

HYDROIDS (CNIDARIA: HYDROZOA) FROM SOUTHERN QUEENSLAND

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Abstract

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Fifteen species of hydroids were collected from a reef off Palm Beach, southern Queensland. Six records are new for Queensland; several species are circumtropical and two are cosmopolitan. *Symplectoscyphus sibogae* is recorded for the first time outside the type locality of Indonesia.

Introduction

A collection of hydroids was made on 9 May 2001 by the author using SCUBA from a reef approximately 1 km offshore from Palm Beach, southern Queensland (28°5'52''S, 153°26'34''E). In this area, a reef system extends 1–2 km offshore along the coast at a depth of 5–15 m, several higher parts of the reef being emergent as small islets. The water regime in the area is subtropical, the temperature at the time of the survey being 26°C. While not subject to strong currents the reefs are exposed to swells of the South Pacific Ocean.

The reef surrounding Cook Island off Burleigh Heads was inspected but yielded no hydroids. This island is a marine sanctuary, the surrounding waters being closed to recreational fishing; the invertebrate reef community is heavily grazed by fishes. In contrast, the reef off Palm Beach, outside the protected area and subject to considerable recreational fishing pressure, has fewer fish and the invertebrate community is much more diverse and abundant.

With the exception of *Macrorhynchia philippina* and *Aglaophenia sinuosa* which grow on exposed reef surfaces all species were small and cryptic, mostly occurring in sheltered crevices. Colonies of *M. philippina*, a tropical species, were quite small, indicating that it may be near the southern end of its range. Colonies of *A. sinuosa*, the other visually dominant hydroid, showed evidence of grazing by fish.

The collection, made in one dive over an area of several hundred square metres of reef, yielded

15 species of hydroids. Six species, *Eudendrium glomeratum*, *Hydrodendron daidalum*, *Salacia desmoides*, *Symplectoscyphus sibogae*, *Aglaophenia sinuosa* and *Obelia angulosa* and are new records for Queensland, having been previously recorded from temperate southern Australia and tropical northern Australia. Pennycuik (1959) recorded 46 species from the Queensland coast between the New South Wales border and north of Moreton Bay (latitudes 26–28°S). As only four species in the present collection (*Antennella secundaria*, *Synthecium campylocarpum* (= *S. patulum*), *Hincksella cylindrica*, *Macrorhynchia philippina*) were recorded from this region by Pennycuik, the number of known species from southern Queensland is thus increased to 57.

Several species in the present collection are circumtropical in distribution, and two (*Halecium sessile* and *Antennella secundaria*) are cosmopolitan. *Symplectoscyphus sibogae* is recorded for the first time outside the type locality of Indonesia. The collection also contains a small colony of a species of *Halecium* that could not be matched with any known species and may therefore be new. In the following descriptions only those synonymies relevant to Australia or the southern hemisphere are given. Material is deposited in Museum Victoria (NMV).

List of Species.

- Eudendrium* ?*glomeratum* Picard, 1951
- Hebelopsis scandens* (Bale, 1888)
- Halecium sessile* Norman, 1867
- Halecium* sp.

- Hydrodendron daidalum* (Watson, 1969).
Salacia desmoides (Torrey, 1902)
Dynamena quadridentata (Ellis and Solander, 1786)
Dynamena quadridentata (Ellis and Solander, 1786)
Symplectoscyphus sibogae (Billard, 1924)
Synthecium campylocarpum Allman, 1888
Hincksella cylindrica (Bale, 1888)
Antennella secundaria (Gmelin, 1791)
Lytocarpia brevirostris (Busk, 1852)
Aglaophenia sinuosa Bale, 1888
Macrorhynchia philippina (Kirchenpauer, 1872)
Obelia angulosa Bale 1888

Anthoathecatae

Eudendriidae L. Agassiz, 1862

Eudendrium Ehrenberg, 1834

Eudendrium ?glomeratum Picard

Eudendrium glomeratum Picard, 1951: 338.—Picard, 1955: 183.—Teissier, 1965: 14.—Watson, 1985: 213.—Boero and Cornelius, 1987: 244.—Watson, 1996: 78.—Watson, 1999: 7.

Eudendrium generalis von Lendenfeld, 1885: 351.—Thornely, 1904: 110.—Jäderholm, 1916: 3.

Eudendrium indopacificum Stechow, 1924: 59.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91283, several infertile stems to 4 mm high on barnacle, alcohol preserved.

Description. Stolon tubular, entwining substrate. Stems unfascicled, unbranched or sparingly branched in one plane; hydranths terminal on short pedicels or on single pedicels arising directly from stolon. Cnidome comprising small microbasic euryteles in tentacles and macrobasic euryteles on hydranth body. Colour, stems brown, hydranths white.

Distribution. Previously known in Australia from the tropical north and north-western coasts (Watson, 1999).

Remarks. The material is doubtfully assigned to *E. glomeratum* based on the presence of macrobasic euryteles distributed over the hydranth body. Although the nematocysts were not aggregated in pads on the hydranth as is normal in this species, reduction or loss of discrete pads and spreading of nematocysts over the entire hydranth body sometimes occurs (Watson, pers. obs.). If indeed *E. glomeratum* it is the most southerly record of the species in Australian waters.

Leptothecatae

Lafocidae A. Agassiz, 1865

Hebellopsis Hadzi, 1913

Hebellopsis scandens (Bale)

Figure 1A

Lafocia scandens Bale, 1888: 758.—Billard, 1904: 481.—Billard, 1906: 174.—Warren, 1908: 272, 341, 349.

Hebella scandens.—Marktanner-Turneretscher, 1890: 214.—Millard, 1975: 182.—Migotto, 1996: 26.—Watson, 1996: 78.—Boero et al., 1997: 8.

Hebellopsis scandens.—Vannucci-Mendes 1949: 237.—Vannucci-Mendes, 1950: 85.—Calder, 1991: 43, 45, 95.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91284, infertile colonies epizoic on *Dynamena quadridentata*, alcohol preserved.

Description. Stolon tubular, very thin, wrinkled, closely adpressed to the hydrorhiza of *Dynamena quadridentata*, then running up stem of host. Hydrotheca tubular, issuing beside or between hydrothecae of host. Pedicel short, thin, tubular, wall of hydrotheca obtusely flexed about halfway along length, creased at bend; rim of hydrotheca circular, transverse to hydrothecal axis, slightly thickened and very weakly outrolled. Perisarc rather thin, fragile at hydrothecal margin. Hydranth with about 12 tentacles deeply withdrawn into hydrotheca (preserved material). Colourless.

Distribution. Cosmopolitan.

