

## Benthic hydroids (Cnidaria: Hydrozoa) from Peter I Island (Southern Ocean, Antarctica)

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**Abstract** Twenty-three species of benthic hydroids, belonging to eight families and 13 genera, were found in a hydroid collection from Peter I Island, collected during both the *Bentart 2003* and *Bentart 2006* Spanish expeditions with BIO *Hespérides* in 2003 and 2006. Fourteen out of the 23 species constitute new records for Peter I Island, raising the total number of known species in the area to 30, as also do seven out of the 13 genera. The majority of the species are members of the subclass Leptothecata; the subclass Anthoathecata being scarcely represented. Sertulariidae is the family with the greatest number of species in the collection, with eight species (35%), followed by Lafoeidae with five (22%). *Symplectoscyphus* with four species (17%) and both *Antarctoscyphus* and *Halecium* with three (13%), including *H. frigidum* sp. nov., were the most diverse genera. Twenty species (ca. 77%) are endemic to Antarctic waters, either with a circum-Antarctic (11 species, ca. 42%) or West Antarctic (9 species, ca. 35%) distribution. Twenty-four (ca. 92%) are restricted to Antarctic or Antarctic/sub-Antarctic waters; only two species have a wider distribution. Peter I Island hydroid fauna is composed of typical representatives of the Antarctic benthic hydroid fauna, though it is characterized by the low representation of some of the most diverse and widespread Antarctic genera (*Schizotricha* and *Staurotheca*).

**Keywords** Hydrozoans · Peter I Island · Southern Ocean · Benthos · Autecology · Biogeography · New species · New records

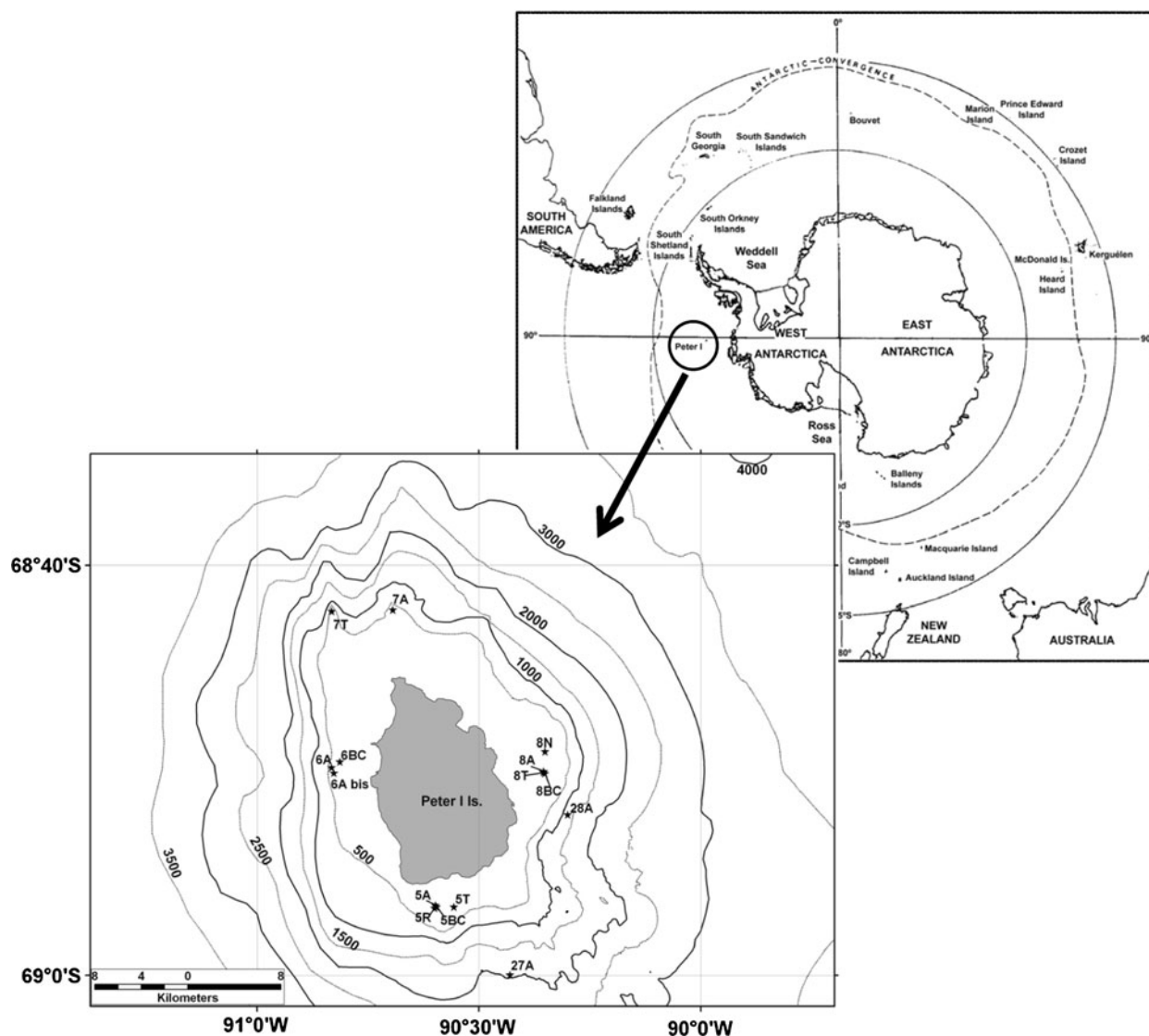
### Introduction

Peter I Island (cf. Fig. 1) is an isolated marine island located approximately 450 km north off Eights Coast (Ellsworth Land) in the Bellingshausen Sea of Antarctica. The island is heavily glaciated and surrounded by pack ice except for a brief period in late summer. Due to its remote location and difficult access, it has been little studied and is, consequently, poorly documented.

The benthic hydroid fauna of Peter I Island is little known, with only 16 species (excluding Stylanderidae) reported from the island in two papers until now. On one hand, Broch (1948) found eight species in a collection obtained from four different locations off the west coast (namely Andersen's Point, Cape Ingrid, Depot Point and Tofte Glacier). On the other hand, Blanco and Bellusci de Miralles (1972a) reported nine species, eight of which represented new records, based on a small collection obtained at a single location, at a depth of 60 m, between Tvistein rock and Norvegia bay (68°45'S 90°41'W), raising the number of known species to 16.

During the *Bentart 2003* Spanish expedition with BIO *Hespérides* in 2003, a sampling program of sea bottoms around Peter I Island was carried out with the aim of improving the scarce scientific knowledge on the benthic fauna inhabiting its shelf communities. Additional sampling of deeper waters was also done during the *Bentart 2006* campaign. An account is given here of species of hydroids collected near Peter I Island during both expeditions. Of the 23 species found, 14 represent new

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**Fig. 1** Area of study

records for the island (including *Halecium frigidum* sp. nov.), raising the overall number of species known from the area to 30. Seven out of the 13 genera present in the collection are also first reported.

## Materials and methods

Materials examined here were collected during both the *Bentart 2003* and *Bentart 2006* Spanish expeditions to the Bellingshausen Sea and Antarctic Peninsula with *BIO Hespérides* in 2003 and 2006 (cf. Table 1). Four types of benthos sampling gear, namely Agassiz trawl, Rock dredge, Box Corer grab and Supra-benthic sledge, were used to obtain samples. In addition, some colonies were obtained

on nets and ropes of baited traps. Hydroids were fixed in 70% ethanol.

Information on ecology and distribution of a majority of species present in this collection has been provided in recent publications (cf. Peña Cantero 2006, 2008; Peña Cantero and Ramil 2006; Peña Cantero and Vervoort 2003, 2004, 2005; Peña Cantero et al. 2004) and is not repeated here. Only new information on autoecology and geographical distribution of those species is included in the present paper, together with data from the previous records in the area by Broch (1948) and Blanco and Bellusci de Miralles (1972a).

All species recorded from Peter I Island, including those absent in this collection, were considered in a final general discussion on biodiversity, bathymetric distribution and biogeography of the hydroid fauna of the study area.

