

PORT PHILLIP SURVEY 1957—1963.

HYDROIDA.

By PATRICIA M. RALPH

Zoology Department, Victoria University of Wellington,
New Zealand

SUMMARY.

Athecate hydroids (5 species) and thecate hydroids (28 species) were taken from 23 of the 70 areas sampled. Approximately one-third of the total number of species have not previously been recorded from Port Phillip. The thecate family Sertulariidae is represented by the greatest number of species namely thirteen, and areas 58 and 59 are particularly rich in hydroids both in respect to numbers of species and quantity of material collected.

INTRODUCTION.

During the Port Phillip Bay ecological survey from 1957 to 1963, 33 species of hydroids in all were collected from 23 of the 70 areas sampled. These hydroids were taken either by dredging or skin-diving down to a depth of approximately seven fathoms. Eleven species, *Eudendrium capillare* Alder; *Tubularia* (?) *larynx* Ellis and Solander; *Myriothela australis* Briggs, 1928; *Orthopyxis crenata* (Hartlaub); *Hincksella corrugata* Millard, 1958; *Dynamena quadridentata* (Ellis and Solander); *Symplectoscyphus subdichotomus* (Kirchenpauer); *Symplectoscyphus* sp.; *Sertularella simplex* (Hutton); *Sertularella undulata* Bale and *Aglaophenia decumbens* Bale have not previously been recorded from Port Phillip. Two of these species however, namely *Dynamena quadridentata* and *Symplectoscyphus subdichotomus* have been taken in the adjacent Bass Strait area; *Sertularella undulata* and *Aglaophenia decumbens* from Tasmania and *Myriothela australis* from New South Wales waters. Of the remaining six species, *Eudendrium capillare* and *Tubularia larynx* are cosmopolitan, *Sertularella simplex* and *Orthopyxis crenata* are best known from New Zealand waters, *Symplectoscyphus* sp. is known only from Port Phillip, and *Hincksella corrugata* from the Natal coast of South Africa.

Thecate hydroids are dominant both in number of species taken and in quantity, although large handsized "tufts" of *Tubularia* (?) *larynx* were present in the collections. The family of thecate hydroids represented by the greatest number of species is the Sertulariidae with thirteen species, followed by the Plumulariidae with seven species and the Campanulariidae with five species. The families Haleciidae, Lafoeidae and Syntheciidae are represented by one species each.

Three species only from the family Sertulariidae were taken in the inner-Bay areas, the others were found towards the entrance of the Bay particularly in areas 58 and 59. Collections from these latter areas

together with those from the nearby areas of 60, 61, 62, 63, 66, and 68 showed by far the greatest variety of species. Of the plumularians, only *Plumularia setaceoides* (Areas 30; 31) was not collected in the outer-Bay area. Area 59 (36) Popes Eye Bank and Area 58 seem especially rich in hydroid species as 26 of the 33 species recorded here were taken from these areas. Collection at Point Cook Jetty (Area 10; (103)) during the same time period yielded the next largest number of species, that is five in all. The species most frequently taken over the whole collection range were *Plumularia wattersii*, *Obelia australis* and the small sertularian *Amphisbetia minima*.

LIST OF HYDROID SPECIES TAKEN DURING THE SURVEY OF PORT PHILLIP 1957-1963.

Species previously recorded from Port Phillip are given in bold face type.

ATHECATA

EUDENDRIIDAE

Eudendrium capillare Alder, 1857 . . . Areas 10 (103), 59 (36).

TUBULARIIDAE

Tubularia RALPHII Bale, 1884

Areas 14 (117), 58 (-).

Tubularia (?) *larynx* Ellis and Solander
1768

Areas 10 (11), 12 (110-3); 60 (268).

PENNARIIDAE

PENNARIA DISTICHA Goldfuss, 1820

Areas 58 (80), 61 (37); 62 (221-2).

MYRIOTHELIDAE

Myriothela australis Briggs, 1928 . . .

Area 59 (24).

THECATA

CAMPANULARIIDAE

OBELIA AUSTRALIS von Lendenfeld,
1885.

Areas 12 (110-3); 21 (115); 30 (130);
31 (10); 43 (303); 61 (37); 63 (16);
58 (218-9).

