

OCTOCORALLIA

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Abstract

Only 10 octocorals were identified from the samples taken during the survey of Port Phillip Bay. They include one telestaccan (*Telesto*), three alcyonaceans (*Parerythropodium* 2 spp and *Chondronephthya* 1 sp.), five gorgonaceans (*Mopsella* 4 spp. and *Mopsea* 1 sp.) and one pennatulacean (*Virgularia* 1 sp.). Unfortunately, no stoloniferan such as *Clavularia* spp. collected and reported from the earlier survey (Hickson, 1890) were obtained.

Introduction

The octocoral fauna around the SE. coast of Australia is poorly known from classic works published mostly at the end of the 19th century (e.g. Kölliker 1872, Studer 1878, 1895, Ridley 1884, Wright and Studer 1889, Hickson 1890, Kükenthal 1906, 1919, Thomson and Mackinnon 1911), contrasting with the recent progress of studies on the octocorals in tropical shallow waters of N. Australia and the NE. Great Barrier Reef area.

Among these pioneer zoologists, Hickson (1890) was the first to examine a collection of Alcyonaria and Zoantharia collected by Professor Spencer in the Port Phillip Survey of 1889, and he recorded without detailed descriptions 12 alcyonarians (including two new species of *Clavularia*) and three zoantharians.

At the kind invitation of Mrs J. Hope Black, I have examined the octocorals collected in Port Phillip Bay, 1957-63. The specimens are in the National Museum of Victoria (NMV), and some of the duplicates are retained in the museum of the Seto Marine Biological Laboratory (SMBL).

The present collection consists of *Telesto* (one species), *Parerythropodium* (two species), *Chondronephthya* (one species), *Mopsella* (four species), *Mopsea* (one species) and *Virgularia* (one species), all of which have already been recorded from the SE. Australian coast, some extending down to Antarctica and S. Africa.

Order TELESTACEA

Family TELESTIDAE Milne Edwards and Haime, 1857

1. *Telesto smithi* (Gray, 1869)

Pl. 7, fig. 1.

Telesto (Alexella) Smithii Gray 1869: 21, fig. 1 (Garden Island, Sydney).*Telesto smithi*, Ridley, 1884: 334 (Arafura Sea 32-36 fm; Port Molle, Queensland, 12-20 fm).*Telesto smithi*, Hickson, 1890: 137-138 (Port Phillip Bay).*Telesto smithii*, Laackmann, 1909: 84, fig. E; Pl. 4, fig. 5 (Formosa Strait; Port Jackson, Australia).

MATERIAL: Survey Areas 59 (36), 69 (221).

REMARKS: All the specimens collected at the two stations range from 2 cm to 15 cm in height and 1-2 mm in diameter. They are mostly erect simple, but sometimes slightly furcately branched in one plane when fully grown. Dirty white to yellowish in colour. Axial polyp is about 5 mm long, 1.5 mm wide. Side polyps are cylindrical to clavate, tapering downwards, 1-4 mm long, 1.2-1.3 mm wide, and alternately arranged with the interval of 3-7 mm long.

Order ALCYONACEA

Family ALCYONIIDAE Lamouroux, 1812 (emend. May, 1900)

2. *Parerythropodium membranaceum* (Kükenthal, 1906)

Fig. 1; Pl. 7, fig. 2.

Alcyonium (Erythropodium) membranaceum Kükenthal, 1906: 52, Pl. 1, fig. 3; Pl. 9, figs. 42-44 (St Francis Bay, S. Africa, 34°7'3"S, 24°59'3"E, 100 m).

Alcyonium (Erythropodium) membranaceum, Thomson and Mackinnon, 1911: 665 (11 miles E. of Broken Bay, N.S.W.).

Alcyonium (Erythropodium) membranaceum, J. St. Thomson, 1921: 159 (Mossel Bay Lighthouse, S. Africa, 10-12 fm; Capt St. Blaize, S. Africa, 12 fm).

Parerythropodium membranaceum, Kükenthal, 1916: 463 (genus name altered and regrouped).

MATERIAL: Survey Area 55 (144). A number of fragments.

REMARKS: The membranous colony broken into pieces is uniformly thin, about 0.5 mm in thickness and ivory buff in colour. On the upper surface mound-like calyces into which zooids are withdrawn are very irregularly scattered with the intervals of 1.5-3.0 mm. They are mostly 2 mm across and 1 mm high.

The anthocodial spicules are warty slender rods or flattened spindles; 0.09×0.008 , 0.16×0.002 , 0.018×0.02 (in mm). The coenenchymal spicules are quincuncrate, capstan-like or star-shaped, tuberculate bodies; 0.05×0.05 , 0.09×0.05 , 0.09×0.09 (in mm).

3. *Parerythropodium hicksoni*, n. sp.

Fig. 2; Pl. 7, fig. 3.

? *Symphodium verrilli* Hickson, 1890: 138 (Port Phillip Bay).

MATERIAL: Survey Area 55 (35). Holotype, Nat. Mus. Vic. G1545 Area 30 (130). Paratype, Nat. Mus. Vic. G1546 and SML-Type No. 232.