Remarks. The narrow stolon of *H. scandens* can only be distinguished from that of *D. quadridentata* as a thin, almost invisible tube lying closely beside the broad hydrorhiza of the host. The colonies of *H. scandens* contain neither straight nor slightly asymmetrical hydrothecae conforming to the accepted concept of *H. scandens*. Various authors (Vervoort, 1968; Vervoort and Vasseur, 1977; Boero et al., 1997) have reported straight and contorted hydrotheca in the same colony of *H. scandens* while hydrothecae of *H. scandens* from northern Australia were all contorted (Watson, 2000). While it is possible that *H. scandens* may undergo torsion as a response to ecological conditions it is nevertheless possible that there may be two closely related species involved, one with almost symmetrical hydrothecae and one with contorted hydrothecae. This can only be resolved with further collecting of an adequate live material over a wide geographical

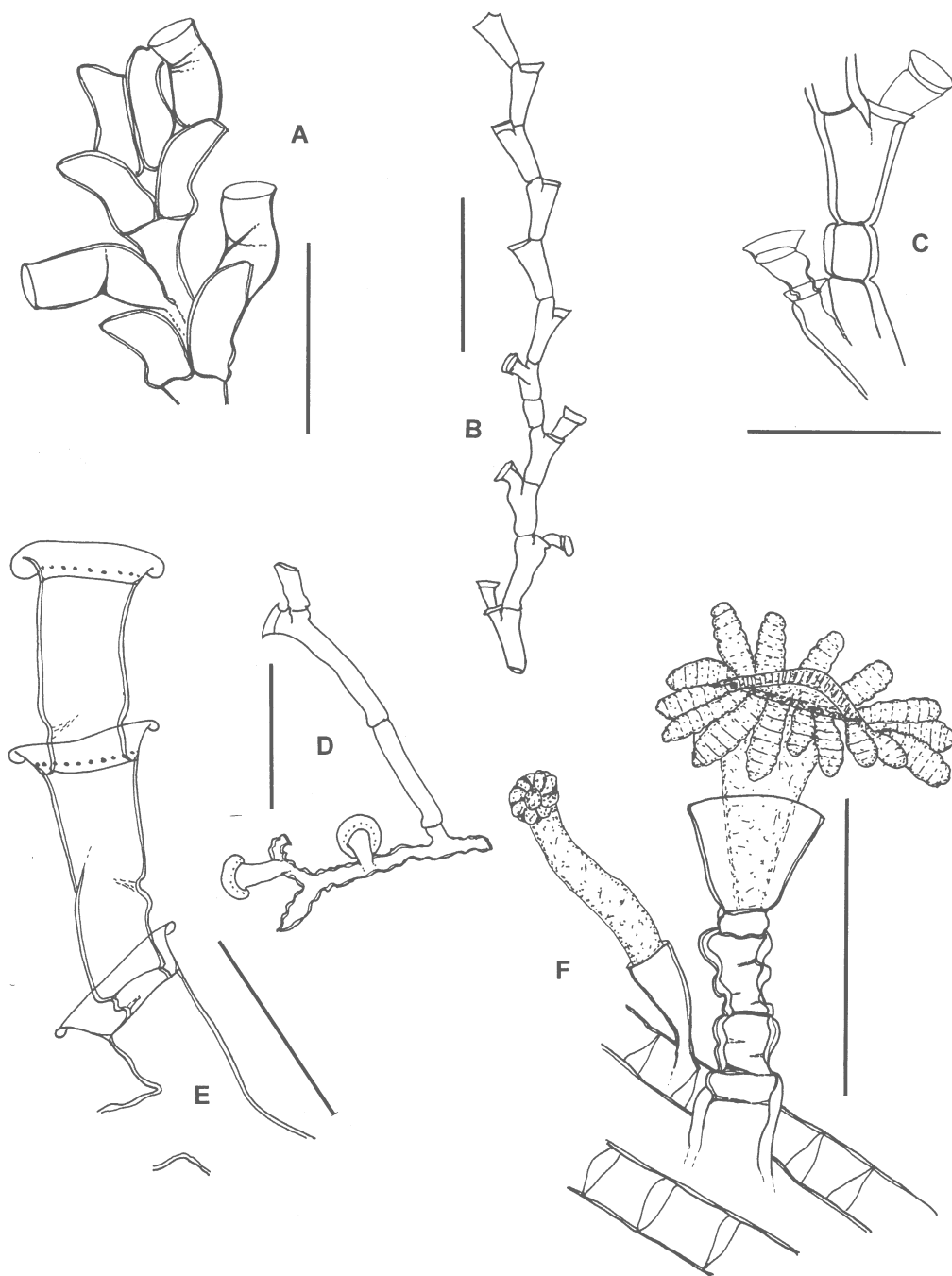


Figure 1. A, *Hebellopsis scandens* (Bale, 1888). Three hydrothecae on *Dynamena quadridentata*. B, C, *Halecium sessile* Norman, 1867. B, part of branch; C, stem internodes with hydrothecae. D, E. *Halecium* sp. D, part of colony with stolonial hydrothecae and erect stem; E, hydrophores and hydrothecae. F, *Hydrodendron daidalum* (Watson, 1969). Hydroid stem, hydrotheca and nematophore. Scale bar: A, D, C, 0.5 mm; B, 1 mm; E, 0.1 mm; F, 0.2 mm.

range and detailed investigation of reproductive strategies.

Haleciidae Hincks, 1868

Halecium Oken, 1815

Halecium sessile Norman

Figures 1B, C

Halecium sessile Norman, 1867: 205.—Ritchie, 1911: 812.—Stechow, 1913: 9.—Billard, 1927: 329.—Picard, 1958: 192.—Ralph, 1958: 331.—Pennycuik, 1959: 174.—Teissier, 1965: 21.—Vervoort, 1966: 100.—Redier, 1967: 386.—Vervoort, 1968: 95.—Schmidt, 1972: 42.—Cornelius, 1975: 406.—Millard, 1975: 154.—Watson, 1979: 234.—Ramil and Vervoort, 1992: 85.—Watson, 1994: 66.—Cornelius, 1995: 292.—Hirohito, 1995: 27.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, NMV F 91285, sparingly branched infertile colonies on various invertebrate substrates in crevices, alcohol preserved.

Description. Hydrorhiza reptant on substrate, stolons tubular. Stems monosiphonic, to 4 mm high, straight to slightly zig-zag, simple or sparsely branched near base. Stem internodes widening distally to hydrophore, nodes transverse, deep. Hydrophore short, primary hydrotheca very shallow, sessile or very closely adpressed to internode at level of node, shallow dish-shaped, sloping gently downwards away from internode, diaphragm distinct with a row of desmocytes above. Margin circular, not everted. Secondary hydrophores rare, on lower parts of stems, issuing from diaphragm of preceding hydrotheca, adcauline wall deeply indented at level of diaphragm. Perisarc smooth throughout, thick on proximal parts of stems, becoming very thin on hydrotheca. Hydranths robust, very extensible with about 24 stubby tentacles. Colour yellowish-brown.

Distribution. Cosmopolitan. Recorded in Australia from southern Queensland to Bass Strait.

Remarks. Secondary internodes are sometimes present between the main stem internodes. The material is assigned to *Halecium sessile* because of the almost straight stems and rather shallow, sessile primary hydrothecae. Although *H. sessile* was originally described from the cool temperate northern Atlantic there are now many records from other parts of the world, although some may be incorrect. Until a full world review of the species is undertaken, it is best to refer the Queensland material to *H. sessile*.

Halecium sp.

Figures 1D, E

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, small infertile colonies on *Obelia angulosa* (NMV F91294) and *Salacia desmoides* (NMV F91287), alcohol preserved.

Description. Stolon straggling, tubular, faintly to strongly rugose. Stems simple, very short, arising at intervals from hydrorhiza; basal stem internodes long, tubular, smooth, nodes deep, transverse, internode tumescent above node. Primary hydrophores given off singly from stolons and distally on stem internodes, outwardly bent, succeeding internode arising from a short apophysis below hydrophore. Primary hydrophore fairly short, cylindrical, surmounted by a deep, bowl-shaped hydrotheca; rim of hydrotheca strongly outrolled; diaphragm distinct, a clearly visible ring of peg-shaped desmocytes above. Secondary and tertiary hydrophores arising from diaphragm of primary hydrotheca, usually several proximal constrictions in perisarc of hydrophore just above diaphragm. Perisarc of colony rather thin throughout. Hydranth too contracted for tentacle count. Colour, white (preserved material).

