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INTERTIDAL ALCYONARIANS IN THE VICINITY OF DARWIN, NORTHERN TERRITORY, AUSTRALIA*

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Plates 15 and 16. Text-figures 1-12.

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ABSTRACT

The octocorals, mostly soft alcyonaceans which were collected by Miss Elizabeth C. Pope on the shore reefs near Darwin, northern Australia, during her ecological survey made between 1965 and 1967, are treated systematically in this paper. In all, seventeen known species are listed here. Of the alcyonaceans, two species belong to *Lobophytum*, four to *Sarcophyton*, and one to *Sinularia*; these are all the members of Alcyoniidae and are well-known main reef-builders widespread on the Indo-West Pacific coral reefs. Of the remaining Nephtheidae, six species of *Stereonephthya*, one species of *Dendronephthya* and one species of *Nephthea* were obtained and observed rather commonly in the intertidal zone near Darwin; some of these nephtheid octocorals are easily observed here to form colourful zonation around the reef at low tide.

Although the amount of material available for the study of the local fauna was limited, now it became clear that there was much confusion concerning the nomenclature of common tropical Australian alcyonarians in earlier decades, mainly due to the lack of free currency of literature concerned and the paucity of actual exploration in the field.

INTRODUCTION

The octocorals, mostly alcyonaceans, treated in this paper, were collected by Miss Elizabeth C. Pope, Curator of Worms and Echinoderms at the Australian Museum, on the shore reefs near Darwin, Northern Territory, Australia, during her ecological survey in October, 1965, and, supplementally, by Mr A. J. Boase, her field assistant, in October, 1966, and September-October, 1967.

Most of the specimens entrusted to me for identification are confined to the inhabitants of intertidal reef flat or reef margin, except only one subtidal gorgonacean (*Euplexaura nuttingi* Kükenthal). Though the collection is limited, it contains unexpectedly many species of *Stereonephthya*, besides leathery alcyonaceans prevalent on the Indo-Pacific coral reefs. All of them have already been recorded from the neighbouring areas; some of them seem to be very common and abundant there, showing colourful zoning communities at low tide.

I am much obliged to Dr F. H. Talbot, Director of the Australian Museum and Editor of its publications, for permitting this paper in the *Museum's Records*, and, particularly, to Miss Elizabeth C. Pope, for entrusting me with this interesting collection, together with pertinent ecological comments. My thanks are also due to Mr Chuichi Araga, of our laboratory, for taking the photographs.

* Contribution from the Seto Marine Biological Laboratory, Kyoto University, No. 548.

SPECIES REPRESENTED IN THE COLLECTION

Subclass **OCTOCORALLIA** Haeckel, 1866Order **STOLONIFERA** Hickson, 1883

Family Tubiporidae Ehrenberg, 1828

1. *Tubipora musica* Linné, 1758

Order **ALCYONACEA** Lamouroux, 1816

Family Alcyoniidae Lamouroux, 1812

2. *Lobophytum pauciflorum* (Hemprich and Ehrenberg, 1834)
3. *Lobophytum crassospiculatum* Moser, 1919
4. *Sarcophyton moseri* Roxas, 1932
5. *Sarcophyton ehrenbergi* Marenzeller, 1886
6. *Sarcophyton glaucum* (Quoy and Gaimard, 1833)
7. *Sarcophyton trocheliophorum* Marenzeller, 1886
8. *Simularia polydactyla* (Hemprich and Ehrenberg, 1834)

Family Nephtheidae Gray, 1862 (emend. Utinomi, 1954)

9. *Nephthea chabrolii* Audouin, 1828
10. *Stereonephthya whiteleggi* Kükenthal, 1905
11. *Stereonephthya costatofulva* (Burchardt, 1898)
12. *Stereonephthya costatocyanea* (Burchardt, 1898)
13. *Stereonephthya longicaulis* Kükenthal, 1911
14. *Stereonephthya armata* Kükenthal, 1910
15. *Stereonephthya bellissima* Thomson and Dean, 1931
16. *Dendronephthya (Morchellana) spinosa* (Gray, 1862)

Order **COENOTHECALIA** Bourne, 1895

Family Helioporidae Moseley, 1876

17. *Heliopora coerulea* (Pallas, 1766)

SYSTEMATIC ACCOUNT

STOLONIFERA

Genus **Tubipora** Linné, 1758**Tubipora musica** Linné, 1758

For description and literature see: Wright, 1869, p. 377, pl. 23; Hickson, 1883, p. 556, with 14 figs.

Material.—Not examined directly by the author.

Habitat.—Found only at Dudley Point, Darwin, where it was growing near the inner side of the very wide reef-flat dominated by brain corals (such as *Leptoria* and *Platygyra*). The growths were miserably small and stunted. This contrasted greatly with the fine growths of *Tubipora musica* one finds on the Pacific coast of Australia. In fact, I would say it was almost absent along the northern Australian coast (after a personal communication from Miss Pope, 11th April, 1967).

Distribution.—Previously recorded from various localities in the Red Sea, the Indian Ocean and the tropical Pacific Ocean, as far north as Garanbi, southernmost cape of Formosa (Utinomi, 1959, p. 304). Earlier record of occurrence from the West Indies seems to be due to misidentification.

ALCYONACEA

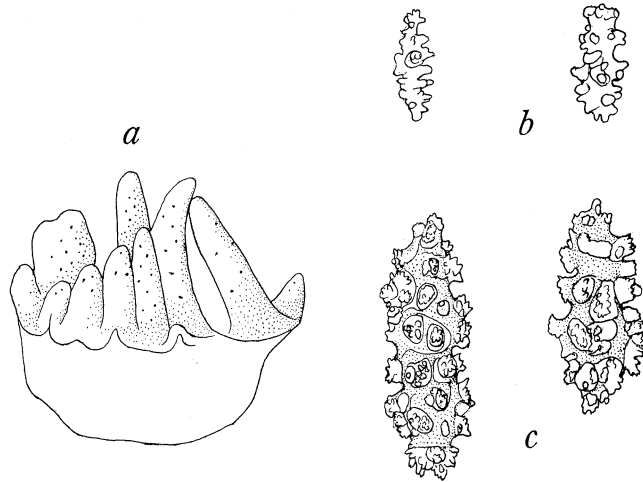
Genus **Lobophytum** Marenzeller, 1886**Lobophytum pauciflorum** (Hemprich and Ehrenberg, 1834)

(Text-fig. 1; pl. 15, fig. 2)

For principal literature see: Tixier-Durivault, 1958, p. 127, figs 138, 141 and 142; Verseveldt, 1960, p. 218.

Material.—Coll. no. 3: A small colony. Fannie Bay, Darwin, on rocks near muddy shore. Coll. J. Boase and E. C. Pope, 11th October, 1965. Coll. no. 10: A small colony. Dudley Point, Darwin, in pools in muddy zone. Coll. E. C. Pope, 14th October, 1965.

Colour in life.—Brownish-green. When preserved in alcohol after narcotization, turned to light grey or greyish-white.



Text-fig. 1.—*Lobophytum pauciflorum* (Hemprich and Ehrenberg). *a*, a small colony with digitate lobes (coll. no. 10), side view; *b*, spicules from stalk cortex; *c*, spicules from stalk interior.

(*a*, $\times \frac{2}{3}$, *b-c*, $\times 110$.)

Description.—The first-mentioned specimen (coll. no. 3) is 3 cm in height and the upper disc is deeply depressed in the centre, and marginally lobed with widely separated broad lobes of which the largest one is 4 cm high, 2 cm wide and 5 mm in thickness. In the other specimen (coll. no. 10, text-fig. 1), on the other hand, the lobes are all narrow digitiform, approximately 10–25 mm long and 6–7 mm wide at the base, erect and very thickly set on the disc, as figured by Tixier-Durivault (1958, fig. 138). The texture of the coenenchym is firm and brittle. The autozooids are distinct, about 2 mm apart on the lobes but rather scarce in the area between the lobes.

The coenenchymal spicules of the lobes are almost barrels, with 4–6 whorls of tubercles; they measure in millimetres: 0.16×0.08 , 0.2×0.082 . In the disc cortex are contained tuberculate spindles, measuring in millimetres: 0.12×0.02 , 0.16×0.05 , 0.2×0.04 .

