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# Soft-bottom hydroids (Cnidaria: Hydrozoa) collected in the Ría de Vigo (NW Spain)

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Key words: Cnidaria; Hydrozoa; Hydroida; soft-bottom; Ría de Vigo; NW Spain.
Thirty-one hydroids species, living on the sublittoral soft-bottoms, are reported from the Ría de Vigo, representing one third of the species currently known, from the Ría. Twenty-four are Leptomedusae and only seven are Anthomedusae. The identifications of *Campomma hincksi*, *Cosmetira pilosella* and *Laodicea undulata*, based only on the hydroid stage, are discussed. The report includes one species that could be identified only to generic level as well, and also a description of the previously unknown male gonotheca of *Halecium liouvillei*. Five species, *Merona cornucopiae*, *Hydractinia echinata*, *Lovenella clausa*, *Opercularella* spec. and *Laomedea angulata*, were collected exclusively from soft bottoms that seem to be their typical habitat. Analysis of geographical distribution shows that the cosmopolitan species are dominant followed by tropical-Atlantic and boreal groups; and Indo-Pacific and endemic species are absent. Concerning life cycles 60% of the species have fixed gonophores. The species with free medusae (40%) dominate only in the cosmopolitan group.

## Introduction

The Ría de Vigo, the most southern of the Rías Baixas, is located between 42°21'-42°09'N and 8°37'-8°54'W, its main axis following an ENE direction. It covers 176 km$^2$ with a length of 33 km from head to mouth; a maximum width of 10 km at the mouth, narrowing to 0.6 km towards the head. The Ría is protected by the Cíes islands situated off the mouth.

Complete information on the oceanographic conditions of the Ría de Vigo was given by Nogueira et al. (1997). Surface salinity oscillates from 33.30 in winter to 35.00 in summer and from 35.45 to 35.73 at the bottom. Surface temperature varies from 13° C in winter to 18° C in summer and from 14°C to 13°C at the bottom. The sediments were mapped by Vilas et al. (1995).

Knowledge of the benthic fauna of the Ría de Vigo is scarce in comparison to the rest of Galician rías (López-Jamar & Cal, 1990). Only two invertebrate phyla have been extensively studied so far; the Mollusca (Rolán, 1983; Rolán et al., 1989) and the Bryozoa (Fernández Pulpeiro & Rodríguez, 1980; Fernández Pulpeiro, 1984; Barcia et al., 1993).

The results of the study of the hydroids collected in 1985 and 1986 on the sublittoral soft-bottoms of the Ría de Vigo are given in this study. The material was collected with a rectangular dredge (type 'Charcot') along transects perpendicular to the main axis of the Ría.

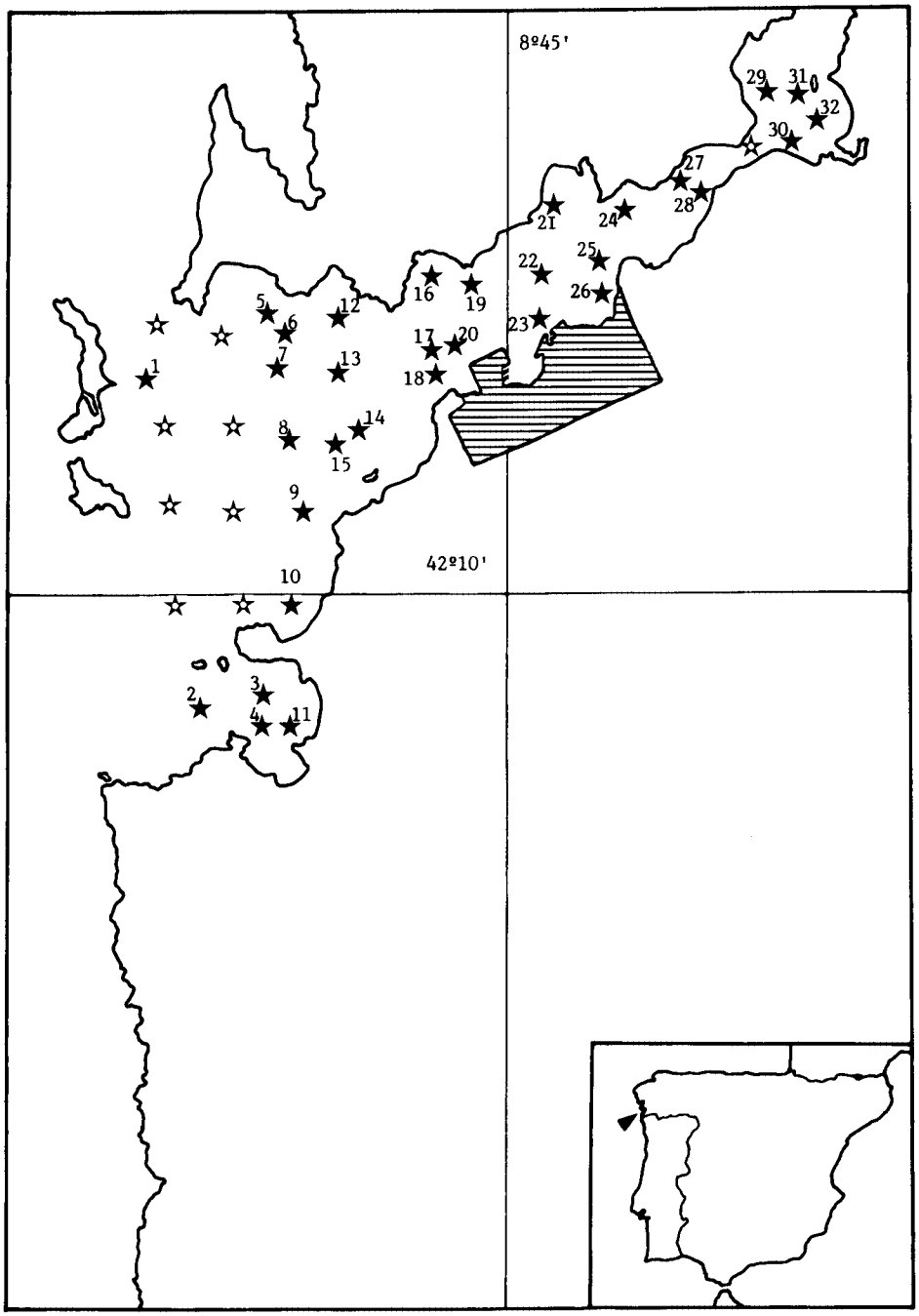


Fig. 1. Map of the Ría de Vigo showing the positions of stations. ★ = samples with hydroids. ☆ = samples without hydroids.

The specimens are deposited in the collections of the Departamento de Ecoloxía e Bioloxía Animal, Vigo University, Spain.

## List of stations

V 1: 42°13,74'N 08°53,26'W, 02.viii.1985; depth 23 m, shell-gravel bottom.
V 2: 42°08,2'N 08°52,45'W, 07.viii.1985; depth 30 m, shell-gravel bottom.
V 3: 42°08,21'N 08°50,28'W, 07.viii.1985; depth 10 m, sand bottom.
V 4: 42°07,56'N 08°50,31'W, 07.viii.1985; depth 9 m, sand bottom with shell.
V 5: 42°14,73'N 08°50,05'W, 02.viii.1985; depth 27 m, shell-gravel bottom.
V 6: 42°14,63'N 08°50'W, 02.viii.1985; depth 13 m, shell-gravel bottom.
V 7: 42°13,85'N 08°50'W, 02.viii.1985; depth 35 m, muddy bottom with shell.
V 8: 42°12,91'N 08°49,78'W, 02.viii.1985; depth 38 m, sandy bottom with shell.
V 9: 42°11,71'N 08°49,7'W, 02.viii.1985; depth 35 m, sandy bottom with shell.
V 10: 42°09,96'N 08°49,66'W, 16.vii.1986; depth 19 m, shell-gravel bottom.
V 11: 42°07,53'N 08°49,53'W, 07.viii.1985; depth 9 m, sandy bottom with shell.
V 12: 42°14,7'N 08°48,76'W, 02.viii.1985; depth 24 m, shell-gravel bottom.
V 13: 42°13,83'N 08°48,50'W, 02.viii.1985; depth 36 m, muddy bottom.
V 14: 42°12,83'N 08°48,43'W, 02.viii.1985; depth 24 m, sandy bottom with shell.
V 15: 42°12,63'N 08°48,78'W, 16.viii.1986; depth 27 m, sandy bottom with shell.
V 16: 42°15,15'N 08°46,50'W, 02.viii.1985; depth 13 m, 'maërl' and shell-gravel on muddy bottom.
V 17: 42°14'N 08°46,96'W, 16.viii.1986; depth 44 m, muddy bottom.
V 18: 42°13,83'N 08°46,73'W, 16.vii.1986; depth 35 m, shell-gravel on muddy bottom.
V 19: 42°15,10'N 08°45,83'W, 16.ix.1986; depth 12 m, shell-gravel bottom with algae.
V 20: 42°14,30'N 08°46,16'W, 02.viii.1985; depth 41 m, muddy bottom.
V 21: 42°16,30'N 08°43,85'W, 07.viii.1985; depth 13 m, muddy bottom.
V 22: 42°15,50'N 08°44,05'W, 07.viii.1985; depth 21 m, muddy bottom.
V 23: 42°14,45'N 08°44,11'W, 07.viii.1985; depth 22 m, muddy bottom.
V 24: 42°16,45'N 08°42,23'W, 07.viii.1985; depth 14 m, muddy bottom.
V 25: 42°15,58'N 08°42,91'W, 16.ix.1986; depth 26 m, muddy bottom.
V 26: 42°15'N 08°43'W, 16.ix.1986; depth 20 m, muddy bottom.
V 27: 42°16,90'N 08°40,85'W, 07.viii.1985; depth 10 m, muddy bottom.
V 28: 42°16,34'N 08°40,31'W, 07.viii.1985; depth 15 m, shell-gravel on muddy bottom.
V 29: 42°18,10'N 08°38,51'W, 07.viii.1985; depth 6 m, muddy bottom.
V 30: 42°17,45'N 08°38,08'W, 16.ix.1986; depth 24 m, muddy bottom.
V 31: 42°18,31'N 08°37,91'W, 07.viii.1985; depth 3.5 m, muddy bottom.
V 32: 42°17,46'N 08°37,83'W, 07.viii.1985; depth 3 m, shell-gravel bottom.