**Table 1** Sampling stations and their characteristics

Station	Date	Latitude (S)	Longitude (W)	Depth (m)	Area of study
<i>Bentart 2003</i>					
5A	04/02/2003	68°56'37"–68°56'43"	90°35'50"–90°35'19"	124–124	South
5R	04/02/2003	68°56'45"–68°56'56"	90°35'58"–90°35'32"	138–140	South
5BC	04/02/2003	68°56'42"	90°35'43"	126	South
5T	04/02/2003	68°56'42"	90°33'22"	124	South
6A	05/02/2003	68°49'54"–68°49'47"	90°49'54"–90°49'08"	192–241	West
6Abis	05/02/2003	68°50'10"–68°50'01"	90°49'35"–90°49'29"	220–216	West
6BC	05/02/2003	68°49'37"	90°48'47"	210	West
7A	06/02/2003	68°42'12"–68°42'15"	90°41'37"–90°41'12"	370–380	North
7T	06/02/2003	68°42'16"	90°49'52"	363	North
8A	06/02/2003	68°50'05"–68°50'16"	90°21'15"–90°21'16"	86–85	East
8BC	07/02/2003	68°50'11"	90°21'05"	90	East
8T	06/02/2003	68°50'08"	90°21'17"	87	East
8N	06/02/2003	68°49'07"	90°21'03"	100	East
<i>Bentart 2006</i>					
27A	22/01/2006	69.00°	90.43°	1,873	South
28A	23/01/2006	68.87°	90.30°	1,191	East

A Agassiz trawl, R Rock dredge, BC Box corer grab, T Supra-benthic sledge, N Baited trap

## Results and discussion

### Taxonomic account

#### Anthoathecate undetermined

*Material examined.* **Stn 7A**, stolonial colony with a few polyps, on bryozoans.

*Remarks.* The colony is stolonial, spreading on the substrate. Hydranths are white, provided with a conical hypostom and ca. 7 filiform tentacles in one whorl. No gonophores. No spines. No dactylozooids.

With the present available material, the species is not identifiable even to family level.

*Ecology and distribution.* Our material was collected at a depth of 370–380 m off the north coast, on bryozoans.

Family Tubulariidae Fleming, 1828

#### *Tubularia antarctica* Billard, 1914

*Tubularia antarctica* Billard, 1914: 3–5, figs 1–2.

? *Tubularia hodgsoni*: Broch, 1948: 4, 6–7.

*Material examined.* **Stn 8T**, three polyps, up to 130 mm high, with gonophores.

*Description.* Polyps with 24 ca. 5 mm long, filiform, aboral tentacles in eight groups of three and a large number (ca. 50) of filiform oral tentacles, ca. 1.5 mm long. Blastostyles arising between aboral tentacles and polyp column. Seven unbranched blastostyles with ca. 12 gonophores observed. Gonophores of different development along blastostyle, much more developed to the end. Gonophores spherical, though mature ones slightly flattened at the poles. Cnidome: desmonemes (5–6 × 3.5–4 μm), stenoteles

(9–11 × 7–8 μm) and, apparently, two types of haplo-nemes, one with elongated capsule (12–14 × 4–5.5 μm) and another with almost spherical capsule (13–14.5 × 9.5–10.5 μm).

*Remarks.* Our material agrees perfectly with Billard's (1914) account in the number of both oral and aboral tentacles and in the number and structure of blastostyles and gonophores. Broch's 1948 material also seems to belong to this species, though we cannot be completely certain without re-examining his specimens. Broch (1948) reported about 25 basal tentacles and some 40 oral ones. He also indicated the presence of seven or eight blastostyles with 8–10 gonophores, but, unfortunately, he did not describe the gonophores.

*Ecology and distribution.* Billard's (1914) material was collected at low tide from Admiralty Bay, King George Island (South Shetland Islands), in December. Broch's (1948) material came from a depth of 150 m off Andersen's Point. Our material, with gonophores, was collected at a depth of 87 m off the east coast in February.

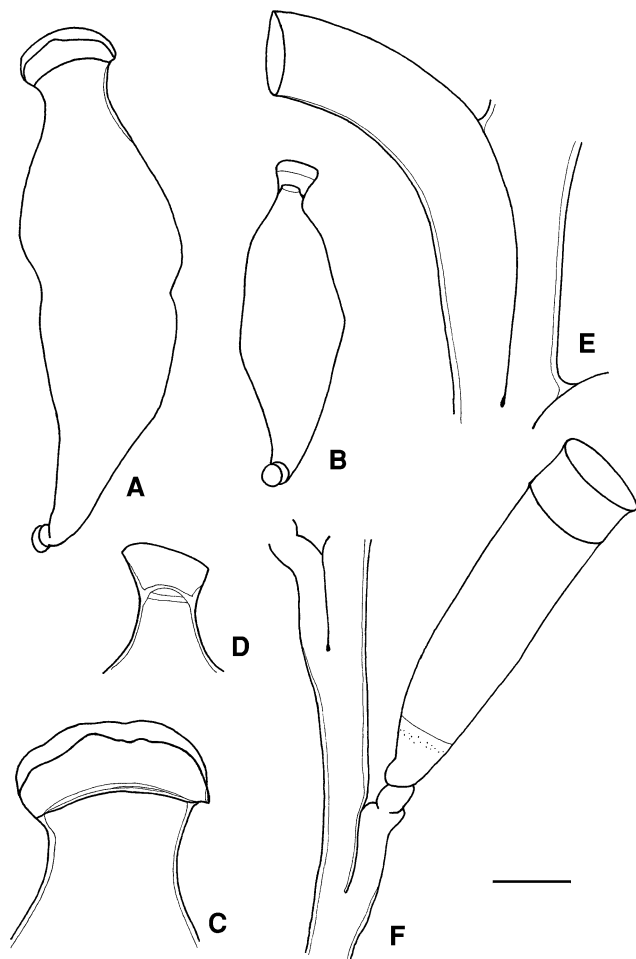
Family Campanulinidae Hincks, 1868

#### *Stegella lobata* (Vanhöffen, 1910)

(Fig. 2a–d)

*Stegella grandis*: Broch, 1948: 4, 19, 21; Blanco, 1984: 13–14, pl. 9 fig. 21.

*Material examined.* **Stn 5A**, numerous stems and fragments, up to 55 mm high, with gonothecae, on *Cnemidocarpa verrucosa*, basibiont of *Filellum antarcticum*; **Stn 5R**, five stems, up to 20 mm high, on *Cnemidocarpa verrucosa*; **Stn 5T**, a stem fragment, ca. 12 mm long; **Stn 6A**,



**Fig. 2** a–d *Stegella lobata*: **a** Female gonotheca, **b** male gonotheca, **c** distal part of female gonotheca and **d** distal part of male gonotheca. **e** *Acryptolaria* sp.: hydrotheca. **f** *Lafoea gaussica*: hydrotheca [scale bar 500  $\mu\text{m}$  (a, b), 250  $\mu\text{m}$  (c–f)]

one stem, ca. 16 mm high; **Stn 6Abis**, a few stems and fragments, up to 40 mm high, with gonothecae; **Stn 7A**, 22-mm long stem fragment in bad condition; **Stn 8A**, one stem fragment, ca. 45 mm long, with gonothecae, basibiont of *Filellum* sp.

**Remarks.** Hitherto, only female gonothecae had been described. Present material has plenty of gonothecae of both sexes; the existence of a clear sexual dimorphism in this species could be noticed. Female gonothecae (Fig. 2a) are much larger than male ones (Fig. 2b) and have a clearly different structure at the distal part: female gonothecae have a long and narrow aperture at the base of the lobes (Fig. 2c), whereas male ones present a strongly marked diaphragm delimiting a wide opening (Fig. 2d).

**Ecology and distribution.** Broch's (1948) material came from a depth of 200 m off Andersen's Point. Our material was collected at depths between 85 and 380 m all around the island. Epibiotic on the ascidian *Cnemidocarpa verrucosa*. Basibiont for colonies of *Filellum antarcticum*. The

colonies with gonothecae were collected in February. *Stegella lobata* has a circum-Antarctic distribution, being widely known from shelf waters of both East and West Antarctica (cf. Peña Cantero et al. 2004).

