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DESCRIPTIONS OF TYPES AND OTHER ALCYONACEAN MATERIAL
(COELENTERATA: OCTOCORALLIA)
IN THE AUSTRALIAN MUSEUM, SYDNEY

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SUMMARY

Six types of alcyonaceans, previously described by Whitelegge (1897) and Thomson & Mackinnon (1911), have been re-examined. Two new species of octocorals recently collected by Ms Helen K. Larson and a known species collected by Mr Neville Coleman are also described.

INTRODUCTION

During March and April 1977 the authors worked on octocorals in the Roche Research Institute of Marine Pharmacology at Dee Why, Sydney, Australia. During his stay in Australia the senior author (J.V.) was told that Whitelegge's (1897) and Thomson & Mackinnon's type specimens were kept in the Australian Museum, Sydney. He knew there were taxonomic problems with the type collection deserving investigation, especially with the species *Sinularia* ("*Lobophytum*") *densa*.

With the assistance of Dr J.K. Lowry (Australian Museum) we were able to examine all six types of alcyonaceans. We found that in many respects Whitelegge's and Thomson & Mackinnon's descriptions are correct, but in other respects our re-examination led to surprising results: *Lobophytum hedleyi* Whitelegge = *L. crassum* Von Marenzeller; *Sinularia* ("*Lobophytum*") *densa* has foliaceous clubs, which were not recorded by Whitelegge, with all the unpleasant consequences of this; *Spongodes pallida* Whitelegge must be transferred to the genus *Scleronephthya*. In some cases the smallness of the specimens and the paucity of the material prevented us from making more detailed investigations.

At the request of Ms Helen K. Larson, Technical Officer, Australian Museum, the senior author investigated a number of octocorals collected by her near Lizard Island, Great Barrier Reef. In her collection he found two new species, viz. *Sinularia larsonae* sp.n and *Nephthea legiopolypa* sp.n. They are kept in the Museum mentioned, and are described below.

Finally, Mr Neville Coleman sent J.V. samples of octocorals from Australian waters. Among them was a specimen of *Dendronephthya* (*Morchellana*) *australis* Kükenthal, 1905. It is redescribed here.

P.A. made the photographs of Whitelegge's and Thomson & Mackinnon's specimens, while Mr G.J. Vrijmoeth made the photographs of other colonies. J.V. made the drawings for the text-figures.

Australian Museum register numbers are preceded by the abbreviation AM. One of Coleman's specimens is kept in the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands; the register number is preceded by the abbreviation RMNH.

LIST OF SPECIES EXAMINED

Order Alcyonacea Lamouroux, 1816

Family Alcyoniidae Lamouroux, 1812

1. *Alcyonium etheridgei* Thomson & Mackinnon, 1911
2. *Lobophytum crassum* Von Marenzeller, 1886 = *L. hedleyi* Whitelegge, 1897
3. *Sinularia densa* (Whitelegge, 1897)
4. *Sinularia larsonae* sp. nov.

Family Nephtheidae Gray, 1862

5. *Dendronephthya (Morchellana) australis* Kükenthal, 1905
6. *Dendronephthya (Morchellana) waitei* Thomson & Mackinnon, 1911
7. *Nephthea legiopolypa* sp. nov.
8. *Scleronephthya pallida* (Whitelegge, 1897)

Family Nidaliidae Gray, 1869

9. *Siphonogorgia macrospina* Whitelegge, 1897

TAXONOMIC ACCOUNT

Alcyonium etheridgei Thomson & Mackinnon, 1911

Fig. 1, Pl. 1A-C

Alcyonium etheridgei Thomson & Mackinnon, 1911:666-668, Pl. 61 figs 2, 3, Pl. 62 fig. 3, Pl. 67, fig. 4, Pl. 69; Verseveldt, 1977b:177-179, Figs 2, 3, 39b.

MATERIAL: Manning Bight, depth 40 m (22 fathoms). AM G12170, holotype; AM G12171-G12180, paratypes.

DESCRIPTION OF THE HOLOTYPE: The colony is 75 mm high, the maximum width is 65 mm (Pl. 1A). The main stem is 32 to 35 mm wide. It gives off two branches, 17 and 21 mm wide, each bearing short, thick lobes, rounded or fingerlike, 4 to 15 mm wide and up to 30 mm long. The bottom 10 mm of the base of the stem are free from polyps. All of the anthocodiae are fully retracted, most of them into dome-shaped calyces, but many hardly project at all. The polyp heads are armoured with eight rows of longitudinally arranged, thin, spiny needles, up to 0.40 mm long; see Verseveldt, 1977b, Fig. 2c-e. The armature is as figured in Verseveldt's Fig. 2b, but with fewer sclerites per row.

In the surface layer of the branches and lobes there are spiny or warty spheres, ovals and dumb-bells, 0.07 to 0.16 mm long (Fig. 1a-e). Occasional spindles and clubs also occur, especially in the summits of the lobes; they are up to 0.33 mm long (Fig. 1f-h). The tips of the eight teeth of the calyces mainly contain clubs.

In the surface layer of the stem the majority of the sclerites are dumb-bells with a distinct waist; length: 0.07 to 0.18 mm (Fig. 1i).

The interiors of the branches and the lobes have very few, scattered sclerites: warty-ended dumb-bells, 0.07 to 0.16 mm long (a few are 0.21 mm long), all with a distinct waist. In the coenenchyme of the base of the stem two layers can be distinguished:

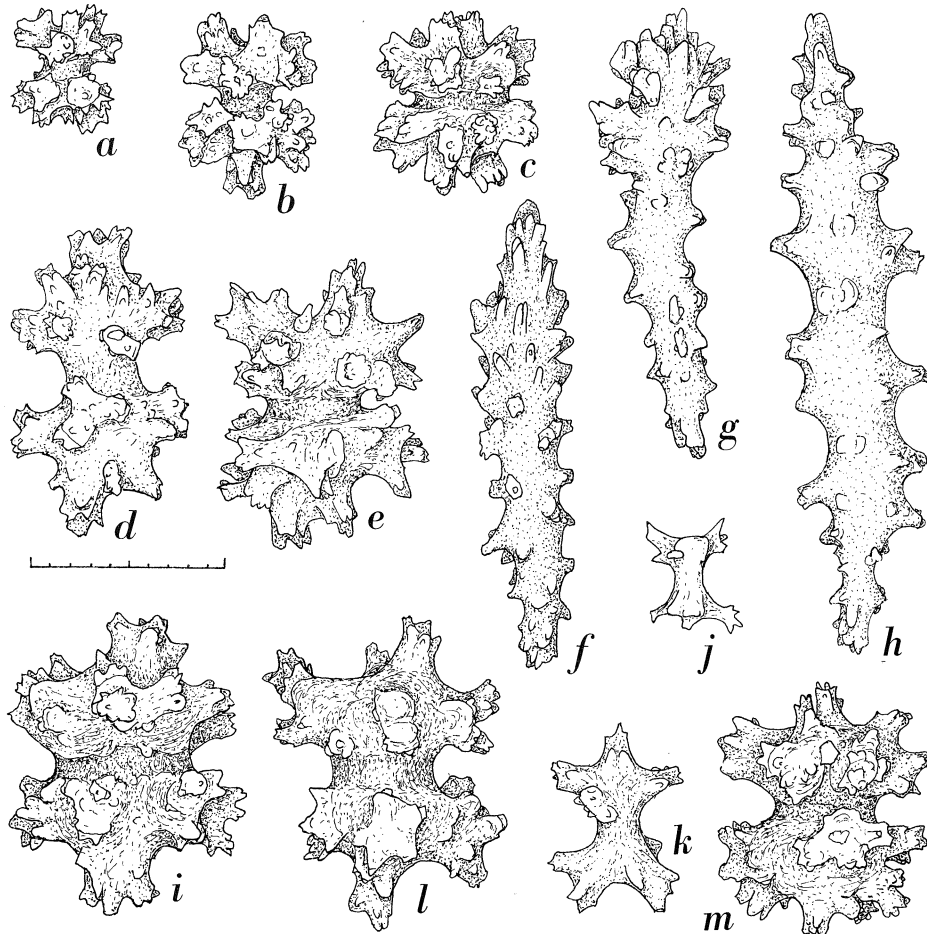


Fig. 1. *Alcyonium etheridgei* Thomson & Mackinnon, holotype, AM G12170. **a-h**, sclerites from surface layer of a lobe; **i**, sclerite from surface layer of the stem; **j-m**, sclerites from coenenchyme of the stem. (Scale line = 0.1 mm)

1. An outer layer, 3 to 4 mm thick, densely packed with sclerites all showing a distinct waist. Some of them are warty-ended dumb-bells, 0.09 to 0.18 mm long; some are as wide as they are long (Fig. 1l,m), others are smaller, smooth, with antlerlike ends ('antler-capstans'), 0.04 to 0.09 mm long (Fig. 1j,k).

2. The inner layers of the coenenchyme have sclerites of the following types: (a) a few warty spheres and ovals, up to 0.18 mm long, (b) warty-ended dumb-bells, 0.09 to 0.18 mm long, and (c) 'antler-capstans', 0.04 to 0.09 mm long.

VARIABILITY: In some respects the paratypes G12171 to G12180 show some variability:

The amount of the stem base free of polyps is quite variable, being at least 10 mm in all but one colony and up to 30 mm in G12177.

Some paratypes have expanded polyps (Pl. 1B). The quantity of spindles making up the longitudinal rows in the anthocodiae is quite variable. Whereas in the holotype and G12173 a row is about 5 to 7 needles wide and neatly arranged, intermediates are found leading to G12180, where the row may be twenty needles wide at the base, and they are often very irregularly arranged.

In the spiculation in other parts of the colonies, we also found variability. The holotype G12170 described above appears to represent one end of the spectrum with paratype G12180 forming the other.

In the calyx the proportion and size of clubs and spindles varies. The holotype and most of the paratypes display only a few clubs and spindles in the vicinity of the eight calycal teeth; their length is 0.19 to 0.31 mm. In G12179 and especially in G12180, virtually the whole of the calyx is composed of spindles and clubs, which extend on to the surface of the colony and often, particularly on the lobes, occupy the whole space between neighbouring polyps. The lengths of these sclerites are far greater, 0.19 to 0.45 mm. The occurrence of spindles and clubs in the surface layer of the colony varies from rare to frequent. In the interior of the lobes there are variations in the occurrence and type of the sclerites. In some paratypes the dumb-bells are few and scattered, in others entirely absent. In G12180, although rare, some spindles and clubs are present with the dumb-bells.

A notable item in the interior of the stem is the erratic occurrence of the small 'antler-capstans'. In the holotype they are present in large numbers, in some paratypes (e.g. G12180) they are entirely absent.

REMARKS: At the end of their description Thomson & Mackinnon (1911:667) say that in many respects this species comes very near to Hickson's *Alcyonium purpureum* (Hickson, 1904:215-217, Pl. 7 fig. 1, Pl. 9 fig. 18).