## List of species

Family Bougainvilliidae Lütken, 1850
*Bougainvillia muscus* (Allman, 1863)
Family Clavidae McCrady, 1859
*Merona cornucopiae* (Norman, 1864)
Family Eudendriidae L. Agassiz, 1862
*Eudendrium ramosum* (Linnaeus, 1758)
Family Hydractiniidae L. Agassiz, 1862
*Hydractinia echinata* (Fleming, 1828)
*Podocoryne carnea* M. Sars, 1846
Family Pandeidae Haeckel, 1879
*Leuckartiara octona* (Fleming, 1823)
Family Tubulariidae Allman, 1864
*Tubularia larynx* Ellis & Solander, 1786
Family Campanulinidae Hincks, 1868
*Calycella syringa* (Linnaeus, 1767)
?*Campomma hincksi* (Hartlaub, 1897)
*Lafoeina tenuis* G. O. Sars, 1874
Family Mitrocomidae Haeckel, 1879
*Cosmetira pilosella* (Forbes, 1848)
Family Lovenellidae Russel, 1953
*Lovenella clausa* (Lovén, 1836)
Family Phialellidae Russel, 1953
*Opercularella* spec.
Family Laodiceidae Browne, 1907

*Laodicea undulata* (Forbes & Goodsir, 1853)
Family Haleciidae Hincks, 1868
*Halecium lankesteri* (Bourne, 1890)
*Halecium liouvillei* Billard, 1934
*Halecium pusillum* M. Sars, 1857
Family Aglaopheniidae Broch, 1918
*Aglaophenia pluma* (Linnaeus, 1758)
Family Halopteridiidae Millard, 1962
*Antennella secundaria* (Gmelin, 1791)
Family Kirchenpaueriidae Millard, 1962
*Kirchenpaueria pinnata* (Linnaeus, 1758)
Family Plumulariidae L. Agassiz, 1862
*Nemertesia ramosa* Lamarck, 1816
*Plumularia setacea* (Linnaeus, 1758)
Family Sertulariidae Lamouroux, 1812
*Amphisbetia operculata* (Linnaeus, 1758)
*Sertularella gayi* (Lamouroux, 1821)
Family Campanulariidae Hincks, 1868
*Clytia gracilis* (M. Sars, 1850)
*Clytia hemisphaerica* (Linnaeus, 1767)
*Clytia paulensis* (Vanhöffen, 1910)
*Laomedea angulata* Hincks, 1861
*Obelia dichotoma* (Linnaeus, 1758)
*Obelia geniculata* (Linnaeus, 1758)
*Orthopyxis crenata* (Hartlaub, 1901)

## Description of the material

### Family Bougainvillidae Lütken, 1850
### *Bougainvillia muscus* (Allman, 1863)

*Perigonymus muscus* Allman 1863: 12.
*Bougainvillia muscus*; Allman, 1864: 366; Hincks, 1868: 111; Calder, 1988: 24, figs 19-20.
*Bougainvillia ramosa*; Hincks, 1868: 109, pl. XIX, figs 2, 2a; Vervoort, 1946: 135, figs 52a, 53; Leloup, 1952: 121, figs $A^1$-$A^4$, B; Patriti, 1970: 15, fig. 7A-C; Chas Brínquez & Rodríguez Babío, 1977: 22, fig. 5A-B; Cornelius et al., 1994: 124, fig. 4.8.

Material.— V 20: two colonies detached from substratum; with gonophores.

Remarks.— The material was collected at 41 m depth on a muddy bottom. Fertile material in August. *B. muscus* is widely distributed in the Atlantic, Indian and Pacific Oceans (Calder, 1988: 28).

### Family Clavidae McCrady, 1859
### *Merona cornucopiae* (Norman, 1864)
### (fig. 2a, b)

*Tubiclava cornucopiae* Norman, 1864: 82, pl. IX, figs 4-5; Hincks, 1868: 11, pl. II, figs 2, 2a.
*Merona cornucopiae*; Rees, 1956: 499, figs 1-3; Cabioch, 1965: 401, figs 1, 2A-D, 3; Millard, 1966: 452, fig. 5H-J; Millard & Bouillon, 1973: 28, fig. 3H-J; Millard, 1975: 74, fig. 25A-B.

Material.— V 6: one colony on gastropod shell *Turritella communis* Risso, 1826, occupied by the sipunculid *Phascolion strombus* (Montagu, 1804); no gonophores. V 14: one colony on shell fragments; no gonophores.

Description.— Colonies composed of a reticulate network attached to the substrate. Gastrozoids composed of a stem supporting a single hydranth. The stem is covered by a firm perisarc tube expanding gradually towards the distal end, and is encrusted with sand or other exogenous particles. Hydranth elongate with a rounded hypostome and 16-20 scattered filiform tentacles. Nematophores completely covered with perisarc arising directly from hydrorhiza, with a dilated distal end provided with a cluster of microbasic euryteles. Gonosome not observed.

Table 1. Measurements of *Merona cornucopiae* in μm.

| | |
|---|---|
| Total height to hypostome | 1540-3030 |
| Polyp, height | 630-1060 |
| diameter | 160-360 |
| Stem, length | 960-2300 |
| maximum diameter | 240-390 |
| Nematophores, length | 40-250 |
| diameter | 30-60 |

Remarks.— The presence of nematophores was described for the first time by Cabioch (1965: 401), and Rees (in Cabioch, 1965: 404) verified the presence of the nematophores on syntype material. Colonies without nematophores were reported by Millard (1966: 453; 1975: 75) who indicated that the presence or absence of nematophores is varied in South African material.

The material was collected between 13 and 24 m depth on bottoms of shell-gravel and sand with shells. *Merona cornucopiae* has a wide distribution, with many records in the Atlantic Ocean (Shetland Islands to South Africa), the Mediterranean, Indian and Pacific Oceans (Millard, 1975: 75).

## Family Eudendriidae L. Agassiz, 1862
## *Eudendrium ramosum* (Linnaeus, 1758)

*Tubularia ramosa* Linnaeus, 1758: 804.

*Eudendrium ramosum*; Hincks, 1868: 82, pl. XIII, fig. 8a-c; Vervoort, 1946: 147, figs 58, 59a-c; Millard & Bouillon, 1973: 32, fig. 4F; 1974: 19, figs 3A-D; Millard, 1975: 85, fig. 31A-D; Ramil & Vervoort, 1992: 20; Cornelius et al., 1994: 123, fig. 4.8.

Material.— V 5: several colonies on shell fragments; without gonophores. V 6: several colonies on shell fragments; without gonophores. V 16: several colonies on stone and shell fragments; no gonophores.

Remarks.— This species was collected between 13 and 27 m depth on bottoms of shell-gravel and 'maërl' and mud with shell gravel. *Eudendrium ramosum* is generally considered a cosmopolitan species (Ramil & Vervoort, 1992: 21; Boero & Bouillon, 1993: 259).

## Family Hydractiniidae L. Agassiz, 1862
## *Hydractinia echinata* (Fleming, 1828)

*Alcyonium echinatum* Fleming, 1828: 517.

*Hydractinia echinata*; Hincks, 1868: 23, pl. IV, figs 1-6; Vervoort, 1946: 130, fig. 51; Leloup, 1952: 112, figs 53 $A^1$-$A^2$, $B^1$-$B^4$; Calder, 1975: 295, fig 2F; Chas Brínquez & Rodríguez Babío, 1977: 21, fig. 3A-B; Cornelius et al., 1994: 125, fig. 4.6.

Material.— V 11: one colony on gastropod shell inhabited by hermit crab *Pagurus bernhardus* (Linnaeus, 1758); no gonophores. V 27: one colony on gastropod shell inhabited by *P. bernhardus*; no gonophores. V 28: one colony on gastropod shell inhabited by *P. bernhardus*; no gonophores.

Remarks.— *Hydractinia echinata* was collected between 9 and 15 m depth on sandy bottoms with shells, mud, and mud with shell-gravel. This species has a boreal distribution (Boero & Bouillon, 1993: 259).

### *Podocoryne carnea* M. Sars, 1846

*Podocoryne carnea* M. Sars, 1846: 4, pl. I, figs 7-18; Hincks, 1868: 29, pl. V, figs a-e, e'; Leloup, 1952: 115, figs 5 $A^1$-$A^2$, B; Edwards, 1972: 122, figs 7A-B, 8A-D, 9A-B; Chas Brínquez & Rodríguez Babío, 1977: 21, figs 4A-B; Cornelius et al., 1994: 125, fig. 4.6.
*Hydractinia carnea*; Vervoort, 1946: 126, fig. 49; Naumov, 1969: 219, figs 51 C, c, 87A-B.

Material.— V 6: one colony on the gastropod *Nassarius reticulatus* (Linnaeus, 1758); without gonophores. V 13: one colony on the gastropod *Aporrhais pespelecani* (Linnaeus, 1758); without gonophores. V16: five colonies on *N. reticulatus*; with gonophores. V 19: one colony on *N. reticulatus*; with gonophores. V 22: three colonies on *N. reticulatus*; with gonophores. V 23: five colonies on *N. reticulatus*; with gonophores. V 24: ten colonies on *N. reticulatus*; with gonophores. V 25: one colony on *N. reticulatus*; with gonophores. V 27: six colonies on *N. reticulatus* and one colony on a shell of *N. reticulatus* inhabiting by the sipunculid *Phascolion strombus* (Montagu, 1804); with gonophores. V 28: one colony on *N. reticulatus*; with gonophores. V 29: one colony on *N. reticulatus*; with gonophores. V 30: one colony on *N. reticulatus*; without gonophores. V 32: one colony on *N. reticulatus*; with gonophores.