Family Lafoeidae A. Agassiz, 1865

***Acryptolaria* sp.**

(Fig. 2e)

**Material examined.** **Stn 5A**, one stem, ca. 40 mm high; **Stn 7A**, one basally broken stem, ca. 40 mm high; **Stn 8A**, one stem, ca. 60 mm high.

**Remarks.** Stems scarcely branched, usually with only primary branches, though up to third-order branches were observed. Branching approximately in one plane, either alternate or irregular. Branches straight. Hydrothecae more or less in one plane. Measurements (in  $\mu\text{m}$ ): diameter at aperture ca. 270, free adcauline length 640–770, adnate adcauline length 940–1000, adcauline length 1640–1710, abcauline length 1250–1300. Large nematocysts: 17–19  $\times$  6–6.5  $\mu\text{m}$ .

Our material is undoubtedly conspecific with the material described by Peña Cantero et al. (2004) as *Acryptolaria* sp.

**Ecology and distribution.** Present material collected at depths between 85 and 380 m off the north, south and east coasts of the island. Peña Cantero et al. (2004) recorded the species from depths between 208 and 450 m in the Weddell Sea.

***Filellum antarcticum* (Hartlaub, 1904)**

(Fig. 3a–c)

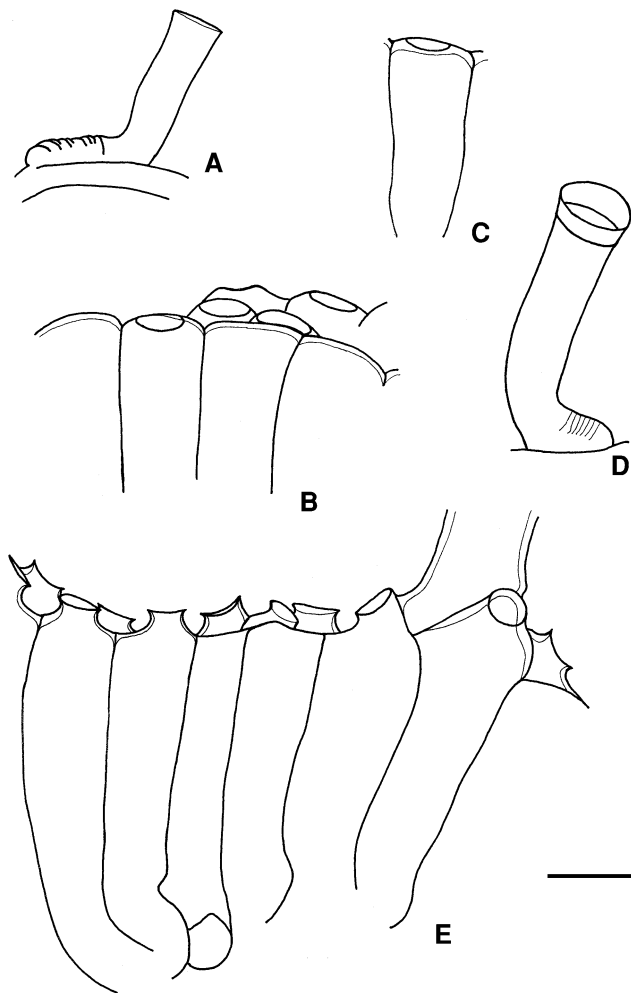
*Filellum antarcticum*: Peña Cantero et al., 2004: 2283–2287 figs 2C–F, 3, 4.

**Material examined.** **Stn 5A**, several hydrothecae, with coppiniae, on *Stegella lobata* and *Cnemidocarpa verrucosa*; ? **Stn 6Abis**, a few hydrothecae, on *Symplectocyphus cumberlandicus*; ? **Stn 8A**, several hydrothecae, on *Stegella lobata* and *Symplectocyphus cumberlandicus*.

**Remarks.** Peña Cantero et al. (2004) assigned a neotype for this species and presented a full description. Our material is in complete agreement with this species. Coppinia consists of closely packed gonothecae (Fig. 3b) surrounded by a fence of distally open defensive tubes arching over the gonothecae and forming a sort of nest. Gonothecae without distal neck (Fig. 3b, c), ca. 300  $\mu\text{m}$  high and ca. 120  $\mu\text{m}$  in maximum diameter. Gonothecal aperture, ca. 70  $\mu\text{m}$  in diameter. Cnidome: 5.5–6  $\times$  2.5–3  $\mu\text{m}$  and 10–12  $\times$  4–4.5  $\mu\text{m}$ . Hydrothecal diameter ca. 150  $\mu\text{m}$ . Adnate part of hydrothecae provided with strongly marked striae on dorsal side (Fig. 3a).

Infertile material with hydrothecae having a diameter at the aperture similar to that in *F. antarcticum* is doubtfully included here.

**Ecology and distribution.** Our fertile material was collected at a depth of 124 m off the south coast in February.



**Fig. 3** a–c *Filellum antarcticum*: a Hydrotheca, b detail of coppinia showing gonothechal arrangement and c gonotheca. d–e *Filellum magnificentum*: d hydrotheca and e part of coppinia showing shape of gonothecae and its disposition [scale bar 250  $\mu$ m (a, d), 125  $\mu$ m (b, c, e)]

Epibiont on *Stegella lobata* and the ascidian *Cnemidocarpa verrucosa*. *Filellum antarcticum* has been recorded from both East and West Antarctica, but also from off South Africa (cf. Peña Cantero et al. 2004).

***Filellum magnificentum* Peña Cantero, Svoboda and Vervoort, 2004**

(Fig. 3d, e)

*Filellum magnificentum* Peña Cantero et al., 2004: 2287–2289, figs 2G, H, 5.

**Material examined.** **Stn 5A**, several hydrothecae, with coppiniae, on *Cnemidocarpa verrucosa*; ? **Stn 5BC**, several hydrothecae, on *Halecium pallens* and ascidians; ? **Stn 5R**, numerous hydrothecae, on ascidian pedicel; ? **Stn 6A**, a few hydrothecae, on *Symplectoscyphus glacialis*; **Stn 8A**, several hydrothecae, with coppinia, on *Schizotricha vervoorti*, *Symplectoscyphus glacialis* and ? *Tubularia* tube; ? **Stn 8A**, numerous hydrothecae, on *Staurotheca dichotoma*

and *Lafoea dumosa*; **Stn 8T**, numerous hydrothecae, with coppiniae, on *Schizotricha vervoorti*.

**Remarks.** Our material is in complete agreement with this species. Coppinia with a fence of protective tubes surrounding the closely packed gonothecae (Fig. 3e) and arching over them, creating a protective chamber; with tubes also arising from among the gonothecae (Fig. 3e). Gonotheca ca. 500  $\mu$ m high and ca. 120  $\mu$ m in maximum diameter. Gonothecal aperture, ca. 60  $\mu$ m in diameter, on a distinctly everted distal neck, ca. 30  $\mu$ m high. Protective tubes not forked and with a distal aperture. Hydrothecae with a much reduced, or even absent, adnate part (Fig. 3d); usually with long renovations, increasing in diameter distally. Adnate part of hydrothecae provided with slightly marked striae on dorsal side (Fig. 3d). Height of hydrothecae 650–700  $\mu$ m, diameter at aperture 175–230  $\mu$ m. Cnidome: 6–8  $\times$  3–3.5  $\mu$ m (frequent) and 18–21  $\times$  4–4.5  $\mu$ m (extremely rare).

Peña Cantero et al. (2004) indicated that *F. magnificentum* may be clearly distinguished from *F. antarcticum* by the larger size of the hydrothecae, especially the larger diameter at the hydrothecal aperture. Consequently, infertile material with hydrothecae having a diameter at the aperture similar to that in *F. magnificentum* is doubtfully included here.

This constitutes the second record for the species.

**Ecology and distribution.** Hitherto *Filellum magnificentum* was only known from the south and east coasts of the Weddell Sea, where it was collected at depths between 205 and 640 m, epibiotic on hydroids and sponges, and fertile in February (Peña Cantero et al. 2004). Our fertile material was collected at depths between 85 and 124 m off the south and east coasts of Peter I Island in February. Epibiont on *Schizotricha vervoorti*, *Symplectoscyphus glacialis*, the tube of ? *Tubularia* and on the ascidian *Cnemidocarpa verrucosa*.

