

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Briggs, E. A., 1918. Descriptions of two new hydroids and a revision of the hydroid-fauna of Lord Howe Island. *Records of the Australian Museum* 12(3): 27–47, plates v–vi. [12 March 1918].

doi:10.3853/j.0067-1975.12.1918.878

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

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DESCRIPTIONS OF TWO NEW HYDROIDS, AND A REVISION
OF THE HYDROID-FAUNA OF LORD HOWE ISLAND

BY

E. A. BRIGGS, B.Sc., Zoologist, Australian Museum.

(Plates v.-vi.)

I.—DESCRIPTIONS OF THE NEW SPECIES.

Family PLUMULARIDÆ.

Genus AGLAOPHENIA, *Lamouroux*.

AGLAOPHENIA HOWENSIS, *sp. nov.*

(Pl. v., fig. 1-2; Pl. vi., fig. 1.)

Trophosome.—Hydrocaulus monosiphonic, unbranched, simply pinnate, attaining a height of 6 cm. The stem is divided into regular internodes, separated by oblique nodes, which slope successively in opposite directions. Each internode bears a single hydrocladium. The hydrocladia are slender, alternate, close, both series nearly in one plane, and rising at an angle of about 35°-40°; nodes slightly oblique. The hydrocladia are divided into a series of regular internodes, each of which bears a solitary hydrotheca.

The hydrothecæ are borne nearly on the front of the hydrocladia. They are closely set, sub-cylindrical, with the axis of the hydrotheca lying away from the hydroclade at an angle of about 40°. There is a well-developed anterior intrathecal ridge proceeding from about the middle of the front of the cell and extending to about its centre, where it ends in a hammer-like thickening. There is in addition a small projection in front of the hydropore with a rounded median tooth, which is clearly a rudimentary posterior ridge. The hydropore is parallel with the hydrocladium, or nearly so, but raised above it. The border of the hydrotheca has a well-developed median anterior tooth, which is incurved, and four teeth on each side. The first pair of lateral teeth from the front are triangular, rounded at the apex, and strongly everted; the second pair, roughly rectangular in appearance, are bent inwards; the third pair are broad, rounded at the apex, and strongly everted; the fourth pair are narrow, pointed, and lie behind the lateral sarcothecæ. The back is adnate. The front of the hydrotheca is provided with an external longitudinal hollow chamber extending from the anterior intrathecal ridge, and terminating in an elevated pointed crest over the anterior marginal tooth. Hydrothecal internode without septal ridges.

The mesial sarcotheca is about half the length of the hydrotheca, and is adnate for about half its length, the free distal portion usually being directed more outward. The terminal and inferior apertures are completely confluent. A small septum runs across the cavity of the mesial sarcotheca. The lateral sarcothecæ are small, adnate up to the margin of the hydrotheca, and project slightly beyond it; the terminal and inferior apertures are confluent. There are three cauline sarcothecæ; two on the anterior surface of the rachis at the base of each hydrocladium, the distal anterior sarcotheca being similar to the laterals, but larger, or with two orifices bordering the free margin; while the proximal anterior sarcotheca is smaller, and almost oval in outline, with a solitary wide superior aperture. The third cauline sarcotheca is similar to the laterals in shape, but larger, and is situated at the back of each axil.

Gonosome.—The gonangial branch replaces a hydrocladium, and bears a single hydrotheca below the corbula. The corbulæ are long and cylindrical, and each consists of twelve to nineteen pairs of alternate ribs, springing from separate internodes of the rachis as narrow pinnules, but expanding above into broad leaflets, which unite to form a closed corbula, except for oblique openings between the bases of the leaflets left by the incomplete fusion of the latter in this region. Each leaflet bears a row of sarcothecæ along its distal edge; the proximal edge, however, is devoid of sarcothecæ.¹ A single sarcotheca—sometimes two—occurs on the rachis at the base of each leaflet.

Colour.—Light brown, stem darker.

Dimensions.—

Stem internode, length	0·24-0·28 mm.
Stem internode, diameter	0·28-0·35 mm.
Hydrocladium, length	up to 10 mm.
Hydroclade internode, length	0·22-0·24 mm.
Hydrotheca, depth	0·18-0·19 mm.
Hydrotheca, breadth at mouth ²	0·10-0·12 mm.
Corbula, length	up to 6 mm.
Corbula, diameter	1 mm.

Both Billard and Bale have drawn attention to the tendency exhibited by some species of *Aglaophenia* to reversal of the front and back of the polypidom. I have observed this condition in *A. howensis*, in which four or five of the hydrocladia on each side alternately face the front and back throughout the length of the stem, with the result that no fewer than eighteen reversals occur in a length of 6 cm. As a consequence the stem, when viewed laterally, presents a very wavy appearance. Billard's explanation that reversals followed a regeneration of a broken part does not appear applicable in this instance, as I am unable to detect any break in the continuity of the stem. This change of front is not confined to the hydrocladia, but is shared also by the corbulæ. In *A. howensis* the gonangial branches replace the hydrocladia, and wherever a reversal of the latter occurs the corbulæ also face in the same direction.

Affinities.—*Aglaophenia howensis* is very closely allied to *A. sinuosa*, Bale³, from Port Denison, Queensland. It differs, however, from Bale's species in the form and position of the posterior intrathecal ridge, which is quite rudimentary in *A. howensis*, but is well developed in *A. sinuosa*, in which species the hydropore is not elevated as in *A. howensis*. Other characters by which this species may be distinguished from *A. sinuosa* are (1) the smaller size of the hydrotheca (0·19 mm. as against 0·31 mm. in depth); (2) the form and position of the lateral teeth on the margin of the hydrotheca; (3) the different configuration of the apocauline side of the hydrotheca with the mesial sarcotheca; (4) the presence on the front of the hydrotheca of a prominent external

¹ This is contrary to Nutting's observations on the structure of the corbulæ of American species of *Aglaophenia*, in which there is always "a row of nematophores on the proximal or inner edges of each leaf, the nematophores projecting into the cavity of the corbula" (Nutting—American Hydroids, pt. I.,—Plumulariæ, 1900 p. 33).

² Distance from posterior wall to anterior tooth.

³ Bale—Proc. Linn. Soc. N.S.Wales (2), iii., 1888, p. 790, pl. xxi., fig. 1, 2.

hollow chamber, which terminates in an elevated pointed crest over the anterior marginal tooth; and (5) the structure of the corbula, and the arrangement of the sarcothecæ on the leaflets.

Remarks.—Whitelegge⁴, in his list of Hydroids from Lord Howe Island, includes "*Halicornaria*, sp. nov. ?", and specimens so labelled in the Australian Museum collection prove on examination to be identical with *Aglaophenia howensis*. There is also preserved in the Macleay Museum a specimen of this species from an unknown locality, collected by the "Chevert" expedition. The itinerary of this expedition did not include Lord Howe Island, the "Chevert's" movements being confined to the Australian coast (the inner passage from Percy Island to Cape York), New Guinea, and Torres Straits.

Loc.—Middle Beach, Lord Howe Island, South Pacific Ocean. This specimen has been selected as the holotype.

Holotype.—In the Australian Museum, Sydney.

Genus *AGLAOPHENOPSIS*, *Fewkes*.

Aglaophenopsis, Fewkes, Bull. Mus. Comp. Zool., viii., 1881, p. 132. *Id.*, Nutting, American Hydroids, pt. I.,—Plumularidæ, 1900, p. 118.

The genus *Aglaophenopsis*, with *hirsuta* for its type, was described by Fewkes in 1881 from specimens taken by the "Blake" Expedition. In 1900 Nutting added two new species, *A. (?) distans*, and *A. verrilli*, and also referred to this genus *Cladocarpus cornutus*, Verrill. The genus has hitherto been known only from North American waters. The occurrence in Australian seas of a fifth species is, therefore, particularly noteworthy. The bathymetrical distribution of the American species ranges from 200 to 1,497 fathoms. The Australian representative was dredged in 50 fathoms.

AGLAOPHENOPSIS VAGA, *sp. nov.*

(Pl. v., fig. 3-7; Pl. vi., fig. 2.)

Trophosome.—Hydrocaulus polysiphonic, branched, reaching a height of 16 cm. The hydrocladial tube is divided into regular internodes by distinct nodes. Each internode bears a single hydrocladium. The hydrocladia are slender, alternate, both series springing from the front of the hydrocladial tube and directed forwards; nodes slightly oblique. The hydrocladia are divided into a series of regular internodes, each of which bears a solitary hydrotheca.

The hydrothecæ are deep, oval in shape, narrowing towards the base, the axis of the hydrotheca lying almost parallel with the hydrocladium. There is a well-developed intrathecal ridge near the base, projecting from the adcauline wall, and reaching a little more than one-third across the cavity of the hydrotheca. The aperture of the hydrotheca is circular, and has a well-developed anterior tooth; the border is otherwise entire, smooth, or very faintly undulated. The back is adnate. The hydrothecal internode is provided with three septal ridges, one opposite the intrathecal ridge, another behind the lateral sarcothecæ, and a third near the base of the internode. Besides these a small septum generally runs across the cavity of the mesial sarcotheca.

