

**A survey on Anthozoa and its habitats  
along the Northwest African coast and some islands:  
new records, descriptions of new taxa and biogeographical,  
ecological and taxonomical comments. Part I.**

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## RESUMEN

Varias especies de Actiniarios y Escleractinias han sido recolectadas y estudiadas a lo largo de la costa noroeste africana y algunos de sus archipiélagos. Esta es la primera parte de un artículo más extenso que está centrado en Marruecos y Cabo Verde pero que también incluye información de otras zonas geográficas (Islas Canarias, Madeira, Gabón y Mauritania). La segunda parte incluirá bastante material del Golfo de Guinea. Cuatro nuevas especies y un nuevo género son descritos además de cinco nuevos registros de especies para la región estudiada. *Bellactis caeruleus*, *Tubastrea caboverdiana*, *Thalamophyllia wirtzi* y *Africana wirtzi* son las cuatro especies y el nuevo género descrito para la ciencia. Se han completado algunas descripciones de especies que de una forma y otra no estaban bien estudiadas.

**Palabras clave:** Antozoos, Actiniarios, Escleractinias, género nuevo, especies nuevas, Óceano Atlántico, costa noroeste de África e islas.

## ABSTRACT

Several species of Actiniaria and Scleractinia have been searched and collected along the Western African coast and some of its archipelagos. This paper constitutes the first part of an extensive paper and it is focused on Morocco and Cape Verde, although some material and images from other spots (Canary Islands, Madeira, Gabon or even Mauritania) are included. The second part will also include some material from Gulf of Guinea. Four new species and a new genus are described, and five new records are also included in the paper. *Bellactis caeruleus*, *Tubastrea caboverdiana*, *Thalamophyllia wirtzi* and *Africana wirtzi* are the four new species and the new genus described. Some species, due to previous lack of good descriptions, are presented more deeply from the point of view of the descriptive aspect.

**Key words:** Anthozoa, Actiniaria, Scleractinia, new genus, new species, Atlantic Ocean, Western Africa coast and islands.

## 1. INTRODUCTION

This study tries to supply information about Anthozoa and its habitats along the not well-known coast of North West Africa. This paper includes images of habitat features and sites from the Atlantic coast of North Africa, between the Strait of Gibraltar and Gulf of Guinea, with the addition of some information about the Atlantic islands. Most information comes from Moroccan coast, from north to south until the Mauritanian border, and some data collected during the CANCAP (Azores, Canary I., Madeira, Cape Verde I., Morocco) (see VAN DER LAND, 1987) by the second autor (there are much more data waiting to be publish). Moreover, there is some other oportunistic information that were taken from some short travels to different geographical areas as Cape Verde Islands, or even provided by different colleagues, some of them included in the paper. The foccus of this paper is to provide information on the species recorded, with some new records and new taxa, also offering a general view of intertidal and shallow waters habitats, through the color images of the species showing, in some cases, the main encountered communities. Some species of particular concern, due to their abundance or other biological aspect, as the case of *Bunodosma biscayensis*, have been studied extensively. In this first part of the study, octocorals as well as many other hexacorallians are not included, leaving them for a second part. The complete study (Part I and II) includes a general catalogue of the Anthozoa species from the Moroccan coast and also a list of interesting biological sites from Morocco littoral, including Western Sahara. This long term project, carryed by the Museo del Mar from Ceuta, covers an extended not well known area along North African littoral, with the support of colleagues from different institutions, who have been enriched the paper with their contributions, not only on Anthozoa, but also on other subjects of interest in this paper. Most of the studied material is deposited in the Museo del Mar de Ceuta collection. Nevertheless, due to the lack of scientific information on Anthozoa on the North African region we feel relevant the present contribution.

## 2. MATERIAL AND METHODS

The specimens were collected by snorkeling, scuba diving or intertidal exploration and preserved in 8% formaldehyde in sea water, and later stored in 70% alcohol or in dry conditions in the collections of the “Museo del Mar de Ceuta (MMC)”. Colonies of Scleractinia were prepared using hypochlorite, in order to remove the organic tissues to study the general morphology and the anatomical features of the skeleton by means of a stereo dissecting microscope. Nematocysts of the Actiniaria were examined with a light microscope equipped with a Nomarski differential interference contrast optic system. The classification and terminology of nematocysts follows that of SCHMIDT (1972), as adapted by HARTOG (1980) and HARTOG *et al.* (1993). This terminology can be used as a convenience (penicilli=p-mastigophore; spirulae=b-mastigophore) along the paper. The surveys on the cnidom are summarized in tables in which nematocysts means (in the case of new taxon) and ranges of length and width are included. The following codes are used in the tables: vc: very common; c: common; rc: rather common; uc: uncommon; r: rare. The color images were taken with different cameras along the years, there are images from small field aquariums and also underwater pictures. The material and the images studied come from different locations within the North West Africa, the Gulf of Guinea, Cape Verde Islands, Madeira and The Canaries. Some images come from the CANCAP expedition to North West Africa (see VAN DER LAND, 1987).

### *Localities and its coordinates*

Spanish North Africa: Ceuta maritime moat (35°53.355'N 5°19.112'W); Ceuta (San Amaro) (35°53.912'N 5°17.976'W); Ceuta (South Bay) (35°53.107'N 5°18.245'W).

Canary Islands: Candelaria (Tenerife) (28°21.363'N 16°22.125'W).

Morocco: Cala Iris (35°9.071'N 4°21.955'W); M'Dik (35°41.108'N 5°18.862'W); Cabo Negro (35°41.191'N 5°16.426'W); Punta Siri (35°54.533'N 5°28.282'W); Playa del Avi3n (actual T3nger Med) (35°53.207'N 5°30.215'W); Alkasar Seguir (35°51.109'N 5°32.722'W); Cape Spartel (35°47.200'N 5°55.839'W); Asilah (35°28.214'N 6°2.390'W); Sidi Mghit (35°23.450'N 6°4.925'W); Sidi Rhal (33°28.812'N 7°56.824'W); Jorf Lasfar (El Jadida) (33°8.505'N 8°37.218'W); Sidi el Abed (33°4.471'N 8°40.062'W); Oualidia (32°44.323'N 9°2.635'W); Cape Beddouza (32°32.702'N 9°16.931'W); Safi (32°18.155'N 9°14.988'W); Bhaibeh (31°47.791'N 9°35.071'W); Mouley Bouzarktounne (31°38.689'N 9°40.631'W); Diabat (Essauira) (31°29.329'N 9°46.545'W); Sidi Kaouki (31°21.871'N 9°48.166'W); Imsouane (30°50.327'N 9°49.364'W); Agadir (30°25.126'N 9°40.452'W); Sidi Mohamed Abdallah-Mirleft (29°34.058'N 10°3.304'W); Legzira (29°26.952'N 10°6.927'W); Sidi Ifni (29°23.440'N 10°10.337'W); Tan Tan (28°30.124'N 11°20.106'W); Aiun (27°11.635'N 13°23.388'W); Dakhla (23°49.847'N 15°51.988'W); Dakhla (23°39.355'N 15°59.980'W); Dakhla (23°45.780'N 15°45.779'W); Dakhla (Porto Rico) (23°28.918'N 15°57.372'W).

Cape Verde Islands: Tarrafal (Sao Tiago) (15°16.955'N 23°45.419'W); Quebra Canela (Sao Tiago) (14°54.145'N 23°31.028'W); Buracona (Sal) (16°47.906'N 22°59.606'W); Murdeira Bay (Sal) (16°40.683'N 22°56.208'W).

Gabon: Pongara National Park (0°20.295'N 9°18.801'E)

Madeira: Quinta do Lorde-Caniçal (Madeira) (32°44.465'N 16°42.500'W).

### 3. SYSTEMATICS

Orden ACTINIARIA Hertwig, 1882  
Family ACTINIIDAE (Gosse, 1858)

#### *Actinia schmidti*, Monteiro, Solé-Cava & Thorpe, 1997

*Actinia equina* Patriti, 1970: 116-117.

*Actinia schmidti* Ocaña, Brito y González, 2005: 479-482, figs. 1 and 7a-d. Description and discussion with other Actinians species. Canary Islands, Madeira, Azores, Mediterranean and Atlantic coast of Morocco.

To check synonymous list see Ocaña *et al.*, (2005).

**Material examined:** Atlantic Morocco: Sidi Rahal beach, MMC-001, 29.vii.2000, in crevices of the flat rocky platform, 2 specimens, O. Ocaña leg. Imsouane beach and harbour, MMC-002, 8.xii.2001, intertidal platforms, small pools of the mesolitoral and supralitoral, 2 big specimens, red color, also many small specimens growing on the mussels carapaces, O. Ocaña leg. Sidi Mohamed Abdallah-Mirleft, MMC-003, September 2002, intertidal, numerous small specimens growing on mussels carapaces, red, brown and green colours, O. Ocaña leg. Moulay Bouzerktoum (30 km North Essauira), MMC-009, 7.xii.2001, upper intertidal in pools and crevices, 4 specimens with juvenils inside, O. Ocaña leg. Bhaibeh beach, MMC-004, 30.vii.2000, upper intertidal and supralitoral, small crevices and pools, 2 specimens, red and green colours, O. Ocaña leg. Tan Tan beach, MMC-005, 8.iv.2001, upper litoral and mesolitoral, 15 specimens with juvenils inside, O. Ocaña leg. Oualidia, MMC-006, 6.iv.2001, mesolitoral in rocky platform covered by *Fucus*, pools; also in supralitoral and big intertidal caves, deep red in the specimens near *Fucus*, red, green and brown colours in the intertidal caves, 3 deep red specimens collected near *Fucus* and also 12 specimens collected in the intertidal caves, O. Ocaña leg. Sidi Ifni beach, MMC-007, 1.viii.2000, intertidal area with boulders and flat platform areas, on stones and crevices, 3 specimens, red color, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-008, 2.viii.2000, intertidal on mussels, understones and crevices in upper litoral, 5 specimens, red color, O. Ocaña leg. Sidi el Abed, (South of Jadida), MMC-009, 30.vii.2000, intertidal on sloped wall and platform, upper mesolitoral and supralitoral, 5 specimens, red, deep red and green colours, O. Ocaña leg. Diabat, Essauira beach, opposite to Mogador Island, MMC-010, 1.viii.2000, intertidal crevices and pools among stones, 7 specimens, red and green colours, O. Ocaña leg. Sidi Kaoki, North Essauira, MMC-011, 29.iii.2013, located in holes at the rocky platform, 4 medium to big specimens and one juvenil from inside the specimens, red, green and brown colours, O. Ocaña leg. Sidi Mghit (North Asilah), MMC-012, 17.vi.2000, mesolitoral on small pools, crevices, slopes and under big boulders, 7 specimens, O. Ocaña leg. Aiun, Western Sahara, MMC-017, September 2002, intertidal area, under stones, 8 specimens, O. Ocaña leg., Porto Rico, MMC-013, 22.ii.2012, intertidal, rocky platform with holes and also under stones, 3 specimens, red color, Francisca Serrais leg. Dakhla, MMC-014, 20.ii.2012, stony intertidal area, 12 small specimens, red and green colours, Javier Martin Barrios leg.

Strait of Gibraltar coast of Morocco: North of Kasar Seguer, MMC-015, 25.v.2003, stony intertidal, under stones and very shallow pools from upper mesolitoral and supralitoral, juvenils inside, 4 specimens, red color, O. Ocaña leg. Punta Siri, MMC-016, 11.ii.2001, under stones in stony intertidal area, red color, O. Ocaña leg.




Mediterranean Morocco: Cala Iris, (FMM-BM-AA-7=MMC-017), 10.vi.2000, 2 specimens, O. Ocaña leg., upper littoral on boulder, red colour. Ceuta: Maritime moat, MMC-018, 5.iii.1999, intertidal in pools and walls, 5 specimens, red color, O. Ocaña leg.

**Diagnosis:** The species presents the typical expected morphology and color (commonly red but also green and even brownish was observed). Enlarged typical endodermic sphincter and well developed retractors in the mesenteries. We find very well developed acrorhagi at the upper margin; characteristic homotrachs with the tube arranged spirally all along in the acrorhagi and p-mastigophores B-1 in the filaments. Viviparism was observed in some specimens (see material examined).

**Habitat:** This taxon has been recorded mainly in intertidal areas, from pools to platforms, covered by seaweeds. Exceptionally, it can occur also under stones, in shallow waters up to 5 metres deep.

**Distribution and abundance:** We recorded it from Madeira and the Canary Islands: Lanzarote, Fuerteventura, Gran Canaria and Tenerife. It seems to be absent from La Gomera, La Palma and El Hierro. The species is not common in Central Macaronesia (Canary Islands and Madeira), but is more common in Fuerteventura and Lanzarote than in any other island that we have searched. The species was previously known from the western Mediterranean and the Atlantic coast of Morocco (OCAÑA *et al.*, 2005).

**Remarks:** *Actinia schmidt* is well distributed along the Atlantic coast of Morocco and belong to the group I (homotrachs with the tube arranged spirally all along and presence of p-mastigophores B-1 in the filaments) (see OCAÑA *et al.*, 2005). Both characters together with the presence of larger b-mastigophore (=spirulae) in the tentacles are typical for this species. The species was previously recorded from Morocco as *Actinia equina* (see PATRITI, 1970) and much more recently as *Actinia schmidt* (OCAÑA *et al.*, 2005).