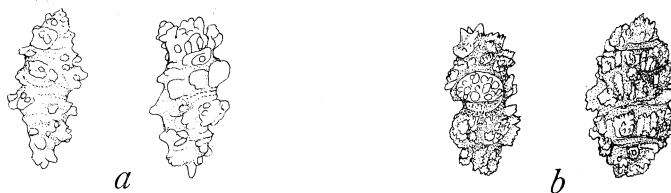
Distribution.—Widespread in the warm Indo-West Pacific area.

Lobophytum crassospiculatum Moser, 1919

(Text-fig. 2; pl. 15, fig. 1)

Lobophytum crassum Marenz. var. *sansibaricum* May, 1900, p. 119, pl. 5, fig. 9 (pars).*Lobophytum crebriplicatum* Marenzeller, 1886, p. 362, pl. IX, fig. 7.*Lobophytum crebriplicatum* var. *crassospiculatum* Moser, 1919, p. 273, text-fig. 16; Roxas, 1933, p. 363.*Lobophytum crassospiculatum*, Tixier-Durivault, 1958, p. 132, figs. 140, 147 and 148; Tixier-Durivault, 1966, p. 78, fig. 61.*Lobophytum crebriplicatum*, Utinomi, 1953, p. 156, text-fig. 4*f-h*, pl. VIII, fig. 7.*Material*.—Coll. no. 6. A small colony, 55 mm × 30 mm in extent. East Point, Darwin, on rocks at mid tide level. Very common. Coll. E. C. Pope, 26-X-1965.*Colour in life*.—Brownish.

Description.—The columnar stalk is 1–2 cm high, thick, robust and 3 cm across at base. The capitular disc is provided with radially arranged 8 large and small plate-form high lobes, thickly set. The largest lobe measures 23 mm high, 35 mm long and 5–6 mm in thickness. Larger lobes reach the centre of the disc, but smaller ones are set only marginally. High lobes are closed below at the margin of the disc and their tip is plain or secondarily bilobed slightly. Lower lobes are open below at the margin of the disc. The autozooids are large, about 0.2–0.3 mm in diameter and 1.5 mm apart. Between them lie the closely set siphonozooids.

Text-fig. 2.—*Lobophytum crassospiculatum* Moser. *a*, spicules from stalk cortex; *b*, spicules from stalk interior. (All × 110.)

The interior of the stalk contains barrel-shaped spicules with large compound tubercles in more than 4 whorls, up to 0.27 mm long and 0.07 mm wide. The spicules in the stalk cortex are rather less-tuberculate spindles with smaller warts in undifferentiated whorls, as long as 0.2 mm on an average.

Distribution.—Tokara Islands (Utinomi), Philippines (Moser, Roxas), Zanzibar (May, Moser, Tixier-Durivault).

Genus **Sarcophyton** Lesson, 1834 (emend. Marenzeller, 1886)**Sarcophyton moseri** Roxas, 1932

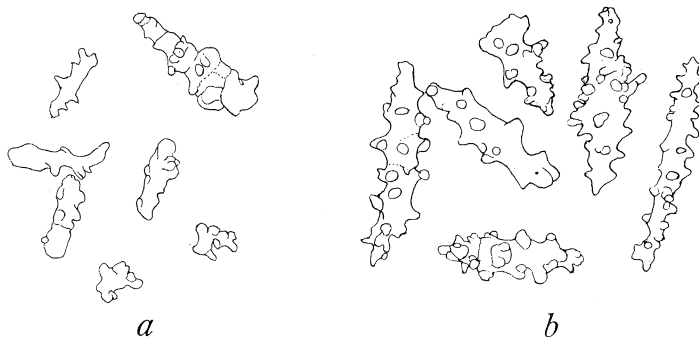
(Text-fig. 3)

Sarcophyton moseri Roxas, 1932, p. 80, figs 2a–2e; Roxas, 1933, p. 378, pl. 1, fig. 6; Utinomi, 1953, p. 155, text-fig. 3g–3m, pl. 8, fig. 5.*Sarcophyton moseri*, Tixier-Durivault, 1946, p. 169; Tixier-Durivault, 1958, p. 14, figs 4 and 10.

Material.—Coll. no. 8. Half of a complete colony. Dudley Point reef, Darwin, in muddy area. Coll. E. C. Pope, 14-X-1965.

Colour in life.—Greenish with fluted margins showing pinkish tint.

Description.—The specimen, light greyish in alcohol, measures 3 cm across at the base of the short stalk, 1.5 cm high at the centre of the disc which is 7 cm across *in situ* and marginally folded. Marginal folds are only slightly projecting over the slightly hollowed upper surface and evenly thin, being 2–3 mm in thickness. They are all simple, undivided into secondaries. The autozooids are few in number and concentrated towards the hollowed centre of the disc. A few of the autozooids are extended in preservation and small in size.



Text-fig. 3.—*Sarcophyton moseri* Roxas. *a*, spicules from stalk cortex; *b*, spicules from stalk interior. (All $\times 96$.)

The spicules of the stalk cortex are tiny rods with 1 or 2 whorls of warts; they measure in millimetres: 0.005×0.0017 , 0.01×0.0026 , 0.017×0.007 , 0.035×0.003 . The spicules of the stalk interior are small, tuberculate spindles; they measure in millimetres: 0.14×0.035 , 0.18×0.035 , 0.26×0.035 , 0.3×0.04 , 0.35×0.05 .

Distribution.—Philippines (Puerto Galera Bay, Mindoro), southern Japan (Nakanosima, Tokara Islands), New Caledonia (Noumea).

***Sarcophyton ehrenbergi* Marenzeller, 1886**

(Pl. 15, fig. 4)

For synonymy and description see: Tixier-Durivault, 1958, p. 16, figs 5 and 12.

Material.—Coll. no. 11. A small colony. Dudley Point, Darwin, in pools in muddy zone. Coll. E. C. Pope, 14-X-1965.

Colour in life.—Greenish.

Description.—The specimen, greyish and brittle in alcohol, is quite mushroom-shaped, only 34 mm high and 35 mm across where the disc is only feebly folded around the margin.

Most of the spicules contained are fairly small slender spindles with few warts, as repeatedly described and figured by Marenzeller (1886), Burchardt (1902), Pratt (1903, 1905), Moser (1919), Roxas (1933) and Tixier-Durivault (1958).

Distribution.—Recorded from various localities in the Red Sea and the Indian and Pacific Oceans.

Sarcophyton glaucum (Quoy and Gaimard, 1833)

(Pl. 15, fig. 3)

For synonymy and description see: Moser, 1919, p. 253, fig. 12; Tixier-Durivault, 1958, p. 61, figs 58, 66-68; Utinomi, 1959, p. 307, fig. 2.

Material.—Coll. no. 7. A small colony. East Point, Darwin, in muddy area at mid tide level. Coll. E. C. Pope, 26-X-1965.

Description.—A single specimen here examined is a light brown-coloured contracted disc, 8 cm × 4 cm in extent, the basal part of the stalk being cut off. The disc is convoluted marginally and hides completely the top of the stalk which is roughly 5 cm × 2.5 cm in extent. The texture is somewhat hard in alcohol.

The autozooids are large, 1-2 mm apart and there are 4-5 distinct siphonozooids between 2 autozooids.

The spicules contained in the interior of the stalk are barrel-shaped spindles with compound warts, 0.2-0.28 mm long. In the cortex of the stalk occur tiny slender tuberculate spindles with compound warts, about 0.003-0.12 mm long.

Distribution.—Widespread in coral reefs of the Indo-West Pacific tropical area.

Sarcophyton trocheliophorum Marenzeller, 1886

(Text-fig. 4; pl. 15, fig. 5)

For description and synonymy see: Marenzeller, 1886, p. 359, pl. IX, figs 5-6. Moser, 1919, p. 246, figs 8-9. Roxas, 1933, p. 379, pl. I, fig. 7. Tixier-Durivault, 1958, p. 75, figs 76, 82 and 83.

Material.—Coll. no. 5. Part of a large colony. East Point, Darwin, on rocks at E.L.W. spring tide. Coll. E. C. Pope, 26-X-1965.