Remarks.— *Podocoryne carnea* is a common species and was collected between 3 and 36 m depth on all bottoms in the Ría de Vigo. Fertile material was collected in August and September. Boero & Bouillon (1993: 259) consider this species as cosmopolitan, but in the opinion of Naumov (1969: 219) *P. carnea* is distributed only in the North Atlantic Ocean, Mediterranean and Black Sea. Furthermore there are some records from the Seychelle Islands (Millard & Bouillon, 1973: 37) and Mozambique (Millard & Bouillon, 1974: 20) in the Indian Ocean. Reports from Texas, Chile and New Caledonia were regarded as doubtful by Edwards (1972: 124), and the South African records were referred to *Hydractinia marsupialia* Millard, 1975, by Millard (1975: 113).

## Family Pandeidae Haeckel, 1879

### *Leuckartiara octona* (Fleming, 1823)

*Geryonia octona* Fleming, 1823: 299.
*Leuckartiara octona*; Rees, 1938: 12, figs 3a-f, 4a-b, 5; Millard, 1975: 123, figs 41A-D; Ramil & Vervoort, 1992: 21; Cornelius et al., 1994: 125, fig. 4.7.
*Perigonimus repens*; Hincks, 1868: 90, pl. XVI, figs 2, 2a, 2b; Vervoort, 1946: 141, figs 54, 55a-b; Leloup, 1952: 116, figs 55 $A^1$-$A^2$, $13^1$, $B^2$.

Material.— V 1: one colony on scaphopod shell *Dentalium novemcostatum* Lamarck, 1818, inhabited by the sipunculid *Phascolion strombus*; no gonophores. V 6: several colonies on gastropod shells *Turritella communis*; no gonophores. V 9: one colony on gastropod shell *Nucella lapillus* (Linnaeus, 1758) occupied by the sipunculid *Phascolion strombus*; with gonophores. V 13: several colonies on gastropod shells *Nassarius semistriatus* (Brocchi, 1814); no gonophores.

Remarks.— The material was collected between 13 and 36 m depth on bottoms of shell-gravel, sand with shells and mud. Fertile material in August. *Leuckartiara octona* is

a cosmopolitan species (Rees, 1938: 12; Millard, 1975: 125; Ramil & Vervoort, 1992: 22).

## Family Tubulariidae Allman, 1864
## *Tubularia larynx* Ellis & Solander, 1786

*Tubularia larynx* Ellis & Solander, 1786: 31; Hincks, 1868: 118, pl. XXI, figs 1, 1a; Vervoort, 1946: 103, figs 39b, 41; Calder, 1975: 239, fig. 2c; Millard, 1975: 35, fig. 15H-J; Chas Brínquez & Rodríguez Babío, 1977: 20, fig. 2a-c; Cornelius et al., 1994: 116, fig. 4.5.

Material.— V 9: one colony on gastropod shell *Nucella lapillus*; no gonophores.

Remarks.— *Tubularia larynx* was collected at 35 m depth on sandy bottom with shells. This species is cosmopolitan in the opinion of some authors (Patriti, 1970: 19; Millard, 1975: 35), but we have not found any records from the Indian Ocean. According to Boero & Bouillon (1993: 261) *T. larynx* has a boreal distribution.

## Family Campanulinidae Hincks, 1868
## *Calycella syringa* (Linnaeus, 1767)

*Sertularia syringa* Linnaeus, 1758: 311.
*Lafoea pygmaea*; Hincks, 1868: 205, pl. XL, figs 3, 3a.
*Calycella syringa*; Hincks, 1868: 206, pl. XXXIX, figs 2, 2a; Naumov, 1969: 332, fig. 198; Cornelius, 1995a: 186, fig. 42A-D.
Not *Calicella syringa*; García Corrales et al., 1979: 24, fig. 11A-C.

Material.— V 12: one colony rising from stolon creeping on the pedicel of *Clytia hemisphaerica* (Linnaeus, 1767); no gonothecae.

Remarks.— The material described as *Calicella syringa* by García Corrales *et al.* (1979: 24), characterized by the long and tubular hydrothecae with a delicate diaphragm and an opercular apparatus composed of 8-12 triangular flaps not demarcated from the walls of the hydrotheca, must be excluded from *C. syringa* because this species has no diaphragm and the opercular apparatus is clearly demarcated from hydrothecal walls.

The material was collected at 24 m depth on shell-gravel bottom. *C. syringa* is a nearly cosmopolitan species in coastal waters (Cornelius, 1995a: 188).

## ?*Campomma hincksi* (Hartlaub, 1897)
## (fig. 2c)

*Campanulina Hincksi* Hartlaub, 1897: 496, pl. XXI, fig. 11.
*Campomma hincksi*; Stechow, 1921: 30; Stechow, 1923: 229.
*Campanulina hincksi*; Leloup, 1932: 1, figs 1-5; Leloup, 1952: 134, figs 70 $A^1$-$A^2$, $B^1$-$B^3$; Chas Brínquez & Rodríguez Babío, 1977: 26, fig. 10A-B.
*Campanulina hincksii*; Vervoort, 1946: 210, fig. 88.

Material.— V 6: several colonies, creeping on algae and *Clytia hemisphaerica*; no gonothecae. V 20: one colony, on an unidentifiable athecate hydroid; without gonothecae. V 21: one colony on algae; no gonothecae.

Description.— Colony stolonal or erect with sympodial branching; pedicels and branches are annulated throughout. The hydrothecae are campanulate, with delicate basal diaphragm; hydrotecal rim with an opercular apparatus composed of several triangular flaps not demarcated from hydrothecal walls. Hydranth long with a conical hypostome and 16-18 tentacles united by a basal web.

Table 2. Measurements of ?*Campomma hincksi* in μm.

| | |
|---|---|
| Colony, height | 1420-4625 |
| Pedicel, length | 60-655 |
| diameter | 40-80 |
| Hydrotheca, length (excluding operculum) | 110-175 |
| length (including operculum) | 185-280 |
| diameter at rim | 80-120 |
| Cnidome: | |
| Haplonemic isorhizas | 4.8-7.2 × 0.8-1.6 |
| Microbasic mastigophores | 5.6-6.4 × 1.6 |

Remarks.— The validity of *Campomma hincksi* (*Campanulina Hincksi* Hartlaub, 1897) is uncertain. Hartlaub (1897: 496) indicated that the newly liberated medusa resembles that of *Eucheilota maculata* Hartlaub, 1894, but Stechow (1921: 30) considered it as a valid species, including it in the new genus *Campomma*. This genus has been provisionally recognised by Rees (1939: 442), Werner (1968: 164) and Bouillon (1985: 128) until its medusa is fully described. Cornelius (1995a: 157) followed Hartlaub and Rees, in considering *C. hincksi* as conspecific with *E. maculata*.

The material coming from Ría de Vigo differs from *E. maculata* in the cnidome, assuming that the polyp of *E. maculata* has only one type of nematocyst: basitrichous haplonemes (Werner, 1968: 161), whereas our material has two different types of nematocysts: isorhizic haplonemes and microbasic mastigophores. Furthermore, the hydrotheca of *E. maculata* is deciduous (Cornelius, 1995a: 158) and our material has persistent hydrothecae. The colonies from Ría de Vigo are similar to the *Phialella quadrata* (Forbes, 1848) (see Cornelius, 1995a: 177, fig. 39d), but differ from this species because the hydranths have an intertentacular web that is absent from *P. quadrata* (see Rees, 1939: 443; Huve, 1952: 38; Bouillon, 1985: 128). Cornelius (1995a: 180) indicated that some material of *P. quadrata* deposited in the British Museum (The Natural History Museum) has a web while other material has not, and it is not clear if the character is variable or if more than one species is involved.

This species was collected at 13 and 15 m depth on muddy and shell-gravel bottoms. Considering the taxonomic confusion it is difficult to give a realistic distribution of this species. Records of *C. hincksi* are known from Helgoland (Hartlaub, 1897: 496; Broch, 1928a: 119), from the Dutch coast (Leloup, 1933: 5; Vervoort, 1946: 212), from Belgium (Billard, 1917: 4; Leloup, 1932: 1; 1947: 20; 1952: 134), and from various localities in the Iberian Peninsula (Chas Brínquez y Rodríguez Babío, 1977: 27; Ramil, 1988: 133; Medel, & López-González, 1996: 196). The records from the Catalonian coast (Gili, 1982: 48; Gili et al., 1984: 413; Gili & Castello, 1985) were referred to *P. quadrata* by Gili (1986: 130).

