Actiniaria from Ria de Arosa, Galicia, northwestern Spain, in the Netherlands Centre for Biodiversity Naturalis, Leiden

J.C. den Hartog† & R.M.L. Ates

Hartog, J.C. den & R.M.L. Ates. Actiniaria from Ria de Arosa, Galicia, northwestern Spain, in the Netherlands Centre for Biodiversity Naturalis, Leiden.
Zool. Med. Leiden 85 (2), 29.iv.2011: 11-53, figs 1-4, tabs 1-18.— ISSN 0024-0672.

J.C. den Hartog, Netherlands Centre for Biodiversity Naturalis (formerly Rijksmuseum van Natuurlijke Historie), P.O. Box 9517, 2300 RA Leiden, the Netherlands [deceased].
R.M.L. Ates, Govert Flinckstraat 19, 1506 LL Zaandam, the Netherlands (pseudocorynactis@zonnet.nl).

Key words: distribution; new records; sea anemones.

Twentysix species of sea anemones (Actiniaria) collected in Galicia, northwestern Spain are present in the collection of the Netherlands Centre for Biodiversity Naturalis. They are listed and discussed. The cnidom of seventeen species is surveyed. *Diadumene cincta* is not a recent immigrant in western Europe. *Sagartia luciae* is (re)assigned to the genus *Diadumene*. The presence of *Sagartia troglodytes* in the Mediterranean is doubtful at best.

Introduction

During the years 1962-1964 marine biological, oceanographical and sedimentological investigations were carried out in the Ria de Arosa, northwestern Spain, jointly by a team of the Rijksmuseum van Natuurlijke Historie, Leiden (now Netherlands Centre for Biodiversity Naturalis) and the Department of Geology and Mineralogy of Leiden University. For information on the scope and aims of these investigations, see Brongersma & Pannekoek (1966).

During the three research campaigns 932 marine stations were sampled using *e.g.* the Van Veen grab and a small dredge designed by R. Zariquiey Alvarez, resulting in considerable collections of various groups of marine invertebrates. Several of these groups were studied and the results published [*e.g.* Mollusca (Cadée, 1968), Foraminifera (Voorthuysen, 1973), and Ostracoda (Bless, 1973)]. Other groups, however, so far remained untouched on the museum shelfs, among them the Actiniaria dealt with in this paper. The collection comprised 84 samples, including only 14 species. A part of the collection was rather poorly preserved (in too much deluted formalin or alcohol), internally macerated, and for this reason several samples were disposed of. Nonetheless, most of this material could easily be identified, mainly on the basis of nematocyst studies by the senior author.

Unfortunately collecting activities were almost exclusively restricted to general shipboard sampling as no specialist participated in the expeditions. As a result the sampling of shallow water habitats (*e.g.* seagrass beds) and the intertidal zone was grossly neglected. Therefore, to get a more balanced impression of the actinian fauna of the area, additional fieldwork was done by the junior author in the summer of 1993. In addition, a few more samples from the area were provided by Dr F. Ramil, La Coruña, Spain, and by Mr M.S.S. Lavaleye, Texel, the Netherlands (material from Sangenjo).

After the decease on 7th October 2000 of the senior author, a manuscript was left behind with several gaps mostly felt in the sections concerning the cnidom. In this field J.C. den Hartog was an authority. After some hesitation it was decided to fill other gaps, and update the manuscript for publication, as the information on *e.g.* nematocysts supplied by the senior author should not be lost.

Material and methods

The classification and terminology of nematocysts used is essentially after Schmidt (1969, 1972a, 1974), as adapted by Den Hartog (1980: 7-9, 1995: 156-158). The surveys of the cnidom of the species (tables 1-18 present means and ranges of length and (maximum) width of nematocyst capsules, or ranges only where means are obviously irrelevant due to scarcity of cnidae or to the width of the range, as usually holds for spirocysts. Frequencies given are subjective impressions based on squash preparations, but they do at least give some idea of the absolute and relative abundance of the various types, varieties and size-classes.

The following codes and abbreviations are used in the tables under frequencies: +++ = very common, ++ = common, + rather common, - = uncommon, - - = rare, - - - = sporadic; +/++ = rather common to common; uncommon to rather common, etc.; ? = data insufficient to even suggest numbers because of the condition of the tissue concerned; inc. = inconspicuous; cont? = contamination?

Systematic part

Survey of the species

Aiptasiidae Carlgren, 1924
Aiptasia mutabilis (Gravenhorst, 1831) form 2 Schmidt, 1972b

Material.— RMNH Coel. 18627 (Sta. RA 1.101, “Flor da Ponte”, 23.vii.1962, 2.4 km S to E of Hotel la Toja, mouth of Rio Dena, depth 0.6 m, middle-grab, gravel with sand and some clay; 1 small specimen); RMNH Coel. 23828 (channel close to Isla Tourisa, between the islet and main coast, 14.viii.1993; leg. R.M.L. Ates, sta 4).

Cnidom.— See table 1.

Distribution.— According to Schmidt (1972b: 22) *Aiptasia mutabilis* occurs in the entire Mediterranean and in the neighbouring Atlantic, from the Gulf of Guinea in the south to Plymouth in the north. In addition it has been recorded in southern Ireland (Picton, 1985) and near the Azores (Wirtz et al., 2003).

Discussion.— The species of *Aiptasia* from the Atlantic coast of Europe used to be referred (*e.g.* Stephenson, 1935: 208) to as *A. couchii* (Cocks, 1850). Since Schmidt (1972b: 22) claimed that it is an ecotype of the large well-known Mediterranean *A. mutabilis* (Gravenhorst, 1831), it is now mostly (*e.g.* Manuel, 1981b/1988: 126) referred to as *A. mutabilis* form 2. When preserved the latter can easily be confused (Schmidt, 1972b: 26) with another Mediterranean species, *A. diaphana* (Rapp, 1829). Live specimens of these species can be distinguished easily according to Schmidt (1972b: 25). Since England’s (1992: 88) remarks in respect of the number of mesenteries of these two species of *Aiptasia*, there is reason to examine the relationship of the Mediterranean aiptasiids.

Table 1. *Aiptasia mutabilis*. Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel 18627).

tissue	nematocyst type	average and range of length and width of nematocyst capsules in μm	n	frequency
column	homotrichs	8.5(8.0-8.9) × 1.9(1.8-2.2)	10	+
	spirulae	13.3(11.6-14.2) × 2.3(2.2-2.5)	20	++
	penicilli B2	18.6(16.0-20.5) × 3.6(3.3-3.8)	20	++
tentacles	spirocysts	ca 13.5-25 × 2.7-5.0	—	+?
	spirulae	15.4(14.2-16.9) × 2.5(2.2-2.7)	20	++
	penicilli B2	28.1(24.9-31.2) × 3.9(3.6-4.2)	20	++
stomodaeum	?spirulae	10.4(9.8-11.6) × 1.5(1.3-1.6)	10	- -?
	spirulae	20.2(17.8-23.1) × 2.5(2.2-2.7)	20	+/++
	penicilli B2	32.2(27.6-35.6) × 4.1(3.8-4.5)	20	++
filaments	homotrichs?	9.8(8.9-10.7) × 1.3(1.1-1.6)	10	+
	spirulae	10.8(9.8-12.5) × 2.1(1.8-2.2)	15	+
	penicilli B1	11.7(10.2-12.5) × 3.0(2.9-3.1)	20	+++
	penicilli B2	33.6(30.3-36.5) × 4.4(4.0-4.7)	20	+
acontia	spirulae	27.5(25.8-28.5) × 2.0	20	+++
	penicilli B2	76.7(68.5-83.7) × 7.3(6.8-8.0)	20	++

Aiptasiogeton hyalinus (Delle Chiaje, 1825)

Material.— After having been sectioned and researched, the sample kindly supplied by Dr F. Ramil is assumed to have got lost. It could not be located in the museum collections during an extensive search in 2009.

Cnidom.— A survey of the cnidom of this species is presented in table 2.

Distribution.— *Aiptasiogeton hyalinus* has been reported from the western Mediterranean (Schmidt, 1972b: 28 as *A. comatus*) where it can be common. It also occurred in western France (Fischer, 1874: 214 as *Sagartia pellucida*; Schmidt, 1972b), southern England (Manuel, 1979 as *A. pellucidus*), the Adriatic (Birkemeyer, 1995 as *A. pellucidus*), the Canary Islands and the Atlantic coast of Morocco (Ocaña & Den Hartog, 2002: 44 as *A. hyalinus*) as well as Madeira (RMNH Coel. 19895), the Azores (RMNH Coel. 33129), Egypt (RMNH Coel. 18529 & 19670) and Israel (RMNH Coel. 19669). It was also found to occur near Oban, western Scotland (pers. observ. R.A.), see fig. 1. A record from the eastern Mediterranean by Doumenc et al. (1985, as *A. pellucidus*) is doubtful, because their nematocyst data differ from those in table 2 in a profound way.

Discussion.— Since Schmidt (1972b: 26/29) this species was known as *Aiptasiogeton comatus* (Andres, 1880: 314) until Manuel (1981b/1988: 128), based on as yet unpublished research by R.B. Williams, changed the name to *A. pellucidus* (Hollard, 1848). However, apart from possibly being unavailable because of not having been published in the sense of the Code of Zoological Nomenclature (see Tubbs, 2001), Hollard's name is preceded by the one published by Delle Chiaje (1825: 243). We consider the latter's description ("Corpore pusillo, hyalino, laevissimo, tentaculis uniseriatis e cuius exteriori membrana viscera transparent") diagnostic because of, in combination, size and appearance.

This is the first record of *A. hyalinus* from Galicia and the Atlantic coast of Spain. Ramil (1987) and Ramil & Fernández (1990) misidentified the present material as

Fig. 1. *Aiptasiogeton hyalinus*. Several specimens with slightly contracted tentacles in the Sound of Kerrera, near Oban, western Scotland, depth about 9 m. This constitutes the first record for Scotland. *In situ* photograph taken on 22.v.2000, R.M.L. Ates.

Table 2. *Aiptasiogeton hyalinus.* Survey of the cnidom of a specimen from Ria de Arosa supplied by Dr F. Ramil.

tissue	nematocyst type	average and range of length and width of nematocyst capsules in µm	n	frequency
column	homotrichs/spirulae?	17.0(15.1-17.8) × 3.7(3.1-4.2)	20	+
	spirulae	10.9(9.3-12.0) × 1.8(1.8-2.0)	12	-
	spirulae	14.6(11.6-17.8) × 2.8(2.4-3.3)	30	+
	penicilli B2	21.1(18.7-23.1) × 4.9(4.5-5.4)	20	+++
tentacles	spirocysts	ca. 11.5-26.5 × 2.7-4.0	—	+++
	spirulae	not measured		
	spirulae	17.8(15.1-23.1) × 2.4(2.2-2.7)	30	+
	penicilli B2	12.9(11.6-15.1) × 2.9(2.7-3.1)	20	+
	penicilli B2	26.4(22.3-29.4) × 4.1(3.8-4.9)	20	+++
stomodaeum	spirulae	18.1(17.4-19.6) × 2.4(2.2-2.7)	10	-? (inc.)
	penicilli B2	12.4(10.7-13.4) × 2.8(2.7-3.1)	8	- -
	penicilli B2	20.7(18.7-22.3) × 3.6(3.3-3.8)	20	++/+++
filaments	spirulae	14.4(13.4-15.6) × 1.4(1.3-1.6)	12	+? (inc.)
	penicilli B1	12.1(10.7-13.4) × 3.7(3.6-4.0)	25	+++
	penicilli B2	18.4(14.2-23.1) × 2.7(2.2-3.1)	20	+
	penicilli B2	31.1(27.6-33.8) x 4.9(4.2-5.8)	25	++
acontia	spirulae	28.4(26.3-31.2) x 2.2(2.0-2.4)	20	+++
	penicilli B2	25.7(21.4-31.2) x 3.4(3.1-4.0)	30	- /+
	penicilli B2	52.6(48.1-58.7) x 6.0(5.3-6.2)	20	+++

Haliplanella lineata (Verrill, 1869)(= *Diadumene luciae* [1898]), a species that has been recorded in the vicinity of Vigo (Mijon et al., 1999).

Contrary to Schmidt (1972b: 27), we recognize two size classes of penicilli in the acontia of *A. hyalinus* (see table 2) (cf. Manuel, 1981b/1988: 128).

R.W. Seaton (in Minasian, 1982: 158) identified the anemone species used by Smith & Lenhoff (1976) as *A. comatus* (= *A. hyalinus*). There may be a confusion with *Aiptasia eruptaurantia* (Field, 1949) as according to Schmidt (1972b: 29) this species shares several characters with it. The characters supplied by Smith & Lenhoff (1976: 117) do all fit *A. hyalinus*, but may fit other species as well if colour is not taken too strictly. Smith & Lenhoff (1976) found this species on floating *Sargassum* in Florida and kept it in aquaria for nine years. As far as we know, this is the first and only time that this species has been recorded on a floating object. Neither has it been recorded to be attached to a firm substratum in Florida, as far as we know. If the identification could be confirmed, it might constitute an interesting case of a natural range extension, in which rafting can not be excluded.

Diadumenidae Stephenson, 1920

Diadumene cincta Stephenson, 1925

Material.— RMNH Coel. 31242 (NW Spain, Ria de Arosa, 1982, no further information, 1 specimen, dissected, leg. F. Ramil).

Cnidom.— Not recorded.

Distribution.— *Diadumene cincta* has a fairly wide distribution along the Atlantic coast of Europe: the British Isles (*e.g.* Manuel, 1981b/1988; Wood, 2005), Sweden (Östman, 2000: 32 as *Diadunema cincta*), Germany (*e.g.* Stripp, 1969; Harms, 1993), the Netherlands (*e.g.* Portielje, 1933; Ates, 1997), Belgium (Massin et al., 2002), France (*e.g.* Lafargue, 1970: 426 and references therein; Glaçon, 1977: 7) as well as Galicia, Spain (Ramil, 1987: 199). Its occurrence in the Mediterranean is confused in part. According to Schmidt (1972b: 1) some nineteenth century records of *Metridium senile* (Linnaeus, 1761) may actually have been *D. cincta*. As far as is known, the distribution of *D. cincta* in the Mediterranean is limited to the neighbourhood of Venice (Steiner, 1983: 54; Birkemeyer, 1995), but it may possibly have (had) a wider distribution in the northern Adriatic (see Probst, 1970). According to Cohen & Carlton (1995: 36/37) a sea anemone tentatively identified as *D. cincta* was introduced into San Francisco Bay between the mid-1950s and the early 1970s. However, according to D.G. Fautin and M. Daly (pers. comm. 18.i.2006) neither "*D. cincta*" as in Cohen & Carlton (1995) nor *Diadumene lighti* Hand, 1956, which was very likely thought to be identical to *D. cincta* by Riemann-Zürneck (in Nehring & Leuchs, 1999: 14), are conspecific with it. We therefore infer that *D. cincta* exclusively occurs in Europe, as far as is known.

Discussion.— Stephenson (1925: 880) related to the circumstance that by about 1860 the majority of British littoral sea anemone species had been discovered. Since Gosse (1858-1860) no new species had been added to the British fauna, except *Diadumene luciae* (see below) which "appears to have been imported from abroad". Considering the latter quote in connection with the absence of a similar remark in respect of *D. cincta*, Stephenson (1925) obviously wanted to make clear that *D. cincta* should not be considered to be a recent addition to the British fauna. Wolff (2005: 47) ignored this fact and presented *D. cincta* as a nonindigenous species, *e.g.* claiming that it had suddenly appeared at Plymouth a few years before it was described. However, according to Stephenson (1925: 880) *D. cincta* had been on the Breakwater near Plymouth as long as Dr. E.J. Allen (Director of the Plymouth Marine Biological Station, 1894-1936) could remember. Stephenson (1925: 883) further stated that it was "found in numbers on the Breakwater by Garstang in the early (eighteen) nineties...". There is certainly no element of suddenness in the discovery of *D. cincta* at Plymouth as claimed by Wolff (2005) and his allegation that *D. cincta* was probably found at Plymouth a few years before 1925 is a lapse. Incidentally, nothing points at the possibility that *D. cincta* only arrived in Europe shortly before the 1890s. If the anemone species portrayed by Baster (1762 *special edition*: plate III, 5) is of Dutch origin, which is most likely, then it is certainly *D. cincta*, implicating that it already occurred here in the 18th century (Ates, 2006b). In respect of the reason why *D. cincta* had not been described earlier, Stephenson (1925: 884) elaborates on its confusion with *Metridium senile* var. *pallidus* (Holdsworth, 1855). In the field certain young specimens of *M. senile* can only be distinguished from *D. cincta* by two clear-cut, but rather subtle characters: the way in which the tentacles are retracted in urgency (the column of *D. cincta,* contrary to *M. senile,* becoming folded and asymmetrical in the process) and smell (most people tested by us appeared to be sensitive to the distinctive smell given off by the "slime" of *M. senile*, whereas *D. cincta* is scentless in comparison)(pers. observ. R.A.). Distinction between these two species, notably in case of young or orange coloured specimens, can consequently only be made by someone knowledgeable and attentive.