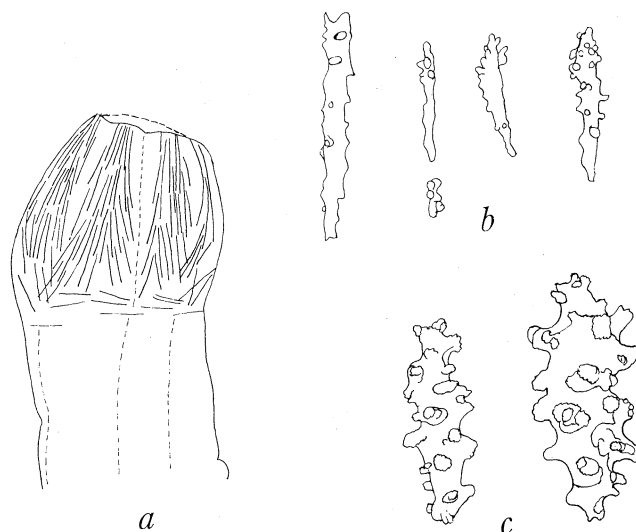
Colour in life.—Flesh-coloured stock with ash-grey polyyps.

Description.—The specimen preserved in alcohol is uniformly yellowish brown and rather soft in texture.

The autozooids are much larger than those of the preceding *S. glaucum*. And the siphonozooids are distinct to the naked eye and numerous; there are approximately 5 siphonozooids between 2 autozooids, 2-3 mm apart, on the lateral surface of lobes. On the upper surface of the disc the distance between autozooids becomes much wider, up to 5 mm at contracted state.

The upper surface of the disc is very broad and flat, the margin of the disc forms some downwardly-bent thick folds.

In contrast with a figure made by Tixier-Durivault (1958, fig. 76B, C) based on a young specimen, the spiculation of a well grown autozoid, about 1 mm in diameter, herein figured (text-fig. 4a) shows 8 chevroned rows of slender point spicules above a few similar ones in transverse rows. In *S. glaucum*, however, such transverse collarets are lacking (Verseveldt, 1965, p. 32, fig. 1). The introvertible neck zone is devoid of spicules. The coenenchymal spicules of the stalk are mostly roundly-ended, barrel-shaped spindles scattered with very large compound warts irregularly, whereas the cortical spicules of the disc are tiny rods with small simple warts.



Text-fig. 4.—*Sarcophyton trocheliophorum* (Quoy and Gaimard). *a*, distal part of autozooid; *b*, spicules from disc cortex; *c*, spicules from stalk interior. (*a* × 30, *b-c* × 96.)

Distribution.—Widespread in the warm Indo-West Pacific area, as far north as Tokara Islands, southern Japan (Utinomi, 1953, p. 155).

Genus **Sinularia** May, 1900

Sinularia polydactyla (Hemprich and Ehrenberg, 1834)

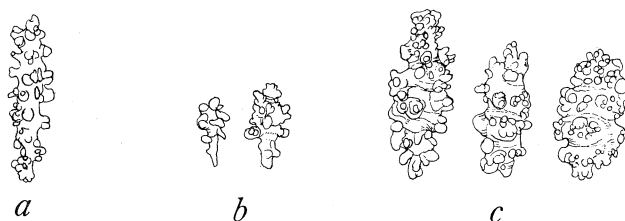
(Text-fig. 5)

For description and synonymy see: Roxas, 1933, p. 353, pl. 2, fig. 7; Tixier-Durivault 1951, p. 50, figs 43, 44, 57–66. And also refer to Utinomi, 1956, p. 227 (Palau); Verseveldt, 1960, p. 240 (Malay Archipelago); Tixier-Durivault, 1966, p. 185, figs 178–180 (Madagascar).

Material.—Coll. no. 4. Half of a large colony. Fannie Bay, Darwin, attached to rocks on mid shore. Coll. A. J. Boase and E. C. Pope, 12-X-1965. Coll. no. 9. Part of a somewhat small colony. Dudley Point, Darwin, in pools in muddy zone. Coll. E. C. Pope, 14-X-1965.

Colour in life.—Olive green.

Description.—Both specimens here examined in alcohol are greyish or white in colour and hard in texture, though brittle. The larger one (Coll. no. 4) has many well-extended digitate branches, 2–4.5 cm long and 1.1–1.5 cm wide at base, like those shown in a photograph from living colonies (cf. Macfadyen, 1936, pl. I, fig. 2), while the smaller one (Coll. no. 9) retains the contracted state of the branches as shown in the same author's photograph (cf. pl. I, figs 1 and 3)—namely, the largest lobe measures only 3.5 cm long and 2 cm wide at base. Each of the lobes are divided into secondary and tertiary branches. It suggests that the external appearance of preserved specimens of such leathery alcyonarians differs greatly, depending upon the time of collecting and of placing in fixatives in the field.



Text-fig. 5.—*Simularia polydactyla* (Hemprich and Ehrenberg). *a*, spicule from cortex of lobes; *b*, spicules from stalk cortex; *c*, spicules from stalk interior. (All $\times 96$.)

The spiculation of the cortex and interior of both specimens coincides fairly well. The interior of the robust stalk is thickly filled with many stout spindles up to 3 mm long. In the cortex of the stalk are contained small clubs, 0.075–0.175 mm long with a head 0.03–0.07 mm wide.

Distribution.—Widespread in coral reefs of the Red Sea and the tropical Indo-West Pacific.

Genus **Nephthea** Audouin, 1828

Nephthea chabrolii Audouin, 1828

(Pl. 16, fig. 1)

Nephthea chabrolii Audouin, 1828, p. 230 (Explanation for Savigny's "Description de l'Egypte . . .", 1817, pl. 2, figs 51–5; later reproduced by Shann, 1912, pl. LXI, figs 2–5 and pl. LXII, fig. 6).

Nephtya chabrolii, Klunzinger, 1877, p. 33, pl. II, figs. 5*a*–5*d* (Red Sea); Kükenthal, 1896, p. 89 (with varieties *ternatana* and *moluccana*); Kükenthal, 1904, p. 157 (synonymy); Thomson and Russell, 1910, p. 183 (Salomon Reef, East Africa); Thomson and Dean, 1931, p. 83 (Malay Arch.).

Spongodes (*Nephtya*) *chabrolii*, Holm, 1895, p. 25, pl. 2, figs. 1–3.

Nephthea chabrolii, Roxas, 1933, p. 412 (Palawan, Philippines); Utinomi, 1954c, p. 59, fig. 2 (Kii coast, middle Japan); Utinomi, 1956, p. 233 (Palau Is.); Verseveldt, 1966, p. 14, text-figs 6–7, pl. 4, fig. 1 (Java); Tixier-Durivault, 1966, p. 273, figs 256–259 (Nosy Bé, Madagascar).

Material.—Coll. no. 101. Three colonies. East Point, Darwin. Coll. A. J. Boase, late X–1967.

Colour in life.—Pale fleshy-pink grey stock, with ashy-purplish polyps.

Description.—The well preserved specimens show pale yellow in polyparium and ivory white in sterile stem. They measure 6–7 cm long and each one attached together at their bases consists of 2- to 4-times divided flabby main stem, 2.5–4 cm wide at base and covered with a number of cone-shaped catkins on branches. These polyp-bearing catkins are rounded at the tips and variable in size, ranging from 3 mm \times 2 mm to 9 mm \times 4 mm.

The spiculation has been fully described and figured, especially by Verseveldt (1966) and Tixier-Durivault (1966) in detail, so that it is unnecessary to reiterate their descriptions here.

According to the field note by Miss Pope, this nephtheid represents a major zoning organism at L.W.M. spring tide level.

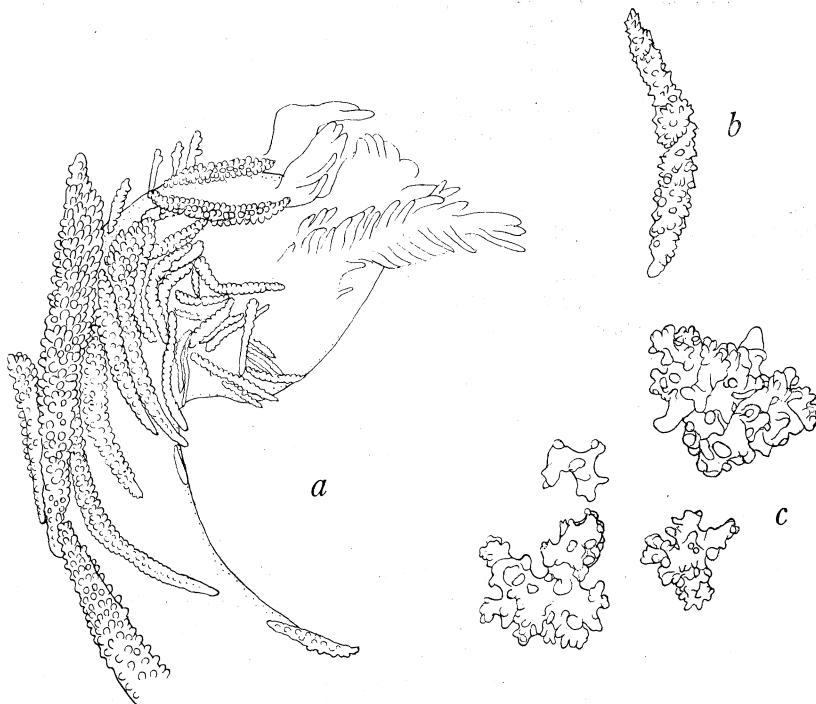
Distribution.—Widespread in the Red Sea and the warm Indo-West Pacific area as far north as middle Japan (Utinomi, 1954c).

