OCTOCORALLIA FROM NORTH-WESTERN MADAGASCAR (PART II)

by

J. VERSEVELDT
Zwolle, The Netherlands

With 15 plates and 40 text-figures

INTRODUCTION

In the preface of the first part of the series "Octocorallia from north-western Madagascar" (Verseveldt, 1969) I mentioned that Dr. Arthur G. Humes, Boston University, Massachusetts, U.S.A., made a rich collection of octocorals from the waters north-west of Madagascar, and that he kindly entrusted this material to me for study and report.

This second part deals with a large number of these octocorals, belonging to the orders Telestacea, Alcyonacea and Gorgonacea (suborder Scleraxonia).

The majority of the specimens reported upon are now in the Rijksmuseum van Natuurlijke Historie, Leiden; their register numbers are preceded by the abbreviation RMNH. A few specimens collected by Dr. J. H. Stock now form part of the collection of the Zoölogisch Museum, Amsterdam; their register numbers are preceded by the abbreviation ZMA.

I want to express my sincere gratitude to Mr. G. J. Vrijmoeth for making the excellent photographs, and to Mr. W. ter Spill for revising my manuscript. Both friends of mine have so often given evidence of their interest in my work that I am happy to name two new species described in this paper after them.

LIST OF THE SPECIES

Order Telestacea Hickson, 1930b

Family Telestidae Milne Edwards & Haime, 1857. — 1. *Telesto arborea* Wright & Studer, 1889; 2. *Coelogorgia palmosa* Milne Edwards & Haime, 1857.

Order Alcyonacea Lamouroux, 1816

Family Alcyoniidae Lamouroux, 1812. — 3. *Alcyonium flaccidum* Tixier-Durivault, 1966; 4. *Alcyonium flaccidum aberrans* nov. subspec.; 5. *Alcyonium utinomii* nov. spec.; 6. *Cladiella sphaerophora* (Ehrenberg, 1834); 7. *Cladiella pachyclados* (Klunzinger, 1877); 8. *Cladiella krempfi* (Hickson, 1919); 9. *Cladiella laciniosa* (Tixier-Durivault, 1944); 10. *Cladiella latissima* (Tixier-Durivault, 1944); 11. *Lobophytum pauciflorum* (Ehrenberg, 1834); 12. *Lobophytum crassum* Von Marenzeller, 1886; 13. *Lobophytum cristagalli* Von Marenzeller, 1886; 14. *Lobophytum depressum* Tixier-Durivault, 1966; 15. *Lobophytum latilobatum* nov. spec.; 16. *Sarcophyton glaucum* (Quoy & Gaimard, 1833); 17. *Sarcophyton acutangulum* (Von Marenzeller, 1886); 18. *Sarcophyton ehrenbergi* Von Marenzeller, 1886; 19. *Sarcophyton trocheliophorum* Von Marenzeller, 1886; 20. *Sarco-*

phyton cornispiculatum nov. spec.; 21. *Sarcophyton stolidotum* nov. spec.; 22. *Sinularia polydactyla* (Ehrenberg, 1834); 23. *Sinularia leptoclados* (Ehrenberg, 1834); 24. *Sinularia fungoides* Thomson & Henderson, 1906a; 25. *Sinularia triaena* Kolonko, 1926; 26. *Sinularia humesi* Verseveldt, 1968; 27. *Sinularia vrijmoethi* nov. spec.; 28. *Sinularia terspilli* nov. spec.; 29. *Sinularia arborea* nov. spec.; 30. *Sinularia heterospiculata* Verseveldt, 1970; 31. *Sinularia minima* nov. spec.; 32. *Sinularia maxima* nov. spec.

Family Nidaliidae Gray, 1869 (emend. Utinomi, 1958). — 33. *Siphonogorgia pichoni* nov. spec.

Family Xeniidae Ehrenberg, 1828. — 34. *Anthelia glauca* Lamarck, 1816; 35. *Anthelia ternatana* (Schenk, 1896); 36. *Anthelia gracilis* (May, 1898); 37. *Cespitularia erecta* Macfadyen, 1936; 38. *Cespitularia turgida* nov. spec.; 39. *Heteroxenia fuscescens* (Ehrenberg, 1834); 40. *Heteroxenia elisabethae* Kölliker, 1874; 41. *Xenia umbellata* Lamarck, 1816; 42. *Xenia viridis* Schenk, 1896; 43. *Xenia macrospiculata* Gohar, 1940; 44. *Xenia lepida* nov. spec.

Family Viguieriotidae Bayer, 1954. — 45. *Studeriotes semperi* (Studer, 1888).

Order Gorgonacea Lamouroux, 1816 (emend. Verrill, 1866)

Suborder Scleraxonia Studer, 1887

Family Anthothelidae Broch, 1916. — 46. *Solenocaulon tortuosum* Gray, 1862; 47. *Solenocaulon ramosum* Hickson, 1903.

Taxonomic report

Telestidae Milne Edwards & Haime, 1857

Telesto Lamouroux, 1812

Telesto arborea Wright & Studer, 1889

Telesto arborea Wright & Studer, 1889: 262-264, pl. 39 figs. 1, 1a; Thomson & Henderson, 1906a: 434-435; Laackmann, 1909: 88-90, fig. G, pl. 4 fig. 6; Thomson & Simpson, 1909: 276-277; Thomson & Mackinnon, 1911: 692, pl. 67 fig. 2; Thomson & Dean, 1931: 212-213, pl. 11 figs. 4, 6; Utinomi, 1961: 199-200, fig. 1.

Material. — North-east coast of Antany Mora, Radama Islands, 14°6'10"S., 47°45'10"E., depth 4 m; 30 September 1964. A. G. Humes no. 957, RMNH Coel. no. 6602. A number of colonies and fragments.

Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 18 m; 11 July 1967. A. G. Humes no. 1157, RMNH Coel. no. 6709. Two large colonies and some fragments. Basal parts fused and covered with Porifera. Field-note: "Yellowish twiglike stems with short erect yellowish white branches".

Remark. — For a description of this species I refer to previous authors.

Geographical distribution. — The species has been recorded from Zanzibar, Karachee, Sydney, and some localities in the Malay Archipelago.

Coelogorgia Milne Edwards & Haime, 1857

Coelogorgia palmosa Milne Edwards & Haime, 1857

Coelogorgia palmosa Milne Edwards & Haime, 1857: 191; Wright & Studer, 1889: 266-269, pl. 43 figs. 1-8; Thomson & Henderson, 1906a: 435-436; Thomson & Dean, 1931: 215-216; Tixier-Durivault, 1966: 24-25, figs. 7-9.

Material. — Ambariobe, near Nosy Bé, depth 1 m; 7 August 1963. A. G. Humes no. 674, RMNH Coel. no. 4962. Two small colonies and some fragments. Field-note: "Odour of garlic".

The same locality and depth; 17 December 1963. J. H. Stock no. 777, RMNH Coel. no. 4961. Numerous small fragments.

Pointe Ambarionaomby, Nosy Komba, near Nosy Bé, depth 2 m; 27 September 1964. A. G. Humes no. 946, RMNH Coel. no. 4963. Several large colonies and many small fragments.

Nosy Ovy, Radama Islands, 13°59'S., 47°48'E., depth 8 m; 30 September 1964. A. G. Humes no. 954, RMNH Coel. no. 4964. Some fragments. Field-note: "Colour: grey".

Pointe à la Fièvre, Nosy Bé, depth 2 m; 24 May 1967. A. G. Humes no. 1021, RMNH Coel. no. 6710. Many fragments of a large colony. Field-note: "Reddish brown, stems whitish".

Pointe Lokobe, Nosy Bé, depth 3 m; 3 June 1967. A. G. Humes no. 1039, RMNH Coel. no. 6711. Two large colonies and some fragments. Field-note: "Brownish, pale stem, short rather horny branches".

Ambariobe, near Nosy Bé, depth 1 m; 25 June 1967. A. G. Humes no. 1119, RMNH Coel. no. 6712. Several fragments of a large colony. Field-note: "Tough slender main stem, branches short, with brownish to pale lavender terminal branches".

Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 18 m; 11 July 1967. A. G. Humes no. 1150, RMNH Coel. no. 6713. Many fragments of a large, slender colony. Field-note: "Bluish grey".

Nosy Iranja, south-west of Nosy Bé, depth 15 m; 9 August 1967. A. G. Humes no. 1240, RMNH Coel. no. 4965. Some large fragments. Field-note: "Light brown".

Remark. — A description of this well-known species is superfluous.

Geographical distribution. — The species has been recorded from Zanzibar, Madagascar, Nosy Bé, Ildabra Islands, and a few places in Indonesian waters.

Alcyoniidae Lamouroux, 1812

Alcyonium Linné, 1758

Alcyonium flaccidum Tixier-Durivault, 1966 (fig. 1, pl. 1 fig. 1)

Alcyonium flaccidum Tixier-Durivault, 1966: 29-31, figs. 10-11.

Material. — West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1210, RMNH Coel. no. 6603. Two colonies. Field-note: "Short cream tan stalks, short stubby branches covered with pale brown polyps". A. G. Humes no. 1212, RMNH Coel. no. 6604. Four colonies. Field-note: "Whitish stalks, tipped with moderately slender and rather blunt finger-like branches speckled with brown polyps".

Banc de Cinq Mètres, near Nosy Bé, depth 20 m; 6 August 1967. A. G. Humes no. 1231, RMNH Coel. no. 6605. Three colonies. Field-note: "Short stalks, rather stout, covered with short blunt branches, greyish brown".

North of Ankazoberavina, near Nosy Bé, 13°27.6'S., 47°58.2'E., depth 25 m; 24 August 1967. A. G. Humes no. A7, RMNH Coel. no. 6606. Two colonies.

Remarks. — All these specimens agree very well with Tixier-Durivault's (1966) description of this species. Usually the pinnules on the tentacles are shorter and rounder than those pictured by Tixier-Durivault (1966, fig. 10B), their number is six to seven in a row.

In the coenenchymal spicules I found some variability. In some specimens (RMNH Coel. nos 6604, 6605 and 6606) the spicules are blunt-ended, warty ovals or thick rods (fig. 1 a, b), and narrower, fusiform, spiny spicules

(fig. 1 c, d). In the specimens numbered RMNH Coel. no. 6603 the blunt-ended forms are far in the minority, the spicules are less warty and more spiny.

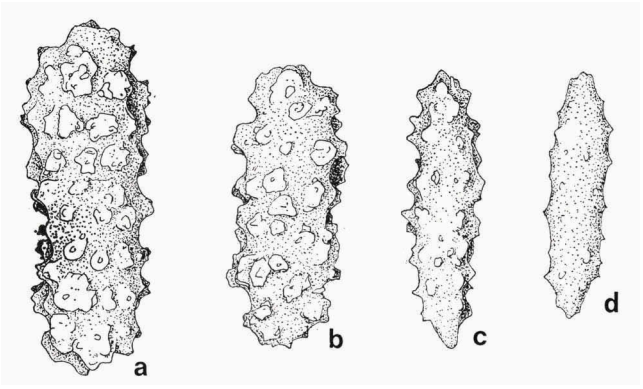

Fig. 1. *Alcyonium flaccidum* Tixier-Durivault. a-d, spicules from coenenchyme. × 170.

Geographical distribution. — The species has been reported by Tixier-Durivault from Tanikely (four miles from Nosy Bé), Madagascar.

Alcyonium flaccidum aberrans nov. subspec. (fig. 2; pl. 3 fig. 1)

Material. — Near black buoy in pass north of Pointe Ambarionaomby, Nosy Komba, depth 17 m; 5 August 1967. A. G. Humes no. 1218, RMNH Coel. no. 6607. One colony, holotype. Field-note: "Slimy, tips of branches blunt and dotted with grey polyps".

Description. — Externally the specimen very much resembles those described as *A. flaccidum*. The lobes are large, conical, somewhat pointed, but they are slightly more closely packed, and the colony is rigid. The zooids are of the same shape and dimensions.

The principal difference is in the shape and the dimensions of the spicules. In the coenenchyme of the stem we find large, blunt-ended, more or less cylindrical spicules, covered with conical spines or small warts. Most of these measure 0.25 to 0.36 mm in length, a few are up to 0.42 mm long (fig. 2 a). But there are also markedly larger and wider spicules, more or less irregularly shaped, and up to 0.50 mm long (fig. 2 b). Finally we find smaller spindles with less and lower spines (fig. 2 c).

In the interior of the lobes a large number of narrow, slender spindles occurs (fig. 2 d).

The aberrant types of spicules induce me to establish a new subspecies for the present specimen.

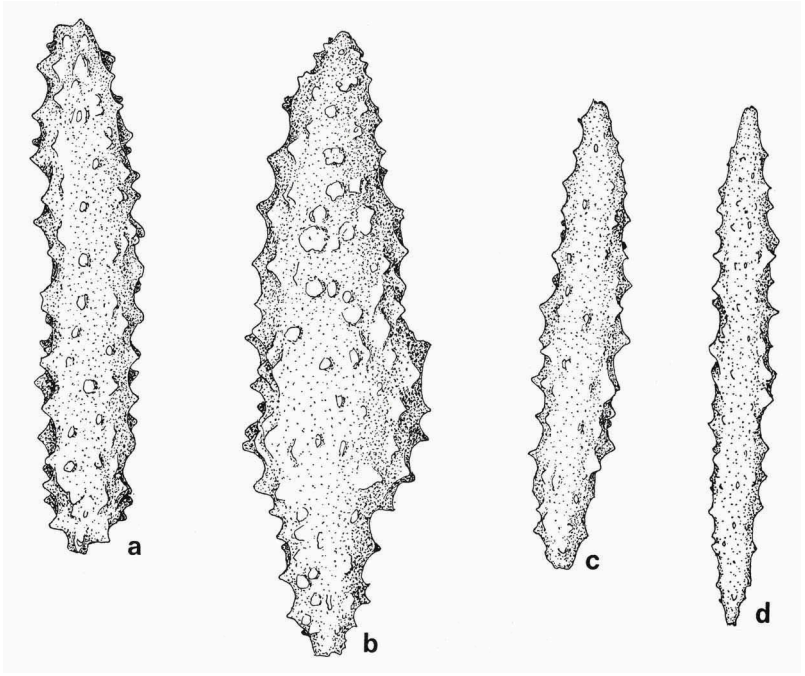

Fig. 2. *Alcyonium flaccidum aberrans* nov. subspec. a-c, spicules from coenenchyme of the stem; d, spicule from coenenchyme of a lobe. × 170.

Alcyonium utinomii nov. spec. (fig. 3; pl. 2 figs. 1, 2)

Material. — West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1202, RMNH Coel. no. 6608. One colony, holotype. Field-note: "Short blunt whitish hyaline branches, speckled with small brownish polyps".

Banc de Cinq Mètres, near Nosy Bé, depth 40 m; 3 September 1967. A. G. Humes no. A 35, RMNH Coel. no. 6609. One colony, paratype.

Description. — The holotype (pl. 2) measures 40 mm in height, the maximum width is 85 mm. The sterile stalk is 25 mm high and 25 to 30 mm wide at the base. Upwards it widens, and passes into the polyparium. The latter consists of a number of primary lobes, which give off secondary lobes. These are rounded or slightly conical in shape, about 7 to 12 mm wide and up to 15 mm high. The polyparium as a whole has grown obliquely: on one side of the colony the sterile stalk is clearly visible, on the reverse side the stalk is hidden from view by the overhanging lobes. The sterile stalk is soft to the touch, the lobes are weak.

The zooids are monomorphic; they are not densely crowded. The centres are 1.60 to 2.50 mm apart. They are retracted, and form low hills, about 1.60 mm in diameter at the base. In the centre the tentacles may protrude.

In the anthocodial wall there are eight double rows of chevroned or more or less transversely placed spicules, ten to fifteen in a row. These spicules are smooth, mostly blunt-ended rods, up to 0.40 mm long. In the tentacles there are numerous tiny rods.

In the cortex of the sterile stalk we find pointed spindles, up to 0.80 mm long and 0.10 mm wide. They bear only a few, very low cones; consequently they look nearly smooth.

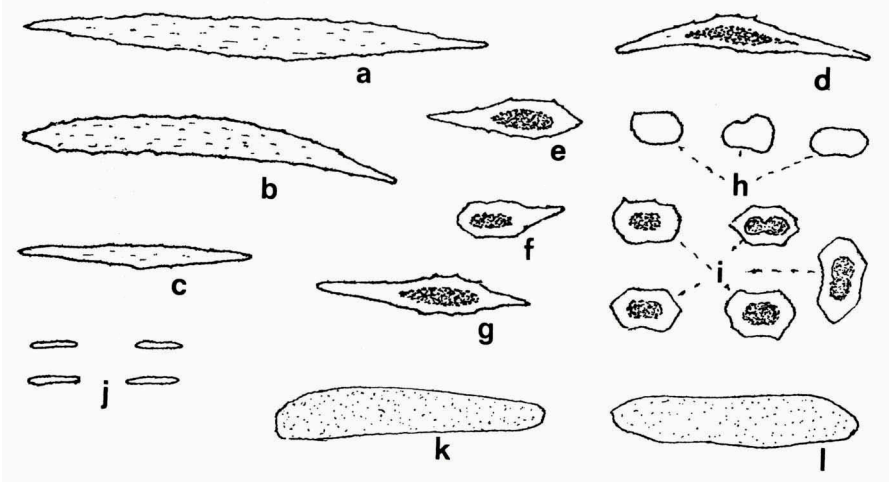

Fig. 3. *Alcyonium utinomii* nov. spec. a-i, spicules from interior of the stalk; j-l, spicules from cortex of a lobe. a-j, × 60; k, l, × 340.

The interior of the stalk contains the same spindles, up to 1.00 mm long (fig. 3 a-c). Besides these there are oval-shaped and more or less hexagonal spicules, 0.10 to 0.18 mm long (fig. 3 h, i), and intermediate forms between the spindles and these hexagonal spicules (fig. 3 d-g).

In the cortex of the lobes small, finger-biscuit-like rods predominate, 0.08 to 0.12 mm long (fig. 3 j-l). A few fusiform spicules are also met with. Besides the nearly smooth spindles the interior of the lobes has small rods of about the same length as those just mentioned.

Colour. — The whole colony is creamy white.

Variability. — In the smaller paratype the hexagonal spicules are absent. The coenenchymal spindles are longer, up to 1.40 mm. For the rest there is a close agreement with the holotype.

Remark. — The species is characterized, among other things, by the nearly smooth, fusiform spicules. It is named after Dr. Huzio Utinomi, Seto Marine Biological Laboratory, Sirahama, Japan, as a token of appreciation for his extensive and excellent studies on octocorals.

Cladiella Gray, 1869

Cladiella sphaerophora (Ehrenberg, 1834) (pl. 4 fig. 1)

Lobularia sphaerophora Ehrenberg, 1834: 57; Thomson & Dean, 1931: 41; Tixier-Durivault, 1948: 29-35, figs. 15-19.

Alcyonium sphaerophorum, Dana, 1846: 616; Milne Edwards & Haime, 1857: 119; Klunzinger, 1877: 22-23, pl. 1 fig. 1; May, 1899: 105-106; Cohn, 1908: 231-233; Stiasny, 1937a: 392.

Cladiella sphaerophora, Gray, 1869: 125; Tixier-Durivault, 1966: 36, fig. 16.

Microspicularia sphaerophora, Utinomi, 1956: 226-227, fig. 2 l-u.

Material. — Nosy N'Tangam, near Nosy Bé, depth 1 m; 21 July 1967. A. G. Humes no. 1181, RMNH Coel. no. 6610. Four colonies. Field-note: "Flat sheets, with knob-like tentacles (?), brown with polyps extended, but whitish grey when contracted".

Remark. — For a description I refer to Klunzinger (1877), Utinomi (1956) and Tixier-Durivault (1966).

Geographical distribution. — The species has been recorded from the Red Sea, the Malay Archipelago, Madagascar, Seychelles, Tahiti, and the Bonin Islands.

Cladiella pachyclados (Klunzinger, 1877) (fig. 4; pl. 15 fig. 1)

Alcyonium pachyclados Klunzinger, 1877: 24-25, pl. 1 fig. 5; May, 1899: 106; Hickson & Hiles, 1900: 503-504; Pratt, 1903: 534-535; 1905: 258; Thomson & Henderson, 1906a: 416; Cohn, 1908: 235-236; Kükenthal, 1910: 34-35; Lüttschwager, 1915: 20-22; 1922: 522; Hickson, 1930a: 219-220; Roxas, 1933: 357-358; Stiasny, 1937a: 392.

Lobularia pachyclados, Thomson & Dean, 1931: 40-41; Tixier-Durivault, 1944: 340-341; 1948: 219-225, figs. 215-220.

Microspicularia pachyclados, Macfadyen, 1936: 29-30, pl. 3 fig. 2.

Cladiella pachyclados, Tixier-Durivault, 1966: 50, fig. 30.

Non *Alcyonium pachyclados*, Hickson, 1900: 72-73; J. St. Thomson, 1910: 570-573, pl. 2 fig. 14, pl. 4 figs. 33, 34.

Material. — Ambariotelo, near Nosy Bé, depth 1 m; 15 May 1964. A. G. Humes no. 869, RMNH Coel. no. 6611. Nine colonies. Field-note: "Stalks white, distal knobs brown (but white when disturbed)".

Description. — A short description only of this well-known species is given here.

The maximum diameter of the colonies varies from 40 to 70 mm, the total height from 30 to 50 mm; the length of the sterile stalk is 10 to 25 mm. The lobes are rounded or conical in shape, 5 to 10 mm wide, and rather densely placed.

The zooids show all phases of retraction. In the majority the expanded tentacles are surrounded by a calyx, like a ring-wall. The height of this calyx is 0.30 mm, the inside diameter is 0.80 mm, the outside diameter is 1.40 mm. The polyps are often so closely set that the calyces touch each other. The

centres of the zooids are 1.40 to 2.00 mm apart. In other polyps the anthostele has completely been retracted; in the round openings only the tentacles can be seen. But other zooids again are more expanded, the anthosteles are stretched, reaching a height of 0.80 mm.

The tentacles are up to 1.00 mm long. On each side they bear two rows of finger-shaped pinnules, the outer row has seven pinnules.

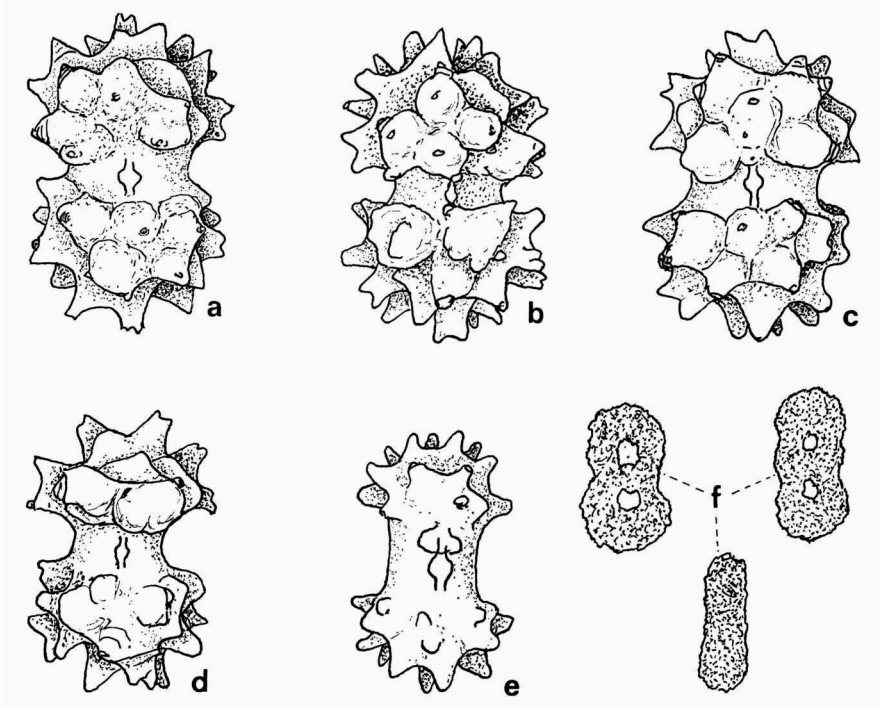

Fig. 4. *Cladiella pachyclados* (Klunzinger). a-e, spicules from interior of the sterile stalk; f, spicules from the tentacles. × 340.

The spicules in the cortex and in the interior are large dumb-bells, up to 0.12 mm long (fig. 4 a-e). In the tentacles there are finger-biscuit-like forms, 0.050 to 0.073 mm long, often with two transparent centres (fig. 4 f).

Geographical distribution. — The species has been recorded from numerous localities in the Red Sea, the Pacific Ocean and the Indian Ocean.

Cladiella krempfi (Hickson, 1919) (fig. 5; pl. 5 fig. 1)

Alcyonium krempfi Hickson, 1919: 411-424, figs. 1, 2; Tixier-Durivault, 1941: 104-111, pl. 1-4.

Lobularia krempfi, Tixier-Durivault, 1944: 187-188; 1948: 96-102, figs. 88-93.

Microspicularia krempfi, Utinomi, 1956: 225-226, fig. 2a-k.
Cladiella krempfi, Tixier-Durivault, 1966: 38-40, figs. 20, 21.

Material. — West of Pointe de Tafondro, Nosy Bé, depth 1 m; 5 December 1963. A. G. Humes no. 773, RMNH Coel. no. 6612. Seven colonies. Field-note: "Colour brown (white when disturbed)".

Description. — This species has been excellently described by Hickson (1919) and Tixier-Durivault (1948). The colonies are more or less hemispherical in shape, the flat base is oval. The largest of the colonies has a maximum diameter of 95 mm and a height of 50 mm; the smallest colony measures 48 mm in diameter and 25 mm in height.

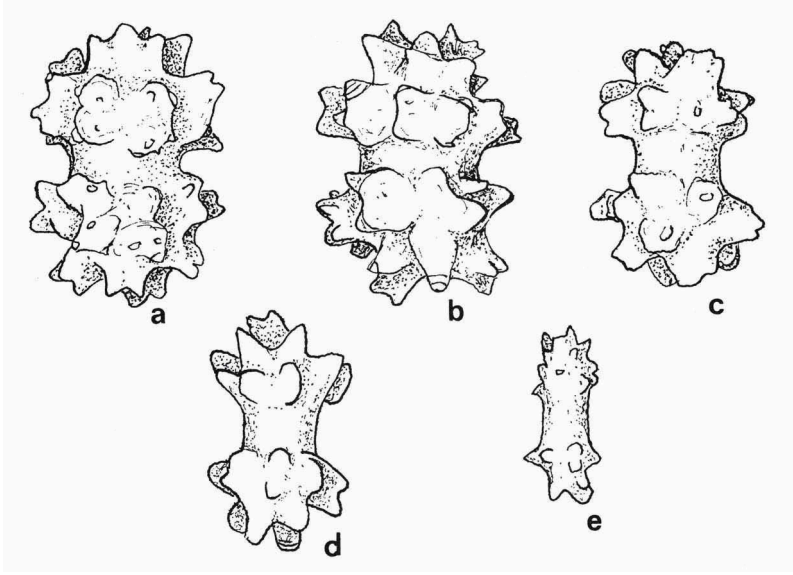

Fig. 5. *Cladiella krempfi* (Hickson). a-e, spicules from cortex of the sterile stalk. × 340.

The spicules in the cortical layer of the sterile basal part (fig. 5) perfectly resemble those in the cortex of the lobes and in the interior of the colony.

Among other things the species seems to be characterized by the small pits, into which the zooids are retracted (cf. Hickson, 1919, fig. 1; Tixier-Durivault, 1948, fig. 88 c).

Hickson (1930a: 220) supposed that this *Alcyonium* (*Cladiella*) *krempfi* had to be regarded as identical with *C. pachyclados*, basing this conclusion on Miss Smith's re-examination of the type-specimens from Annam and of material of *Alcyonium* (*Cladiella*) *pachyclados* from various parts of the world. In an unpublished thesis, Hickson writes, she has demonstrated the close resemblance between all these specimens.

I am of the opinion, however, that *C. krempfi* is a good species. It differs from *C. pachyclados* in two clear respects. First, in *C. pachyclados* the spicules are up to 0.12 mm long, in *C. krempfi* they are up to 0.10 mm long. And, secondly, in *C. pachyclados* the retracted zooids are surrounded by a distinctly protruding calyx, whereas in *C. krempfi* a calyx is absent, the surface between the zooids being quite flat.

Colour. — In alcohol the colour is white.

Geographical distribution. — The species has been recorded from Annam (Viet-nam), Seychelles, Koror (Palau Islands), Madagascar, and Mauritius.

Cladiella laciniosa (Tixier-Durivault, 1944) (fig. 6; pl. 5 fig. 2)

Lobularia laciniosa Tixier-Durivault, 1944: 188; 1948: 79-83, figs. 71-75.
Cladiella laciniosa, Tixier-Durivault, 1966: 38, figs. 18, 19.

Material. — West of Pointe de Tafondro, Nosy Bé, depth 2 m; 30 May 1967. A. G. Humes no. 1037, RMNH Coel. no. 6613. Two colonies. Field-note: "Greyish white, short stalk, capitulum with knobs covered with fine black dots".

Description. — The largest of both rigid colonies (pl. 5 fig. 2) is about oval-shaped, viewed from above. The diameters are 110 and 70 mm, the height of the colony is 37 mm. The sterile stalk is very low, at the edge only 3 to 5 mm high, the underside is flat. The capitulum, which on all sides protrudes beyond the stalk, consists of numerous, densely packed lobes, which strongly ramify into smaller secondary lobes, 3 to 7 mm wide. The height of the lobes is up to 28 mm, they are flattened laterally. On the outside of the capitulum larger, more rounded lobes occur, 10 to 12 mm wide.

Some of the polyps are entirely retracted, in others the tentacles protrude more or less above the surface of the lobes. In this case the tentacles are up to 0.30 mm long; on each side they bear six to seven small, finger-shaped pinnules. The diameter of the most expanded zooids is 0.80 mm, the centres of the zooids are 0.90 to 1.20 mm apart.

In the cortex of the sterile stalk and in the coenenchyme of the stalk and of the lobes we find about the same types of spicules (fig. 6 a-d). They are double-spheres (dumb-bells), 0.09 to 0.11 mm long. The cortex of the lobes has, in addition to these double-spheres (fig. 6 e), numerous dumb-bells with a long waist portion (fig. 6 f-h, l). Moreover, we find many very small finger-biscuit-like forms and flat double-spheres with finely crenated margins (fig. 6 i-k). In the tentacles are tiny, granulated, finger-biscuit-like spicules, 0.035 to 0.045 mm long (fig. 6 m).

Colour. — The colonies are greyish white. There is nothing left of the "fine black dots" mentioned in the field-note.