DESCRIPTION OF HOLOTYPE: A membranous colony wholly covering the shell of a living mussel *Mytilus planulatus* (Lamarck). The specimen in alcohol is creamy white, 3 mm thick in the middle part of the colony, thinner towards the margin, and the texture is rather soft. The zooidal opening is large, about 1.2-2.0 mm in diameter, with the smooth marginal rim not upheaved as mound. They are uniformly all over the upper surface of the membrane with the intervals of 0.5-0.8 mm. The zooids are retractile rather deeply into the gastric cavity; when fully extended, they may attain about 5 mm in length, including contracted tentacles, of which the dorsum forms curved ridge

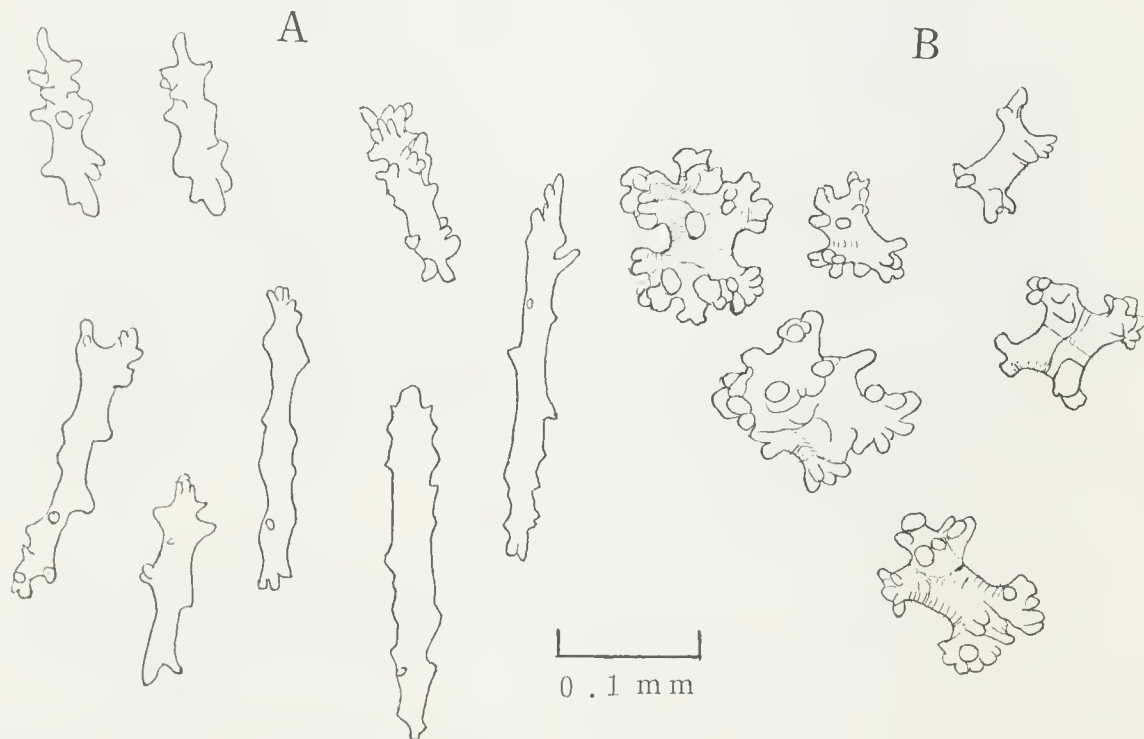


Fig. 1—*Parerythropodium membranaceum* (Kükenthal), Survey 55 (144). A, anthocodial spicules; B, coenenchymal spicules.