The senior author (J.V.) has had the opportunity to investigate a co-type of this species in the British Museum (Natural History), register number 1962.7.20.19. (This specimen is rather like the colony represented by Hickson, Pl. 7 fig. 1; if they are really the same colony, the enlargement of Hickson's drawing is $\times 1.2$ and not natural size as stated by him.) It appeared, however, that the specimen described by Hickson was not one colony, but a number of small, more or less spherical colonies, 15 mm high, oval in shape when seen from above; the largest diameter was 20 mm. All these colonies are attached to a tunicate test: a relatively high, dome-shaped, hollow, white, cartilaginous substratum, a few mm thick. So Hickson's 'lobes' are really colonies. Consequently there is no question of any relation to *A. etheridgei*.

Lobophytum crassum Von Marenzeller, 1886

Fig. 2, Pls 2-4

Lobophytum crassum Von Marenzeller, 1886: 363-364, Pl. 9 fig. 8a-c (for synonymy of *L. crassum* see Tixier-Durivault, 1958: 173-174).

Lobophytum hedleyi Whitelegge, 1897: 216-217, Pl. 10 figs. 2a-h; Thomson & Dean, 1931: 68; Verseveldt, 1960: 218.

? *Lobophytum hedleyi*, Pratt, 1905: 252-253; Roule, 1908: 176-177; Lüttschwager, 1915: 32; Moser, 1919: 287-288; Roxas, 1933: 366.

non *Lobophytum hedleyi*, Cohn, 1908: 223-224; Tixier-Durivault, 1956: 541; Tixier-Durivault, 1958: 163-164, Figs. 180, 194, 195; Tixier-Durivault, 1966: 92-96, Figs. 82-84.

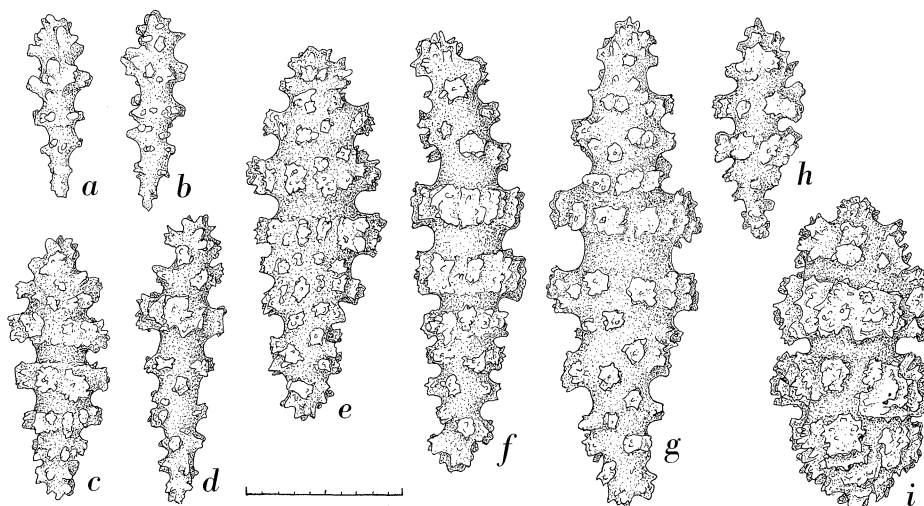


Fig. 2. *Lobophytum crassum* Von Marenzeller (= *L. hedleyi* Whitelegge). Whitelegge's type specimen, AM G1537. **a-e**, clubs and spindles from surface layer of a lobe; **f, g**, spindles from interior of a lobe; **h**, sclerite from surface layer of the sterile stalk; **i**, sclerite from coenenchyme of the stalk. (Scale line = 0.1 mm)

MATERIAL: Funafuti Atoll, Ellice Is.; AM G1537, three colonies, Whitelegge's type specimens.

PRELIMINARY NOTE: We hold the view that *L. crassum* Von Marenzeller and *L. hedleyi* Whitelegge are one and the same species. In the following we first give a description of Whitelegge's type specimens and then make some remarks on *L. crassum*.

DESCRIPTION OF THE LARGER TYPE SPECIMEN OF *L. HEDLEYI*: Whitelegge (1897, Pl. 10 fig. 2a) gave a good drawing of this colony. Our Pl. 2 shows the same colony seen from above and from the side. Additional remarks concerning the size and the shape of the lobes are superfluous. On the distal parts of the lobes the irregularly disposed autozooids are 0.70 to 1.50 mm apart; there are one or two siphonozooids between them. Towards the base of the lobes the distance of the autozooids increases, and so does the number of the siphonozooids: four to eight siphonozooids between two autozooids.

The surface layer of the lobes has clubs, 0.12 to 0.20 mm long, with weakly developed heads and usually two distinct median girdles of warts (Fig. 2a-d). Sclerites like the one represented by Whitelegge, Pl. 10 fig. 2g also occur; their length is 0.15 to 0.23 mm.

In the interior of the lobes lie spindles, 0.22 to 0.35 mm long, with two median girdles of warts separated from each other by a distinct waist (Fig. 2f,g). Besides these two girdles a few more may be present. The sclerite Fig. 2e is a transitional form between a clavate sclerite from the surface layer and a coenenchymal sclerite.

The clubs in the surface layer of the sterile stalk are slightly shorter and wider; the length varies from 0.12 to 0.17 mm (Fig. 2h). The coenenchymal sclerites in the stalk are of two

types: (a) ovals or barrels, 0.18 to 0.22 mm long, with two distinct median girdles of coarse warts and two terminal clusters of warts (sometimes these clusters look like a girdle of smaller warts with a terminal one) (Fig. 2i), and (b) spindles resembling those in the coenenchyme of the lobes; they are 0.23 to 0.32 mm long.

VARIABILITY: One of the other colonies referred to as *L. hedleyi* by Whitelegge (1897) has a total height of 40 to 45 mm and a maximum width of 45 mm. The third colony (Pl. 3) is a bigger one. In these specimens most of the lobes are fingerlike, just as in the specimen described above, but the autozooids are more densely placed.

REMARKS ON PREVIOUS IDENTIFICATIONS: Pratt's determination (1905) may be right, that of Roule (1908) is doubtful, that of Cohn (1908) is wrong. Lüttchwager's (1915) and Moser's (1919) identifications are presumably right, but Lüttchwager overlooked the difference between spines (*Dornen*) and warts (*Warzen*). Moser did not mention the clubs. Roxas' description (1933) is essentially the same as Moser's.

Tixier-Durivault's description (1958) cannot be right, as is shown in the following table (length of sclerites in mm).

TABLE 1: Features of '*Lobophytum crassum*' specimens.

Tixier-Durivault, 1958	Whitelegge, 1897	Own observations on Whitelegge's type specimen
1. Colony fleshy	stem rigid, harsh to touch	stem rigid, harsh to the touch; lobes firm but flexible
2. Sclerites:		
<i>a in surface lobe:</i> clubs (and spiny rods) up to 0.14 mm	see below at <i>c</i>	clubs 0.12–0.20 mm
<i>b in interior lobe:</i> needles 0.24–0.32 mm, processes irregularly placed	spindles 0.15–0.30 mm, tubercles in whorls	spindles 0.22–0.35 mm, tubercles in whorls, especially the median ones
<i>c in surface stalk:</i> clear cylinders 0.11–0.15 mm	clubs 0.12–0.15 mm	clubs 0.12–0.17 mm
<i>d in interior stalk:</i> small barrels 0.18 mm	subcylindrical 0.15–0.20 mm	ovals, barrels 0.18–0.22 mm
with 4 rows of irregularly placed tubercles	4-6 whorls of tubercles	2 distinct median whorls of tubercles and 2 less distinct whorls
tubercles not very voluminous	spiny tubercles	compound tubercles
spindles not recorded	?	spindles present, 0.23–0.32 mm

TABLE 1 continued

Tixier-Durivault, 1958	Whitelegge, 1897	Own observations on Whitelegge's type specimen
3. Autozooids: distance 0.3–0.8 mm	wide intervals, on margins and summits of lobes 1–2 mm or even less apart	intervals 0.75–1.50 mm on summits of lobes
4. Siphonozooids: 1, 2 or 3 between two autozooids	as many as 12, on the margins fewer	tip lobes 1–3, base lobes 4–8

Remarks on *L. crassum* Von Marenzeller, 1886: In her description of *L. crassum* Tixier-Durivault (1958: 174) states that she received a photograph of Von Marenzeller's type specimen. She kindly allowed us to make a copy of this photograph and also of another photograph of the same colony, side-view (Pl. 4; see also Tixier-Durivault, 1958, Fig. 191).

A comparison of the photographs of *L. hedleyi* and of *L. crassum* shows that the lobes have the same dimensions and fingerlike shape; a distinct difference cannot be established.

Von Marenzeller (1886) says very little about the distribution of the autozooids and the siphonozooids in *L. crassum*; the number of siphonozooids between the autozooids is not mentioned at all. However, on the tips of some lobes in Pl. 4 the autozooids are visible; their mutual distances are the same as in *L. hedleyi*.

The spiculation of both species is also the same. Tixier-Durivault investigated the sclerites of Von Marenzeller's type specimen of *L. crassum*. The coenenchymal sclerites in the sterile stalk are 0.15 to 0.20 mm long, in Whitelegge's type of *L. hedleyi* 0.18 to 0.22 mm. In both species spindles are scarce in the sterile stalk. In the lobes the spindle-shaped spicules predominate. According to Von Marenzeller the length in *L. crassum* is 0.25 to 0.32 mm (Tixier-Durivault, 1958: 176, has 0.22 to 0.29 mm); the width is 0.07 (to 0.08) mm. In *L. hedleyi* the length varies from 0.22 to 0.35 mm, the width from 0.08 to 0.10 mm. The shape and the distribution of the tubercles (with median girdles) is the same. The clubs in the surface layers of lobes and stalks do not show any difference either.

CONCLUSION: Thomson & Dean (1931: 67) stated that one of the colonies of *L. crassum* investigated by these authors 'shows some points of resemblance, especially in its mode of growth and spicules, to Whitelegge's *L. hedleyi*; but it seems still closer to the variable *L. crassum*. Whatever view be taken as to the separateness of the species, *L. hedleyi* and *L. crassum* must be close together.'

The present authors go further: we are of the opinion that there is no essential difference between the two species, and that the junior name *hedleyi* must therefore be abandoned.

***Sinularia densa* (Whitelegge, 1897)**

Fig. 3, Pl. 5A

Lobophytum densum Whitelegge, 1897: 219-220, Pl. 11 figs. 4a-h.

? *Lobophytum densum*, Hickson & Hiles, 1900: 505-506.

