

THE MALACOLOGICAL FAUNA OF SALVAGE ISLANDS.

1. OPISTHOBRANCH MOLLUSCS

By MANUEL ANTÓNIO E. MALAQUIAS * & GONÇALO J.P. CALADO ¹

With 2 figures and 1 table

ABSTRACT. During the "Selvagens 94" expedition, intertidal and infralittoral communities of Salvage Grande (Salvage Islands) were sampled for molluscs these latter by SCUBA diving to a depth of 25 m.

Individuals assignable to a total of 44 species of opisthobranch molluscs from five orders were collected (13 to the Cephalaspidea, 9 to the Anaspidea, 3 to the Ascoglossa, 2 to the Notaspidea and 17 to the Nudibranchia). This paper reports 33 of those which have their identity at specific level confirmed. Of these 28 are first records for the Salvage Islands.

From a zoogeographical point of view, the opisthobranch fauna of this island is dominated by eastern Atlantic elements (British Isles, Morocco, western Mediterranean). Special zoogeographical remarks are given for *Runcina adriatica*, *Stylocheilus longicauda*, *Stiliger llerai*, *Berthella stellata*, *Plocamopherus maderae* and *Hypselodoris bilineata bilineata*.

RESUMO. Como resultado da Expedição "Selvagens 94" são descritas 44 espécies de opistobrânquios recolhidos nas Ilhas Selvagens, nas zonas interdital e infralitoral, até à profundidade máxima de 25m. As espécies registadas distribuem-se por 5 Ordens (13 Cephalaspidea, 9 Anaspidea, 3 Ascoglossa, 2 Notaspidea e 17 Nudibranchia). Das 44 espécies referidas, 33 foram determinadas ao nível específico, constituindo 28 delas novos registos para as Ilhas Selvagens.

Do ponto de vista zoogeográfico, os opistobrânquios das Selvagens são predominantemente espécies do Atlântico Este. São ainda fornecidos alguns comentários acerca da biogeografia de algumas espécies em particular.

* Museu Municipal do Funchal (História Natural), R. da Mouraria, 31, 9000 Funchal, Portugal

¹ Instituto Português de Malacologia, Apartado No. 52, S. Pedro do Estoril, 2765 Estoril, Portugal

INTRODUCTION

During July and August 1994, Museu Municipal do Funchal (História Natural) and Instituto Português de Malacologia carried out a joint expedition ("Selvagens 94") to the Natural Reserve of the Salvage Islands (Fig. 1). This expedition is part of a larger research program addressing the opisthobranch molluscs of Madeira Archipelago (Madeira, Porto Santo, Desertas and Salvage Islands); this program started in April 1994 and aims at achieving a better understanding of the Portuguese malacological fauna, as a whole.

Our knowledge of the opisthobranch fauna of the Salvage Islands is very limited. Until rather recently only six species, all assigned to the Order Cephalaspidea, were reported (TALAVERA, 1978 and NORDSIECK & TALAVERA, 1979) for this Islands. This paper represents a substantial improvement in the situation and contributes to the faunistic and zoogeographical aspects of the opisthobranch molluscs.

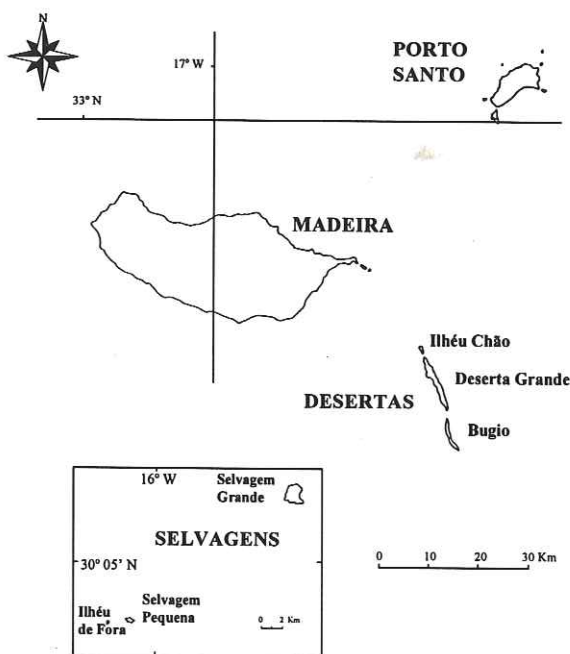


Fig. 1 - Map of the Madeira and Salvage Archipelagos (adaptated from ZINO & BISCOITO, 1994)

STUDY AREA

The study area was restricted to the island Salvage Grande where ten sampling stations were established (Fig. 2). Two stations on the northern coast (a total of two sampling efforts) and eight stations on the southern coast (a total of eighteen sampling efforts).