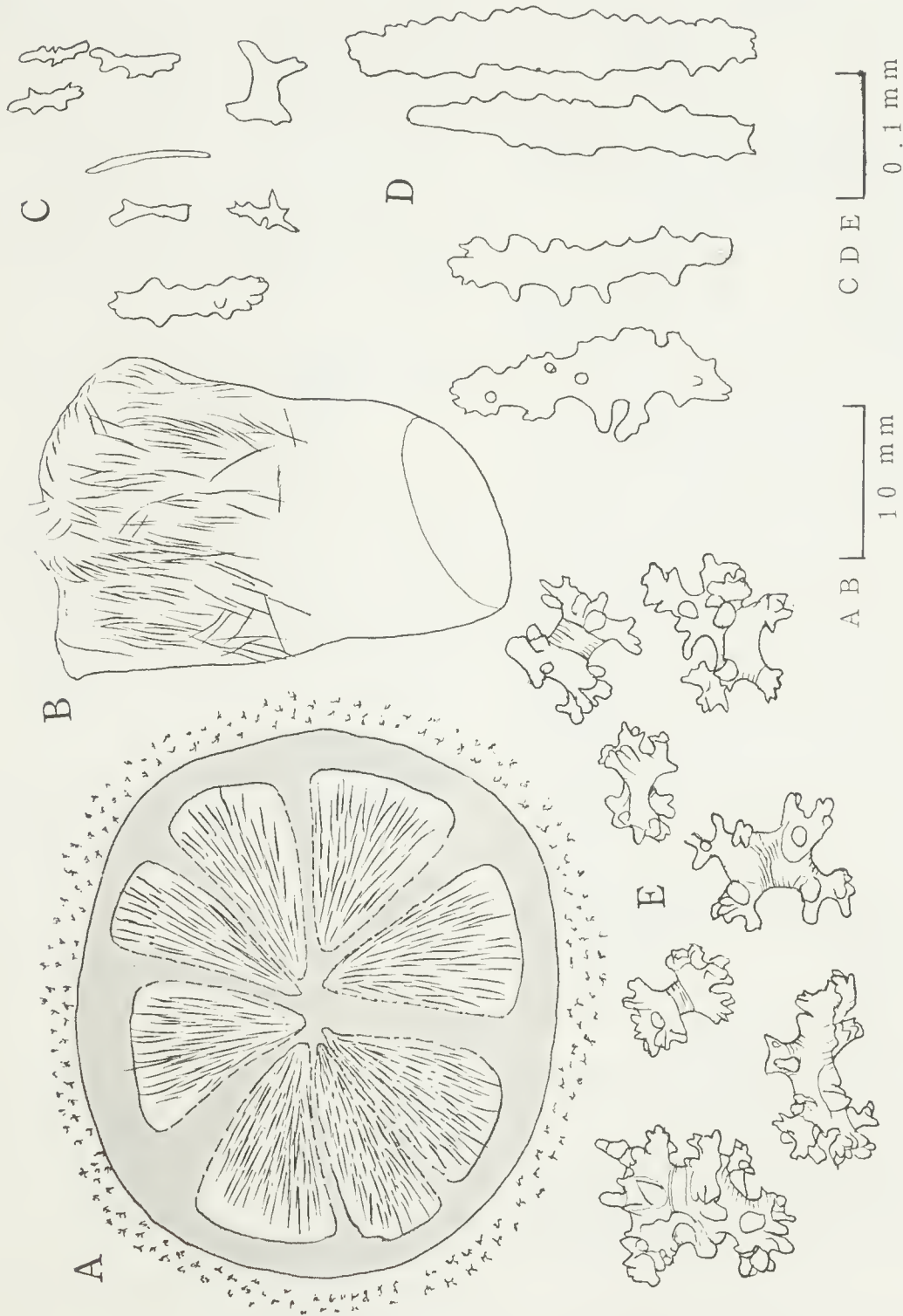


Fig. 2.—*Parythythropodium hicksoni* n. sp., holotype, Survey Area 55(35). A, a zooid retracted into the zooidal gastric cavity, viewed from above, semidiagrammatic; B contracted zooid, viewed from side; C, spicules from tentacles and pinnules; D, spicules from anthocodia; E, coenenchymal spicules.

provided with numerous spicules lengthwise. These spicules are flattened rods with few excrescences; 0.07×0.002 , 0.09×0.002 , 0.2×0.035 , 0.3×0.04 , 0.35×0.05 (in mm).

The coenenchymal spicules are minute irregular bodies, capstan-like triradiates or quadriradiates, about $0.005-0.1$ mm across. Rarely occur also tuberculate spindles; 0.05×0.05 , 0.07×0.06 , 0.09×0.09 (in mm).

REMARKS: Hickson (1890) assigned a membranous alcyonacean colony with retractile polyps growing on a piece of alga collected by an earlier Port Phillip Survey to '*Sympodium verrilli*' which was originally collected by HMS *Challenger*, and described by Wright and Studer (1889, p. 271, Pl. 42, fig. 12—spicules only) from the S. of Montevideo, S. America, 600 fm. According to Kükenthal (1916, p. 455), the *Challenger* specimen is not a real *Sympodium* in his sense but probably a kind of stoloniferan *Clavularia*. In the modern concept of taxonomy, *Sympodium* Ehrenberg, 1834 is a member of the Xeniid alcyonacean (cf. Kükenthal 1916, Bayer 1956). The nearest ally, *Parerythropodium membranaceum* (Kükth.) mentioned above, has similar coenenchymal spicules, but differs from it in having smaller mound-like calyces raised over the thinner membrane. Another ally *P. reptans* (Kükth.), which was originally described from Bouvet Island, Antarctica, 470 m and later recorded from the coast of New South Wales, 30-40 fm (Thomson and Mackinnon 1911), seems to be much different in the structure of spicules and calyces.

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

4. *Chondronephthya fusca* (Wright and Studer, 1889)

Pl. 7, fig. 4.

Eunephthya fusca Wright and Studer, 1889: 190, Pl. 36, figs. 1a-b (off Port Jackson, *Challenger* Station 163A, 150 fm).

Chondronephthya (n. gen.) *fusca* Utinomi, 1960: 35, Figs. 4-5 (type specimen re-examined and re-named).

MATERIAL: Survey Area 58 (293).

REMARKS: Of five specimens examined, three are sepia-brown coloured, while two are pale

brown. They are all flabby in texture, but bilaterally branched in one plane from the erect main stem, about 5 mm across in the middle. The base is expanded to a small membrane. All the polyps are incurved conical, 2 mm long and 1 mm wide; two or three are grouped around the branch or at the end of branches. Their outer covering is very finely granulate and provided with eight deep furrows around the mouth-opening. The characteristic spiculation of polyps and branch cortex is already described and illustrated in detail (cf. Utinomi 1960, fig. 5).

This unique nephtheid seems to be endemic to the SE. coast of Australia.

