

## The hydroid fauna of Tasmanian seamounts

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Key words: Tasmania; Australia; seamount; hydroids.

Seventy seamounts 50 to 100 km off South East Cape, southern Tasmania, rise from depths of 1000-2000 m on the Australian continental slope. Sampling of the slopes of 14 seamounts was undertaken in 1997 by the Australian Commonwealth Scientific & Industrial Research Organisation (CSIRO).

The collection yielded 14 species of hydroids, six of which are new, including two species of a new genus. Only *Halecum fragile* Hodgson, 1950, and *Tripoma arboreum* Hirohito, 1995, have previously been recorded from Tasmania. Other species are known from deep water off New Zealand, Japan and the south-western Atlantic.

### Introduction

Approximately 70 seamounts, remnants of extinct volcanoes about 400 m high, rise from water depths of 1000-2000 m on the continental slope 50 to 100 km off South East Cape, southern Tasmania (fig. 1). The seamount field is a distinctive geological feature not known from elsewhere along the continental margins of Australia (Koslow & Gowlett-Holmes, 1998). To exclude environmental damage from deep water trawl fishing, part of the area has been set aside by the Australian Government as a marine reserve.

In January 1997 the Australian Commonwealth Scientific & Industrial Research Organisation (CSIRO) undertook a survey of 14 of the reserved seamounts. Sampling of the slopes was undertaken by benthic sledge at depths of 620-1997 m.

The sessile seamount fauna is dominated by a hard grey, branching colonial scleractinian coral, *Solenosmilia variabilis* Duncan, 1873, together with octocorals, antipatharians, sponges, bryozoans and hydroids.

Seamounts create a distinct environment, the slow deep-sea currents being enhanced by their topography; consequently little sediment is deposited allowing evolution of unique communities dominated by corals and other filter feeders (Genin et al., 1986). Recruitment and longevity of cold deep water corals and their associated communities has not been studied in Tasmania; however, C<sup>14</sup> ageing of *Solenosmilia variabilis* from the seamounts indicates that the species may live up to 100 years (Koslow & Gowlett-Holmes, 1998). The associated hydroid fauna may also comprise comparatively long-lived species.

The earliest records of hydroids from the Tasmanian region were those from material collected from Bass Strait by the "Géographe" and "Naturaliste" expeditions (Lamouroux, 1816) and H.M.S. "Rattlesnake" (Busk, 1852). Several Tasmanian species were described by Thompson (1879) and in 1883 and 1888 Allman described hydroids

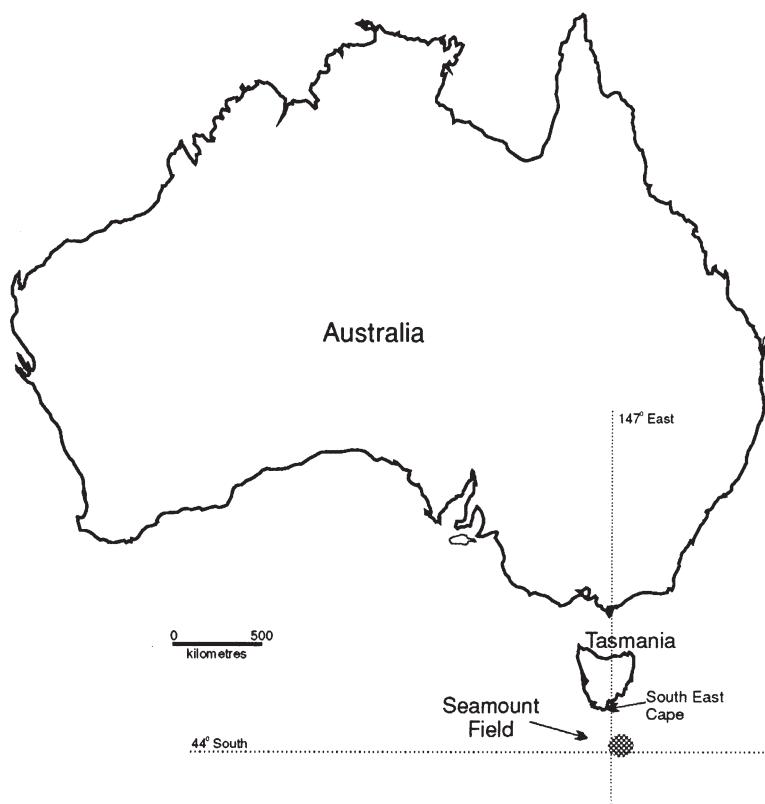


Fig. 1. Map of Australia and Tasmania showing location of seamount field.

dredged by H.M.S. "Challenger" from a station in eastern Bass Strait. Briggs (1914) recorded 13 species dredged from a depth of 183 m east of Cape Pillar, and in 1915 recorded 15 species from depths to 146 m off the Freycinet Peninsula, Oyster Bay and in the D'Entrecasteaux Channel in south-eastern Tasmania. Bale (1914a, 1914b, 1915) recorded 21 species from dredgings to a depth of 320 m off Bruny Island by the Fisheries Investigation Steamer "Endeavour". Several species dredged off Maria Island by the Australasian Antarctic Expedition 1911-1914 were also described by Briggs (1939). More recently, Hodgson (1950) published a revision and synopsis of the Tasmanian Hydriida from material from shallow water dredgings and shore-collecting, recording 63 known and one new species, and Watson (1975) recorded 34 species from Bruny Island in south-east Tasmania. Altogether, 81 species were known from the Tasmanian region prior to the seamount survey. The seamount collection yielded 14 species of hydroids, including one new genus and six new species, increasing the known number of Tasmanian species to 94.

The many new invertebrate species reported in most major phyla suggests a high level of endemism in the Tasmanian seamount habitat (Koslow & Gowlett-Holmes, 1998). Of the 14 hydroids reported in this paper, four species (29% of the hydroid

fauna) are described as new and are assumed to be endemic. *Halecium ralphae* spec. nov. was previously recorded under another name from the Chatham Islands east of New Zealand and *Gymnangium japonicum* spec. nov. has previously been recorded from Japan as *Halicetta* spec. *Acryptolaria gracilis* and *Symplectoscyphus epizooticus* were described from northern New Zealand and *Stegolaria geniculata* and *Sertularella vervoorti* are known from South America and the south-western Atlantic. *Zygophylax sibogae* is widely distributed in the Indo-Pacific region and is also known from the Bay of Biscay region. The range of *Gonaxia*, a genus well represented on the Norfolk Ridge from New Caledonia to northern New Zealand (Vervoort, 1993) is extended southwards. Although not present in the seamount collection, *Sertularella edentula* Bale, 1924, is here designated as the type of *Tasmanaria*, a newly proposed genus. With the exception of *Halecium fragile* and the possible record of *Halecium ralphae* from Japan, all known species are from moderately deep shelf to slope waters.

## Material

Preserved holotype, paratype and voucher specimens are deposited in the Tasmanian Museum, Hobart, Tasmania (indicated TM K and a number). Microslide preparations, stained with lignin pink and mounted in malinol taken from holotype, paratype and voucher specimens are deposited in the Museum of Victoria, Melbourne (indicated MV F and a number) and the National Museum of Natural History (formerly: Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands (RMNH-Coel.).

## List of stations and species

- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 06, 44°27'S 147.07°E to 44.27°S 147.11°E, depth 1110 m, 76.7 km SSE of South East Cape, Tasmania, 27.i.1997: *Halecium fragile* Hodgson, 1950; *Tasmanaria aegis* spec. nov.; *Lytocarpia lepida* spec. nov.; *Gonaxia tasmanica* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 14, 44.28°S 147.27°E to 44.29°S 147.21 E, depth 1000 m, 82.6 km SSE of South East Cape, Tasmania, 23.i.1997: *Tasmanaria aegis* spec. nov.; *Filellum* spec.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 15, 44.27°S 149.29°E to 44.30°S 147.23°E, depth 1100-1122 m, 82.9 km SSE of South East Cape, Tasmania, 23.i.1997: *Halecium ralphae* spec. nov.; *Symplectoscyphus epizooticus* Totton, 1930; *Tasmanaria aegis* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 36, 44.27°S 147.33°E to 44.24°S 147.36°E, depth 987 m, 83.8 km SSE of South East Cape, Tasmania, 27.i.1997: *Halecium ralphae* spec. nov.; *Tasmanaria monticola* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 37, 44.27°S 147.33°E to 44.22°S 147.40°E, depth 1300-1450 m, benthic sledge, 84 km SSE of South East Cape, Tasmania, 27.i.1997: *Tasmanaria aegis* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 45, 44.42°S 147.24°E to 44.46°S 147.20°E, depth 1715-1815 m, benthic sledge, 96.8 km SSE of South East Cape, Tasmania, 28.i.97: *Gonaxia tasmanica* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 50, 44.21°S 147.04°E to 44.16°S 147.05°E 640 - 700 m, benthic sledge, 69.7 km SSE of South East Cape, Tasmania, 29.i.1998: *Tripoma arboreum* Hirohito, 1995; *Halecium ralphae* spec. nov.; *Tasmanaria aegis* spec. nov.; *Sertularella vervoorti* El Beshbeeshy, 1991.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 52, 44.21°S 147.05°E to 44.22°S 147.05°E,

- depth 750-900 m, benthic sledge, 70 km SSE of South East Cape, Tasmania, 21.i.1997: *Gymnangium japonicum* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 53, 44.19°S 147 02°E to 44 22°S 147 05°E, depth 936-1018 m, benthic sledge, 67.4 km SSE of South East Cape, Tasmania, 29.i.1997: *Acryptolaria gracilis* (Allman, 1888).
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 55, 44.19°S 146.95°E to 44.19°S 147.01°E, depth 620-800 m, benthic sledge, 66.5 km SSE of South East Cape, Tasmania. 29.i.1997: *Zygophylax sibogae* Billard, 1918.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 56, 44.18°S 147.00°E to 44.20°S 146.96°E, depth 800 m, benthic sledge, 65.5 km SSE of South East Cape, Tasmania, 29.i.1997: *Stegolaria geniculata* (Allman, 1888); *Halecium ralpae* spec. nov.
- CSIRO F.R.V. "Southern Surveyor" Cruise SSO1/97, Stn 57, 44.18°S 146.99°E to 44.21°S 146.95°E, depth 900-1100 m, benthic sledge, 65.1 km SSE of South East Cape, Tasmania, 29.i.1997: *Tripoma arboreum* Hirohito, 1995; *Symplectoscyphus epizooticus* Totton, 1930; *Gonaxia tasmanica* spec. nov.; *Tasmanaria aegis* spec. nov.

### Taxonomic report

#### Order Leptothecatae Cornelius, 1992

#### Family Tiarannidae Russell, 1940

#### Genus *Stegolaria* Stechow, 1913

*Stegolaria geniculata* (Allman, 1888)

(fig. 2a-d)

*Cryptolaria geniculata* Allman, 1888: 41, pl. 20 figs 1, 1a-b.

*Lafoea geniculata*; Billard, 1910: 5.

*Stegolaria geniculata*; Stechow, 1913a: 139; Totton, 1930: 154; Vervoort, 1946: 299, figs 2-3; Ralph, 1957: 849; Millard, 1977: 106, 112, fig. 3; 1978: 198; Gravier-Bonnet, 1979: 16; Millard 1980: 130; Vervoort 1985: 281-282; Ramil & Vervoort, 1992: 32-34, fig. 4c-e; Calder & Vervoort, 1998: 13, fig. 4a-b.

?*Cryptolaria operculata* Nutting, 1905: 947-948, pl. 3 fig. 4, pl. 10 figs 12-14.

*Stegolaria operculata*; Vervoort, 1985: 282.

Material.— TM K1715, CSIRO Cruise SSO1/97, Stn 56, bunched, branched and simple stems to 70 mm high on dead stem of antipatharian; microslides MV F83422-83425, RMNH-Coel. 29001, slide 4451, parts of colony.