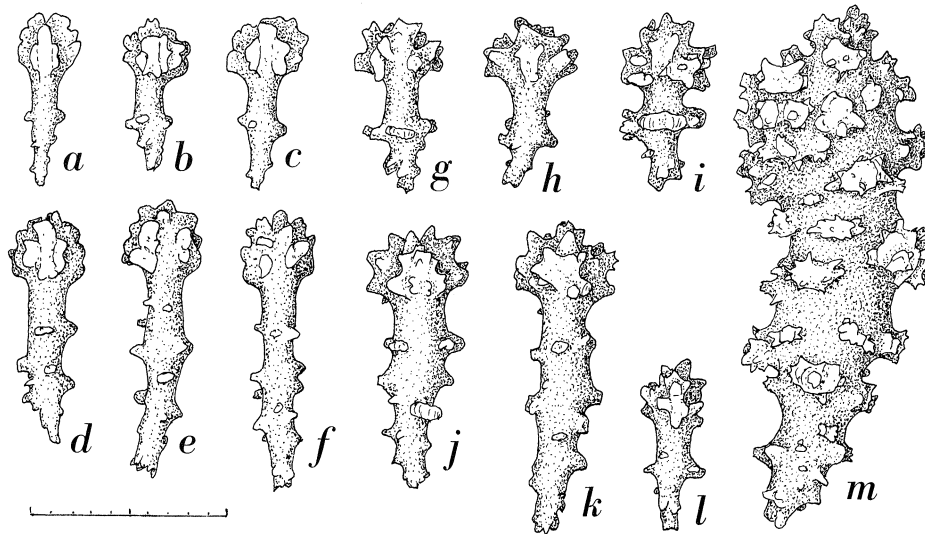


Fig. 3. *Sinularia densa* (Whitelegge), type specimen, AM G1541, **a-f**, clubs from surface layer of a lobe; **g-m**, sclerites from surface layer of the sterile stalk. (Scale line = 0.1 mm)

? *Sclerophyllum densum*, Pratt, 1903: 521, Pl. 29 fig. 18, Pl. 30 figs. 20-22; Pratt, 1905: 256; Thomson & Simpson, 1909: 6; Thomson & Mackinnon, 1910: 177; Cary, 1931, Pl. 4 figs. 12, 13.

Sclerophyllum densum, Thomson & McQueen, 1907: 55 (perhaps right).

? *Sinularia densa*, Lüttschwager, 1915: 11.

non *Sinularia densa*, Kolonko, 1926: 314-315; Tixier-Durivault, 1945: 59; Tixier-Durivault, 1951: 38-41, Figs. 39, 40, 45-48; Verseveltdt, 1960: 233-235, Pl. 7 fig. 4; Tixier-Durivault, 1966: 182-185, Figs. 175-177; Tixier-Durivault, 1970: 149.

Sinularia brongersmai, Verseveltdt, 1972: 460-463, Figs. 2, 3, Pl. 1 fig. 2; Verseveltdt, 1977a: 20-21, Fig. 14, Pl. 6 fig. 2.

MATERIAL: Funafuti Atoll, Ellice Is. AM G1541, one colony, Whitelegge's type specimen.

NOTES ON TYPE SPECIMEN AM G1541: The colony is hard. The lobes have been correctly described by Whitelegge (1897). The description of the sclerites, however, deserves important additions.

The surface layer of the lobes contains numerous clubs, 0.08 to 0.16 mm long, the smaller ones with distinct foliaceous heads; the handles bear blunt spines; their number depends on the length of the handle (Fig. 3a-f). In the sterile stalk the surface layer has also numerous clubs; they are of the same length, but they are wider, the heads are coarser, and have more wartlike prominences (Fig. 3g-l). Big clubs with spiny warts (Fig. 3m) may be regarded as transitional forms to coenenchymal sclerites.

In the coenenchyme of lobes and sterile stalk lie pointed spindles, in the lobes up to 4 mm long, in the stalk up to 2.50 mm. In a few cases they are forked at one end. They are covered with high, strongly crenellated warts, usually 0.07 to 0.08 mm in diameter (processes included); the diameter of warts should always be measured in a direction parallel to the longitudinal axis of the sclerite, for in a transverse direction the warts are often strongly

developed or fused). The warts on the spindles from the lobes are usually regularly arranged in transverse rows; those on the spicules from the stalk are often irregularly placed. The coenenchyme of the stalk also contains numerous small spindles, 0.15 to 0.40 mm long; they bear some spines. Between these and the stout coenenchymal spicules there are transitional forms.

REMARKS: Whitelegge's incomplete description of the sclerites must be the cause of so many subsequent incorrect or dubious identifications and descriptions (see the synonymy above). The more or less deceptive drawing of the club with its spiny head in Whitelegge's Pl. 11 fig. 4h, and especially the failure to mention the occurrence of the small foliaceous clubs in the lobes must have confused many investigators.

In 1972 J.V. described the new species *S. brongersmai*. A comparison of this species with *S. densa* described above shows that the differences are of very little importance. We are therefore of the opinion that the junior name *brongersmai* must be abandoned.

***Sinularia larsonae* sp. nov.**

Fig. 4, Pl. 5C

MATERIAL: Lizard Is., Great Barrier Reef, lagoon, SE of Palfrey Is., depth 4–8 m, 2 November 1975. H.K. Larson no. LZ 75-4, AM G14800; one colony, holotype.

DESCRIPTION: The basal part of the sterile stalk has been cut off slantingly. The remaining part of the colony has a total height of 65 mm. The maximum spread of the capitulum is 75 mm (Pl. 5C). The sterile part is 30 to 35 mm wide. It imperceptibly passes into the polyp-bearing capitulum. The latter consists of some thick branches, which in their turn bear some side-branches. These are cylindrical, sometimes slightly curved, 4 to 7 mm wide and usually 8 to 12 mm long; a few are up to 20 mm long. In some cases these branches are indented at the top. The whole colony is hard and stiff.

The polyps are completely retracted, leaving shallow pits; at their bottom are eight-rayed openings. The centres are 1.00 to 1.50 mm apart; in the distal parts of the branches they are less distant.

The surface layer of the branches and of the sterile stalk has clubs 0.10 to 0.24 mm long (Fig. 4a-h). The heads consist of some blunt-ended processes or simple warts; in many cases a central wart is present. The handles are straight or slightly curved rods, with a few low cones.

In the coenenchyme there are usually curved spindles, in the branches up to 5 or 6 mm long (Fig. 4i, j), in the sterile stalk right up to 10 mm long (Fig. 4k-o). Many of them have a median constriction; a few are bifurcated at one end. The warts are small to medium-sized, about 0.05 mm in diameter. They may be in transverse rows or irregularly distributed; they stand close together or wider apart; sometimes the processes are only low cones. All these differences can be found on one and the same spicule.

Colour: In alcohol the colour is brown.

REMARKS: The species is characterized by the tree-like shape of the colony, by the long, slender, nearly smooth handles of the clubs in the surface layer, and, last but not least, by the extraordinary long coenenchymal spicules.

The species is named after Ms Helen K. Larson, collector of the specimen.

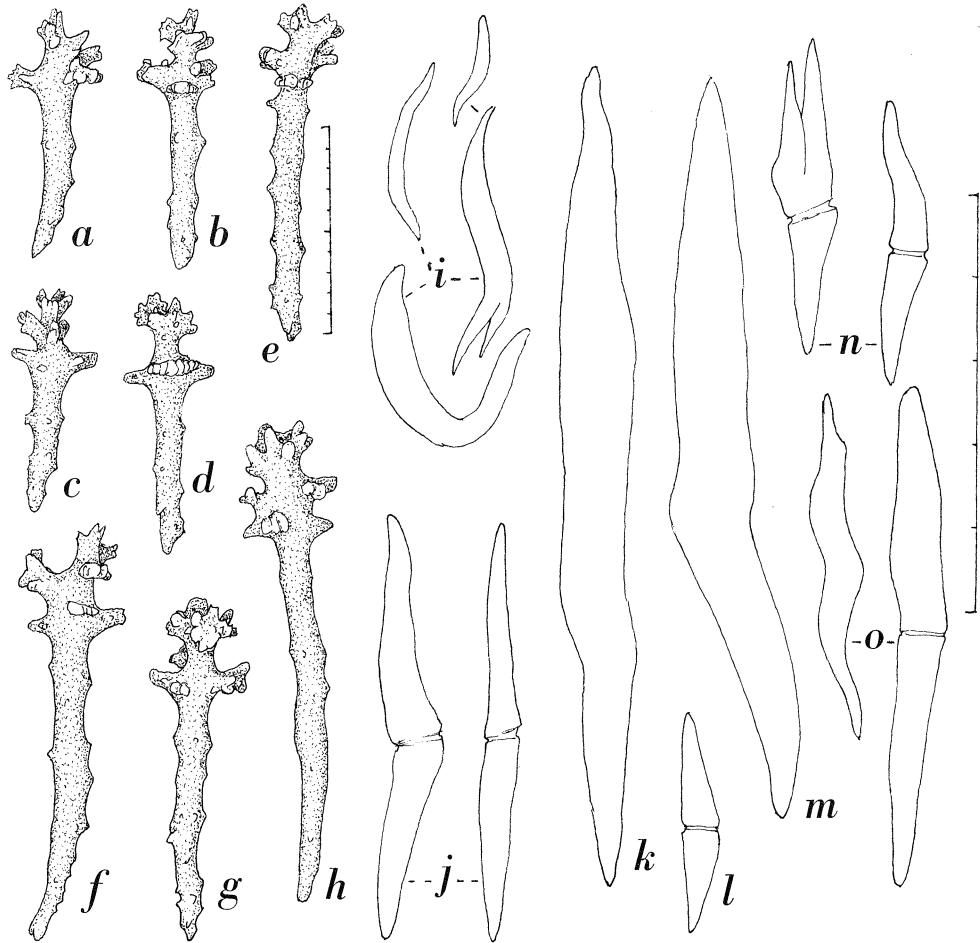


Fig. 4. *Sinularia larsonae* sp. nov., holotype, AM G14800. **a-h**, sclerites from surface layer of a lobe; **i-j**, sclerites from interior of a lobe; **k-o**, sclerites from interior of the sterile stalk. (Enlargement of **a-h** indicated by 0.1 mm scale at **e**; that of **i-o** by 5 mm scale to the right of **n-o**.)

***Dendronephthya (Morchellana) australis* Kükenthal, 1905**

Fig. 5, Pl. 5B

Dendronephthya australis Kükenthal, 1905: 631-632, Fig. F¹, Pl. 29 fig. 32.

Morchellana australis, Tixier-Durivault & Prevorsek, 1962: 17-21, Figs. 2-4.

MATERIAL: Fly Point, Port Stephens, N.S.W., Australia, depth 18 m, 6 December 1975. N. Coleman no. 274, RMNH Coel. no. 12299, one colony.

DESCRIPTION OF COLONY RMNH COEL. NO. 12299. The flabby colony is 55 mm high (Pl. 5B). The sterile stalk, 20 to 25 mm long, is flattened laterally and furrowed longitudinally.