TABLE 1 - Sampling Stations: names and geographical coordinates

Name of location	Geographical coordinates
Ponta da Atalaia (PA)	30° 08' 19" N; 15° 52' 20" W
Enseada das Cagarras (EC)	38° 08' 17" N; 15° 52' 11" W
Ponta dos Moinhos (PM)	30° 08' 13" N; 15° 52' 06" W
Restinga (R)	30° 08' 06" N; 15° 52' 00" W
Enseada da Fonte das Galinhas (EFG)	30° 08' 12" N; 15° 51' 56" W
Ponta do Inferno (PI)	30° 08' 08" N; 15° 51' 43" W
Fonte Salgada (FS)	30° 08' 09" N; 15° 51' 29" W
Ponta do Leste (PL)	30° 08' 09" N; 15° 51' 16" W
Ponta do Corgo da Areia (PCA)	30° 08' 12" N; 15° 51' 37" W
Ponta do Risco (PR)	30° 09' 08" N; 15° 52' 11" W

Locations corresponding to the sampling stations were named herein after the "Plano Hidrográfico da Salvage Grande" of the "Missão Hidrográfica das Ilhas Adjacentes de 1938".

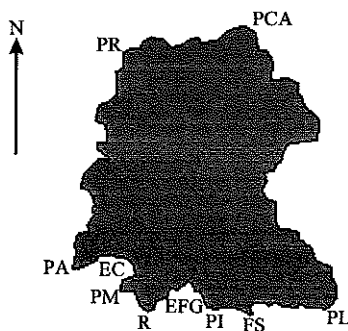


Fig. 2 - Salvage Grande island: Sampling stations.

From Figure 2 it can be noticed that the distribution of the sampling stations is not uniform, due to technical and accessibility reasons. Access to the coast line from the interior of the island is hampered due to the slope of the cliffs and the approach from the

sea is very dependent on the weather conditions, especially as the only boat available has a low powered motor. The sea is usually rough off the northern coast of the island. It should also be mentioned that the terrain between the sampling stations and the field laboratory is particularly difficult.

MATERIAL AND METHODS

Collecting was carried out from the intertidal area down to a depth of 25m. On the intertidal zone small rock pools and their walls were searched for molluscs and inspection under areas of naturally cemented stones (by sponges and calcareous algae) and boulders was made possible using a metal lever. Infralittoral samplings were carried out by SCUBA diving. Whenever possible rocky walls and surfaces, of variable slope and lighting conditions (vertical walls, ceiling of caves, surfaces of rocks and large boulders), were inspected and frequently specimens were individually collected. The underside of movable stones and small boulders, usually rich in sessile organisms, was also inspected for molluscs. Collecting was also carried out using an air suction device or by brushing organisms into a 1mm mesh bag. Areas covered with algae of genus *Codium*, as well as sandy areas adjacent to rocks or larger boulders were also sampled.

Collected samples were subsequently screened at the field laboratory (set up at Reserva Natural's facilities). Materials were sieved (sieves with meshes of 5mm, 2mm and 1mm) using sea water. Fractions were separated in trays with sea water. These trays were left alone for some time and, due to anoxia, living organisms would tend to crawl to the surface, thus allowing a first visual sorting. After this, the remaining materials were observed with a stereo-microscope to complete the sorting.

After sorting, the opisthobranchs were, if possible identified and their external morphology recorded, either by photography (with a macro lens or through the stereomicroscope) or by drawing the general appearance of the individual as well as details of meaningful external structures. In order to make this easier specimens were anaesthetised with magnesium chloride.

After the above procedures specimens were deeply anaesthetised (with magnesium chloride, or by freezing) and preserved in 70% ethanol.

RESULTS

All samples were deposited in the collection of Museu Municipal do Funchal (História Natural).

During the expedition specimens assignable to a total of 44 species from five orders were collected (13 to the Cephalaspidea, 9 to the Anaspidea, 3 to the Ascoglossa, 2 to the Notaspidea and 17 to the Nudibranchia). This paper reports 33 of those which have had their specific names confirmed.

The taxonomic classification follows the parameters outlined by CERVERA *et al.* (1988).

Class GASTROPODA CUVIER, 1797

Subclass OPISTHOBRANCHIA MILNE EDWARDS, 1848

Order CEPHALASPIDEA FISCHER, 1883

Family Retusidae THIELE, 1926

***Retusa truncatula* (BRUGUIÈRE, 1792)**

Location, date and number of specimens: PI - 9/8/94, one specimen.

Ecological remarks: Collected on sand at depths of 15 to 16 meters.

Distribution: Norway, Baltic Sea, France, Canary Islands and Mediterranean Sea (Dautzenberg et Fischer, 1925 (as *Tornatina* (*Retusa*) *truncatula*); Thompson, 1988); Iberian Peninsula (Cervera *et al.*, 1988); Azores (Dautzenberg, 1889; Mikkelsen, 1995); Madeira (Watson, 1897; Nobre 1937; Nordsieck & Talavera 1979); Porto Santo (Nobre, 1937).

Previous records: First record for Salvage Islands.