Description.— Tallest stems heavily fascicled and irregularly branched, perisarc thick, polysiphonic tubes narrow, becoming fewer distally but running almost to tips of branches.

Internodes of monosiphonic parts of branches long, perisarc smooth to slightly undulating. Hydrothecae alternate, tubular, occupying entire internode but not overlapping, adnate for half length, curving gracefully outwards, adcauline wall sometimes slightly sinuated, abcauline wall concave, diameter increasing from base to margin, a faint transverse diaphragm at base; adcauline wall continuing below diaphragm, terminating in a small elongate plug of perisarc. Margin of hydrotheca deep gable-shaped, operculum of two delicate valves. Hydranths small, deeply contracted within hydrothecae, insufficiently preserved for tentacle count.

Gonothecae borne on both polysiphonic and monosiphonic branches, usually between two consecutive hydrothecae but sometimes in axils of branches. Gonotheca sessile, completely adnate to branch, variable in length, more or less cylindrical,



Fig. 2a-d. *Stegolaria geniculata* (Allman, 1888) from stn 56; a, colony; b, monisiphonic part of branch; c, pedicellate hydrotheca with operculum intact; d, gonotheca. Scale bar: a, 5 cm; b-d, 1 mm.

sometimes swollen posteriorly; usually a single polysiphonic tube attached to abcauline wall, terminating below orifice. Orifice scoop-shaped, upturned with a produced adcauline lip, operculum delicate, consisting of several flaps. Gonophore with up to six ova, none well preserved.

Table 1. Measurements of *Stegolaria geniculata* in µm.

Hydrotheca	
length of adnate adcauline wall	480-600
length of free adcauline wall	550-600
diameter of hydrotheca below margin	220-300
width of hydrothecae at floor	110-130
Gonotheca	
length	840-1600
maximum width	200-300
diameter of orifice	200-250

Remarks.— The small scars covered by thin perisarc beside the base of some hydrothecae may be the former site of gonothecae. Hydrothecae are rare on the lower branches and stems but when present, are usually immersed in the fascicular tubes with only the distal ends protruding. Few of the delicate opercular valves are intact but those present show no evidence of plications.

Vervoort (1946) figured a gonotheca of *Stegolaria geniculata* with a circular orifice. Although the orifices of the present material are elliptical and have a produced adcauline lip, in all other respects the species conforms to his figures. Accordingly, the species is referred to *Stegolaria geniculata*, though with some doubt. *Stegolaria operculata* (Nutting, 1905), described from Hawaiian waters, may be conspecific with *S. geniculata* (cf. Vervoort, 1985).

Distribution.— *Stegolaria geniculata* is a deep water species, recorded from lower latitudes of the Pacific and Atlantic Oceans, Bay of Biscay, off the coast of Morocco, the Gulf of Guinea (Vervoort, 1985; Ramil & Vervoort, 1992) and the mid-Atlantic Ridge (Calder & Vervoort, 1998). If conspecific with *Stegolaria operculata* (Nutting, 1905), it is also known from the Pacific and Indian Oceans (Vervoort, 1946; Millard, 1977).

### Family Campanulinidae Hincks, 1868

#### Genus *Tripoma* Hirohito, 1995

*Tripoma arboreum* Hirohito, 1995

(fig. 3a-b)

*Tripoma arboreum* Hirohito, 1995: 98, fig. 28a-e, pl. 6 fig. A; Watson & Vervoort (in press).

Material.— TM K1708, CSIRO Cruise SSO1/97, Stn 57, several fertile stems to 30 mm high on calcareous bryozoan; microslides MV F 83426-83428, RMNH-Coel. 29002, slide 4452, parts of colony. TM K1709, CSIRO Cruise SSO1/97, Stn 50, a large mass of fertile stems to 50 mm high on dead stem of bryozoan.

Remarks.— A full redescription of *Tripoma arboreum* from the Tasmanian seamounts and Tasman Sea is given by Watson & Vervoort (in press).

Distribution.— Moderately deep water in the Tasman Sea, Bass Strait and Sagami Bay, Japan.



Fig. 3a-b. *Tripoma arboreum* Hirohito, 1995 from stn 57; a, colony; b, part of branch. After Watson & Vervoort (in press). Scale bar: a, 1 cm; b, 0.5 mm.

**Family Lafoeidae Hincks, 1868**  
**Genus *Aryptolaria* Norman, 1875**  
*Aryptolaria gracilis* (Allman, 1888)  
(fig. 4a-c)

*Cryptolaria gracilis* Allman, 1888: 42, pl. 20 figs 2, 2a; Farquhar, 1896: 461.  
*Aryptolaria gracilis*; Totton, 1930: 162; Ralph, 1958: 314, fig. 3b-d.

Material.— TM K1713, CSIRO Cruise SSO1/97, Stn 53, infertile branched colony 50 mm high; microslides MV F 83429, MV F 83430, parts of colony.

Description.— Hydrorhiza a plug of tubes embedded in a sponge. Colony stiff, branching irregularly and arborescently more or less in one plane, stem and branches heavily fascicled; perisarc thick, polysiphonic tubes continuing almost to tips of branches. No caudine internodes. Hydrothecae alternate, long, tubular, almost entirely immersed in fascicular tubes, facing slightly forwards and curving smoothly out to margin; adcaudine wall convex, free part (if present) short, a small knob of perisarc at base, abcaudine wall concave to very faintly sinuous. Margin circular, not everted, tilted upwards at about 30-40° to branch axis, perisarc thin at rim, some margins replicated up to five times. Hydranths small, deeply withdrawn into hydrothecae.

Colour.— Preserved material pale yellow-brown.

Table 2. Measurements of *Aryptolaria gracilis* (Allman, 1888) in  $\mu\text{m}$ .

Branch		
distance between successive hydrothecae on same side of branch		1300-1425
Hydrotheca		
length of adnate adcauline wall		650-700
length of free adcauline wall (including replications)		50-200
width at margin		150-220

Remarks.— Most of the polysiphonic tubes run more or less parallel up the stem but with some minor contortions. The hydrothecae are thick-walled and deeply immersed in the perisarc and can only be properly seen in the monosiphonic region of the branches. Although most hydrothecal margins are damaged and many are completely immersed in the branch, some show unusual annular thickenings resulting from thin fascicular tubes running around the margin.

In microscopical characters the specimen conforms to the redescription of *Aryptolaria gracilis* of Ralph (1958). Dimensions were deduced by Ralph from Allman's (1888) figures of *Cryptolaria gracilis* and from measurements of a stem fragment thought by her to be part of Allman's type material, held in the collection of the

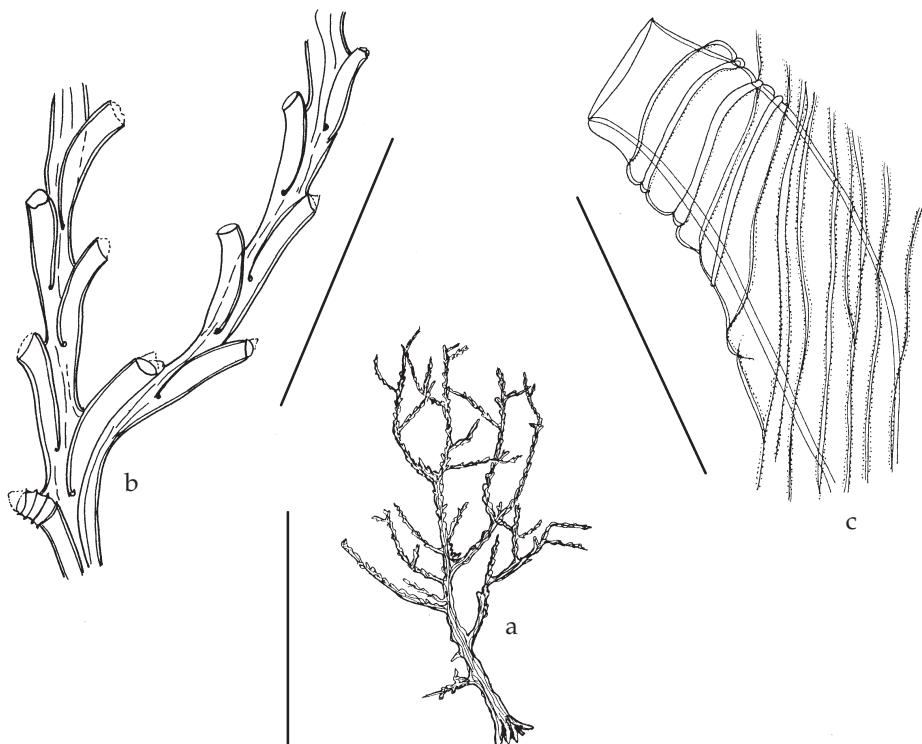


Fig. 4a-c. *Aryptolaria gracilis* (Allman, 1888) from stn 53; a, colony; b, part of branch; c, hydrotheca with annular fascicular distal tubes. Scale bar: a, 3 cm; b, 2 mm; c, 0.5 mm.

Otago Museum, Dunedin, New Zealand. Ralph noted the similarity between *Acryptolaria minima* Totton, 1930, and *Acryptolaria gracilis*, the hydrothecae of the latter being about twice as large as those of the former, suggesting that *A. minima* may well be a small form of *A. gracilis*. As the seamount material fails to shed any further light on the problem, so for the present, following Ralph, the two are considered separate species.

Allman's (1888) comment upon the slenderness and flaccidity of the apical monosiphonic branches of *A. gracilis* was confirmed by examination of the holotype in the Natural History Museum, London, by Dr. P.F.S. Cornelius. This observation leads to some doubt that the rather rigid seamount specimen is indeed *A. gracilis*. However, because of the paucity of comparative material we tentatively refer the specimen to *A. gracilis*. A redescription of the holotype of *A. gracilis* will be given in a synopsis of the hydroid fauna of New Zealand by Watson & Vervoort (in preparation).

**Distribution.**—*Acryptolaria gracilis* is known from a depth of 1274 m from the type locality off East Cape, New Zealand (Ralph, 1958).

**Genus *Zygophylax* Quelch, 1885**  
*Zygophylax sibogae* Billard, 1918  
 (fig. 5a-d)

*Zygophylax sibogae* Billard, 1918: 21, fig. 1; Totton, 1930: 167, fig. 21; Ralph, 1958: 311, fig. 2e-l; Millard, 1964: 21, fig. 5G-H; 1975: 198, fig. 65A-C; Hirohito, 1983: 32, fig. 12; Rees & Vervoort, 1987: 72 (synonymy); Vervoort, 1987: 91, fig. 10.8; Dawson, 1992: 16; Altuna Prados & Álvarez Claudio, 1995: 10, figs 5-6; Álvarez-Claudio & Anadón, 1995: 239; Hirohito, 1995: 144, fig. 45a-d, pl. 9 fig. D.

**Material.**—TM K1714, CSIRO Cruise SSO1/97, Stn 55, an infertile colony 54 mm high without hydrorhiza; microslides MV F83431 & 83432, parts of colony.

**Description.**—Hydrocaulus flaccid, hyaline, lightly fascicled, polysiphonic tubes almost parallel, running up stem and major branches to just below the distalmost branches. Branching irregular, more or less in one plane, bifurcations common, a hydrotheca in each fork; perisarc of stem and branches smooth, internodes long, nodes (if present) just above apophysis of branch.

Hydrothecae alternate, facing forward, widely separated along branch, pedicels long and narrow, pointing obliquely upward from a strong, bulbous apophysis, a constriction at junction with apophysis, diameter of pedicel increasing distally to hydrotheca. Hydrothecae long, trumpet-shaped, distally bent perpendicular to proximal axis at two thirds distance from floor; hydrothecal floor clearly demarcated from pedicel by a slightly concave diaphragm pierced by a small central foramen; adcauline wall almost straight to bend then becoming concave to margin; abcauline wall swollen below bend, narrowing into a deep flexure at bend then becoming convex to margin. Margin circular, rim strongly everted, most hydrothecae with up to four slightly everted replications. Perisarc moderately thick.