⁴ Whitelegge in Etheridge—Mem. Austr. Mus., ii., 1889, p. 41.

The mesial sarcotheca is very nearly as long as the hydrotheca, and is closely adnate throughout its length. The aperture is simple and oblique, and has a slightly undulated margin. A small septum runs across the cavity of the mesial sarcotheca. The lateral sarcothecæ are adnate up to the hydrotheca-margin, the upper posterior corner attaining a level somewhat higher than that of the hydrotheca. They are saccate, roughly triangular in outline, with a broad, free margin, which never becomes tubular at the ends. On the hydrocladate tube there are three cauline sarcothecæ to each internode; one antero-lateral in position at the origin of the hydrocladium, another a little below this in the middle line on the anterior surface, both of which are similar to the lateral sarcothecæ, and a third similar to the laterals in shape—but smaller—is situated at the back of each axil. On each accessory tube the cauline sarcothecæ are small, numerous, and arranged in a single, evenly-spaced series along the whole length of the tube.

Gonosome.—The gonangia are borne singly on the branches at the bases of the hydrocladia. They are oblong-ovate, with a latero-terminal orifice. No stalk is present, and in frontal view they appear as much elongated (length three times maximum breadth) cylindrical bodies, with the aperture lying a little within the upper margin, and facing the observer. The aperture is pear-shaped, with its basal portion distinctly contracted. There is a slight pit-like depression situated immediately below the lower lip of the aperture. In lateral aspect the profile is obovate, with the summit curved over the latero-terminal orifice, which faces outwards and slightly downwards. The gonangia reach a length of 1.75 mm., with a maximum diameter of 0.59 mm., about the proximal third of their length.

Each gonangium is protected by a jointed, unbranched appendage, springing from the proximal internode of the hydrocladium, and bearing a single row of sarcothecæ, and one or two terminal hydrothecæ. Each protective appendage originates from one side of the hydrocladium just below the hydrotheca, and is divided by oblique nodes into a series (up to seven in number) of regular internodes. Each internode is short, and bears a solitary sarcotheca, with the exception of one or two of the distal internodes, which are longer and provided with hydrothecæ. The sarcothecæ are similar to the lateral sarcothecæ of the hydrotheca.

Colour.—Buff.

Dimensions.—

Hydrocladate tube internode, length	... ..	0.80-0.89 mm.
Hydrocladate tube internode, diameter	... ..	0.29-0.35 mm.
Hydrocladium, length	... ..	up to 8 mm.
Hydroclade internode, length	... ..	0.59-0.63 mm.
Hydroclade internode, diameter	... ..	0.17-0.21 mm.
Hydroclade proximal internode, length	... ..	0.87-0.89 mm.
Hydrotheca, depth	... ..	0.42-0.43 mm.
Hydrotheca, breadth at mouth (lateral aspect)	... ..	0.28-0.29 mm.
Gonangium, length	... ..	1.75 mm.
Gonangium, maximum diameter	... ..	0.59 mm.
Phylactogonium, length	... ..	up to 4 mm.
Phylactogonium internode (with sarcotheca), length	... ..	0.36-0.43 mm.
Phylactogonium internode (with hydrotheca), length	... ..	0.70-0.75 mm.

The colony, 16 cm. in height, consists of a main stem, 3 mm. in diameter, which is destitute of hydrocladia. The basal portion of the stem is missing. At a height of 5.5 cm. branching begins, the largest primary branch having a diameter at the base of 3 mm., and a length of 12 cm. The secondary branches, up to 8 cm. in length, are abundant and irregularly arranged, varying in position from alternate, through sub-alternate to opposite. A few small branches of the third order also occur. The stem, branches, and branchlets are all strongly fascicled. In transverse section the stem is seen to be made up of a great number of tubes—as many as fifty-seven being counted. The polysiphonic branches and branchlets consist of a hydrocladial tube, supported by a varying number of accessory tubes. The hydrocladial tube runs along the surface of the branches, but in the stem it loses its superficial position, and, becoming immersed in the accessory tubes, occupies a central or axial position. The hydrocladial tube is alone divided into internodes, which are separated by distinct nodes. About the middle of each internode is a process upon which a hydrocladium is set. The hydrocladia arise alternately from the hydrocladial tube, and reach a length of 8 mm. Each hydrocladium commences with a long proximal internode separated from the tube process by a transverse node, and from the next succeeding hydroclade internode, by an articulation, very oblique in lateral view, and resembling from the front two cones, the points of which interpenetrate. The remaining internodes are considerably shorter than the proximal one, and are separated by slightly oblique nodes.

The gonangia are borne singly on the branches at the bases of the hydrocladia, and not on the phylactogonia as in *A. verrilli*, Nutting.

In his introductory remarks on the structures for the protection of the gonangia and their contents among the Plumularidæ, Nutting⁵ states that "in *Aglaophenopsis* the phylactogonium is supposed to be a greatly reduced mesial nematophore of the proximal hydrotheca." In *A. vaga* the phylactogonium does not occupy the place of a mesial sarcotheca, but springs from one side of the proximal internode of the hydrocladium, originating from that part of the internode, which is between the node and the base of the hydrotheca. The phylactogonium apparently intrudes between the mesial sarcotheca and the base of the hydrotheca, since the sarcotheca is there, but, as it were, forced out of its natural position. It is true that this sarcotheca does not represent the ordinary type of mesial sarcotheca; it is not in contact with the hydrotheca, and is much wider and similar in size and shape to the cauline sarcothecæ on the hydrocladial tube. It is doubtful whether the phylactogonium is a modified mesial sarcotheca, either in my specimen or in the American species, and Nutting also seems dubious, as is evident from his remark "it is impracticable to insist in all cases on such homologies."

The phylactogonium is a jointed, unbranched appendage, bearing a single row of sarcothecæ, and one or two terminal hydrothecæ. According to Nutting, this type of protective appendage is "unique among the Statoplea, and if consistent would prove an excellent generic character." In *A. vaga* either one or two terminal hydrothecæ are present. Both

⁵ Nutting—American Hydroids, pt. I.,—Plumularidæ, 1900, p. 35.

hydrothecæ may be quite normal in appearance, or the proximal one may have the ordinary mesial sarcotheca wanting, and a sarcotheca similar to the cauline sarcotheca of the hydrocladate tube present on the internode below the hydrotheca. The arrangement of the sarcothecæ on the protective appendage is very uniform, each internode being armed with a single sarcotheca, except for one or two instances when two sarcothecæ were observed on a single internode.

Affinities.—The present specimen has been referred to the genus *Agluophenopsis*, on account of the phylactogonium, which is a jointed, unbranched appendage springing from the proximal internode of the hydrocladium, and bearing a single row of sarcothecæ, and one or two terminal hydrothecæ. Plumularians of this type have hitherto been recorded only from North American waters, where they are represented by four species. The discovery of a fifth species on the coast of New South Wales is, therefore, of great interest. The species is a well-marked one, and differs considerably from the previously-described members of the genus. It is readily distinguished from *A. hirsuta* by its single mesial sarcotheca; from *A. distans* and *A. verrilli* by its large mesial sarcotheca, which is adnate to the front of the hydrotheca; and from *A. cornuta* by the front of the hydrotheca, which is without a ridge or keel.

Loc.—Off Botany Bay, New South Wales, 50 fathoms.

Holotype.—In the Australian Museum, Sydney.

Key to the species of the genus *Agluophenopsis*:—

- a. Mesial sarcotheca single.
 - b. Mesial sarcotheca small, separate from hydrotheca.
 - c. Margin of hydrotheca with a prominent anterior tooth; lateral teeth shallow or sinuous *A. distans*.
 - cc. Margin of hydrotheca without a prominent anterior tooth; lateral teeth subequal *A. verrilli*.
 - bb. Mesial sarcotheca large, adnate to hydrotheca.
 - d. Front of hydrotheca with a prominent ridge or keel *A. cornuta*.
 - dd. Front of hydrotheca without a ridge or keel *A. vaga*.
- aa. Mesial sarcotheca double *A. hirsuta*.

II.—REVISION OF THE HYDROID-FAUNA OF LORD HOWE ISLAND.

Hydroid Zoophytes were present in the collections made at Lord Howe Island in August-September, 1887, by a collecting party despatched by the Trustees of the Australian Museum to this isolated Island. Lord Howe Island is situated in S. Lat. 31° 33', and E. Long. 159° 5'. It is the most southern of the outlying islands on the east coast of Australia.

The determination and description of these collections was effected by the Museum staff, and Mr. T. Whitelegge⁶ prepared a short account of the Coelenterata, which included a list of Hydroids collected chiefly from seaweeds thrown up on the sandy beach of the lagoon. The Hydroids mentioned in this list, with their identification as now understood, are as follows:—

<i>Ceratella fusca</i> , Gray? ...	...	<i>Solanderia fusca</i> (Gray).
<i>Sertularella solidula</i> , Bale ...	...	<i>Sertularella indivisa</i> , Bale.
<i>Eucopeella campanula</i> , Lendfel. ...	...	<i>Silicularia campanularia</i> (Lendenfeld).