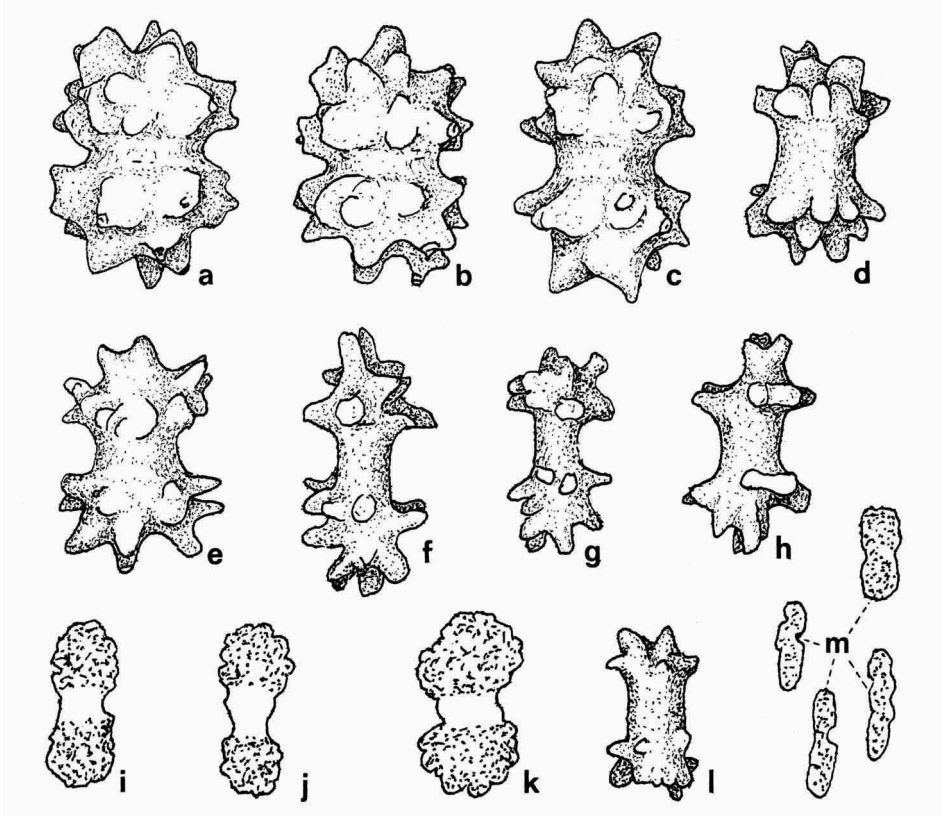

Fig. 6. *Cladiella laciniosa* (Tixier-Durivault). a-d, spicules from coenenchyme of the stalk; e-l, spicules from cortex of a lobe; m, spicules from the tentacles. × 340.

Variability. — The remaining colony is a smaller, the largest diameter is 60 mm.

Geographical distribution. — The species has been recorded from the Red Sea, Madagascar, and Mauritius.

Cladiella latissima (Tixier-Durivault, 1944) (fig. 7; pl. 4 fig. 2)

Lobularia latissima Tixier-Durivault, 1944: 189; 1948: 125, figs. 116-121.
Cladiella latissima, Tixier-Durivault, 1966: 40-44, figs. 22, 23.

Material. — Pointe de Tafondro, Nosy Bé, depth 1 m; 12 July 1967. A. G. Humes no. 1148, RMNH Coel. no. 6614. Six colonies. Field-note: "Short stalks, knobbed white and brown branches".

Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 18 m; 11 July 1967. A. G. Humes no. 1155, RMNH Coel. no. 6615. Six colonies. Field-note: "Whitish grey, granular'".

Description. — Each colony has a sterile basal part, the stalk, 5 to 25 mm high. This stalk gives rise to a number of sterile branches or primary lobes, 7 to 13 mm wide and mostly 5 to 10 mm high; they are transversely striated. These primary lobes bear a number of round or oval secondary lobes, 2 to 4 mm wide. These lobes are very densely placed. They are soft and

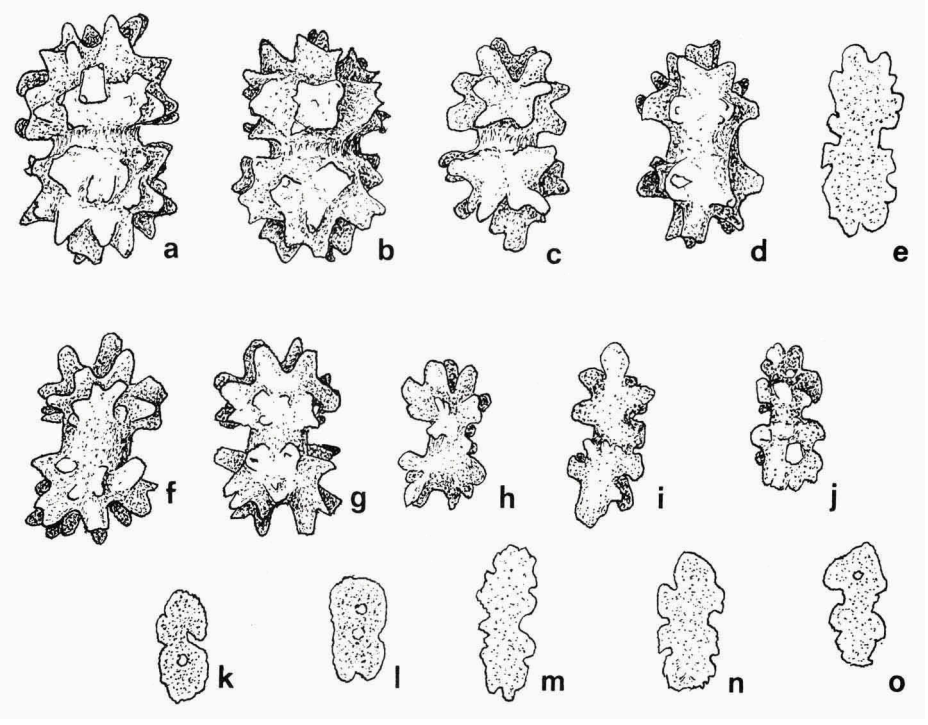

Fig. 7. *Cladiella latissima* (Tixier-Durivault). a-e, spicules from coenenchyme of the stalk; f-j, spicules from coenenchyme of a lobe; k-o, spicules from the zooids. × 340.

flexible, the stalk is not granular to the touch. Most colonies have oval-shaped polyparia. The largest colony measures 105 × 45 mm, the total height of the colonies varies from 40 to 50 mm.

On the lobes the zooids are crowded. They are usually not retracted, the uppermost part of the anthocodia with the tentacles protrudes above the surface. The total height of these extended parts and their width is 1 mm. The tentacles are about 0.80 mm long; they are 0.20 to 0.25 mm wide at the base and taper distally. On each side they bear five, sometimes six pinnules, 0.20 mm long.

The spicules in the sterile stalk are dumb-bells, up to 0.11 mm long; they

are of the usual type, with a short, wide waist. Some smaller spicules have longer waists, a few are granular, lobate plates (fig. 7 a-e). In the cortical layer the dumb-bells are slightly smaller, up to 0.10 mm long. In the lobes the spicules are still smaller, up to 0.08 mm long (fig. 7 f-j). In the anthocodiae and in the tentacles we find flat, granular plates, 0.04 to 0.06 mm long (fig. 7 k-o). In the tentacles the spicules are only present along the medio-dorsal side, the pinnules are devoid of spicules.

Colour. — The stalk is greenish grey, the cortex of the lobes is nearly white, but owing to the extended tentacles of the zooids the lobes give a slightly greenish impression.

Geographical distribution. — The species has been recorded from Nha Trang (Viet-nam) and Madagascar.

Lobophytum Von Marenzeller, 1886
Lobophytum pauciflorum (Ehrenberg, 1834)

Lobularia pauciflora Ehrenberg, 1834: 58.
Alcyonium pauciflorum, Dana, 1846: 616.
Amocella pauciflora, Gray, 1869: 124.
Sarcophytum pauciflorum, Klunzinger, 1877: 29, pl. 2 fig. 2.
Alcyonium submurale Ridley, 1883: 251-252.
Lobophytum pauciflorum, Von Marenzeller, 1886: 350, 366-367; Studer, 1894: 122; Hickson & Hiles, 1900: 505; Pratt, 1903: 515-516, pl. 28 fig. 7, pl. 29 figs. 12-14; 1905: 253; Thomson & Henderson, 1906a: 421; Thomson & Mackinnon, 1910: 175; Kükenthal, 1913: 11; Lüttschwager, 1915: 32-34, fig. 4; Moser, 1919: 277-281, fig. 19; Thomson & Dean, 1931: 69; Roxas, 1933: 367-368; Macfadyen, 1936: 47-48, pl. 3 fig. 1; Tixier-Durivault, 1956: 545-546; 1958: 127-130, figs. 138, 141, 142; Utinomi, 1953: 156, fig. 4a-c, pl. 8 fig. 6; Verseveldt, 1960: 218-220.
Lobophytum pauciflorum var. *validum* Von Marenzeller, 1886: 367-368, pl. 9 fig. 12; Whitelegge, 1897: 216; Lüttschwager, 1915: 34; Moser, 1919: 281, fig. 20; Macfadyen, 1936: 48.
Lobophytum madreporoides Ridley, 1887: 225, pl. 17 figs. 7-11.
Lobophytum candelabrum Roule, 1908: 177-179, figs. 6-9; Thomson & Dean, 1931: 65.

Material. — Pass between Nosy Komba and Nosy Bé, depth 17 m; 10 August 1967. A. G. Humes no. 1246, RMNH Coel. no. 6616. Seven colonies. Field-note: "Small colonies on sand, blunt branches, pitted with small holes, brownish grey".

Description. — The largest of the specimens measures 45 mm in total height. The sterile stalk is 25 mm wide and 30 mm high. The capitulum is 36 mm in maximum diameter. The smallest colony is only 25 mm high, its capitulum is 18 mm wide, and laterally flattened. In spite of the small dimensions of the colonies the identification was not difficult: the dimensions and mutual distances of autozooids and siphonozooids, the shape and dimensions of the spicules are in full agreement with the descriptions of previous authors.

Geographical distribution. — The species is widely distributed in the Red Sea, the Indian Ocean and the Pacific Ocean.

Lobophytum crassum Von Marenzeller, 1886

Lobophytum crassum Von Marenzeller, 1886: 363-364, pl. 9 fig. 8; May, 1899: 119; Hickson & Hiles, 1900: 506; Cohn, 1908: 224-225; Thomson & Simpson, 1909: 4; Thomson & Mackinnon, 1910: 175; Lüttschwager, 1915: 28-29, fig. 1; Moser, 1919: 282-286, fig. 22; Thomson & Dean, 1931: 65; Roxas, 1933: 365; Macfadyen, 1936: 43-45; Tixier-Durivault, 1956: 478-479; 1958: 173-176, figs. 191, 211, 212; Verseveldt, 1960: 215-217; Tixier-Durivault, 1966: 96-98, figs. 88-90.

Alcyonium murale Dana, 1846: 622-623, pl. 58 fig. 3.

Lobophytum crassum var. *prolifera* Von Marenzeller, 1886: 365-366, pl. 9 fig. 11; Lüttschwager, 1915: 31.

Lobophytum crassum var. *sansibaricum* May, 1898: 28-29; May, 1899: 119-120, pl. 5 fig. 9; Lüttschwager, 1915: 29-30.

Lobophytum pauciflorum, Pratt, 1903: 515-516, pl. 28 fig. 7, pl. 29 figs. 12-14; Thomson & Dean, 1931: 69.

Material. — Nosy N'Tangam, Nosy Bé, depth 1 m; 5 September 1963. A. G. Humes no. 692, RMNH Coel. no. 6617. One colony. Field-note: "Colour grey-green".

Nosy Bé, opposite Ambariotri Maramara, depth 1 m; 12 June 1964. A. G. Humes no. 884, RMNH Coel. no. 6618. One colony. Field-note: "Colour light tan".

Ambafaho, Nosy Bé, depth 10 m; 25 September 1964. A. G. Humes no. 937, RMNH Coel. no. 6619. One colony. Field-note: "Colour grey-green".

Ambariobe, Nosy Bé, depth about 2 m; 17 December 1963. J. H. Stock. ZMA Coel. no. 5567. One colony.

Antsamantsara, north of Madirokely, Nosy Bé, depth 4 m; 9 June 1967. A. G. Humes no. 1065, RMNH Coel. no. 6620. Two colonies. Field-note: "Large fleshy firm stalk, capitulum with radiating ridges with fingerlike lobes, brownish grey".

Ankify, on the mainland of Madagascar, opposite Nosy Komba, depth 1 m; 10 July 1967. A. G. Humes no. 1144, RMNH Coel. no. 6621. One colony. Field-note: "Short broad tough stalk, capitulum expanded with erect lobes and processes, brown".

Remark. — A description of this species is superfluous.

Geographical distribution. — The species has been recorded from many localities in the Pacific Ocean and the Indian Ocean.

Lobophytum cristagalli Von Marenzeller, 1886 (fig. 8)

Lobophytum crassum var. *cristagalli* Von Marenzeller, 1886: 365, pl. 9 fig. 10; Lüttschwager, 1915: 30; Moser, 1919: 286-287, fig. 23.

Lobophytum cristagalli, Tixier-Durivault, 1956: 480; 1958: 158-161, figs. 187-189; 1966: 92, figs. 79-81.

Material. — Tany Kely, a small island to the south of Nosy Bé, depth 25 m; 14 August 1967. A. G. Humes no. 1262, RMNH Coel. no. 6622. One colony. Field-note: "Tough whitish stalk, capitulum lavender with narrow broad erect lobes divided into fingerlike branches".

Description. — The colony measures 135 mm in total height. The sterile stalk is high and funnel-shaped, at the base it is 55 mm wide, on the level of the capitulum it is 140 mm wide. It is longitudinally grooved, the ridges are finely striated. The capitulum consists of a number of radially arranged, cock's comb-like lobes, sometimes their edges have grown into finger-like

prominences. The lobes are densely placed, about 6 mm thick and 35 to 50 mm high. The disc, from which the lobes arise, is hollow.

The zooids are clearly visible, but it is not easy to distinguish autozooids from siphonozooids. A good view is obtained by making sections parallel to the surface. It appears that the autozooids are irregularly distributed, their centres being 1.0 to 2.5 mm apart. The coelenterons are 0.70 mm wide, whereas those of the siphonozooids are 0.30 mm wide. There are one to five siphonozooids between two autozooids.

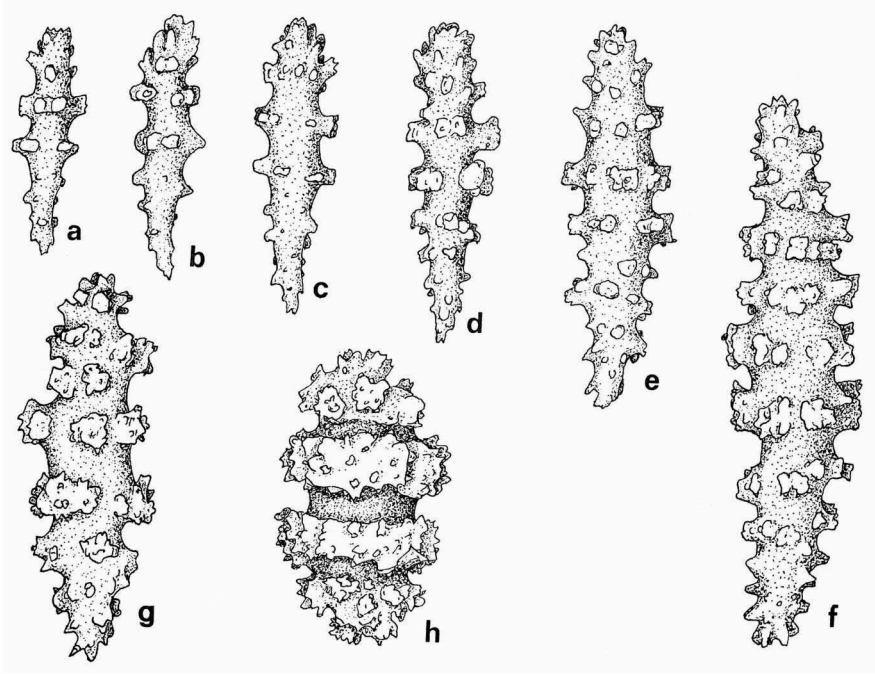

Fig. 8. *Lobophytum cristagalli* Von Marenzeller. a-e, spicules from cortex of a lobe; f, g, spicules from interior of a lobe; h, spicule from interior of the stalk. × 220.

In the cortex of the lobes there are club-shaped spicules, 0.12 to 0.20 mm long, with weakly developed heads (cf. Von Marenzeller, 1886, pl. 9 fig. 10a), and spindles, 0.15 to 0.26 mm long. Both forms bear warts arranged in girdles (fig. 8 a-e). In the cortex of the sterile stalk we find small clubs and rods, 0.12 mm long, with two girdles of warts, and cylinders, 0.16 mm long, with four girdles of warts.

In the coenenchyme of the lobes most of the spicules are spindles, 0.28 to 0.35 mm long and 0.040 to 0.055 mm wide (without the warts). The warts are regularly placed in girdles or they are irregularly distributed (fig. 8 f, g).

The coenenchyme of the stalk has barrels, 0.16 to 0.20 mm long, with two distinct and two indistinct girdles of warts (fig. 8 h). Besides we find here a few, more fusiform spicules, up to 0.35 mm long, and some crosses.

Colour. — In alcohol the colour is greyish brown.

Geographical distribution. — The species has been recorded from Tonga, Zanzibar, Ceylon, New-Guinea (?), and Madagascar.

Lobophytum depressum Tixier-Durivault, 1966 (figs. 9-11; pl. 6)

Lobophytum depressum Tixier-Durivault, 1966: 88-92, figs. 76-78.
Sarcophyton auricularis Verseveldt, 1968: 53-54.

Material. — Ambatoloaka, Nosy Bé, depth 1 m; 5 September 1964. A. G. Humes no. 916, RMNH Coel. no. 3904. Three colonies. Field-note: "Colour brown, but whitish when disturbed".

Banc de Cinq Mètres, near Nosy Bé, depth 25 m; 18 June 1967. A. G. Humes no. 1093, RMNH Coel. no. 6623. One colony. Field-note: "Flat short stalk, capitulum broad, flat, brownish with small tan polyps".

The same locality, depth 40 m; 3 September 1967. A. G. Humes no. A39, RMNH Coel. no. 6624. One colony.

Description. — Seen from above the largest colony from lot RMNH Coel. no. 3904 is oval in outline, with diameters of 205 and 100 mm. It has the form of a dish, the margin of which is bent inward. This margin is not, or only weakly, folded; in one place it is more strongly folded in a *Sarcophyton*-like manner. The central part of the hollow disc is smooth, but it has four lobes, 20 to 25 mm high.

The autozooids are small. In the central part of the disc they are 1 to 3 mm apart, at the periphery they are closer together, 0.5 mm apart. The anthocodiae are completely retracted, or they are expanded, measuring 1 to 3 mm in height. In the anthocodiae spicules are absent. The tentacles are short, 0.30 mm long, blunt-ended, they bear 5-6 pairs of pinnules. The siphonozooids are very small and scarcely discernable with a pocket-lens. In the middle part of the disc there are two or three, sometimes four, siphonozooids between two autozooids, at the margin usually one.

The cortex of the disc contains:

(a) Clubs, 0.10-0.27 mm long, the heads provided with warts, the handles with smaller warts or spines. Warts and spines are often arranged in girdles (fig. 9 a-d).

(b) Small rods, 0.10-0.14 mm long, with two girdles of warts or spines (fig. 9 e, f).

(c) Large spindles or cylinders, 0.24-0.38 mm long, with rough warts (fig. 9 g). Between these three types transitional forms occur.

(d) Some four-rayed crosses.

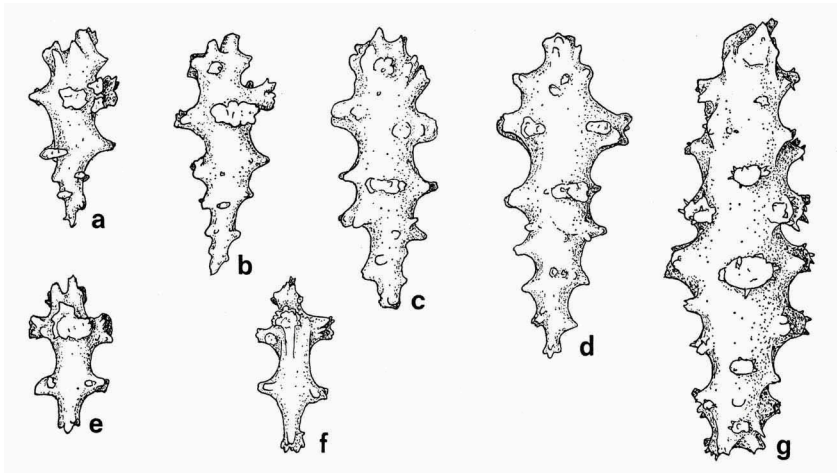

Fig. 9. *Lobophytum depressum* Tixier-Durivault. a-g, spicules from cortex of the disc. × 170.

In the cortex of the sterile part we find:

(a) Clubs with very rough warts; their length is 0.12-0.21 mm (fig. 10 c, d).

(b) Small rods and larger rods or spindles, provided either with laterally flattened cones (fig. 10 a, e) or with warts (fig. 10 b, f). The small spicules are 0.10-0.15 mm long, the larger ones measure 0.20-0.30 mm in length.

In the coenenchyne there are spindles or blunt-ended rollers, sometimes curved, 0.20-0.42 mm long, but mostly 0.33 to 0.36 mm long, and covered with

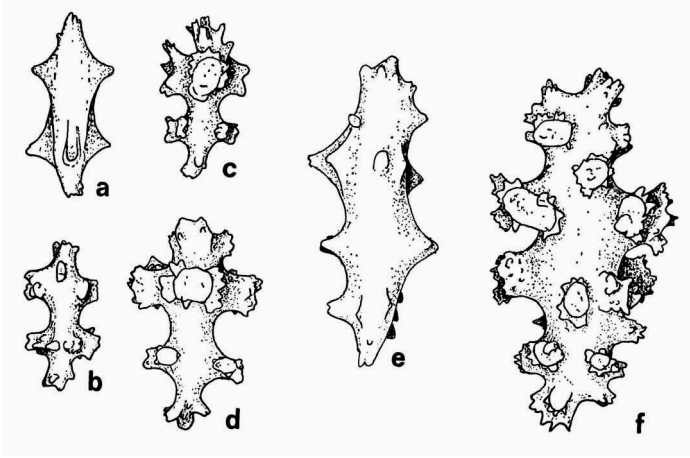

Fig. 10. *Lobophytum depressum* Tixier-Durivault. a-f, spicules from cortex of the sterile stalk. × 170.

warts, in some cases with cones; warts and cones are often arranged in girdles (fig. 11 a-c).

Colour. — In alcohol the colour is light brown, the disc is grey, the autozooids are brown.

Variability. — The other colonies from lot RMNH Coel. no. 3904 and the specimen RMNH Coel. no. 6623 are also dish-shaped. The margins of these colonies are strongly bent inward, and they are not folded. The hollow polyparium is perfectly smooth, there are no lobes. The shape of the colonies reminds of smooth auricles. The coenenchyme is only about 10 mm thick, the margins are thinner. The outside of the colonies is longitudinally grooved.

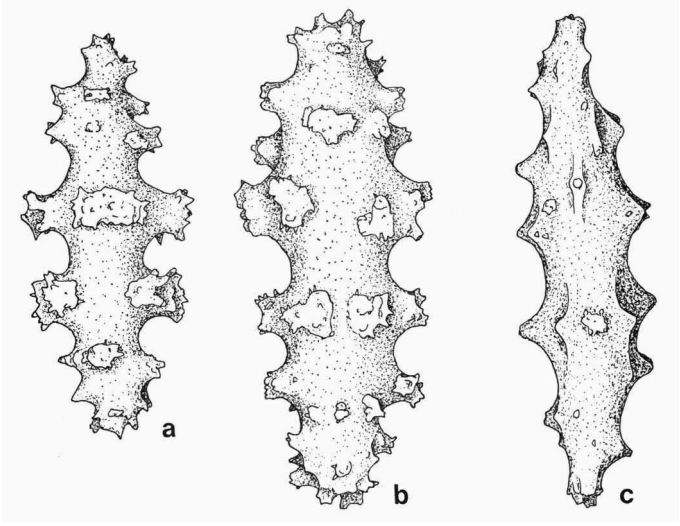

Fig. 11. *Lobophytum depressum* Tixier-Durivault. a-c, spicules from interior of the disc. × 170.

The colonies are oval in shape: the dimensions of the colonies from RMNH Coel. no. 3904 are 135 × 60 mm and 115 × 50 mm. In the specimen RMNH Coel. no. 6623 the margins are so strongly bent together that the disc with the zooids is invisible. In the field-note added to this specimen the collector, Dr. Humes, records that the polyparium is flat. Perhaps the strongly bent margins have been caused by preservation in a too narrow jar. In the specimen RMNH Coel. no. 6624 the disc is smooth except for a very low knob; the margin is weakly folded. The diameters of this colony are 150 mm and 130 mm.

Remarks. — The colonies agree very well with Tixier-Durivault's description (1966: 88-92) of *L. depressum*. In general shape four of the colonies

strongly resemble *L. patulum* Tixier-Durivault, 1956, fig. 120; 1966, fig. 46. In *L. patulum*, however, the coenenchymal spicules are barrel-shaped ("tonnelets"), this form being characteristic of the genus *Lobophytum*. In our material they are more spindle-shaped, which form is typical of the genus *Sarcophyton*. Moreover, in the four colonies mentioned lobes are absent, only the largest colony from lot RMNH Coel. no. 3904 shows a few thick lobes arising from the disc. On these grounds I at first (1968) described the specimens as belonging to a new species of *Sarcophyton*, viz., *S. auricularis* Verseveldt (1968: 53-54). If the emphasis is laid on the arrangement of the spicular warts in girdles, as did Tixier-Durivault, the specimens belong to the genus *Lobophytum*, viz., to *L. depressum*. I have now decided to follow Tixier-Durivault in her taxonomical conception.

Lobophytum latilobatum nov. spec. (figs. 12, 13; pl. 7 fig. 1)

Material. — Nosy N'Tangam, near Nosy Bé, depth 1 m; 21 July 1967. A. G. Humes no. 1182, RMNH Coel. no. 6625. One colony, holotype. Field-note: "Short stalk, large flat disc with erect lobes, light brown".

Description. — The outline of the colony (pl. 7 fig. 1) is more or less circular with a diameter of 180 mm; the height varies from 30 to 80 mm. Round the edge of the capitulum there are folds and stout finger-like lobes, rather densely placed. These lobes are 12 to 20 mm wide at the base, and 15 to 40 mm high. From the hollow central part very stout lobes arise. They are irregularly shaped, sometimes slightly flattened laterally, up to 45 mm high and 20 to 40 mm wide at their base. They are not radially directed, not closely set, and not cock's comb-like.

The autozooids are small and completely retracted, forming small pits with diameters of 0.40 to 0.50 mm. Their centres are 0.70 to 1.00 mm apart. The siphonozooids are invisible. Their presence could only be demonstrated by making sections through the cortical layer parallel to the surface. It appeared that the coelenterons of the autozooids are 0.55 to 0.65 mm in diameter, the walls between them being 0.20 mm thick. In these walls siphonozooids are absent, but in the more or less quadrangular spaces between four coelenterons one siphonozooid can be met with. So the number of siphonozooids is much smaller than that of the autozooids. The diameter of the coelenteron of a siphonozooid is 0.30 to 0.40 mm.

In the cortex of the lobes there are warty clubs, 0.12 mm long (fig. 12 a, b). But also larger, club-shaped and spindle-shaped spicules occur; the clubs are 0.17 to 0.27 mm long (fig. 12 c, d), the spindles up to 0.36 mm (fig. 12 e).

In the cortex of the sterile stalk we find clubs and rods, 0.10 to 0.16 mm

long (fig. 13 a, b) and stouter club-shaped (fig. 13 c) and warty rod- or spindle-shaped spicules, 0.21 to 0.26 mm long.

In the interior of the lobes and of the sterile stalk wide spindles occur. In the lobes most of these are 0.37 mm long, and 0.05 to 0.08 mm wide (without warts); a few are up to 0.42 mm long. They are provided with warts, which are either irregularly placed (fig. 12 f) or form two girdles

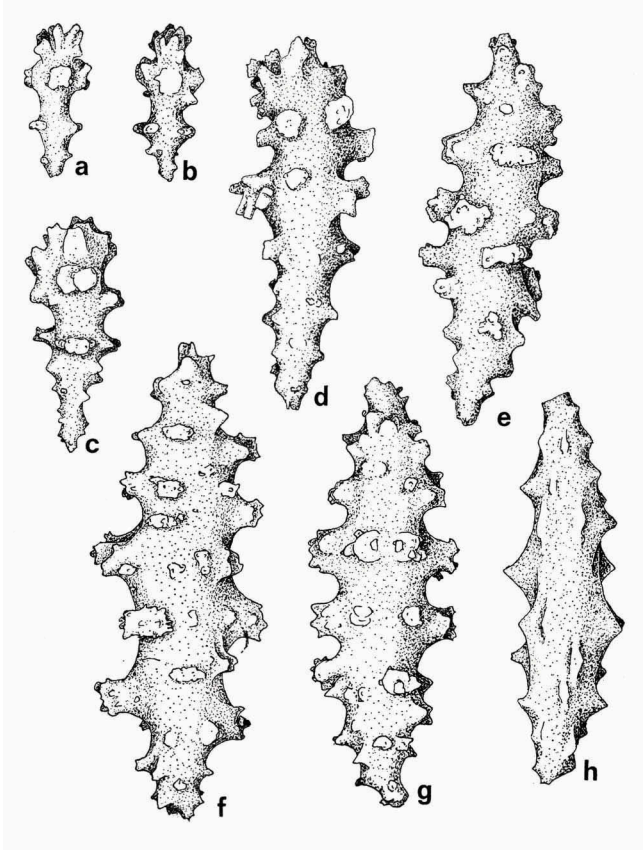

Fig. 12. *Lobophytum latilobatum* nov. spec. a-e, spicules from cortex of a lobe; f-h, spicules from interior of a lobe. × 170.

at the middle of the spicule (fig. 12 g). Smaller spindles often have simple spines (fig. 12 h). In the stalk the spindles are up to 0.36 mm long (fig. 13 e), but most of the spicules are more or less barrel-shaped, 0.27 mm long, and bear two distinct median girdles of warts (fig. 13 d). Also crosses are met with.

Colour. — In alcohol the colour is greyish brown.

Remarks. — As I mentioned above there are, in the basal coenenchyme, stout barrels, usually 0.27 mm long, and warty spindles, up to 0.36 mm long. Tixier-Durivault (1958, 1966), in her tables distinguished four groups of *Lobophytum* species, numbered with the Roman numerals I to IV. As in our specimen barrels and spindles are present in the basal coenenchyme, the

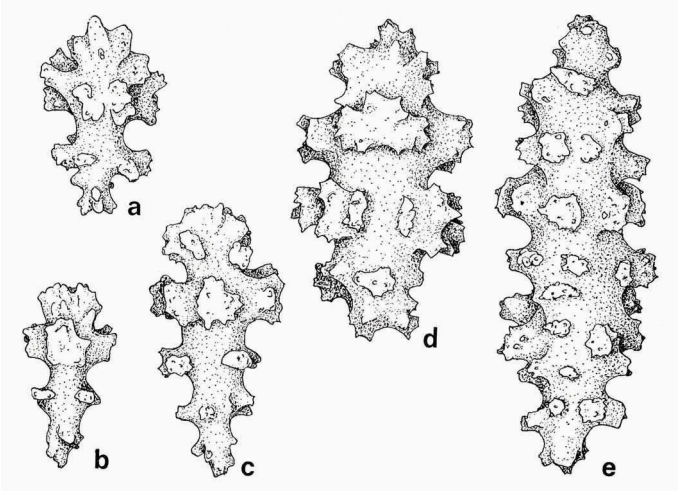

Fig. 13. *Lobophytum latilobatum* nov. spec. a-c, spicules from cortex of the sterile stalk; d, e, spicules from interior of the sterile stalk. × 170.

colony belongs to group II. In this group she placed five species (cf. Tixier-Durivault, 1958: 92). I compared my specimen with each of these, but it differs from all five species either in the shape of the colony and its lobes, or in the spicules, or in the number and dimensions of the autozooids and siphonozooids.

