef (Capricorn Group), NW, depth 8-10 m, 14 May 1979, coll. L. Thompson. R.N. HER.57.

Wistari Reef (Capricorn Group), depth 11 m, 30 May 1979, coll. L. Owens. R.N. HER.76.

HOLOTYPE

(HER.76) MSNG 46932

PARATYPE

(HER.57) MSNG 46933

DESCRIPTION

Specimen HER.76 grows erect from a restricted base, expanding shrub-like, about 9 cm high and 7 cm wide, composed of a large number of branches which in part anastomose. These branches may be somewhat flattened, but they have typically a trigonal transverse section; their diameter is 5 to 7 mm. The colour in life was bright red; it is light brown in alcohol. The consistency is firm, flexible. The surface of the branches is minutely foliaceous or grooved and rendered minutely and densely pilose by the projecting ends of the skeletal fibres. Oscules are not clearly distinguishable.

Specimen HER.57 consists of only two erect branches 6 cm high, starting from a common base.

The skeleton consists of densely-set spongin fibres ascending, ramifying and anastomosing in an often contorted way, also coalescing in bundles. The fibres have a diameter of about 35 µm and taper toward the surface, from which they project for about 0.3 mm, as much apart. The fibres are cored by a variable number of spicules longitudinally arranged. Scattered spicules are also present.

Spicules. 1) Diactines slender, straight, with widened axial canal often blackened. They may be regarded as strongyles, but often one extremity is slightly attenuated. Their size is 230-280 µm by about 3 µm. 2) Diactines straight, also with wide axial canal often blackened, rarely regularly strongylate, more often with both ends slightly attenuated, with a blunt or mucronated point. Their size is 125-175 µm by about 3 µm. The latter spicules are less frequent. Intermediates are rare.

REMARKS

Two representatives of the genus *Batzella* are already known from the Australian waters, *Batzella inaequalis* Hentschel (1911: 325) and the species recorded as *Strongylacidon intermedia* by Burton (1934: 550).

HYMENIACIDONIDAE

Dictyonella australiensis sp. n.

Fig. 10, 11

OCCURRENCE

Heron Island, NW end of northern shore, depth 12 m, 26 April 1979. R.N. HER.27.

Heron Island, north reef slope, "Blue Pools" area, depth 17 m, 3 October 1979. R.N. HER.66.

HOLOTYPE

(HER.27) MSNG 46934

PARATYPE

(HER.66) MSNG 46935

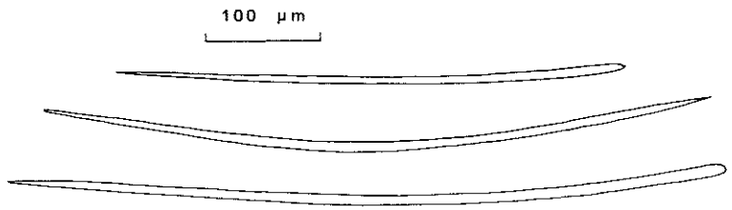

Fig. 10. *Dictyonella australiensis* sp. n. Spicules.

DESCRIPTION

HER.27 was apparently growing erect, measuring 25 x 20 x 12 mm. Its colour in life was orange; it is light orange-brown in spirit. The consistency is softly elastic. The oscules are sparse, 1 to 3 mm wide.

HER.66 is irregularly cushion-shaped, 45 x 35 mm wide, 20 mm thick. The colour in life was orange red; in spirit it is a very light orange (C.C.190). The consistency is softly resilient. The oscules are sparse, about 2 mm wide.

The ectosome is a transparent membrane containing some foreign debris and, occasionally, some scattered spicules. The skeleton consists of ascending multispicular bundles of styles bound by a limited amount of clear spongin, branching and anastomosing, terminating in acute conules about 1.5 mm high. Scattered spicules are also present.

Spicules. Styles gently curved, rarely straight, 430-600 x 4-9.5 µm, up to 11 µm thick in specimen HER.27. Their base is often hastate or mucronate; modifications toward an oxeate form are present.

REMARKS

Dictyonella Schmidt was hitherto known only from the Mediterranean and East Atlantic. The sponge described as *D. dasyphylla* by de Laubenfels (1954: 195) from Palau has skeletal characters not agreeing with the revised diagnosis of the genus (Topsent, 1938: 10).

Fig. 11. *Dictyonella australiensis* sp. n., specimen HER.27 (preserved). Scale: 1 cm.

POECILOSCLERIDA

MYCALIDAE

Arenochalina mirabilis Lendenfeld

Fig. 12

Arenochalina mirabilis Lendenfeld, 1887: 821

Occurrence

Heron Island, NW end of northern shore, depth 11 m, 26 April 1979. R.N. HER.26.

Heron Island, depth 12 m, 23 November 1979. R.N. HER.3.

Wistari Reef (Capricorn Group), NW, depth 17 m, 26 December 1980, coll. N.L. Bruce. R.N. HER.104.

Wistari Reef (Capricorn Group), depth 30 m, 18 May 1979, coll. L. Owens. R.N. HER.64.

Description

The specimens appear incomplete. HER.26 has a cylindrical shape (9 x 3.5 cm) which might be due, however, to constriction into a former

container. The other specimens have no definite shape. In all of them the flesh has disappeared almost entirely, leaving a coarse skeleton of spongin fibres. HER.104 still bears a small strip of coriaceous, smooth ectosome supported by rather scattered radiating fibres. The consistency (in spirit) is softly resilient, the colour from cream to light brown. The colour in life of HER.26 has been noted as orange-red. The fibres are not clearly distinguishable in primary and secondary ones; from 90 to 500 μm thick, they form a very irregular reticulation whose density is variable also within the same specimen. Sand grains are enclosed in the fibres with considerable variability: they are rare in HER.104, while in HER.3 the thicker fibres may be made almost entirely by them. All the fibres contain abundant tylostyles longitudinally arranged. The same spicules are present in the ectosome, where they are not abundant, forming ill-defined tracts.

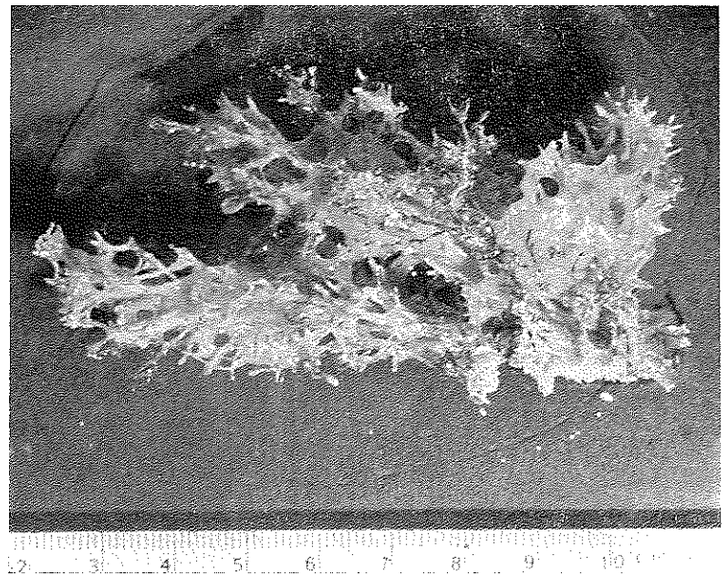

Fig. 12. *Arenochalina mirabilis*, specimen HER.26 (fresh).

Spicules. Tylostyles (subtylostyles) straight — but inside the fibres they may follow their curvature — 240-280 μm long. Their head is elongated, about as thick as the shaft at its middle, that is 3-4 μm. The mineral matter of these spicules is scarce, the axial canal predominating. The tylostyles seem to be quite closely set inside the fibres, but only those with blackened axial canal are clearly discernible. In the preparations in nitric acid few spicules are obtained, mostly broken and diaphanous.

REMARKS

The spicules of this species were originally described as oxeas, then by Whitelegge (1901: 76, 1906: 460) as styles. Hallmann (1912: 252) ascertained that they are subtylostyles, a fact confirmed by Burton (1932: 293) who in the British Museum had available several specimens identified by Lendenfeld. Their size was firstly indicated by Lendenfeld as 0.02 x 0.004 mm — which is certainly to be interpreted as 200 x 4 μm — then by Whitelegge as 190-200 x 4-5 μm (1901: 76) and 150-190 x 4-4.5 μm (1906: 460). They are a little longer and thinner in the present samples.

The known species of *Arenochalina* are Australian. A sponge from Ascension Island described by Burton (1932: 293) as *A. incrustans*, having in common with *A. mirabilis* only the peculiar tylostyles, but possessing a fundamentally different skeleton (not reticulated, with little or no spongin and devoid of inclusions of foreign matter), does not appear to belong to this genus.

Mycale tylostrongyla sp. n.

Fig. 13, 14

OCCURRENCE

Heron Island, outer reef flat, 29 November 1979. R.N. HER.49.

HOLOTYPE

MSNG 46936

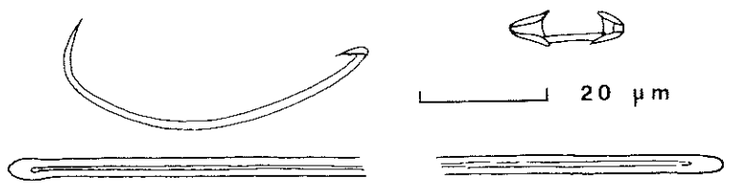

Fig. 13. *Mycale tylostrongyla* sp. n. Spicules.

DESCRIPTION

The available specimen is shapeless and fragmentary; having lost most of its flesh, it consists of a network of stout spongin fibres rather

regularly cylindrical, 130-210 μm thick, almost entirely charged with sand grains and containing few proper megascleres. From these fibres secondary short ones set out, tapering, branching but not anastomosing, made by dense wisps of megascleres bound by scarce spongin, devoid of foreign inclusions. There is no apparent specialized dermal skeleton; possibly, the surface was encrusted by sand. The fibres, in the preserved state, are white.

Spicules. 1) Subtylostrongyles straight, isodiametric, with generally blackened axial canal, 236 to 310 μm long and about 2.7 μm thick, head elongated and scarcely conspicuous. 2) Sigmas of rather constant size and shape, with a chord of 47-54 μm, 1-1.5 μm thick. 3) Anisochelas of uniform size and shape, measuring 18-22 μm.

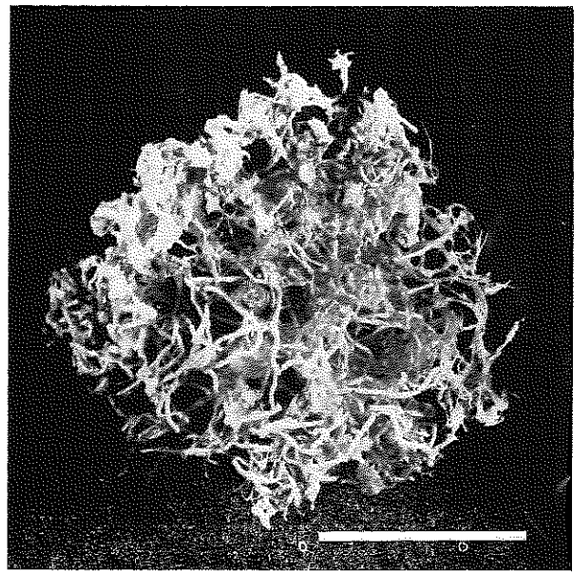

Fig. 14. *Mycale tylostrongyla* sp. n., specimen HER.49 (preserved). Scale: 1 cm.

