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A SECOND COLLECTION OF MARINE DEMOSPONGIAE FROM MAHE ISLAND IN THE SEYCHELLES BANK

(INDIAN OCEAN)

by

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INTRODUCTION

The present account deals with a second collection of sponges made from Mahe Island in the Seychelles Bank by a Zoological Expedition organized by the Musée Royal de l'Afrique Centrale, Tervuren, Belgium and the Université Libre de Bruxelles, during the year 1972. The present collection came exactly from the same area as that of the former (see Thomas, 1973) and hence the details regarding the environmental conditions, centres of collection, etc., are not included in the present report.

The present collection, though not extensive when compared with the previous one, contained 58 species, one subspecies and a variety of marine Demospongiae belonging to 47 genera divided among 28 families (table 1). Three species viz. *Myxilla seychellensis, Rhaphidectyon encrusta* and *Axinella minor* are new to science. Five species could be identified only upto generic level. Species belonging to the order Carnosida of the Class Demospongiae are not represented in the present collection, so also those of the classes Hyalospongiae and Calcispongiae.

Of a total of 60 species, subspecies and variety of Demospongiae represented in the present collection, 29 are common to both the collections from Mahe Island, and as descriptive accounts of these species already exist (Thomas, 1973) only those which are recorded as new to this Island are dealt with in detail in the part dealing with systematics. And in the case of those previously reported, only the names of species are given and interesting points, if any, are discussed under the title «remarks».

A list of species hitherto known from Mahe Island is given along with this account as an appendix. The other species recorded previously from the Seychelles Bank in general, are listed in the earlier account.

Specimens, including the Types, are deposited in the Musée Royal de l'Afrique Centrale, Tervuren, Belgium, registered under the numbers referred to in the text.

LIST OF SPECIES

Table 1. - **List of species represented in the present collection.**

(Those marked with an asterisk (*) are common to both collections)

Phylum **PORIFERA** Grant

Class **DEMOSPONGIAE** Sollas

Order KERATOSIDA Gray

Family *SPONGIIDAE* Grant

1. *Spongia officinalis* Lin. var. *ceylonensis* Dendy
2. *Hippiospongia* sp.
* 3. *Heteronema erecta* Keller
4. *Ircinia* sp.
5. *Verongis* sp.
* 6. *Thorectopsamma seychellensis* Thomas

Family *DYSIDEIDAE* Gray

7. *Dysidea fragilis* (Montagu)

Family *APLYSILLIDAE* Vosmaer

8. *Psammaplysilla purpurea* (Carter)

Order HAPLOSCLERIDA TOPSENT

Family *HALICLONIDAE* de Laubenfels

* 9. *Haliclona cribricutis* (Dendy)
10. *Haliclona* sp.

Family *DESMACIDONIDAE* Gray

* 11. *Iotrochota purpurea* (Bowerbank)
* 12. *I. baculifera* Ridley
13. *I. hiatti* (de Laubenfels)

Family *ADOCIIDAE* de Laubenfels

* 14. *Petrosia nigricans* Lindgren
15. *Damirina verticillata* Burton

Family *CALLYSPONGIIDAE* de Laubenfels

16. *Callyspongia fibrosa* (Ridley and Dendy)

Order POECILOSCLERIDA Topsent

Family *COELOSPHAERIDAE* Hentschel

* 17. *Oceanapia fistulosa* (Bowerbank)

Family *AGELASIDAE* Verrill

18. *Agelas ceylonica* Dendy

Family *PHORBASIDAE* de Laubenfels

* 19. *Damiriana schmidti* (Ridley)

Family *CYAMONIDAE* de Laubenfels

* 20. *Cyamon vickersi* (Bowerbank)

Family *MYXILLIDAE* Hentschel

21. *Myxilla seychellensis* n.sp.

Family *TEDANIIDAE* Ridley and Dendy

* 22. *Tedania anhelans* (Lieberkuhn)
23. *Acarnus ternatus* Ridley
* 24. *Acanthacarnus souriei* Lévi

Family *RASPAILIIDAE* Hentschel

25. *Raspailia viminalis* Schmidt
26. *Rhaphidectyon encrusta* n.sp.

Family *MICROCIONIDAE* Hentschel

27. *Microciona prolifera* (Ellis and Solander)
28. *Microciona* sp.
29. *Isociona tuberosa* (Hentschel)

Family *OPHLITASPONGIIDAE* de Laubenfels

* 30. *Clathria frondifera* Bowerbank
* 31. *C. procera* (Ridley)
* 32. *Mycale* sp.

Family *AMPHILECTIDAE* de Laubenfels

33. *Biemna fortis* (Topsent)
* 34. *Tylodesma truncata* (Hentschel)

Order HALICHONDRIDA Vosmaer

Family *AXINELLIDAE* Ridley and Dendy

* 35. *Axinella carteri* (Dendy)
36. *A. donnani* (Bowerbank)
* 37. *A. minor* n.sp.

Order HADROMERIDA Topsent

Family *SPIRASTRELLIDAE* Hentschel

* 38. *Spirastrella cupsidifera* (Lamarck)
* 39. *S. inconstans* (Dendy)
40. *Timea curvistellifera* Dendy

Family *SUBERITIDAE* Schmidt

* 41. *Aaptos aaptos* (Schmidt)

Family *CLIONIDAE* Gray

* 42. *Aka minuta* Thomas
* 43. *Cliona vastifica* Hancock
44. *C. carpenteri* Hancock
45. *C. viridis* (Schmidt)
46. *C. margaritifera* Dendy
47. *Cliona* sp.
48. *Thoosa radiata* Topsent

Order EPIPOLASIDA Sollas

Family *JASPIDAE* de Laubenfels

49. *Prostylyassa foetida* (Dendy)
* 50. *Jaspis bouilloni* Thomas
* 51. *J. jonesi* Thomas
* 52. *Zaplethea digonoxea* s. sp. *diastra* Vacelet and Vasseur

Family *TETHYIDAE* Gray

* 53. *Tethya robusta* Bowerbank
54. *Tethytimea repens* (Schmidt)

Family *SCLERITODERMIDAE* Sollas

55. *Azorica pfeifferae* Carter

Order CHORISTIDA Sollas

Family *ANCORINIDAE* Gray

56. *Ecionemia acervus* Bowerbank
* 57. *Myriastra purpurea* (Ridley)

Family *GEODIIDAE* Gray

* 58. *Geodia lindgreni* (Lendenfeld)

Family *CRANIELLIDAE* de Laubenfels

* 59. *Cinachyra cavernosa* (Lamarck)

Family *KALIAPSIDAE* de Laubenfels

60. *Discodermia sceptrellifera* Carter

It may be seen from the above given list (table 1) that out of the 60 species, subspecies and variety represented in the present collection, only 31 are recorded for the first time from Mahe Island. Hence in the following part dealing with the distribution, only these species are considered and the distribution of the other species is available in the previous report.

GENERAL DISTRIBUTION

The general distribution of the newly recorded species is given in table 2 (p. 8).

Most of the newly recorded species of this collection are widely distributed in the Indo-Pacific region. Species like *Dysidea fragilis* (Montagu) and *Cliona viridis* (Schmidt) are cosmopolitan, and *C. carpenteri* is circumtropical in distribution. Species which are common to the Indian Ocean and the Atlantic are not many and the previous records of the species like *Callyspongia fibrosa* (Ridley and Dendy) and *Oceanapia fistulosa* (Bowerbank) from the latter are highly questionable. The first Indian Ocean record of the common Mediterranean species, *Raspailia viminalis* Schmidt, was that of Burton and Rao (1932) from the Bay of Bengal. And in the same work Burton and Rao recorded a very common North Atlantic species, *Microciona prolifera* (Ellis and Solander), from the Indian Ocean.

Regarding the affinity of the newly recorded species, it may be stated that the fauna, as a whole, shows greater affinity to that of the Australian Region and 13 species are common to both these areas. The next area with which the present collection has more relationship is the Pacific Ocean; and 10 species are common to both these areas. There are 8 species common to both the Atlantic Ocean and the Indian Ocean; and the other areas, based on the relationship, are the Red Sea (7 species) and the Mediterranean Sea (3 species). It is also interesting that the sponges in the present collection showed very poor affinity with those of the Red Sea, but when taking into consideration the entire species so far reported from Mahe Island it could be well affirmed that the area with which the Seychelles fauna is more closely related to, after the Australian Region, is the Red Sea.

Table 2.- General distribution of the newly recorded species.

Sr. n°	Species	A.O*	M.S	R.S	I.O	A.R	P.O	E
1.	*Spongia officinalis* var. *ceylonensis*	-	-	x	x	-	-	-
2.	*Hippiospongia* sp.	-	-	-	x	-	-	-
3.	*Ircinia* sp.	-	-	-	x	-	-	-
4.	*Verongia* sp.	-	-	-	x	-	-	-
5.	*Dysidea fragilis*	x	x	x	x	x	x	-
6.	*Psammaplysilla purpurea*	-	-	x	x	x	x	-
7.	*Haliclona* sp.	-	-	-	x	-	-	-
8.	*Iotrochota hiatti*	-	-	-	x	-	x	-
9.	*Damirina verticillata*	-	-	-	x	-	-	-
10.	*Callyspongia fibrosa*	x?	-	-	x	x	x	-
11.	*Oceanapia fistulosa* (1)	x?	-	-	x	x	-	-
12.	*Agelas ceylonica*	-	-	-	x	-	-	-
13.	*Maxilla seychellensis*	-	-	-	x	-	-	-
14.	*Acarnus ternatus*	-	-	x	x	x	x	-
15.	*Raspailia viminalis*	x	x	-	x	-	-	-
16.	*Rhaphidectyon encrusta*	-	-	-	x	-	-	-
17.	*Microciona prolifera*	x	x?	-	x	-	-	-
18.	*Microciona* sp.	-	-	-	x	-	-	-
19.	*Isociona tuberosa*	-	-	-	x	x	-	-
20.	*Biemna fortis*	-	-	x	x	x	-	-
21.	*Axinella donnani*	x	-	x	x	-	-	-
22.	*Timea curvistellifera*	-	-	-	x	-	-	-
23.	*Cliona carpenteri*	x	-	-	x	x	x	-
24.	*C. viridis*	x	x	x	x	x	x	-
25.	*C. margaritifera*	-	-	-	x	x	-	-
26.	*Cliona* sp.	-	-	-	x	-	-	-
27.	*Thoosa radiata*	-	-	-	x	-	-	-
28.	*Prostylyssa foetida*	-	-	-	x	x	-	-
29.	*Tethytimea repens*	x	-	-	x	x	x	-
30.	*Azorica pfeifferae*	x	-	-	x	-	x	-
31.	*Ecionemia acervas*	-	-	-	x	x	x	-
32.	*Discodermia sceptrellifera*	-	-	-	x	-	-	-

* A.O = Atlantic Ocean; M.S = Mediterranean Sea; R.S = Red Sea; I.O = Indian Ocean; A.R = Australian Region; P.O = Pacific Ocean; E = Elsewhere; X = Present; - = Absent.

(1) *Oceanapia fistulosa* (Sr. n° 11) is included in this list since the identity of the same is confirmed (see also *Oceanapia* sp., Thomas, 1973, p. 23) and *Axinella minor* n. sp., not included since its distribution remains unchanged (see *Axinella* sp., Thomas, 1973, p. 43).

SYSTEMATICS

Order KERATOSIDA Grant

Family *SPONGIIDAE* Gray

Subfamily SPONGIINAE de Laubenfels

The various genera represented in the present collection are : 1. *Spongia* Linnaeus, 2. *Hippiospongia* de Laubenfels, 3. *Heteronema* Keller and 4. *Ircinia* Nardo. In the first mentioned three genera the main fibres are not trellised or fascicular and are devoid of any sand cortex or armoured dermis, whereas in the last mentioned genus the fibres are trellised but dermis is not armoured.

Genus **Spongia** Linnaeus

Spongia officinalis Lin. var. *ceylonensis* Dendy

(pl. I, fig. 1)

Euspongia officinalis var. *ceylonensis* Dendy, 1905, p. 211, fig. 3, pl. 16, fig. 5.

Spongia officinalis var. *ceylonensis* Burton, 1937, p. 39; Thomas, 1968; Thomas, 1979a, 1979b.

Material : One specimen (Reg. n° 1547).

Description : Body irregularly spherical; height, 50 mm and width, 60 mm.

Colour : Pale brown externally and pale yellow internally.

Consistency : Soft with good resiliency.

Surface highly conulose, conules compound; 2-5 mm high and rather closely arranged. Interior cavernous.

Oscules and pores, not traceable due to the presence of long conules.

Skeletal arrangement is typical of the variety. Main fibres run at a distance of 0.16 - 0.32 mm to the surface in a parallel course. These fibres are cored by arenaceous objects, and the diameter may vary from 0.03 - 0.08 mm. The connectives are devoid of foreign objects and are of uniform size, say, 0.016 - 0.032 mm. They form fine reticulation of polygonal meshes ranging in diameter from 0.07 - 0.018 mm. Colour of spongin is pale yellow.

Remarks : The present specimen possessed stouter fibres when compared with those noted in the specimens from the Gulf of Mannar and Palk Bay. A few specimens of bivalve mollusc, *Vulsella vulsella* (Lin.) were found in association with the sponge. This bivalve is a very common associate of this variety in the Gulf of Mannar and Palk Bay also. Normally when the bivalve is found in association with the sponge the usual surface structure is lost and it becomes highly conulose or brush-like in appearance.

Distribution : Red Sea, Indian Ocean.

Genus **Hippiospongia** de Laubenfels

Hippiospongia sp.

