

MARINE ALGAE FROM ILHÉU DE FORA (SALVAGE ISLANDS).

(CANCAP — project Contributions no. 13)

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With 2 figures

SUMÁRIO — Na lista seguinte anota-se 34 espécies de algas marinhas colhidas no Ilhéu de Fora, pertencentes às famílias seguintes: Ceanophyceae 6, Chlorophyceae 1, Phaeophyceae 9, Rhodophyceae 18. Oito destas são novas para as Ilhas Selvagens, sendo uma delas nova para toda a área de CANCAP. A lista das espécies de algas marinhas, conhecidas das Ilhas Selvagens, fica portanto ampliada para 135.

SUMMARY — An annotated list of 34 species of marine algae, collected from the Ilhéu de Fora, is given: 6 Cyanophyceae, 1 Chlorophyceae, 9 Phaeophyceae, 18 Rhodophyceae. Of these, 8 are new records to the Salvage Islands, one of which being new to the whole CANCAP-area. The list of marine algae, known from the Salvage Islands, is herewith increased to 135 species.

INTRODUCTION

The CANCAP-project is a long-term programme of biogeographically oriented marine research in the south-eastern part of the North Atlantic Ocean (fig. 1). The project is initiated by the Rijksmuseum van Natuurlijke Historie (National Museum of Natural History), Leiden. The Rijksherbarium (National Herbarium), Leiden, and the Geologisch Instituut (Geological Institute), Groningen, participate in the programme. Phycological observations have been made during expeditions, mainly with the oceanographic research vessel Hr. Ms. «Tydeman» of the Dutch Royal Navy, to the Canary Islands (1977, 1978, 1980) the Madeira Archipelago (1978, 1980), Mauritania (1978) and the Salvage Islands (1978, 1980). During the last visit to the latter (1980) the weather allowed landing on the Ilhéu de Fora (also called Pitão Pequeno), 30° 02'N 16° 03'W. As far as is known no algae have been collected on this little island before, so all 34 species, mentioned in this paper, are new to Ilhéu de Fora. The numbers 1, 2, 5, 9, 17, 25, 29 and 34 in the list of species are new records for the Salvage

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Islands, and number 5 is new to the CANCAP-area. To a former list of 105 species of Gil Rodriguez, Acebes Ginoves & Perez de Paz (1978), which is based on observations by these authors, and on literature (Levring, 1974, Gain & Mirande, 1912 and Pickering & Hansen, 1963), the species listed by Gain (1914) and the species of my list can be