REMARKS

This species appears related to a group of Indo-Australian sponges: *Mycale penicillium* (Lendenfeld, 1888: 213), *M. moluccensis* Thiele (1903: 950), *M. bidentata* (Dendy, 1905: 163), *M. repens* (Whitelegge, 1907: 487) and *M. dichela* (Hentschel, 1911: 305).

ESPERIOPSIDAE

Neofibularia irata Wilkinson

Fig. 15

Neofibularia irata Wilkinson, 1978: 267

OCCURRENCE

Heron Island, outer reef flat, 23 June 1979. R.N. HER.72, HER.72 bis.

DESCRIPTION

The two specimens were apparently growing erect; they are respectively 11 and 7 cm high. They consist of folding lamellae anastomosing and irregularly fused together at the lower part of the sponge. The lamellae, where free, are 3-4 mm thick. The oscules are scattered, not numerous, about 1 mm wide. The surface is smooth; the ectosome is not separable. The consistency is tough, moderately compressible and resilient. The colour in life was dark brown; it is middle brown (C.C.694) after preservation in spirit. Field notes do not indicate whether the living sponge was irritating to the skin; in the preserved state it does not give off mucus and is not irritating.

The skeleton consists of mostly flattened fibres of pale spongin, with irregular outline, branching and fusing, 50-180 μm thick, forming mostly elongate but irregular and rather confused meshes 270-450 μm wide. Strongyles are embedded in the fibres in variable number; dense rows of them in continuous lines show the main orientation of the fibres to be toward the surface. There is no ectosomal skeletal differentiation, but at the surface the fibres, still very irregular, become thinner and more reticulated.

Spicules. 1) Strongyles straight or moderately curved, 190-230 μm (mostly 200 μm) long and about 3 μm thick. In the preparations their axial canal appears often blackened. 2) Microxeas straight, of two categories: 73-84 μm (mostly 81 μm) by about 1.5 μm, and 32-40 μm long, thinner. 3) Sigmas not abundant, apparently not separable in categories, with a chord of 14-73 μm, up to about 2 μm thick. 4) Raphides immeasurably thin, about 85 μm long.

REMARKS

Some differences in spiculation between these specimens and Wilkinson's material, indicating some variability, may be pointed out. The megascleres have in my samples a notably larger size; the large microxeas were rare in the type material while they are the most abundant in my specimens; the smaller sigmas, which were found to be frequent, are absent in the present material.

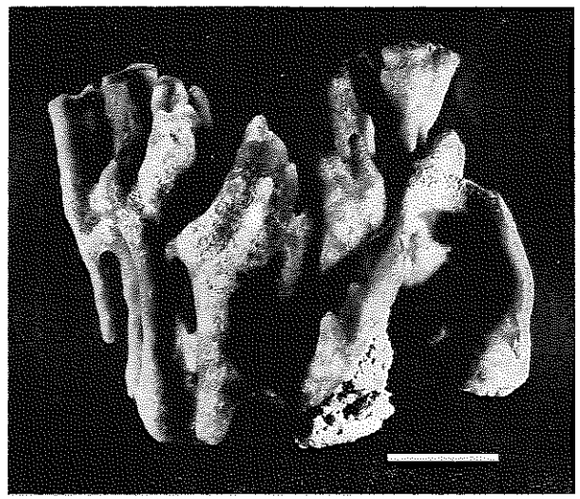

Fig. 15. *Neofibularia irata*, specimen HER.72 (preserved). Scale: 2 cm.

BIEMNIDAE

Kerasemna gen. n.

DIAGNOSIS

Biemnidae with a main skeleton of reticulated, strongly developed spongin fibres cored by proper spicules. Megascleres: slender subtylostyles. Microscleres: toxas, sigmas and raphides, of which one or more categories may be rare or wanting. Type-species: *Kerasemna tenuityla* sp. n.

REMARKS

It is here proposed to transfer to this genus *Ophlitaspongia* (?) *arbuscula* Row, 1911: 347 and *Ophlitaspongia* (?) *horrida* Row, 1911: 349 from the Red Sea. Hallmann (1917: 674) observed that these two species perhaps belong to a new genus related to *Tylodesma* (= *Desmacella*). Burton (1952: 169) synonymized them with *Esperiopsis anomala* Ridley & Dendy (1886: 341), for which he established a new genus *Parisociella*. The latter seems based on a misunderstanding: it has a type-species with isochelas and is diagnosed as possessing anisochelas. Neither type of chelas was present in Row's species.

Kerasemna tenuityla sp. n.

Fig. 16 - 17

OCCURRENCE

Heron Reef, NW end of northern shore, depth 11 m, 26 April 1979. R.N. HER.23.

HOLOTYPE

MSNG 46937

DESCRIPTION

The specimen has a massive, irregularly lobate shape, 7 cm in maximum diameter; its colour in life was dark red. It is presently macerated and consists of a skeleton of reticulated strong spongin fibres to which very little flesh and a small strip of dermal membrane is attached. The reticulation is irregular, but some stouter fibres have an ascending orientation. The meshes are irregular; their width may be roughly indicated as from 300 to 2000 μm. The fibres are from 200 to 750 μm thick — there are also some thinner, connecting ones — and contain subtylostyles in variable number, rather irregularly arranged and rarely closely packed. The same spicules are scattered in the flesh and also present, tangentially oriented, in the dermal membrane; they may be in irregular bundles, reinforced by spongin, where the membrane is connected with the main skeleton.

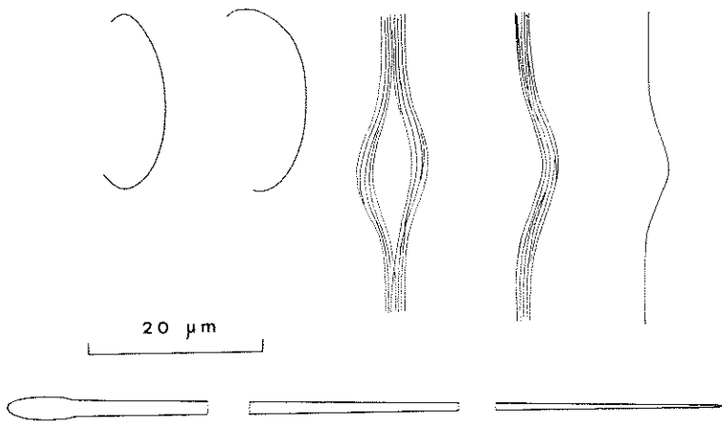

Fig. 16. *Kerasemna tenuityla* gen. n., sp. n. Spicules.

Spicules. 1) Subtylostyles measuring 200-260 x 1.5-2.5 μm, isodiametric, straight (inside the fibres they may follow their curvature), with wide axial canal often appearing blackened. They have a peculiarly elongated head (about three times as long as thick), sometimes only faintly apparent. 2) Toxas abundant, 25-40 μm long, single or in dragmata often of a peculiar form, consisting of two sheaves facing each other. 3) Sigmas not abundant, with a constant C-shape, with a chord of 22-27 μm. 4) Raphides?

All these microscleres are immeasurably thin. Raphides are dubiously present, as abundant trichites, appearing in dense and confused aggregations in the spicule preparations, could not be identified. Some of them are recognizable as toxas, but, for the most part, they cannot be made out even at the highest optical magnification.

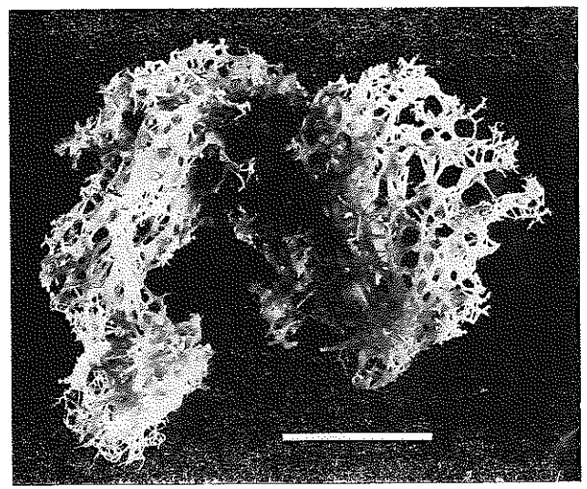

Fig. 17. *Kerasemna tenuityla* gen. n., sp. n., specimen HER.23 (preserved). Scale: 2 cm.

REMARKS

The peculiar toxodragmata present in this species have been observed in another Biemnid, *Sigmatoxella humilis* (Thiele, 1903: 944).

CLATHRIIDAE

Echinoclathria pluritoxa sp. n.

Fig. 18, 19

OCCURRENCE

Heron Island, 8 December 1979. R.N. HER.33.

HOLOTYPE

MSNG 46938

DESCRIPTION

The specimen is small, roundish, apparently a fragment; no field data are available. In the dry state the sponge is light brown, firm and rather resilient. The structure is honeycombed, with the cavities formed by the anastomosing trabeculae about 4 mm wide.

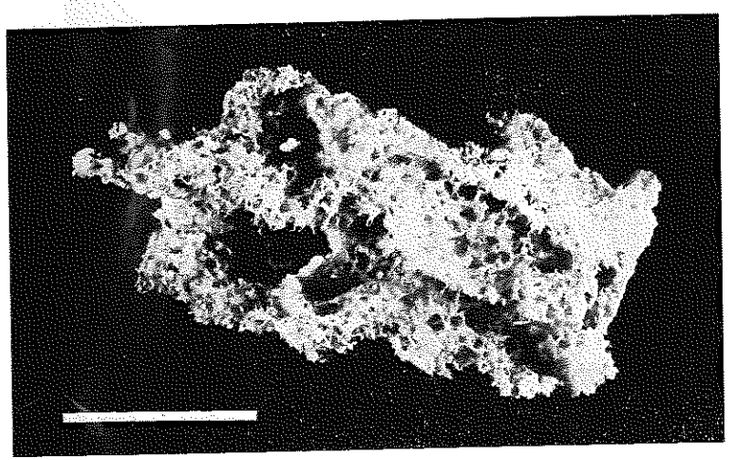

Fig. 18. *Echinoclathria pluritoxa* sp. n., specimen HER.33 (preserved). Scale: 1 cm.

The skeleton is an irregular network of pale brown spongin fibres with uneven outline, 20-100 μm in diameter, forming meshes 300-500 μm wide. The fibres are sparsely cored by a moderate amount of styles; there are no accessory megascleres. Auxiliary megascleres, in the form of straight strongyles, are interstitially present.

Spicules. 1) Styles gently curved, measuring 270-320 μm x 4-9 μm. 2) Strongyles straight, isodiametric, measuring 230-250 μm by about 2.7 μm. 3) Toxas abundant, very variable in size, with a chord of 53-188 μm, 2-4 μm thick in the middle. 4) Toxas with a uniform size of about 10 μm, fairly abundant. 5) Palmate isochelas, with a uniform size of about 13.5 μm, very abundant.

