

Additional records of Actiniaria (Anthozoa) from Greece

Ch. Chintiroglou & J.C. den Hartog

Chintiroglou, Ch. & J.C. den Hartog. Additional records of Actiniaria (Anthozoa) from Greece. Zool. Med. Leiden 69 (27), 29.xii.1995: 353-364, figs 1-3, tabs 1-5.
Ch. Chintiroglou, Aristotle University of Thessaloniki, School of Biology, Department of Zoology, Box. 134, 54006 Thessaloniki, Macedonia, Greece
J. C. den Hartog, National Museum of Natural History, PO. Box 9517, 2300 RA Leiden, The Netherlands.

Key words: Actiniaria; new records; Greece; Ionian and Aegean Seas; eastern Mediterranean; nematocysts.

A small collection of four species of Actiniaria, partly representing new records for Greece and the eastern Mediterranean, is described and discussed. These four species are: *Bunodeopsis strumosa* Andres, 1881, *Edwardsia claparedii* (Panceri, 1869), *Actinia cari* delle Chiaje, 1825, and *Phymanthus pulcher* (Andres, 1883).

Introduction

Although sparse information on Actiniaria from Greece can be found scattered in the older literature (e.g. Spratt & Forbes, 1847: 122; Forbes, 1843: 152, 155; Goette, 1897: 292) knowledge of the actinian fauna of Greece strongly increased in recent years starting with the publication of Doumenc et al. (1985), which lists and describes 15 species from the northern Aegean Sea. Ever since, several more records were published, and the number of species recorded now amounts to 23 (Ates, 1990a, 1990b, 1992a, 1992b; Chintiroglou, 1992; Chintiroglou & Stefanidou, 1994; Doumenc et al., 1987; den Hartog, 1995; present publication) (see table 1).

The present paper deals with records of four species from the northern Aegean Sea and the island of Zakynthos (northern Ionian Sea), three of which were listed previously by Chintiroglou (1992), however without further documentation. These species are: *Bunodeopsis strumosa* Andres, 1881, *Edwardsia claparedii* (Panceri, 1869), *Actinia cari* delle Chiaje, 1825, and *Phymanthus pulcher* (Andres, 1883). All except *Actinia cari* are new records for Greece and the eastern Mediterranean. Another undocumented record listed by Chintiroglou (1992) as new to the Greek fauna, viz. *Paranemonia cinerea* (Contarini, 1844), proved to bear upon a misidentification; a careful examination of the poorly preserved material (2 specimens) showed it to belong to a small Aiptasiid anemone.

Table 1. Survey of the species of Actiniaria so far recorded from Greece, and the most important references.

Species	Reference(s)
<i>Bunodeopsis strumosa</i> Andres, 1881	Goette, 1897 (Ionian Sea, Corfu); Ates, 1992b (Ionian Sea, Lefkas); present paper (N Aegean)
<i>Aiptasia mutabilis</i> (Gravenhorst, 1831)	Doumenc et al., 1985 (Aegean)

<i>Aiptasiogeton comatus</i> (Andres, 1881) [= <i>A. pellucidus</i> (Hollard, 1848) sensu Manuel, 1981]	Doumenc et al., 1985 (Aegean)
<i>Sagartiogeton undatus</i> (O.F. Müller, 1788)	Doumenc et al., 1985 (Aegean)
<i>Cereus pedunculatus</i> (Pennant, 1777)	Goette, 1897 (Ionian Sea, Corfu); Doumenc et al., 1985 (Aegean)
<i>Telmatactis forskalii</i> (Ehrenberg, 1834)	Doumenc et al., 1985 (Aegean); Ates, 1990a (Aegean and Ionian coasts); den Hartog, 1995 (Samos, Aegean)
<i>Telmatactis solidago</i> (Duchassaing & Michelotti, 1864)	Den Hartog, 1995 (Rhodos)
<i>Telmatactis cricoides</i> (Duchassaing, 1850)	Ates, 1990 (Ionian coast); den Hartog, 1995 (N Crete)
<i>Actinauge richardi</i> (Marion, 1882)	Doumenc et al., 1985 (Aegean)
<i>Hormathia coronata</i> (Gosse, 1858)	Doumenc et al., 1985 (Aegean)
<i>Calliactis parasitica</i> (Couch, 1842)	Doumenc et al., 1985 (Aegean)
<i>Adamsia palliata</i> (O.F. Müller, 1788)	Doumenc et al., 1985 (Aegean)
<i>Mesacmaea mitchellii</i> (Gosse, 1853)	Doumenc et al., 1985 (Aegean)
<i>Andresia parthenopea</i> (Andres, 1883)	Doumenc et al., 1985 (Aegean)
<i>Actinia equina mediterranea</i> form I (oviparous) and form II (viviparous) Schmidt, 1971	Doumenc et al., 1985 (Aegean)
<i>Actinia striata</i> Rizzi, 1907	Chintiroglou, 1992 (undocumented); Chintiroglou & Stefanidou, 1994
<i>Actinia cari</i> delle Chiaje, 1825	Ates, 1990b (Ionian coast; Gulf of Corinthe; Evvias, Aegean Sea); present paper (Ionian Sea, Zakynthos)
<i>Paranemonia vouliagmenensis</i> Doumenc et al., 1987	Doumenc et al., 1987 (Vouliagmeni Lake at the Saronikos Gulf); Ates, 1992a (idem)
<i>Anemonia viridis</i> (Forskål, 1775) [= <i>A. sulcata</i> (Pennant, 1777)]	Doumenc et al., 1985 (Aegean)
<i>Condylactis aurantiaca</i> (delle Chiaje, 1825)	Goette, 1897 (Ionian Sea, Korfu); Doumenc et al., 1985 (Aegean)
<i>Bunodactis verrucosa</i> (Pennant, 1777)	Doumenc et al., 1985 (Aegean)
<i>Phymanthus pulcher</i> (Andres, 1883)	Chintiroglou, 1992 (undocumented); present paper (N Aegean).
<i>Edwardsia claparedii</i> (Panceri, 1869)	Chintiroglou, 1992 (undocumented); present paper (N Aegean)
Not <i>Paranemonia cinerea</i> (Contarini, 1844)	Chintiroglou, 1992 (undocumented mis- identification; see introduction)