Genus *Stereonephthya* Kükenthal, 1905*Stereonephthya whiteleggi* Kükenthal, 1905

(Text-fig. 6; pl. 15, fig. 6)

Spongodes pallida, Whitelegge, 1897, p. 221, pl. XII, figs 7a-c (not Holm, 1895).*Stereonephthya whiteleggi* Kükenthal, 1905, p. 705, fig. L2, pl. 32, fig. 57; Kükenthal, 1910, p. 57, pl. III, fig. 23, text-fig. 29.*Material*.—Coll. no. 1. A small colony. Darwin Harbour, attached to screen of power house intake. Coll. E. C. Pope, 22-X-1966.*Colour in life*.—Cream-white stock, light purplish towards the base of stalk, as in alcohol.*Description*.—The specimen in alcohol is 8 cm long, of which the lower 2.5 cm long belongs to the sterile stalk. According to a label attached to the material, however, this has shrunk to about $\frac{1}{4}$ of its size in life.

The stalk is flabby and evenly cylindrical with a maximum diameter of 13 mm. At its light-purplish base a few short stolons exist. The main stem is quite white, narrower and more flabby than the lower stalk. It arises 3 narrower side branches, 2-3.5 cm long, obliquely upwards on either side, so that the polyparium is somewhat flattened. The side branches and their short twigs, mostly 3-5 mm long, bear a few cream-coloured, incurved polyps.



Text-fig. 6.—*Stereonephthya whiteleggi* Kükenthal. a, zooid; b, point spicule; c, spicules from stalk cortex. (a \times 53, b-c \times 96.)

The polyps, about 5 in group, are small and have rather slender long stalk. The anthocodia is supported dorsally by a few spicules of which the uppermost one slightly projects over the head. The point spicules on lateral sides are rather small and mostly 3-paired; those in the ventral row are much smaller. The ventral side of the polyp stalk mostly lacks spicules.

In the stem cortex small, transparent spindles are arranged mostly transversely. In the stalk cortex irregular-shaped, strongly tuberculate, small spicules are contained. The interior of the stalk and stem apparently lacks spicules.

Distribution.—Hitherto recorded only from Funafuti Atoll, Ellice Islands, 40–70 fms (Whitelegge, 1897), Tapam-Pass (Kükenthal, 1905) and northwest Australia (Kükenthal, 1910).

Stereonephthya costatofulva (Burchardt, 1898)

(Text-fig. 7; pl. 16, fig. 2)

Spongodes costatofulva Burchardt, 1898, p. 440, pl. XXXI, figs 7–7a; pl. XXII, figs 5a–c.

Stereonephthya costatofulva, Kükenthal, 1905, p. 697.

Material.—Coll. no. 2. Two complete colonies. Darwin, attached to base of screens of power house. Coll. E. C. Pope, 22–X–1966. (Shrunk to 1/4 the size in life.)

Coll. no. 106. A small shrunken colony. East Point, Darwin, near L.W.M. spring tide. Coll. A. J. Boase, late X–1967.

Coll. no. 107. A large, heliotrope-coloured colony, attached to supports of wharf. Darwin Harbour, E.L.W.M. spring tide. Coll. A. J. Boase, IX–1967.

Coll. no. 109. A shrunken colony. East Point, Darwin, at E.L.W.M. spring tide. Coll. A. J. Boase, IX–1967.

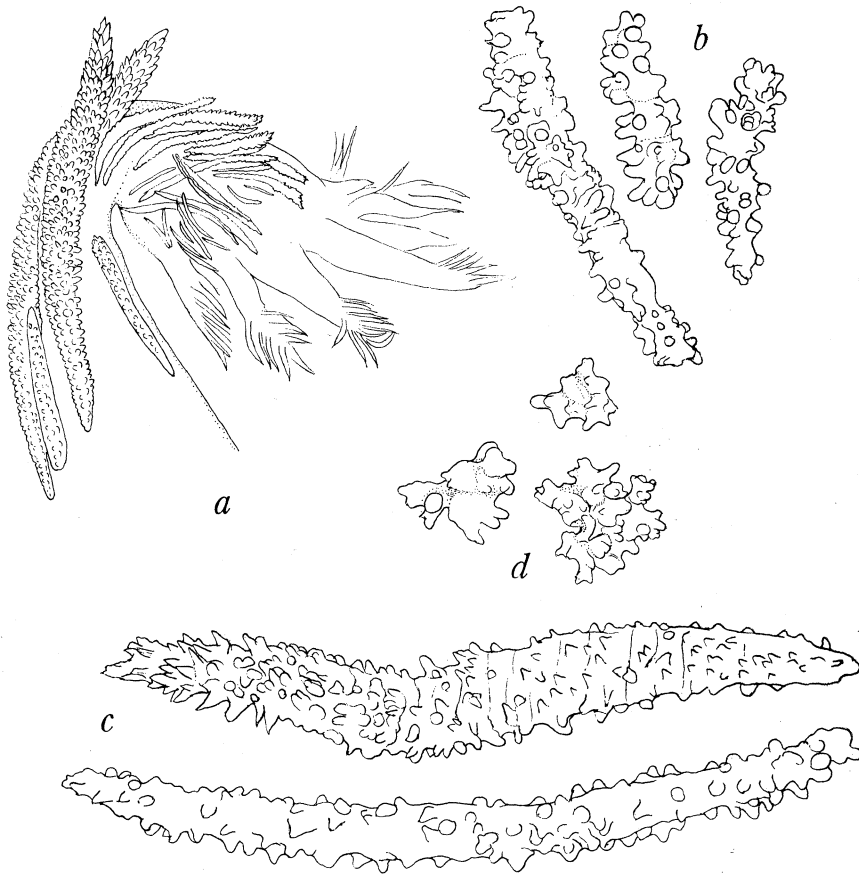
Colour in life.—Largely heliotrope and polyps slightly deeper shade of heliotrope (Coll. no. 107). Burgundy-coloured (Coll. no. 2).

Description.—A number of light or deep purple coloured specimens represented here are certainly referable to *Stereonephthya costatofulva* (Burchardt), recorded only once from the Torres Straits, despite various shade of colouration.

All specimens, either large or small, have a roughly oblong polyparium, flattened in one plane. The sterile stalk is rather evenly cylindrical and lacks stolons at base. The ratio of length between the polyparium and stalk is 3:2. The main stem and branches are uniformly plump and flabby.

The colour in spirit is generally light purple in upper stem and branches, while the stalk is light brown drab. The polyps crowded on branchlets and twigs are much more dark purple (burgundy), often mottled with white tentacles when extended.

The polyp heads are small, campanulate, standing at right or acute angles to the stalks. They measure less than 2 mm in length; the supporting bundle is of the sheathing type, consisting of 7 or 8 robust spicules of which the uppermost 1 or 2 project a little beyond the head. The anthocodial armature is composed of 8 rows of points, each consisting of steeply sloping slender spindles (red or purplish red in transmitted light); dorsal (adaxial) ones are well developed but not distinctly paired, lateral ones distinctly 2-paired and ventral (abaxial) ones are small, 1-paired only. All these point spicules do not project beyond the base of tentacles. In addition, there are one pair of smaller intermediate spicules between points. S. B. spicules are robust and deep red but often translucently white distally. The tentacles are large and adorned with many slender pinnules, but lack spicules.



Text-fig. 7.—*Stereonephthya costatofulva* (Burchardt). *a*, zooid; *b*, spicules from branch cortex; *c*, S. B. spicule (above) and spicule from upper stem (below); *d*, spicules from stalk cortex. (*a* \times 33, *b-d* \times 96.)