***Retusa leptoneilema* (BRUSINA, 1866)**

Location, date and number of specimens: EC - 28/7/94, one shell, 2 mm long.

Ecological remarks: Collected by suction on sand at 5 to 10 m.

Distribution: Canary Islands (Nordsieck & Talavera, 1979); Balearic Islands (Cervera *et al.*, 1988); Porto Santo (Nordsieck & Talavera, 1979).

Previous records: Talavera (1978: 126); Nordsieck & Talavera (1979: 176, pl. XLIV, fig. 39).

***Retusa mammillata* (PHILIPPI, 1836)**

Location, date and number of specimens: PA - 11/8/94, one shell.

Ecological remarks: Found on sand at a depth of 16 m.

Distribution: Northwest of France (Dautzenberg et Fischer, 1925), Iberian Peninsula, Balearic Islands (Cervera *et al.*, 1988); Canary Islands (Nordsieck, 1972); Madeira (Nordsieck, 1972); Porto Santo (Nordsieck & Talavera, 1979).

Previous records: Talavera (1978: 126); Nordsieck & Talavera (1979: 177, pl. XLIV, fig. 42).

Family Runcinidae H. & A. ADAMS, 1854

***Runcina adriatica* THOMPSON, 1980**

Location, date and number of specimens: EC - 31/7/94, one specimen, 2 mm long; R - 7/8/94, three specimens (two 1,5 mm and one 2 mm long); FS - 14/8/94, six specimens all between 2 to 4 mm long.

Ecological remarks: One collected near sponges at 8m deep, the others at depths of 3m and 18m.

Distribution: Adriatic Sea (Thompson, 1980) and Azores (Gosliner, 1990).

Previous records: First record for Salvage Islands.

***Runcina ornata* (QUATREFAGES, 1844)**

Location, date and number of specimens: EC - 31/7/94, one specimen, 1 mm long.

Ecological remarks: Collected at a depth of 8 m near sponges.

Distribution: From the British Isles to Portugal and French Mediterranean (Thompson, 1988); Galisia, Asturias and Andalusia (Cervera *et al.*, 1988).

Previous records: First record for the Salvage Islands.

Family Bullidae LAMARCK, 1801

***Bulla mabiliei* LOCARD, 1896**

Location, date and number of specimens: EC - 28/7/94, one shell, 26 mm long; EC - 3/8/94, one shell, 41 mm long; EC - 8/8/94, one shell, 34 mm long.

Ecological remarks: All collected on sand at depths of 8-10 m.

Distribution: This species is only known from Macaronesian archipelagos - Cape Verde Archipelago, Canary Islands, Salvage and Madeira (Dauzenberg et Fischer, 1906; Dautzenberg, 1927; Pérez Sánchez & Moreno Batet, 1990); Madeira (Watson, 1897; Nobre, 1937; Nordsieck, 1972; Nordsieck & Talavera, 1979).

Previous records: Talavera (1978: 126); Nordsieck & Talavera (1979: 174, pl. XLIII, fig. 29).

Family Haminoeidae PILSBRY, 1895

***Haminoea hydatis* (LINNÉ, 1758)**

Location, date and number of specimens: EC - 28/7/94, eleven specimens and six shells; PL - 13/8/94, five specimens ranging between 2 and 9 mm long.

Ecological remarks: Collected at depths of 3-15 m deep, a very abundant species.

Distribution: East Atlantic, from the British Isles to the Ascension and St. Helena Islands. Mediterranean Sea (Talavera *et al.*, 1987); Balearic Islands and Canary Islands (Cervera *et al.*, 1988); Madeira (Watson, 1897; Nobre, 1937; Nordsieck & Talavera, 1979).

Previous records: Talavera (1978: 126).

***Haminoea cf. ortei* TALAVERA, MURILLO & TEMPLADO, 1987**

Location, date and number of specimens: FS - 14/8/94, one specimen, 2 mm long.

Ecological remarks: Collected by suction on rocks between 3 and 15 m deep.

Distribution: Murcia ("Mar Menor", Gata Cape and Palos Cape) (Talavera *et al.*, 1987); Azores (Mikkelsen, 1995, as *H. cf. ortei*).

Previous records: First record for Salvage Islands.

***Atys macandrewi* SMITH, 1872**

Location, date and number of specimens: PA - 5/8/94, one specimen.

Ecological remarks: Collected at a depth of 18 m on sand.

Distribution: Canary Islands (Cervera *et al.*, 1988) and Azores (Nordsieck, 1972; Mikkelsen, 1975); Madeira (Nordsieck, 1972).

Previous records: Talavera (1978: 126).