OBELIA GENICULATA Linnaeus, 1758
forma *subtropica* Ralph, 1956

Areas 30 (130); 58 (80).

Orthopyxis crenata (Hartlaub, 1901)
forma *subtropica* Ralph, 1957.

Areas 42 (108); 58 (79); 59 (36).

ORTHOXYXIS CALICULATA (Hincks,
1863).

Area 59 (57).

SILICULARIA BILABIATA (Coughtrey,
1875) forma *subtropica* Ralph, 1956.

Areas 5 (54); 10 (103); 59 (36); 61
(204).

HALECIIDAE

HALECIUM DELICATULUM Cought-
rey, 1876.

Area 59 (57).

LAFOEIDAE

HEBELLA CALCARATA (L. Agassiz,
1862).

Area 59 (36).

SYNTHECIIDAE

Hincksella corrugata Millard, 1958. . .

Area 59 (36).

SERTULARIIDAE

THYROSCYPHUS MARGINATUS (Bale,
1884).

Areas 58 (80); 59 (36).

| | |
|---|---|
| STEREOTHECA ELONGATA (Lamou- roux, 1816). | Areas 58 (88); 59 (36). |
| DIPHASIA SUBCARINATA (Busk, 1852). | Areas 58 (88); 59 (36). |
| AMPHISBETIA MINIMA (Thompson, 1879). | Areas 5 (54); 29 (107); 58 (79); 59 (24. 87). |
| AMPHISBETIA OPERCULATA (Lin- naeus, 1758). | Area 59 (87). |
| SERTULARIA UNGUICULATA Busk, 1852. | Area 58 (88). |
| THUIARIA LATA Bale, 1882 | Area 58 (223). |
| <i>Dynamena quadridentata</i> (Ellis and Solander, 1786). | Area 10 (103). |
| <i>Symplectoscyphus subdichotomus</i> Kir- chenpauer, 1884). | Area 51 (271); 62 (99). |
| <i>Symplectoscyphus</i> sp. | Area 59 (36). |
| <i>Sertularella simplex</i> (Hutton, 1873). .. | Areas 43 (303); 58 (79); 59 (36). |
| SERTULARELLA ROBUSTA Coughtrey, 1876. | Area 10 (103). |
| <i>Sertularella undulata</i> Bale, 1915. . | Area 59 (36). |
| PLUMULARIIDAE | |
| PLUMULARIA SETACEOIDES Bale, 1882. | Areas 30 (130); 31 (10). |
| PLUMULARIA WATTSII Bale, 1887 .. | Areas 19 (179); 43 (303); 51 (271); 53 (253); 58 (223); 66 (292); 68 (218-9). |
| PLUMULARIA PROCUMBENS Spencer, 1891. | Area 58 (223). |
| AGLAOPHENIA DIVARICATA (Busk, 1852). | Areas 58 (223); 59 (36); 66 (292). |
| <i>Aglaophenia decumbens</i> Bale, 1914. .. | Areas 59 (36); 69 (221-2). |
| HALICORNARIA LONGIROSTRIS (Kir- chenpauer, 1872). | Area 69 (221-2). |

A description of the above species with the exception of *Eudendrium capillare*, *Tubularia ralphii*, *Myriothela australis*, *Hincksella corrugata*, *Thyroscyphus marginatus*, *Thuiaria lata*, *Sertularella undulata*, *Plumularia procumbens*, *Aglaophenia divaricata*, and *Aglaophenia decumbens* was given by Ralph (1953, 1957, 1958, 1961a, 1961b). Hodgson (1950) is a reference source for a description of *Sertularella undulata*, *Aglaophenia divaricata* and *A. decumbens*; Bale (1884) for *Tubularia ralphii* and *Thuiaria lata*; Hincks (1868) for *Eudendrium capillare*; Spencer (1891) for *Plumularia procumbens*; Millard (1958) for *Hincksella corrugata*; Spletstosser (1929) for *Thyroscyphus marginatus*, and Manton (1940) for *Myriothela australis*.

AREA DISTRIBUTION.