Order GORGONACEA

Suborder SCLERAXONIA

Family MELITHAEIDAE Gray, 1870

Of the octocorallian collections made in the present survey, the scleraxonian *Mopsella* is dominant, comprising at least four species living S. of the Nepean Bay Bar on a sandy or gravelly bottom adjacent to deep water at the entrance to the Bay, and passing into the open sea (Bass Strait).

5. *Mopsella aurantia* (Esper, 1798)

Fig. 3; Pl. 7, fig. 5.

Mopsella aurantia (Esper) Verrill, 1864: 38 (Synonymy: Australia); Kükenthal, 1919: 161, Pl. 36, fig. 31, Figs. 75-77 (Bintang Is., Singapore); Kükenthal, 1924: 67 (Synonymy); Hickson, 1937: 142, Fig. 18A-C; Stiasny, 1940: 230, Fig. H, Pl. 14, figs. 36-37 (Malay Arch.); Stiasny, 1951: 30 (New Holland).

Melitella retifera (Lamarek), Gray, 1870: 7 (Indian Ocean and Australia).

MATERIAL: Survey Area 58 (293) Portsea Pier, intertidal coll. Area 59 (36), Area 61 (37).

REMARKS: Represented by many specimens, either complete or incomplete, ranging from 10 cm to 15 cm in height where the main stem exists. Anastomosis is rather frequent. In the main and secondary stems the nodes are moderately swollen and distinctly shorter than the slender internodes. Terminal branches are open, generally more slender and gradually taper from the main and secondary stems. The polypal verrucae, which are abundant on one surface and sides, are generally smaller than 1 mm wide and nearly so in height.

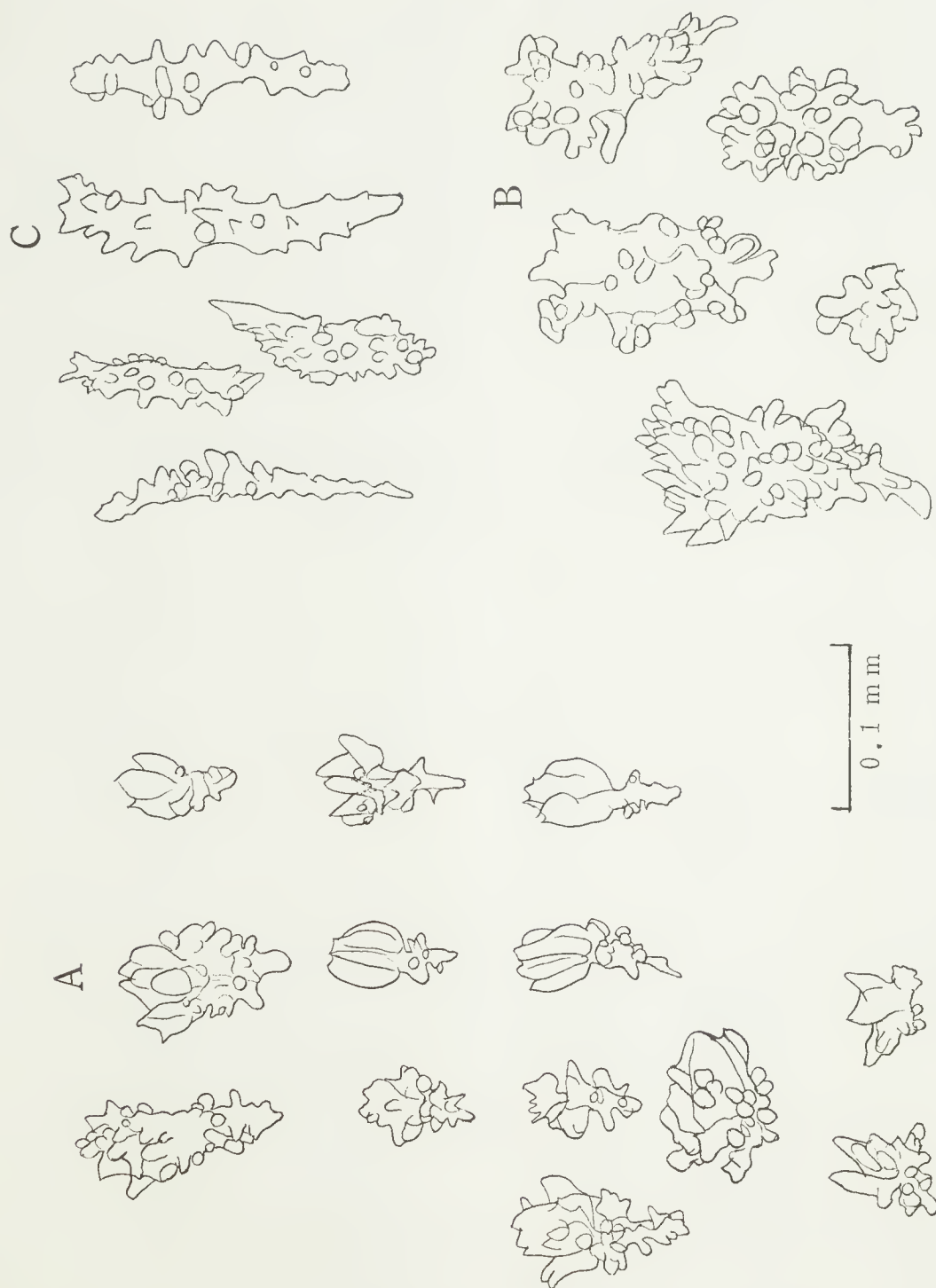


Fig. 3—*Mopsella aurantia* (Esper), Survey Area 58 (293) A, small foliate clubs variable in form, abundant in cortex; B, larger tuberculate clubs or ovate spindles contained in cortex; C, anthocodial spindles.