⁶ Whitelegge in Etheridge—Mem. Austr. Mus., ii., 1889, p. 41.

<i>Sertularia minima</i> , Thompson	...	<i>Sertularia minima</i> , Thompson.
<i>Halicornaria</i> , sp. nov. ?	...	<i>Aglaophenia howensis</i> , Briggs.
<i>Halicornaria</i> , sp. nov. ?	...	<i>Thecocarpus brevirostris</i> (Busk).
<i>Plumularia</i> , sp. nov. ?	...	<i>Plumularia balei</i> , Bartlett.
<i>Plumularia spinosa</i> , Bale...	...	<i>Plumularia spinulosa</i> , Bale.
<i>Campanularia tinctoria</i> , Hincks	...	<i>Campanularia tinctoria</i> , Hincks.

Whitelegge's list is of interest as being the first contribution to the study of the Hydroid Zoophytes of Lord Howe Island, although no serious work was attempted on the specimens with the exception of those of *Solanderia fusca* (Gray), which were fully described and figured by Prof. Baldwin Spencer⁷.

During a visit to the island in November, 1913, I collected a number of Hydroids, and these, in conjunction with Whitelegge's specimens, form the basis of the present paper. Although the collection is a small one, consisting of twenty species belonging to twelve genera, it forms a useful addition to our very meagre knowledge of the Hydroid fauna of this island. The collection, moreover, shows the relationship which the Hydroids bear to those of neighbouring seas. Nineteen of the twenty species here recorded have previously been recognised from the Australian coast. On the other hand, only two species are common to the Kermadec Islands and Lord Howe Island. Considering the zoo-geographical relationships of these two islands, the lack of similarity in their respective Hydroid faunas is very striking, especially as Hilgendorf⁸ has recorded eight species from the Kermadecs, and I have been able to examine—through the kindness of Mr. W. R. B. Oliver, of Auckland, New Zealand—a number of additional forms from the same locality, as well as duplicates of Hilgendorf's specimens. Of the eight species recorded by Hilgendorf, only one (*Sertularia minima*, Thompson) is common to the two islands; and, with additional material at my disposal, I have only been able to add a second species, *Thecocarpus brevirostris* (Busk), from Sunday Island, Kermadecs. The same species appears in Whitelegge's list as "*Halicornaria*, sp. nov. ?"

In an addendum I have been able to assign to their correct positions Hilgendorf's *Aglaophenia* ? x and *Aglaophenia* ? y, from Denham Bay, Sunday Island, Kermadec Islands.

The complete list of the species in the collection from Lord Howe Island is as follows:—

Family SOLANDERIDÆ.

Solanderia fusca (Gray).

Family CAMPANULARIDÆ.

Campanularia tinctoria, Hincks.

Silicularia campanularia (Lendenfeld).

Family LAFOEIDÆ.

Hebella calcarata (L. Agassiz), var. *contorta*, Marktanner-Turneretscher.

⁷ Spencer—Trans. Roy. Soc. Vict., ii., 2, 1891, pp. 8-24, pl. ii., fig. 1-3a, pl. iii., fig. 4-8, pl. iiiia., fig. 9-14.

⁸ Hilgendorf—Trans. N.Z. Inst., xliii., 1910 (1911), pp. 540-543.

Family SERTULARIDÆ.

- Sertularella indivisa*, Bale.
Sertularella subarticulata (Coughtrey).
Sertularia bispinosa (Gray).
Sertularia minima, Thompson.
Thuiaria sinuosa, Bale.
Thuiaria tubuliformis (Marktanner-Turneretscher).
Pasythea quadridentata (Ellis and Solander), var. *obliqua*, Lamouroux.

Family PLUMULARIDÆ.

- Plumularia balei*, Bartlett.
Plumularia buskii, Bale.
Plumularia spinulosa, Bale.
Halicornaria ascidioides (Bale).
Halicornaria prolifera (Bale).
Aglaophenia divaricata (Busk).
Aglaophenia howensis, Briggs.
Aglaophenia parvula, Bale.
Thecocarpus brevirostris (Busk).

Family SOLANDERIDÆ.

Genus SOLANDERIA, *Duchassaing and Michelin*.

- Solanderia*, Duchassaing and Michelin, *Revue Zoologique*, 1846, p. 219.
Ceratella, Gray, *Proc. Zool. Soc.*, 1868, p. 579.

Stechow, who has examined the type of *Solanderia gracilis*, has shown that the genus *Ceratella* should be suppressed, being synonymous with *Solanderia*.

SOLANDERIA FUSCA (Gray).

- Ceratella fusca*, Gray, *Proc. Zool. Soc.*, 1868, p. 579, fig. 2. *Id.*, Carter, *Ann. Mag. Nat. Hist.* (4), xi., 1873, pp. 8, 10. *Id.*, Bale, *Cat. Austr. Hydroid Zoophytes*, 1884, p. 48. *Id.*, Lendenfeld, *Proc. Linn. Soc. N.S. Wales*, ix., 1885, p. 612. *Id.*, Brazier, *Ibid.* (2), i., 1886, p. 575. *Id.*, Bale, *Ibid.* (2), iii., 1888, p. 748. *Id.*, Spencer, *Trans. Roy. Soc. Vict.*, ii., 2, 1891, pp. 8-24, pl. ii., fig. 1-3a; pl. iii., fig. 4-8; pl. iiiia., fig. 9-14. *Id.*, Nutting, *Bull. U.S. Fish. Comm.*, xxiii., 3, 1906, p. 939.

Among the specimens of *Solanderia fusca* (Gray), preserved in the Australian Museum, are several colonies which were collected by Whitelegge at Lord Howe Island. These were submitted to Prof. Sir Baldwin Spencer, and were fully described and figured in his paper "On the Structure of *Ceratella fusca* (Gray)," which appeared in 1891.

Distribution.—Previously recorded from New South Wales (Gray, Brazier); Lord Howe Island (Spencer); Flinders Island, Bass Strait (Spencer); North coast of the Island of Maui, Hawaiian Islands (Nutting).

Family CAMPANULARIDÆ.

Genus CAMPANULARIA, *Lamarck*.CAMPANULARIA TINCTA, *Hincks*.

Campanularia tincta, Hincks, Ann. Mag. Nat. Hist. (3), vii., 1861, p. 280, pl. xii. *Id.*, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 57, pl. i., fig. 4-6; pl. xix., fig. 29. *Id.*, Jäderholm, Wissensch. Ergeb. schwedischen Südpolar-Exped., Bd. v., Zool. i., Hydroiden, 1905, p. 14, pl. v., fig. 5. *Id.*, Warren, Ann. Natal Govt. Mus., i., 3, 1908, p. 337, fig. 18. *Id.*, Vanhöffen, Deutsche Südpolar-Exped., Bd. xi., Zool. iii., Hydroiden, 1910, p. 296, fig. 17. *Id.*, Ritchie, Mem. Austr. Mus., iv., 16, 1911, p. 814. *Id.*, Nutting, American Hydroids, pt. iii., Campanularidæ and Bonneviellidæ, 1915, p. 41, pl. iv., fig. 6, 7.

Specimens of this species were observed on seaweeds thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Port Phillip (Hincks), and Portland, Victoria (Bale); Falkland Islands (Jäderholm, Ritchie); Straits of Magellan (Hartlaub); Natal (Warren); Gauss-Station, Antartica (Vanhöffen); New South Wales (Ritchie).

Genus SILICULARIA, *Meyen*.SILICULARIA CAMPANULARIA (*Lendenfeld*).

Eucopella campanularia (in part), Lendenfeld, Zeitschr. für Wiss. Zool., xxxviii., 1883, pp. 497-583, pl. xxix., fig. 15, D1-D $\frac{1}{2}$.

Eucopella campanularia, Bale (part), Proc. Linn. Soc. N.S. Wales (2), iii., 1888, p. 751. *Id.*, Mulder and Trebilcock, Geelong Naturalist (2), vi., 1, 1914, p. 9, pl. ii., fig. 8-11.

? *Eucopella reticulata*, Hartlaub, Zool. Jahrb., Suppl. vi., iii., 1905, p. 569, fig. R¹.

Silicularia campanularia, Bale, Proc. Roy. Soc. Vict. (n.s.), xxvii., 1, 1914, p. 84, pl. xiii., fig. 1, 5.

Typical specimens of this species were found on seaweeds thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Victoria (Lendenfeld, Mulder and Trebilcock); New South Wales (Bale, Marktanner-Turneretscher); Port William, Falkland Islands (Hartlaub, as *Eucopella reticulata*).

Family LAFOEIDÆ.

Genus HEBELLA, *Allman*.HEBELLA CALCARATA (*L. Agassiz*),var. CONTORTA, *Marktanner-Turneretscher*:

Hebella contorta, Marktanner-Turneretscher, Ann. K. K. Hofmus. Wien, v., 1890, p. 215, pl. iii., fig. 17a, b. *Id.*, Campenhausen, Abh. Senckenb. Naturf. Ges. Frankfurt-a-M., 1897, p. 307. *Id.*, Levinsen, Vidensk. Medd. fra den naturh. Foren, 64, 1913, p. 285, pl. v., fig. 16, 17.