Order ANASPIDEA FISCHER, 1883

Family Aplysiidae LAMARCK, 1809

Aplysia depilans* GMELIN, 1791**Location, date and number of specimens: EFG - 7/8/94, two specimens, each 120 mm long.Ecological remarks: Both were collected at a depth of 11 m on the surface of a shell of *Pinna rudis*.Distribution: From southeast of the British Isles to the western coasts of Africa, Morocco, Rio do Ouro and Cape Verde Archipelago (Dautzenberg et Fisher, 1925; Ortea & Martínez, 1990); Portugal (Oliveira, 1895; Nobre, 1938-40); Canary Islands (Altamira & Ros, 1979; Ortea & Martínez, 1991); Spanish Mediterranean coast (Cervera *et al.*, 1988); Cyprus (Barash & Danin, 1989); Sicily (Cattaneo-Vietti & Chemello, 1987); Madeira (Eales, 1957; 1960; Nordsieck & Talavera, 1979).Previous records: First record for Salvage Islands.Aplysia fasciata* POIRET, 1789**Location, date and number of specimens: EC - 27/7/94, two specimens, 95 and 100 mm long.Ecological remarks: Collected at a depth of 10 m, on stones.Distribution: Eastern Atlantic, southeast coast of England (Thompson, 1988), from France to Angola, Morocco, Senegal and Ghana. Red Sea (Eales, 1960; Ortea & Martínez, 1991); Ivory Coast (Marcus & Marcus, 1968); Portugal (Nobre, 1938-40); Azores (Wirtz & Martins, 1993); Canary Islands (Odhner, 1931, as *A. leporina*); Cape Verde Archipelago (Ortea & Martínez, 1990); Mediterranean Sea, Sicily and Cyprus (Cattaneo & Barletta, 1984; Cattaneo-Vietti & Chemello, 1987; Cattaneo-Vietti & Thompson, 1989; Barash & Danin, 1989); Madeira (Nordsieck & Talavera, 1979).Previous records: First record for Salvage Islands.***Aplysia dactylomela* RANG, 1828**Location, date and number of specimens: EC - 28/7/94, one specimen, 170 mm long.Ecological remarks: Very common from the intertidal zone to a depth of 15 m.Distribution: It is a circumtropical species, whose geographical distribution includes Red Sea, India, Mauritius Id., South Africa, China, Japan, Philippines, Australia, New Zealand, Florida, Panama, Mexico, Brazil and Bermuda (Eales, 1960); Puerto Rico, Barbados, Jamaica and Curaçao (Thompson, 1977); Cuba (Martínez & Ortea, 1991-92); Canary Islands (Odhner, 1931); "Cape Verde" (Rang, 1828); Senegal, Ghana (Bebbington, 1982) and Morocco (Pruvot-Fol, 1953); Madeira (Watson, 1897; Nobre, 1937).Previous records: First record for the Salvage Islands.***Aplysia parvula* GÜLDING in MÖRCH, 1863**Location, date and number of specimens: EC - 28/7/94, three specimens of 17, 20 e 22 mm long.

Ecological remarks: Found at depths between 5 and 10 m.

Distribution: According to Eales (1960) this is a circumtropical species existing between the latitudes 40° N and 40° S, having been found in India, Mauritius Ids., Japan, China, Samoa, Hawaii, Australia, New Zealand and California. On Western Atlantic it was found in Florida and Brazil (Eales, 1957) as well as in Jamaica, the Caribbean Islands, Curaçao and Puerto Rico (Thompson, 1977). On Eastern Atlantic locations it is known from Morocco, Senegal, Azores (Eales, 1960), Madeira (Eales, 1957; 1960) and Portugal (García-Gómez *et al.*, 1991). Concerning Mediterranean locations it was reported from Southeastern Spain and Balearic Ids. (Cervera *et al.*, 1988), Turkey (Swennen, 1961) and Italy (Cattaneo, 1982).

Previous records: First record for the Salvage Islands.

Family Dolabriferidae PILSBRY, 1895

***Dolabrifera dolabrifera* CUVIER, 1817**

Location, date and number of specimens: EC - 28/7/94, three specimens, one with 39 mm and the others with 40 mm long; EC - 3/8/94, one specimen with 38 mm long; EC - 4/8/94 one specimen with 40 mm long.

Ecological remarks: All were collected under stones, at depths of 5 to 10 m.

Distribution: It is a circumtropical species. Indo-Pacific (Yonow & Hayward, 1991); Antilles (Mörch, 1863); Bermuda (Verrill, 1901); Curaçao (Engel, 1927); Florida (Marcus & Marcus, 1962), Brazil (Marcus & Marcus, 1964); Barbados (Marcus & Hughes, 1974); Colombia (Marcus, 1976), Jamaica (Thompson, 1977) and Cuba (Martínez & Ortea, 1991-92). Concerning eastern Atlantic locations it was reported from the Gulf of Guinea and the Island of S. Tomé (Haefelfinger and Kress, 1970), Cape Verde Archipelago (Ortea and Martínez, 1991), Canary Islands (Ortea and Martínez, 1991) and Madeira (Wirtz, 1995).

Previous records: First record for the Salvage Islands.

