SCI. MAR., 63 (Supl. 1): 209-218 SCIENTIA MARINA 1999

MAGELLAN-ANTARCTIC: ECOSYSTEMS THAT DRIFTED APART. *W.E. ARNTZ and C. RÍOS (eds.)*

Biogeographical distribution of the benthic thecate hydroids collected during the Spanish "Antártida 8611" expedition and comparison between Antarctic and Magellan benthic hydroid faunas*

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SUMMARY: The biogeographical distribution of the benthic hydroid species collected during the Spanish Antarctic expedition "Antártida 8611" has been studied. An inventory of the Antarctic and Magellan benthic thecate hydroid faunas, along with a comparison between the two, have been also carried out. 104 and 126 species of thecate hydroids have been considered in the Antarctic and Magellan areas, respectively. 72 species (69%) of the Antarctic species and 49 (39%) of the Magellan species are endemic. 23 species are present both in the Antarctic Region and in the Magellan area, representing 22% and 18% respectively, and indicating an important relationship between both faunas.

Key words: Hydrozoa, biogeographic distribution, Antarctic region, Magellan region, Scotia Sea.

RESUMEN: DISTRIBUCIÓN BIOGEOGRÁFICA DE LAS ESPECIES DE HIDROZOOS TECADOS BENTÓNICOS RECOGIDAS DURANTE LA CAMPAÑA "ANTÁRTIDA 8611" Y COMPARACIÓN ENTRE LA FAUNA DE HIDROZOOS BENTÓNICOS ANTÁRTICOS Y MAGALLÁNICOS. – Se ha estudiado la distribución biogeográfica de las especies de hidrozoos bentónicos recogidos durante la campaña de prospección científico-pesquera "Antártida 8611". Asimismo, se ha realizado un inventario de la fauna de hidrozoos tecados bentónicos antárticos y magallánicos, habiéndose llevado a cabo una comparación entre ambas faunas. 104 y 126 especies de hidrozoos tecados se han considerado en las áreas antártica y magallánica respectivamente. 72 especies (69%) de las especies antárticas y 49 (39%) de las magallánicas son endémicas. 23 especies están presentes en ambas regiones, representando un 22% y un 18% respectivamente e indicando una importante relación entre ambas faunas.

Palabras clave: Hydrozoa, distribución biogeográfica, Antártida, región de Magallanes, Mar de Escocia.

INTRODUCTION

During the Spanish Antarctic expedition "Antártida 8611" to the area of the Scotia Ridge islands, carried out in the austral summer of 1986-87 by the Instituto Español de Oceanografía, a large amount of benthic samples were obtained by trawling. Hydroids was one of the zoological groups best represented in the studied area. Forty-six species were found, of which ten were identifed to generic level only, in many cases because of the scarce material available (*cf.* Peña Cantero and García Carrascosa, 1995).

In the present paper a study of the biogeographical distribution of the 36 species determined to spe-

*Accepted October 22, 1998.

cific level has been undertaken. Furthermore, an inventory of both the Antarctic and Magellan benthic thecate hydroid fauna has been carried out. This aimed at estimating the relationship between the Antarctic hydroid fauna and that present in the Magellan region. Nevertheless, it is necessary to take into account the limitations concerning our knowledge of the hydroid fauna in those areas. Thus, for example, athecate hydroids, which were not present in the "Antártida 8611" collection, are poorly known both in the Antarctic region and in the Magellan area, and for this reason are not considered in the present study. Moreover, the hydroid fauna is still unknown in large areas of the Antarctic and not even the sampling efforts in the area so far studied have been uniform.

MATERIAL AND METHODS

Figure 1 represents the itinerary followed during the "Antártida 8611" expedition. In Figure 2 are represented the different areas studied, along with the stations in which hydroid species were obtained.

In defining the limits of the Antarctic region the ideas stated by Hedgpeth (1969), and basically followed by Picken (1985) and Knox (1995), are considered. According to those authors the Antarctic region covers the whole of the area south of the Antarctic Convergence, whereas the Sub-Antarctic region includes the area between the Antarctic Convergence and the Sub-tropical Convergence. In this study, however, Andriashev (1964) and Picken (1985) have been followed in considering the northern limit of the pack-ice as the most valid limit for the Antarctic benthos. To the Magellan area the limits stated by Briggs (1974) have been followed; this author situated the northern Atlantic limit at the mouth of the Río de la Plata (Argentina) and the northern Pacific limit at the northern tip of Chiloé Island (Chile).

In this paper, Circum-Antarctic distribution indicates the distribution throughout the Antarctic region; Pan-Antarctic distribution also includes the distribution throughout the Sub-Antarctic region. Antarctic-Kerguelen and Antarctic-Patagonian distributions refer to the distribution throughout the Antarctic and either the Sub-Antarctic islands or the Magellan area, respectively.

Due to the absence of athecate hydroids in the "Antártida 8611" collection, and the scarce knowledge of this group both in the Antarctic region and the Magellan area, they are not included in this study.