Hebella cylindrica (in part), Pictet, Rev. Suisse de Zool., i., 1893, p. 41.

Hebella scandens (in part), Bale, Proc. Roy. Soc. Vict. (n.s.), xxvi., 1913, p. 117.

Hebella calcarata (L. Agassiz), var. *contorta*, Bale, Biol. Res. "Endeavour," iii., 5, 1915, p. 253.

Loc.—Growing on *Pasythea quadridentata* (Ellis and Solander), var. *obliqua*, Lamouroux, thrown up on the sandy beach of the lagoon, Lord Howe Island.

Family SERTULARIDÆ.

Genus SERTULARELLA, Gray.

SERTULARELLA INDIVISA, Bale.

Sertularella indivisa, Bale, Biol. Res. "Endeavour," iii., 5, 1915, p. 285 (synonymy).

Numerous specimens of this small species were obtained which do not exceed 10 mm. in height. Some of the specimens give rise to one or two pinnately-disposed branches. Gonangia are present on several of the colonies.

Remarks.—This species appears in Whitelegge's list as *S. solidula*, Bale. Owing to the extreme range of variation exhibited by the forms distinguished as *S. indivisa*, *S. solidula*, and *S. variabilis*, all three are now generally regarded as a single variable species; this must be known as *S. indivisa*, which name appears first in the publication.

Loc.—Growing on seaweeds thrown up on the sandy beach of the lagoon, Lord Howe Island.

SERTULARELLA SUBARTICULATA (Coughtrey).

Thuiaria articulata, Hutton, Trans. N.Z. Inst., v., 1872, p. 258 (not *Thuiaria articulata*, Johnston).

Thuiaria subarticulata, Coughtrey, Trans. N.Z. Inst., vii., 1874, p. 287, pl. xx., fig. 32-34. *Id.*, Thompson, Ann. Mag. Nat. Hist. (5), iii., 1879, p. 110.

Thuiaria bidens, Allman, Journ. Linn. Soc., Zool., xii., 1876, p. 269, pl. xviii., fig. 1, 2.

Sertularia fertilis, Lendenfeld, Proc. Linn. Soc. N.S.Wales, ix., 1885, p. 406, pl. vii., fig. 4, 5.

A single dried colony, 9 cm. in height, representing this typical New Zealand species, agrees with the specimens described and figured by Allman under the name of *Thuiaria bidens*, which is synonymous with *S. subarticulata* (Coughtrey).

Loc.—Lord Howe Island.

Distribution.—Previously recorded from New Zealand (Hutton; Coughtrey; Allman, as *Thuiaria bidens*; Lendenfeld, as *Sertularia fertilis*). Whitelegge⁹ has recorded this species from Maroubra Bay, New South Wales.

⁹ Whitelegge—Proc. Roy. Soc. N.S.Wales, xxiii., 1889, p. 193.

Genus SERTULARIA, *Linnaeus*.SERTULARIA BISPINOSA (*Gray*).

Sertularia bispinosa (*Gray*), *Nutting, American Hydroids*, pt. II.,—*Sertulariadae*, 1904, p. 56, pl. ii., fig. 8-11 (synonymy).

A few fragmentary but typical examples of this species were found entangled with *Sertularella subarticulata* (*Coughtrey*). Gonangia are present on several of the specimens.

Dimensions.—

Stem internode, length	0.50-0.66 mm.
Stem internode, diameter at base of hydrotheca ...	0.26-0.31 mm.
Hydrotheca, length of external profile	0.38-0.43 mm.
Hydrotheca, length of free portion	0.28-0.33 mm.
Hydrotheca, length of adnate portion	0.17-0.19 mm.
Hydrotheca, diameter at mouth	0.14-0.15 mm.
Gonangium, length	up to 2 mm.
Gonangium, maximum diameter	up to 1.5 mm.

Remark.—*Levinsen*¹⁰, in his "Systematic Studies on the Sertulariadae," refers *Sertularia bispinosa* (*Gray*) to his new genus *Odontotheca*.

Loc.—Lord Howe Island. Entangled with *Sertularella subarticulata* (*Coughtrey*).

Distribution.—Previously recorded from New Zealand (*Gray, Hutton, Lendenfeld*); Brighton, South Australia; Bass Strait? (*Bale*); Victoria (*Lendenfeld, Bale, Mulder and Trebilcock*); Indian Ocean (*Marktanner-Turneretscher*); East coast of South America (*Nutting*).

SERTULARIA MINIMA, *Thompson*.

Sertularia minima, *Bale, Biol. Res. "Endeavour,"* iii., 5, 1915, p. 269 (synonymy).

Many small colonies belonging to this widely-distributed species, and averaging 2-3 mm. in height, occur creeping over the fronds of seaweeds. The minute characters of the trophosome are quite typical. The transverse markings in the hydrorhiza in the form of perisarcial thickenings are well developed.

*Mulder and Trebilcock*¹¹ have drawn attention to the presence of two small external apertures at the base of the chamber ("infrathecæ chamber") below each pair of hydrothecæ. These apertures are small, circular holes from which short, fragile tubes protrude. I have not been able to detect on my specimens the presence of these apertures, which *Mulder and Trebilcock* found on their specimens from the Victorian coast. These writers, however, point out that in typical specimens "the tubes are nearly always absent . . . and the apertures small and difficult to detect. Sometimes they are missing altogether." In the case of typical specimens from Port Phillip, Victoria, *Bale* found very few of these orifices. An examination of *Ritchie's* specimens of *S. minima* obtained by the "Thetis" on the coast of New South Wales reveals the presence of these orifices on several of the internodes.

¹⁰ *Levinsen*—*Vidensk. Medd. fra den naturh. Foren.* 64, 1913, pp. 273, 308.

¹¹ *Mulder and Trebilcock*—*Geelong Naturalist*, vi., 2, 1914, p. 39.

Gonosome.—Gonangia are present on several of the colonies. The aperture of each gonangium is provided with a narrow denticulated collar.

Dimensions.—

Total height	... ..	up to 3 mm.
Stem internode, length	... ..	0.31-0.33 mm.
Stem internode, diameter at base of hydrotheca	... ..	0.10-0.12 mm.
Hydrotheca, length of external profile	... ..	0.24-0.27 mm.
Hydrotheca, length of free portion	... ..	0.14-0.15 mm.
Hydrotheca, length of adnate portion	... ..	0.19-0.21 mm.
Hydrotheca, diameter at mouth	... ..	0.07-0.08 mm.
Gonangium, length	... ..	1.09-1.20 mm.
Gonangium, maximum diameter	... ..	0.87-0.88 mm.

Loc.—Growing on seaweeds thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from New Zealand (Coughtrey); Cape of Good Hope (Allman); St. Vincent Gulf, Adelaide (Thompson); Victoria (Bale, Mulder and Trebilcock); New South Wales (Marktanner-Turneretscher, Ritchie); Port William, Falkland Islands (Jäderholm); Suez (Thornely); Denham Bay, Sunday Island, Kermadecs (Hilgendorf); Southern Chili, Fitzroy Canal (Jäderholm); Nuyts Archipelago, Great Australian Bight (Bale).

Genus THUIARIA, *Fleming*.

THUIARIA SINUOSA, *Bale*.

Thuiaria sinuosa, Bale, Biol. Res. "Endeavour," iii., 5, 1915, p. 279 (references).

The curvature of the hydrothecæ is not so pronounced as in the type, but otherwise the specimen agrees with Bale's description and figures. Gonangia are present on the pinnae.

Loc.—Middle Beach, Lord Howe Island.

Distribution.—Previously recorded from Port Molle, Queensland (Bale); Jervis Bay and Shoalhaven Bight, New South Wales (Ritchie, Bale); Queenscliff (?), Victoria (Mulder and Trebilcock); Seven miles east of Cape Pillar, Tasmania, 100 fathoms (Briggs); Great Australian Bight, 100 fathoms (Bale).

THUIARIA TUBULIFORMIS (*Marktanner-Turneretscher*).

Dynamena tubuliformis, Marktanner-Turneretscher, Ann. K.K. Hofmus. Wien, v., 1890, p. 238, pl. iv., fig. 10.

Thujaria tubuliformis, Billard, Bull. Mus. Histoire Naturelle, x., 1904, p. 482.

Thuiaria tubuliformis, Nutting, American Hydroids, pt. II.,—Sertularidæ. 1904, p. 70, pl. xi., figs. 1-8. *Id.*, Clarke, Mem. Mus. Comp. Zool. Harvard, xxxv., 1907, p. 14, pl. ix., figs. 1-5. *Id.*, Billard, Bull. Mus. Histoire Naturelle, xiii., 1907, p. 275. *Id.*, Warren, Ann. Natal Govt. Mus., i., 3, 1908, p. 314, fig. 12. *Id.*, Thornely, Journ. Linn. Soc., xxxi., 1908, p. 83. *Id.*, Ritchie, Proc. Zool. Soc., 1910, p. 832.