Nehring & Leuchs (1999: 14) also presented *D. cincta* as an immigrant species, introduced into Heligoland waters in 1928 or 1929. However, a remark by Carlgren (1929: 109) implies that it already occurred near Heligoland before this import from the Netherlands took place. The German actinofauna is not among the best studied (vide Riemann-Zürneck, 1969: 179) and considering that *D. cincta* has been present in western Europe for a very long time, this species undoubtedly occurred in Germany since long as well. Neither does, similarly, the belated recognition of *D. cincta* being native to Belgium by Massin et al. (2002) mean that it arrived in Belgian waters a small number of years ago. Arguments supporting the idea of an overseas origin of *D. cincta,* as brought forward by Nehring & Leuchs (1999) and Wolff (2005), are nonexistent, see also Ates (2006a, 2006b).

Diadumene luciae (Verrill, 1898)

Material.— RMNH Coel. 23934 (Punta Estralo, San Adrian, Ria de Vigo, mesolittoral, 18.iv.1996; coll. F. Ramil & O. Mijon).

Cnidom.— Measurements of the cnidom of the Galician specimen were not recorded, but in table 3 we present a survey of the cnidom of specimens from the Azores which was found among the notes of the senior author.

Distribution.— *Diadumene luciae* is generally considered to be a cosmopolitan species, originating from eastern Asia (*e.g.* Manuel, 1981b/1988: 135-136). Its occurrence in Galicia was first recorded by Mijon et al. (1999: 242 as *Haliplanella lineata*) after it had appeared that specimens previously reported by Ramil (1987) actually belonged to *Aiptasiogeton hyalinus* (see above).

Table 3. *Diadumene luciae.* Survey of the cnidom of specimens from the Azores.

tissue	nematocyst type	average and range of length and width of nematocyst capsules in μm
pedal disc	spirulae	10.7(9.8-12.5) × ca. 1
	spirulae	14.8(13.4-15.1) × 2.1(2-2.2)
	penicilli B2	15.4(12.9-16.9) × 3.7(3.3-4)
scapus	spirulae	14(13.4-15.1) × 2.2(2-2.4)
	homotrichs	13.2(10.7-15.1) × 4.7(4.5-5.3)
	penicilli B2	14.5(11.6-17.8) × 3.5(3.1-4.2)
capitulum	spirulae	10.2(8-11.6) × 1.3(1.3-1.5)
	penicilli B2	11.2(9.8-13.4) × 3.2(2.7-3.6)
tentacles	spirocysts	17.6(13.4-20.5) × 3.7(3.1-4.5)
	homotrichs?	15.4(14.2-16) × 3.6(3.6-4)
	spirulae	15.1(13.4-16.9) × 2(2-2.2)
	penicilli B2	10.2(9.5-11.6) × 3.5(3.1-3.6)
	penicilli B2	19.3(16.9-20.5) × 3.7(3.6-4)
stomodaeum	spirulae	11.7(9.8-14.7) × ca. 1.2-1.6
	spirulae	18.1(16-19.6) × 2.2(2-2.2)
	penicilli	10.9(9.8-12) × 3(2.7-3.6)
	penicilli	21(18.7-23.1) × 3.5(3.3-3.6)
filaments	spirulae	10.1(9.8-10.7) × ca. 1.3
	penicilli B1	9.4(8.5-9.8) × 3.6(3.1-3.8)
	penicilli B1	16.6(14.2-18.7) × 4.5(4-5)
	penicilli B2	21.8(19.1-24.9) × 3.6(3.1-4.2)
	penicilli B2	13.1(9.3-16) × 2.8(2.7-3.1)
acontia	spirulae	14.8(12.5-15.6) × 2(2-2.2)
	penicilli B2	13.7(9.8-15.6) × 3.6(3.3-4.2)
	penicilli B2	38(32.9-44.5 × 6(5.8-6.2)

The "history" of the advance of *D. luciae*, *e.g.* along the Atlantic coasts of northern America and western Europe, as laid out by *e.g.* Stephenson (1935: 205), is in our opinion not only too fragmented to be useful but also frustrated by the well-known habit of this species to disappear for seemingly long periods from many locations it colonized previously. As these episodes of colonization, disappearence and recolonization may have taken place since long (see also Stephenson, 1935: 202, 205/206), its inferred dispersal history can be no more than speculation. The differences between certain populations of this species (see *e.g.* Stephenson, 1935: 201/202) need to be investigated urgently as does their relationship by means of DNA-studies in an effort to understand their dispersal history.

Discussion.— As made clear by *e.g.* Stephenson (1935: 197/207), this species fits in all respects in the genus *Diadumene*. Carlgren (*e.g.* 1949: 109) had placed it in the genus *Aiptasiomorpha* (family Aiptasiomorphidae), presumably since it was not known at that time that *D. luciae* is indeed able to form catch tentacles (compare Stephenson, 1935: 185/187). Hand (1956: 190) foresightedly decided that the presence or absence of catch tentacles (now mostly called fighting tentacles) is an impractical character to distinguish between members of different families. Indeed, it is common practice nowadays to refrain from using these elongated tentacles as a taxonomic character (*e.g.* Riemann-Zürneck, 1975: 85) on the ground that they are not always existent in each individual specimen. Consequently, Hand (1956) united the families Diadumenidae and Aiptasiomorphidae, moving the members of the latter family to *Diadumene*. Also, Hand (1956: 210) correctly noted that the acontia of *D. luciae* contain amastigophores in the sense of Weill (1934), as well as spirulae and the normal penicilli (or p-mastigophores, or p-rhabdoids; incidentally the p-prefix stands for penicillus, see also Den Hartog, 1980: 7 and Den Hartog, 1995: 156, but the name penicillus is unambiguous, its use is unproblematic and it has priority). As a result Hand (1956) inferred, incorrectly as we shall explain, that the acontia of *D. luciae* contain three types of nematocysts and he, also incorrectly, assumed this condition to be unique to *D. luciae*. Therefore Hand (1956) removed *D. luciae* from the family Diadumenidae and established a monotypic genus (*Haliplanella*) and family (Haliplanellidae) to accommodate it.

The presence of amastigophores in Weill's sense is a common occurrence in the acontia of many, but not all, species belonging to the Aiptasiidae, Diadumenidae and Sagartiidae (Den Hartog, 1970: 97; 1978: 74; 1995: 156) in combination with typical penicilli. This is in itself reason to decline Hand's (1956) decision to separate *D. luciae* from the family Diadumenidae and put it in a genus and a family of its own, because some taxonomically coherent groups of Actiniaria would likewise have to be broken up as a consequence. It would for example not make sense to separate *Sagartia troglodytes* (Price, in Johnston, 1847) from family Sagartiidae based on the types or subcategories of nematocysts known to occur in its acontia (see table 5).

It is however on the aspect of the amastigophore as a type of nematocyst that we must elaborate, as it has been ill-understood in the past and because it is crucial to taxonomy. Possibly, Hand (1956) could not know about the results of the studies on nematocysts by Cutress (1955), but Stephenson (1929: 178/179) had already noted that penicilli with or without a terminal thread or tubule existed. Cutress (1955) confirmed that before discharge penicilli and amastigophores in Weill's sense are indistinguishable. Cutress (1955: 130) observed amastigophores in many species known to possess them and left no doubt that in all of those examined by him there is a terminal tubule of variable length on the shaft inside the unfired capsule. During discharge this terminal tubule breaks at the end of the shaft and it remains behind in the capsule presumably because it is stuck to the capsule wall (see fig. 2). Thus, the only discernible difference between penicilli and amastigophores, after discharge, is a vestigial tubule of variable length either remaining inside the capsule of the amastigophore or remaining on the shaft of the typical penicillus. Cutress (1955: 131) consequently reasoned that maintaining the

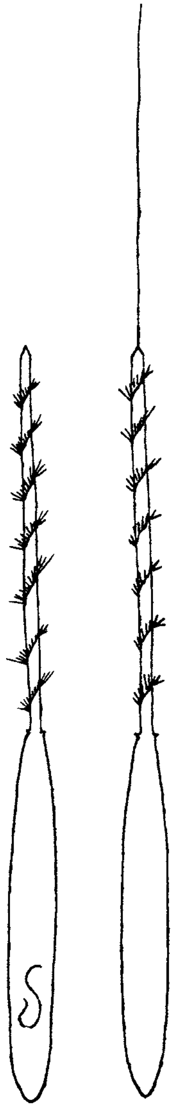

Fig. 2. Apart from the terminal tubule remaining in the capsule of the amastigophore in the sense of Weill (1934) after discharge, there is no difference with the penicillus. The amastigophore on the left and the penicillus on the right. After Den Hartog (1970: 98).

amastigophore as a separate type of nematocyst would be an arbitrary decision considering the gradual transition between penicilli with a very short tubule and typical ones. The conclusion that amastigophores in the sense of Weill (1934) are penicilli the terminal tubule of which remains inside the capsule after discharge was also reached by *e.g.* Schmidt (1969, 1972a, 1974), and Den Hartog (1970, 1995). Since Den Hartog (1995: 156) described penicilli without a terminal tubule in the acontia of members of the genus *Telmatactis*, the situation has become slightly more complicated. Östman (2000: 43) proposed to change the name amastigophore into p-amastigophore. Should this new term apply to penicilli with a tubule remaining inside the capsule after discharge (in the sense of Östman, 2000) or with no tubule at all, like those in *Telmatactis*? Also considering the confusion in respect of the systematic position of *D. luciae* in the past, we prefer to follow Cutress (1955) and Schmidt (1969, 1972a, 1972b, 1974) in their elimination of the amastigophore as a separate type of nematocyst.We take penicilli to be nematocysts conforming to Stephenson's (1929: 178/179) definition, incorporating Schmidt's (*e.g.* 1972b: 6-9) subcategories (of p-rhabdoids), as amended by Den Hartog (1995: 156/158). The question is of course not whether one type of nematocyst can be distinguished from another based on an isolated character, but whether they are sufficiently similar to justify to be treated as one variable type. It is irrelevant that the amastigophore was "improperly named" (De Oliveira Pires [1988: 515], but presumably only until Den Hartog [1995: 156] described the "true amastigophore"). What matters is that the typical penicillus is connected to the "true amastigophore", as in the acontia of species of *Telmatactis*, by penicilli having a variable length of tubule either on the shaft or remaining in the capsule after discharge. Furthermore, certain members of *e.g.* the genera *Aiptasia, Aiptasiogeton, Sagartia* and *Actinothoe* and probably several more, have penicilli without a tubule on the shaft after discharge in their acontia apart from typical penicilli, while other species belonging to these same genera only have typical penicilli in their acontia.

Elimination of the amastigophore as a separate type of nematocyst should have avoided further taxonomical disarray. De Oliveira Pires (1988: 514/515) claims that three types of nematocysts are present in the acontia of *Tricnidactis errans* De Oliveira Pires, 1988, but following Schmidt's nomenclature of the nematocysts as she obviously intends to, there are only two, i.e. b-rhabdoids (= spirulae) and p-rhabdoids B (= penicilli B), in two subcategories. Species descriptions should not be based on a single isolated character (see also *e.g.* Stephenson, 1928: 106), certainly not on a controversial one like the amastigophore. This is exemplified by the description of *T. errans*. We have not been able to study this species, but considering the morphological and anatomical details supplied by De Oliveira Pires (1988), we think *T. errans* belongs to another family, possibly the Sagartiidae. The claimed possession of penicilli C (De Oliveira Pires, 1988: 514) is most remarkable, considering that this type of nematocyst was until now only known to occur in the Boloceroidaria (see Schmidt, 1969: 303).

The introduction by Hand (1956) of the genus *Haliplanella* and of the family Haliplanellidae was exclusively based on the assumed presence of a combination of three types of nematocysts in the acontia. As it is clear from the previous paragraphs that two of these belong in reality to one variable type, we (re)assign *Sagartia luciae* Verrill, 1898 to the genus *Diadumene*. Manuel (1981b/1988: 134) united the family Haliplanellidae with the Diadumenidae, but he, although admitting the amastigophore to be a category of p-mastigophore, maintained the genus *Haliplanella* based, apparently, on the fact that "a well-marked parapet and fosse [are] always present in any state of extension" contrary to *Diadumene.* Stephenson (1935: 204) had already considered this to be a species level character, see also Stephenson's (1935: 184) generic diagnosis. We doubt if "smoothing away of the parapet and the fosse" can be a character of taxonomic use. As there are to our knowledge no convincing characters separating *D. luciae* more than specifically from a congener like *D. cincta* (cf. Stephenson, 1935: 184), there is in our view no basis to maintain the genus *Haliplanella*. The recent proposal by Fautin et al. (2009) to suppress the name *Haliplanella* Treadwell, 1943 in favour of *Haliplanella* Hand, 1956 will thus serve no purpose.

Williams (1978) reintroduced the specific epithet *lineata* Verrill, 1869. We concur with Dunn & Hand (1978) and Gollasch & Riemann-Zürneck (1996: 255) that it would have been up to Williams to demonstrate that *Sagartia lineata* Verrill, 1869 is a senior synonym of *S. luciae* Verrill, 1898. Anyone wanting to do so would have to nullify Stephenson's (1935: 201/202) well-defined and fundamental doubts about the identity of Uchida's (1932: 71, 75) specimens.These doubts, of which both Williams (1978) and Seaton (1985) seemed to have been unaware, were based on partly inferred differences in size, anatomy and reproduction compared to European specimens of *D. luciae*. Please also note the confusion revealed by Seaton's (1985) remarks concerning the colour of the stripes on the column of his subject (red according to Verrill [1869], orange according to Uchida [1932: 71; 75]) and we suspect "why previous authors (Verrill included) hesitated to assign validity to *lineata*", cf. Seaton (1985: 307). It remains to be seen if Seaton's (1985) suggestion that *D. luciae* "is perhaps the only actiniarian species that in many cases can be identified with reasonable certainty by a colour pattern alone" is correct (incidentally please note the inherent vagueness of this statement). More than one species of Asian sea anemones may have stripes on the column, in Uchida & Soyama (2001) we count several such species in Japan alone.

Even if absolute proof could be supplied that *Sagartia lineata* Verrill, 1869 and *S. luciae* Verrill, 1898 are conspecific, which we doubt, the name *Diadumene luciae* should be preferred for being the least taxonomically disruptive. This was at least the case until 1985, as demonstrated by Seaton (1985: 306). We do not know why Seaton's (1985) proposal to conserve *S. luciae* Verrill, 1898 was not voted upon by the ICZN.

Metridiidae Carlgren, 1893

Metridium senile (Linnaeus, 1761)

Material.— RMNH Coel. 18485 (Sta. RA 1.32, "Flor da Ponte", 13.vii.1962, W. Sinas, Mussel-concession VII, 6 m long rope with *Mytilu*s reaching up to 0.5 m below water surface; ca 15 specimens); RMNH Coel. 18486 (Sta. RA 1.151, "Flor da Ponte", 17.vii.1962, ca 1.5 km W of Playa de Grandin, depth 25 m, middle-grab, clay and Foraminifera; 1 specimen); RMNH Coel. 18487 (Sta. RA 1.158, "Flor da Ponte", 18.vii.1962, 2.5 km NW of Villajuan, depth 13.5 m, middle-grab, clay and Foraminifera; 1 specimen); RMNH Coel. 18488 (Sta. RA 1.522, "Flor da Ponte", 29.vii.1963, 2 km N of Pta Aguiuncho, Isla de Arosa, depth 30-36 m; 1 specimen); RMNH Coel. 18489 (Sta. RA 1.524, 29.vii.1963, 0.8 km N of Pta Campelo, Isla de Arosa, 43 m, middle-grab, mud; 1 specimen); RMNH Coel. 18490 (Sta. RA 1.606, "Flor da Ponte", 20.vii.1964, 1.5 km N to E of lighthouse of Isla de Arosa, 30-40 m, Zariquiey's dredge; 1 specimen + 4 asexually reproduced juveniles); RMNH Coel. 18491 (Sta. RA 1.722, "Josefa", 31.vii.1964, depth 70-50 m, dredge upward slope; 1 large specimen).