Methods and material

Samples were collected in the northern Aegean sea and in the island of Zakynthos in the Ionian Sea at depths varying from 0 to 40 m using Van Veen grabs and Charcot-Picard dredges, and by SCUBA diving. In addition soft bottoms were sampled with a corer to study the granulometric composition (cf. Buchanan, 1971). Sampling stations which yielded Actiniaria are indicated in fig. 1. All samples were preserved in 5% formalin/sea-water. Paraffin sections, 8 µm thick and stained with hematoxylin and eosin, were prepared for histological study. Measurements of cnidae were taken from undischarged capsules in squash preparations. As a compromise between the authors the nematocyst classification follows both Weill (1934) [as modified by Carlgren (1940: 4)] and Schmidt (1969, 1972) [terminology as used by Stephenson (1928: 62-63) and den Hartog (1980: 7-8; 1995: 156)].

Abbreviations: MZDAUT = Museum of the Department of Zoology, Aristotle University, Thessaloniki; RMNH = Rijksmuseum van Natuurlijke Historie (at present Nationaal Natuurhistorisch Museum, NNM), Leiden, The Netherlands.

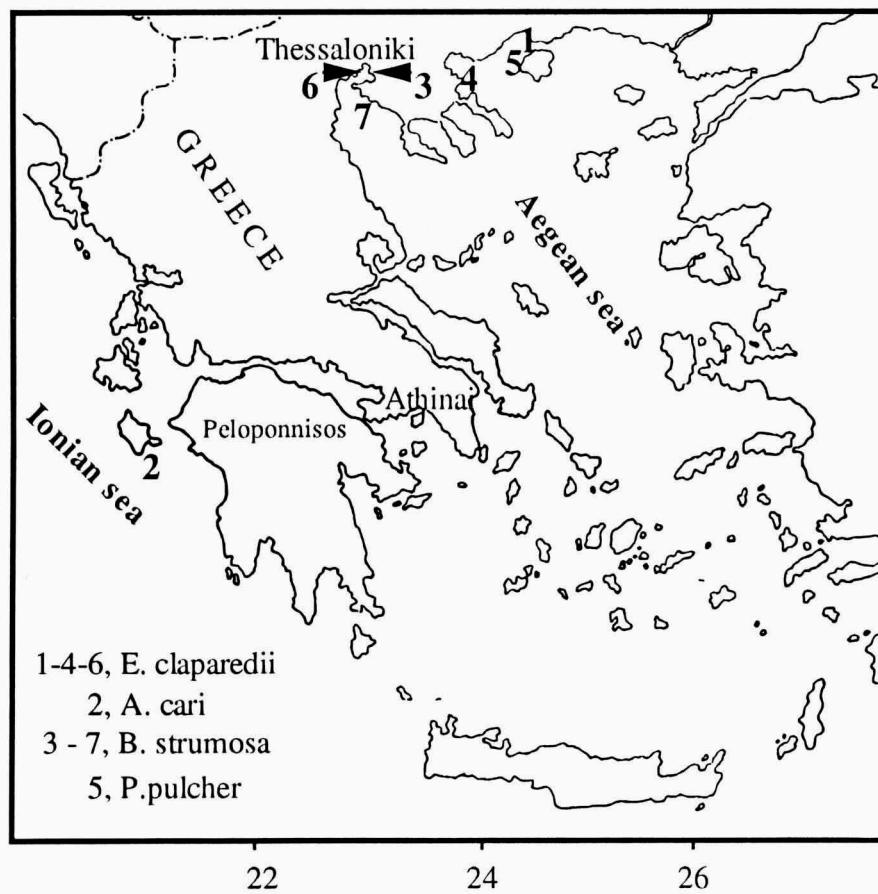


Fig. 1. Map indicating the sampling stations where the material of the present study was collected.
1, 5 = Gulf of Kavala; 2 = Zakynthos; 3, 6 = Gulf of Thessaloniki; 4 = Gulf of Strimonikos; 7 = Gulf of Thermaikos.

Notes on the species

Boloceroididae Carlgren, 1924

Bunodeopsis strumosa Andres, 1881

Tetractis jonica Goette, 1897: 292, 350 (footnote), pl. 19 figs 80-82 (Korfu).

Tetractis janthina; Schmidt, 1972: 12, 14 (misspelling of *T. jonica* Goette).

Bunodeopsis strumosa Andres, 1881: 315; Andres 1883: 444-445 [236-237] pls 6 fig. 1, 13 fig. 5; Andres, 1884: 227-228 pls 6 fig. 1, 13 fig. 5; Carus, 1885: 68-69; Carlgren 1940: 29-30, fig. 7.5-7.8; Carlgren, 1949: 41; Pérès & Picard, 1964: 55; Pérès, 1967: 486; Schmidt, 1972: 12-14, figs 11, 13b).