The distribution of the hydroid species considered in this study has been reconstructed using infor-

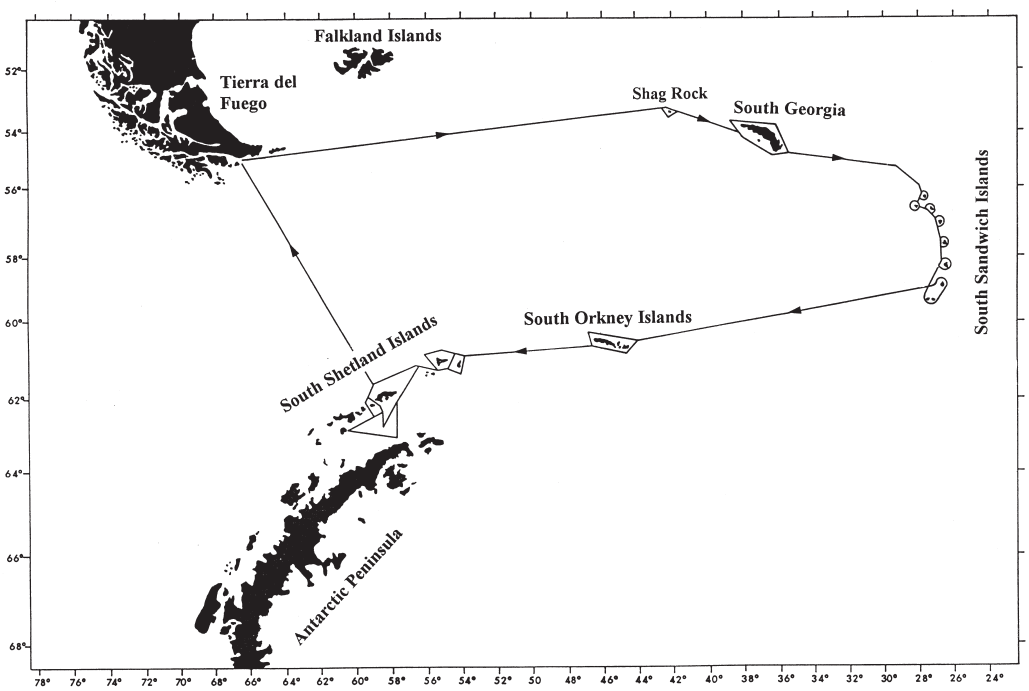

FIG. 1. – Itinerary followed during the Spanish Antarctic expedition "Antártida 8611".

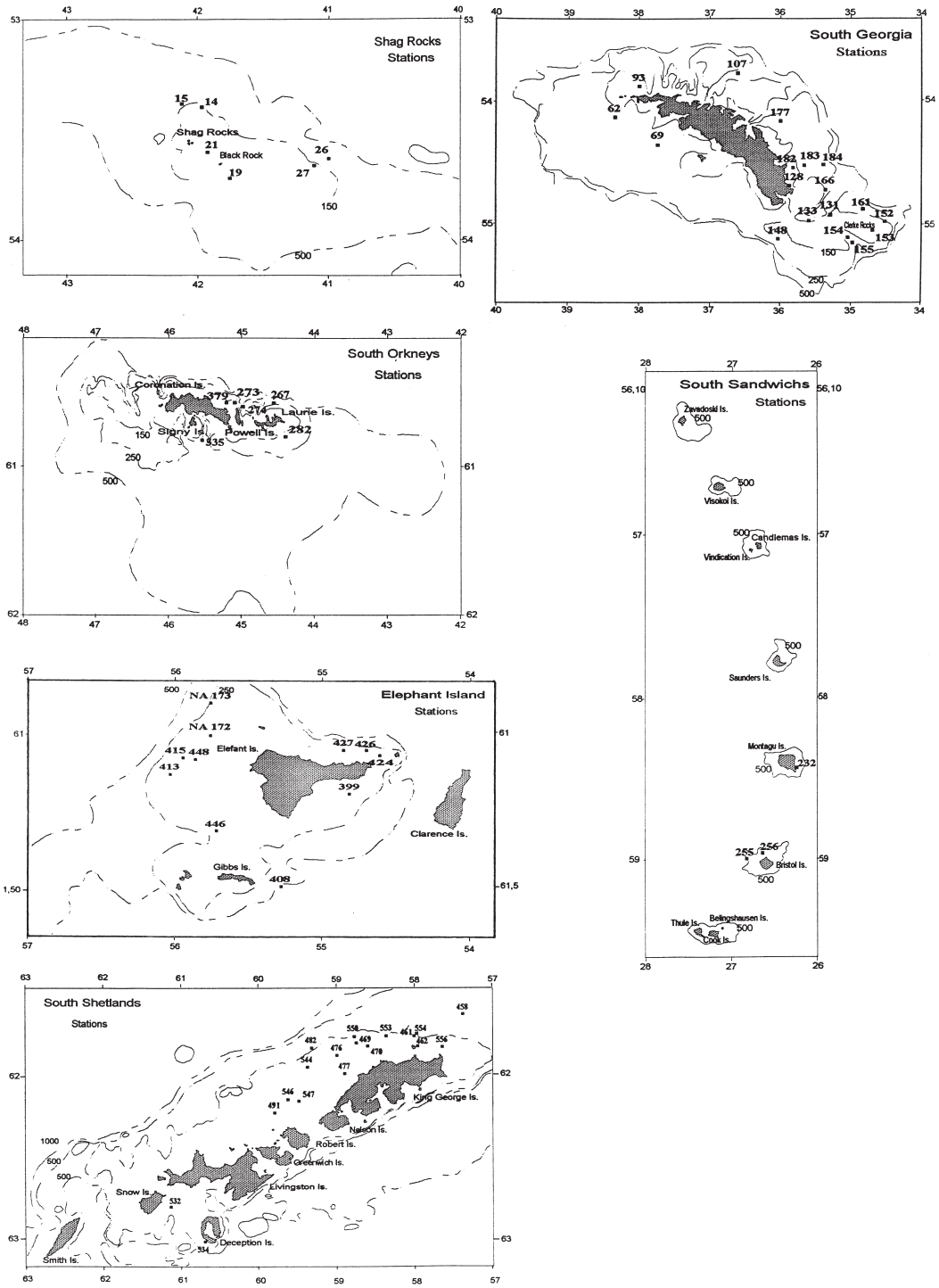

FIG. 2. – Areas studied during the Spanish Antarctic expedition "Antártida 8611", showing the stations in which species of hydroids were found (see also Table 1).

mation obtained from Blanco (1994), El Beshbeeshy (1991), Hartlaub (1905), Peña Cantero (1998), Peña Cantero and García Carrascosa (1995, 1998), Peña Cantero *et al*. (1997), Peña Cantero and Vervoort (1998), Peña Cantero *et al*. (1997a, 1997b) and Stepan'yants (1979).