Sarcophyton Lesson, 1834

Sarcophyton glaucum (Quoy & Gaimard, 1833) *)

Alcyonium glaucum Quoy & Gaimard, 1833: 270, pl. 22 figs. 11, 12.

Sarcophytum glaucum, Von Marenzeller, 1886: 352-354, pl. 9 fig. 1; May, 1899: 112-114; Burchardt, 1902: 674, pl. 55 fig. 3, pl. 57 fig. 7; Cohn, 1908: 215-216; Thomson & Dean, 1931: 57, pl. 8 fig. 6, pl. 16 fig. 7; Tixier-Durivault, 1958: 61-66, figs. 58, 66-68.

Sarcophyton glaucum, Moser, 1919: 253-256, fig. 12; Roxas, 1933: 381, pl. 1 fig. 10; Macfadyen, 1936: 42; Tixier-Durivault, 1966: 142-146, figs. 138-140.

Material. — Tany Kely, a small island to the south of Nosy Bé, depth 20 m; 20 December 1963. J. H. Stock, ZMA Coel. no. 5568. Two colonies.

*) For complete synonymy see Tixier-Durivault, 1958: 61-62.

The same locality, depth 3 m; 27 May 1967. A. G. Humes no. 1031, RMNH Coel. no. 6626. One specimen. Field-note: "White fleshy stout stalk, capitulum broad, greenish grey, smooth, edges with broad undulating lobes".

Pointe à la Fièvre, Nosy Bé, depth 2 m; 24 May 1967. A. G. Humes no. 1022, RMNH Coel. no. 6627. Two colonies. Field-note: "Large cream-coloured fleshy base, expanded lobulate capitulum with broad lobes, light greenish grey".

Ambariotelo, a small island nearly between Nosy Komba and Nosy Bé, depth 3 m; 6 June 1967. A. G. Humes no. 1050, RMNH Coel. no. 6628. One colony. Field-note: "Lobulate capitulum, fine yellow polyps".

Antsamantsara, north of Madirokely, Nosy Bé, depth 4 m; 9 June 1967. A. G. Humes no. 1068, RMNH Coel. no. 6629. Three colonies. Field-note: "Single stalk, broad flat capitulum, brownish grey with minute projections, resembling an overgrown sea pansy".

Nosy N'Tangam, near Nosy Bé, depth 2 m; 24 June 1967. A. G. Humes no. 1115, RMNH Coel. no. 6630. One colony. Field-note: "Stout white fleshy short stalk, capitulum flat with slightly undulating edges, grey".

Near black buoy in pass north of Pointe Ambarionaomby, Nosy Komba, depth 17 m; 5 August 1967. A. G. Humes no. 1217, RMNH Coel. no. 6631. One colony. Field-note: "Stout short pale olive green stalk, capitulum darker olive green with irregular lobes and yellow polyps".

Pass between Nosy Komba and Nosy Bé, depth 17 m; 16 August 1967. A. G. Humes no. 1305, RMNH Coel. no. 6632. One colony. Field-note: "Stalk whitish and half buried in sand, capitulum grey with brown polyps, rather long".

Ankify, on the mainland of Madagascar, opposite Nosy Komba, near Nosy Bé, depth 1 m; 22 July 1967. A. G. Humes no. A 23, RMNH Coel. no. 6633. One colony.

The same locality and depth; 23 August 1967. A. G. Humes no. 1318, RMNH Coel. no. 6634. One colony. Field-note: "Greenish grey capitulum, yellow-tipped polyps, stalk very short".

The same locality, depth and date. A. G. Humes no. 1319, RMNH Coel. no. 6635. One colony. Field-note: "Flat grey capitulum, undulating edges, stalk short and tough".

Pass at Pointe Lokobe, Nosy Bé, depth 8 m; 25 August 1967. A. G. Humes no. A 11, RMNH Coel. no. 6636. One colony.

Geographical distribution. — This well-known species has been recorded from many localities in the Red Sea, the Indian Ocean and the Pacific Ocean.

Sarcophyton acutangulum (Von Marenzeller, 1886)

Sarcophytum ehrenbergi var. *acutangulum* Von Marenzeller, 1886: 357-359, pl. 9 fig. 4.
Sarcophytum roseum Pratt, 1903: 512, pl. 29 figs. 10, 11.
Sarcophytum contortum Pratt, 1905: 251, pl. 1 figs. 6, 7.
Sarcophytum acutangulum, Kükenthal, 1910: 25-29, figs. 2, 3, pl 2 figs. 10, 11; Thomson & Dean, 1931: 54-55; Tixier-Durivault, 1946: 81-86; 1958: 21-24, figs. 14-16.
Sarcophyton acutangulum, Moser, 1919: 244-245, fig. 7; Roxas, 1933: 377-378; Utinomi, 1953: 153-155, fig. 3a-d; 1954: 51-52; Verseveldt, 1960: 220-224; Tixier-Durivault, 1966: 114-116, figs. 105-107.
Sarcophytum acutangulum var. *occidentalis* Thorpe, 1928: 502-504, pl. 31 fig. 6, pl. 34 fig. 5.
Sarcophytum convolutum Thomson & Dean, 1931: 63-64, pl. 11 fig. 7, pl. 23 fig. 1.

Material. — Antsamantsara, north of Madirokely, Nosy Bé, depth 4 m; 9 June 1967. A. G. Humes no. 1067, RMNH Coel. no. 6637. One large colony, broken into two pieces. Field-note: "Tough stout stalks, capitulum with very curly edges, greyish brown".

Off Ampombilava, Nosy Bé, depth 1 m; 7 July 1967. A. G. Humes no. 1137, RMNH Coel. no. 6638. One colony. Field-note: "Stout stalk, broad crenated grey capitulum".

Nosy N'Tangam, Nosy Bé, in *Cymodocea*, depth 1 m; 21 July 1967. A. G. Humes no. 1179, RMNH Coel. no. 6639. Two colonies. Field-note: "Short tough stalk, capitulum broad, flat, brown".

Tany Kely, a small island to the south of Nosy Bé, depth 25 m; 14 August 1967. A. G. Humes no. 1263, RMNH Coel. no. 6640. One large colony. Field-note: "Stalk whitish, tough, capitulum dark brown, irregularly lobed".

Geographical distribution. — The species is known from a number of localities in the Red Sea, the Indian Ocean and the Pacific Ocean.

Sarcophyton ehrenbergi Von Marenzeller, 1886

Sarcophytum ehrenbergi Von Marenzeller, 1886: 356-357, pl. 9 fig. 3; Hickson & Hiles, 1900: 504; ? Pratt, 1903: 508, pl. 28 figs. 1, 2; Pratt, 1905: 252; Thomson & Simpson, 1909: 4; Kükenthal, 1910: 23-24; Thomson & Mackinnon, 1910: 176; Kükenthal, 1913: 10; Thomson & Dean, 1931: 55, pl. 9 fig. 1; Tixier-Durivault, 1946: 84-85; 1958: 16-20, figs. 5, 11, 12.

Sarcophyton ehrenbergi, Moser, 1919: 240-242, fig. 4; Roxas, 1933: 374, pl. 1 fig. 3; Tixier-Durivault, 1966: 112-114, figs. 102-104.

Sarcophytum ehrenbergi var. *sansibaricum* May, 1899: 114, pl. 5 fig. 7a-c; Kükenthal, 1910: 24.

Sarcophytum ehrenbergi var. *areolata* Burchardt, 1902: 677, pl. 55 fig. 7, pl. 57 figs. 10, 11.

?*Sarcophytum tenuis* Pratt, 1903: 512-513, pl. 28 fig. 6, pl. 29 fig. 9.

Sarcophytum oligotrema Pratt, 1905: 250-251, pl. 1 figs. 3-5.

Non *Sarcophytum lobulatum* Cohn, 1908: 214-215.

Material. — Andilana, Nosy Bé, depth 0.5 m; 9 August 1963. A. G. Humes no. 680, RMNH Coel. no. 6641. One specimen, funnel-shaped, with corrugated margins. Field-note: "Colour: light grey".

Geographical distribution. — The species has been recorded from the Red Sea, the Indian Ocean and the Pacific Ocean.

Sarcophyton trocheliophorum Von Marenzeller, 1886 (fig. 14)

Sarcophytum trocheliophorum Von Marenzeller, 1886: 359-361, pl. 9 fig. 5; May, 1899: 114-115; Cohn, 1908: 213-214; Thomson & Dean, 1931: 60-62; Tixier-Durivault, 1958: 75-79, figs. 76, 82, 83.

Sarcophytum trocheliophorum forma *typica* Kükenthal, 1910: 18.

Sarcophytum pulmo Klunzinger, 1877: 28-29, pl. 1 fig. 8.

Sarcophytum trocheliophorum var. *amboinense* Von Marenzeller, 1886: 361-362, pl. 9 fig. 6; Wright & Studer, 1889: 249-250, pl. 41 fig. 11; Studer, 1894: 121; May, 1898: 27-28; 1899: 115-117; Burchardt, 1902: 679-681, pl. 55 figs. 8, 9, pl. 57 fig. 12.

Sarcophytum reichenbachi Schenk, 1896: 74-75, pl. 4 figs. 34-37; Roule, 1908: 173; Kükenthal, 1910: 31-32; Thomson & Mackinnon, 1910: 175-176, pl. 13 fig. 12.

Sarcophytum dispersum Schenk, 1896: 75-76, pl. 4 figs. 38, 39.

Sarcophytum trocheliophorum var. *intermedia* Burchardt, 1902: 681, pl. 55 fig. 10, pl. 57 fig. 6.

Sclerophytum viride Thomson & Henderson, 1906a: 420-421, pl. 29 figs. 2, 3.

Sarcophytum pallidum Cohn, 1908: 221, pl. 10 figs. 7-10; Kükenthal, 1910: 19-20.

Sarcophyton trocheliophorum, Moser, 1919: 246-249, figs. 8, 9; Macfadyen, 1936: 42-43; Utinomi, 1953: 155, figs. 3 e, f, pl. 8 fig. 4; Verseveldt, 1960: 232-233; Tixier-Durivault, 1966: 155-158, figs. 150-152.

Sarcophytum trocheliophorum var. *australiensis* Thorpe, 1928: 500-502, pl. 31 fig. 5.

Material. — Tany Kely, near Nosy Bé, depth 0.5 m; 23 June 1963. A. G. Humes no. 646, RMNH Coel. no. 6642. Two mushroom-shaped colonies. Field-note: "Stalk white, disc dark grey, polyps with brown stalk and bright green tips".

Ambariobe, Nosy Bé, reef, depth about 2 m; 17 December 1963. J. H. Stock, ZMA Coel. no. 5569. One large colony.

West shore of Nosy Komba, near Nosy Bé, depth 2 m; 4 June 1967. A. G. Humes no. A18, RMNH Coel. no. 6643. Three small colonies.

Description. — In a previous paper (Verseveldt, 1960: 224) I stated that, in my opinion, the most important difference between *Sarcophyton crassocaule* Moser, 1919, and *S. trocheliophorum* is not to be found in the spicules, but in the shape of the disc. I have now come to a different conclusion after examination of the new material from Madagascar and after a re-examination of the

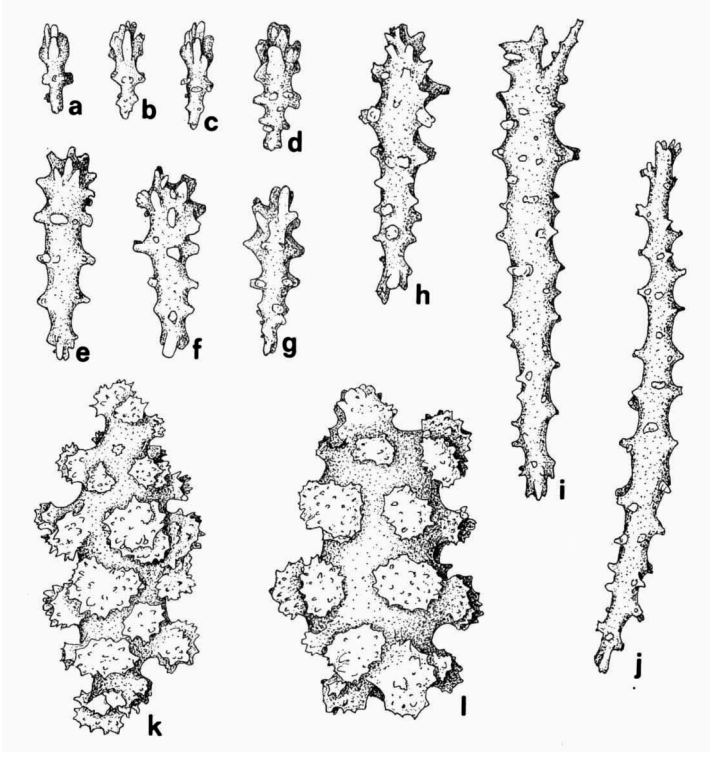

Fig. 14. *Sarcophyton trocheliophorum* Von Marenzeller. a-g, spicules from cortex of the disc; h-j, spicules from interior of the disc; k, l, spicules from interior of the sterile stalk. × 170.

material collected by the Siboga Expedition. It struck me that in *S. trocheliophorum* the cortex of the disc contained small clubs of a characteristic shape, the heads being provided with flat, upright prominences (fig. 14 a-c). This type of clubs being present, the interior of the sterile stalk has always the oval spindles and lemon-shaped spicules, which are so characteristic of *S. trocheliophorum* (fig. 14 k, l; cf. Thomson & Dean, 1931: 61).

This feature is accompanied by some other characters. The margin of the disc is much convoluted. The surface of the disc is rubbery. The autozooids are 1 to 2 mm apart. Between two autozooids there are one to five siphonozooids. In the interior of the disc the spindles are sometimes up to 0.50 mm long (fig. 14 h-j). The coenenchymal spicules in the sterile stalk have heavy warts with pointed spines.

Colour. — The colonies RMNH Coel. no. 6642 are creamy-white, the colony ZMA Coel. no. 5569 is grey, the specimens RMNH Coel. no. 6643 have a light brown disc and a slightly darker brown stalk.

Geographical distribution. — The species is widespread in the Red Sea, the Indian Ocean and the Pacific Ocean.

Sarcophyton cornispiculatum nov. spec. (figs. 15, 16; pl. 1 fig. 2)

Material. — Near black buoy in pass north of Pointe Ambarionaomby, Nosy Komba, depth 17 m; 5 August 1967. A. G. Humes no. 1219, RMNH Coel. no. 6644. One colony, holotype. Field-note: "Tough grey stalk, short, broad smooth greyish green capitulum".

Description. — The colony (pl. 1 fig. 2) is mushroom-shaped. At the base the sterile stalk is oblique, hence on one side the height of the stalk is 30 mm, on the other 25 mm. Just above this base the stalk is 20 mm in maximum diameter, upwards it narrows. It is strongly folded longitudinally.

The capitulum is smooth, it sits obliquely on the stalk. Towards the edges it passes into three large lobes, which are bent downward partly hiding the stalk from view. The edges of the lobes are strongly curled downward. The sterile stalk is stiff, the capitulum is rather weak.

The autozooids are distributed over the surface of the disc, very often they are arranged in regular rows. At the edges of the disc their centres are 1.30 to 2.10 mm apart, in the middle part of the disc they are 2 to 3 mm apart. The majority are completely retracted, leaving funnel-shaped pits with diameters of 0.50 × 0.60 mm, 0.60 × 0.80 mm, or 0.80 × 0.80 mm. A few are not fully retracted: only the distalmost part protrudes, in which part the anthocodial armature is found. Other zooids, however, protrude further. Such zooids measure 2 mm in total height. They bear no spicules except in the uppermost part, which measures 0.50 to 0.60 mm in height and 0.80 mm in width. The spicules are 0.22 to 0.35 mm long, they are weakly spined rods

or spindles, often slightly curved. Sometimes they are arranged in distinct chevrons, about five in a row. In other cases they all lie side by side in a longitudinal direction. The tentacles have numerous small, flat, rod- or oval-shaped spicules, 0.05 to 0.10 mm long, they are transversely arranged.

With a pocket-lens the siphonozooids are clearly visible. They are small pits, 0.25 to 0.30 mm in diameter, and separated from each other by walls 0.12 to 0.20 mm thick. At the edges of the capitulum there are one to three siphonozooids between two autozooids, in the central part their number is four to five.

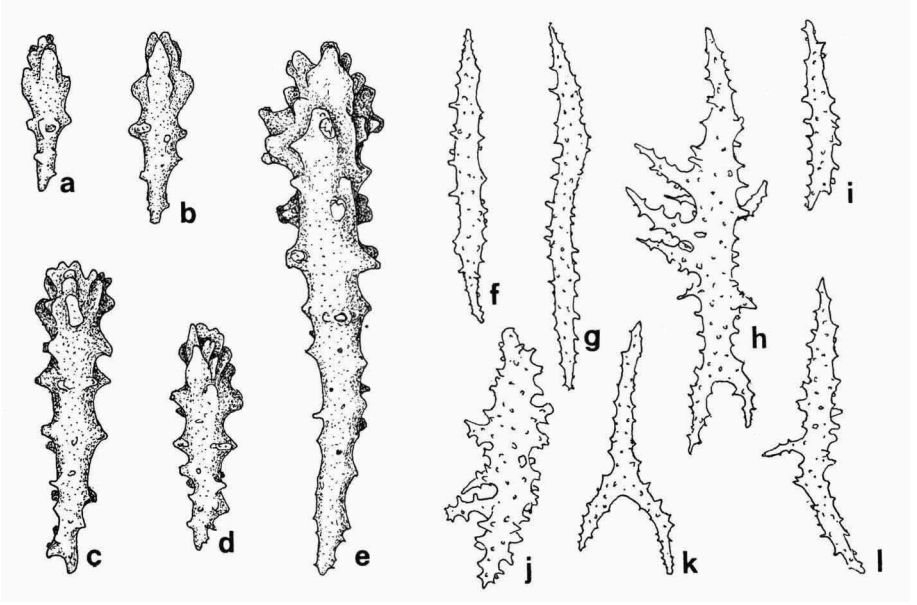

Fig. 15. *Sarcophyton cornispiculatum* nov. spec. a-e, spicules from cortex of the disc; f-l, spicules from interior of the disc. a-e, × 220; f-l, × 70.

The cortex of the disc contains numerous clubs, 0.08 to 0.12 mm long (fig. 15 a, b), but also larger clubs are met with, up to 0.32 mm long (fig. 15 c-e). The interior of the disc has spindles and needles, often curved, and provided with high spines (fig. 15 f, g). But there are also numerous fantastically shaped spicules (fig. 15 h-l). Many of them are broad and flat, and have long, spiny ramifications, others are bifurcated at one end. Their length is up to 0.85 mm.

In the cortex of the sterile stalk we find clubs, which are wider than those in the disc (fig. 16 a-f). The length is 0.11 to 0.20 mm, their warts are often arranged in girdles. In the interior of the stalk there are very warty ovals,

spindles and cylinders, up to 0.78 mm long (fig. 16 g-k). The coarse warts are densely placed and irregularly distributed.

Colour. — In alcohol the sterile stalk is light brown, the capitulum is grey.

Remark. — The species is, among other things, characterized by the remarkable, irregularly branched spicules in the interior of the disc.

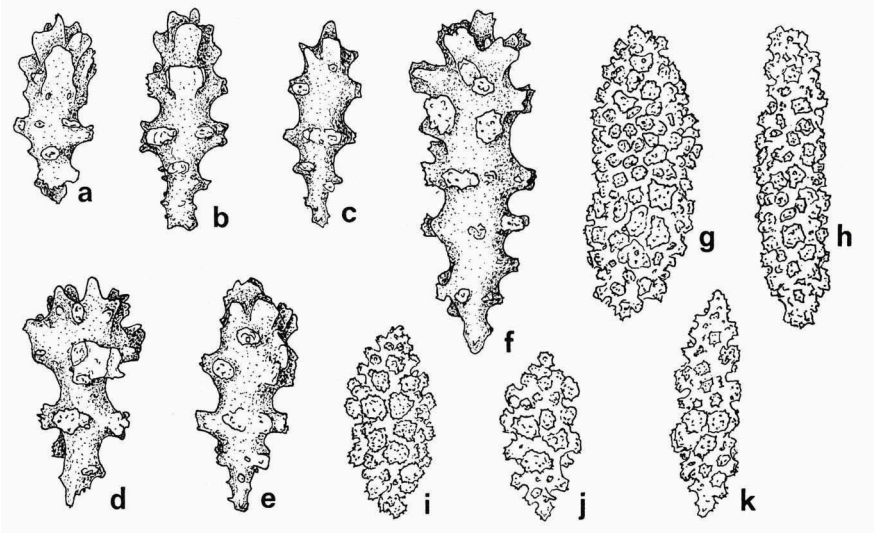

Fig. 16. *Sarcophyton cornispiculatum* nov. spec. a-f, spicules from cortex of the sterile stalk; g-k, spicules from interior of the sterile stalk. a-f, × 220; g-k, × 70.

Sarcophyton stolidotum nov. spec. (fig. 17; pl. 3 fig. 2)

Material. — Pass between Nosy Komba and Nosy Bé, on sand, depth 17 m; 16 August 1967. A. G. Humes no. 1306, RMNH Coel. no. 6645. One colony, holotype. Field-note: "Very short stalk, capitulum broad, greyish green with curled edges".

Description. — The rather weak colony (pl. 3 fig. 2) has a sterile stalk, which is strongly shrivelled. It measures only about 10 mm in height, the width is 40 mm. It gradually passes into the marginal folds of the funnel-shaped capitulum, at the outside of the latter there is no boundary between stalk and folds. These folds are relatively large, the tips are curved inwards over the hollow disc. The edges of the folds are thin. The total height of the colony is 40 mm, the diameter of the capitulum is 80 mm.

The autozooids and siphonozooids are clearly visible. The autozooids are completely retracted. They form small pits, in the central part of the disc 0.80 to 1.00 mm in diameter. At the edges of the folds they are smaller, 0.50 to 0.80 mm wide, and they are more densely placed, the centres being 0.60 to 0.80 mm apart. At the sides of the folds their distance is 1.30 to 1.60

mm, in the centre of the disc they are 2.50 to 6.00 mm apart. The more or less hexagonal siphonozooids have a diameter of 0.50 to 0.80 mm. At the edges they are smaller, about 0.30 mm wide, and here there is one siphonozooid between two autozooids. Towards the centre their number increases: in the central part there are four to six siphonozooids between two autozooids. Contrary to the autozooids the siphonozooids form no pits.

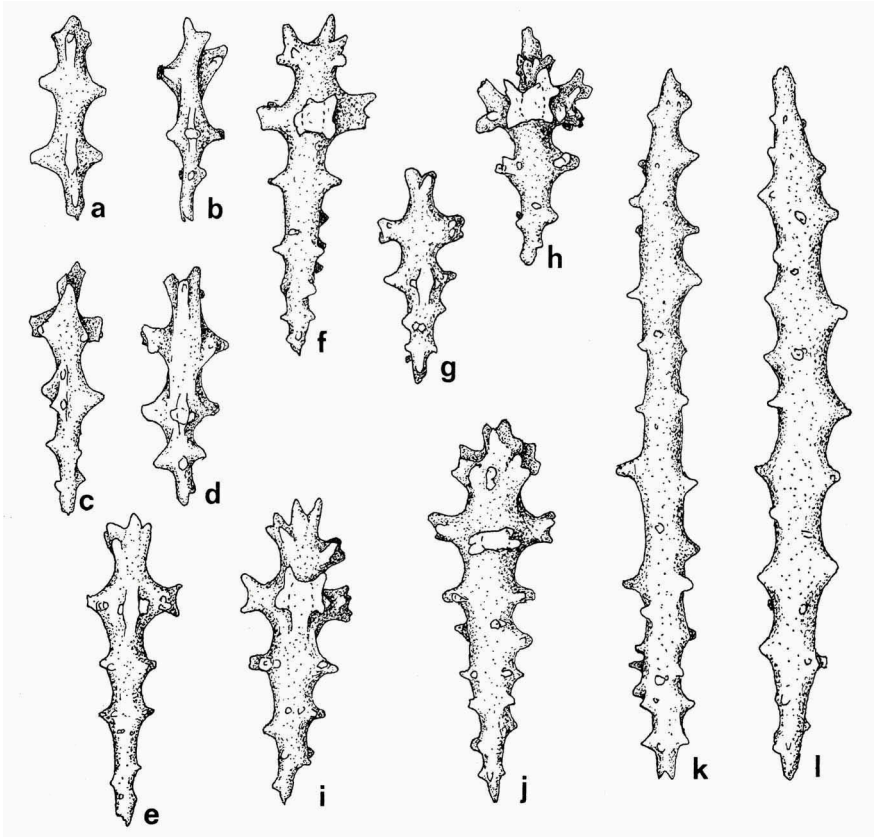

Fig. 17. *Sarcophyton stolidotum* nov. spec. a-f, spicules from cortex of the disc; g-j, spicules from cortex of the sterile stalk; k, l, spicules from interior of the sterile stalk. × 220.

The cortex of the disc contains small rods, 0.10 to 0.17 mm long, and provided with laterally flattened spines (fig. 17 a-d). Larger spicules are more club-shaped (fig. 17 e-f). In the cortex of the sterile stalk the rods as represented in fig. 17 a are few in number. Most spicules are clubs, 0.12 to 0.20 mm long, a few are longer (fig. 17 g-j, the types h and i are most common). Below the terminal prominences these clubs have a girdle of large,

winged, butterfly-shaped warts, and below this girdle there is a second one, consisting of smaller, more spine-shaped projections. The handles have irregularly distributed spines.

In the interior of the colony the spicules are not numerous. They are thin needles provided with dispersed spines. In the folds the needles are 0.26 to 0.37 mm long, in the stalk most of them are 0.45 to 0.55 mm long and 0.02 to 0.04 mm wide (fig. 17 k, l).

Colour. — In alcohol the colour is greenish grey.

Remarks. — The species differs from *S. acutangulum* (Von Marenzeller, 1886) in the weakness of the colony, the shape of the cortical spicules in the disc, the shape and the dimensions of the coenenchymal spicules in capitulum and stalk, the shape of the prominences of the spicules, and the dimensions of the zooids.

In some respects the species recalls *S. tortuosum* Tixier-Durivault, 1946. From this species it also differs in some respects, as e.g., the shape of the cortical spicules and the dimensions of the zooids.

Sinularia May, 1898
Sinularia polydactyla (Ehrenberg, 1834)

Lobularia polydactyla Ehrenberg, 1834: 58.

Alcyonium polydactylum, Dana, 1846: 617; Milne Edwards & Haime, 1857: 121; Dana, 1859: 124; Klunzinger, 1877: 26, pl. 1 fig. 6; Schenk, 1896: 69-70; May, 1898: 25-26; 1899: 107-108; Hickson & Hiles, 1900: 502-503; Burchardt, 1902: 663-664, pl. 54 fig. 7, pl. 56 figs. 5-7; Roule, 1908: 179.

Amocella polydactyla, Gray, 1869: 125.

Sclerophytum polydactylum, Pratt, 1903: 524-525; 1905: 255; Thomson & Henderson, 1906a: 418-419, pl. 31 fig. 2.

Sinularia polydactyla, Cohn, 1908: 229-230; Thomson & Crane, 1909: 363; Thomson & Simpson, 1909: 5; Kükenthal, 1913: 12; Kolonko, 1926: 319-325, pl. 4 figs. 1, 2; Thomson & Dean, 1931: 47-48, pl. 22 fig. 3; Roxas, 1933: 353, pl. 2 fig. 7; Macfadyen, 1936: 38-39; Tixier-Durivault, 1951: 50-56, figs. 43, 44, 57-66; 1953: 315-317; Utinomi, 1956: 227; 1959: 305, fig. 1a, b; Tixier-Durivault, 1960: 360; Verseveldt, 1960: 240-241; Tixier-Durivault, 1966: 185-188, figs. 178-180.

Material. — Tany Kely, near Nosy Bé, depth 15 m; 30 August 1964. A. G. Humes no. 914, RMNH Coel. no. 6646. Six colonies. Field-note: "Colour: greyish tan".

Banc de la Lanterne, Bay of Tsimipaika, east of Nosy Komba, near Nosy Bé, depth 15 m; 26 July 1967. A. G. Humes no. 1197, RMNH Coel. no. 6647. Two colonies. Field-note: "Tough broad base, erect fingerlike brown lobes".

West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1205, RMNH Coel. no. 6648. Two colonies. Field-note: "Tough broad light brown stalk, capitulum with many small dark brown branches".

Ambariobe, a small island nearly between Nosy Komba and Nosy Bé, depth 2 m; 22 August 1967. A. G. Humes no. 1307, RMNH Coel. no. 6649. Four colonies. Field-note: "Tough short base, capitulum with many knoblike branches, brown".

Banc de Cinq Mètres, near Nosy Bé, depth 20 m; 6 August 1967. A. G. Humes

no. A4, RMNH Coel. no. 6650. One colony. A. G. Humes no. A16, RMNH Coel. no. 6651. One colony.

Pointe Ambarionaomby, Nosy Komba, near Nosy Bé, depth 2 m; 22 August 1967. A. G. Humes no. A10, RMNH Coel. no. 6652. One large colony, dry; two fragments of it have been preserved in alcohol.

Remark. — A description of this well-known and wide-spread species is superfluous.

Colour. — The colour of the specimens from lot RMNH Coel. no. 6646 is greyish, all the other colonies are partly greyish to light brown, partly dark brown to black.

Geographical distribution. — The species has been recorded from the Red Sea, the Indian and the Pacific Ocean (see Tixier-Durivault, 1966: 188).

Sinularia leptoclados (Ehrenberg, 1834)

Lobularia leptoclados Ehrenberg, 1834: 58.

Alcyonium leptoclados, Milne Edwards & Haime, 1857: 116; Klunzinger, 1877: 26-27, pl. 1 fig. 7; Schenk, 1896: 70; May, 1899: 108; Burchardt, 1902: 661-663, pl. 54 fig. 6, pl. 56 fig. 4; Kükenthal, 1913: 11; Stiasny, 1937a: 392.

Sinularia leptoclados, Lüttschwager, 1915: 3-4; Kolonko, 1926: 305-309, pl. 2 fig. 2; Thomson & Dean, 1931: 45-47, pl. 11 fig. 5, pl. 21 figs. 6, 9; Roxas, 1933: 350-351, pl. 2 fig. 8; Macfadyen, 1936: 37; Tixier-Durivault, 1951: 124-129, figs. 173-175, 179-181; Verseveldt, 1960: 240; Tixier-Durivault, 1966: 218-225, figs. 212-214.