***Lafoea dumosa* (Fleming, 1820)**

*Lafoea dumosa*: Cornelius, 1975: 385–390, fig. 4.

**Material examined.** **Stn 5A**, numerous stems, up to 20 mm high, on *Cnemidocarpa verrucosa*; **Stn 5R**, several stems, up to 20 mm high, on *Cnemidocarpa verrucosa*; **Stn 8A**, numerous stems, up to 35 mm high, on *Schizotricha vervoorti*, and two stems, up to 5 mm high, on *Billardia subrufa*, basibiont of *Filellum* sp.

**Ecology and distribution.** Our material came from depths between 85 and 140 m off the south and east coasts. Epibiotic on *Billardia subrufa*, *Schizotricha vervoorti* and the ascidian *Cnemidocarpa verrucosa*. Basibiont for colonies of *Filellum* sp. *Lafoea dumosa* is considered to have a cosmopolitan distribution. In Antarctic waters, it has frequently been recorded both in East and West Antarctica (cf. Peña Cantero et al. 2004).

***Lafoea gaussica***

(Fig. 2f)

*Lafoea gaussica*: Peña Cantero et al., 2004: 2293–2294, fig. 6A–E.

*Material examined.* **Stn 5BC**, one stem, ca. 15 mm high.

*Remarks.* Uncommon species easily recognizable by its adnate pedicels and large hydrothecae.

*Ecology and distribution.* Present material came from a depth of 126 m off the south coast. *Lafoea gaussica* has scarcely been recorded, though it seems to have a circum-Antarctic distribution (cf. Peña Cantero et al. 2004).

Family Hebellidae Fraser, 1912

***Hebella plana* Ritchie, 1907**

*Hebella plana*: Totton, 1930: 156, fig. 12a, b.

*Material examined.* **Stn 6A**, a few hydrothecae, on *Symplectoscyphus glacialis*.

*Ecology and distribution.* Our material was collected at depths from 192 to 241 m off the west coast. Epibiotic on *Symplectoscyphus glacialis*. Apparently, *Hebella plana* has an Antarctic-Patagonian distribution, being mainly known from Antarctic waters, but also present in Patagonian waters (cf. Peña Cantero et al. 2004).

Family Haleciidae Hincks, 1868

***Halecium delicatulum* Coughtrey, 1876**

(Fig. 4a)

*Halecium delicatulum*: Ralph, 1958: 334, figs 11e, h–n, 12 a–p.

? *Halecium delicatulum*: Blanco and Bellusci de Miralles, 1972a: 7–10, pl. 1 figs 3–5.

*Material examined.* **Stn 5R**, a few incipient stems, on ascidian pedicel; **Stn 7A**, several stems, up to 30 mm high, with male gonothecae, on tube of benthic organism.

*Remarks.* Stem monosiphonic, divided into internodes arranged in a slight zigzag pattern. Branching irregular; branches originate from primary or lower-order hydrophores. Usually with numerous lower-order hydrothecae (up to ninth-order hydrothecae observed). Pseudodiaphragm little marked. Gonothecae on primary hydrophores.

Blanco and Bellusci de Miralles's (1972a) material could be composed of both *H. delicatulum* and *H. pallens* Jäderholm, 1904. In particular, the material figured by them (Blanco and Bellusci de Miralles 1972a: pl. 2 fig. 5) reminds of Jäderholm's species and the structure of the 30-mm long colony they studied, with a regular alternate branching, also agrees with that of *H. pallens*.

*Ecology and distribution.* Blanco and Bellusci de Miralles's (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material came from depths between 138 and 380 m off the north and south coasts. Epibiotic on tube of benthic organism and ascidian pedicel. Our material with gonothecae was collected in February. *Halecium delicatulum* has probably a cosmopolitan distribution; in Antarctic waters it has been reported from both East and West Antarctica (cf. Peña Cantero 2006).

***Halecium pallens* Jäderholm, 1904**

(Fig. 4b)

*Halecium pallens*: Jäderholm, 1905: 4, 12–13, 38, pl. 5 figs. 1–3; Broch, 1948: 4, 7–8, fig. 1.

*Material examined.* **Stn 5R**, two unattached polysiphonic stems, 30 and 40 mm high, and a stem, ca. 13 mm high, on *Cnemidocarpa verrucosa*; **Stn 5BC**, one stem, ca. 50 mm high, on ascidians, basibiont of *Filellum* sp.; **Stn 6BC**, a distal stem fragment, ca. 20 mm long; **Stn 7T**, one stem, ca. 45 mm high.

*Remarks.* Branching regularly alternate in one plane, taking place at every third hydrotheca. Only primary branches present, originating from primary hydrophore. Stem and branches divided into roughly straight internodes. Hydrothecae in two planes making a very wide angle; almost in one plane. With well-marked pseudodiaphragm, though little-marked or even absent in material from Stn 7T. Usually only primary hydrothecae present; in a few occasions with secondary hydrothecae too. Hydrothecae distinctly smaller than those of *H. delicatulum*.

As indicated above, part of the material assigned to *H. delicatulum* by Blanco and Bellusci de Miralles (1972a) could belong here.

*Ecology and distribution.* Broch's (1948) material came from a depth of 200 m off Andersen's Point. Our material was collected from depths between 126 and 363 m off the north, south and west coasts. Epibiotic on the ascidian *Cnemidocarpa verrucosa*. Basibiont for colonies of *Filellum* sp. *Halecium pallens* has a circum-Antarctic distribution, being known from both East and West Antarctica (cf. Peña Cantero 2006).

***Halecium frigidum* sp. nov.**

(Fig. 4c–f)

*Halecium* sp. Peña Cantero and García Carrascosa, 1995: 13, fig. 1E, F.

? *Halecium antarcticum*: Blanco, 1984: 7–10, pls 4, 5.

*Material examined.* **Stn 6Abis**, one polysiphonic stem, ca. 95 mm high (Holotype, MNCN 2.03/436, Museo Nacional de Ciencias Naturales, Madrid, Spain).

*Description.* Colony formed by an erect main stem, almost completely polysiphonic, and provided with a rhizoidal hydrorhiza. Branching alternate in one plane, regular, taking place at every third hydrotheca and providing a regular colonial habit. Branches originating from hydrophore of primary hydrothecae. Primary branches basally polysiphonic and more or less perpendicular to long axis of stem, but monosiphonic and directed upwards at distal part of stem. Some distal internodes with primary paired branches in an alternate pattern, originating from opposite sides of hydrophore of primary hydrotheca (cf. Fig. 4c). Primary branches longer at basal part of stem, giving rise to secondary branches alternately in two planes. Some second-order branches with incipient third-order ones.