(pl. I, figs. 2, 2A, 2B and 2C; pl. III, fig. 27)

Material : Ten specimens (Reg. n^{os} 1556, 1559, 1577, 1580, 1596, 1599, 1626, 1628, 1606 and 1634).

Description : Body encrusting in the initial stage (n^{os} 1559, 1634) attaining subspherical or massive form in advanced stages. The largest specimen (n^{o} 1577) has a width of 140 mm and height of 70 mm. Specimens grow attached to the substratum by many points, and much foreign material is incorporated into the body. A thick layer of silt is often found lodged at the surface. Tubular outgrowths (branches?), often repent, are also noted in some specimens (n^{os} 1580, 1599).

Colour : Dark gray or black.

Consistency : Rather hard and incompressible when dry, turning spongy on soaking in water.

Surface conulose very often, but extensive areas without even a single conule are also met with. Rugged surface pattern is also found in some specimens. Conules simple or compound, rarely attaining a length of 5 - 7 mm. Ridges are also formed at the surface by the fusion of adjacent conules.

Oscules on elevated parts only and often with darker margin; diameter 2 - 5 mm. Pores, not traceable.

Ectosome : Black in colour and not detachable from the underlying skeleton; thickness, 0.02 - 0.03 mm. Subdermal canals extensive, 4 - 8 mm in diameter and, rounded to elliptical in cross section. The walls between the adjacent subdermal canals, quite narrow, 1 - 3 mm in thickness and the fibres are rather compactly arranged at this part. These walls, at the surface, expand forming islands, which in dry specimens, are clearly noticeable as the roofing dermal membrane sinks down.

Endosoma : Cavernous.

Skeleton composed of fine fibres making a reticulation of small meshes varying in diameter from 0.09 - 0.28 mm. The thickness of a fibre may vary from 0.016 - 0.035 mm and are not divisible into primaries and secondaries. At places, especially beneath the conules, these fibres may take a parallel course and end in the conules supporting them. These fibres, at the conule, never fuse together. Spongin is pale yellow in colour.

Remarks : Detailed discussions on the historical background of this genus and its relationship with the genus *Spongia* Lin. are available in de Laubenfels (1936, 1948). Species of this genus have got economic importance in many parts of the world. It is also interesting that the specimens of *Hippiospongia* were not represented in the former collection from Mahe Island.

Genus **Heteronema** Keller

Heteronema erecta Keller

Material : One specimen (Reg. n^{o} 1631).

Genus **Ircinia** Nardo

Ircinia sp.

(pl. I, figs. 3, 3A and 3B)

Material : Two specimens attached to a coral rock (Reg. n^{o} 1607).

Description : Both these specimens are more or less of the same shape and size. Body filiform, height 30 mm and diameter 3 mm on an average; tips pointed.

Colour : Pale brown.

Consistency : Soft and spongy.

Oscules and pores are not traceable. Surface uniformly conulose; conules 0.5 - 0.8 mm high and often in linear series.

Skeleton composed of primaries running parallel to each other and ending in surface conules. They run at a distance of 0.1 - 0.2 mm and are connected by slender fibres or secondaries. The primaries have a diameter varying between 0.07 - 0.1 mm and are devoid of any coring material and the diameter may vary from 0.028 - 0.04 mm. Spongin is pale amber coloured. The characteristic filaments found in the species of *Ircinia* are present, but they are very slender and the tips are globular or elliptical measuring to about 0.001 mm.

Remarks : This can only be a sponge of this genus at the initial stage of development, and based on such specimens it is difficult to acertain the specific status.

Subfamily VERONGIINAE de Laubenfels

Two genera are represented in the present collection. They are : 1. *Verongia* Bowerbank and 2. *Thorectopsamma* Burton. Main fibres, in both these genera, are not trellised or fascicular; and are also devoid of any sand cortex. The fibres are laminated and pithed in the former genus whereas in the latter, though pithed, both primaries and secondaries are cored by arenaceous objects. *Verongia crassa* (Hyatt) is known previously from the Seychelles Bank (as *Aplysina fusca* Ridley, 1884 non Carter, 1880).

Genus **Verongia** Bowerbank

Verongia sp.

(pl. I, figs. 5, 5A)

Material : One highly damaged specimen (Reg. n^{o} 1638).

Description : Body spherical and attached to the substratum by many points. Height of the largest bit about 10 mm and length, 20 mm.

Colour : Pale white when dry, turning brown on soaking in water.

Consistency : Fibrous, slightly brittle in dry state due to the presence of sand grains.

Oscules and pores are not traceable. Surface conulose, conules. 0.3 - 0.5 mm high and 1 1.5 mm apart. Ectosome is not detachable from the underlying endosome.

Skeleton consists of ascending primaries and interconnecting secondaries. Both primaries and secondaries are pithed and laminated. It is noted that in primaries the pith diameter is about 1/6th of the total diameter of the fibre and in secondaries it is about 1/4 th to 1/5 th of the total diameter. The diameter of primaries varies from 0.11 - 0.37 mm and that of secondaries from 0.01 - 0.13 mm. Another interesting aspect noted in the present specimen is the presence of small fibres, measuring to about 0.01 - 0.03 mm in diameter arising abruptly from the internodes of the primaries and secondaries. These fibres form fine reticulation and are well represented at the peripheral parts of the specimen. Pith, in such fibres, occupies the major portion of the fibre and the spongin looks almost like a sheath without concentric layers added on to it. Spongin is pale amber coloured and the mesh size varies from 0.15 - 0.52 mm.

Genus **Thorectopsamma** Burton

Thorectopsamma seychellensis Thomas

Material : Two specimens (Reg. nos 1541 and 1668).

Remarks : All details agree closely with those of the type (Thomas, 1973).

Family *DYSIDEIDAE* Gray

Genus **Dysidea** Johnston

Only one species *(Dysidea fragilis)* is represented in this collection. The previous record of this species from the Seychelles Bank is that of Topsent (1893, as *Spongelia spinifera* Schclze). Later Burton (1934) synonymised it with *D. fragilis.*

Dysidea fragilis (Montagu)

(pl. I, fig. 4)

Dysidea fragilis Burton, 1934, p. 583, pl. 2, figs. 2-11 (synonymy); Burton, 1959, p. 272; Thomas, 1968; Thomas, 1979a.

Material : One specimen (Reg. n° 1540).

Material : Body massive with finger shaped braches arising from the upper part. Size, 60 x 40 mm; height of branches, 10 mm.

Colour : Sandy gray.

Consistency : Highly friable.
Surface conulose, conules, 0.5 - 1.5 mm high and 1 - 3 mm apart.

Ectosome : Highly charged with foreign objects.

Skeletal arrangement is highly concealed due to the presence of extra amount of sand grains incorporated. Both primaries and secondaries are equally cored by sand grans. The individual fibres are rather easy to make out at the peripheral parts of the specimen and at this part the diameter may come to about 0.28 mm. The secondaries may have the same diameter as that of the primaries. Towards the deeper parts the reticulation becomes more irregular and fibres illdefined. Spongin is transparent.

Distribution : Cosmopolitan.

Family *APLYSILLIDAE* Vosmaer

Genus **Psammaplysilla** Keller

Psammaplysilla purpurea (Carter)

Aplysina purpurea Carter, 1880, p. 36.

Psammaplysilla purpurea Bergquist, 1965, p. 135, figs. 6a-d (synonymy); Thomas, 1968.

Material : One specimen (Reg. n° 1619).

Description : Body concial, width 30 mm at the base and the terminal part (growing tip) is cut up into 3 small branches. Total height 50 mm.

Colour : Black externally and pale brown internally.

Consistency : Hard and incompressible when dry.

Oscules and pores not traceable. Surface conulose, conules 1 - 2 mm high and 1 - 4 mm apart. Ridges may or may not connect adjacent conules.

Cortex : Dense, thickness may vary from 0.09 - 0.18 mm.

The skeletal arrangement is typical of the species. Fibres are irregular in shape and are confined only to older parts. Extensive areas without any trace of fibres are also noted. Fibres though support the conules are not traceable below the cortical zone. In hand sections these fibres appear white and granular in structure. In older parts several such fibres may get connected together to form thick bands measuring up to 0.6 mm or even more in diameter.

Details regarding the anatomy of this species are given in Wilson (1925) and Bergquist (1965).

Distribution : Red Sea, Indian Ocean, Australian Region, Pacific Ocean.

Order HAPLOSCLERIDA Topsent

The following families are represented : - 1. Haliclonidae de Laubenfels; 2. Desmacidonidae Gray; 3. Adociidae de Laubenfels and 4. Callyspongiidae de Laubenfels. The last mentioned family is reported here for the first time from the Seychelles Bank.

Family *HALICLONIDAE* de Laubenfels

Genus **Haliclona** Grant

Only two species, *Haliclona cribricutis* (Dendy) and *Haliclona* sp. are represented in the present collection. Of these the first mentioned species is represented in both collections from Mahe Island. The various other species known from the Seychelles Bank include *H. cribriformis* (as *Reniera cribriformis* Ridley, 1884), *H. camerata* (as *Riniera camerata* Ridley, 1884), *H. minor* Row (as *Acervochalina fenitima* (Schmidt) var. Ridley, 1884) and *H. seychellensis* (as *Petrosia seychellensis* Dendy, 1921).

Haliclona cribricutis (Dendy)

Material : Five specimens (Reg. n° 1645). A barnacle attached to one specimen harboured another sponge, *Agelas ceylonica* Dendy, (Reg. n° 1647, vide infra).

Haliclona sp.

(pl. I, figs. 6, 6A)

Material : Three specimens (Reg. n^{os} 1562, 1566 and 1608).

Description : Out of the three specimens represented in this collection, two (n^{os} 1562, 1566) were found attached to bivalve shells and the other (n° 1608) in a detached condition. Specimens found on the shells were encrusting with irregularly cylindrical and repent branches often bearing oscules at their extremities. The other was composed of cylindrical branches united together in a clathrous manner. Branches 2 - 5 mm in diameter. The area occupied by the largest specimen (n° 1608) was 40 x 40 mm and height 10 mm.

Colour : Pale brown.

Consistency : Soft and spongy with good resiliency.

Oscules terminal or in linear series; diameter 2 - 3 mm. Pores not traceable.

Dermal skeleton composed of triangular or rectangular meshes with uniserially arranged oxeas. In some parts of the specimen the primaries and secondaries are clearly visible but in other parts they are illdefined. Both primaries and secondaries are uniserially cored by oxeas and when well formed primaries measure 0.028 mm and secondaries, 0.021 mm.

Spicules : Oxeas. Slightly curved, gradually or abruptly pointed. Size varies from 0.126 - 0.168 (0.147 mm (*) x 0.004 - 0.008 (0.006 mm).

(*) Averages are given in parantheses.

Family *DESMACIDONIDAE* Gray

Genus **Iotrochota** Ridley

Three species are represented in the present collection. Of these, *I. purpurea* (Bowerbank) and *I. baculifera* Ridley are previously recorded from Mahe Island (Thomas, 1973) and other parts of Seychelles Bank (Dendy, 1921; Topsent, 1893). A third species, *I. hiatti* (de Laubenfels), common in the West Central Pacific, is reported here from Mahe Island.

Iotrochota purpurea (Bowerbank)

Material : Five specimens (Reg. n^{os} 1542, 1636, 1660, 1669 and 1670).

Iotrochota baculifera Ridley

Material : Seven specimens [Reg. n^{os} 1560, 1585, 1622, 1639, 1641 (on the outer part of the shell), 1599 and 1658].

Remarks : One specimen was highly loaded with sand grains and hence was quite brittle.

Iotrochota hiatti (de Laubenfels)

(pl. I, fig. 7; pl. II. fig. 2; pl. III, fig. 28)

Hiattrochota hiatti de Laubenfels, 1954, p. 125, fig. 78.

Material : Three specimens (Reg. n^{os} 1614, 1648 and 1659).

Description : Sponge encrusting in the initial stage (n° 1614, Host-coral) giving rise to slender branches, which at a later stage fuse and form a clathrous mass (n° 1648). This clathrous mass, after further growth, may become a compact structure without leaving any trace of individual branches (n° 1659). At this stage only the growing tips of branches are discernible at the surface and may form lumps or ridges at the surface.

Colour : Greenish brown (n^{os} 1614, 1648) or chocolate (n° 1659).

Consistency : Hard and incompressible when dry.

Surface minutely conulose when young (n° 1614); conules 0.5 - 0.8 mm. Conules formed on the branches usually large, 2 - 4 mm high and often with radiating ridges. Adjacent conules may fuse and form ridges on the surface. In one specimen (n° 1659) the surface is rather corrugated without any trace of conule except at the growing tips.

Oscules about 2 mm in diameter and are distributed irregularly on the surface. Pores minute, sometimes in groups, localised at an area of about 0.7 mm in diameter; individual pore about 0.05 - 0.1 mm.

Ectosome : Detachable and the skeleton consists of strongyles arranged irregularly. Smaller strongyles, peculiar to the endosome, are also met with in the ectosome rarely

Skeleton composed of main fibres and connectives forming a raticulation of rectangular to polygonal meshes. Main fibres are noted at a distance of 0.1 - 0.2mm and end in surface conules. The thickness of a main fibre is about 0.06 mm and that of connectives, 0.04 mm.

The reticulation become more irregular in the older parts. Spongin content is rather sparse

Spicules : 1. Strongyles. Mainly dermal; size, 0.184 - 0.218 (0.195 mm) x 0.004 mm. 2. Strongyles. Endosomal, rarely stylote; size, 0.117 - 0.147 (0.130 mm) x 0.006- 0.008 (0.007 mm). 3. Birotulates. With 4 teeth on either side, teeth free or fused; chord length, 0.014 mm.