Material. — Ankify, on the mainland of Madagascar, opposite Nosy Komba, depth 1 m; 22 July 1967. A. G. Humes no. 1183, RMNH Coel. no. 6653. Two colonies. Field-note: "Tough stalk, branches on capitulum knobbed, brown".

The same locality and depth; 11 August 1967. A. G. Humes no. 1250, RMNH Coel. no. 6654. One colony. Field-note: "Brownish grey, slender erect branches covered with small brown dots".

The same locality and depth; 23 August 1967. A. G. Humes no. 1320, RMNH Coel. no. 6655. Three colonies. Field-note: "Light tan, short fingerlike branches". A. G. Humes no. 1321, RMNH Coel. no. 6656. Three colonies. Field-note: "Light tan, with fingerlike lobes". A. G. Humes no. 1322, RMNH Coel. no. 6657. Four colonies. A. G. Humes no. 1323, RMNH Coel. no. 6658. Five colonies.

Nosy Iranja, to the southwest of Nosy Bé, depth 15 m; 9 August 1967. A. G. Humes no. 1239, RMNH Coel. no. 6659. One colony. Field-note: "Tough, brown, short branches".

West of Andilana, Nosy Bé, 13°18'S., 48°07'E., depth 20 m; 24 August 1967. A. G. Humes no. 1331, RMNH Coel. no. 6660. One colony.

Pass at Pointe Lokobe, Nosy Bé, 13°26'S., 48°20.5'E., depth 15 m; 19 June 1967. A. G. Humes no. A28, RMNH Coel. no. 6661.

Remark. — The species has often been described previously. It is characterized by (a) the sometimes thickly set, upright lobes, up to about 15 mm long and 4 mm wide, (b) the small cortical clubs, 0.07 to 0.09 mm long, the typical heads consisting of closely set, oblong, blunt prominences (leaf-clubs with a "tête foliacée"), and (c) long cortical clubs, 0.18 to 0.25 mm long, especially occuring in the lobes, their handles have only few spines.

The spindles in the interior of lobes and sterile stalk are up to 4 or 5 mm long, occasionally the length is 5.70 mm. In a few cases the spindles are bifurcated at one end. The coarse warts covering these spindles are small, 0.03 to 0.06 mm in diameter; they are mostly arranged in transverse rows. In the lobes the spindles often have simple spines.

Geographical distribution. — The species has been recorded from numerous localities: Red Sea, Ceylon, Port Denison (West Australia), Philippines, Malay Archipelago, Nicobares, Low Isles (Great Barrier Reef), Madagascar, Island of Aldabra (N.W. of Madagascar). Tixier-Durivault, 1966: 225, records "Indes orientales allemandes; Archipel Malais", probably a mistake for Dutch East Indies, now Indonesia, Malay Archipelago.

Sinularia fungoides Thomson & Henderson, 1906 (figs. 18, 19; pl. 8)

Sinularia fungoides Thomson & Henderson, 1906a: 417-418, fig. 85; Lüttschwager, 1915: 14; Kolonko, 1926: 330; Tixier-Durivault, 1945: 60; 1951: 41-45, figs. 41, 49-51.

Material. — Banc de Cinq Mètres, west of Nosy Bé, 13°23'30"S., 48°03'30"E., depth 30-39 m; 10 January 1964. J. H. Stock. ZMA Coel. no. 5570. One colony.

Description. — The handsome colony (pl. 8) measures 75 mm in total height. The broad sterile stalk is 40 to 55 mm high, in a transverse section it is more or less oval. In many places the large coenenchymal spicules protrude from the surface, which is strongly corrugated longitudinally. Upwards the stalk widens and passes into the outermost lobes of the capitulum, a basal line being absent. Along the edges of these outermost lobes the first zooids are met with. The capitulum has diameters of 125 mm and 70 mm. It consists of many closely set lobes, which are thin, plate-like, and irregularly folded and grooved longitudinally. The height of the lobes is 20 to 30 mm. The irregularly shaped edges of the lobes bear small, digitiform secondary lobes, up to 10 mm long. The whole colony is rigid and granular to the touch.

The autozooids are regularly distributed, and 1.10 to 1.50 mm apart. They all are retracted, their places are indicated by clearly visible small pits. Each pit is surrounded by an elevation. About the anthocodial armature nothing can be said.

The spicules in the cortex of the lobes are small clubs, 0.09 to 0.12 mm long (fig. 18 a-c). The head is composed of a low central wart and three side-warts, which are often flattened laterally (fig. 18 b). The width of the heads varies from 0.040 to 0.055 mm. The handles are pointed, and have small knobs or warts. Just below the three side-warts the handle measures 0.016 to 0.020 mm in width. In addition, small spindles are present, 0.15 to 0.22

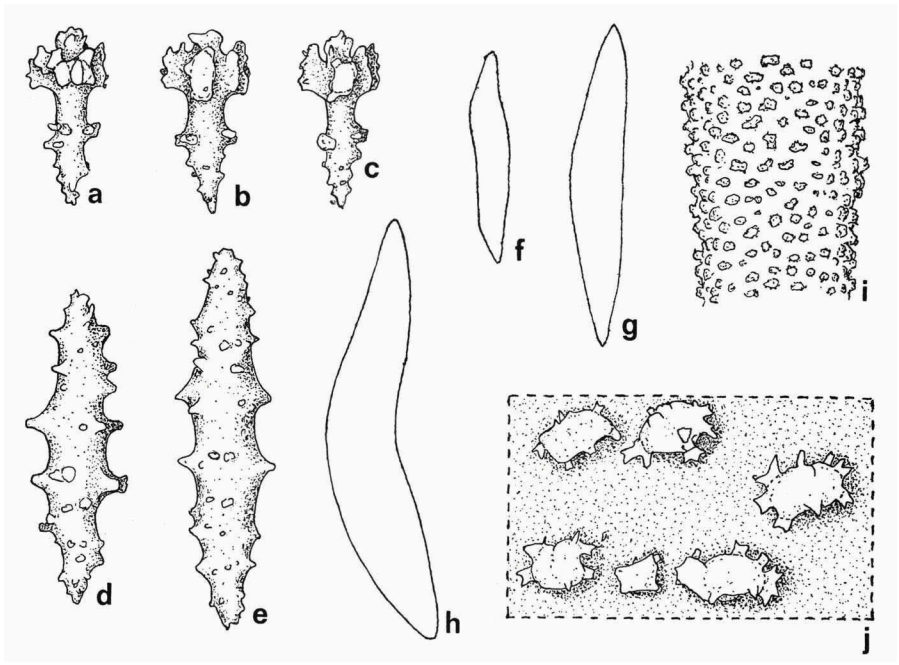

Fig. 18. *Sinularia fungoides* Thomson & Henderson. a-e, spicules from cortex of a lobe; f-h, spicules from interior of a lobe; i, part of a spicule from interior of a lobe; j, warts on a coenenchymal spicule from a lobe. a-e, j, × 220; f-h, × 10; i, × 40.

mm long and 0.028 to 0.034 mm wide, and provided with cones or small warts (fig. 18 d, e).

In the cortex of the sterile stalk the clubs are of the same length, viz., 0.09 to 0.12 mm, but they are wider than those in the lobes: the width of the heads is 0.055 to 0.070 mm and the width of the handle below the girdle of head-warts is 0.028 to 0.034 mm (fig. 19 a-f). The cortical spindles are also wider: 0.03 to 0.04 mm (fig. 19 g). A few tiny crosses are met with (fig. 19 h).

In the interior of stalk and lobes the same spicules occur, viz., large, straight or curved spindles, sharp or blunt-ended, without a median constriction (fig. 18 f-h). They are more than 5 mm long, the width is up to 0.7 mm. They are rather densely covered with small warts, which are provided with minute, often divided spines. On the stalk-spicules the warts have a diameter of up to about 0.08 mm, on the spicules from the lobes the warts are smaller (cf. fig. 18 j and fig. 19 i).

Colour. — In alcohol the colony is a light grey.

Geographical distribution. — The species has been recorded from Wasin (N. of Zanzibar), depth 10 fathoms, and from Indo-China.

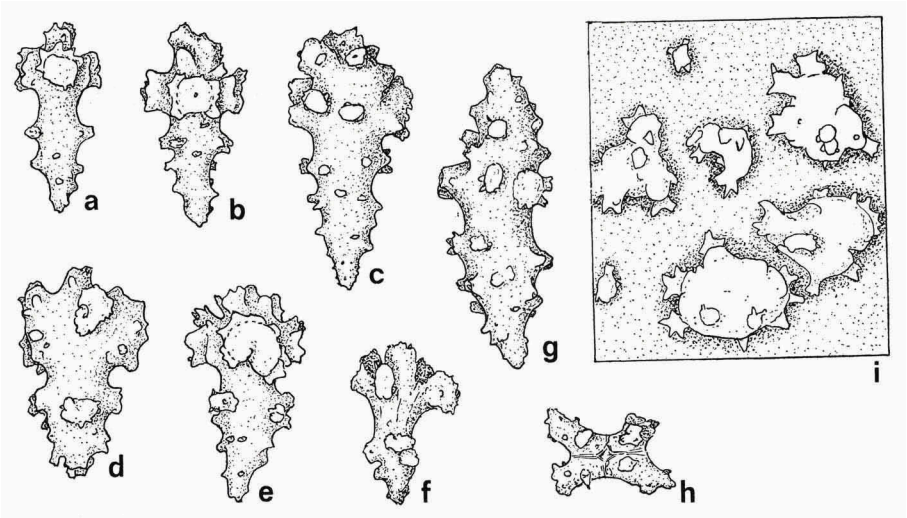

Fig. 19. *Sinularia fungoides* Thomson & Henderson. a-h, spicules from cortex of the sterile stalk; i, warts on a coenenchymal spicule from the sterile stalk. × 220.

Sinularia triaena Kolonko, 1926 (figs. 20, 21; pl. 9 fig. 2)

Sinularia triaena Kolonko, 1926: 304, pl. 1 fig. 4; Roxas, 1933: 349-350; Tixier-Durivault, 1951: 121-124, figs. 142, 168-172; 1966: 217-218, figs. 208-211.

Material. — Ankify, on mainland of Madagascar, opposite Nosy Komba, near Nosy Bé, depth 1 m; 22 July 1967. A. G. Humes no. 1184, RMNH Coel. no. 6662. Two colonies. Field-note: "Without distinct stalk, brown, irregular fingerlike branches, surface granular, with egglike structures embedded in basal part".

Nosy Iranja, south-west of Nosy Bé, depth 15 m; 19 August 1967. A. G. Humes no. A1, RMNH Coel. no. 6663. Two colonies.

Description. — The largest of the specimens from RMNH Coel. no. 6662 measures 85 mm in height and 100 mm in width (pl. 9 fig. 2). The colony has evidently been torn from a basal part, as a result of which the sterile stalk is absent. The collector, Dr. Humes, already records the absence of a distinct stalk in his field-note. I suppose the sterile stalk is always very low in this species, which is in accordance with the observations of previous authors (Kolonko, 1926: 304: "niedrige Scheibe"; Roxas, 1933: 349: "thin, corrugated stalk", and "low, disclike base"; Tixier-Durivault, 1951: 123: "pied bas, large, encroûtant, sterile").

The specimen consists of a disc from which arise a number of erect primary lobes, up to 70 mm in height and 15 to 20 mm in width at the base. They are flattened, densely placed, and stiff. They bear side-lobes which arise at different levels from the primary lobes. They are finger-like, rounded, 10 to

30 mm long and 3 to 6 mm wide. The surface of the lobes is strongly corrugated.

The autozooids on the disc and on the lobes are marked by hillocks, 1.10 to 1.50 mm in diameter, the centres of the zooids usually are 0.80 to 1.10 mm apart. The majority of the zooids are totally retracted within the coenenchyme, but sometimes they protrude above the surface like small stars. The "egglike structures embedded in basal part" recorded by Dr. Humes in his field-note are eggs of the autozooids; the diameter is 0.60 to 0.75 mm.

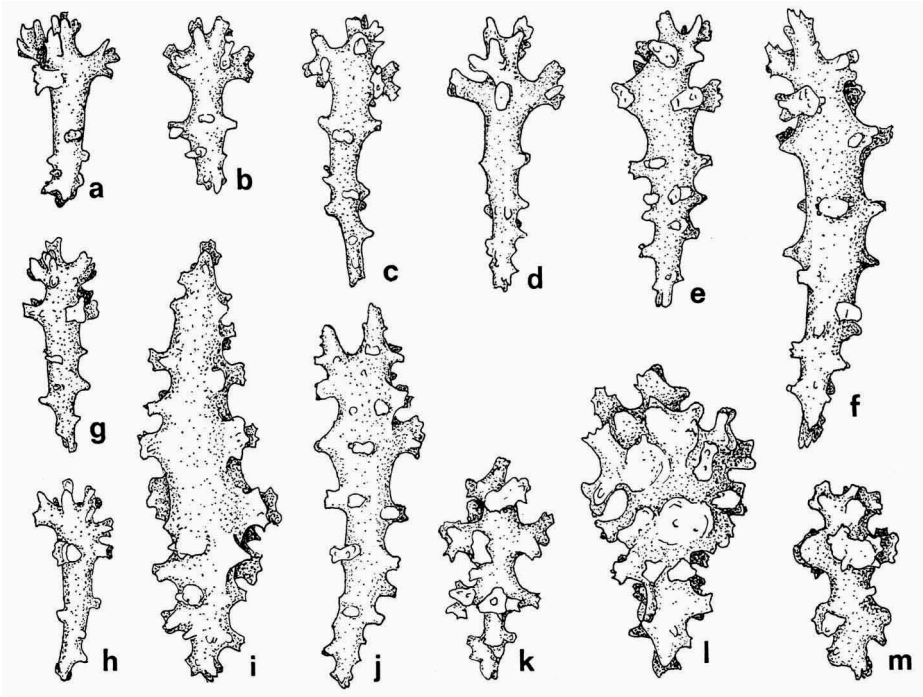

Fig. 20. *Sinularia triaena* Kolonko. a-j, spicules from cortex of the disc; k-m, spicules from cortex of the sterile stalk. × 220.

In cortex of disc and lobes clubs are present, 0.10 to 0.17 mm in length, a few may have a length of 0.22 mm (fig. 20 a-d, g, h). In many cases the heads of the clubs consist of three prominences radiating in three oblique directions, at the ends they are thicker and wart-like. In many clubs, however, these triradiated heads are indistinct. The handles of the clubs have spines and small warts. Intermediate forms between clubs and spindles are also present (fig. 20 e, f, i, j), that represented in fig. 20 j is typical. At one side of the colony I found a narrow strip of the cortex of the sterile stalk. In this strip the same clubs are met with, but, besides, small, warty rods (fig. 20 m),

clubs with heavily warted handles (fig. 20 k), and coarse, wide, club-shaped (fig. 20 l) or more fusiform warty spicules.

In the interior of the disc and of the lobes the spicules are straight or bent, thick spindles with rounded ends and a constriction in the middle. They are up to 3.75 mm in length and 0.70 mm in width (warts included) (fig. 21 a-g).

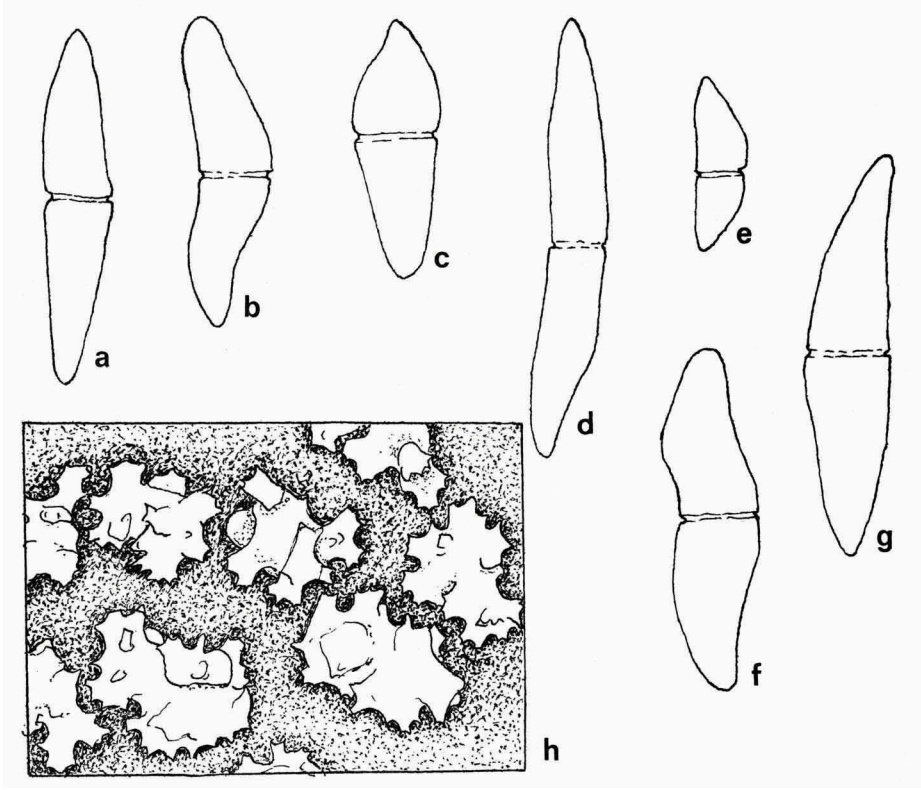

Fig. 21. *Sinularia triaena* Kolonko. a-g, spicules from interior of the basal part of a lobe; h, warts on a coenenchymal spicule. a-g, × 16; h, × 340.

They are provided with thickly set, compound, crenulate warts, usually regularly placed in transverse rows; the diameter of the larger ones is 0.60 to 0.80 mm (teeth included) (fig. 21 h). The stout spindles up to 10 mm long, as recorded by Kolonko, and up to 6 mm, as recorded by Tixier-Durivault, have not been found, probably owing to the fact that the sterile stalk is missing.

Colour. — In alcohol the colony has a light greyish colour.

Variability. — In the three remaining colonies the sterile stalk is also missing, probably they have all been torn off. In all respects they agree with

each other and with the specimen described above. In one of the colonies from RMNH Coel. no. 6663 I found that among the coenenchymal spicules there are some very fantastically shaped spicules, with irregular side-branches; sometimes they have coalesced.

Geographical distribution. — The species has been recorded from Palawan (Philippines), the Gulf of Suez, and the island of Aldabra (N.W. of Madagascar).

Sinularia humesi Verseveldt, 1968 (figs. 22-24; pl. 9 fig. 1)

Sinularia humesi Verseveldt, 1968: 54.

Material. — Off Ampombilava, Nosy Bé, depth 2 m; 26 September 1964. A. G. Humes no. 940, RMNH Coel. no. 3905. One colony, holotype. RMNH Coel. no. 6664. One colony, paratype. Field-note: "Colour = grey-green".

Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 18 m; 11 July 1967. A. G. Humes no. 1151, RMNH Coel. no. 6665. One colony. Field-note: "Grey, tough".

Opposite Andjiabe, Nosy Komba, near Nosy Bé, depth 13 m; 2 September 1967. A. G. Humes no. 1377, RMNH Coel. no. 6666. Five colonies. Field-note: "Brown, long erect digitiform lobes".

Description. — The holotype (pl. 9 fig. 1) has a length of 150 mm, a width of 40 to 60 mm and a total height of 60 mm. The sterile stalk is firm, encrusting, smooth, 20 to 30 mm in height, a basal line is present.

Without distinct boundary the stalk passes into the capitulum, which consists of many close-set, flattened primary lobes, 20 to 45 mm high. Each

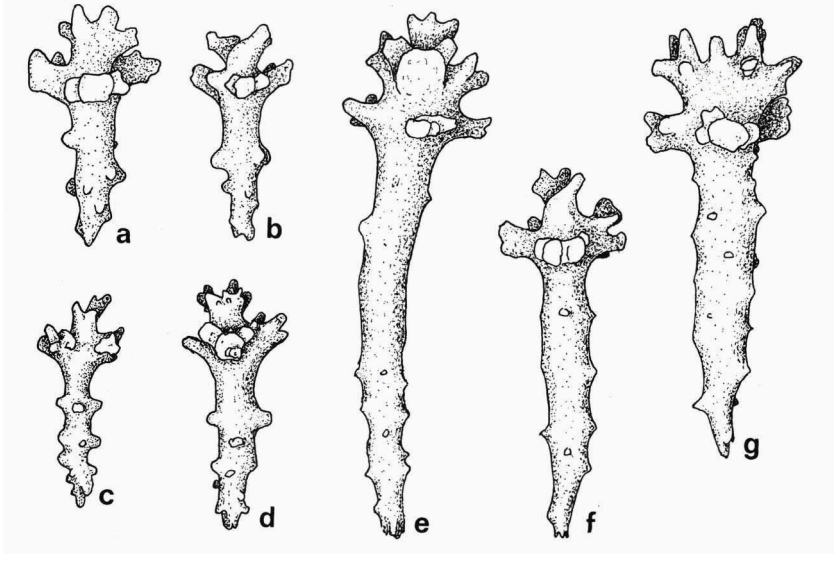

Fig. 22. *Sinularia humesi* Verseveldt. a-g, spicules from cortex of a lobe. × 220.

lobe is more or less subdivided: at the tips and from the edges and flat sides secondary lobes arise, sometimes as small knobs, about 5 mm in diameter and in height, in other cases finger-shaped, up to about 15 mm high, the width is 5 to 8 mm. They may be strongly flattened and in that case the width is 10 mm. The lobes are a little flexible.

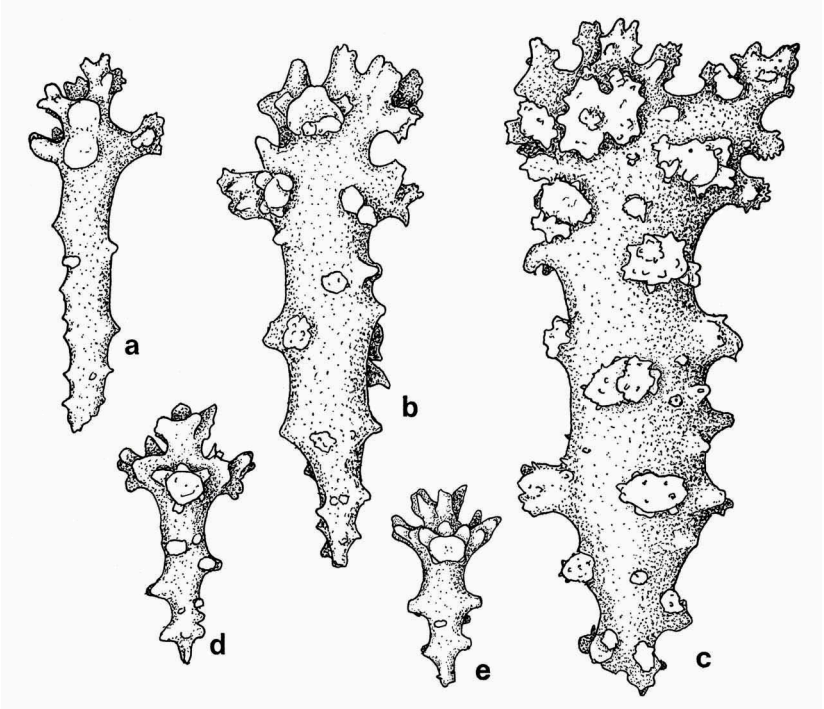

Fig. 23. *Simularia humesi* Verseveldt. a-e, spicules from cortex of the sterile stalk. × 220.

On the lobes the autozooids are numerous, their centres are 1 to 1.5 mm apart. They protrude above the surface like small stars with eight blunt, triangular rays formed by the body-wall. In these rays there are many spicules of the club-shaped type represented in fig. 22 e, f. The tentacles are curved inward over the oral disc; at each side they bear 4 to 6 finger-like pinnules.

In the cortex of the lobes there are small clubs. Those with a knobby handle are 0.12 to 0.16 mm long (fig. 22 a-d). They are less numerous than those with almost smooth handles, which usually vary in length from 0.18 to 0.31 mm (fig. 22 e-g).

The cortex of the sterile stalk contains two types of spicules. (a) Clubs, 0.12 to 0.21 mm long, with a handle which is almost smooth or provided with a few rounded small knobs. In some cases a central terminal wart seems to be

present (fig. 23 a, d, e). (b) Large, wide, more or less club-shaped spicules, 0.24 to 0.38 mm long, with a thick, blunt-ended handle and a head beset with many rough warts (fig. 23 c). Transitional types occur (fig. 23 b).

In the interior of stalk and lobes we find stout, straight or bent spindles, up to more than 3 mm in length and 0.45 mm in width (without warts) (fig. 24 a-c, i, k). Many of them show a distinct constriction in the middle. They are covered with characteristic rounded tubercles, which are beset with very tiny knobs or spines (fig. 24 k-n). These warts are 0.05 to 0.10 mm in diameter, but in the middle of the spicule they are larger, up to 0.15 mm. In addition to these many smaller spindles occur, up to 0.75 mm long, with a distinct waist, and provided with smooth, blunt spines (fig. 24 d-g, h, j). In the lobes the spicules are slightly narrower and more rod-shaped.

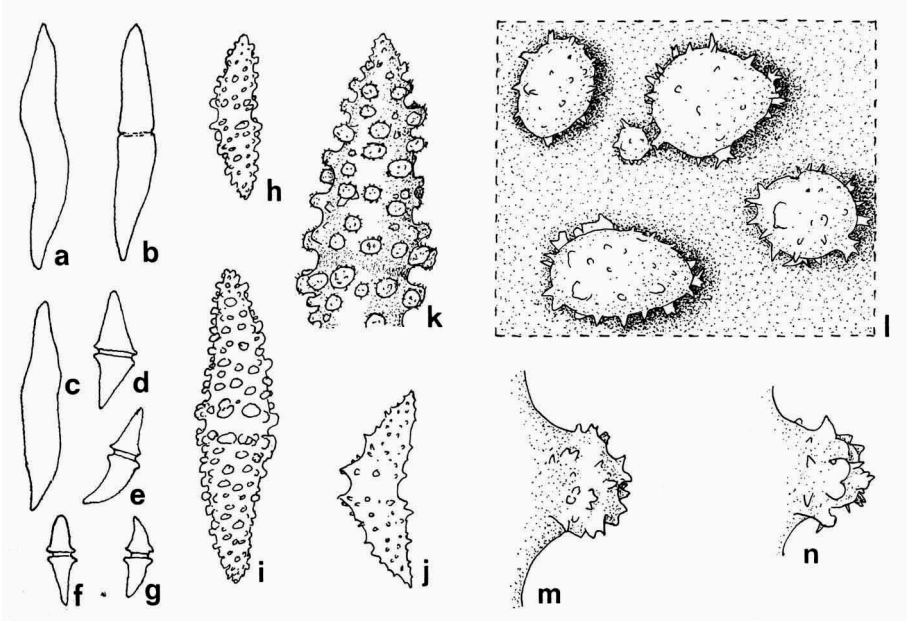

Fig. 24. *Sinularia humesi* Verseveldt. a-j, spicules from interior of the sterile stalk; k, part of a coenenchymal spicule from the sterile stalk; l-n, warts on a coenenchymal spicule from the sterile stalk. a-g, × 11; h-j, × 22; k, × 40; l-n, × 220.

Colour. — In alcohol the colour is greyish white.

Variability. — The paratype is slightly smaller than the holotype, the diameters are 120 mm and 35 to 40 mm, the height is 50 mm. It agrees in all respects with the holotype, only in the cortex of the sterile stalk big cortical clubs as represented in fig. 23 c are absent, and the clubs with smooth handles may be longer, up to 0.32 mm. The colour is identical.

The specimen from RMNH Coel. no. 6665 is large, measuring 165 mm in length, 95 mm in width, and 80 mm in total height. The sterile stalk is 30 to 40 mm high. The primary lobes are up to 50 mm long, the secondary lobes up to about 35 mm. All lobes are stiff, and are spread more or less horizontally over the disc. The lobes and the sterile stalk are granular to the touch. The colour is greyish white.

The five colonies from lot RMNH Coel. no. 6666 look slightly different. They seem to have been torn off, the sterile stalk is absent or only the extreme distal part of it is present. Stalk and lobes are rather weak, not tough, and not so granular to the touch as in the type specimens. The colour is greyish green, the autozooids are green. The coenenchymal spicules are up to 3.70 mm long, sometimes they have side-branches or are ramified at one end. The warts are the same as those in the type-specimens.

Sinularia vrijmoethi nov. spec. (figs. 25-27; pl. 10 fig. 2)

Material. — North of Ankazoberavina, near Nosy Bé, 13°27.6'S., 47°58.2'E., depth 25 m; 24 August 1967. A. G. Humes no. 1326, RMNH Coel. no. 6667. One colony, holotype. Field-note: "Long fingerlike lobes, granular, greyish brown".

West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. A13, RMNH Coel. no. 6668. One small colony, paratype.

Description. — The holotype (pl. 10 fig. 2) has a total height of 85 mm and a maximum spread of the capitulum of 70 mm. The sterile stalk measures 25 mm in height and 42 mm in maximum width; it is grooved longitudinally. It passes imperceptibly into the lobes, consequently a marginal rim is absent. The primary lobes are up to 60 mm in length. At different levels they give off long, digitiform secondary lobes, 20 to 35 mm long and 6 to 9 mm wide. Short knob-like side-branches are also present.

The autozooids are 0.80 mm in diameter, they project for a distance of 0.40 to 0.60 mm above the surface of the lobes, sometimes they appear to be spherical. The armature consists of a crown, three or four rows deep, and composed of curved spiny rods, 0.25 to 0.35 mm long and 0.025 to 0.035 mm wide. This crown is superposed by some club-shaped spicules, 0.17 mm long, and above these we find small rods, 0.07 to 0.10 mm long. The siphonozooids are absent.

In the cortex of the lobes there are heavy clubs, 0.13 to 0.26 mm in length. Sometimes the tuberculated heads have a central wart; the handles are spiny and pointed (fig. 25 a-f). In the sterile stalk the cortical clubs are wider and coarser. Especially in the basal part of the stalk the clubs are stout with thick, strongly warted heads (fig. 26 a-e). They measure up to 0.29 mm in length, the heads are 0.08 to 0.13 mm wide.

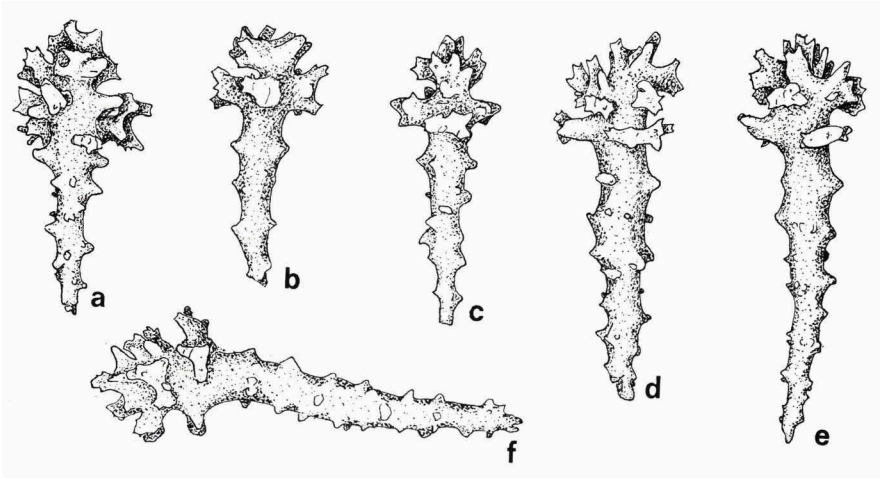

Fig. 25. *Sinularia vrijmoethi* nov. spec. a-f, spicules from cortex of a lobe. × 220.

