

Vegetation and Flora of the Islands of Masirah and Shaghaf, Sultanate of Oman

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ABSTRACT. The vegetation of the Islands of Masirah and Shaghaf is broadly classified with that of Barr al Hikman (east-central Oman) and its adjacent areas. The detailed study shows 8 vegetation types which are related to the different landforms of the Islands. The highest number of species are recorded in the central mountain range in Masirah and the highest number of halophytes known from Shaghaf. Wadis are identified as the most species-rich areas. *Stipagrostis masirahensis* and *Euphorbia masirahensis* are endemic. Poecilohydric lichens, unknown elsewhere on mainland Oman, are present on limestone outcrops in the north and south of the central mountains in Masirah.

The islands of Masirah and Shaghaf lie on the south-eastern coast of Oman between Lat. 20-21° N and Long. 58-59° E. Masirah is the largest island with an area of about 655 km². It is separated from mainland Oman by a narrow channel, Khalij Masirah (also referred to as Khawr Masirah). Masirah is approximately 65 km from Ras Hilf in the north to Ras Abu Rasas in the south and has a maximum breadth of ca. 15 km. Shaghaf is a small island, about 5 km long and 1 km wide, and lies west of the central "waist" of Masirah (Fig. 1). About 5,000 people inhabit Masirah, mainly around the northern town of Hilf. There are few settlements elsewhere alongside irrigated cultivations. Shaghaf is uninhabited.

Both Masirah and Shaghaf islands are of great biological significance. They are the nesting sites for Crab Plover, Sooty Gulls and five species of Terns. Masirah is the breeding site for four species of sea turtles. In addition, due to their geographical location, both islands are wintering grounds for migrant birds from the E and W Palearctic and Indomalayan regions (Uttley *et al.* 1990).