Some characteristics cnidae for <i>A. schmidt</i> (taken from Dakhla material)	
Homotrachs from acrorhagie	P-mastigophore B-1 from filaments
	  



*Actinia schmidt* from Dakhla.



*Actinia* sp. from Dakhla.

*Actinia* sp.

**Remarks:** Possibly we found in Dakhla (Sahara region) a new species belonging to the genus *Actinia*. The specimens were observed under stones in low tide, and all of them showed an ochreous colour and sparse green spots at the body wall. The green spots are exclusively known in the species *A. fragacea* but it never presents this ochreous colour. Unfortunately, we lost the material during the travel back to Spain, so only the collection of new material will solve this identification problem.

## *Actinia striata* Risso, 1826

*Actinia depressa* Rapp, 1829

*Paractis striata* Jourdan, 1880. The author describes the lack of acrorhagi in the species.

*Paractinia striata*, Andres, 1884. A new genus erected, due to the lack of acrorhagi presence in some specimens.

*Actinia striata*, Schmidt, 1971 and 1972. Complete anatomical description and cnidom data; its habitat and reproduction pathern are remarkably characters.


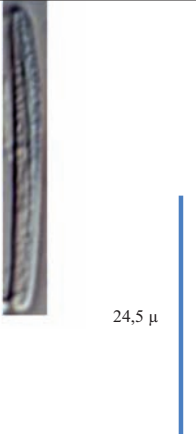
*Actinia striata*, Tur, 1989: He thinks *A. striata* and *A. virgata* could be the same species.

*Actinia striata*, Ocaña, Brito & González, 2005: cnidoma data comparison among several species including the species in the Group II. Cnidom characteristics differentiate *A. striata* from *A. virgata*.

**Material examined:** Strait of Gibraltar coast of Morocco: North of Kasar Seguer, MMC-019, 25.v.2003, stony intertidal, under stones in mesolitoral, 1 specimen, pinkish color with longitudinal stripes, O. Ocaña leg. Oued el Marsa, MMC-023, June 1998, under stone in shallow waters, two specimens, O. Ocaña leg.

Mediterranean Morocco: Cala Iris, (FMM-BM-AA-7=MMC-020), 10.vi.2000, 1 specimen, O. Ocaña leg., shallow waters, under stones, pinkish with longitudinal stripes.

**Remarks:** LÓPEZ-GONZÁLEZ (1993) recorded this species in Ceuta, however, he mentioned to be present in the African coast of the Strait of Gibraltar. We have recorded the species in differente spots of the Mediterranean Moroccan coast.

Some characteristics cnidae for <i>A. striata</i> (taken from Kasar Seguer)	
Homotrachs from acrorhagie	large b-mastigophore from the pharynx
	 24,5 μ



*Actinia striata* from Ceuta region (Juan Junoy & Alfonso Herrera-Bachiller).

## *Actinia fragacea* Tugwell, 1856

*Actinia fragacea* Tugwell, 1856: 98

*Actinia mesembryanthemum* var. *fragacea* Gosse, 1860: brief description of the colour and size, plate vi, fig. 6.

*Actinia fragacea*, Teissier and Teissier, 1930: 190: based on Gosse information, claims for a separate species.

*Actinia equina* var. *fragacea*, Stephenson, 1935: 114. Data of shape and colour; Patrìti, 1970: 116-117. Diagnosis with colour, shape and external morphology, juvenils inside the coelenteron (viviparous) was observed also for this author.

*Actinia fragacea*, Manuel, 1981 and 1988:101.

*Actinia equina* spp. *fragacea*, Schmidt, 1971 y 1972. Based on coloration, habitat, reproduction pattern and the cnidome characters; the subspecies is established by the author.

*Actinia fragacea*, Carter & Thorpe, 1981. Genetics data supported *A. fragacea* as a separate species.

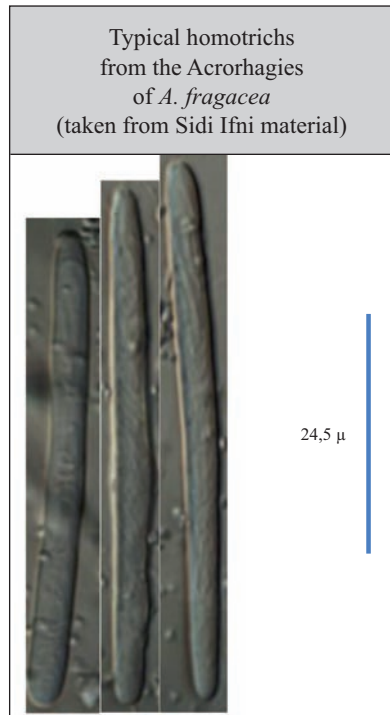
*Actinia fragacea* López González, 1993: 250-253, description and some data about the cnidome, habitat and distribution include the Rabat and Casablanca area but without studied material.

*Actinia fragacea*, Ocaña, Brito & González, 2005: cnidoma data comparison among several species including the species in the Group II.

**Material examined:** Atlantic Morocco: Sidi Rahal beach, MMC-024, 29.vii.2000, in crevices of the flat rocky platform, 1 specimen, red color with greenish spots O. Ocaña leg. Oualidia, MMC-031, 31.iii, 2013, 1 meter deepn, in a hole of *S. alveolata* colony at a mesolitoral big pool, 1 specimen, O. Ocaña leg. Beddouza Cape, MMC-021, 7xii.2001, flat rocky platform with algae, in crevices, 2 spec-



*Actinia fragacea* from Sidi Ifni





imens, red color with greenish spots in the body wall. Bhaibeh beach, MMC-022, 30.vii.2000, intertidal pools, 2 specimens, red color with greenish spots, O. Ocaña leg. Bhaibeh beach, MMC-027, 30.vii.2000, intertidal in the pools, 6 specimens, red color with greenish spots, O. Ocaña leg. Imsouane beach and harbour, MMC-023, 8.xii.2001, intertidal platforms, in mesolitoral canals, 3 big specimens, red color with greenish spots, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-025, 2.viii.2000, intertidal on mussels in shadow places, crevices inside Sabellaria alveolata colonies, mesolitoral and first meters of the infralitoral, 7 specimens, red color with greenish spots in the body wall, O. Ocaña leg. Sidi Ifni beach, MMC-026, 1.viii.2000, intertidal area with boulders and flat platform areas, under stones and crevices, 1 specimen, red color, O. Ocaña leg. Tan Tan beach, MMC-029, 8.iv.2001, in pools and small crevices in the mesolitoral platform, 3 specimens, red color with greenish spots, O. Ocaña leg. Aiun, Western Sahara, MMC-028, 6.ix.2002, intertidal area, under stones, 4 specimens, O. Ocaña leg. Sidi Mghit (North Asilah), MMC-030, 17.vi.2000, mesolitoral on small crevices and in holes of the Sabellaria alveolata colonies, 4 specimens, O. Ocaña leg.

Strait of Gibraltar coast of Morocco: North of Kasar Seguer, MMC-032, 25.v.2003, stony intertidal, under stones in mesolitoral, 1 specimen, red color with greenish spots, O. Ocaña leg. Punta Siri, MMC-033, 11.ii.2001, under stones in shallow waters, 1 meters deep, red color with greenish spots, O. Ocaña leg.

**Remarks:** The species can be recorded along the Moroccan atlantic coast and Sahara region but we did not find the species in Dakhla.

### *Bunodosoma biscayensis* (Fisher, 1874)

*Bunodes biscayensis* Fisher, 1874: 229-231. External description and remark on the multilobulate verrucae. We find also this character in the big specimens.

*Bunodosoma diadema* Patriti, 1970:117. Just some external data, the red color was recorded previously by this autor.

*Phymactis diadema* Carlgren, 1934: 21. Anatomical description including some data on cnidome, sphincter depicted, material from South Rabat.

*Bunodosoma biscayensis* den Hartog, 1987: Complete description and detailed cnidae with the categories, distribution and measurements. Images of histology and cnidae. Acuarian images.

*Bunodosoma biscayensis* López González, 1993: 269-275 External description and some data about the anatomy and the cnidae. Anatomical and acuarian images.

**Material examined:** Atlantic Morocco: Sidi Mghit (South of Asilah), MMC-042, 17.vi.2000, mesolitoral on small pools, buried in sand and among big boulders, 5 specimens, pale brownish color, O. Ocaña leg. Sidi Rahal beach, MMC-046, 29.vii.2000, buried in pools and rocky platform, 2 specimens, O. Ocaña leg. Between Oualidia and Beddouza Cape (South Oualidia), MMC-045, 7.xii.2001, buried in upper mesolitoral with Fucus and mussels reefs, 3 specimens, O. Ocaña leg. Bhaibeh beach, MMC-043, 30.vii.2000, mesolitoral, pools and crevices, 2 specimens, O. Ocaña leg. Bhaibeh beach, MMC-044, 6.iv.2001, mesolitoral, pools, 1 specimen, O. Ocaña leg. Imsouane beach and harbour, MMC-036, 8.xii.2001, intertidal platforms, small pools of the mesolitoral and supralitoral, 3 big specimens, in crevices of the pools, we observed mollusk feeders? on *B. biscayensis*, O. Ocaña leg. Among Agadir and Tiguert cape (30 km North Agadir), MMC-035, 8.iv.2001, walls and crevices in the pools, 3 specimens, 2 with brown column with grey verrucae, disc and tentacles red and blue; 1 specimen with tentacles and column deep red, O. Ocaña leg. Aiun, Western Sahara, MMC-034, 6.ix.2002, intertidal area, buried in shallow pools, 3 specimens, O. Ocaña leg. Sidi Ifni, Legzira

beach, MMC-038, 2.viii.2000, intertidal on pools: buried in crevices or also understones, 9 specimens a bit macerated, three specimens of fedder mollusks (*Nassarius* cf. *reticulatus*), several colours but normally brown color with cream tentacles and disc or commonly also with red and blue tentacles and disc, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-037, 2.viii.2000, shallow waters 1-3 meters deep also intertidal on pools but much more rare, 3 specimens, tentacles, disc and column included verrucae are deep red coloured, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-040, 6.ix.2002, intertidal, pools among mussels reefs, 4 specimens, several colours, O. Ocaña leg. Sidi Ifni beach, MMC-039, 1.viii.2000, intertidal area with boulders and flat platform areas, buried in the sediment and attached on stones, 10 specimens a bit macerated; one specimen eating small mussels, 7 specimens in good conditions, several colours, O. Ocaña leg. Tan Tan beach, MMC-041, 8.iv.2001, mesolitoral, in pools, understones and buried in the sediment, 9 specimens and one very small, O. Ocaña leg. Dakhla, MMC-047, 19.ii.2012, understone in intertidal rocky platform with stones and sand, 1 specimen, O. Ocaña leg.

Cape Verde Islands: Tarrafal, Sao Tiago, MMC-048, 15.viii.2002, intertidal in crevices under calcareous algae at coastal cliff, 1 specimen, red colour with some white verrucae, O. Ocaña leg.

**Diagnosis:** The verrucae (simple or with several lobes, although normally two) cover the whole column and the arrangement along longitudinal rows cannot be easily distinguished, acrorhagi present. HARTOG (1987) describes the colour and its variability in the Archon population. We find the colour patterns observed by the previous author, but we also observed a great variety of colours along the distribution range. Typically the specimens observed present ochreous colour with some of the verrucae grey in the column; other specimens show a mixture of both colour with a high number of grey verrucae. The bands colour pattern described by FISCHER (1874) and HARTOG (1987) generally lack in our material. Specimens completely red coloured seems to be present only at Africa coast from Tanger till Senegal; tentacles with red and blue stripes is a very characteristic colour pattern in this species, and can be found in Europe and also in Africa. Small specimens developed in crevices and little pools can be easily overlooked, big and medium size specimens are very conspicuous to the observers. The measurements and distribution of the cnidae agree very well with the previous works, but some data merits to be commented: in the body wall the smaller b-mastigophore (spirulae) catagorie may lack or be sporadic; the size of the cnidae present some measurements differences among the population, regarding that bigger specimens present also bigger homotrichs in the acrorhagi. Although these differences are included in the variation range of this wide distributed taxon.

**Remarks:** Dana includes a description of *Bunodes diadema* (*Actinia diadema*) in his paper in 1846, including the drawing that Drayton did the same year. The drawing shows the shape of such species recorded from Cape Verde Islands. CARLGREN (1949) included the species into the genus *Bunodosoma*; later, the same author (see CARLGREN 1934) studied material from South Rabat (Morocco) and, as well as Dana did with the material from Cape Verde Islands, referred the species to *Phymactis diadema*. Carlgren in 1939 revised the material of Dana, including anatomical description and sphincter depicted, assigned definitely the material to *Bunodosoma diadema* from Cape Verde and remarks the possible differences among this material and the other from Rabat studied by himself some years before. PATRITI (1970), following Dana's work, identified *Bunodosoma diadema* as a common species from Moroccan Atlantic coast. Carlgren's intuition (see CARLGREN,











*Bunodosoma* cf. *diadema* from Cape Verde Islands (CANCAP).