***Petalifera petalifera* RANG, 1828**

Location, date and number of specimens: FS - 14/8/94, one specimen 15 mm long.

Ecological remarks: Collected under a stone, at 8-13 m deep.

Distribution: Mediterranean Sea (Cattaneo-Vietti & Thompson, 1989); southeastern coasts of Spain (Cervera *et al.*, 1988); Canary Islands (Ortea & Martínez, 1991). In the Western Atlantic it is mentioned a form of this species, *Petalifera petalifera* f. *bonairei*, from Bonaire, Puerto Rico, Brazil and Barbados (Ortea & Martínez, 1991).

Previous records: This is also a first record for Salvage Islands.

***Petalifera ramosa* BABA, 1959**

Location, date and number of specimens: PA - 11/8/94, one specimen 55 mm long.

Ecological remarks: Collected under a stone at a depth of 20 m.

Distribution: Florida and Colombia (Marcus & Marcus, 1967; Marcus, 1976); Jamaica (Thompson, 1977); Cuba (Martínez & Ortea, 1991-92); Eastern Atlantic, Canary Islands (Ortea & Martínez, 1991).

Previous records: This is a first record for this Salvage Islands.

Family Notarchidae EALES and ENGEL, 1935

***Stylocheilus longicauda* (QUOY and GAIMARD, 1824)**

Location, date and number of specimens: FS - 13/8/94, one specimen 38 mm long.

Ecological remarks: Collected by suction between 10 and 15 m deep, on rocks covered by algae of the genus *Codium* and *Padina*.

Distribution: According to Eales (1960) this is a circumtropical species. It known from Inhaca Id., Mozambique (Macnae, 1962) and Indian Ocean's coast of South Africa (Gosliner, 1987). On western Atlantic it was reported from Florida, Colombia, Curaçao, Brazil, Barbados and Puerto Rico (Thompson, 1977). The only eastern Atlantic capture location mentioned in the literature is Cape Verde Archipelago (Ortea and Martínez, 1990).

Previous records: This is a first record for Salvage Islands.

Order ASCOGLOSSA BERGH, 1876

Family Elysiidae H. y A. ADAMS, 1854

***Elysia viridis* (MONTAGU, 1804)**

Location, date and number of specimens: PM - 30/7/94, one specimen, 3 mm long.

Ecological remarks: Collected by suction between 10 and 18 m deep.

Distribution: British Isles, Norway, France (Dautzenberg et Fischer, 1925; Thompson, 1988); All the Iberian coasts (Cervera *et al.*, 1988); Portugal (Oliveira, 1895; Nobre, 1931, 1938-40); Ceuta (García-Gómez *et al.*, 1989); Mediterranean Sea (Schmekel & Portmann, 1982; Cattaneo-Vietti & Thompson, 1989); South Africa (Gosliner, 1987); Canary Islands (Bacallado *et al.*, 1996); Madeira (Wirtz, 1995).

Previous records: First record for the Salvage Islands

Family Polybranchiidae H. y A. ADAMS, 1854

***Stiliger llerai* ORTEA, 1981**

Location, date and number of specimens: PL - 13/8/94, one specimen, 5 mm long.

Ecological remarks: Collected by suction at a depth between 3 and 15 m, on rocks covered by algae of the Genera *Codium* and *Padina*.

Distribution: Tenerife Island, Canary archipelago (Ortea, 1981).

Previous records: This is a first record for the Salvage Islands

Order NOTASPIDEA FISCHER, 1883

Family Tylodinidae GRAY, 1847

***Tylodina perversa* (GMELIN in L., 1791)**

Location, date and number of specimens: PM - 30/7/94, two specimens, 9 and 10 mm long; PI - 9/8/94, twenty-one specimens; PA - 11/8/94, one specimen; PL - 13/8/94, four specimens; FS - 14/8/94, eight specimens.

Ecological remarks: All were collected at depths of 3 to 15 m, usually on the sponge *Verongia aerophoba*.

Distribution: Mediterranean Sea, Sicily, Sardinia and Balearic Islands (Cattaneo-Vietti & Chemello, 1987; Doneddu & Manuza, 1990; Templado, 1982); Ceuta (García-Gómez *et al.*, 1989); Canary Islands (Odhner, 1931, as *Tylodina citrina*); Madeira (Watson, 1897; Nobre, 1937; Nordsieck & Talavera, 1979).

Previous records: This represents a first record for Salvage Islands.

Family Pleurobranchidae FÉRUSAC, 1822

***Berthella stellata* (RISSO, 1826)**

Location, date and number of specimens: EFG - 8/8/94, two specimens, 13 and 25 mm long; PI - 9/8/94 one specimen with 8 mm.

Ecological remarks: One specimen was found in a tide-pool in the intertidal zone, under a stone, the other one was collected at a depth of 15 m under a rock.

Distribution: Mediterranean Sea (Cattaneo & Barletta, 1984); Cantabric Sea, Andalusia, Catalonia and Balearic Islands (Cervera *et al.*, 1988); Ceuta (García-Gómez *et al.*, 1989).

