

**BIOGEOGRAPHICAL DIVISION  
OF THE SOKOTRA ISLANDS**  
(draft)

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*Dracaena cinnabari*, Tertiary relict, endemite of Socotra Isl. It has water reservoir in its stem. Woodland with no young trees – all being eaten by goats. These are about 400 years old. Max. age being about 800 years. Great threat to the future. Firmihin, ca. 550 m a.s.l., southern slopes.



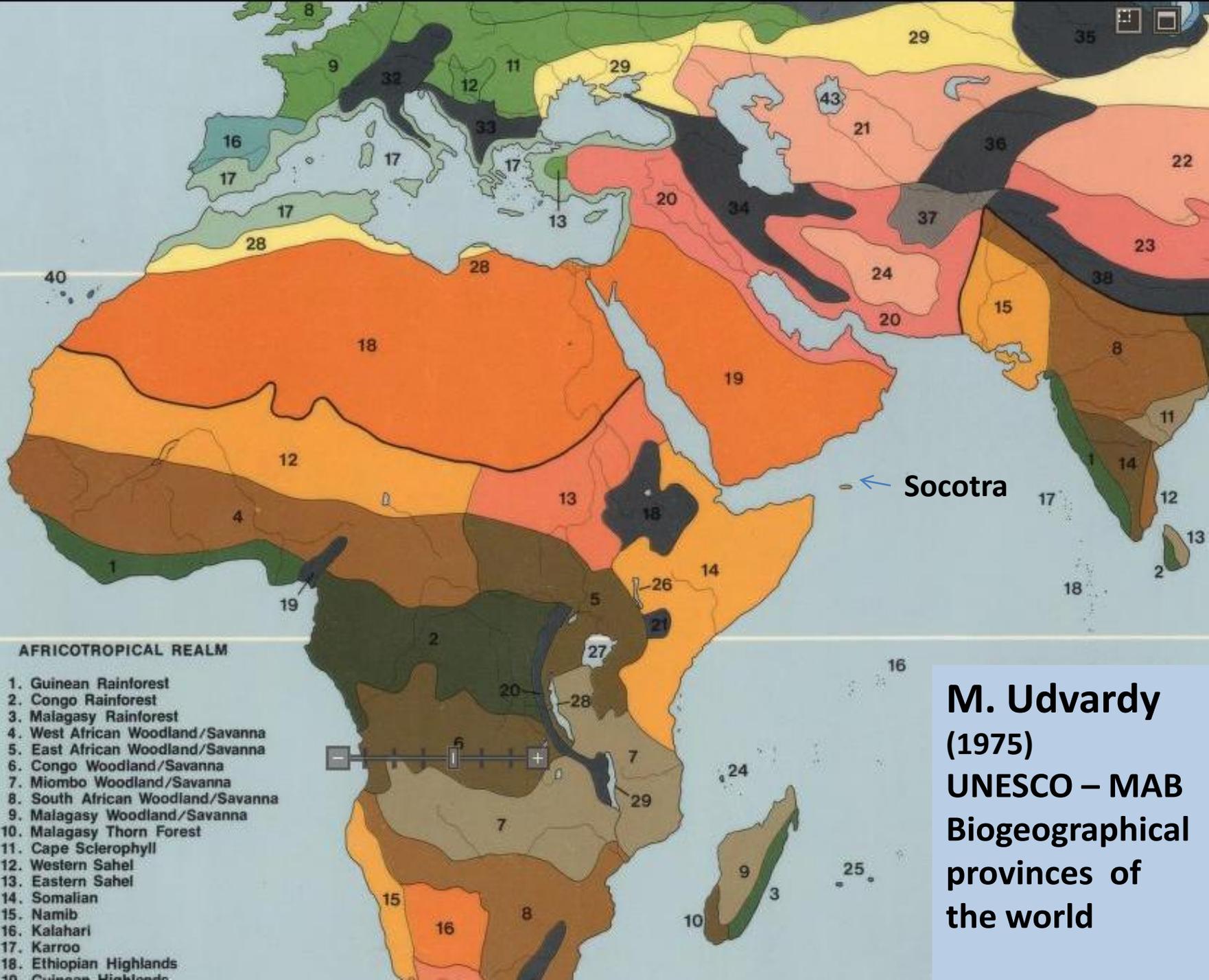
# The World context

- M. Udvardy (1975): Africotropical Realm, part of Somalian province – no detailed division
- A. L. Tachtadžjan (Takhtajan) (1986): Paleotropical Kingdom, Sudano-Zambezian Region, province No. 75 Socotra
- **Many relicts**
- **± 700 endemic species (flora + fauna) (Burdick, Alan, 2007) + 5 hard corals (from 230).**
- 307 out of the 825 (37%) plant species on Socotra are endemic (Miller, Morris, 2004) → archipelago the world's tenth richest island group for endemic plant species
- No native amphibians, no mammals except bats **x**  
continental island ! Why:
- 7 endemic species of birds !
- Reptiles ≥ 90 % endemic
- insects - very rich: 600 species of insects, 90% endemic

# Relations of biota on Socotra islands

[http://www.socotraislandadventure.com/Socotra\\_%20fauna&flora.htm](http://www.socotraislandadventure.com/Socotra_%20fauna&flora.htm)