Remarks. The colony is so minute that it was noticed only during microscopical examination of *Obelia angulosa*. The rather tangled stolon is easily detached from the substrate, the few stems being difficult to differentiate from the stolons. The specimen bears no resemblance to any of the smaller species of *Halecium* known from Australian waters. In size of colony and morphology of the hydrotheca it somewhat resembles *H. pygmaeum* Fraser, 1911; but dimensions are greater than those given by Hirohito (1995) for that species. Since many haleciids cannot be accurately identified in the absence of the gonosome, the material is not presently assigned to species.

Hydrodendron Hincks, 1874

Hydrodendron daidalum (Watson)

Figure 1F

Scoresbia daidala Watson, 1969: 111.—Watson, 1979: 234.—Watson, 1982: 92.—Stranks, 1993: 6.

Hydrodendron daidalum.—Rees and Vervoort, 1987: 22.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, NMV F91286, infertile colony on the brown alga *Zonaria crenata*, alcohol preserved.

Description. Hydrorhiza a reticulating network covering algal surface; stolons very wide, flat and

ribbon-like, outer flanges with dark excavations. Hydrotheca distal on a short, thick, deeply rugose pedicel, deep bowl-shaped, rim circular, slightly everted. Nematothecae small, elongate urn-shaped, inserted on hydrorhiza beside hydrothecal pedicel, margin circular with everted rim. Hydranth with thick dome-shaped hypostome and 20–24 tentacles too large to retract into hydrotheca. Nematophore long, extensile, armed with a distal cluster of nematocysts. Colour, pale honey-yellow.

Distribution. This record extends the range of *H. daidalum* from southern Australian coastline to warmer subtropical waters of the central east coast. Endemic to Australia.

Remarks. *H. daidalum* is an obligate epiphyte of the small brown alga *Zonaria crenata*, the hydrorhiza and widely spaced pedicels forming an easily recognisable network on the algal thallus (Watson, 1969). Although Rees and Vervoort (1987) synonymised *Scoresbia* with *Hydrodendron* there are nevertheless several points of difference such as the simple, pedicellate stems and stolonial nematothecae that set *H. daidalum* apart from the typically branched colonies and cauline nematothecae of the accepted concept of *Hydrodendron*.

Sertulariidae Lamouroux, 1812

Salacia Lamouroux, 1816

Salacia desmoides (Torrey)

Figure 2A, B

Sertularia desmoides Torrey, 1902: 65.—Billard, 1924a: 66.—Fraser, 1938: 110.—Fraser, 1948: 247.—Stechow, 1923: 213.—Millard, 1975: 274.—Watson, 1996: 78.—Watson, 1997: 518.—Medel and Vervoort, 1998: 30.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91287, infertile colony on bryozoan, alcohol preserved.

Description. Hydrorhiza loosely reptant on substrate, stolon tubular. Stems short, unbranched, proximal stem of same diameter as stolon, atecate, ending in a strong V-shaped joint; stem thereafter thecate. Internodes slender, conical, nodes usually V-shaped, sometimes transverse. Hydrothecae biseriata, paired, tubular, situated about two-thirds distance up internode, adcauline walls conjoined, parallel to internodal axis, straight to slightly convex, free adcauline wall directed outwards in convex curve, abcauline wall sinuous to flatly concave, floor of hydrotheca

transverse to internode, straight or downwardly convex. Hydrotheca narrowing somewhat to margin; margin oblique to both internodal and hydrothecal axes, operculum of one valve attached inside abcauline margin. Perisarc smooth, rather thick in lower stem region, thinner but firm on hydrothecae. Hydranth with about 20 tentacles. Colour, deep yellow.

Distribution. California, south-west Indian Ocean, Mediterranean Sea. Recorded previously in Australia from Houtman Abrolhos Is, Western Australia. A new record for the Australian east coast.

Remarks. The internodes of the present material are much shorter and the hydrothecae thus closer together than in specimens described from the Houtman Abrolhos Is by Watson (1997). The oblique margin with abcauline opercular valve is characteristic of the species.

Dynamena Lamouroux, 1812

Dynamena quadridentata (Ellis and Solander)

Figure 2C–F

Sertularia quadridentata Ellis and Solander, 1786: 57.—Lamarck, 1816: 2, 121.

Dynamena quadridentata.—Billard, 1925: 194, 222.—Trebilcock, 1928: 23.—Blackburn, 1938: 320.—Blackburn, 1942: 113.—Pennycuik, 1959: 193.—Ralph, 1961: 790.—Mammen, 1965: 49.—Ralph, 1966: 159.—Shepherd and Watson, 1970: 140.—Millard, 1975: 266.—Gibbons and Ryland, 1989: 411.—Calder, 1993: 68.—Vervoort, 1993: 108.—Calder, 1995: 543.—Hirohito, 1995: 176.—Watson, 1996: 78.—Watson, 1997: 520.—Watson, 2000: 15

Pasya quadridentata.—Stechow, 1922: 148.—Stechow, 1923: 166.—Fraser, 1948: 239.

Pasythea (Sertularia) quadridentata.—Lamouroux, 1812: 183.—Lamouroux, 1816: 156.—Whitelegge, 1889: 193.—Nutting, 1927: 226.—Yamada, 1959: 58.

Dynamena thankasseriensis Mammen, 1965: 48.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91288, sparingly fertile colony on the bryozoan *Flustra* sp. and infertile colony on red alga, alcohol preserved.

Description. Hydrorhiza reptant on substrate, stolon flat, wide and ribbon-like, edged by a flange and canal with irregular, cusp-like indentations. Stems short, 2–4 mm long, widely spaced along hydrorhiza, proximal stem internode atecate with a strongly twisted V-shaped distal node, internodes thereafter hydrothecate, with 1–4 pairs of hydrothecae, nodes between sets of hydrothecae obscure, usually represented by constriction of perisarc. Hydrothecae biseriata, opposite,