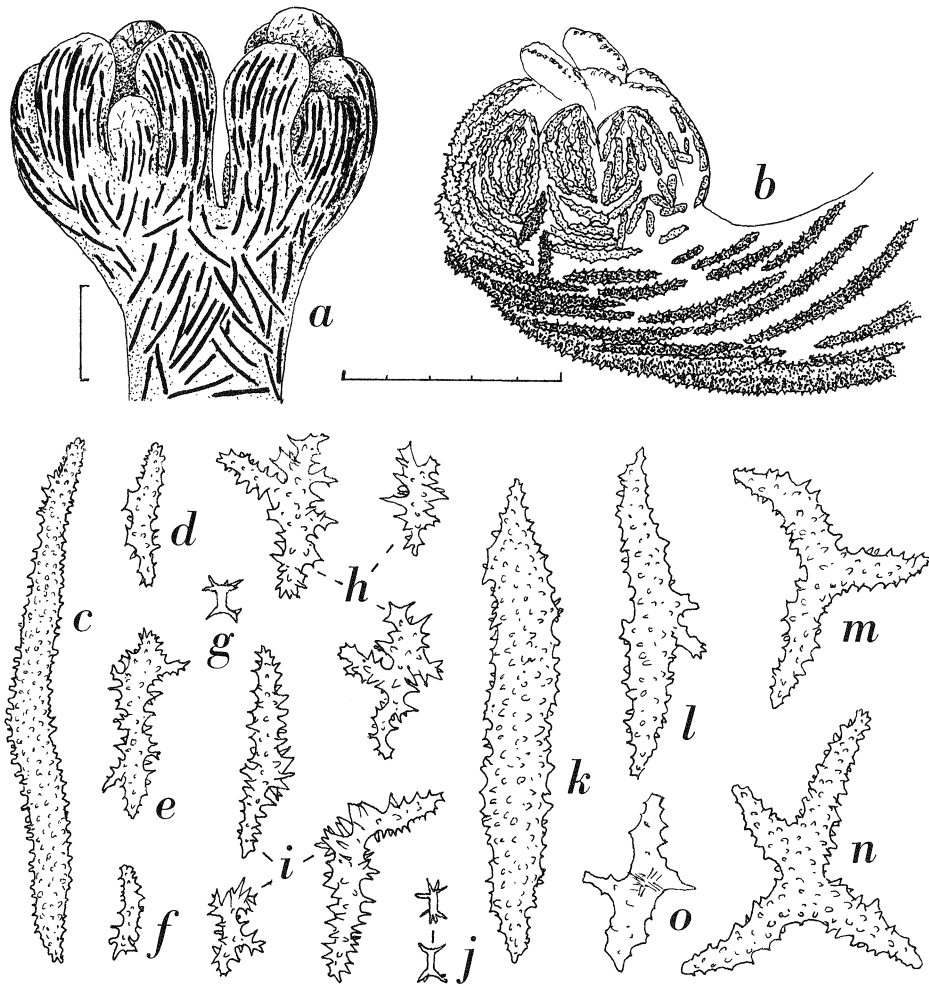


Fig. 5. *Dendronephthya (Morchellana) australis* Kükenthal, RMNH Coel. no. 12299. **a**, small 'lobe'; **b**, polyp; **c-f**, sclerites from surface layer of the stem; **g-j**, sclerites from surface layer of the sterile stalk; **k-o**, sclerites from coenenchyme of the stalk. (Enlargement of **a** indicated by 1 mm scale adjacent; that of **b-o** by 0.5 mm scale at **b**.)

Its basal half is covered with grey mud. The polyparium, too, is flattened laterally. It is widest distally: 23 mm. The sterile stalk passes into the stem, which distally divides into a few branches. In this part of the colony the groups of polyps are numerous and densely placed, whereas proximally only small groups are found, which stand further apart. There are no foliaceous branches.

At first sight these groups of polyps resemble the lobes of *Nephthea*, but on closer investigation it appears that the polyps are not regularly distributed all over the 'lobe' as is the case with *Nephthea*, but arranged in small, round, nearly unstalked groups of about six polyps, which groups or umbels are united into larger 'lobes'. Fig. 5a represents a small 'lobe' consisting of a short, thick twig with only two umbels. Proximally the 'lobes' are small, distally they are larger and composed of numerous, crowded umbels. Besides, on one side of the flat colony the 'lobes' are more numerous than on the other side.

The spherical anthocodiae, about 0.70 mm wide, form right angles with their short stalks, 0.10 to 0.40 mm long (Fig. 5b). Their wall is densely filled with spiny spindles. Those on the asulcal (dorsal) side are largest, averaging 0.30 mm long; on the lateral sides they are 0.12 to 0.20 mm long, on the sulcal (ventral) side 0.07 to 0.13 mm. In many cases they show an arrangement *en chevron*, with six to eight spicules in a row. The supporting bundle is weak. It consists of some spiny spindles, up to 1 mm long. They are red in colour, as are the basalmost anthocodial sclerites; the other anthocodial sclerites are colourless. In the drawing Fig. 5b the red spicules are more darkly spotted. In the tentacles, which may be extended, there are minute, strongly toothed scales, 0.045 to 0.065 mm long.

Anthocodial grade and formula: II = (6-8)p + 0 Cr. + weak S.B.

The sclerites in the surface layer of the stem are of two types: (1) curved rods, up to 1.30 mm long and 0.12 mm wide (prominences included; 0.07 mm, without prominences), and densely covered with spines (Fig. 5c), and (2) shorter spindles, 0.20 to 0.50 mm long, with higher, sharp spines (Fig. 5d-f). Many of them have long, pointed processes. In the surface layer of the sterile stalk the sclerites, about 0.40 to 0.50 mm long, are irregularly shaped and very spiny (Fig. 5h, i). In addition to these there are small sclerites, 0.06 to 0.08 mm in length or in diameter; many of these are dumb-bells with heads formed by a few spines (Fig. 5g, j).

The coenenchyme of the sterile stalk contains spindles and derivative forms of these, tri- and quadri-radiates, etc. The length is up to 1.20 mm; their surface is covered with high cones (Fig. 5k-n). A few flat sclerites also occur (Fig. 5o).

Colour: In alcohol the sterile stalk and the basal part of the stem are dirty-white. Distally the sclerites become increasingly redder, the twigs and supporting bundles having dark-red spicules. The anthocodiae are white.

REMARKS: As we said above, the specimen looks like a *Nephthea* species with rounded lobes. These 'lobes', however, usually consist of a number of smaller groups, the umbels, but these umbels stand so close that they can hardly be called umbels.

In addition to this, the species is characterized by the armature of the polyps and by the shape of the sclerites in the surface layer of stem and stalk.

GEOGRAPHICAL DISTRIBUTION. The species has previously been recorded from Port Jackson and Port Hacking, both in the neighbourhood of Sydney, Australia, as is Port Stephens, the locality of the specimen described above.

***Dendronephthya (Morchellana) waitei* Thomson & Mackinnon, 1911**

Figs. 6, 7, Pl. 6

Dendronephthya waitei Thomson & Mackinnon, 1911: 668-670, Pl. 62 fig. 4, Pl. 65 Fig. 2, Pl. 67 fig. 3.

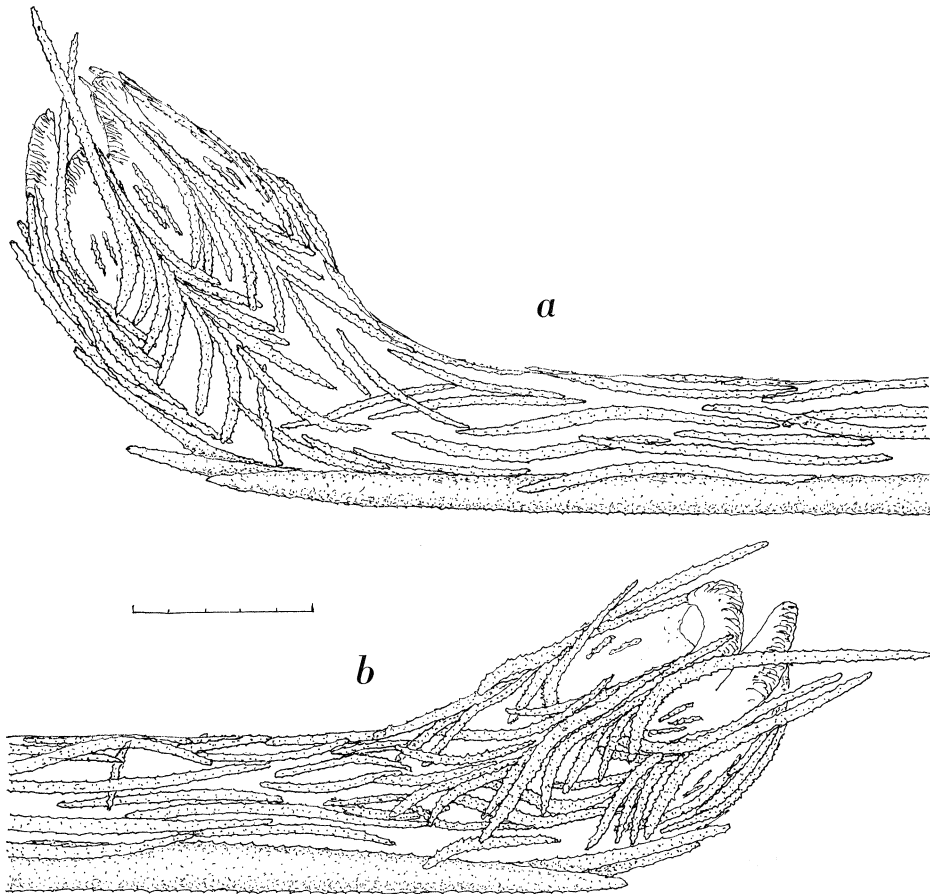


Fig. 6. *Dendronephthya (Morchellana) waitei* Thomson & Mackinnon, type specimen, AM G12191. **a-b**, polyps. (Both figures drawn to the same scale; Scale line = 0.5 mm)

MATERIAL: Thetis Expedition, Sta.25, Newcastle Bight, N.S.W., Australia, depth 77 to 88 m (42 to 48 fathoms). AM G12191, type specimen.

DESCRIPTION: Thomson & Mackinnon's picture (1911, Pl. 62 fig. 4) of the type specimen gives a very good impression of the colony. In Pl. 6 a fragment of the polyparium is reproduced.