Previous records: First record for the Salvage Islands.

Order NUDIBRANCHIA BLAINVILLE, 1814

Suborder DORIDACEA ODHNER, 1934

Family Triophidae ODHNER, 1941

***Plocamopherus maderae* (LOWE, 1842)**

Location, date and number of specimens: EC - 27/7/94, one specimen, 9 mm long; EC - 28/7/94, one specimen, 16 mm long; EFG - 7/8/94, one specimen, 13 mm long.

Ecological remarks: Individuals of this species were collected from the intertidal zone (inside tidal pools) down to 19 m deep. Our specimens were collected not only in photic environments with dense algal growths but also in places having poor illumination with dense sponge communities.

Distribution: Cape Verde (Eliot, 1906); Canary Islands (Ortea & Pérez, 1992); Madeira (Lowe, 1842; Watson, 1897; Nobre, 1937; Nordsieck, 1972).

Previous records: First record for the Salvage Islands.

Family Aegiretidae FISCHER, 1883

***Aegires sublaevis* (ODHNER, 1931)**

Location, date and number of specimens: PA - 29/7/94, one specimen, 9 mm long.

Ecological remarks: Collected at a depth of 10 m, on a wall covered with sponges. Specimens collected at Madeira Id. have the peculiarity of being white.

Distribution: Canary Islands (Odhner, 1931; Altamira & Ros, 1979; Sánchez *et al.*, 1991); Mediterranean, Spain from the Gata Cape to the Catalonia coasts (Cervera *et al.*, 1988); Bermudas (Thompson, 1981).

Previous records: This is also a first record for the study area.

Family Polyceriatidae ALDER & HANCOCK, 1845

***Thecacera pennigera* (MONTAGU, 1815)**

Location, date and number of specimens: PA - 12/8/94, one specimen, 12 mm long.

Ecological remarks: Found at 5-10 m, near sponges and cnidarians.

Distribution: British Isles and Shetland Islands (Thompson, 1988); Brest (Dautzenberg et Fischer, 1925); Asturias and Andalusia (Cervera *et al.*, 1988); Mediterranean (Vayssi re, 1913); From Cape Blanco to Angola, Cape Verde, Ascension and Sta Helena Islands (Edmunds, 1977); Brazil (Marcus 1957); South Africa (Gosliner, 1987), Pakistan, Australia, Japan and New Zeland (Thompson, 1988); Madeira (Wirtz, 1995).

Previous records: First record for the Salvage Islands.

Family Chromodorididae BERGH, 1891

***Hypselodoris cf. tricolor* (CANTRAINE, 1835)**

Location, date and number of specimens: PA - 5/8/94, one specimen, 8,5 mm long.

Ecological remarks: Collected at a depth of 19 m, under a rock.

Distribution: Asturias (Ortea, 1977); Galicia, Gibraltar, Andalusia, Catalonia and Balearic Islands (Cervera *et al.*, 1988); Mediterranean (Haefelfinger, 1969; Schemekel & Portmann, 1982; Cattaneo & Barletta, 1984).

Previous records: This is a first record for the Salvage Islands.

***Hypselodoris picta webbi* (d'ORBIGNY, 1839)**

Location, date and number of specimens: EC - 27/7/94, two specimens, 50 mm and 72 mm long; EC - 28/7/94, one specimen, 187 mm long; PL - 13/8/94, two specimens; FS - 14/8/94, two specimens, 93 mm and 110 mm long; PI - 9/8/94, three specimens.

Ecological remarks: All specimens collected on rocks, at depths of 1-15 m.

Distribution: From Florida to Brazil, its presence in the Caribbean Sea needing confirmation, Canary Islands to southern Spain (Ortea *et al.*, 1996).

Previous records: This represents a first record for the Salvage Islands.

***Hypselodoris bilineata bilineata* (PRUVOT-FOL, 1953)**

Location, date and number of specimens: EC - 27/7/94, one specimen, 45 mm long; EC - 3/8/94, one specimen, 38 mm long; EC - 4/8/94, one specimen, 33 mm long; PL - 13/8/94, one specimen, 39 mm long.

Ecological remarks: Some specimens were collected from the intertidal zone, in tidal pools, on the brown algae *Cystoseira abies-marina* and others to depths of 15 m.

Distribution: Portugal, Algarve (Garc a-G mez *et al.*, 1991); Cadiz (Cervera & Garcia, 1986); Algeciras (Garc a-G mez, 1983; Cervera *et al.*, 1988); Mediterranean Sea (Pruvot-Fol, 1953; Cattaneo-Vietti & Thompson, 1989; Cattaneo & Barletta, 1984); Ceuta (Garc a-G mez *et al.*, 1989); Morocco (Pruvot-Fol, 1953); Madeira (Wirtz, 1995).

Previous records: This represents a first record for the Salvage Islands.