- Flora: Relations to Somalia and Arabia, but:
- *Dracaena cinnabari* - tertiary relict, related species in S. Arabia, NE Africa, the Canary Islands
- *Kalanchoe*, *Helichrysum* - strong links with S. Africa
- The genus *Thamnosma* (with *T. socotrana* on Socotra) - related species in S. Arabia, SW Africa and SW North America.
- Fauna – close to Africa (part of Afrotropical (Ethiopian) Realm, some insects to Palearctic)
- The marine fauna life: Socotra - a spectacular mixture of sp. from different biog. regions - the western Indian Ocean, the Red sea, East Africa and the wider Indo-Pacific.  
680 species of fishes - comparable to the Red Sea.
- **Socotra: more closely linked with Africa than Arabia**
- **Interesting affinities with other island groups - the granitic Seychelles, remote islands of the Atlantic Ocean**



**AFRICOTROPICAL REALM**

1. Guinean Rainforest
2. Congo Rainforest
3. Malagasy Rainforest
4. West African Woodland/Savanna
5. East African Woodland/Savanna
6. Congo Woodland/Savanna
7. Miombo Woodland/Savanna
8. South African Woodland/Savanna
9. Malagasy Woodland/Savanna
10. Malagasy Thorn Forest
11. Cape Sclerophyll
12. Western Sahel
13. Eastern Sahel
14. Somalian
15. Namib
16. Kalahari
17. Karroo
18. Ethiopian Highlands
19. Guinean Highlands