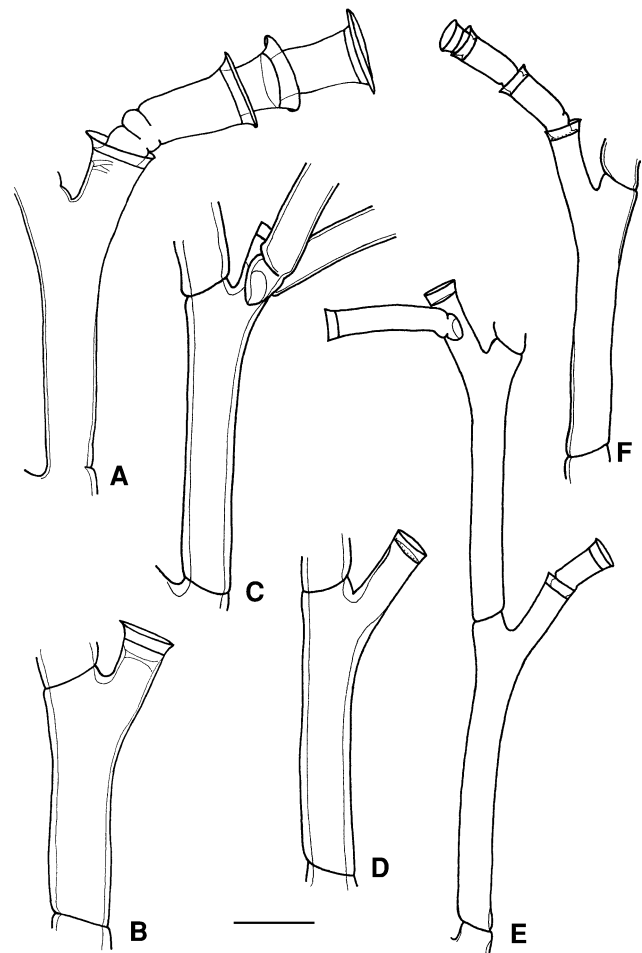
Stem and branches divided into long and thin internodes by alternately arranged oblique nodes. Internodes roughly straight (Fig. 4c–f). Hydrothecae alternately arranged in about one plane (Fig. 4e). Hydrothecae placed at the end of exceedingly long hydrophores (ratio between adcauline length of hydrophore and diameter at diaphragm ca. 2.3); hydrophores straight, regularly diverging from internode. Hydrothecae surpassing distal node of internode for a considerable distance (Fig. 4d). Hydrotheca tiny, walls straight and slightly diverging upwards from diaphragm. Rim even, not everted or inconspicuously flared. Typically only with primary hydrothecae, though secondary hydrothecae are sometimes present (Fig. 4e); extra lower-order hydrothecae are extremely rare (Fig. 4f). Measurements (in  $\mu\text{m}$ ): diameter at aperture 115, diameter at diaphragm 90, height 30, adcauline length of hydrophore 210. Cnidome (not seen discharged): heteronemes in two size classes ( $9\text{--}10 \times 4.5\text{--}5 \mu\text{m}$  and  $6.5 \times 3 \mu\text{m}$ ).

No gonothecae observed.

**Remarks.** Although the presence of alternate pairs of primary branches is not dominant in our material, it is the rule in the material studied by Peña Cantero and García Carrasco (1995). In this material, the ratio between adcauline length of hydrophore and diameter at diaphragm is ca. 2.8.

Notwithstanding the absence of gonothecae, the peculiarities in colony structure, with polysiphonic stems giving rise to paired branches, the regular branching at every third hydrotheca, the remarkably long hydrophores, and the relatively tiny hydrothecae, warrant the description of this species new to science. Although *Halecium frigidum* sp. nov. is close to *H. pallens*, in colony structure, also having polysiphonic stems with paired branches and long hydrophores, it differs from Jäderholm's species in having distinctly smaller hydrothecae, longer and thinner internodes and much longer hydrophores (ratio between adcauline length of hydrophore and diameter at diaphragm ca. 1 in *H. pallens*). Furthermore, there is typically a pseudodiaphragm in *H. pallens*, and the hydrophore bends adcaudally, resting close to the internode, frequently almost parallel to it, and forming a basal convexity. It also reminds of *H. delicatulum* in having the hydrothecae at the end of a long hydrophore, but in Coughtrey's species the hydrophore is much shorter (ratio between adcauline length of hydrophore and diameter at diaphragm ca. 1), the hydrotheca is much larger and provided with an everted rim, there is typically a pseudodiaphragm and the colony structure is different.

Peña Cantero (2008) described as *Halecium* sp. 1 material also characterized by having very long hydrophores (up to  $424 \mu\text{m}$ , ratio between adcauline length of hydrophore and diameter at diaphragm ca. 2.9). Nevertheless, it differs from our material mainly in having slightly geniculate stems, with internodes arranged in a zigzag pattern, and



**Fig. 4** **a** *Halecium delicatulum*: internode showing primary and lower-order hydrothecae. **b** *Halecium pallens*: internode showing hydrotheca. **c–f** *Halecium frigidum* sp. nov.: **c** cauline internode showing basal part of paired branches and axillary hydrotheca, **d** inter-branches cauline internode showing hydrotheca, **e** fragment of primary branch showing hydrothecal arrangement, secondary hydrotheca and incipient second-order branch and **f** branch internode showing lower-order hydrothecae (scale bar  $250 \mu\text{m}$ )

slightly wider hydrothecae (ca.  $192 \mu\text{m}$  in diameter at aperture) with strongly diverging hydrothecal walls and with numerous secondary hydrothecae with everted rim. The differences, however, could be due to the fact that they are incipient, up to 12 mm high, monosiphonic stems. The same applies to the incipient stems, up to 8 mm high, described as *Halecium* sp. by Peña Cantero and Vervoort (2009), also characterized by long hydrophores (ca.  $300 \mu\text{m}$  in length, ratio between adcauline length of hydrophore and diameter at diaphragm ca. 2.7), but with slightly larger hydrothecae (ca.  $190 \mu\text{m}$  in diameter at aperture) provided with strongly everted rim.

Blanco (1984) assigned to *H. antarcticum* Vanhöffen, 1910 mono- and polysiphonic stems up to 80 mm high, from different Antarctic localities, that may partially belong to *H. frigidum* sp. nov. In particular, material figured by her

(cf. pl. 4 figs 10, 11 and pl. 5 fig. 13) perfectly agrees with our material.

**Etymology.** The specific name “*frigidum*” comes from the Latin adjective *frigidus* and makes reference to the icy cold waters in which this species lives.

**Ecology and distribution.** Our material was collected at depths between 216 and 220 m off the west coast of Peter I. Peña Cantero and García Carrascosa’s (1995) material came from depths of 401–415 m in the South Orkney Islands.

Family Schizotrichidae Peña Cantero, Sentandreu and Latorre, 2010

***Schizotricha vervoorti* Peña Cantero, 1998**

*Schizotricha vervoorti* Peña Cantero, 1998: 79–82, fig. 2.

*Schizotricha unifurcata*: Blanco and Bellusci de Miralles, 1972a: 21–23, pl. 5 figs 34–40.

**Material examined.** **Stn 8A**, numerous stems, up to 400 mm high, with gonothecae, basibiont for *Campanularia hicksoni*, *Filellum magnificum* and *Symplectoscyphus curvatus*; **Stn 8T**, one stem, ca. 300 mm high, with male gonothecae, basibiont for *Filellum magnificum*, and another stem, ca. 400 mm high, basibiont for *Filellum* sp. and *Symplectoscyphus curvatus*.

**Remarks.** The two infrathecal nematothecae on the unforked hydrocladial internodes are usually more or less at the same level, but they are sometimes located at different level in distal internodes. Occasionally, a single infrathecal nematotheca is present in the most distal internodes.

See Peña Cantero (1998) for the reasons to consider Blanco and Bellusci de Miralles’s (1972a) material of *S. unifurcata* belonging to this species and Peña Cantero et al. (2010) for the allocation of the species of *Schizotricha* in the family Schizotrichidae.

**Ecology and distribution.** Blanco and Bellusci de Miralles’s (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material, with gonothecae, was collected at a depth of 85–87 m off the east coast in February. Basibiont for colonies of *Campanularia hicksoni*, *Filellum magnificum* and *Symplectoscyphus curvatus*. *Schizotricha vervoorti* is mainly known from West Antarctica, but it has also been reported at 54°50′–54°51′S, 129°48′–129°46′W, far from its common known area of distribution (cf. Peña Cantero and Vervoort 2005).

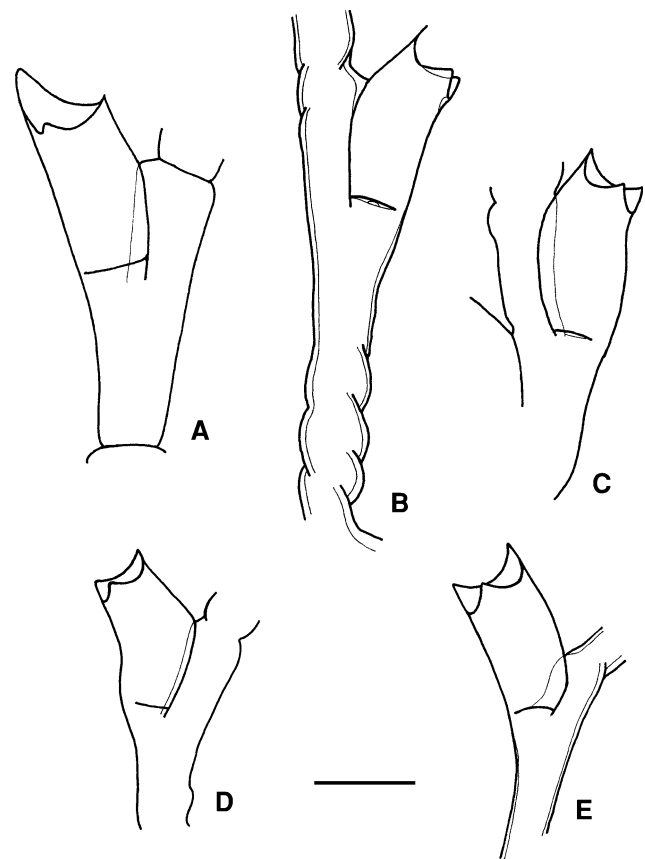
Family Sertulariidae Lamouroux, 1812

***Antarctoscyphus asymmetricus* Peña Cantero, García Carrascosa and Vervoort, 1997a**

(Fig. 5a)

*Antarctoscyphus asymmetricus* Peña Cantero et al. 1997a: 27–29, figs 1, 3b.