The colour of the cortex and polyps is very variable between separate colonies; dull yellow, peach-red or orange or dull red with the same coloured polyps. Some are generally dull orange to red on the cortex mottled with yellow polyps. The colour of the denuded axis is different according to the location and colour of the overlying cortex. In dull yellow or orange colonies, the axis of the main stem is generally pink, while the axis of terminal branches is dark red.

The cortical spicules, as illustrated by both Kükenthal and Hickson, consist of foliate clubs with three to five flattened folia apically pointed and a short, often bifurcate, shaft and slightly larger tuberculate clubs, all yellow to orange.

6. *Mopsella zimmeri* Kükenthal, 1908

FIG. 4; Pl. 7, fig. 6.

Mopsella zimmeri Kükenthal, 1908: 199; Kükenthal, 1919: 163, Pl. 36, fig. 32 (Sydney, Australia); Kükenthal, 1924: 68, fig. 50.

MATERIAL: Survey area 59 (36), Area 61 (37).

REMARKS: The colony is distinctly flabellate and dichotomously branched with a sharp angle; the anastomosis is, however, not so frequent as in *M. aurantia*. The upper stem and branches are somewhat compressed. A complete colony, photographed in fig. 6 of Plate 7, is 13 cm high and 10 cm wide, and uniformly coloured sulphur yellow. Another colony, 12 cm high and 9 cm wide, included in the collection is brick-coloured. Comparing with the adjoining branches, the main stem is short and cylindrical in section. The denuded axis is dull red or fawn in the swollen nodes, while white or pale pink in the furrowed internodes. The calyces scattered on one surface and at sides are longer than wide (e.g. 0.9 mm long and 0.4 mm wide), as compared with those of typical *M. aurantia* (Esper).

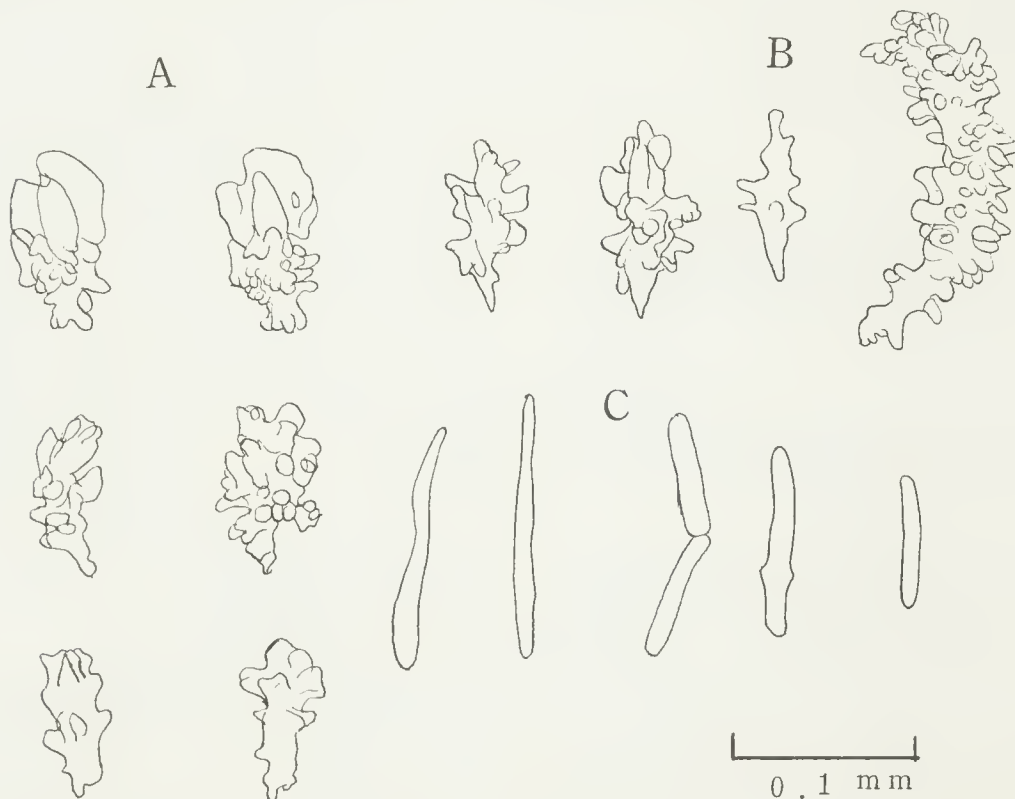


Fig. 4—*Mopsella zimmeri* Kükenthal from Port Phillip Survey Area 61 (37). A, foliate clubs from cortex; B, tuberculate spindles rarely found in cortex; C, smooth rods from nodes.