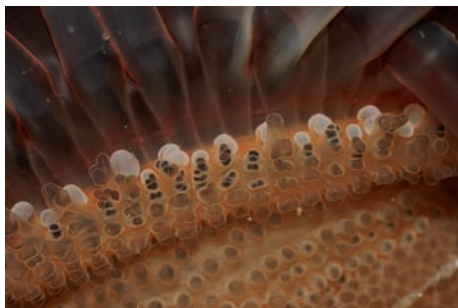
1939) may be right as *Bunodosoma diadema* can be a valid species and occurs at the Cape Verde Islands (should be also present in other tropical West Africa sites), and it is apparently different from *B. biscayensis* in the external appearance. In the continental coast *Bunodosoma biscayensis* (see HARTOG, 1987) is widely distributed from tropical West Africa along the African coast till South Portugal, including some special environments at France; the species is also present at Cape Verde Islands. Morphological characters of the analyzed material, assigned to *B. Biscayensis*, agree very well with the descriptions from the previous authors (see HARTOG, 1987). The last author also collected material in the Cape Verde Archipelago that does not present a dense packet verrucae in the column (according to Drayton's drawing) and can be easily assigned to the species *B. diadema*. However, our material of *Bunodosoma* collected at Sao Tiago and Sal islands is clearly identified as *B. biscayensis*.

The drawing from Drayton of *B. diadema* agrees with the information of such species that we have from the CANCAP expedition; we include images of this material. These images are supporting the possible presence of a different species of *Bunodosoma* (*B. diadema*) at the Cape Verde Islands, although the only way to solve this problem should be the revision of the material from Dana Expedition and also all the CANCAP material belonging to such genus. After all, the presence of *B. biscayensis* at the Cape Verde remarks the possibility of that *B. biscayensis* can be synonymous of *B. diadema*. We leave *Bunodosoma biscayensis* as a valid name pending the CANCAP material revision in order to take an accurate decision about *Bunodosoma diadema*.

Unfortunately, J. C. den Hartog overlooked the paper and did not recognize the species in PATRITI (1970). This is the first record from Morocco; nevertheless, den Hartog had previously remarked the possible presence of the species along the Moroccan littoral (see HARTOG, 1987) and Portugal. The species is also recorded for the first time in Cape Verde and some images showing the external characters of the species from the Gulf of Guinea (although the last record should be confirmed checking material). Attending to the distribution pathern, it seems to be a species from the North Western Africa

Some characteristics cnidae for <i>B. biscayensis</i> (taken from Sidi Ifni material)		
Homotrich from Acrorhagi	Homotrich and Spirulae from Body wall	Spirulae from tentacles
		   24,5 $\mu$

Some characteristics cnidae for <i>B. biscayensis</i> (taken from Cape Verde material)		
Homotrich from Acrorhagi	Spirulae from Body wall	Spirulae from tentacles
		   24,5 $\mu$



*Bunodosoma biscayensis* from Dakhla.



*Bunodosoma biscayensis* from Sidi Ifni.



*Bunodosoma biscayensis*, Cameroon, P. Wirtz.



From the left to the right: *Bunodosoma biscayensis*, Sao Tomé, P. Wirtz; *Bunodosoma biscayensis* from Principe, P. Wirtz; *Bunodosoma biscayensis* from Cape Verde Islands (CANCAP Expedition)

(with clear subtropical/tropical affinities) that can reach appropriate Northern habitats and survive on them (maybe the European populations reached these coasts during the last warm period along the Pleistocene). The species has been recorded in Portugal (Nuno Vasco sent this information). Nevertheless, a general study of material from different coasts should be interesting to determinate the variation range and also possible different species along such extended geographical range. Above, some characteristic cnidae and colour images are shown from different localities along West African coasts. The species *Ocenebra erinaceus* has been observed frequently on the base and in the body wall near the base of this species.

### *Anemonia sulcata* (Pennant, 1777)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Imsouane beach and harbour, MMC-049, 8.xii.2001, intertidal platforms, mesolitoral with important populations (see biological sites and habitats), 8 specimens, greenish color with purple tips in tentacles, *Ocenebra erinaceus* may feed on the specimens, O. Ocaña leg. Moulay Bouzerktoum (30 km North Essauira), MMC-050, 7.xii.2001, upper mesolitoral, 2 specimens, O. Ocaña leg. Tan Tan beach, MMC-051, 8.iv.2001, mesolitoral, 2 specimens, O. Ocaña leg. Sidi Rahal beach, MMC-052, 29.vii.2000, mesolitoral, in big pools, 4 specimens, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-053, 2.viii.2000, intertidal, in pools, 5 specimens, red color, O. Ocaña leg. Sidi Ifni beach, MMC-054, 1.viii.2000, intertidal area with boulders and flat platform areas, in pools with sand and understones, 2 specimens, O. Ocaña leg. Dakhla, MMC-055, 19.ii.2012, intertidal area, rocky platform with stones, understones, 1 specimen, O. Ocaña leg.

Strait of Gibraltar coast of Morocco: Playa del Avión (área destruida por Tanger-Med), MMC-056, 11.ii.2001, under stones in stony bottom, shallow water, 0.5 m, 1 specimen, *Spurilla neapolitana* feeding on the column, O. Ocaña leg.

Mediterranean Morocco: Cala Iris, MMC-057, 29.ix.2001, 3 specimens, O. Ocaña leg., shallow waters, on rocky bottom, under stones.

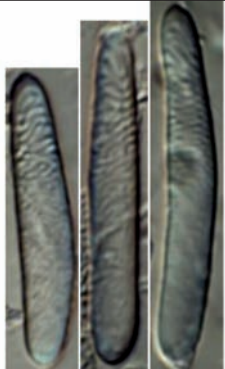


**Remarks:** The species is widely distributed along Morocco and Western Sahara.

*Anemonia melanaster* (Verrill, 1907)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Dakhla, MMC-058, 19.ii.2012, intertidal area, rocky platform with stones, understones, 4 specimens, O. Ocaña leg. Dakhla, MMC-059, 23.ii.2012, shallow waters in rocky platform with stones, among rocky platform with algae and understones, 2 specimens, O. Ocaña leg.

**Remarks:** First record from Morocco, but only found in the extreme southern region near Mauritania. Also from Senegal there are some images of *A. melanaster*, and possibly the species may be distributed in the Gulf of Guinea. *A. melanaster* is the typical amphiatlantic species widespread in subtropical/tropical region (see OCAÑA & HARTOG, 2002), also found in the Azores (see WIRTZ *et al.*, 2003) and recorded in both shores of the Atlantic Ocean. The angular morphology of the homotrachs from the acrorhagies is very characteristic of this species.

Characteristics cnidae from acrorhagie of <i>Anemonia melanaster</i>	
Homotrachs	Spirulae o b-mastigophore
	 <div style="text-align: right;">              24,5 μ         </div>



*Anemonia melanaster* from Dakhla (left); acrorhagie morphology (right).

*Anthopleura thallia* (Gosse, 1854)

To check synonymous list see Ocaña & den Hartog, 2002.

?*Anthopleura balli* Patriti, 1970:117. Just some external data; acrorhagic present in the material analyzed by the author.

**Material examined:** Atlantic Morocco: Imsouane beach and harbour, MMC-060, 8.xii.2001, intertidal platforms, supralitoral pools, 5 specimens, color similar to the Canary Islands populations, O. Ocaña leg. Dakhla, MMC-061, 20.ii.2012, stony intertidal area, 2 small specimens, pinkish colum with dark capitulum in retracted conditions, Javier Martin Barrios leg. Dakhla, MMC-062, 19.ii.2012, intertidal area, rocky platform with stones, understones, 2 specimens, pinkish colum with dark capitulum in retracted conditions, O. Ocaña leg.

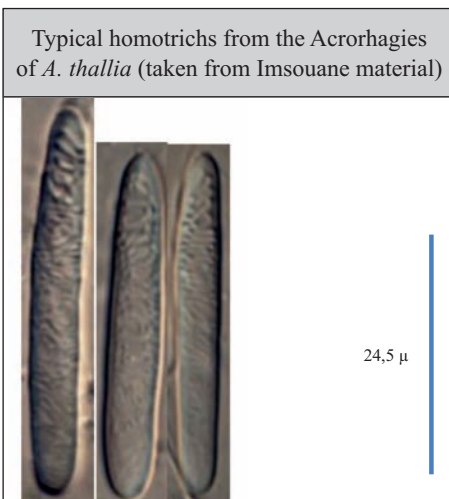


*Anthopleura thallia* from Dakhla.



Mediterranean Sea: Ceuta: San Amaro, MMC-063, 09.ix.2000, mesolitoral, in small pools, 7 specimens, O. Ocaña leg. Monte Hacho, South Bay, MMC-064, vi, 2001, mesolitoral, in small pools, 7 specimens, orange color in the column and white stripes in the disc, O. Ocaña leg.

**Remarks:** Colour and homotrichs from Acrorhagies are very important to recognize the species; this is the first record from Morocco. Patrity comments, on the material assigned to *A. balli* in his paper, exhibit the existence of acrorhagies in his material (small to medium size specimens) from Morocco. The common absence of acrorhagie in small to medium size specimens of *A. balli* advice us to have in mind that perhaps the specimens assigned to *A. balli* by PATRITI (1970) should be refered to *A. thallia*. After all, *A. balli* is extremely rare in Morocco (only found in the Strait of Gibraltar), meanwhile *A. thallia* is a quite common species along the Atlantic coast of Morocco.

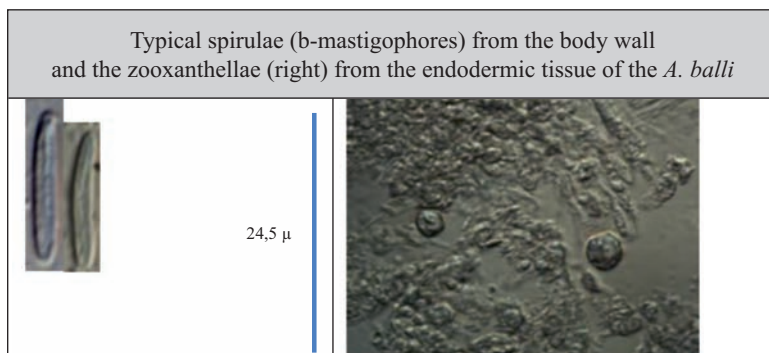


### *Anthopleura ballii* (Cocks, 1851)

To check synonymous list see Ocaña & den Hartog, 2002

**Material examined:** Strait of Gibraltar coast of Morocco: Playa del Avión (destroyed by Tanger-Med), MMC-065, 11.ii.2001, mesolitoral, understone, 2 specimens, O. Ocaña leg.

**Remarks:** The presence of zooxanthellae in the endodermic tissues of our material is one of the key character to recognized *A. balli* distinguishing from *A. thallia*. It is possible that Patrity was in confusion with *A. thallia*, a common species in the Atlantic of Morocco.



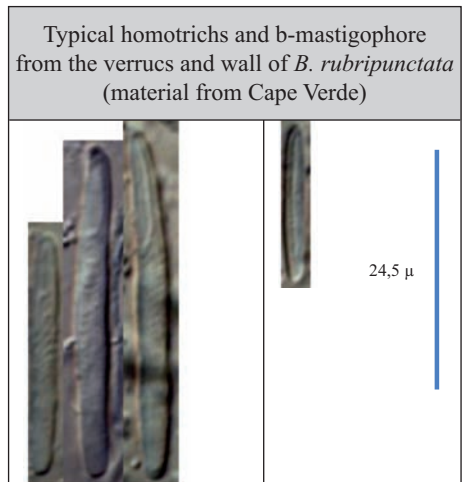
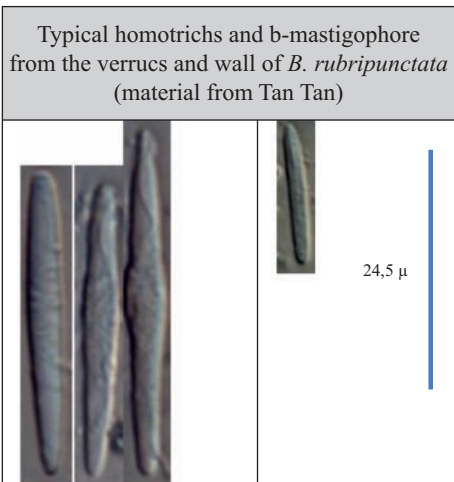
***Bunodactis rubripunctata* (Grube, 1840)**

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Moulay Bouzerktoum (30 km North Essauira), MMC-066, 7.xii.2001, mesolitoral centre and near infralitoral, 5 specimens, O. Ocaña leg. Tan Tan beach, MMC-067, 8.iv.2001, mesolitoral, under stone, 1 specimen, O. Ocaña leg. Oualidia, MMC-068, 6.iv.2001, mesolitoral, in pools, 2 specimens, O. Ocaña leg. Sidi Rahal beach, MMC-069, 29.vii.2000, mesolitoral, buried in the rocky platform and also in the pools, 4 specimens, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-070, 2.viii.2000, intertidal, burryed in sand, 2 specimens, O. Ocaña leg. Bhiha beach, MMC-071, 30.vii.2000, intertidal in pools, 1 specimen, O. Ocaña leg. Bhiha beach, MMC-072, 6.iv.2001, mesolitoral, pools and rocky platform, 3 speci-



*Bunodactis rubripunctata*. One specimen from Dakhla, it was not collected.



mens, O. Ocaña leg. Cape Verde Islands: MMC-073, 15.viii.2002, intertidal in crevices under calcareous algae at coastal cliff, 2 specimens, redish colour, O. Ocaña leg.

