Ulrich Deil

Holy Forests in Northern Morocco - A materialization of the noosphere in the biosphere

Abstract

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In the Maghreb countries, the surroundings of Qubbas (= buildings where saints (Marabut) are buried) are used as cemeteries by local people. Such areas often shelter the last remnants of natural vegetation in intensely cultivated regions. Two holy forests in different ecoregions of the Tangier Peninsula in Northern Morocco have been studied and mapped to see, which plant species and vegetation types do occur there.

At both graveyards, pasturing, small scale burning and burial activities result in a fine grained mosaic of different vegetation types. The heterogeneity of the whole Marabut-area is of anthropo-zoogenic origin. It is ensured by a continuation of the traditional use. Protection in the sense of "non-use" would diminish its floristic and structural diversity. The Marabut-areas are of outstanding biological importance and of esthetic and spiritual value. In the Holy forests, the noosphere becomes tangible in the biosphere.

Introduction

Within cultural landscapes, vegetation patches created by ethnic and cultural traditions are of minor importance, but do exist. In the Maghreb countries, such ethnogeobotanical elements are the holy forests ("bois sacrés", "forêts maraboutiques") around Qubbas, the buildings where saints (Marabut) are buried. These places are used as burial ground by the local people. For religious reasons and because of the "Habbous" ownership (religous donation), such areas are protected from clearing even in the intensely cultivated plains of Morocco. They shelter the last remnants of natural and semi-natural vegetation there.

The cultural and spiritual importance of those holy places is well known (Lang 1992; von Droste zu Hülshoff & al. 1995), their effect for the inner-Moroccan tourism as destinations of pilgrimage has been elucidated by Berriane (1990, 1992). The value of these Marabut-forests for nature conservation purposes has been underlined by many authors (for example by Quézel & Barbero 1990 and Benabid 1991). It is therefore astonishing, that a detailed and consequent floristic and faunistic inventory of such places is still missing. In a first step, we outline here the results of the geobotanical analysis of two holy forests in different natural landscapes of the Tangier Peninsula in Northern Morocco. They have been studied to answer the following questions:

1. Which plant species and which vegetation structures are the elements of such burial grounds?
2. Are the holy forests virgin forests or what is the anthropo-zoogenic impact?
3. Is there a nature conservation value of those sites?

The study areas

The cemeteries are located east respectively south of the city of Tangier (Fig. 1). The first place, named Sidi Ali bou Knâdel is situated in the ecoregion "Crêtes du Détroit" (André 1971), at an altitude of 140 m a.s.l. at the top of a marl hill near the sandstone ridges of Jebel Sanduc, a few kilometers south of the Straits of Gibraltar. The climate is of mediterranean-atlantic character (semi-humid with 750 - 850 mm mean annual precipitation, frostfree, often windy).

The second place is Briech, named after the village nearby. It is located at an altitude of 40 m a.s.l in an ecoregion called "Sahel du Nord", a littoral sand plateau bordering the Atlantic Sea between Tangier and Azilah. The precipitations are slightly lower there (650 to 700 mm). The bioclimate is of semi-humid character with mild, frostfree winters. In this thermo-mediterranean vegetation belt, the climax vegetation type is a mixed forest with *Olea europaea*, *Pistacia lentiscus* and *Chamaerops humilis* (Emberger 1939).

Both sites are spiritual places of only local importance and not submitted to regional or nationwide pilgrimage activities like the Marabut of Moulay Abdessalam in the Western Rif Mountains.