***Chromodoris britoi* ORTEA & PÉREZ, 1983**

Location, date and number of specimens: EC - 28/7/94, two specimens with 18mm and 22 mm; PR - 1/8/94, one specimen; PA - 12/8/94, one specimen with 21 mm.

Ecological remarks: One specimen was collected on a stone in a tidal pool, the remaining were collected at a depth of 10 m.

Distribution: Gibraltar (García-Gómez, 1987); Catalonia (Cervera *et al.*, 1988); Canary Islands (Ortea & Pérez, 1983; Pérez Sánchez *et al.*, 1991); Madeira (Ortea *et al.*, 1994; Wirtz, 1994).

Previous records: First record for the Salvage Islands.

Family Aldisidae ODHNER, 1939

***Aldisa smaragdina* ORTEA, PÉREZ & LLERA, 1982**

Location, date and number of specimens: EC - 3/8/94, one specimen, 41 mm long.

Ecological remarks: Collected at a depth of 10 m, on the sponge *Anchinoe fictitius*, under a rock.

Distribution: Portugal, Algarve (García-Gómez *et al.*, 1991); Galisia, Gibraltar and southeast Spain (Cervera *et al.*, 1988); Ceuta (García-Gómez *et al.*, 1989); Canary Islands (Ortea *et al.*, 1981).

Previous records: First record for the Salvage Islands.

Family Discodorididae BERGH, 1891

***Geitodoris planata* (ALDER & HANCOCK, 1846)**

Location, date and number of specimens: EC - 28/7/94, one specimen, 4 mm long.

Ecological remarks: Collected by suction at a depth between 5 m and 10 m.

Distribution: Brest (Dautzenberg et Fischer, 1925); Scotland, Gibraltar and Canary Islands (Ortea, 1990); Asturias and Andalusia (Cervera *et al.*, 1988); Norway, British Isles and Biscay Gulf (Thompson, 1988); Mediterranean (Cattaneo-Vietti & Thompson, 1989); Portugal, Algarve (Oliveira, 1895; Nobre, 1938-40; García-Gómez *et al.*, 1991).

Previous records: First record for the Salvage Islands.

***Geitodoris cf. perfossa* ORTEA, 1990**

Location, date and number of specimens: PA - 11/8/94, one specimen, 14 mm long.

Ecological remarks: Found under a stone at a depth of 20 m.

Distribution: Canary Islands (Ortea, 1990); Madeira (Wirtz, 1995).

Previous records: First record for the Salvage Islands.

Family Platydorididae BERGH, 1891

***Platydorid argo* (LINNÉ, 1758)**

Location, date and number of specimens: EC - 27/7/94, three specimens, each 57, 58 and 68 mm long; PA - 12/8/94, four specimens with ranges between 50 and 61 mm.

Ecological remarks: All were collected from under rocks at depths of 4 to 18 m.

Distribution: Brest (Dautzenberg et Fischer, 1925); Portugal (Oliveira, 1895; Nobre, 1938-40; García-Gómez *et al.*, 1991); Azores (Bergh, 1899); Southeast of Spain (Ballesteros *et al.*, 1986a); Gibraltar (García-Gómez, 1983); Mediterranean, Sicily (Cattaneo-Vietti & Chemello, 1987);

Balearic Islands (Templado, 1982); Ceuta (García-Gómez *et al.*, 1989); Canary Islands (d'Orbigny, 1839; Odhner, 1931; Altimira & Ros, 1979; Ortea & Bacallado, 1981); Azores (Wirtz & Martins, 1993); Madeira (Wirtz, 1994).

Previous records: First record for the Salvage Islands.

Suborder Aeolidacea ODHNER, 1934

Family Tergipedae THIELE, 1931

***Cuthona cf. genovae* (O'DONOGHUE, 1926)**

Location, date and number of specimens: PA - 5/8/94, one specimen, 5 mm long.

Ecological remarks: The specimen was collected at 17 m deep on a *Aglophenia* hydrozoa.

Distribution: Ireland (Wilson & Picton, 1984); Mediterranean (Bouchet, 1976; Schmekel & Portmann, 1982); Ceuta (García-Gómez *et al.*, 1989); Balearic Islands, Menorca Island (Ballesteros *et al.*, 1986b); Asturias, Andalusia, and Catalonia (Cervera *et al.*, 1988); Portugal, Algarve (García-Gómez *et al.*, 1991).

Previous records: First record for the Salvage Islands.

DISCUSSION

Records for the opisthobranch molluscs, especially the non-testacean species, of the macaronesian portuguese archipelagos were generally poor. NOBRE (1937) stated that nudibranch molluscs were not represented in Madeira, meaning that there was no capture records of such molluscs for that Island, which was reasonably well searched for other members of the Mollusca. Research carried out in recent years (ORTEA, 1981; ORTEA, 1988; ORTEA & LLERA, 1988; ORTEA, 1990; ORTEA & MARTÍNEZ, 1990; ORTEA & MARTÍNEZ, 1991; PÉREZ SÁNCHEZ *et al.*, 1991) revealed that both the Cape Verde and Canary Archipelagos were rich in this particular group of molluscs, a situation which aroused interest with regard to the Salvage Islands which lies north of the Canary Islands.