Nematothecae on adcauline side of apophysis at base of hydrothecal pedicel, variable in length but mostly small, cigar-shaped, diameter of orifice a little less than that of body, some with a long tubular extension with replicated margin, perisarc thin.

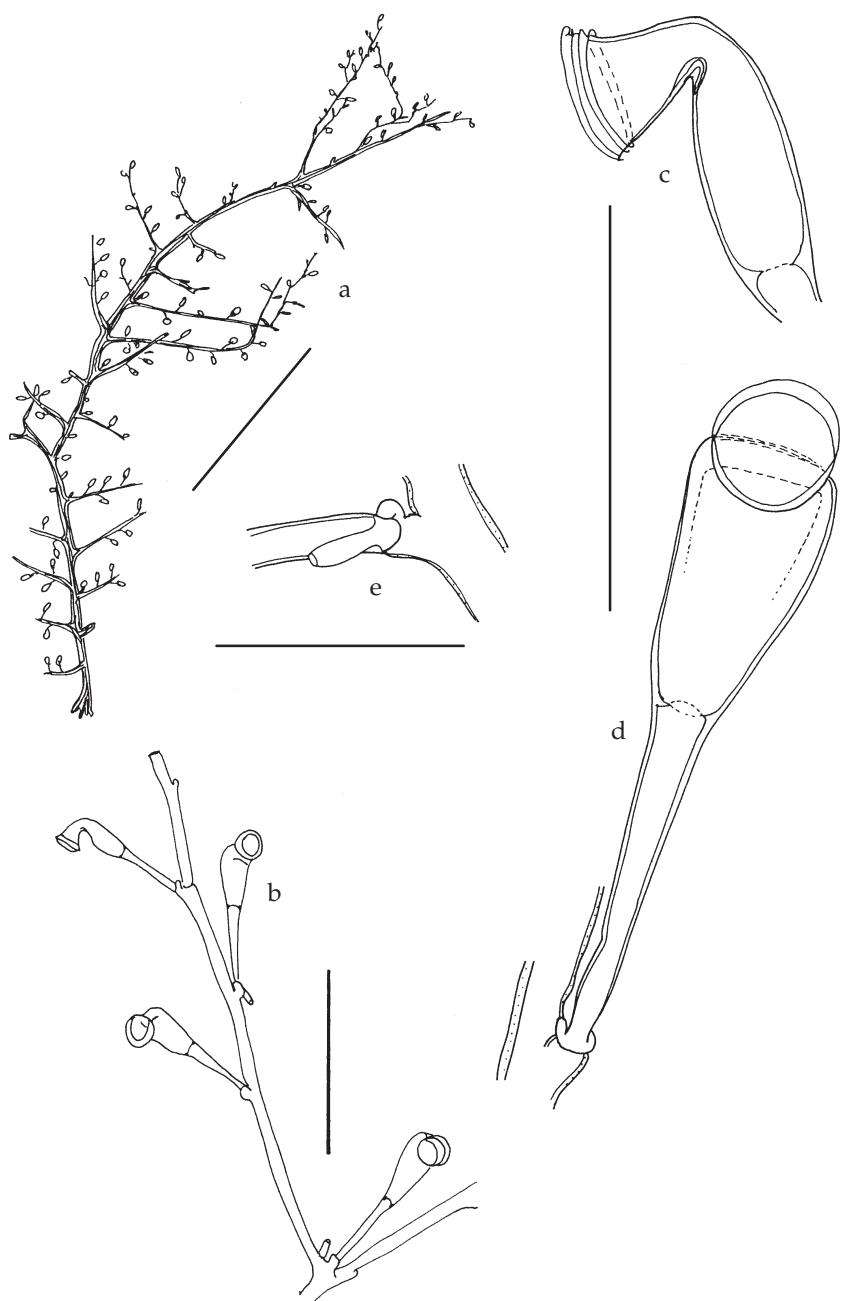


Fig. 5a-e. *Zygophylax sibogae* Billard, 1918 from stn 55; a, colony; b, forked branch with axillary hydrotheca; c, lateral view of hydrotheca; d, anterior view of hydrotheca; e, nematotheca. Scale bar: a, 1 cm; b, 1 mm; c-d, 0.5 mm; e, 0.3 mm.

Hydranths deeply withdrawn into hydrotheca, too poorly preserved for description.

Colour.— Transparent and colourless.

Table 3. Measurements of *Zygophylax sibogae* in µm.

Branch	
width	70-100
distance between hydrothecal pedicels	560-820
Hydrotheca	
width of pedicel at apophysis	40-45
length of pedicel	430-550
length, floor to bend	280-300
width at floor	75
width at flexure (lateral view)	120-130
width at flexure (anterior view)	270-190
diameter at margin	150-160
Nematotheca	
length of tube	100-530

Remarks.— The colony is quite flaccid out of fluid. The nematothecae are variable in length, the smaller cigar-shaped tubules being more or less similar in length and width; the longer ones are probably regrowth from the original basal tubules.

Morphology and dimensions of the hydrotheca are remarkably uniform throughout the colony. In anterior view, the bend in the hydrotheca appears as a thickened line bisecting the body behind the margin; in lateral view it is seen as a deep flexure. This flexure is much more pronounced than depicted in figures and electron micrographs of the same species by Altuna Prados & Álvarez Claudio (1995). However, because of the variability in the outward bend of the hydrotheca in a wide range of material of *Z. sibogae* from New Caledonia and New Zealand (Watson & Vervoort, in preparation) we do not hesitate in referring the seamount material to this species.

Distribution.— Indo-Pacific, Japan, southern Africa, Bay of Biscay region (Altuna Prados & Álvarez-Claudio, 1995).

#### Genus *Filellum* Hincks, 1868

*Filellum* spec.  
(fig. 6a-b)

Material .— TM K1704, CSIRO Cruise SSO1/97, Stn 14, microslide MV F83433 from a sparse, infertile colony creeping on *Tasmanaria aegis* spec. nov.

Description.— Colony stolonial, hydrorhiza tubular, undulating. Hydrothecae sessile, variable in length, basal part adnate to substrate, a little inflated, abcauline wall of adnate part a finely wrinkled meshwork; free part of hydrotheca cylindrical, turned sharply upward, perisarc thin, margin circular, rim moderately everted, some hydrothecae with up to three widely spaced marginal replications.

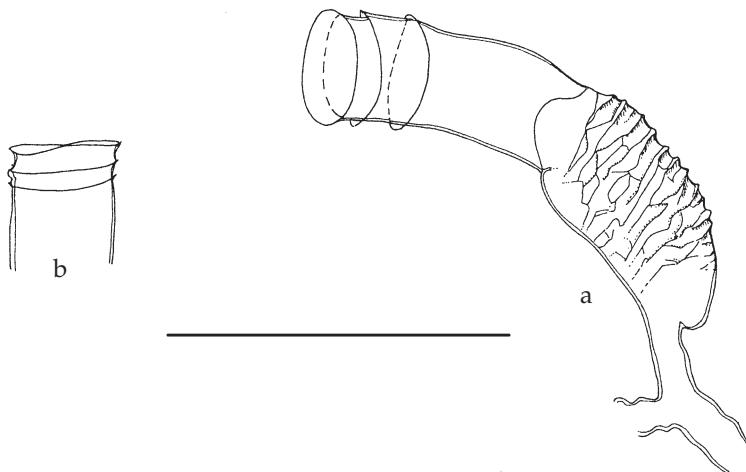


Fig. 6a-b. *Filellum* spec. on *Tasmanaria aegis* spec. nov. from stn 14; a, single hydrotheca showing mesh-work of adcauline striae; b, replicated rim of margin. Scale bar: 0.5 mm.

Table 4. Measurements of *Filellum* spec. in  $\mu\text{m}$ .

Hydrorhiza	
width	40-50
Hydrotheca	
overall length	450-850
length of free part including replications	340-500
diameter of margin	90-220

Remarks.— The large size and wrinkled rather than striated abcauline wall of the seamount specimen distinguishes it from other species of *Filellum*. However, as species of *Filellum* are very difficult to identify in the absence of the coppinia, we cannot assign the specimen to any known species.

**Family Haleciidae Hincks, 1868**  
**Genus *Halecium* Oken, 1815**  
*Halecium ralpiae* spec. nov.  
 (fig. 7a-d)

*Halecium beanii* pro parte Ralph, 1958: 332, fig. 10 a,b, e-k.

*Halecium sessile* pro parte Hirohito, 1995: 27, fig. 7 e-h.

Material.— TM K1717, CSIRO Cruise SSO1/97, Stn 36, female colony 45 mm high, detached from substrate (holotype); microslides MV F83434 & 83435, RMNH-Coel. 29003, slide 4453 parts of holotype colony. TM K1718, CSIRO Cruise SSO1/97, Stn 56, small female colony to 30 mm high, detached from substrate; microslide (MV F83437), colony. TM K1719, CSIRO Cruise SSO1/97, Stn 15, branched female colony 50 mm high attached to a coral fragment. TM K1720, CSIRO Cruise SSO1/97, Stn 50, four small colonies to 15 mm high, poorly preserved.

Description.— Colonies lacking a true main stem, branching and rebranching irregularly from near base; proximal stem heavily fascicled by a mass of gnarled polysiphonic tubes, these becoming nearly parallel further up stem and running along secondary and tertiary branches; ultimate branches monosiphonic.

Monosiphonic branches flexuous, often bifurcate, internodes variable in length, usually long and slender, widening distally to a node just above primary hydrophore. Nodes distinct, somewhat tumescent, tilted away from hydrophore; perisarc thin and hyaline. Primary hydrophores sub-sessile, alternate, abcauline wall sloping smoothly outwards, adcauline wall adnate; hydrotheca shallow saucer-shaped, diaphragm distinct, a ring of desmocytes above; margin circular, a little elevated on adcauline side, very slightly everted, sometimes replicated once or twice. Secondary, sometimes tertiary hydrophores present, often curved; pedicel usually long, proximally tumescent, expanding to base of hydrotheca. Hydranth large, with about 20 tentacles.

Gonothecae large, borne distally on monosiphonic branches, usually facing distally on branch, seated on a long expanding pedicel inserted into a short tumid apophysis opposite or below a hydrophore; pedicel merging into base of gonotheca. Mature gonotheca coiled into a flattened disk; perisarc thin, a tumescence (visible only in transverse view) on each side of gonotheca at junction with pedicel; recurvature of distal region onto lower body producing a cavity partially filled by a pair of upwardly-facing hydrothecae with reduced hydranths, seated on the pedicular tumescence. A subcircular thinning of perisarc is visible in the distal wall inside the cavity. Gonophore a chain of up to ten large ova following curve of gonothecal wall.

Colour.— Lower stem probably yellow in life, ultimate branches white to colourless.

Table 5. Measurements of *Haleciump ralpiae* spec. nov. in  $\mu\text{m}$ .

Branch	
length of internode	450- 880
width at node	80- 120
Hydrotheca	
depth to diaphragm	25-45
diameter at margin	130-160
length of secondary and tertiary hydrophores	320-590
Gonotheca	
length of pedicel	330-500
maximum diameter of mature gonotheca	1000-1060

Remarks.— Immature gonothecae are kidney-shaped, exposing the twin upwardly-facing, gonophoral hydrothecae seated on the pedicular tumescences; by maturity, the hydrothecae are almost enclosed by coiling of the distal end of the gonotheca. Thinning and rupture of the internal distal wall of this enclosure permits escape of the ova.