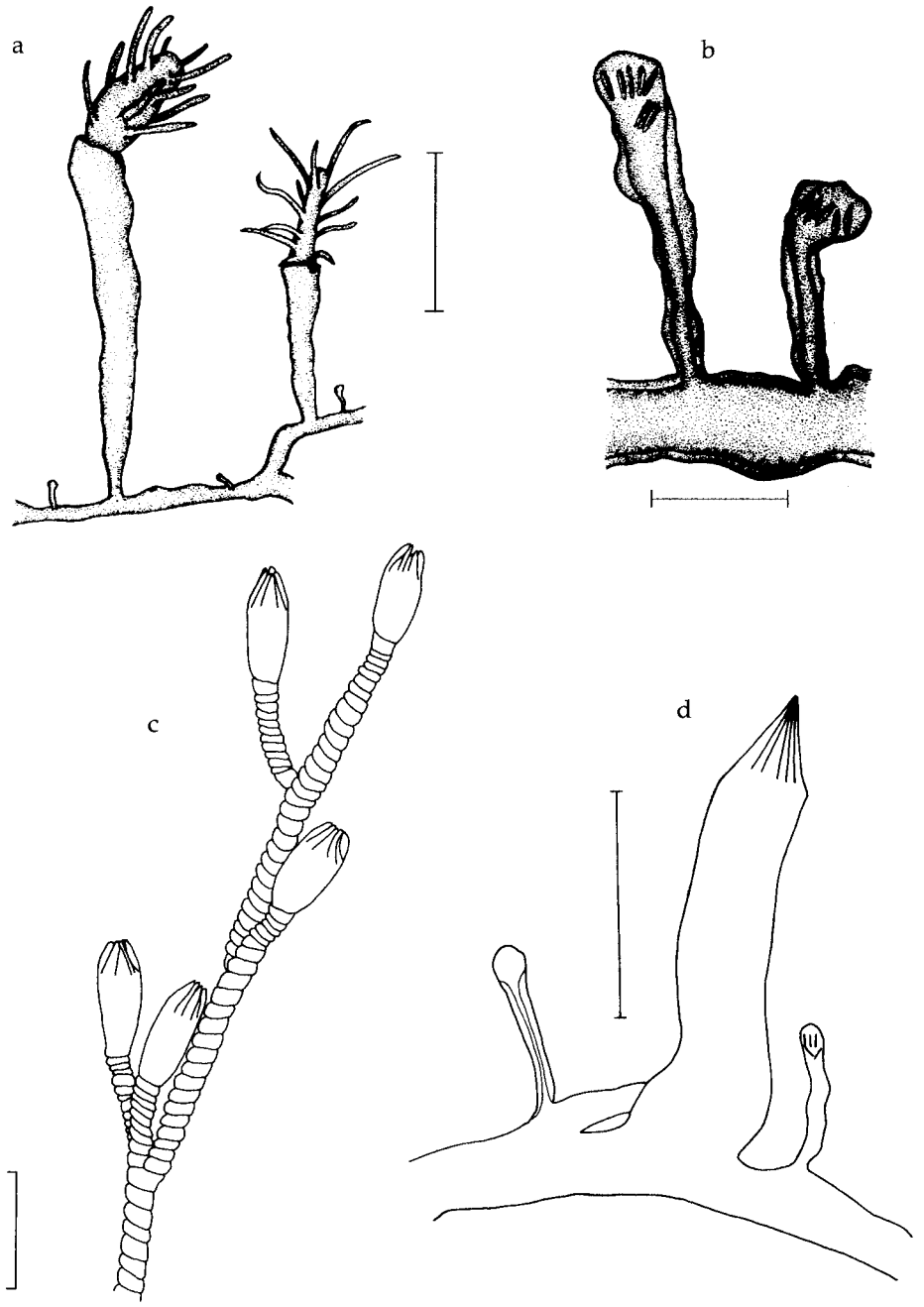


Fig. 2. a, b, *Merona cornucopiae* (Norman, 1864). a, part of a colony; b, two nematophores. c, ?*Campomma hincksi* (Hartlaub, 1897), part of a colony. d, *Lafoeina tenuis* G.O. Sars, 1874, part of colony with one hydrotheca and two nematothecae. Scales a = 1 mm, b = 0.1 mm, c-d = 0.25 mm.

## *Lafoeina tenuis* G.O. Sars, 1874
(fig. 2d)

*Lafoeina tenuis* G.O. Sars, 1874: 119, pl. V, figs 1-5; Broch, 1928b: 65, fig. 56.
*Lafoeina vilae-velebiti*; Bouillon, 1971: 64, figs 1-3.
*Lafoeina tenuis*; Naumov, 1969: 339, fig. 204; Cornelius, 1995a: 197, fig. 45A-D.

Material.— V 18: one colony growing on a shell fragment; no gonothecae.

Remarks.— The morphology of the hydrotheca is very similar to that of *Cosmetira pilosella* (Forbes, 1848) but differs in the presence, in *L. tenuis*, of nematothecae on the hydrorhiza.

In the Ría de Vigo this species was collected at 35 m depth on mud with shell-gravel bottom. *L. tenuis* was considered by Boero & Bouillon (1993: 262) as a boreal species.

## Family Mitrocomidae Haeckel, 1879
## *Cosmetira pilosella* (Forbes, 1848)
(fig. 3a)

*Thaumantias pilosella* Forbes, 1848: 42, pl. VIII, fig. 1.
?*Cuspidella grandis* Hincks, 1868: 210, pl. XL, fig. 4; Fraser, 1914: 158, pl. XVIII, fig. 62A-C; Broch, 1928a: 118; Naumov, 1969: 326, fig. 93; García Corrales et al., 1979: 24, fig. 12.
*Cosmetira pilosella*; Rees, 1941: 55, figs 1-2.

Material.— V 5: two colonies on a dead bivalve shell and on the gastropod *Turritella communis*; no gonothecae. V 6: one colony on the bryozoan *Microporella ciliata* (Pallas, 1766); no gonothecae.

Description.— Colonies with hydrothecae arising directly from creeping hydrorhiza. Hydrotheca cylindrical, straight, smooth, without basal constrictions or annulations. Opercular apparatus formed by several triangular flaps not demarcated from the hydrothecal rim. Signs of renovation or growth were not observed.

Table 3. Measurements of *Cosmetira pilosella* in μm.

| | |
|---|---|
| Length of hydrotheca without operculum | 445-950 |
| Idem, with operculum | 535-1120 |
| Diameter of hydrotheca | 80-140 |

Remarks.— The material collected, in the Ría de Vigo, resembles with the description of the hydroid of *Cosmetira pilosella* given by Rees (1941:55); but our identification, based only on the hydroid stage, must be considered provisional. Rees (1941: 57) suggested that *Cuspidella grandis* Hincks, 1868 may be identical with the hydroid *Cosmetira pilosella*, but final conclusions regarding the identity of the various species of *Cuspidella* cannot be reached until the life-cycle of all medusae possessing *Cuspidella* hydroids has been studied.

The colonies were collected between 13 and 27 m depth, on shell-gravel bottoms. Records of *C. pilosella* are known from the NE Atlantic Ocean; the hydroid is probably distributed from the Faeroes to about Portugal (Cornelius, 1995a: 132).

## Family Lovenellidae Russell, 1953
## *Lovenella clausa* (Lovén, 1836)
## (fig. 3b)

*Campanularia clausa* Lovén, 1836: 262.

*Lovenella clausa*; Hincks, 1868: 177, fig. 19, pl. XXXII, fig. 2; Fraser, 1912: 364, fig. 26A-D; Da Cunha, 1944: 44, fig. 22; Patriti, 1970: 32, fig. 38; García Corrales et al., 1979: 30, fig. 16; Cornelius, 1995a: 162, fig. 36A-H.

Material.— V 3: one colony on the bivalve *Chamalea striatula* (Da Costa, 1778); no gonothecae. V 5: two

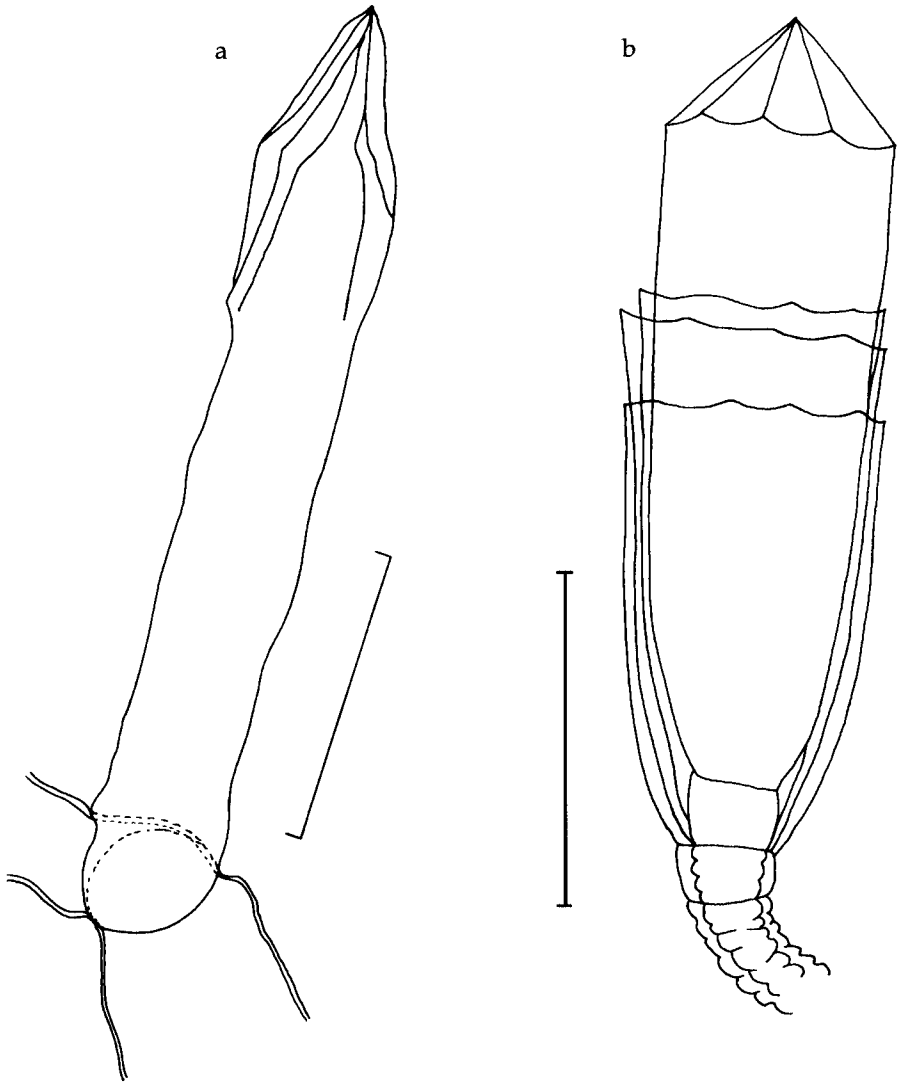


Fig. 3. a, *Cosmetira pilosella* (Forbes, 1848), single hydrotheca. b, *Lovenella clausa* (Lovén, 1836), detail of renovated hydrotheca. Scales a = 0.25 mm, b = 0.5 mm.

colonies on the bivalve *Timoclea ovata* (Pennant, 1777) and on the gastropod shell *Turritella communis*; no gonothecae. V 6: one colony on shell fragments; no gonothecae. V 7: one colony on shells fragments; without gonothecae. V 13: three colonies on gastropod shells *T. communis* and on the scaphopod *Dentalium novemcostatum*; no gonothecae. V 18: three colonies on bivalve shells *Ensis* spec. and *Tapes* spec.; no gonothecae. V 28: four colonies on shell fragments and on the bivalve *Chlamys opercularis* (Linnaeus, 1758); no gonothecae.

