

BOTANICAL REPORT ON THE ISLAND OF SOCOTRA (YEMEN)

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This contribution shows the results of a botanical expedition on the island of Socotra (Yemen) during the spring of 1999. Many endemic plants are reported from 9 localities visited. Some phytogeographical and geobotanical aspects are discussed with the aim of conservation of the high floristic biodiversity present in the island.

Key words: Biodiversity, flora, Yemen, Socotra.

Tardelli, M. & Baldini, R. M., 2000. Notícia sobre uma expedição botânica na Ilha de Socotorá (Iémene). *Portugaliae Acta Biol.* **19**: 443-453.

Este trabalho corresponde os resultados de uma pesquisa sobre a flora da Ilha de Socotorá (Iémene) efectuada na primavera de 1999. Foi encontrado um número significativo de elementos endémicos em 9 localidades da ilha. São apresentados dados fitogeográficos e geobotânicos indicativos com prioridades sob o ponto de vista da conservação da biodiversidade florística.

Palavras Chave: Biodiversidade, flora, Iémene, Socotorá.

INTRODUCTION

During the spring 1999 (07.04.1999-02.05.1999) an expedition on the Island of Socotra (Yemen) was carried out by Botany Staff of Tropical Herbarium and Botanical Museum of University of Florence in collaboration with the EPC (Environmental Project Conservation) of Yemen Government and the precious support of UNOPS (Conservation and Sustainable Use of Biodiversity of Soqotra Archipelago). The main goals of the mission were the study of the most

important habitats of the island in connection with the high level of endemics present and a stage in botanical education for local people.

ABOUT SOCOTRA

Socotra (Yemen) is located in the Indian Ocean (Gulf of Aden) between 12°19'-12°42' N and 53°18'-54°32'E (cf. GWYNNE 1968). The area is about 3549 sq. km and the maximum altitude is 1506 m (Haghier Mts.). The human population is estimated at 30.000-35.000 people and consists of shepherds (of sheep, goats and dwarf cattle). Many animals are free around the island and frequently represent a serious problem in grazing important endemics, *e. g.*, *Dendrosicyos socotranus* Balf. f., *Dracaena cinnabari* Balf. f. (at seedling stage). A clear demographic knowledge of the island is not yet available; one of the main problems in this respect is the frequent migration of the people related to the grazing seasons.

GEOLOGY AND SOILS

The geology of Socotra with special attention to the soil characterization, can be referred to three main formation types (cf. POPOV 1957, GWYNNE 1968):

- Granite massif of the Haghier Mts. (up to 1506 m) in the central part of the island.
- Limestone plateau (*e. g.*, Dixsam, Momi and Hammaderoh plains).
- Alluvial plains located along the northern and southern coasts (*e. g.*, Hadiboh area in the north, Nogah area in the south).

CLIMATE

Socotra is situated in the arid tropical zone where the water deficit is very high. As stated by many authors (see MYES & BEYHL 1996) useful climatic data are always missing. The monsoonal winds influence the climate; in fact the maximum intensity of the SW monsoon is in June, while that of the NE monsoon is in December-January, producing two seasons in temperatures and rainfalls. The temperatures in summer exceed 40°C at noon and generally fall no lower than 25-28°C at night. The temperature range throughout the year can be placed between 24°C-35°C.

The rainy seasons are linked to the two main annual wind directions. The SW monsoon originating in the southern hemisphere is charged with high level of humidity, so that from August to November (December) we have the main period of rainfalls. The other rainy period is in April-May and is influenced by NE monsoon, which comes from the northern hemisphere (Arabian Peninsula) and produces a low rainfall on the island. Probably the recent influence of the ENSO (El Niño Southern Oscillation) has a role in climatic change, especially in the increase of dry climate.

The expedition, carried out from 07.04.1999 to 02.05.1999, coincided with a really dry period, one of the most difficult of the last years.

VEGETATION

At this time information on the vegetation is not available in detail. The contributions on this matter are based especially on the physiological interpretations of some vegetation sites (POPOV 1957, GWYNNE 1968; see also UNOPS documentation in Socotra), as result of expeditions carried out in difficult situations. The incomplete knowledge of the flora, frequently related to many environmental difficulties, is the main problem in identifying the typology of vegetation sites. The most recent contributions on the vegetation with additional information are those of MIES & ZIMMER (1993) and MIES et al. (1995).

THE EXPEDITION (07.04.1999-02.05.1999)

Our exploration of Socotra (Fig. 1), limited to the short period of a month, has identified the main types of habitats of the island as:

N coastal area: Qadub (location 1-2), airport area (location 7).

Central siliceous highlands: Haghier mountains (location 4) (Fig. 2).

NE limestone plateau:

-Hamaderoh hills (location 6) (Fig. 3).

-Momi plateau (location 5) (Fig. 4).

-Dixsam plateau (location 8) (Fig. 5).

W coastal area: Qalansiyah-Ras Shoab area (location 9) (Fig. 6).

Alluvial soils: Wadi-Dininghen, Hadiboh spring-water (location 3) (Fig. 7).

FLORA

Since the first contributions (BALFOUR 1888; FORBES 1903, VIERHAPPER 1907) the Island of Socotra is known for its high level of endemics.