The interior of the stalk contains spindles usually not longer than 1.80 mm, a few measure up to 2.70 mm; the width is up to 0.37 mm (without warts; 0.46 mm, warts included). Irregularly branched forms are met with (fig. 27 a-i). The spicules are covered with numerous large, coarse warts, 0.07 to

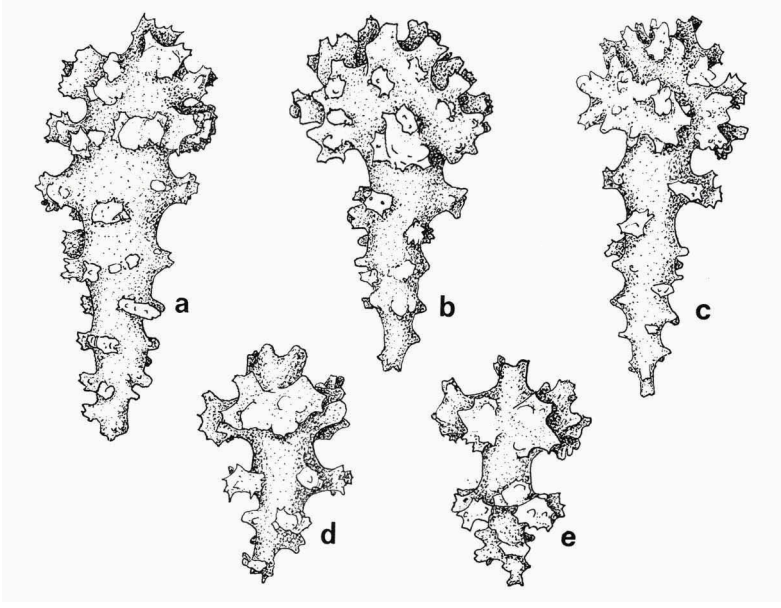

Fig. 26. *Sinularia vrijmoethi* nov. spec. a-e, spicules from basal part of the sterile stalk. × 220.

0.10 mm in diameter (fig. 27 q), they are irregularly distributed. In the lobes the coenenchymal spicules are of the same length, but many of them are more slender, pointed spindles, covered with spines or low cones (fig. 27 j-p).

Colour. — In alcohol the colour is white.

Remarks. — The general shape of the colony is strongly reminiscent of that of *Sinularia humesi* Verseveldt. But in spiculation there are distinct differences. In the lobes of *S. vrijmoethi* the cortical clubs (fig. 25) have

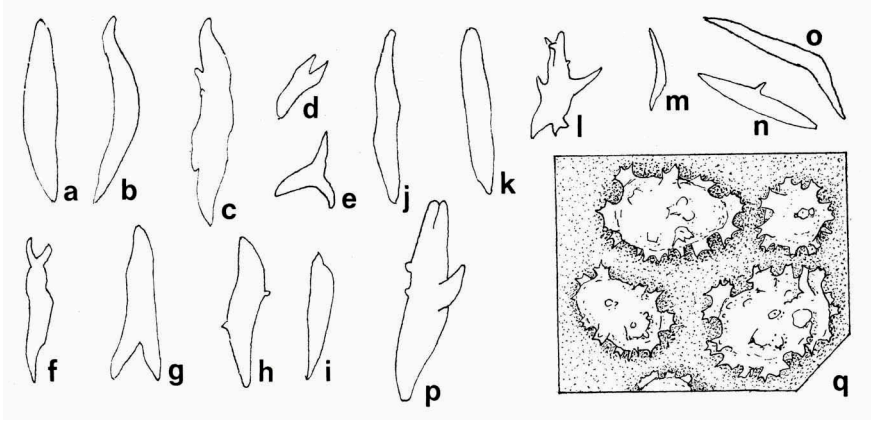

Fig. 27. *Sinularia vrijmoethi* nov. spec. a-i, spicules from interior of the sterile stalk; j-p, spicules from interior of a lobe; q, warts on a coenenchymal spicule from the stalk. a-p, × 11; q, × 220.

wider heads composed of numerous coarse warts, in *S. humesi* the heads are simpler and narrower (fig. 22). In *S. vrijmoethi* the handles have many spines and small warts, in *S. humesi* they are often nearly smooth. In the sterile stalk of *S. vrijmoethi* the clubs have much heavier, wider and coarser heads than those in *S. humesi* (cf. fig. 23 a, d, e with fig. 26 a-e; the more aberrant forms as represented in fig. 23 b, c, have been left out of consideration). In *S. vrijmoethi* the coenenchymal spicules show all kinds of strange forms, whereas the warts are coarser and more spiny than in *S. humesi*. Small, thick spindles with a median constriction as those represented in fig. 24 d-g are abundant in *S. humesi* and scarce in *S. vrijmoethi*.

Sinularia terspilli nov. spec. (figs. 28, 29; pl. 7 fig. 2)

Material. — West of Andilana, Nosy Bé, 13°18'S., 48°07'E., depth 20 m; 24 August 1967. A. G. Humes no. 1333, RMNH Coel. no. 6669. One colony, holotype.

Description. — The colony (pl. 7 fig. 2) measures 120 mm in maximum diameter and 30 to 40 mm in thickness; it is flattened laterally. The total height is about 80 mm, of which 25 to 40 mm go to the encrusting sterile

stalk. Here and there the capitulum has a well-marked marginal seam, the edge of the capitulum slightly projects and curles downwards. But in other places the capitulum passes imperceptibly into the stalk.

The capitulum consists of a number of closely set, broad, flattened primary lobes, measuring up to 55 mm in height. Especially along their edges these primary lobes give rise to secondary and even tertiary lobes; they are short, digitate, rounded, up to 10 mm long and 4 to 6 mm wide. The sterile stalk and the lobes are stiff and granular to the touch.

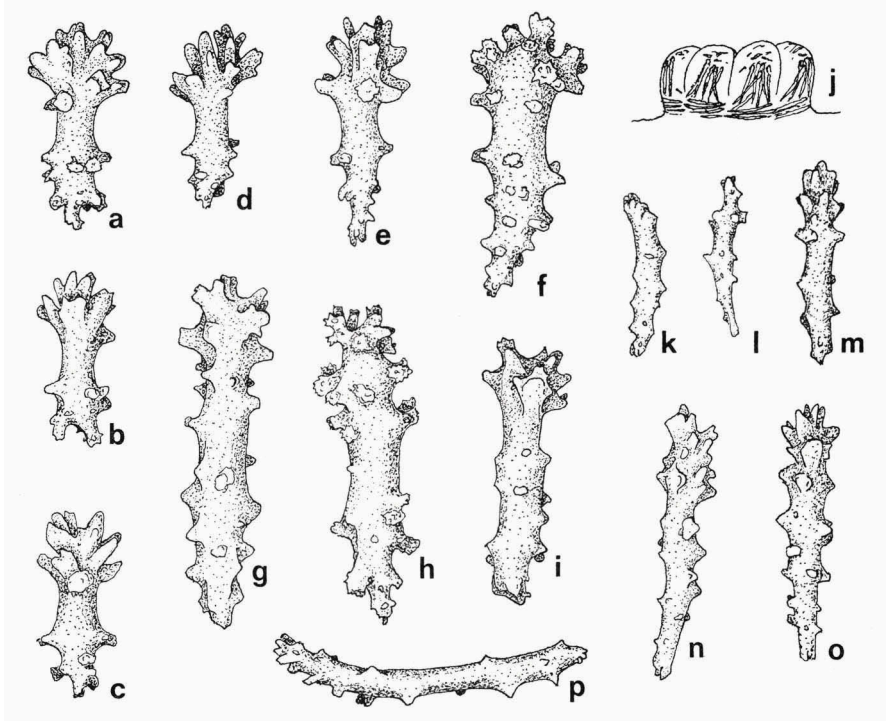

Fig. 28. *Sinularia terspilli* nov. spec. a-i, spicules from cortex of the sterile stalk; j, zooid, side-view; k-p, anthocodial spicules. a-i, k-p, × 220; j, × 35.

In the basal parts of the primary lobes the autozooids are less numerous than in the branches, in the latter the centres are 0.80 to 1.10 mm apart. They are contracted and look like low, white stars, 0.50 to 0.70 mm in diameter; the height is 0.35 mm (fig. 28 j). They are armoured with a crown of more or less rod-shaped spicules, 0.17 to 0.22 mm long (fig. 28 p), two to four rows deep. Above this crown we find club-shaped spicules, 0.12 to 0.17 mm long. They are somewhat longitudinally arranged, the heads being directed upwards

(fig. 28 n, o). Here and there, and also distally from these clubs, smaller, about 0.08 mm long spicules are met with (fig. 28 k-m).

In the cortex of the sterile stalk there are two types of spicules. First we find clubs, 0.09 to 0.14 mm long, with foliated heads and relatively thick handles, which bear a number of warts and spines in the basal part only (fig. 28 a-e). Secondly there are larger spicules, 0.14 to 0.22 mm long, which are club-, rod-, or spindle-shaped, the warts and spines accumulating at one end (fig. 28 f-i). In the cortex of the lobes the same types are found.

The coenenchyme of the sterile stalk contains tuberculate spindles, pointed or blunt-ended, up to 5 mm long. Many of them are irregularly curved or ramified (fig. 29 a-f). In the lobes the coenenchymal spicules are smaller, up to about 3 mm long. They are often fantastically shaped, with all kinds of ramifications (fig. 29 g-n), and covered with large, coarse warts. Those on the spicules in the sterile stalk are largest, 0.07 to 0.12 mm in diameter (fig. 29 o). Sometimes the warts are arranged in transverse rows.

Colour. — The colour of the sterile stalk and the basal part of the lobes is brown, distally the lobes are grey; the zooids are dirty-white.

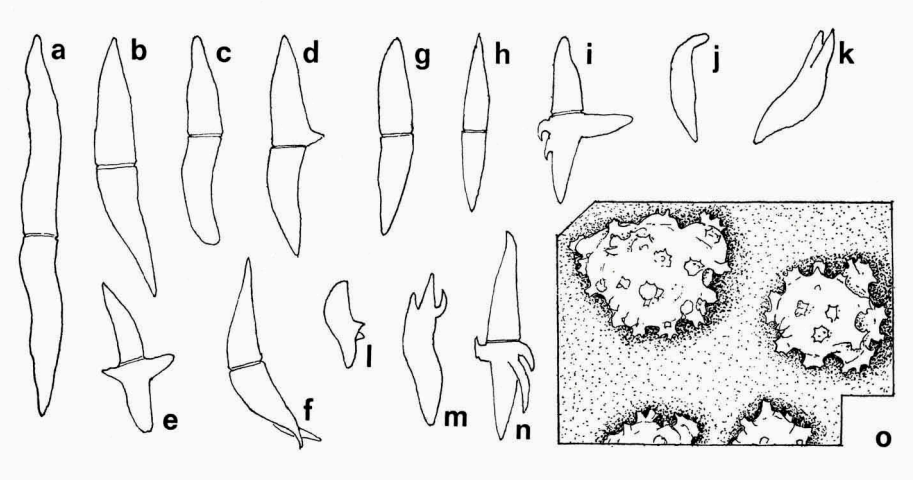

Fig. 29. *Sinularia terspilli* nov. spec. a-f, spicules from interior of the sterile stalk; g-n, spicules from interior of a lobe; o, warts on a coenenchymal spicule from the sterile stalk. a-n, × 11; o, × 220.

Remark. — The shape of the colony and the presence of foliated cortical clubs seem to point to *S. leptoclados* (Ehrenberg, 1834). In the following table some differences between *S. leptoclados* and *S. terspilli* nov. spec. are listed.

Sinularia terspilli	*Sinularia leptoclados*
1. Small cortical clubs 0.09-0.12 mm in length.	1. Small cortical clubs 0.07-0.09 mm in length.
2. Larger cortical clubs with warty or spiny handles.	2. Larger cortical clubs with nearly smooth handles.
3. Coenenchymal spindles often ramified or fantastically shaped.	3. Coenenchymal spindles usually unbranched, rarely forked.
4. Warts on coenenchymal spicules large, 0.07-0.12 mm in diameter.	4. Warts on coenenchymal spicules small, 0.03-0.06 mm in diameter.

Besides *S. leptoclados* several other *Sinularia* species with foliated cortical clubs have been described. But from these our colony also differs.

Sinularia arborea nov. spec. (figs. 30, 31; pl. 10 fig. 1)

Material. — Opposite Ampombilava, Nosy Bé, depth 2 m; 7 July 1967. A. G. Humes no. 1136, RMNH Coel. no. 6670. One colony, holotype RMNH Coel. no. 6671. Three colonies, paratypes. Field-note: "Rather stout stalks, tips with short brown knobs".

Tany Kely, a small island to the south of Nosy Bé, depth 20 m; 20 December 1963. J. H. Stock no. 781, ZMA Coel. no. 5571. Two small colonies.

The same locality, depth 23 m; 30 June 1967. A. G. Humes no. 1124, RMNH Coel. no. 6672. Eight specimens. Field-note: "Greyish brown, stalks fleshy, tips with many short branches".

Pointe Lokobe, Nosy Bé, depth 2 m; 3 June 1967. A. G. Humes no. 1043, RMNH Coel. no. 6673. One colony. Field-note: "Fleshy white base, stalks tipped with short branches speckled with brown".

West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1206, RMNH Coel. no. 6674. Six colonies. Field-note: "Fairly short tough greyish stalks, tips with many short hard small branches".

Opposite Andjiabe, Nosy Komba, near Nosy Bé, depth 13 m; 2 September 1967. A. G. Humes no. 1375, RMNH Coel. no. 6675. Sixteen colonies. Field-note: "Grey". A. G. Humes no. 1376, RMNH Coel. no. 6676. Seven colonies. Field-note: "Tough stalk, greyish white, branches rather slender, short and greenish".

Banc de Dzamandzar, Nosy Bé, depth 20 m; 30 August 1967. A. G. Humes no. A31, RMNH Coel. no. 6677. Four colonies.

Description. — The holotype (pl. 10 fig. 1) measures 115 mm in total height. The base of the sterile stalk slants; owing to this the stalk measures 80 mm in height on one side and 60 mm on the other. It is hard, flattened, and longitudinally grooved. A basal line is present.

The capitulum has a maximum spread of 75 mm. It consists of a number of stiff primary lobes, 30 to 40 mm long and 7 to 10 mm wide at the base. They bear stiff, finger-like, tapering side-branches and twigs, mostly 8 to 10 mm long, but varying in length from 2 to 12 mm; at the base they are 2 to 3 mm wide.

On the primary lobes the autozooids are scarce, on the side-lobes and the

twigs they are closely set, the centres being 0.40 to 1.00 mm apart. They are small, only 0.50 mm in diameter, sometimes they are fully retracted. The anthocodial spicules are clubs, 0.15 to 0.22 mm long. They are identical with the cortical clubs described below, but narrower. Only in the basal part of the tentacles a few tiny, rod-shaped spicules occur, 0.050 to 0.085 mm long.

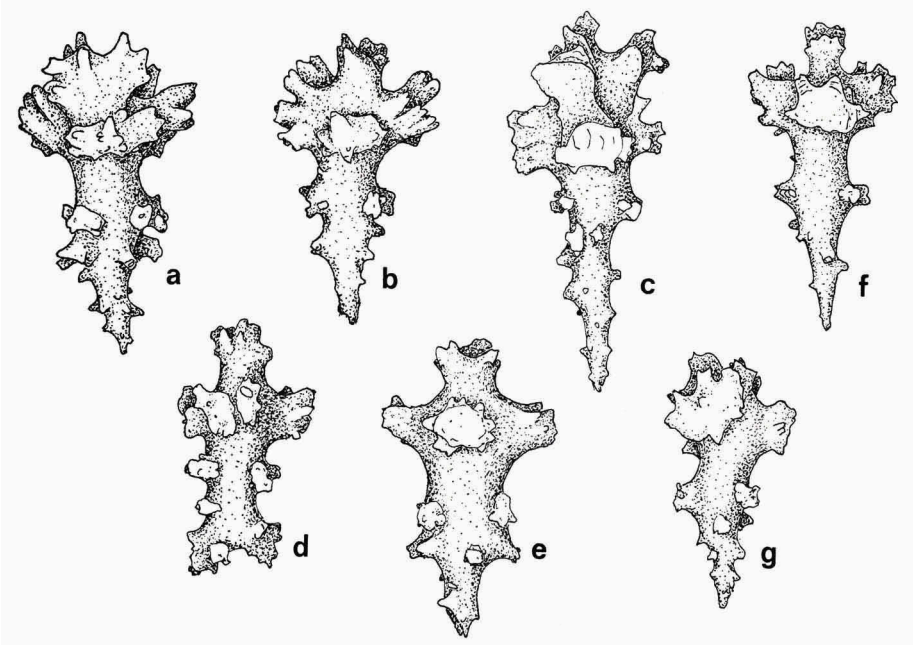

Fig. 30. *Sinularia arborea* nov. spec. a-e, spicules from cortex of the basal part of the sterile stalk; f, g, spicules from cortex of the distal part of the sterile stalk. × 220.

The cortex of the sterile stalk and of the lobes and twigs contains everywhere the same spicules, viz., stout clubs, 0.15 to 0.22 mm in length (fig. 30 a-c, e-g). The heads are up to 0.10 mm wide and beset with coarse warts; sometimes a central wart is present (fig. 30 f). The handle is thick, warty, and pointed. In addition warty rods (fig. 30 d) and transitional types between rods and clubs are present.

In the interior of sterile stalk and lobes straight or irregularly curved, pointed or blunt-ended spindles are present (fig. 31 a-c). There are, however, also numerous irregularly shaped spicules, derivable from spindles, often with ramifications at one or at both ends (fig. 31 d-j). They are up to 6.50 mm long, the width is up to 0.90 mm, warts included. The majority of the spicules are constricted in the middle. They are densely covered with warts, mostly 0.05 to 0.06 mm in diameter (fig. 31 k).

Colour. — The colony is creamy white.

Variability. — The three paratypes show the same remarkable habitus, viz., a long, slender sterile stalk and a rather small, strongly branched capitulum. The colour is the same. The specimens from RMNH Coel. no. 6675 and 6676 are rather small, mostly measuring 50 to 75 mm in height. The colony from RMNH Coel. no. 6673, however, is a large one. It measures 130 or 150 mm in maximum diameter, the height is 100 mm. It consists of a common basal part, from which four stout sterile stalks and a few smaller ones arise, each of them bearing a capitulum. The common base and the stalks are rather weak, though granular to the touch. The specimens from lot RMNH Coel. no. 6677 have a less branched capitulum.

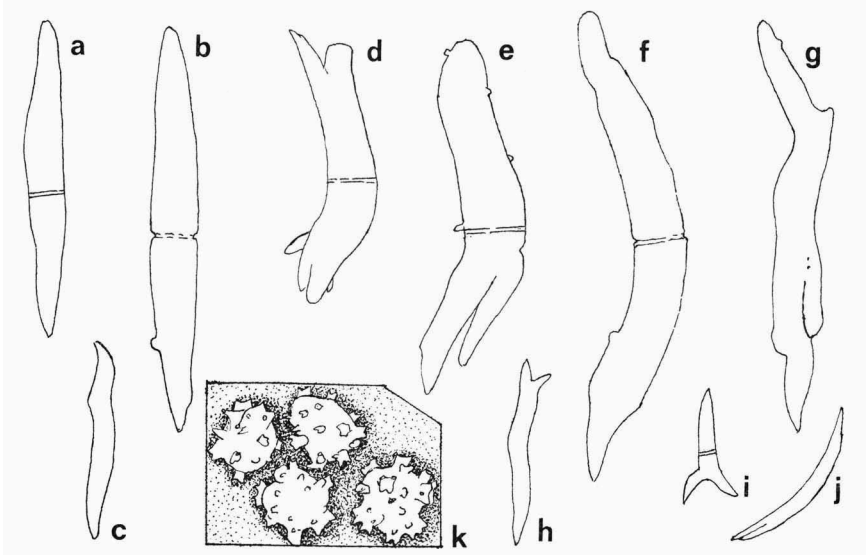

Fig. 31. *Sinularia arborea* nov. spec. a-j, spicules from interior of the sterile stalk; k, warts on a coenenchymal spicule from the sterile stalk. a-j, × 11; k, × 220.

Remark. — The species seems nearest to *S. lochmodes* Kolonko in having small, finger-like branches and twigs, but in *S. lochmodes* they are smaller (Kolonko, 1926: 300: up to 5 mm), and the spiculation is different.

Sinularia heterospiculata Verseveldt, 1970 (pl. 11 fig. 1)

Sinularia heterospiculata Verseveldt, 1970: 165-168, figs. 1-3.

Material. — North of Ankazoberavina, near Nosy Bé, depth 25 m; 24 August 1967. A. G. Humes no. 49, RMNH Coel. no. 6600. One colony, holotype.

Remark. — The colony has fully been described recently. Suffice it to give a photograph of the colony (pl. 11 fig. 1).

Geographical distribution. — The species has also been discovered in the ulf of Elat (Red Sea).

Sinularia minima nov. spec. (figs. 32, 33; pl. 12 fig. 2)

Material. — Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 15 m; 1 September 1967. A. G. Humes no. 1370, RMNH Coel. no. 6678. One colony, holotype. RMNH Coel. no. 6679. Seven colonies, paratypes. Field-note: "Hard, grey".

Description. — All eight colonies are rather small. The total height varies from 40 to 57 mm, the height of the sterile stalk varies from 20 to 34 mm and its width from 15 to 28 mm. I chose the largest specimen as the holotype (pl. 12 fig. 2). It measures 57 mm in total height, the sterile stalk is 34 mm high and 27 mm wide in the middle, it widens basally and distally. There is no marginal seam separating the capitulum from the stalk. The capitulum consists of a number of densely set, short, thick, often branched lobes, 4 to 8 mm long and 3 to 7 mm wide. The marginal lobes may be bent downwards. The whole colony is hard and stiff.

The autozooids are often completely retracted, the centres are 0.90 to 1.10 mm apart. When the zooids are not retracted, only the tentacles are visible. The latter contain very tiny needles and spiny, sometimes flattened rods, 0.030 to 0.045 mm long (fig. 32 k). Siphonozooids are absent.

In the cortex of the lobes we find clubs varying in length from 0.10 to 0.20 mm (fig. 32 a-f). A central wart is usually present. In the larger clubs the handles may be nearly smooth. In the cortex of the sterile stalk the clubs are thicker (fig. 32 g-j), the length varies from 0.10 to 0.15 mm. Especially those with a length of 0.10 mm are numerous. Clubs with smooth handles are absent.

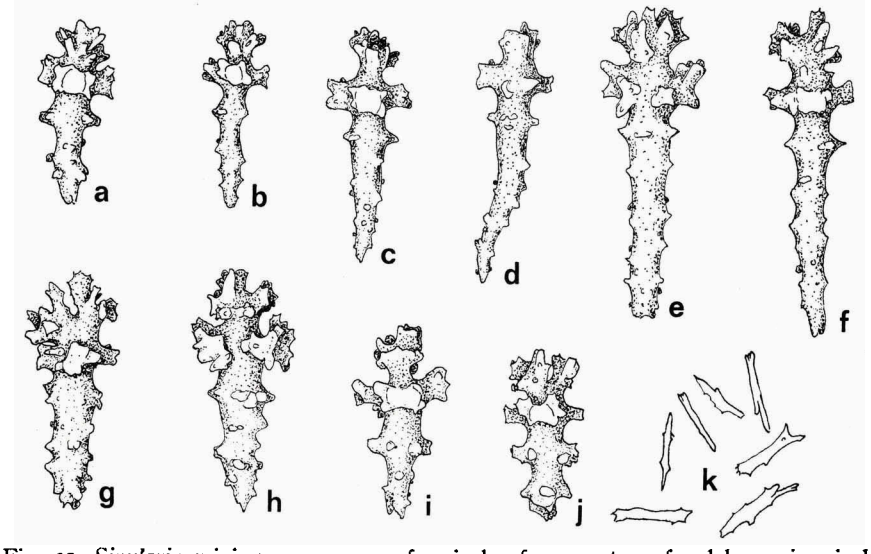

Fig. 32. *Sinularia minima* nov. spec. a-f, spicules from cortex of a lobe; g-j, spicules from cortex of the sterile stalk; k, spicules from the tentacles. × 220.

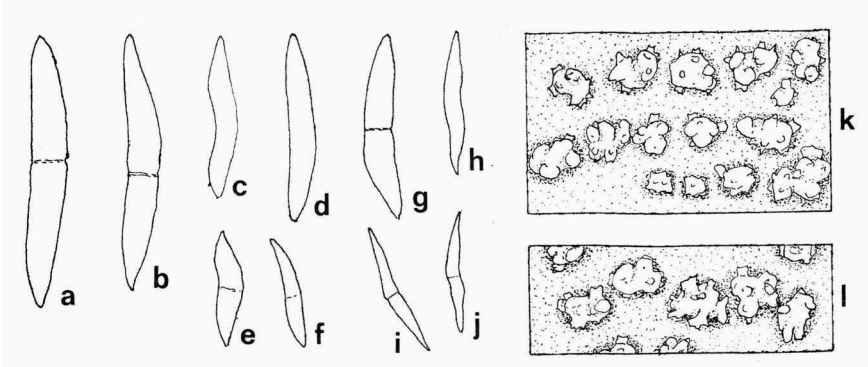

Fig. 33. *Sinularia minima* nov. spec. a-f, spicules from interior of the sterile stalk; g-j, spicules from interior of a lobe; k, l, warts on a coenenchymal spicule from the sterile stalk. a-j, × 11; k, l, × 220.

In the interior of the lobes and the sterile stalk spindles occur; those in the lobes (fig. 33 g-j) are shorter (up to 2.70 mm in length) than those in the sterile stalk (fig. 33 a-f), which measure up to 3.40 mm; the width of the latter is 0.44 mm (warts included). They are pointed or blunt-ended, warty spindles, sometimes slightly constricted in the middle. The spiny warts are small, 0.030 to 0.045 mm in diameter (spines included), but often they are still smaller, 0.020 to 0.030 mm. Usually they are regularly arranged in transverse rows (fig. 33 k), but sometimes they are irregularly placed (fig. 33 l).

Colour. — The colony is brown to nearly black.

Variability. — The paratypes are slightly smaller. For the rest they agree in all respects with the holotype.

Remark. — The species is characterized by the small size of the colony, the erect sterile stalk, the small lobes, and the shape and dimensions of the cortical clubs.

Sinularia maxima nov. spec. (figs. 34, 35; pl. 12 fig. 1)

Material. — Opposite Andjiabe, Nosy Komba, near Nosy Bé, depth 13 m; 2 September 1967. A. G. Humes no. A38, RMNH Coel. no. 6680. One colony, holotype. RMNH Coel. no. 6681. One colony, paratype.

Pointe Lokobe, Nosy Bé, depth 1 m; 12 June 1967. A. G. Humes no. 1076, RMNH Coel. no. 6682. Two colonies. Field-note: "Massive tough base with long branched finger-like erect lobes, brownish grey".

Description. — In the holotype (pl. 12 fig. 1) the sterile stalk and especially the lobes are strongly bent to one side. Measured along the outside of the curved colony the total height is about 210 mm, of which 90 mm go to the stalk and 120 mm to the lobes. The stalk is oblique; at one side it measures 90 mm in height, at the other side 30 mm. It is grooved longitudinally. The

capitulum consists of lobes which are uncommonly robust. The wide primary lobes give rise to some blunt-ended secondary ones, 15 to 50 mm long and 6 to 12 mm wide. The sterile stalk and the lobes are rather weak, and soft to the touch.

The sterile stalk gradually passes into the capitulum, a basal line is absent. At first the autozooids are rather scarce, but on the lobes they are more densely packed, the centres being 1.00 to 1.40 mm apart. The anthocodiae are short and flat (fig. 34 a, b). The diameter is 0.70 to 0.85 mm, the height is 0.30 mm. The tentacles, which look like rounded lobes, encircle the oral disc, in the centre of the latter is the oval mouth-opening. At each side the tentacles have about six small, rounded pinnules (fig. 34 c). The anthocodial armature consists of a crown, three to five rows deep, and lying in the narrowed zone below the tentacles. Its spicules are slightly curved, spiny rods, 0.12 to 0.15 mm long (fig. 34 d-f). The crown is superposed by a number of club-shaped rods, more or less longitudinally arranged, and 0.09 to 0.13 mm long (fig. 34 g-i).

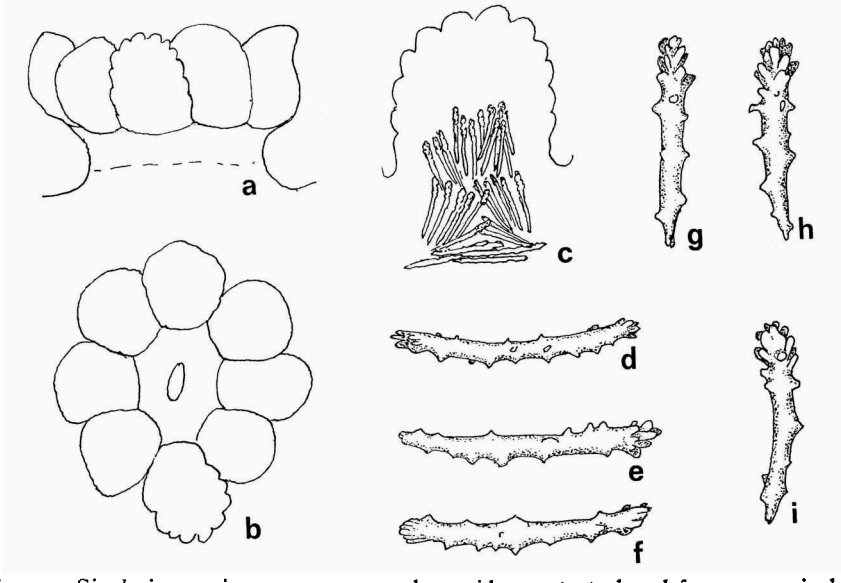

Fig. 34. *Sinularia maxima* nov. spec. a, b, zooids; c, tentacle; d-f, crown spicules; g-i, point spicules. a, b, × 40; c, × 65; d-i, × 220.

The outermost cortical layer of the sterile stalk has small clubs, 0.06 to 0.08 mm long, a few are 0.10 mm long (fig. 35 a-g). The heads of the clubs consist of longitudinally placed, leaf-like prominences with lobate edges. In most of these clubs the handles have only one whorl of spines near the base. Just under this outer cortical layer we find relatively thick, spiny spindles,

0.14 to 0.20 mm long (fig. 35 l, m); they can be considered as transitional forms to the coenenchymal spicules. The cortex of the lobes contains the same clubs as those in the stalk, but slightly more inward we find thin, spiny needles, 0.17 to 0.30 mm long (fig. 35 h-k).

In the interior of the stalk there are pointed spindles, straight or curved, and strongly varying in length. The larger ones are up to 3.30 mm in length and 0.47 mm in width (without warts; 0.55 mm, warts included) (fig. 35 n, o). The warts are large and spiny and densely placed, the diameter is up to 0.10 mm (fig. 35 s). In the lobes the coenenchymal spicules are as long as those in the stalk, but they are narrower, up to 0.34 mm wide (fig. 35 p, q).