Material.— MZDAUT B 460c (Gulf of Thermaikos, 1.5-2 m, 15.vii.1986, leg. Ch. Chintiroglou; 45 specimens); RMNH Coel. 19697 (same data; 9 specimens).

Morphology.— Base 2 to 4 mm and oral disc ca 1.5 to 4.0 mm in diameter. Height of column ca 1-3 mm. Number of tentacles 12 to 28, ca 2-5 mm long, exceeding height of column. Lower part of column with simple spheroidal or compound vesicles, sessile or stalked and containing microbasic amastigophores (penicilli C). Sphincter absent. No distinct siphonoglyphs.

Colour.— In formalin/sea-water semi-transparent to beige. Vesicles generally translucent.

Cnidom.— See table 2. The cnidom of the present specimens is in general agreement with that given by Schmidt (1972: 13) for specimens from Banyuls and Naples. However, in all body parts of the Greek specimens we found an additional size-class of very small microbasic p-mastigophores/penicilli B2, presumably overlooked by Schmidt.

Table 2. *Bunodeopsis strumosa*, survey of the cnidom based on samples from the Gulf of Thermaikos (MZDAUT B 460c and RMNH Coel. 19697).

Body part	Nematocyst type	Mean, SD, and range (in parentheses) of length and width of nematocyst capsules in µm	N
1. Scapus & vesicles	Basitrichs/Spirulae	12.1 ± 1.1 (10.7 - 14.2 × 1.8 - 2.2)	11
	Micr. p-mast./Penicilli B2	9.2 ± 0.7 (8.1 - 9.8 × 2.2 - 2.7)	14
	Micr. p-mast./Penicilli B2	23.1 ± 2.5 (18.0 - 27.0 × 3.0 - 4.0)	30
	Micr. amast./Penicilli C	40.7 ± 2.6 (30.9 - 44.9 × 5.5 - 7.5)	55
2. Tentacles	Spirocysts	24.3 ± 3.9 (18.5 - 30.5 × 3.5 - 6.0)	20
	Basitrich/Spirulae	10.7 ± 1.2 (9.0 - 14.0 × 1.5 - 2.2)	20
	Micr. p-mast./Penicilli B2	10.3 ± 1.5 (8.5 - 15.5 × 2.0 - 2.7)	23
	Micr. p-mast./Penicilli B2	32.4 ± 2.4 (29.0 - 39.0 × 3.5 - 4.0)	20
	Micr. amast./Penicilli C	37.4 ± 2.4 (31.0 - 40.5 × 5.5 - 7.0)	20
3. Pharynx	Micr. p-mast./penicilli B2	10.0 ± 0.8 (8.9 - 11.6 × 2.0 - 2.7)	10
	Micr. p-mast./penicilli B2	23.5 ± 2.2 (18.7 - 26.7 × 3.6 - 4.5)	20
4. Filaments	Basitrichs/Spirulae	9.2 ± 0.5 (8.5 - 9.8 × 1.6 - 1.8)	10
	Micr. p-mast./Penicilli B1	6.2 ± 0.4 (5.3 - 7.1 × 2.7 - 3.6)	15
	Micr. p-mast./Penicilli B2	9.6 ± 0.6 (8.5 - 10.7 × 2.2 - 2.7)	20
	Micr. p-mast./Penicilli B2	24.1 ± 1.8 (22.0 - 28.0 × 3.0 - 5.5)	30

Distribution.— So far, *Bunodeopsis strumosa* had been reported only from the western Mediterranean (Naples, Banyuls, Adriatic Sea, Korfu) (see the above references). Recently it was also found in Lefkas island (Ionian Sea) (Ates, 1992b: 33-34), and it is here reported for the first time from the Aegean and the eastern Mediterranean.

Remarks.— *Bunodeopsis strumosa* is a characteristic member of euryhaline and eurythermal biocoenoses in brackish waters and the biocoenosis of the superficial

muddy sands in sheltered areas, often occurring attached to algae or the leaves of *Zostera* and *Cymodocea* (e.g. Pérès, 1967: 486; Schmidt, 1972: 13). An interesting point concerns the behaviour of the species at low temperatures. When the temperature drops below 10°C, these little anemones retract into the substratum in order to avoid the adverse conditions (Schmidt, 1972). In the Gulf of Thermaikos the species was found in *Zostera* beds at a depth of 1.5 to 2.0 m. In addition the species was found at 2.5 m depth on hard substrata of the semi-polluted areas of the Gulf of Thessaloniki (personal observation Ch. Chintiroglou; no reference material collected). In both situations the populations were quite dense.

A specimen of lot RMNH Coel. 19697 that was dissected to study the cnidom of the internal organs contained a single, well preserved, as yet unidentified copepod (Harpacticoida), possibly a commensal or parasite.

Edwardsiidae Andres, 1880
Edwardsia claparedii (Panceri 1869)
 (fig. 2)

Halcampa claparedii Panceri 1869: 6.

Edwardsia Claparedii; Andres, 1880: 221-236, pl. 1 [1881:123-142, pl. 8]; Andres, 1883 (pro parte): 303-305 [95-96], pl. 11 figs 2-3; Andres, 1884 (pro parte): 90-92, pl. 11 figs 2-3.

Edwardsia claparedii; Manuel 1981b/1988: 198-199, fig. 71; Chintiroglou, 1992: 33 (undocumented Greek records).