Spiculation. The cortex contains roundly headed foliate clubs (0.047×0.028 , 0.033×0.028 , 0.034×0.028 , 0.075×0.028 , 0.09×0.07 mm) and sharply ended spindles (0.12×0.028 , 0.13×0.018 , 0.2×0.028 mm).

Polyp spicules are highly tuberculate spindles (0.12×0.028 , 0.13×0.028 , 0.2×0.028 mm). All are lemon-yellow coloured. The soft joint (node) of the axis contains transparent colourless rods (0.074×0.01 , 0.09×0.011 , 0.15×0.014 mm).

In reviewing the species of the family Melitodidae (= Melithaeidae), Hickson (1937, p. 143) tentatively admitted Kükenthal's *zimmeri* as distinct from Esper's *M. aurantia*, although both are closely related to each other. Later Stiasny (1940) synonymized the former with the latter, using specimens from the Malay Archipelago. Kükenthal's key for distinguishing the species of *Mopsella*, especially between *M. aurantia* and *M. zimmeri*, as cited by Hickson, seems to be misleading to later workers, since the mode of branching is highly variable. Notwithstanding, the shape of cortical spicules as figured herein, as well as the external appearance of the colony in respect to the arrangement and shape of calyces, convince me that they should be retained as separate species.

7. *Mopsella clavigera* Ridley, 1884

Fig. 5.

Mopsella clavigera Ridley, 1884: 360, Pl. 37, fig. B; Pl. 38, figs. a-a¹¹¹ (Port Curtis, Queensland, 5-11 fm; Port Molle, 14 fm; Thursday Island, Torres Straits, 4-6 fm).

? *M. clavigera*, Thomson and Mackinnon, 1911: 670, Pl. 68, fig. 9 (11 miles E. of Broken Bay, N.S.W., 30-40 fm).

? *M. clavigera*, Nutting, 1911: 49 (Bay of Nangamessi, Sumba, up to 36 m; not figured).

M. clavigera, Kükenthal, 1919: 160 (no new record); Kükenthal, 1924: 66 (no new record).

? *M. clavigera*, Dean, 1932: 12, Fig. 2 (Pulo Mariri, Aru Islands, Malay Archipelago).

M. clavigera, Hickson, 1937: 139, Fig. 17 (Murray Islands, Torres Straits).

MATERIAL: Survey Area 59 (36).

REMARKS: Three orange-red colonies referable to this species were obtained in the same area, together with one sulphur-yellow colony of *M. zimmeri*, and one pink colony of *M. klunzingeri* described below. The colonies in alcohol are generally brick-red, but when dried

they may turn yellowish in the distal part of the colony with reddish-brown calyces scattered over the cortex. They are all flabellate with few anastomoses in the branching. The main stem and branches are not distinguishable by their diameter, as most of the branches are relatively narrow (about 1.5-2 mm wide), and the meshes thus formed are either longitudinally elongate or irregularly polygonal, the distal parts being freely open. The denuded axis is colourless; the nodes in the larger lower stem are 4 mm long, 3-4 mm wide, and the calcareous internodes are 4-5 mm long, 2-2.5 mm wide. The calyces, approximately 0.8 mm across, are scattered on one surface and the sides.

Spiculation. The cortex contains spicules of the following three types, each of which is very variable in form, size and colour:

1. Bluntly ended spindles are coarsely tuberculated. Of these the larger ones are somewhat swollen at one end and somewhat flattened and smooth at the other tapering end, while the smaller ones are less tuberculated on the surface and truncated at both ends. This type is mostly orange or red in colour; 0.06×0.02 , 0.07×0.014 , 0.09×0.019 , 0.1×0.02 , 0.12×0.018 (in mm).

2. Foliate clubs consist of two or three lancetform leaves (i.e. head) and a finely tuberculated, short (often bifurcated, irregularly branched or obsolete) shaft. They are uniformly lemon-yellow, or else the head is lemon-yellow and the shaft orange; 0.05×0.018 , 0.05×0.028 , 0.056×0.028 (in mm).

3. Smaller spindles with sharp ends, red, rarely occur. The polyp spicules (D) are all slender, sharply ended tuberculate spindles, coloured orange; 0.09×0.014 , 0.1×0.014 , 0.75×0.03 (in mm).

8. *Mopsella klunzingeri* Kükenthal, 1908

Fig. 6.

Mopsella klunzingeri Kükenthal, 1908: 198; Kükenthal, 1910: 100, Fig. 51; Kükenthal, 1919: 167, Pl. 36, fig. 33; Kükenthal, 1924: 69, Figs. 51-52 (Oyster Harbour near Albany, W. Australia, 3/4-5/2 m).

Mopsella klunzingeri, Thorpe, 1928: 518 (and p. 520) (Wooded Is. and Pelsart Is., Abrolhos Group, W. Australia).

Mopsella klunzingeri, Hickson, 1937: 144 (no new locality).