Remarks : This species was originally described by de Laubenfels (1954) under the genus *Hiattrochota* from Lemotol Bay, and according to him it was moderately abundant throughout the Truk Region. Bergquist (1965) synonymised it with *Iotrochota baculifera* (Ridley, 1884). Specimens of *I. baculifera* with typical spiculation are well represented both in the Seychelles and also in Truck Region. Examination of the spicules of *I. baculifera* from the Seychelles, Inhaca Island (Thomas, 1979a), Paradise Island (Thomas, 1979b) and other parts of the Indian subcontinent (Thomas, 1968) revealed that the occurrence of strongyles is rather an exceptional character and never constituted more than 6 - 8% in the samples. In *I. hiatti*, de Laubenfels (1954) reported that strongyles are «somewhat less common» and most of the spicules of the interior are styles and birotulates had fused teeth. In the present specimens the strongyles are noted as a rule (80 - 90%) and styles are rather exceptional. Birotulates, though possessed only 4 teeth on one side, as in *I. baculifera* showed a tendency to fuse together and form saucer like structures on either side.

The colour of the present specimens was also quite different from that noted in *I. baculifera* from different parts of the Indian Ocean. Chocolate colour was noted only in one specimen (n° 1659) but the others were greenish brown and it was, hence, rather easy to separate them from *I. baculifera* by colour alone.

Taking all the above mentioned facts into consideration, the species *I. hiatti* is retained here as separate from *I. baculifera* and treated under the genus *Iotrochota* Ridley as suggested by Bergquist (1965).

Distribution : Indian Ocean, Pacific Ocean

Family *ADOCIIDAE* de Laubenfels

Genus **Petrosia** Vosmaer

Petrosia nigricans Lindgren

Material : Three specimens (Reg. n^{os} 1567, 1602 and 1637).

Genus **Damirina** Burton

Damirina verticillata Burton

(pl. I, figs. 8, 8A; pl. II, fig. 3)

Damirina verticillata Burton, 1959, p. 240, fig. 25.

Material : Two specimens (Reg. n^{os} 1595 and 1666).

Description : Sponge encrusting; with fistules arising from the surface; thickness 1 - 8 mm (including fistules). Fistules 1 - 3 mm high and about 1 - 3 mm in diameter . Fistules hallow, opening to the exterior by large openings (or broken tips?). Both specimens were growing on

globular coral pieces sending ramifications to the interior (or boring ?).

Colour : Pale brown externally and deep brown internally.

Consistency : Cork-like.

Surface smooth and uniform. Oscules terminal on fistules (?). Pores minute, oval with a diameter of 0.07 mm; rather rare.

Ectosome easily detachable, and skeleton composed of irregularly strewn tornotes. Extensive areas without any spicule are also met with; deeply pigmented with brown pigment granules.

Main skeleton composed of acanthostrongyles arranged in a triangular pattern, one side of which is formed of one, two, or three spicules lying side by side. Spongin is not seen. In some places several acanthostrongyles get arranged in linear series. The outermost arms of the main skeleton may adhere to the dermal part when the latter is removed.

Spicules : 1. Tornotes. Slightly curved and heads microspined (measurements are given in table 3). 2. Acanthostrongyles. Slightly curved; spines in whorls, recurved or hook like. Normal number of whorls, 15 - 28; but smooth or partly annulated spicules are also noted. Oxeote forms are also rarely met with.

Remarks : Burton (1959) placed this genus in the subfamily Myxillidae, but a more suitable place for this genus would be in the family Adociidae, somewhere near the genus *Damiria* Keller, since the renierine affinity of the latter is well established. Thomas (1968a) erected a second species (*D. papillata*) in this genus but it differs from the type, *D. verticillata* Burton, 1959, in the smaller dimensions of the spicules. *D. papillata* Thomas, also shows a tendency to occupie the crevices of the coral rocks sending ramifications far deep into the coral.

Table 3. - **Spicular measurements (in mm) of** *D. verticillata* **Burton.**

Reg. n° Author	Host	Tornotes	Acanthostrongyles
1595	Coral	0.218-0.235(0.226) x 0.002-0.004(0.003)	0.235-0.26(0.241)x 0.008-0.020(0.016)
1666	Coral	0.218-0.28(0.273) x 0.004-0.008(0.006)	0.239-0.268(0.260) x 0.012-0.024(0.016)
Burton (1959)	-	0.36 x 0.01	0.2 x 0.02

Distribution : Indian Ocean.

Family *CALLYSPONGIIDAE* de Laubenfels

Genus Callyspongia Duch. and Mich.

Callyspongia fibrosa (Ridley and Dendy)

(pl. I, figs. 9, 9A; pl. II, fig. 4; pl. III, fig. 29)

Dasychalina fibrosa Ridley and Dendy, 1886, p. 330.

Callyspongia fibrosa Burton, 1934, p. 540 (synonymy); Burton, 1959, p. 224; Thomas, 1968 (synonymy); Bergquist, 1969, p. 66; Thomas, 1979a, 1979b.

Material : Two specimens (Reg. nos 1575 and 1594).

Description : Both specimens were growing attached to coral bits. Branches erect or repent fusing at irregular intervals forming a clathrous mass. Branches conulose throughout; conules long and more crowded at the growing tips which are slightly swollen when compared with the rest of the branch. Specimen no 1575 has a width of 100mm and height of 10 mm.

Colour : Pale brown.

Consistency : Hard but slightly compressible.

Oscules terminal, rounded or elliptical, shallow and compound; and diameter up to 14 mm. Pores minute, one per mesh and about 0.04 mm in diameter.

Surface conules, conules 1 - 6 mm high and 3 - 5 mm apart.

Dermal skeleton is a well developed reticulation of spongin fibres. Meshes triangular or rectangular and are subdivided by slender fibres which are either uni- or multiserially cored by spicules.

Main skeleton composed of stout fibres cored heavily by spicules; and running towards the periphery. During their course they may divide and redivide and get connected by secondaries in an irregularly reticulated pattern. Tertiary fibres may also be traceable. The diameter of primaries is about 0.1 mm and that of secondaries, 0.04 mm.

Spicules : Oxeas. Straight, slightly curved or even crooked. Tips gradually or actutely pointed or even blunt. Size, 0.07 - 0.106 (0.09 mm) x 0.002 - 0.004 (0.003 mm).

Distribution : Indian Ocean, Australian Region, Atlantic Ocean (?), Pacific Ocean.

Order POECILOSCLERIDA Topsent

The following families are represented in the present collection : 1. Coelosphaeridae Hentschel, 2. Agelasidae Verrill, 3. Phorbasidae de Laubenfels, 4. Cyamonidae de Laubenfels, 5. Myxillidae Hentschel, 6. Tedaniidae Ridley and Dendy, 7. Raspailiidae Hentschel, 8. Microcionidae Hentschel, 9. Ophlitaspongiidae de Laubenfels and 10. Amphilectidae de Laubenfels.

Family *COELOSPHAERIDAE* Hentschel

Genus Oceanapia Norman

Only one species (O. *fistulosa* Bowerbank) is represented in the present collection. Fistules of this species, though present in the earlier collection, the specific identification was not possible at that time. Another species reported from the Seychelles Bank is O. *seychellensis* (as *Phloeodictyon seychellensis* Dendy, 1921).

Oceanapia fistulosa (Bowerbank)

(pl. I, fig. 10; pl. II, fig. 5; pl. III, fig. 30)

Phloeodictyon fistulosum Dendy, 1905, p. 165 (synonymy); Dendy, 1921, p. 49; Hentschel, 1912, p. 412.

Oceanapia fistulosa Topsent, 1897, p. 467; Burton, 1934, p. 546; Rao, 1941, p. 443; Burton, 1959, p. 222.

Oceanapia sp. Thomas, 1973, p. 23, pl. I, figs. 16, 16A.

Material : One entire specimen and several fistules [Reg. nos 1545, 1642 (fistules)].

Description : The fistules represented compare well with those described previously (Thomas, 1973). The other specimen is massively globular with fistules arising from the entire upper surface. Fistules small, 2 - 8 mm in length and 3 - 5 mm in diameter. Diameter of massive part about 80 mm.

Colour : Yellowish white, pale brown or dirty white.

Consistency : Firm and compact

There are circular openings at the extremities of fistules, but it is not sure whether these are oscules or not. Pores, 0.04 mm in diameter and oval in shape.

Dermal skeleton consists of horizontally arranged oxeas often irregularly arranged or rarely in bands. Small oxeas (0.1 x 0.001 mm) are rather well represented in the dermal region. Main skeleton is a coarse reticulation of spicular fibres. Meshes are rectangular and the spongin is sparsely visible (for skeletal arrangement of the fistules, see Thomas, 1973).

Spicules : Oxeas. Slightly curved and gradually or abruptly pointed. These oxeas, according to Hentschel (1912) are divisible into two sets, smaller oxeas being dominant in the surface. But in the present specimens, such a demarkation is not possible. Though smaller oxeas are present in the dermal part frequently, they are found intermingled with the larger type. Size, 0.11 - 0.278 (0.225 mm) x 0.004 - 0.012 (0.008 mm).

Remarks : The presence or absence of sigmas is a much disputed problem with regard to this species. Sigmas are not met with in the present specimens.

Distribution : Atlantic Ocean (?), Indian Ocean, Australian Region.

Family *AGELASIDAE* Verrill

This is the first record of this family from the Seychelles Bank.

Genus Agelas Duch. and Mich.

Agelas ceylonica Dendy

(pl. I, fig. 11; pl. II, fig. 6)

Agelas ceylonica Dendy, 1905, p. 174, pl. 12, fig. 9; Lévi, 1961, p. 23, fig. 30; Thomas, 1968.

Ectyon ceylonica Dendy, 1921, p. 73, pl. 6, fig. 2.

Material : One specimens (Reg. n° 1647).

Description : This was found encrusting on a barnacle test which in turn was attached to a specimen of *Haliclona cribricutis* (n° 1645). Body encrusting, thickness 1 - 3 mm and area occupied, 20 x 15 mm.

Colour : Pale gray.

Consistency : Smooth, spongy with good resiliency.

Surface minutely hispid due to the presence of minute conules, and also by the erect spicules arising from the peripheral fibres. Oscules and pores are not traceable.

A thin, aspiculous and highly pigmented dermal membrane stretching across the conules, is present. Endosome is cavernous.

The main skeleton is an irregular reticulation of fine spongin fibres. Though ascending and connective fibres are not well defined, in some parts, especially near the surface, some fibres assume an ascending course and such fibres contain more echinating spicules. In the present specimen, spicules are never found coring the fibres, but in Dendy's original description it is stated that the spicules occasionally get embedded lengthwise within the fibres, two or three side by side. The diameter of the fibres varies from 0.02 to 0.06 mm and the spongin is pale yellow in colour. The echinating spicules are rather rare or absent in the deeper parts.

Spicules : Acanthostyles. Straight or slightly curved, spined vertically, and the number of annulations may vary from 8 - 24. Spicules which are entirely smooth or with one or two annulations are also met with. Measurements of spicules noted by various workers are given in table 4

Distribution : Indian Ocean.

Table 4. - Spicular measurements (in mm) of *A. ceylonica* Dendy recorded by different workers.

Author/Year	Locality	Lenght	Width
Dendy, 1905	Ceylon	0.24	0.02
Dendy, 1921	Cargados	0.32	0.025
Lévi, 1961	Canal Johny	0.080-0.275	0.005-0.015
Thomas, 1968	Gulf of Mannar	0.088-0.4 (0.241)	0.007-0.011 (0.011)
N° 1647	Mahe	0.012-0.358 (0.237)	0.006-0.012 (0.011)

Family *PHORBASIDAE* de Laubenfels

Genus Damiriana de Laubenfels

Damiriana schmidti (Ridley)

Material : One specimen (Reg. n° 1549).

Remarks : Oxeas are rarely represented.

Family *CYAMONIDAE* de Laubenfels

Genus Cyamon Gray

Cyamon vickersi (Bowerbank)

Material : Two specimens (Reg. n^{os} 1640, 1656).

Family *MYXILLIDAE* Hentschel

Genus Myxilla Schmidt

Myxilla seychellensis n.sp.

(pl. I, fig. 15; pl. II, fig. 7)

Material : One specimen (Reg. n° 1548), holotype colony.

Description : Specimen found encrusting on a semi-fossilised bivalve shell. Body thickly encrusting, at places forms thick crusts of 5 mm or even more.

Colour : Dark brown.

Consistency : Hard but friable.

Surface hispid due to the presence of plumose columns of fibres ending in the surface.

Oscules and pores are not traceable. Remnants of a thin dermal membrane are present at the surface; and tornotes are arranged horizontally at the dermal part.

Main skeleton composed of plumose columns of spongin fibres arising from the basal part. Large acanthostyles are plumosely arranged in the fibres and small acanthostyles echinate the fibres. Sigmas and chelas are distributed throughout the endosome irregularly.

Spicules : 1. Acanthostyles. Slightly curved, head densely spined and shaft less densely but uniformly spined. Size, 0.18 - 0.33 (0.31 mm) x 0.002 - 0.012 (0.010 mm). 2. Acanthostyles. Straight, head densely and shaft sparsely spined. Size, 0.075 - 0.168 (0.121 mm) x 0.004 0.013 (0.008 mm). 3. Tornotes. Straight, head minutely spined or smooth. Size, 0.211 - 0.253 (0.235) x 0.004 mm (average). 4. Isochelas. Arucuate, chord length up to 0.016 mm. 5. Sigmas. Thin and semicircular. Chord length varies from 0.026 - 0.048 mm.