Edwardsia callimorpha; Carlgren & Stephenson, 1928: 20-23, figs 6-10; Stephenson 1928: figs 7c, 8b, 15, 21a, 23, 33a, 45b, c, pl. 1, pl. 2 fig. 2, pl. 4 fig. 3; Stephenson 1935: 53-63, figs 49, 50, 52, pl. 15.6; Carlgren 1949: 23.

Not *Scolanthus callimorphus* Gosse, 1853: 157, pl. 10; Gosse, 1860: 255-258, pl. 7 fig. 7. (see Manuel, 1981a).

Material.— MZDAUT B 460a (Gulf of Thessaloniki, 20 m, 11.x.1976, leg. Ch. Chintiroglou; 5 specimens); RMNH 19696 (same data; 2 specimens); MZDAUT 461 (Gulf of Kavala, 22 m, 24.ix.1976, leg. Ch. Chintiroglou; 3 specimens); MZDAUT B 462 (Gulf of Strimonikos, 27 m, 4.ii.1977, leg. Ch. Chintiroglou; 2 specimens).

Morphology (fig. 2).— Length of contracted specimens ranging from 5.6 to 26 mm (mean 16.2 mm).

Column differentiated into physa, scapus and scapulus. Scapus with nemathybomes and periderm. Nemathybomes arranged in 8 longitudinal rows, containing two types of nematocysts (see table 2). Physa naked, without cinclides.

Anatomy.— There are 8 macrocnemes provided with gonads, and in addition 4 inconspicuous microcnemes in the distalmost part of the body, so that there are 2 pairs of macrocnemes and 4 pairs of mesenteries made up of one macrocneme and one microcneme each.

Colour.— Specimens preserved in formalin are brown to rusty red with pale tentacles.

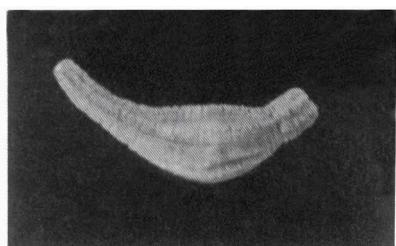


Fig. 2. *Edwardsia claparedii*, preserved specimen from the Gulf of Thessaloniki (MZDAUT B 460 a). Ca × 2.

Cnidom.— See table 3. The cnidom of the Greek specimens is in general agreement with that of specimens from e.g. the northern Adriatic Sea and south-west England (den Hartog, unpublished). It is interesting to note that a distinct V-shaped notch was observed in the undischarged shaft of part of the large b-mastigophores/spirulae of the filaments of the RMNH specimen, so that, according to the classification of Schmidt (1969), these cnidae should possibly be referred to as penicilli B1. A more detailed study of these cnidae is desirable.

Table 3. *Edwardsia claparedii*, survey of the cnidom based on samples from the Gulf of Thessaloniki (MZDAUT B 460a and RMNH Coel. 1969).

Body part	Nematocyst type	Mean, SD, and range (in parentheses) of length and width of nematocyst capsules in μm	N
1. Scapus	Micr. b-mast./Spirulae	$15.1 \pm 1.2 (11.5 - 18.5 \times 2.3 - 3.7)$	30
2. Tentacles	Spirocysts	$20.2 \pm 2.5 (15.2 - 27.0 \times 2.8 - 5.0)$	62
	Basitrichs/Spirulae	$26.2 \pm 2.9 (20.0 - 31.2 \times 2.0 - 3.6)$	62
3. Nemathombes	Pterotrichs	$151.7 \pm 16.6 (125.0 - 193.2 \times 5.0 - 9.3)$	96
	Micr. t-mast.	$87.9 \pm 8.0 (82.5 - 102.0 \times 2.5 - 5.1)$	78
4. Pharynx	Basitrichs/Spirulae	$17.5 \pm 1.5 (15.1 - 20.5 \times 2.4 - 3.1)$	20
	Basitrichs/Spirulae	$29.9 \pm 3.2 (24.0 - 35.6 \times 2.7 - 3.6)$	20
	Micr. p-mast./Penicilli A	$28.5 \pm 2.1 (23.1 - 31.2 \times 6.2 - 8.0)$	20
5. Filaments	Basitrichs/Spirulae	$20.1 \pm 2.9 (16.0 - 24.9 \times 2.7 - 3.1)$	20
	Micr. b-mast./Spirulae [Penicilli B1?]	$34.2 \pm 2.1 (32.0 - 38.3 \times 4.9 - 5.8)$	20
	Micr. p-mast./Penicilli A	$26.1 \pm 1.3 (24.0 - 28.5 \times 5.8 - 7.1)$	20

Habitat.— *Edwardsia claparedii* is found in the infralittoral zone, usually in muddy bottoms, often in *Zostera* beds (e.g. Panceri, 1869: 6; Stephenson, 1935: 63; Manuel, 1981/1988: 198). According to Picard (1965: 147) the species occurs in the biocoenosis of muddy detritic substratum up to a depth of 75 m. Recently, Morri et al. (1991: 38) noted its presence in similar substratum at 92 m depth. The present specimens from the northern Aegean were collected in depths between 20 and 27 m in muddy substrata consisting of particles smaller than 50 μm . Similar conditions were reported by Rawlinson (1935: 141) for *Edwardsia callianthus* Rawlinson, 1935, and by Ellehaug (1978: 18) for *Edwardsia longicornis* Carlgren, 1921, and *E. danica* Carlgren, 1921.

Distribution.— Frequent on the coast of Britain, where it has been reported to occur in large numbers at some off-shore localities. Also recorded from northern France, the western Mediterranean and the Adriatic Sea (e.g. Stephenson, 1935: 63; Pax & Müller, 1962: 145; Manuel, 1981b/1988: 198). Its presence in the Aegean Sea and the eastern Mediterranean is here recorded for the first time.