RESULTS AND DISCUSSION

In Table 1 is shown the list of the 36 species collected during the "Antártida 8611" expedition and determined to specific level. The most important feature is the high degree of endemism at the specif-

TABLE 1. – Species of benthic hydroids collected during the "Antártida 8611" expedition. (Distribution: AK, Antarctic-Kerguelen; AP, Antarctic-Patagonian; CA, Circum-Antarctic; MA, Multiaustral; PA, Pan-Antarctic; SA, Sub-Antarctic; W, Worldwide; WA, West Antarctic).

Species	Stations	Depth (m)	Distribution
Lafoeidae Hincks, 1868			
Abietinella Levinsen, 1813			
A. operculata (Jäderholm, 1903)	133, 408, 470, 491, 550, 556, NA 173	63-471	AP
Hebella Allman, 1888			
H. striata Allman, 1888	491, NA 173	63	PA
Lafoea Lamouroux, 1821			
L. dumosa (Fleming, 1820)	14, 19, 128, 133, 184, 470	150-246	W
Haleciidae Hincks, 1868			
Halecium Oken, 1815			
H. delicatulum (Coughtrey, 1876)	21, 470, 556	140-202	W
H. ovatum Totton, 1930	408	438-471	CA
Hydrodendron Hincks, 1874			
H. arboreum (Allman, 1888)	14, 152, 426, 532	91-475	PA
Halopteridídae Millard, 1962			
Schizotricha Allman, 1883			
S. anderssoni Jäderholm, 1904	93, 133, 152, 161, 183	91-254	CA
S. falcata Peña Cantero, 1998	470	150-154	WA
S. multifurcata Allman, 1883	232, 255, 256	100-194	SA
S. turqueti Billard, 1906	413, 446	164-261	WA
S. vervoorti Peña Cantero, 1998	379, 462	51-149	WA
Kirchenpaueriidae Millard, 1962			
Oswaldella Stechow, 1919			
O. elongata Peña Cantero, García Carrascosa and Vervoort, 1995	161, 182	86-250	WA
O. grandis Peña Cantero, Svoboda and Vervoort, 1997	NA 172	?	WA
O. incognita Peña Cantero, Svoboda and Vervoort, 1997	446	234-261	WA
O. shetlandica Stepan'yants, 1979	470, 476, 553	150-216	WA
Sertulariidae Hincks, 1868			
Antarctoscyphus Peña Cantero, García Carrascosa and Vervoort, 1997			
A. asymmetricus Peña Cantero, García Carrascosa and Vervoort, 1997	133, 256, 446, 476, NA173	100-261	WA
A. elongatus (Jäderholm, 1904)	NA172	?	AK
A. encarnae Peña Cantero, García Carrascosa and Vervoort, 1997	469, 477	100-220	WA
A. spiralis (Hickson and Gravely, 1907)	256, 274, 491	63-369	CA
Staurotheca Allman, 1888			
S. affinis (Jäderholm, 1904)	128	198-202	WA
S. compressa Briggs, 1938	399, 408, 413, 415, 426, 446, 462, 469, 470, 476, 477, 482, 532	51-475	CA
S. dichotoma Allman, 1888	15, 131, 161, 184, 491, 534, 544, 546, NA173	63-250	AK
S. frigida Peña Cantero, Svoboda and Vervoort, 1997	133, 148, 153, 155, 161, 177, 182, 183, 282	86-330	AK
S. juncea (Vanhöffen, 1910)	427, 446, 448, 469	117-261	CA
S. pachyclada (Jäderholm, 1904)	14, 19, 26, 27, 62, 69, 107, 131, 415, 424, 448, 461, 546, 554	74-400	WA
S. vanhoeffeni (Peña Cantero and García Carrascosa, 1993)	424, 461, 476	196-400	CA
Staurotheca sp. nov. 1	155	279-330	WA
Staurotheca sp. nov. 2	128, 133, 154, 183, 184, 255, 256	100-254	WA
Staurotheca sp. nov. 3	446	234-261	WA
Staurotheca sp. nov. 4	476	198-215	WA
Staurotheca sp. nov. 5	273, 446, 458	234-407	WA
Symplectoscyphus Marktanner-Turneretscher, 1890			
S. curvatus (Jäderholm, 1917)	461, 470	150-232	CA
S. glacialis (Jäderholm, 1904)	155, 273, 413, 424, 426, 446, 477, 554, 556	111-475	AK
S. subdichotomous (Kirchenpauer, 1884)	133	229-240	MA
S. vanhoeffeni Totton, 1930	267	166-208	CA
Campanulariidae Hincks, 1868			
Billardia Totton, 1930			
B. subrufa (Jäderholm, 1904)	273, 469, 554, 556	111-267	AP

ic level. As shown in Table 1, of 36 species determined to the specific level, 24 (67%) are endemic in the Antarctic region. Furthermore, sixteen of these species (44%) are endemic in West Antarctica, being restricted in their distribution to the area of the Antarctic Peninsula, Bellingshausen Sea, Weddell Sea and the Scotia Sea islands (*S. affinis*, *Staurotheca* sp. nov. 1 and *O. elongata* have only been recorded at South Georgia which is usually considered as a district in the Antarctic region).