Mediterranean, Ceuta: Monte Hacho, South Bay, MMC-074, vi, 2001, mesolitoral, in small crevice, 1 specimen, near *A. schmidti* and *A. thallia*, O. Ocaña leg.

**Remarks:** The species was previously recorded from Morocco (see OCAÑA & HARTOG, 2002), and now we add the collection data and distribution along the North African coast. The species has been found at the Cape Verde Islands for the first time, so it is quite possible its presence along the tropical coast of West Africa. The distribution pattern followed by this species is similar to what is known for *B. biscayensis*.

### *Bunodactis verrucosa* (Pennant, 1777)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Sidi Ifni, Legzira beach, MMC-075, 6.ix.2002, mesolitoral, crevice in small pool, 2 specimens, O. Ocaña leg. Tan Tan beach, MMC-076, 8.iv.2001, mesolitoral, understone, 2 specimens, O. Ocaña leg. Bhaibeh beach, MMC-077, 30.vii.2000, intertidal in pools, 5 specimens and



*Bunodactis verrucosa* from Dakhla.

2-3 juvenils, O. Ocaña leg. Bhaibeh beach, MMC-078, 6.iv.2001, mesolitoral, partially buried in pools, 2 specimens, O. Ocaña leg. Dakhla, MMC-079, 23.ii.2012, mesolitoral, understone in rocky platform with sediment, 1 specimen, O. Ocaña leg.

**Remarks:** The species was previously recorded from Morocco (see OCAÑA & HARTOG, 2002) and now we add the collection data and distribution along the North African coast.

*Actinostella cf. flosculifera* (Lesueur, 1817)

To check synonymous list see Ocaña & den Hartog, 2002.

**Remarks:** The images show typical characters of this species, remarking the two faces (day and night) showed by *A. flosculifera*, although studying the material is the only way to confirm the presence at Cape Verde Islands; we can not reject the presence of more than one species along the North African coast. This is apparently the first record from Cameroon, Senegal and Cape Verde Islands. The species is typically found in bottoms with sediment and stones and also can tolerate important quantities of organic matter dissolved in the water (first author personal observation in Cuba Island).



*Actinostella cf. flosculifera* from Cape Verde (CANCAP).



*Actinostella. cf. flosculifera*, shallow waters, Cameroon, P. Wirtz.

*Andresia partenopea* (Andres, 1884)

*Ilyanthus partenopeus* Andres, 1884: external morphology and colour varieties, drawings based on acuarian specimens. Gulf of Naples, Mediterranean.

*Andresia parthenopea* Carlgren, 1949: 33; just the family and genus diagnosis and references.

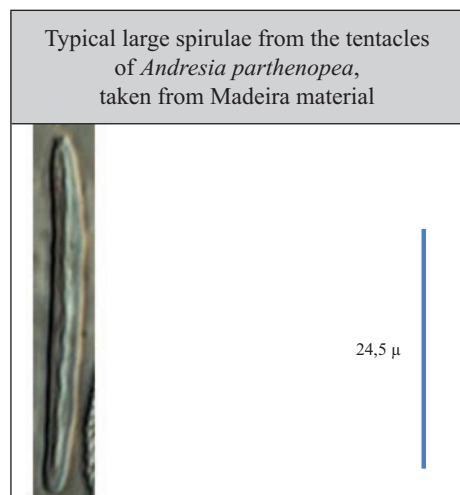
*Andresia partenopea* Schmidt, 1972: 61-63; complete description and cnidome data, high quality black and white underwater images. Atlantic and Mediterranean distribution.

*Andresia partenopea* den Hartog & Ates, 2011: 33-34 the paper includes cnidome data and references but not images. Ria de Arosa, Galicia. Also referenced for Atlantic coast of France and even Eastern Mediterranean.

*Andresia parthenopea* Wirtz, 2013. Just the record and an underwater image of the species in its habitat. Madeira.

**Material examined:** Madeira, Quinta do Lorde marina, near Caniçal, MMC-080, ii.2006, 18 m, sand bottom, 1 specimen, P. Wirtz leg.

**Remarks:** *A. parthenopea* (= *A. partenopea*) has been recorded recently in Madeira Archipelago (see Wirtz, 2013). We include some images from the Canaries that may belong to this species although morphological confirmation is needed, this can be first record from the Canaries and also from Senegal. The species is possibly spread along the North African Atlantic coast.



*Andresia* cf. *partenopea* from Gran Canaria (Sanchez Cuervo).

***Phelliactis hertwigi* Simon (1892)**

**Material examined:** Tenerife, Candelaria, Canary Islands, MMC-081, 20.xii.2011, lost fishing basket, 400 meters deep, 3 specimens, Javier Martín Barrios leg.

To check synonymous list see Riemann-Zürneck, 1973; Ocaña & den Hartog, 2002.







**Remarks:** The species had been recorded in the Canaries previously (CARLGREN, 1934; OCAÑA & HARTOG, 2002), but life observations and cnidome study are included to complete the information gathered by RIEMAN-ZÜRNECK in 1973 (see below). *P. hertwigi* has been recorded and studied under different taxonomical names. STEPHENSON (1918) (also GRAVIER, 1922) did not succeed in recognizing the species previously described by Simon in 1892, and perhaps their descriptions are not well pointed to the species identification as it happens nowadays, but the habitus drawings (see STEPHENSON, 1918: plate XV figure 3), and even the black and white images, allow us to recognize some important characters of the species (see GRAVIER, 1922: planche IV, fig., 39) that can be also noticed in the new colour images printed here. Although some external characters are not exclusively found in *Phelliactis* but in others hormathidae species, the constant presence of “thickened white aboral swellings of mesogloea” in the tentacles is well described by STEPHENSON (1918) and others authors. CARLGREN (1942) includes in his description of *P. hertwigi* a good sintesis of the color features showed by the species. *P. hertwigi* may include a number of closer species grouped by the shape and the presence of six couples of perfect mesenteries; other characteristics should diferenciate the species included in such group, as in the case of *P. capricornis* and *P. pelophila* (see RIEMAN-ZÜRNECK, 1973). Although the lack of pointed descriptions are an extended fact in the genus, some species (see *P. coccinea* and *P. pulchra* listed by RIEMAN-ZÜRNECK, 1973) may be synonymous of *P. hertwigi*. The wide external variability, apparently showed by this species, make difficult its identification; often this variability is not well understood, being more than one species mixed up under the same name (see RIEMAN-ZÜRNECK, 1973). Cnidom characters (measurements, location and morphology) are usefull descriptors also in this genus. *P. michaelsarsi* present quite different measurements in the cnidom of the acontiae, much more smaller in *P. hertwigi* (see RIEMAN-ZÜRNECK, 1986). *P. incerta* from the gulf of Cádiz is included by RIEMAN-ZÜRNECK (1973) in the synonymous list of *P. hertwigi*; the similarities are obvious, even in the cnidom generalities, but the long and thick penicillie found in the tentacles (see CARLGREN, 1934: 15) is not present in *P. hertwigi* (see RIEMAN-ZÜRNECK, 1973: 297; see our cnidom data). A cnidom comparison between the species of *Phelliactis* is usefull for taxonomical purposes, not only the measurements but also the morphology can show some differences; the enlarged and curved spirulae type from tentacles is something typical from *P. hertwigi* and apparently unknown in other species of the same genus with printed cnidom images (see RIEMAN-ZÜRNECK, 1973 and 1986).





Supplementary information after RIEMANN-ZÜRNECK paper in 1973: New data about the cnidom, the colour and habitus of the Canary Island specimens are included in

the present paper. Very few information is known from the bathyal bottoms around the Canaries, so it is possible that *P. hertwigi* can be locally abundant. Three specimens from the South of Tenerife were collected in 2011; body measurements are similar to the specimen showed by CARLGREN (1910) and collected North East off Fuerteventura. The enlarged and curved spirulae with short shaft from tentacles can be a pointed character in order to distinguish *P. hertwigi* from others of the same genus. The cnidom measurements and categories showed in this paper are widely consistent with what was known for *P. hertwigi* (see CARLGREN, 1942; RIEMAN-ZÜRNECK, 1973). The presence of large spirulae in the body wall should be due to a contamination from the acontia.



*Phelliactis hertwigi* from Tenerife.

<i>Phelliactis hertwigi</i>					
Tentacles		Pharynx		Filaments	
Spirocysts	Spirulae	Spirulae	Penicilli	Spirulae	Penicilli
					

<i>Phelliactis hertwigi</i>		
Acontiae	Body wall	
Spirulae	Spirulae	Penicilli
		  24,5 μ 



Tissue	Nematocysts type	Range of length and with of the nematocysts capsules in $\mu\text{m}$	Frequency
Acontias	Spirulae	(19-23) $\times$ (2)	c-rc
	Spirulae	(30-40) $\times$ (3-4)	vc
Tentacles	Spirulae	(10-16) $\times$ (1.5-2)	r
	Spirulae	(33-35) $\times$ (4)	uc-rc
	Spirulae	(30-45) $\times$ (3-4)	c
	Spirocysts	(35-50) $\times$ (5-8)	vc
Pharynx	Penicilli	(32-35) $\times$ (4)	c
	Spirulae	(30-36) $\times$ (3-4)	c
Filaments	Penicilli	(25-30) $\times$ (4)	c
	Spirulae	(13-15) $\times$ (2)	rc
	Spirulae	(30-34) $\times$ (3-4)	c
Body wall	Penicilli	(27-36) $\times$ (3.5-4)	rc
	Spirulae	(35-36) $\times$ (3)	uc
	Spirulae	(10-20) $\times$ (1.5-3)	c-vc

***Adamsia carciniopados* (Otto, 1823)**

To check synonymous list see Ocaña & den Hartog, 2002

**Material examined:** Mediterranean Morocco: M'dik harbour, MMC-082, 10.ix.2001, 1 specimen, collected from the fishermen nets, O. Ocaña leg.

**Remarks:** The species was previously recorded from Morocco (see OCAÑA & HARTOG, 2002), we have observed specimens in the Essauria harbour and Bhaibeh beach (Atlantic Morocco).

***Calliactis parasitica* (Couch, 1838)**

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Western Sahara: Dakhla, MMC-083, February, 2012, 6 specimens, collected from the fishermen nets, O. Ocaña leg.

**Remarks:** The species was previously recorded from Morocco (see PATRITI, 1970 and also OCAÑA & HARTOG, 2002), we also observed specimens in the Bhaibeh beach in the fishermen nets.



*Calliactis parasitica* from Mauritania (CANCAP).

***Hormathia cf. coronata* (Gosse, 1858)**

*Bunodes coronata* Gosse, 1860: 202-204, general description and color details. Plate VII, fig. 4 shows a very characteristic drawing of such species.

*Hormathia coronata*, Stephenson, 1935: 269-275, general description including anatomical details and some data about cnidome.

*Hormathia coronata*, Carlgren, 1949: 92, main references and distribution, up to 90 meters.

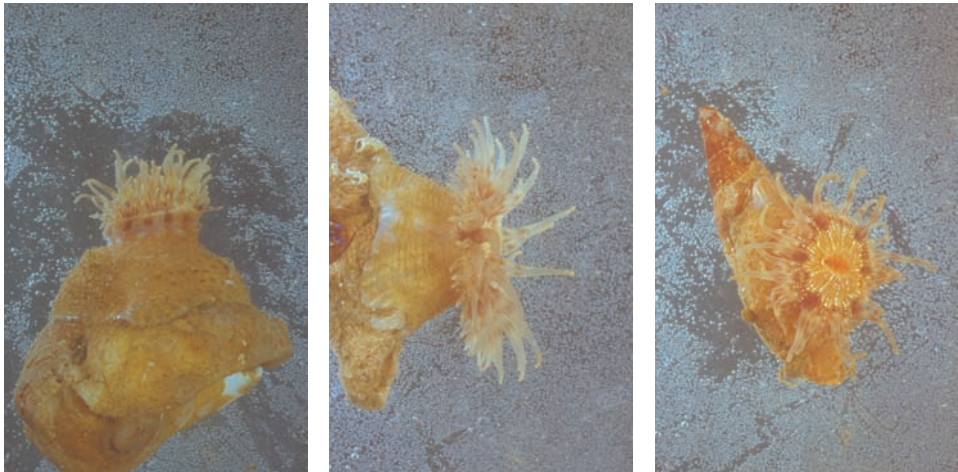
*Hormathia coronata*, den Hartog, 1977b: 237-244, remarks about the slightly differences among *H. coronata*, *C. brodricii* and *P. expansa*; cnidome images, plate II.

*Hormathia coronata*, Schmidt, 1972: 29-32, general and anatomical description, cnidome and hábitat information, Abb 20.

*Hormathia coronata*, Manuel, 1981 y 1988: 166-167, external descriptions, hábitat and distribution, fig. 57.

*Hormathia coronata*, Tur, 1989: 87-94, general and anatomical descriptions, cnidome measurements and drawings of them, figs. 19, 20 and Lámina II fig. e.

**Remarks:** The images show the typical shape and color pattern of the species *H. coronata*, although the material should be studied before its definitive identification.



*Hormathia cf. coronata* from Mauritania (CANCAP).