Remarks : Since this specimen shows a tendency to form massive at places, it is retained in the genus *Myxilla* Schmidt.

Family *TEDANIIDAE* Ridley and Dendy

Three species belonging to this family are represented in this collection, of which *Tedania anhelans* and *Acanthacarnus souriei* are previously known fro Mahe Island. A third species, *Acarnus ternatus* Ridley, is recorded here from Mahe Island.

Genus **Tedania** Gray

Tedania anhelans (Lieberkuhn)

Material : Three specimens (Reg. nos 1563, 1616, 1652).

Genus **Acarnus** Gray

Acarnus ternatus Ridley

(pl. I, fig. 14; pl. II, fig. 8)

Acarnus ternatus Ridley, 1884, p. 453, pl. 42, figs. b, b'; Lévi, 1958, p. 35, fig. 32 (synonymy).

Acarnus wollfgangi Keller, 1889, p. 399, pl. 24, fig. 53.

Material : One specimen (Reg. no 1644).

Description : Body cylindrical; height 40 mm and diameter 25 mm. Cavity inside continuous, communicating to the exterior at the terminal part (oscule ?) and diameter about 14 mm.

Colour : Pale brown

Consistency : Stiff, but slightly compressible.

Surface conulose, conules are of two types : simple and compound. Simple conules are formed by the extremities of the fibres and compound conules by the fusion of several such simple conules. These conules may have a height varying between 2 - 5 mm and are at 90° to the surface at the bottom, at 45° to the surface at the middle part and parallel to the surface at the growing tip of the specimen.

Remnants of dermal membrane are found only at the vicinity of the conules. Tylotes are common at the dermal part.

Main skeleton composed of an irregular reticulation of spongin fibres varying in diameter from 0.033 - 0.168 mm. The meshes are rectangular towards the peripheral parts but in deeper parts they become irregular or even circular. These fibres are cored by styles and echinated by cladotylotes. The cladotylotes are richly distributed in the peripheral parts, especially at the conular tips.

Spicules : 1. Styles. Slightly curved at the basal part. Size, 0.311 - 0.412 (0.382) x 0.008 - 0.020 (0.017 mm). 2. Tylotes. Straight or slightly curved; head minutely spined. Size, 0.211 - 0.263 (0.243 mm) x 0.002 - 0.004 (0.003 mm). 3. Cladotylotes. Two types are noted : a) «Palm tree» type. This has smooth shaft and three sharp recurved spines at the tip. Base slightly swollen and uniformly rounded. At the early stage of development this spicule looks exactly like tylote with smooth heads. Spines are developed at one end and gradually gets transformed into a well formed spicule. b) The second type of cladotylote is rarely met with, and was never reported before in this species. Shaft is smooth as in the former type (but one spicule with one recurved spine was noted) and tip with three recurved spines. Base, uniformly rounded and smooth. Various parts of the former type measure : shaft, 0.26 x 0.012 mm; clads, 0.058 mm and chord 0.046 mm and of latter measure : shaft, 0.092 x 0.007 mm; clads, 0.016 mm and chord, 0.016 mm, when well formed. 4. Toxas. Two types are noted : first type measures up to 0.4 mm and the second up to 0.94 mm in length. 5. Isochelas. Chord length varies from 0.016 - 0.020 mm.

Remarks : A very interesting feature of the present specimen is the presence of two different sets of cladotylotes. The smaller type is very rare, and one spicule was rather exceptional in having a recurved spine on the shaft.

From all the known records of *A. ternatus* Ridley (1884), Lévi (1958) separated those possessing «two types of cladotylotes of which one spiny» and erected a new species (*A. thielei*). The large cladotylotes of *A. ternatus* are quite stouter when compared with those of *A.thielei* and the heads are bulbous and uniformly rounded whereas in *A. thielei* these are often irregular. The smaller cladotylotes seen in the present specimen resembled the larger form in general shape, but rarely possessed recurved spine, on the shaft. Previous workers have not recorded a second category of cladotylotes in this species. Being very rare there is every likelihood that these might have been left unnoticed.

Distribution : Red Sea, Indian Ocean, Australian region, Pacific Ocean.

Genus **Acanthacarnus** Lévi

Acanthacarnus souriei Lévi

Material : One specimen (Reg. no 1613).

Remarks : The present specimen is found thickly encrusting on a gastropod shell. Thickness of specimen, 6 mm. Consequent on this growth form illdefined spicular fibres with rectangular meshes, which are echinated by cladotylotes, are also noted. The growth form, recorded by previous workers, was thinly encrusting.

Family *RASPAILIIDAE* Hentschel

This family is reported here for the first time from Seychelles Bank.

Genus Raspailia Schmidt

Raspailia viminalis Schmidt

(pl. II, fig. 9)

Raspailia viminalis, freyeri and *stelligera* Schmidt, 1862, p. 59.

Raspailia viminalis and *freyeri* Pike, 1905, pp. 7, 30, pls. 1-4.

Raspailia viminalis Babic, 1922, p. 243; Topsent, 1928, p. 287; Burton and Rao, 1932, p. 342; Lévi, 1959, p. 126, fig. 16, pl. 6, fig. 2.

Material : Two specimens (Reg. n^{os} 1590 and 1653).

Description : Body encrusting with closely set columns arising from the substratum. These columns are about 2 - 5 mm high and 0.8 - 1.5 mm wide. Though one specimen (n^o 1653) appears to be finger shaped, with conules arranged readily, this body form is only due to its growth around a tubular foreign object. The other specimen was encrusting on a bivalve shell.

Colour : Pale gray.

Consistency : Hard and friable.

Surface highly hispid, dermal membrane, not traceable.

The skeleton composed of plumose columns of spicular bands arising from the base. Several such spicular bands unite to form a columnar growth mentioned above. These columns end in the surface giving much hispidity to the latter. Acanthostyles echinate the fibres rather profusely.

Spicules : 1. Styles or tylostyles. Size up to 1.5 x 0.024 mm. 2. Small styles. Stylote or oxeote; size up to 0.52 x 0.005 mm. 3. Acanthostyles. Conical; size 0.15 x 0.008 mm when well developed.

Remarks : There is considerable similarity between this species and the other species like *R. bifurcata* Ridley and *R. pykii* (Carter) known previously from the Indian Ocean.

Distribution : Atlantic Ocean, Mediterranean Sea, Indian Ocean.

Genus Rhaphidectyon Topsent

Rhaphidectyon encrusta n.sp.

(pl. II, fig. 10)

Material : One coral rock lodging this species (Reg. n^o 1553), holotype colony.

Description : This specimen is found in a coral rock along with two other boring sponges (*Cliona* sp. and *Thoosa radiata :* vide infra). Adjacent to the cavity formed by the *Cliona* sp. a thin film of sponge was noted. The substratum beneath this specimen presented a much disintegrated appearance, and microscopic examination revealed that the underlying part was also equally infested. Sponge tissue was found to reach to a depth of about 6 mm inside the coral

Colour : Pale white.

Oscules and pores are not traceable. Surface presented a highly netted appearance due to the presence of styles, in illdefined bands, running in different directions.

The skeleton composed of illdefined bands of styles running horizontally in the surface. These bands are made of 2 -5 spicules lying side by side and cemented together by traces of spongin. This arrangement, at places, may get replaced by spicules scattered irregularly. Acanthostyles are often seen echinating these bands. Bundles of raphides looking exactly like fish scales in shape, were quite abundant in the dermal part. Sponge tissue found inside the coral had also the same type of spicular arrangement but the quantity of spongin was much less, raphides were also scarcely represented.

Spicules : 1. Styles. Slightly curved and sharply pointed. Size, 0.451 - 0.678 (0.511 mm) x 0.004 - 0.008 (0.007 mm). 2. Acanthostyles. Head often with two whorls of spines, shaft smooth, sharply pointed and rarely with spines. Size, 0.063 - 0.108 (0.082 mm) x 0.006 - 0.008 (0.007 mm). 3. Raphides. In bundles measuring to 0.04 x 0.021 to 0.050 - 0.021 mm. These may look like fish scales when viewed under microscope. Individual size, 0.04 - 0.05 mm and hair like.

Remarks : The genus *Rhapidectyon* was created by Topsent in the family Raspailiidae with type *R. spinosus.* de Laubenfels (1936) transferred another speices originally described as *Thrinacophora dubia* Brondsted (1924) to this genus, and a third species is described herein. Taking the encrusting (or boring ?) habit into consideration, the specific name *encrusta* is suggested here.

Family *MICROCIONIDAE* Hentschel

This is the first record of this family from the Seychelles Bank.

Genus Microciona Bowerbank

Microciona prolifera (Ellis and Solander)

(pl. II, fig. 11; pl. IV, fig. 31)

Microciona prolifera Hartman, 1958, p. 36 (synonymy) (non *Spongia prolifera* Grant, 1826).

Material : Three specimens (Reg. n^{os} 1597, 1612 and 1623).

Description : Body a clathrous mass of flatened branches. Width of branches 2 - 8 mm and thickness 2 - 4 mm. The growing tips may show a tendency to become flat with longitudinal ridges and as growth proceeds, the valleys in between these ridges may become thin giving rise to new branchlets. But all the branches thus formed may not grow in the same rate and those with stunted growth may become conical and conule like ornamenting the extremities of the branches. Height of the largest specimen (n^o 1612) 5 mm, and width 90 mm.

Colour : Pale white (n^o 1612) or pale brown.

Consistency : Hard, slightly compressible.

Oscules and pores are not seen. The dermal skeleton composed of small tylostyles arranged vertically or horizontally. This part is white in colour and the thickness may vary from 0.1 - 0.18 mm, but in some parts this may get supressed and the spicules form brushes at the terminal parts of the fibres.

Main skeleton is an irregular reticulation of amber coloured spongin fibres ranging in diameter between 0.04 - 0.08 mm. These fibres are echinated by acanthostyles, often profusely at the peripheral parts.

Spicules : 1. Subtylostyles. Slightly curved, head microspined or smooth. Shaft smooth or rarely with spines. Size, 0.168 - 0.462 (0.291 mm) x 0.006 - 0.014 (0.009 mm). 2. Thin subtylostyles. Straight, head microspined. Size, 0.11 - 0.32 (0.281 mm) x 0.002 - 0.004 (0.003 mm). 3. Acanthostyles. Head densely and shaft sparsely spined. Size, 0.06 - 0.105 (0.084) x 0.004 - 0.008 (0.007 mm). 4. Isochelas. Chord length varies from 0.012 - 0.016 mm. 5. Toxas. Very rare, size up to 0.06 mm. In one specimen (nº 1597) a few hair like toxas measuring to about 0.25 mm were noted.

Distribution : Atlantic Ocean, Mediterranean Sea (?), Indian Ocean.

Microciona sp.

(pl. II, fig. 13)

Material : One specimen (Reg. nº 1664).

Description : Sponge encrusting on the shell of *Murex* sp. (on its outer surface). At places, especially at the spinous portion of the shell, the sponge forms thick crusts to a height of 8 mm or even more. These crusts are columnar in nature and may be provided with conules at their extremities or may even end blindly.

Colour : Pale brown.

Consistency : Fibrous.

Oscules and pores are not traceable. Surface generally hispid due to the presence of spicules projecting from the extremities of the fibres.

Skeleton consists of plumose columns of spongin fibres, cored and echinated by styles and acanthostyles, arising from the basal coating of spongin. In the columnar portion of the specimen, several, such spicular fibres unite together and form a compact column. Spongin is deep brown in colour.

Spicules : 1. Styles. Smooth, slightly curved, and sharply pointed. Size, 0.311 - 0.58 (0.422 mm) x 0.010 - 0.021 (0.015 mm). 2. Subtylostyles. Straight, head minutely spined. These occur in dermal brushes. Size, 0.211 - 0.452 (0.312 mm) x 0.003 - 0.006 (0.004 mm). 3. Acanthostyles. Head and shaft uniformly spined. Size, 0.07 - 0.105 (0.089 mm) x 0.004 - 0.009 (0.006 mm). 4. Isochelas. Chord length up to 0.021 mm. 5. Toxas. Two types are noted. Smaller forms are distinctly angulated at the centre, and larger forms, oxeote in nature. The former may measure 0.060 - 0.126 x 0.004 mm; and latter, 0.49 x 0.004 mm.

Remarks : There is considerable similarity between the larger toxas of this species and those of *M. anonyma* Burton (1959). But *M. anonyma* is devoid of isochelas and the larger subtylostyles have minutely spined heads. Burton (1959) expressed the opinion that *M. anonyma* is closely related to *M. longitoxa* Hentschel (1912). But the toxas found in *M. longitoxa* are centrally angulated measuring to about 0.8 mm. Both *M. anonyma* and the present species possess oxeote toxas.

Genus Isociona Hallmann

Isociona tuberosa (Hentschel)

(pl. I, fig. 13; pl. II, fig. 14; pl. IV, fig. 32)

Lissodendoryx tuberosa Hentschel, 1911, p. 326.

Isociona tuberosa Hallmann, 1919, p. 768; Burton and Rao, 1932, p. 341.

(?) *Clathria hartmeyeri* Hentschel, 1911, p. 379.

Material : Three specimens (Reg. nºs 1583, 1587 and 1610).

Description : Body encrusting with cylindrical branches. Branches 2 - 3 mm in diameter and with tuberous extremities. Branches divide dichotomously and the irregular fusion of branches may give rise to a clathrous structure. In one specimen (nº1587) the branches are flat, but this also had a basically clathrous growth form as noted in the other specimens. Height of the largest specimen (nº 1587), 50 mm and width, 60 mm.