Sertularia vegæ, Pictet, Rev. Suisse de Zool., i., 1893, p. 44, pl. ii., figs. 37-38 (not *Thuiaria vegæ*, Thompson).

Many specimens of this species, the largest 25 mm. in height, were obtained. The structural details agree more closely with Warren's figures of Natal specimens than with those by Marktanner-Turneretscher and Nutting. In this respect the specimens differ from those recorded by Ritchie from the East Indian Ocean. The characters agree in detail with Warren's description, except that the hydrothecæ only very seldom show a tendency to arrange themselves in groups towards the distal ends of the branches. As in Clarke's Perico Island specimens, some of the stem internodes bear a branch and three hydrothecæ on one side, and two hydrothecæ on the other. In rare cases opposite instead of alternate branches arise from the proximal stem-internode. *Gonosome* not present.

Dimensions.—

Height of colony	up to 25 mm.
Typical stem internode, length	1.51 mm.
Stem internode, diameter	0.21-0.31 mm.
Branch, length	up to 10 mm.
Hydrotheca, length of adnate portion	0.43-0.47 mm.
Hydrotheca, length of free portion	0.14-0.17 mm.
Hydrotheca, diameter	0.14-0.15 mm.

Synonymy.—Pictet has ranked *Dynamena tubuliformis*, Marktanner-Turneretscher, as a synonym of *Thuiaria vegæ*, Thompson. The two species, however, are quite distinct, as is shown by their different gonangia. Pictet, moreover, has referred to *T. vegæ* specimens from Amboyna, which clearly belong to *T. tubuliformis*; his description and figures of them agree exactly with *T. tubuliformis*, and the dimensions correspond with those given by Marktanner-Turneretscher.

Remarks.—The range of this species must now be extended to include the eastern coast of Australia, as I have recently collected numerous specimens on the Great Barrier Reef, about the latitude of Cooktown, where it appears to be the most frequently-occurring Hydroid on the reefs. I have also examined specimens from Caloundra, Queensland, and from Nelson's Bay, Port Stephens, New South Wales.

Loc.—Middle Beach, Lord Howe Island. Common under stones.

Distribution—Previously recorded from Dschidda, Red Sea (Marktanner-Turneretscher); Amboyna, East Indies (Pictet, as *Sertularia vegæ*); Gulf of Tadjourah (Billard); Bay of Bahia, Brazil; Florida, between Salt Pond and Stock Island; Bahama Banks, 3-6 fathoms (Nutting); Perico Island, Gulf of Panama (Clarke); St. Thomas Island, Atlantic Ocean (Billard); Isipingo, Scottburgh, Park Rynie, Natal (Warren); Suez Bay, 10 fathoms (Thornely); Flying-Fish Cove, Christmas Island, Indian Ocean (Ritchie).

Genus PASYTHEA, *Lamouroux*.

PASYTHEA QUADRIDENTATA (*Ellis and Solander*),

var. OBLIQUA, *Lamouroux*.

Dynamena obliqua, Lamouroux, Hist. Polyp. Cor. Flex., 1816, p. 179.

Pasythea quadridentata, Bale, Proc. Linn. Soc. N.S.Wales (2), iii., 1888, p. 770 (part), pl. xiv., fig. 6.

Pasythea quadridentata (Ellis and Solander), var. *balei*, Billard, Arch. de Zool. exp. et gén. (4), vii., 1907, p. 335, fig. vi. A, B. *Id.*, Billard, Ann. Sci. Nat., Zool. (9), ix., 1909, p. 321.

Growing upon the surface of a seaweed are numerous colonies which do not exceed 6 mm. in height. Typical specimens of *Pasythea quadridentata* have the hydrothecæ in sets of one, two, or three pairs, each pair in contact with those above and below in the same set. In the specimens which I have referred to *Pasythea quadridentata*, var. *obliqua*, the majority of the internodes bear only a single pair of hydrothecæ each. In this respect the colonies do not differ from a typical *Sertularia*, and thus constitute an intermediate link between the typical *Pasythea* and the true *Sertularia*. Some of the specimens have the same disposition of the hydrothecæ on the proximal part of the stem, while at the distal extremity the hydrothecæ on the last two internodes are grouped in sets of two each, as in typical specimens of *Pasythea quadridentata*.

The present specimens also differ from the typical form in that the apertures of the hydrothecæ are directed more to the front and have blunter teeth than in the type, and the joints between the internodes are in some cases simple and inconspicuous, while in others the base of the upper internode runs down into a point in front, and the top of the lower one is produced upwards into a similar point at the back. A similar articulation separates the basal portion, which is destitute of hydrothecæ, from the remainder of the colony.

The specimens thus agree most closely with those described and figured by Billard¹² from Mozambique under the name of *Pasythea quadridentata*, var. *balei*, and with Bale's figure¹³ (pl. xiv., fig. 6) of a colony from Bondi, New South Wales.

The transverse markings in the hydrorhiza, referred to by Warren in his description of Natal specimens of *Pasythea quadridentata*, are well developed in the present colonies. These markings are very similar to those which occur in *Sertularia minima*, in the form of ribs of chitin running vertically up the sides of the hydrorhizal tubes at irregular intervals, and projecting across the cavity of the tube for about a quarter of its breadth. Warren has suggested that the occurrence of this structure may be of specific value, but Ritchie has recorded its presence in such widely-separated species as *Podocoryne echinata*, *Sertularia heterodonta*, and *Plumularia lagenifera*, var. *septifera*.

Dimensions.—

Height of colony	up to 6 mm.
Stem internode, length	0.40-0.49 mm.
Stem internode, diameter	0.12-0.19 mm.
Hydrotheca, length of external profile	0.28-0.29 mm.
Hydrotheca, length free	0.15-0.19 mm.
Hydrotheca, length adnate	0.23-0.24 mm.
Hydrotheca, diameter at mouth	0.10-0.12 mm.
Hydrotheca, diameter at base	0.11-0.12 mm.
Distance between two pairs of hydrothecæ	0.14-0.31 mm.

¹² Billard—Arch. de Zool. exp. et gén. (4), vii., 1907, p. 335, fig. 6.

¹³ Bale—Proc. Linn. Soc. N.S. Wales (2), iii., 1888, p. 770, pl. xiv., fig. 6.

Nomenclature.—*Dynamena obliqua*, Lamouroux, is said by Billard, who has examined the type, to be identical with the variety described by him in 1907 as *Pasythea quadridentata*, var. *balei*. I, therefore, use Lamouroux' name for this variety.

Loc.—Growing on a seaweed thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—This variety has hitherto been recorded only from the following localities:—Australia (Lamouroux); Bondi, New South Wales (Bale); Mozambique (Billard).

Family PLUMULARIDÆ.

Genus PLUMULARIA, *Lamarck*.

PLUMULARIA BALEI, *Bartlett*.

(Plate v., figs. 8-10.)

Plumularia balei, Bartlett, Geelong Naturalist (2), iii., 4, 1907, p. 65, figure. *Id.*, Mulder and Trebilcock, *Ibid.* (2), iv., 1, 1909, p. 29, pl. i., figs. 1-3 (not *Plumularia balei*, Billard, Arch. de Zool. exp. et gén. (5), viii., 1911, p. lxiii., fig. 3).

Plumularia, sp. nov., Whitelegge in Etheridge, Mem. Austr. Mus., ii., 1889, p. 41.

Trophosome.—Hydrophyton reaching a height of 6 mm., monosiphonic, unbranched, bearing hydrothecæ as well as hydrocladia. The lower portion of the stem consists of a varying number of internodes separated by transverse joints, the lower internodes being destitute of appendages, while those nearest the cladate portion of the stem bear a series of several sarcothecæ. The latter internodes are separated by an articulation very oblique in lateral view, and resembling from the front two cones, the points of which interpenetrate. The hydrocladia are alternate, each borne towards the distal extremity of an internode. They spring from one side or the other of each stem-hydrotheca, and are divided into alternately long and short internodes, of which only the former bear hydrothecæ.

The hydrothecæ lie almost parallel with the hydrocladium in their proximal portion, while the distal part is curved outwards. The front wall of the hydrotheca is deeply inflected at about its middle. There is a well-developed anterior intrathecal ridge proceeding from about the middle of the front of the cell, and extending a little more than half-way across the cavity. The border of the hydrotheca is undulate, peaked behind and in front, and with a small lateral tooth-like projection opposite the peduncle of the supracalcine sarcotheca. The back is free.

The sarcothecæ are bithalamic, canaliculate; one in front of each hydrotheca, fixed, curved over and almost appressed to the hydrotheca; one slightly smaller, fixed, between every two hydrothecæ, on the intermediate internode; one, fixed, in the sinus behind the back of each hydrotheca; and one at each side of a hydrotheca borne on a long slender, tubular peduncle, and projecting beyond the border of the hydrotheca. These supracalcine sarcothecæ have the whole of one side open.