Disposed material.— Sta RA 1.522 (2 specimens, cf. RMNH Coel. 18488); Sta. RA 1.602 ("Flor da Ponte", 20.vii.1964, La Barsa, S of Pta del Chazo, depth 10 m, middle-grab, coarse sand; 2 specimens).

Cnidom.— See table 4.

Distribution.— According to Carlgren (1942: 59/60) and Stephenson (1935: 231) *Metridium senile* is a coastal species of the northern hemisphere, in the Atlantic occurring from the Atlantic coast of France in the east and from Cape Cod in the west until the Murman coast in the north and in the northern Pacific occurring from Japan to San Francisco (provided s.sp. *fimbriatum* is conspecific). Ramil (1985: 156) was the first to publish records of its occurrence in Galicia. *M. senile* has also been reported from the northwestern Pacific (*e.g.* Sanamyan & Sanamyan, 1998) including Japan (*e.g.* Uchida & Soyama, 2001: 41) and Korea (Cha & Song, 2001: 104). Based on Riemann-Zürneck (1975: 92) *M. senile* also occurs on the Argentinian shelf (southern Atlantic) at 85-120 m depth, at least since the late 1890s. As, based on its description *Paraisometridium pehuensis* Zamponi, 1978 is clearly referable to *M. senile*, the latter species also occurs in shallow waters of Argentina. Griffiths et al. (1996) claimed *M. senile* to have invaded Table Bay Harbour (Kaapstad, South-Africa). In the southeastern Pacific *M. senile* (in part provided s.sp. *lobatum* is conspecific) has in historic times been reported from Chile (Riemann-Zürneck, 1975: 92; Riemann-Zürneck, 1986: 116; Häussermann, 2006: 31).

Discussion.— It is well known that the acontia of small specimens of *M. senile* contain large penicilli. In adult specimens they are rare or absent (*e.g.* Stephenson, 1935: 226; Carlgren, 1942: 59 as "amastigophors"; Manuel, 1981b/1988: 138) and this sample from northern Spain agrees to this. *M. senile* is generally considered to be primarily a shallow-water species, but *Metridium* spec. (possibly *M. farcimen* (Brandt, 1835)) has been photographed at 2500 feet off San Diego (Church, 1971: 118 as *Tealia*). Bucklin & Hedgecock (1982) used genetical methods to demonstrate the existence of more than

Table 4. *Metridium senile*. Survey of the cnidom of a large specimen (RMNH Coel 18491).

tissue	nematocyst	average and range of length and in width of nematocyst capsules in μm	n	frequency
scapus	spirulae	10.4(9.3-11.6) × 1.7(1.6-1.8)	25	++
	spirulae	16.5(15.1-17.8) × 2.8(2.7-3.1)	25	++
	penicilli B2	28.2(24.0-32.0) × 3.7(3.3-4.0)	25	++
tentacles	spirocysts	ca. 20-27.5 × 2.7-5.4	—	+++
	spirulae	11.5(9.8-15.1) × 1.9(1.8-2.2)	20	+
	spirulae	23.3(21.4-25.8) × 2.6(2.4-2.7)	20	++
	penicilli B2	not measured		
	penicilli B2	23.3(21.4-25.8) × 2.6(2.4-2.7)	20	+
stomodaeum	spirulae	not measured		
	penicilli B2	27.1(24.9-30.3) × 4.1(3.8-4.5)	20	++
filaments	spirulae	not measured		
	penicilli A	25.1(22.3-28.5) × 4.1(3.6-4.5)	30	++
	penicilli B1	11.8(10.7-12.5) × 3.6(3.1-4.2)	30	+
	penicilli B1	not measured		
	penicilli B2	not measured		
acontia	spirulae	not measured		
	spirulae	62.2(55.2-66.8) × 3.9(3.6-4.2)	25	+++

one species of *Metridium* in the northeastern Pacific. Presently three species are being recognized in that area: *M. senile*, *M. exilis* Hand, 1956 and *M. farcimen*.

Sagartiidae Gosse, 1858

Sagartia troglodytes (Price, in Johnston, 1847)

Material.— In spite of an intensive search in 2009 the sample originally labeled "NW Spain, Sangenjo, rocky shore, intertidal, 18.viii.1979, 1 specimen, leg. C. & M.S.S. Lavaleye" could not be retraced in the collection of the NCB Naturalis.

Cnidom.— See table 5. It is noteworthy that penicilli A were not rare in the acontia. Their presence in the acontia of this species has not been reported previously, either because they may have been overlooked or because they may have been considered contaminations. However, their presence is not unusual: in a specimen from Ostend, Belgium (RMNH Coel. 24810), they even proved to be rather common.

Distribution.— *Sagartia troglodytes* is an eastern Atlantic species, typically common in muddy or sandy habitats of the North Sea, the Baltic, the Atlantic coasts of England and France. Carlgren's (1942: 7) records from Scandinavia make no distinction between varieties. As *Sagartia ornata* was recently separated from this species (Shaw et al. 1987), it is hard to establish which of Carlgren's (1942) records actually concern *S. troglodytes*. According to Moen & Svensen (2000: 135) *S. troglodytes* occurs on the coast of Norway till Trøndelag. In the southern part of its range it becomes less common. South of the Bay of Arcachon, France, the species is uncommon. Reliable, documented records from the French Basque coast and from the Iberian Peninsula are scarce. Apart from the specimen from Sangenjo there is one other sample in the NCB Naturalis collection from Algarve, Portugal (RMNH Coel. 24809). We have not seen the specimen(s) reported by

Table 5. *Sagartia troglodytes*. Survey of the cnidom of the specimen from Sangenjo.

tissue	nematocyst type	average and range of length and	n	frequency
column	homotrichs	14.4(13.0-16.1) × 3.9(3.7-4.3)	20	+
	spirulae	13.4(11.2-14.9) × 2.4(2.2-2.5)	20	+
	penicilli B2	13.2(12.4-15.5) × 3.8(3.4-4.0)	20	+++
tentacles	spirocysts	12.5-23 × 2.2-3.7	—	+++
	spirulae	18.9(17.4-19.8) × 2.7(2.5-3.1)	20	++
	penicilli B2	15.3(14.3-16.1) × 3.7	10	- - - / -
stomodaeum	spirulae	27.4(25.4-29.8) × 3.2(3.1-3.4)	20	++
	penicilli A	25.5(24.2-27.3) × 4.8(4.3-5.0)	20	-
filaments	spirulae	12.9(11.2-14.3) × 1.9(1.9-2.5)	20	+
	penicilli A	24.4(19.2-28.5) × 4.4(4.0-5.0)	20	+
	penicilli B1	12.3(11.2-13.6) × 4.2(3.7-4.7)	20	++
	penicilli B1	22.1(19.2-24.2) × 5.2(4.7-5.6)	20	++
acontia	atrich	1 observed, not measured		
	spirulae	not measured		
	spirulae	17.2(15.5-19.2) × 3.1(2.8-3.7)	20	+++
	penicilli A	not measured		
	penicilli B2	26.1(23.6-28.5) × 4.1(4.0-5.0)	20	+++

Table 6. *Sagartia troglodytes* sensu Schmidt, 1972b from Naples, Mediterranean (SMF1942). Size and types of nematocysts in the acontia as measured by Schmidt and by us.

source	nematocyst type	average and range of length and width of nematocyst capsules in µm	n
Schmidt,1972b	b-rhabdoids	27.3(24.7-30.0) × 2.9(2.3-3.3)	10
	p-rhabdoids B 2a	33.3(28.6-36.4) × 4.6(3.9-5.2)	10
Den Hartog, in:	spirulae	15.4(13.4-16.5) × 2.6(2.4-2.7)	20
Ates et al., 1998: 270	penicilli B2	24.9(22.7-26.7) × 3.8(3.6-4.0)	20

Ramil (1985) and Ramil & Fernández (1990) from Miño, Galicia and the one from Huelva, Andalucia by P.J. López-González (pers. comm. 4.i.2002). Ocaña (in Ocaña & Den Hartog, 2002: 42) mentioned this species from the Canary Islands, but this record refers to the closely related *Sagartia ornata* Holdsworth, 1855 (see below). Records from the Mediterranean are doubtful at best (see discussion).

Discussion.— Schmidt (1972b: 51) found one specimen near Naples which he claims to be the first to prove the occurrence of *S. troglodytes* in the Mediterranean. However, his description differs considerably from Atlantic and North Sea specimens, notably in the cnidom of the acontia (Schmidt, 1972b: 49) as measured by *e.g.* Stephenson (1935: 337), Riemann-Zürneck (1969: 178) and ourselves (see table 5). In addition the filaments of Schmidt's Mediterranean specimen lack the large penicilli B1, common in typical *S. troglodytes*. Reexamination of the specimen described by Schmidt (SMF 1942) yielded, somewhat puzzling, measurements of the cnidae in the acontia that are roughly 10% smaller than the values given by Schmidt (cf. table 6), but even so, the averages and ranges found are still atypical for *S. troglodytes*. We have not found any specimen in which these ranges are approached.

In our opinion the existence of *S. troglodytes* in the Mediterranean is still very doubtful, despite Schmidt's (1972b: 51) claim. Records by Pax & Müller (1962: 211) of the var. *decorata* from the Adriatic Sea are very doubtful, as already made clear by Schmidt (loc. cit.). Apart from lacking any information in their description (no data on the cnidom and anatomy), Pax & Müller (1962: 213) figure a transverse section of a juvenile "unmittelbar nach der Geburt", which implicates viviparity. To our present knowledge this variety is never viviparous. Possibly, Pax & Müller mistook certain vividly coloured ("hell gefärbte") specimens of *Cereus pedunculatus* for *S. troglodytes*. The specification that Adriatic specimens of *S. troglodytes* only belong to the vividly coloured ('hell gefärbte") var. *decorata*, seems to exclude the possibility that *S. ornata* was involved. As Excoffon & Zamponi (1999: 81) compared their nematocyst data of a supposed European immigrant species of *Sagartia* in Argentina largely with those of Schmidt (1972b: 49), their identification needs verification.

Sagartia ornata Holdsworth, 1855

Material.— RMNH Coel. 23843 (SW part of Ria, islet with lighthouse situated between Ribeiro and Punta Falcoeiro; rather protected NW side of islet, upper littoral zone, 17.viii.1993, 1 specimen; leg. R.M.L. Ates, sta 5).

Cnidom.— See table 7.

Distribution.— Stephenson (1935: 341) recorded *Sagartia troglodytes* var. *ornata* for several locations in Britain and Ireland, as well as for Heligoland (Germany) and Kristineberg (Sweden). This is the first documented record of *S. ornata* from the Iberian Peninsula, but based on personal collections we have established the presence of the species in the Faeroe Islands, western Scotland, southern England and several localities along the Atlantic coast of Europe, ranging from the north of the Netherlands southward to the Basque coast of France (pers. obs. JCdH). Williams (1972: 951 as *S. troglodytes* var *ornata*) found it in Norfolk, Ates (1985: 10 as *S. troglodytes*) in Aberdeen, Jones (1993: 113 as *S. troglodytes* var *ornata*) in Morecambe Bay (Irish Sea). Carlgren (1942: 8) mentioned viviparous *S. troglodytes* from Norway (Titran) and this record doubtlessly refers to *S. ornata*. Wood (2005: 73, as *Anthopleura thallia*) published a picture of *S. ornata* taken in the Outer Hebrides. In the Faeroe Islands the senior author looked in vain for *S. troglodytes* in sandy/muddy bottoms of fiords, whereas *S. ornata* was found twice (RMNH Coel. 19800, 19801) in crevices on exposed rocky outer coasts of Suderoy and Eysturoy. Whether the records from Iceland (*e.g.* Stephenson, 1935: 340; Carlgren, 1939: 8; Carlgren, 1942: 7) bear upon *S. troglodytes* or on *S. ornata* needs verification. Apart from the Atlantic coast of Europe we have established the presence of *S. ornata* in the Canary Islands (Gran Canaria, Arguineguin and Lanzarote, Arrecife). Until now the species is not known from the Mediterranean.

Discussion.— The specimen from the Ria de Arosa is a juvenile. *Sagartia ornata* has long been considered to be a variety of *S. troglodytes*, presumably under the influence of

Table 7. *Sagartia ornata*. Survey of the cnidom of a small specimen from Ria de Arosa (RMNH Coel. 23843; base ca 5 mm across).

tissue	nematocyst type	average and range of length and width of nematocyst capsules in μm	n	frequency
column	homotrichs	17.5(16.0-19.6) × 4.3(3.8-4.7)	20	+
	spirulae	8.9 × 1.6	1	—
	spirulae	13.7(11.1-16.9) × 2.2(2.0-2.4)	20	-
	penicilli B2	12.8(11.6-14.2) × 3.6(3.3-4.0)	20	+++
tentacles	spirocysts	ca 10.5-21.5 × 2.2-3.6		
	?homotrichs	19.7(17.4-22.3) × 2.9(2.7-3.3)	20	- (inc.)
	spirulae	12.9(10.7-14.2) × 2.0(2.0-2.2)	10	?(inc.)
	spirulae	17.5(16.5-19.6) × 2.5(2.2-2.7)	30	++/+++
	penicilli B2	16.0(14.2-17.8) × 3.2(2.9-3.6)	10	- - -
stomodaeum	spirulae	15.7(12.5-17.8) × 2.2(2.0-2.4)	10	- -
	spirulae	25.1(23.1-28.5) × 2.8(2.7-3.1)	30	+/++
	penicilli A	24.5(23.1-26.7) × 5.2(4.7-5.6)	20	-/+
filamenten	spirulae	14.8(13.4-16.9) × 1.9(1.8-2.2)	25	+
	penicilli A	17.8 × 4.0	1	?(inc.)
	penicilli A	25.4(24.0-26.7) × 4.6(4.0-5.1)	20	+/++
	penicilli B1	13.8(12.5-15.6) × 4.0(3.6-4.7)	20	+/++
	penicilli B1	25.0(21.4-28.5) × 5.1(4.5-5.6)	20	++
acontia	spirulae	13.4 × 1.8	1	?(inc.)
	spirulae	18.3(16.0-19.6) × 3.1(2.7-3.6)	25	+++
	penicilli B2	23.9(21.4-26.7) × 4.0(3.6-4.5)	25	++

Stephenson (1935) who recognized them as var. *ornata* and var. *decorata* (see also Schmidt, 1972b: 50). Den Hartog (1970: 96/97) suggested that the two forms were specifically different, emphasizing that var. *ornata*, both in the Netherlands and in Great-Britain is viviparous, whereas there is no evidence of viviparity in the var. *decorata*. Shaw et al. (1987), on the basis of DNA sequencing proved *S. ornata* to be a valid species. The recent redescription, by their own account, by Acuña et al. (2004) may well refer to another species as the cnidome signature provided by them differs from Stephenson's (1935: 337) findings as well as from those presented here.

Apart from being viviparous, less variable in colour, generally smaller, and with a tendency to occupy a different habitat (the upper intertidal zone, occasionally even the splash zone, in crevices, often among *Mytilus*), it also seems that *S. ornata* has a wider distribution compared to *S. troglodytes*.

Sagartia elegans (Dalyell, 1848)

Material.— RMNH Coel. 18601 (Sta. RA 1.115, "Flor da Ponte", 26.vii.1962, Pta Caballo, Isla de Arosa, depth 7 m, large grab and middle grab, clay and marl; 1 specimen), RMNH Coel. 18602 (Sta RA 1.118, "Flor da Ponte", 26.vii.1962, W of N point Jideiro Arenoso, depth 11.8-13 m, dredge, clay and gravel; 2 very small specimens); RMNH Coel. 18602 (Sta Ra 1.603, "Flor da Ponte", 20.vii.1964, 0.6 km SW of Pta del Chazo, depth 10 m, middle-grab; 2 specimens).