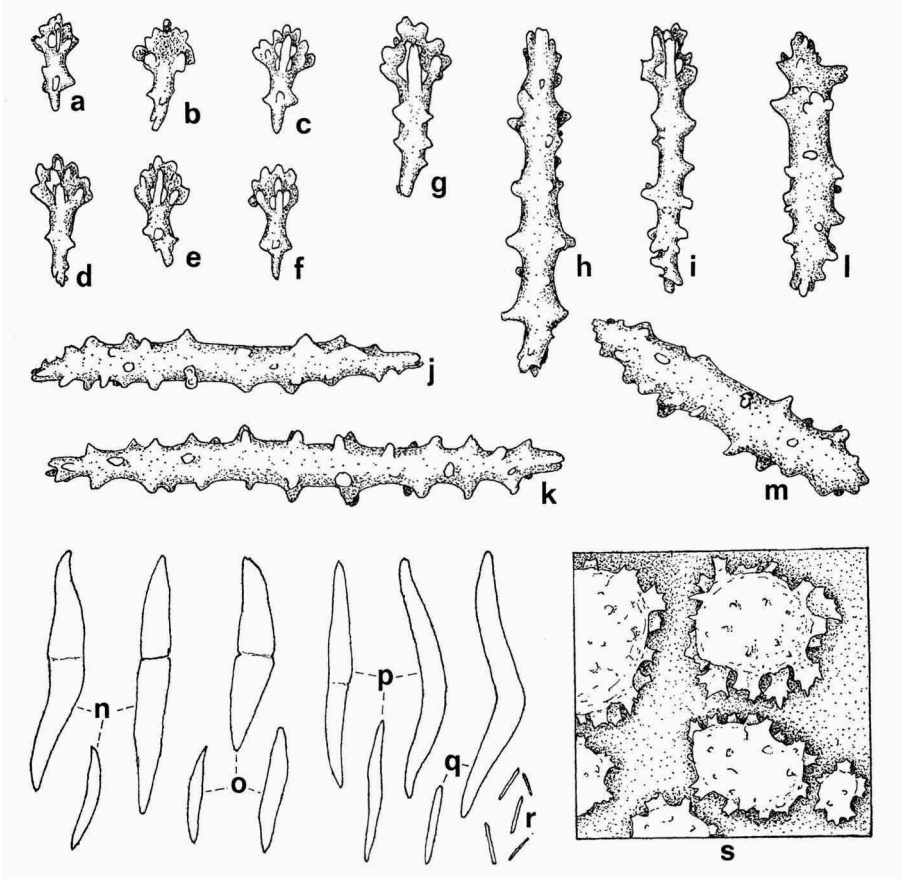

Fig. 35. *Sinularia maxima* nov. spec. a-g, spicules from cortex of the sterile stalk; h-k, spicules from cortex of a lobe; l, m, transitional forms to coenenchymal spicules in the sterile stalk; n, o, spicules from interior of the sterile stalk; p-r, spicules from interior of a lobe; s, warts on a coenenchymal spicule from the sterile stalk. a-m, × 220; n-r, × 11; s, × 220.

Some of them are provided with warts, which are less densely packed, but many others have blunt spines or low cones, a few are almost smooth. In addition to these there are numerous thin, spiny needles, 0.25 to 0.50 mm long (fig. 35 r).

Colour. — In some parts the colony is grey, in other parts the colour shades into dark grey and black.

Variability. — The paratype is slightly smaller, the sterile stalk is shorter, on one side of the colony the stalk is absent.

The specimens from RMNH Coel. no. 6682 are very large. One of them measures 190 mm in height, the diameters are 160 mm and 60 to 70 mm; the colony is flattened laterally. The colony seems to have been cut off, for a sterile basal part is absent. The other colony has the same height, viz., 190 mm, but the diameters are 95 mm and 70 mm. Both specimens differ from the holotype in the anthocodial armature: crown and points are absent, there are only a few spicules, which are arranged irregularly. In the coenenchyme of the common stalk the spindles are slightly larger: up to 4 mm long and 0.55 mm wide (without warts; 0.63 mm, warts included). For the rest there is full agreement.

Remark. — This new species agrees in some respects with Tixier-Durivault's descriptions (1951, 1966) of *Sinularia querciformis* (Pratt). Especially the clubs with the foliate heads are identical, they have the same length, viz., 0.08 mm. However, Pratt (1903: 530) records that the length of the clubs "near the surface" is 0.20 to 0.26 mm. She did not mention the leaf-clubs with a length of 0.06 to 0.08 mm. At any rate our specimens differ from the colonies described by Pratt and Tixier-Durivault in the weakness of the colonies, in the length and width of the primary and secondary lobes, and in the length of the coenenchymal spicules in the stalk.

Nidaliidae Gray, 1869 (emend. Utinomi, 1958)

Siphonogorgia Kölliker, 1874

Siphonogorgia pichoni nov. spec. (figs. 36, 37; pl. 13)

Material. — South of Andjiabé, Nosy Komba, near Nosy Bé, depth 10-12 m; 30 July 1964. Collected by M. Pichon. A. G. Humes no. 897, RMNH Coel. no. 6853. One large colony, holotype, and some fragments. Field-note: "Stalk cream-white, polyps bluish".

Banc de Dzamandzar, Nosy Bé, depth 20 m; 16 September 1964. A. G. Humes no. 925, RMNH Coel. no. 6854. One slightly smaller colony (paratype) and five branches. Field-note: "Stems white".

Near black buoy in pass north of Pointe Ambarionaomby, Nosy Komba, depth 17 m; 5 August 1967. A. G. Humes no. 1222, RMNH Coel. no. 6856. A number of branches, up to about 250 mm long; A. G. Humes no. R1222, RMNH Coel. no. 6873. Two complete colonies, 150 to 180 mm long. Field-note: "Stems white, short side-branches reddish brown with bluish polyps when alive, large arborescent flat colony".

Tany Kely, a small island to the south of Nosy Bé, depth 25 m; 14 August 1967.

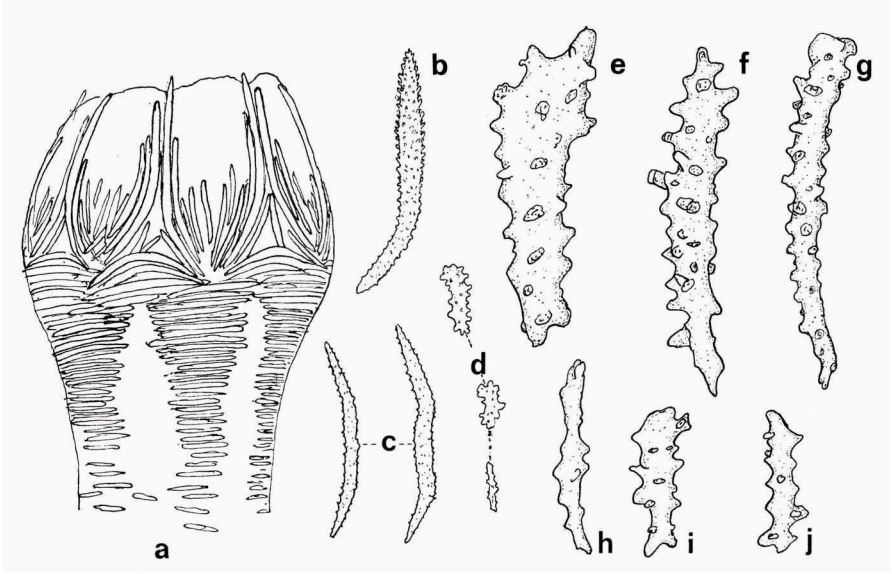

Fig. 36. *Siphonogorgia pichoni* nov. spec. a, anthocodia; b, point spicule; c, crown spicules; d-j, spicules from the tentacles. a, × 50; b-d, × 65; e-j, × 220.

A. G. Humes no. 1267, RMNH Coel. no. 6855. A number of fragments, up to 300 mm long. Field-note: "Cream coloured main branches, dark red smaller branches".

Description. — The holotype measures 270 mm in total height. It has a basal expansion with diameter of 60 and 75 mm. Just above this expansion, at a height of 10 to 20 mm, a number of main branches arise, which have grown in all directions. Usually they are 4 to 20 mm wide, a few are wider. They ramify more and more in a tree-like manner. The thinner branches are flattened and grooved longitudinally. The branches bear numerous twigs, which are up to about 20 mm long, their width is 1 to 2 mm. Only the twigs are beset with zooids. Here and there the branches bear small groups of zooids, but such groups may be regarded as small twigs. At the tips of the twigs the zooids are more crowded. The distal parts of the branches and also many twigs are bent downwards, giving the whole colony the appearance of a "weeping willow". If the branches stood upright the total height of the colony would measure about 450 mm.

On the outside the zooids are protected by a kind of calyx, which is attached obliquely to the twig. It consists of a number of longitudinally placed spindles, 1 to 1.5 mm long, and united into two bundles. One could speak of two supporting bundles of the weak or ensheathing type. Of each bundle a few spindles project above the edge of the calyx for a distance of about 0.40 mm.

The anthocodiae may be retracted within the calyces, but they may also protrude for a distance of 0.80 to 1.20 mm. Each anthocodia consists of a narrower neck-zone, 0.50 to 0.60 mm wide, and a broader upper part, 0.90 mm wide (fig. 36 a). The armature consists of a crown of numerous, transversely arranged spindles. The distalmost spindles are the largest, measuring about 0.45 mm in length (fig. 36 c). Towards the neck-zone they gradually become smaller, 0.06 to 0.16 mm long. Here they are arranged in eight strips. In the aggregate the crown is 25 to 30 rows deep.

The crown is superposed by eight points, each composed of three or four pairs of spicules. One of these is the largest, rarely up to 0.65 mm long, usually not longer than 0.50 mm. It is slightly hockeystick-shaped, the thickened tip-part is provided with stronger spines (fig. 36 b). Between each pair of points we find three to six intermediates, which are arranged in a more or less fan-like manner.

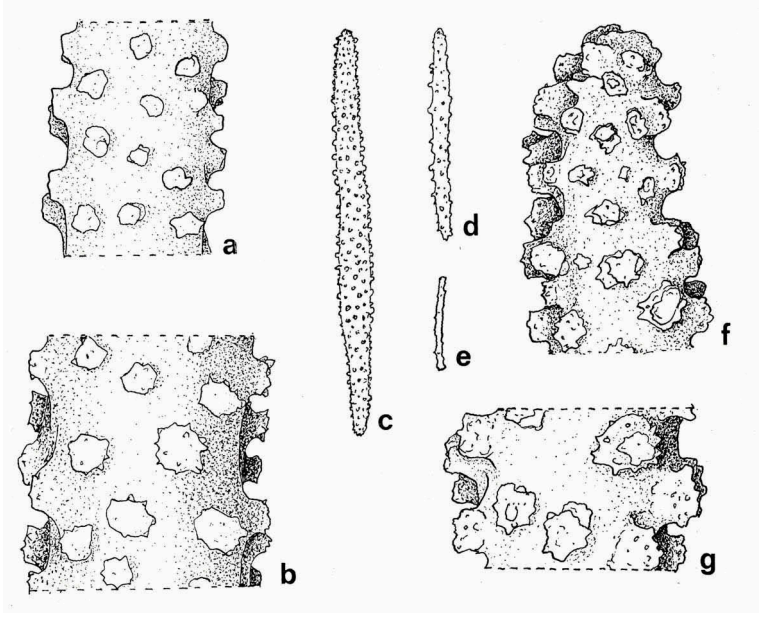

Fig. 37. *Siphonogorgia pichoni* nov. spec. a, b, parts of spicules from cortex of a narrow branch; c-e, spicules from cortex of a thick branch; f, g, parts of these spicules. a, b, f, g, × 220; c-e, × 50.

Anthocodial formula: Incompletely retractile = 1P + (2-3)p + (25-30) Cr + (1½-3)M.

The retracted tentacles are up to 0.8 mm long. They are white but the spicules in them are red. The latter are 0.10 to 0.22 mm long (fig. 36 d-j).

In the transversely folded stomodaeum we find numerous tiny, red spindles, 0.06 to 0.08 mm long.

The cortical layer of the stem and of the main branches contains thin spindles and rods, up to 1.90 mm long and 0.13 mm wide. They are covered with warts or truncated cones (fig. 37 c-g). Besides, we find small rods and spindles, which may be smooth or provided with tiny spines. They measure 0.12 to 0.20 mm in length.

In the interior of stem and branches there are the same large spindles, usually irregularly curved, up to 2.80 mm long and 0.22 to 0.25 mm wide, sometimes as wide as 0.30 mm, and, besides, the same small rods as in the cortex.

In the thinner branches the cortical spicules are arranged longitudinally. They are slender spindles and needles with truncated cones (fig. 37 a), sometimes the prominences are more wart-like with tiny spines (fig. 37 b). The spicules measure up to 2.3 mm in length and usually 0.09 to 0.12 mm in width, a few are 0.17 mm wide (0.21 mm, prominences included). In the interior of these branches the canal-walls (which are very thin) have a few spindles and needles, which are smaller than those in the cortex. Besides, there are many tiny rods such as described above.

In the cortex and in the interior of the twigs the spiculation is the same as that in the thin branches, only the spicules in the cortex are shorter, up to 1.5 mm long.

In the hard, thick stems and branches the canals are about seven in number; they vary in width, and are separated by thick, hard walls. In the secondary and tertiary branches the canal-walls are thin.

Colour. — In alcohol the colour of the stem and the main branches is creamy white, here and there covered with a purplish tint. Apically the colour of the branches becomes more and more purplish. The twigs are purplish, too; the zooids are purplish-crimson. The tentacles are seen as white spots. In a cross section of the thicker branches the colour varies from creamy-white to violet; sometimes the outer layer is violet, the central part is white.

Variability. — The paratype (RMNH Coel. no. 6854) is a beautiful colony; it is slightly smaller than that described above. The total height is 200 mm, the breadth is 125 mm. It is laterally flattened, as the main branches arising from the base expand in one plane. Moreover, this lot contains eight broken branches varying in length from 120 to 240 mm. A remarkable fragment is a thick branch, as much as 35 to 40 mm wide at the base. It bears only some small and narrow branches with twigs, the other ramifications being broken off.

All colonies and fragments have the same colour.

Remarks. — At first I was of the opinion that the specimens belonged to *Siphonogorgia pendula* Studer, for in many respects they agree with this species. Also with *S. variabilis* (Hickson) it shows much resemblance. There are, however, important differences between the present new species and those just mentioned, especially as regards the anthocodial armature: in our species the crown is 25 to 30 rows deep, and the points are composed of up to four pairs of spindles.

Humes & Ho (1968) recorded that two of their new species of *Lichomolgus* (cyclopoid copepods) were associated with *Siphonogorgia pendula* Studer, basing that statement on my identification of the host (Humes & Ho, 1968: 694, 713, 719). I regret to say, however, that my information was incorrect. The name of this host must be *Siphonogorgia pichoni.*

Xeniidae Ehrenberg, 1828

Anthelia Lamarck, 1816

Anthelia glauca Lamarck, 1816 (fig. 38)

Anthelia glauca Lamarck, 1816: 407; Savigny, 1817, pl. 1 figs. 4-7; Ehrenberg, 1834: 54; Klunzinger, 1877: 45; Kükenthal, 1904: 43-47; Thomson & Mackinnon, 1910: 170-

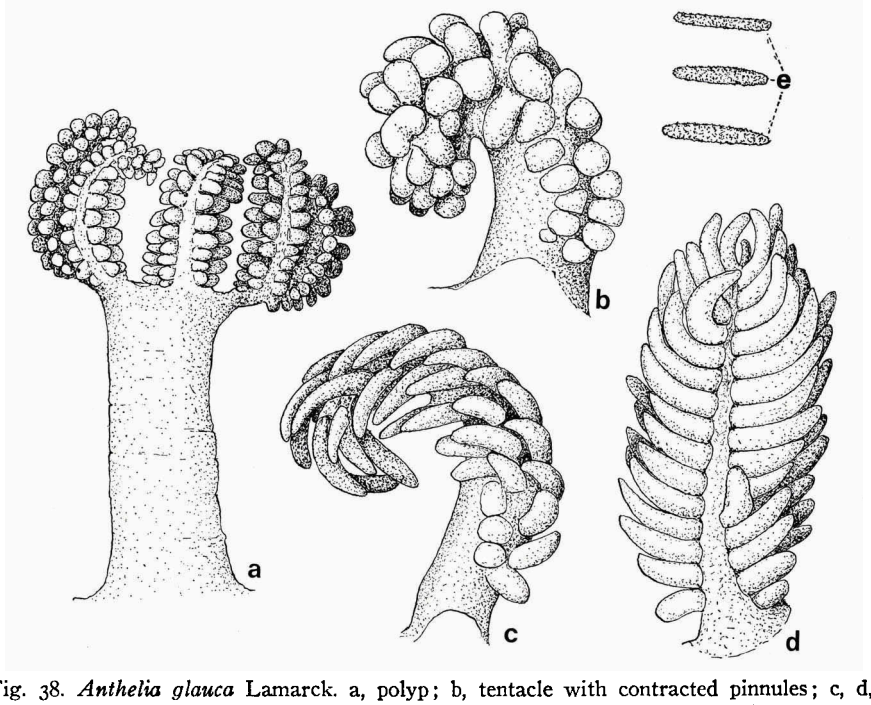

Fig. 38. *Anthelia glauca* Lamarck. a, polyp; b, tentacle with contracted pinnules; c, d, tentacle with more expanded pinnules, c, side-view, d, aboral side; e, spicules. a, × 9; b-d, × 19; e, × 180.

171; Molander, 1921: 6; Thomson & Dean, 1931: 9-10; Roxas, 1933: 67-68; Gohar, 1940a: 88-91, fig. 9, pl. 3a; Verseveldt, 1960: 247-248; Tixier-Durivault, 1960: 361; 1966: 349-451, fig. 318.

Anthelia strumosa Ehrenberg, 1834: 54; May, 1899: 42-43, pl. 1 fig. 2.

Clavularia garciae Hickson, 1894: 341-342, pl. 46.

Clavularia pulchra Thomson & Henderson, 1906a: 405.

Material. — Nosy Ovy, Radama Islands, 13°59'S., 47°48'E., depth 8 m; 30 September 1964. A. G. Humes no. 953, RMNH Coel. no. 6683. Some colonies.

West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1207, RMNH Coel. no. 6684. Some specimens. Field-note: "Slender soft white stalks 1.5" long with crowns of pinnate brown branches".

Banc des Frères, Isles Mitsio, N.E. of Nosy Bé, 12°58'S., 48°28'E., depth 24 m; 17 August 1967. A. G. Humes no. A6, RMNH Coel. no. 6685. Three colonies.

Remarks. — The specimens from RMNH Coel. no. 6683 and 6684 show nothing particular.

The specimens from RMNH Coel. no. 6685 are strongly contracted. The stiff tentacles are bent towards the mouth (fig. 38 a, b). In the majority of the polyps the pinnules are short, thick lobes, but in a few the pinnules are longer, finger-shaped, tapering to the tip (fig. 38 c, d). Another remarkable thing is that these specimens have uncommonly long spicules: up to 0.08 mm long (fig. 38 e). However, Gohar (1940a: 90) records that in *A. glauca* the spicules are 0.04 to 0.08 mm long. In this respect, too, *A. glauca* is a very variable species.

Geographical distribution. — The species has previously been recorded from the Red Sea and some localities in the Indian and the Pacific Oceans.

Anthelia ternatana (Schenk, 1896)

Clavularia ternatana Schenk, 1896: 45-48, pl. 3 fig. 27.

Anthelia ternatana, Thomson & Dean, 1931: 10-11, pl. 14 fig. 2.

Material. — Banc du Touareg, Bay of Ampasindava, near Nosy Bé, depth 18 m; 11 July 1967. A. G. Humes no. 1152, RMNH Coel. no. 6686. One colony. Field-note: "Long slender fleshy stalks with crown of prominent greenish feathered branches at tip".

Description. — The membranous base spreads over a piece of coral. It is 1 mm thick.

The polyps are densely crowded, up to 30 mm long (without the tentacles), and strongly flattened. In this state they are about 10 mm wide; if the anthocodiae were not flattened (or compressed?), they would have a diameter of about 6 mm. One young and small anthocodia is not flattened, it measures 2 to 3 mm in width. The anthocodial walls are so thin that the mesenteries can be seen through the transparent wall.

The slender tentacles (the "prominent greenish feathered branches" mentioned in the field-note) are very long: 15 to 20 mm; at the base they are

1.20 mm wide. On each side of the tentacle there is one row of 40 to 50 pinnules. Proximally we see a feeble attempt to form two rows. The pinnules are curved cylinders, sometimes slightly tapering, with blunt tips; their length is 1.20 to 1.40 mm, the width is 0.25 to 0.30 mm.

The basal membrane, the walls of the polyps, the tentacles and the pinnules contain numerous spicules of the ordinary type: minute, granulated rodlets, 0.04 to 0.05 mm long and 0.014 mm wide.

Colour. — The colony is whitish to light brown.

Geographical distribution. — The species has previously been recorded from some localities in the Malay Archipelago.

Anthelia gracilis (May, 1898)

Clavularia gracilis May, 1898: 7-8; 1899: 41-42; Thomson & Henderson, 1906a: 402-403. *Anthelia gracilis*, Molander, 1921: 7; Roxas, 1933: 63 (in the "key").

Material. — Antsakoabé, Nosy Bé, depth 0.5 m; 12 July 1964. A. G. Humes no. 888, RMNH Coel. no. 6687. Six colonies or fragments. Field-note: "On *Cymodocea* stems; colour bluish".

Description. — In all respects the specimens agree with the description of the type by May. However, the distal funnel-shaped widening as recorded by May is usually absent (cf. Thomson & Henderson, 1906a: 402). The zooids, usually less than 10 mm, taper distally: at the base the width is 1.5 mm, just below the tentacles the width is 0.5 mm. Sometimes a part of the zooid-wall is vesiculate.

The field-note records: "on *Cymodocea* stems", but one of the colonies is attached to a stone (piece of coral?).

Colour. — In alcohol the colonies are brown.

Geographical distribution. — Previous material has been recorded from Mozambique and Zanzibar.

Cespitularia Milne Edwards & Haime, 1850
Cespitularia erecta Macfadyen, 1936 (pl. 14 fig. 1)

Cespitularia erecta Macfadyen, 1936: 26-27, pl. 4 fig. 7.

Material. — Banc de Cinq Mètres, near Nosy Bé, depth 25 m; 18 June 1967. A. G. Humes no. 1092, RMNH Coel. no. 6688. One colony. Field-note: "Fleshy white stalk, bluish distally, branches light tan".

The same locality, depth 15 m; 9 July 1967. A. G. Humes no. 1140, RMNH Coel. no. 6689. One colony. Field-note: "White stalk, tips of branches light greyish with short lateral branches". A. G. Humes no. 1142, RMNH Coel. no. 6690. One colony. Field-note: "Whitish fleshy basal branches, small tan distal branches". A. G. Humes no. A26, RMNH Coel. no. 6691. One colony, now two pieces.

The same locality, depth 20 m; 6 August 1967. A. G. Humes no. 1233, RMNH Coel. no.

6692. Three fragments. Field-note: "Short slender fleshy white stalks, distally pale brownish lavender, polyps pale green".

West of harbour, Hellville, Nosy Bé, depth 12 m; 4 August 1967. A. G. Humes no. 1211, RMNH Coel. no. 6693. One colony. Field-note: "Fleshy white stalks, divided terminally into fine brown branches". A. G. Humes no. A14, RMNH Coel. no. 6694. Two small colonies.

Banc des Frères, Isles Mitsio, N.E. of Nosy Bé, 12°58'S., 48°28'E., depth 24 m; 17 August 1967. A. G. Humes no. 1281, RMNH Coel. no. 6695. One colony. Field-note: "Fleshy stalks, brown tips on branches, slimy". A. G. Humes no. 1282, RMNH Coel. no. 6696. One colony. Field-note: "Fleshy stalks, brown tips, slimy".

Description. — The colonies make the impression of having been pressed together, but according to personal information by the collector, Dr. Humes, the colonies are very slimy (cf. field-notes), and, consequently, they stuck together by fixation in alcohol, forming compact masses. Before anything could be investigated I first had to unravel the specimen; stems, branches and zooids had to be separated. In addition, many colonies are enveloped by a thready matter or a kind of tough slime. And, finally, in many specimens the zooids are more or less damaged, the tips of the tentacles and the pinnules being injured, or having disappeared.

The only specimen which has not been compressed into a formless mass is one of the small colonies from lot RMNH Coel. no. 6694. This colony is represented in pl. 14 fig. 1. The following description is based on this specimen.

The colony has a height of 40 mm and a maximum spread of 70 mm. The stem is slightly flattened, its height is 15 mm, at the middle the width is 10 mm. It divides into three main branches, which give rise to a few small side-branches. All branches are strongly flattened, stem and branches are grooved longitudinally. On the branches the zooids are not closely set, at the ends they are crowded. The anthocodiae are 2.50 to 3.40 mm long and 1.40 to 1.60 mm wide. The tentacles are up to 4 mm long, at the base the width is 0.60 to 0.80 mm. They bear a single row of 20 to 22 pinnules on each side. The pinnules are long and pointed, cowhorn-shaped, those placed at the middle of the tentacle are about 0.60 mm long.

Spicules are scarce; in the other specimen from the same lot they are numerous. Their shape is circular, oblong, or triangular with rounded corners. The discs are 0.012-0.018 mm in diameter, the ovals are 0.030 mm long, the triangles measure 0.024 mm in diameter.

In the other specimens the length of the anthocodiae varies strongly. Sometimes they are 14 mm long and 1 mm wide, in other colonies they are much shorter. The tentacles are sometimes 4 mm long, in other colonies 5 to 6 mm long, and in yet another they measure no less than 9 mm in length. The number of pinnules also varies. Usually there are 18-22 pinnules in a row,

but in one colony their number is 14-16, in another there are 24 pinnules. Usually the pinnules are long and pointed, 0.6-0.8 mm long, but in one colony they have a length of 1.60 mm. In many specimens anthocodiae, tentacles and pinnules are densely filled with small, white spicules: minute round discs, or ovals, or irregularly shaped discs, sometimes jagged, or triangular. The diameter is 0.025-0.035 mm. In the stems the spicules are less numerous.

All these differences and variations are connected by forms intermediate in shape or dimensions, often in one and the same colony. Hence I refer them all to one species, *Cespitularia erecta* Macfadyen, though with some hesitation. The main reasons for doing so are the flattened stems and branches, the number and the arrangement of the pinnules, and the occurrence and the shape of the spicules. However, spicules with a diameter of 0.045 mm are scarce. The anthocodiae and the tentacles may be much larger than appears from Macfadyen's description.

Colour. — All colonies are light-grey. According to the field-notes the stalks are usually white, sometimes bluish distally. The branches are light-tan (RMNH Coel. no. 6688) or brown (some other colonies), sometimes the polyps are pale green (RMNH Coel. no. 6692).

Geographical distribution. — The species has been recorded from the Great Barrier Reef.

Cespitularia turgida nov. spec. (pl. 14 fig. 2)

Material. — West of Andilana, Nosy Bé, 13°18'S., 48°07'E., depth 20 m; 24 August 1967. A. G. Humes no. 1332, RMNH Coel. no. 6697. One colony, holotype. Field-note: "Grey".

The colony (pl. 14 fig. 2) is flaccid and soft. It seems to consist of three parts connected by thin anastomoses, which are 2 to 3 mm wide. Each part consists of a common basal portion, 10 to 15 mm high, from which a number of stems arise. The latter are finger-shaped, up to 50 mm long an 6-9 mm wide. Most of them are unbranched, a few are very simply branched. They are slightly strained and inflated to the touch.

Only the extreme basal portion is sterile; the higher portion of the basal part, the stems and the branches, bear the zooids. On the basal part they are few and far between and strongly retracted. On the stems they are irregularly distributed. The distance between the centres of the zooids varies from 0.8 to 2.20 mm, 1.60 mm being a frequent distance.

The zooids are in all phases of contraction. Especially in the more basal parts a few are fully retracted within the coenenchyme, only the tentacles can be seen from the outside. In other zooids the tentacles only protrude above the surface. In all the other zooids the anthocodial wall is more or less

expanded, up to 1.60 mm long. The tentacles are 0.40 mm high, so that the total height of an anthocodia may be as much as 2 mm. The width of the cylindrical anthocodia is 0.65 to 0.72 mm. At the height of the tentacles the anthocodiae are widest, 0.90 mm in diameter.

The tentacles are 0.30 mm wide at the base, and 0.40 mm high, the tips are curved inward. On each side they bear one row of five to six pinnules, being rounded or slightly conical knobs.

In the basal part of the common base spicules are scarce. Distally their number increases, in the outer layer of stems and branches and in the anthocodiae they are very numerous. The spicules are small discs and ovals, 0.015 to 0.025 mm in diameter.

Colour. — The whole colony is light brown, but on account of the white spicules stems and branches are slightly lighter in colour.

Remark. — Thomson & Dean (1931 : 33) established the species *C. simplex*. At first I thought that the present specimen was identical with this species. However, re-examination of Thomson & Dean's type-specimen (Siboga Expedition, Sta. 40, Kawassang) revealed important differences, as is shown in the following table.

C. simplex Thomson & Dean	*C. turgida* n. sp.
1. Stems flattened.	1. Stems round, inflated.
2. Cortex has very few spicules.	2. Cortex has numerous spicules.
3. Spicules oblong, pear-shaped or angular.	3. Spicules round or oblong.
4. Anthocodiae 1.40-2.80 mm high, surmounted by tentacles 0.80 to 1.20 mm long.	4. Anthocodiae 2 mm in total height.
5. Pinnules 10-12 in a row.	5. Pinnules 5-6 in a row.

I may add to this that in *S. simplex* the spicules are 0.015-0.021 mm in diameter, and not 0.01 mm as recorded by Thomson & Dean.

Heteroxenia Kölliker, 1874

Heteroxenia fuscescens (Ehrenberg, 1834)

Xenia fuscescens Ehrenberg, 1834: 54; Klunzinger, 1877: 41, pl. 3 fig. 4; Schenk, 1896: 57; Kükenthal, 1902: 654; 1904: 34-38; Thomson & McQueen, 1907: 52; Kükenthal, 1913: 6-7.

Heteroxenia fuscescens, Gohar, 1940: 102-104, pls. 4, 6; Tixier-Durivault, 1960: 362; 1966: 370-371, fig. 333.

Material. — Banc de Cinq Mètres, near Nosy Bé, depth 20 m; 6 August 1967. A. G. Humes no. 1232, RMNH Coel. no. 6698. Four colonies. Field-note: "Short soft whitish stalks crowned with brown branches".

Remark. — For a description of the species I refer to Gohar (1940) and Tixier-Durivault (1966).

Geographical distribution. — The species has been recorded from the Red Sea, Zanzibar, Madagascar, and Inhaca Island (Bahia de Lourenço Marques).