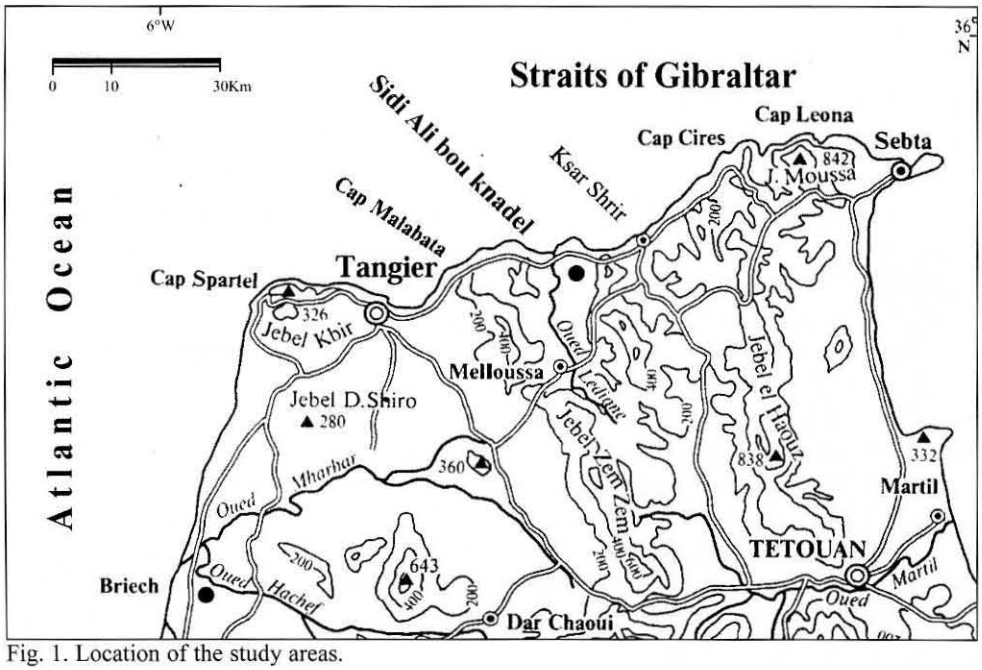

Fig. 1. Location of the study areas.

Methods

In May 1993, both cemeteries have been studied in order to document, which plant species and vegetation types do occur there and whether a biological conservation value (endangered species for example) can be stated. The vegetation types have been classified according to their floristic similarity. The full data set of the plant sociological samplings (Braun-Blanquet-method) is given in Deil (2000), a table reduced to constant respectively diagnostic species is presented here (Table 1). The nomenclature of the plant species is according to Valdes & al. (1987), the delimitation and naming of the plant communities follows Perez Latorre & al. (1999) and further special publications. The study areas have been mapped (Figs 2, 3) to see, what kind of structural vegetation mosaïc is created by the multipurpose use of these sites.

Table 1. Vegetation types occuring around both Marabut sites.

column						11	11	1111
	123	45	6	7	89	01	23	4567
area (S = Sidi Ali, B = Briech)	**SSS**	**BB**	**S**	**S**	**BB**	**BB**	**SS**	**SSBB**
vegetation type	**AAA**	**BB**	**C**	**D**	**EE**	**FF**	**GG**	**HHHH**
CS of evergreen forests (Tamo-Oleetum/Quercetea ilicis)								
Olea europaea sylvestris (tree)	441	44	.	.	54	..	..	....
Olea europaea sylvestris (shrub)	11.	..	1	+	..	..	..	..++
Clematis cirrhosa	2+2	..	.	+	..	..	..	....
Smilax aspera	..1	..	+	.	..	..	..	....
Arisarum simorrhinum	+21	++	+	+	..	..	..	....
Arum italicum	+1+	..	.	.	..	..	..	....
CS of maquis (Pistacio-Rhamnetalia)								
Pistacia lentiscus (tree)	114	..	.	.	.2	..	..	....
Pistacia lentiscus (shrub)	11.	23	2	1	..	..	..	....
Chamaerops humilis (shrub)	1..	11	1	1	++	.+	..	..+.
Quercus coccifera (tree)	122	..	.	.	..	..	..	....
Quercus coccifera (shrub)	11.	..	.	3	..	..	..	....
CS of the spiny mantle community (Asparago-Calicotometum)								
Calicotome infesta intermedia	.+.	..	4	1	..	..	..	....
Asparagus aphyllus	...	++	+	.	..	..	..	..r.
Rubus ulmifolius	...	22	.	.	..	..	..	...r
fire succeeders, subspontaneous ornamental								
Cistus monspeliensis	...	..	.	3	..	..	..	....
Iris germanica	...	+.	.	.	..	.1	..	....
ombrophytic ruderals (CS Geranio-Anthriscion)								
Geranium rotundifolium	++.	..	.	.	..	..	..	....
Torilis nodosa	22.	..	.	.	..	..	..	....
Geranium purpureum	..+	..	.	+	..	..	..	....
mesophytic ruderals (CS of Veronico-Urticion, Sisymbrietalia								
Mercurialis annua ambigua	.+.	..	.	.	22	+.	..	....
Urtica urens	...	..	.	.	43	..	..	....
Malva parviflora	...	..	.	.	+1	..	..	....
Sisymbrium officinale	...	..	.	.	21	1.	..	....
Hordeum leporinum	...	..	.	.	21	1+	..	..+.
Chrysanthemum coronarium	...	..	.	.	++	44	..	..rr
Verbascum sinuatum	...	..	.	.	..	++	..	....