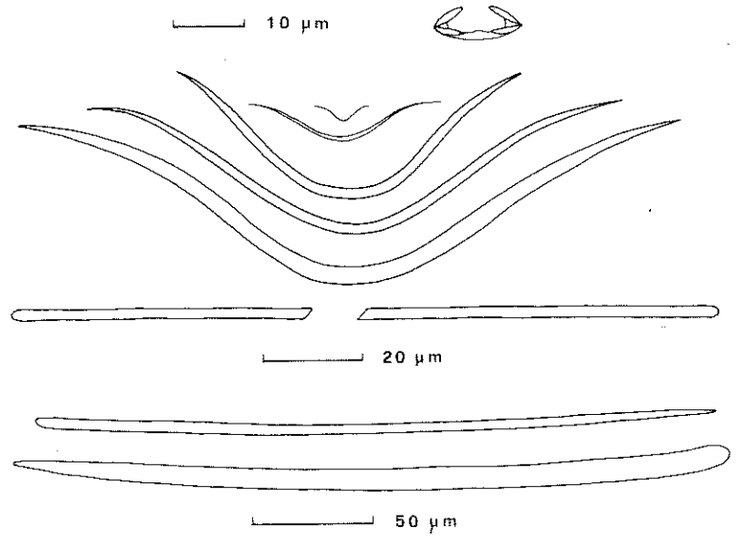

Fig. 19. *Echinoclathria pluritoxa* sp. n. Spicules.

REMARKS

The generic attribution of this specimen is advanced with some reserve, as no species of *Echinoclathria* possessing toxas had been hitherto recorded.

HAPLOSCLERIDA

HALICLONIDAE

Cladocroce aculeata sp. n.

Fig. 20, 21

OCCURRENCE

Lizard Island, 11 December 1976, coll. D. Fisk. R.N. LIZ.5.

Lizard Island, north reef, December 1980, coll. N.L. Bruce. R.N. LIZ.6.

HOLOTYPE

(LIZ.5) MSNG 46939

PARATYPE

(LIZ.6) MSNG 46940

The specimen LIZ.5 consists of a curved lamella, torn in two pieces, apparently belonging to a tubular sponge having a diameter of about 5 cm and a wall 5-7 mm thick. The fragment does not include the base of attachment of the sponge. The concave surface is even, microscopically hispid; it is perforated by numerous vents 0.5-2 mm wide. The convex surface is beset with irregular spines up to 7 mm high. There are rare vents, less than 1 mm wide. The colour (in formalin) is cream; the consistency is firm, moderately flexible but rather fragile.

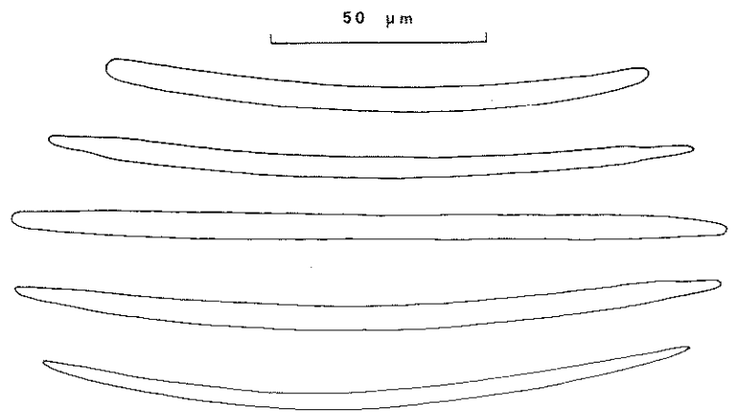

Fig. 20. *Cladocroce aculeata* sp. n. Spicules.

The skeleton consists of 1) a regular isodictyal unispicular network of spicules bound by scarce spongin at the nodes; 2) strong ascending, branching and anastomosing fibres made by thickly-set parallel spicules bound by scarce, colourless, not overlapping spongin. These fibres are 50 to 170 µm thick; they run longitudinally and join their distal ends to form the spines, but do not reach the ectosome, which is supported solely by the renierid network.

The specimen LIZ.6, also a fragment, smaller, has exactly the same characters.

Spicules. Oxeas slightly curved, with more or less strongylate ends, measuring 120-160 x 4-6.8 µm.

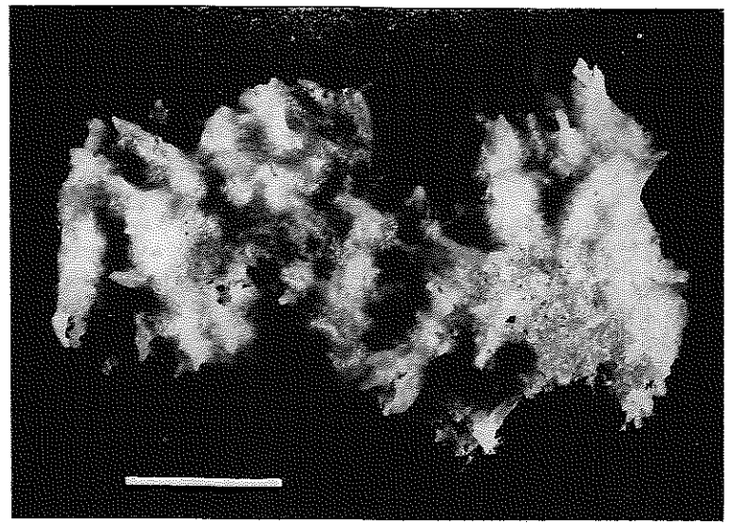

Fig. 21. *Cladocroce aculeata* sp. n., specimen LIZ.5 (preserved). Scale: 2 cm.

REMARKS

The genus *Cladocroce* Topsent was hitherto recorded only from the north-eastern Atlantic Ocean, from deep waters. *Cladocroce aculeata* differs from the four known species for the thorny processes on the convex face of the lamella, for the size of its oxeas and the tendency of the same toward a strongylate form.

Gellius subtilis sp. n.

Fig. 22

OCCURRENCE

Heron Island, reef flat, 2 November 1978. R.N. HER.5.

HOLOTYPE

DESCRIPTION
MSNG 46941

it measures about 35 x 25 x 6 mm. In the dried state it is very light and
The specimen was growing on dead coral. Irregularly cushion-shaped,

friable and has a cream colour. The surface is smooth; there are a few scattered oscules with elevated rim, 2 to 3 mm in diameter.

The main skeleton is a rather irregular network made by oxeas bound by scarce spongin, main fibres paucispicular, connectives unispicular. The meshes are about 100-135 µm wide. There is no dermal specialization.

Spicules. 1) Oxeas slender, slightly and evenly curved, with short points, 135-165 x 2.7-4 µm. 2) Sigmas C-shaped, with chord of 22-32 µm, immeasurably thin, fairly abundant. 3) Toxas with a chord of 40-45 µm, thickness not measurable, rather rare.

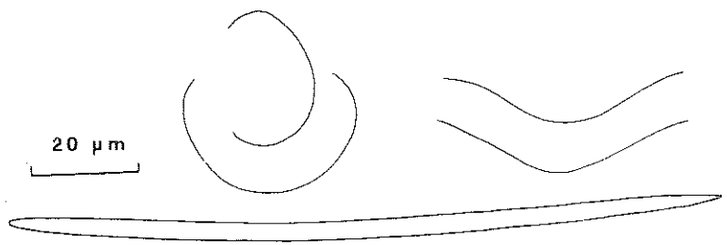

Fig. 22. *Gellius subtilis* sp. n. Spicules.

REMARKS

The genus *Gellius* is here used in the traditional sense. With reference to the revisions recently proposed respectively by van Soest (1980) and by Bergquist & Warne (1980) it must be observed that the present specimen does not agree with van Soest's *Gellius* because of the presence of toxas, and not with Bergquist & Warne's *Orina* because of the absence of a specialized ectosomal skeleton.

NIPHATIDAE

Gelliodes tenuirhabdus sp. n.

Fig. 23, 24

OCCURRENCE

Wistari Reef (Capricorn Group), 15 June 1979. R.N. HER.44.

HOLOTYPE

MSNG 46942

Fig. 23. *Gelliodes tenuirhabdus* sp. n. Spicules.

DESCRIPTION

The specimen is irregularly massive, measuring about 40 x 30 x 15 mm. In formalin the colour is brown, the consistency resilient.

The skeleton consists of a coarse reticulation of pale-yellow horny fibres 16-43 µm thick not clearly separable in primaries and secondaries, not forming regular meshes. At the surface the network becomes paratangential, with the nodes of the meshes more or less elevated. The fibres are cored by a variable number of longitudinally running slender diactines rarely pluriserially arranged, mostly isolated, missing in many fibre tracts. A few sigmas are sparsely present in the fibres. In the flesh, diactines are rare, sigmas very abundant.

Spicules. 1) Oxeas isodiametric with short points, measuring about 100 x 1.5 µm, straight (they may follow the curvature of the fibre). They appear to consist of very little mineral matter: inside the fibres they are visible because of the blackening of their axial canal; it is difficult to obtain them in nitric acid preparations. 2) Sigmas evenly C-shaped, with a chord of 13-27 µm, 0.8-1.3 µm thick.

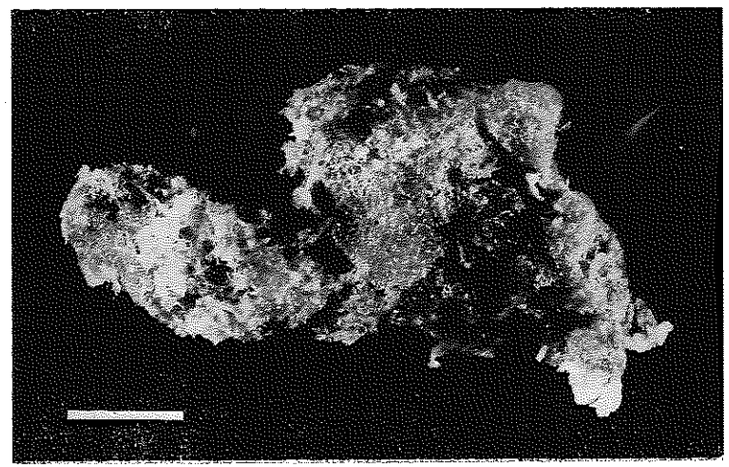

Fig. 24. *Gelliodes tenuirhabdus* sp. n., specimen HER.44 (preserved). Scale: 1 cm.

Amphimedon aculeata sp. n.

Fig. 25 - 27

OCCURRENCE

Wistari Reef (Capricorn Group), NE slope, depth 10 m, 18 June 1979. R.N. HER.80.

HOLOTYPE

MSNG 46943

DESCRIPTION

The specimen is a large fragment about 17 x 10 x 10 cm (now cut in two) of a vase-shaped sponge about 17 cm high and as much in maximum diameter. There is a concavity at the top, 5 cm wide and 8 cm deep, with a tapering rim. The surface is glabrous, with aculeate, conical or ridged projections up to 15 mm high, irregularly, more or less thickly set. The colour (in spirit) is light brown. The consistency is tough and incompressible: the sponge cannot be torn and is not brittle when dry. The choanosome is cavernous, with numerous canals up to 6 mm wide. Subdermal cavities abund; oscules are not apparent.