Heteroxenia elisabethae Kölliker, 1874

Heteroxenia elisabethae [1]) Kölliker, 1874: 12-17, pl. 2 figs. 7, 8; Bourne, 1895: 476-480, pl. 12 figs. 15, 15A; Ashworth, 1899: 284-291; Thomson & Henderson, 1906a: 413-414; Light, 1915: 165-166; Roxas, 1933: 99-100; Utinomi, 1950: 86, fig. 2c; Tixier-Durivault, 1960: 361; 1966: 369-370, fig. 332.
Xenia elisabethae, May, 1899: 84-85.

Material. — Pointe Ambarionaomby, Nosy Komba, near Nosy Bé, depth 1 m; 27 September 1964. A. G. Humes no. 944, RMNH Coel. no. 6699. Twenty-seven colonies or fragments of colonies.

Description. — The colonies are small, up to 35 mm high and usually strongly branched. The tentacles bear only three rows of pinnules on each side. Spicules are absent. For a further description of the species I refer to Utinomi (1950) and Tixier-Durivault (1966).

Geographical distribution. — The species has been recorded from Port Denison (Australia), Zanzibar, the Philippines, Formosa, Torres Straits, Low Isles (Great Barrier reef), Inhaca Island, and Madagascar.

Xenia Lamarck, 1816
Xenia umbellata Lamarck, 1816

Xenia umbellata Lamarck, 1816: 410; Savigny, 1817: 227, pl. 1 fig. 3; Ehrenberg, 1834: 53-54; Klunzinger, 1877: 39-40, pl. 3 fig. 3; Schenk, 1896: 57; May, 1899: 82-84; Ashworth, 1900: 513-516, pl. 53 figs. 10-13; Kükenthal, 1902: 650-651; 1904: 34; Thomson & Henderson, 1905: 273; 1906a: 410-411; Thomson & McQueen, 1907: 50; Gravier, 1908: 206-207; Kükenthal, 1913: 7; Thomson & Dean, 1931: 26-27; Hickson, 1931: 156-157; Roxas, 1933: 88-89, pl. 2 fig. 3; Gohar, 1940: 93-95; Verseveldt, 1965: 46-47; Tixier-Durivault, 1966: 367, fig. 330.

Material. — Andilana, Nosy Bé, depth 1 m; 9 August 1963. A. G. Humes no. 681, RMNH Coel. no. 6700. Some colonies.

Remark. — For a description see: Gohar (1940), Verseveldt (1965), and Tixier-Durivault (1966).

Geographical distribution. — The species has been recorded from the Red Sea, the Indian Ocean and the Pacific Ocean.

Xenia viridis Schenk, 1896

Xenia viridis Schenk, 1896: 62-63, pl. 2 figs. 4-8; Ashworth, 1900: 516-518, pl. 53

1) The original name *H. elisabethae* is spelled by many authors as *H. elizabethae*.

fig. 14; Kükenthal, 1902: 649-650; Thomson & Dean, 1931: 26; Roxas, 1933: 84, pl. 1 fig. 6; Verseveldt, 1960: 246-247, fig. 4c; Tixier-Durivault, 1966: 363-365, fig. 328.

Material. — Navetsy, Nosy Bé, on intertidal rocks; 7 August 1967. A. G. Humes no. 1237, RMNH Coel. no. 6701. Field-note: "Small white stalks, soft light grey branches".

Remark. — For a description I refer to Schenk (1896), Verseveldt (1960) and Tixier-Durivault (1966).

Geographical distribution. — The species has been recorded from localities in the Indian and the Pacific Oceans.

Xenia macrospiculata Gohar, 1940 (fig. 39)

Xenia macrospiculata Gohar, 1940: 96-98.

Material. — Banc de Cinq Mètres, near Nosy Bé, depth 20 m; 6 August 1967. A. G. Humes no. 1234, RMNH Coel. no. 6702. Four colonies. Field-note: "Soft white stems, short terminal branches greyish".

Description. — The small colonies measure 25 to 35 mm in height and 30 to 35 mm in width, they are flattened laterally. At different levels the stem divides into primary branches, 4 to 6 mm wide, which may give off short secondary branches, about 4 mm wide. Stems and branches are longitudinally grooved.

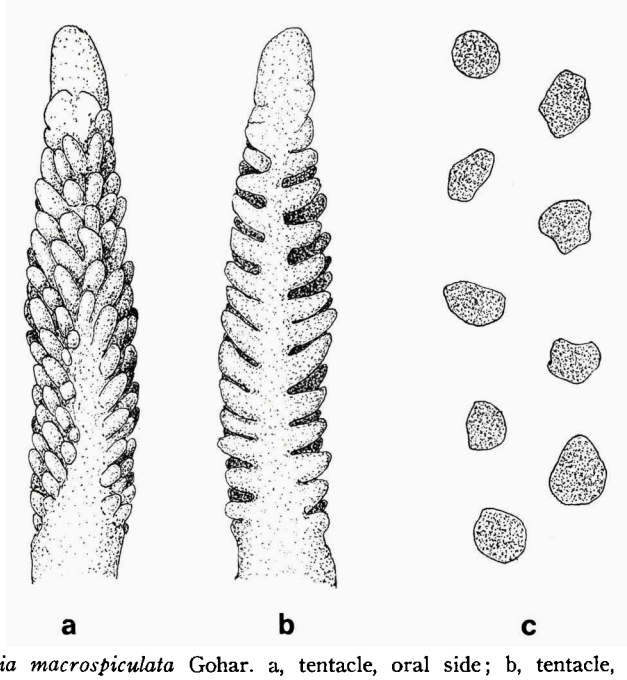

Fig. 39. *Xenia macrospiculata* Gohar. a, tentacle, oral side; b, tentacle, aboral side; c, spicules. a, b, × 20; c, × 220.

The anthocodiae are up to about 4 mm long, the width is 0.60 mm. The nearly cylindrical tentacles measure up to 4 or 4.5 mm in length and about 1 mm in width, pinnules included (fig. 39 a, b). The latter are densely placed on the oral side of the tentacles; in the basal part there are three rows, in the middle part four rows on each side. In the tip part they cover the whole surface of the tentacles, only the basal part of the tentacle shows a narrow free space. The pinnules are short, finger-shaped with rounded tips; they are curved towards the distal end of the tentacle and measure up to 0.4 mm in length. The aboral row has 12-16 pinnules. In many zooids the tentacles and pinnules are strongly contracted: the tentacles average 3 mm in length, the pinnules are very densely placed knobs.

The spicules have shapes of all sorts, they may be circular, oval, triangular with rounded angles, pear-shaped, etc. (fig. 39 c). The largest diameter varies from 0.020 to 0.042 mm. They are very numerous in all parts of the colonies, on the oral side of the tentacle they are less numerous, at the tips of the pinnules they are absent.

Colour. — In alcohol stems and branches are greyish white, the polyps are creamy-pink.

Remark. — The colonies agree very well with Gohar's description. Only the number of longitudinal rows of pinnules differs from that recorded by Gohar (1940: 97), who mentions "three — rarely two — longitudinal rows". I recently had an opportunity to identify some xeniids collected by Dr. L. Fishelson, Tel-Aviv University, Israel, in the Gulf of Aqaba (Red Sea). Among these were colonies which I identified as *Xenia macrospiculata*, but also in these specimens I occasionally found four longitudinal rows of pinnules.

Geographical distribution. — This species was first recorded from Ghardaqa (Red Sea).

Xenia lepida nov. spec. (fig. 40; pl. 15 fig. 2)

Material. — Pointe Lokobe, Nosy Bé, depth 10 m; 18 July 1967. A. G. Humes no. 1170, RMNH Coel. no. 6703. One colony, holotype. RMNH Coel. no. 6704. Thirteen colonies, paratypes. Field-note: "Soft white stalks, tips of branches brownish with long polyps".

Description. — The stalk (stem) of the holotype (pl. 15 fig. 2 a) has a spreading base, 18 mm in maximum diameter. At a distance of 10 mm from the base it divides into two branches, 4 and 7 mm wide. At different levels they give off a few side-branches, usually 3 to 5 mm wide, their lengths vary from 5 to 20 mm. The whole colony is flabby, stalk and branches are irregularly curved, and longitudinally striated.

Each branch or side-branch ends in a capitulum, 3 to 8 mm in diameter,

which consists of young and full-grown polyps. The anthocodiae are transparent, very flabby, 1.40 to 1.60 mm wide, and vary strongly in length: the longest being 14 mm.

The tentacles are thin, flabby threads, 5 to 10 mm long and 0.2 to 0.4 mm wide at the base (fig. 40). At each side there are three rows of pinnules. The outer rows consist of twenty-eight to thirty-two pinnules. On the oral side of the tentacle they leave a median space uncovered, which extends from the base to about two-thirds of the tentacle. Sometimes the tentacles are slightly more contracted, in which case the pinnules are more regularly arranged in three rows (fig. 40 a, b). But usually the tentacles are long and thread-like, only in the basal part showing three rows of pinnules (fig. 40 c).

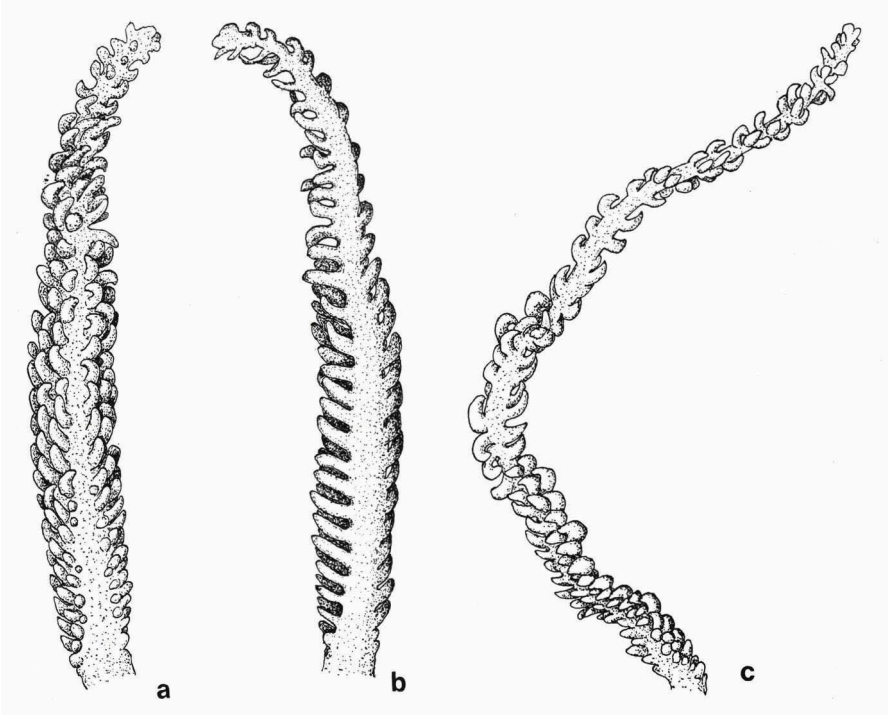

Fig. 40. *Xenia lepida* nov. spec. a, tentacle, oral side; b, the same tentacle, aboral side; c, more expanded tentacle. × 15.

The pinnules are cowhorn-shaped, those placed in the middle of the tentacle are longest, viz., about 0.40 mm long.

It is difficult to detect the spicules, but with the aid of a polarizing microscope they can be found more easily. In the stalk and branches they are

scarce and appear as minute, round discs, 0.009 mm in diameter. In the polyps they are more numerous, usually oval-shaped, 0.015 mm long.

Colour. — The colony is dirty-white.

Variability. — The paratypes are slightly smaller than the holotype. Some of them are unbranched, the stalk is slender. In pl. 15 fig. 2 b, c, two paratypes are figured.

Remark. — The species comes near to *X. distorta* Tixier-Durivault (1966: 359-361). It agrees with it in the number of pinnules in a row (28 to 32), in the slenderness of the tentacles and in the smallness of the spicules. But it differs in the shape of the colony (in *X. distorta* the stalks are unbranched), in the length of the anthocodiae, and in the number of rows of pinnules (in *X. distorta* there are two rows on each side of a tentacle).

Viguieriotidae Bayer, 1954

Studeriotes Thomson & Simpson, 1909

Studeriotes semperi (Studer, 1888)

Spongodes semperi Studer, 1888: 69; Wright & Studer, 1889: 221-222; Kükenthal, 1903: 169.

Dendronephthya semperi, Kükenthal, 1905: 537-541, pl. 26 fig. 1: Roxas, 1933: 440-441.

Studeriotes semperi, Kükenthal, 1910: 69-71, figs. 39, 40, 43, 44, pl. 4 figs. 30, 32; Thomson & Dean, 1931: 189; Macfadyen, 1936: 65-66.

Material. — Pass at Pointe Lokobe, Nosy Bé, on sand, depth 18 m; 14 July 1967. A. G. Humes no. 1167, RMNH Coel. no. 5000. One colony. Field-note: "Lower half of stalk tough, upper part soft and covered with short blunt branches scattered with brown polyps".

The same locality, depth 17 m; 23 August 1967. A. G. Humes no. 1315, RMNH Coel. no. 4998. Three specimens. Field-note: "Tough, base buried in sand, tip with short tan branches, retractile in alcohol".

The same locality, depth 17 m; 25 August 1967. A. G. Humes no. 1325, RMNH Coel. no. 4999. One colony. Field-note: "Embedded in sand".

Pass between Nosy Komba and Nosy Bé, depth 17 m; 10 August 1967. A. G. Humes no. 1244, RMNH Coel. no. 5001. One colony. Field-note: "Stalk buried in sand, capitulum with short greyish brown erect branches".

Remark. — The species has sufficiently been described by previous authors, especially by Kükenthal (1905; 1910).

Geographical distribution. — The species has been recorded from the Philippines, Formosa, and the Great Barrier reef.

Anthothelidae Broch, 1916

Solenocaulon Gray, 1862

Solenocaulon tortuosum Gray, 1862

Solenocaulon tortuosum Gray, 1862: 34-35, fig. on p. 36; Studer, 1878: 669; Ridley, 1884: 353-355; Hickson, 1903: 495-497, figs. 13, 18; Janower, 1904: 514-518, pl. 7 fig. 1:

Thomson & Henderson, 1905: 286-287; Harrison, 1908: 189-190; 1909: 39, pl. 3 figs. 14, 15, pl. 7 figs. 66-77; Thomson & Simpson, 1909: 154-156, 159; Thomson & Mackinnon, 1910: 196; Kükenthal, 1919: 68-69; Thomson & Dean, 1931: 192; Stiasny, 1937b: 54-56, fig. Q; Tixier-Durivault, 1966: 379.

Solenocaulon akalyx Germanos, 1896: 159-161, pl. 9 fig. 4.

Material. — Pass at Pointe Lokobe, Nosy Bé, depth 15 m; 13 June 1967. A. G. Humes no. R1074, RMNH Coel. no. 6705. Three colonies. Field-note: "Rosy orange, growing erect in sand".

The same locality, depth 18 m; 3 July 1967. A. G. Humes no. 2R1074, RMNH Coel. no. 6706. Three colonies. Field-note: "Rosy to brownish, on sand".

The same locality and depth; 14 July 1967. A. G. Humes no. 1164, RMNH Coel. no. 6707. Seven fragments. Field-note: "Stalked, curly branches, orange tan; on sand".

Geographical distribution. — The species has been recorded from north Australia, Maldives, Singapore, Ceylon, Bay of Bengal, Amirantes, Seychelles, Andamans, Cape Comorin, Persian Gulf, Ternate and Borneo.

Solenocaulon ramosum Hickson, 1903 (pl. 11 fig. 2)

Solenocaulon ramosum Hickson, 1903: 498-499, figs. 14-17; Janower, 1904: 527-528; Harrison, 1908: 190; 1909: 39, pl. 3 fig. 16, pl. 7 figs. 78-81; Thomson & Simpson, 1909: 159; Kükenthal, 1919: 75-76; Stiasny, 1937b: 49-51, fig. O; Verseveldt, 1940: 90-91.

Material. — Near Nosy Bé, 13°24'30"S., 48°0'30"E., depth 26-33 m; 29 August 1967. A. G. Humes no. A24, RMNH Coel. no. 6708. One beautiful, complete colony.

Description. — The colony has a total height of 220 mm. The stalk is 55 mm high and 10 mm thick. It divides into two stems; about 25 mm higher one of them divides again, consequently there are three stems.

The species is characterized by the wide, wing-shaped flattenings of the stems, which flattenings are called "belts" by Hickson. From the edges of these belts long, narrow twigs arise, up to about 30 mm long and 1.5 to 2 mm wide. Many of them have short side-twigs. Also from the cylindrical parts of the stems twigs arise, which may have a length of 55 mm. The twigs are fragile: many of them have been broken off.

The majority of the zooids are placed along the edges of the slightly flattened twigs, at each side one row. The calices are 1 to 1.5 mm high, cone-shaped or more or less cylindrical. The anthocodial spicules are longer and thicker than, e.g., in *Solenocaulon tortuosum* (cf. Hickson, 1903: 499).

Colour. — The stalk is dirty-brown, the stems are grey, the twigs with the zooids are light grey, the belts are still lighter grey.

Geographical distribution. — The species has previously been recorded from the Maldives and from the Bay of Bengal.

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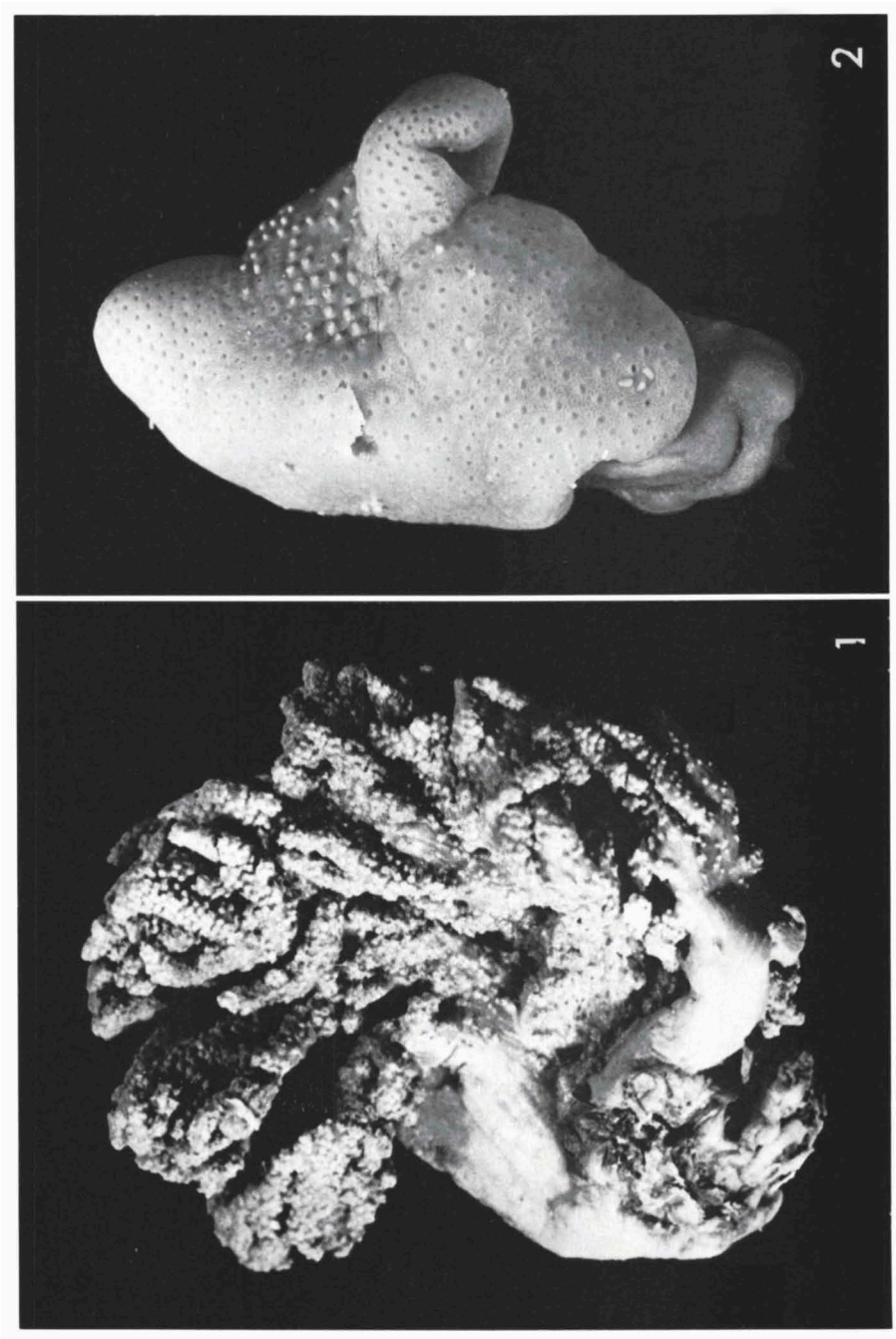
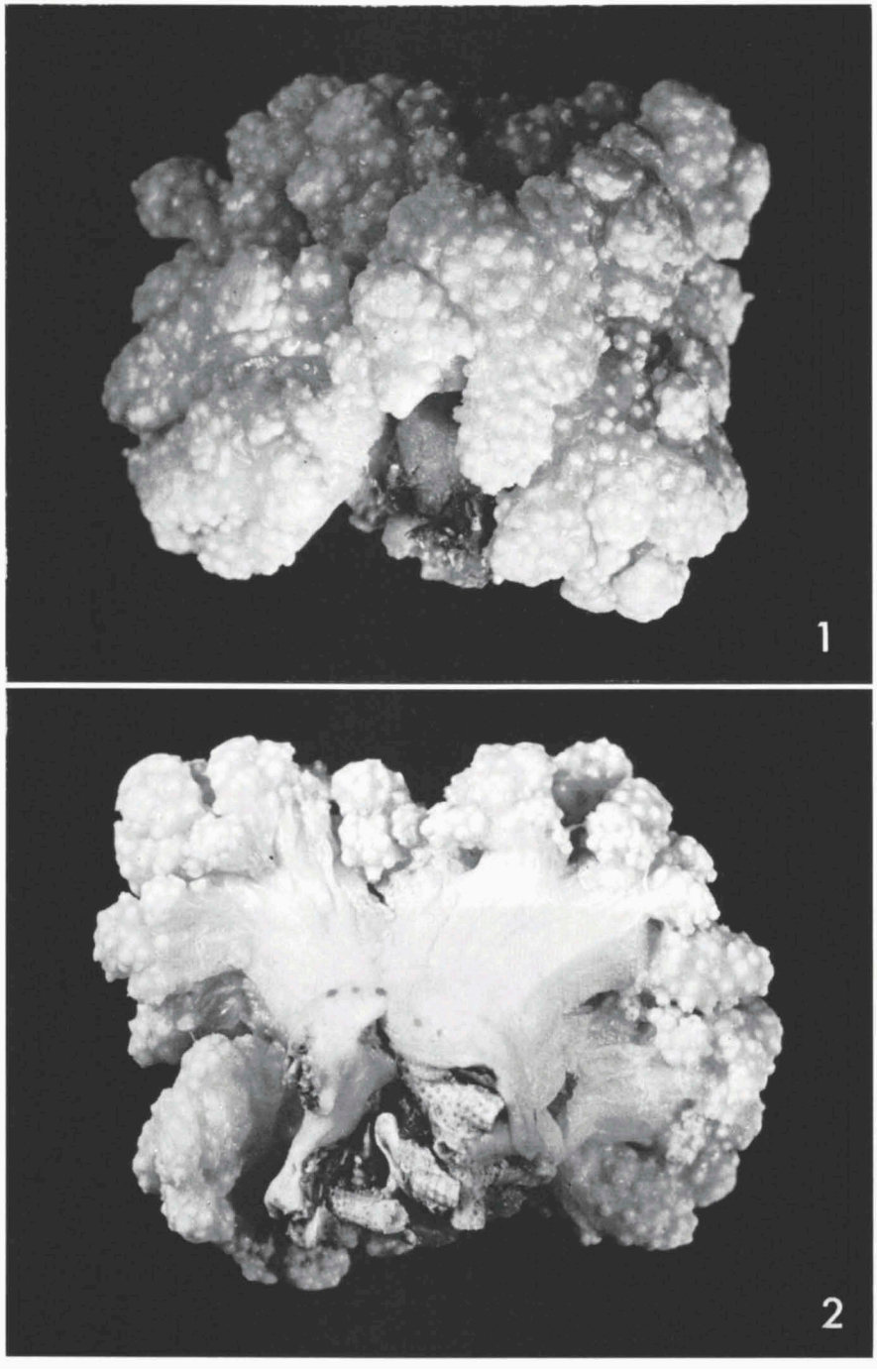


Fig. 1. *Alcyonium flaccidum* Tixier-Durivault, RMNH Coel. no. 6604. × 1.
Fig. 2. *Sarcophyton cornispiculatum* nov. spec., holotype, RMNH Coel. no. 6644. × 1.5.



Figs. 1, 2. *Alcyonium utinomii* nov. spec., holotype, RMNH Coel. no. 6608. Upper side (fig. 1) and under side (fig. 2). × 1.3.

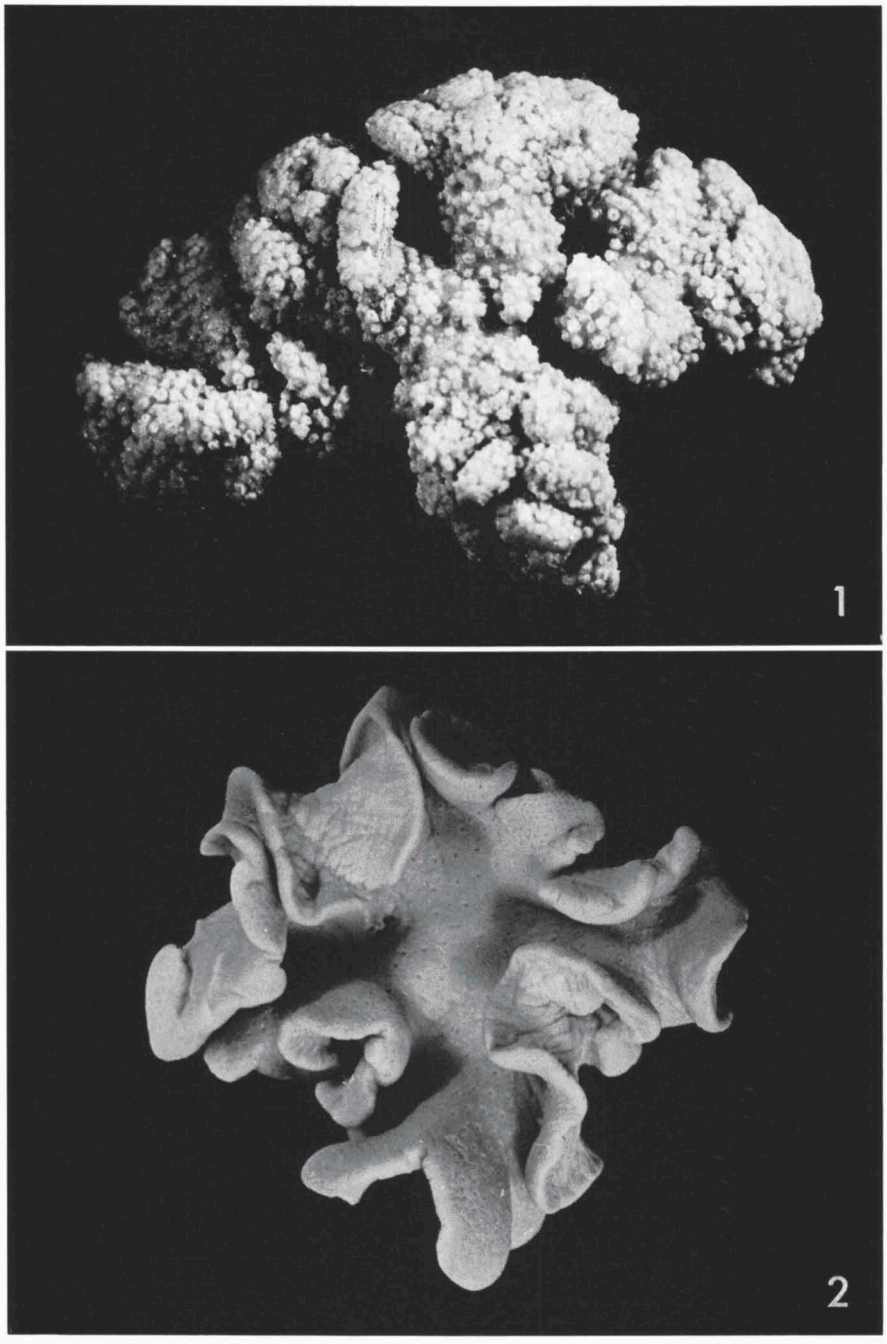


Fig. 1. *Alcyonium flaccidum aberrans* nov. subsp., holotype, RMNH Coel. no. 6607. × 1.4.
Fig. 2. *Sarcophyton stolidotum* nov. spec., holotype, RMNH Coel. no. 6645. × 1.

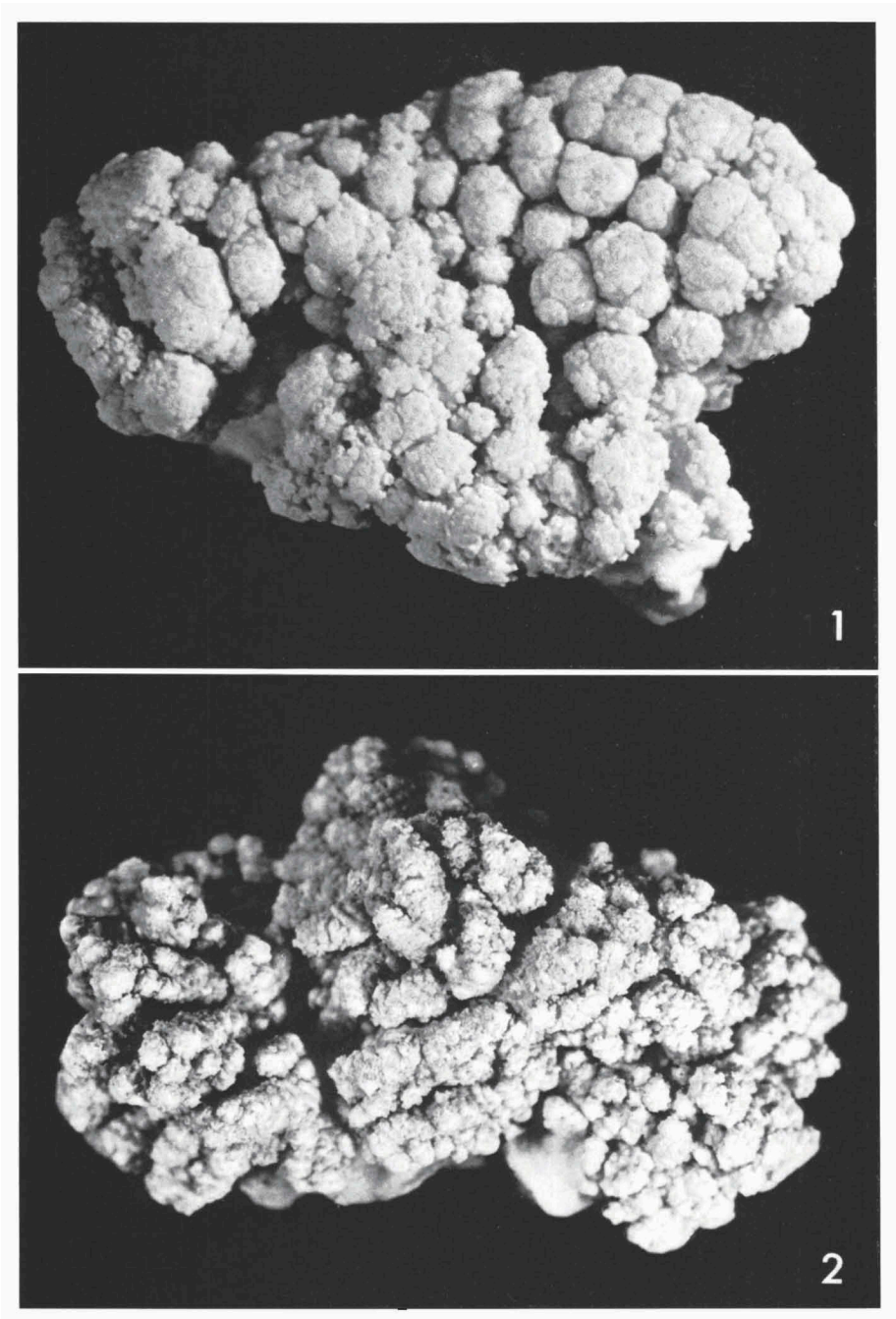


Fig. 1. *Cladiella sphaerophora* (Ehrenberg), RMNH Coel. no. 6610. × 2.
Fig. 2. *Cladiella latissima* (Tixier-Durivault), RMNH Coel. no. 6614. × 1.3.