The branch cortex is covered with pink-coloured irregular bodies with irregular warts, 0.08–0.12 mm across. The canal-walls of the stem and stalk lack spicules.

Distribution.—Type locality: Thursday Island, Torres Straits.

Stereonephthya costatocyanea (Burchardt, 1898)

(Text-fig. 8; pl. 16, fig. 3)

Spongodes costatocyanea Burchardt, 1898, p. 441, pl. XXXI, fig. 8; pl. XXXII, figs 6a–c.

Stereonephthya costatocyanea, Kükenthal, 1905, p. 698.

Material.—Coll. no. 104. One colony, 11 cm long. East Point, Darwin, E.L.W.M. spring tide. Coll. A. J. Boase, late X–1967.

Coll. no. 105. One colony, 14 cm long. East Point, Darwin, E.L.W.M. spring tide. Coll. A. J. Boase, late X–1967.

Coll. no. 110. A small shrunk colony, 6 cm long. Dudley Point, Darwin, E.L.W.M. spring tide. Coll. A. J. Boase, IX-1967.

Colour in life.—Open polyps orange. Branch cortex and buried polyps are dark purple. Upper stem dull purple, fading towards the stalk, where it is generally dull brown, becoming reddish brown towards the base.

This colouration, mentioned on a label attached to the material, does not so much differ from that of alcohol-preserved specimens.

Description.—In the well-developed colonies (Coll. nos. 104 and 105), the main stem is uniformly plump, cylindrical, as wide as 3 cm and erect in life. Most of the short branches are given off rather horizontally around the lower part of the stem. Longer branches are given off in the upper part of the stem and directing upwards. Polyp-bearing twigs are arranged in close-set groups on these branches and solitarily on the lower stem. So the polyparium, occupying the upper half of the stem, may be described as “arborescent” in form, not so distinctly flattened as in the preceding *costatofulva*. In a smaller colony (Coll. no. 110), however, the upper stem divides bush-like at their ends into slender branches, branchlets and twigs, the latter bearing at their ends zooids in small groups. The polyparium is thus distinctly demarcated from the sterile stalk and the colouration of the cortex and polyps of the polyparium is much darker.

The external surface of the stem and branches, devoid of polyp-bearing twigs, is delicately wrinkled transversely, leathery in texture and contains irregularly small slender spindles, purple in colour, measuring in millimetres: 0.23×0.04 , 0.25×0.035 , 0.3×0.03 . The cortex of the sterile stalk contains red-purple coloured, star-shaped spicules arranging irregularly; they measure in millimetres: 0.023 , 0.07 and 0.1 across. The interior of the stem and branches is almost vacant, and paper-like canal-walls are devoid of spicules.



Text-fig. 8.—*Stereonephthya costatocyanea* (Burchardt). *a*, zooid; *b*, spicules from branch cortex; *c*, spicules from stalk cortex. (*a* $\times 53$, *b-c* $\times 96$.)

The polyp-head is cone-shaped, standing at obtuse angle to the short, robust stalk; it measures about 0.23 mm long (projecting point spicules excluded), about 0.8 mm long (point spicules included) and 0.7–0.8 mm wide. The polyp-stalk is 0.35 mm long on the ventral side just below the head, and 0.9 mm long on the dorsal side (S. B. spicules included).

The anthocodial armature is stronger towards the dorsal side and weaker towards the ventral side. The uppermost point spicules on the dorsal side and dorsal one of the dorso-lateral rows are conspicuously strong, hockey-stick-like in shape, and project far beyond the oral margin, forming "crest-like projections" apically together with the S. B. spicules at the lower level. The point spicules of the lateral rows and ventro-lateral rows are smaller, and those on the ventral row are much smaller and less tuberculate. They measure in millimetres for a specimen figured here: S. B. spicules (robust spindles), 0.9×0.18 , 1.23×0.14 ; uppermost hockey-stick-like spicules in dorsal row, 0.3×0.09 ; uppermost hockey-stick-like spicules in dorso-lateral row, 0.7×0.09 ; uppermost spicules in ventro-lateral and ventral rows, 0.17×0.035 .

Besides, there are one or two pairs of smaller intermediate spicules between points. The anthocodial grade and formula of spiculation for the genus *Dendronephthya* may be applied, too, as follows: $IV = 1P + 2p + 0Cr + (1 - 2)M +$ very strong S. B.

Details of colouration in anthocodial and cortical spicules in transmitted light are:

S. B. spicules: orange (in peripheral layer), colourless (in deeper layer).

Projecting point spicules: orange (lower half) and yellow (distal part).

Non-projecting point spicules and intermediates: reddish orange.

Accessory spicules near S. B.: orange to yellow.

Tentacle spicules: almost colourless ("green" according to Burchardt; "greenish yellow" according to Kükenthal).

Distribution.—Type locality: Thursday Island, Torres Straits.

***Stereonephthya longicaulis* Kükenthal, 1911**

(Text-fig. 9; pl. 16, fig. 4)

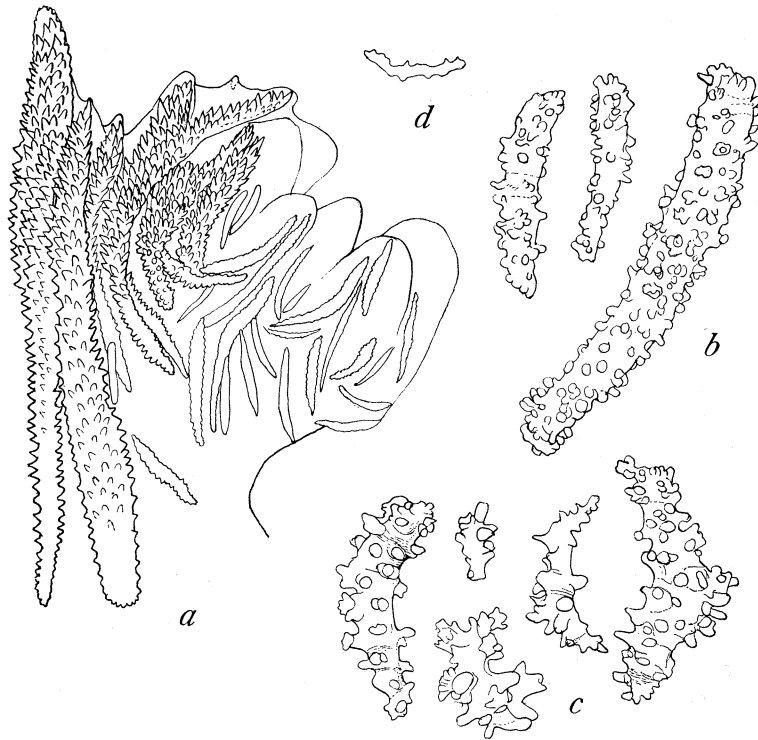
Stereonephthya longicaulis Kükenthal, 1911, p. 324, figs 38–40, pl. XXI, fig. 12.

Material.—Coll. no. 103. A single colony, wrapped by a greenish mottled compound ascidian (*Leptoclinum virens*?) round the basal part. East Point, Darwin, near E.L.W.M. spring tide level. Coll. A. J. Boase, late X–1967.

Colour in life.—Deep claret-coloured stock with lemon-yellow to orange polyps.

Description.—The specimen, 85 mm in total length, is flabby and uniformly cylindrical. Its lower part, approximately 4 cm long and 1.5 cm wide, is largely sterile and may be called the stalk. The upper part of the stock is secondarily divided into two large branches, both about 3 cm long and 1 cm wide, in addition 5 shorter branches (2–3 cm long, 1 cm wide) and a number of polyp-bearing branchlets are given off at different levels; these branches and branchlets are blunt-tipped and grouped together somewhat in a flattened plane. Also, a number of polyps, each one 2–3 in small transverse lappets and a few polyp-bearing twigs, 3–5 mm long, are scattered all over the stock.

The outer surface of the nude stock is uniformly claret (purplish red) and weakly wrinkled transversely. The interior of the stock seems to be vacant, only supported by quite white, thin canal-walls.



Text-fig. 9.—*Stereonephthya longi aulis* Kükenthal. *a*, zooid; *b*, spicules from branch cortex; *c*, spicules from stalk cortex; *d*, spicule from canal-walls, scarcely found. (*a* \times 66, *b-d* \times 96.)