Familia SAGARTIIDAE Gosse, 1858

*Actinotheroe sphyrodeta* (Gosse, 1858)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Imsouane beach and harbour, MMC-084, 8.xii.2001, intertidal platforms, in the mesolitoral channels and shadow places with water movement, 25-28 specimens, whitish color with green stripes in the column, O. Ocaña leg. Tan Tan beach, MMC-085, 8.iv.2001, mesolitoral and infralitoral in shallow waters, 20-30 specimens, O. Ocaña leg. Bhaibeh beach, MMC-086, 6.iv.2001, mesolitoral, pools, also shallow infralitoral, 5 specimens, O. Ocaña leg. Sidi Ifni, Legzira beach, MMC-087, 2.viii.2000, near infralitoral on mussels reefs and understones in the rocky platform, also in shallow waters till 10 meters deep, whitish tentacles and column with green longitudinal stripes, numerous specimens of small size, O. Ocaña leg.

Strait of Gibraltar coast of Morocco: Playa del Avión (destroyed by Tanger-Med), MMC-088, 11.ii.2001, understone in stony bottom, shallow waters, 0.5 m, 1 specimen, O. Ocaña leg.

**Remarks:** The species has been previously recorded from Morocco (see PATRITI, 1970). This is a common species along the shallow infralitoral and it is also present in large mesolitoral pools.



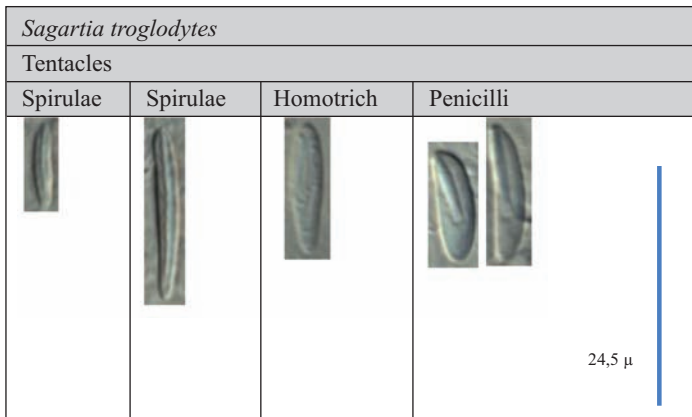
*Actinotheroe sphyrodeta* from Sidi Ifni.

### *Sagartia troglodytes* (Price, 1847)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Imsouane beach and harbour, MMC-089, 8.xii.2001, intertidal platforms, supralittoral pools, 6 specimens, close to *A. thallia*, *A. schmidtii* and *B. biscayensis*, O. Ocaña leg.

**Remarks:** This is the first record from Morocco. The species has been recently recorded from Madeira (see WIRTZ, 2013). Typically, the species present in the tentacles several nematocyst capsules: two spirulae, one penicilli and one homotrich.



### *Cereus pedunculatus* (Pennant, 1777)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Oualidia, MMC-063, 06.iv.2001, upper mesolittoral and supralittoral pools, buried in sand, 6 specimens, red and green colours, O. Ocaña leg.

Mediterranean Morocco: Cala Iris, MMC-090, 29.ix.2001, 4 specimens, O. Ocaña leg., shallow waters, 0.5 m, under stones, partially buried in sand.

**Remarks:** This species was recorded previously from Morocco (see OCAÑA & HARTOG, 2002).

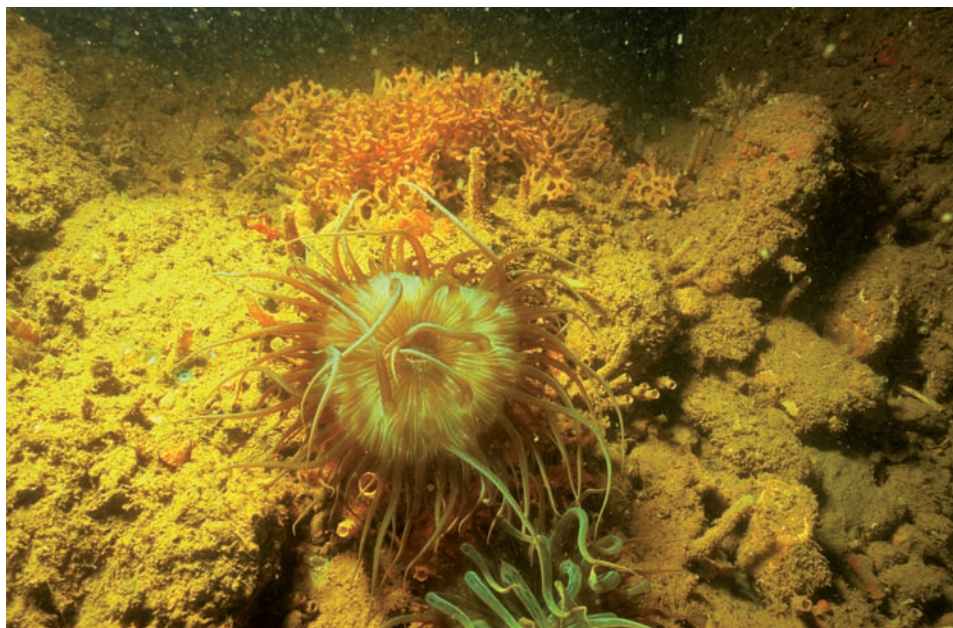
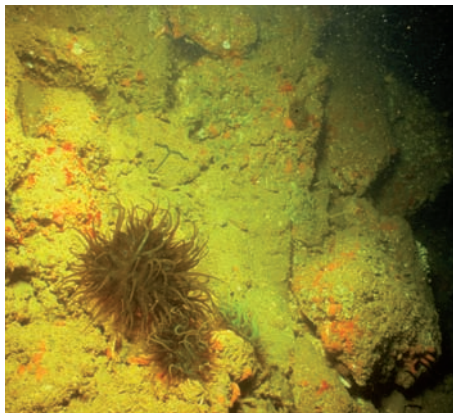
Familia AIPTASIIDAE Carlgren, 1924

*Aiptasia couchii* (Cooks, 1851)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Mediterranean Morocco: Cala Iris, MMC-091, 29.xii.2001, 3 specimens, O. Ocaña leg., shallow waters, 1 m, under stones.

**Remarks:** A morphological revision of the genus *Aiptasia* and the Aiptasiidae family has been recently published (see GRAJALES & RODRÍGUEZ, 2014), and the previous species *Aiptasia mutabilis* have split up in two different species: *Aiptasia couchii* and *Aiptasia mutabilis*. *A. mutabilis* is restricted to the Mediterranean but *A. couchii* is widely distributed along the North East Atlantic and also the Mediterranean. *A. couchii* had been recorded previously from Morocco (see PATRITI, 1970).



*Aiptasia couchii* from Agadir bottoms.

*Aiptasiogeton hyalinus* (Delle Chiaje, 1825)

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Imsouane beach and harbour, MMC-092, 8.xii.2001, intertidal platforms, mesolitoral chanel, growing inside big *Balanus sp.*, 1 specimen, O. Ocaña leg.

**Remarks:** The species has been recorded previously from Morocco (see OCAÑA & HARTOG, 2002). It was exclusively found in Imsouane. The species is apparently also present in Mauritany but it should be confirmed checking the material from CANCAP expedition.



*Aiptasiogeton hyalinus* cf. from Mauritanian coast (CANCAP).

## *Bellactis caeruleus* Ocaña, den Hartog & Brito new species

**Material examined:** Holotype, MMC-19, Cape Verde Arquipelago: Tarrafal, Sao Tiago, 15.viii.2002, 8 meters deep, small crevices in stony bottoms with sand, partially buried in sand, 0.8 cm high  $\times$  1 cm broad semi-retracted specimen, dissected and stained, O. Ocaña leg. Paratype; MMC-20, 0.7 cm high  $\times$  0.5 cm broad, semi-retracted specimen sectioned and stained for anatomical purposes. Paratype, MMC-21, 0.8 cm high  $\times$  0.8 cm broad, semi-retracted specimen with numerous acontiae. Paratype, MMC-22, 0.5 cm high  $\times$  1 cm broad, retracted specimen. Paratype, MMC-23, 0.4 cm high  $\times$  1 cm broad, strongly retracted specimen, pedal laceration abundant. Paratype, MMC-24, 0.4 cm high  $\times$  0.3 cm broad, very small semi-retracted specimen. Paratype, MMC-25, specimen inside hydrocoral.

**Diagnosis:** Measurements in fixed conditions: 1 cm high  $\times$  1 cm broad; one small specimen measured 0.4 cm high  $\times$  0.3 cm broad. External anatomy and colour. Up to 120 short pointed tentacles grouped in six cycles on a lobed capitulum (one small specimen shows four cycles). Short column in fixed conditions but surely it can be expanded considerably as it usually happens in the species of this family. Irregular base with evident pedal laceration processes. Colum grey, disc and tentacles are blue coloured with some ochreous spots in the tentacles; white acontia. Microanatomy: Two first cycles macrocnemes with well developed restricted retractors, two microcnemes cycles without muscular development. Folded pharynx with two enlarged syphonoglyphs. Numerous acontia, cinclides disposed around the base and also in the scapus. Sphincter absent; well-developed restricted retractors showing reniform to enlarged morphology; parietobasilar poorly developed and exclusively observed in the two first cycles. Upper part of the column with a thinner ectoderm and mesogloea present the mesogloea and ectoderm thinner than in the scapus, margin tentacular. Zooxanthellae present in the endoderm tissue and specially concentrate in the tentacles and column endoderm.

Cnidom. A survey of the cnidom is summarized in the table II. See remarks too.

**Etymology:** The name remarks the conspicuous blue color present in this new species.

**Habitat and distribution:** The species was exclusively recorded in Tarrafal (Sao Tiago Island) in the Cape Verde Archipelago although it should be widely distributed in the islands. *B. caeruleus* was found in 10 meters bottom, and in all the samples observed, the pedal disc and column were located inside stones, hermatypic scleractinian and fire coral holes. The new species was found also near some colonies and individuals of *Balanopsammia wirtzi*.

**Remarks:** This is one of the two species of the genus *Bellactis*. Indeed both species are very close (*B. ikalyseae* and *B. caeruleus*), but some significative differences are enough to distinguish them. Color is quite different but very little is known about this character in the genus. Anatomically, both species are very similar but there are much more tentacles in *B. ikalyseae* (up to 204) than in *B. caeruleus* (up to 120), also the retractors of *B. caeruleus* are slightly more extended than in *B. ikalyseae*. We do not observe sphincter under binocular, using staining “in toto” although it is possible its presence searching histological sections. Pedal laceration is very evident in the studied species in this article; meanwhile asexual reproduction is pending to be confirmed in the case of *B. ikalyseae* (see GRA-

JALES & RODRÍGUEZ, 2014). Nevertheless, the most relevant and consistent differences can be observed searching the cnidom: large penicilli (p-mastigophore) from the pharynx, larger in *B. caeruleus* than in *B. ikalyseae*, there is also an extra penicilli category in the pharynx of *B. caeruleus*, apparently absent in *B. ikalyseae*; tentacles of *B. caeruleus* have two different categories of spirulae (basitrichs or b-mastigophores), meanwhile one categorie can be observed in *B. ikalyseae* (see GRAJALES & RODRÍGUEZ, 2014).










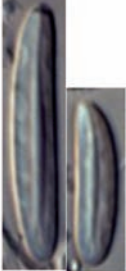

*Bellactis caeruleus* new species, Tarrafal, Sao Tiago (Cape Verde Islands). P. Wirtz




In addition, large penicilli of the acontia are larger in *B. ikaluseae* than in *B. caeruleus*; the morphology of the large Penicilli from the filaments of *B. ikalyseae* (see GRAJALES & RODRÍGUEZ, 2014) is quite different in *B. caeruleus*.




Tissue	Nematocysts type	Mean and range of length and with of the nematocysts capsules in $\mu\text{m}$	Number of capsules measured	Frequency
Acontias	Spirulae	27 (28-33) $\times$ 1.6 (1-2)	30	c
	Penicilli	14 (11-15) $\times$ 2.4 (2-3)	20	rc
	Penicilli	67.3 (63-73) $\times$ 7 (6-8)	25	c
Tentacles	Spirulae	13.8 (10-19) $\times$ 2.5 (2-3)	30	c
	Spirulae	18.5 (14-22) $\times$ 2.5 (2-3)	40	vc
	Penicilli	22 (15-27) $\times$ 2.5 (2-3)	35	vc
	Spirocysts	(12-20) $\times$ (2-4)		vc
Pharynx	Spirulae	19.8 (17-22) $\times$ 2.6 (2-3)	25	rc-c
	Penicilli	14.2 (12-16) $\times$ (2)	8	uc
	Penicilli	33.8 (28-45) $\times$ 4 (3.5-4.5)	35	c-vc
Filaments	Spirulae	11.7 (10-14) $\times$ 2.2 (2-3)	15	c-rc
	Penicilli	10.8 (10-13) $\times$ 2.4 (2-4)	20	c-rc
	Penicilli	30.2 (19-35) $\times$ 4.8 (3-5)	30	c
Body wall	Spirulae	11 (8-15) $\times$ 1.6 (1.5-3)	40	vc
	Spirulae	24.3 (18-30) $\times$ 3.8 (3.5-4)	30	c-vc
	Penicilli	18.1 (15-20) $\times$ 3.8 (3-4)	25	c-vc






<i>Bellactis caeruleus</i>		
Acontia		
Spirulae	Penicilli	Penicilli
		
		 24,5 $\mu$

<i>Bellactis caeruleus</i>			
Tentacles			
Spirocysts	Spirulae	Spirulae	Penicilli
			
			 24,5 $\mu$

<i>Bellactis caeruleus</i>		
Pharynx		
Spirulae	Penicilli	Penicilli
		
24,5 $\mu$		

<i>Bellactis caeruleus</i>		
Body wall		
Spirulae	Spirulae	Penicilli
		
24,5 $\mu$		

<i>Bellactis caeruleus</i>		
Filaments		
Spirulae	Penicilli	Penicilli
		
24,5 $\mu$		

Family ISOPHELLIIDAE Stephenson, 1935

***Telmatactis elongata* (Delle Chiaje, 1825)**

To check synonymous list see Ocaña & den Hartog, 2002.