Remarks.— This species is characterised by the long and campanulate hydrothecae with an opercular apparatus composed of eight triangular flaps well demarcated from the hydrothecal rim; typically with 1-4 renovated hydrothecae. Well preserved hydranths with 12 tentacles around conical hypostome.

*Lovenella clausa* is a common species in the Ría de Vigo and was collected between 10 and 36 m depth on bottoms of sand, shell-gravel, and mud with shells. *L. clausa* is an Atlantic-Mediterranean species (Boero & Bouillon, 1993: 262) and its geographical distribution has been summarized also by Cornelius (1995a: 164).

## Family Phialellidae Russel, 1953
## *Opercularella* spec.
## (fig. 4a, b)

?*Calicella syringa*; García Corrales et al., 1979: 24, fig. 11A-C.

Material.— V 5: one colony on shell fragments; no gonothecae. V 6: one colony on shell fragments; no gonothecae.

Description.— Colonies comprising a stolon attached to the substrate bearing erect pedicels spirally ringed, each supporting a single hydrotheca. Hydrotheca deep and cylindrical with almost parallel walls, narrowing basally. Diaphragm distinct, delicate, delimiting a short basal chamber. Hydrothecal rim with an opercular apparatus comprising several triangular flaps, not demarcated from hydrothecal wall.

Table 4. Measurements of *Opercularella* spec. in μm.

| | | *Calicella syringa* (García Corrales et al., 1979) |
|---|---|---|
| Colony, height | 900-1540 | |
| Pedicel, length | 350-1170 | 190-230 |
| diameter | 30-35 | 35-50 |
| Hydrotheca, total length | 375-545 | |
| length diaphragm-rim (excluding operculum) | 250-410 | 170-210 |
| Idem, (including operculum) | 360-530 | 230-270 |
| length basal chamber | 15-25 | |
| maximum diameter | 120-125 | 90-110 |
| diameter at diaphragm | 40-45 | 40-55 |

Remarks.— This species with unknown gonosome has been included in the genus *Opercularella* following Rees (1939: 437). The material described by García Corrales et

al. (1979: 24) as *Calicella syringa* [Not *Calycella syringa* (Linnaeus, 1767)] may be identical with the present species, but a definite conclusion is not possible so long as the gonosome of both species remains unknown. *Opercularella* spec. also approaches ?*Calycella gracilis* Hartlaub, 1897, redescribed by Cornelius (1995a: 182), but this species lacks a diaphragm.

The species was collected between 13 and 27 m depth on shell-gravel bottoms.

Family Laodiceidae Browne, 1907
*Laodicea undulata* (Forbes & Goodsir, 1853)
(fig. 4c)

*Thaumantias undulata* Forbes & Goodsir, 1853: 313, pl. X, fig. 7.
*Cuspidella costata* Hincks, 1868: 210, pl. XL, figs 5, 5a; Vervoort, 1946: 205, fig. 86a-e; Leloup, 1952: 132, fig. $67B^1$-$B^2$.
*Laodicea undulata*; Russell, 1936: 581, figs 1-7; Cornelius, 1995a: 99, fig. 22A-G.

Material.— V 7: two colonies growing on the bivalves *Chlamys opercularis* and *Venus verrucosa* Linnaeus, 1758; no gonothecae. V 18: one colony on shell fragments; no gonothecae.

Remarks.— Our material resembles the available descriptions of *Cuspidella costata* Hincks, 1868, of which the hydromedusa, according to Russell (1936: 586), is *Laodicea undulata*. However, the identification was based only on the hydroid stage, and must be considered with some reserve.

The species was collected at 35 m depth on mud with shell-gravel bottoms. Boero & Bouillon (1993: 262) considered a *Laodicea undulata* as a species with a tropical-Atlantic distribution, but Cornelius (1995a: 102) indicated that its distribution is wider and perhaps nearly world-wide in coastal and shelf waters. The hydroid stage records were discussed by Ramil & Vervoort (1992: 28).

Family Haleciidae Hincks, 1868
*Halecium lankesteri* (Bourne, 1890)

*Haloikema lankesteri* Bourne, 1890: 395, pl. XXVI.
*Halecium lankesteri*; Bedot, 1911: 213, pl. XI, figs 1-5; Vervoort, 1959: 221, figs 3, 4a-c; Cornelius, 1975: 399, fig. 8a-c; Millard, 1975: 153, fig. 50B-E; Ramil & Iglesias, 1988: 74, pl. 5; Cornelius, 1995a: 285, fig. 65A-E.

Material.— V 5: one colony on shell fragments; no gonothecae. V 7: one colony on shell fragments; without gonothecae.

Remarks.— The material was collected between 27 and 35 m depth on bottoms of shell-gravel and mud with shells. This species shows a tropical-Atlantic distribution (Boero & Bouillon, 1993: 263), with additional records from Mozambique, in the Indian Ocean (Millard & Bouillon, 1974: 5; Millard, 1975: 153).

*Halecium liouvillei* Billard, 1934
(fig. 4d)

*Halecium Liouvillei* Billard, 1934: 227, fig. 1.

*Halecium liouvillei*; Leloup, 1937: 94, fig. 2A, B, B[1]; Patriti, 1970: 24, fig. 22; Van Praët, 1979: 878, fig. 11; Ramil & Fernández Pulpeiro, 1991: 63, figs 2A-B, 3; Altuna, 1992/93: 47, figs 2A-C, 3A-C, 4A-B.

Material.— V 6: one colony on shell of gastropod *Turritella communis*; no gonothecae. V 16: one colony on ascidian; no gonothecae. V 19: one colony detached from the substrate; with male gonothecae.

Remarks.— This species was been recently redescribed by Ramil & Fernández Pulpeiro (1991: 65) and Altuna (1992/93: 51). The male gonotheca, as yet undescribed, originates from the diaphragm of a primary hydrotheca or from a secondary hydranthophore and is ovate with a terminal aperture. Fertile material was collected in September.

Table 5. Measurements of *Halecium liouvillei* in μm.

| | |
|---|---|
| Cauline internodes, length | 610-790 |
| diameter | 150-190 |
| Hydrotheca, length | 40-70 |
| diameter at diaphragm | 130-150 |
| diameter at rim | 200-220 |
| Male gonotheca, maximum height | 610-950 |
| maximum width | 310-410 |

*H. liouvillei* was collected from 12-13 m on bottoms of shell-gravel and mud with 'maërl' and shell-gravel. This species is known from the Bay of Biscay (Altuna 1992/93: 52), from various localities on Galician coasts (Ramil & Iglesias, 1988: 75; Ramil & Fernández Pulpeiro, 1991: 68), from the Strait of Gibraltar (Medel & López-González, 1996: 199), from Agadir (Billard, 1934: 227; Patriti, 1970: 25; Van Praët, 1979: 878) and from the coast of Rio de Oro (Leloup, 1937: 96).

## *Halecium pusillum* (M. Sars, 1857)

*Eudendrium pusillum* M. Sars, 1857: 154, pl. I, figs 14-16.
*Halecium pusillum*; Broch, 1912: 16, fig. 2; Babic, 1913: 496, figs 1-3; Stechow, 1919: 36, fig. F; García Corrales et al., 1978: 14, fig. 4A-F; Boero, 1981: 109, fig. 2a-b; Ramil & Iglesias, 1988: 75, pls 6-7.

Material.— V 4: one colony on bivalve shell *Solen* spec.; no gonothecae. V 6: one colony on shell fragments; no gonothecae. V 14: one colony on the bivalve *Dosinia exoleta* (Linnaeus, 1758); no gonothecae.

Remarks.— This species was collected from 4 to 24 m depth on bottoms of shell-gravel and sand with shells. *Halecium pusillum* is considered a tropical-Atlantic species (Boero & Bouillon, 1993: 263). It is widely distributed in the Mediterranean Sea and in the Atlantic Ocean. There are records from France to Morocco, and scattered records from the western Atlantic and Indian Oceans. The records from the Pacific Ocean were considered dubious by Gili (1986: 141).