According to the authors just mentioned (1911: 669) the polyps 'occur in bundles of about six, in typically "glomerate" arrangement'. We think, however, that the mode of growth of the colony is not at all typically glomerate: there is a profuse branching of the polyparium, and the grouping of the bundles of polyps into roundish bundles is far from clear. In our opinion the species belongs to the Umbellatae, so to the subgenus *Morchellana*. The terminal

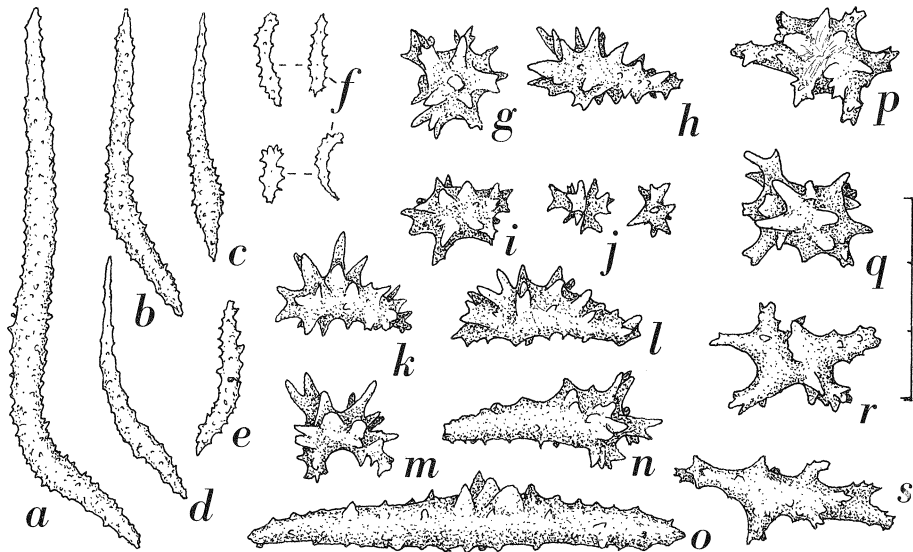


Fig. 7. *Dendronephthya (Morchellana) waitei* Thomson & Mackinnon, type specimen, AM G12191. **a-e**, anthocodial spicules; **f**, sclerites from tentacles; **g-o**, sclerites from surface layer of the base of the sterile stalk; **p-s**, sclerites from interior of the sterile stalk. (All figures drawn to the same scale; Scale line = 0.3 mm)

twigs form corymblike aggregates of polyps, with more than six polyps in one corymb. These aggregates bear a great resemblance to the corymbs, e.g., in the umbellate colony of *D. sinensis*, represented by Pütter, 1900, Pl. 30 fig. 12, and by Kükenthal, 1905, Pl. 30 fig. 40. The sparse occurrence of branches on one side of the colony also points to the Umbellatae.

In each corymb there are a few long-stalked polyps (Fig. 6). The stalks, up to 2 mm long, are straight; the width is 0.40 mm. The anthocodiae, 0.80 to 0.90 mm wide, make a very obtuse angle with the stalk, giving the polyps a clavate appearance. The younger polyps have short, often curved stalks. The anthocodial armature consists of eight double rows of spindles arranged *en chevron*. The sulcal (ventral) and lateral rows have six to eight pairs of curved, spiny spindles, usually 0.25 to 0.50 mm long; in the asulcal (dorsal) rows there may be more spindles, nine or ten in a row (Fig. 7b-e). In each row the distalmost sclerites, up to 0.90 mm long, are hockey-stick-shaped; they project for a distance of up to 0.30 mm (Figs. 6, 7a). In the interstices between the points there are about three intermediates. The tentacles, 0.35 to 0.45 mm long, are armed with transversely arranged, toothed scales, 0.10 to 0.15 mm long (Fig. 7f).

In the full-grown polyps the supporting bundle is strong. It consists of one straight spindle up to 4 mm long and 0.17 mm wide, accompanied by a few shorter ones. In the younger polyps the supporting bundles are weak. In the polyp-stalks there are thin, curved, nearly smooth spindles.

Anthocodial grade and formula: II = 1P + (5-7)p + 0 Cr. + strong S.B. + (1-2) M.

In the surface layer of the upper part of the colony thin spindles and needles occur; they bear low cones, which are wide apart. For dimensions see Thomson & Mackinnon, 1911: 669. The surface layer of the base of the sterile stalk has stars, club-shaped forms, and spindles up to 1 mm long; many of them have higher spines on one side (Fig. 7g-o). The canal-walls contain irregularly shaped, starlike sclerites, 0.18 to 0.36 mm in diameter or in length (Fig. 7p-s).

REMARKS: Thomson & Mackinnon (1911: 669) think that in certain features *D. (M.) waiteri* approaches *D. maxima* Kükenthal. In our opinion there is a closer resemblance to *D. (M.) sinensis* (Pütter); see Pütter, 1900: 455-456, Pl. 29 fig. 6, Pl. 30 fig. 12, and Kükenthal, 1905: 649-650, Pl. 30 fig. 40. However *D. (M.) sinensis* has (a) four to six pairs of spindles in each anthocodial point, (b) one intermediate between two adjacent points, (c) longer tentacles, and (d) different coenenchymal sclerites.

***Nephtea legiopolypa* sp. nov.**

Fig. 8, Pl. 7B

MATERIAL: Lizard Is., Great Barrier Reef, west tip of Palfrey Is., on reef slope, depth 4.5-6 m, rubble, sand and corals, 3 November 1975. H.K. Larson no. DFH 75-254, AM G14806, one colony, holotype.

DESCRIPTION: The rather flabby colony measures 105 mm in total height (Pl. 7B). The sterile stalk is 40 mm high and 25 to 30 mm wide; it is furrowed longitudinally. The distal part of it is covered by the undermost branches. The capitulum is flattened laterally; it is 60 mm wide and 30 to 35 mm thick.

The stem gives off some side-branches, which are thickly set with lobules. The latter are often cone-shaped, 6 to 7 mm high and 4 mm wide. Others are smaller and spherical.

The lobules are densely covered with polyps, which are practically stalkless. The anthocodiae are about 0.60 mm high and 0.65 mm wide (Fig. 8a); the tentacles are incurved. At the asulcal side of an anthocodia there are a few rods, 0.12 to 0.18 mm long; they are longitudinally arranged and are provided with high, blunt-ended processes (Fig. 8b). There are also some more or less flattened sclerites, 0.09 to 0.11 mm long (Fig. 8c, d). The greater part, however, consists of oval or finger-biscuit-like or slightly irregularly shaped small bodies, 0.03 to 0.07 mm long (Fig. 8e). The latter also occur in the tentacles. The supporting bundle is weak, ensheathing; it consists of a few spiny spindles. The largest ones are up to 1.20 mm long. One or two may project for a distance of 0.20 or 0.30 mm beyond the anthocodia.

The surface layer of a branch has a mixture of slender, spiny rods, up to 1.00 mm long (Fig. 8f) and numerous small, more or less rod-shaped sclerites, 0.07 to 0.15 mm long, provided with some low cones (Fig. 8h, i). The sclerites represented in Fig. 8g are transitional forms. In the surface layer of the middle part of the sterile stalk there are shorter rods, up to about 0.40 mm long (Fig. 8j, m) and a great many irregularly shaped bodies: some are dumb-bells, 0.08 to 0.12 mm in diameter (Fig. 8k), others are short 'caterpillars', up to 0.16 mm long (Fig. 8l). In the basal part of the stalk some sclerites are larger and fantastically shaped, and up to 0.45 mm long (Fig. 8n, o, q), but there are also numerous small sclerites, 0.10 to 0.20 mm in length or in diameter: crosses, dumb-bells, etc. (Fig. 8p).

The coenenchyme of the sterile stalk has: (1) large, branched or unbranched spindles, up to 2.20 mm long, covered with small, blunt spines or with higher, larger spines (Fig. 8r), and (2) numerous small sclerites: three- or four-radiated forms, irregular spindles, etc.; diameter 0.25 to 0.50 mm (Fig. 8s -v).

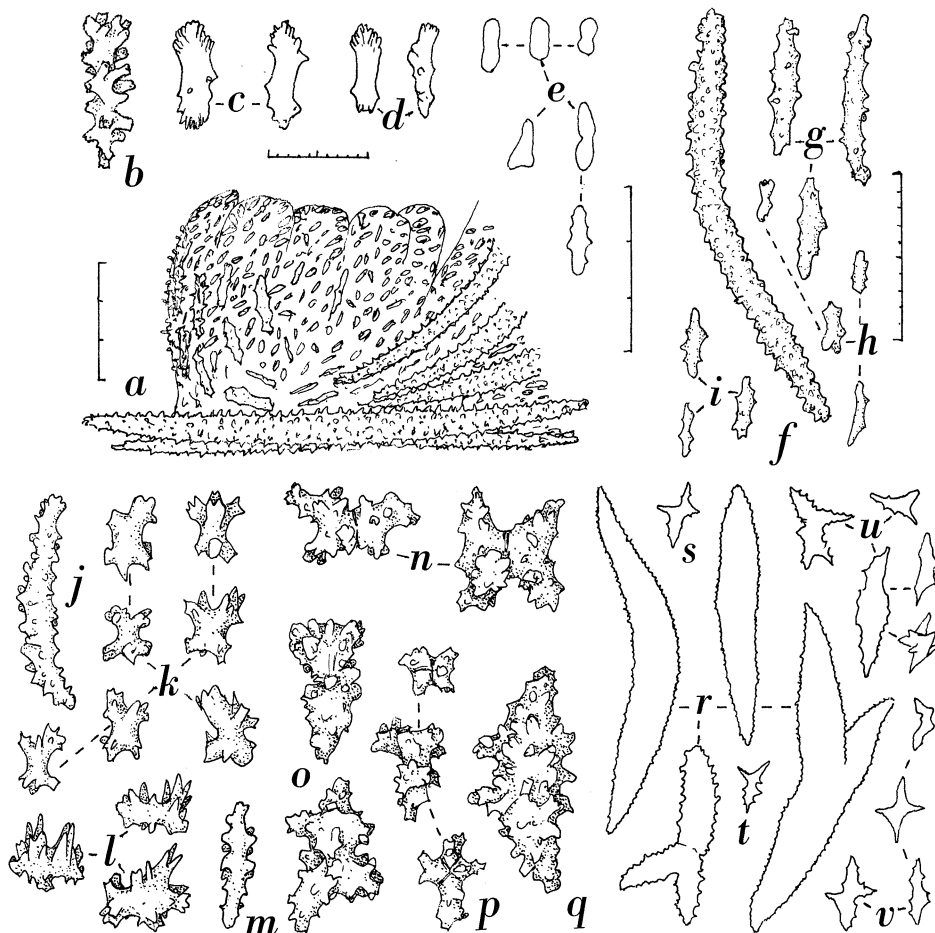


Fig. 8. *Nephthea legiopolypa* sp. nov., holotype, AM G14806. **a**, polyp; **b-e**, anthocodial sclerites; **f-i**, sclerites from surface layer of a branch; **j-m**, sclerites from surface layer of the middle of the sterile stalk; **n-q**, sclerites from surface layer of the base of the sterile stalk; **r-v**, sclerites from coenenchyme of the sterile stalk. (Enlargement of **a** indicated by 0.3 mm scale to the left of **a**; that of **b-e** by 0.1 mm scale below **c-d**; that of **f-q** by 0.3 mm scale between **e** and **i**; that of **r-v** by 1 mm scale to the right of **g-h**.)

Colour. In alcohol the colour is creamy-light brown.

REMARKS: The species is characterized by the crowded, stalkless polyps with a remarkable armature. The specific name refers to these tight-packed polyps (Latin *legio* = large number).