Eight species may be considered to have a Circum-Antarctic distribution (i.e. present both in East and West Antarctica).

There are eight species distributed both in Antarctic and Sub-Antarctic waters. Of those, only *H. striata* and *H. arboreum* may be considered Pan-

Antarctic species, being present both in the Magellan and in the Kerguelen areas. At present, four species (*A. elongatus*, *S. dichotoma*, *S. frigida* and *S. glacialis*) are considered to have an Antarctic-Kerguelen distribution, their records are restricted to the Antarctic and Kerguelen areas (there are no records of these species in the Magellan area). Alternatively, two species (*A. operculata* and *B. subrufa*) might be considered to be Antarctic-Patagonian species, since their records are restricted to the Antarctic and the Magellan areas (they have never been recorded in the Kerguelen area).

Symplectoscyphus subdichotomous has usually been recorded in Sub-Antarctic waters, though in a few occasions in Antarctic waters as well. *Schizotricha multifurcata* might be considered a Sub-Antarctic species, being present in the Magellan and in the Kerguelen areas with the most southern record at the South Sandwich islands. The remaining two species, *H. delicatulum* and *L. dumosa*, have an almost cosmopolitan distribution.

These results are similar to those obtained if all the known Antarctic thecate hydroid species are considered (Table 2). Thus, at specific level, the originality of the Antarctic benthic thecate hydroid fauna is remarkable, since 72 (69%) of the 104 species determined to specific level are endemic in the Antarctic region. Stepan'yants (1979), in a study on the Antarctic and Sub-Antarctic species of hydroids, found that of 91 species present in the Antarctic region, 44 species (48%) were endemic in that region.

The degree of endemism in the Antarctic benthic hydroid fauna is similar to that found in other invertebrate groups; e.g. 81% of endemic species in Cheilostomatous Bryozoa (Hayward, 1995), 77% in Echinoidea (Pawson, 1969) or 57% in Polychaeta (Knox and Lowry, 1977). Nevertheless, it is lower than in other groups; e.g. >90% in Pycnogonida (Fry, 1964), 95% in Amphipoda (Jazdzewski *et al.*, 1991) or 87% in Isopoda (Brandt, 1991).

At present, as is shown in Table 2, of the 72 endemic species, 21 (29%) may be considered to have a Circum-Antarctic distribution. The remaining endemic species are either endemic in East Antarctica (5 species or 7%) or in West Antarctica (46 species or 64%). These results contrast with those obtained by Stepan'yants (1979) who found that of 44 endemic species in the Antarctic region (see above), 13 (14%) were endemic in East Antarctica and 11 (12%) in West Antarctica. The much higher number of endemic species in West Antarctica, at present, may be due to the unequal sampling and study efforts in East and West Antarctica since Stepan'yants paper.

The originality of the Antarctic hydroid fauna is greater if we consider the Antarctic species also present in Sub-Antarctic waters. Here are included the five species with Pan-Antarctic distribution, the two species with Sub-Antarctic distribution, the five species with Antarctic-Patagonian distribution and the nine species with an Antarctic-Kerguelen distribution. Thus, the number of Antarctic species either endemic in the Antarctic region or in Antarctic and Sub-Antarctic waters is raised to 93, representing *ca* 89% of the 104 species of thecate hydroids determined to specific level.

Only 11 Antarctic species of benthic thecate hydroids are also present outside the area comprised by Antarctic and Sub-Antarctic waters. These are four species with a multiaustral distribution, two bipolar species, one circumglobal species and four species with a worldwide distribution.

None of the 23 genera with representatives in the Antarctic region is endemic in this area. However, the genera *Stegella*, *Staurotheca*, *Antarctoscyphus* and *Oswaldella* are probably genera with the Antarctic region as centre of origin. Thus, of 23 species referred to *Staurotheca* [*cf.* Peña Cantero *et al.* (1997a) and present paper], 19 species are endemic in the Antarctic region, two have an Antarctic-Kerguelen distribution and the remaining two are endemic in the Magellan area. Of 22 species referred to *Oswaldella* (*cf.* Peña Cantero and Vervoort, 1998 and Peña Cantero and García Carrascosa, 1998) 21 are endemic in the Antarctic region, the majority being restricted to the continental Antarctic region (high Antarctica and Scotia Ridge), the remaining one is endemic in the Magellan region. Of eight known species of *Antarctoscyphus* [*cf.* Peña Cantero *et al.* (1997)], seven are endemic in the Antarctic region, whereas the remaining has an Antarctic-Kerguelen distribution. Finally, the single member of the genus *Stegella* (*S. grandis*) has an Antarctic-Kerguelen distribution.

In the Antarctic region there are also other invertebrate groups without endemic genera (e.g. Porifera or Bryozoa), whereas other groups have either a low endemism [e.g. 5% in Holothuroidea and Polychaeta, *cf.* Pawson (1969) and Knox and Lowry (1977), respectively] or a relatively high endemism [e.g. 25% in Echinoidea (Pawson, 1969), 39% in Amphipoda (Knox and Lowry, 1977)].

TABLE 2. – Families, genera and species of thecate hydroids reported both in the Antarctic Region and in the Magellan area (common species in bold). (Distribution: AA, Amphi-Atlantic; AK, Antarctic-Kerguelen; AP, Antarctic-Patagonian; BP, Bipolar; CA, Circum-Antarctic; CG, Circum-Global; CT, Circum-Tropical; D, Disjunct; EA, East Antarctic; KP, Kerguelen-Patagonian; M, Magellan; MA, Multiaustral; PA, Pan-Antarctic; S, Scattered; SA, Sub-Antarctic; T/ST, Tropical/Sub-tropical; W, Worldwide; WA, West Antarctic; WT, Widespread in temperate waters).