Full details of the collecting schedule is given in the introductory paper to the Port Phillip Survey. (cf. Macpherson and Lynch, page i.)

Positions of Areas and Stations are shown on Charts 1 and 2 (back of volume).

Chart 1 is a bathymetric chart plotted from Admiralty Chart 1171, Port Phillip with the numbered area grid superimposed.

Chart 2 shows position of the stations numbered 1–317 with the same grid superimposed to aid in location of the stations and for correlation with depth, etc.

Localities in the text are shown as Area number followed immediately by the station number in brackets. Table A (back of volume) records station number, date, method of collecting (dive or dredge) and depth in fathoms.

AREA 5 (54)

Amphisbetia minima.
Silicularia bilabiata forma *subtropica*.

AREA 10 (103).

Silicularia bilabiata forma *subtropica*.
Dynamena quadridentata.
Eudendrium capillare.
Orthopyxis crenata forma *subtropica*.
Sertularella robusta.

AREA 10 (11).

Tubularia (?) *larynx*

AREA 12 (110–3).

Tubularia (?) *larynx*.
Obelia australis.

AREA 14 (117).

Tubularia ralphii.

AREA 19 (179).

Plumularia watsii.

AREA 21 (115)

Obelia australis.

AREA 29 (107).

Amphisbetia minima.

AREA 30 (130).

Obelia geniculata forma *subtropica*.
Plumularia setaceoides.
Obelia australis.

AREA 31 (10).

Plumularia setaceoides.
Obelia australis.

AREA 42 (108).

Orthopyxis crenata forma *subtropica*.

AREA 43 (303).

Obelia australis.
Sertularella simplex.
Plumularia watsii.

AREA 51 (271).

Symplectosecyphus subdichotomus
Plumularia watsii.

AREA 53 (253).

Plumularia watsii.

AREA 58 (—).

Tubularia ralphii.
Thyroscyphus marginatus.

- AREA 58 (79).
Orthopyxis crenata forma *subtropica*.
Amphisbetia minima.
Sertularia unguiculata.
Sertularella simplex.
- AREA 58 (80).
Obelia geniculata forma *subtropica*.
Pennaria disticha.
- AREA 58 (88).
Diplasia subcarinata.
- AREA 58 (223).
Stereotheca elongata.
Thuiaria lata.
Plumularia wattsi.
Plumularia procumbens.
Aglaophenia divaricata.
- AREA 59 (24).
Myriothele australis.
- AREA 59 (36).
Amphisbetia minima.
Sertularella simplex.
Aglaophenia divaricata.
Hebella calcarata.
Sertularella undulata.
Stereotheca elongata.
Symplectoscyphus sp.
Aglaophenia decumbens.
Eudendrium capillare.
Silicularia bilabiata forma *subtropica*.
Diplasia subcarinata.
Amphisbetia operculata.
Hincksella corrugata.
Thyroscyphus marginalis.
- AREA 59 (87).
Orthopyxis caliculata.
Halecium delicatulum.
Amphisbetia minima.
Aglaophenia decumbens.
- AREA 60 (268).
Tubularia (?) larynx.
- AREA 61 (37).
Pennaria disticha.
- AREA 61 (240).
Obelia australis.
Silicularia bilabiata forma *subtropica*.
- AREA 62 (99).
Symplectoscyphus subdichotomus.
- AREA 62 (221-2).
Pennaria disticha.
Aglaophenia decumbens.
Halicornaria longirostris.
- AREA 63 (16).
Obelia australis.
- AREA 66 (292).
Plumularia wattsi.
Aglaophenia divaricata.
- AREA 68 (218-9).
Obelia australis.
Plumularia wattsi.

SYSTEMATIC REMARKS ON SOME OF THE SPECIMENS COLLECTED.

Genus *Eudendrium* Ehrenberg, 1834.

A small *Eudendrium* sp. rather similar in erect stem habit to the present specimens was described by Bale from the neighbouring area of Portland in 1884. The Port Phillip specimens have irregularly branched stems up to 1.75 cm. in height and a few possessed male gonophores on the proximal third of the stem. The position and characters of these male gonophores as well as the characters of the erect, monosiphonic stem determine the present specimens as *Eudendrium capillare* Alder, 1857.