dry resistant ephemerals(CS of Trachynion distachyae s.l.)								
Trifolium scabrum	++.	..	.	.	..	.+	32	....
Trifolium stellatum	1+.	..	.	.	..	..	32	....
Cleonia lusitanica	...	..	.	.	..	..	22	....
Daucus muricatus	...	..	.	.	..	..	+1	....
Aegilops geniculata	...	..	.	1	..	1+	++	2233
Brachypodium distachyon	22.	..	2	2	11	11	12	2122
Trifolium angustifolium	+..	.+	.	.	..	+.	++	+.12
CS of productive grassland (Phalaridetalia caerulescentis)								
Hordeum bulbosum	...	1+	.	.	..	++	..	..+1
Hedysarum coronarium	...	..	.	.	..	..	13	22..
Leontodon maroccanus	...	..	1	.	..	..	++	....
pasture weeds and ruderals								
Galactites tomentosa	r1.	..	.	+	++	2+	11	.+12
Avena barbata s.str.	...	..	.	.	..	++	..	2222
Scabiosa simplex dentata	...	..	.	.	..	..	.+	+4..
Bromus diandrus	...	..	.	.	..	++	..	..11
Desmazeria rigida	.+.	..	.	.	..	..	..	+1..
Atractylis cancellata	...	..	.	.	..	..	2.	+...
Cynara humilis	+..	++	+	.	..	..	+.	+++1
Scolymus hispanicus	++.	+.	.	.	..	.+	..	..++

(table reduced to constant respectively diagnostic species)
(full species list is documented in Deil 2000)(CS = character species)

Results

The Marabut-areas are fine-scaled mosaïcs of different plant communities ranging from evergreen sclerophyllous forests to thornbushes and to a riot of flowers in the bordering areas with predominant annual and ruderal species. They are also very heterogenous from a structural point of view (Figs 2, 3; Table 1).

At both graveyards the central area around the tomb is covered by a closed evergreen forest, at Sidi Ali by the *Tamo-Oleetum quercetosum cocciferae* (columns 1-3), at Briech by the *Tamo-Oleetum typicum* (columns 4-5). At Sidi Ali, the central woodland is surrounded by a dense, spiny *Asparagus aphyllus-Calicotome villosa-Crataegus monogyna*-mantle community (column 6). The latter is opened from time to time by burning. This initiates the establishment of a *Cistus monspeliensis*-facies (column 7), sheltering some rare mesophytic herbs like *Cirsium scabrum* and *Origanum compactum*.

Below the tree layer, the forest floor is densely covered with nitrophytic and ombrophytic herbs and grasses (character species of the alliance *Veronico-Urticion*)(columns 8-9), indicating a moderate pasturing impact and a considerable fertilisation by the animals, resting there. The combination of an overaged tree layer and the dominance of therophytic ruderals on the floor is the result of a too strong pasture pressure over decades. Quézel & Barbero (1990) call this type of anthropo-zoogenic degradation the "therophytisation of forests". Such "subfossile" forests stands without any true forest species in the herb layer are nowadays quite common in Morocco.