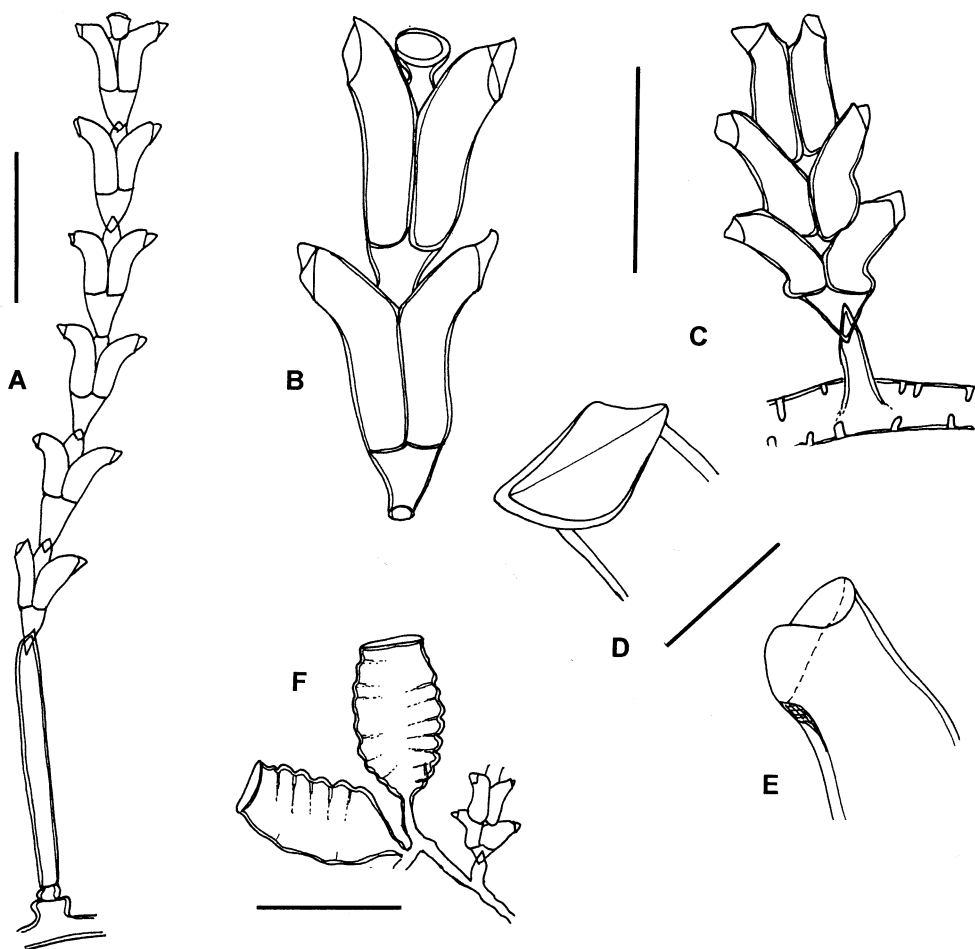


Figure 2. A, B, *Salacia desmoides* (Torrey, 1902). A, part of stem; B, internodes with hydrothecae. 2C–F, *Dynamena quadridentata* (Ellis and Solander, 1786). C, hydrorhiza and hydrothecate stem internode; D, anterior view of hydrotheca; E, lateral view of hydrotheca with operculum; F, gonothecae. Scale bar: A, F, 1 mm; B, C, 0.5 mm; D, E, 0.1 mm.

elongate saccate, adcauline walls in partial contact across internode, conjoined walls straight to convex, remaining adnate and free adcauline wall bent outwards to margin, floor of hydrotheca transverse to decidedly rounded. In stems with single pairs of hydrothecae the pairs separated by a narrow internodal neck; when more than one pair on internode, these closely adpressed, slightly overlapping, adcauline hydrothecal wall overlapping base of that above; free adcauline wall short, convex; abcauline wall complexly curved to almost straight; basal abcauline wall of first pair of group with pronounced lateral swelling, base of higher pairs acutely rounded, fitting into internode.

Floor of basal group transverse, thick, a basal abcauline swelling forming a wide tunnel through perisarc; base of adcauline wall with large knob, floor penetrated by a central funnel-shaped hydropore, directed upwards. Margin with a pair of broad opposite lateral lobes, adcauline wall thickened and recurved into a cusp; operculum delicate, of 2 valves. Perisarc of stems and hydrotheca thick, thinning to hydrothecal margin.

Hydranth with about 16 tentacles on a short, wrinkled column, no caecum. Gonotheca large, arising from hydrorhiza on a moderately long cylindrical pedicel; barrel-shaped, widest about middle; body with 6–8 deep annular corrugations, apex transverse, truncate, with thickened rim.

Gonophore slender, cigar-shaped containing numerous small ova. Colour, honey-brown.

Distribution. Circumglobal in tropical waters. Previously recorded from tropical Australia.

Remarks. The annular corrugations on the gonothecae are usually not all the same depth around the body, tending to become shallower on one side. In the present material there is no submarginal abcauline intrathecal perisarcal thickening as described in specimens from Darwin (Watson, 2000), the colonies being more like those reported from the Houtman Abrolhos Is (Watson, 1997). In most hydrothecae a strand of tissue infested with numerous large ovoid diatoms extends from the hydranth along the inner abcauline wall of the hydrotheca towards the margin. *Hebellopsis scandens* is a common epizoite of the colonies.

Sertularella Gray, 1848

Sertularella minuscula Billard

Figure 3A–E

Sertularella minuscula Billard, 1924b: 648.—Billard, 1925: 139.—Leloup, 1932: 161.—Pennycuik, 1959: 195.—Hirohito, 1974: 18.—Cooke, 1975: 98.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91289, small fertile colony on test of a solitary ascidian, alcohol preserved.

Description. Stolon tubular, rugose; stems to 5 mm high, unbranched, lower stem of same diameter as stolon, proximal internode athecate, stem thereafter thecate, internodes with 2 alternate hydrothecae, nodes distinct, oblique, sloping alternately left and right, usually a small tumescence above and below node.

Hydrothecae on both stolon and caulus, all of

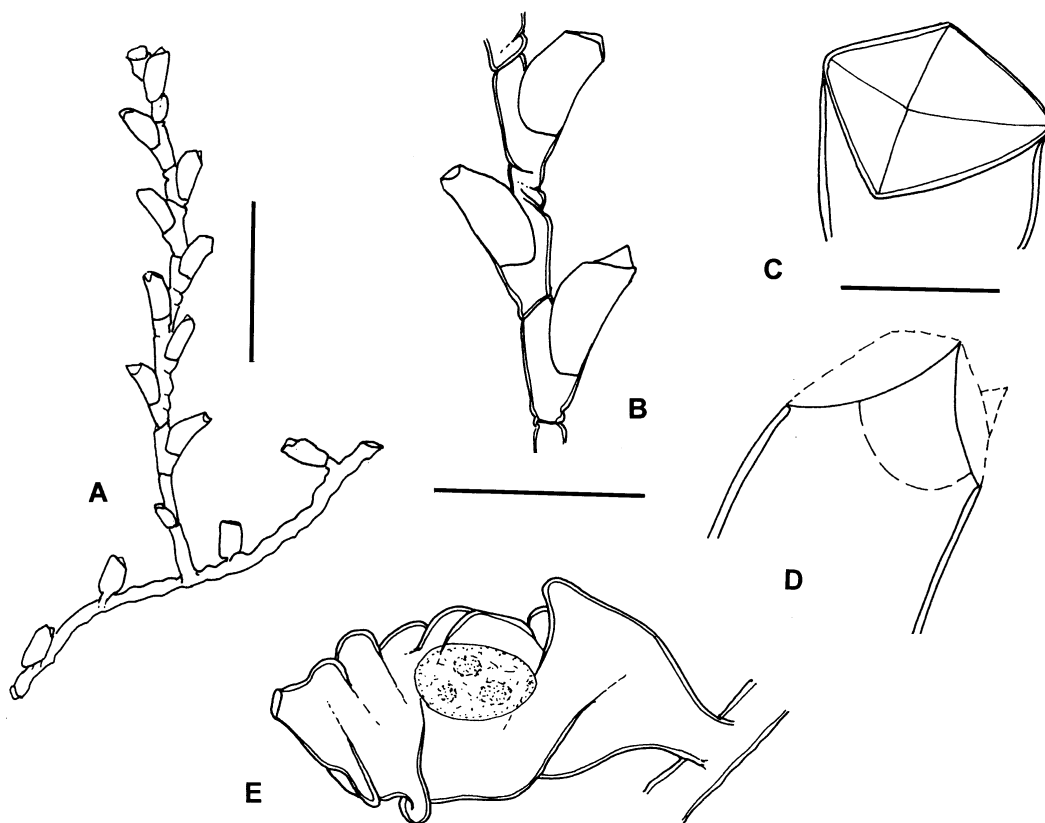


Figure 3. A–E, *Sertularella minuscula* Billard, 1924. A, stolon with single hydrothecae and erect thecate stem; B, hydrothecate stem internodes; C, anterior view of hydrotheca with operculum; D, lateral view of hydrotheca and operculum; E, female gonotheca. Scale bar: A, 1 mm; C, D, 0.1 mm; B, E, 0.5 mm.

same shape. Stolon hydrothecae widely spaced, on a short pedicel, cauline hydrothecae sessile, displaced slightly towards front of stem; hydrotheca tubular, narrowing slightly to margin, adcauline wall convex, about half free of internode, abcauline wall contiguous with border of internode, almost straight to weakly concave; floor of hydrotheca transverse to internodal axis; margin quadrangular (anterior view), rim with 4 cusps, lateral cusps sharp with deep semicircular embayment between, operculum of four fragile triangular valves. Hydranth with 10–12 tentacles; no evidence of an abcauline caecum in contracted or extended hydranths. Gonotheca irregularly obovoid, usually widening distally, body deeply crumpled, some gonothecae with 1 or 2 deep flanges, body narrowing into a rather wide, smooth pedicel, some arising from within stolon hydrothecae, apex of gonotheca a short inverted funnel, orifice circular. An oval body in 1 gonotheca may be an ovum. Perisarc rather thin, fragile at hydrothecal margin, operculum and gonotheca. Colour, colony pale yellowish-white.