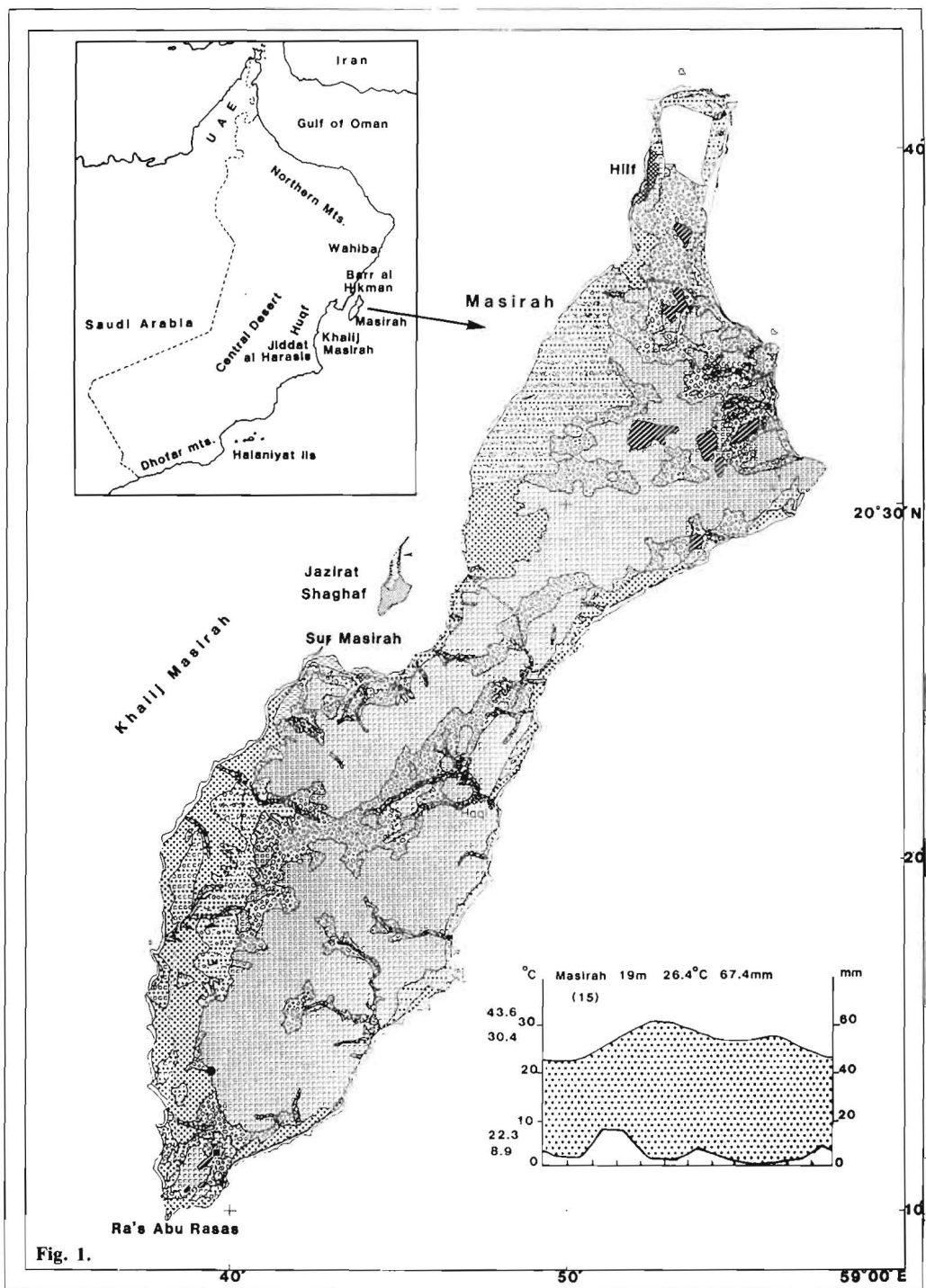











Fig.1.Vegetation map of Masirah and Shaghaf Islands. Insets show the physical position of Oman and Masirah (top left) and climate of Masirah (bottom right).

Vegetation:

- i,  *Mangroves*;
 - ii,  *Halophytic shrub communities*;
 - iii,  *Halopeplis perfoliata* community;
 - iv,  *Limonium stocksii-Cyperus conglomeratus* community;
 - v,  *Pulicaria glutinosa-Stipagrostis masirahensis* community;
 - vi,  *Wadi communities*;
 - vii,  *Vernonia arabica-Sporobolus ioclados* and lichen communities;
 - viii,  *Ruppia maritima* community;
- Rock outcrops and shifting sand, vegetation tupe
- iv,  Intramontane pediplains and stony footplains, vegetation typs V.

Climogram: The name of the station (Masirah) is followed by its altitude, mean annual temperature and mean annual precipitation. The number in parentheses refers to the years of observation. On the right ordinate the first number is the absolute maximum temperature followed by the mean maximum of the hottest month, mean daily minimum of the coldest month and the absolute minimum temperature. On the abscissa are months (January-December). Monthly means of temperature are shown by the thin line and monthly means of precipitation by the thick line. Stippled area represents the arid period.

Except for Scholz (1993, description of a new species) the vegetation and flora of Masirah and Shaghaf have not been studied. A few collections exist from around the town of Hilf. No collections have been made previously from the central range of mountains of Masirah and the southern part of the island. There are no previous collections from Shaghaf.

In this paper we give an account of the vegetation and a floral list for Masirah and Shaghaf.

Topography

A range of mountains occupy the central part of Masirah, where the highest elevation is at Jabal Madhrub (255 m). Other high points are Jabal Humr (185 m) in the north and Jabal Suwayr (150 m) in the south. The central mountains consist of steep to gentle slopes, pediplains, stony footplains, alluvial gravel fans and stream channels. Rock outcrops are bare or have a skeletal colluvium covering the lower slopes. Sandy, gravelly and stony plains extend from the base of the hills down to sea level. The western coast consists of tidal flats and alluvial plains covered with small dunes, while the eastern coast is mostly rocky. Shaghaf is flat and sandy, with a low depression in the northern part of the island.