Genus *Tubularia* Linnaeus, 1758.

The two tubularians collected were very different in size. The smaller has irregularly corrugated stems averaging in height 4.0 cm. while the larger possesses tall smooth stems about 10.0 cm. in height. The shorter species is tentatively identified as *T. larynx* because of the stem size and the presence of corrugations. When collected the two hand-size clumps of this small tubularian appear to have been in a moribund state and the two or three immature hydranths observed did not allow a firm decision on the status of the material to be made. The tall-stemmed tubularian possesses characters similar to that described by Bale (1884) for specimens from Port Phillip, and by other workers (Broch, 1948) for *T. ralpii* Bale.

Genus *Pennaria* Oken, 1815.

The present specimens possess stem characters similar to those described for *Pennaria disticha* var. *disticha*, in that the pedicel of the hydranth is ringed along its whole length and not just at the proximal and distal ends as in the more common variety taken in Australian and New Zealand waters, namely *P. disticha* var. *australis*. The number of capitate tentacles on the hydranth cannot be accurately determined in the present material. No eyespot at the tentacular base of the attached gonophores was observed in the few fertile polyps available for study.

Genus *Myriothela* Sars, 1849.

Three specimens of the solitary capitate hydroid *Myriothela australis* Briggs, 1928 were taken. They range in length (as preserved) from 2.0 cm. to 3.5 cm. and all possess mature female blastostyles which show the features described and figured by Briggs (1929) and Manton (1940), for *M. australis*.

Genus *Hincksella* Billard, 1925.

Six unattached stems from one locality were collected of the small unbranched synthecid *H. corrugata* Millard, 1958, which also possess distinctive alternating hydrothecae. The maximum height of stem was 5.0 mm. and up to eight hydrothecae were present on a stem. The dimensional range of the hydrotheca, and the stem internodes falls within that given by Millard for her Natal specimens. Also, the faint transverse corrugations described by Millard on the walls of the hydrotheca, the everted margin to the hydrotheca, the presence of basal corrugations on

the stem and the similar ratio of the length of free hydrothecal wall to adnate wall (1 : 1 approx.) are characters easily observed in the present material.

The description of *Hincksella cylindrica* (Bale, 1884) shows this species to be rather similar to *H. corrugata*. However, Millard (1958) clearly distinguishes the two species, and although the present material comes from the same locality as Bale's *H. cylindrica* the present material shows the characters of *H. corrugata* and is here recognized as the latter species.

Genus *Symplectoscyphus* Marktanner-Turneretscher, 1890.

The erect stem characters of one of the two symplectoscyphids taken in Area 59 suggest that it is a new species, but the colonies are infertile and the decision on the specific status of this material must await the collection of fertile specimens. A description of the erect stem characters is as follows.

Symplectoscyphus sp.

(Figs. 1-4).

Erect stem monosiphonic, up to 3.5 cm. in height, stem stiff, usually subdichotomously branched; branches arising from stem at approximately 75°; branch internodes not readily distinguishable from those of the stem except for the proximal internode, which is borne on an apophysis of the stem internode, and is distinctive in that it is approximately twice the length (0.75 mm.) and half the width (0.18 mm.) of other branch internodes (Fig. 1); nodes regular and clearly marked on stem and branches by an oblique twisted constriction which directs the hydrothecae towards the front of the stem; internode swollen immediately above and below the nodal constriction; two hydrothecae of the stem between each subdichotomy and one in the axil of each branch; internodes (other than proximal branch internodes) 0.50 to 0.80 mm. in length and 0.09 to 0.125 mm. in width at the middle; hydrothecae set at an angle of approximately 40° to stem and branches; adcauline side of hydrotheca from two-thirds to three-quarters of its length from stem and branches; hydrotheca large, with adcauline side, measured from margin to base 0.40 to 0.50 mm. in length, and adcauline side, 0.25 to 0.37 mm. in length; greatest width of hydrotheca, which occurs about half-way up the theca, is from 0.20 mm. to 0.25 mm.; width at margin of hydrotheca approximately 0.14 mm. hydrotheca flattened on three sides, so that it is subtriangular in cross section, the "angles" of the triangle corresponding approximately in position to the marginal teeth (Fig. 4); edge and sides of hydrotheca facing toward stem or branches with, in most cases, three well formed ridges; adcauline edge without ridges and straight in outline from margin to base of hydrotheca; adcauline edges bulging towards the stem or branch, at the base of the hydrotheca (Fig. 3); margin of hydrotheca with three very well developed, thick, robust, bluntly pointed teeth, the outermost tooth being the largest, and the inner median adcauline tooth the smallest; three deep embayments between the teeth; margin of hydrotheca greatly thickened down to the level of the origin of the three components of the operculum, at which level the thickening ceases abruptly; three large, internal submarginal teeth present (Fig. 2).