Each polyp stands upright in small lappets transversely arranged. On the bare stem there are mostly 1-3 zooids for a lappet, supported dorsad by a few stout spicules down *in situ*, although variably directed around the twigs. The zooids themselves are small, ca. 0.6 mm high, 0.5 mm wide, and the anthocodia stands at obtuse angle to the very short, thick stalk, lying in parallel with the supporting bundle of which the tip slightly projects beyond the head proper.

The anthocodial armature consists of eight double rows of steeply converging spicules, each in 3-5 pairs; dorsal point spicules are much larger and strongly spinose than those of the lateral sides, while those on the ventral side are smaller and fewer, though not wholly suppressed. Between the point spicules there are one pair of intermediate spicules on the lateral sides. The ventral side of the polyp stalk is wholly nude. Eight tentacles are bent inward and cover the oral opening of the cup, apparently lacking spicules. The supporting bundle is of the sheathing type, thick and composed of 5-6 large, stout spindles, only up to 2 mm in length.

On the branch cortex, blunt-ended, slender spindles with small warts, red-coloured, are arranged longitudinally; they measure in millimetres: 0.18×0.1 , 0.2×0.05 , 0.26×0.035 , 0.4×0.04 , 0.9×0.1 . On the stalk cortex, red-coloured, kneed spindles or irregular bodies covered with high warts are irregularly scattered; they measure in millimetres: 0.18×0.1 , 0.2×0.05 , 0.23×0.09 . The canal-walls are mostly devoid of spicules, although very tiny, bright-red, rods (0.17×0.003) occur very scarcely. S. B. spicules and accessory spicules are deep-red, while the point spicules are mostly lemon-yellow or often orangish. The point spicules on lateral sides measure in millimetres: 0.17×0.026 to 0.5×0.035 .

Distribution.—Type locality: Aru Islands in the Arafura Sea (Kükenthal, 1911).

Stereonephthya armata Kükenthal, 1910

(Text-fig. 10; pl. 16, fig. 5)

Stereonephthya armata Kükenthal, 1910, p. 58, figs 30–31 and pl. IV, fig. 26; Broch, 1916, p. 8 (not figured).

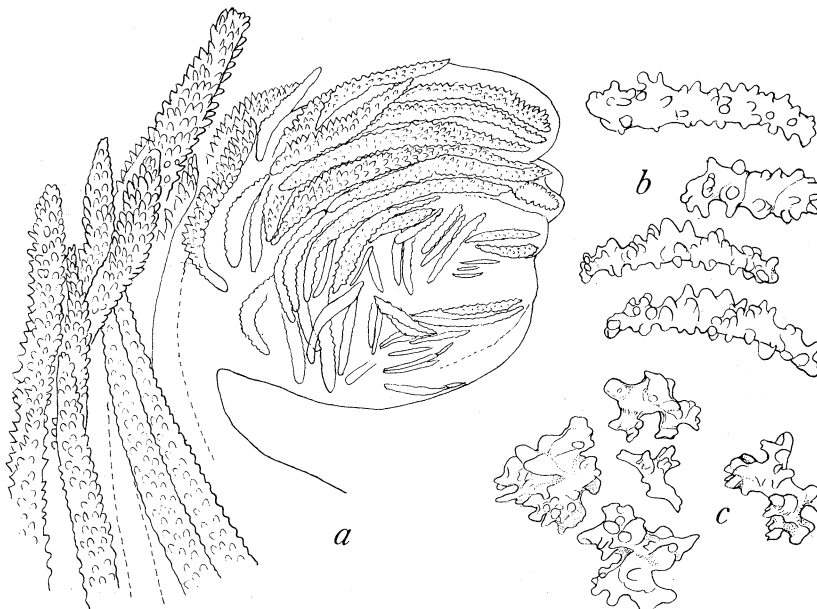
Material.—Coll. no. 108. A small shrunk colony, 8 cm long. Darwin Harbour, on the base of supports of wharf, at E.L.W.M. spring tide. Coll. A. J. Boase, X-1967.

Colour in life.—Pale flesh-coloured stock, tending to mauve basalwards.

Description.—The specimen attached to a barnacle (*Balanus amaryllis* Darwin), preserved in alcohol, consists of the uniformly cylindrical sterile stalk, ca. 4 cm long and 1.5 cm in basal diameter, and the flattened polyparium, occupying the upper half of the main stock. The lower half is strongly wrinkled longitudinally, flabby and mauve-coloured (light dull-purple).

The upper polyparium consists of a main stem and three side branches arising from each side; all are flattened in one plane, flabby in texture, with light yellowish-brown cortex transversely wrinkled and dull-yellowish zooids arranged in small lappets.

The zooids are very small, about 1 mm high (up to the tip of the supporting bundle). The polyp-head is 0.6 mm wide, 0.7–0.8 mm long, and stands at right angle to the short, thick stalk (0.6 mm long on the ventral side below the head and 0.6 mm wide at base). The supporting bundle is thick, of the sheathing type and composed of about twelve robust spicules in a triangle peripherally; it does not project beyond the tip of the head; uppermost ones are mostly blunt-ended, colourless, and measure in millimetres up to 1.0×0.07 .



Text-fig. 10.—*Stereonephthya armata* Kükenthal. *a*, zooid; *b*, spicules from branch cortex; *c*, spicules from stalk cortex. (*a* \times 53, *b*–*c* \times 96.)

The anthocodial armature is well developed towards the dorsal side where the point spicules are large and thickly set, not forming any ordinary paired row. On the lateral sides, the point spicules are also strong but show indistinct arrangement *en chevron*; each point is composed of three pairs of colourless, curved, long spindles (0.35×0.035 , 0.43×0.035 in mm), not projecting beyond the base of tentacles. On the ventral side the point spicules are only one-paired and small (0.17×0.01 mm). These point rows are generally widely separated on the ventro-lateral sides, but often 2-3 smaller intermediates occur between them. The ventral side of the polyp-stalk is quite nude.

On the branch cortex, colourless, blunt-ended, short, warty spindles (0.18×0.035 , 0.2×0.05 , 0.43×0.07 in mm) are closely packed, roughly transversely. On the sterile stalk cortex, pale purple, star-shaped spicules with large conical warts (0.05 , 0.07 , 0.08 , 0.1 mm across) are irregularly arranged. The canal-walls are apparently devoid of spicules, despite Kükenthal's mentioning and figures.

Distribution.—Sharks Bay, West Australia (type locality, Kükenthal, 1910), and 42-45 miles W.S.W. off Cape Jaubert, 66-72 feet, northwest Australia (Broch, 1916).

***Stereonephthya bellissima* Thomson and Dean, 1931**

(Text-fig. 11; pl. 16, fig. 6)

Stereonephthya bellissima Thomson and Dean, 1931, p. 143, pl. VII, figs. 2-5; Roxas, 1933, p. 460, pl. 2, fig. 5.

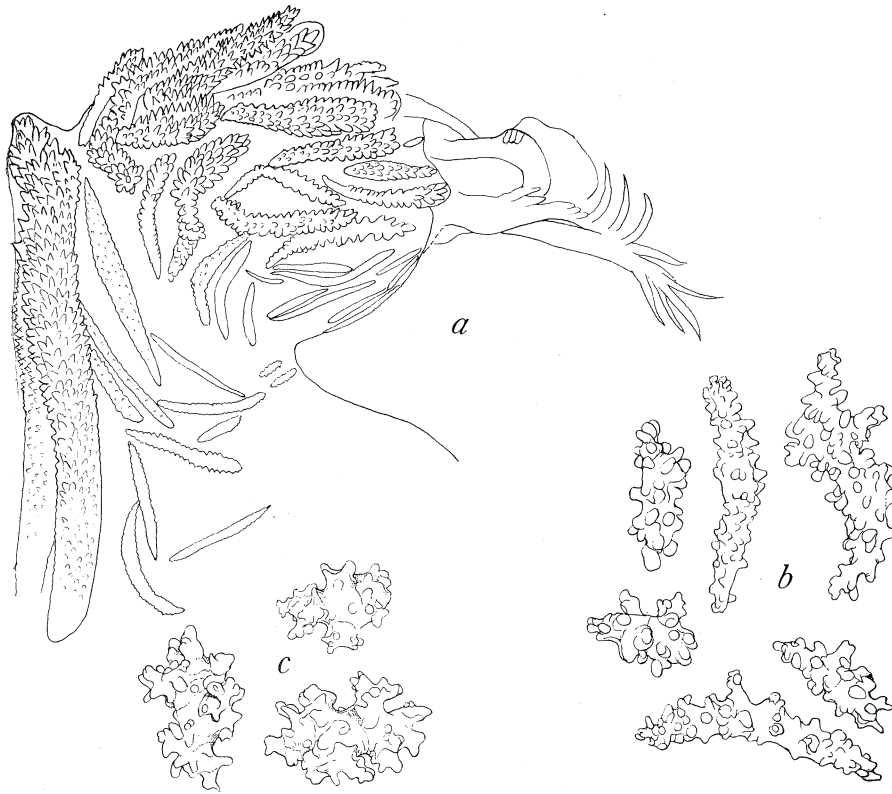
Material.—Coll. no. 111. A beautiful complete colony. Dudley Point reef, Darwin, at E.L.W.M. spring tides. Coll. A. J. Boase, 1967.