**Material examined.** **Stn 5A**, one stem, ca. 21 mm high, on *Cnemidocarpa verrucosa*.



**Fig. 5** a *Antarctoscyphus asymmetricus*: hydrotheca. b–c *Symplectoscyphus cumberlandicus*: b first stem hydrotheca and c distal hydrotheca. d *S. glacialis*: internode with hydrotheca. e *S. nesioticus*: hydrotheca (scale bar 250  $\mu$ m)

**Ecology and distribution.** Present material came from a depth of 124 m off the south coast; epibiotic on the ascidian *Cnemidocarpa verrucosa*. *Antarctoscyphus asymmetricus* is a little-reported species with a West Antarctic distribution (cf. Peña Cantero 2006).

***Antarctoscyphus grandis* (Blanco, 1977)**

*Antarctoscyphus grandis*: Peña Cantero et al., 1999: 1750–1756, figs 4, 5, 7B–C.

**Material examined.** **Stn 8A**, a basally truncated stem, ca. 65 mm high, with gonothecae.

**Ecology and distribution.** Our material, with gonothecae, was collected from a depth of 85–86 m off the east coast in February. *Antarctoscyphus grandis* has a circum-Antarctic distribution (cf. Peña Cantero 2008).

***Antarctoscyphus spiralis* (Hickson and Gravelly, 1907)**

*Antarctoscyphus spiralis*: Peña Cantero et al., 1999: 1759–1760, fig. 2G–H.

**Material examined.** **Stn 27A**, two stems, up to 70 mm high; **Stn 28A**, one stem, ca. 75 mm high.

**Ecology and distribution.** Present material came from depths between 1,191 and 1,873 m, off the south and east coasts, notably increasing its known bathymetric range.



*Antarctoscyphus spiralis* has been reported widely from both East and West Antarctica (cf. Peña Cantero et al. 1999; Peña Cantero 2008).

***Staurotheca dichotoma* Allman, 1888**

*Staurotheca dichotoma*: Peña Cantero and Vervoort, 2003: 2681–2683, fig. 7.

**Material examined.** **Stn 5A**, one colony, ca. 120 mm high, with female gonothecae; **Stn 5R**, one colony, ca. 65 mm high, with male gonothecae; **Stn 6Abis**, four colony fragments, up to 45 mm long; **Stn 7A**, one colony, ca. 90 mm high; **Stn 8A**, several palmate colonies, largest one 180 × 180 mm, with female gonothecae, basibiont of *Filellum* sp.; **Stn 8BC**, two colonies, up to 60 mm high, with male gonothecae, basibiont for *Campanularia hicksoni*.

**Remarks.** Usually with three hydrothecae per verticil, but decussate pairs may also be present. One female colony from St. 8-A has gonothecae forming a kind of glomulus, like those so characteristic of *S. glomulosa* Peña Cantero et al., 1997.

**Ecology and distribution.** Our material was collected at depths between 85 and 380 m all around the island. Basibiont for colonies of *Filellum* sp. and *Campanularia hicksoni*. The colonies with gonothecae were found in February. *Staurotheca dichotoma* has an Antarctic-Kerguelen distribution (cf. Peña Cantero and Vervoort 2003).

***Symplectoscyphus cumberlandicus* (Jäderholm, 1905)**

(Fig. 5b, c)

*Symplectoscyphus cumberlandicus*: Peña Cantero et al., 2002: 1519–1523, fig. 3.

*Sertularella* (*Symplectoscyphus*) *liouvillei*: Broch, 1948: 5, 13, fig. 3b–d (in part).

*Symplectoscyphus divaricatus*: Blanco and Bellusci de Miralles, 1972a: 13–16, pl. 3 figs 22–25, pl. 4 figs 26, 27.

**Material examined.** **Stn 5A**, several stems, up to 120 mm high, with juvenile gonothecae (a stem with a complete one), on *Cnemidocarpa verrucosa*; **Stn 5BC**, one stem, ca. 50 mm high, and two incipient stems, up to 15 mm high, on *Cnemidocarpa verrucosa*; **Stn 5R**, several stems, up to 90 mm high, with juvenile gonothecae, on pebbles and *Cnemidocarpa verrucosa*; **Stn 6Abis**, three stems, up to 120 mm high, basibiont of *Filellum* sp.; **Stn 7A**, one stem, ca. 150 mm high; **Stn 8A**, two stems, ca. 50 and 120 mm high, basibiont of *Filellum* sp.; **Stn 8BC**, two stems, up to 25 mm high, one with a complete gonotheca.

**Description.** Polysiphonic stems up to 150 mm high. Branching alternate in one plane. Branches originating at regular intervals, usually at every third hydrotheca. Usually with only primary branches. Large colonies with primary branches much developed, polysiphonic and giving rise to second-order branches; some of these, in turn, forming third-order branches. Internodes little marked. Hydrothecae alternate, with a variation in hydrothecal packing, from quite distant basally to closely set distally, with distal part

of one hydrotheca overreaching basal part of the alternate one (Fig. 5b, c). Frequently with accessory hydrothecae at the position usually occupied by gonothecae. All gonothecae on the same side of branches. Complete gonothecae with ca. 14 rings. Young stems monosiphonic, unbranched or with a few primary branches, and with hydrothecae more distant. Hydrothecal measurements (in  $\mu\text{m}$ ): abcauline length 380–450, adcauline length 530–600, free adcauline length 160–250, adnate adcauline length 300–440, maximum diameter 200–240, diameter at aperture 175–210.

**Remarks.** Our material is undoubtedly conspecific with that assigned by Broch (1948) and Blanco and Bellusci de Miralles (1972a) to *Symplectoscyphus liouvillei* and *S. divaricatus*, respectively. Peña Cantero et al. (2002) considered the material studied by those authors conspecific with *S. cumberlandicus*, though indicating that it has slightly smaller hydrothecae (cf. Peña Cantero et al. 2002: 1522). We have assigned our material to Jäderholm's species mainly due to the similar colony structure and branching pattern, though there are remarkable differences too. These concern (1) the division into internodes, marked by strong nodes, particularly visible in distal parts, in Jäderholm's species, but obscure, if present, in our material, and (2) the shape and size of the hydrotheca, distinctly longer in Jäderholm's material (e.g. 430–550  $\mu\text{m}$  in length of the abcauline wall), with a greater portion of the adcauline wall free (240–310  $\mu\text{m}$  free and 345–420  $\mu\text{m}$  adnate) and with the hydrothecal cusps separated by deeper embayments.

**Ecology and distribution.** Broch's (1948) material came from a depth of 86 m off Tofte Glacier, whereas Blanco and Bellusci de Miralles's (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material came from depths between 85 and 380 m all around the island. Epilittic on pebbles and epibiotic on the ascidian *Cnemidocarpa verrucosa*. Basibiont for colonies of *Filellum* sp. The colonies with gonothecae were collected in February. *Symplectoscyphus cumberlandicus* has a circum-Antarctic distribution (cf. Peña Cantero et al. 2002; Peña Cantero 2006).

***Symplectoscyphus curvatus* (Jäderholm, 1917)**

*Symplectoscyphus curvatus*: Blanco and Bellusci de Miralles, 1972a: 12–13, pl. 3 figs 20, 21; Peña Cantero et al., 2002: 1523–1525, figure 1C, D.