Distribution. Indonesia, Caribbean, Micronesia, Japan and Queensland.

Remarks. The species is remarkable for its small size and delicacy and the crumpled appearance of the gonotheca.

Symplectoscyphus

Marktanner-Turneretscher, 1890

Symplectoscyphus sibogae (Billard)

Figure 4A, B

Symplectoscyphus sibogae Billard, 1924: 69.—Billard, 1925: 166.—Vervoort, 1993: 241.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, NMV F91295, infertile stem detached from substrate, malinol mounted microslide preparation.

Description. Stolon thick-walled, tubular. Stem 4 mm high, straight, with 5 alternate hydrothecae, an indistinct transverse basal node between hydrorhiza and first hydrotheca; no other obvious nodes. Hydrothecae large, tubular, arching outwards from stem, narrowing to margin, adnate adcauline wall short, parallel with internode, free adcauline wall weakly convex to almost straight, abcauline wall contiguous with border of internode, faintly concave; floor of hydrotheca narrow, transverse to internodal axis. Margin everted with 3 fairly sharp cusps with shallow embayments between; a large internal submarginal cusp at base of each embayment; operculum of 3 delicate triangular valves. Perisarc thick and

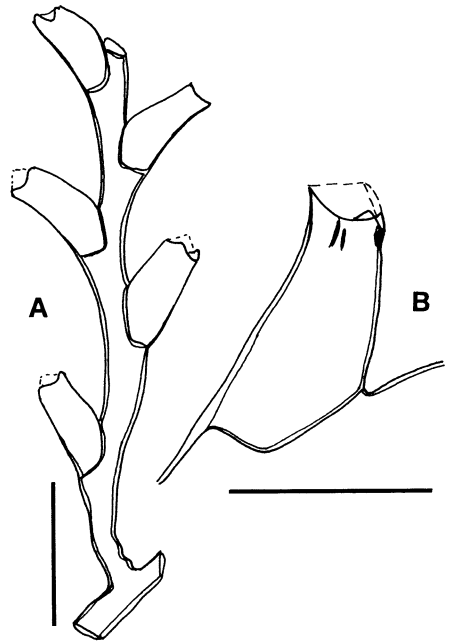


Figure 4. A, B, *Symplectoscyphus sibogae* (Billard, 1924). A, part of stem; B, hydrotheca. Scale bar: A, 1 mm, B, 0.5 mm.

smooth throughout; opercular valves thick. Colour white.

Distribution. This is the second record of the species, the original record being from the type locality in Indonesia.

Remarks. Although the small colony is obviously juvenile, it nevertheless conforms to descriptions of the species. Because of their position below the embayments the marginal cusps are rather difficult to see. The species is notable for its smooth perisarc, and large, elegant hydrothecae with great length free of the internode,

Syntheceiidae Marktanner-Turneretscher, 1890

Syntheceium Allman, 1872

Syntheceium campylocarpum Allman

Figure 5A–C

Syntheceium campylocarpum Allman, 1888: 78.—Marktanner-Turneretscher, 1890: 248.—Farquhar, 1896: 466.—Stechow, 1913: 127.—Jäderholm, 1919: 14.—Totton, 1930: 169.—Ralph, 1958: 347.—Yamada, 1959: 52.—Hirohito, 1969: 18.—Watson, 1996: 78.—Watson, 2000: 40.

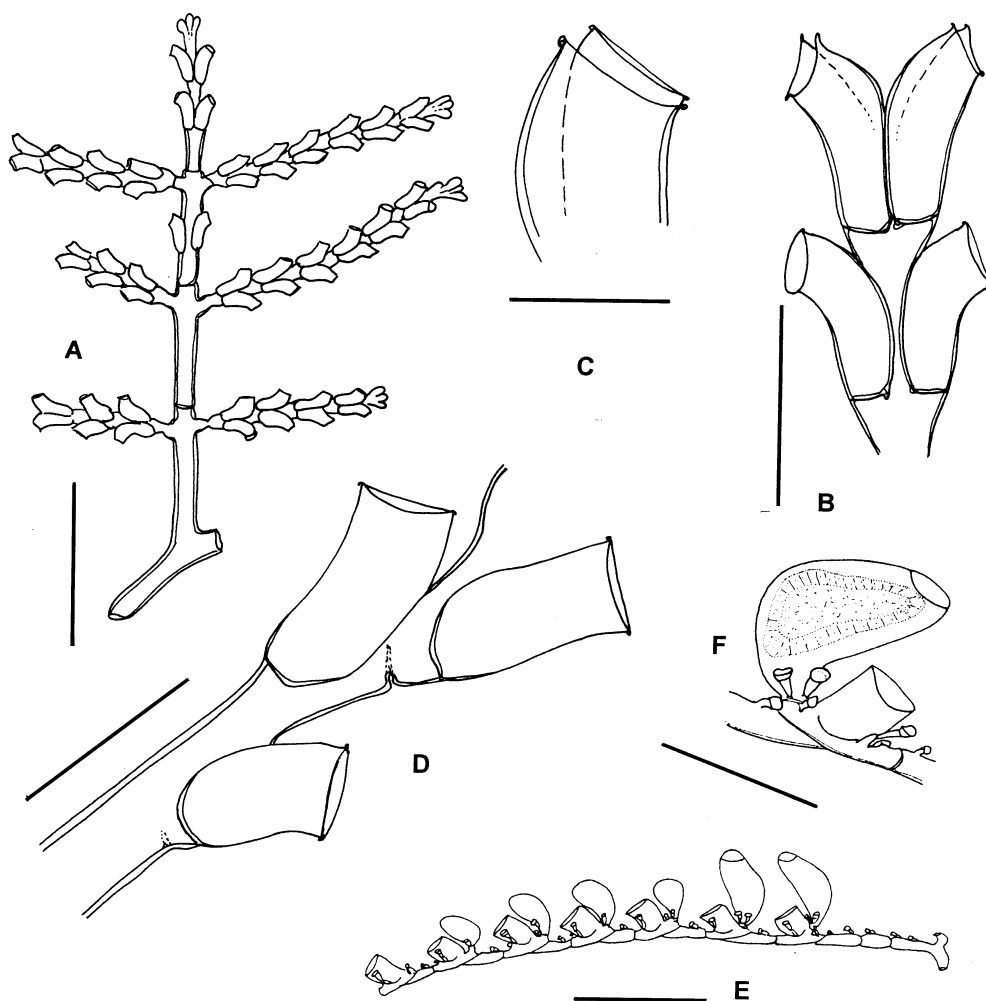


Figure 5. A–C, *Synthecium campylocarpum* Allman, 1888. A, whole stem; B, hydrothecate hydrocladial internodes; C, hydrotheca showing regrowth of margin from within hydrotheca. D, *Hincksella cylindrica* (Bale, 1888). Part of stem. E–F, *Antennella secundaria* (Gmelin, 1791). E, fertile hydrocladium; F, female gonotheca (after Watson, 2000). Scale bar: A, 2.5 mm; E, 1 mm; B, D, F, 0.5 mm; C, 0.1 mm.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15, NMV F91900, three short, infertile stems on calcareous bryozoan.