Its flora counts 850 taxa, with 281 endemics (including subspecific taxa) and 10 endemic genera (POPOV 1957, RADCLIFFE-SMITH et al. 1971, MIES & ZIMMER 1993, MIES 1994, MIES et al. 1995, LAVRANOS 1995, MILLER & BAZARA'A 1996, MILLER & COPE 1996). Its importance is also due to its floristic relationship with East-African and Mediterranean-Macaronesian floras (MOGGI & PISACCHI 1967, FICI 1991, MIES 1995, see also MARRERO et al. 1998).

About 200 taxa were collected, in spite of the difficult arid season. Many of the most important endemics were encountered: *Acacia pennivenia* Schweinf. in Balf. f., *Acridocarpus socotranus* Oliv., *Adenium obesum* (Forssk.) Roem. & Schult. subsp. *socotranum* (Vierh.) Lavranos (Fig. 8), *Aerva revoluta* Balf. f., *Aloe perryi* Baker, *Ballochia amoena* Balf. f., *Boswellia socotrana* Balf. f. (Fig.

9), *Caralluma socotrana* (Balf. f.) N. E. Br. (Fig. 10), *Cocculus balfourii* Schweinf. in Balf. f., *Commiphora socotrana* Balf. f., *Croton pachyclados* Radcl.-Sm. (Fig. 11) *Dendrosicyos socotranus* Balf. f. (one of the endemic genera, Fig. 12), *Dichrostachys dehiscentes* Balf. f., *Dracaena cinnabari* Balf. f., (Fig. 13), *Euphorbia arbuscula* Balf. f. (Fig. 14), *Euphorbia socotrana* Balf. f., *Euphorbia spiralis* Balf. f. (Fig. 15), *Euryops socotranus* Balf. f., *Gnidia socotrana* (Balf. f.) Gilg in Engl. & Prantl, *Helichrysum balfourii* (Balf. f.) Vierh., *Hibiscus stenanthus* Balf. f., *Jatropha unicostata* Balf. f., *Kalanchoe farinacea* Balf. f., *Lavandula nimmoi* Benth., *Limonium socotranum* (Vierh.) Radcl.-Sm., *Lycium socotranum* Wagner & Vierh. in Vierh., *Punica protopunica* Balf. f. (Fig. 16), *Trichocalyx obovatus* Balf. f., *Withania riebeckii* Schweinf. in Balf. f.

Many conservation problems were observed, especially for the species growing in forestry habitats such as *Dracaena cinnabari* Balf. f. and *Dendrosicyos socotranus* Balf. f..

The role of goats's overgrazing and the deforestation by rural people is preminent in stopping the renovation of plants.

An improved and aware policy in biodiversity conservation is required, and, to help implement this, a stage in botanical education for local people was carried out (*i.e.*, management of an herbarium, ecological interpretation of the most important vegetation sites).

The collection from Socotra housed in Tropical Herbarium of Florence (FT) is always under currently and further reports will follow with more details and information.

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CAPTIONS OF FIGURES

- Fig. 1 - The Isle of Socotra (1 – 9 localities of collection)
Fig. 2 - Haghier Mts.
Fig. 3 - Hamaderoh Mts. - Forest of *Dracaena cinnabari* Balf. f. (Dracaenaceae).
Fig. 4 - Momi plateau.
Fig. 5 - Dixsam plateau - Fractures in the limestone platform.
Fig. 6 - Ras Shoab - Coastal plain with *Avicennia marina* (Forssk.) Vierh. (Avicenniaceae). Mangroves.
Fig. 7 - Wadi-Dininghen. - Spring-water.
Fig. 8 - *Adenium obesum* (Forssk.) Roem. & Schult. *subsp. socotranum* (Vierh.) Lavranos (Apocynaceae).
Fig. 9 - *Boswellia socotrana* Balf. f. (Burseraceae), the frankincense tree.
Fig. 10 - *Caralluma socotrana* (Balf. f.) N. E. Br. (Asclepiadaceae).
Fig. 11 - *Croton pachyclados* Radcl.-Sm. (Euphorbiaceae).
Fig. 12 - *Dendrosicyos socotranus* Balf. f. (Cucurbitaceae).
Fig. 13 - *Dracaena cinnabari* Balf. f. (Dracaenaceae).
Fig. 14 - *Euphorbia arbuscula* Balf. f. (Euphorbiaceae).
Fig. 15 - *Euphorbia spiralis* Balf. f. (Euphorbiaceae).
Fig. 16 - *Punica protopunica* Balf. f. (Punicaceae).

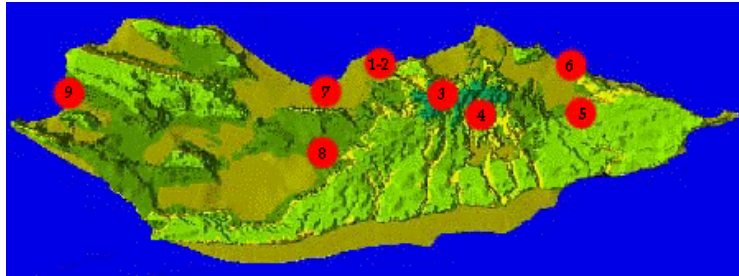


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig.11



Fig. 13



Fig. 12



Fig. 14



Fig. 16



Fig. 15