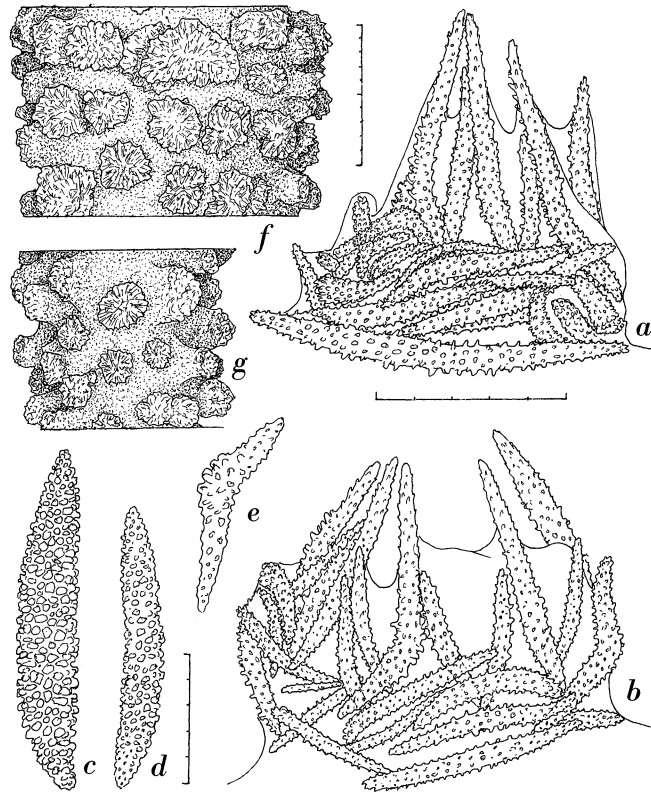


Fig. 9. *Scleronephthya pallida* (Whitelegge), type specimen, AM G1543. **a, b**, polyps; **c-e**, spicules from coenenchyme of the base; **f-g**, prominences on coenenchymal sclerites. (Enlargement of **a, b** indicated by 0.5 mm scale below **a**; that of **c-e** by 0.5 mm scale at **d**; that of **f, g** by 0.1 mm scale to the right of **f**.)

***Scleronephthya pallida* (Whitelegge, 1897) n. comb.**

Fig. 9, Pl. 7A

Spongodes pallida Whitelegge, 1897: 221-222, Pl. 12 fig. 7a-c.

non *Stereonephthya whiteleggi* Kükenthal, 1905: 705-707, Pl. 32 fig. 57; Utinomi, 1971: 95-96, Pl. 15 fig. 6.

non *Stereonephthya whiteleggei* Kükenthal, 1910, 57-58, Pl. 3 fig. 23.

MATERIAL: Funafuti Atoll, Ellice Is. AM G1543, one colony, Whitelegge's type specimen.

In 1905 Kükenthal identified a specimen from the Hamburg Museum with Whitelegge's *Spongodes pallida* and described it under *Stereonephthya whiteleggi* nom. nov. In 1910 he adopted the spelling *S. whiteleggei*. A comparison of both the short re-description below and Whitelegge's description (1897) with those of Kükenthal (1905, 1910) and Utinomi (1971) clearly shows that the colonies described by the latter authors are quite unlike *Spongodes*

pallida. Kükenthal's figures (1905, Fig. L2; 1910, Fig. 29) and Utinomi's picture (1971, Text-fig. 6) of polyps remove all doubt on this point.

A single glance at Whitelegge's Pl. 12 fig. 7b (1897) already suffices to show that the polyps lack supporting bundles. One might be inclined to ascribe this absence to the drawer of the figure, but re-examination showed that the drawing is correct: a supporting bundle is in fact wanting. The polyps are radially symmetrical, a sulcal and an asulcal side cannot be distinguished as easily as in *Dendronephthya* and *Stereonephthya*. The drawings Fig. 9a and b have been made from an old slide, present in the Australian Museum, and mounted by Whitelegge himself. These drawings show that the anthocodial armature consists of crown and points. The crown is composed of about four rows of spindles, 0.25 to 0.60 mm long. Each point consists of one pair of nearly straight, but often slightly hockey-stick-shaped sclerites. One of each pair is longer than the other, up to 0.75 mm, and projects above the anthocodia for a distance of 0.25 to 0.30 mm. The shorter point spicule is 0.18 to 0.35 mm long. Sometimes there are two shorter sclerites. All anthocodial sclerites bear blunt spines.

The polyps are 0.80 to 1.00 mm wide, the stalk is very short or absent. The tentacles, which are withdrawn into the anthocodiae, are armoured with a number of flat, more or less rodlike, sometimes slightly clavate sclerites, 0.12 to 0.15 mm long, with toothed edges, and densely arranged *en chevron*.

In the surface layer of the stems and of the encrusting base, and also in the coenenchyme of the base, lie spindles up to 1.40 mm long, and varying in width from about 0.13 to 0.24 mm (Fig. 9c-e). They are thickly covered with blunt spines. Their summits, 0.02 to 0.04 mm in diameter (measured in a direction parallel to the longitudinal axis of the sclerite), are curiously grooved (Fig. 9f, g).

REMARKS: Striking characters of the type specimen are the absence of a supporting bundle, and the radial symmetry of the polyps and their armature. We therefore refer it to the genus *Scleronephthya* for the same reason as *S. corymbosa* Verseveldt & Cohen, 1971.

***Siphonogorgia macrospina* Whitelegge, 1897**

Pl. 8

Siphonogorgia macrospina Whitelegge, 1897: 224-225, Pl. 12 fig. 8a-d; Thomson & Simpson, 1909: 131-132, Pl. 9 fig. 8; Thomson & Dean, 1931: 159-160, 171.

MATERIAL: Funafuti Atoll, Ellice Is., outside the reef, depth 73-128 m (40-70 fathoms), AM G1548; a number of fragments forming Whitelegge's type.

NOTES: A slide with a few branches mounted by Whitelegge and kept in the Australian Museum has kindly been placed at our disposal. The following observations could be made.

The anthocodiae, about 0.40 mm wide, are retracted within calyces formed by one or two stout spicules, bent sideways, and a few shorter ones, while, moreover, the anthocodiae are protected by a palisade of warty clubs standing erect and parallel to each other, the thickened ends directed upwards. The length of these clubs varies from about 0.40 to 0.80 mm. The clavate spicule represented in Thomson & Simpson's Pl. 9 fig. 8 (1909), in the middle to the right, resembles such a club.

The anthocodial armature consists of crown and points. The crown, probably up to eight rows deep, is composed of smooth, curved spindles, 0.33 mm (or more ?) mm long. Each of the points consists of five to eight bent, smooth spindles, arranged *en chevron*; they are 0.20 to 0.30 mm long.

The spicules in the outer layer of the fragments are up to 6 mm long and 0.45 mm wide. Some of them are very sinuous. All of the warts are roughly circular in outline, mostly 0.028 to 0.085 mm in diameter, and 0.035 mm high, domed or pedicellate with rugged, hillock summits. In the canal-walls lie straight or slightly curved needles: the smaller ones, 0.15 to 0.25 mm long, have some tiny spines; the larger ones, up to 1.60 mm long (Whitelegge: 1.80 mm; see his Pl. 12 fig. 18c) and 0.05 mm wide, are smooth.

ACKNOWLEDGEMENTS

We are indebted to Dr J.K. Lowry, Curator of Crustacea and Coelenterata, Australian Museum, Sydney, for the loan of the type specimens present in this museum. Thanks are also due to Ms Helen K. Larson and Mr Neville Coleman, both of the same museum, for placing their collections at our disposal. Finally we want to express our gratitude to Mr W. ter Spill for his critical reading of the English text, and to Mr G.J. Vrijmoeth for making some of the photographs.

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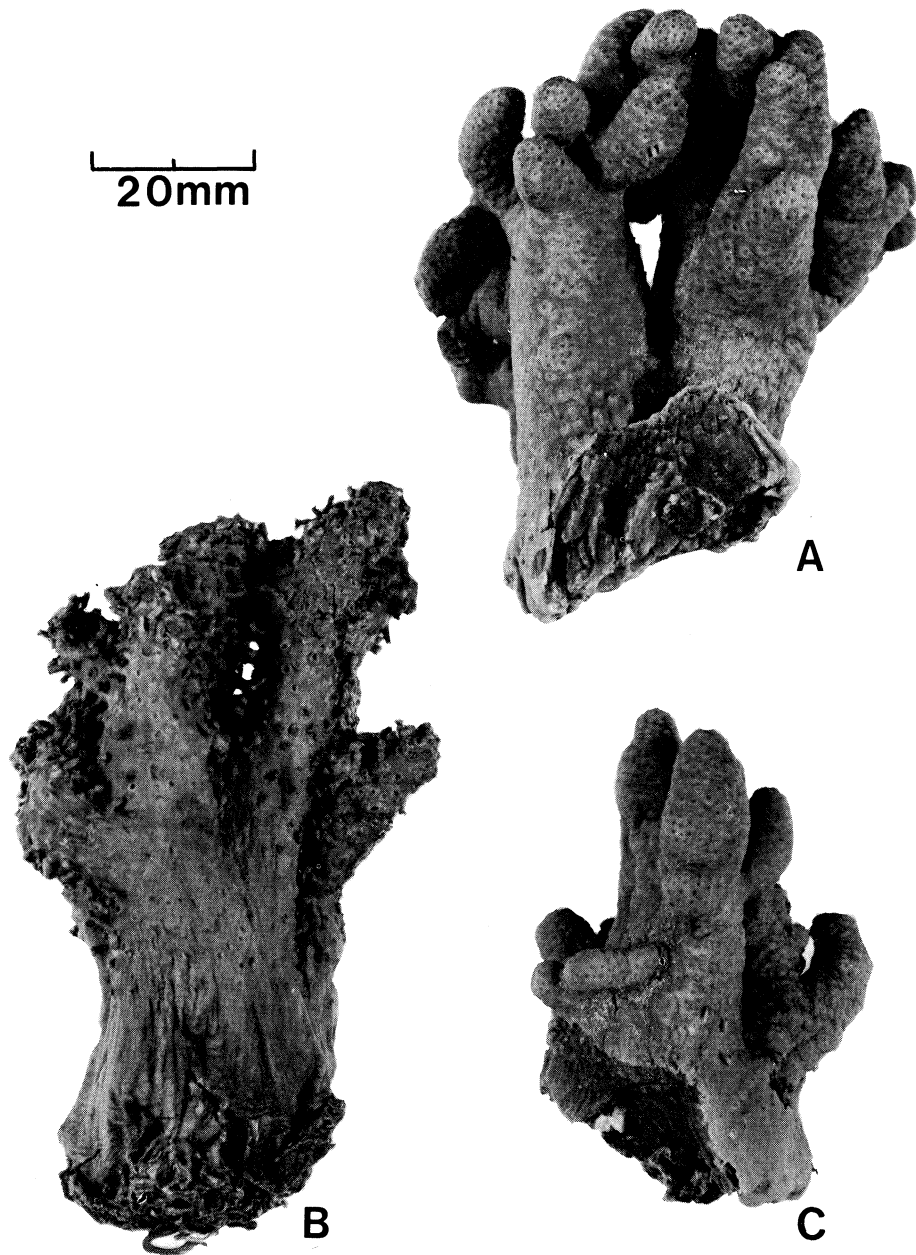


Plate 1. *Alcyonium etheridgei* Thomson & Mackinnon. **A**, holotype, AM G12170. **B**, paratype, AM G12173. **C**, paratype, AM G12172.