**M. Udvardy  
(1975)  
UNESCO – MAB  
Biogeographical  
provinces of  
the world**

# Division of Tachtadjan



# Methodology of biogeographical division of Socotra

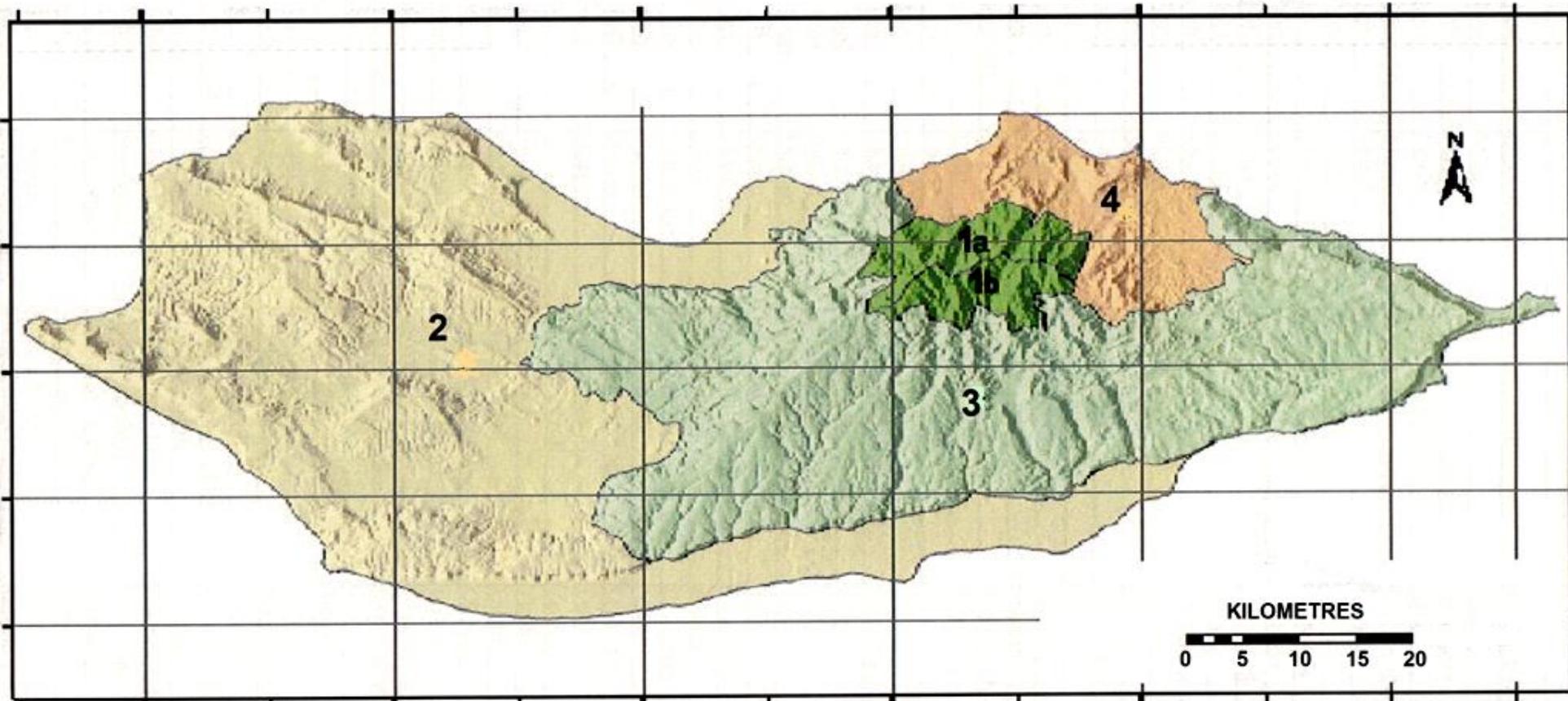
- Complex approach – abiotic conditions taken in account.
- ± Evolutionary approach – supposed refugia and barriers taken in account.
- Regionalisation → Individual unites.
- Recent time (± 19. century) – before devastation in 20 - 21. century.
- Priority given to the flag-ship species, esp. *Draceana cinnabari*.

# Biogeographical division

- Biog. Province: Socotra Archipelago
- Biog. Subprovinces: 1. Socotra Isl.
- 2. 3 Isl. left (15 end. flora sp.)
- Biog. Districts of Socotra: 1.1 Haghier Mts.
  - Biog. Subdistricts: 1.1a Northern walls (Skant)
  - 1.1b Southern slopes
  - 1.2 Western Highlands
  - 1.3 Eastern Highlands
  - 1.4 Northern Highlands

# BIOGEOGRAPHICAL DISTRICTS OF SOCOTRA

M. Culek



# 1.1 Haghier Mts.

- Hyperalkaline plutonic rocks.
- Higher parts – climatically subtropic, rel. wet, fogs
- Permanent water courses, fresh water !
- Refugium, esp. „mountain“ species
- Altitudinal vegetation tiers (zones): 2 – 5
- Highest biodiversity
- 2 forms of *Draceana cinnabari*

# 1.1 Haghier Mts.

- **1.1a Northern walls** – wet in „winter“ (November-January), in April-June, Sept –October - fogs. Relatively extremely cold and wet. Lower parts in summer monsoon (May-September) hot, windy.
- Extremely steep – low use.
- Forests in gullies, broadleaf bushes (*Trichodesma scotii*) ± continuous lichens.
- ± absence of *Adenium* and other „alien looking“ trees and bushes (excluding *Draceana*).
- Typical real tree – *Sterculia africana*.