Colour : Pale white (nºs 1583, 1610) or deep brown (nº 1587).

Consistency : Slightly compressible.

Oscules and pores are not traceable. Surface microscopically hispid due to the presence of spicules arising from the extremities of the fibres.

Dermal skeleton consists of tangentially arranged tylostyles extending in between the dermal brushes.

The main skeleton of the encrusting portion is in a renierine pattern, each side of the mesh made of 1 - 3 spicules lying side by side. The amount of spongin is rather meagre and found at the corners only. In the branches spicular fibres are noted. These fibres contain 2 - 4 spicules in cross section and run towards the peripheral parts, and are interconnected in a scalariform pattern by slender fibres containing 2 - 3 spicules lying side by side. The quantity of spongin found in these fibres is a highly variable factor.

Spicules : Subtylostyles. Straight. head portion narrow, handle like and with minute spines. These spicules are common in the dermal brushes (measurements are given in table 5). 2. Acanthostyles. Head well developed an densely spined. Shaft slightly curved and sparsely spined. 3. Tylostyles. Straight or sinuous; head well developed and minutely spined or smooth. 4. Isochelas.

Remarks : Burton and Rao (1932) could record smooth subtylostyles as in *Clathria hartmeyeri* Hentschel, in their specimens from the Ganjam coast. Other characters which isolate *C. hartmeyeri* from *Isociona tuberosa* are the presence of more spongin and the occurrence of smooth sybtylostyles. Spongin content, as noted in the present specimens is a highly variable factor. The supression of one or different types of spicules, is also a well known phenomenon among sponges.

Distribution : Indian Ocean, Australian region.

Table 5. - Spicular measurements (in mm) of *I. tuberosa* represented in the present collection.

Reg. nº	Subtylostyles	Acanthostyles	Tylostyles	Isochelas
1583	0.159-0.26 (0.205)x0.004-0.012 (0.008)	0.084-0.126 (0.109)x0.004-0.008 (0.006)	0.126-0.252 (0.205)x0.002 0.008 (0.006)	0.012 0.014
1587	0.126-0.336 (0.221)x0.008-0.012 (0.009)	0.080-0.102 (0.09)x0.004-0.008 (0.007)	0.121-0.248 (0.189)x0.003-0.005 (0.004)	0.012 0.014
1610	0.126-0.21 (0.180)x0.008-0.016 (0.012)	0.11-0.126 (0.109)x0.005-0.012 (0.008)	0.121-0.189 (0.121)x0.002-0.004 (0.003)	0.014

Family *OPHLITASPONGIIDAE* de Laubenfels

Genus **Clathria** Schmidt

Clathria frondifera Bowerbank

Material : Three specimens (Reg. nºs 1544, 1569 and 1573).

Clathria procera (Ridley)

Material : Seven specimens [Reg. nºs 1551, 1572,1581, 1584 (inner surface), 1589, 1609 and 1643].

Genus Mycale Gray

Mycale sp.

Material : One specimen (Reg. nº 1603).

Remarks : Macerated skeletal net work is only available as in the previous collection. Hence it is not possible to add much to what was given in the earlier work (see Thomas, 1973, p. 37, under *Mycale* sp.).

Family *AMPHILECTIDAE* de Laubenfels

Genus **Biemna** Gray

A variety of *Biemna variantia* (Bow.) (var. *seychellensis* Thomas) was reported in the previous work and another species (*B. fortis*) is added here to the fauna of the Seychelles Bank.

Biemna fortis (Topsent)

(pl. II, fig. 12)

Desmacella fortis Topsent, 1897, p. 463, pl. 21, fig. 30; Sollas, 1902, p. 213.

Biemna fortis Hentschel, 1912, p. 350; Burton, 1930, p. 523 (synonymy); Burton, 1959, p. 226; Thomas, 1968.

Material : One specimen (Reg. nº 1646).

Description : Body finger shaped with hallow interior. Length, 75 mm and width 10 mm average. It is possible that the present specimen can only be a branch arising from a massive specimen burried inside the sand.

Colour : Pale white.

Consistency : Friable

A definite dermal skeleton is absent; but in certain parts the spicular bands arising from the deeper parts assume a horizontal course at the surface. The main skeleton consists of styles arranged in illdefined bands. These bands, as they go towards the outer surface, may divide and redivide and get interconnected by styles in an irregular fashion

Spicules : 1. Styles. Slightly curved and sharply pointed; base uniformly rounded and less wider than the shaft. Size, 0.754 - 1.13 (0.94 mm) x 0.004 - 0.020 (0.012 mm). 2. Large sigmas. 'C' or 'S' shaped, chord length, 0.080 - 0.112 (0.093 mm). 3. Smaller sigmas. Shape as in the former, chord length, 0.014 - 0.025 mm. 4. Raphides. In bundles. Individual length up to 0.126 mm; hair like.

Distribution : Red Sea, Indian Ocean, Australian region.

Genus Tylodesma Thiele

Tylodesma truncata (Hentschel)

Material : Three specimens (Reg. nº 1543, 1546 and 1663).

Order HALICHONDRIDA Vosmaer

Family *AXINELLIDAE* Ridley and Dendy

Subfamily AXINELLINAE de Laubenfels

Genus **Axinella** Schmidt

Axinella carteri (Dendy)

Material : One specimen (Reg. nº 1600).

Axinella donnani (Bowerbank)

(pl. II, fig. 15; pl. IV, fig. 33)

Isodictya donnani Bowerbank, 1873, p. 28, pl. 6.

Axinella donnani Dendy, 1887, p. 158, pl. 11, fig. 1; Burton, 1937, p. 35, pl. 6, fig. 32 (synonymy); Burton, 1956, p. 134, Thomas, 1979a, 1979b.

Phakellia donnani Dendy, 1905, p. 190; Row, 1911, p. 357, pl. 38, fig. 16; Dendy, 1916, p. 118; Dendy, 1921, p. 116.

Material : Four specimens [Reg. nos 1557, 1558 (three specimens)].

Description : Body thickly encrusting (n° 1558) or massively globular with lobose projections. The largest specimen in the present collection has a height of 40 mm and diameter of 50 mm.

Colour : Gray.

Consistency : Tough and incompressible.

Oscules 2 - 4 mm in diameter, compound and distributed irregularly on the surface at a distance of 10 - 15 mm. Pores minute, irregularly scattered.

Surface hispid due to the presence of closely set conules. Near the oscule the conules are arranged radially. These conules are covered externally by a thin, transparent and aspiculous dermal membrane.

Axial part is quite dense, and the specimens being globular, it has developed extraordinarily leaving only a 4 - 6 mm zone along the periphery for extra axial part. In the axial part the individual fibres are very difficult to make out. The extra axial fibres arise from the axial part and run vertically up to the surface. These fibres are connected either by smaller fibres or by spicules scattered in between. Spongin is present in good quantities and is pale yellow in colour. Spicules are arranged in a plumose manner in these fibres. These fibres, though perfectly rounded in cross section in the interior (0.2 - 0.5 mm), may become very broad (0.75 mm) at or near the surface.

Spicules : 1. Styles. Shaft slightly curved near the basal part, sharply pointed or blunt. Size, 0.152 - 0.452 (0.352 mm) x 0.004 - 0.033 (0.021 mm). 2. Oxeas. Uniformly curved, tips sharply pointed, stair stepped or even blunt (size as in the former).

Distribution : Atlantic Ocean, Red Sea, Indian Ocean.

Axinella minor n. sp.

(pl. I, figs. 12, 12A; pl. II, fig. 16)

Axinella sp. Thomas, 1973, p. 43, pl. II, fig. 17.

Material : Three specimens [Reg. nos 1654, 1655 (type) and 1657].

Description : Body finger shapped, tips blunt, height of the largest specimen (n° 1655) 50 mm and diameter 18 mm (maximum). All of them were attached to the substratum by broad (n° 1655) or constricted base (nos 1654, 1657).

Colour : Brown or gray.

Consistency : Compressible with good resiliency.

The other details closely agree with those given for *Axinella* sp. (see Thomas, 1973).

Spicules : Styles. Slightly curved and sharply pointed; head conspicuous in younger forms. Size, 0.168 - 0.345 (0.277 mm) x 0.002 - 0.024 (0.013 mm).

Distribution : Indian Ocean.

Order HADROMERIDA Topsent

Following families are represented : 1. Spirastrellidae Hentschel, 2. Suberitidae Schmidt and 3. Clionidae Gray.

Family *SPIRASTRELLIDAE* Hentschel

Genus **Spirastrella** Schmidt

Species of the genus *Spirastrella* previously reported from Mahe Island include : *S. cuspidifera* (Lam.), *S. inconstans* (Dendy) and *S. pachyspira* Lévi. Of these three, the first mentioned two are represented in the present collection.

Spirastrella cuspidifera (Lamarck)

Material : Eight specimens (Reg. nos 1564, 1570, 1571, 1574, 1604, 1620, 1624 and 1625).

Spirastrella inconstans (Dendy)

Material : Five specimens (Reg. nos 1578, 1579, 1582, 1586 and 1598).

Genus **Timea** Gray

Only one species (*T. curvistellifera* Dendy) is represented in the collection. Other species reported previously from Mahe Island include : *T. stellata* (Bowerbank) and *T. stelligera* (Carter).

Timea curvistellifera Dendy

(pl. II, fig. 17)

Timea curvistellifera Dendy, 1905, p. 121, pl. 5, fig. 6; Lévi, 1961, p. 11, fig. 13.

Material : One specimen (Reg. n° 1651).

Description : Body encrusting on an irregular coral piece; thickness about 1 mm.

Colour : Pale brown.

Consistency : Soft and friable.

Oscules and pores are not traceable. Surface microscopically hispid due to the presence of dermal brushes.

The skeleton composed of tylostyles arising from the basal part either singly or in groups. In thinly encrusting portion of the specimen these spicules are often seen erect on the

substratum and in places, where the specimen has grown to a considerable height, fascicules of tylostyles may be noted. These fascicules end in the surface brushes giving considerable hispidity. Apart from these fascicules, imperfect ones arising at or near the surface, may also be noted. These also contribute much hispidity to the surface.

Spicules : 1. Tylostyles. Straight, head globular; greatest width at the distal half. Size, 0.1 0.56 (0.434 mm) x 0.003 - 0.021 (0.021 mm); diameter of head, when well formed, may come up to that of the shaft. 2. Asters. Smaller forms often with a curved axis, and with spines which are arranged in three groups. Larger forms rather spherical with conical or branched rays. Size, 0.08 - 0.046 mm.

Distribution : Indian Ocean.

Family SUBERITIDAE Schmidt

Genus **Aaptos** Gray

Aaptos aaptos (Schmidt)

Material : Three specimens (Reg. nos 1588, 1601 and 1615).

Family *CLIONIDAE* Gray

Two groups are considered here. In the first group - Cliona group - the microscleres are simpler whereas in the other group - Thoosa group - these are much more complicated in structure. Genera like *Aka* de Laubenfels, *Cliona* Grant, come under the first group and the genus *Thoosa* Hancock, under the latter.

Genus **Aka** de Laubenfels

Aka minuta Thomas

Material : One specimen found infesting the branch of a coral (Reg. n° 1552).

Genus **Cliona** Grant

Cliona vastifica Hancock

Material : Three specimens (nos 1591, 1627 and 1632).

Cliona carpenteri Hancock

(pl. II, fig. 18)

Cliona carpenteri Hancock, 1867, p. 241, pl. 8, fig. 4; Thomas, 1968, Thomas, 1972b.

Cliothosa carpenteri de Laubenfels, 1936, p. 156.

Cliona bacillifera Carter, 1887, p. 76.

Material : One semi-fossilised bivalve shell infested with this sponge (Reg. n° 1593).

Description : Only the upper part of the shell is perforated, openings small, 0.2 - 0.7 mm in diameter, and are circular or oval in outline. Perforations irregularly distributed, distance between the adjacent openings, 1 - 1.5 mm.

Cavities formed inside the shell oval or angulated in outline, and the diameter may vary from 0.5 - 1 mm. Connections found in between the adjacent cavities short and the inner surfaces of the cavities have an etched out appearance.

Spicules : 1. Tylostyles. Straight, head globular or oblong. Size, 0.161 - 0.242 (0.198 mm) x 0.002 - 0.006 mm. Head, when well formed, 0.006 mm. 2. Microxeas. Uniformly curved or slightly angulated; spined or granulated. Size, 0.067 - 0.11 (0.088 mm) x 0.002 - 0.006 (0.004 mm). 3. Bacilliform spicules. Straight, bacilliform or slightly curved with granulated or spined body. Size, 0.016 x 0.002 mm.

Distribution : Atlantic Ocean, Indian Ocean, Australian region, Pacific Ocean.

Cliona viridis (Schmidt)

(pl. II, fig. 19)

Vioa viridis Schmidt, 1862, p. 77.

Cliona viridis Gray, 1967, p. 525; Hechtel, p. 61 (synonymy); Thomas, 1968, 1972a, p. 349, pl. 2, fig. 1; Thomas, 1972b.

Material : One specimen infesting a bivalve shell (Reg. n° 1621).

Description : Found infesting the shell and calcareous alga attached to it. Perforations found at the upper surface of shell, small, about 0.8 mm in diameter, and are very rare. But those found at the lower surface of the shell, large, 1 - 2 mm in diameter.

Cavities formed inside the shell large, 2 - 3 mm in diameter and irregular in outline. The adjacent cavities communicate through mere openings on the wall or through small canals ranging in diameter from 0.5 - 1 mm. The interior of cavities presents an etched out appearance.