Magellan area Species	Distribution
Campanulinidae Hincks, 1868	
Operculariella Hincks, 1868	
O. belgicae (Hartlaub, 1904)	PA
Phialellidae Russell, 1953	
Phialella Browne, 1902	
P. chilensis (Hartlaub, 1905)	PA
Tiarannidae Russell, 1940	
Modeeria Forbes, 1848	
M. rotunda (Quay and Gaimard, 1827)	W
Stegopoma Levinsen, 1893	
S. fastigiatum (Alder, 1860)	WT
S. irregularis Totton, 1930	MA
S. plicatile (M. Sars, 1863)	BP
Lafoeidae Hincks, 1868	
Abietinella Levinsen, 1913	
A. operculata (Jäderholm, 1903)	AP
Acryptolaria Norman, 1875	
A. conferta (Allman, 1877)	W
A. crassicaulis (Allman, 1888)	S
A. operculata Stepan'yants, 1979	M
A. patagonica El Beshbeeshy, 1991	M
Filellum Hincks, 1868	
F. antarcticum (Hartlaub, 1904)	MA
F. serpens (Hassall, 1848)	W
F. serratum (Clarke, 1879)	WT
Grammaria Stimpson, 1854	
G. abietina (M. Sars, 1850)	D
Hebella Allman, 1888	
H. calcarata (Agassiz, 1862)	W
H. plana Ritchie, 1907	AP
H. striata Allman, 1888	PA
Lafoea Lamouroux, 1821	
L. dumosa (Fleming, 1820)	W
Haleciidae Hincks, 1868	
Halecium Oken, 1815	
H. beanii (Johnston, 1838)	W
H. cymifore Allman, 1888	M
H. delicatulum Coughtrey, 1876	W
H. fraseri Ralph, 1958	D
H. jaederholmi Vervoort, 1972	PA
H. tenellum Hincks, 1861	W
Hydrodendron Hincks, 1874	
H. arboreum (Allman, 1888)	PA
Aglaopheniidae Broch, 1918	
Aglaophenia Lamouroux, 1812	
A. acacia Allman, 1883	AA
A. antarctica Jäderholm, 1903	M
Cladocarpus Allman, 1874	
C. cornutus Verrill, 1879	D
Lytocarpia Stechow, 1919	
L. canepa Blanco and De Miralles, 1971	M
L. distans Allman, 1877	AA
L. vervoorti Stepan'yants, 1979	M
Halopteridiidae Millard, 1962	
Halopteris Allman, 1877	
H. catharina (Johnston, 1833)	AA
H. constricta Totton, 1930	SA
H. diaphana (Heller, 1868)	CT
Schizotricha Allman, 1883	
S. multifurcata Allman, 1883	SA
Kirchenpaueriidae Millard, 1962	
Oswaldella Stechow, 1919	
O. herwigi El Beshbeeshy, 1991	M
Plumulariidae Hincks, 1868	
Nemertesia Lamouroux, 1812	
N. cymodocea (Busk, 1851)	SA
N. vervoorti El Beshbeeshy, 1991	M
Plumularia Lamarck, 1815	
P. diploptera Totton, 1930	SA
P. duseni Jäderholm, 1904	M
P. curvata Jäderholm, 1904	M
P. leloupi Blanco and De Miralles, 1971	M
P. pulchella Bale, 1882	SA
P. setacea (Linnaeus, 1758)	CG
P. vervoorti El Beshbeeshy, 1991	M
Sertulariidae Hincks, 1868	
Abietinaria Kirchenpauer, 1884	
A. abietina (Linnaeus, 1758)	S
Amphisbetia Agassiz, 1862	
A. bispinosa (Gray, 1843)	SA
A. episcopus (Allman, 1876)	SA
A. minima (Thompson, 1879)	SA
A. norte El Beshbeeshy, 1991	M
A. operculata (Linnaeus, 1758)	W