The species has a colony structure similar to that reported by Ralph (1958) for *Haleciump beanii* (Johnston, 1838) from New Zealand. However, the female gonotheca of that material, collected in deep water off the Chatham Islands east of New Zealand and figured by Ralph (1958, fig. 10e) as the gonotheca of *H. beanii*, is more tightly

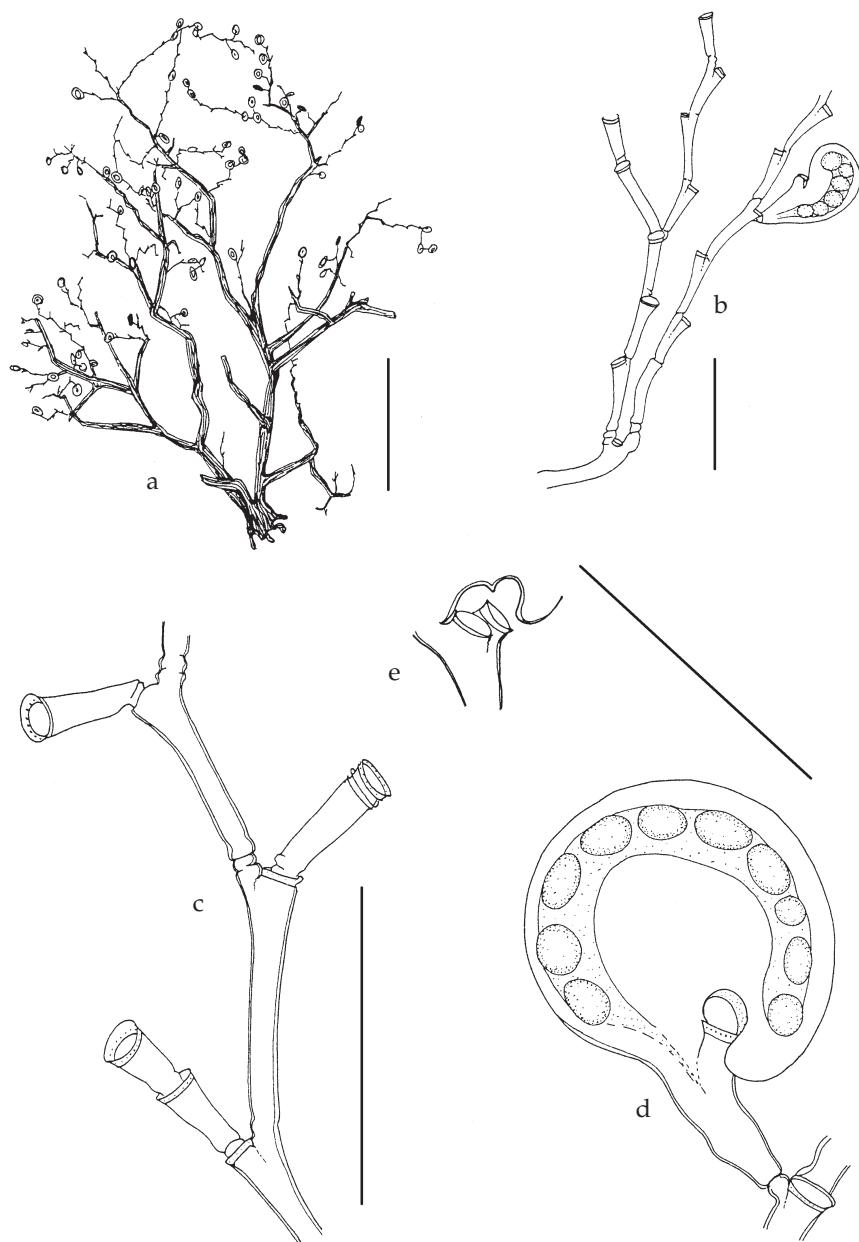


Fig. 7a-e. *Halecium ralpae* spec. nov. from stn 36; a, fertile colony; b, branch with immaturity, partially coiled gonotheca; c, part of branch showing internodes, multiple hydrophores and replicated hydrothecal margin; d, mature, fully coiled gonotheca, with paired gonothecal hydrothecae; e, apertures of paired gonothecal hydrothecae. Scale bar: a, 1 cm; b-e, 1 mm.

coiled than is known for that species. Furthermore, the present material has two, not one gonophoral hydrotheca as in *H. beanii*. An immature and a ripe gonotheca from Sagami Bay material, figured by Hirohito (1995, fig. 7 f, g) as that of *Halecium sessile* Norman, 1867, may also belong to *H. ralphae* spec. nov.

**Distribution.**— Previously known only from one locality at a depth of 475-512 m off the Chatham Islands. Possibly, as explained above, also from shallow water in Sagami Bay, Japan.

**Etymology.**— Named for the late Patricia M. Ralph, who greatly assisted one of us (J.E.W.) with advice and encouragement.

*Halecium fragile* Hodgson, 1950  
(fig. 8a-e)

*Halecium fragile* Hodgson, 1950: 15, figs 25-27; Ralph, 1958: 340, fig. 11a-d; Watson, 1994: 66.

**Material.**—TM K1711, CSIRO Cruise SSO1/97, Stn 6, a small fertile colony of a few stems growing on *Gonaxia tasmanica* spec. nov.; microslides MV F83439 & 83440, RMNH-Coel. 29004, slide 4454, parts of colony.

**Description.**— Stems to 8 mm high, arising from a stolon loosely winding over host. Hydrocaulus monosiphonic, delicate, flexuous, of same diameter as hydrorhiza. A node above junction with hydrorhiza and one to three nodes below first hydrotheca; hydrocaulus simple or sparingly dichotomously branched from paired knob-shaped apophyses below a hydrotheca. Cauline internodes long, straight or a little curved, expanding smoothly to hydrophore. Proximal node just distal to hydrophore, transverse to slightly oblique, deeply constricted. Hydrotheca shallow, walls flaring to margin, diaphragm distinct, a row of desmocytes above, rim delicate, sometimes replicated. When present, secondary hydrophores arising from a constriction below hydrothecal diaphragm. Perisarc thin and smooth throughout. Hydranths too poorly preserved for description.

Gonothecae given off on a pedicel from within hydrophore, pedicel rounded distally; gonotheca long, sausage-shaped, when mature with blunt apex, without operculum, perisarc very thin. Gonophore too poorly preserved to accurately determine sex, but probably male.

Table 6. Measurements of *Halecium fragile* in µm.

Internode	
length of first cauline internode	2250
length of succeeding internodes	950-1330
width at node	60-80
Hydrotheca	
depth from margin to diaphragm	25
diameter at margin	150- 180
Gonotheca	
length	950-1050
width	230- 260

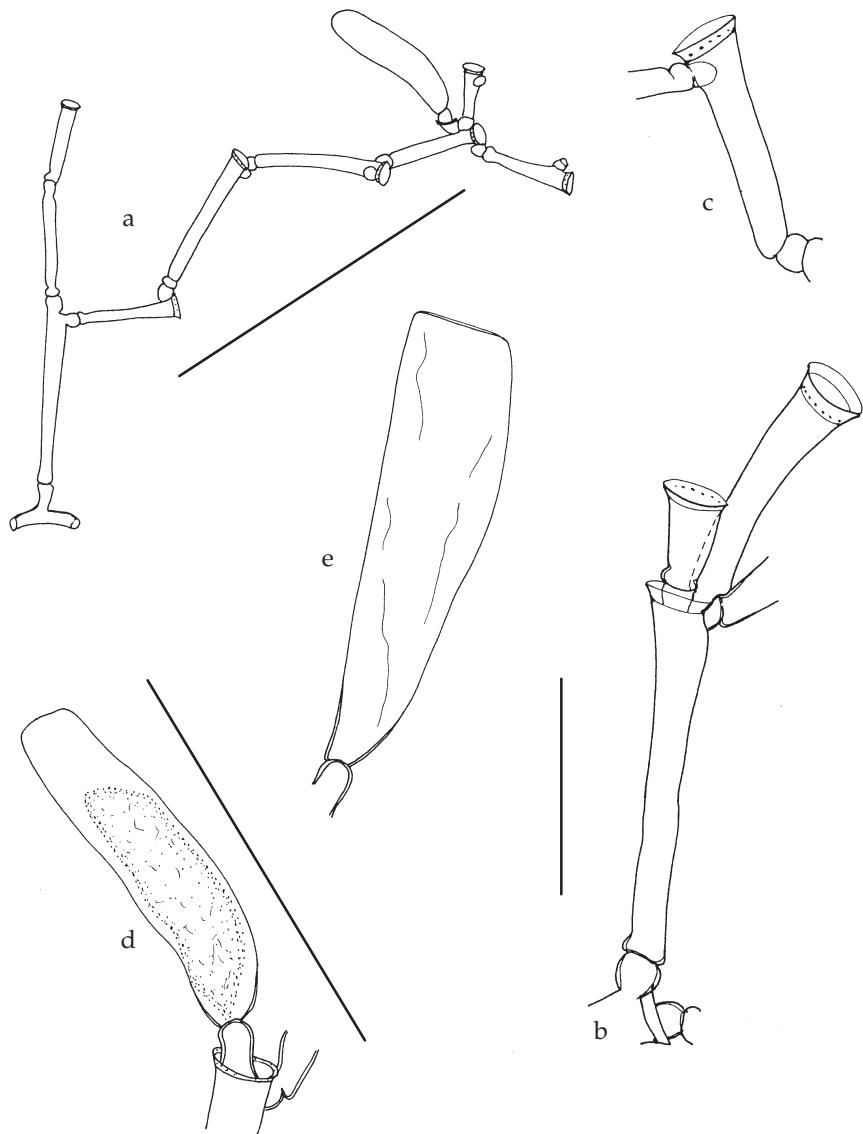


Fig. 8a-c. *Halecium fragile* Hodgson, 1950 on *Gonaxia tasmanica* spec. nov. from stn 6; a, stem with hydrorhiza; b, stem internode with two secondary hydrophores; c, branching from internode below hydrotheca; d, nearly mature gonotheca; e, empty gonotheca. Scale bar: a, 2 mm; b-c, 0.5 mm; d-e, 1 mm.

Remarks.— Replicated hydrothecal margins are often closely overlapping, their presence being revealed only by multiple rows of desmocytes.

The present material falls within the range of dimensions of *H. fragile* given by Hodgson (1950) and Ralph (1958) and conforms well with their descriptions, though their figures do not show the dichotomous branching. As presently known, the species is an epizoite of other hydroids. The gonotheca of *H. fragile* is here

recorded and described for the first time.

Distribution.— Shallow waters of south-eastern Tasmania (Hodgson, 1950), eastern Bass Strait (Watson, 1994) and New Zealand (Ralph, 1958).

**Family Sertulariidae Hincks, 1868**

**Genus *Sertularella* Gray, 1848**

*Sertularella vervoorti* El Beshbeeshy, 1991

(fig. 9a-d)

*Sertularella cylindritheca*; Vervoort, 1972: 120, 126, fig. 39a; Stepanjants 1979: 90, pl. 14 fig. 5A-B; Cornelius, 1979: 306 (not *Sertularella cylindritheca* Allman, 1888).

*Sertularella vervoorti* El Beshbeeshy, 1991: 192, fig. 48; Vervoort, 1993: 192.

Material.— TM K1712, CSIRO Cruise SSO1/97, Stn 50, a small fertile colony on upper branch of *Tasmanaria aegis* spec. nov.; microslides MV F83442-83445, RMNH-Coel. 29005, slide 4455, parts of colony.

Description.— Hydrorhiza creeping on host; no true stems present. Hydrocauli up to 35 mm long, monosiphonic, flaccid, sparingly branched, one or two branches given off subdichotomously, a hydrotheca in fork. Internodes long and slender, perisarc smooth, expanding a little distally, one hydrotheca distal on internode, node an indentation in perisarc. Hydrothecae on front of stem, large, almost tubular; adcauline wall smooth, flatly convex, adnate part very short, convex, floor perpendicular to hydrothecal axis; abcauline wall variable in shape, faintly sinuous, concave or straight; margin of hydrotheca quadrate with four sharp cusps, separated by wide, flat embayments, rim replicated many times with fine, closely packed striae; operculum of four thick triangular valves.

Hydranths too poorly preserved for description.