Cnidom.— See table 8.

Table 8. *Sagartia elegans*. Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel. 18601).

tissue	nematocyst type	average and range of length and width of nematocyst capsules in µm	n	frequency
column	atrichs	32.1(29.4-33.8) × 8.7(8.0-9.8)	10	- /+
	homotrichs	17.7(15.1-20.5) × 4.3(4.0-4.7)	20	-
	spirulae	10.8(8.9-13.4) × 1.8(1.9-2.0)	10	- -
	spirulae	20.6(16.0-23.2) × 3.1(2.7-3.6)	20	++
	penicilli B2	24.2(16.9-27.8) × 4.2(3.6-4.7)	30	+
tentacles	spirocysts	ca 17.8-33.8 × 2.4-5.3	—	+++
	spirulae	not measured		
	spirulae	21.6(16.9-27.6) × 2.5(2.2-2.7)	25	+
	spirulae	28.1(27.0-29.4) × 2.7(2.5-2.9)	20	+++
	penicilli B2	29.4(24.0 31.2 -) × 4.1(3.8-4.5)	25	+
stomodaeum	spirulae	16.0(13.4-18.7) × 1.8(1.8-2.0)	15	- /+
	spirulae	30.5(25.8-34.7) × 2.6(2.4-2.9)	20	+/++
	penicilli A	25.0(22.3-26.7) × 4.3(4.0-4.7)	20	+/++
filamenten	spirocysts	ca. 18-34 × 2.7-5.8	—	?
	spirulae	11.7(9.8-12.9) × 1.8(1.8-2.0)	20	+
	spirulae	25.3(21.8-27.6) × 2.6(2.5-2.9)	20	- -
	penicilli A	23.4(22.3-24.9) × 4.4(4.0-4.7)	20	- /+
	penicilli B1	12.2(10.7-14.2) × 2.9(2.7-3.3)	20	++
	penicilli B1	15.2(13.4-16.9) × 5.4(4.9-6.2)	20	++
acontia	spirulae	15.2(13.4-17.4) × 1.9(1.8-2.0)	20	- /+
	spirulae	36.0(32.9-39.2) × 3.6(3.1-3.8)	25	+++
	penicilli B2	63.2(49.8-71.2) × 5.5(4.9-5.8)	25	+++

Distribution.— *Sagartia elegans* is widely distributed along the Atlantic coast of Europe. The species has been recorded from Iceland (Carlgren, 1939: 8), Faeroe Islands (personal records, JCdH); Scandinavia (Carlgren, 1942: 8), all around the British Isles (Stephenson, 1935: 324; Manuel, 1981b/1988: 144), the Netherlands (Ates et al., 1998), France and Spain and Portugal (RMNH-collection). Its distribution in the Mediterranean seems to be restricted to the colder parts of the western basin (*e.g.* Schmidt, 1972b: 47; Ocaña et al, 2000: 57). The species is not known from Madeira or the Canary Islands.

Discussion.— The cnidom of *Sagartia elegans* has been studied previously by Carlgren (1942: 8) and Schmidt (1972b: 47). Schmidt's survey is quite detailed and therefore it is interesting to observe that it differs in several details from the survey presented in table 8. As regards the column, Schmidt does neither note the presence of atrichs (a character shared with *Sagartiogeton undatus*, see below) nor of rather opaque elliptical to ovoid capsules here tentatively identified as homotrichs. These atrichs and homotrichs were found in several other specimens that were checked, though in variable numbers. The atrichs are extremely thinwalled and may easily be overlooked in squash preparations. The presence and abundance of homotrichs might at least to some extent be ecologically determined. Also interesting is the presence in the filaments of a Ria de Arosa specimen of an additional small size-class of penicilli B1 of a more or less elliptical shape and with the uneverted shaft not exceeding about half of the capsule length. The numbers of these nematocysts appeared to be very variable, even within the same specimen; in some specimens they were not found at all, but in others they were quite common. In the Ria de Arosa specimen included in table 8 they were the most common nematocyst type in filaments of the older mesenteries in the lower part of the body, but rare or absent in those of the younger mesenteries. Schmidt (loc. cit.) mentioned the rare presence of small spirulae [ca 10.2(8.8-12.5) × 1.9(1.6-2.2)μm] in the filaments of Mediterranean specimens, but in our experience such small spirulae can usually be found throughout the body tissues, and they are invariably present in significant numbers in at least the filaments and the acontia [in which Schmidt completely overlooked them, also in other eastern Atlantic Sagartiidae such as *Sagartia troglodytes*, *S. ornata*, *Sagartiogeton undatus* (see below) and *S. laceratus*].

Sagartia elegans is quite variable as regards colouration and it is therefore not surprising that it was described under many different names by 19th century naturalists, at a time when form and colour were the exclusive criteria to discriminate between actinian species. Stephenson (1935: 306-314) summarized the literature and maintained five more or less distinct colour varieties: var. *venusta*, var. *rosea*, var. *nivea* and var. *miniata* and var. *aurantiaca*. Recently uniform brown specimens adorned with a white stripe on the oral disc were found in the estuary of the Oosterschelde (Netherlands) (Ates, 2008). They do not conform to any of the described varieties. It was decided to amend the description of var. *rosea* to accommodate it, rather than describe a new variety. Pending more knowledge of the colour variety of *S. elegans* in all parts of its distributional range the decision to change the description of var. *rosea* may be revoked. With hindsight Stephenson's (1935) decision to keep Gosse's names for *Sagartia elegans* in existence (as varieties) may be questioned as in consequence later authors imprecisely considered this species to "occur in reasonably distinct, constant colour forms" (Manuel, 1981b/1988: 146).

Sagartiogeton undatus (O.F. Müller, 1788)

Material.— RMNH Coel. 14484 (Sta. RA 1.32, "Flor da Ponte", 13.vii.1962, W. Sinas, mussel concession VII, 6 m long rope with *Mytilus* reaching to 0.5 m below surface; 1 specimen), RMNH Coel. 18462 (Sta. RA 1.43, "Flor da Ponte", 16.vii.1962, 1.2 km WNW of harbour Villagarcia, depth 9 m, clay, large and small grabs; 1 specimen); RMNH Coel. 18463 (Sta. RA 1.48, "Flor da Ponte", 16.vii.1962, 300 m ENE of Pta Cabio, depth 6.5 m, large grab, coarse sand; 1 specimen); RMNH Coel. 18464 (Sta. RA 1.150 or 1.151, "Flor da Ponte", 17.vii.1962, 1.5 km W of Playa de Grandin, depth 25 m, middle-grab, clay and Foraminifera; 2 specimens); RMNH Coel. 18465 (Sta. RA 1.158, "Flor da Ponte", 2.5 km NW of Villajuan, depth 11.5 m, middle-grab, clay and Foraminifera; 3 specimens on *Turritella communis* Risso); RMNH Coel. 18466 (Sta. RA 1.189, "Flor da Ponte", 21.vii.1962, 150 m E of Puebla del Caramiñal, depth 5.8 m, middle-grab, coarse sand; 1 specimen on *Turritella communis*); RMNH Coel. 18605 (Sta. RA 1.209, "Flor da Ponte", 3.viii.1962, 400 m WNW of Villanueva, depth 6 m, dredge, clay with one little stone; 1 specimen); RMNH Coel. 18467 (Sta. RA 1.522, "Flor da Ponte", 29.vii.1963, 0.8 km N of Pta Campelo, Isla de Arosa, depth 43 m, middle grab, mud; 19 specimens); RMNH Coel 18468 (Sta. RA 1.524, 0,8 km N of Pta Campalo, Isla de Arosa, 29.vii.1963, dredge, 40-44 m, haul direction WSW; 13 specimens, 1 on worm tube); RMNH Coel. 18606 (Sta. RA 1.579, "Josefa", 17.vii.1964, 0.7 km SW to S of light of Polvos, depth 45 m. large grab, fine sand with mud; 8 specimens on shells of *Turritella communis* and fragments of *Ostrea* spec.); RMNH Coel. 18469 (Sta. RA 1.596, "Flor da Ponte", 18.vii.1964, 0.3 km NNE of Pta Campelo, Isla de Arosa, depth 18 m, haul in E direction, Zariquiey's dredge, coarse sand; 6 specimens, 3 on valve of *Pecten* spec.); RMNH Coel. 18470(Sta. RA 1.602, "Flor da Ponte", 20.vii.1964, La Barsa, S of Pta del Chazo, depth 12.5 m, middle grab, coarse sand; 1 specimen); RMNH Coel. 18471 (Sta. RA 1.607, "Flor da Ponte", 20.vii.1964, 0.3 km NNO of Pta Campelo, Isla de Arosa, depth ca 20 m, Zariquiey's dredge, 2 specimens); RMNH Coel. 18472 (Sta. RA 1.719, "Josefa", 31.vii.1964, 2.7 km SE to the E of buoy of "Polvos", depth 45-55 m, haul in N direction, dredge, grey mud; 8 specimens, 3 on empty *Turritella communis* shells, 2 on shell fragments of bivalves); RMNH Coel. 18473 (Sta. RA 1.722, "Josefa", 31.vii.1964, 0.4 km S of lighthouse of Rua, haul in ENOE direction, depth 40-70 m, dredge, grey mud; 1 specimen); RMNH Coel. 18628 (Sta. RA 1.340, slope, 8.vii.1963, 0.5 km S to the W of Pta Bodian, Enseada de Rianjo, depth 1.5 m, Zariquiey's dredge, silt; 3 specimens); RMNH Coel. 18632 (Sta. RA 1.449, "Flor da Ponte", 17.vii.1963, mouthof Rio Ulla, 1 km Eof Pta Lioira, depth unknown, Zariquiey's dredge, silt; 1 specimen); RMNH. Coel. 18633 (Sta. RA 1.629, "Flor da Ponte", 22.vii.1964, 0.3 km NW of buoy of Isla de Arosa, depth 44, middle grab, mud with shell fragments; 2 specimens); RMNH Coel. 18642 (Sta. RA 1.688, sloop, 29.vii.1964, 2.4 km SE of Pta Piedra Rubia, Pen. Chazo, depth 10-12 m, haul direction SW, Zariquiey's dredge, mud; 2 specimens); RMNH Coel. 18636 (Sta. RA 1.474, "Flor da Ponte", 24.vii.1963, 1.3 km N of buoy of Seca to the NW of Jidoiro Pedregoso, depth 55-60 m, middle grab, clay; 2 specimens, 1 on valve of *Venus striata*); RMNH Coel 18637 (Sta. RA 1.346, "Flor da Ponte", 9.vii.1963, between Ia Briñas and Sn Bartolome, haul direction SW and W, depth 5 m, middle grab and large dredge, silt; 1 specimen); RMNH Coel. 18639 (Sta. RA 1.476, "Flor da Ponte", 24.vii.1963, 1.8 km W of the light of Loba to S of Jidoiro, depth 40 m, middle grab, clay; 1 specimen, on valve of *Venus striata*); RMNH Coel. 18640 (Sta. RA 1.625, "Flor da Ponte", 22.vii.1964, 0.9 km NNO of Pta Campelo, Isla de Arosa, depth 40 m, middle grab, green mud; 2 specimens).

Disposed material.— Sta. RA 1.677 ("Flor da Ponte", 28.vii.1964, 0.8 km NE to E of the lighthouse of Rua, depth 50-55 m, middle grab, grey-green mud; 1 specimen); Sta. RA 1.624 ("Flor da Ponte", 22.vii.1964, 1.3 km S to the W of La Barsa, Pta del Chazo, depth 20.5 m, middle grab, green mud; 1 specimen); Sta. RA 1.300 (sloop, 5.vii.1963, 0.5 km SE to the S of Pta Aquillon, Isla de Arosa, depth ca 8 m, Zariquiey's dredge, clay?; 1 specimen); Sta. RA 1. 090 ("Flor da Ponte", 21.vii.1962, harbour of Puebla del Caramiñal, depth 5.5 m, middle grab, clayey sand; 1 specimen).

Cnidom.— See table 9.

Distribution.— According to Stephenson (1935: 362) and Carlgren (1942: 24/25) *Sagartiogeton undatus* occurs along the coast of western Europe from the Trondheimfjord (Norway), well into the Mediterranean and the Black Sea. Schmidt's (1972b: 56) notion

Table 9. *Sagartiogeton undatus*. Survey of the cnidom of a specimen from Ria de Arosa (A = RMNH Coel. 18469) and the Netherlands (B = RMNH Coel. 17712).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
column	A atrichs	ca. 30 × 9	—	- - -
	B	not observed	—	—
	A homotrichs?	not observed	—	—
	B	15.4(14.2-16.5) × 4.4(3.6-4.7)	20	+
	A spirulae	10.2(8.0-11.6) × 1.9 (1.8-2.0)	20	+
	B	9.7(8.5-11.6) × 1.7(1.6-1.8)	20	+
	A spirulae	13.9(12.5-16.0) × 2.5(2.4-2.7)	20	+
	B	14.8(12.0-16.9) × 2.5(2.2-2.7)	20	++
	A penicilli B2	16.8(14.7-19.6) × 3.7(3.6-4.0)	30	++
	B	20.3(16.0-26.7) × 3.6(3.1-4.0)	20	++
tentacles	A spirocysts	ca. 13.5-25.0 × 2.7-5.0	—	+++
	B	ca. 12.5 -27.0 × 2.7-5.0	—	+++
	A spirulae	17.9(16.9-19.6) × 2.5(2.2-2.7)	20	++
	B	18.0(16.9-20.5) × 2.4(2.2-2.7)	20	+
	A penicilli B2	21.1(18.7- 22.3) × 3.7(3.3-4.0)	20	+
	B	21.6(19.6-24.0) × 3.5(3.1-3.8)	20	- /+
stomodaeum	A spirulae	13.5(11.6-16.0) × 1.8(1.6-2.0)	6	- - -
	B	not observed	—	—
	A spirulae	23.5(21.4-25.8) × 2.7(2.7-2.9)	20	++
	B	22.3(21.4-24.0) × ca. 2.7	20	+
	A penicilli A	23.8(22.3-25.4) × 4.5(4.0-5.1)	20	+
	B	25.1(23.1-26.7) × ca. 3.6?-4.5?	12	+
filaments	A spirulae	10.6(9.3-14.2) × 1.8(1.6-2.0)	20	+
	B	11.6(9.8-13.4) × 1.8(1.8-2.0)	10	+
	A penicilli A	22.6(21.4-23.6) × 4.5(4.0-4.9)	20	+
	B	27.0(24.0-30.3) × 4.6(4.5-5.4)	20	+
	A penicilli B1	12.5(11.6-13.4) × 4.6(4.2-4.7)	20	++
	B	16.8(14.7-18.7) × 5.1(4.5-5.4)	20	++
acontia	A spirulae	13.7(12.5-15.1) × 1.7(1.6-2.0)	20	+
	B	14.2(12.5-15.1) × 1.9(1.8-2.2.)	20	+
	A spirulae	27.9(25.8-30.3) × 2.6(2.4-2.9)	20	++
	B	26.6(24.0-28.5) × 2.7	20	++
	A penicilli B2	43.1(40.9-45.4) × 5.3(4.9-5.6)	20	+++
	B	47.0(42.7-50.7) × 5.4(5.1-6.2)	20	+++

that *S. undatus* is present in the whole of the Mediterranean will remain a speculation until the African coast of the Mediterranean has received sufficient faunistic attention.

Discussion.— Contrary to *e.g.* Stephenson (1935: 361) and Schmidt (1972b: 56) we recognize two size classes of spirulae in the acontia of *S. undatus*. England (1971: 34) claims, without clarification, that he found three types of nematocysts in the acontia of this species. As is obvious from table 9 there are minor variations in nematocyst dimensions in specimens from the Netherlands and from Spain. Possibly these small variations may be explained as geographical variations. More data would be desirable. Certain very rare types of nematocysts in specimens from different regions, notably from the column, may easily be overlooked, as may be obvious from table 9. The large penicilli found in the column of this species by Doumenc et al. (1985: 521) may have originated from the acontia, which raises the question of the number of specimens examined by them. Apart from overlooking some common types of nematocysts, other disagreements with our nematocysts data, notably in respect of penicilli from the stomodaeum and the column, are apparent in the data supplied by Doumenc et al. (1985). This raises questions about species identity. Doumenc et al. (1985) may possibly have had a closely related species under consideration.