Lower part of Northern slopes, low trees, flowering on left side – *Boswellia* – source of resin (= kadidlo !)



Upper part of Northern walls, end of April 2004, 15 h.



*Trichodesma scotii*,  
afternoon fogs.





The only forest on Island – Homheir Pass, cca 1400 m. End of April 2004

# 1.1 Haghier Mts.

- **1.1b Southern slopes** – wet and foggy in summer. Strong sunshine, warm surface. Green in summer.
- Slopes – accessible → intens. pastures, f. fields.
- Ridges – „macchie“ with *Draceana*, slopes – dry low woodlands with *Euphorbium*, medium parts – typical presence of *Commiphora*, flowering sp., in lower parts – succulent trees with *Dorstenia gigas* in upper part of canyons.
- Typical region for end. freshwater crab



Vegetation similar to the makchie, 1400 m a.s.l., end of April 2004

Dry woodlands – bushlands, 3 m high. Ca 1300 m, southern slopes.



Southern slopes, ca 1100 m, low trees – *Commiphora planifrons*  
(source of myrrh !)



## 1.2 Western highlands

- Limestone, dust, gravel, coastal sands.
- Dry, windy, mostly wet in summer, northern slopes – wet in winter.
- Western part – caves – ext. dry x springs
- Separated by passes and basins from Mts.
- Strongly devastated by grazing.
- Poor vegetation, low biodiversity, probably naturally without *Draceana* → distinguished ± negatively.
- Positively – vegetation of gypsum soils, mangroves.

# Bushes of *Croton*, strongly affected by grazing



Green bushes – similar to submediterranean Buxus  
(=zimostráz)



The last mangrove on Noged, souther coast (*Avicennia marina*)



# 1.3 Eastern Highlands

- Limestone plains x canyons in hyperalkaline plutonites.
- Great  $\pm$  periodical watercourses, waterholes, caves, carstic springs.
- Wet in summer, medium dry, dry winds in winter
- Intensively used but more wet and green (pastures, plantations, *Tamarindus* ...)
- Connected to Haghier Mts.  $\rightarrow$  descend of „mts.“ species.
- *Punica protopunica*
- Presence of *Draceana*, common *Boswelvia*, freshwater crab.
- Most endangered district.

Southern slopes, cover of limestone, to the right - tops of Haggier Mts.  
on granitoid rocks. Vegetation destrued, but rests surviving.



Draceana woodland on southern slopes (limestone plateau Firmihin, ca 600 m a.s.l.)



*Punica protopunica* (= wild predecessor of pomegranate = granátové  
jablko !)



# 1.4 Northern Highlands

- Limestone, hyperalkaline plutonites, gravel, floodplains, sand dunes.
- Medium wet in winter, extr. dry and hot rest of the year. Strong turbulented winds, föhns. +8 °C.
- Water from Mts.
- Strongly used floodplains (plantations) x poor pastures
- Separeted partly by baselines, passes, limestone boundaries.
- Poor vegetation, poor biodiversity, probably naturaly *Draceana* absent
- Positively – *Flamingoes*, rich in *Adenium o. s.*

Föhn clouds on mountains during summer monsoon (wind from SW), view from NE. Flamingoes in brakish water in a bay.



Vegetation on granitoid rocks with *Croton* (low bush) and *Adenium* (in flower). Ca 400 m a.s.l.



Sand dune Houlef, ca 350 m high, and low bushes on windy coast



Date palm plantations in floodplains, and highest specimen (6,7 m) of endemite *Adenium socotranum*.