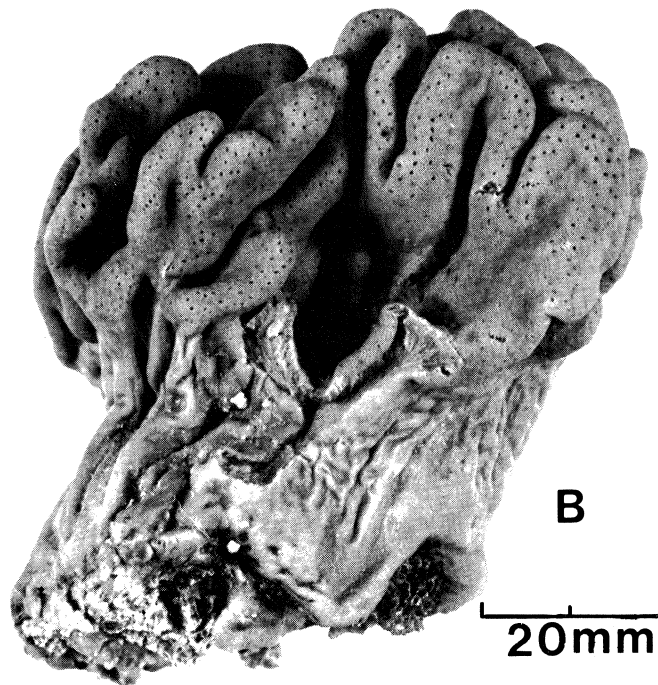


Plate 2. *Lobophytum crassum* Von Marenzeller, type specimen of *L. hedleyi* Whitelegge, AM G1537. **A**, colony seen from above; **B**, side-view.

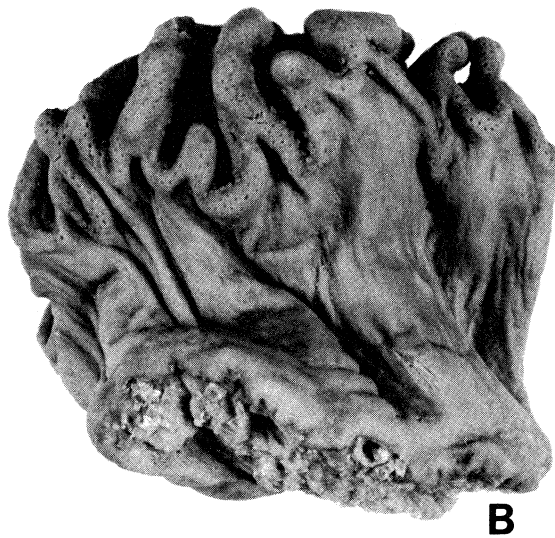
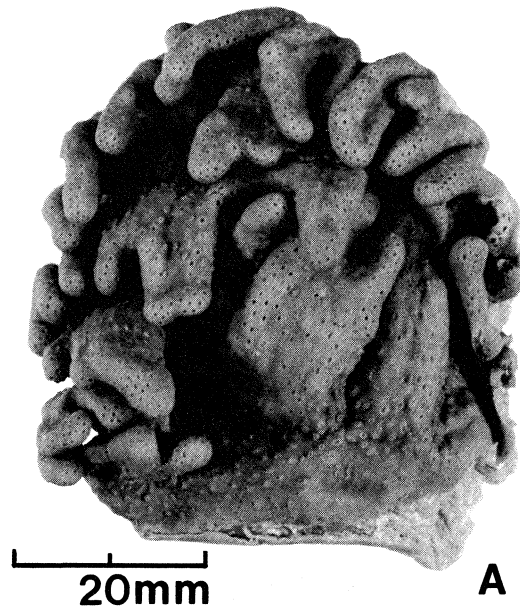


Plate 3. *Lobophytum crassum* Von Marenzeller, paratype of *L. hedleyi* Whitelegge, AM G1537. **A**, colony seen from above; **B**, side-view.

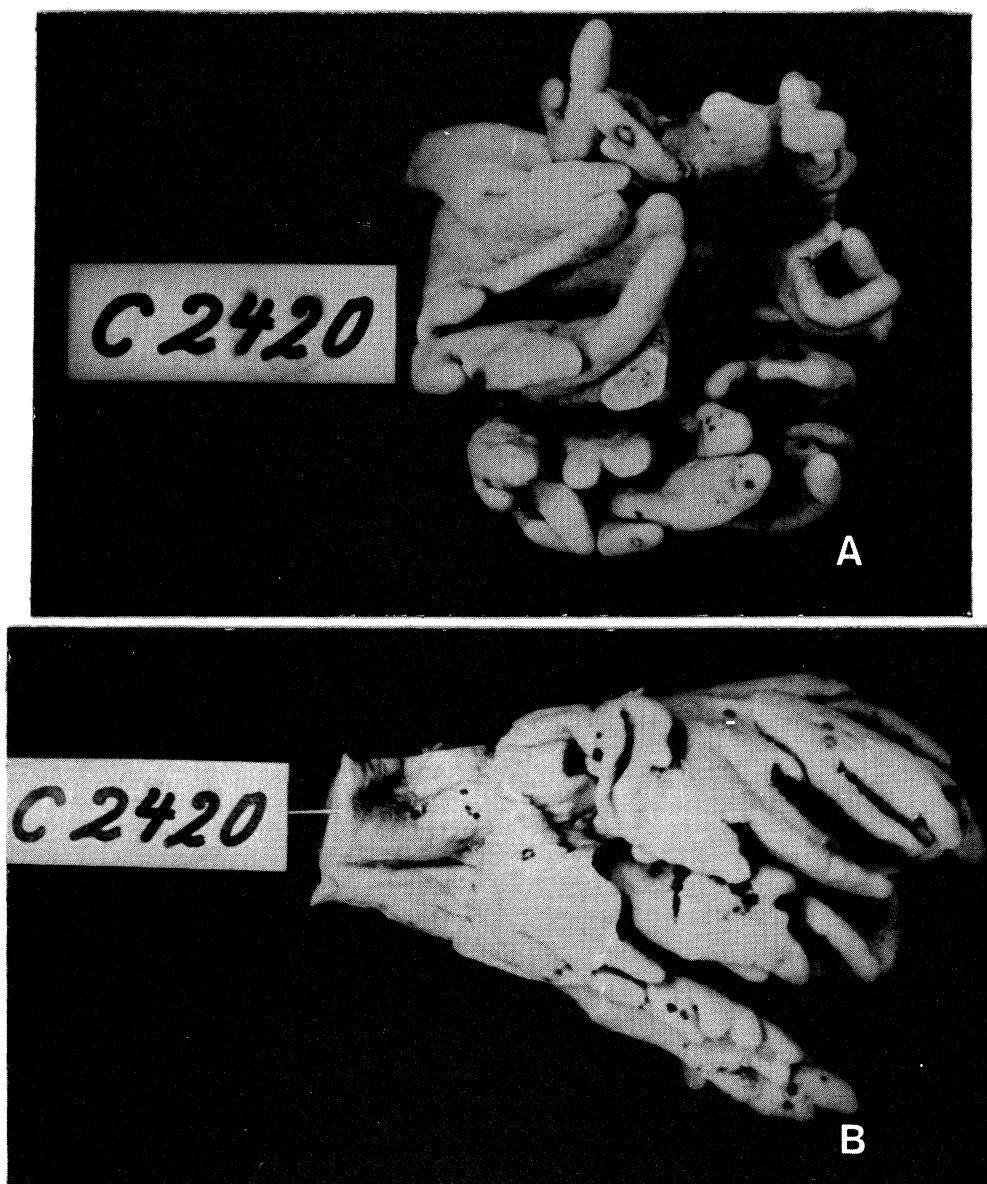


Plate 4. *Lobophytum crassum* Von Marenzeller, type specimen, photograph Museum Codeffroy, Hamburg. **A**, colony seen from above; **B**, side-view.

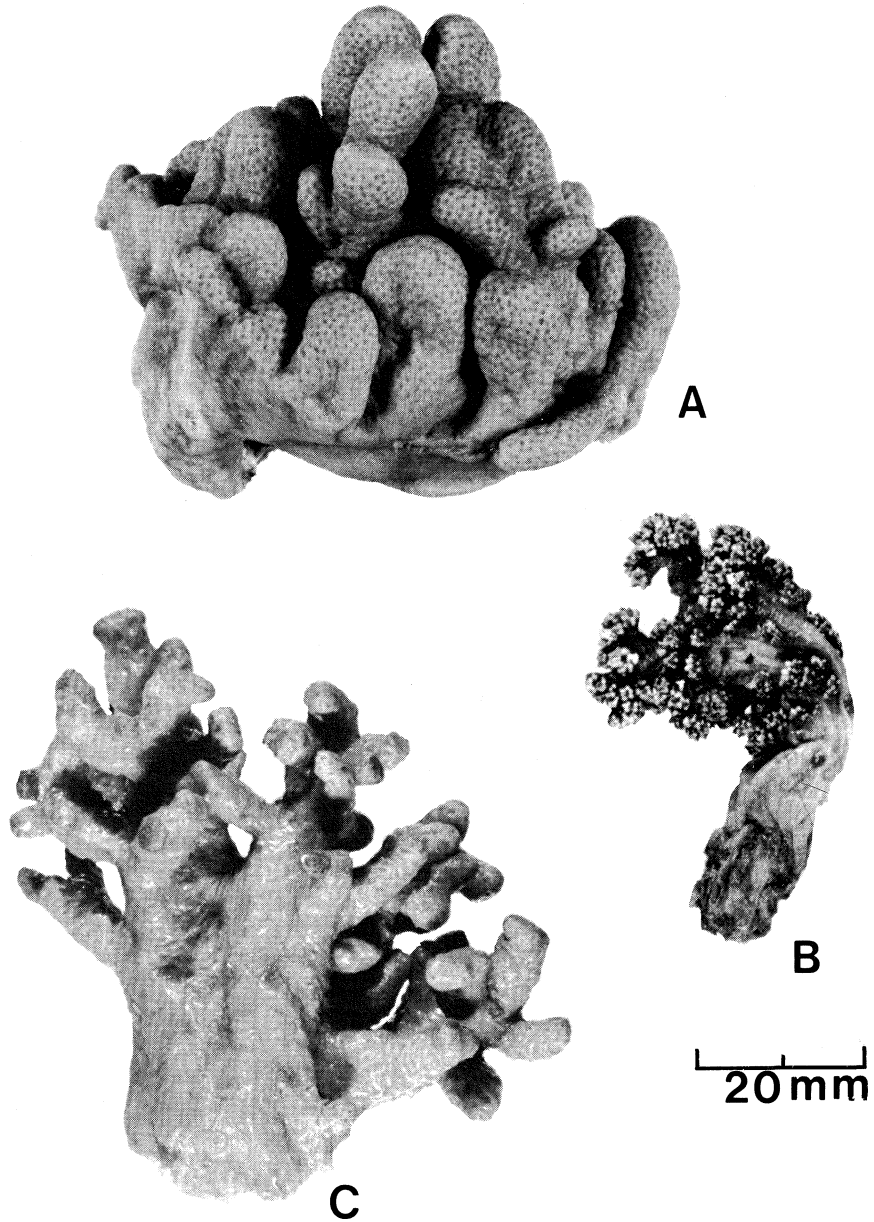


Plate 5. **A**, *Sinularia densa* (Whitelegge), type specimen, AM G1541. **B**, *Dendronephthya* (*Morchellana*) *australis* Kükenthal, RMNH Coel. no. 12299. **C**, *Sinularia larsonae* sp. nov., holotype, AM G14800. (All to same scale.)