Spicules : 1. Tylostyles. Straight or slightly curved near the neck portion. Head spherical with maximum diameter near the terminal part. Size, 0.24 - 0.396 (0.33 mm) x 0.002 - 0.012 (0.010 mm); head, when well developed, 0.012 mm. 2. Spirasters. Spines spirally arranged, conical and prominent at the angular portions. Length of spine, when well formed, may exceed the width of the shaft. some spicules have 5 or even more angulations. Size up to 0.054 x 0.002 mm.

Distribution : Atlantic Ocean, Mediterranean Sea, Red Sea, Indian Ocean, Australian region, Pacific Ocean.

Cliona margaritifera Dendy

(pl. II, fig. 21)

Cliona margaritiferae Dendy, 1905, p. 128, pl. 5, fig. 9; Annandale, 1915, p. 9 (synonymy).

Cliona margaritifera Vacelet and Vasseur, 1971, p. 77, fig. 21; Thomas, 1979a.

Material : One coral bit attached to *Hippiospongia* sp. (Reg. nos 1634 and 1635).

Description : Cavities made inside the coral small, 1 - 2 mm in diameter and more or less oval in outline. The upper surface of the coral was removed while collecting and hence other details regarding the openings through which the excurrent and incurrent papillae protrude out of the substratum are not available.

Spicules : 1. Tylostyles. Straight or slightly curved. Head globular or cap shaped. Size, 0.22 - 0.39 (0.32 mm) x 0.004 - 0.008 (0.006 mm). Diameter of head up to 0.010 mm. 2. Microxeas. Angulated at the central portions; spiny, granular or smooth. They may get gradually transformed into spirasters with 3 - 5 angulations possessing robust spines. Size, up to 0.050 x 0.004 mm. 3. Ordinary spirasters. With 2 - 4 angulations; spines long and conical; prominent at the convex parts. Length of spines almost double the width of the shaft in well developed forms. Size, up to 0.054 x 0.003 mm; length of spines about 0.006 mm.

Remarks : In the original description (Dendy, 1905) the spirasters were regarded as modified microxeas, and the spines were blunt and robust. The same characters were noted in the specimens collected from Inhaca Island (Thomas, 1979a) also. But in the present specimen, ordinary spirasters measuring up to 0.054 x 0.003 mm and possessing long spines originating from the convex parts were noted along with the other spirasters. Such ordinary spirasters were represented in the specimens from Tulear (Vacelet and Vasseur, 1971) also.

This species is very common in the Pearl Banks of Ceylon (Dendy, 1905).

Cliona sp.

(pl. II, fig. 22)

Material : One coral rock infested with this sponge (Reg. n ° 1554).

Description : The cavities formed inside the coral are 0.5 - 1 mm in diameter and the adjacent cavities communicate through minute openings. The borings are found to a depth of 15 mm inside the coral. Since the surface portion of the coral got detached while collecting, other details are not traceable.

Colour : Brilliant violet. When a portion of coral is treated with nitric acid the entire acid turned violet, and this colour vanished only after boiling the acid for some time.

Skeleton consists of irregularly arranged tylostyles inside the cavities. Violet pigment granules, ranging in diameter from 0.008 - 0.012 mm, are abundantly found inside the cavities.

Spicules : 1. Tylostyles. Slightly curved; head globular, cap shaped, oblong or even trilobed. Additional wellings may be noted at the neck portion; or stylote. Size, up to 0.34 x 0.016 mm; head, when well formed, 0.021 mm. 2. Spirasters. Straight, semi-circular, or even with 2 - 4 bendings. Spines conical; size, up to 0.024 mm.

Remarks : Brilliant violet colour noted in this specimen is rather unique among clionids.

Genus **Thoosa** Hancock

Only one species (*T. radiata* Topsent) is represented in this collection. Another species, *T. armata* Topsent is reported previously from Mahe Island (Thomas, 1973).

Thoosa radiata Topsent

(pl. II, fig. 23)

Thoosa bulbosa Hancock, 1849, p. 347, pl. 12, fig. 11; pl. 13, fig. 8 (parts).

Thoosa radiata Topsent (1887), 1888, pp. 81, 89, 90, pl. 7, fig. 11; Topsent, 1891, pp. 577, 597, 586; Annandale, 1915, p. 17.

Material : One coral rock infested with this sponge (Reg. n° 1555).

Description : Cavities found inside the coral large, 3 - 6 mm in diameter; oval or angulated in outline. These cavities communicate to the outside through straight canals varying in diameter from 0.5 - 1 mm; and the number of such canals arising from a cavity may vary from 1 - 3 (often two). The 'tissue' of the sponge shows a tendency to shrink when taken out of water, and as a result the lining of these canals often get with drawn into the cavity beneath. Communication between the adjacent cavities is effected through slender canals.

Papillae not seen; but at the surface of the coral, at the entrance of each canal, a disc (or detached tip of the papella) is noted. These discs, based on their structure may be classified under two different types : those with a pore in the centre and others without such a pore. In the first type the central pore occupies almost 1/3 of the total diameter, which is 0.8 mm on an average. The amphiasters are found just encircling the central opening and oxyasters, at the peripheral parts with their one arm radiating towards the zone of amphiasters. In the latter type, there is no central opening and this area is covered with a semi-transparent membrane reinforced by amphiasters. The arrangement of oxyasters is the same as that of the former type. It is possible that the former type may represent oscule bearing papillae and latter, pore bearing; pores being highly contractile got obliterated while drying. When there is only one papilla arising from a cavity it is found to be of former type, and when two, the second one always belongs to the latter category and when one more is added (i.e. three totally) the third one will invariably of the latter type.

Spicules : 1. Amphiasters (slender). With a short central axis bearing 6 rays on either end in whorls and a median ray on either end as continuation of the central axis. Tip of the ray capitate, spiny or acutely pointed; and often with an annular swelling near the terminal part. Size when well developed, 0.021 x 0.012 mm (including rays); rays very slender, 0.001 mm in diameter and length about 0.005 mm. 2. Amphiasters (robust). Arrangement of rays as in the former type; rays and axis rather robust. Tips of ray deltoid and spiny. Size, 0.016 x 0.012 mm when well developed and the diameter of the ray, 0.004 mm. 3. Oxyasters. Often with two rays (one spicule with three rays was also noted); rays straight (about 10%), slightly curved (about 30%) or angulated in the middle (about 60%). Rays end abruptly in an acute point. Centrum rounded and forms a bulbous expansion. Size of ray, 0.050 x 0.003 mm when well developed.

Eggs measuring to about 0.28 mm, were present inside certain chambers; and were circular in outline.

Remarks : Hancock (1849) while describing *I. bulbosa*, gave the details of another 'form' (p. 347) and its spicules; but he was not sure whether this is a separate species or not and hence it was treated only as a 'form' of *T. bulbosa*. Later, Topsent (1888) located a specimen from a

similar condition (i.e. from the shell of *Tridacna*) and separated this totally different species from *T. bulbosa*. Taking the structure of «big stars» (amphiasters), possessing rays ending in conical points, into consideration the name '*radiata*' was suggested (see Topsent, 1891, for a key for the different species of *Thoosa* devoid of megascleres).

Previous records of this species were from shells, and it is now recorded from a coral.

Distribution : Indian Ocean.

Order EPIPOLASIDA Sollas

Following families of this order are represented : 1. Jaspidae de Laubenfels, 2. Tethyidae Gray and 3. Scleritodermidae Sollas. The last mentioned family is here reported for the first time from the Seychelles Bank.

Family *JASPIDAE* de Laubenfels

To subfamilies are considered : 1. Rhaphidistiinae de Laubenfels and 2. Jaspinae de Laubenfels.

Subfamily RHAPHIDISTIINAE de Laubenfels

Only one genus (*Prostylyssa* Topsent) of this subfamily is represented and the species is *P. foetida* (Dendy). Another species, *P. occulata* (Kieschnick), is also reported from Mahe Island (Thomas, 1973).

Genus **Prostylyssa** Topsent

Prostylyssa foetida (Dendy)

(pl. II, fig. 20)

Hymeniacidon foetida Dendy, 1889, p. 87, pl. 4, fig. 5.

Prostylyssa foetida Burton, 1937, p. 37, pl. 7, fig. 45 (synonymy); Vacelet and Vasseur, 1965, p. 118; Thomas, 1968; Thomas, 1979b

Material : One specimen (Reg. n° 1568).

Description : Massively encrusting, total length, 80 mm and height, 30 mm. Upper surface of the specimen irregular due to the presence of tubercular branches.

Colour : Pale yellow.

Consistency : Hard and friable.

Oscules terminal on branches; diameter, 1 - 3 mm and compound in nature. Pores minute, one per mesh, diameter up to 0.06 mm. Surface uneven and with conules of 1 - 2 mm high.

Dermal skeleton composed of irregular bands of oxeas forming polygonal, triangular or irregular meshes. These bands are often ornamented with small styles.

Main skeleton is irregular and is composed of bands of oxeas. These bands may become rather confused towards the outer part of the specimen, and some oxeas may even project out giving considerable hispidity to the surface. Spongin content is rather meagre and is colourless.

Spicules : 1. Oxeas. Slightly curved and sharply pointed. Size, 0.311 - 1.211 (0.567 mm) x 0.002 - 0.021 (0.016 mm). 2. Styles. Slightly curved with greatest width at the central part. Size, 0.113 - 0.223 (0.182 mm) x 0.004 - 0.010 (0.006 mm).

Distribution : Indian Ocean, Australian region.

Subfamily JASPINAE de Laubenfels

Genus **Jaspis** Gray

Jaspis bouilloni Thomas

Material : One specimen (Reg. n° 1665).

Jaspis jonesi Thomas

Material : One specimen (Reg. n° 1650).

Genus **Zaplethea** de Laubenfels

Zaplethea digonoxea ssp. *diastra* Vacelet and Vasseur

Material : One specimen (Reg. n° 1662).

Family *TETHYIDAE* Gray

Genus **Tethya** Lamarck

Only one species (*T. robusta* Bowerbank) is represented in the present collection. Other species already reported from this Island include *T. diploderma* Schmidt and *T. japonica* Sollas.

Tethya robusta Bowerbank

Material : One specimen (Reg. n° 1633).

Genus **Tethytimea** de Laubenfels

Tethytimea repens (Schmidt)

(pl. II, fig. 24)

Tethya repens Schmidt, 1870, p. 51; Burton, 1959, p. 215 (synonymy).

Donatia repens Burton, 1924, p. 1036 (synonymy).

Tethytimea repens de Laubenfels, 1936, p. 164; Thomas, 1968 (synonymy).

Material : One specimen (Reg. n° 1539).

Description : Sponge thickly encrusting, thickness 10 mm average. Surface hispid due to the presence of spicular brushes. A thick layer of silt is found on the surface.

Colour : Pale white.

Consistency : Hard and incompressible.

Oscules and pores are not traceable; cortex well developed, thickness, 0.5 mm and is densely packed with asters.

The main skeleton is made of bands of megascleres arising from the basal part. These bands are perfectly circular in outline in the basal part (0.3 mm in diameter) where they come in to contact with the substratum, but as they go towards the surface assume a fan shaped structure, and measure about 0.6 mm in diameter. Bifurcation of these bands, at or near the surface, is also noted. In between such bands, incomplete bands, originating from the middle portion of the sponge, are also met with. All these bands end in the surface in dermal brushes.

Spicules : 1. Tylostyles or styles. Straight, shaft fusiform. Head prominent in the younger forms only. Size, 2.00 x 0.041 mm when well developed. 2. Spherasters. Centrum conspicuous, rays long, pointed or blunt. Branched rays are also met with. Total diameter up to 0.33 mm and rays about 0.112 mm when well developed. 3. Chiasters. Centrum small and with 6 - 12 rays, rays straight with smooth or granulated tips. Size, up to 0.012 mm.

Remarks : The size of spheraster is a highly variable factor. Burton (1959) recorded large spherasters measuring up to 0.6 mm.

Distribution : Atlantic Ocean, Indian Ocean, Australian region Pacific Ocean.

Family *SCLERITODERMIDAE* Sollas

Genus Azorica Carter

Azorica pfeifferae Carter

(pl. II, fig. 25)

Azorica pfeifferae Carter, 1873, pp. 438, 442; Sollas, 1888, p. 319, pl. 36 (synonymy); Burton, 1928, p. 112; Tospent, 1904, p. 63.

Leiodermatium pfeifferae Lendenfeld, 1903, p. 148 (synonymy).

Material : One small bit (Reg. nº 1629).

Description : A small bit of this sponge was found among other foreign objects incorporated into the body of *Hippiospongia* sp. (Reg. nº 1628). Size, 11 x 9 mm and thickness 1.5 mm. This may only be a bit of a lamellar specimen severed off from the parent body and later got incorporated into the body of the host.

Colour : Pale white.

Consistency : Hard and incompressible.

Surface uniformly smooth and even. Other details could not be studied since the

specimen was in a highly erroded condition. Skeleton composed of interlocked desmas forming a compact structure.

Spicules : Desmas. When well developed measure up to 0.31 mm chord; thickness of cladup to 0.031 mm. 2. Oxeas. Slightly curved, size up to 0.81 x 0.016 mm.

Distribution : Atlantic Ocean, Indian Ocean, Pacific Ocean.

Order CHORISTIDA Sollas

Following families are represented : 1. Ancorinidae Gray, 2. Geodiidae Gray, 3. Craniellidae de Laubenfels and 4. Kaliapsidae de Laubenfels.

Family *ANCORINIDAE* Gray

This family is divided into two subfamilies. 1. Ancorininae de Laubenfels, and 2. Stellettinae Sollas.