Description. Hydrorhiza thick, tubular. Longest stem 12 mm high, straight, hydrocladia opposite, three widely separated pairs almost perpendicular to axis of stem; stem internodes long, cylindrical, smooth, nodes transverse, just above hydrocladia, a subopposite pair of hydrotheca between, halfway along some internodes. Hydrocladia inserted on short, tubular apophyses narrowing distally but without obvious distal node.

Hydrothecae paired, opposite, tubular, of same diameter throughout length, supported on a short conical section of internode between pairs; adcauline walls in contact or slightly separated on internode, adnate walls parallel to internode, straight, or slightly convex, free wall convex or continuing bend of adnate wall, abcauline wall sinuous, basally convex, concave behind margin; floor of hydrotheca convex, thickened, a hydrospore at base of abcauline wall. Margin faintly sinuous (lateral view), tilted upwards to internode, rim slightly but sharply outrolled, many margins

regenerated by growth of new hydrotheca from deep within old, abcauline wall of new hydrotheca free, visible, adcauline wall attached to wall of primary hydrotheca. Hydranth with about 12 long tentacles. Perisarc of stem, hydrocladia and hydrothecae thick and smooth, thinner on hydrothecal margin. Colour, pale yellow.

Distribution. Type locality, New South Wales (Allman, 1888). Tropical northern Australia and New South Wales. Previously recorded from southern Queensland as *S. patulum* by Pennycuik (1959).

Remarks. The distinction between *Synthecium campylocarpum* and *S. patulum* (Busk, 1852) was discussed by Watson (2000). The present material is assigned to *S. campylocarpum* because of the shorter hydrothecae, less pronounced marginal sinuosity of the hydrotheca and yellow colour of the colony.

***Hincksella* Billard, 1918**

***Hincksella cylindrica* (Bale)**

Figure 5D

Sertularella cylindrica Bale, 1888: 765.
Synthecium cylindricum.—Ritchie, 1911: 847.—Stechow, 1923: 150.—Fraser, 1948: 234.
Hincksella cylindrica.—Blackburn, 1937: 173.—Pennycuik, 1959: 189.—Vervoort, 1959: 245.—Vervoort, 1968: 101.—Millard, 1975: 232.—Watson, 1979: 234.—Calder, 1993: 68.—Vervoort, 1993: 193.—Watson and McInnes, 1999: 108.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, NMV F91901, several infertile stems detached from substrate, malinol mounted microslide preparation.

Description. Stems fragile, to 4 mm high, proximal part of stem athecate, upper stem with up to 6 hydrothecae, stem internodes wide, cylindrical, curved, smooth, an indistinct slightly oblique node below some hydrothecae. Hydrothecae subopposite to alternate, cylindrical, adnate adcauline wall convex, free adcauline wall about one quarter length of adnate wall, continuing curve of fused wall, abcauline wall concave; floor of hydrotheca transverse to internode, narrow. Margin circular, rim weakly outrolled. Perisarc of lower stem thick, thinning markedly on hydrothecae, most of which have collapsed in mounting. Colour, white.

Distribution. Type locality, Port Jackson, New South Wales (Bale, 1888). Southern Australia, Pacific coast of North America, Caribbean. Previously recorded from southern Queensland.

Remarks. *Hincksella cylindrica* is an uncommon species, usually found as single stems or colonies consisting of only a few stems.

Halopterididae Millard, 1962

***Antennella* Allman, 1877**

***Antennella secundaria* (Gmelin, 1791)**

Figure 5E–F

Sertularia secundaria Gmelin, 1791: 3856.
Aglaophenia secundaria.—Lamouroux, 1824: 19.
Antennella secundaria.—Pennycuik, 1959: 176.—Watson, 1973: 183.—Millard, 1975: 332.—Ryland and Gibbons, 1991: 525.—Ramil and Vervoort, 1992: 143.—Medel and Vervoort, 1995: 35.—Watson, 1996: 78.—Schuchert, 1997: 14.—Calder, 1997: 29 (full synonymy).—Watson, 1997: 522.—Watson, 2000: 45.
Antenella secundaria.—Stechow and Müller, 1923: 473.

Material examined. Palm Beach, Queensland, 2 km off-shore, depth 5–15 m, NMV F91290, fertile colonies on barnacles and solitary ascidians in crevices, alcohol preserved.

Description. Stems (hydrocladia) simple, unbranched, to 6 mm high, arising from a tubular stolon; proximal part of hydrocladium with one to three athecate internodes, nodes transverse, each internode bearing one or two nematothecae, distalmost node strongly oblique. Internodes thereafter alternately thecate and athecate, proximal node of thecate internode strongly oblique, passing beneath hydrotheca, distal node transverse below hydrothecal margin.

Hydrotheca occupying almost entire internode, facing forward, deep cup-shaped, walls almost parallel, free adcauline wall straight to slightly concave, adnate part convex, curving back to small hydropore at base of abcauline wall; margin circular, slightly sinuous. Nematothecae bithalamic, small, 2 on athecate internode, basal chamber stout, cup small, foreshortened on adcauline side; mesial inferior stout, adcauline side of cup foreshortened, just reaching base of hydrotheca, lateral nematotheca borne on a long, slender pedicel where adcauline wall of hydrotheca becomes free, cup broad and shallow, excavated on adcauline side, not quite reaching hydrothecal margin; a small mesial superior nematotheca inserted beneath hydrotheca. Female gonothecae obovoid, somewhat flattened, facing forward, borne on a short, thick pedicel beside mesial inferior nematotheca; 2 large nematothecae at base; basal chamber of nematotheca long, cup wide, shallow, excavated on side facing gonotheca. Orifice of gonotheca distal, subcircular, closed by a

thin operculum, gonotheca containing a single planula larva almost filling gonotheca at maturity. Colour, golden yellow, planula shining white.

Distribution. A cosmopolitan species with temperate and tropical distribution in Australian waters.

Remarks. A few male gonothecae are present on the stems. The species conforms in all respects with descriptions of *A. secundaria* from other Australian localities (Watson, 2000).

Aglaopheniidae Marktanner-Turneretscher,
1890

Lytocarpia Kirchenpauer, 1872

Lytocarpia brevirostris (Busk)

Figure 6A–D

Plumularia brevirostris Busk, 1852: 397.

Aglaophenia brevirostris.—Bale, 1913: 135.

Thecocarpus brevirostris.—Billard, 1913: 89.—Briggs, 1918: 34, 45.—Stechow, 1919: 137.—Bedot, 1922: 157.—Jarvis, 1922: 350.—Pennycuik, 1959: 187.—Vasseur, 1974: 158.—Millard, 1975: 454.

Lytocarpia brevirostris.—Stechow, 1922: 151.—Stechow, 1923: 245.—Ryland and Gibbons, 1991: 545.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91291, infertile colony on polychaete tube, alcohol preserved.

Description. Hydrorhiza a stout tube from which stems arise at intervals. Stems short, pinnate, to 10–15 mm high, proximal part of stem ahydrocladial, some with a supplementary fascicular tube running part way up stem. Stem internodes short, nodes poorly defined, transverse to slightly oblique; hydrocladia alternate, about 2 mm long, 1 per stem internode, inserted on a short apophysis on front of stem; a small open pore (mamelon) on base of apophysis.