Geology

Masirah is almost entirely composed of a well developed ophiolite (granites, basalt, gabbro and pyroclastics). This is, however, completely unrelated to the ophiolite of the northern mountains of mainland Oman and is believed to be of Late Jurassic to Early Cretaceous age. Certain aspects of the geochemistry of the granites suggest that Masirah ophiolite was derived from oceanic crust of the Indian Ocean during the early Cretaceous (Smewing *et al.* 1991), when Masirah was thrust against continental Arabia (Moseley 1990). The ophiolite is overlaid by a folded Eocene limestone in the central part of the northern half of the island (Jabal Humr, Jabal Shabah) and at the very southern end on Masirah (Jabal Suwayr). The coastal of Masirah consist of quaternary sediments. The oldest are the stony footplains; gravel fans, wadi terraces and wadi beds are of younger age. The south-west exposed coastal plains are extensively overlaid by shifting, fine or coarse sand. Salt pans and mud-flats are present in limited places.

Climate

The mean annual temperature at Masirah is about 26.4° C. March, April and May are the hottest while December and January the coolest months. The mean annual rainfall is 67 mm (data based on 15 years), and usually falls during March and April (Fig. 1, Climogram). Rainfall, however, is erratic and not localized. The SW-monsoon winds bring heavy mists to Masirah usually between June and July. No data

on the precipitation from mists is available, but data from the central limestone plateau of Jiddat al Harasis of central Oman (Stanley-Price *et al.* 1988) could be comparable.

Materials and Methods

Vegetation and Flora

The vegetation of Masirah and Shaghaf is classified into eight vegetation types. These are related to the topography and landforms of the Islands (Fig.1).

The vegetation was mapped using aerial photographs (scale 1:60,000) for delimiting the vegetation component.

This was later transferred to a topographic map (scale 1:100,000). Field work consisted of three transects across Masirah (two in the south and one in the centre) and recording vegetation types at several other sites based on the preliminary investigations. Plant cover along transects was recorded by using a 1 = rare, 2 = common and 3 = frequent scale.

A list of flowering plants and lichens collected at Masirah and Shaghaf is given in Appendix I. A few species, not collected by the authors, but collected by others on separate occasions, are also listed. It should be noted that this study was conducted during a period when no rain had fallen for a considerable period (up to five years at certain locations), and, therefore, mainly represents the perennial species. However, a few collections around irrigated areas included annual species.

i. Mangroves

Landform: Sheltered coastal lagoons and inlets; altitude: s.l.

Azonal vegetation composed of a single species, *Avicennia marina*¹. A dense but small belt of this vegetation type occurs in the northeastern part of Shaghaf Island.

ii. Halophytic shrub communities

Landform: Littoral dune belt of saline silt, soft sand or soft gravel; altitude: 1 - 2 m a.s.l.

On the low coastal dunes which receive salt spray, a community of *Atriplex farinosa*-*Suaeda moschata* occurs. In the shelter of these dunes *Arthrocnemum macrostachyum* and *Suaeda* spp. are found. These communities are the dominant coastal vegetation on Shaghaf but absent from the coastal areas of Masirah. (A few plants of *Atriplex farinosa* are present on the eastern coast of Masirah. A belt, potentially vegetated by this community, but destroyed by inhabitants and off road driving along the coast is present around the coast of Masirah).

¹ - Authors for plant names are given in the floral list in Appendix I.

iii. *Halopeplis perfoliata* community

Landform: Silty salt pan of marine or fluvial origin (*sabkha*); altitude: s.l. - 1 m. *Sabkha* is devoid of vegetation except at the fringes where, predominantly pure stands of *Halopeplis perfoliata* occur. Other species are *Arthrocnemum macrostachyum* or *Limonium stocksii* which are present behind the fringing vegetation.