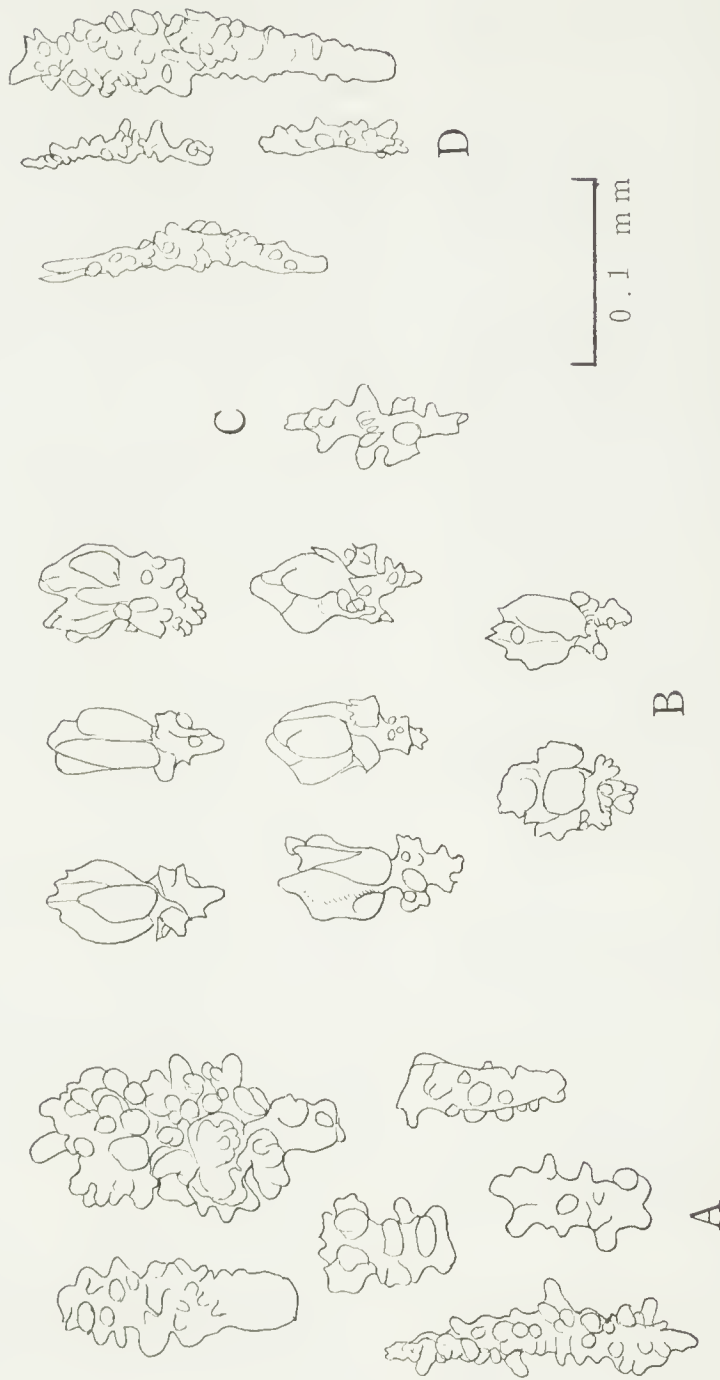


Fig. 5—*Mopsella clavigera* Ridley, Survey Area 59 (36). A, bluntly ended, coarsely tuberculate cortical spicules, either fusiform or somewhat conical in form; B, foliate clubs from cortex; C, smaller tuberculate spindle rarely found in cortex; D, anthocodial spindles.

MATERIAL: Survey Area 59 (36). One specimen.

REMARKS: This beautiful specimen obtained together with the above-mentioned *M. clavigera* seems to be referable to *M. klunzingeri*, hitherto recorded only from W. Australia.

The two main branches followed by a short lower stem are more or less winding as in Kükenthal's photograph (later reproduced as a drawing). As mentioned 'baumartig in einer Ebene' by Kükenthal, the branching is not decidedly flattened but assumes roughly a flabellate form. The cortex is pink and the calyces, irregularly scattered over the surface of its branches, are conical in form, as long as wide (about 1 mm) and pale pink or whitish. The denuded internodes are deep red; in section the lower stem and branches are round, but somewhat flattened and pointed distally. The nodes on which the branches are borne almost at right angles are hardly distinguishable from the adjoining internodes. Anastomosis is rare, so that it may not be said to be 'reticulate'.

Spiculation. The cortex contains orange or colourless, 0-0.15 mm long, strongly tuberculate spindles sharply pointed at both ends and peculiar foliate clubs which consist of very broadened round blades strongly indented at

the tip and with a short robust shaft, which appears to be lemon-yellow. No ovate clubs as seen in *M. clavigera* Ridley occur. The greyish brown nodes contain the usual smooth rods marked with a slight swelling in the middle. The polypal spicules are sharply ended spindles, 0.1-0.2 mm long, provided with many whorls of conical warts, pink.

Suborder **HOLAXONIA**

Family **ISIDIDAE** Lamouroux, 1812

9. **Mopsea encrinula** (Lamarck, 1816)

Mopsea encrinula (Lm.), Studer, 1878: 665 (NW. coast of Australia, 50 fm); Wright and Studer, 1889: 43, Pl. 7, figs. 1-1b; Pl. 9, fig. 11 (off E. Moncoeur Island, Bass Strait, 38 fm); Thomson and Mackinnon, 1911: 674 (11 miles E. of Broken Bay, N.S.W.)

Mopsea encrinula, Kükenthal, 1919: 620, Figs. 281-283; Pl. 46, figs. 86-87 (Tasmania); Kükenthal, 1924: 438, Fig. 207 (synonymy: Australia, 69-92 m).