Hydrocladial internodes long, base of each strongly displaced with respect to next one, node present, indistinct or absent at point of displacement, internode with 1 complete septum beneath posterior quarter of hydrotheca and another, partial, below saddle in hydrotheca. Hydrotheca elongate, parallel with internode, margin separated from mesial nematotheca by deep saddle; margin sloping forward with a long, sinuously curved, blunt anterior cusp, followed by 3 pairs of deeply incised, sharply pointed cusps, the third pair usually obscured by lateral nematothecae; base of hydrotheca with a short, forwardly pointing intrathecal septum. Mesial hydrothecal nematotheca rather short, digitate, at an angle of about 50° to internode, apex about level with anterior

hydrothecal cusp, orifice small, shallowly canaliculate; lateral nematotheca flask-shaped, laying almost parallel to internode, orifice small, canaliculate down to internode. Two cauline nematothecae, one above and one below hydrocladial apophysis; same shape as laterals, but base a little more inflated, orifice of upper facing away from apophysis, orifice of lower facing up and outwards. Colour, yellow.

Distribution. A common Indo-Pacific species previously recorded from Queensland.

Remarks. The colony was found on the tube of a worm of the genus *Eunice*. The tough, mucilaginous tube of this polychaete genus is a favoured substrate of hydroids in tropical and temperate waters (Watson, 2000).

Aglaophenia Lamouroux, 1812

Aglaophenia sinuosa Bale

Figure 6E–H

Aglaophenia sinuosa Bale, 1888: 790.—Whitelegge, 1889: 194.—Jäderholm, 1916: 19.—Watson, 1994: 67.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91292, infertile colonies of many stems on exposed rock surfaces, alcohol preserved.

Description. Hydrorhizal stolons thick, reptant on substrate; stems monosiphonic, up to 70 mm long, internodes short, wide, nodes transverse to slightly oblique, sloping in different directions, a deep shoulder at node. Hydrocladia to 10 mm long, alternate, one per cauline internode, inserted on a short apophysis. Hydrocladial internodes deep, nodes slightly oblique, distinct, a weak intranodal septum sometimes below posterior of hydrotheca.

Hydrotheca saccate, base convex, posterior wall deeply indented, a thick septum passing down into body from junction of abcauline wall with mesial nematotheca, edge of septum ragged in anterior view. Margin sloping sharply downwards to internode; margin (lateral view) with a thick rostrum overtopping median anterior tongue-shaped cusp, flanked by 2 pairs of tongue-shaped cusps and a pair of sharp, upwardly pointed cusps behind nematothecae. In anterior view, first pair of cusps outwardly directed, second pair produced inward over hydrothecal margin, third pair slightly outwardly directed; the entire margin having a fluted appearance. Mesial nematotheca short, free end blunt, reaching level of intrathecal septum, margin widely canaliculate, curving down to junction with hydrotheca.

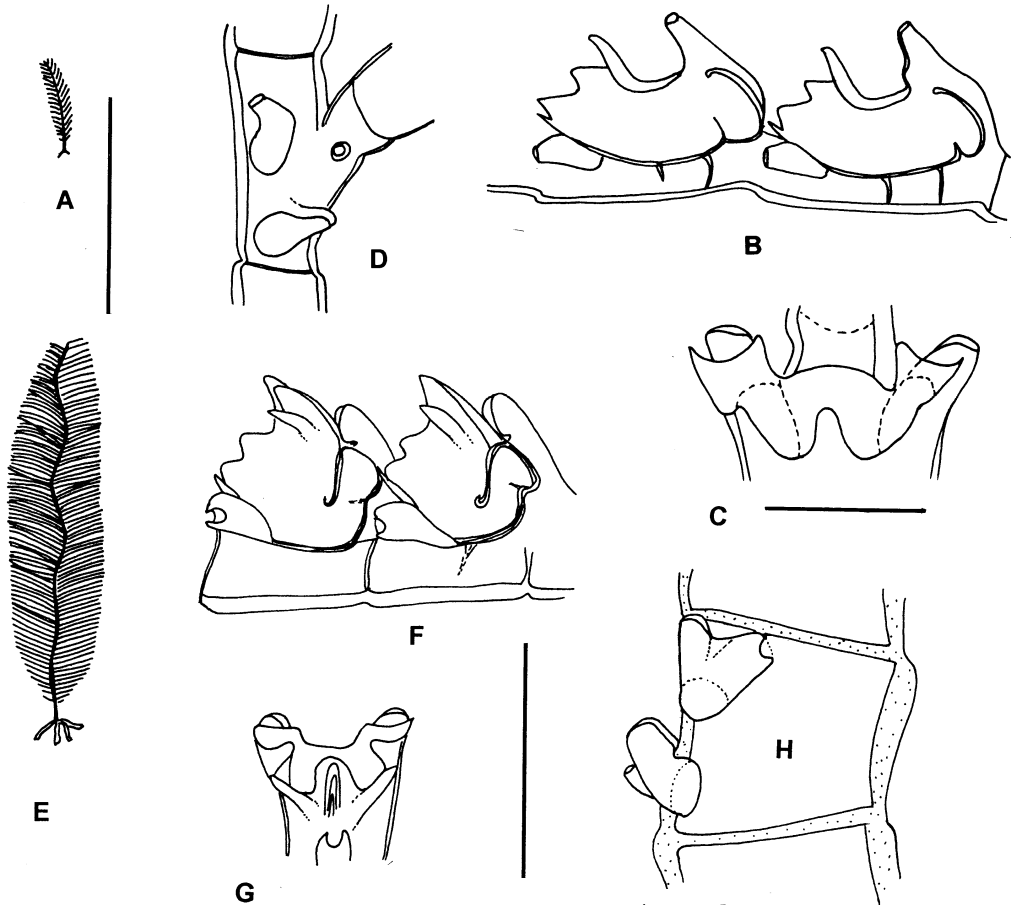


Figure 6. A–D, *Lytocarpia brevirostris* (Busk, 1852). A, whole stem; B, hydrothecate hydrocladial internodes; C, hydrotheca, anterior view; D, stem internode with cauline nematothecae and mamelon. E–H, *Aglaophenia sinuosa* Bale, 1888. E, single stem from colony; F, hydrocladial hydrothecae; G, hydrotheca, anterior view; H, front of stem showing oblique internodes and cauline nematothecae (hydrocladia not shown). Scale bar: A, E, 20 mm; B, C, D, F, G, H, 0.3 mm.

Lateral nematothecae conical, widening from base to margin, base parallel with internode, orifice circular, level with node, excavated down to internode. Three cauline nematothecae: i) on front of internode at base of apophysis, facing inwards, ii) between apophysis and proximal node, facing outwards, iii) one behind apophysis; all nematothecae with 2 opposite orifices. Colour, dark brown.

Distribution. Tasman Sea, New South Wales. Not previously recorded from the Queensland coast; possibly at the northern end of its range.

Remarks. *Aglaophenia sinuosa* is easily recognisable among Australian aglaopheniid hydroids by the sinuous bends at intervals along the stem,

each bend marking a reversal of the direction in which the hydrocladia face so that succeeding groups of hydrocladia alternately face forwards and backwards. The marginal hydrothecal cusps are quite difficult to describe as their apparent position and morphology changes according to the angle of view; in lateral view the cusps may appear as sharply pointed whereas in anterior view some are tongue-shaped and inwardly and outwardly fluted. There is some discrepancy between the morphology of the hydrotheca of the present material and Bale's description and figure of the species, his specimens having two intrathecal septa and more upright lateral nematothecae. This may be a rather variable species, but not enough is yet known of its range of variation.