**Material examined:** Atlantic Morocco: Sidi Ifni, Legzira beach, MMC-093, 2.viii.2000, mesolitoral in crevices from small pools, 2 specimens, O. Ocaña leg. Sidi el Abed, South of el Jadida, MMC-094, 30.vii.2000, mesolitoral in crevices, 2 specimens, O. Ocaña leg.

Strait of Gibraltar coast of Morocco: Playa del Avión (destroyed by Tanger-Med), MMC-095, 11.ii.2001, mesolitoral exposed, in crevices, 1 specimen, O. Ocaña leg.

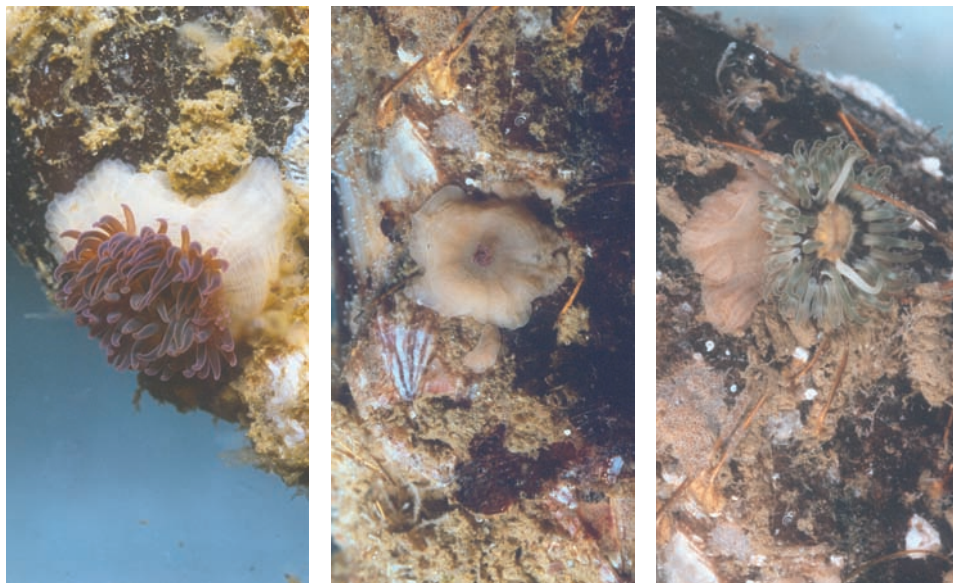
**Remarks:** The species had been recorded previously from Morocco (see OCAÑA & HARTOG, 2002). The species is widely known as *Telmatactis forskalii*.

Family DIADUMENIIDAE Stephenson, 1920

***Diadumene leucolena* (Verrill, 1866)**

To check synonymous list see Ocaña and den Hartog, 2002.

**Remarks:** We had already recorded the species from Senegal (see OCAÑA, 1994; OCAÑA & HARTOG, 2002). We include some new images, showing the color of column and tentacles.



*Diadumene leucolena* from Senegal (CANCAP).

Orden SCLERACTINIA Bourne, 1900

Family DENDROPHYLLIIDAE Vaughan & Wells, 1943

***Dendrophyllia laboreli* Zibrowius & Brito, 1984**

*Dendrophyllia laboreli* Zibrowius & Brito, 1984: 641-657, plates 1 and 2.

*Dendrophyllia laboreli*, Brito y Ocaña, 2004: 431-434, Lámina 101, figs. 61 and 68

*Dendrophyllia laboreli*, López-González, Megina, Martínez, Gómez, Arroyo, Fernández-Casado & Tamsouri, 2010: 1-4 pp, color plate.

*Dendrophyllia laboreli*, Ocaña, Herrera, Brito, Garrido, González-Lorenzo, Monterroso & Aguilar, 2011: 53-68, 8 figs., 2 tables.

**Material examined:** see Ocaña *et al.*, 2011.

**Remarks:** In the Mediterranean, this species is exclusively known from Cabo Negro in the coast of Morocco.



*Dendrophyllia laboreli* from Cabo Negro (Morocco).

***Dendrophyllia cornigera* (Lamarck, 1816)**

To check synonymous list see Zibrowius, 1980.

**Material examined:** M'Dik, MMC-096, 35°41'15.25"N 5°16'23.65"W, 05.vii. 2007, part of a colony collected by fishermen, O. Ocaña leg; Safi, MMC-097, 26.xii.2004, small colony collected by fishermen, O. Ocaña leg.



*Dendrophyllia cornigera*. Two colonies from Safi (left) and Cabo Negro (right).

**Remarks:** *Dendrophyllia cornigera* was already known from the Atlantic coast of Morocco (see ZIBROWIUS, 1983) and this is the first time recorded in the Mediterranean coast.

#### ***Dendrophyllia ramea* (Linné, 1758)**

To check synonymous list see Zibrowius, 1980.

**Material examined:** Jorf Lasfar (El Jadida), MMC-098, , 22.xii.2010, medium size colony collected by the fishermen, O. Ocaña leg.; Asilah, MMC-099, 15.vi. 2005, a big colony collected by fishermen, O. Ocaña leg.

**Remarks:** *Dendrophyllia ramea* was already known from Atlantic coast of Morocco (see Zibrowius, 1983) and shows a wide range of distribution in the North Atlantic region (see ZIBROWIUS, 1980; BRITO & OCAÑA, 2004).

#### ***Balanophyllia regia* Gosse, 1860**

To check synonymous list see Zibrowius, 1980.

**Material examined:** Oualidia, MMC-100, 02.i.2013, two specimens collected in a big intertidal pool, with strong waves influence, O. Ocaña leg.

**Remarks:** *B. regia* was already recorded from Tanger and Mohammedia, in the Atlantic coast of Morocco (see ZIBROWIUS, 1983), and shows a wide range of distribution in the

North Atlantic region (see ZIBROWIUS, 1980; BRITO & OCAÑA, 2004). The species was found in the same habitat of *A. macrodentata* and it is not easy to be found in the intertidal or shallow waters because the excessive sedimentation observed along the Atlantic coast; nevertheless, it should be present in special sites with some protection from the waves action. We find them in the shadow part of a wide pool, with good environmental conditions and interesting benthonic assemblages. We found the two color varieties (yellow and orange), but the orange one is most common. The parasitic barnacle *Megatrema anglicum* was commonly observed in several specimens.



*Balanophyllia regia* from Oualidia (Morocco).



*Balanophyllia regia* from Oualidia (Morocco).

We have received some images from Cape Verde Islands showing the typical characters of this species, so the species should be present in the Archipelago; nevertheless, to confirm its presence is necessary to check some material.



Image from Cape Verde, Boa Vista, P. Wirtz.

### *Balanopsammia wirtzi* Ocaña & Brito, 2013

**Material examined:** Cape Verde Islands, Sao Vicente, MMC-101, 08.xi.2014, intertidal, two small specimens, P. Wirtz leg.; Tarrafal, Sao Tiago, MMC-102, vii, 2008, 3 specimens and one small colony of three polyps, in formaline, P. Wirtz leg; MMC-127, 03.ix.2015, 3 specimens, red colour, P. Wirtz leg.

**Remarks:** The description can be checked at OCAÑA & BRITO (2013). We just include in this paper some extra material of this new species.



*Balanopsammia wirtzi* from Buracona (Sal), A. Brito.

### *Astroides calycularis* (Pallas, 1766)

To check synonymous list see Zibrowius, 1980.

**Material examined:** Cape Spartel, Tanger, MMC-103, 15.ix.2010, 5 colonies, O. Ocaña leg.

**Remarks:** The species has been previously recorded in Morocco, at Cape Spartel near Tanger (see ZIBROWIUS, 1980; OCAÑA, 2005; and MERINO-SERRAIS *et al.*, 2012) and now we include some information and images about the habitat. In shallow waters (up to 8 meters deep) the species is not abundant and generally restricted to some shadow places as vertical walls, ruffs and small caves. The algae carpets are very important in the area, covering most of the rocky substrate. From 15 to 20 meters deep there are also *Astroides calycularis* populations associated to *Lithophyllum expansum*. We suspect the species may be spread between this site and Asilah region but it needs to be confirmed. The genetic structure of this population has been recently studied (see MERINO-SERRAIS *et al.*, 2012).



*Astroides calycularis* from Cape Spartel (Morocco).

### *Tubastrea caboverdiana* Ocaña & Brito new species

**Material examined:** Coll. MMC-26: 10 meters, in rocky substrate on a ruff of a tunnel, King Fish, Tarrafal, Sao Tiago Island, Cape Verde Islands, O. Ocaña leg., 15/08/2002, yellow color, one colony, Holotype; Coll. MMC-27: infralitoral, Inv. 97, c-28, Gran Canaria University expedition to Cape Verde Islands, LIFE project, one colony, Paratype; Coll. MMC-28: 10 meters, in rocky substrate on a ruff of a tunnel, King Fish, Tarrafal, Sao Tiago Island, Cape Verde Islands, O. Ocaña leg., 15/08/2002, one colony, Paratype; MMC-29: 6 m, rocky substrate on a shadow ruff, Quebra Canela, Praia, Sao Tiago, A. Brito leg., 1986, one rounded colony, Paratype; MMC-30: 4 m, shadow vertical walls, Buracona, Sal, A. Brito leg., 18/07/2014, dry colony with the soft tissues not removed, one rounded colony, Paratype; MMC-31: Sao Vicente, 6.xi.2014, small ramified colony, Peter Wirtz leg., Paratype; MMC-32: Buracona, Sal, 18.vii.2014, 4 m, shadow wall, A. Brito leg., one small ramified colony, Paratype; MMC-33: Boavista Island, 03.ix.2015, shallow waters in a wall, Peter Wirtz leg., two portion of colonies with the tissues not removed, Paratype; MMC-34: Sao Vicente, viii.2015, shallow waters, Peter Wirtz leg., small portion of a colony with tissues nor removed, Paratype.



**Diagnosis:** Corallum cylindrical and elongate (up to 6 cm long and 1.3 cm wide) forming ramified colonies showing bushy like morphology. Large polyps with several buds project, not only but mainly, in the upper part of the corallum. Corallum may be straight but often curved or even contorted. The calices are round to elliptical in outline, costae are granular. The calices contain up to 45 spiny septa with 24 full grown and the rest with low development; incomplete S4 may be join to S3 and the last can be also join to S2. Fossa moderately deep enclosing a massive spongy columella although can be practically absent from other polyps. Orange to yellow are the only colours known for this new species.

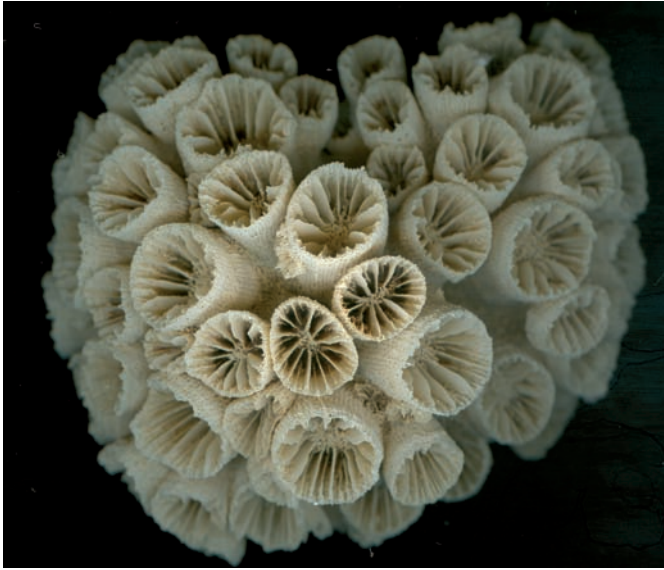
**Etymology:** The name is dedicated to Cape Verde Islands.

**Habitat and distribution:** The species has been located at shadow places in shallow waters although, as it happens with other species belonging to the same genus including *Astroides calycularis*, it may occur in deeper environments. Ruffles and walls from caves and tunnel gates are common places to find the new species. *T. caboverdiana* is only known from Cape Verde Islands. *Tubastrea caboverdiana*, as well as *Astroides calycularis*, may build up skeletons in the bottom forming a peculiar habitat.