Colour in life.—Stock dirty pink at base, through grey to purple near branches. Polyps brick red.

Description.—The sterile stalk, lacking stolons, is very short, about 1.5 cm long and as wide; its cortex is leathery and dull purple in colour. From this short stalk four upright stems (2.5 cm, 3 cm, 3.5 cm, 5 cm and 5.5 cm in length respectively) arise at the tip. Each stem is flaccid proximally and gives off a number of shorter digitate branches (1-5 cm long), bearing numerous polyps on all sides, where they are more thickly arranged together than on the main stems, giving the side branches remarkable rigidity in contrast to the flabby main stems. On the main stems proper, however, a few polyps are arranged only in small transverse lappets. These polyp-bearing side branches are roundly tipped and uniformly 3-5 mm in diameter, variably in accordance with their own length. Thus, the polyparium may be called "shrubby in appearance".

Polyps are on the average 1.2 mm long and 0.6 mm wide, making a very acute angle with the stalk, usually short, less than 1 mm long, so the head is truly not campanulate.

The anthocodial armature consists of five double rows only, the dorsal three rows being strong ($0.4-0.5$ mm long and 0.05 mm wide) and not distinctly paired; on the lateral sides point spicules are 3- or 4-paired and 0.35×0.05 mm in size. On the ventral three rows point spicules are 2-paired and much smaller, non-tuberculate, only 0.2×0.03 mm. All these point spicules are bright red in transmitted light; larger ones may be called "clavate" but never opaque. Intermediates are not found. The tentacles have small white discoid spicules which lie transversely in the contracted condition; pinnules are slender and translucent. The supporting bundle is of the sheathing type; usually two outer spicules are larger, about 1.2 mm long and 0.1 mm wide, and project beyond the head for about 0.3 mm; peripheral spicules are deep-red wholly, while deeper ones are lighter or colourless.



Text-fig. 11.—*Stereonephthya bellissima* Thomson and Dean. *a*, zooid; *b*, spicules from upper cortex; *c*, spicules from stalk cortex. (*a* \times 53, *b-c* \times 96.)

On the cortex of branches and upper stem, small spindles with high conical warts and derivatives are irregularly packed; they measure in millimetres: 0.17×0.05 , 0.2×0.09 , 0.35×0.07 , 0.7×0.07 ; of these smaller forms are mostly bright red in transmitted light, while larger ones are mostly orangish. On the cortex of the sterile stalk, which externally looks purplish-brown, red-coloured, highly tuberculate star-shaped bodies, mostly 0.15 mm across, are densely packed together; these spicules may be derivatives of smaller spindles distributed on the upper stem. The canal-walls lack spicules at all, although Roxas says there occur very scarcely pointed spindles or rods 0.42 mm long.

Distribution.—Unrecorded *Siboga* station in the Malay Archipelago (Thomson and Dean, 1931) and Puerto Galera Bay, Mindoro Island (Roxas, 1933).

Remarks.—The anthocodial armature of this beautifully red stereonephthyid, originally illustrated in colour painting only by an artist (Miss Alice M. Davidson), not by the authors themselves (cf. Thomson and Dean, 1930, pl. VII, figs 2–5), seems to me to be very unsatisfactory, as her rough sketches omitted giving details of the most important zooidal characters peculiar to *Stereonephthya* for differentiating from the related *Dendronephthya*. Also her coloured illustrations of polyp armature appear somewhat different in detail from Roxas's and mine, but this may be negligible, depending in part on either slight colour variation or artistic abridgement.

Genus **Dendronephthya** Kükenthal, 1905Subgenus **Morchellana** Gray, 1862 (*pro generis*)**Dendronephthya (Morchellana) spinosa** (Gray, 1862)

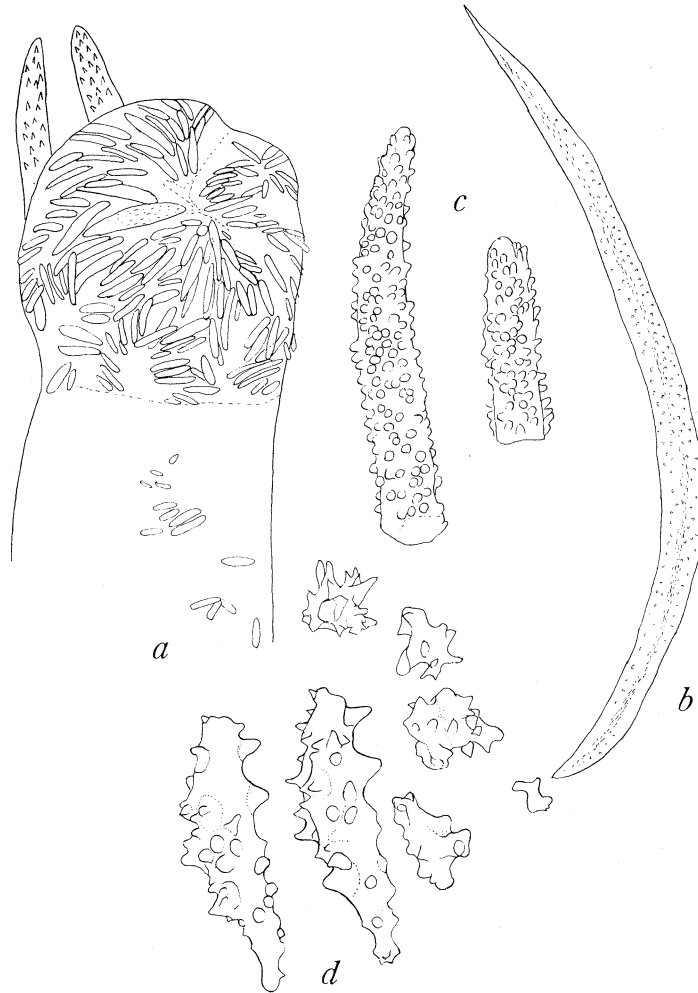
(Text-fig. 12; pl. 16, fig. 7)

Spogodes spinosa Gray, 1862, p. 27, pl. IV, figs 5-7; Gray, 1869, p. 128.*Spongodes spinosa* var. Ridley, 1884, p. 332.*Spogodes spinosa* Gray: Wright and Studer, 1889, p. 197.*Dendronephthya spinosa* (Gray): Kükenthal, 1905, p. 641 (no new locality!).*Morchellana spinosa* (Gray): Tixier-Durivault and Prevorsek, 1962, p. 63 (no new locality!).*Dendronephthya Michaelsoni* Kükenthal, 1910, p. 54, text-fig. 24, pl. III, fig. 17, *syn. nov.**Dendronephthya Michaelsoni* var. *laevis* Kükenthal, 1910, p. 55, text-fig. 25, pl. III, fig. 18, *syn. nov.**Dendronephthya Michaelsoni* Kükenthal: Broch, 1916, p. 7 (not figured).Non *Spongodes spinosa* Gray: Studer, 1878, p. 636 (= *Dendronephthya studeri* (Ridley, 1884)).*Material.*—Coll. no. 102. A single small shrunk colony. East Point, Darwin, near L.W.M. spring tides, attached in crevice among boulders. Coll. A. J. Boase, X-1967.*Colour in life.*—Dark red (crimson) with white short stock and light prominent spikes projecting over the surface.*Description.*—The single specimen here examined is small for the genus and about 2 cm high, with a transversely elongated oval polyparium (20 mm × 35 mm as viewed from top). The present specimen preserved in alcohol is thus strongly depressed obliquely and much shrunken, but when alive it may be forming a roundish spinose mass, as Gray originally notes.