Cereus pedunculatus (Pennant, 1777)

Material.— RMNH Coel. 18604 (Sta. RA 1.84, "Flor da Ponte", 21.vii.1962, 100 m of Conchida beach, depth 4.5 m, middle grab, rather coarse sand; 1 poorly preserved specimen on fragment of bivalve shell); RMNH Coel. 18629 (Sta. RA 1.397, sloop, 11.vii.1963, Playa del vado, Los Tarays, hauldirection SW, depth 2-4 m, Zariquiey's dredge, fine sand; 2 small specimens). RMNH Coel. 23844 (channel close to Isla Tourisa, between the islet and main coast, 14.viii.1993; leg. R.M.L. Ates, sta. 4); RMNH Coel. 23845 (Ria de Arosa, south side of bridge connecting Isla de Arosa and mainland, low water, depth 2m, 18.viii.1993; leg. R.M.L. Ates, sta. 7).

Disposed material.— Sta. RA 1.054 ("Flor da Ponte", 17.vii.1962, 1.5 km NE of Pta del vado, depth 4.5 m, large grab, coarse sand 1 specimen).

Cnidom.— Not recorded.

Distribution.— According to Schmidt (1972b: 54) *Cereus pedunculatus* occurs in the western Mediterranean, the Adriatic and along the Atlantic coast of Europe to the north until western Sotland. The northernmost autochthonous occurrence on the European continent of this species is in the northern part of the Channel (Glaçon, 1977; pers. comm. Y. Müller, 6.ii.2008). As far as the Belgian coast is concerned we have our doubts as no reliable or recent autochthonous records are known to us. As far as we know *C. pedunculatus* has never been found near Walcheren (Netherlands) so that we think that Leloup's (1947: 50, 71) records may be based on a misidentification. To the south this species has been recorded near the Azores (Doumenc, 1975: 200; Wirtz et al., 2003), the Canary Islands and on the Moroccon Atlantic coast (Ocaña in: Ocaña & Den Hartog, 2002: 42). It is also mentioned for the Aegean by Doumenc et al. (1985: 518).

Discussion.— This is one of several species that were found beached in the Netherlands (Ates, 1997: 26/27) on dislodged *Himanthalia* spec. most probably from the Channel area. Such opportunities for a natural range extension are doubtlessly much older than the transport on mussels or oysters by humans which may or may not have taken place (see Nehring & Leuchs, 1999: 68). Until recently *C. pedunculatus* failed to establish itself in the southern North Sea, the cause of which should probably be sought in its temperature or its photic requirements. It has indeed been introduced into the estuary of the Oosterschelde (Netherlands) together with imported shellfish (Ligthart & Faasse, 2007: 147).

Actinothoe sphyrodeta (Gosse, 1858)

Material.— RMNH Coel. 18615 (Sta RA 1.683, "Flor da Ponte", 28.vii.1964, 0.3 km NE of E point of Jidoiro Pedregoso, depth unknown, haul direction NW, Zariquiey's dredge, marl; 8 specimens on sponge;

RMNH Coel. 23826 (SW part of Ria de Arosa, islet with lighthouse between Ribeiro and Pta Falcoeira, rather protected NW side of islet, 7 specimens on boulders between *Mytilus*, 14/15.viii.1993; leg. R.M.L. Ates, Sta. 5); RMNH Coel. 23827 (Ria de arosa, Isla Salvora, sublittoral, exposed smooth rounded rocks, 17.viii.1993; leg. R.M.L. Ates, Sta. 6).

Cnidom.— Not recorded.

Distribution.— According to Stephenson (1935: 347) *Actinothoe sphyrodeta* occurs in south-west England and Ireland and in the Irish Sea as well as in western France and "perhaps also in the Mediterranean". No reason was given for the latter statement, but recently not just an isolated specimen (Williams, 1997) but a convincing population was recorded by Ocaña et al. (2000; and references therein) just inside Gibraltar. There is also a record for the Adriatic (Kružić, 2007: 248), which we would like to see being verified. To the south it was reported by Ocaña (in Ocaña & Den Hartog, 2002: 43) to be very rare in the Canary Islands. Until now it was not found in Madeira, but it has been recorded from the Moroccon coast (Patriti, 1970: 120). To the north there are additional records for the Hebrides and Orkney, Scotland (Wood, 2005: 62). This species was recently found in the southern part of the North Sea (pers. comm. F. Kerckhof, 7.viii.2007). It was also reported from Heligoland by Harms (1993; based on a student's report). It may therefore be curious why it never established itself in the Netherlands where it was beached more than once, attached to *Himanthalia* spec. (Ates, 1997: 27; Ates et al., 1998: 267). A further, curious, record exists for northern Norway (Gulliksen, 1978).

Isophelliidae Stephenson, 1935: 183

Telmatactis forskalii (Ehrenberg, 1834)

Material.— A sample from Galicia kindly supplied by Dr. F. Ramil (Vigo, Spain) was researched by the first author, but got subsequently lost, supposedly in the mêlée shortly after his decease when clearing out his desk. In 2009 Dr. Ramil kindly supplied a replacement sample of two specimens from Cabo Silleiro, Ria de Vigo, Pontevedra, collected 8.iii.1997, but the second author was told that this got lost in 2010.

Cnidom.— Not recorded.

Distribution.— See Den Hartog (1995: 162). Additionally, Ocaña (in Ocaña & Den Hartog, 2002: 41) recorded this species for the Moroccon Atlantic coast. The occurrence of *T. forskalii* in Galicia was first reported by Ramil (1985: 158).

Discussion.— For a long time (see *e.g.* Carlgren, 1949: 90) this species had been known as *Telmatactis elongata* (Delle Chiaje, 1825; incidentally not 1841), until Schmidt (1972b: 44) reintroduced the specific epithet *forskalii* Ehrenberg, 1834. Delle Chiaje (1825) is included in Schmidt's (1972b) reference list but ignored in his discussion of this species. We have been able to check (cf. Den Hartog, 1995: 158) Delle Chiaje's (1822-1829) work, the figures of which appear to have been published in a separate volume inscribed with the year "1822". The only reference to the epithet *elongatus* that we could find is on plate XXXVI (but it should be noted that plate XXX is missing from the copy consulted by us). Delle Chiaje's (1822, plate XXXVI: 11) figure rather reminded us of a compound ascidian or perhaps a zoanthid, but certainly not of an actinian, contrary to Jourdan (1880: 3, 39). Fischer's (1889: 297/299) reasons to assign the first description of this species to Jourdan (1880: 39/40) are also based on the inadequacy of Delle Chiaje's

(1825)[sic] figure and even on Delle Chiaje's (1841) fallible description, *e.g.* for the absence of the periderm characteristic to *T. forskalii.* It seems to be best to accept the seniority of the name proposed by Schmidt (1972b).

Hormathiidae Carlgren, 1925
Calliactis parasitica (Couch, 1842)

Material.— RMNH Coel. 18492 (Sta. RA 1.116, "Flor da Ponte", 26.vii.1962, at Pta Caballo, Isla de Arosa, depth 7 m, dredge, mud with shells and shell gravel; 1 specimen, without substratum), RMNH Coel. 18493 (Sta. RA 1.259, "Flor da Ponte", 3.vii.1963, 0.3 km E of light of Ostreira, NNE of Pta Cabio to the S of Caramiñal, depth 14 m, dredge, brown silt with shells; 10 specimens attached to *Gibbula magus* [3×, 2 very small], *Nucella lapillus* with small hermit crabs [2×], loose valves of *Cardium edule* [3×], of *Tapes spec.*[1×], and a solitary tunicate [1x]), RMNH Coel. 18494 (Sta. RA 1.338, fishing vessel, 8.vii.1963, between Pta Porto Mouro and Pta Capitan, Pen. Chazo, haul direction NW, depth 2 m, Zariquiey's dredge; silt; 1 specimen with base enveloping a shell or shell fragment), RMNH Coel. 18495 (Sta. RA 1.348, "Flor da Ponte", 9.vii.1963, 0.8 km NW of Pta Barbafeita, Isla de Arosa, along N side of buoy Bajo Ter, depth 45 m, middle grab and large dredge; 1 specimen attached to bunch of shell fragments), RMNH Coel. 18496 (Sta. RA 1.418, "Flor da Ponte", 13.vii.1963, 2.5 km to the E of Pta Figueioriño, Isla Salvora, depth 50 m, large dredge, haul direction SSW, sediment unknown; 1 specimen, unattached); RMNH Coel. 18497 (Sta. RA 1.631, "Flor da Ponte", 22.vii.1964, 0.6 km S to the W of Pta Cabio, depth 7 m, middle grab, hauldirection NNE, marl; 1 specimen of fragment of *Lutraria* spec.), RMNH Coel. 18498 (Sta. RA 1.634, "Flor da Ponte", 22.vii.1964, 0.4 km SSW of light of Los Mezos, depth 18-22 m, Zariquiey's dredge, haul direction SW; 2 specimens on large *Triton* shell); RMNH Coel. 18499 (Sta. RA 1.840, "Josefa", 6.viii.1964, mouth of Ria de Arosa 2.5 km SW of Pta Canellas, Pen. del Grove, depth 35-65 m, dredge, haul direction NW to W, sediment unknown; 3 specimens, 2 attached to shells of live *Aporhais pespelicana*); RMNH Coel. 23823 (channel close to Isla Tourisa, between islet and main coast, 12.viii.1993; leg. R.M.L. Ates, sta. 4); RMNH Coel. 23824 (channel close to Isla Tourisa, between islet and main coast, 12.viii.1993; leg. R.M.L. Ates, sta. 4, one specimen on live gastropod); RMNH Coel. 23825 (south side of bridge connecting Isla de Arosa and mainland, low water, depth 2m, on stones 18.viii.1993; leg. R.M.L. Ates, sta. 7)
Disposed material.— Sta. RA 1.472 ("Flor da Ponte", 23.vii.1963, 0.4 km SE of the buoy of Lobeira de Camados, S of Isla de Arosa, depth 20 m, large dredge, haul direction E and W; 1 specimen, unattached).

Cnidom.— Not recorded.

Distribution.— According to Schmidt (1972b: 42) *Calliactis parasitica* occurs in the western Mediterranean, the Adriatic and probably in the eastern Mediterranean. Along the Atlantic coast of Europe it occurs until southern England and southern Ireland according to Stephenson (1935: 244). Its extension into the southern Atlantic is unknown but a number of records can be added: Madeira (Johnson, 1861: 299), the Canary Islands as well as the Atlantic coast of Morocco (Ocaña in: Ocaña & Den Hartog, 2002: 39) and the Aegean (Doumenc et al., 1985: 516). Its occurrence in the southern North Sea is very doubtful (cf. Manuel, 1981b/1988: 175). Leloup (1952: 260) records it as a rare inhabitant of the open sea off the Belgian coast, but his description is inaccurate. If Leloup (1952) obtained specimens *e.g.* from fishermen, which he does not disclose, these may have originated from further south in the Channel area, because Glaçon (1977: 7) does not mention this species for the northern part of the Channel. The species has not been recorded in that area as yet (pers. comm. Y. Müller, 6.ii.2008) and no reliable records for the southern North Sea are known to us.

Adamsia palliata (O.F. Müller, 1776)

Material.— RMNH Coel. 18474 (Sta RA. 1.524, "Flor da Ponte", 29.vii.1963, 0.8 km N of Pta Campelo, Isla de Arosa, depth 40-44 m, Zariquiey's dredge, haul direction WSW, mud; 2 specimens), RMNH Coel. 18614 (Sta. RA 1.722, 31.vii.1964, 0.5 km NW to N of buoy of Jidoiro Pedregoso, depth 50-70 m, haul direction SW, against slope; 1 large specimen on empty shell of *Gibbula magus*); RMNH Coel. 18631 (Sta. RA s.n. Atlantic Ocean, Portugal, Villareal de Santo Antonio (near Spanish border), depth 8-10 m, 28. vii.1962); 2 specimens on empty shells of *Natica* spec.); RMNH Coel. 18634 (Sta RA 1.187, "Flor da Ponte", 1.viii.1962, ca 0.5 km E of Pta del Castillo, parallel to coast, depth 11 m, dredge, coarse sand with shells; 1 specimen without shell and host hermit crab and 5 on empty gastropod shells: *Gibbula* spec. [3×], *Natica* spec. [1×], 1 completely enveloping an unidentified shell]); RMNH Coel. 18635 (Sta. RA 1.418, 2,5 km E of Pta Figueriño, Isla Salvora, haul direction SSW, dredge, depth 50 m, 13.vii.1963, one specimen on shell of *Nucella lapillus*).

Cnidom.— Not recorded.

Distribution.— According to Schmidt (1972b: 37) *Adamsia palliata* occurs in the whole of the Mediterranean, as well in the eastern Atlantic from Norway in the north and to the Cape Verde Islands in the south. It possibly also occurs in the Gulf of Aqaba (Red Sea) (Lewinsohn, 1969: 69).

Discussion.— Please note (see under Material) that a number of individuals was found on empty shells, i.e. without a hermit crab host. The hermit crab may have vacated the shells before or after these were taken by the catching devices. The same had been noticed by *e.g.* Stephenson (1935: 250/251). Additionally, in the Mediterranean Schmidt (1972b: 37) observed that *Pagurus prideaux* Leach, 1815 may leave its shell and flee up to 10 m away from it when a scuba-diver approaches, contrary to *e.g. Paguristes eremita* (Linnaeus, 1767) and *Dardanus arrosor* (Herbst, 1796). Although rarely noticed in other regions (*e.g.* in Norway: Moen & Svensen [2000: 141] published a picture captioned with "this hermit crab left its anemone for unknown reasons", and in Scotland: Wood [2005: 96] published an in situ picture of an empty shell covered with *A. palliata*), this behaviour possibly indicates that *P. prideaux* uses its shell and the accompanying anemone for protection to a lesser extent than the other hermit crab species mentioned. It had already been noted by Ross (1971: 402) that *P. prideaux* is not protected from attack by *Octopus* spec. to the same extent as *D. arrosor* by its respective symbiotic anemone species, but this does not explain why *P. prideaux* leaves its anemone behind when fleeing for larger objects such as divers and grabs. Behavioural studies of *A. palliata*, also in relation with its three symbiotic hermit crab species (Ates, 1995), will probably be rewarding.

The first description of this species was generally attributed to Bohadsch (1761: 135) (see *e.g.* Stephenson, 1935: 245; Schmidt, 1972b: 35) until Manuel (1981b/1988: 176) noted that Bohadsch's publication figures on the list of rejected works for nomenclatural purposes by the International Commission on Zoological Nomenclature (1944: opinion 185). He therefore reintroduced *Adamsia carciniopados* (Otto, 1823) as the oldest available name. Ates (1985) and Cornelius & Ates (2003) pointed out that Manuel had overlooked, however, that Bohadsch' name, *Medusa palliata*, had been used and validated prior to 1823 by O.F. Müller (1776: 233). Daly et al. (2004: 388) made one more attempt to keep a time honoured name in existence, but they selected and proposed an author junior to O.F. Müller (1776).

Table 10. *Amphianthus dohrnii*. Part of the cnidom of the Ria de Arosa specimens (RMNH Coel. 18607).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in μm	n	frequency
filaments	spirulae	10.7(8.9-13.4) × 1.9(1.8-2.2)	16	+
	penicilli B1	17.2(14.7-18.7) × 3.6(3.3-4.0)	25	+
acontia	spirulae	27.8(24.9-32.0) × 4.2(3.6-4.5)	25	+++

Amphianthus dohrnii (Von Koch, 1878)

Material.— RMNH Coel. 18607 (Sta. RA 1.524, "Flor da Ponte", 29.vii.1963, 0.8 km N of Pta Campelo, Isla de Arosa, depth 40-44 m, Zariquiey's dredge, haul direction WSW, mud; 4 small specimens on chitinous worm tubes).

Cnidom.— See table 10.

Distribution.— According to Schmidt (1972b: 42) *Amphianthus dohrnii* is present in the western Mediterranean and in the Adriatic, as well as in western European waters, to the north including the British Isles. It is now also known from the eastern Mediterranean (Vafidis et al., 1997: 58) and from the Canary Islands (Ocaña & Den Hartog, 2002: 40).