Gonosome not observed. The gonangia are described by Mulder and Trebilcock as "Gonothecæ—male, ovate slightly longer than hydrothecæ,

bearing one sarcotheca near base; female, about twice as long as hydrothecæ and almost as broad as long, ovate, truncate, bearing four sarcothecæ near base, margin thickened, operculate." According to measurements deduced from Mulder and Trebilcock's figures, the male gonangium has a length of 0.75 mm., and a maximum diameter of 0.50 mm., while the female gonangium is 1.35 mm. in length, and 1.17 mm. in maximum diameter.

Dimensions.—

Stem internode, length...	...	...	...	0.26-0.29 mm.
Stem internode, diameter	...	...	...	0.08-0.10 mm.
Hydroclade, length	...	...	...	up to 1.4 mm.
Hydroclade thecate internode, length	...	...	...	0.21-0.22 mm.
Hydroclade intermediate internode, length...	...	...	...	0.08-0.12 mm.
Hydrotheca, depth	...	...	...	0.22-0.24 mm.
Hydrotheca, diameter at mouth	...	...	...	0.23-0.24 mm.

These measurements do not agree very closely with those deduced from Mulder and Trebilcock's figure, but they correspond with those of Victorian examples in the Australian Museum collection. The specimen from Lord Howe Island otherwise agrees with the same authors' description of this rare species.

Remarks.—An examination of Whitelegge's slide listed as "*Plumularia*, sp. nov.?" from Lord Howe Island, shows it to be identical with *Plumularia balei*, Bartlett.

Loc.—Middle Beach, Lord Howe Island.

Distribution.—Previously recorded only from the following localities on the Victorian coast—Bream Creek, Geelong; Queenscliff; and Airey's Inlet (Bartlett).

PLUMULARIA BUSKII, *Bale*.

Plumularia buskii, Bale, Biol. Res. "Endeavour," iii., 5, 1915, p. 296 (synonymy).

Several specimens of this species were obtained, which do not differ in any important particular from the type. The characteristic male and female gonangia are present on some of the colonies. The male gonangia are small, and are borne on the hydrocladia. They are ovate, with a sarcotheca at each side near the peduncle. The female gonangia are large, about three to three and one-half times as long as the male gonangia, and are borne on the stem. In the female gonangia the sarcothecæ are arranged in two series on the dorsal surface. Each series generally consists of five or six sarcothecæ; the lower ones are fairly evenly spaced, but towards the distal extremity the interval becomes reduced, and the uppermost two are brought very close together. Besides the parallel series of sarcothecæ, a single sarcotheca occupies a median position near the summit of the gonangium.

Dimensions.—

Gonangium (male), length	...	...	...	0.52-0.64 mm.
Gonangium (male), maximum diameter	...	...	...	0.22-0.24 mm.
Gonangium (female), length	...	...	...	1.80-1.90 mm.
Gonangium (female), maximum breadth	...	...	...	0.82-0.87 mm.

Loc.—Middle Beach, Lord Howe Island.

Distribution.—Previously recorded from Griffith Point, Victoria (Bale); Laysan Island, Hawaiian Archipelago (Hartlaub); Gulf of Manaar, Ceylon (Thornely); Flying-Fish Cove, Christmas Island, Indian Ocean (Ritchie); East Indies (Billard); Tasmania (Briggs); Great Australian Bight; South Australia; Bass Strait (Bale).

PLUMULARIA SPINULOSA, *Bale*.

Plumularia spinulosa, Bale, Journ. Micro. Soc. Vict., ii., 1882, p. 42, pl. xv., fig. 8. *Id.*, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 139, pl. xii., fig. 11-12. *Id.*, Lendenfeld, Proc. Linn. Soc. N.S. Wales, ix., 1885, p. 475. *Id.*, Bale, *Ibid.* (2), iii., 1888, p. 783, pl. xix., fig. 11-13. *Id.*, Warren, Ann. Natal Govt. Mus., i., 3, 1908, p. 320. *Id.*, Mulder and Trebilcock, Geelong Naturalist (2), iv., 4, 1911, p. 123, pl. iii., fig. 9, 9a.

Specimens of this minute and delicate species occur creeping over the surface of seaweeds. The colonies do not exceed 6 mm. in height. The hydrothecæ approach most closely those of Bale's figure¹⁴ (pl. xix., fig. 11) of a specimen from Coogee, New South Wales, in which the hydroclades terminate in a blunt conical point at the level of the margin of the hydrotheca, instead of being produced upwards into an incurved spine. The transverse markings of the hydrorhiza, to which Bale and Warren refer, are here well developed as thickenings of the perisarc which project into the interior of the hydrorhizal tubes.

Warren states that the gonosome is unknown. Bale, however, figures¹⁵ the gonangia and refers to them as "very large, ovate, truncate above, and with the margin rather widely everted." According to measurements deduced from Bale's figures the gonangia have a length of 1.05-1.1 mm., and a maximum diameter of 0.46-0.47 mm.

Dimensions.—

Stem internode, length	0.26-0.29 mm.
Stem internode, diameter	0.04-0.05 mm.
Hydroclade, length	0.26-0.28 mm.
Hydroclade thecate internode, length	0.22-0.23 mm.
Hydroclade intermediate internode, length... ..	0.04-0.05 mm.
Hydroclade internode, diameter	0.03-0.05 mm.
Hydrotheca, depth	0.12-0.14 mm.
Hydrotheca, diameter at mouth	0.14-0.17 mm.

Loc.—Growing on sea-weeds thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Queenscliff, Victoria (Bale); Timaru, New Zealand (Lendenfeld); Coogee, New South Wales (Bale); Park Rynie, Natal (Warren); Barwon Heads, Victoria (Mulder and Trebilcock).

Genus HALICORNARIA, *Allman*.

HALICORNARIA ASCIDIODES (*Bale*).

(Pl. vi., fig. 3.)

Aglaophenia ascidioides, Bale, Journ. Micro. Soc. Vict., ii., 1882, p. 32, pl. xiii., fig. 5.

¹⁴ Bale—Proc. Linn. Soc. N.S. Wales (2), iii., 1888, p. 783, pl. xix., fig. 11.

¹⁵ Bale—Proc. Linn. Soc. N.S. Wales (2), iii., 1888, p. 783, pl. xix., figs. 12-13.

Halicornaria ascidioides, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 176, pl. xiii., fig. 2, pl. xvi., fig. 1. *Id.*, Bale, Proc. Roy. Soc. Vict. (n.s.), vi., 1894, p. 106, pl. v., fig. 1.

A number of unbranched, simply pinnate colonies were found together with a large branched specimen, 10.5 cm. in height, with long hydrorhizal tubes at the base. The specimens are mature and bear well-developed gonangia, which spring from the bases of the hydrocladia. The characters agree in detail with Bale's descriptions except that the colonies are much larger than the Victorian specimens, which usually attain a height of about two inches (5 cm.).

Dimensions.—

Hydroclade-bearing internode, length	... ..	0.47-0.49 mm.
Hydroclade-bearing internode, diameter	... ..	0.40-0.42 mm.
Hydroclade internode, length	... ..	0.24-0.28 mm.
Hydroclade internode, diameter	... ..	0.17-0.21 mm.
Hydrotheca, depth	... ..	0.19-0.21 mm.
Hydrotheca, breadth at mouth (lateral aspect)	... ..	0.14-0.15 mm.
Hydrotheca, length free portion mesial sarcotheca	... ..	0.22-0.24 mm.
Gonangium, length	... ..	0.95-1.13 mm.
Gonangium, maximum width	... ..	0.40-0.54 mm.

Loc.—Thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Queenscliff and Port Phillip Bay, Victoria (Bale). Whitelegge¹⁶ has recorded the occurrence of this species at Maroubra Bay and Coogee Bay, New South Wales.

HALICORNARIA PROLIFERA (Bale).

Aglaophenia prolifera, Bale, Journ. Micro. Soc. Vict., ii., 1882, p. 34, pl. xiv., fig. 5.

Halicornaria prolifera, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 183, pl. xiv., fig. 1, pl. xvi., fig. 10. *Id.*, Ritchie, Mem. Austr. Mus., iv., 16, 1911, p. 858, pl. lxxxv., fig. 2, 3.

A number of branching specimens, 11 cm. in height, are characterised by the shortness of their mesial sarcothecæ, which are considerably abbreviated reaching only to the level of the anterior hydrothecal tooth. In this character the specimens agree with those originally described and figured (pl. xiv., fig. 5) by Bale (1882) from Queenscliff, Victoria, although later (1884) he showed that in robust and well-developed specimens, the mesial sarcothecæ are much longer and curved gracefully forwards.

Loc.—Thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Queenscliff, Victoria (Bale); Southern coast of New South Wales (Ritchie).

Genus AGLAOPHENIA, *Lamouroux*.

AGLAOPHENIA DIVARICATA (*Busk*).

Aglaophenia divaricata, Bale, Biol. Res. "Endeavour," iii., 5, 1915, p. 309 (synonymy).

¹⁶ Whitelegge—Proc. Roy. Soc. N.S. Wales, xxiii., 1889, p. 194.

There are a few typical colonies of this form, the largest reaching a height of 17.5 cm. *Gonosome* not present.