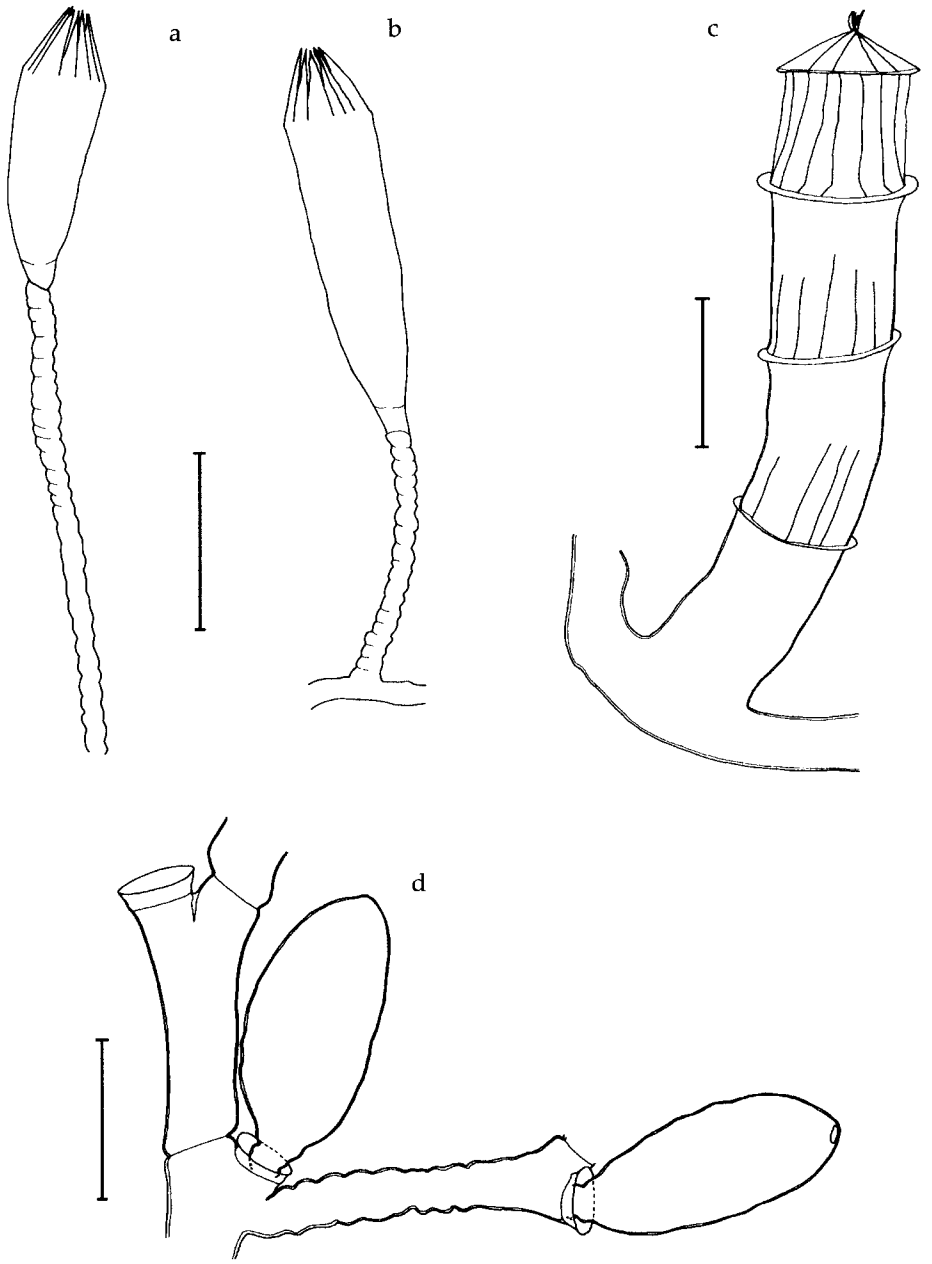


Fig. 4. a, b, *Opercularella* spec., two hydrothecae with pedicels. c, *Laodicea undulata* (Forbes & Goodsir, 1853), hydrotheca with renovations. d, *Halecium liouvillei* Billard, 1934, part of colony with two male gonothecae. Scales a-c = 0.25 mm, d = 0.50 mm.

## Family Aglaopheniidae Broch, 1918
## *Aglaophenia pluma* (Linnaeus, 1758)

*Sertularia pluma* Linnaeus, 1758: 811.
*Plumularia cristata* Lamarck, 1816; 125. (nom. nov. for *Sertularia pluma* Linnaeus, 1758).
*Aglaophenia pluma*; Hincks, 1868: 286, fig. 37, pl. 63, fig. 1 (part); Vervoort, 1946: 190, figs 80-81 (part); Svoboda & Cornelius, 1991: 30, figs 10f, 12, 13a-g, 19a-b, 24a-b; Cornelius, 1995b: 192, fig. 45A-E.

Material.— V 6: several colonies growing on algae; no corbulae.

Remarks.— This species was collected from 13 m depth on shell-gravel bottom. The geographical distribution of *A. pluma* includes the north-eastern Atlantic (British Isles to Morocco) and the Mediterranean. Records from other parts of the world were discussed by Svoboda & Cornelius (1991: 32).

## Family Halopteridídae Millard, 1962
## *Antennella secundaria* (Gmelin, 1791)

*Sertularia secundaria* Gmelin, 1791: 3856.
*Plumularia secundaria*; Pictet & Bedot, 1900: 27, pl. VI, fig. 7.
*Antennella secundaria*; Millard, 1975: 332, fig. 107F-L; Rees & Vervoort, 1987: 113, fig. 23a-b; Ramil & Vervoort, 1992: 143, fig. 37a-d; Calder, 1997: 29, fig. 7a-f; Schuchert, 1997: 14, figs 3a-g, 4a-e.
*Halopteris catharina*; García Corrales et al., 1978: 47, fig. 20A-C. [Not *Halopteris catharina* (Johnston, 1833)].

Material.— V 6: several colonies on tubeworms; with gonothecae. V 9: several colonies on the shell of the gastropod *Nucella lapillus*; with gonothecae. V 15: several colonies on tube of the polychaete *Chaetopterus variopedatus* (Renier, 1804); no gonothecae. V 20: one colony on *Halecium* spec.; no gonothecae.

Remarks.— This species was collected from 13 to 41 m depth on bottoms of shell-gravel, sand with shells, and mud. Fertile material was collected in August. *Antennella secundaria* is a cosmopolitan species most numerous in temperate and warmer localities (Schuchert, 1997: 15).

## Family Kirchenpaueriidae Millard, 1962
## *Kirchenpaueria pinnata* (Linnaeus, 1758)

*Sertularia pinnata* Linnaeus, 1758: 813.
*Plumularia pinnata*; Hincks, 1868: 295, pl. LXV, figs 1, 1a, 1b; Billard, 1904: 202, figs 74-77.
*Plumularia echinulata*; Hincks, 1868: 302, pl. LXV, figs 2, 2a, 2b; Billard, 1904: 191, figs 69-73.
*Plumularia similis*; Hincks, 1868: 303, pl. LXV, figs 3, 3a, 3b.
*Kirchenpaueria pinnata*; Vervoort, 1946: 167, figs 69a, 70a-b; Millard, 1975: 372, fig. 119A-D; Ramil & Vervoort, 1992: 158, fig. 41a-c; Cornelius, 1995b: 130, fig. 30A-G; Medel & Vervoort, 1995: 41, figs 17a-d, c'-d', 18a-d.
*Kirchenpaueria echinulata*; Picard, 1951: 341, fig. 1A.
*Kirchenpaueria similis*; Roca & Moreno, 1987: 46, fig. 2; Cornelius, 1995b: 135, fig. 31A-F.

Material.— V 5: two colonies detached from the substrate; no gonothecae. V 6: several colonies on algae and the bryozoan *Electra pilosa* (Linnaeus, 1767); no gonothecae. V 15: several colonies on the

tube of *Chaetopterus variopedatus*; with gonothecae. V 20: one colony detached from the substrate; no gonothecae. V 22: several colonies on *Zostera marina* Linnaeus, 1753; with gonothecae. V 28: one colony on shell fragments; no gonothecae. V 29: several colonies on *Zostera marina*; with gonothecae.

Remarks.— This species was collected from 6 to 41 m depth on bottoms of shell-gravel, mud, and sand with shells. Fertile material was noted in August. *Kirchenpaueria pinnata* is widely distributed from the North Atlantic to South Africa, and is common in the Mediterranean (Ramil & Vervoort, 1992: 159).

## Family Plumulariidae L. Agassiz, 1862

### *Nemertesia ramosa* Lamarck, 1816

*Antennularia ramosa* Lamarck, 1816: 123; Hincks, 1868: 282, pl. LXII, figs a-c.
*Nemertesia ramosa*; Vervoort, 1946: 182, figs 76b, 77; Ramil & Vervoort, 1992: 173, fig. 44a-f; Cornelius, 1995b: 155, fig. 36A-E; Medel & Vervoort, 1995: 48, figs 20a-e, 23a.
*Nemertesia ramosa* var. *Plumularioides*; Vervoort, 1959: 293, figs 46b, 47.

Material.— V 20: one colony on a shell fragment; no gonothecae.

Remarks.— *Nemertesia ramosa* was collected from 41 m depth on a muddy bottom. The species is widely distributed in the eastern Atlantic Ocean (North Atlantic to South Africa), probably including the whole Mediterranean (Vervoort, 1993: 553). The records of *N. ramosa* from the south-west Atlantic (Vervoort, 1972: 234; Blanco, 1976: 57) have been referred to *Plumularia insignis* Allman, 1877, by Stepan'yants (1979: 117) and Ramil & Vervoort (1992: 175), and the records from Indian Ocean were also discredited by Ramil & Vervoort (1992: 175).

### *Plumularia setacea* (Linnaeus, 1758)

*Sertularia setacea* Linnaeus, 1758: 813.
*Plumularia setacea*; Hincks, 1868: 297, pl. LXVI, figs 1, 1a; Vervoort, 1946: 175, figs 24f, 73; Millard 1975: 399, fig. 124E-K; Ramil & Vervoort, 1992: 191, fig. 47f-i; Cornelius, 1995b: 158, fig. 37A-E; Medel & Vervoort, 1995: 56, fig. 24a-d; Calder, 1997: 17, fig. 4a-d.