Discussion.— More records of *A. dohrnii* seem to exist for the Mediterranean (*e.g.* Bourcier & Zibrowius, 1973: 826; Templado et al., 1986: 98; Vafidis et al., 1997: 58; Vafidis & Chintiroglou, 2002: 90; Kružić, 2002: 274; Kružić, 2007: 246) than for the Atlantic. "Because of the rarity of this species and its apparent decline", Wood (2005: 98) relates to action plans in England to protect the sea fans on which *A. dohrnii* lives. Apart from living on gorgonians, *A. dohrnii* may live on worm tubes (see above), hydroids, pennatulids, antipatharians (*e.g.* Schmidt, 1972b: 41), deepwater decapods like *Paromola cuvieri* (Risso, 1816) (see Mori & Manconi, 1990), leaves of *Posidonia* spec. (Kružić, 2007: 246) as well as on a rocky substratum (Kružić, 2002: 274).

The specimens obtained in the Ria de Arosa are quite small and poorly preserved, so that it was hardly possible to make uncontaminated preparations of the filaments and the acontia. However, in these preparations it was possible to distinguish between dense concentrations of relatively large nematocysts representing tissue of acontia and more homogeneously spread tissue with scattered, less concentrated smaller nematocysts, deriving from the filaments.

Andresiidae Stephenson, 1922

Andresia partenopea (Andres, 1883)

Material.— RMNH Coel. 2259 (RA Sta. 1.596, 0.3 km NNO of Pta Campelo, Isla de Arosa, depth 18 m, 18.vii.1964, haul direction E, Zariquiey's dredge, 1 small well preserved specimen; original identification label stating "*Cerianthus lloydii* Gosse" det W. V. 1964); RMNH Coel. 18475 (RA Sta. 1.189, "Flor da Ponte", 1.viii.1962, 0.3 km E of Centoliro, parallel to coast, depth 12 m, gear and sediment unknown; 2 specimens); RMNH Coel. 18476 (RA Sta. 1.338, fishing vessel, 1.2 km ESE of buoy Lobeira de Cambados, S of Isla de Arosa, depth 10-20 m, toothed 1 m dredge, haul direction SSE and SW, sediment not recorded; 1 specimen); RMNH Coel. 18477 (RA Sta. 1.348, "Flor da Ponte", 9.vii.1963, between Cortegada and Isla Salvora, depth 2 m, large dredge, haul direction SE, coarse sand, 1 specimen); RMNH Coel. 18478 (RA Sta. 1.522, "Flor da Ponte", 29.vii.1963, 2 km N of Pta Aguiuncho, Isla de Arosa, depth 30-36 m, dredge, haul direction NNW, 26 specimens, many small); RMNH Coel. 18479 (RA Sta. 1.596, "Flor da

Table 11. *Andresia partenopea.* Survey of the cnidom of a sizeable specimen (RMNH Coel. 18482).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
column	spirulae	12.9(12.0-13.4) × 2.3(2.2-2.7)	10	- -
	spirulae	18.8(16.9-19.6) × 3.1(2.7-3.3)	25	++
tentacle tips	spirocysts	ca. 21.5-46.5 × 2.7-4.0	—	+++
	spirulae	48.8(39.2-54.3) × 3.5(3.1-3.8)	20	+++
stomodaeum	spirulae	32.3(26.7-35.6) × 3.8(3.6-4.0)	20	++
	penicilli A	19.6(17.8-21.4) × 4.7(4.5-5.6)	20	-
filaments	spirulae	17.0(16.0-18.2) × 2.5(2.2-2.9)	20	+
	spirulae	23.5(20.5-27.0) × 3.9(3.6-4.5)	20	+
	spirulae	30.1(24.0-33.8) × 3.5(3.3-3.8)	20	+
	penicilli A	19.3(17.4-20.9) × 5.0(4.5-5.8)	20	+

Ponte", 18.vii.1964, 0.3 km NNE of Pta Campelo, Isla de Arosa, depth 18 m, Zariquiey's dredge, haul direction E, coarse sand; 4 specimens); RMNH Coel. 18480 (RA Sta. 1.603, "Flor da Ponte", 20.vii.1964, 0.6 km S of Pta del Chazo, depth 12.5 m, middle grab, coarse sand; 2 specimens); RMNH Coel. 18481 (RA Sta. 1.606, "Flor da Ponte", 20.vii.1964, 1.5 km N to the E of lighthouse of Isla de Arosa, depth 30-40 m, Zariquiey's dredge, sediment not recorded; 5 specimens); RMNH Coel. 18482 (RA Sta. 1.719, "Josefa", 31.vii.1964, 2.7 km SE to the E of Buoy of "Polvos", depth 45-55 m, dredge, haul direction N, grey mud; 14 specimens); RMNH Coel. 18483 (RA Sta. 1.722, "Josefa", 31.vii.1964, 0.5 km NW to the W of buoy of Jidoiro Pedregoso, depth 70-75 m, haul direction SW, against slope, sediment not recorded; 5 specimens).

Disposed material.— RA Sta. 1.189 ("Flor da Ponte", 1.viii.1962, 0.3 km EE of Centolliro, parallel to coast, depth 12 m, gear and sediment not recorded; 1 specimen), RA Sta. 1.384 ("Flor da Ponte", 11. vii.1963, 0.3 km S of Cabo Cruz, Pen. Chazo, depth 18 m, middle grab, clay with coarse shell gravel 1 specimen), RA Sta. 1.472 ("Flor da Ponte", 23.vii.1963, 0.4 km SE of buoy of Lobeira de Cambados, S of Isla de Arosadepth ca 20 m, large dredge, haul direction E and W, silt; 2 specimens), RA Sta. 1.524 ("Flor da Ponte", 29.vii.1963, 0.8 km N of Pta Campelo, Isla de Arosa, depth 40-44 m, Zariquiey's dredge, haul direction WSW, mud; 18 specimens, mostly small), RA Sta. 1.572 ("Flor da Ponte", 16.vii.1964, 2.2 km N to the E of light of Pombeiriño, Pen. del Grove; 1 specimen), RA Sta. 1.607 ("Flor da Ponte", 20.vii.1964, 0.3 km NNE of Pta Campelo, Isla de Arosa, depth ca 20 m, Zariquiey's dredge, sediment not recorded; 1 specimen).

Cnidom.— See table 11.

Distribution.— The presence of *Andresia partenopea* in the Ria de Arosa (first recorded by Ramil & Fernández, 1990: 23) fits in with the known distributional range. According to Schmidt (1972b: 62-63) *A. partenopea* occurs in the western Mediterranean, the Adriatic and on the Atlantic coast of France (Roscoff, Cherbourg)(see *e.g.* Fauvel, 1924; Teissier, 1965: 48). It has in the meantime been reported from the eastern Mediterranean (Doumenc et al., 1985: 511; Moosleitner, 1988).

Actiniidae Gosse, 1858

Anemonia sulcata (Pennant, 1777)

Material.— RMNH Coel. 18609 (Sta. RA 0.15, Ria de Arosa, San Vicente, beach, 10.vii,1962, 1 specimen); RMNH Coel. 18610 (Sta. RA 1.189, "Flor da Fonte", 1.viii.1962, 0.3 km E of Centolliro, depth 12 m, gear and sediment not recorded; 1 specimen); RMNH Coel. 18611 (Sta. Ra 1.559, "Flor da Fonte", 3.ii.1994, beacon of Jodoiro Pedregoso, depth 18 m, Zariquiey's dredge, haul direction ESE, sand; 7 specimens + 1

specimen of a gall-forming endoparasite *Staurosoma parasiticum*); RMNH Coel. 18630 (Sta. RA 1.397, sloop, 11.vii.1962, Playa del vado, Los Tarays, depth 2-4 m, Zariquiey's dredge, haul direction SW; 2 rather small specimens). RMNH Coel. 23807 (Pueblo del Caramiñal, Playa de Cambio, protected beach facing SW, bordered by rock and large boulders, depth at high tide ± 2 m, between large brown algae, 11.viii.193; leg. R.M.L.Ates, sta. 1); RMNH Coel. 23808 (near lighthouse in front of small harbour of Pueblo del Caramiñal, protected side beach facing SW, bordered by rock and large boulders, depth at high tide ± 2 m, between large brown algae, 11.viii.193; leg. R.M.L.Ates, sta. 2); RMNH Coel. 23809 (SW part of Ria de Arosa, islet with lighthouse between Ribeiro and Pta Falcoeiro, rather protected NW side of islet, on large horizontal boulders, 14.viii.193; leg. R.M.L.Ates, sta. 5); RMNH Coel. 23810 (SW part of Ria de Arosa, islet with lighthouse between Ribeiro and Pta Falcoeiro, rather protected NW side of islet, brown specimens on large horizontal boulders, 14.viii.193; leg. R.M.L.Ates, sta. 5); RMNH Coel. 23811 (channel close to Isla Tourisa between islet and main coast, brown specimens without purple tentacle ends, common on seagrass 14.viii.193; leg. R.M.L.Ates, sta. 4); RMNH Coel. 23812 (channel close to Isla Tourisa, between islet and main coast; common on seagrass, with purple tentacle ends, 12.viii.1993, leg. R.M.L. Ates, sta. 4); RMNH Coel. 23813 (Isla Salvora, specimens without purple tentacle tips on smooth rounded rocks, sublittoral, 17.viii.1993, leg. R.M.L. Ates, sta. 6); RMNH Coel. 23814 (south side of bridge connecting Isla de Arosa and mainland, base of pillars of bridge surrounded by deposit of stones, depth 2m at low water, specimens with purple tentacle ends on thalli of *Laminaria saccharina*, 18.viii.1993, leg. R.M.L. Ates, sta. 7); RMNH Coel. 23815 (west side of Ria de Arosa, field of stone blocks at ca 500 m from second lighthouse, intertidal, in rock pools, extremely common, specimens with purple tentacle ends, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 23816 (west side of Ria de Arosa, field of stone blocks at ca 500 m from second lighthouse, intertidal, in rock pools, extremely common, specimens without purple tentacle ends, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 31229 (Sta. 0.54, Ria de Arosa, muddy shallows at the NE side of narrow part of peninsula Del Grove, depth 0-0,5 m, between seagrass and rocks, 10.vii.1963); RMNH Coel. 31230 (Sta 0.62, Ria de Arosa, San Vicente, peninsula Del Grove, beach N coast of peninsula just N of the church of Sao Vicente, rocky pools, 15.vii.1964); RMNH Coel. 31231 (Sta 0.98, Ria de Arosa, Pta San Vicente peninsula Del Grove, rocks, low water, 15.vii.1964); RMNH Coel. 31232 (Sta 1.469, Ria de Arosa, 0,3 km NW of Pta Cabella, Isla de Arosa,S side of buoy Bajo Bajo Ter, depth 10-20 m, dredge, 23.vii.1963)
Disposed material.— Sta. RA 0.54 (1 specimen); Sta. RA 0.98 (1 specimen).

Cnidom.— Not recorded.

Distribution.— According to Schmidt (1972b: 73) *Anemonia sulcata* occurs in the Mediterranean from the coast of Palestina until Gibraltar and in the eastern Atlantic from Madeira and the Canary Islands until the neighbourhood of Bergen (Norway). Lewis (1964: 240) published a rather detailed map of the distribution of *A. sulcata* in the British Isles, including the most northern part of eastern Scotland, but according to Wood (2005: 69) it is rare in eastern England and Scotland. This is probably related to its temperature requirements, teste Todd & Lewis (1984). The species is also rarely recorded in the southern North Sea (Ates, 1997: 26; Ligthart & Faasse, 2007: 146; pers. comm. M. van der Giessen, 7.xii.2007), although rafting on *Himanthalia* spec. into this area may be a regular occurrence (Ates, 1997: 26). Since *e.g.* Carlgren (1942: 67) mentions its occurrence on algae, the record for Bergen may likewise be the result of rafting. Moen & Svensen (2000) make no mention of this species in Norway. Ocaña (in Ocaña & Den Hartog, 2002: 35) records its occurrence on the coast of West Sahara.

Discussion.— This well-known species was generally referred to as *Anemonia sulcata* (Pennant, 1777) until Manuel (1981b/1988: 102), based on as yet unpublished research by R.B. Williams, reintroduced the name *Anemonia viridis* (Forskål, 1775). Apart from the question whether it was sensible to replace the well-established name *Anemonia sulcata*, the matter has recently become more complicated as data have become available suggesting that the species in fact represents a species complex consisting of two or more species (*e.g.* Bulnheim & Sauer, 1984). Wiedenmann et al. (2000) refuted the possibility that more than two species were involved. In the latter study Atlantic specimens were not included, indicating that a definitive conclusion on the number of species in the *Anemonia sulcata*-complex is pending.

Paranemonia cinerea (Contarini, 1844)

Material.— RMNH Coel. 23859 (Ria de Arosa, on seagrass, 23-7-1990, coll. R.M.L. Ates); RMNH Coel. 23860 (Ria de Arosa, on seagrass, summer 1991, 3 specimens, coll. R.M.L. Ates); RMNH Coel. 23861 (Ria de Arosa, on seagrass in channel close to Isla Tourisa, between islet and main coast; strong current in between turn of tides, no deeper than 4 m at high water, 12.viii.1993, coll. R.M.L. Ates, sta 4).

Cnidom.— See table 12.

Distribution.— *Paranemonia cinerea* was exclusively known (Schmidt, 1972b: 76) from the western Mediterranean and the Adriatic until Ates (1992: 34) discovered the species in the Ria de Arosa. As far as we know one credible record exists for the eastern Mediterranean (Vafidis et al., 1997: 70).

Discussion.— This species can only be confused with small individuals of *Anemonia sulcata* which may likewise be found on seagrass. Small-sized live specimens of *A. sulcata* and *P. cinerea* can be distinguished by the vague cream-coloured spots on the tentacles of the latter (see fig. 3), but preserved specimens present serious difficulties. Both species are characterized by the abundant presence of zooxanthellae in the tentacular

Fig. 3. *Paranemonia cinerea*. On leaves of *Zostera* sp. in the tidal channel next to Isla Tourisa. *In situ* photograph taken on 13.viii.1993, R.M.L. Ates.

Table 12. *Paranemonia cinerea.* Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel. 23861).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
column	spirulae	9.0(8.0-10.7) × 1.9(1.8-2.0)	20	+
	spirulae	13.7(12.5-15.1) × 2.2(2.0-2.4)	20	+
tentacles	spirocysts	16.0-33.8 × 2.2-3.3	—	++
	spirulae	27.7(24.0-31.2) × 3.0(2.7-3.3)	20	++
stomodaeum	spirulae	23.7(19.6-25.8) × 3.1(2.7-3.1)	10	?
	penicilli A	20.3(18.7-22.3) × 3.8(4.0-5.1)	15	?
filaments	spirulae	11.1(9.3-12.5) × 2.0(1.8-2.2)	20	+
	spirulae	27.8(22.3-30.3) × 4.1(3.6-4.9)	12	?
	penicilli A	19.2(17.8-21.4) × 3(4.0-4.7)	13	?

endoderm; the cnidom too is quite similar. The differences suggested to exist by Schmidt (1972b: 76; absence of acrorhagi, absence of fossa, absence of siphonoglyphs and directives; absence of atrichs in the ectoderm of the column) are not as clear as one might wish. *P. cinerea* lacks atrichs in the columnar ectoderm, which are present in *Anemonia sulcata*. However, as these atrichs are easily overlooked, and their absence, taken by itself, is not a practical character, this character cannot be used with confidence.