Subfamily ANCORININAE de Laubenfels

Genus **Ecionemia** Bowerbank

Ecionemia acervus Bowerbank

Ecionemia acervus Bowerbank, 1862, p. 1101, pl. 73, fig. 1; Burton, 1959, p. 194 (synonymy); Thomas, 1968.

Ancorina acervus 2Bergquist, 1965, p. 191, fig. 3a, b.

Material : One specimen (Reg. nº 1576).

Description : This is found attached to the concave surface of a semi-fossilised bivalve shell. Shape, irregularly spherical; diameter, 25 mm and height, 15 mm.

Colour : Pale brown.

Consistency : Hard and incompressible.

Oscules and pores are not traceable. Surface hispid.

Cortex rather well developed, thickness about 0.3 mm; structure same as that seen in *E. carteri* Dendy, 1905. Brown pigment granules are found scattered irregularly in the cortex and endosome alike.

Skeleton typically radial, consisting of oxeas and triaenes closely packed. The clads of triaenes are arranged at various levels. Protriaenes and anatriaenes project out of the surface giving hispidity to the surface. Small oxeas are very common just beneath the surface arranged radially.

Spicules : 1. Orthotriaenes. Shaft conical and straight; clads stout and sharply pointed or blunt. Size, when well developed : shaft, 1.6 x 0.075 mm, clad, 0.227 x 0.056 mm. 2. Anatriaenes. Slender, clad 'T' shaped in younger forms. Size : shaft, 2.6 x 0.012 mm, clad, 0.071 mm and chord, 0.105 mm. 3. Protriaenes. Rare; shaft, 1.8 x 0.056 mm and clad, 0.054 x

0.008 mm. 4. Oxeas. Slightly curved, size, up to 2.45 x 0.056 mm. 5. Microxeas. Straight, slightly curved or even crooked. Size, 0.24 x 0.002 mm. 6. Microstrongyles. Minutely spined; size, 0.012 - 0.016 x 0.001 - 0.003 mm. 7. Tylasters. Centrum indistinct and with 4 - 8 rays. Diameter up to 0.009 mm. 8. Anthasters. With 4 - 8 microspined rays; diameter, 0.021 mm.

Distribution : Indian Ocean, Australian region, Pacific Ocean.

Subfamily STELLETTINAE Sollas

Genus **Myriastra** Sollas

Myriastra purpurea (Ridley)

Material : One specimen (Reg. n^{0} 1618)

Family *GEODIIDAE* Gray

Genus **Geodia** Lamarck

Geodia lindgreni (Lendenfeld)

Material : Two specimens (Reg. n^{0s} 1605 and 1611).

Family *CRANIELLIDAE* de Laubenfels

Genus **Cinachyra** Sollas

Cinachyra cavernosa (Lamarck)

Material : Four specimens (Reg. n^{0s} 1550, 1561, 1565 and 1617).

Family *KALIAPSIDAE* de Laubenfels

Genus **Discodermia** Bocage

Discodermia sceptrellifera Carter

(pl. II, fig. 26)

Discodermia sceptrellifera Carter, 1881, p. 373, pl. 18, fig. 2; Burton and Rao, 1932, p. 307.

Rhacodiscula (?) *sceptrellifera* Sollas, 1888, p. 333.

Material : One specimen, attached to the surface of a coral nodule (Reg. n^{0} 1667).

Description : Sponge thickly encrusting on a spiral tube (probably of polychaete). Thickness, 1 - 6 mm.

Colour : Dirty gray.

Consistency : Hard and incompressible.

Oscules and pores are not traceable.

Skeleton composed of discotriaenes in the surface with their shafts pointing inwards; and tetracrepid desmas forming a dense and compact mass in the interior.

Spicules : 1. Discotriaenes. Disc not perfectly rounded (but Carter, 1881, stated that perfectly rounded discs were present in the specimens which he examined). In the present specimen discs with cut up margins were only available as in the specimen recorded by Burton and Rao, 1932 from Ganjam Coast. Total diameter, in well developed forms, up to 0.37 mm. Shaft conical, length up to 0.07 mm. 2. Desmas. Tetracrepid, tips tuberculate. Diameter up to 0.33 mm. 3. Amphiasters. They were totally absent.

Distribution : Indian Ocean.

LIST OF SPECIES HITHERTO REPORTED FROM MAHE ISLAND

Phylum PORIFERA Grant

Class DEMOSPONGIAE Sollas

Order KERATOSIDA Gray

Family *SPONGIIDAE* Gray

Subfamily SPONGIINAE de Laubenfels

1. *Spongia officinalis* Lin. var. *ceylonensis* Dendy
2. *Hippiospongia* sp.
3. *Heteronema erecta* Keller
4. *Hyattella cribriformis* (Hyatt)
5. *Phyllospongia foliascens* (Pallas)
6. *Ircinia* sp.

Subfamily VERONGIINAE de Laubenfels

7. *Verongia* sp.
8. *Thorectopsamma seychellensis* Thomas
9. *Fasciospongia cavernosa* (Schmidt)

Family *DYSIDEIDAE* Gray

10. *Dysidea fragilis* (Montagu)

Family *APLYSILLIDAE* Vosmaer

11. *Psammaplysilla purpurea* (Carter)

Order HAPLOSCLERIDA Topsent

Family *HALICLONIDAE* de Laubenfels

12. *Haliclona retiderma* (Dendy)
13. *H. cribricutis* (Dendy)
14. *Haliclona* sp.

Family *DESMACIDONIDAE* Gray

15. *Iotrochota purpurea* (Bowerbank)
16. *I.baculifera* Ridley
17. *I. hiatti* (de Laubenfels)

Family *ADOCIIDAE* de Laubenfels

18. *Sigmadocia fibulata* (Schmidt)
19. *Petrosia nigricans* Lindgren
20. *Damirina verticillata* Burton

Family *CALLYSPONGIIDAE* de Laubenfels

21. *Callyspongia fibrosa* (Ridley and Dendy)

Order POECILOSCLERIDA Topsent

Family *COELOSPHAERIDAE* Hentschel

22. *Oceanapia fistulosa* (Bowerbank)

Family *PHORBASIDAE* de Laubenfels

23. *Echinodictyum clathratum* Dendy
24. *Damiriana schmidti* (Ridley)

Family *AGELASIDAE* Verrill

25. *Agelas ceylonica* Dendy

Family *CYAMONIDAE* de Laubenfels

26. *Cyamon vickersi* (Bowerbank)

Family *MYXILLIDAE* Hentschel

27. *Myxilla dendyi* Burton
28. *M. seychellensis* n. sp.

Family *TEDANIIDAE* Ridley and Dendy

29. *Tedania anhelans* (Lieberkuhn)
30. *Acarnus ternatus* Ridley
31. *Acanthacarnus souriei* Lévi
32. *Lissodendoryx isodictyalis* (Carter)
33. *L. massalis* (Dendy)

Family *RASPAILIIDAE* Hentschel

34. *Raspailia viminalis* Schmidt
35. *Rhaphidectyon encrusta* n.sp.

Family *MICROCIONIDAE* Hentschel

36. *Microciona prolifera* (Ellis and Solander)
37. *Microciona* sp.
38. *Isociona tuberosa* Hentschel

Family *OPHLITASPONGIIDAE* de Laubenfels

39. *Clathria frondifera* (Bowerbank)
40. *C. procera* (Ridley)
41. *Mycale grandis* Gray
42. *M. spongiosa* (Dendy)
43. *Mycale* sp.
44. *Zygomycale parishii* (Bowerbank)

Family *AMPHILECTIDAE* de Laubenfels

45. *Biemna variantia* (Bow.) var. *seychellensis* Thomas
46. *B. fortis* (Topsent)
47. *Toxemna tubulata* (Dendy)
48. *Tylodesma truncata* (Hentschel)

Order HALICHONDRIDA Vosmaer

Family *AXINELLIDAE* Ridley and Dendy

49. *Axinella carteri* (Dendy)
50. *A. donnani* (Bowerbank)
51. *A. minor* n.sp.
52. *Axinella* sp.
53. *Phakettia conulosa* (Dendy)
54. *Phycopsis* sp.
55. *Myrmekioderma granulata* (Esper)

Family *HYMENIACIDONIDAE* de Laubenfels

56. *Acanthella cavernosa* Dendy

Order HADROMERIDA Topsent

Family *SPIRASTRELLIDAE* Hentschel

57. *Spirastrella cuspidifera* (Lamarck)
58. *S. inconstans* (Dendy)
59. *S. pachyspira* Lévi
60. *Sigmosceptrella laevis* (Lindgren)
61. *Timea stellata* (Bowerbank)
62. *T. stellivarians* (Carter)
63. *T. stelligera* (Carter)
64. *T. curvispiculifera* Dendy

Family *SUBERITIDAE* Schmidt

65. *Suberites carnosus* (Johnston)
66. *Pseudosuberites andrewsi* Kirkpatrick
67. *Aaptos aaptos* (Schmidt)

Family *CLIONIDAE* Gray

68. *Amorphinopsis excavans* Carter
69. *Aka minuta* Thomas
70. *Cliona celata* Grant
71. *C. vastifica* Hancock
72. *C. carpenteri* Hancock
73. *C. viridis* (Schmidt)
74. *C. margaritifera* Dendy
75. *Cliona* sp
76. *Thoosa armata* Topsent
77. *T. radiata* Topsent

Order EPIPOLASIDA Sollas

Family *JASPIDAE* de Laubenfels

Subfamily RHAPHIDISTIINAE de Laubenfels

78. *Prostylyssa foetida* (Dendy)
79. *P. oculata* (Kieschnick)

Subfamily JASPINAE de Laubenfels

80. *Jaspis penetrans* (Carter)
81. *J. bouilloni* Thomas
82. *J. jonesi* Thomas
83. *Zaplethea digonoxea* ssp. *diastra* Vacelet and Vasseur

Family *SOLLASELLIDAE* Lendenfeld

84. *Epipolasis salomonensis* (Dendy)

Family *TETHYIDAE* Gray

85. *Tethya diploderma* Schmidt
86. *T. robusta* Bowerbank
87. *T. japonica* Sollas
88. *Tethytimea repens* (Schmidt)

Family *SCLERITODERMIDAE* Sollas

89. *Azorica pfeifferae* Carter

Order CHORISTIDA Sollas

Family *ANCORINIDAE* Gray

Subfamily ANCORININAE de Laubenfels

90. *Ecionemia laviniensis* Dendy
91. *E. acervus* Bowerbank

Subfamily STELLETTINAE de Laubenfels

92. *Myriastra purpurea* (Ridley)
93. *Stelletta cylindrica* Thomas
94. *Aurora oxytoxa* Thomas

Family *GEODIIDAE* Gray

95. *Geodia lindgreni* (Lendenfeld)

Family *CRANIELLIDAE* de Laubenfels

96. *Cinachyra cavernosa* (Lamarck)
97. *Acanthocinachyra seychellensis* Thomas
98. *Paratetilla bacca* (Selenka)

Family *KALIAPSIDAE* de Laubenfels

99. *Discodermia sceptrallifera* Carter
100. *Discodermia* sp.

Order CARNOSIDA Carter

Family *HALINIDAE* de Laubenfels

Subfamily HALININAE de Laubenfels

101. *Halina plicata* (Schmidt)
102. *Plakortis simplex* Schulze

Subfamily CORTICIINAE Vosmaer

103. *Samus anonyma* Gray

Family *CHONDRILLIDAE* Gray

104. *Chondrilla nucula* Schmidt

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PLATES

PLATE I

1.- *Spongia officinalis* var. *ceylonensis* : main skeleton. 2.- *Hippiospongia* sp. : skeletal arrangement. 2A.- *Hippiospongia* sp. : section of the specimen showing the subdermal canals and the islets formed at the surface. 2B.- *Hippiospongia* sp. : a compound conule. 2C.- *Hippiospongia* sp. : conule, different stages of development. 3.- *Hircinia* sp. : entire specimen. 3A.- *Hircinia* sp. : skeletal arrangement. 3B.- *Hircinia* sp. : «filament». 4.- *Dysidea fragilis* : skeletal arrangement. 5.- *Verongia* sp. : main skeleton. 5A.- *Verongia* sp. : cross section of main fibre. 6.- *Haliclona* sp. : main skeleton. 6A.- *Haliclona* sp. : dermal skeleton. 7.- *Iothrochota hiatti* : main skeleton. 8.- *Damirina verticillata* : dermal skeleton. 8A.- *Damirina verticillata* : main skeleton; arrangement of spicules. 9.- *Callyspongia fibrosa* : dermal skeleton. 9A.-*Callyspongia fibrosa* ; main skeleton. 10.- *Oceanapia fistulosa* : dermal skeleton. 11.- *Agelas ceylonica* : skeleton. 12.- *Axinella minor* n. sp. : axial skeleton. 12A.- *Axinella minor* n. sp. : extra-axial fibre. 13.- *Isociona tuberosa* : skeletal arrangement. 14.- *Acarnus ternatus* : skeletal arrangement of a compound conule; some simple conules formed from these fibres are also shown. 15.- *Myxilla seychellensis* n. sp. : a spicular column.