Fig. 25. *Amphimedon aculeata* sp. n. Spicules.

The choanosomal skeleton consists of a network of plurispicular spongin fibres having a sinuous course, thus forming roundish, more or less elongated meshes. The fibres are irregular as to outline, thickness and spicule content; the spongin is abundant, transparent. The spicules may be so closely packed that their number cannot be reckoned or they may be few, ill-aligned. The thickness of the fibres may be indicated as 90 to 300 µm; the meshes are from 270 to 450 µm wide, sometimes more. The ectosomal skeleton is paratangential, not separable, extending uniformly over the entire surface, covering the terminations of the canals and the subdermal cavities. It consists of a network of plurispicular spongin fibres 27-70 µm thick, forming meshes about 210-320 µm wide. The embedded spicules, variable in number, are not well aligned, a few project from the fibre.

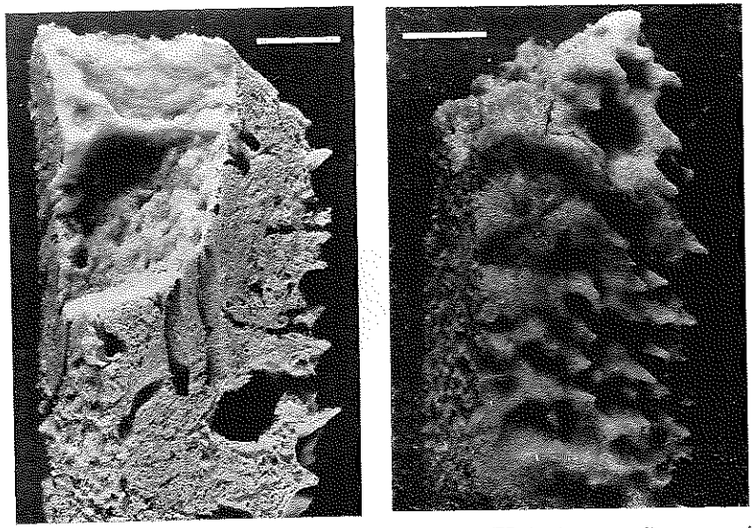

Fig. 26, 27. *Amphimedon aculeata* sp. n., specimen HER.80 (preserved), two sections. Scale: 2 cm.

Spicules. Strongyles curved, some almost straight, with ends generally evenly rounded, rarely attenuated or mucronate. Their length is from 175 to 300 µm, mostly about 250 µm; their thickness is rather uniform, 4-5.5 µm.

CALLYSPONGIIDAE

Callyspongia muricina (Lamarck)

Fig. 28

Spongia muricina Lamarck, 1813: 438
Siphonochalina confoederata: Lendenfeld, 1887: 803
Spinosella muricina: Topsent, 1931: 82
Callyspongia confoederata: Bergquist, 1969: 65
non *Tuba confoederata* Ridley, 1884: 400

OCCURRENCE

Heron Island, SE reef, depth 17 m, 14 June 1979, coll. L. Owens. R.N. HER.69.

DESCRIPTION

The specimen consists of six irregular tubular processes joined at the base and partly coalescing. Overall the sponge is 9 cm high, 7 cm across.

The single tubes are from 2 to 6 cm high, 2 to 4 cm in diameter, open at the summit, uniformly hollow down to the base. The apical vent is fringed. The surface, harsh to the touch, bears strong conules 3-4 mm high, 4-5 mm apart. In spirit, the consistency is stiff, scarcely compressible, the colour is light yellowish brown (C.C.250, darker).

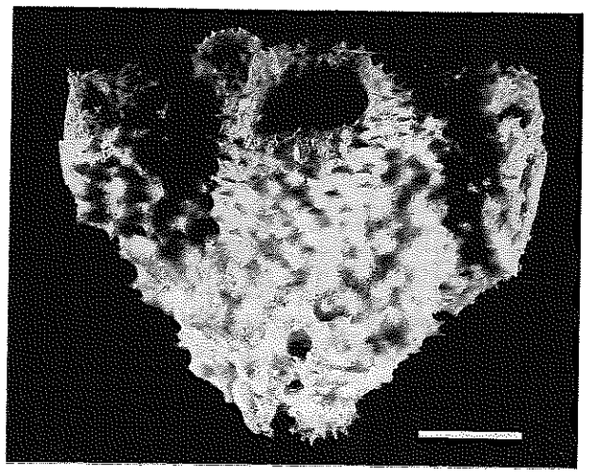

Fig. 28. *Callyspongia muricina*, specimen HER.69 (preserved). Scale: 1 cm.

The ectosomal skeleton, strongly differentiated and tangential, consists of a network of primary spongin-fibres 40-110 µm thick, forming irregularly polygonal meshes 450-830 µm wide. The fibres are cored pluriserially by oxeas; the spongin is pale yellow. Inside these meshes there is a secondary — dividing the mesh in two or three parts — and tertiary reticulation of clear spongin-fibres 5-18 µm thick, forming meshes 35-75 µm wide. These fibres are mostly uniserially cored by oxeas; some tracts are free.

The choanosomal skeleton is an irregular network of colourless to amber-coloured spongin-fibres 16 to 92 µm thick, cored by a variable amount of pluriserially arranged oxeas. Thick fibrofascicles terminate in the conules and in the pseudoscular fringe. At the inner surface of the tubes, which is even, fasciculated fibres, tangentially arranged, bound thickly-set oscules up to 2 mm wide.

Spicules. Oxeas gently curved, measuring 60-70 µm by about 1 µm.

Callyspongia carens sp. n.

Fig. 29

OCCURRENCE

Wistari Reef (Capricorn Group), depth 20 m, 14 May 1979, coll. L. Owens. R.N. HER.55.

HOLOTYPE

MSNG 46944

DESCRIPTION

The specimen appears to be incomplete, representing the upper part of an erect tubular sponge. Clavate, 5 cm high, it has a maximum diameter of 4 cm. At the top there is a circular vent 13 mm wide, with a thin elevated rim, giving access to a tubular uniform cavity. On the outer surface there are strong spines wide at the base, 3 to 4 mm high, about 5 mm apart. In spirit, the consistency is firmly resilient, the colour light brown, about the same as in life (C.C.694, lighter).

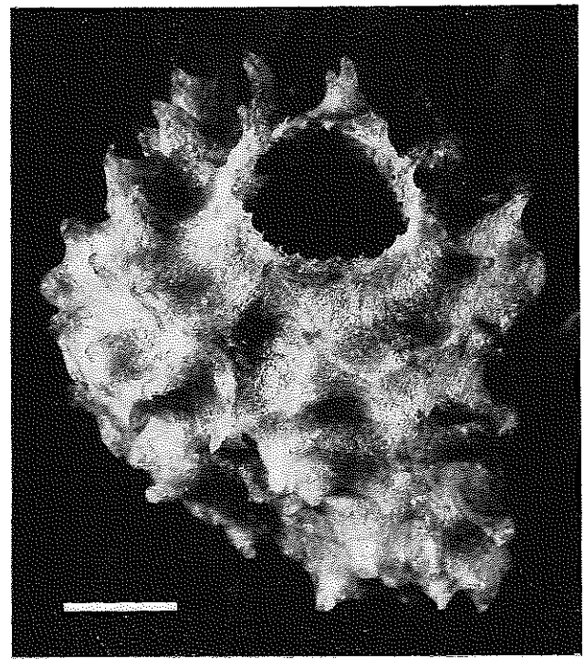

Fig. 29. *Callyspongia carens* sp. n., specimen HER.55 (preserved). Scale: 1 cm.

The ectosomal skeleton is differentiated, tangential, consisting of 1) main amber-coloured spongin fibres 80-100 μm thick forming mostly triangular meshes, not quite regular, 900-1300 μm wide; 2) a secondary reticulation of clear fibres 27-38 μm thick, not forming regular meshes; 3) a tertiary network of clear fibres 11-17 μm thick forming meshes 50-110 μm wide.

The choanosomal skeleton consists of ascending main fibres of clear to amber-coloured spongin 55-85 μm thick, becoming denser and fasciculated as they come to support the superficial spines, and of secondary fibres 8-27 μm thick forming irregular meshes 100-200 μm wide. This skeleton does not assume a differentiated structure at the inner surface of the tube, which presents scattered oscules 1 to 3 mm wide.

Inside the fibres, only here and there some vestigial spicules — or, better said, traces of spicules — appear. None has been observed in the ectosomal skeleton.

REMARKS

Similar in habitus to the above described *Callyspongia muricina*, this sponge is mainly distinguishable by its choanosomal skeleton, which does not assume a tangential arrangement at the inner surface of the tube.

Callyspongia capricorni sp. n.

OCCURRENCE

Heron Island, north reef slope, "Blue Pools" area, depth 16 m, 3 October 1979. R.N. HER.77.

HOLOTYPE

MSNG 46945

DESCRIPTION

The specimen appears to be a fragment, 9 x 6 cm wide, from a rather large sponge. It consists of a slightly concave lamella about 15 mm thick with markedly differentiated surfaces. The convex face is conulose, the conules about 2 mm high, 2-4 mm apart, often connected by ridges. On the concave face, which is uneven, longitudinal nervures slightly prominent, about 1 mm thick and 4 mm apart, run toward the margin of the lamella and are visible to the unaided eye. Oscules and pores are not apparent. The choanosome is cavernous. The colour of the living sponge was dull yellow; it is light brown in spirit. The consistency is firm, resilient.

The ectosomal skeleton, tangential, consists of primary fibres of light-yellow spongin about 80 μm thick, forming irregular meshes 700-1000 μm wide, inside which there is a secondary network of paler fibres 25-40 μm thick, forming meshes 200-250 μm wide.

The choanosomal skeleton is an intricate and irregular reticulation of pale yellow fibres 20-120 μm thick. Fasciculated fibres, up to 1 mm thick, terminate in the conules at the outer face of the lamella and run flush with the surface, toward the margin, at the inner face.

All the fibres, without exception, are cored by spicules in variable number, proportional to the thickness of the fibre.

Spicules. Oxeas slightly curved, with blunt points, 120-140 μm long, about 1.3 μm thick.

Callyspongia brucei sp. n.

Fig. 30

OCCURRENCE

Chesterfield Island, seaward edge, depth 20 m, 14 June 1979. R.N. HER.45.

HOLOTYPE

MSNG 46946

DESCRIPTION

The specimen consists of two tubular processes joined at a restricted base. The tubes are 5 cm high, 2 cm in diameter, with a wall 5 mm thick; the apical vent is 1 cm wide. The surface is smooth and even. In spirit, the consistency is firm and elastic; the colour is light dull yellow (C.C.265).

The ectosomal skeleton consists of a differentiated tangential network of clear spongin fibres about 30 μm thick forming meshes about 500 μm wide, which include a secondary reticulation of fibres 10-20 μm thick forming meshes 50-100 μm wide. Inside the fibres there are sparse vestigial spicules, mostly singly arranged.