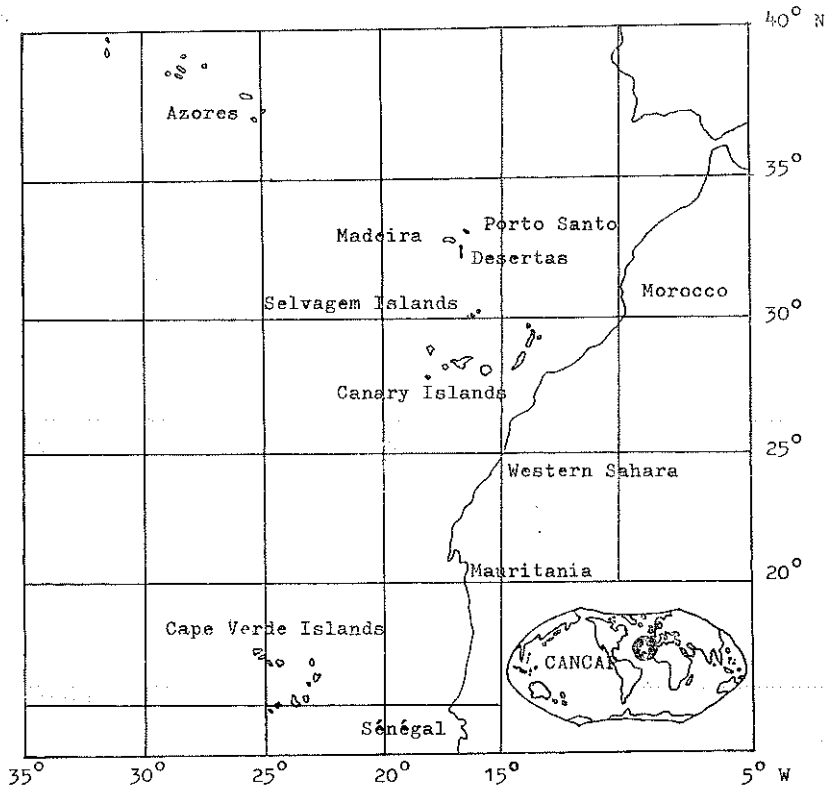
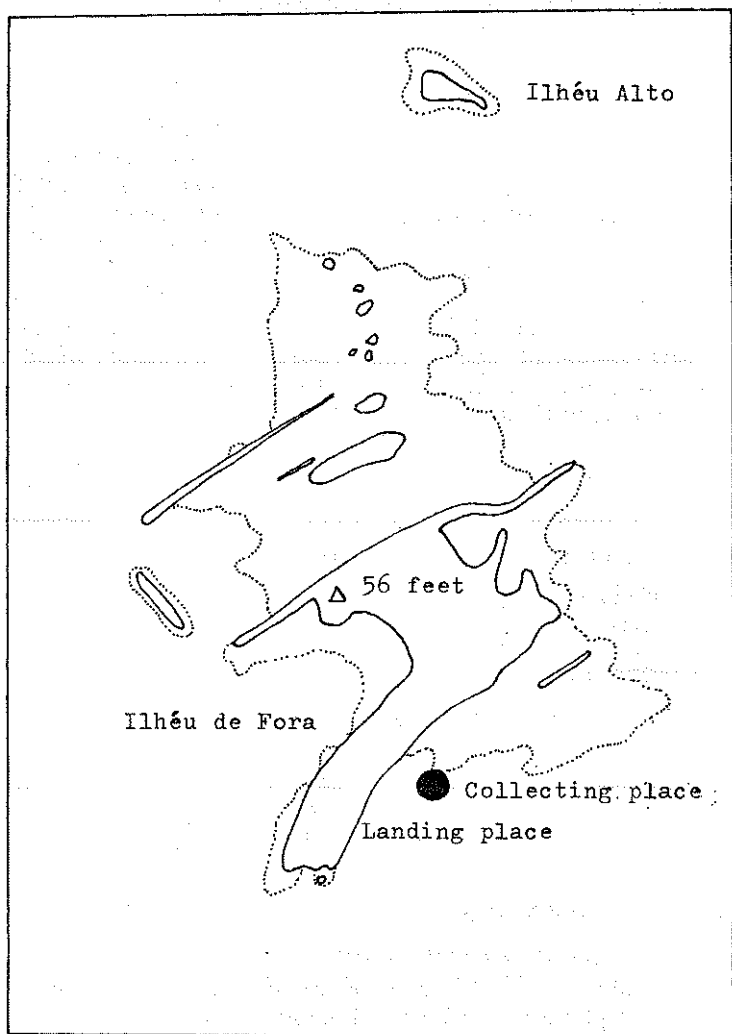


Fig. 1

added, resulting in a list of 135 names. A new list of marine algae of the Salvage Islands will be published later: studies of the marine algae of the other Salvage Islands are still in progress.

MATERIAL AND METHODS

The marine algae from Ilhéu de Fora were collected by free diving, on May 26th 1980, during the CANCAP-4 expedition, by W. F. Prud'homme van Reine, participant in this expedition. The algae were collected from the south-east coast, in the intertidal zone and in depths



—— High-water mark
..... Low-water mark

Fig. 2

down to 2.5 m (fig. 2). Some samples were dried, others were preserved in a 4% formaldehyde solution in seawater.

The names of the species are according to the following authors:

Cyanophyceae	: Geitler, 1930-1932.
Chlorophyceae	: Lawson & Price, 1969.
Phaeophyceae	: Price, John & Lawson, 1978.
Ceramiaceae	: Feldmann-Mazoyer, 1946.
Corallinaceae	: Hamel & Lemoine, 1952.
Rest of Rhodophyceae	: Børgesen, 1927-1930.
Rest of Rhodophyceae, not in Børgesen	: Taylor, 1960.

LIST OF SPECIES

With annotations and CANCAP-distribution according to CANCAP-card-index of the Rijksherbarium, together with data obtained from Price, John & Lawson (1978). New records for the Salvage Islands are marked with an asterisk (*).

Cyanophyceae.

1. *Aphanocapsa litoralis* Hansg.

* The diameter of the cells is 5-7 μm .

Salvage Islands	: Ilhéu de Fora
Canary Islands	: Gran Canaria

2. *Calothrix aeruginea* (Kütz.) Thur.

Epiphytic on *Jania capitillacea*, *Corallina granifera* and *Sphacelaria cirrosa*.

Salvage Islands	: Ilhéu de Fora
Madeira Archipelago	: Deserta Grande
Canary Islands	: Gran Canaria, Tenerife
Africa	: Morocco.

3. *Calothrix confervicola* Ag.

Epiphytic on *Cystoseira compressa*.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande
Madeira Archipelago	: Deserta Grande
Azores	: São Miguel, Terceira
Canary Islands	: Gran Canaria, Tenerife
Cape Verde Islands	: Ilha do Sal.

4. *Lyngbya maiuscula* Harv. in Hook.