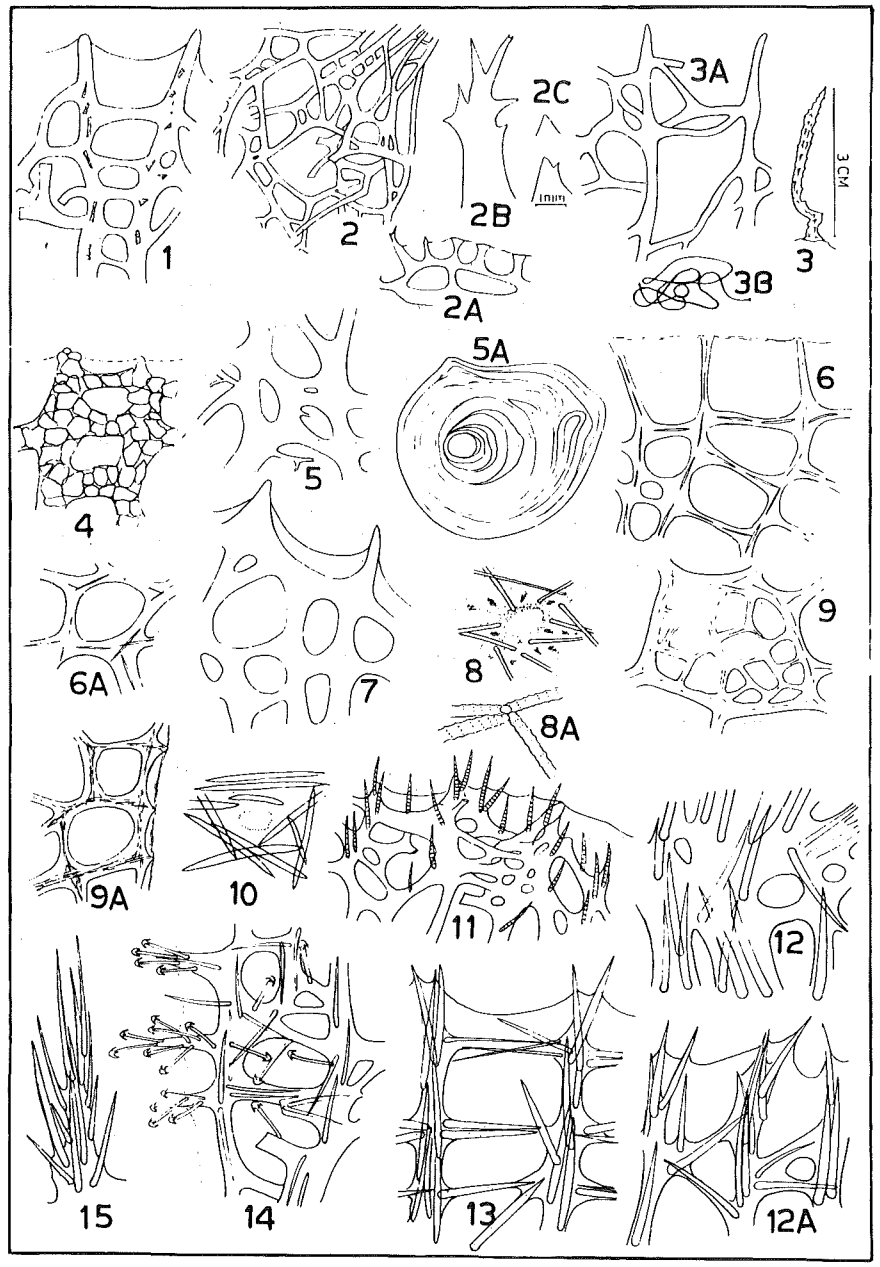


PLATE II

1.- *Haliclona* sp. : oxeas. 2.- *Iotrochota hiatti* : (a) strongyle; (b) strongyles and styles; (c) birotulates. 3.- *Damirina verticillata* : (a) acanthostrongyles; (b) tornotes. 4.- *Callyspongia fibrosa* : oxeas. 5.- *Oceanapia fistulosa* : (a) large oxeas; (b) small oxeas. 6.- *Agelas ceylonica* : acanthostyles, different types. 7.- *Myxilla seychellensis* n. sp. : (a) acanthostyles, large; (b) acanthostyles, small and straight; (c) tornotes; (c') head of tornotes showing echination; (d) sigmas, different types; (e) isochelas. 8.- *Acarnus ternatus* : (a) styles; (b) tylotes; (c) cladotylotes, developmental stages (c1-c4); (d) cladotylotes (small) with recurved spine on the shaft; (e) toxas, small; (f) toxa, large; (g) isochelas. 9.- *Raspailia viminalis* : (a) tylostyles or styles; (b, b') small styles, ordinary and enlarged; (c, c') acanthostyles, ordinary and enlarged. 10.- *Rhaphidectyon encrusta* n. sp. : (a) styles; (b) acanthostyles; (c, d) trichodragmas; (c', d') raphides. 11.- *Microciona prolifera* : (a) subtylostyles; (b) thin subtylostyles; (c) acanthostyles; (d) isochela; (e) toxas. 12.- *Biemna fortis* : (a) style; (b) large sigmas; (c) small sigmas, (d) raphide. 13.- *Microciona* sp. : (a) styles; (b) small tylostyles; (c) acanthostyles; (d) isochelas; (e) toxas; (f) oxeote toxa. 14.- *Isociona tuberosa* : (a) subtylostyles; (b) acanthostyles; (c) tylostyle; (d) isochela. 15.- *Axinella donnani* : (a) styles; (b) oxeas. 16.- *Axinella minor* n. sp. : styles. 17.- *Timea curvistellifera* : (a) tylostyles; (b) asters. 18.- *Cliona carpenteri* : (a) tylostyle; (b) acanthoxeas; (c) bacilliform spicules. 19.- *Cliona viridis* : (a) tylostyle; (b) spirasters. 20.- *Prostylyssa foetida* : (a) oxea; (b) style. 21.- *Cliona margaritifera* : (a) tylostyle; (b) acanthoxeas; (c) spirasters. 22.- *Cliona* sp. : (a) tylostyle; (a') head of tylostyle and its modifications; (b) spirasters. 23.- *Thoosa radiata* : (a) boring pattern; (b) excurrent disc; (c) incurrent disc; (d) oxyasters; (e) amphiasters, slender; (e') tip of a ray of slender amphiaster enlarged; (f) amphiasters, robust; (f') tip of a ray of robust amphaster enlarged. 24.- *Tethytimea repens* : (a) tylostyles; (b) spherasters; (c) chiasters. 25.- *Azorica pfeifferae* : (a) desmas; (b) oxea. 26.- *Discodermia sceptrellifera* : (a) discotriaenes; (b) tetracrepid desmas.

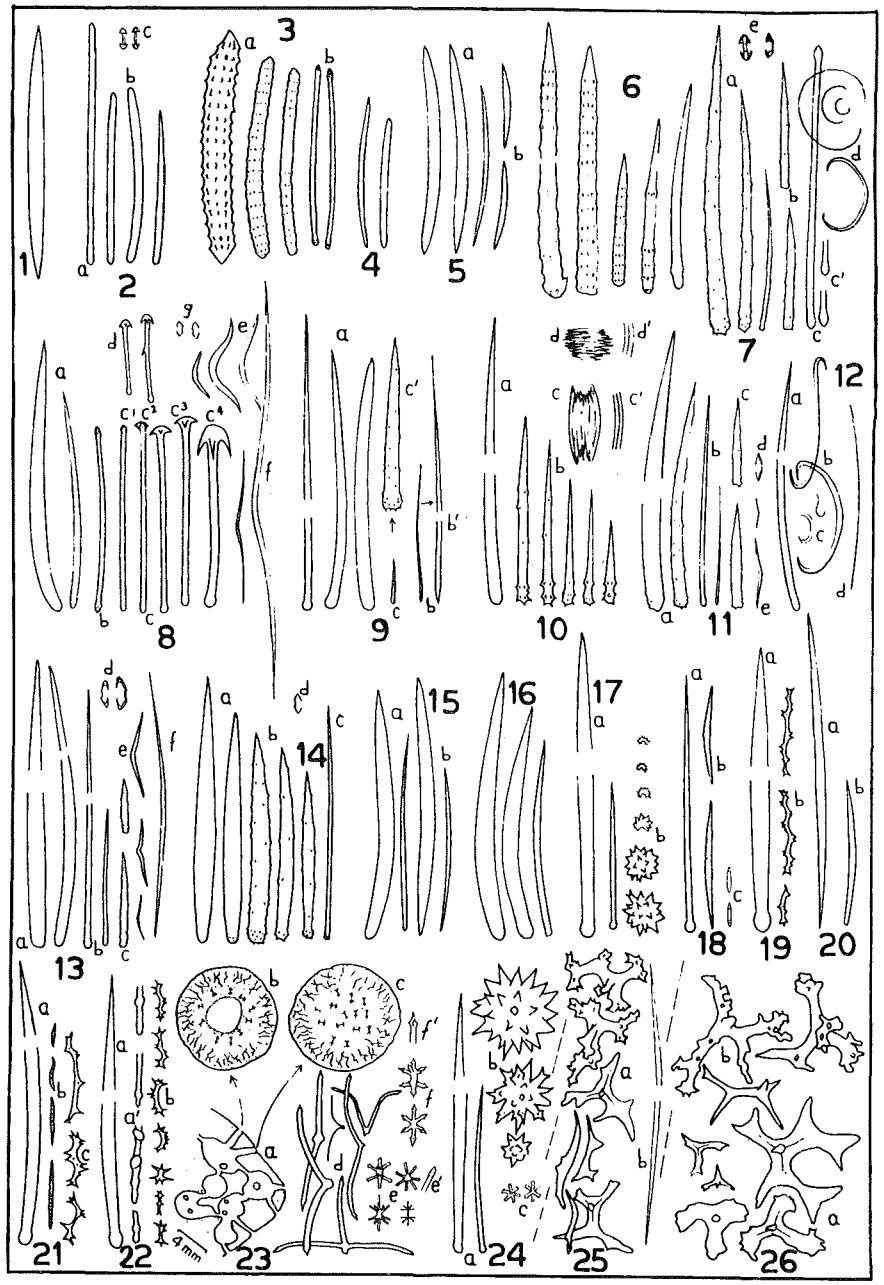


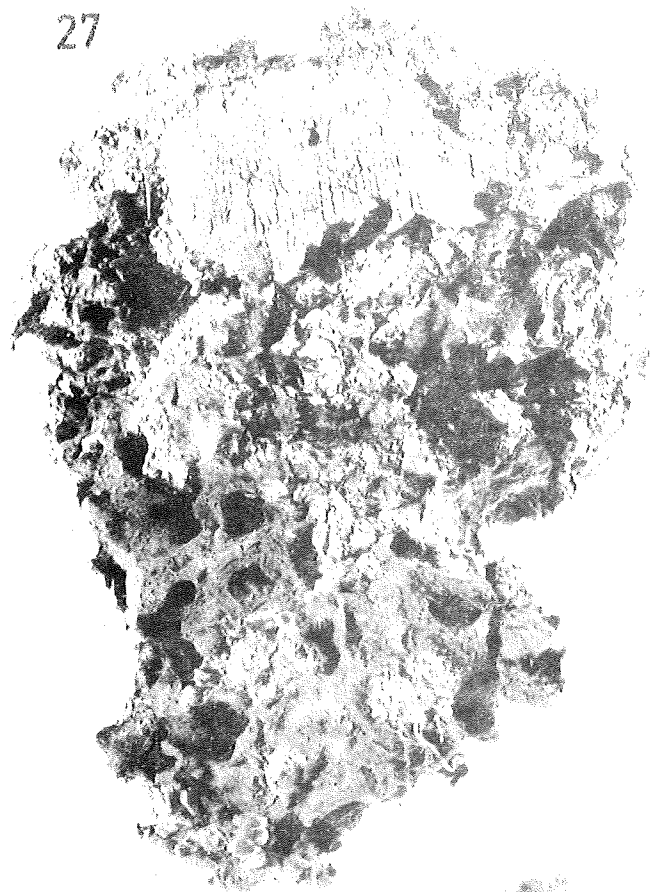
PLATE III

27.- *Hippospongia* sp.

28.- *Iotrochota hiatti* (de Laubenfels).

29.- *Callyspongia fibrosa* (Ridley and Dendy).

30.- *Oceanapia fistulosa* (Bowerbank).



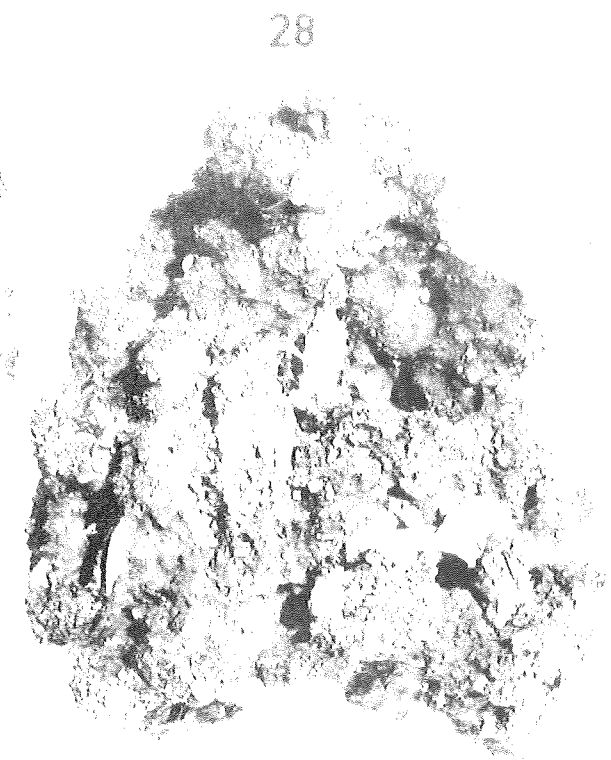


PLATE IV

31.- *Microciona prolifera* (Ellis and Solander).

32.- *Isociona tuberosa* (Hentschel).

33.- *Axinella donnani* (Bowerbank).