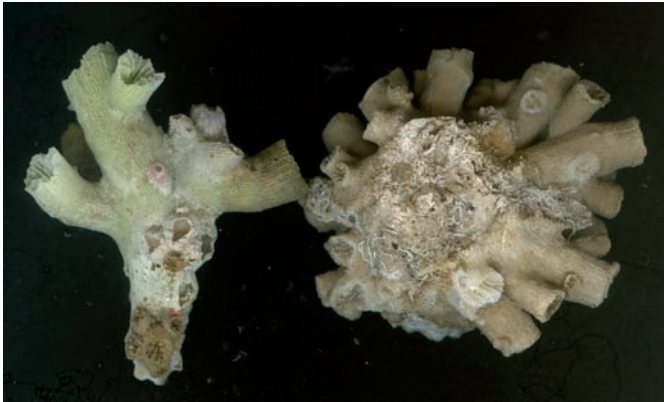
**Remarks:** From the point of view of the way of growing, the species belonging to *Tubastrea* genus can be divided in two groups: 1) *T. coccinea*, *T. aurea* y *T. faulkneri* form a basal plate and do not branch out, showing all of them attracting yellow-orange colours, meanwhile *T. diaphana* and *T. micrantha* (= *T. micranthus*) always ramify profusely, even similar to *Dendrophyllia* genus, and show brownish color in their polyps and tissues (see VERON, 1986; ARRIGONI *et al.*, 2014). The new species described, *T. caboverdiana*, ramifies discreetly and normally does not show basal plate (in case of its presence, branching and budding are evident), but present yellow-orange colours. Furthermore, *T. cabover-*



Skeletons of *Tubastrea caboverdiana* build up in the bottom, Tarrafal, Sao Tiago, Cape Verde. Image, O. Ocaña.



*Tubastrea caboverdiana*. Image from paratype MMC-30.

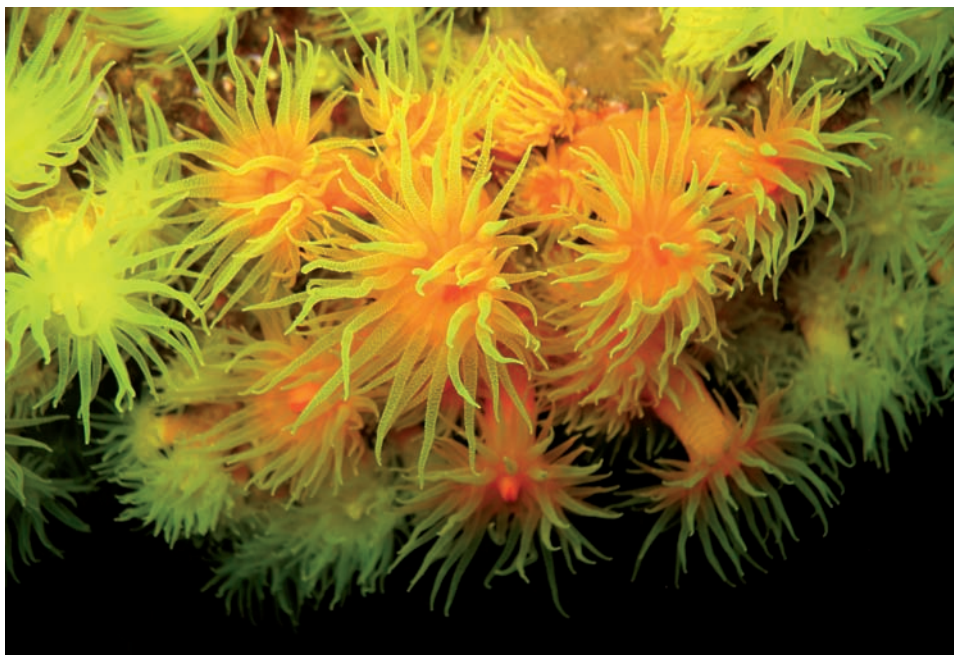


*Tubastrea caboverdiana*. Images of Paratype MMC- 31 right and Paratype MMC-33 left.

*diana* presents enlarged polyps. *T. coccinea* originally described from Bora Bora, in the Pacific Ocean, has been identified to be distributed along the Caribbean Sea and the Brazil region too. ROOS (1979), and ZLATARSKI & ESTALELLA (1982) shown the morphology and typical features of *T. coccinea* from Curacao and Cuba, both materials are quite different from *Tubastrea caboverdiana* as well as the material of *T. coccinea* studied by ARRIGONI *et al.*, (2014). In the colony of *T. coccinea* showed by CAIRNS & KITAHARA (2012), but also in ROOS (1979) and ZLATARSKI & ESTALELLA (1982), there are important differences with *T. caboverdiana*; colonies of *T. coccinea* present placoids to



*Tubastrea caboverdiana*. Image from Tarrafal, Sao Tiago. P. Wirtz.



*Tubastrea caboverdiana*. Image from Tarrafal, Sao Tiago. P. Wirtz.

faceloids morphology, meanwhile *T. caboverdiana* forms dendroids colonies. *Tubastrea sp1* from New Caledonia (ARRIGONI *et al.*, 2014) also develops modest dendroids colonies but color, and septa disposition are different. Furthermore, the septa are sipiny in *T. caboverdiana* and this character is apparently absent from *T. coccinea*; spiny septa are also identified in *Tubastrea sp2*. from New Caledonia although the columella is not spongy (see ARRIGONI *et al.*, 2014). The species *T. diaphana* is the most simmilar to *T. caboverdiana* in the growing morphology, although *T. caboverdiana* presents longer polyps, less open ramification and yellow-orange pigmentation, meanwhile, coenosteum, calyces and polyps of *T. diaphana* are brown coloured. The new species from Cape Verde was previously identified as *Enallopsammia micranthus* by CHEVALIER (1966); the researcher was impressive by the ramified colonies found at Cape Verde islands. However, the large dendroids ramification makes *T. micrantha* (= *E. micranthus* and *T. micranthus*) quite different from *T. caboverdiana* and any other known *Tubastrea*. Later, two different forms were identified in tropical West African coasts by LABOREL (1974): yellow-orange ramified form found in the Cape Verde Islands and other orange placoid form recorded along the Gulf of Guinea. This autor finds out the pigments differences among both species found in the tropical West Africa and the Chevalier misidentification, finally he also claims about a general revition of the genus *Tubastrea* to solve the taxonomical mistakes.

Family RHIZANGIIDAE d'Orbigny, 1851

### *Astrangia macrodentata* Thiel, 1940

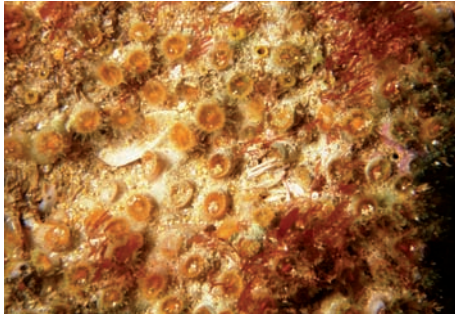
*Astrangia macrodentata* Thiel, 1940: 195-200, 3 Abb.

*Astrangia astraeformis*, Chevalier, 1966: 926-930, pl. III and IV.

**Material examined:** Agadir, MMC-104, 25.vii.2004, 20 meters, rocky bottom covered by sediments, 4 colonies growing on *Balanus*, O. Ocaña leg. Dakhla, MMC-105, 19.ii.2012, intertidal, understone, 3 small colonies, O. Ocaña leg. Oualidia, MMC-106, 31.iii.2013, intertidal in a shadow area of a big pool, 0.5-1 meter deep, rocks and sand, rocks affected by sediments, colonies invaded by calcareous algae, 1 small colony dry, 5 small colonies in alcohol and 1 colony in formaline, O. Ocaña leg.

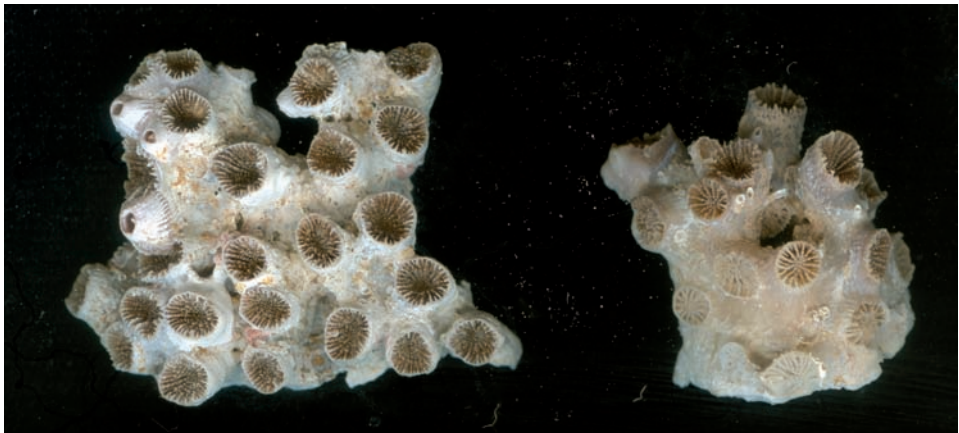
**Diagnosis:** Encrusting colonies with corallum reptoid, although sometimes giving the placoid apparence, corallites round, elliptical and also irregular in shape, never tightly packed but always spaced several millimeters apart (5 mm can be reached as a maximum separation among calyces). Calices 2-4 mm in diameter and 2-6 mm in height; septa arranged in 3 complete cycles, 4° cycle not complete. No more than 36 septa were observed but most calyces present more than 24 septa, S3 and S4 may enclose to S1, S2 and not very common S4 to S3. Septa dentate, strongly dentate in some corallites, fossa deep, columella normally papillose but some specimens may present trabecular. Colonies normally present brown color in the skeleton as a whole and particulary strongly in the fossa and septa, some colonies shows white color in the fossa. Extended polyps show whitish tentacles with green or even yellow in their contact with the oral disc, acrospheres white. Oral disc brownish or orange color, with green spots and stripes, oral operture orange. Zooxanthellae not observed.

**Habitat and distribution:** The colonies were found understones, growing on *Balanus sp.*, and also on shadow places of wide intertidal pools. All the environments share the presence of sand and rock, the dominance of algae was observed in the intertidal habitats and the invertebrate assemblage were very important in the infralitoral habitats from Agadir. The corallum was invaded by red algae in one of the intertidal locality but in both intertidal sites the sand covered the corallites. *Astrangia macrodentata* has been previously recorded from Congo (see THIEL, 1940). The species has been recorded also from Sierra Leone, Konakry and Dakar (see CHEVALIER, 1966). Due to its reduced size the species can be easily overlooked but it might be extended widely along North African coast.



*Astrangia macrodentata*. Images from Oualidia.

**Variability:** From the point of view of the skeleton, the material presents some variation. Brown color might be more usual, as we found it in the material from Agadir and Oualidia, while the white color was present only in the colonies from Dakhla. Some calyces from infralitoral are taller than the others from intertidal areas and present also trabecular columella although papillose is the normal morphology. Elliptical to irregular corallites are more typical from very stressing intertidal habitats.



*Astrangia macrodentata*. Images from Dakhla (left) and Agadir (right).

**Remarks:** Extratentacular budding is the most common way of asexual spread, but intratentacular has been inferred in our colonies and also observed previously on the material from Punta Noire in Congo (see THIEL, 1940: Abb 1-3). Sensu several authors (see PETERS *et al.*, 1988), the species, belonging to the genus *Astrangia*, recorded in Africa (see THIEL, 1928 and 1940; CHEVALIER, 1966), may represent different species. *A. macrodentata*, described by Thiel in 1940, belongs to this group of *Astrangia* species that do not present pali developed. *A. mercatoris* (from African coasts; see CHEVALIER, 1966) and *A. solitaria* (from the American coasts; see ZLATARSKY & ESTALELLA, 1982) develop pali meanwhile *A. macrodentata* (from African coasts), *A. rathbuni* and *A. poculata* (from American coasts and *A. rathbuni* also recorded from Antarctica by Cairns) do not develop pali. *A. macrodentata* do not form the tightly packed colonies with the polygonal corallites commonly observed in *A. poculata*. *A. macrodentata* and *A. rathbuni* are similar in shape and way of growing (see VAUGHAN, 1906), and we have thought to merge both species into one. However, the slight but constant differences (already remarked by CHEVALIER in 1966) between both species (wider calycinal diameter, taller corallites and four complete cycles in *A. rathbuni*), make us to leave them in two separate species. The specimens studied by Chevalier present a similar way of growing what we have found (see CHEVALIER, 1966, planche III and IV). López-González described colonies belonging to the genus *Astrangia* but without definitive status. The *Astrangia sp.* shows very much resemblance with our colonies, even the intratentacular budding, but unfortunately it is not possible to observe the fossa properly (see LÓPEZ-GÓNZALEZ, 1993: 415, Lam. 57D-E). López-González also describes pali in his specimens, although we appreciate some doubts about this particular, as he wrote about some soft differences between pali and columella not very consistent at all. Attending to these arguments, and also to the extended distribution range showed in this genus, it should be considered the possibility that *Astrangia sp.* (see LÓPEZ-GONZÁLEZ, 1993) could be *Astrangia macrodentata*. This is a new record from Morocco.

Family CARYOPHYLLIIDAE Gray, 1846

***Desmophyllum dianthus* (Esper, 1794)**

To check synonymous list see Cairns, 2000.

**Material examined:** Tenerife, Candelaria, Canary Islands, MMC-127, 20.xii.2011, lost fishing basket, 400 meters deep, 1 specimen, Javier Martín Barrios leg.

**Remarks:** The species was previously recorded from Canary Islands (see ZIBROWIUS, 1980) in the South East of Tenerife and it was confirmed in another publication (see BRITO & OCAÑA, 2004), although the information came from a dead specimen found associated to the colonial biobuilder *Solenosmilia variabilis*. The new found at Tenerife coast, in the upper bathial bottoms, of a live specimen, has been interesting not only to assure at least the rather common presence in the Canary sea but also it makes possible to have the general



*Desmophyllum dianthus* from Tenerife.

color information of the specimen. The species is widely known as *Desmophyllum crista-galli* (see ZIBROWIUS, 1980).