Actinia equina (Linnaeus, 1767)

Material.— RMNH Coel. 32484 (Sangenjo, W of Ponteverdra, 1,5 km W of Portonovo, 200 m W of Camping Paxarinos, 15.viii.1979, leg. M.S. Lavaleye); RMNH Coel. 23847 (Ria de Arosa, Puebla del Caramiñal, Playa de Cambio, protected beach facing SW bordered by rock and large boulders, brown coloured specimens, 11.viii.1993, coll. R.M.L. Ates, sta 1); RMNH Coel. 32848 (Ria de Arosa, Puebla del Caramiñal, Playa de Cambio, protected beach facing SW bordered by rock and large boulders, brown coloured specimens, 14.viii.1993, coll. R.M.L. Ates, sta 1); RMNH Coel. 23849 (SW part of Ria, islet with lighthouse situated between Ribeiro and Punta Falcoeiro; rather protected NW side of islet, upper littoral zone, red coloured specimens, 14.viii.1993, coll. R.M.L. Ates, sta 5); RMNH Coel. 23850 (Ria de Arosa, Isla Salvora, brown and reddish specimens on smooth rounded rocks, 17.viii.1993, leg. R.M.L. Ates, sta. 6); RMNH Coel. 32851 (W side of Ria de Arosa, field of stone blocks at ± 500 m from 2nd lighthouse, intertidal, very common, reddish coloured specimens, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 32852 (W side of Ria de Arosa, field of stone blocks at ± 500 m from 2nd lighthouse, intertidal, common, red specimens, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 32853 (W side of Ria de Arosa, field of stone blocks at ± 500 m from 2nd lighthouse, intertidal, very common, reddish coloured specimens, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 32854 (W side of Ria de Arosa, field of stone blocks at ± 500 m from 2nd lighthouse, intertidal, very common, green specimens, 19.viii.1993, leg. R.M.L. Ates, sta. 8); RMNH Coel. 32855 (SW part of Ria de Arosa, islet with lighthouse between Ribeiro and Pta Falcoeiro, rather protected NW side of island, green specimens on large horizontal boulders, 14.viii.193; leg. R.M.L.Ates, sta. 5).

Cnidom.— Not recorded.

Distribution.— According to Stephenson (1935: 123) *Actinia equina* occurs in the eastern Atlantic from the White Sea southward as far as the island of São Tomé, including the Mediterranean and the Black Sea. Beyond this range, Stephenson (loc. cit.) records it to possibly occur in the Red Sea, Japan and other areas, but “other species of

Actinia perhaps replace it" there. This presumption is at least correct for *e.g.* South-Africa (Schama et al., 2005: 441), but a number of species occurring inside the aforementioned range have in the meantime been split from the nominal species, like *A. prasina* Gosse, 1860 (see Haylor et al., 1984), *A. schmidti* Monteiro et al., 1997 and *A. sali* Monteiro et al., 1997.

Discussion.— For a long time only a single, widespread, variable species of *Actinia* was thought to occur along the coasts of western Europe (*e.g.* Carlgren, 1949: 49; Stephenson, 1935: 123). Although his paper has a preliminary character, Schmidt (1971) clearly showed that the variation of the species is not random and that a number of rather distinct taxa and forms can be distinguished on the basis of anatomy (notably the arrangement and number of mesenteries), reproduction (by oviparity or by viviparity presumably by apomictic parthenogenesis) and significant differences in the cnidom. It became obvious that *Actinia equina* actually is a species complex. In more than twenty-five years of his lifetime the senior author collected and obtained via friends and colleagues hundreds of samples of *Actinia* from numerous parts of the Atlantic and the Mediterranean. Indeed, a whole section of the NCB Naturalis collection has been reserved for *Actinia* spec. It was the senior author's wish and intention to attempt in due time to get a broader and clearer picture by performing a monographic study of the genus. Due to his untimely decease this time will not come. In the circumstances we can only present the material collected in Galicia belonging to what is usually called *A. equina* referring to the names used by Schmidt (1971). Future studies will almost inevitably lead to changes.

As the most common representative of the genus *Actinia* in the Ria de Arosa we recognize *Actinia equina equina* (Linnaeus, 1767) form 1 Schmidt, 1971. It can be recognized based on the presence of homotrichs in its scapus in combination with being viviparous and having three cycles of perfect mesenteries. Its colour is variable, from red to brown. Schmidt (1971: 163) found this form from Heligoland to Quiberon (Brittany, France). Another form that we recorded in the Ria de Arosa was described as *Actinia equina mediterranea* Schmidt 1971 form 2 Schmidt, 1971. It is easily recognized by the combination of its small size, its irregular anatomy, its viviparous character, and its cnidom (presence of penicilli B1 in the filaments; spirulae of the pharynx shorter than the large spirulae in the filaments). It is usually found in the highest strip of the intertidal zone, being submerged for only a few hours a day. This form has been reported by Schmidt (1971: 162; 1972b: 66) to occur from Banyuls and the Aeolic islands in the Mediterranean, and outside the Mediterranean from Celorio on the north coast of Spain, and in addition from the Canary Islands. We have seen this form also on the French Basque coast (Biarritz, St Jean de Luz) (pers. oberv. JCdH). We have reason to believe that this form is very close to or even identical with *Actinia bermudensis* Verrill, 1889 and that it is widely distributed in tropical and warm-temperate parts of the northern Atlantic.

Actinia fragacea Tugwell, 1856

Material.— RMNH Coel. 23846 (Ria de Arosa, Puebla del Caramiñal, Playa de Cambio, protected beach facing SW bordered by rock and large boulders, 3 m (high tide), in sand at base of large stones, 11.viii.1993, coll. R.M.L. Ates, sta 1).

Cnidom.— Not recorded.

Distribution.— According to Manuel (1981b/1988: 101) and Monteiro et al. (1997: 431) *Actinia fragacea* is restricted to south and west coasts of Britain and north-west France, but according to Schmidt (1971: 164) it occurs from the English coast until northern Portugal. Further records, some of which may also have been previously overlooked, have been published by Glaçon (1977: 7) for the northern Channel area, by Teissier (1965: 48) and Lafargue (1970: 422) for Brittany, by Ramil (1985: 153) and Ramil & Fernández (1990: 22) for Galicia and by Ocaña (in Den Hartog & Ocaña, 2003: 233) for the Atlantic and Mediterranean coasts of Morocco. It is also mentioned for southwest Ireland (Sherkin Island) by Vethaak (1983) and west Ireland by Wood (2005: 66). No records for Madeira and the Canary Islands are known to us. Although this species was reported once to have been beached in the Netherlands (Ates, 1997: 27) on *Himanthalia* spec., most probably originating from the Channel area, no records of attached specimens in the North Sea exist.

"Bunodactis" verrucosa (Pennant, 1777)

Material.— RMNH Coel. 23829 (SW part of Ria de Arosa, islet with lighthouse between Ribeiro and Pta Falcoeiro, rather protected NW side of islet, brown specimens on large horizontal boulders, 17.viii.193; leg. R.M.L.Ates, sta. 5); RMNH Coel. 23830 (W side of Ria de Arosa, field of stone blocks at ca 500 m from 2nd lighthouse, intertidal, common, 19.viii.1993, coll. R.M.L. Ates, sta. 8); RMNH Coel. 23838 (Ria de Pontevedra, 7 km W of Sangenjo, 18.viii.1979, leg. M.S. Lavaleye).

Cnidom.— Not recorded.

Distribution.— According to Stephenson (1935: 161) *"Bunodactis" verrucosa* occurs in southern England and Wales northward until the Island of Man as well in Ireland and it extends southward from the coasts of Belgium and France well into the Mediterranean. Its northern limit was extended to the Inner Hebrides (western Scotland) by Mitchell et al. (1983: 169). Schmidt (1972b: 86) relates to a distribution from the Adriatic until the Belgian and English coasts, dividing the species into at least three forms. Doumenc et al. (1985: 508) recorded one specimen in the Aegean Sea. Ocaña (in Ocaña & Den Hartog, 2002: 36/37) reported it as an uncommon species in the Canary Islands and on the Moroccon Atlantic coast. *B. verrucosa* has been washed ashore in the Netherlands on *Himanthalia* (see Ates, 1997: 27) but until now it did not establish itself there. This species is not known to occur in the northern part of the Channel (Glaçon, 1977: 7; pers. comm. Y. Müller, 6.ii.2008). As far as Belgian waters are concerned there is much doubt as no reliable or recent records are known. Leloup (1952: 249-250) describes *B. verrucosa* as having approx. 100 long and slender tentacles but on the Atlantic coast of continental Europe, Galicia included, it has 48 tentacles "of medium length, stout, blunt" (Stephenson, 1935: 157, but see also the record of larger specimens on the Devon coast by Manuel, 1981b/1988: 117). Leloup (1952) also describes this species as containing zoochlorellae but *B. verrucosa* never contains symbiotic algae (see also Schmidt, 1972b: 83). Leloup's (1947: 47; 1952: 249) records of a deepwater occurrence in the southern North Sea seem to rely heavily on older, equally uncertain records (*e.g.* Lameere, 1895: 28 as *Bunodes gemmacea*).

Anthopleura thallia (Gosse, 1854)

Material.— RMNH Coel. 23858 (Ca 7 km W of Sangenjo, 18.viii.1979, 2 specimens; leg. C. & M.S.S. Lavaleye); RMNH Coel. 23839 (NW Spain, Ria de arosa, Isla de Arosa, W side, field of stone blocks, ca 500 m from 2nd lighthouse, in narrow fissure, in uppermost fringe of intertidal zone, 19.viii.1993, leg. R.M.L. Ates, sta. 8).

Cnidom.— Not recorded.

Distribution.— Stephenson (1935: 167) listed a number of localities in Wales and England where *Anthopleura thallia* occurs, but noted that "nothing is known for certain of its foreign distribution". We do not know the source(s) of Carlgren's (1949: 53) information that this species occurs on the "west coast of Scotland, Irish Sea, Ireland, South England, Atlantic coast of France and the Mediterranean". Probably this is just a lapse (cf. Williams, 1998: 364). Relatively few records of this species have accumulated since Stephenson (1935), but these have widened its range considerably. M. Daly (pers. comm. 9.ii.2004) found it in Ireland and Ocaña & Den Hartog (2002: 36) in Madeira and the Canary Islands. It has been reported from Roscoff (Brittany, France) by Teissier (1965: 49), from Galicia by Ramil (1985: 156), from the Algarve (Portugal) (RMNH Coel. 23841, 31241), from the neighbourhood of Gibraltar by Lopez-Gonzalez (1993: vide Ocaña & Den Hartog, 2002: 36), from Morocco (Cabo Guir) (RMNH Coel. 19912), from Ceuta (RMNH Coel 17997) as well as from Malaga (Spain) by Williams (1998: 364). The latter records are actually the only ones we know for the Mediterranean, apart from a record for the Adriatic (Kružić, 2007: 242) which we would like to see being verified. A record from the Hebrides (Wood, 2005: 73) actually concerns *Sagartia ornata* (see above). The record of Portielje (1933: 142) of an allegedly autochthonous specimen from Den Helder (Netherlands) is based on a misidentification (Ates, 1997: 27). Den Hartog (1962: 10) found two allochthonous specimens beached a few kilometers from the same locality. The latter specimens probably originated from northern France, the source of *Himanthalia* spec. in the Netherlands, on which they were found. As far as we know *A. thallia* did not establish itself in the Netherlands.

Anthopleura ballii (Cocks, 1850)

Material.— RMNH Coel. 18500 (Sta. RA 1.53, "Flor da Fonte", 17.vii.1962, 1.5 km NE of Pta del vado, depth 5 m, large dredge, gravel with fauna; 1 specimen); RMNH Coel. 18638 (Sta. RA 1.734, "Flor da Fonte", 31.vii.1964, 1.7 km E of Pta Con cerrado, Isla de Arosa, depth 3 m, middle grab, coarse gravel, 1 specimen); RMNH Coel. 18641 (Sta. RA 1.325, sloop, 6.vii.1963, Las Hermanas, N to the E of Pta de la Casilla, depth 6-8 m, Zariquiey's dredge, haul direction S, fine sand and silt; 1 small specimen); RMNH Coel. 18643 (Sta. RA 1.338, fishing vessel, 1.2 km ESE of buoy Lobeira de Cambados, S of Isla de Arosa, depth 10-20 m, toothed 1 m dredge, haul direction SSE and SW, variable fauna, sediment not recorded; 1 specimen); RMNH Coel. 23820 (channel close to Isla Tourisa, between islet and main coast, 1 specimen, 15.viii.1993, coll. R.M.L. Ates, sta. 4).

Disposed material.— Sta. RA 1.84 ("Flor da Fonte", 21.vii.1962, 0.1 km off Conchida beach, depth 4.5 m, middle grab, rather coarse sand; 1 specimen); Sta. RA 1.158 ("Flor da Fonte", 30.vii.1962, 0.45 km N of N tip Isla Jidoiro, depth 42 m, dredge, mud with shells; 1 specimen); RA 1.727 ("Flor da Fonte", 31.vii.1964, 0.8 km SSE of Pta Chastellas, Isla de Arosa, depth 6 m, middle grab, sand;1 specimen); Sta. RA 1.728 ("Flor da Fonte", 31.vii.1964, 0.8 km SEE of Pta Chastellas, Islas de Arosa, depth 7.5 m, middle grab, mud and fine sand; 1 specimen).

Table 13. *Anthopleura ballii*. Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel. 18500). Acrorhagi were not observed in this specimen.

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
scapus	spirulae	20.2(17.8-26.3) × 2.2(2.0-2.4)	40	++
pseudo-acrorhagi	spirulae	23.8(16.9-27.6) × 2.4(2.2-2.7)	40	+++
tentacles	spirocysts	ca. 16.0-27.5 × 2.2-3.1	—	+++
	spirulae	23.5(20.9-27.1) × 2.3(2.2-2.4)	20	++
stomodaeum	spirulae	27.5(24.0-30.7) × 2.8(2.7-3.1)	20	+
	penicilli A	20.9(18.7-22.3) × 3.9(3.6-4.2)	10	- /+
filaments	spirulae	12.6(11.6-14.2) × 1.7(1.6-1.8)	20	+
	spirulae	33.7(31.2-37.4) × 4.2(3.8-4.9)	25	+
	penicilli A	21.6(18.7-23.1) × 3.7(3.6-4.0)	20	+
	penicilli B1	15.4(14.2-18.7) × 3.0(2.9-3.1)	20	- /+

Cnidom.— See table 13.

Distribution.— According to Stephenson (1935: 172) *Anthopleura ballii* occurs on a number of localities in southern England and in southern and western Ireland as well as on the Atlantic coast of France and in the Mediterranean. Schmidt (1972b: 92) specified that it is a rare species in the Adriatic and the western Mediterranean. Relatively few records have been published since Schmidt (1972b) although it is not an uncommon species in certain parts of Western Europe, notably in southwestern (Lafargue, 1970: 422) and northeastern Brittany (pers. observ. R.A.) in contradiction to Teissier (1965: 49) relating to Roscoff (western Brittany) where it is said to be rare. In the Atlantic it was additionally recorded in Galicia (Ramil, 1985: 155; Ramil & Fernández, 1990: 23), the Canary Islands (Ocana & Den Hartog, 2002: 35/36), the Azores (Wirtz et al., 2003 and references therein) and on the Moroccon coast (Patriti, 1970: 117). Recently some specimens were found settled in the Netherlands, probably having arrived with shipments of oysters or mussels from Ireland or France (Ligthart & Faasse, 2007). Among the recent records for the Mediterranean are those for southern Spain (Ocaña et al., 2000: 57) and for the Adriatic (pers. comm. M. Vestjens & A. Frijsinger, 3.iv.2005; Kružić, 2007: 242).

Discussion.— *Actinia rhododactylos* Grube, 1840: 3/4 has been referred to *Sagartia elegans* by Pax & Müller (1962: 209), to *"Bunodactis" rubripunctata* by Schmidt (1972b: 90) and to *Anthopleura ballii* by Tur (1989: 61) which may indicate Grube's (1840) description to be wanting (see also Schmidt, 1972b: 47 and Manuel, 1981b/1988: 144). If necessary the name *Anthopleura ballii* should be conserved for the sake of nomenclatural stability. Incidentally, Tur's (1989) work, its microfiche-version included, is unavailable to zoology as it was not published in the sense of the Code of Zoological Nomenclature (see Tubbs, 2001).

Urticina felina (Linnaeus, 1761)

Material.— RMNH Coel. 23817 (NW Spain, Ria de Arosa, Puebla del Caramiñal, Playa de Cambio; protected beach facing SW, bordered by rock and large boulders, just subtidally under flat stone, 15. viii.1993, 1 specimen; leg. R.M.L. Ates nr 22, sta. 1); RMNH Coel. 23818 (NW Spain, Ria de Arosa, SW part of Ria, islet with lighthouse situated between Ribeiro and Pta Falcoeiro; rather protected NW side of islet, upper litoral zone. 17.viii.1993, 3 specimens; leg. R.M.L. Ates nr 34, sta. 5); RMNH Coel. 23819 (NW Spain, Ria de Arosa, Isla de Arosa, W side, field of stone blocks at ca 500 m from second lighthouse; intertidal, in rockpool, 19.viii.1993, 1 specimen; leg. R.M.L. Ates nr 33, sta. 8).