Remarks.— On the basis of external morphology the species may be confused with *Scolanthus callimorphus* Gosse, 1853 (see Manuel, 1981a). However, the two spe-

cies are easily distinguished on the basis of their cnidom, notably as concerns the nematocysts present in the nemathybomes. In *Edwardsia clavaredii* the nemathybomes contain two types of nematocysts (cf. table 1), for which England (1987: 219-221) proposed the names pterotrich and microbasic t-mastigophore, whereas those of *Scolanthus callimorphus* contain only a single type (cf. Manuel, 1981b/1988: 198, 204).

Actiniidae Goldfuss, 1820
Actinia cari delle Chiaje, 1825
 (fig. 3)

Actinia cari delle Chiaje, 1825: 233, 243, pl. 17; delle Chiaje, 1841: 126.

Actinia cari; Andres 1883: 402-403 [194-195], pl. 1 figs 1, 5-6; Andres, 1884: 187-188, pl. 1 figs 1, 5-6; Carlgren 1949: 49; Pax & Müller 1962: 165-167, fig. 85; Schmidt 1972: 67-68, fig. 27b; Ates, 1990b: 37, fig.; Chintiroglou, 1992: 33 (undocumented Greek record).

Actinia concentrica Riso, 1826: 286, fig. 33.

Not *Actinia virgata* Johnson, 1861: 301-302; Andres, 1883: 402 [194]; Andres, 1884: 187; Schmidt, 1972: 68.

Material.— MZDAUT B 460 b (Zakinthos, E coast, 0.5-1 m, 24.viii.1992, leg. Ch. Chintiroglou; 7 specimens); RMNH Coel. 19698 (same data; 2 specimens).

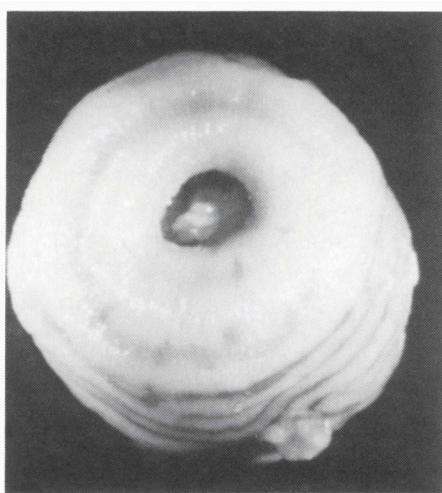


Fig. 3. *Actinia cari*, preserved specimen from Zakynthos (MZDAUT B 460 b). Ca × 3.

Morphology.— Diameter of base ranging from 3.0 to 17 mm (i.e. quite small in comparison with those reported by Schmidt, 1972: 67). Column low, smooth and cylindrical ca 2-6 mm in the contracted specimens. A ring of simple acrorhagi present in the fosse of all specimens. Tentacles readily retracted, 96 in number in the largest specimens, hexamerously arranged.

Anatomy.— Number of mesenteric cycles in the largest specimens 5, of which 3 perfect and 2 imperfect.

Colour.— Usually the anemones are brown or green with small amounts of light brown, and are invariably marked by dark concentric lines or bars. The base is green, with its limbus marked by narrow blue line. Acrorhagi blue.

Cnidom.— See table 4. The data here presented are rather well in agreement with those of Schmidt (1972: 68) based on Adriatic specimens. However, unlike Schmidt, we noticed the presence of atrichs/homotrachs in the column, but only close to the limbus. Hence, Schmidt may have overlooked these cnidae.

Table 4. *Actinia cari*, survey of the cnidom based on samples from Zakynthos (MZDAUT B 460b and RMNH Coel. 19698).

Body part	Nematocyst type	Mean, SD, and range (in parentheses) of length and width of nematocyst capsules in µm	N
1. Column	Atrich/Homotrich	18.2 ± 2.2 (15.1 - 21.4 × 3.3 - 4.5)	20
	Micr. b-mast./Spirulae	17.9 ± 1.1 (16.0 - 20.0 × 2.0 - 3.0)	31
2. Acrorhagi	Atrichs/Homotrichs	53.1 ± 4.3 (45.5 - 61.0 × 3.5 - 5.5)	46
3. Tentacles	Spirocysts	21.3 ± 1.6 (18.0 - 25.0 × 2.0 - 3.0)	25
	Basitrichs/Spirulae	18.2 ± 1.2 (15.5 - 20.0 × 2.0 - 2.5)	20
4. Pharynx	Micr. b-mast./Spirulae	21.7 ± 2.3 (17.0 - 26.0 × 2.0 - 3.0)	31
5. Filaments	Basitrichs/Spirulae	12.4 ± 1.5 (10.5 - 16.0 × 1.5 - 2.5)	20
	Micr. b-mast./Spirulae	26.1 ± 1.4 (25.5 - 30.5 × 3.0 - 5.0)	20
	Micr. p-mast./Penicilli A	20.3 ± 2.5 (18.0 - 25.5 × 3.5 - 5.0)	22

Discussion and Remarks.— *Actinia cari* is usually found in the shallow infralittoral as a member of the biocoenosis of photophytic algae, often attached to bare stones and rocks (cf. Pax & Müller 1962: 166; Schmidt, 1972: 68). However, it may occur to a depth of at least 20 m, as demonstrated by a specimen found in the Adriatic Sea, attached to the stalk of a colony of *Alcyonium palmatum adriaticum* (Kükenthal, 1906) (cf. Pax & Müller, 1962: 273 fig. 146).