The diameter of the trichomes is 30 μm , of the sheath 11 μm . The trichomes are occasionally spirally arranged within the sheath.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande
Madeira Archipelago	: Deserta Grande
Azores	: São Miguel
Canary Islands	: Gran Canaria, Tenerife, Lanzarote
Africa	: Morocco.

5. **Nodularia harveyana** Thur.

* New record for the CANCAP - area.

Salvage Islands	: Ilhéu de Fora.
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6. **Symploca hydroides** Kütz.

Epiphytic on *Chondria tenuissima*. Diameter trichomes 4-5 μm endcell without calyptra, rounded.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande
Canary Islands	: Tenerife
Cape Verde Islands	: Ilha do Sal, Santo Antão.

C h l o r o p h y c e a e.

7. **Dasycladus vermicularis** (Scop.) Krass.

Often with epiphytic *Ceramium*-spp. on the distal ends.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira, Porto Santo, Deserta Grande
Canary Islands	: Gran Canaria, Tenerife, Lanzarote, Gomera, Hierro.

P h e o p h y c e a e.

8. **Cystoseira compressa** (Esp.) Gerl. & Nizam.

Receptacles present. Host to many epiphytes.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira
Canary Islands	: Gran Canaria, Tenerife, Lanzarote, Gomera, Hierro
Africa	: Morocco.

9. **Dictyota cervicornis** Kütz.

* Antheridia present.

Salvage Islands	: Ilhéu de Fora
Canary Islands	: Gran Canaria (= new record for the CANCAP - area in: Weisscher et al., in press).

10. *Dilophus fasciola* (Roth) Howe

Sporangia present.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
 Madeira Archipelago : Madeira, Porto Santo, Deserta Grande
 Canary Islands : Gran Canaria, Graciosa
 Cape Verde Islands : São Vicente
 Africa : Morocco.

11. *Feldmannia irregularis* (Kütz.) Ham.Epiphytic on *Chondria tenuissima*.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira
 Canary Islands : Gran Canaria, Lanzarote
 Cape Verde Islands : São Vicente, São Nicolau
 Africa : Morocco, Mauritania, Sénégal.

12. *Halopteris filicina* (Grat.) Kütz.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira, Deserta Grande
 Azores : Santa Maria, São Miguel, Terceira
 Canary Islands : Gran Canaria, Tenerife
 Africa : Morocco.

13. *Haloperis scoparia* (L.) Sauv.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
 Madeira Archipelago : Madeira, Porto Santo, Deserta Grande
 Azores : Santa Maria, São Miguel, Terceira, Faial, Flores, Corvo, Ilhéu de Vila Franca
 Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma, Hierro
 Cape Verde Islands : São Vicente
 Africa : Morocco.

14. *Lobophora variegata* (Lamour.) WomEpilithic, and epiphytic on *Cystoseira compressa*.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira, Porto Santo
 Azores : Formigas
 Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma; Hierro
 Cape Verde Islands : São Vicente, São Nicolau
 Africa : Western Sahara, Mauritania, Sénégal.

15. *Padina pavonica* (L.) Lamour.

Sporangia present.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
 Madeira Archipelago : Madeira, Porto Santo, Deserta Grande
 Azores : Santa Maria, São Miguel, Terceira, Faial, Flores, Corvo, Ilhéu de Vila Franca
 Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma, Hierro
 Cape Verde Islands : São Vicente
 Africa : Morocco, Mauritania, Sénégal.

16. *Sphacelaria cirrosa* (Roth) Ag.

A. o. epiphytic on *Cystoseira compressa*. According to Prud'homme van Reine (1974: 173) *S. hystrix*, a common epiphyte on *Cystoseira*. is synonymous.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira
 Azores : Santa Maria, São Miguel, Terceira
 Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma
 Cape Verde Islands : São Vicente
 Africa : Morocco.

R h o d o p h y c e a e.

17. *Callithamnion corymbosum* (Smith) Lyngb.* Epiphytic on *Chondria tenuissima*.

- Salvage Islands : Ilhéu de Fora
 Madeira Archipelago : Madeira
 Canary Islands : Gran Canaria.

18. *Centroceras clavulatum* Mont.A. o. epiphytic on *Dictyota cervicornis*.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira
 Azores : São Miguel, Terceira
 Canary Islands : Gran Canaria, Tenerife, Gomera
 Cape Verde Islands : Santo Antão, São Vicente
 Africa : Morocco, Mauritania, Sénégal.

19. *Ceramium ciliatum* (E11.) Ducl.Epiphytic on *Dasycladus vermicularis*.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira, Porto Santo
Azores	: São Miguel, Ilhéu de Vila Franca
Canary Islands	: Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma, Hierro
Cape Verde Islands	: São Vicente
Africa	: Morocco.

20. **Ceramium diaphanum** (Roth) Harv.