The choanosomal skeleton is a close reticulation of spongin fibres of which the main ones are 30-60 μm thick and form irregular meshes 100-200 μm wide. They are connected, without regularity, by tortuously running secondary fibres 6-16 μm thick. The skeleton is not differentiated at the inner surface of the tubes. A few scattered oscules are present on the inner surface of only one of the tubes. Vestigial spicules inside the choanosomal fibres are extremely rare or absent.

Spicules. Vestigial diactines measuring about 70-80 μm by about 1 μm. Inside the fibres they are revealed by their blackened axial canal. If the canal is clear, they are almost undiscernible under optical magnification.

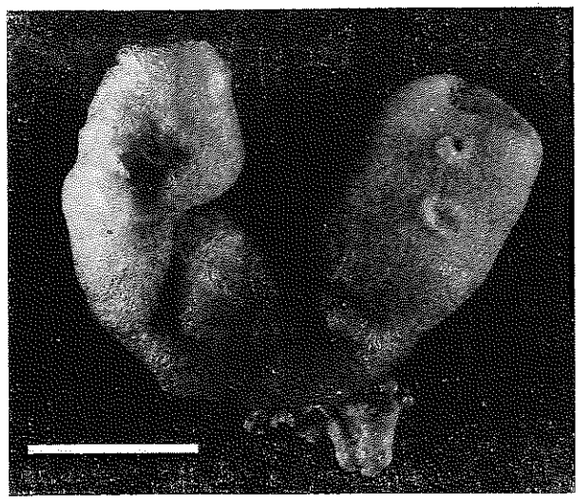

Fig. 30. *Callyspongia brucei* sp. n., specimen HER.45 (preserved). Scale: 2 cm.

REMARKS

This species is named after Dr. A.J. Bruce, former director of the Heron Island Research Station.

Callyspongia trichita sp. n.

Fig. 31

OCCURRENCE

Heron Island, reef flat, 1 May 1979. R.N. HER.18.

HOLOTYPE

MSNG 46947

DESCRIPTION

The specimen is irregularly tubular and annulate, approximately 10 cm long and 3 cm thick, with a narrow lateral base of attachment, with a vent about 1 cm wide at each end leading to a wide internal cavity. The colour in life was light orange; after preservation in formalin and then in spirit it is light brownish yellow. The consistency is firm and resilient.

The ectosomal skeleton is a two-dimensional network of spongin fibres with the principal ones 90 to 180 μm thick, forming meshes 700 to 1250 μm wide. The nodes of these meshes are thickened and slightly elevated, making the surface rough to the touch. Thinner, secondary fibres may divide these meshes in two to five parts, which in turn are reticulated by much paler fibres 4 to 14 μm thick, forming meshes 45-70 μm wide.

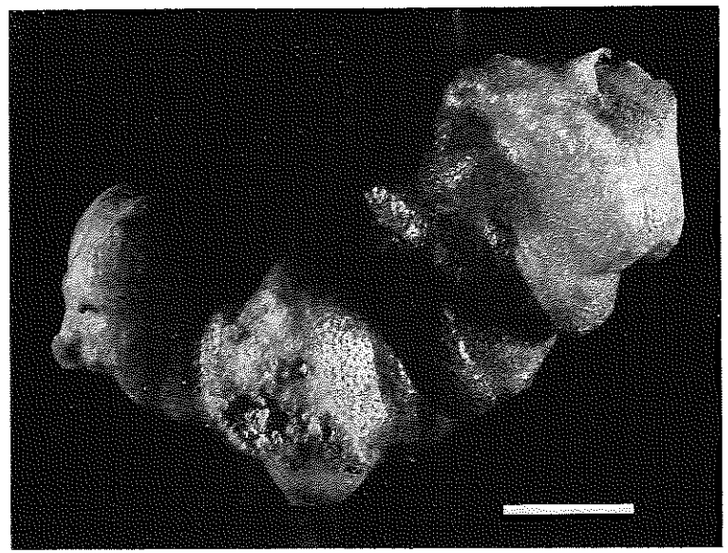

Fig. 31. *Callyspongia trichita* sp. n., specimen HER.18 (preserved). Scale: 2 cm.

The choanosomal skeleton consists of a rather regular network of spongin fibres 50 to 90 μm thick, forming meshes 320-640 μm wide. These fibres are not clearly distinguishable in main and connective ones. The surface of the inner cavity is not differentiated; it is perforated by oscules 1 to 4 mm wide irregularly grouped.

The fibres, both ectosomal and choanosomal, contain longitudinally arranged spicules whose density is proportional to the thickness of the fibre. Isolated spicules or none are present in the thinnest fibres.

Spicules. Slightly curved, isodiametric diactines 50-90 μm long, less than 1 μm thick. Clearly visible in the fibres mounted in balsam because of the blackened axial canal, they are scarcely discernible in the spicule preparations, even at the highest power of optical magnification.

Siphonochalina deficiens sp. n.

Fig. 32

OCCURRENCE

Heron Island, SW reef slope, 29 October 1979. R.N. HER.71.

HOLOTYPE

MSNG 46948

DESCRIPTION

The specimen, with a total height of 7 cm, consists of eight erect tubes in large part laterally coalescent, joined at the base. The tubes are rather regularly cylindrical, with a diameter of about 1 cm, open at the summit, with a wall about 2.5 mm thick. The sponge, compared with a photograph taken in the fresh state, is presently much shrunken. The colour, both in life and in spirit, is light brown. The consistency is softly elastic. The surface is even, glabrous, porous outside the tubes, perforated by abundant scattered oscules less than 1 mm wide on the inside.

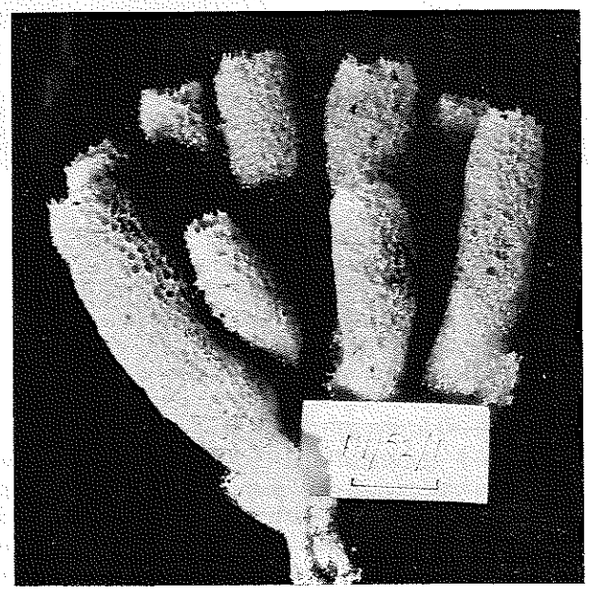

Fig. 32. *Siphonochalina deficiens* sp. n., specimen HER.71 (fresh). Scale: 1 cm.

The skeleton is a rather irregular reticulation of pale-amber spongin fibres 20-45 μm thick, forming meshes 170-450 μm wide. A tangential, differentiated skeleton is evident only on parts of the surface, mainly near the base of the sponge. It consists of an irregular network of somewhat thinner fibres.

Spicules. Only vestigial and extremely rare diactines are present inside the fibres. Discernible by their blackened axial canal, they are very slender, about 55 μm long. They are entirely lacking in most parts of the sponge.

Arenosclera gen. n.

DIAGNOSIS

Haplosclerida with a specialized dermal skeleton consisting of a tangential regular network of foreign debris joined by scarce spongin and a choanosomal rather irregularly reticulated skeleton of spongin fibres cored by both foreign material and proper diactines in variable proportion. Secondary fibres, uncored or cored by proper spicules only, may be present or absent in the ectosomal skeleton. In the choanosomal skeleton the secondary fibres — not always distinguishable from the primary ones — are generally cored by proper spicules only.

Type species: *Arenosclera heroni* sp. n.

REMARKS

In the two-family scheme for the Haplosclerida proposed by Griessinger (1971) the present genus would find its place in the Haliclonidae; according to more recent treatments (van Soest, 1980 and Bergquist & Warne, 1980) it appears nearest to the Callyspongiidae, but would excessively widen the scope of that family if placed there. It will probably require the erection of a new family.

Chalinopsilla arborea (Lendenfeld, 1889: 147) is here transferred to the present genus.

Another sponge referable to *Arenosclera* is *Arenochalina arabica* Keller (1889: 393). De Laubenfels (1936: 46) transferred it to his genus *Querciclona* having as type-species *Antherochalina quercifolia* Keller (1889: 338). But the two species have little in common, the latter — and consequently the genus *Querciclona*, if at all valid — belonging probably to the Clathriidae.

Arenosclera heroni sp. n.

Fig. 33 - 35

OCCURRENCE

Heron Reef, NW end of northern shore, depth 12 m, 26 April 1979, coll. J. Halverson. R.N. HER.32.

HOLOTYPE

MSNG 46949

DESCRIPTION

The specimen is massive, irregularly lobate, growing repent from a restricted base of attachment, measuring 5 x 2.5 x 2 cm. The colour in life was light yellow; it is light yellowish brown (C.C.250) in spirit. The consistency is firm and resilient. The oscules are numerous and sparse, 1.5-3 mm in diameter, with a somewhat elevated rim; one opens at the summit of a short digitate process. The surface is smooth, here and there raised in discontinuous low ridges.

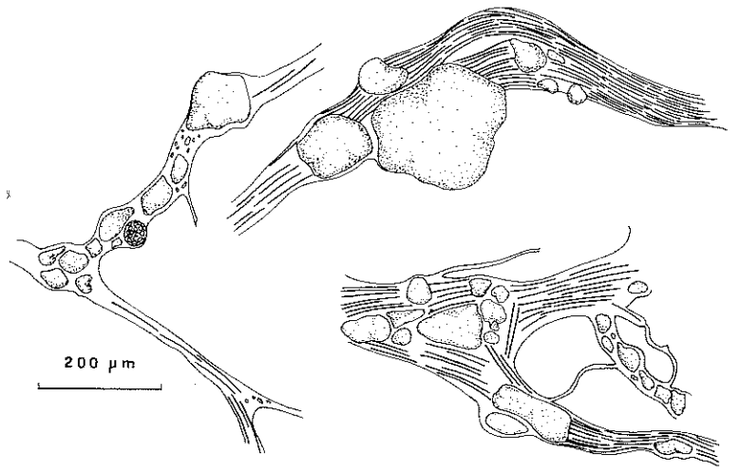

Fig. 33. *Arenosclera heroni* gen. n., sp. n. Fibres of the choanosomal skeleton.

The ectosomal skeleton, not separable, is a tangential network of strings of foreign debris (mainly sand) cemented by a hardly perceptible quantity of spongin. The sand grains are up to 80 µm in diameter; the meshes are roundish, 130-160 µm wide. Very rare connective fibres of clear spongin, about 6 µm thick, cored by a single proper spicule, are present.