The present specimens from Zakynthos were all found on hard substratum in shallow water up to about 1 m depth, generally solitary. Only in one case two individuals were found on the same stone. Other invertebrates found in the same biocoenosis were e.g. *Ophiothrix fragilis* (Abildgaard, 1789), *Diogenes pugilator* (Roux, 1829), *Clibanarius erythropus* (Latrelle, 1818), *Haliotis* spec., *Amphitrite* spec., and *Acanthochiton* spec.

Distribution.— *Actinia cari* is a Mediterranean endemic, and is generally considered a rare species (Riedl, 1963: 159; Schmidt, 1972: 68). It has been reported from the Gulf of Naples by Andres (1883: 402 [194]), but Schmidt (1972: 68) failed to find it there in the 1970s and suggested a decline of the species in the western Mediterranean. Most records are from the Adriatic Sea (Carus, 1885: 67; Pax & Müller, 1953: 24-25; 1962: 166; Simunovic, 1970: 28; Schmidt, 1972: 68). The species was recently reported for the first time from the Aegean Sea (Evian Island) by Ates (1990b: 37), and the present record from Zakynthos is the first for western Greece.

Remarks.— Schmidt's suggestion that the species has also been reported from Madeira as *Actinia virgata* Johnson, 1861 (: 301-302) is wrong: *Actinia virgata* definitely is specifically different (den Hartog, personal observations). It is clear from Schmidt's statement "Johnson beschreibt zahlreiche Querlinien von der gleichen Farbe wie der Limbus 'purlish [sic] blue' und blaue Acrorhagen", that he misread Johnson's description, for the latter does not mention transverse lines, but longitudinal lines "which extend from the margin of the disk to the angle of the column and the base

[the limbus], where there is a circumferent line of the same colour".

A record of *Actinia cari* from the W coast of Norway at ca 63°N by Pax & Müller (1962: 167) can be done with as extremely unlikely.

Phymantidae Andres, 1883
***Phymanthus pulcher* (Andres, 1883)**

Ragactis pulchra Andres, 1883: 467-468 [259-260], pl. 13 figs 1-2; Andres, 1884: 251 pl. 13 figs 1-2; Pax & Müller, 1962: 62, 180-182, figs 12, 91.

Phymanthus pulchra; Carlgren, 1949: 75.

Phymanthus pulcher; Schmidt, 1972: 94-97, figs 34d, 36.

Material.—MZDAUT B 460d (Gulf of Kavala, 22 m, biogenic debris, 25.vii.1991, leg. Ch. Chintiroglou; 1 specimen; 6 histological slides of single specimen, rest of the material mislaid); RMNH Coel. 19699 (same data; 5 histological slides).

Morphology.— Base 25 mm in diameter. Column semi-contracted, cylindrical, height ca 52 mm. Upper part of column with adhesive verrucae. Oral disc of about the same diameter as the base. Tentacles 96, occupying outer $\frac{2}{3}$ of disc, ca 6 to 7 mm long, with well developed lateral protuberances.

Anatomy.— Sphincter absent. Circular muscle layer distinct. Retractor muscles diffuse, strong. Parietobasilar muscles distinct, forming a free flap.

Colour.— Oral disc and tentacles green; base of tentacles grey. Column orange and yellow with yellowish white verrucae.

Cnidom.— See table 5. Schmidt (1972: 95) found rather large isolated "p-rhabdoids A" (= microbasic amastigophores/penicilli A) in the column of three out of five specimens he examined. This nematocyst type was neither found in the column of the present specimen from Greece, nor in its actinopharynx. A few spirocysts found in the actinopharynx possibly represent contaminations from the tentacles.

Table 5. *Phymanthus pulcher*, survey of the cnidom based on the single specimen (now mislaid) from the Gulf of Kavala (MZDAUT B 460d).

Body part	Nematocyst type	Mean, SD, and range (in parentheses) of length and width of nematocyst capsules in µm	N
1. Column	Basitrichs/Spirulae	18.3 ± 3.4 (10.4 - 20.8 × 1.3 - 2.6)	52
2. Tentacles	Spirocysts	26.3 ± 5.5 (16.9 - 33.8 × 2.0 - 3.9)	32
	Basitrichs/Spirulae	24.3 ± 1.4 (20.8 - 27.3 × 2.5 - 2.6)	42
3. Pharynx	Spirocysts	27.1 ± 1.9 (24.7 - 29.9 × 2.0 - 3.3)	6
	Basitrichs/Spirulae	25.6 ± 1.6 (20.8 - 29.3 × 2.0 - 2.6)	46
4. Filaments	Basitrichs/Spirulae	16.2 ± 2.9 (11.7 - 20.8 × 1.3 - 2.6)	33
	Micr. b-mast./Spirulae	40.1 ± 3.6 (32.5 - 50.7 × 3.6 - 5.8)	34
	Micr. p-mast./Penicilli A	26.8 ± 4.9 (18.2 - 35.1 × 2.6 - 5.2)	20

Habitat.— According to Schmidt (1972: 95-96) *Phymanthus pulcher* is a typical representative of biogenic substrata, but it is also present in coralligenous biocoenosis and in *Posidonia* meadows. Fedra (1978: 78), notes that the species is the main inhabitant of the *Ophiothrix* populations in the Gulf of Triest, but that it is also found with *Cerianthus membranaceus*. The general depth range of the species lies between 15 and 70 m (e.g. Pax & Müller, 1962: 181; Schmidt, 1972: 94).