Loc.—Thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Bass Strait (Busk, Allman, Bale); Swan Island, Banks Strait (Busk); Tasmania (Kirchenpauer, Briggs, Bale); Victoria (Kirchenpauer, Bale, Marktanner-Turneretscher); South Australia (Bale); New South Wales (Bale, Ritchie).

AGLAOPHENIA HOWENSIS, *Briggs.*

Aglaophenia howensis, Briggs, see ante, p. 27, pl. v., fig. 1-2, pl. vi., fig. 1. *Halicornaria*, sp. nov., Whitelegge in Etheridge, Mem. Austr. Mus., ii., 1889, p. 41.

An examination of Whitelegge's specimens listed as "*Halicornaria*, sp. nov.?" from Lord Howe Island shows them to be identical with *Aglaophenia howensis*, Briggs.

Loc.—Middle Beach, Lord Howe Island.

AGLAOPHENIA PARVULA, *Bale.*

Aglaophenia parvula, Bale, Journ. Micro. Soc. Vict., ii., 1882, p. 35, pl. xiv., fig. 3, 3a, 3b. *Id.*, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 165, pl. xiv., fig. 3, pl. xvii., fig. 10. *Id.*, Bale, Trans. and Proc. Roy. Soc. Vict., xxiii., 1887, p. 97. *Id.*, Bale, Proc. Linn. Soc. N.S. Wales (2), iii., 1888, p. 790. *Id.*, Marktanner-Turneretscher, Ann. K.K. Hofmus. Wien, v., 1890, p. 269. *Id.*, Bale, Proc. Roy. Soc. Vict. (n.s.), vi., 1894, p. 105. *Id.*, Vanhöffen, Deutsche Südpolar Exped., Bd. xi., Zool. iii., Hydroiden, 1910, p. 335, fig. 47.

On the surface of a sea-weed there occurred a hydrorhiza from which sprung three monosiphonic, unbranched, simply pinnate colonies, the largest 11 mm. in height. The minute characters agree in detail with Bale's diagnosis and figures of a specimen from Queenscliff, Victoria. The colonies, however, are somewhat smaller than those originally described.

Dimensions.—

Hydroclade-bearing internode, length	...	...	0.17-0.22 mm.
Hydroclade-bearing internode, diameter	...	...	0.13-0.14 mm.
Hydroclade internode, length	...	...	0.23-0.24 mm.
Hydroclade internode, diameter	...	...	0.06-0.07 mm.
Hydrotheca, depth	...	...	0.24-0.26 mm.
Hydrotheca, breadth at mouth	...	...	0.15-0.17 mm.

Loc.—Growing on a sea-weed thrown up on the sandy beach of the lagoon, Lord Howe Island.

Distribution.—Previously recorded from Queenscliff; Portland; and Port Phillip, Victoria (Bale); Port Jackson (Bale) and Kiama, New South Wales (Marktanner-Turneretscher); St. Paul Island (Vanhöffen).

Genus THECOCARPUS, *Nutting.*

THECOCARPUS BREVIROSTRIS (*Busk*).

Plumularia brevirostris, Busk, Voy. "Rattlesnake," i., 1852, p. 397.

- Aglaophenia brevirostris*, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 169. *Id.*, Kirkpatrick, Sci. Proc. R. Dublin Soc. (n.s.), vi., 1890, p. 611. *Id.*, Billard, C. R. Acad. Sci., cxlviii., 1909, p. 368. *Id.*, Bale, Proc. Roy. Soc. Vict. (n.s.), xxvi., 1, 1913, p. 135, pl. xiii., fig. 7-9.
- Thecocarpus brevirostris*, Billard, Ann. Sci. Nat., Zool. (9), xi., 1910, p. 51, fig. 24. *Id.*, Billard, Les Hydroïdes de l'Expéd. du Siboga, i., Plumulariidae, 1913, p. 89, fig. lxxv.
- Aglaophenia heterocarpa*, Bale, Journ. Micro. Soc. Vict., ii., 1882, p. 30 (note).
- Aglaophenia vitiana*, Bale, Cat. Austr. Hydroid Zoophytes, 1884, p. 153 (Not *Plumularia vitiana*, Kirchenpauer).
- Aglaophenia maldivensis*, Borradaile, Fauna and Geogr. Maldive and Laccadive Archipel., ii., 1905, p. 843, pl. lxix., fig. 8-8b.
- Halicornaria*, sp. nov., Whitelegge in Etheridge, Mem. Austr. Mus., ii., 1889, p. 41.

A single simply pinnate, unbranched, unfasciated colony, 11 mm. in height, represents this species, which was originally described by Busk under the name of *Plumularia brevirostris*, from Cumberland Island, Queensland. The minute characters of the hydrothecæ agree with Bale's recent diagnosis and figures, except that the constriction of the hydrotheca is much less abrupt than that shown, and in this respect the hydrotheca approaches most closely the condition of that figured by Borradaile and by Billard. Such hydrothecæ occur in the specimens from Murray Island and from Fiji, but Bale has found that "in both cases the majority are of the more abruptly bent type."

Dimensions.—

Hydroclade-bearing internode, length	...	...	0.22-0.28 mm.
Hydroclade-bearing internode, diameter	...	...	0.13-0.15 mm.
Hydroclade internode, length...	...	...	0.24-0.28 mm.
Hydroclade internode, diameter	...	...	0.07-0.08 mm.
Hydrotheca, depth	...	...	0.26-0.27 mm.
Hydrotheca, breadth at mouth	...	...	0.09-0.10 mm.
Hydrotheca, length free portion mesial sarcotheca	...	...	0.07-0.08 mm.

Remarks.—An examination of Whitelegge's slide listed as "*Halicornaria*, sp. nov.?" from Lord Howe Island shows it to be identical with *Thecocarpus brevirostris* (Busk).

The range of this species must be extended to the Kermadecs as I have recently examined a specimen from Denham Bay, Sunday Island, Kermadec Islands.

Loc.—Lord Howe Island.

Distribution.—Previously recorded from Cumberland Island, Queensland, 27 fathoms (Busk); Fiji (Bale); Murray Island, Torres Strait, 15-20 fathoms (Kirkpatrick); Hulule, Male Atoll, Maldive Islands (Borradaile); East Indies (Billard).

III.—ADDENDUM.

An examination of the co-types of the species described by Hilgendorf¹⁷ under the names of *Aglaophenia?* x and *Aglaophenia?* y, from the Kermadec Islands, has enabled me to assign these species to their correct positions.

Family PLUMULARIDÆ.

Genus HALICORNARIA, *Busk*.HALICORNARIA HIANs, *Busk*.

Halicornaria hians (Busk), Billard, Les Hydroides de l'Expédition du Siboga, i.,—Plumulariidae, 1913, p. 68 (synonymy).

Aglaophenia? y, Hilgendorf, Trans. N.Z. Inst., xliii., 1910 (1911), p. 543, fig. 5.

The co-type of the species described by Hilgendorf as *Aglaophenia?* y agrees with Bale's¹⁸ description and figures of *Halicornaria hians* (Busk), except for the greater length of the thecate internodes compared with their diameter, the greater depth of the hydrothecæ and their more erect posture, and the greater distance of the intrathecal ridge from the base of the hydrotheca. In these characters the specimen comes nearest to the variety described by Ritchie¹⁹ from the Andaman Islands as *Halicornaria hians* (Busk), var. *profunda*. I, therefore, arrange the synonymy as above, following Billard in including Ritchie's variety in the synonymy of *H. hians*.

Loc.—Denham Bay beach, Sunday Island, Kermadec Islands.

Genus LYTOCARPUS, *Allman*.LYTOCARPUS PHŒNICEUS, *Busk*.

Lytocarpus phœniceus (Busk), Billard, Les Hydroides de l'Expédition du Siboga, i.,—Plumulariidae, 1913, p. 74, fig. lx. (synonymy).

Aglaophenia? x, Hilgendorf, Trans. N.Z. Inst., xliii., 1910 (1911), p. 542, fig. 4.

The co-type of the species described by Hilgendorf under the name of *Aglaophenia?* x agrees exactly with the descriptions and figures of *Lytocarpus phœniceus*, Busk. I, therefore, arrange the synonymy as above.

Loc.—Denham Bay, Sunday Island, Kermadec Islands.