iv. *Limonium stocksii* - *Cyperus conglomeratus* community

Landform: Gravel plains with loose wind-shifting sand; sand covered rock outcrops; altitude: 2 - 50 m. This psammophytic community is well tolerant to saline soils; *Limonium stocksii* secretes salt as well. Both *L. stocksii* and *Cyperus conglomeratus* collect sand and form small hummocks or *nebkhas*. Other associated species are *Atriplex coriacea*, *Echiochilon jugatum*, *Heliotropium kotschyi* and *Sphaerocoma aucheri*. On the more sandy rocks *Launea mucronata* and *Fagonia indica* are associates. In deeper sands, *Panicum turgidum* is associated. The rock outcrops with shifting sand cover support a sparse community of *Pulicaria glutinosa* and *Stipagrostis masirahensis* and a dense community of *Limonium stocksii* and *Cyperus conglomeratus*.

v. *Pulicaria glutinosa* - *Stipagrostis masirahensis* community

Landform: Ophiolite mountains, intramontane pediplains and stony footplains and their small wadi systems; altitude: 10 - 100 m. Vegetation cover is sparse in this zone but species diversity is high. In the drainage channels and depressions runoff water is available and therefore support a dense vegetation. On the lower slopes of the hills, (in the north) on colluvium, the endemic *Euphorbia masirahensis* is common. Its distribution is restricted to the northeastern part of the central mountains. Trees are rare on Masirah island, and isolated specimens of *Acacia tortilis*, *Prosopis cineraria* and *Zizyphus spina-christi* occur. In sandy areas low shrubby species such as *Crotolaria aegyptiaca*, *Taverniera sparteae* are common associates of the dominant community.

vi. Wadi communities

Landform: Wadi banks and beds; altitude: 1 - 70 m. Wadis include varied plant communities which are influenced by the depth of the rooted substrate, depth of available underground water, mechanical impact of floods and disturbance by man. Generally, in wadis, available water as runoff or collected in depressions is more and therefore supports a dense, rather diverse vegetation. In low depressions or near habitation where irrigation is present, species such as *Tamarix arabica* and *Pluchea arabica* and usually pure stands of *Juncus rigidus* occur. In the sandy areas of wadis, *Crotolaria aegyptiaca*, *Taverniera lappacea* and *T. sparteae* occur. *Sporobolus spicatus*, *Lasiurus*

scindicus also occur in sandy planes and under rock overhangs. On deep substrates around settlements, species such as *Zygpphyllum qatarense*, *Tephrosia apollinea*, *Pergularia tomentosa* and *Senna holosericea* occur. These species are unpalatable to livestock and indicate over-grazing in these areas, where more palatable species are preferred by the livestock.

vii. *Vernonia arabica* - *Sporobolus ioclados* and lichen communities

Landform: Limestone rock outcrops; altitude: 50 - 150 m.

The vegetation on the rocky limestone outcrops is sparse. Plants occur in soil pockets and in rock crevices. *Commicarpus boissieri* is commonly associated with the dominant plants. Crustose lichens such as *Diploicia* sp. and foliose lichens such as *Roccella balfourii*, *Roccellographa cretacea* and *Simonyella variegata* commonly occur on the rocks.

viii. *Ruppia maritima* community

Landform: Permanent brackish water; altitude: 40 m.

This community is found only at a single location on Masirah. It is present in a shallow pool of permanent brackish water, where a dense growth of the submerged *Ruppia maritima* occurs. *Cressa cretica*, *Sporobolus virginicus* and *S. spicatus* grow on the edges of the water.

Discussion

The classification of the vegetation of Oman (Ghazanfar 1991) was re-analyzed using Masirah as a distinct stand. Using TWINSpan (Hill 1979) Masirah and Barr al Hikman are classified in the same group. The vegetation characterizing this zone occurs throughout the Barr al Hikman peninsula, extends to Ramlat Wahiba in the north and borders with the Huqf escarpment at its southern limit. A re-ordination of the data shows that Masirah falls inbetween the sandy saline and gravelly plains.

Though Barr al Hikman (with the adjacent areas) and Masirah fall in the same broad vegetation zone, the detailed study shows a more rich and diverse vegetation in Masirah. Each vegetation zone consists of three to five species; though in some, such as the mangroves and *Halopeplis perfoliata* communities, only a single species is dominant.

Species richness is highest in the wadis. There, low lying areas and depressions, which collect runoff water, provide a favorable ecotype for the growth and diversity of the species.