Distribution.— The species is generally regarded a Mediterranean endemic, so far exclusively known from the western Mediterranean and the Adriatic Sea (cf. Pax & Müller, 1962: 180; Schmidt 1972: 96). The present record is the first for the Aegean Sea and the eastern Mediterranean.

Remarks.— Originally accommodated in the genus *Ragactis* Andres, 1883 (: 457 [259]), the present species is currently included in the genus *Phymanthus* Milne-Edwards, 1857. However, it may in fact be more closely related to the tropical Indo-Pacific genus *Heteractis* Milne-Edwards & Haime, 1851, notably to its type species *H. aurora* (Quoy & Gaimard, 1833). This was already suggested by McMurrich (1896: 185) (See also Haddon, 1898: 444), and a comparative study of these two species is therefore desirable.

References

- Andres, A., 1880. Intorno all'*Edwardsia claparedii* (*Halcampia claparedii* Panc.).— Atti Accad. naz. Lincei Memorie 5: 221-236, pl. 1. [Idem, 1881.— Mitt. zool. Stn Neapel 2: 123-142, pl. 8].
- Andres, A., 1881. Prodromus neapolitanae actiniarum faunae addito generalis actiniarum bibliographiae catalogo.— Mitt. zool. Stn Neapel 2: 305-371.
- Andres, A., 1883. Le attinie.— Atti Accad. naz. Lincei, Memorie (3) 14: i-xi, 211-673 [separate reprint: i-xi, 1-460], figs 1-78, pls 1-13. [Second edition, 1884.— Fauna Flora Golf Neapel, monogr. 9: 1-459, figs 1-78, pls 1-13].
- Ates, R., 1990a. Nicht selten, aber kaum bekannt: *Telmatactis* aus dem Mittelmeer.— DATZ 43 (2): 89-92, figs 1-6.
- Ates, R., 1990b. Pferde-Aktinien. Arten und Verbreitung.— Das Aquarium 254: 35-38, 5 figs.
- Ates, R., 1992a. Europäische Seeanemonen auf Algen und Seegras 1: Verbreitung und Systematik.— Das Aquarium 272: 30-31, 2 figs.
- Ates, R., 1992b. Europäische Seeanemonen auf Algen und Seegras 2: Arten und ihre Verbreitung.— Das Aquarium 274: 32-35, 6 figs.
- Buchanan, J.B., 1971. Measurements of the physical and chemical environment. Sediments. In: N.A. Holme & A.D. McIntyre (eds). Methods for the study of marine benthos.— I.B.P. Handbook, no 16, Oxford: 30-52, figs 1-6.
- Carlgren, O., 1940. A contribution to the knowledge of the structure and distribution of the cnidae in the Anthozoa.— Act. Univ. lund. (new ser.) 36 (3): 1-62, figs 1-16.
- Carlgren, O., 1949. A survey of the Ptychodactaria, Corallimorpharia and Actiniaria.— K. svenska Vetensk. Akad. Handl. 1: 1-121.
- Carlgren, O. & T.A. Stephenson, 1928. The British Edwardsiidae.— J. mar. Biol. Ass. U.K. 15: 1-31, figs 1-18.
- Carus, J., 1885. Prodromus Faunae Mediterraneae 1: i-xi, 1-525.— Stuttgart.
- Chiaje, S. delle, 1825. Memorie su la storia e la notomia degli Animali senza vertebre del Regni di Napoli (4 vols + atlas, 1823-25-28-29).— Napoli. [Not seen].
- Chiaje, S. delle, 1841. descrizione e notomia degli animali invertebrati delle Due Sicilie (5 vols).— Napoli. [Not seen].
- Chintiroglou, C., 1992. Note sur les Actinies de la Méditerranée (données préliminaires).— Rapp. Comm. int. Mer Médit 33: 33.