Antarctic region Species	Distribution
Campanulinidae Hincks, 1868	
Lafoeina G. O. Sars, 1874	
L. longitheca Jäderholm, 1904	AK
Operculariella Hincks, 1868	
O. belgicae (Hartlaub, 1904)	PA
Stegella Stechow, 1919	
S. grandis (Hickson and Gravely, 1907)	AK
Phialellidae Russell, 1953	
Phialella Browne, 1902	
P. chilensis (Hartlaub, 1905)	PA
Tiarannidae Russell, 1940	
Stegopoma Levinsen, 1893	
S. irregularis Totton, 1930	MA
S. plicatile (M. Sars, 1863)	BP
Lafoeidae Hincks, 1868	
Abietinella Levinsen, 1913	
A. operculata (Jäderholm, 1903)	AP
Acryptolaria Norman, 1875	
A. corniformis Naumov and Stepan'yants, 1962	EA
Filellum Hincks, 1868	
F. antarcticum (Hartlaub, 1904)	MA
F. serpens (Hassall, 1848)	W
Halisiphonia Allman, 1888	
H. nana Stechow, 1921	WA
Hebella Allman, 1888	
H. plana Ritchie, 1907	AP
H. striata Allman, 1888	PA
Lafoea Lamouroux, 1821	
L. dumosa (Fleming, 1820)	W
L. gaussica Vanhöffen, 1910	EA
Haleciidae Hincks, 1868	
Halecium Oken, 1815	
H. delicatulum Coughtrey, 1876	W
H. incertus Naumov and Stepan'yants, 1962	AK
H. interpolatum Ritchie, 1907	WA
H. jaederholmi Vervoort, 1972	PA
H. ovatum Totton, 1930	CA
H. pallens Jäderholm, 1904	CA
H. secundum Jäderholm, 1904	WA
H. tenellum Hincks, 1861	W
Hydrodendron Hincks, 1874	
H. arboreum (Allman, 1888)	PA
Halopteridiidae Millard, 1962	
Schizotricha Allman, 1883	
S. anderssoni Jäderholm, 1905	CA
S. falcata Peña Cantero, 1998	WA
S. glacialis (Hickson and Gravely, 1907)	CA
S. jaederholmi Peña Cantero and Vervoort, 1996	WA
S. multifurcata Allman, 1883	SA
S. nana Peña Cantero *et al*., 1996	CA
S. turqueti Billard, 1906	WA
S. unifurcata Allman, 1883	AK
S. vervoorti Peña Cantero, 1998	WA
Kirchenpaueriidae Millard, 1962	
Oswaldella Stechow, 1919	
O. antarctica (Jäderholm, 1904)	WA
O. bifurca (Hartlaub, 1904)	WA
O. billardi Briggs, 1938	EA
O. blanconae El Beshbeeshy, 1991	WA
O. crassa Peña Cantero and Vervoort, 1998	WA
O. curiosa Peña Cantero and Vervoort, 1998	WA
O. delicata Peña Cantero *et al*., 1997	WA
O. elongata Peña Cantero *et al*., 1995	WA
O. encarnae Peña Cantero *et al*., 1997	WA
O. erratum Peña Cantero and Vervoort, 1997	WA
O. garciacarrascosai Peña Cantero *et al*., 1997	WA
O. gracilis Peña Cantero *et al*., 1997	WA
O. grandis Peña Cantero *et al*., 1997	WA
O. incognita Peña Cantero *et al*., 1997	WA
O. obscura Peña Cantero *et al*., 1997	WA
O. rigida Peña Cantero *et al*., 1997	CA
O. shetlandica Stepan'yants, 1979	WA
O. stepanjantsae El Beshbeeshy, 1991	CA
O. terranovae Peña Cantero and Vervoort, 1996	EA
O. tottoni Peña Cantero and Vervoort, 1996	CA
O. vervoorti Peña Cantero and García Carrascosa (1998)	WA
Sertulariidae Hincks, 1868	
Antarctoscyphus Peña Cantero *et al*., 1997	
A. asymmetricus Peña Cantero *et al.* 1997	WA
A. biformis (Jäderholm, 1905)	WA
A. elongatus (Jäderholm, 1904)	AK
A. encarnae Peña Cantero *et al*., 1997	WA
A. grandis (Blanco, 1977)	CA
A. gruzovi (Stepan'yants, 1979)	WA