**Material examined.** **Stn 5A**, several stems, up to 25 mm high, on axis of dead gorgonian; **Stn 8A**, numerous stems, up to 44 mm high, with gonothecae, on *Schizotricha vervoorti* and tube of *Tubularia*?; **Stn 8N**, numerous stems, up to 35 mm high, with gonothecae; **Stn 8T**, one stem, ca. 12 mm high, on *Schizotricha vervoorti*.

**Ecology and distribution.** Blanco and Bellusci de Miralles's (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material was collected at depths from 85 to 124 m off the south and east

coasts. Epibiotic on axis of dead gorgonian, tube of benthic organism and *Schizotricha vervoorti*. The colonies with gonothecae were found in February. *Symplectoscyphus curvatus* is widely known from both East and West Antarctica (cf. Peña Cantero et al. 2002; Peña Cantero 2006).

***Symplectoscyphus glacialis* (Jäderholm, 1904)**

(Fig. 5d)

Not *Sertularella* (*Symplectoscyphus*) *glacialis*: Broch, 1948: 5, 11–13, figs 2d, e, 3a (= *Symplectoscyphus frigidus* Peña Cantero, Svoboda and Vervoort, 2002).

*Symplectoscyphus glacialis*: Blanco and Bellusci de Miralles, 1972a: 16–19, pl. 4 figs 28–32; Peña Cantero et al., 2002: 1533–1538, fig. 6.

**Material examined.** **Stn 5A**, a mass of stems and branches, ca. 10 mm in diameter, and numerous stems, up to 15 mm high, on *Cnemidocarpa verrucosa*; **Stn 5R**, four stems, up to 10 mm high, on *Cnemidocarpa verrucosa*; **Stn 6A**, several stems, up to 25 mm high, on stone, basibiont of *Hebella plana* and *Filellum* sp.; **Stn 6Abis**, a mass of stems, ca. 20 mm in diameter; **Stn 7A**, a mass of stems and branches, ca. 10 mm in diameter; **Stn 8A**, a few stems and fragments, up to 30 mm high, on ? *Tubularia* tube, basibiont for *Filellum magnificum*; **Stn 8N**, a mass of stems and branches, ca. 20 mm long, with remnants of a gonotheca.

**Remarks.** The material assigned by Broch (1948) to this species clearly does not belong here. Peña Cantero et al. (2002) considered it conspecific with *S. frigidus*.

**Ecology and distribution.** Blanco and Bellusci de Miralles's (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material was collected at depths between 85 and 380 m all around the island. Epilithic on stone and epibiotic on the ascidian *Cnemidocarpa verrucosa* and tube of benthic organism. Basibiont for colonies of *Filellum magnificum* and *Hebella plana*. *Symplectoscyphus glacialis* has an Antarctic-Kerguelén distribution (cf. Peña Cantero et al. 2002; Peña Cantero 2006).

***Symplectoscyphus nesioticus* Blanco, 1977**

(Fig. 5e)

*Symplectoscyphus nesioticus*: Peña Cantero et al., 2002: 1549–1550, fig. 11E, G.

**Material examined.** **Stn 7A**, one stem, ca. 6 mm high, on bryozoans.

**Ecology and distribution.** Present material came from depths between 370 and 380 m off the north coast. Epibiotic on bryozoans. *Symplectoscyphus nesioticus* is a little-reported species, hitherto only known from the South Shetland Islands region (Blanco 1977; Peña Cantero 2006) and the Weddell Sea (Peña Cantero et al. 2002).

Family Campanulariidae Johnston, 1836

***Billardia subrufa* (Jäderholm, 1904)**

*Billardia subrufa*: Totton, 1930: 151–152, fig. 8b.

**Material examined.** **Stn 8A**, several stems, up to 90 mm high, with gonothecae, basibiont of *Lafoea dumosa*; **Stn 8T**, a few incipient stems, up to 30 mm high.

**Ecology and distribution.** Present material came from depths of 85–87 m off the east coast. Basibiont for colonies of *Lafoea dumosa*. The colonies with gonothecae were collected in February. *Billardia subrufa* has an Antarctic-Patagonian distribution (cf. Peña Cantero et al. 2004). Outside Antarctic waters, it is only known from the sub-Antarctic Falkland Islands (Totton 1930).

***Campanularia hicksoni* Totton, 1930**

*Campanularia hicksoni* Totton, 1930: 148, fig. 7a–e; Blanco and Bellusci de Miralles, 1972a: 10–11, pl. 1 figs 6–10, pl. 2 figs 11–17, pl. 3 figs 18–19.

**Material examined.** **Stn 8A**, several hydrothecae, on *Schizotricha vervoorti*; **Stn 8BC**, numerous hydrothecae, with gonothecae, on *Staurotheca dichotoma*.

**Ecology and distribution.** Blanco and Bellusci de Miralles's (1972a) material was collected at a depth of 60 m between Tvistein rock and Norvegia bay. Our material came from depths between 85 and 90 m off the east coast. Epibiotic on colonies of *Schizotricha vervoorti* and *Staurotheca dichotoma*. The colonies with gonothecae were collected in February. *Campanularia hicksoni* has been recorded from both East and West Antarctica, apparently having a circum-Antarctic distribution (cf. Peña Cantero et al. 2004).

### Remarks on other species reported in Peter I Island

A few species reported from Peter I Island are not present in our collection. A discussion on its taxonomic status is, however, necessary before analyzing the faunistic peculiarities, bathymetric distribution and biogeography of the species present in the area.

Broch (1948) assigned with uncertainty material to *Eudendrium antarcticum* Totton, 1930, himself indicating that it was “so defective that it is impossible to identify them to species. Neither polyps nor gonophores are present” (Broch 1948: 5). Consequently, it is not possible to ascertain the identity of the *Eudendrium* material present at the island.

Blanco and Bellusci de Miralles (1972a) reported *Halecium tenellum* form Peter I. We have serious doubts about the correctness of the identification. The material was infertile and scarce (only several up to 5-mm long fragments). According to those authors, the monosiphonic stem is vigorously ringed, whereas *H. tenellum* has smooth internodes. Moreover, it has distinctly larger hydrothecae than those of typical colonies of *H. tenellum*. It could be conspecific with *H. ovatum* Totton, 1930, but it would be necessary to examine their material to determine its taxonomic status.

Blanco and Bellusci de Miralles (1972a) also assigned to *Symplectoscyphus naumovi* Blanco, 1969 material that according to Peña Cantero et al. (2002) seems to belong actually to *S. plectilis* (Hickson and Gravely, 1907).

Although absent in our collection, the genus *Oswaldella* is represented in the area by three species so far. Broch (1948) identified as *O. billardi* Briggs, 1938 material that was later considered by Peña Cantero and Vervoort (1997) as belonging to *O. erratum* Peña Cantero and Vervoort, 1997. Broch (1948) also identified as *O. antarctica* (Jäderholm, 1904) material that clearly does not belong to Jäderholm's species and that was considered conspecific with *O. stepanjantsae* El Beshbeeshy, 1991 by Peña Cantero et al. (1997b). Finally, Blanco and Bellusci de Miralles (1972a, b) assigned to *O. antarctica* material that may not belong to this species; it would be, however, necessary to re-examine the material for defining its systematic position.

### General remarks

The 30 species of benthic hydroids reported from Peter I Island so far belong to 11 families and 16 genera. Most are members of the subclass Leptothecata Cornelius, 1992; the subclass Anthoathecata Cornelius, 1992 is little represented, because only one species of *Tubularia*, one unidentified species of *Eudendrium* and one anthoathecate incertae sedis are known. Sertulariidae and Lafoeidae are the most diverse families in the area, including ten (ca. 33%) and five species (ca. 17%), respectively. Predominant genera were *Symplectoscyphus* with six species (20%), *Halecium* with four (ca. 13%) and *Antarctoscyphus* and *Oswaldella* with three species each (10%). As characteristic for the Antarctic benthic hydroid fauna (cf. Peña Cantero and García Carrascosa 1999; Peña Cantero 2008), biodiversity is concentrated in just a few genera. Thus, in Peter I Island, 16 species (ca. 53%) belong to the last four-mentioned genera, representing 25% of the total. As shown above, 14 species and seven genera present in our collection are first recorded from Peter I Island.