The choanosomal skeleton is an intricate, irregular reticulation in which primary and secondary fibres are not clearly distinguishable. The thicker fibres may be variably cored by foreign debris, proper spicules or both. There are also irregular tracts of debris cemented by scarce spongin. Proper spicules are not observable in the tracts of densely aggregated debris, but are otherwise abundant, either coring the fibres together with

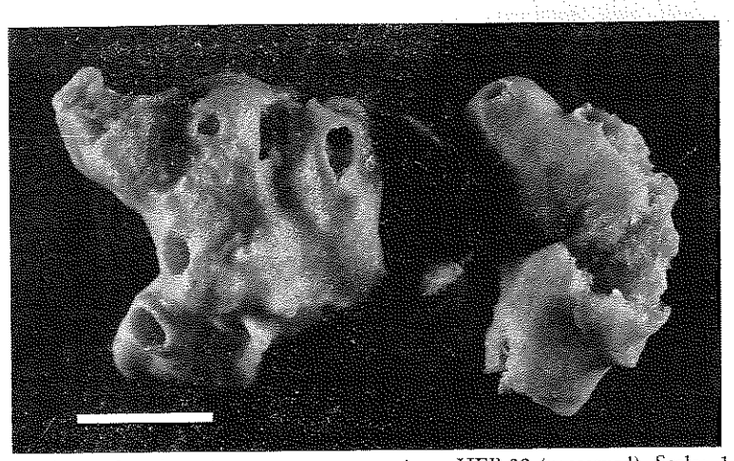

Fig. 34. *Arenosclera heroni* gen. n., sp. n., specimen HER.32 (preserved). Scale: 1 cm.

isolated sand grains or in thick bundles which may occupy the entire fibre. The spongin is colourless. The thinner fibres contain sparse spicules or are sometimes uncored. A few spicules may be observed scattered in the flesh. The foreign material consists almost entirely of sand and does not include sponge-spicules, with the exception of a few calcareous triacts in the dermal skeleton.

Spicules. Oxeas straight (they may follow the curvature of the fibres) 80-90 µm long, about 1 µm thick. Most of their bulk is occupied by the axial canal, which appears blackened in the preparations.

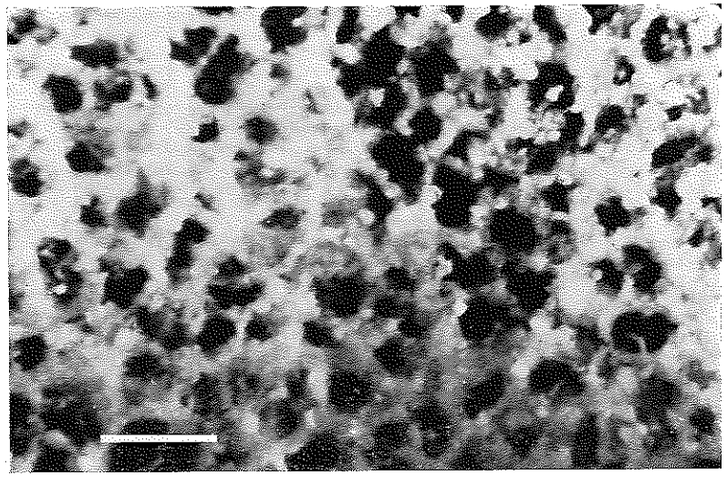

Fig. 35. *Arenosclera heroni* gen. n., sp. n. Ectosomal skeleton. Scale: 300 µm.

Arenosclera parca sp. n.

Fig. 36

OCCURRENCE

Heron Island, 4 December 1979. R.N. HER.51.

Wistari Reef (Capricorn Group), northern end, depth 10-13 m, 13 June 1979. R.N. HER.78.

HOLOTYPE

(HER.78) MSNG 46950

PARATYPE

(HER.51) MSNG 46951

DESCRIPTION

HER.78: measuring 7 cm in diameter, 4 cm thick, the specimen is very irregular, with folds and lobes which anastomose leaving open spaces between them. The consistency in spirit is firm and resilient; the colour is a very light brown. The surface is glabrous.

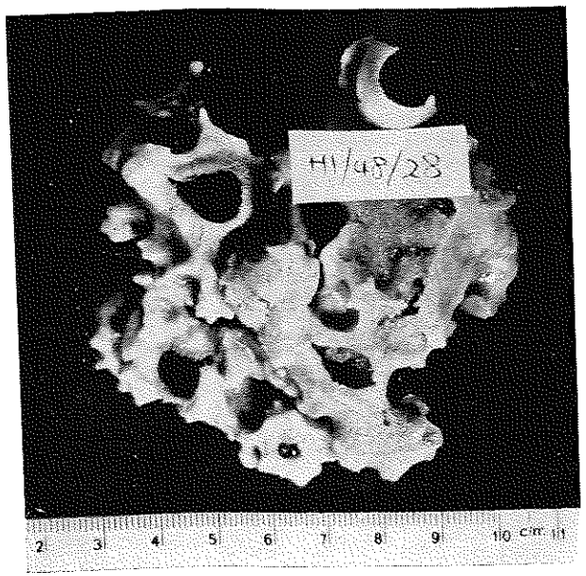

Fig. 36. *Arenosclera parca* gen. n., sp. n., specimen HER.78 (fresh).

HER.51: measuring 6 x 5 x 2 cm, the specimen has the same characters, but it also bears some blunt conical processes 2-3 cm high with a small vent at the top.

There is a differentiated dermal skeleton, not separable, consisting of a regular tangential reticulation made by strings of debris cemented by a variable amount of spongin, 55-80 μm thick, forming polygonal or roundish meshes about 160 μm wide. A secondary reticulation, not always present, is scarce and irregular, consisting of fibres of clear spongin about 5 μm thick which generally contain a single imbedded proper spicule. Inside the meshes very few scattered proper spicules and debris are present.

The choanosomal skeleton is a dense network of fibres of which the primary ones, about 50-100 μm thick, have a very uneven outline as they are mainly made by foreign debris of various sizes, sometimes exceeding the diameter of the fibre. The spongin, pale, is variable in quantity: it may just cement irregular strings of debris or regularly envelop them. When the core of debris is discontinuous, bundles of proper spicules are observed. The meshes are irregular, 270-540 μm wide. The primary fibres are irregularly connected by branching, tortuous secondary ones, which are either free of inclusions or contain, sparsely, a single longitudinal proper spicule. These fibres are from 5 to 13 μm thick. A few proper spicules are found scattered in the flesh.

Spicules. Oxeas straight or gently curved, with long tapering points, 70-80 μm long and less than 1 μm thick. They appear degraded: inside the fibres they are made discernible by their blackened axial canal; it is difficult to obtain them in nitric-acid preparations.

REMARKS

The difference between this sponge and *Arenosclera heroni*, as to skeletal structure, is certainly slight and might be attributed to normal variability. A distinction has been maintained, at least provisionally, mainly because of their difference in habit.

PETROSIDA

PETROSIIDAE

Xestospongia mamillata sp. n.

Fig. 37, 38

OCCURRENCE

Wistari Reef (Capricorn Group), SE, 13 May 1979. R.N. HER.83.

HOLOTYPE

MSNG 46952

DESCRIPTION

The specimen appears incomplete. It is flattened, about 10 x 4 cm wide, with an uneven thickness of 4 to 20 mm, valliculated and with irregular lobes. Several oscules, 1-2.5 mm wide, open in the middle of low mammiform prominences on one face of the lamella, but one or two vents of the same size are found also on the other face. The surface is smooth; the ectosome is not separable. The consistency in spirit is tough, incompressible, slightly flexible and not brittle. The colour is light greenish grey, slightly tinging the preservative liquid. The choanosomal skeleton consists of a network of loose spicular bundles forming roundish

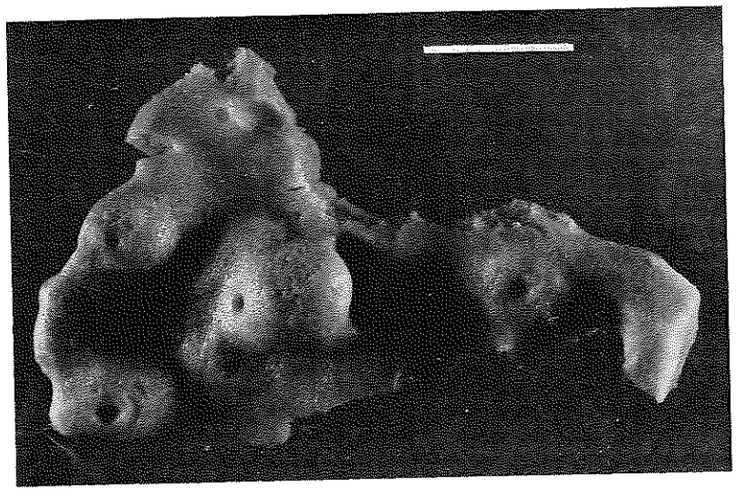

Fig. 37. *Xestospongia mamillata* sp. n., specimen HER.83 (preserved). Scale: 2 cm.

meshes about 130 μm wide. As many spicules are ill-oriented, this reticulation may appear confused. At the surface, for a depth of about 200 μm, the spiculation becomes denser and halichondroid.

Spicules. Oxeas straight or gently curved. They have a wide size-range: 160 x 1.5 to 330 x 14 μm and do not appear separable into categories.

Fig. 38. *Xestospongia mamillata* sp. n. Spicules.

DICTYOCERATIDA

SPONGIIDAE

Carteriospongia delicata sp. n.

Fig. 39

OCCURRENCE

Lizard Island, north reef, 14 December 1976, coll. D. Fisk. R.N. LIZ.1.

HOLOTYPE

MSNG 46953

DESCRIPTION

The specimen consists of four tubes (now collapsed) open at the top, joined at the base and attached to dead coral. The largest tube measures 6 x 2 cm, the smallest one 3 x 0.8 cm. The wall is about 3 mm thick at the middle of the largest tube, becoming thinner towards the top. The specimen, firstly preserved in formalin, presently in spirit, is brown (C.C.701); its consistency is very softly resilient.

The outer surface of the tubes is smooth, strewn with small sand grains (about 50 μm across) which neither form a continuous layer nor a tangential reticulation, but reinforce a honeycombed structure of radial septa, about 700 μm deep, surrounding the pores. This delicate pattern, with meshes 400-700 μm wide, is apparent to the nacked eye. No oscules open on this surface.

The inner surface appears quite different. It is devoid of foreign bodies, perforated by oscular vents 1 to 2 mm wide, about 2 mm apart, minutely ridged by ascending, tangentially arranged subdermal main fibres. These fibres consist of foreign debris (mostly sand) which generally do not exceed 50 μm across, joined by scarce spongin, forming tracts or columns 150-170 μm thick which have a rather irregular course and

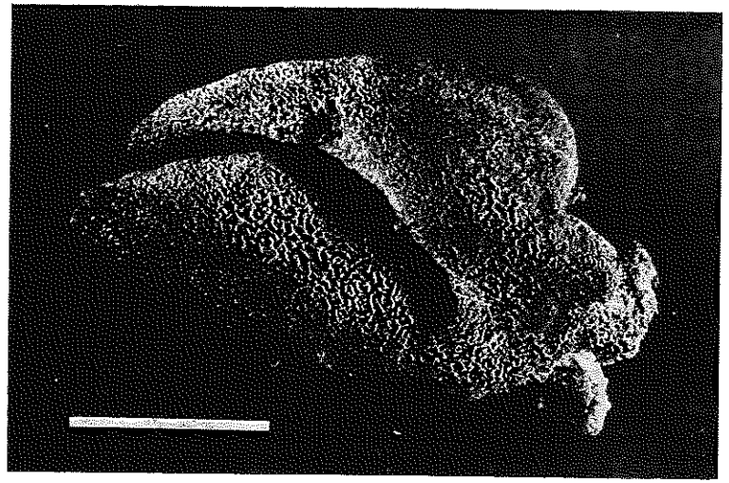

Fig. 39. *Carteriospongia delicata* sp. n., specimen LIZ.1 (preserved). Scale: 2 cm.

rather seldom anastomose. Near the inner surface these tracts are 1 to 2 mm apart and allow secondary fibres to predominate. The latter are made of brown spongin devoid of foreign matter, and are not laminated or pithed. They are long, branching, not forming regular meshes, tangled, sometimes fasciculated; their diameter is 8 to 27 μm. In the outer part of the wall of the tubes the sand tracts become radial, closely set, and the secondary fibres are reduced to occasional short connections.