A. trispinosa (Coughtrey, 1875)	SA
Dynamena Lamouroux, 1812	
D. pumilla (Linnaeus, 1758)	S
Parascyphus Ritchie, 1911	
P. repens (Jäderholm, 1904)	KP
Parathuiaria Leloup, 1974	
P. polycarpa (Kirchenpauer, 1884)	M
Sertularella Gray, 1847	
S. allmani Hartlaub, 1900	SA
S. antarctica Hartlaub, 1900	KP
S. argentinica El Beshbeeshy, 1991	M
S. blanconae El Beshbeeshy, 1991	M
S. contorta Kirchenpauer, 1884	M
S. cruzensis El Beshbeeshy, 1991	M
S. fuegonensis El Beshbeeshy, 1991	M
S. gayi gayi (Lamouroux, 1821)	M
S. grandensis El Beshbeeshy, 1991	T/ST
S. hermanosensis El Beshbeeshy, 1991	M
S. jorgensis El Beshbeeshy, 1991	M
S. mogotensis El Beshbeeshy, 1991	M
S. paessleri Hartlaub, 1900	M
S. patagonica (D'Orbigny, 1839)	M
S. peregrina Bale, 1926	SA
S. picta (Meyen, 1834)	KP
S. polyzonias Linnaeus, 1758	W
S. protecta Hartlaub, 1900	SA
S. quadrifida Hartlaub, 1900	M
S. robusta Coughtrey, 1876	S
S. sanmatiasensis El Beshbeeshy, 1991	M
S. stepanyantsae El Beshbeeshy, 1991	S
S. unilateralis (Lamouroux, 1824)	SA
S. vervoorti El Beshbeeshy, 1991	M
Staurotheca Allman, 1888	
S. jaederholmi (Stechow, 1920)	M
S. vervoorti (El Beshbeeshy, 1991)	M
Symplectoscyphus Marktanner-Turneretscher, 1890	
S. affinis (Hartlaub, 1900)	M
S. aggregatus (Jäderholm, 1917)	AP
S. bathyalis Vervoort, 1972	D
S. chubuticus El Beshbeeshy, 1991	M
S. filiformis (Allman, 1888)	M
S. flexilis (Hartlaub, 1900)	M
S. leloupi El Beshbeeshy, 1991	M
S. magellanicus (Marktanner-Turneretscher, 1890)	M
S. margaritacea (Allman, 1885)	M
S. marionensis Millard, 1971	SA
S. milneanus (D'Orbigny, 1846)	M
S. modestus (Hartlaub, 1900)	M
S. paraglacialis El Beshbeeshy, 1991	M
S. pinnatus (Clark, 1876)	D
S. pulchella (Jäderholm, 1905)	M
S. salvadorensis El Beshbeeshy, 1991	M
S. singularis El Beshbeeshy, 1991	M
S. subdichotomous (Kirchenpauer, 1884)	MA
S. valdesicus El Beshbeeshy, 1991	M
S. vervoorti El Beshbeeshy, 1991	M
Thuiaria Fleming, 1828	
T. thuia (Linnaeus, 1758)	D
Syntheciidae Marktanner-Turneretscher, 1890	
Synthecium Allman, 1872	
S. robustum Nutting, 1900	M
Campanulariidae Hincks, 1868	
Billardia Totton, 1930	
B. subrufa (Jäderholm, 1904)	AP
Campanularia Lamarck, 1816	
C. agas Cornelius, 1982	M
C. hicksoni Totton, 1930	AP
C. hincksii Alder, 1856	CG
C. laevis Hartlaub, 1905	?
C. tincta Hincks, 1861	MA
Clytia Lamouroux, 1812	
C. hemisphaerica Linnaeus, 1767	CG
C. noliformis (McCrady, 1857)	T/ST
C. paulensis (Vanhöffen, 1910)	CT
Gonothyraea Allman, 1864	
G. loveni (Allman, 1859)	S
Hartlaubella Poche, 1914	
H. gelatinosa Pallas, 1766	S
Laomedea Lamouroux, 1812	
L. tottoni (Leloup, 1935)	T/ST
Obelia Peron and Lesueur, 1810	
O. bidentata Clarke, 1875	CG
O. dichotoma (Linnaeus, 1758)	CG
O. geniculata (Linnaeus, 1758)	W
O. longissima (Pallas, 1766)	BP
Orthopyxis Agassiz, 1862	
O. clytoides (Lamouroux, 1824)	WT
O. crenata (Hartlaub, 1900)	CT
O. eurycalyx El Beshbeeshy, 1991	M
O. hartlaubi El Beshbeeshy, 1991	M
Silicularia Meyen, 1834	
S. rosea Meyen, 1834	MA
Tulpa Stechow, 1921	
T. tulipifera (Allman, 1888)	KP
A. mawsoni (Briggs, 1938)	EA
A. spiralis (Hickson and Gravely, 1907)	CA
Sertularella Gray, 1847	
Sertularella sp.1	-
Sertularella sp. 2	-
Staurotheca Allman, 1888	
S. affinis (Jäderholm, 1904)	WA
S. amphorophora Naumov and Stepan'yants, 1962	WA
S. antarctica Hartlaub, 1904	CA
S. australis Peña Cantero *et al*., 1997	WA
S. compressa Briggs, 1938	CA
S. dichotoma Allman, 1888	AK
S. frigida Peña Cantero *et al*., 1997	AK
S. glomulosa Peña Cantero *et al*., 1997	WA
S. juncea (Vanhöffen, 1910)	CA
S. nonscripta Peña Cantero *et al*., 1997	WA
S. pachyclada (Jäderholm, 1904)	WA
S. plana Peña Cantero *et al*., 1997	WA
S. polarsterni Peña Cantero *et al*., 1997	CA
S. stolonifera (Hartlaub, 1904)	WA
S. undosiparietina (Stepan'yants, 1979)	WA
S. vanhoeffeni (Peña Cantero and García Carrascosa, 1993)	CA
Staurotheca sp. nov. 1	WA
Staurotheca sp. nov. 2	WA
Staurotheca sp. nov. 3	WA
Staurotheca sp. nov. 4	WA
Staurotheca sp. nov. 5	WA
Symplectoscyphus Marktanner-Turneretscher, 1890	
S. aggregatus (Jäderholm, 1917)	AP
S. cumberlandicus (Jäderholm, 1905)	CA
S. curvatus (Jäderholm, 1917)	CA
S. densestriatus Zhican, 1991	WA
S. exochus Blanco, 1982	WA
S. glacialis (Jäderholm, 1904)	AK
S. hero Blanco, 1977	WA
S. liouvillei (Billard, 1914)	CA
S. naumovi Blanco, 1969	CA
S. nesioticus Blanco, 1977	WA
S. plectilis (Hinckson and Gravley, 1907)	CA
S. vanhoeffeni Totton, 1930	CA
S. subdichotomous (Kirchenpauer, 1884)	MA
Campanulariidae Hincks, 1868	
Billardia Totton, 1930	
B. intermedia Blanco, 1967	WA
B. subrufa (Jäderholm, 1904)	AP
Campanularia Lamarck, 1816	
C. hicksoni Totton, 1930	AP
C. tincta Hincks, 1861	MA
C. norvegiae Broch, 1948	AK
Obelia Peron and Lesueur, 1810	
O. longissima (Pallas, 1766)	BP
O. bidentata Clarke, 1875	CG
Silicularia Meyen, 1834	
S. rosea Meyen, 1834	SA

At family level, as shown in Table 2, Sertulariidae is clearly the dominant family. This agrees with the results obtained by Stepan'yants (1979). Of 106 species of thecate hydroids recorded in the Antarctic region, 44 species (*ca* 42%) belong to that family. Kirchenpaueriidae is also an important family in the Antarctic benthic ecosystem, with records of 21 species (*ca* 20%), all belonging to *Oswaldella*. The families Lafoeidae, Haleciidae and Halopteridídae with nine species (*ca* 8%) and Campanulariidae with eight species (*ca* 8%) are also well represented, whereas the remaining families (Campanulinidae, Tiarannidae and Phialellidae) have little representation (three, two and one species, respectively).

The predominant life cycle (characterized by the suppression of the free-swimming stage) in the Antarctic thecate hydroid fauna might have favoured the high degree of endemism at specific level. In the Antarctic region primary production is highly seasonal and at most coastal sites is generally limited to the period of open water. However, a small fraction of nano- and picoplankton is available throughout the year (Froneman and Perissinoto, 1996). During the rest of the year redistribution of accumulated energy from one trophic level to another takes place (Picken, 1985). This fact might have favoured those groups of hydroids that have a reduced or even suppressed free-swimming stage. Thus, the majority of the known Antarctic thecate hydroid fauna has fixed gonophores and only a few species have medusae. In spite of the *a priori* lower dispersal potential of the fixed gonophores, there is a high number of Circum-Antarctic species which may have been favoured by the uniform general conditions present throughout the Antarctic Ocean during a long time. The high number of endemic species in West Antarctica might merely reflect which part of Antarctica has been better studied and certainly future scientific surveys will change the distribution of many of those species to Circum-Antarctic.