Material.— V 6: one colony detached from the substrate; with gonothecae. V 12: several colonies detached from the substrate; no gonothecae. V 28: one colony detached from the substrate; no gonothecae.

Remarks.— The material was collected from 13 to 24 m depth on bottoms of shell-gravel and mud with shell-gravel. Fertile material was noted in August. This well-known species has a cosmopolitan distribution (Boero & Bouillon, 1993: 264; Medel & Vervoort, 1995: 50).

## Family Sertulariidae Lamouroux, 1812

### *Amphisbetia operculata* (Linnaeus, 1758)

*Sertularia operculata* Linnaeus, 1758: 808; Hincks, 1868: 263, pl. LIV, figs a-c; Vervoort, 1946: 249, fig. 109a-b.

*Amphisbetia operculata*; Leloup,1952: 174, fig. 101A-C; Ralph, 1961: 775, fig. 8i-k; Millard, 1975: 251, fig. 83A-E; Cornelius, 1979: 254, fig. 6a-b; Cornelius, 1995b: 30, fig. 4A-G.
*Dynamena operculata*; Naumov, 1969: 357, fig. 220A-B, pl. VII, fig. 1.

Material.— V 28: several colonies detached from the substrate; no gonothecae.

Remarks.— This species was collected from 15 m depth on shell-gravel on a muddy bottom. *Amphibestia operculata* is considered by some authors (Ralph, 1961: 777; Patriti, 1970: 44; Millard, 1975: 251) as cosmopolitan. Cornelius (1995b: 32) considered the species widely distributed in temperate to tropical coastal waters and indicated that *A. operculata* does not occur on the Atlantic coast of North America and that it may be absent from the North Pacific Ocean as well.

### *Sertularella gayi gayi* (Lamouroux, 1821)

*Sertularia gayi* Lamouroux, 1821: 12, pl. 66, figs 8-9.
*Sertularella Gayi*; Hincks, 1868: 237, fig. 29, pl. 46, fig. 2.
*Sertularella gayi*; Leloup, 1952: 166, figs 96A$^1$-A$^2$, B, C; Vervoort, 1959: 273, figs 33b-c, 34b; Vervoort, 1966: 127, fig. 30; Patriti, 1970: 37, fig. 48A-C; Cornelius, 1979: 284, fig. 21a-d; Ramil et al., 1992: 496, figs 1a, 2a-b, 3; Cornelius, 1995: 71, fig. 16A-E.
*Sertularella gayi gayi*; Ramil & Vervoort, 1992: 219, fig. 61a-e.

Material.— V 12: two colonies detached from the substrate; no gonothecae. V 17: one colony detached from the substrate; no gonothecae. V 19: one colony detached from the substrate; no gonothecae.

Remarks.— *Sertularella gayi gayi* is characterized by the strongly polysiphonic axis, by the regular, pinnate ramification in one plane, and by the bilobate gonothecal aperture. Differences from *Sertularella gayi robusta* Allman, 1873, and *Sertularella polyzonias* (Linnaeus, 1758), were summarized by Ramil & Vervoort (1992a: 222, 225). On Galician coasts this species has only been collected from unstable bottoms and it seems to be absent from rocky substrates.

The species was collected from 12 to 44 m depth on shell-gravel and muddy bottoms. Cornelius (1995b: 72) indicated that the geographical distribution of *S. gayi* is uncertain because taxonomic difficulties make identification of existing records problematic. The species is widely distributed in the Atlantic Ocean (Spitzbergen to Gough Island) (Ramil & Vervoort, 1992: 222), but was considered as boreal by Boero & Bouillon (1993: 264), and cosmopolitan by Ralph (1961: 833).

## Family Campanulariidae Hincks, 1868

### *Clytia gracilis* (M. Sars, 1850)

*Laomedea gracilis* M. Sars, 1850: 138 (part).
*Laomedea* (*Campanularia*) *gracilis*; M. Sars, 1857: 161, pl. I, figs 1-3, 5.
*Gonothyraea gracilis*; Hincks, 1868: 183, pl. XXXVI, figs 1, 1', 1a.
*Laomedea* (*Phialidium*) *pelagica*; Vervoort, 1959: 313, fig. 55b-c; Vervoort, 1968: 15, fig. 5a-b.
*Laomedea* (*Clytia*) *pelagica*; Vervoort, 1972: 91, fig. 26c; García Corrales et al., 1978: 28, fig. 11A-B.
*Clytia gracilis*; Cornelius & Östman, 1986: 165; Calder, 1991: 54, fig. 31a-d; Ramil & Vervoort, 1992: 235, fig. 67a; Cornelius, 1995b: 246, fig. 56A-H.

Material.— V 1: several colonies on shell fragments; with gonothecae. V 5: several colonies on shell fragments, on the gastropod shell *Turritella communis* and *Eudendrium* spec.; with gonothecae. V 6: several colonies on shell fragments and fragments of echinoid test; no gonothecae. V 7: two colonies on shell fragments; no gonothecae. V 9: one colony growing on shell of gastropod *Nucella lapillus*; with gonothecae. V 14: three colonies on shell fragments and on sponge; with gonothecae. V 19: one colony on the bivalve *Tapes* spec.; no gonothecae. V 20: two colonies on shell of gastropod *Turritella communis*, occupied by the sipunculid *Phascolion strombus*, and on the bivalve *Chlamys opercularis*; with gonothecae. V 26: one colony on stem of *Obelia dichotoma* (Linnaeus, 1758); no gonothecae. V 28: one colony on shell fragments; no gonothecae.

Remarks.— *Clytia gracilis* is a common species on soft bottoms in the Ría de Vigo and was collected from 12 to 35 m depth on bottoms of shell-gravel, mud and sand with shells, and mud. Fertile material was noted in August. This species has a wide distribution in the Atlantic, Indian and Pacific Oceans (see Vervoort, 1993: 558). The possibility of widespread dispersal by rafting has been suggested and the species may prove to be nearly cosmopolitan in coastal waters (Cornelius, 1995b: 250).

## *Clytia hemisphaerica* (Linnaeus, 1767)

*Medusa hemisphaerica* Linnaeus, 1767: 1098
*Clytia Johnstoni*; Hincks, 1868: 143, pl. XXIV, figs 8, 8a, 9.
*Clytia hemisphaerica*; Calder, 1975: 300, fig. 4A-B; García Corrales et al., 1988: 25, fig. 10A-I; Calder, 1991: 57, fig. 32a-b; Cornelius, 1995b: 252, fig. 57A-H.

Material.— V 1: several colonies on algae; with gonothecae. V 2: several colonies on the bivalve *Mytilus galloprovincialis* (Lamarck, 1819); with gonothecae. V 6: several colonies on algae; with gonothecae. V 9: one colony on gastropod shell *Nucella lapillus*; no gonothecae. V 12: one colony on algae; no gonothecae. V 14: several colonies on tubicolous polychaetes and shell fragments; no gonothecae.

Remarks.— *C. hemisphaerica* was collected from 13 to 35 m depth on shell-gravel and sandy bottoms with shell. Fertile material was collected in August. Boero & Bouillon (1993: 264) considered *C. hemisphaerica* a cosmopolitan species, but Cornelius (1995b:254) indicated that difficulties of identification in this genus make nearly all records suspect.

## *Clytia paulensis* (Vanhöffen, 1910)

*Campanularia paulensis* Vanhöffen, 1910: 298, fig. 19.
*Clytia paulensis*; Stechow, 1923: 110, fig. N; Millard, 1966: 481, fig. 15A-H; Millard, 1975: 221, fig. 73A-D; Cornelius, 1982: 88, fig. 15a-c; Ramil & Vervoort, 1992: 239, fig. 67c-d; Cornelius, 1995b: 258, fig. 59A-F.

Material.— V 5: three colonies on stems of *Eudendrium* spec. and *Halecium* spec.; no gonothecae. V 6: one colony on gastropod shell *Ocenebra erinacea* (Linnaeus, 1758) and shell fragments; no gonothecae. V 7: five colonies on stem of *Halecium* spec., on shell of gastropod *Turritella communis* and shell fragments; no gonothecae. V 9: one colony on shell fragments; no gonothecae. V 18: one colony on the bivalve *Ensis* spec.; no gonothecae. V 19: one colony on a unidentifiable athecate hydroid; no gonothecae. V 20: several colonies growing on stone, on algae, on stem of *Halecium* spec. and on the bivalve *Acanthocardia echinata* Linnaeus, 1758; no gonothecae. V 28: one colony on stem of *Amphisbetia operculata* (Linnaeus, 1758); no gonothecae.

Remarks.— This species is common in the Ría de Vigo and was collected from 13 to 41 m depth on bottoms of shell-gravel, sand and mud with shells, and mud. The distribution of *Clytia paulensis* is wide, comprising temperate to warm waters of the Atlantic, Indian and Pacific Oceans. The species is also recorded from antarctic waters (Millard, 1975: 221).

### *Laomedea angulata* Hincks, 1861

*Laomedea angulata* Hincks, 1861: 261, pl. VIII; Cornelius, 1982: 98, fig. 17a-d; Gili, 1982: 63, figs A-B; Cornelius, 1995b: 270, fig. 62A-G.
*Campanularia angulata*; Hincks, 1868: 170, fig. 14, pl. XXXIV, figs 1, 1a.

Material.— V 31: several colonies growing on *Zostera marina*; no gonothecae.

Remarks.— The material was collected at 3.5 m depth on a muddy bottom. This species is know from the Mediterranean to England and the Netherlands (Cornelius, 1995b: 271).

### *Obelia dichotoma* (Linnaeus, 1758)

*Sertularia dichotoma* Linnaeus, 1758: 812.
*Obelia dichotoma*; Hincks, 1868: 156, pl. XXVIII, figs 1, 1a-1d; Millard, 1975: 227, fig. 75F-J; Cornelius, 1990: 550, figs 2-3; Calder, 1991: 72, fig. 38a-d; Ramil & Vervoort, 1992: 243, fig. 68c; Cornelius, 1995b: 296, fig. 69A-K.
*Laomedea dichotoma*; Vervoort, 1946: 292, fig. 128; Leloup, 1952: 164, figs 9a, 95A, $B^1$-$B^2$, C-D.