MATERIAL: Survey Area 59 (36).

REMARKS: Three incomplete feather-like fragments obtained together may be branches of a large complete specimen, 14 cm in height and 5 mm in diameter, with a membraneous base. The spirally arranged conical polyps around the stem and branches are snowy white in alcohol, while the underlying calcareous axis alternately articulated with narrow horny joints

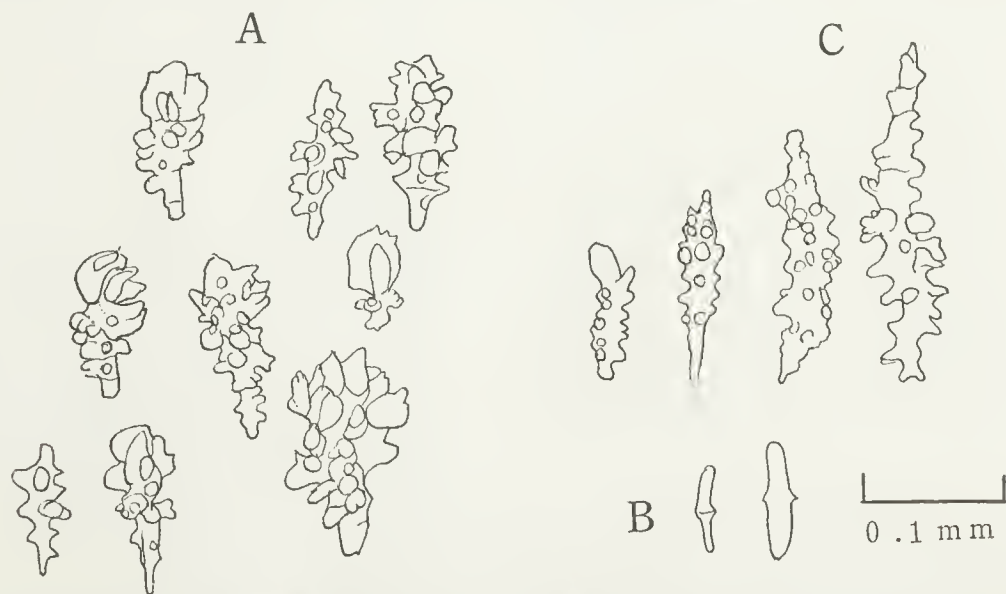


Fig. 6—*Mopsella klunzingeri* Kükenthal, Survey Area 59. A, foliate clubs and spindles coarsely tuberculated around and indented apically, from cortex; B, smooth rods with central swelling from nodes; C, anthocodial spindles.

down to the base is brown. The polyp sculpturing agrees with previous descriptions of this species.

Order PENNATULACEA

Suborder SUBSELLIFLORAE

Family VIRGULARIIDAE Verrill, 1868

10. *Virgularia loveni*, Kölliker 1870
1758]

Pl. 7, fig. 7.

Virgularia Lovenii Kölliker, 1872: 201, Pl. 13, figs. 121-122 (Port Jackson, N.S.W.); Balss, 1910: 97 (listed on distributional table).

Virgularia lowenii (?), Hickson, 1890: 136-137 (Port Phillip Bay); Kükenthal, 1915: 79.

Virgularia mirabilis (?), Hickson, 1916: 157; Hickson, 1921: 370 (reassigned for the Port Phillip Bay specimens).

MATERIAL: Area 13 (82) 12 specimens; Area 31 (10) (83) (92) 12 specimens and fragments.

REMARKS: The virgulariid sea-pen, abundantly collected from the muddy bottom of the central basin of the bay agrees well with *Virgularia loveni* described originally from Port Jackson by Kölliker (1870, 1872) and later recorded from Port Phillip by Hickson (1890). The largest of complete specimens in the present collection measures 43 mm long and 5 mm wide, of which 23 mm is the rhaehis; thus the rhaehis occupies about 3/5 of the total length. On both sides of the rhaehis, elongate leaves, about 2-2.5 mm long and 1.5 mm high in the upper well developed ones, are arranged alternately. Each of the well-developed leaves in the distal part is composed of about 30 autozooids continuous at the base. It is difficult to trace such a transverse row of lateral siphonozooids continuous at the base. It is difficult to trace such a transverse row of lateral siphonozooids between the autozooidal leaves as figured by Kölliker (1872). Hickson (1916: 157, 1921: 370) considers the Australian species *V. loveni* as a synonym of *V. mirabilis* originally described from the N. Atlantic many years ago.

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Plate 7

- Fig. 1—*Telesto smithi* (Gray), branched specimen. $\times 1.3$.
- Fig. 2—*Parerythropodium membranaceum* (Kükenthal). $\times 1$.
- Fig. 3—*Parerythropodium hicksoni*, n. sp., holotype specimen. $\times 1.4$.
- Fig. 4—*Chondronephthya fusca* (Wright and Studer). $\times 1$.
- Fig. 5—*Mopsella aurantia* (Esper). $\times 2/3$.
- Fig. 6—*Mopsella zimmeri* Kükenthal. $\times 2/3$.
- Fig. 7—*Virgularia loveni* Kölliker. $\times 1$.