- Chintiroglou, C. & D. Stefanidou, 1994. Note on the sea-anemone *Actinia striata* (Rizzi, 1907) (Anthozoa, Cnidaria): taxonomy, habitat, distribution.— Bios (Macedonia, Greece) 2: 3-9, fig. 1.
- Doumenc, D., Ch. Chintiroglou & A. Koukouras, 1985. Actinies de la mer Egée: méthodes d' identification, zoogéographie.— Bull. Mus. natn. Hist. nat., Paris, 4^e sér., 7, section A (3): 497-529, figs 1-4.
- Doumenc, D., K.W. England & C. Chintiroglou, 1987. A new species of sea-anemone in the genus *Paranemonia* Carlgren (Anthozoa, Actiniaria) from the Aegean Sea.— Zoologica Scripta 16 (4): 271-275, figs 1-3.
- Ellehauge, O.J., 1978. On the ecology of *Edwardsia longicornis* and *E. danica* (Anthozoa, Actiniaria).— Biokon Rep. 7: 13-40, figs 1-10.
- England, K.W., 1987. Certain Actiniaria (Cnidaria, Anthozoa) from the Red Sea and tropical Indo-Pacific Ocean.— Bull. Br. Mus. nat. Hist. (Zool.) 53: 205-292, figs 1-43.
- Forbes, E., 1843. Report on the Mollusca and Radiata of the Aegean Sea and on their distribution, considered as bearing on Geology.— Rep. brit. Assoc. Adv. Sci. 13: 130-193.
- Fedra, K., 1978. On the ecology of North Adriatic Sea. Wide range investigations on the benthos: The Gulf of Triest. — Memorie Biogeogr. adriat., suppl. vol. 9: 69-87, 14 figs.
- Goette, A., 1897. Einiges über die Entwicklung der Scyphopolypen.— Z. wiss. Zool. 63: 292-378, figs 1-21, pls 16-19.
- Gosse, P.H., 1853. Notes on some new or little known marine animals (no 2).— Ann. Mag. nat. Hist. London (ser. 2) 12 (69): 153-159, pl. 10.
- Gosse, P.H., 1860. Actinologica Britannica: A history of the British sea anemones and corals: i-xl, 1-362, figs, pls 1-12.— van Voorst, London.
- Haddon, A.C., 1898. The Actiniaria of Torres Straits.— Trans. Roy. Dublin Soc. N.S. 6 (16): 393-520, 2 text figs, pls 22-32.
- Hartog, J.C. den, 1980. Caribbean shallow water Corallimorpharia.— Zool. Verh. Leiden 176: 1-83, figs 1-20, pls 1-14.
- Hartog, J.C. den, 1995. The genus *Telmatactis* Gravier, 1916 (Actiniaria: Acontiarida: Isophelliidae) in Greece and the eastern Mediterranean.— Zool. Med. Leiden 69 (14): 153-176, figs 1-8.
- Johnson, J.Y., 1861. Notes on the sea anemones of Madeira, with descriptions of new species.— Proc. zool. Soc. London (1861): 298-306, figs 1-4.
- Manuel, R.A., 1981a. On the identity of the sea anemone *Scolanthus callimorphus* Gosse, 1853 (Actiniaria: Edwardsiidae).— J. nat. Hist. 15: 265-276, figs. 1-2.
- Manuel, R.A., 1981b. British Anthozoa. Synopses of the British fauna no. 18: 1-241, figs 1-83, pls 1-2. [- Revised edition, 1988: i-vii, 1-241, figs 1-83, pls 1-2].— Academic Press, London.
- McMurrich, J.P., 1896. Notes on some actinians from the Bahama Islands, collected by the late Dr. J.I. Northrop.— Ann. N.Y. Acad. Sci. 9 (13): 181-194, pl. 17.
- Morri, C., G. Bavestrello & C.N. Bianchi, 1991. Faunal and ecological notes on some benthic cnidarian species from the Tuscan Archipelago and eastern Ligurian Sea (western Mediterranean).— Boll. Mus. Ist. biol. Univ. Genova 54/55: 27-47, figs 1-2.
- Panceri, P., 1869. Intomo a due nuovi polipi *Cladactis costa* ed *Halcampula clavipinnis*.— Atti Accad. Napoli 4 (11): 1-9, 1 pl..
- Pax, F. & I. Müller, 1953. Die Anthozoenfauna der Bucht von Kastela bei Split.— Acta Adriatica 5 (1): 3-35, figs 1-4.
- Pax, F. & I. Müller, 1962. Die Anthozoenfauna der Adria.— Fauna Flora Adriatica 3: 1-343, figs 1-214.
- Pérès, J.M., 1967. The mediterranean benthos.— Oceanogr. mar. biol. Ann. rev. 5: 449-533, figs 1-11.
- Pérès, J.M. & J. Picard, 1964. Nouveau manuel de bionomie benthique de la mer Méditerranée.— Rec. Trav. Stat. Mar. Endoume, 31 (47): 1-137.
- Picard, J., 1965. Recherches qualitatives sur les biocoénoses marines des substrats meubles dragables de la région Marseillaise.— Rec. Trav. Stat. Mar. Endoume 52: 1-160.
- Rawlinson, R., 1935. *Edwardsia callianthus* sp. nov., A new British species from Menai Straits.— J. mar. biol. Ass. U.K. 20: 129-146.
- Riedl, R., 1963. Fauna und Flora der Adria: 1-640, numerous figs and pls.— P. Parey, Hamburg, Berlin.

- Risso, A., 1826. Histoire naturelle des principales productions de l'Europe Méridionale et particulièrement de celles des environs de Nice et des Alpes Maritimes 5: i-viii, 1-403, figs 1-62.
- Schmidt, H., 1969. Die Nesselkapseln der Aktinien und ihre differentialdiagnostische Bedeutung.— Helgoländer wiss. Meeresunters. 19: 284-317, figs 1-11.
- Schmidt, H., 1972. Prodromus zur einer Monographie der Mediterranen Aktinien.— Zoologica Stuttgart 42 (2) 121: 1-146, figs 1-36.
- Simunovic, A., 1970. Recherches écologiques sur les peuplements faunistiques de l'étage supralittoral des côtes rocheuses de l' Adriatique moyenne.— Acta Adriatica 14 (2): 3-39, figs 1-12.
- Spratt, R.N., & E. Forbes, 1847. Travels in Lycia, Mylias, and the Cibyratis, in company with the late Rev. E.T. Daniell, vol. II: 1-332, figs 1-11.— Van Voorst, London.
- Stephenson, T.A., 1928. The British Sea Anemones 1.— Ray Society Publ. 113: 1-148, figs 1-41, pls 1-14.
- Stephenson, T.A., 1935. The British Sea Anemones 2.— Ray Society Publ. 121: 1-426, pls 15-33, figs 42-107, pls 15-23.
- Weill, R., 1934. Contributions à l'étude des cnidaires et de leurs nématocystes. 1. Recherches sur les nématocystes. 2. Valeur taxonomique du cnidom.— Trav. Stn zool. Wimereux 10, 11: 1-701, figs 1-428.

Received: 12.iv.1995

Accepted: 12.x.1995, after revision

Edited: L.P. van Ofwegen