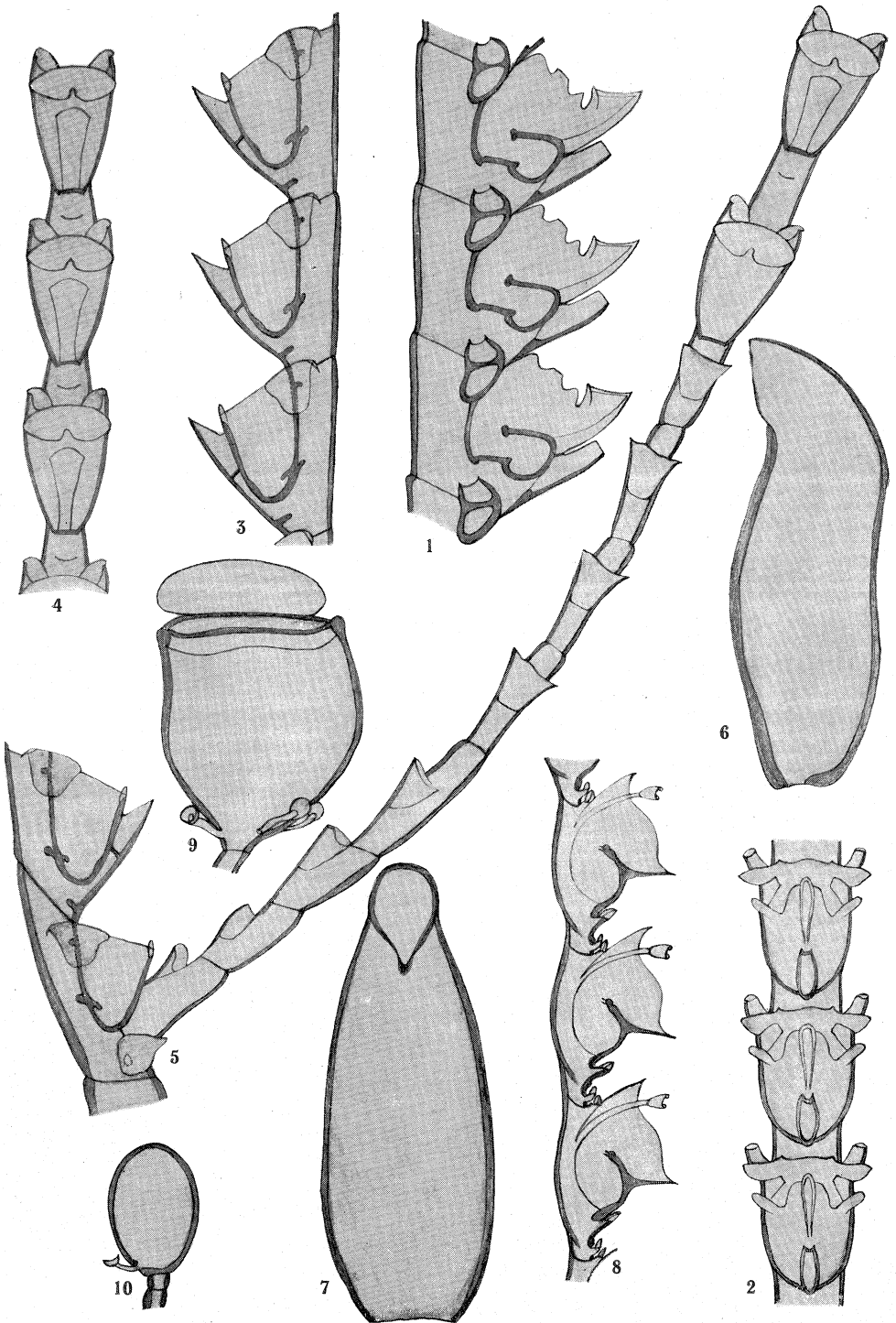
¹⁷ Hilgendorf—Trans. N.Z. Inst., xliii., 1910 (1911), pp. 542, 543, fig. 4, 5.

¹⁸ Bale—Cat. Austr. Hydroid Zoophytes, 1884, p. 179, pl. xiii., fig. 6, pl. xvi., fig. 7.

¹⁹ Ritchie—Rec. Indian Mus., v., 1, 1910, p. 24, pl. iv., fig. 13, 14.

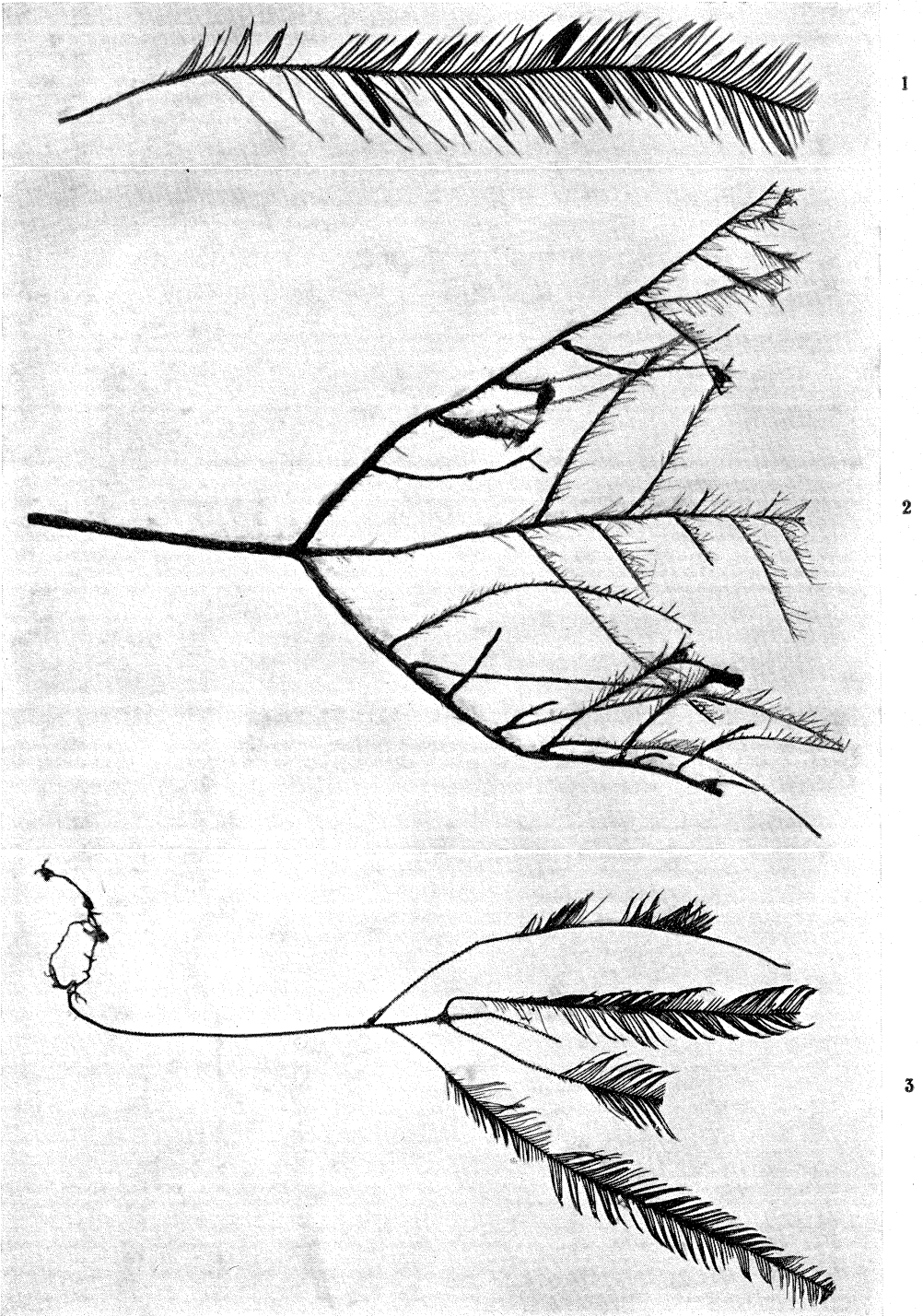
EXPLANATION OF PLATE V.

- Fig. 1. *Aglaophenia howensis*, Briggs, portion of hydroclade with hydrothecæ, lateral aspect. Drawn from the holotype from Middle Beach, Lord Howe Island.
2. *Aglaophenia howensis*, Briggs, portion of hydroclade with hydrothecæ, anterior aspect. Drawn from the holotype.
3. *Aglaophenopsis vaga*, Briggs, portion of hydroclade with hydrothecæ, lateral aspect. Drawn from the holotype from off Botany Bay, New South Wales, 50 fathoms.
4. *Aglaophenopsis vaga*, Briggs, portion of hydroclade with hydrothecæ, anterior aspect. Drawn from the holotype.
5. *Aglaophenopsis vaga*, Briggs, proximal internode of hydrocladium with phylactogonium. Drawn from the holotype.
6. *Aglaophenopsis vaga*, Briggs, gonangium seen in lateral aspect. Drawn from the holotype.
7. *Aglaophenopsis vaga*, Briggs, gonangium seen in frontal aspect. Drawn from the holotype.
8. *Plumularia balei*, Bartlett, portion of hydroclade with hydrothecæ, lateral aspect. Drawn from a specimen from Lord Howe Island.
9. *Plumularia balei*, Bartlett, female gonangium (after Mulder and Trebilcock).
10. *Plumularia balei*, Bartlett, male gonangium (after Mulder and Trebilcock).



EXPLANATION OF PLATE VI.

- Fig. 1. *Aglaophenia howensis*, Briggs. Photograph of the holotype, 6 cm. in height, from Middle Beach, Lord Howe Island.
2. *Aglaophenopsis vaga*, Briggs. Photograph of the holotype, 16 cm. in height, from off Botany Bay, New South Wales, 50 fathoms.
3. *Halicornaria ascidioides* (Bale). Photograph of a specimen, 10·5 cm. in height, from Lord Howe Island.



E. A. BRIGGS, Austr. Mus., photo.