On sunny and sandy sites, the *Malva-Urtica-Mercurialis*-community is replaced by another ruderal community, the *Anacyclo-Hordeetum murini chrysanthemetosum* (columns 10-11). In springtime, this community has a marvelous aspect by the combination

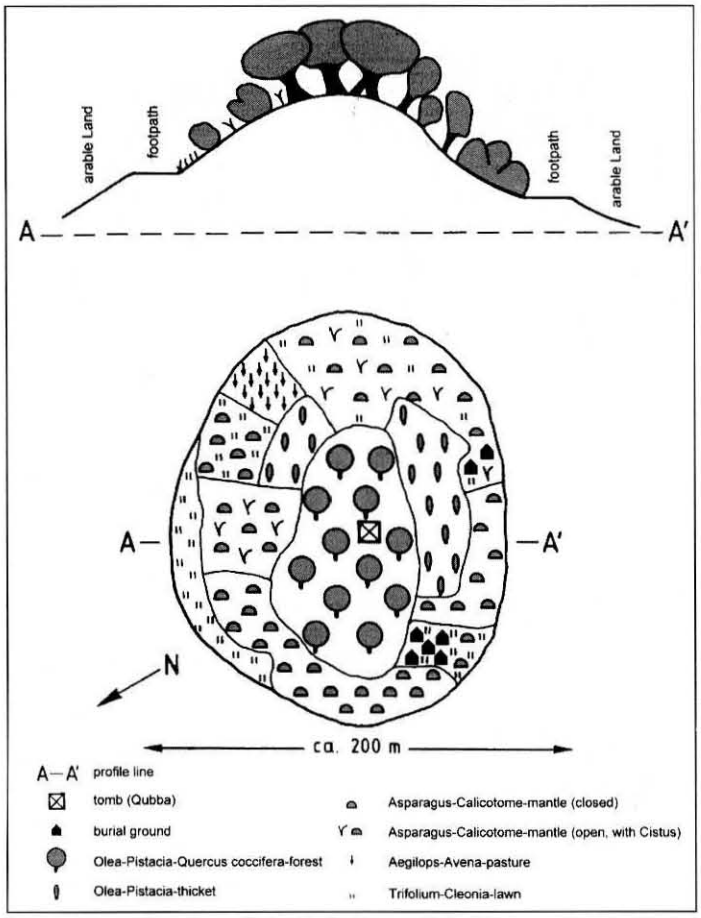

Fig. 2. Vegetation map of the Holy Forest Sidi Ali.

of species with eye-catching flowers like *Chrysanthemum coronarium*, *Hedysarum coronarium*, *Galactites tomentosa* and *Verbascum sinuatum*. This attractive indigenous flora is enriched by planted and subspontaneous species like *Pelagonium capitatum*, *Iris germanica* and *I. albicans*)(*Chrysanthemum-Iris*-community in Fig. 3).

The outer fringes are submitted to a strong and permanent pasture pressure and to periodical disturbances (burial ground). There occur plant communities, rich in species and dominated by short growing ephemerals (*Trifolium scabrum*, *T. stellatum*, *Cleonia lusitanica*) (columns 12-13) (*Trifolium-Cleonia*-lawn in Fig. 2) or by higher growing, subnitrophilous or weedy annuals (*Aegilops geniculata*, *Avena barbata*)(*Aegilops-Avena*-pasture in Figs 2, 3) and character species of the thistle communities *Echio-Galactition* and *Cynaro-Scolymetum* (columns 14-17).

At the studied graveyards, pasturing, small scale burning and burial activities result in a fine grained mosaic of different vegetation types. In total they form a vegetation complex with a repetitive spatial pattern. A typical zonation ranges from the Qubba in the centre,