Peter I benthic hydroid fauna is composed of typically Antarctic components, though with some peculiarities which could be related to its own history and relative isolation from the continent. Although some of the most characteristic Antarctic genera were well represented, particularly *Symplectoscyphus* (six out of 18 known Antarctic species are present in the area) and *Antarctoscyphus* (three out of 10 known species), surprisingly others were not. Thus, *Schizotricha* and *Staurotheca* are represented in the area by only one species each, whereas 13 and 23 species, respectively, are known to inhabit Antarctic waters.

Although indirect sampling methods, as those used in the present study, are not suitable to obtain a complete

picture about the substrata on which the species live, they give us at least a partial view of the reality. Usually species with large colonies, directly attached to the bottom, come on board unattached or even basally broken, which makes it impossible to ascertain the substratum on which they were living. However, morphological characteristics, such as type of hydrorhiza, may give us important information about this. Thus, we have observed that colonies of *S. vervoorti*, *S. dichotoma*, *H. pallens*, and large colonies of *S. cumberlandicus*, are provided with a large rhizoidal hydrorhiza, clearly indicating that they were anchored in soft bottoms. The situation is usually different for species forming smaller colonies growing epibiotic on other organisms. Apart from *S. cumberlandicus* and *S. glacialis*, which were also found on inorganic substrata (pebbles and stones, respectively), the remaining species were found on organic substrata (tubes of benthic organisms, axis of dead gorgonians, bryozoans, ascidians and other species of hydroids) (cf. Table 2). The ascidian *Cnemidocarpa verrucosa* (Lesson, 1830), extremely abundant in the south coast of the island, constitutes a valuable substratum for many epibiotic hydroids, being used by eight species represented in the collection (cf. Table 2). The hydroid species more widely employed as substrate was *S. vervoorti*, we observed four species on it. Concerning the diversity of basibionts employed for each species, *F. magnificum* showed the broadest spectrum, having been found on *Cnemidocarpa* and three species of hydroids (cf. Table 2). In contrast, some species were observed on a single substratum (e.g. *S. lobata*, *H. plana*, *H. pallens*, *A. asymmetricus* and *S. nesioticus*). A few epibiotic species were used, in turn, as basibiont by other species of hydroids; for example, *S. lobata*, epibiotic on *Cnemidocarpa*, was used as substratum by *F. antarcticum*, or *S. glacialis*, epibiotic on *Cnemidocarpa* and a tube of a benthic organism, was a basibiont for *F. magnificum* and *H. plana* (cf. Table 2).

In relation to the bathymetrical distribution, four out of the six groups established by Peña Cantero (2004) were recognized in the benthic hydroids from Peter I Island; neither species restricted to the shallowest sublittoral waters, those affected by sea-ice and anchor-ice, nor deep-sea species were present. The samples examined came from depths ranging from 85 to 1,873 m. The group of continental shelf species absent from the shallowest waters was represented by five species (*L. gaussica*, *H. frigidum* sp. nov., *A. asymmetricus*, *S. frigidus* and *S. nesioticus*). Nine species (*T. antarctica*, *F. antarcticum*, *L. dumosa*, *H. delicatulum*, *H. pallens*, *A. grandis*, *S. cumberlandicus*, *S. plectilis* and *C. hicksoni*) were in the group of species distributed over the whole continental shelf. Seven species (*F. magnificum*, *H. plana*, *S. vervoorti*, *O. erratum*, *O. stepanjantsae*, *S. dichotoma* and *S. curvatus*) belonged to the group including species distributed from below the shallowest

**Table 2** Main ecological characteristics and biogeographical distribution of the species studied

	Depth (m)	Known range (m)	Substrate	Epibionts	Fertile	Locality	Distribution
Anthoathecate	370–380	–	Bryozoans			N	–
<b>Eudendrium</b> sp.	–	–				–	
<i>T. antarctica</i>	87	0–150			February	E	WA
<i>S. lobata</i>	85–380	10–700	<i>Cnemidocarpa</i>	<i>F. antarcticum</i>	February	All around	CA
<i>Acryptolaria</i> sp.	85–380	–				N, S, E	–
<i>F. antarcticum</i>	124	14–423	<i>S. lobata</i> , <i>Cnemidocarpa</i>		February	S	CA+
<i>F. magnificum</i>	85–124	205–640	<i>S. vervoorti</i> , <i>S. glacialis</i> , tube of <i>Tubularia</i> , <i>Cnemidocarpa</i>		February	S, E	WA
<i>L. dumosa</i>	85–140	12–520	<i>B. subrufa</i> , <i>S. vervoorti</i> , <i>Cnemidocarpa</i>	<i>Filellum</i> sp.		S, E	W
<i>L. gaussica</i>	126	40–460				S	CA
<i>H. plana</i>	192–241	92–772	<i>S. glacialis</i>			W	AP
<i>H. delicatulum</i>	138–380	12–385	Tube of benthic organism, ascidian pedicel		February	N, S	W
<i>H. frigidum</i> sp. nov.	216–220	401–415				W	WA
<i>H. pallens</i>	138–363	20–401	<i>Cnemidocarpa</i>	<i>Filellum</i> sp.		N, S, W	CA
<b>H. tenellum</b>	–	–				–	–
<i>S. vervoorti</i>	85–87	50–1,152		<i>C. hicksoni</i> , <i>F. magnificum</i> , <i>S. curvatus</i>	February	E	WA+
<b>O. antarctica</b>	–	150				–	WA
<b>O. erratum</b>	–	55–696				–	WA
<b>O. stepanjantsae</b>	–	36–1,890				–	CA
<i>A. asymmetricus</i>	124	70–429	<i>Cnemidocarpa</i>			S	WA
<i>A. grandis</i>	85–86	15–380			February	E	CA
<i>A. spiralis</i>	1,191–1,873	6–720				S, E	CA
<i>S. dichotoma</i>	85–380	82–799		<i>Filellum</i> sp., <i>C. hicksoni</i>	February	All around	AK
<i>S. cumberlandicus</i>	85–380	8–275	Pebbles, <i>Cnemidocarpa</i>	<i>Filellum</i> sp.	February	All around	CA
<i>S. curvatus</i>	85–124	49–799	Dead gorgonian, tube of benthic organism, <i>S. vervoorti</i>		February	S, E	CA
<b>S. frigidus</b>	–	86–402				–	WA
<i>S. glacialis</i>	85–380	5–922	Stone, <i>Cnemidocarpa</i> , tube of benthic organism	<i>F. magnificum</i> , <i>H. plana</i>		All around	AK
<i>S. nesioticus</i>	370–380	56–522	Bryozoan			N	WA
<b>S. plectilis</b>	–	7–457				–	CA
<i>B. subrufa</i>	85–87	25–1,030		<i>L. dumosa</i>	February	E	AP
<i>C. hicksoni</i>	85–90	10–385	<i>S. vervoorti</i> , <i>S. dichotoma</i>		February	E	CA

(+) Occasionally also reported outside the Southern Ocean. In bold species reported from Peter I Island, but absent in our collection

AK Antarctic-Kerguelén, AP Antarctic-Patagonian, CA Circum-Antarctic, PA Pan-Antarctic, W Worldwide, WA West Antarctic

waters of the continental shelf to bathyal or abyssal depths. Finally, four species (*S. lobata*, *A. spiralis*, *S. glacialis* and *B. subrufa*) were included in the group extending from the shallowest sublittoral to beyond the shelf-break.

Concerning the biogeographical distribution, both circum-Antarctic (11 species, ca. 42%) and West Antarctic

(9 species, ca. 35%) species were clearly dominant and constitute the contingent of endemic species (ca. 77%). When also considering the species restricted in their distribution to Antarctic and sub-Antarctic waters, namely the two Antarctic-Patagonian species (ca. 8%) and the two Antarctic-Kerguelén ones (ca. 8%), nearly the total number of species

present at Peter I Island (24 species, ca. 92%) is included. Only two species are also found outside the Pan-Antarctic area, having a worldwide distribution (*L. dumosa* and *H. delicatulum*).

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