THORECTIDAE

Ircinia microconulosa sp. n.

Fig. 40

OCCURRENCE

Heron Island, outer reef flat, 23 June 1979. R.N. HER.84, HER.84a.

HOLOTYPE

(HER.84) MSNG 46954

PARATYPE

(HER.84a) MSNG 46955

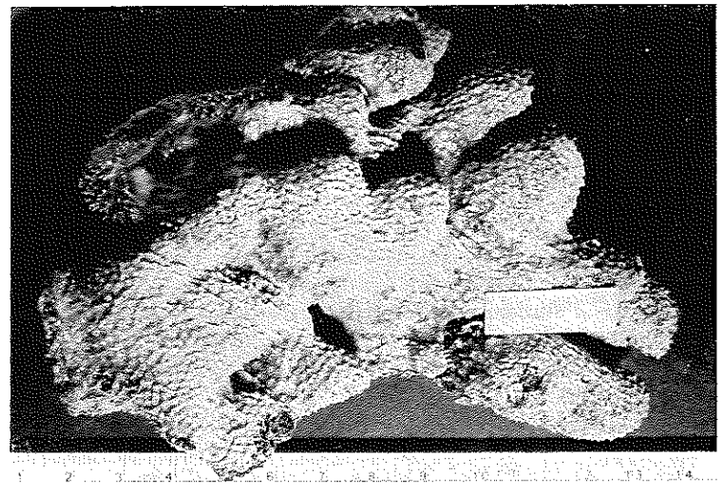

Fig. 40. *Ircinia microconulosa* sp. n., specimen HER.84 (fresh).

DESCRIPTION

The specimen HER.84 is massive, measuring 10 x 6 x 4 cm, with pronounced irregular lobes. In spirit, the colour is very light brown, the consistency fleshy, compressible, easy to cut and tear. The oscules are few, about 3 mm wide, scattered and on top of the lobes. The surface is minutely conulose, the conules being about 0.5 mm high and 1 mm apart. Sand grains with a rather uniform size of 15-25 μm, incorporated in the ectosome, form a continuous thin layer.

The skeleton consists of an ill-defined reticulation in which primary and secondary elements are not distinguishable. The spongin is often entirely obscured by an accumulation of debris, but also amber-coloured fibres with a much reduced content of foreign matter can be observed. Scattered and ill-organized sand grains are abundant. The filaments are abundant and do not form bundles. They are 4 μm thick in the middle and 2 μm thick near the ends. The terminal knob is spherical to irregular, up to 11 μm in diameter.

A second specimen, HER.84a, measuring 7 x 4 x 2.5 cm, has identical characters.

Ircinia pilosa sp. n.

Fig. 41

OCCURRENCE

Wistari Reef (Capricorn Group), NW, depth 8-20 m, 13 May 1979, coll. L. Thompson. R.N. HER.82, HER.86.

HOLOTYPE

(HER.82) MSNG 46956

PARATYPE

(HER.86) MSNG 46957

DESCRIPTION

Specimen HER.82 is flattened, of uneven thickness, with some folds and outgrowths, about 10 x 7 cm wide, 0.5-1 cm thick. It was apparently growing repent, thickly encrusting. The colour of the specimen in spirit is light brown, the consistency softly elastic. Oscules are not clearly recognizable. The surface is pilose, with projecting fibres 1.7-2 mm high, about 180 μm thick and 1 to 2 mm apart. The ectosome, not separable, is encrusted by debris up to 100 μm in diameter which, however, do not form a thick coating. Specimen HER.86, 7 x 5 cm wide, has the same characters: it is possibly a fragment of the former.

The skeleton consists of an irregular reticulation of fibres having an uneven outline and thickness, up to 250 μm in diameter, in which foreign debris predominate over the amber-coloured spongin. Often the latter, cementing irregularly arranged particles, is not apparent. Scattered sand grains are present, also irregularly joined in clusters. The fibres projecting from the surface consist of strong columns of sand grains with very scarce spongin. The filaments are abundant, particularly near the surface: they rarely form bundles. They are about 4 μm thick in the middle and 2.7 μm near the ends, with an irregular knob 9-10 μm in diameter.

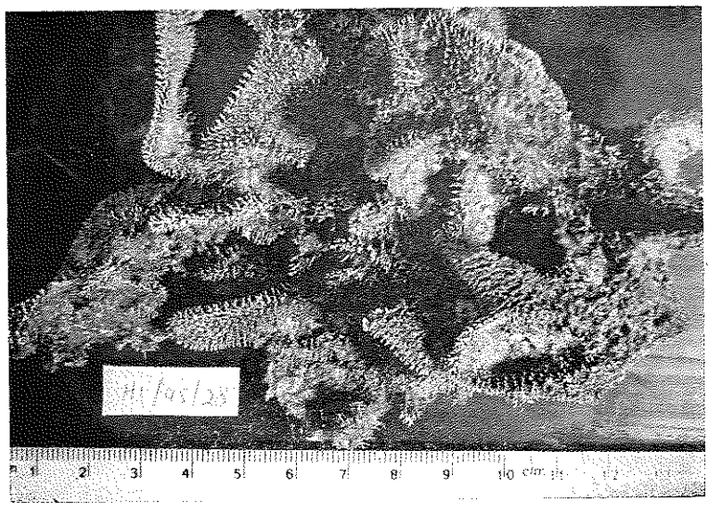

Fig. 41. *Ircinia pilosa* sp. n., specimen HER.82 (fresh).

Ircinia funiculata sp. n.

Figg. 42 - 43

OCCURRENCE

Heron Reef, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.10.

Heron Island, north reef slope, "Blue Pools" area, depth 27 m, 3 October 1979. R.N. HER.70.

HOLOTYPE

(HER.10) MSNG 46958

PARATYPE

(HER.70) MSNG 46959

DESCRIPTION

Specimen HER.10 is massive, 5 cm high with a base 7 cm wide. There are on top two oscular chimneys 1 and 2 cm high whose vents, now shrunk, were probably about 5 mm wide. Further oscules, flush with the surface, 2 to 3 mm wide, are scattered. The surface bears tubercles or blunt irregular conules about 1.5 mm high and 3 mm apart, and is encrusted by a thick continuous coating of fine sand. This specimen has been recorded as abundantly covered by epibionts in life. The colour in spirit is greyish buff.

Specimen HER.70 is massive, 7 cm high and 8 cm wide at the base. It bears on top, almost in a line, seven oscular chimneys 1 to 1.5 cm high, wide but now shrunk. A few further oscules are present, scattered. The heavily encrusted surface is very irregularly folded and tuberculated, here and there conulose. The colour in spirit is a little lighter than in HER.10. The consistency of both specimens is tough, almost incompressible, difficult to tear.

The skeletal structure is confused, consisting of sand grains scattered or organized in irregular tracts in which they may be joined by scarce spongin; more often they are bound by filament strands. The conules are supported by a dense column of sand grains joined by spongin, about 650 μm thick, by free debris becoming denser and merging with the superficial armour, and by ascending filament strands. The filaments measure 6.5-7 μm in the middle; they have terminal knobs irregularly oval, about 6.5 μm thick. They typically form strong bundles or twisted strands up to 200 μm thick, in which often large quantities of debris are incorporated.

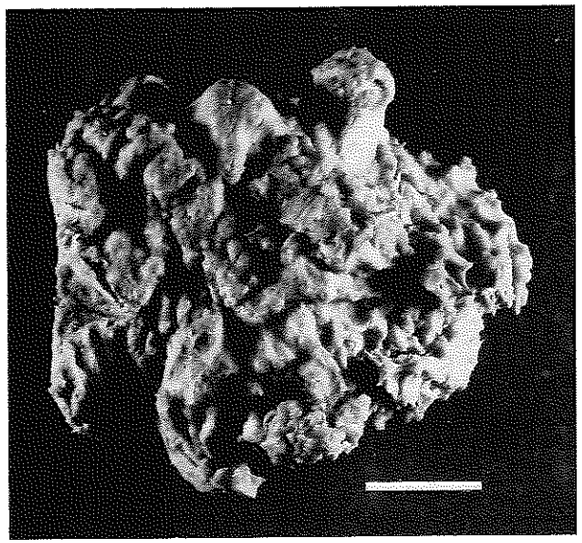

Fig. 42. *Ircinia funiculata* sp. n., specimen HER.70 (preserved). Scale: 2 cm.

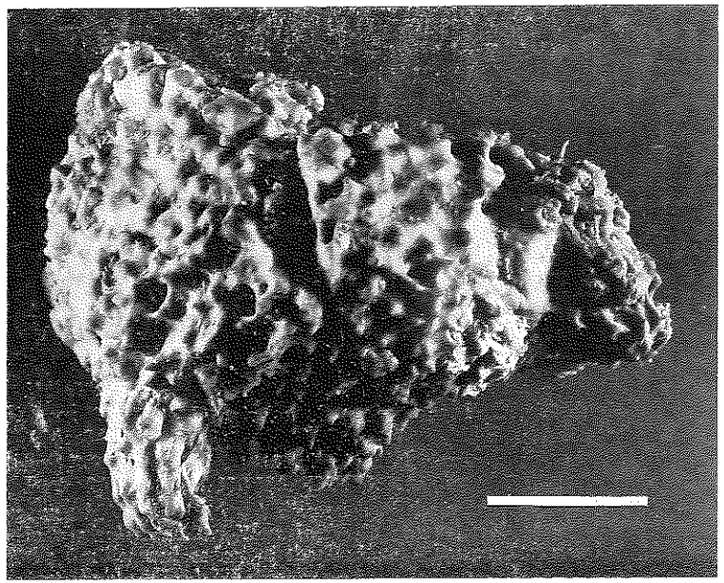

Fig. 43. *Ircinia funiculata* sp. n., specimen HER.10 (preserved). Scale: 2 cm.

REMARKS

This species differs from *Hircinia* (*Psammocinia*) *rugosa* Lendenfeld (1889: 582), as described, only in the thickness of the filaments (6.5-7 μm against 1.5 μm).

A distinct genus *Psammocinia* has not been adopted in the present paper, as Lendenfeld's observation (1889: 579) about the existence of abundant transitional forms appears to be still valid.

DYSIDEIDAE

Euryspongia heroni sp. n.