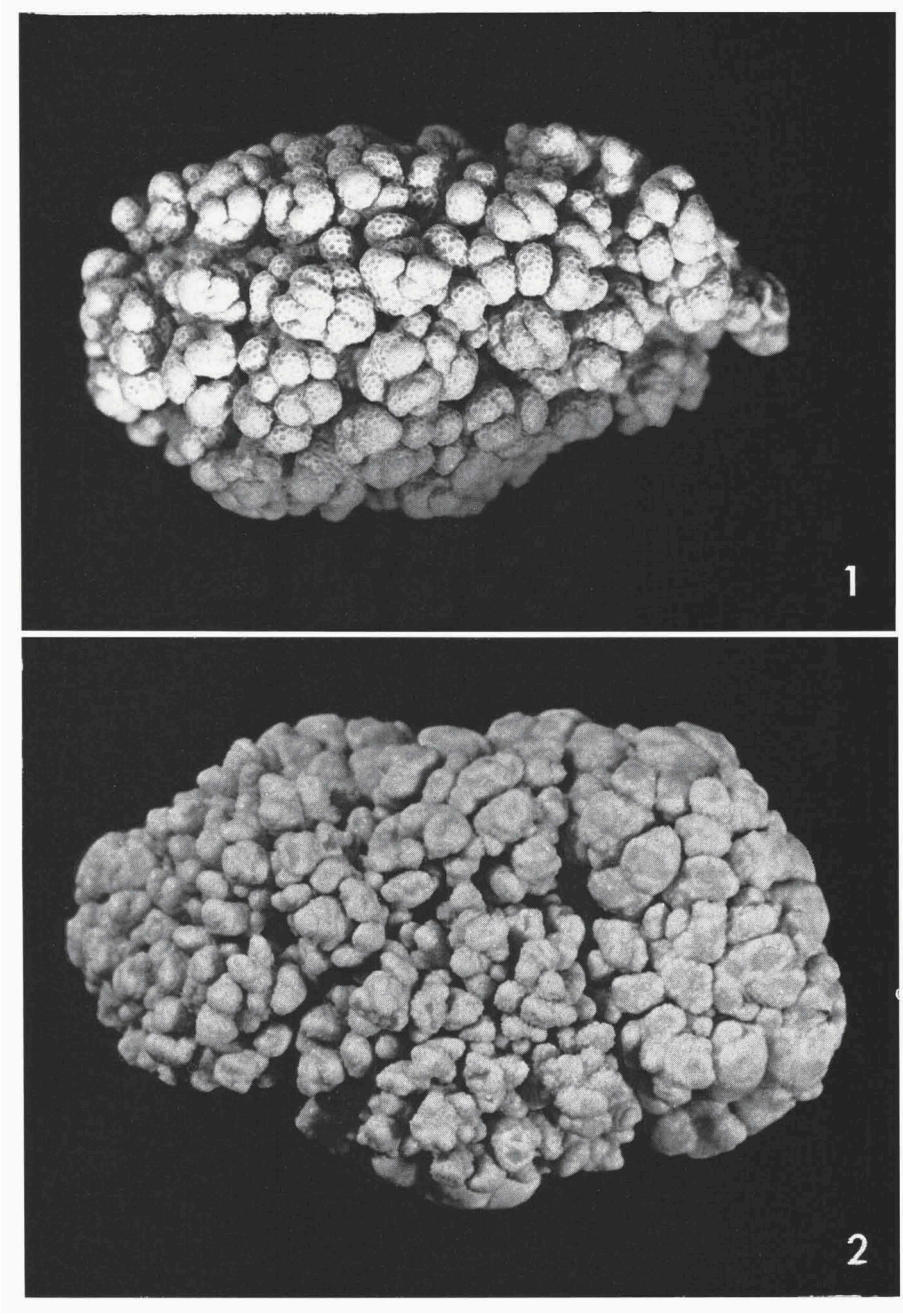


Fig. 1. *Cladiella krempfi* (Hickson), RMNH Coel. no. 6612. × 1.
Fig. 2. *Cladiella laciniosa* (Tixier-Durivault), RMNH Coel. no. 6613. × 1.

Lobophytum depressum Tixier-Durivault, RMNH Coel. no. 3904. × 0.9.

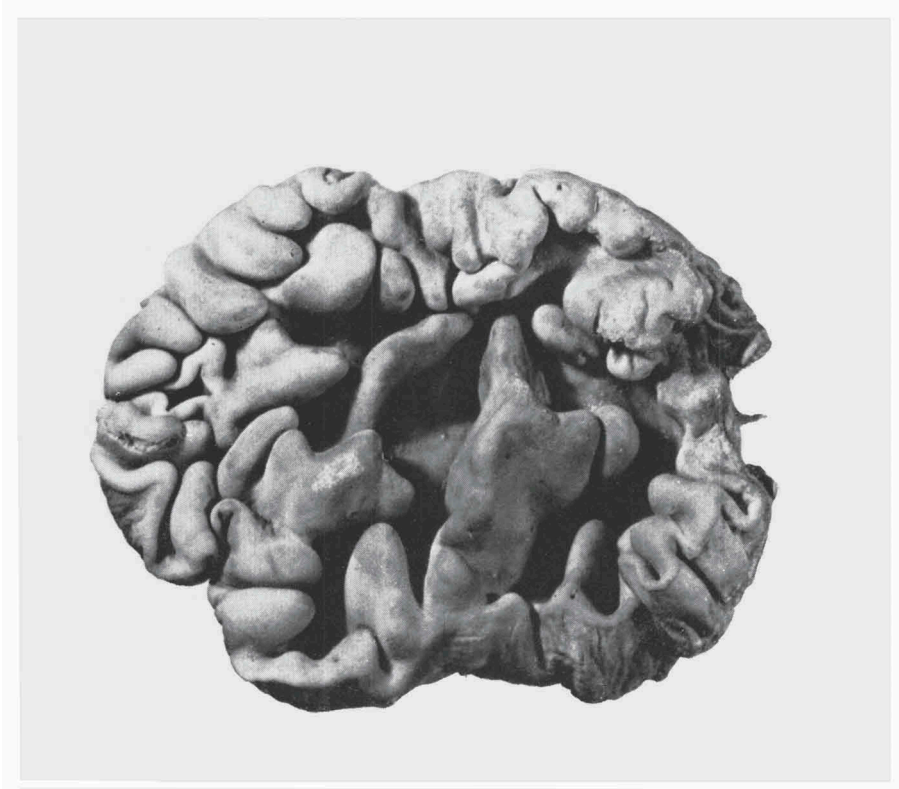
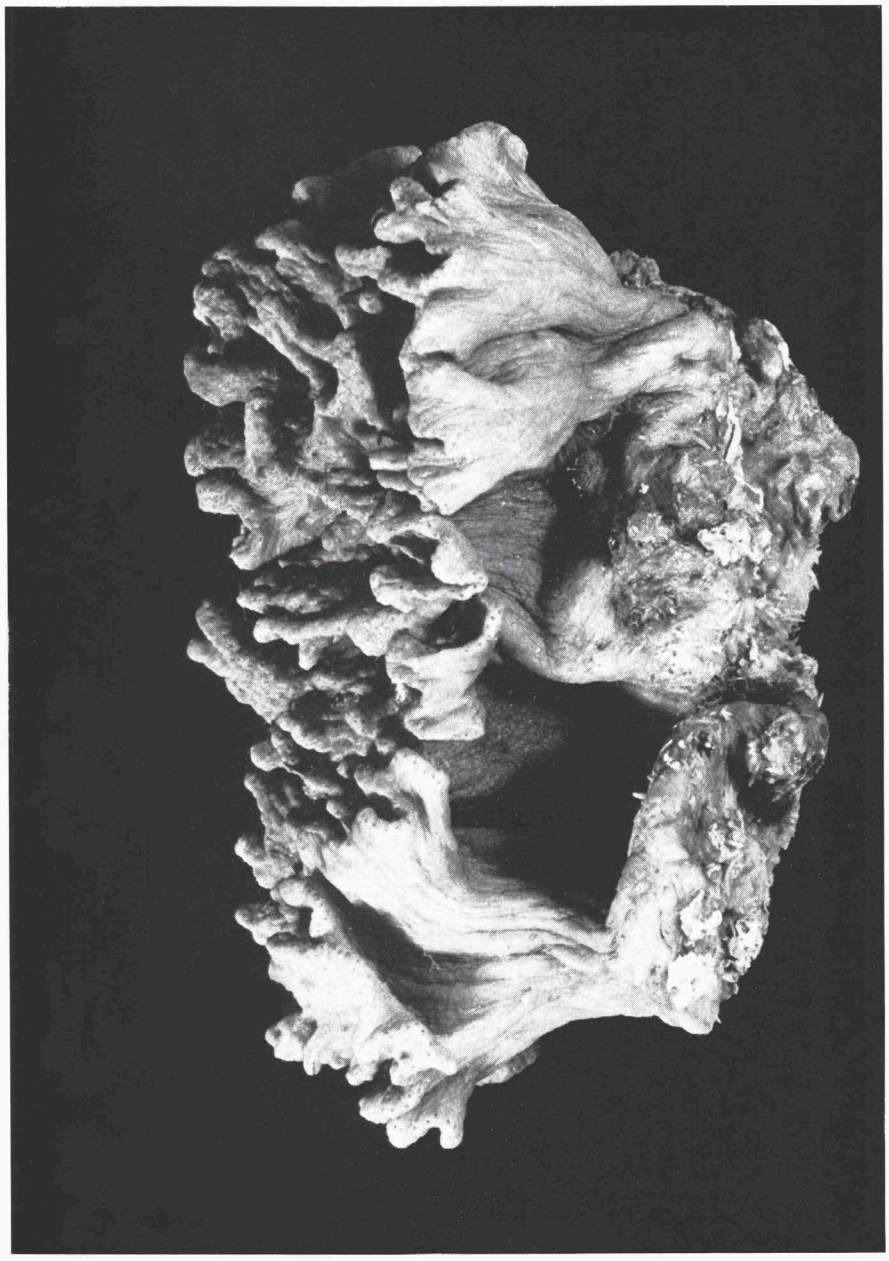


Fig. 1. *Lobophytum latilobatum* nov. spec., holotype, RMNH Coel. no. 6625. × 0.5.
Fig. 2. *Sinularia terspilli* nov. spec., holotype, RMNH Coel. no. 6669. × 0.8.



Sinularia fungoides Thomson & Henderson, ZMA Coel. no. 5570. × 1.1.

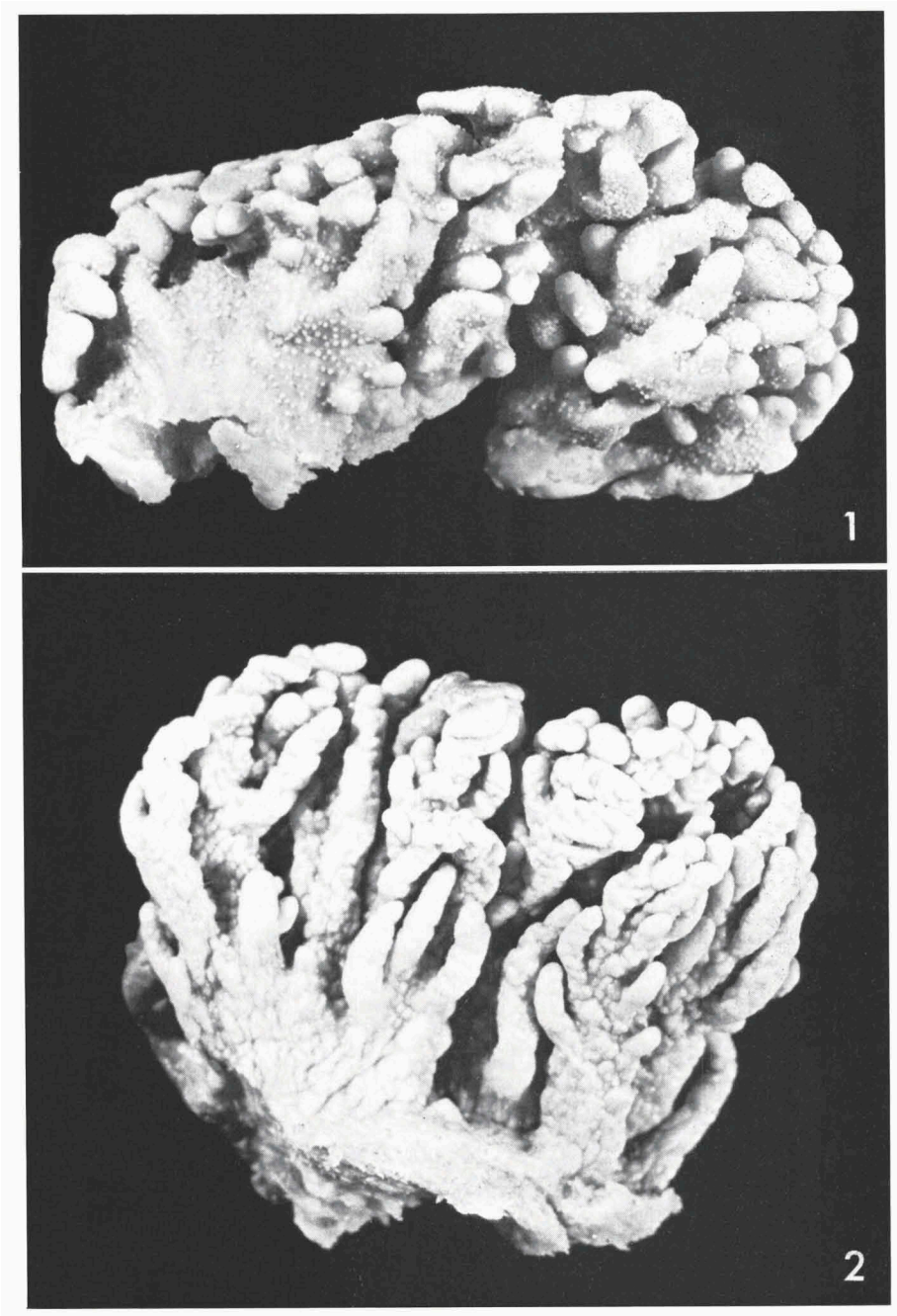


Fig. 1. *Sinularia humesi* Verseveldt, holotype, RMNH Coel. no. 3905. × 0.9.
Fig. 2. *Sinularia triaena* Kolonko, RMNH Coel. no. 6662. × 1.

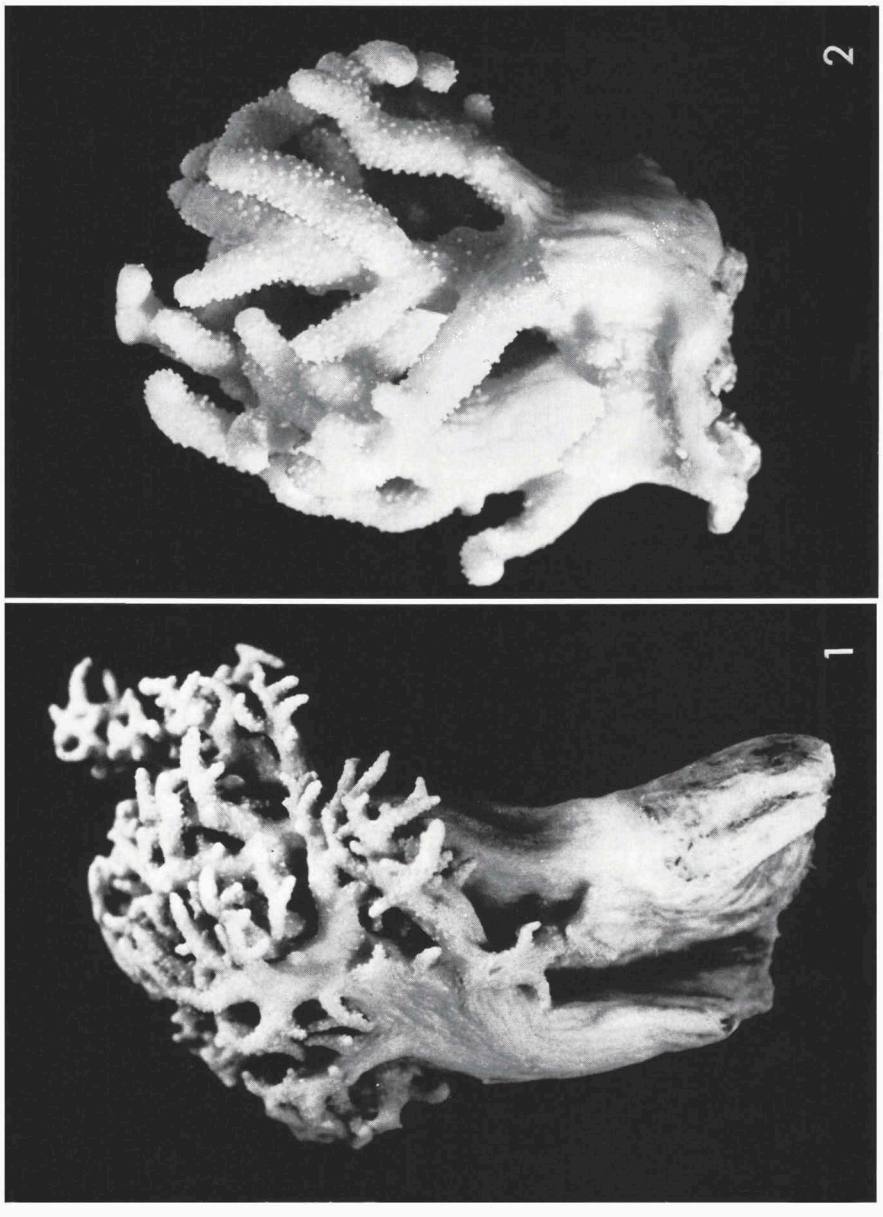


Fig. 1. *Sinularia arborea* nov. spec., holotype, RMNH Coel. no. 6670. × 1.
Fig. 2. *Sinularia vrijmoethi* nov. spec., holotype, RMNH Coel. no. 6667. × 1.

Fig. 1. *Simularia maxima* nov. spec., holotype, RMNH Coel. no. 6680. × 0.8.
Fig. 2. *Simularia minima* nov. spec., holotype, RMNH Coel. no. 6678. × 1.5.

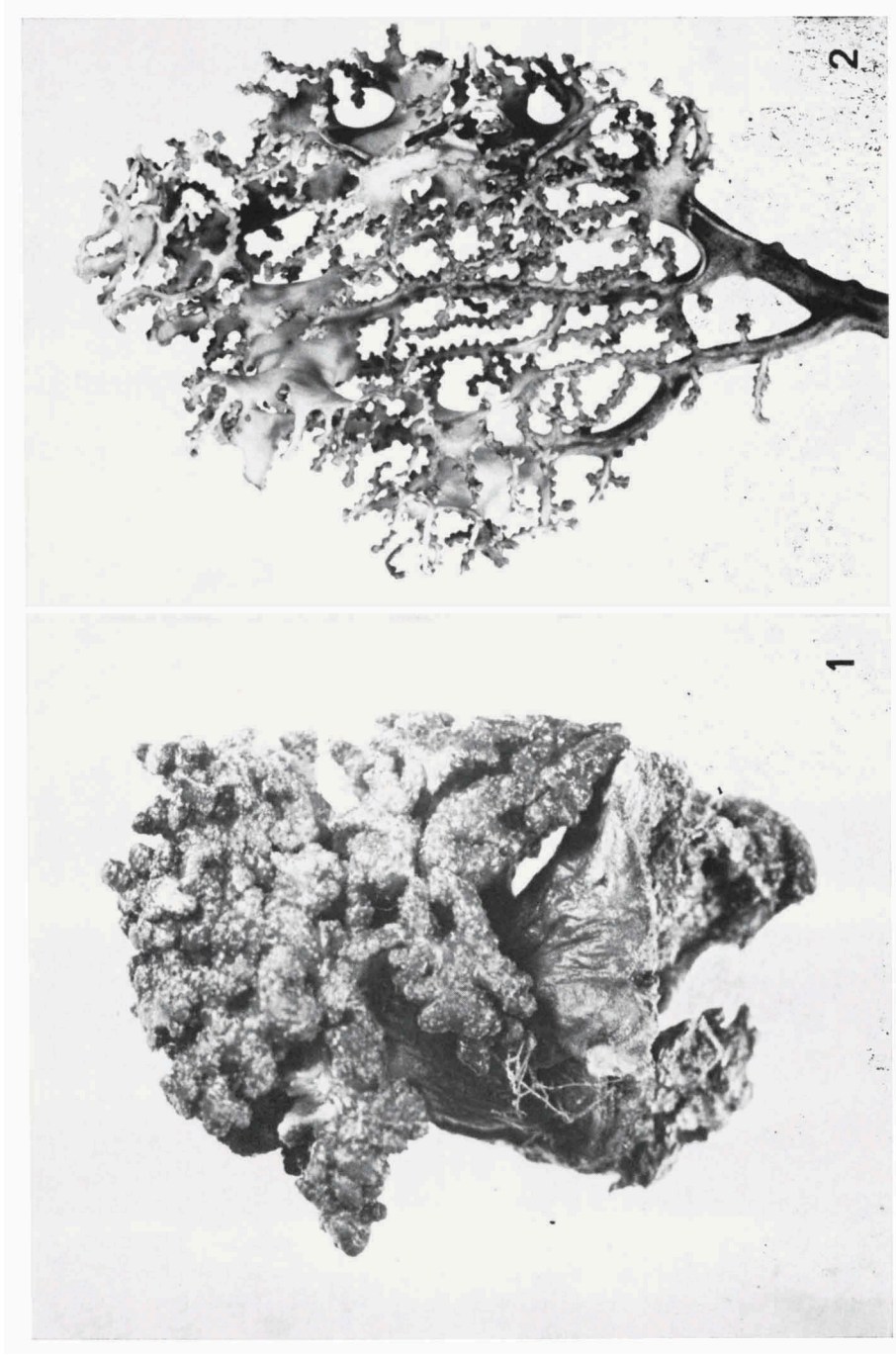


Fig. 1. *Simularia heterospiculata* Verseveldt, holotype, RMNH Coel. no. 6600. × 1.
Fig. 2. *Solenocaulon ramosum* Hickson, RMNH Coel. no. 6708. × 0.65.

Siphonogorgia pichoni nov. spec., part of a colony from lot RMNH Coel. no. 6854. × 1.

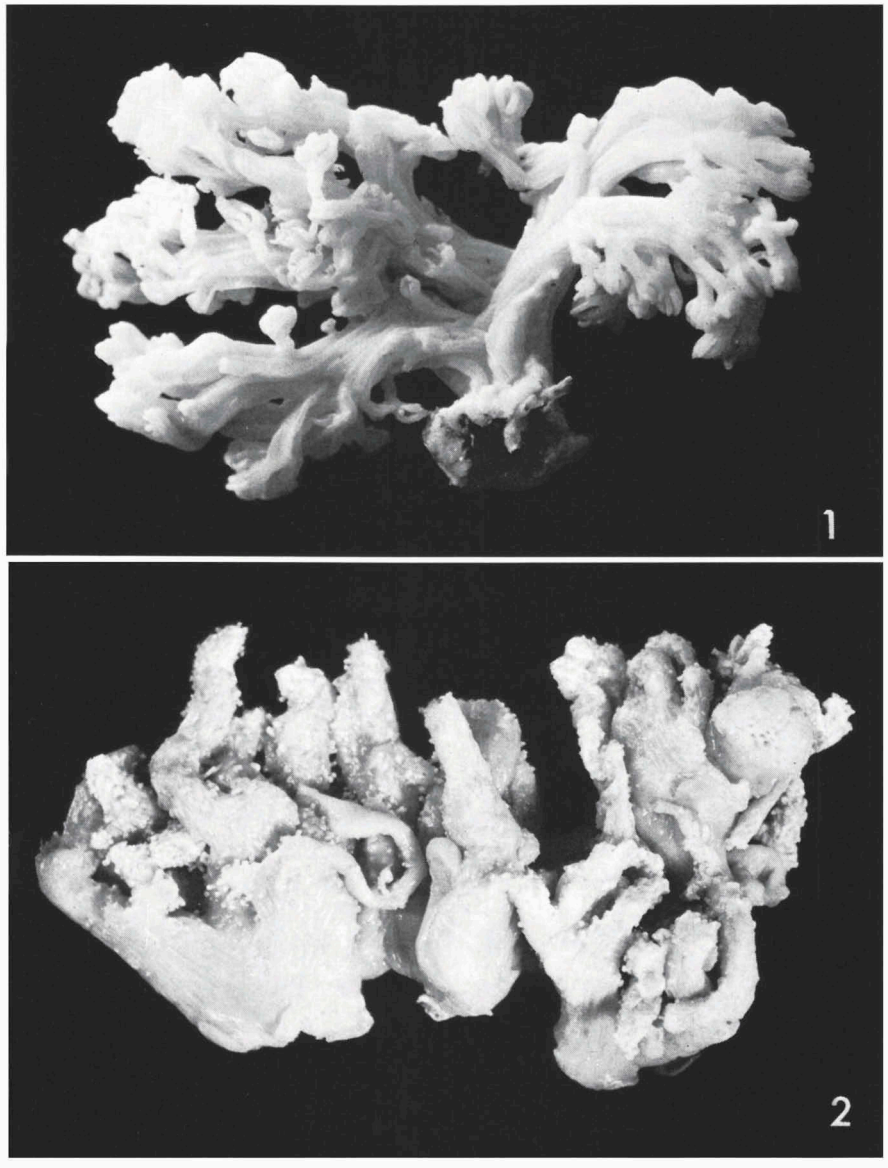


Fig. 1. *Cespitularia erecta* Macfadyen, RMNH Coel. no. 6694. × 1.5.
Fig. 2. *Cespitularia turgida* nov. spec., holotype, RMNH Coel. no. 6697. × 0.9.

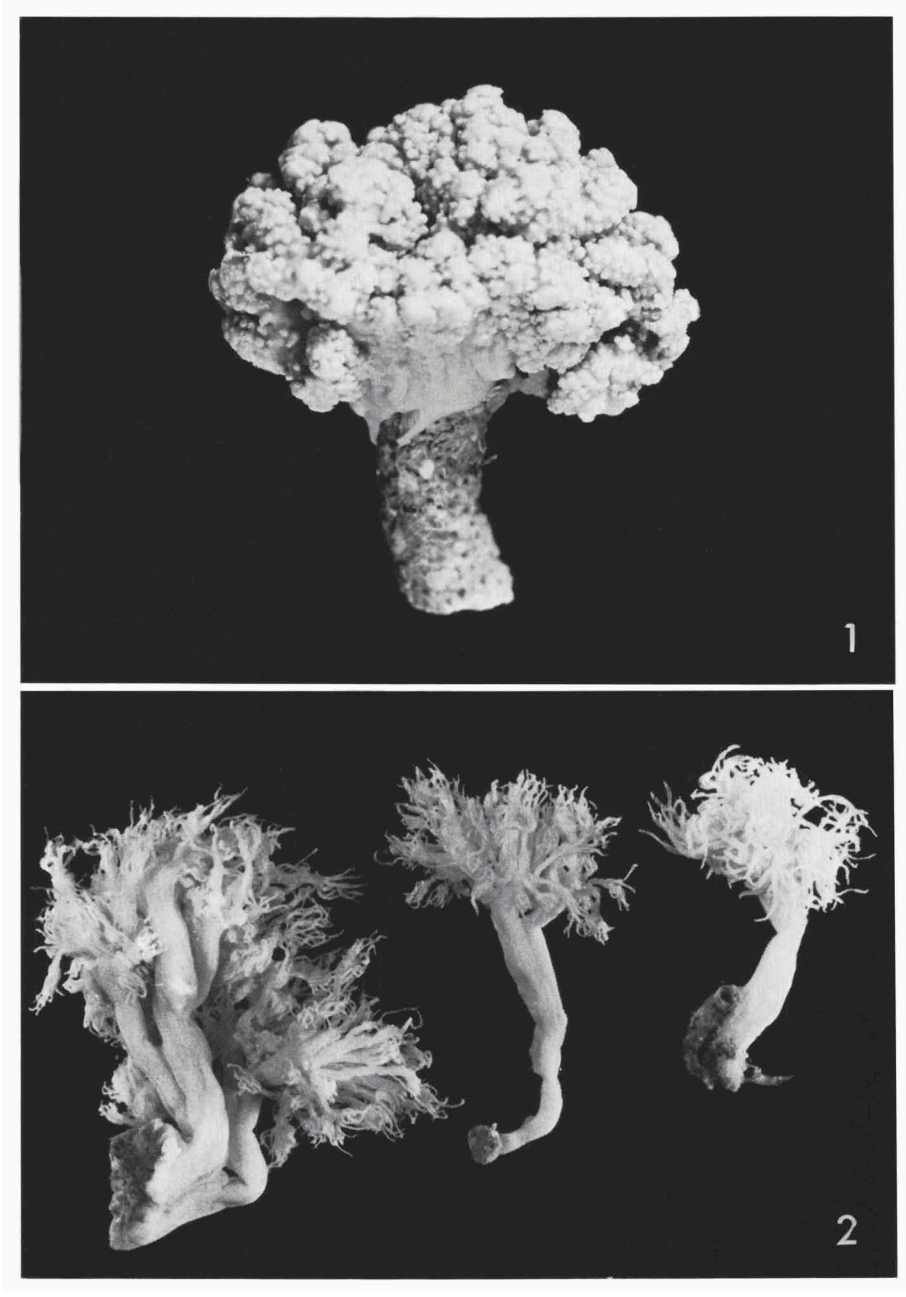


Fig. 1. *Cladiella pachyclados* (Klunzinger), RMNH Coel. no. 6611. × 1.
Fig. 2. *Xenia lepida* nov. spec.; left, holotype, RMNH Coel. no. 6703; right, two paratypes, RMNH Coel. no. 6704. × 1.3.