The stalk almost hidden under the lowest foliaceous collar of the umbellate polyparium is pure white against the dark red polyparium, and very short and thick, as measuring about 13 mm long and 15 mm in basal diameter. Its surface is strongly wrinkled longitudinally and terminates to a number of dirty white, paper-slip-like stolons, encircling the base of attachment.

The upper stem, which is about 1 cm long in contracted condition, divides dichotomously into a number of short, thick (ca. 5 mm) secondary branches and then gives rise to thick (ca. 2 mm) branchlets which widen distally to bear the polyps. The distal branchlets are closely arranged into compact umbels, in which the polyps reach to the same level; these umbels are closely pressed together, forming hemispherical masses with a uniform outline. The lowest branches of the polyparium are foliaceous and form together a complete collar, hanging downwards all over the short stalk.

The cortex of branches and branchlets is protected firmly by close-set dark-red, robust spicules longitudinally or transversely arranged; these cortical spicules are often partly concentrated and upheaved at their ends over the surface to form hump-like projections here and there. In consequence of this compact structure, the stem and branches almost entirely hidden from the exterior are rough in appearance.



Text-fig. 12.—*Dendronephthya (Morchellana) spinosa* (Gray). *a*, zooid, viewed from ventral side, somewhat upward; *b*, spiky projecting spine of supporting bundle, 6 mm long; *c*, part of spicules from cortex of upper stem; *d*, spicules from stalk cortex. (*a* \times 66, *b* \times 20, *c-d* \times 96.)

The polyp-head is very small, upward-directing and protected dorsally by one or two, opaque-white, very strong spicules up to 6 mm long; these spike-like spicules are more than 7 times as long as the polyp-head intact. The anthocodial armature belongs to Grade II of Sheriffs' formula (1922), as figured herein.

Formula II = (6 - 8)p + oCr + (0 - 1)M + very strong S. B.

Details of these spicules and their measurements in millimetres are as follows:

Upper cortex—dark red or orange, long spindles covered with round warts of similar size, bluntly ended. 0.14 \times 0.35, 0.2 \times 0.035, 0.26 \times 0.05, 0.28 \times 0.043, 0.6 \times 0.09.

Stalk and stolon cortex—translucent colourless, small spindles or irregular forms covered with round or conical warts. (Spindle form) 0.19×0.05 , 0.35×0.1 , 0.45×0.12 , 0.5×0.1 . (Irregular form) 0.09 , 0.12 , 0.17 , 0.2 , 0.26 (across).

Canal-walls—antler-like flat bodies rarely occurred— 0.088 (across).

Point spicules—many red, small rods, mostly 0.1 mm long, becoming larger distalwards.

S. B. spicules—one or two prominently projecting, curved spindles covered with dot-like minute warts, sharply ended, up to 4 mm long and opaque-white throughout.

Ventral side of polyp-stalk mostly nude but a few red small rods, as long as 0.1 mm, occur near the base, arranged transversely.

Distribution.—Previously recorded from New Guinea (Gray, 1862); Port Denison near Bowen, Queensland (Ridley, 1884); Torres Straits (Wright and Studer, 1889); Barrow Island and Port Hedland, northwest Australia (Kükenthal, 1910 as *Dend. michaelsoni*); 45 miles W.S.W. off Cape Jaubert, northwest Australia, 66–80 ft. (Broch, 1916 as *Dend. michaelsoni*).

Remarks.—Kükenthal (1905) in his revision of the family Nephthyidae (= Nephtheidae) established a new genus, *Dendronephthya*, to contain three groups (Glomeratae, Divalicatae and Umbellatae), and further subdivided the last Umbellatae into 10 subgroups according to the polypary appearance. He denoted the species having spherical polyparium as the “*spinosa*-group” in which *D. spinosa* (Gray) and *D. pumilio* (Studer) are included, although it is probable that he did not examine himself the specimens referable to *D. spinosa*. Afterwards, he (1910) described *Dend. michaelsoni* n. sp. together with its variety *laevis* from northwestern Australian coasts. It is indeed strange that he did not recognize its close affinity with Gray’s *spinosa* previously known from the neighbouring waters, although he mentioned its close affinity with *Dend. bremirama* (Burchardt) in his “*florida*-group” and *Dend. macrospina* (Wright and Studer) (inserta sedis). In their latest review of *Morchellana* (= Kükenthal’s Umbellatae), Tixier-Durivault and Prevorsek (1962) included *Dend. spinosa* within the *spinosa*-group following Kükenthal’s system, but regret to say they omitted (or overlooked) the name *michaelsoni* and its var. *laevis*.

As mentioned above, there is a striking resemblance between the present specimen and Gray’s coloured figure of *Spogcodes spinosa* and also with Kükenthal’s excellent photographs of *Dend. michaelsoni*, and especially *Dend. michaelsoni* var. *laevis*, in the appearance of the polyparium and the anthocodial armature as regards the polyp armature, this species is much more like that of *D. villosa* Kükenthal in Kükenthal’s “*dendrophyta*-group” than that of *D. pumilio* (Studer) in his “*spinosa*-group”. The former *villosa* belongs to Sheriffs’ grade I, whereas the latter *pumilio* belongs to grade IV.

In conclusion, *Dendronephthya michaelsoni* and its variety *laevis* seem to be identical with Gray’s “*Spogcodes spinosa*”, and therefore both Kükenthal’s junior names should be suppressed as synonyms. Supposedly the type specimen deposited in the West Australian Museum at Perth, on which the description of *D. michaelsoni* Kükenthal was based, may have been dried or else was long preserved at that time. In comparison with it, *D. michaelsoni* var. *laevis* Kükenthal was described and figured, based on the relatively fresh specimens collected during the Hamburger Southwest Australian Expedition in 1905, as deduced from a comparison of both photographs given in Kükenthal’s paper (1910, pl. III, figs 17 and 18) and the present fresh material (pl. 16, fig. 7).

COENOTHECARIA

Genus **Heliopora** Blainville, 1834**Heliopora coerulea** (Pallas, 1766)

(Pl. 16, fig. 8)

For description and literature see: May, 1900, p. 174; Eguchi, 1948, p. 362, pl. 60, figs 3, 4 and 6.

Material.—Portion of a large colony taken on reef flat at Cape Don, Cobourg Peninsula, near L.W.M. neap tide, in pool. Coll. E. C. Pope 17-X-1965.

Ecological notes.—Covered large areas of the intertidal reefs at Cape Don, Cobourg Peninsula, 200 miles N.E. of Darwin. Colour of surface greeny-brown but skeleton blue when branches were broken off.

Distribution.—Widespread in tropical Indo-Pacific coral reefs.

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EXPLANATION OF PLATE 15

- Fig. 1. *Lobophytum crassospiculatum* Moser. Coll. no. 6. $\times 1.1$.
- Fig. 2. *Lobophytum pauciflorum* (Hemprich and Ehrenberg). Coll. no. 3. Natural size.
- Fig. 3. *Sarcophyton glaucum* (Quoy and Gaimard). Coll. no. 7. Appr. natural size.
- Fig. 4. *Sarcophyton ehrenbergi* Marenzeller. Coll. no. 11. Natural size.
- Fig. 5. *Sarcophyton trocheliophorum* Marenzeller. Coll. no. 5. Natural size.
- Fig. 6. *Stereonephthya whiteleggi* Kukenthal. Coll. no. 1. $\times 1.1$.
- (All photos: Ch. Araga.)

EXPLANATION OF PLATE 16

- Fig. 1. *Nephtea chabrolii* Audouin. Coll. no. 101. Half natural size.
- Fig. 2. *Stereonephthya costatofulva* (Burchardt). Coll. no. 2. $\times 2/3$.
- Fig. 3. *Stereonephthya costatocyanea* (Burchardt). Coll. no. 104. A little less than natural size.
- Fig. 4. *Stereonephthya longicaulis* Kukenthal. Coll. no. 103. A little less than natural size.
- Fig. 5. *Stereonephthya armata* Kukenthal. Coll. no. 108. $\times 2/3$.
- Fig. 6. *Stereonephthya bellissima* Thomson and Dean. Coll. no. 111. A little less than natural size.
- Fig. 7. *Dendronephthya (Morchellana) spinosa* (Gray). Coll. no. 102. Approx. $\times 1.3$.
- Fig. 8. *Heliopora coerulea* (Pallus). Coll. no. G. 13708. Photo: Miss E. C. Pope at Cape Don reef.
- (All photos except Fig. 8: Ch. Araga.)