Gonotheca borne beside base of hydrotheca, large, tumid, pedicel merging into body; when mature, irregularly barrel-shaped, expanding to mid-region, body with five to eight smooth annular ridges, these becoming deeper distally; apex with four equidistant cusps similar to hydrotheca, operculum of four finely striated valves. Female gonophore containing several large ova.

Colour.— Clear, hyaline.

Table 7. Measurements of *Sertularella vervoorti* in µm.

Internode	
length	2925-3500
width at node	350-330
Hydrotheca	
length of free adcauline wall (including marginal replications)	2375-2625
length of abcauline wall (including marginal replications)	2050-2475
diameter at margin	800-1000
width at floor	650-800
Gonotheca	
length	1900-2250
width	800-1100
width of margin	400-520

**Remarks.**— The hydrothecae are remarkably large in comparison with the thin, delicate caulus. The proximal region of some stems shows evidence of regeneration after sustaining damage. The specimens conform in most respects with *Sertularella vervoorti*; however, previous descriptions do not mention the numerous, closely set, fine replications of the hydrothecal margin, which considerably extend the length of the hydrotheca beyond the dimensions given for the species by previous authors (see El Beshbeeshy, 1991).

This is the first description of the gonotheca of *S. vervoorti*. A partially expelled gonophore suggests that reproduction may occur by means of an acrocyst.

**Distribution.**— Previously known from the south-western Atlantic (Vervoort, 1972), and Argentina (Stepan'jants, 1979; El Beshbeeshy, 1991).



Fig. 9a-d. *Sertularella vervoorti* El Beshbeeshy, 1991, fertile colony creeping on *Tasmanaria aegis* spec. nov. from stn 50; a, single stem; b, lateral view of hydrotheca with multiple marginal replications; c, hydrothecal margin seen from above; d, gonotheca. Scale bar: a, 5 mm; b-d, 1 mm.

**Genus *Symplectoscyphus* Marktanner-Turneretscher, 1890**  
*Symplectoscyphus epizooticus* Totton, 1930  
 (fig. 10a-d)

*Symplectoscyphus epizooticus* Totton, 1930: 185, figs 36a-b, pl. 1 figs 5-6; Ralph, 1961: 815, fig. 18d-e.

Material.— TM K1700, CSIRO Cruise SSO1/97, Stn 57, fertile colony, a tangled meshwork of many fine, lax stems detached from substrate; microslides MV F83447 & 83448, RMNH-Coel. 29006, slide 4456, parts of colony. TM K1701, CSIRO Cruise SSO1/97, Stn 15, fertile colony attached to dead coral *Solenosmilia variabilis* Duncan, 1873.

Description.— Hydrocauli monosiphonic, flexuous, perisarc smooth; stems simple or irregularly branched in several planes, some branched stems forked from an apophysis below a hydrotheca, forking subdichotomous to almost perpendicular. Internodes long and slender, variable in length, widening to base of hydrotheca; nodes indistinct, a transverse or a slightly oblique constriction in perisarc.

Hydrothecae alternate, one distal on internode, facing slightly frontally; abcauline wall smoothly concave, adcauline wall slightly convex, adnate about same length as free wall (to first marginal replication); hydrotheca narrowing a little to margin, a very thin band of tissue passing obliquely downwards from about one third distance along abcauline wall to low on adcauline wall; an elliptical to triangular fenestra in perisarc below floor. Margin tilted upwards, with three blunt cusps, one adcauline and two abcauline; hydrotheca extended by many fine marginal replications.

Gonotheca borne on a very short pedicel from a fenestra below hydrotheca; gonotheca standing free of stem, barrel-shaped, widest in mid-region, with 11-12 concentric ridges, proximal four or five reduced to undulations, distal seven or eight deep with upturned flanges, perisarc very finely vertically striated between flanges. Orifice of gonotheca trumpet-shaped, seated in a dish-shaped depression surrounded by a deep flange.

Colour.— Preserved material colourless and transparent.

Table 8. Measurements of *Symplectoscyphus epizooticus* in µm.

Internode	
length	730-1030
width at node	70-90
width below hydrotheca	180-200
Hydrotheca	
width at floor	100-140
length of adnate adcauline wall	200-250
length of free adcauline wall to first replication	170-190
length of abcauline wall floor to first replication	220-280
width at margin	150-180
Gonotheca	
overall length	1030
maximum width including flanges	680-780
length of neck	155
diameter of orifice	185

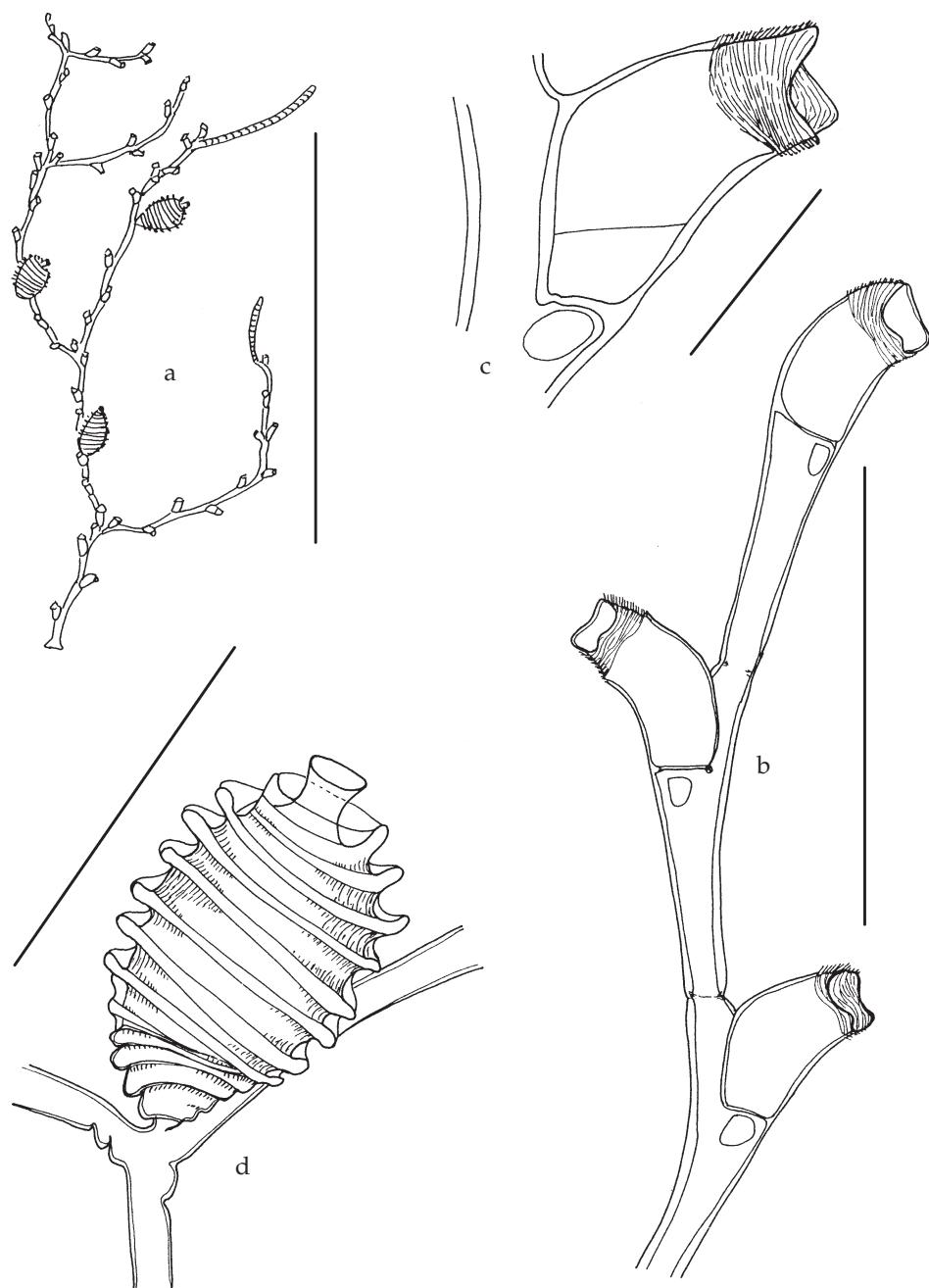


Fig. 10a-d. *Symplectoscyphus epizooticus* Totton, 1930; a, stn 15, fertile stem with apical tendrils from colony on colonial coral; b-d, stn 57; b, stem internodes and hydrothecae; c, hydrotheca with replicated margin and diagonal tissue remnant; d, gonotheca. Scale bar: a, 5 mm, b, d, 1 mm, c, 0.5 mm.

Remarks.— Many hydrocauli end in long, undulating tendrils often forming anastomoses with adjacent stems, producing a tangled meshwork. A tendril identical to those in the present material is clearly shown in Totton's photograph of *S. epizooticus* (1930, pl. 1, fig. 5). Such a meshwork would be advantageous in supporting a flexuous and fragile colony. The numerous marginal replications suggest aged hydrothecae; however, as many hydrothecae still retain fresh opercular remnants, it is possible that replication may be a normal character of the species.

While neither hydranths nor gonophores are preserved in the present material, the relatively large gonothecal orifice suggests a female colony. Totton's specimen bore only a single, probably immature male gonotheca.

Distribution.— *Symplectoscyphus epizooticus* Totton, 1930, has previously been recorded only from the type locality at a depth of 546 m off northern New Zealand.

#### Genus *Tasmanaria* gen. nov.

Diagnosis.— Large, arborescent, planar or plumose colonies; hydrocaulus polysiphonic, perisarc thick; hydrothecae biserrate, alternate or subalternate, immersed in hydrocladia and branches; margin of hydrotheca circular, rim edentulate, operculum of one delicate concave or convex valve fragmenting at eruption of hydranth. Gonothecae large, pyriform, borne singly on branches.

Type species: *Sertularella edentula* (Bale, 1924), as designated below.

The seamount collection contains two sertulariid species: one forming large, heavily fascicled, arborescent colonies, and another, having smaller, plumose colonies. Both species have a circular, edentulate hydrothecal margin and a saucer-shaped operculum. Edentulate genera considered in identification of the species were *Abietinaria* Kirchenpauer, 1884, *Sertularella* Gray, 1848, *Thuiaria* Fleming, 1828 (see Bouillon, 1985; Cornelius, 1995, and Peña Cantero et al., 1997, for generic definitions) and *Papilionella* Antsulevich & Vervoort, 1993. As there is no distal narrowing of the hydrotheca, *Abietinaria* was rejected, and *Sertularella* was not further considered since there is no evidence of a four-valved hydrothecal operculum. The large, rigid colonies and hydrothecae immersed in the internode conform best with concepts of *Thuiaria*, the major difference being the lack of evidence for a single, abcauline opercular valve. While similar in many respects to *Papilionella* the operculum of the seamount material is saucer-shaped and tends to fragment, compared with the more robust wing-shaped operculum of *Papilionella*.

In overall colony morphology the seamount specimens are almost identical with *Sertularella edentula* Bale, 1924, from New Zealand. Bale reported *S. edentula* as having a "trivalvate" operculum which does not accord with the four valves characteristic of *Sertularella*. We have examined five microslide preparations of *Sertularella edentula* held in the collection of the Museum of Victoria, Registered Number MV F58218, nominated "holotype" by Stranks (1993). The slides are labelled in Bale's handwriting "*Sertularella edentula* Bale. Off Cape Maria van Diemen N.Z.". All specimens are monosiphonic parts of branches. A slide from that series labelled with Bale's personal catalogue No. 75 and nominated by him as "cotype", contains several gonothecae. Ralph (1961) examined fragments and made microslide preparations of the original spirit preserved material of *S. edentula* held in the Canterbury Muse-

um, Christchurch, New Zealand, nominating them as holotype. A thorough search for this material by one of us (J.E.W., 1997) in the collections in the Canterbury Museum was unsuccessful. The holotype series is thus assumed to be lost. We therefore designate the five microslides of *Sertularella edentula* Bale, 1924, in the Museum of Victoria as type series as follows: Bale slide No. 75 as lectotype of *Sertularella edentula*; the four remaining slides as paralectotypes. Several of these microslide specimens show remnants of thin, shallow, saucer-shaped opercula inside the margins of some hydrothecae or as thin, scarcely visible fragments adhering to the rim. These sometimes angular fragments may be what Bale believed were opercular valves.