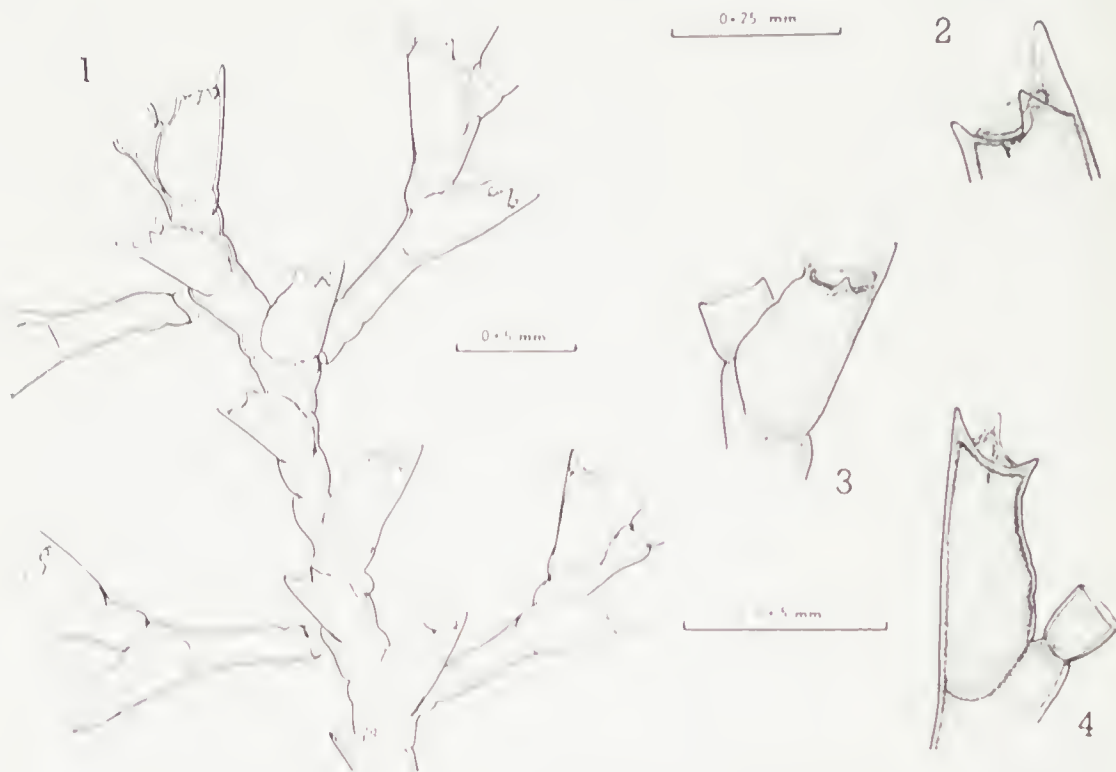


FIG. 1. *Symplectoseyphus* sp. Portion of erect stem to show growth habit (branches of left side detached from stem).

FIG. 2. Aperture and marginal region of hydrotheca showing operculum and one internal submarginal tooth.

FIGS. 3-4. Hydrothecae from different aspects.

ACKNOWLEDGMENTS

The author wishes to thank the former Director, Mr. C. Brazenor, of the National Museum Melbourne for permission to examine the hydroids collected in the Port Phillip Survey, and to Miss Hope Macpherson for her most helpful co-operation and information on collection data.