Cnidom.— See table 14. The most striking aspect of the cnidom of members of the genus *Urticina* is the presence of large spirulae in stomodaeum and filaments, and in addition the presence of large penicilli B1 (the largest known to occur in Actiniaria) and narrow fibre-like spirulae in the filaments. In *Urticina felina* the large spirulae in the stomodaeum are significantly larger and more common than those in the filaments, where it is sometimes hard to trace them. The penicilli of the filaments can often be divided at first glance into two size-clases. In other specimens this is less clear, although plotting of measurements of as many as a hundred capsules will usually result in a graph with two distinct peaks. Capsules of the smallest size-class generally are considerably less abundant than those of the larger size class.

It is noticeable that, like in a number of other Endomyaria, penicilli A are present in the ectoderm of the column; this occurrence is possibly just sporadic but it should be borne in mind that they are thinwalled and easily overlooked.

Distribution.— Based on Carlgren (1921: 164) *Urticina felina* occurs in the northern Atlantic from the coast of France in the southeast and Cape Cod in the southwest to the Kara Sea in the northeast, the western Baltic, Iceland, Faeroe Islands, Jan Mayen and Spitsbergen included, as well as in Franz Joseph Land (Carlgren, 1932: 160). In the southeast this range can be extended to northern Spain and Portugal (Nobre, 1931; Ramil, 1985; Ramil & Fernández, 1990). Carlgren (1921: 164) doubtfully refers to its occurrence on the west coast of North America but according to Sanamyan & Sanamyan (2006: 379) this species does not occur in the Pacific. Sanamyan & Sanamyan (2006: 372) raised var. *crassicornis* to species status, which further reduced the range of *U. felina* as laid out by Carlgren (1921: 170/172).

Table 14. *Urticina felina*. Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel. 23817), diameter of base ca 4.5 × 3.5 cm.

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
column	spirulae	17.9(16.0-19.6) × 2.2(2.0-2.4)	30	+?
	spirulae	8.9 × 1.8	1	- - -?
	penicilli A	19.7(18.2-21.4) × 4.5(4.0-4.9)	3	- - -?
tentacle tips	spirocysts	ca 18-36 × 2.4-3.6	—	+++
	spirulae	22.8(20.5-25.8) × 2.6(2.4-2.7)	30	++
stomodaeum	spirulae	56.3(51.6-61.4) × 5.5(5.1-5.8)	30	++
	spirulae	16.2(11.6-22.3) × 2.3(2.0-3.1)	20	-
	spirulae	33.1(31.2-36.5) × ca 1.8	10	-/+
	penicilli A	24.9(23.1-26.7) × 4.9(4.7-4.9)	5	- - -
filaments	spirulae	19.8(17.8-21.4) × 2.5(2.2-2.7)	20	+
	spirulae	33.0(31.2-34.7) × ca 1.6-1.8	10	+
	spirulae	51.6(44.5-57.9) × 5.1(4.5-5.8)	20	-
	penicilli A	24.9(23.1-26.7) × 4.5(4.2-4.9)	20	+
	penicilli B1	41.7(32.9-48.0) × 5.5(4.7-5.8)	20	++/+++

In the northern part of its range this species may easily be confused with *Urticina eques* (Gosse, 1860), see also Wood (2005: 52). See Discussion, in respect of records from other parts of the northern hemisphere.

Discussion.— Previous records of this species from Portugal [Nobre, 1931: 55, pl. 15 fig. 1; from Porto, as *Tealia crassicornis* (Müller, 1776)] and Spain [Ramil, 1985: 155, 163; Ramil & Fernández, 1990: 22-23; many localities in Galicia] were in our view insufficiently documented to be accepted without doubt. We considered it possible that these records actually bore upon *"Bunodactis" rubripunctata* (Cocks, 1849) or *Bunodosoma biscayensis* (Fischer, 1874: 229). However, the present records from Ria de Arosa proves our hesitation concerning previous records to be fully unjustified.

The taxonomy of the genus *Urticina* is complicated. From European waters, four varieties were distinguished by Carlgren (1921: 162) and Stephenson (1935: 143-153). Hand (1955: 69), identifying three of these with forms occurring in Californian waters, raised them to species status. The latter action was not followed by Manuel (1981b/1988: 106) except for the var. *lofotensis* (Danielssen, 1890), which he, in our view correctly, considered to be synonymous with *Bolocera (= Urticina) eques* Gosse, 1860. Manuel (1981b/1988) recognized that differences exist in the cnidom between *U. lofotensis* (as used by Hand, 1955: 80 but being a species of *Cribrinopsis* according to Sanamyan & Sanamyan, 2006: 360) and *U. eques*. Den Hartog (1970: 99; 1986: 87), also pointed out that notable differences exist between *U. felina* var. *coriacea* from Plymouth and *U. coriacea* (Cuvier, 1798) from California. Further research is necessary to elucidate the possible relationship between north Pacific members of the genus *Urticina* and those in Europe. Such research has been started in the meantime by Sanamyan & Sanamyan (2006).

Hand (1955: 71) proposed to discard the Linnaean name *felina* argueing that it is a nomen dubium. It is true that Linnaeus' description consists of only 5 words and that there has been much confusion in the literature. However, what has escaped the attention of most authors, except *e.g.* Fischer (1874: 234), is that Linnaeus refers to Baster (1759-1765). Apart from being relatively rare, Baster's book is written in Dutch. Baster's description is equally short, but accompanied by a handcoloured plate which leaves no doubt about the identity of the species (for a reproduction see Ates, 2006b). The localities from which he described the species were Brouwershavense Gat and Goereese gat (Baster, 1761: 140) in the province of Zeeland (Netherlands). Due to the construction of dikes only the most western part of the Brouwershavense Gat remains until the present day. This may be considered to be the type locality of *U. felina* and the species is still common here.

Haloclavidae Verrill, 1899

Mesacmaea mitchelli (Gosse, 1853)

Material.—RMNH Coel. 23857 (Sta RA1.836, "Flor da Fonte", 5.viii.1964, 0.8 km W to S of light of "Polvos", depth 45 m, middle grab, mud with gravel; 1 damaged specimen.

Cnidom.— See table 15.

Distribution.— According to Stephenson (1935: 90) *Mesacmaea mitchelli* occurs in the Channel area, in the Irish Sea and in southern Ireland, as well as in the Gulf of Naples (Mediterranean). It had in fact been reported for the northern Adriatic by Graeffe (1884,

Table 15. *Mesacmaea mitchelli.* Survey of the cnidom of the single specimen from Ria de Arosa (RMNH-Coel. 23857).

tissue	nematocyst type	average and range of length and width of nematocyst capsules in µm	n	frequency
column	spirulae	17.5(16.0-19.6) × 3.1(2.9-3.6)	20	+
tentacles	spirocysts	ca 18-45 × 3.1-8.0	—	+++
	spirulae	26.9(24.9-27.6) × 3.1(2.9-3.3)	20	+/++
stomodaeum	spirocysts	ca 30-45 × 5.3-6.7	—	+/++
	spirulae	27.9(25.8-31.2) × 3.6(3.6-4.0)	20	++/+++
	penicilli A	24.4(23.1-25.8) × 5.7(5.3-6.2)	25	++
filaments	spirulae	23.1(21.4-26.7) × 3.3(2.7-3.6)	20	+
	spirulae	26.1(22.3-29.7) × 6.0(5.3-6.7)	20	+
	penicilli A	23.7(20.5-26.7) × 5.8(5.3-7.1)	20	++
	penicilli B1	not measured	—	—

in Pax & Müller, 1962: 147). Later records include those of Teissier (1965: 48) for Roscoff (France), of Gage (1972: 262) for western Scotland, of Picton (1985: 487) for western Ireland, of Gili et al. (1987: 92) and Tur (1989: 158) for northeastern Spain, so that the range of this species is well extended. There is also a record for the Aegean by Doumenc et al. (1985: 506) but their nematocyst data differ from ours in such a way that there is reason for doubt.

Unidentified material

Material.— RMNH Coel. 39503 (Ca 7 km W of Sangenjo, rocky shore, 18.viii.1979, intertidal; 1 specimen; leg. C. & M.S.S. Lavaleye).

Descriptive notes.— The column is wrinkled, 16 mm long and 7 mm across the uppermost part, narrowing distally to about 4-5 mm just above the base, the basal part expanding to 7 mm in diameter. At the oral end the stomodaeum protrudes and tentacles are not externally visible. Closer examination showed them to be very small and turned outside in. There are no verrucae.

Mesenteries seemingly decamerously arranged. In the uppermost part of the column there are 10 mesentery pairs with strong, restricted retractors, reminiscent of those of *Sagartia troglodytes/ornata*, including 1 pair of directives connected with the single siphonoglyph. A second cycle of 10 pairs without clear retractors but with filaments (triple cords??) alternates with cycle I. Two pairs of cycle II, representing the couple of which one pair is adjacent to the directives, are relatively well developed. Six poorly developed pairs of a third cycle are present, and in addition there are 2 such pairs present in one of the endocoels.

Cnidom.— See table 16.

Discussion.— The morphology and anatomy of the specimen as far as studied suggests the species to be an "athenarian" burrowing form, which does not match the statement on the label that it was found on a rocky shore in the intertidal.

Table 16. Gen spec. Survey of the cnidom of the single specimen from Sangenjo, Ria de Arosa (RMNH Coel. 39503).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
column	spirulae	15.0(12.5-16.9) × 2.1(2.0-2.4)	20	+/++
tentacles	spirocysts	11.6-20.9 × 2.0-2.9	—	++
	spirulae	16.4(14.2-17.8) × 2.3(2.0-2.4)	20	++
stomodaeum	spirulae	24.0(22.3-25.8) × 3.0(2.7-3.6)	24	++
	penicilli A	22.7(20.5-24.0) × 4.5(4.0-5.1)	5	-
filaments	spirulae	11.6(10.7-12.5) × 2.4(2.2-2.4)	3	- - -
	spirulae	28.9(20.9-37.4) × 5.0(3.3-6.7)	25	+/++
	spirulae	53.0(50.7-56.1) × 2.7(2.4-2.9)	5	- -
	penicilli A	22.3(20.5-24.0) × 4.5(3.6-4.9)	25	+/++
	penicilli B1	17.5(16.9-18.7) × 2.9(2.7-3.1)	12	- -

Edwardsiidae Andres, 1880

Edwardsia claparedii (Panceri, 1869)

Material.— RMNH Coel. 18625 (Sta. RA 1.477, "Flor da Fonte", 24.vii.1963, 2.7 km W to N of the light of Los Mezos, straight E of buoy of "Polvos", depth 40 m, middle grab, clay; 2 specimens with retracted oral end, 25 × 4.5 and 17 × 3 mm), RMNH Coel. 18626 (Sta. RA 1.476, "Flor da Fonte", 24.vii.1963, 1.8 km W of the light of Loba, S of Jidoiro, depth 40 m, middle grab, clay; 3 small, contracted, juvenile specimens up to ca 10 mm long). RMNH Coel. 31201 (Ria de Arosa, M 132 without exact locality; material collected by J. Mora).

Cnidom.— See table 17.

Distribution.— According to Williams (1981: 346) *Edwardsia claparedii* occurs in southern Italy, northern France, southern Ireland, southern and western England. However some records may have been confused (Manuel, 1981a; 1981b/1988: 204) with *e.g. Scolanthus callimorphus*, see below. It also occurs in western Ireland (Picton, 1985: 487). Chintiroglou & Den Hartog (1995: 357-359) recorded *E. claparedii* in the Aegean. Vafidis et al. (1997: 58) summarized records for the Mediterranean, the eastern part and the Black Sea included, some of which may also actually have been *S. callimorphus*. Recently its occurrence in the northern Adriatic was confirmed by Zavodnik et al. (2006: 83).

Table 17. *Edwardsia claparedii.* Survey of the cnidom of a specimen from Ria de Arosa (RMNH Coel. 18625).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
nemathybomes	spirulae	84.2(78.3-90.8) × 2.7(2.7-2.9)	10	+
	spirulae	143.4(131.7-153.1) × 6.5(6.2-7.1)	25	+++
tentacles	spirocysts	10.7-23.1 × 2.2-4.5	—	++
	spirulae	27.6(26.7-29.4) × 2.7(2.4-2.9)	20	+
stomodaeum	not studied			
filaments	penicilli A?	27.1(25.8-28.9) × 5.4(5.3-5.8)	15	-
	penicilli B1	27.0(24.9-31.2) × 4.0(3.6-4.5)	25	++

Discussion.— In their checklist of the Anthozoa of Galicia Ramil & Fernández (1990: 25) listed only one edwardsiid species, viz. *Scolanthus callimorphus* (Gosse, 1853). The listing of this species was based on an unpublished thesis by Mora (1980) who used the name *Edwardsia callimorpha*. The concept of *Edwardsia callimorpha* was universally used in the sense of Gosse (1855: 271) as followed by *e.g.* Carlgren & Stephenson (1928: 6) and Stephenson (1935: 53) until Manuel (1981a) made clear that the species originally described by Gosse as *Scolanthus callimorphus* definitely is another species. This implicated that the specific name of the species to which the name *E. callimorphus* was generally applied had to be replaced by its oldest available junior synonym, viz. *E. claparedii* Panceri, 1869. It is more than likely that Mora (1980; i.e. one year prior to Manuels publications) used the name *E. callimorphus* in the sense of Gosse (1855: 271) (= *E. claparedii*) and that Ramil & Fernández (1990) should have used the latter name. A study of three of Mora's specimens, one of which was donated to the NCB Naturalis collection by the kind mediation of Dr F. Ramil, Orense, confirmed that Mora's specimens belong to *E. claparedii* and not to *S. callimorphus*. However, the present study has shown that *S. callimorphus* does also occur in the Ria de Arosa (see next species).

Scolanthus callimorphus Gosse, 1853

Material.— RMNH Coel. 23856 (channel close to Isla Tourisa, between islet and main coast, on intertidal mudflat, 12.viii.1993, coll. R.M.L. Ates, sta. 4).

Cnidom.— See table 18.

Distribution.— According to Manuel (1981a: 268/269) *Scolanthus callimorphus* occurs

Fig. 4. *Scolanthus callimorphus*. Three specimens from the mudflat near Isla Tourisa, Ria de Arosa. Aquarium picture taken in January 1992, R.M.L. Ates.

Table 18. *Scolanthus callimorphus*. Survey of the cnidom of a specimen from Ria de Arosa R.M.L. Ates, Sta. 4 (RMNH Coel. 23856).

tissue	nematocyst type	average and range of length and widt h of nematocyst capsules in µm	n	frequency
nemathybomes	spirulae	64.0(59.6-69.4) × 4.0(3.6-4.7)	20	++
tentacles	spirocysts	not measured		
	spirulae	not measured		
stomodaeum	spirulae	26.3(24.0-30.3) × 2.5(2.2-2.9)	10	-
	spirulae	45.0(40.0-50.1) x 4.1(3.6-4.5)	30	++
filaments	spirulae	(11.6-14.7) × (2.5-3.1)	5	- - -
	spirulae	44.4(40.9-49.0) × 3.0(2.7-3.3)	20	+
	spirulae	(47.2-56.1) × (4.9-6.0)	13	-/+

in southern England, western Ireland, western France and near Naples (southern Italy). It was very abundant in a small mud flat which emerged during every low tide near Isla Tourisa in the Ria de Arosa (see fig. 4). Kružić (2007: 246) recorded this species in the Adriatic. Den Hartog (1995: 165) found it near Rhodes, which constitutes the first record for the eastern Mediterranean.

Discussion.— See the discussion in respect of the previous species.

Acknowledgements

We thank Dr. F. Ramil, Universidad de Vigo, Spain, and Mr M.S.S. Lavaleye, Texel, the Netherlands, for providing information and some samples of interesting additional material. Very helpful comments on the manuscript by Dr V. Häussermann and Dr. N. Sanamyan are gratefully acknowledged. The second author expresses gratitude to Wijnand Vlierhuis and Sylvia Hoyinck for help in locating *Urticina felina* in the type locality.

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Tien jaar nadien, nog steeds dankbaar Koos ontmoet te hebben.
R.A.

Received: 22.xii.2009
Accepted: 10.vii.2010
Edited: L.P. van Ofwegen