*Tasmanaria aegis* spec. nov.  
(fig. 11a-e)

**Material.**— TM K1702, CSIRO Cruise SSO1/97, Stn 57, one large branched colony 40 cm high on dead colonial coral *Solenosmilia variabilis* Duncan, 1873 (holotype), microslides MV F83450 & 83451 from holotype colony. TM K1704, CSIRO Cruise SSO1/97, Stn 45, fragmented fertile colony originally about 70 mm high detached from substrate; microslides MV F83452 & 83453, RMNH-Coel. 29007, slide 4457, parts of colony. TM K1703, CSIRO Cruise SSO1/97, Stn 37, fertile colony originally at least 23 cm high, now fragmented, on dead colonial coral *Solenosmilia variabilis*. TM K1705, CSIRO Cruise SSO1/97, Stn 6, small infertile colony 40 mm high. TM K1706, CSIRO Cruise SSO1/97, Stn 15, fragmentary infertile colony on dead coral *Solenosmilia variabilis*. TM K1707, CSIRO Cruise SSO1/97, Stn 50, fragmentary infertile colony originally about 30 cm high.

**Description,** based on holotype and paratype TM K1704.— Hydrorhizae of holotype a thick plug of perisarc up to 25 mm wide; those of paratype ramified, the stolons wound tightly around the colonial coral *Solenosmilia variabilis*.

Colonies heavily fascicled throughout; stems of large colony up to 8 mm thick at base, irregularly and arborescently branched more or less in one plane from just above base.

Hydrocladia pinnate on branches, alternate, up to 50 mm in length, standing out stiffly at an angle of about 70° to branch from a short, tumid apophysis, a caulin hydrotheca on each side of hydrocladium and one opposite; hydrocladium athecate proximally, internodes few, but where present, nodes passing obliquely between pairs of hydrothecae.

Hydrothecae biseriate, immersed in internode, sub-alternate, laterally separate, tubular, narrowing almost imperceptibly from base to margin. Walls smooth, perisarc very thick, adcauline wall smoothly convex, almost entirely adnate. Some hydrothecae with a short free wall. Base of hydrotheca recurved into a terminal plug of perisarc, abcauline wall almost straight, sometimes a faint bulge opposite floor, usually a small internal peg of perisarc on abcauline wall opposite floor; an elliptical scar of varying size, infilled with thin perisarc, below some hydrothecae. Hydrothecal margin tilted upwards at an angle of 30°-40° to hydrocladial axis; margin circular, edentulate, with a thickened, slightly everted rim. Some hydrothecae with up to six close, submarginal replications; margin closed by a low operculum of one saucer-shaped valve, much torn and usually collapsed inward, a ring of minute internal opercular fragments usually adhering to the submarginal ring.

Hydranths with about 20 tentacles, too poorly preserved for description.



Fig. 11a-e. *Tasmanaria aegis* spec. nov., holotype from stn 57; a, branch; b, monosiphonic part of branch; c, branch internodes with hydrotheca with marginal rim and hydrotheca with concave operculum; d, gonotheca adpressed to branch; e, anterior view of female gonotheca. Scale bar: a, 10 cm; b, 3 mm; c, e, 1 mm.

Gonothecae large, shield-shaped, perisarc very thick, borne without pedicel below a hydrotheca on distal half to third of hydrocladium, narrow at base, expanding distally, proximally lightly adpressed to hydrotheca then standing free, adcauline wall strongly convex, abcauline wall faintly convex to almost straight, produced into two large bluntly pointed spines, body of gonotheca narrowing between and above spines into a long tubular neck with broadly bilobate orifice, an embayment facing downwards to abcauline spines. No operculum visible. Gonophore spherical, occupying about half gonotheca, containing several large ova.

Colour.—Honey brown.

Table 9. Measurements of *Tasmanaria aegis* spec. nov. in  $\mu\text{m}$ .

Stem		
distance between successive cauline hydrothecae (same side of stem)	1340-2130	
distance between successive hydrocladia (same side of stem)	8000	
Hydrocladium		
width of apophysis	250-350	
distance to base of proximal hydrotheca	1250-1300	
distance between successive hydrothecae (same side of hydrocladium)	1720-1880	
Hydrotheca		
length of adnate adcauline wall	1150-1180	
length of free adcauline wall		
diameter at margin	390-450	
Gonotheca		
overall length	2630-2750	
maximum width	1200-1250	
length of neck	530-650	
diameter of orifice	510-580	
length of spines	100-270	

Remarks.—Older colonies (preserved material) are rigid, exceedingly brittle and tend to disintegrate when handled; younger colonies are more flexible. The larger colonies have no true main stem, branching commencing almost from the base. The largest colony (from Stn 57) shows evidence of breakage of the lower main stem and regrowth of a secondary branch into a new main stem.

Due to desiccation before preservation the hydranths are too poorly preserved for accurate description. They do, however, appear to be robust with about 20 stubby tentacles. Few hydrothecal opercula remain, and compared to the thick, robust hydrothecal perisarc they are extremely delicate, most remaining as shreds collapsed into the hydrotheca. The gonothecae are distinctive and although only a few are present on colony TM K1704, numerous subhydrothecal scars on other colonies suggest prolific reproduction.

*Tasmanaria aegis* spec. nov. is the most abundant species in the collection, being recorded from depths of 640-1815 m.

Etymology.—The generic name *Tasmanaria* is derived from Tasmania to indicate the presence of the genus on the Tasmanian seamounts; the specific name is taken from the latin noun “aegis”, shield, and refers to the shield-shaped gonotheca.

*Tasmanaria monticola* spec. nov.  
(fig. 12a-c)

**Material.**— TM K1710, CSIRO Cruise SSO1/97, Stn 36, infertile colony comprising two stems, 45 mm and 65 mm high with one side branch, stems detached from hydrorhiza (holotype); microslides MV F83455-83457, RMNH-Coel. 29008, slide 4458, from holotype colony.

**Description of holotype.**— Hydrorhiza a small bunch of tubes, stem polysiphonic; tubes almost parallel, running almost halfway up stem and branches before becoming monosiphonic.

Hydrocladia on branches pinnate, alternate, about 4 mm apart, up to 20 mm in length, directed upwards at an angle of about 30° to branch from a moderately long elbow-shaped apophysis, a hydrotheca in axil, one halfway between successive hydrocladia and one opposite hydrocladium; a transverse, poorly marked node above axillar hydrotheca.

Hydrocladium with a long, curved athecate section above apophysis; hydrocladinal nodes few but where present, only as a shallow transverse to oblique constriction in perisarc just distal to hydrothecal pairs.

Hydrothecae biseriate, alternate, almost completely immersed in internode, laterally separate, tubular, narrowing a little behind margin. Walls smooth, perisarc thick, adcauline wall smoothly convex, almost completely adnate, free wall less than one fifth length of adnate part; free wall of branch hydrothecae longer. Base of all hydrothecae sharply recurved into a short, almost horizontal plug of perisarc with downwardly pointed spur, abcauline wall faintly sinuous, a small internal shelf of perisarc opposite adcauline plug; an elliptical scar, thinly infilled with perisarc below adcauline plug in most hydrothecae.

Margin of hydrotheca thin, tilted upwards at an angle of about 25° to hydrocladinal axis, circular, thin, edentulate; some hydrothecae with a few close submarginal replications from within margin and some with minute internal denticles.

Hydranths too poorly preserved for description.

Colour.— Pale honey brown.

Table 10. Measurements of *Tasmanaria monticola* spec. nov. in µm.

<b>Hydrocladium</b>	
width of apophysis (adcauline side)	250-300
width at distal node	350-470
distance between successive hydrothecae	3250-4125
width of hydrocladium at node	210-320
<b>Hydrotheca</b>	
total length adcauline wall	570-600
length of free adcauline wall	50-100
diameter at margin	170-290

**Remarks.**— While *Tasmanaria monticola* spec. nov. is in many respects similar to *Tasmanaria aegis* spec. nov., the colonies are much smaller and more flexuous. In addition the hydrothecae are smaller, the distance between the hydrothecae on branch

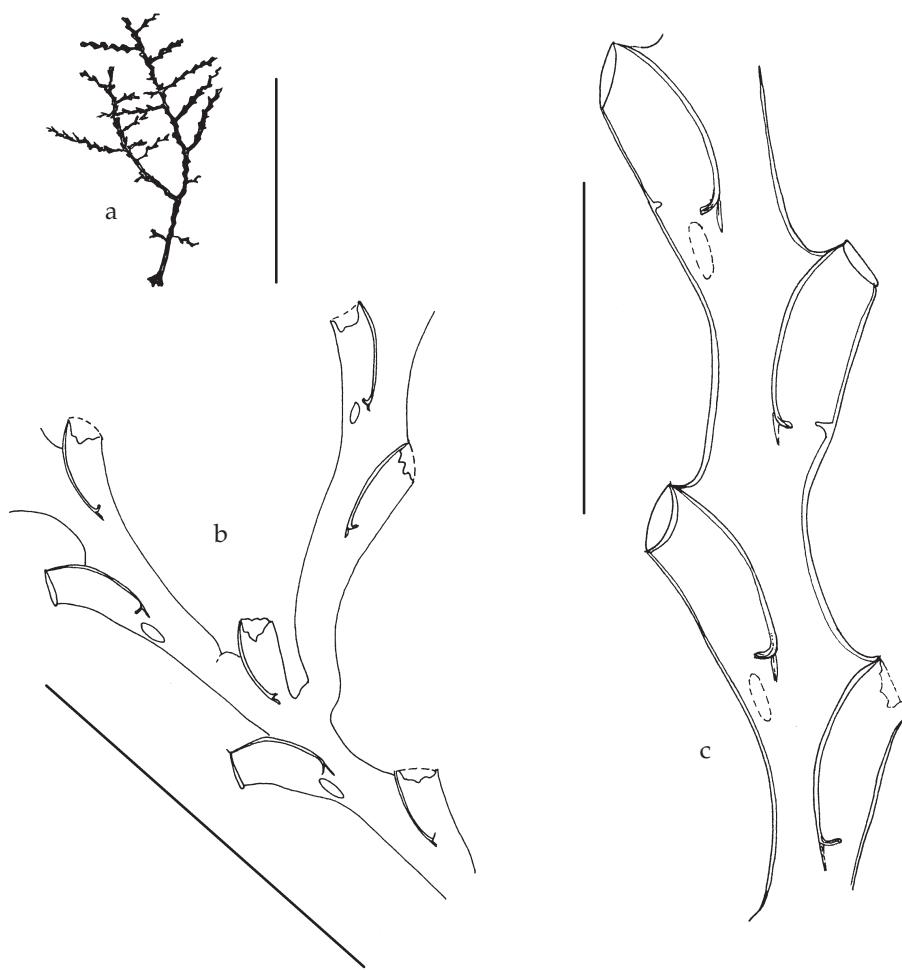


Fig. 12a-c. *Tasmanaria monticola* spec. nov., holotype, from stn 36; a, colony; b, monosiphonic branch with axillary hydrotheca; c, branch internode with hydrothecae. Scale bar: a, 5 cm; b, 5 mm; c, 2 mm.

internodes is much greater, and the marginal rim of the hydrotheca is much thinner and is not everted as in *Tasmanaria aegis*. Although no opercula remain, the marginal rims of some hydrothecae contain minute internal denticles indicating the position of an opercular plate, as in *Tasmanaria aegis*.

**Etymology.**— The specific name '*monticola*', meaning 'living on a mountain', refers to the seamounts where the species was taken.

**Genus *Gonaxia* Vervoort, 1993**

*Gonaxia tasmanica* spec. nov.