Fig. 44

OCCURRENCE

Heron Island, NW, depth 10 m, 13 May 1979, coll. L. Owens. R.N. HER.65.

HOLOTYPE

MSNG 46960

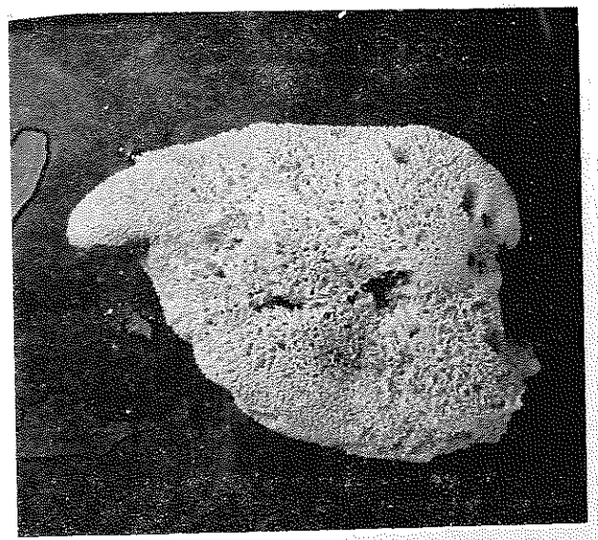

Fig. 44. *Euryspongia heroni* sp. n., specimen HER.65 (fresh). x 1.4.

DESCRIPTION

The specimen is a massive fragment, 6 x 2 cm, now preserved in spirit. The colour is light brown, the same as recorded in life; the consistency is softly resilient. The surface is made microscopically bristly by projecting main fibres less than 1 mm apart. The main fibres consist of coarse sand grains joined by scarcely apparent spongin. They are about 180-360 μm thick and run radially to the surface, more or less parallel to each other, closely set. The secondary fibres are quite distinct: entirely free from detritus, measuring only 5.5-20 μm in diameter, they connect the main fibres by a dense reticulation in which the meshwork has no regularity. Foreign matter (almost exclusively sand) is also incorporated in the flesh.

Among the few sponges hitherto attributed to *Euryspongia*, the present one appears the more closely related to *Euryspongia lactea* Row (1911: 366) from Suez, type of the genus.

DENDROCERATIDA

APLYSILLIDAE

Dendrilla aerophoba Lendenfeld

Fig. 45, 46

Dendrilla aerophoba Lendenfeld, 1883: 294

OCCURRENCE

Wistari Reef (Capricorn Group), NW, depth 10 m, 13 May 1979. R.N. HER.85.

DESCRIPTION

The sponge is fan-shaped, lamellar, widening in one plane, 18 cm high and 16 cm wide. The base of attachment is missing. Its thickness in life seems to have been about 1 cm; in the preserved state the flesh has shrunk to a thin tough membrane. The colour of the living sponge was yellow, it is now (in spirit) black with a violet tinge. The consistency is moderately flexible. The specimen is presently unnaturally bent, suggesting that it may have been constricted into a narrow container upon collection.

The skeleton starts at the base as several stout stems about 3 mm thick, 5 to 10 mm apart, which ascend toward the margin of the lamella, progressively thinner, with a dendritic course, successively branching and here and there anastomosing. The terminal branchlets are still about 0.5 mm thick and are often flattened. At intervals of 5 to 10 mm the fibres give off, on both faces of the sponge, more or less perpendicular offshoots

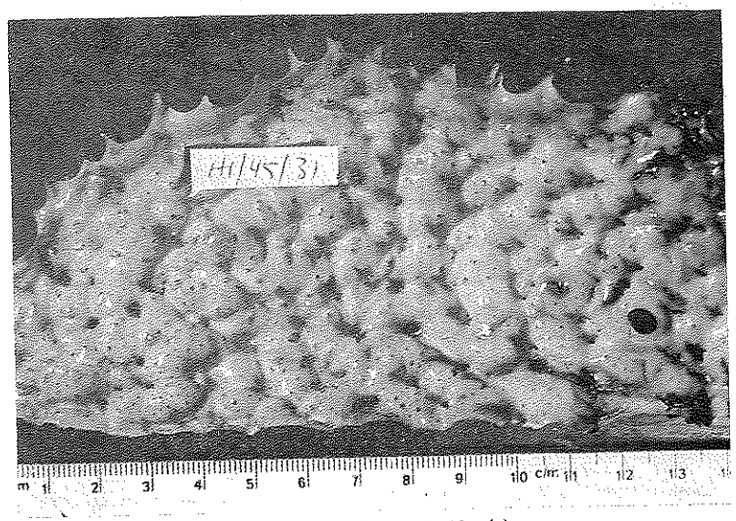

Fig. 45. *Dendrilla aerophoba*, specimen HER.85 (fresh).

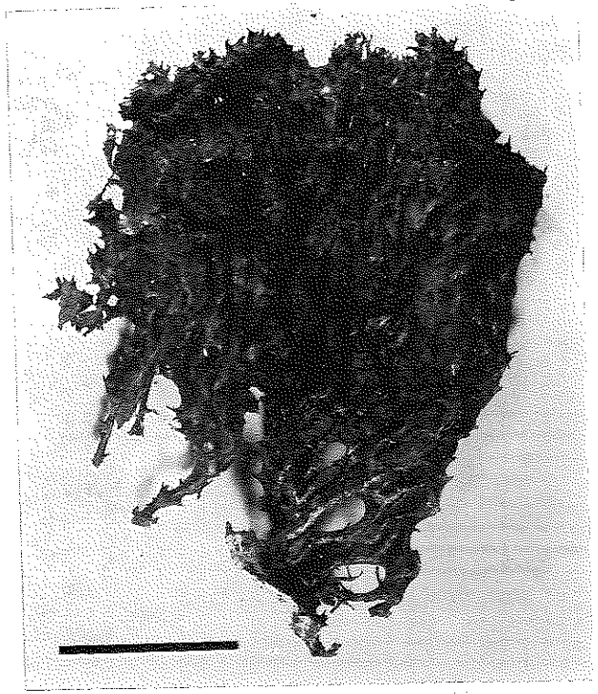

Fig. 46. *Dendrilla aerophoba*, specimen HER.85 (preserved). Scale: 5 cm.

2 to 4 mm high, representing the axes of the conules. The fibres are dark violet, markedly laminated. The pith part, generally appearing empty in the transverse sections, occupies a variable portion of the fibre.

REMARKS

The present specimen represents the second find for this species.

VERONGIDA

APLYSINELLIDÀE

Pseudoceratina clavata sp. n.

Fig. 47

OCCURRENCE

Heron Reef, NW end of northern shore, depth 8-12 m, 25 April 1979. R.N. HER.14.

HOLOTYPE

MSNG 46961

DESCRIPTION

The sponge in the fresh state was about 14 cm high, the colour yellow verging to green; it is now strongly contracted (8 cm high and 3 cm in maximum width) after preservation in formalin and spirit; its colour is black.

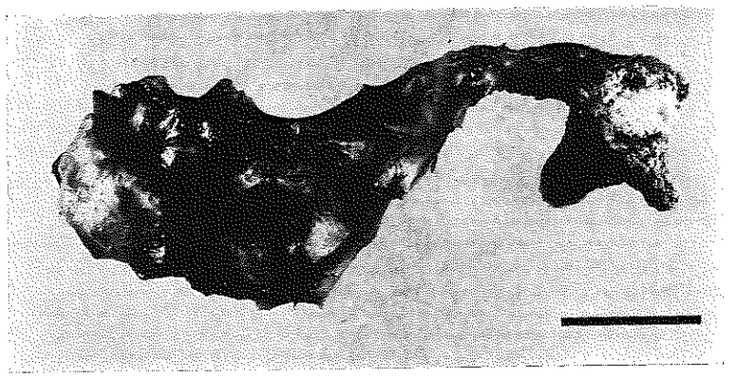

Fig. 47. *Pseudoceratina clavata* sp. n., specimen HER.14 (preserved). Scale: 2 cm.

The shape is claviform, expanding from a long peduncle 9 mm wide at the base of attachment. The surface bears blunt irregular tubercles irregularly spaced (4 to 12 mm) and of various height (up to 5 mm). The consistency is tough, incompressible. Vents are not apparent. The fibres, 400 to 700 μm in diameter, run longitudinally, 4 to 7 mm apart, seldom branching and anastomosing. The spongin is dark amber coloured, markedly laminated; the pith occupies about half of the fibre.

REMARKS

Bergquist's revision (1980: 494) has been here followed. But it seems opportune to observe that *Pseudoceratina* as diagnosed by Bergquist — and comprising *Dendrospongia crassa* Hyatt — does not correspond to Carter's description of *Pseudoceratina durissima* (type of the genus). Already Wiedenmayer (1977: 75), in establishing a genus *Aiolochroia* for *Dendrospongia crassa*, observed that the latter had a skeleton radically different from that of *Pseudoceratina durissima*. In order to adopt *Pseudoceratina* instead of *Aiolochroia* for sponges having the characters of *Dendrospongia crassa* it is necessary to assume that Carter's description (1885: 204), compared with the type material, was wrong.

ACKNOWLEDGEMENTS

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ABSTRACT

Twenty-seven new species of sponges and nine scarcely known ones, collected on the Great Barrier Reef (mostly in the Capricorn Group), are described. The new species are: *Cinachyra tenuiviolacea, Acanthella klethra, Auletta constricta, Phakellia inflexa, Batzella frutex, Dictyonella australiensis, Mycale tylostrongyla, Kerasemna tenuityla. Echinoclathria pluritoxa, Cladocroce aculeata, Gellius subtilis, Gelliodes tenuirhabdus, Amphimedon aculeata, Callyspongia carens, Callyspongia capricorni, Callyspongia brucei, Callyspongia trichita, Siphonochalina deficiens, Arenosclera heroni, Arenosclera parca, Xestospongia mamillata, Carteriospongia delicata, Ircinia microconulosa, Ircinia pilosa, Ircinia funiculata, Eurypongia heroni, Pseudoceratina clavata.* Two new genera are proposed: *Kerasemna* (Poecilosclerida) and *Arenosclera* (Haplosclerida).

RIASSUNTO

Vengono descritte ventisette nuove specie, e nove specie poco conosciute, di spugne raccolte sulla Gran Barriera Australiana (per la maggior parte nel Gruppo del Capricorno). Le specie nuove sono: *Cinachyra tenuiviolacea, Acanthella klethra, Auletta*

constricta, Phakellia inflexa, Batzella frutex, Dictyonella australiensis, Mycale tylostrongyla, Kerasemna tenuityla, Echinoclathria pluritoxa, Cladocroce aculeata, Gellius subtilis, Gelliodes tenuirhabdus, Amphimedon aculeata, Callyspongia carens, Callyspongia capricorni, Callyspongia brucei, Callyspongia trichita, Siphonochalina deficiens, Arenosclera heroni, Arenosclera parca, Xestospongia mamillata, Carteriospongia delicata, Ircinia microconulosa, Ircinia pilosa, Ircinia funiculata, Euryspongia heroni, Pseudoceratina clavata. Due nuovi generi vengono proposti: *Kerasemna* (Poecilosclerida) e *Arenosclera* (Haplosclerida).

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