REFERENCES

- Agassiz, L., 1862.—*Contributions to the Natural History of the United States of America*. Vol. IV., pp. 1-372, Boston.
- Alder, J., 1857.—A catalogue of the Zoophytes of Northumberland and Durham. *Trans. Tyneside Nat. Field Club*, III.
- Bale, W. M., 1882.—On the Hydroids of South eastern Australia, with descriptions of supposed new species and notes on the genus *Aglaophenia*. *J. Micro. Soc. Victoria*, II., pp. 15-48, pls. 12-15.
- Bale, W. M., 1884.—*Catalogue of the Australian Hydroid Zoophytes*. Pub. Australian Museum, pp. 1-192, 19 pls.
- Bale, W. M., 1887.—The genera of Plumulariidae with observations of various Australian hydroids. *Trans. Proc. roy. Soc. Victoria*, XXIII., pp. 73-110.
- Bale, W. M., 1914.—Report on the Hydroids collected in the Great Australian Bight and other localities. *Biol. Res. F.L.S. "Endeavour"* 1909-14. Vol. II. (1) : 1-62, pls. I-VII.

- Bale, W. M., 1915.—Report on the Hydroida collected in the Great Australian Bight and other localities. *Biol. Res. F.I.S. "Endeavour" 1909-14*, Vol. III. (5): 241-336, pls. 46-47.
- Billard, A., 1925.—Les Hydroids de l'Expédition du "Siboga" II. Synthecidae et Sertularidae. *Siboga Exped.*, Leiden C116, pp. 115-232, pls. VII.-IX., text-figs. I.-LVIII.
- Briggs, E. A., 1928.—Studies on Australian Athecate hydroids, No. 1. Two new species of the genus *Myriothela*. *Rec. Aust. Mus. Sydney*. XVI., pp. 305-315, pls. 32-34, 1 text-fig.
- Briggs, E. A., 1929.—Studies on Australian Athecate hydroids, No. 2. Development of the gonophores and formation of the eggs in *Myriothela australis*. *Rec. Aust. Mus. Sydney*. XVII., pp. 244-264, pls. 42-44, 4 text-figs.
- Broch, H. J., 1948.—Antarctic Hydroids, Det Norske Videnskaps Akademi I. Oslo Res. Norwegian Antarctic Exped. 1927-28. No. 28, 23 pp., 7 text-figs.
- Busk, G., 1852.—An account of the Polyzoa and Sertularian zoophytes collected in the voyage of the "Rattlesnake" in the coast of Australia and the Louisiade Archipelago, J. MacGillivray's "Narrative of the Voyage of the "Rattlesnake", commanded by the late Captain O. Stanley, during the years 1846-50." London, I., App. 4, pp. 385-402.
- Coughtrey, M., 1875.—Notes on the New Zealand Hydroidea. *Trans. Proc. N. Z. Inst.*, 7, pp. 281-293, pl. XX.
- Coughtrey, M., 1876.—Critical notes on the New Zealand Hydroidea. *Ann. Mag. Nat. Hist.*, ser. 4, XVII., pp. 22-32, pl. 3.
- Ellis, J. & Solander, D., 1786.—*The natural history of many curious and uncommon Zoophytes collected from various parts of the globe.* London, 4, xii. + 208 pp. 63 pls.
- Goldfuss, G. A., 1820.—*Handbuch der Zoologie.* Erst Abt. Nürnberg, 1820.
- Hartlaub, C., 1901.—Hydroiden aus dem Stillen Ocean. *Zool. Jahrb. Jena Syst.* XIV., pp. 349-378, pls. 21-22.
- Hincks, Th., 1863.—On some new British hydroids. *Ann. Mag. Nat. Hist.* ser. 2, Jan. 1863.
- Hincks, Th., 1868.—*A History of British Hydroid Zoophytes.* John van Voorst. London, pp. 1-338, 67 pls.
- Hodgson, M., 1950.—A revision of the Tasmanian Hydroidea. *Pap. & Proc. roy. Soc. Tasmania for the year 1949*, pp. 1-65, 92 text-figs.
- Hutton, F. W., 1873.—On the New Zealand Sertularians. *Trans. Proc. N.Z. Inst.*, V., pp. 256-259.
- Kirchenpauer, G. H., 1872.—Über die Hydroidenfamilie Plumlaridae, einzelne Gruppe und ihre Fruchtbehälter. I. *Aglaophenia* LX. *Abh. Nat. Ver. Hamburg*, V.3, pp. 1-52, 8 pls.
- Kirchenpauer, G. H., 1884.—Nordische Gattungen und Arten von Sertulariden. *Abh. Nat. Ver. Hamburg*. VIII. (3), 54 pp., pls. 11-16.
- Lamouroux, J. V. F., 1816.—*Histoire des Polypiers Coralligènes flexibles, vulgairement nommés Zoophytes.* Caen. 560 pp. 19 pls.
- Linnaeus, C., 1758.—*Systema Naturae.* 10th. ed. Lipsiae.
- Manton, S. M., 1940.—On two new species of the hydroid *Myriothela*. *Brit. Graham Land Exped. 1934-37. Sci. Rpts. Brit. Mus. (Nat. Hist.)* 1 (4):255-294, 4 pls., 9 text-figs, 2 tabs.
- Millard, N. A. H., 1958.—Hydrozoa from the coasts of Natal and Portugese East Africa. Part I. Calyptoblastea *Ann. South African Mus.* XLIV. (5) : 165-226, 16 text-figs.
- Ralph, Patricia M., 1953.—A guide to the athecate (Gymnoblasic) hydroids and medusae of New Zealand. *Tuatara* 5 (2) : 59-75, 4 text-figs.
- Ralph, Patricia M., 1956.—Variation in *Obelia geniculata* (Linnaeus, 1758) and *Silicularia bilabiata* (Coughtrey, 1875) (Hydroida, F. Campanulariidae). *Trans. roy. Soc. N.Z.*, 84 (2), pp. 279-296, 3 text-figs.
- Ralph, Patricia M., 1957.—New Zealand thecate hydroids. Part I. Campanulariidae and Campanulinidae. *Trans. roy. Soc. N.Z.*, 84 (4) : 811-854, 8 text-figs.