Epiphytic on *Dasycladus vermicularis*, *Cystoseira compressa*, *Padina pavonica* (sporangia present), *Chondria tenuissima* and *Laurencia obtusa*.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira, Deserta Grande
Azores	: Terceira, Faial
Canary Islands	: Gran Canaria, Tenerife, Lanzarote, Gomera, Hierro
Cape Verde Islands	: Santo Antão, São Nicolau
Africa	: Morocco, Sénégal.

21. **Ceramium echionotum** J. Ag.

Epiphytic on *Dasycladus vermicularis*.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira, Porto Santo
Azores	: Azores
Canary Islands	: Gran Canaria, Tenerife, Lanzarote, Hierro
Africa	: Morocco.

22. **Chondria tenuissima** (Good. & Woodw.) Ag.

Sporangia present.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande, Selvagem Pequena
Madeira Archipelago	: Madeira
Azores	: Azores
Canary Islands	: Gran Canaria
Africa	: Morocco, Western Sahara.

23. **Choreonema thuretii** (Born.) Schmitz

On *Jania capillacea*.

Salvage Islands	: Ilhéu de Fora, Selvagem Grande
Madeira Archipelago	: Madeira, Porto Santo, Deserta Grande

- Canary Islands : Gran Canaria
 Africa : Morocco, Mauritania.

24. **Corallina granifera** E11. & Sol.

Epilithic, and epiphytic on *Chondra tenuissima* and *Dilophus fasciola* (corniculate conceptacula present). The plants are very small and thin, and the ramification is irregularly di-trichotomous. This species is easily recognizable, and different from *Corallina officinalis*, so I do not agree with Levring (1974: 69), who combined these two species into one.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira
 Azores : São Miguel, Faial
 Canary Islands : Gran Canaria, Tenerife, Gomera
 Africa : Morocco.

25. **Dipterosiphonia dendritica** (Ag.) Falk.

* Sporangia present. Epiphytic on *Laurencia obtusa*.

- Salvage Islands : Ilhéu de Fora
 Madeira Archipelago : Madeira, Porto Santo
 Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma.

26. **Griffithsia tenuis** Ag.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira, Porto Santo
 Canary Islands : Gran Canaria, Tenerife
 Africa : Sénégal.

27. **Herposiphonia tenella** (Ag.) Nägl.

Epiphytic on *Laurencia obtusa*.

- Salvage Islands : Ilhéu de Fora, Selvagem Pequena
 Madeira Archipelago : Madeira, SW of Deserta Grande
 Canary Islands : Gran Canaria, Tenerife, Gomera
 Africa : Morocco, Mauritania, Sénégal.

28. **Heterosiphonia wurdemanni** (Bail.) Falk.

Forma *typica* was found epiphytic on *Dictyota cervicornis* and on *Cystoseira compressa*.

- Salvage Islands : Ilhéu de Fora, Selvagem Grande
 Madeira Archipelago : Madeira
 Canary Islands : Gran Canaria
 Africa : Morocco, Mauritania, Sénégal.

29. *Jania capillacea* Harv.* Epiphytic on *Cystoseira compressa*.

Salvage Islands : Ilhéu de Fora

Canary Islands : Gran Canaria

Cape Verde Islands : Ilha do Sal.

30. *Laurencia obtusa* (Huds.) Lamour.

Sporangia present. The plants are remarkably green.

Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena

Madeira Archipelago : Madeira, Porto Santo, Deserta Grande

Azores : Terceira, Faial, Flores, Corvo

Canary Islands : Gran Canaria, Tenerife, Gomera, la Palma

Cape Verde Islands : Santo Antão, São Vicente

Africa : Morocco, Mauritania, Sénégal.

31. *Polysiphonia macrocarpa* Harv.The specimens agree with the descriptions of Kapraun (1977: 317), and not with those of Børgesen (1930: 82) *Epiphytic* on *Dasycladus vermicularis*.

Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena

Madeira Archipelago : Madeira

Canary Islands : Gran Canaria, Tenerife, Gomera

Africa : Morocco, Western Sahara, Mauritania.

32. *Ricardia montagnei* Derb. & Sol.On *Laurencia obtusa*.

Salvage Islands : Ilhéu de Fora, Selvagem Grande

Canary Islands : Gran Canaria, Gomera, la Palma.

33. *Spyridia filamentosa* (Wulf.) Harv.

Salvage Islands : Ilhéu de Fora, Selvagem Grande, Selvagem Pequena

Madeira Archipelago : Madeira, Porto Santo

Canary Islands : Gran Canaria, Tenerife, Lanzarote, Gomera, la Palma, Hierro

Africa : Morocco, Mauritania, Sénégal.

34. *Wurdemannia setacea* Harv.

Salvage Islands : Ilhéu de Fora

Madeira Archipelago : Madeira

Canary Islands : Gran Canaria, Gomera

Cape Verde Islands : San Vicente, Ilha do Sal.

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