Macrorhynchia Kirchenpauer, 1872

Macrorhynchia philippina (Kirchenpauer)

Figure 7A, B

Macrorhynchia philippina Kirchenpauer, 1872: 19.—Stechow, 1923: 241.—Stechow and Müller, 1923: 475.—Stechow, 1924: 69.—Stechow, 1925: 258.—Hirohito, 1983: 78.—Rees and Vervoort, 1987: 177.—Watson, 1996: 79.—Migotto, 1996: 40.—Watson, 1997: 538.—Calder, 1997: 62.—Watson, 2000: 67.

Aglaophenia philippina.—Kirchenpauer, 1872: 29, 45.

Lytocarpus philippinus.—Kirkpatrick, 1890: 604.—Bale, 1888: 786.—Billard, 1913: 78.—Bale, 1914a: 6.—Bale, 1915: 293.—Jäderholm, 1916: 7.—Briggs and Gardner, 1931: 193.—Millard, 1958: 220.—Penny-cuik, 1959: 186.—Millard and Bouillon, 1973: 93.—Millard, 1975: 449.

Material and record. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91293, many infertile colonies on rock faces, alcohol preserved.

Description. Hydorrhiza reptant on substrate, stems plumose, to 30 mm high, fascicled, sub-pinnately branched, stem internodes indistinct. Hydrocladia frontal on branch, alternate, hydrocladial internodes short, deep, nodes slightly oblique; two partial intranodal septa, one passing down from base of hydrotheca, the other from base of lateral nematotheca.

Hydrotheca saccate, adcauline wall flat or slightly convex in contact with internode, free part attached to lateral nematotheca, a deep proximal indentation in base of adcauline wall, abcauline sinuate, rising abruptly behind margin, a deep V-shaped septum penetrating hydrotheca between mesial nematotheca and margin. Margin circular with a pair of opposite, low lobes. Mesial nematotheca erect, tubular, parallel with hydrothecal abcauline wall, reaching to or beyond hydrothecal margin, tapering a little distally, terminal orifice circular, a little excavated on adcauline side, a secondary orifice above junction with hydrotheca and another, internal, connecting with hydrotheca. Lateral nematotheca long, tubular, inclined forward beyond hydrothecal margin, orifice circular or slightly excavated. A cauline nematotheca on branch at base of hydrocladium, short, body inflated, orifice circular, on a short neck. Colour, colonies glowing white in situ, stems of preserved material pale brown, hydrocladia greyish-white.

Distribution. *Macrorhynchia philippina* is a very common circumglobal tropical species. It occurs throughout the Australian tropics (Watson 2000).

Remarks. None of the numerous colonies of

M. philippina observed off Palm Beach were more than a few centimetres high, growing close to the rocky substrate in exposed situations. Although the colonies were very small for this species they showed no evidence of grazing by fish, thus suggesting that dwarfism may be due to the species being close to the southern end of its temperature range.

Campanulariidae Johnston, 1836

Obelia Péron and Lesueur, 1810

Obelia angulosa Bale

Figure 7C

Obelia angulosa Bale, 1888: 752.—Whitelegge, 1889: 195.—Stechow, 1914: 129.—Stechow, 1919: 49.—Vannucci-Mendes, 1951b: 115.—Blanco, 1968: 210.—Stranks, 1993: 4.—Blanco, 1994: 193.—Migotto, 1996: 123.

Material examined. Palm Beach, Queensland, 2 km offshore, depth 5–15 m, NMV F91294, many infertile colonies on barnacles, sponges and ascidians, alcohol preserved.

Description. Hydorrhiza tubular, reptant on substrate. Stems to 6 mm high, monosiphonic, lower stem smooth, unbranched, a series of annulations above base, upper stem region slightly sympodial, simple, dichotomously or trichotomously branched, internodes moderately long, tubular, straight, widening a little distally, nodes oblique, faint to absent, proximal part of internode deeply annulated. Hydrothecal pedicels usually alternate, given off at an acute angle distal on internode, pedicels variable in length, annulated throughout or with a central smooth section. Hydrotheca gracefully campanulate, diaphragm transverse to hydrothecal axis, margin faintly everted. Hydranth robust, number of tentacles could not be counted. Perisarc smooth throughout, fairly thick on internodes, pedicels, and around upper body of hydrotheca. Colour, lower stems shining brown, upper stems fading to white.

Distribution. Not previously recorded from Queensland; known from New South Wales (Bale, 1888) and Victorian waters (Watson, unpubl.) and South America.

Remarks. This very delicate species is easily distinguished from its more common southern Australian congener, *Obelia dichotoma* (Linnaeus, 1758), by its smaller size and almost invariably transverse diaphragm. The coenosarc of the hydorrhiza and stems and the tentacles of the specimens are packed with zooxanthellae.

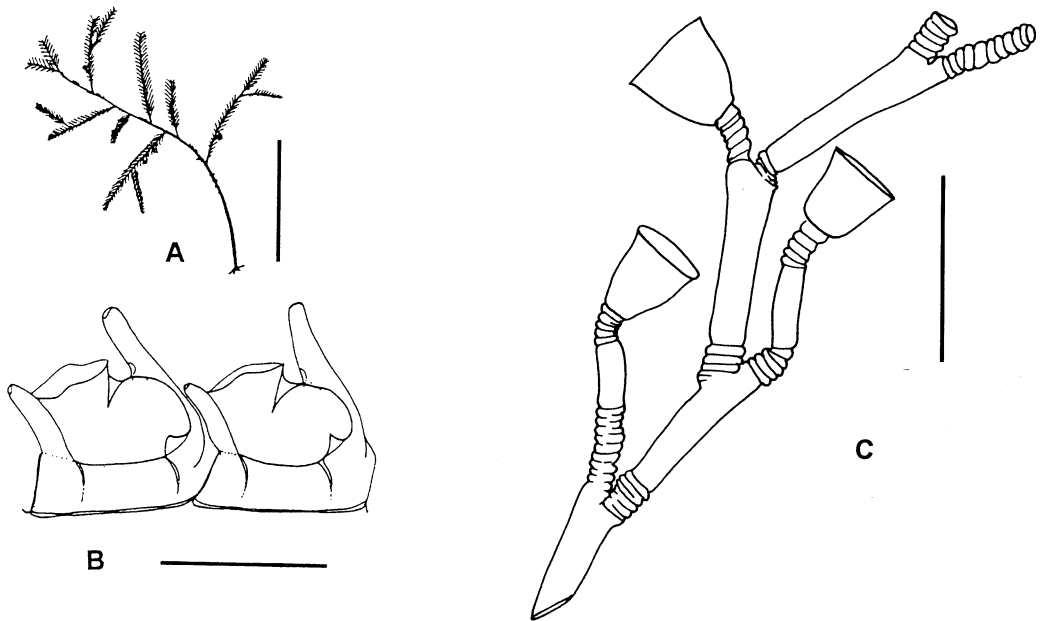


Figure 7. A, B, *Macrorhynchia philippina* (Kirchenpauer, 1872). A, whole stem; B, hydrocladial hydrothecae (after Watson, 2000). C, *Obelia angulosa* Bale, 1888. Stem internodes and hydrotheca. Scale bar: A, 50 mm; B, 0.3 mm; C, 0.5 mm.

O. angulosa is the most abundant species in the collection although it is probably seasonal and likely to be absent at other times of year.

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