- Ralph, Patricia M., 1958.—New Zealand thecate hydroids. Part II. Families Lafoeidae, Lineolariidae, Haleciidae and Syntheciidae. *Trans. roy. Soc. N.Z.*, 85 (2) : 301–356, 18 text-figs.
- Ralph, Patricia M., 1961a.—New Zealand thecate hydroids. Part III. Family Sertulariidae. *Trans. roy. Soc. N.Z.*, 88 (4) : 749–834, 25 text-figs.
- Ralph, Patricia M., 1961b.—New Zealand thecate hydroids. Part IV. Family Plumulariidae. *Trans. roy. Soc. N.Z., Zool.* 1 (3) : 19–74, 10 text-figs.
- Sars, 1849.—Zoolog. Reisi i Lofoten og Finmarken 14.
- Spencer, W. B., 1891.—A new family of Hydroidea, together with a description of the structure of a new species of *Plumularia*. *Trans. roy. Soc. Victoria*, II. (1) : 121–140, pls. 17–23.
- Spletstösser, W., 1929.—Beiträge zur Kenntnis der Sertulariiden. *Thyroscyphus* Allm., *Cnidoscypus* nov. gen., *Parascyphus* Ritchie. *Zool. Jahrb. Jena Syst.*, LVIII., pp. 1–134, 94 text-figs.
- Thompson, D. A. W., 1879.—On some new and rare Hydroid Zoophytes (Sertulariidae and Thuiariidae) from Australia and New Zealand. *Ann. Mag. Nat. Hist.*, (5), III., pp. 97–114, pls. 16–19.
- Totton, A. K., 1930.—Coelenterata. Part V. Hydroida. *Brit. Antarct. "Terra Nova" Exp. 1910*, V. (5) : 131–252, 3 pls, 70 text-figs.
- von Lendenfeld, R., 1885.—The Australian Hydromedusae. *Proc. Linn. Soc. N.S.W.*, 1X., for 1884, pp. 206–241, 345–353, 401–420, 467–492, 581–634, 908–924, pls. 6–8, 12–17, 20–29, 40–43.