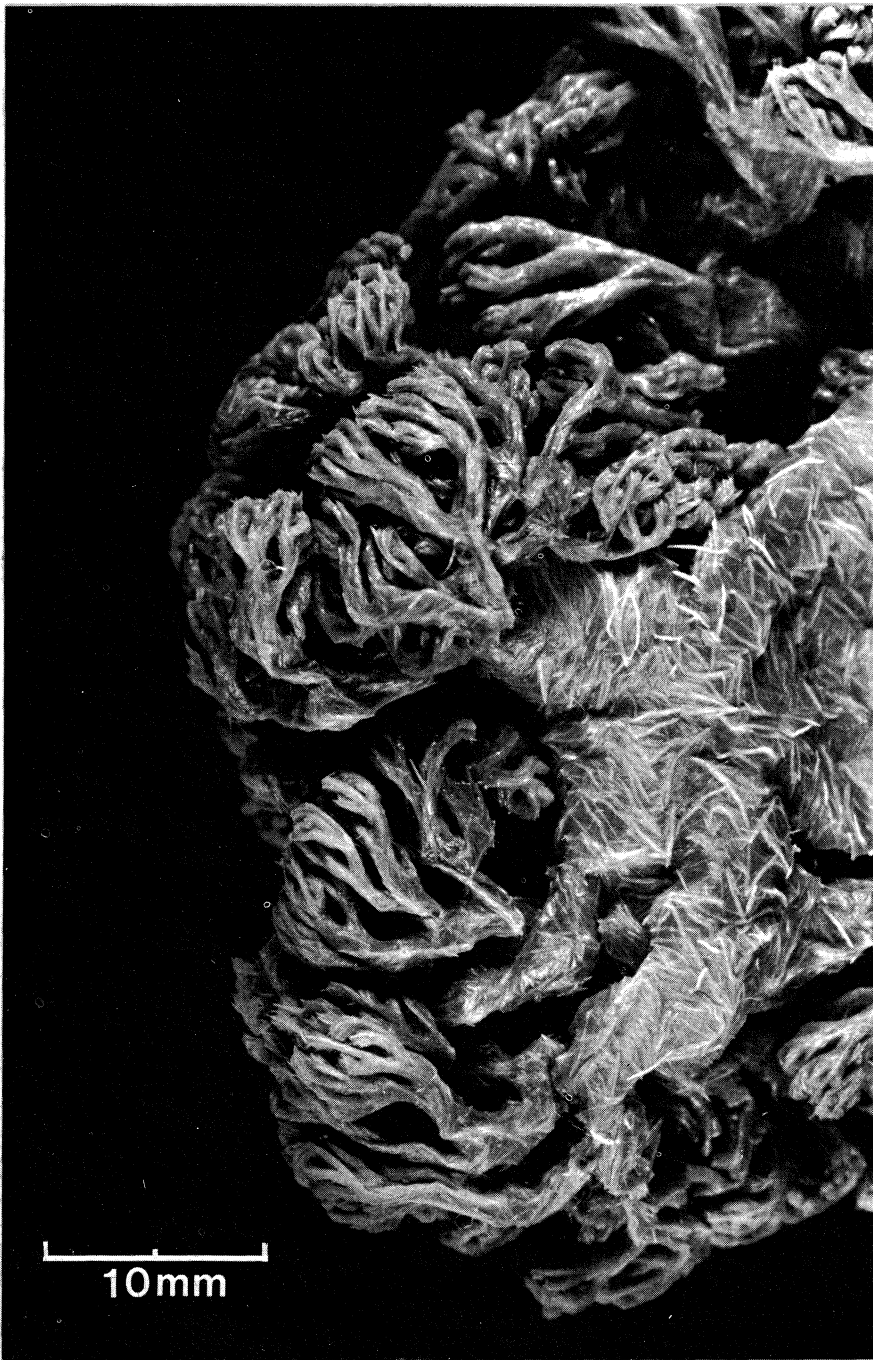


Plate 6. *Dendronephthya (Morchellana) waitei* Thomson & Mackinnon, type specimen, AM G12191; fragment of the polyparium.

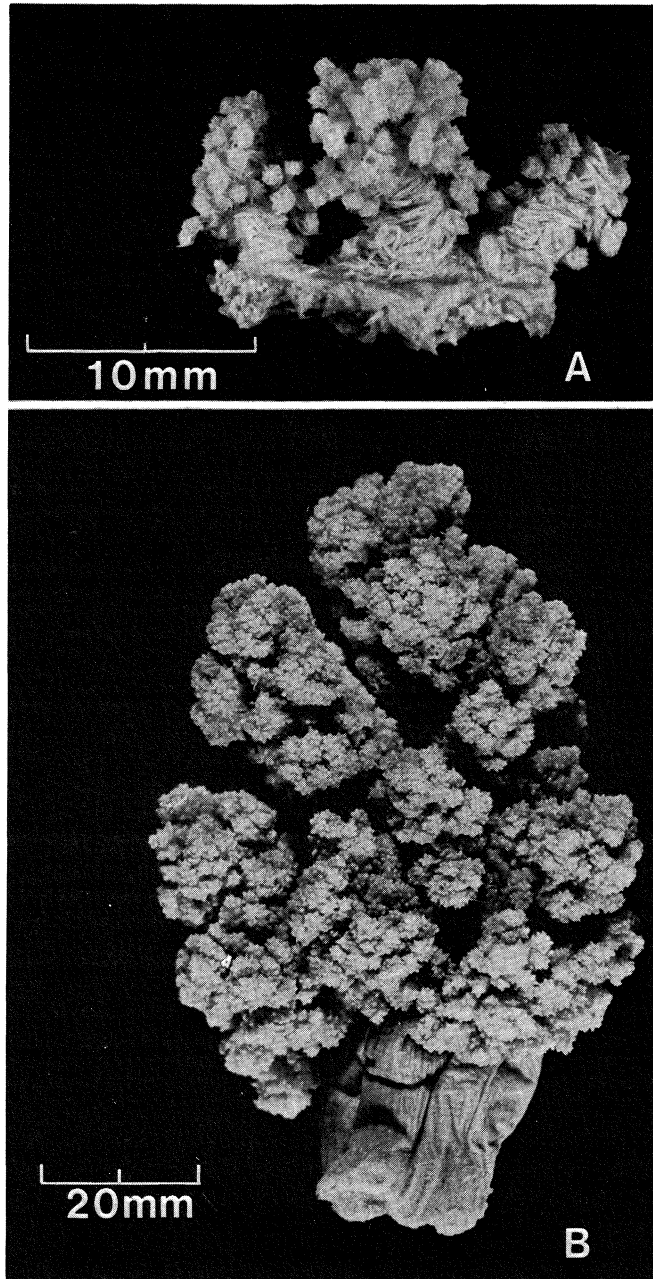


Plate 7. **A**, *Scleronephthya pallida* (Whitelegge), type specimen, AM G1543. **B**, *Nephthea legiopolya* sp. nov., holotype, AM G14806.

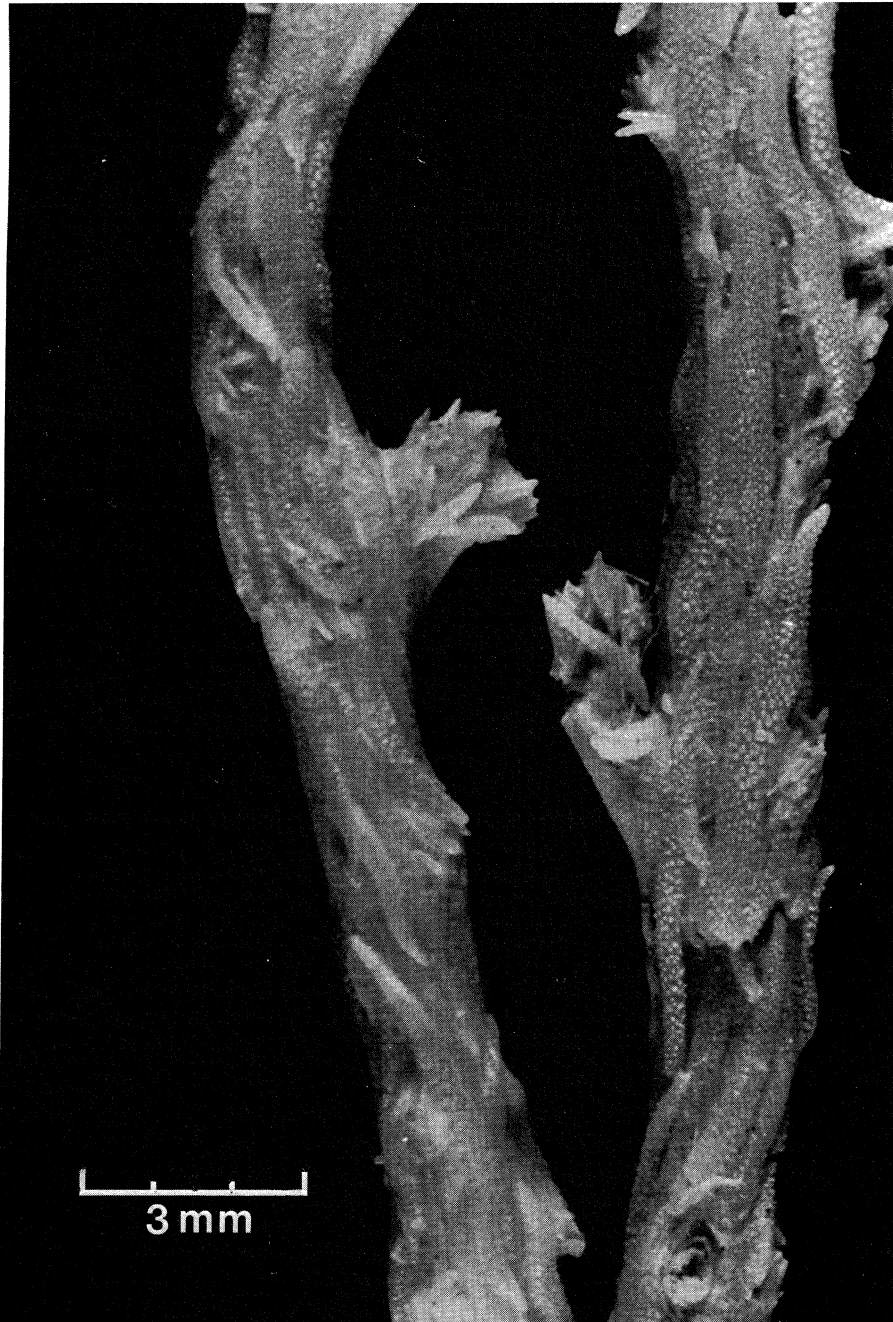


Plate 8. *Siphonogorgia macrospina* Whitelegge, fragments of type specimen. AM G1548.