Material.— V 1: several colonies on shell fragments and algae; with gonothecae. V 5: several colonies on shell fragments, on stems of *Eudendrium* spec. and *Halecium* spec.; no gonothecae. V 6: several colonies on shell fragments, on axis of *Halecium liouvillei* and on tubicolous polychaetes; no gonothecae. V 7: several colonies on the bivalve *Venerupis rhomboides* (Pennant, 1777); no gonothecae. V 9: two colonies on shell of gastropod *Nucella lapillus*; no gonothecae. V 16: one colony on algae; no gonothecae. V 20: one colony on stem of *Eudendrium* spec.; no gonothecae. V 22: several colonies on *Zostera marina*; with gonothecae. V 26: one colony on plastic bottle; with gonothecae. V 28: several colonies on fishing line; with gonothecae.

Remarks.— The material collected in the Ría of Vigo has hydrothecae polygonal in section and a crenate hydrothecal rim. Moreover *O. dichotoma* is characterized by the presence of one nematocyst which is highly distinctive from those of other European species of this family (Östman, 1982: 232).

*O. dichotoma* was collected from 13 to 41 m depth on bottoms of shell-gravel, sand and mud with shells, and mud. Fertile material collected in August and September. The species is considered cosmopolitan (Patriti, 1970: 36; Millard, 1975: 229; Gili et al., 1989: 108; Boero & Bouillon, 1993: 265).

### *Obelia geniculata* (Linnaeus, 1758)

*Sertularia geniculata* Linnaeus, 1758: 812.
*Obelia geniculata*; Hincks, 1868: 149, pl. XXV, figs 1, 1a; Cornelius, 1975: 272, figs 1, 5a-c; Millard, 1975: 229, fig. 75A-B; Cornelius, 1995b: 301, fig. 70A-G.
*Laomedea geniculata*; Vervoort, 1946: 294, figs 129-131; Leloup, 1952: 152, fig. 58.

Material.— V 1: several colonies growing on *Laminaria* spec.; with gonothecae. V 4: several colonies on *Laminaria* spec.; with gonothecae. V 6: several colonies on *Laminaria* spec. and *Cystoseira* spec.; with gonothecae.

Remarks.— The material examined has great variation in the thickness of the asymmetric perisarc. Within the colony, the basal segments have the perisarc thicker than the upper segments. The species has been collected from 9 to 23 m depth on shell-gravel and sand with shell bottoms. Fertile material was collected in August. *Obelia geniculata* is considered by some authors (Leloup, 1947: 25; Patriti, 1970: 35; Cornelius, 1982: 120) as nearly cosmopolitan.

*Orthopyxis crenata* (Hartlaub, 1901)

*Eucopella crenata* Hartlaub, 1901: 364, pl.22, figs 27-31, 33-35.
*Orthopyxis crenata*; Leloup, 1974: 17, fig. 15A-N; Cornelius, 1982: 58, fig. 5.
*Campanularia crenata*; Millard & Bouillon, 1973: 47, fig. 6B-F; Millard, 1975: 204, fig. 68A-F; García Corrales et al., 1978: 19, fig. 7A-F.

Material.— V 1: several colonies on shell fragments; no gonothecae.

Remarks.— *Orthopyxis crenata* was collected at 23 m depth on shell-gravel bottom. The species has a circumtropical distribution in Atlantic, Indian and Pacific Oceans (Boero & Bouillon, 1993: 265).

## Discussion

Study of the epifauna from soft bottoms of the Ría de Vigo identified 31 species of hydroids (7 Anthomedusae and 24 Leptomedusae), representing 1/3 of the total species of hydroids known from the Ría de Vigo.

Most of these species are common in adjacent rocky bottoms close to the coast of the Ría and only five species, *Merona cornucopiae, Hydractinia echinata, Lovenella clausa, Opercularella* spec. and *Laomedea angulata,* were collected exclusively from soft bottoms that, according to the literature, seem to be the typical habitat of these species.

*Merona cornucopiae* was collected, in most cases, by dredging, growing on mollusc shells (scaphopods, bivalves and gastropods) often occupied by the sipunculid *Phascolion strombus* (Montagu, 1804) (Hincks, 1868: 13; Rees, 1956: 499; Cabioch, 1965: 401; Teissier, 1965: 12). However, Motz-Kossowska (1905: 68) cited *M. cornucopiae* growing on the axis of a gorgonian.

*Hydractinia echinata* was recorded on different gastropod shells inhabited by hermit crabs (Hincks, 1868: 27; Leloup, 1952: 115; Teissier, 1965: 12; Chas Brínquez & Rodríguez Babío, 1977: 21; Cornelius et al., 1994: 125), but it was also collected on other substrates, such as Bryozoa, stones etc., summarized by Cazaux (1961: 2). In the Ría de Vigo, *H. echinata* was always collected on shells occupied by *Pagurus bernhardus,* but an association with another species of Paguridae was also reported (Cazaux, 1961: 2). At least two more species of hermit crab, *Pagurus prideauxi* Leach and *Diogenes pugilator* (Roux), live in the Ría de Vigo, but their association with *H. echinata* was never observed.

*Lovenella clausa* was collected especially on shells of *Turritella communis*, sometimes occupied by the sipunculid *Phascolion strombus*. Nevertheless this species has also been recorded on other mollusc shells, such as bivalves and scaphopods and, once, on *Fucus* (see Cornelius, 1995a: 164).

*Laomedea angulata* grows mainly on eelgrass (*Zostera marina*) and Cornelius (1995b: 271) considered that all confirmed records of this species are from *Zostera* and other sea-grasses. The records of this species on other substrates (Sertularidae, *Laminaria*, *Dictyota dichotoma*, *Balanus improvisus* and *Fucus*) may be wrong (Cornelius, 1982: 101).

Analysis of geographical distribution, using the zoogeographical regions proposed by Boero & Bouillon (1993) (see table 6), shows that the cosmopolitan species are the most abundant group (33.3%) followed by the tropical-Atlantic (23.3%), the boreal (16.7%) and circumtropical species (13.3%). The groups of species with Atlantic-Mediterranean and Atlantic distribution are composed solely of one species (3.3%). Two species, *Podocoryne carnea* and *Aglaophenia pluma*, are considered here as non-classifiable, because many records of these species outside the Atlantic Ocean and Mediterranean Sea are uncertain. Indo-Pacific and endemic species are not represented in the study area.

The cosmopolitan species are dominant in the Ría de Vigo. These results are in line with the data obtained by Medel & López González (1996: 185) from the hydroids of the Iberian Peninsula. However, there are some differences in the percentage of the tropical-Atlantic species since in our study the percentage is 23.3% in contrast to 13% in the Iberian Peninsula. The differences from the Mediterranean Sea are greater, because, in Anthomedusae-Leptomedusae, the endemic (19.6%) and circumtropical (16.9%) species are the dominant groups, while the cosmopolitan and tropical-Atlantic species represent 12.8% and 12.1%, respectively (Boero & Bouillon, 1993: 248, table 2). The percentages of boreal species are similar to those reported by Boero & Bouillon (1993) and Medel & López González (1996).

Concerning life cycles, the highest percentage was formed by species with fixed gonophores (18 species, 60%), contrasting with species with free medusae (12 species, 40%). Species with fixed gonophores dominated in tropical-Atlantic and circumtropical groups, while the species with medusae dominate only in the cosmopolitan group. These results are different from those obtained by Boero & Bouillon (1993) and Medel & López González (1996), because the cosmopolitan group is dominated by species with fixed gonophores and the circumtropical group by species with medusae. However, this analysis is based only on species collected from soft bottoms, which, as we have indicated before, represent only 1/3 of the total of hydroid species (Anthomedusae + Leptomedusae) known from the Ría de Vigo.

Table 6. List of species showing the patterns of distribution adopted and their life cycle. C= cosmopolitan; CT= circumtropical; B= boreal; TA= tropical-Atlantic; AM= Atlantic-Mediterranean; A= Atlantic (not present in Mediterranean Sea); NC= non-classifiable; m= medusae; g= fixed gonophores.

| | | |
|---|---|---|
| *Bougainvillia muscus* | CT | m |
| *Merona cornucopiae* | CT | g |
| *Eudendrium ramosum* | C | g |
| *Hydractinia echinata* | B | g |
| *Podocoryne carnea* | NC | m |

| | | |
|---|---|---|
| *Leuckartiara octona* | C | m |
| *Tubularia larynx* | B | g |
| *Calycella syringa* | C | g |
| *?Campomma hincksii* | B | m |
| *Lafoeina tenuis* | B | g |
| *Cosmetira pilosella* | B | m |
| *Lovenella clausa* | AM | m |
| *Opercularella* spec. | ? | ? |
| *Laodicea undulata* | TA | m |
| *Halecium lankesteri* | TA | g |
| *Halecium liouvillei* | A | g |
| *Halecium pusillum* | TA | g |
| *Aglaophenia pluma* | NC | g |
| *Antennella secundaria* | C | g |
| *Kirchenpaueria pinnata* | TA | g |
| *Nemertesia ramosa* | TA | g |
| *Plumularia setacea* | C | g |
| *Amphisbetia operculata* | CT | g |
| *Sertularella gayi* | TA | g |
| *Clytia gracilis* | C | m |
| *Clytia hemisphaerica* | C | m |
| *Clytia paulensis* | C | m |
| *Laomedea angulata* | TA | g |
| *Obelia dichotoma* | C | m |
| *Obelia geniculata* | C | m |
| *Orthopyxis crenata* | CT | g |

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