Antarctic hydroid fauna vs Magellan hydroid fauna

As shown in Table 2, the Magellan area is richer than the Antarctic region concerning the biodiversity of thecate hydroids. At family level, it is remarkable that whereas the nine families of thecate hydroids with members in the Antarctic region also have representatives in the Magellan area, there are three families of thecate hydroids (Syntheciidae, Plumulariidae and Aglaopheniidae) with members in the Magellan area, but without representatives in the Antarctic region; the members of these three families are typically distributed in temperate and warm waters.

In the Magellan area, as in the Antarctic region, Sertulariidae is the dominant family. Thus, of 126 species (*cf.* Table 2), 57 species (45%) belong to this family. However, whereas in the Antarctic region the following family is Kirchenpaueriidae with *ca* a 20% of the species (see above), in the Magellan area it is the family Campanulariidae with 22 species (*ca* 17%), followed by Lafoeidae with 13 species (*ca* 10%).

The differences at generic level between both areas are greater than at family level. The two regions differ in the number of genera, in the presence/absence of certain genera and in the number of species of genera common to both.

The much higher diversity at generic level in the Magellan area is remarkable. Thus, as shown in Table 2, in the Magellan area species of 40 genera of thecate hydroids have been reported, whereas in the Antarctic region species of only 23 genera are known, representing *ca* 58%. Consequently, there is a high number of Magellan genera without representatives in the Antarctic region. In contrast, with the exception of four genera (*Lafoeina*, *Stegella*, *Halisiphonia* and *Antarctoscyphus*), the remaining genera present in the Antarctic region also have representatives in the Magellan area. *Stegella* and *Antarctoscyphus* are genera that probably originated in the Antarctic region, being composed of either species endemic in that region or Pan-Antarctic species. Thus, as stated above, the single member of the genus *Stegella* has an Antarctic-Kerguelen distribution and of eight known species of *Antarctoscyphus*, seven are endemic in the Antarctic region, whereas the remaining one has an Antarctic-Kerguelen distribution.

There are two common genera that probably originated in the Antarctic region and that differ greatly in the number of species present both in the Antarctic region and in the Magellan area. Thus, as was stated above, of 23 species referred to *Stauroteca*, 19 species are endemic in the Antarctic region, two have an Antarctic-Kerguelen distribution and the remaining two are endemic in the Magellan area. Of 22 species referred to *Oswaldella*, 21 are endemic in the Antarctic region, the remaining one being endemic in the Magellan area. There are also large differences concerning the genus *Schizotricha*. Thus, of nine species recorded from

Antarctic and Sub-Antarctic waters (*cf*. Peña Cantero, 1998), a single species is present in the Magellan area, the remaining species being endemic in the Antarctic region.

On the other hand, there are genera in which the proportion is clearly contrary, having a larger number of species in the Magellan area. Thus, El Beshbeeshy (1991), in the Magellan area, referred 26 species to the genus *Sertularella* and 21 to the genus *Symplectoscyphus*, whereas in the Antarctic region two and 13 species, respectively, have been recorded.

The genus *Abietinella*, with its only known member (*A. operculata*), is shared both by the Antarctic region and the Magellan area, and might be considered to have an Antarctic-Patagonian distribution.

At specific level, though the diversity is higher in the Magellan area, the degree of endemism is lower in that area. As was stated above, of 104 species determined to specific level, 72 (69%) are endemic in the Antarctic region. In the Magellan area, however, of 126 species, 49 (39%) may be considered endemic.

The comparison between the thecate hydroid fauna known from both the Antarctic region and the Magellan area (Table 2) shows that only 23 species are present in both areas, representing 22% of the 104 species reported in the Antarctic region and 18% of the 126 species recorded in the Magellan area. These are species with a worldwide distribution (*Halecium tenellum*, *H. delicatulum*, *Lafoea dumosa*, *Filellum serpens* and *Obelia bidentata*), bipolar species (*Stegopoma plicatile* and *Obelia longissima*), species widely distributed in the southern hemisphere (*Stegopoma irregularis*, *Filellum antarcticum*, *Symplectoscyphus subdichotomous* and *Campanularia tincta*), species mainly Sub-Antarctic (*Schizotricha multifurcata*, *Silicularia rosea*), Pan-Antarctic species (*Opercularella belgicae*, *Phialella chilensis*, *Hebella striata*, *Halecium jaederholmi*, *Hydrodendron arboreum*) and, finally, species with an Antarctic-Patagonian distribution (*Abietinella operculata*, *Hebella plana*, *Symplectoscyphus aggregatus* and *Billardia subrufa*).

At present, it is difficult to know which species inhabiting the Antarctic region are of Magellan origin and migrated to Antarctica via the Scotia Ridge and, inversely, which species of Antarctic origin followed the opposite way. Before determining the relative importance of the contingent of species the Antarctic region and the Magellan areas have in common, it would be necessary to improve scientific knowledge concerning the hydroid fauna of both areas, since they are still poorly known, existing for instance vast Antarctic areas in which the hydroid fauna is completely unknown. It would also be necessary to know the relationships between the Antarctic hydroid fauna and that of other areas, mainly that of the Sub-Antarctic islands, but also that of New Zealand, South Australia and South Africa.

ACKNOWLEDGEMENTS

The authors wish to express their sincere gratitude to the Instituto Español de Oceanografía, especially to Ana Ramos, for the opportunity to study the material collected during the "Antártida 8611" expedition.

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