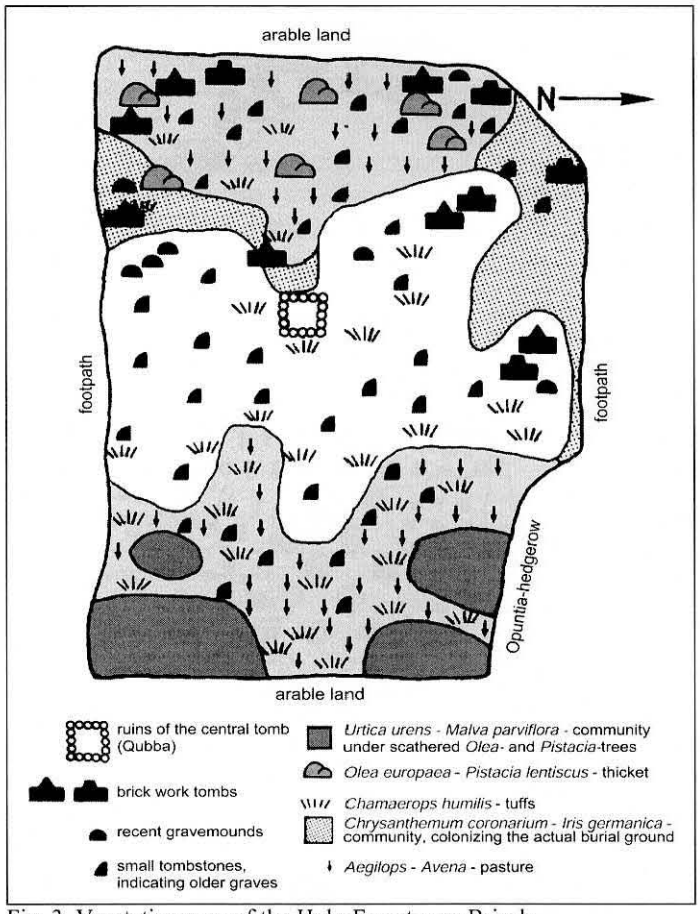

Fig. 3. Vegetation map of the Holy Forest near Briech.

surrounded by a forest with an ombrophilous herb layer, a spiny mantle community and scattered shrubs to a high growing pasture and to a dwarf ephemeral lawn at the outer fringes with recent gravemounds. The central forest is less degraded at the Sidi Ali (far from the village) site than in Briech (close to the settlement).

Conservation aspects

In only a very few places, Marabut-areas are nature reserves in a legal sense. But even without that official status they function to a certain extent like nature reserves (see also Quézel & Barbero 1990; Benabid 1991). The following aspects can be pointed out:

1. In the nearly totally deforested lowlands of Morocco, the esthetic value of these Holy forests is outstanding.
2. They offer habitats for many plant species. About 170 vascular plants could be stated on a few hectares around Sidi Ali and Briech.

3. They are the last remnants of vegetation types, which have been widespread before human intervention, but are nearly extinct nowadays. They represent the sylvicultural potential of the region and can be used to demonstrate sustainable use of the territory. So far they are a counterpoint to anarchic forms of landuse types (Benabid 1991).
4. They are protecting genetic ressources. A few examples should be mentioned: The studied forest at Sidi Ali shelters one of the rare populations of an *Quercus coccifera*-ecotype, which is genetically different from the widespread Kermes-oak-taxon and close to *Q. calliprinos* (Benabid 1985; Quézel 1991). *Cephalanthera longifolia* is restricted to the central parts of the Sidi Ali forest with an intact humus layer. In the Tangier Peninsula, *Cirsium scabrum* occurs nearly exclusively in the surroundings of Holy forests. This late-flowering plurienn-hapaxanthous species is very sensitive to overgrazing (Gálvez & Hernández Bermejo 1990).
5. We can expect that the Marabut-forests offer habitats for many animal species and that they can function as stepping stones for mobile organisms and for diaspores.

The holy forests are not virgin forests. Their structural heterogeneity and their floristic diversity is of anthropo-zoogenic origin. It is ensured by a continuation of the traditional use. Protection in the sense of "non-use" would diminish their floristic and structural diversity. In some cases however, the plant cover around Marabuts can be deteriorated by the pilgrimage activities, if they develop into mass tourism like in Moulay Abdellah near El Jadidah (about 75000 visitors, non regulated camping activities) (Berriane 1992) and if the Marabut is situated in sensitive ecosystems like dunes.

The perception and the evaluation of landscapes and habitats depends upon the normative system of human individuals and societies living there. The Marabut-forest in Maghreb countries play an important role for the identity of tribal groups, because their identity is not linked to a territory, but to genealogy and to myths (Bourquia 1990). In the Holy forests, the noosphere becomes tangible in the biosphere. The evalution remains however restricted to some biotic parameters, which can be registered by a western scientist. A real understanding of their mystic value is far beyond our perceptive faculty.

Acknowledgements

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Addresses of the author:
Ulrich Deil, University of Freiburg, Institute of Biology, Department of Geobotany, Schänzlestr. 1, D-79104 Freiburg, Germany.
Email: ulrich.deil@biologie.uni-freiburg.de