### *Caryophyllia cyathus* (Ellis & Solander, 1786)

To check synomimous list see Zibrowius, 1980.

**Material examined:** Tenerife, Candelaria, Canary Islands, MMC-128, 20.xii.2011, lost fishing basket, 400 meters deep, 1 specimen, Javier Martín Barrios leg.

**Remarks:** The species had been previously recorded from Canary Islands (see ZIBROWIUS, 1980) in Tenerife and Lanzarote. We also found material in Tenerife and that study was already published (see BRITO & OCAÑA, 2004). The new found at Tenerife coast, at the same locality, Candelaria, in the upper batial bottoms of a live specimen has been interesting not only to assure at least the rather common presence in the Canary sea, but it also makes possible to have the general color information of the specimen.



*Caryophyllia cyathus* from Tenerife.

***Phyllangia mouchezii* (Lacaze-Duthiers, 1897)**

To check synonymous list see Brito y Ocaña, 2004 and Zibrowius, 1980.

**Material examined:** Atlantic Morocco: Agadir, MMC-107, 25.vii.2004, 25 meters, rocky bottom covered by sediments, very low visibility, 1 portion of a colony, O. Ocaña leg.; Cape Verde Islands: Three Rocks, Tarrafal, Sao Tiago, MMC-108, vii.2008, 1 colony, P. Wirtz leg.; Sao Vicente, MMC-109, 06.xi.2004, 1 small colony, P. Wirtz leg.; MMC-128, viii. 2015, colony with the tissues do not removed, P. Wirtz leg.; Bahía de Murdeira, Sal Island, MMC-110, ruff, 4-5 meters, 10.vii.2014, 7 colonies of small to medium sizes, A. Brito leg.; Gulf of Guinea, Gabón: Pongara National Park, MMC-111, x.2012, 1 colony, K. Ballesteros leg.

**Remarks:** This is a new record from Morocco and Cape Verde Islands. Certainly, all the material examined shows a variation range typical for a widely distributed species, although keeping the main characters. *Sensu* CAIRNS (2000), *Phyllangia mouchezii* from the North East Atlantic is a subspecies of *Phyllangia americana*, so there are *P. americana americana* and *P. americana mouchezii*. *Sensu* this assertion *P. americana nazensis*, described by CHEVALIER (1966) is merged into *P. americana mouchezii*. However, the colony from Gabon presents cup like calyces, with exerted pointed septa, and these characters have not been observed previously. Although looking the wide range of variation in the species (see BRITO & OCAÑA, 2004; ZIBROWIUS, 1980 and the present images included in this paper) we feel the subject still should be resolved.



*Phyllangia mouchezii*. Images from Agadir (left) and Cape Verde (right).



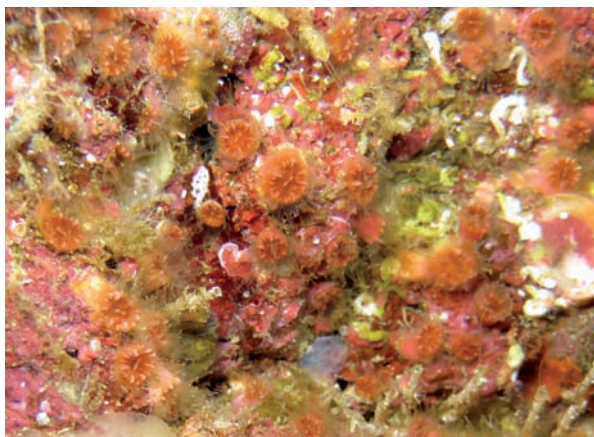


*Phyllangia mouchezii*. Colony from Gabón.

### ***Polycyathus senegalensis* Chevalier, 1966**

To check synonymous list see Brito y Ocaña, 2004 and Zibrowius, 1980.

**Material examined:** Cape Verde Islands, Tarrafal, Sao Tiago: MMC-112, 18.viii.2002, 20 m, gate cave, rocky bottom with sand, 1 colony, O. Ocaña leg; Tarrafal, Sao Tiago: MMC-113, vii.2008, one small colony and another big colony with numerous polyps, P. Wirtz leg; Sao Vicente, MMC-114, 08.xi.2014, ruff in a cave, three small colonies, P. Wirtz leg.



*Polycyathus senegalensis*. Image from Sao Vicente (left) and from Tarrafal (right). P. Wirtz

**Remarks:** This is a new record from Cape Verde Islands. The variability of the colony matches very well with the specimens observed and studied by CHEVALIER (1966). The pali of the material from Senegal and Cape Verde archipelago present an asymmetrical development, very evident in the colony from Senegal (see CHEVALIER, 1966) and also bushy like morphology. In the Canaries and Madeira the corallites merged into the genus *Polycyathus* present commonly a brown dark color, even black in the deepest part of the calyces (not recorded in the material from Senegal or Cape Verde Islands) and indeed we do not find those variation range in the pali; neither observed in the colonies showed by ZIBROWIUS (1980), ZIBROWIUS & SALDANHA (1976) and BEST (1968); however, it is present in our material from Cape Verde.

### ***Thalamophyllia wirtzi* Ocaña & Brito new species**

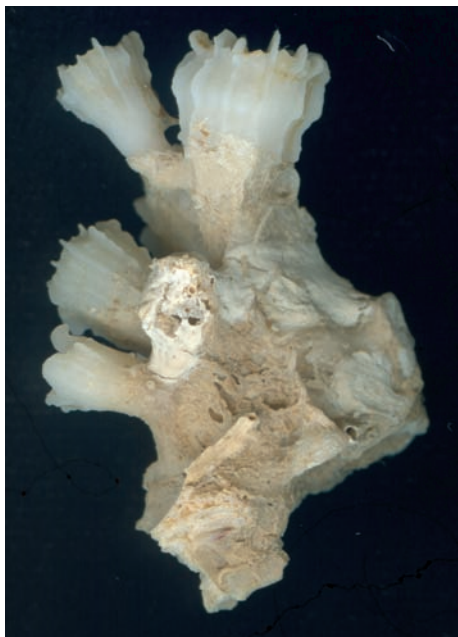
**Material examined:** Cape Verde Islands, Sal, Cavala: MMC-35, 28.xi.2006, 40 m, roof of cave, 1 small colony, P. Wirtz leg., Holotype; idem, 1 small colony, MMC-36, Paratype; Sal Island, Cavala: MMC-37, 28.xi.2006, 40 m, roof of cave, 1 small colony, P. Wirtz leg., Paratype; Tarrafal, Sao Tiago, Arco: MMC-38, vii.2008, shadow place, two placoid colonies, P. Wirtz leg., Paratype; Tarrafal, Sao Tiago, The Wall: MMC-39, viii.2008, several small colonies, P. Wirtz leg., Paratype; Tarrafal, Sao Tiago, Punta do Atum: MMC-40, vii.2008, several small colonies, P. Wirtz leg., Paratype; Tarrafal, Sao Tiago, Danger: MMC-41, vii.2008, several small colonies, P. Wirtz leg., Paratype.

**Diagnosis:** Phaceloids to placoids colonies that forms solid aggregations of corallites. The corallites are not individualized from the common base and can extrude considerably or not extrude very much. Small calyces present 24 septa (S1, S2 and S3), but medium and big ones can reach S1, S2, S3, S4 and even incomplete S5 was observed in one calyx; S1 and S2 are exsert, in some colonies are extremely exsert. Calyces can be circular to elliptical (up to 18 mm in diameter) and the septa present moderate to low exsertness, costae can be well developed or also hardly to be distinguished. There is a wide central space in the calyces with a deep fossa. There is not columella; tiny granules cover the septal faces. Budding is observed as well as commonly intracalycinal partition. Rose and white are the common colors observed in the colonies, greenish and also brown was recorded sporadically.

**Etymology:** The name is dedicated to Dr. Peter Wirtz who has been doing a huge sampling efforts in the behalf of the East Atlantic marine fauna knowledge.

**Habitat and distribution:** The species has been observed in shadow habitats (caves, tunnels and vertical walls) from 20 to 40 meters. *T. africana* is known from Sao Tiago and Sal islands but surely should be present in other Cape Verde islands.

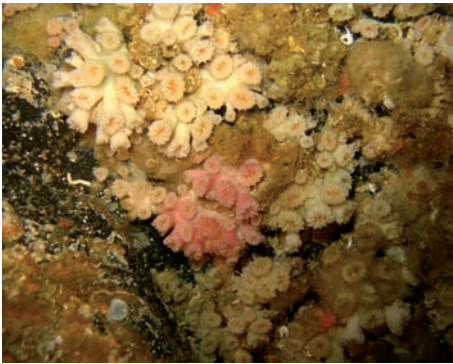
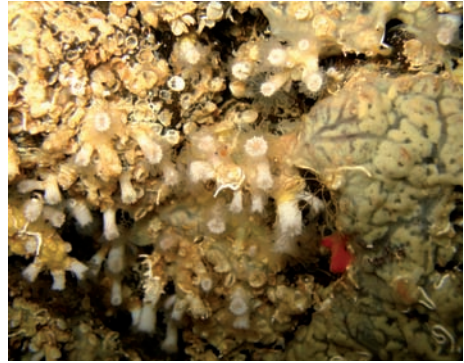
**Remarks:** *T. wirtzi* shows a range of variability from small phaceloids to solid placoids colonies, with the corallites partially embeded in the common skeleton, but it never was observed any reptoid colony. The costae can be very developed along the corallites or, in the contrary, hardly to be noticed. The exertion of S1 and S2 can be observed in phaceloids and placoids colonies as well. The species is placed in the genus *Thalamophyllia* because of its



*Thalamophyllia wirtzi*. Image of the Paratype MMC-35.



*Thalamophyllia wirtzi*. Image of the Holotype MMC-34.



*Thalamophyllia wirtzi*. Images from different bottoms at Tarrafal, Sao Tiago (Cape Verde Islands). P. Wirtz.

shape that fits very well with the general morphology of the genus; moreover, the budding behaviour and the absence of columella are also complementary characters to reinforce the decision. There are four species of this genus, *T. riisei*, *T. gasti*, *T. gombergi* and the present new species. The three previous known species share the development of reptoid and phaceloids colonies and the reproduction trend (extratentacular budding) (see CAIRNS, 1979), meanwhile, *T. wirtzi* mainly present intratentacular bipartition colonies and develop placoid colonies and more septa cycles. Nevertheless, some growings of *T. wirtzi* present some resemblance with *T. gasti* but the last species does not form colonies with polyps not individualized, merged in a common tissue, as it happens in *T. wirtzi*. Furthermore, *T. wirtzi* shows wider polyps with a common intracalycinal bipartition and *T. gasti* only present extratentacular budding and polyps with diameter not wider than 5 mm (see ZIBROWIUS, 1980).

### ***Africana* Ocaña & Brito new genus**

Faceloid to reptoid colonies formed by extracalycinal budding present (intracalycinal also possible). The calices are solid in their skeleton and present septal junction and exsertness in all septa, costa well marked. Columella trabecular like. There is not pali.

*Africana wirtzi* Ocaña & Brito new species

**Material examined:** Cape Verde Islands, Tarrafal, Sao Tiago, Three rocks: MMC-42, viii.2008, one colony, P. Wirtz leg., Holotype.

**Diagnosis:** Small to medium size colonies formed by flat corallites with a solid skeleton (up to 10 mm high × 10 mm wide). S1, S2, S3 and S4 complete and S5 very scarce and only present some couples, S1 most developed and exsert; S2 less developed and exsert; S3 join with S2 at the columella level showing a typical appearance of septal junction. S5 exclusively developed in major specimens, small calyces only reaching incomplete S4. There are granules in most of the developed septa. Thick columella with trabecular appearance, the pali is absent. The color observed was rose or orange in the calyces, disc and tentacles looks like redish color in retraction conditions.



*Africana wirtzi*, holotype.

**Etymology:** The name is dedicated to Dr. Peter Wirtz who has been doing a huge sampling efforts in the behalf of the East Atlantic marine fauna knowledge.

**Remarks:** The presence of a solid corallum joined to the septal junction make *Africana wirtzi* different from other genus into the Caryophylliidae family. Certainly, perhaps its solid calice keep some resemblance with the very strong corallum of *Heterocyathus*, but the rest of characters, as septa arrangement or pali presence, are completely different among both genera (see CAIRNS & KITAHARA, 2012). Septal junction observed in the new genus and species can be typically observed in Dendrophylliidae but the porous corallum, a basic character of this family is indeed absent in *A. wirtzi*. It is possible to find septal junction also in other Caryophylliidae genera as *Stephanocyathus*, *Deltocyathus* or *Peponocyathus* but the corallum characters, morphology and way of life are very different compared to *A. wirtzi*. In the sea, the new species and genus keep some resemblance with the genus *Phyllangia* (see CAIRNS, 1979; ZIBROWIUS, 1980; CAIRNS, 2000). There is only a single colony of the new genus and species, but due to the clear distinction among the others Caryophylliidae species and genera we have decided to describe the new taxa on the base of the holotype.



*Africana wirtzi*. Image from Tarrafal, Sao Tiago. P. Wirtz.

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