(fig. 13a-d)

**Material.**— TM K1698, Stn 6, a fragmentary infertile stem originally 100 mm high (holotype);

microslides MV F83462 & 83463, RMNH-Coel. 29009, slide 4459, from holotype colony. TM K1697, CSIRO Cruise SSO1/97, Stn 57, two infertile stems; microslides MV F83459 & 83460, from these stems.

Description, based on holotype and paratypes.— Stems plumose, straight, stiff, erect, fasciculated for about two thirds of length, polysiphonic tubes broad, running almost parallel up stem; stems becoming monosiphonic in distal third, perisarc thick and hyaline.

Hydrocladia alternate, given off above base of stem to apex, up to 27 mm long, monosiphonic, joining stem at an angle of about 65° to caudine axis; hydrocladial apophysis a small indistinct constriction. Three hydrothecae between each hydrocladium, one about halfway between successive hydrocladia, one on opposite side of stem a little below level of hydrocladial apophysis (both these the same as hydrocladial hydrothecae) partially immersed in fascicular tubes; the third hydrotheca partially emergent from fascicular tubes in axil of hydrocladium.

Hydrocladial nodes indistinct, oblique to transverse constrictions in perisarc between hydrothecae. Hydrothecae biserrate, subopposite to alternate, well separated laterally, long and tubular, variable in length, directed upwards at an angle of 55° to internode, adcauline wall smoothly convex, adnate part variable in length from equalling to twice length of free wall, thick, curving down to a hook-shaped floor terminating in thick untidy strands of perisarc. Internode swollen opposite adnate part of adcauline wall; abcauline wall flatly concave to almost straight, a triangular peg of perisarc projecting inward at base just above level of adcauline hook. Margin tilted upwards at an angle of about 30° to hydrocladial axis, with three very low blunt cusps, one abcauline and two lateral, separated by shallow embayments. Operculum of three valves; a few hydrothecae with marginal replications producing rim into a short neck.

Axillar hydrotheca differing from others; small, digitate, pointing upwards, adcauline wall slightly convex, abcauline wall straight or concave, narrowing distinctly to margin. Margin variable in shape, ranging from circular with everted rim to incipiently dentate; rim often replicated, extending into a long neck.

Hydranths well preserved in distal part of colonies, deeply contracted into hydrothecae, with a ring of about 16 short, stubby tentacles.

Colour.— Main stem and fascicular tubes pale brown, hydrocladia pale brown to white.

Table 11. Measurements of *Gonaxia tasmanica* spec. nov. in µm.

Stem	
distance between successive hydrocladia on same side of stem	3200-3500
distance between successive hydrothecae on same side of stem	630-680
Hydrocladium	
width at node	260-330
Hydrotheca	
length of adnate adcauline wall	530-620
length of free adcauline wall	350-690
length of abcauline wall from internal peg to margin	630-690
maximum width	300-320
diameter at margin	240-280

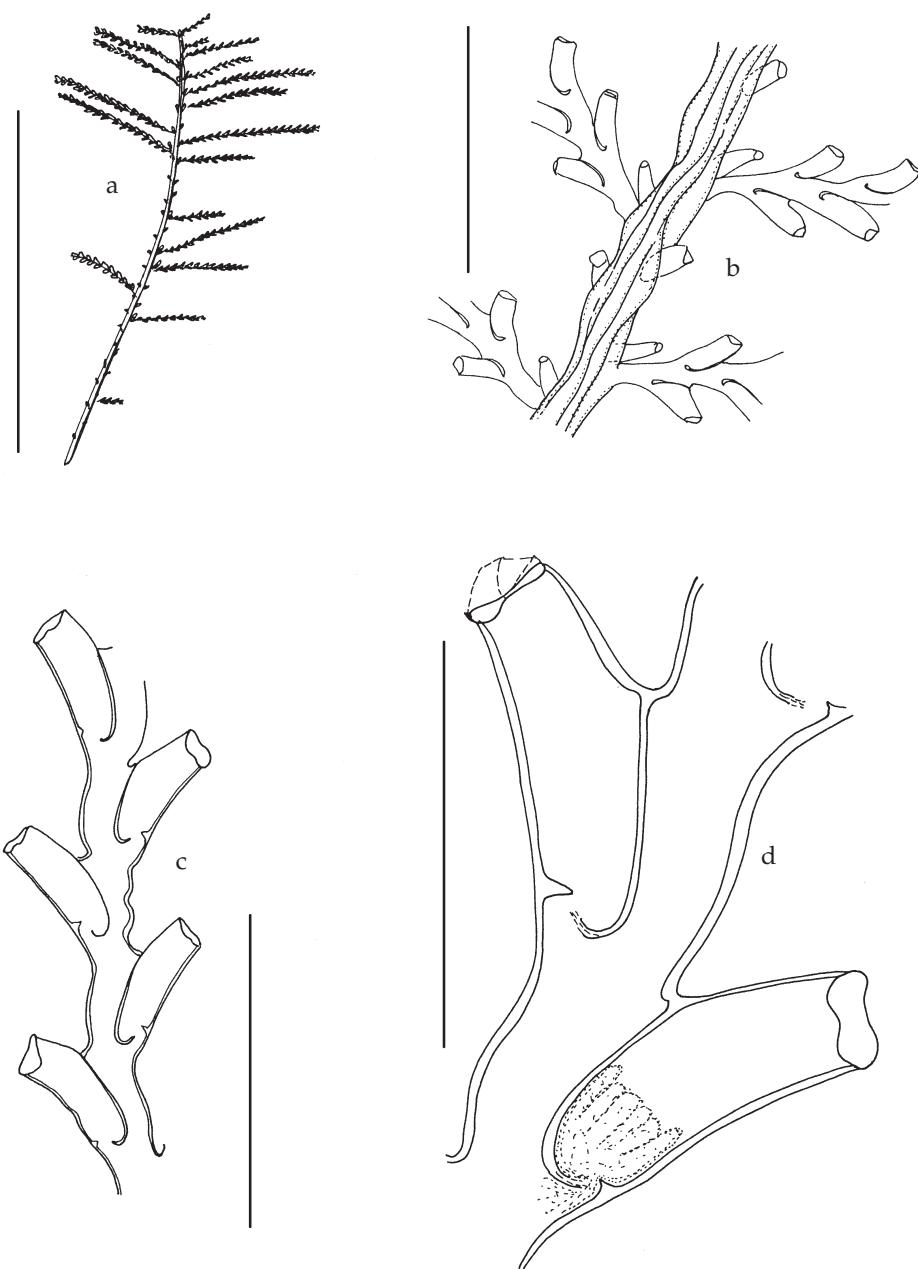


Fig. 13a-d. *Gonaxia tasmanica* spec. nov., holotype from stn 6; a, colony; b, polysiphonic part of stem with axillary hydrothecae; c, branch internodes; d, hydrothecae. Scale bar: a, 5 cm; b, 4 mm; c, 2 mm; d, 1 mm.

Axillary hydrotheca	
length	1050-1150
maximum width	290-330
diameter at margin	180-200

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Remarks.— The axillary hydrothecae are morphologically quite distinct from other hydrothecae and where hydrocladia have been shed they remain on the hydrocaulus, imparting a spiky appearance to the stem. As there is no evidence of gonothecae, the colonies are probably immature. The stems are brittle, hydrocladia being readily shed.

Colony morphology and dentition of the margin places the material in the genus *Gonaxia* Vervoort, 1993. It is close to *Gonaxia errans* Vervoort, 1993, but differs from that species in the inflated internode opposite the hydrotheca, in the curved, digitate axillar hydrothecae, and in the greater length and curvature of the hydrocladial hydrothecae.

Several stems display such variation in width of the hydrotheca, length of the adnate adcauline wall and angle of the hydrotheca to the hydrocladial axis, that the extremes could well be assigned to two, rather than to one species. For the present, especially in the absence of the gonoosome, all are assigned to *G. tasmanica* spec. nov.

Distribution.— *Gonaxia* is a deep water genus known only from the New Caledonian region and northern New Zealand (Vervoort, 1993).

Etymology.— The species name is a reference to the type locality of seamounts in the neighbourhood of Tasmania.

#### Family Aglaopheniidae L. Agassiz, 1862

##### Genus *Lytocarpia* Kirchenpauer, 1872

*Lytocarpia lepida* spec. nov.

(fig.14a-h)

Material.— TM K1716, CSIRO Cruise SSO1/97, Stn 6, part of fertile stem 35 mm high bearing two corbulae (holotype); microslides MV F83464 & 83465, RMNH-Coel. 29010, slide 4460, from holotype colony.

Description of holotype.— Stem plumose, lightly fascicled, polysiphonic tubes almost parallel, running to top of stem. Cauline internodes long, node an indistinct transverse constriction in perisarc; three nematothecae unlike laterals on cauline internode, broad, saccate, one at base of hydrocladium, with orifice facing toward hydrocladium, one opposite hydrocladium, with orifice facing away from hydrocladium, and one behind hydrocladium.

Hydrocladia given off from frontal tube of stem, up to 18 mm long, lax; internodes long, nodes transverse, distinct; five equidistant partial intranodal septa passing into internode from base of hydrotheca, proximal septum oblique, originating beneath a notch in base of hydrotheca, followed by three more or less transverse septa, the fifth (sometimes absent) at base of lateral nematotheca.

Hydrotheca slipper-shaped, laying along internode, divided into an anterior and posterior chamber by a long diagonal blade-shaped septum passing from the basal

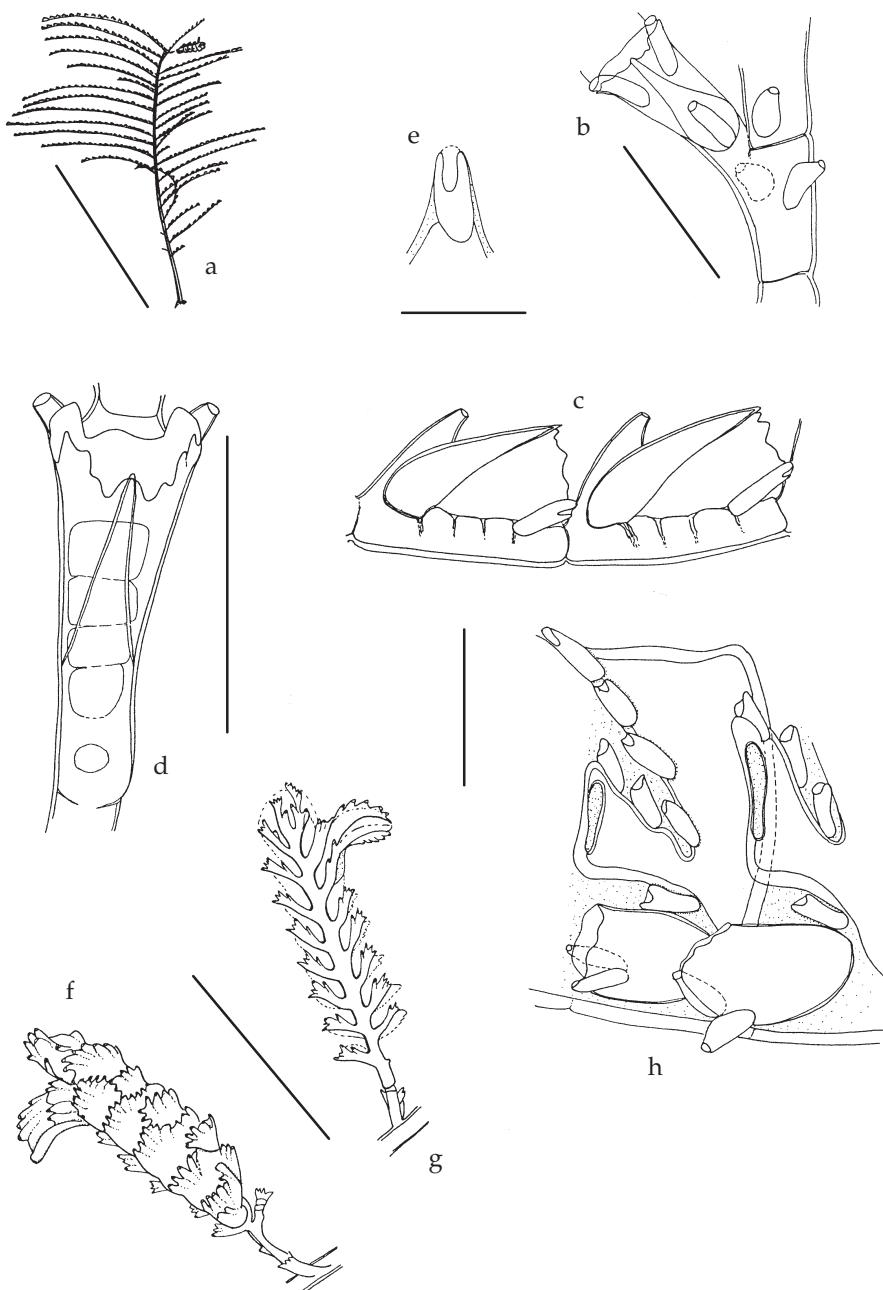


Fig. 14a-h. *Lytocarpia lepida* spec. nov., holotype from stn 6; a, colony; b, stem internode showing nematothecae and base of hydrocladium; c, lateral view of hydrothecae; d, anterior view showing diagonal septum and anterior spine; e, lateral hydrocladial nematotheca; f, g, corbula (drawn from stereo-microscope); h, bifurcated segment of corbula showing nematocladium and basal hydrothecae. Scale bar: a, 2 cm; b-d, h, 0.5 mm; g-f, 3 mm.