During the "Selvagens 94" expedition, 44 species were found and of these 39 were considered new records for the Salvage Islands and five of these (*Runcina adriatica*, *Runcina ornata*, *Stylocheilus longicauda*, *Berthella stellata* and *Thecacera pennigera*) have never been recorded on the nearby Canary Archipelago.

Though amphiatlantic species of opisthobranch molluscs were common around Salvage Grande, such as *Aplysia dactylomela*, *Dolabifera dolabifera*, *Petalifera ramosa*, *Petalifera petalifera*, *Stylocheilus longicauda*, *Aegires sublaevis*, *Thecacera pennigera*, *Hypselerodis picta* subsp. *webbi* and *Favorinus branchialis* (WILLAN, 1977; THOMPSON, 1977; GOSLINER, 1987; TEMPLADO *et al.*, 1987; ORTEA & MARTINEZ, 1991; PÉREZ SÁNCHEZ *et al.*, 1991), it was found that species common to the eastern Atlantic coasts from the British Isles to the Senegal predominated, *sc.*, *Runcina ornata*, *Aplysia fasciata*, *Aplysia punctata*, *Aplysia depilans*, *Elysia viridis*, *Berthella stellata*, *Tylodina perversa*,

Hypselodoris bilineata bilineata, *Aldisa smaragdina*, *Chromodoris britoi*, *Geitodoris planata* and *Platydorhis argo* (CATTANEO & BARLETTA, 1984; GARCIA *et al.*, 1986; CERVERA *et al.*, 1988; THOMPSON, 1988; GARCÍA-GÓMEZ *et al.*, 1989; ORTEA, 1990; ORTEA & MARTÍNEZ, 1991; PÉREZ SÁNCHEZ *et al.*, 1991; ORTEA *et al.*, 1996).

Of the species collected, special remarks concerning the geographical distribution of six of them seem to be of interest.

Runcina adriatica - This species was recorded for the Adriatic Sea (THOMPSON, 1980) and for the Azores (GOSLINER, 1990). Its presence in the Salvage Islands demonstrates a marked extension southwards.

Stylocheilus longicauda - MACNAE (1962) and GOSLINER (1987) reported the presence of this species along the south eastern African coast. THOMPSON (1977) states that this species is circumtropical and indicates its presence at several west Atlantic locations, Florida, Colombia, Curaçao, Barbados, Puerto Rico and Brazil. There is only one recorded occurrence of this species, from the tropical eastern Atlantic, at the Cape Verde Archipelago (ORTEA & MARTÍNEZ, 1990).

Stiliger llerai - First discovered at Tenerife (Canary Archipelago) and described by ORTEA (1981). Its presence on Salvage Grande is an interesting addition to the geographical distribution. This state of affairs could possibly be attributed to a number of factors, namely the influence of strong oceanic currents in the area which could carry larvae or individuals southwards. Being the Canary Islands geographically close, the presence of this species in both groups of islands is no surprise.

Berthella stellata - CATTANEO & BARLETTA (1984) states that this species is endemic to the Mediterranean Sea but CERVERA *et al.* (1988) and GARCÍA-GÓMEZ *et al.* (1989) reported its presence along the Iberian coasts and Ceuta respectively. Its presence on the Salvage suggests an added Atlantic character and represents one more argument to our conviction that there are close "ties" between the Salvage' fauna and those of the Iberian Peninsula and Mediterranean Sea.

Plocamopherus maderae - As this species has only been recorded from macaronesian islands, Madeira (LOWE, 1842; NOBRE, 1937), Cape Verde Archipelago (ELLIOT, 1906; ORTEA & PÉREZ, 1992) and the Canary Islands (ORTEA & PÉREZ, 1992) it may as of now, be considered endemic to Macaronesia.

It is interesting to remark that this species apparently was able to establish viable populations in archipelagos as far apart as those of Cape Verde, Madeira and Canaries, yet it was unable to reach the comparatively closer African continent. This situation seems to suggest that its larval development plays here an important role in its dispersion capability.

Hypselodoris bilineata bilineata - ORTEA *et al.* (1996) recently divided *H. bilineata* in three subspecies. Specimens from Senegal and Ghana (BOUCHET, 1975; EDMUNDS, 1981) are now included in *H. bilineata senegalensis*, while specimens from Canary Islands are included in *H. bilineata viridis*. Specimens from other regions are included in *H. bilineata bilineata* (ORTEA *et al.*, 1996).

Although the proximity between Canary Islands and Salvage our specimens seems

to have more affinities with individuals described from Madeira, at least concerning the colour pattern as described in ORTEA *et al.*, (1996).

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