notch in floor to anterior margin; hydrotheca rounded posteriorly, with posterior abcauline wall convex, becoming flatly convex to slightly sinuous. Mesial nematotheca less than half length of hydrotheca, free part short, abcauline wall convex, terminal orifice large, circular, a secondary orifice of similar size just above hydrotheca, the two sometimes coalescent. Lateral nematothecae long, tubular, almost straight, extending just beyond hydrothecal margin, terminal orifice canaliculate, extending back to internode or sometimes comprising two discrete circular orifices.

Hydrothecal margin almost perpendicular to internode with sharp apex of intrathecal septum overtopping a broad tongue-shaped anterior cusp, followed by four pairs of cusps: the first pair bluntly pointed, symmetrical, the second and third pairs symmetrical, taller, the fourth pair larger, hatchet-shaped, obscured behind lateral nematothecae.

Corbula replacing a hydrocladium; peduncle long, proximal internode with one hydrotheca, following internode with a nematotheca and a short distal branch bearing a single hydrotheca and two transverse nodes distal to the branch; rachis thereafter cladiate, rachial nodes transverse, indistinct. Corbula closed, straight, each side with seven to nine imbricated, unfused nematocladia; a long, free nematocladium arching outward near distal end of corbula. Nematocladia bifurcated into two jaw-bone-shaped segments, distal segment the smaller having two abaxial nematothecae and a long narrow opening along distal margin; larger segment recurved to form roof of corbula, with three (or more) adaxial nematothecae, one nematotheca in axil between segments. Margins of nematocladial nematothecae deeply excavated, a hydrotheca with reduced marginal cusps and two lateral nematothecae at base of each nematocladium, a nematotheca between posterior wall of hydrotheca and base of nematocladium.

Colour.— Pale brown.

Table 12. Measurements of *Lytocarpia lepida* spec. nov. in µm.

Stem		
length of stem internode	450-600	
width at node	160-250	
Hydrocladium		
length of hydrocladial internode	850-900	
width at node	140-150	
Hydrotheca		
length, posterior to margin	620-680	
length of free abcauline wall to anterior tooth	390-420	
height of margin above internode	240-270	
Nematotheca		
length of mesial	310-340	
height of terminal orifice above hydrotheca	85-100	
length of lateral	230-280	
maximum width of lateral	6-9	
length of caulinine nematotheca	180-220	
Corbula		
length	5100	
maximum width	1200	

Remarks.— The hydrocladia arise from several frontal tubes of the stem. Cauline nodes are sometimes absent, but when present are well marked by a constriction in the perisarc. In anterior view many of the supramarginal hydrothecal cusps show several overlapping replications, these probably representing punctuations to growth of the hydrotheca.

The corbulae appear to be mature; however, as only two are available for study, no dissection was made to determine sex or status of the gonophores.

Etymology.— The species name is taken from the latin adjective “lepidus”, pretty, and refers to the graceful appearance of this new species.

**Genus *Gymnangium* Hincks, 1874**

*Gymnangium japonicum* spec. nov.

(fig. 15a-g)

*Halicetta* sp. Hirohito, 1995: 293, fig. 103 e-g, pl. 13 fig. D.

Material.— TM K1695, CSIRO Cruise SSO1/97, Stn 52, colony of three infertile stems 25-70 mm high (holotype); microslides MV F83467 & 83468, RMNH-Coel. 29011, slide 4461, from holotype colony. TM K1696, CSIRO Cruise SSO1/97, Stn 52, one infertile stem 50 mm high on pebble (probably detached from holotype colony).

Description of holotype.— Stems plumose, monosiphonic, lower region ahydrocladiate, caudine internodes short, nodes transverse, distinct, not constricted. Hydrocladia closely alternate, one per internode, long, gracefully recurved, inserted on a long apophysis on front of stem, apophysis with a strong transverse distal node. Caudine internode with three nematothecae; one above, the other at base of apophysis on front of stem, and one behind.

Hydrocladial nodes transverse, indistinct, marked by a notch in perisarc along base of internode; no intranodal septa. Hydrothecae boot-shaped, without intrathecal septa; adnate adcaudine wall flatly convex, free part almost straight, at an angle of 105-110° to hydrocladial axis; abcaudine wall deeply sinuated, posteriorly convex, adnate to mesial nematotheca, free wall deeply recurved to margin. Margin circular, strongly everted, parallel to or slightly inclined to hydrocladial axis, anterior wall thickened, produced into a minute cusp (lateral view), rim with a pair of asymmetrical ear-shaped cusps shifted posteriorly (viewed from above). Perisarc thickest at hydrothecal floor and at margin, thinner in middle.

Mesial nematotheca very long, tubular, thin, narrowing apically, arching forward over succeeding hydrotheca; base narrow. Terminal orifice very small, circular, a larger secondary orifice just above, but not connecting with hydrotheca. Lateral nematothecae small, saccate, directed obliquely upwards, with a large, deeply excavated orifice facing inwards to hydrotheca and a small orifice connecting with internode.

Caudine nematothecae saccate, of similar size to laterals. Frontal nematothecae set closely above one another; orifice of proximal nematotheca extended into a long, upwardly directed tube, similar to but shorter than mesial nematotheca. Distal nematotheca with a much shorter tube, also pointing distally; orifice of posterior axillar nematotheca the same as that of laterals.

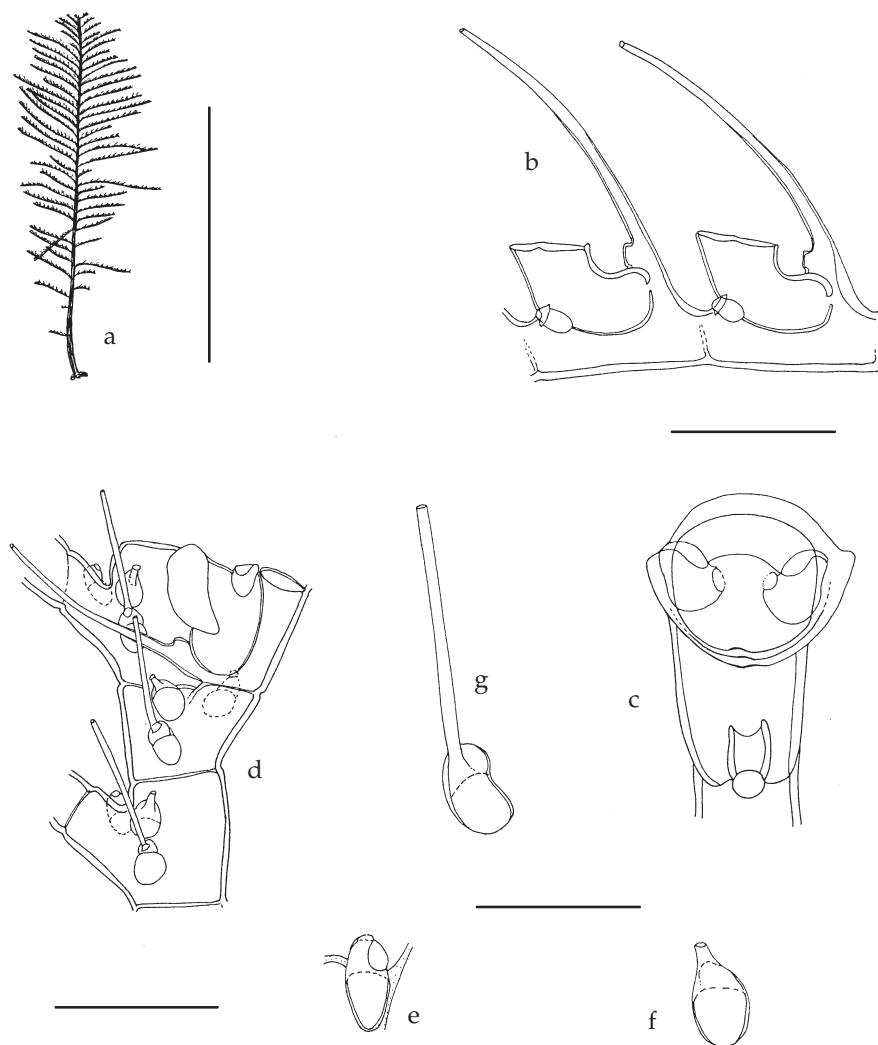


Fig. 15a-g. *Gymnangium japonicum*, spec. nov., holotype from stn 52; a, colony; b, hydrothecae, lateral view; c, hydrotheca, anterior view showing lobate marginal cusps, mesial nematotheca removed; d, cauline internodes with hydrocladia and cauline nematothecae; e, caulline nematotheca from back of hydrocladium; f, distal caulline nematotheca; g, proximal caulline nematotheca. Scale bar: a, 3 cm; b, 1 mm; c-d, 0.5 mm; e-g, 0.5 mm.

Hydranths too poorly preserved for description.

Colour.— Lower stems glistening golden brown, distal part of colony possibly pale yellow in life.

Table 13. Measurements of *Gymnangium japonicum* spec. nov. in µm.

Stem	
width of node, distal part of stem	290-330
Hydrocladium	
length of internode	540-600
width at node	150-170
apophysis, length of proximal side	240-280
Hydrotheca	
length of adnate adcauline wall	410-420
length of free adcauline wall	190-250
height from base to anterior margin	270-310
diameter at margin (lateral view)	260-280
diameter across lobes (anterior view)	300-350
Nematotheca	
maximum length mesial	440
diameter of terminal orifice	25
diameter of suprathecal orifice	65-80
length of lateral	120-130
maximum width of lateral	70-80
length of cauline	130-160
width of cauline	90-110

Remarks.— We have compared our material with a preserved specimen and microslide preparation of *Halicetta* sp. Hirohito, 1995, from Sagami Bay, Japan (No. 2074, NHMT-Hy R: 3817) loaned by the Showa Memorial Institute, Japan. The mesial nematothecae of the Japanese specimens are much shorter than those of the seamount material and the long, tubular extensions of the cauline nematothecae of the seamount specimens are vestigal to absent. Despite this difference, which could be due to age or abrasion of the hydrocaulus, we consider the seamount and Japanese material conspecific.

Distribution.— Previously known from a depth of 250 m in Sagami Bay, Japan (Hirohito 1995).

Etymology.— The species name refers to the country (Japan) where this species was first collected.

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