Stipagrostis masirahensis and *Euphorbia masirahensis* are endemic, the first occurs in the central range and in the transition zone of rocky outcrops and shifting sand, and the latter occurs in the northeastern part of the central range of mountains. The closest ally of *Stipagrostis masirahensis* is *S. sokotrana* (Vierh.) de Winter, which is common on the central limestone plateau of Jiddat al Harasis (Central Oman, Scholz 1983). *S. masirahensis* is also related to *Stipagrostis dhofariensis* Cope, which occurs in the Barr al Hikman and adjacent areas.

There are no close relatives of *Euphorbia masirahensis* in the central limestone plateau of mainland Oman or in the Barr al Hikman area. Its nearest relative is *Euphorbia schimperi* Presl. and *Euphorbia dhofarensis* Carter, which are distributed in the dry regions of Dhofar (Ghazanfar 1992, 1993). The high frequency of *E. masirahensis* at Masirah indicate that it could be a relict species, which has disappeared from the Huqf escarpment due to recent climatic changes. The effect of the monsoon winds, a relatively high precipitation than that of the central desert of mainland Oman and mists may be the factors which have contributed to the continuity of *Euphorbia masirahensis* at Masirah.

Shaghaf is dominated by halophytes. Halophytic vegetation as that present on Shaghaf is also present on Halaniyat islands, in the southern part of Oman.

Floristically, Masirah, as most of Oman, is classified as the Nubo-Sindian Province of the sudanese floristic region of the Paleotropic Kingdom (Zohary 1973). Mandaville (1984), by using the distribution of *Acacia species* as an indicator of the Sudanian elements, has suggested a strong Sudanian presence in central and eastern Arabia. The presence of species such as *Acacia tortilis*, *Blepharis ciliaris* and *Ziziphus spina-christi* are considered as Sudanian relicts which migrated during the late Pliocene from western Arabia. During Pleistocene, when the Arabian Gulf was virtually dry (between 17,000 and 13,000 years B.P., Clarke and Fontes 1990), migration of species probably took place across the channel at Khalij Masirah (then probably dry) to Masirah. Species such as *Echiochilon jugatum*, *Limonium stocksii*, *Sphaerocoma aucheri* and *Zygophyllum qatarense*, which are endemic to south-east Arabia (Deil 1987) also occur at Masirah.

The presence of poecilohydric lichens in south and north-central Masirah is unique. They indicate a humid local climate which is supplemented by the mists brought in by the monsoon winds. These species of lichens, such as *Roccella balfourii*, *Roccellographa cretacea* or *Simonyella variegata* are typical to fog-deserts and are restricted in their distribution. So far they are known only from Sokotra (Republic of Yemen). *Diploica canescens* is commonly found on the Huqf escarpment and a few other places on the eastern coast of central Oman which are also influenced by mists.

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Appendix I

Floral List

Our collection were made from June 4 to July 19 and November 26 to 28, 1991. Collections by S.A. Ghazanfar are present at the Herbarium, Department of Biology, Sultan Qaboos University (SQUH), with duplicates at the National Herbarium, Ministry of National Heritage and Culture, Sultanate of Oman (ON). Collections made by D. Rappenhöner are present at ON with duplicates at the Herbarium of the Chair of Biogeography, University of Bayreuth, Germany. Lichens and some grass specimens are present at Berlin (B). In the floral list, collections by S.A. Ghazanfar have a four digit number and those of D. Rappenhöner have OM91- before the collecting number.

Dicotyledons

Acanthaceae

Blepharis ciliaris (L.) B.L. Burtt, Wadi Qitara, (SW-Masirah), 1371; SW-Masirah, OM91-37.

Aizoaceae

Aizoon canariensis L., RAF camp, Gallagher 6864/1 (ON).

Amaranthaceae

Aerva javanica (Burm.f.) Juss. ex Schultes, Wadi Dawwah, 1375; Wadi Kalban (S-Masirah), 1542; S-Masirah, OM91-234.

Asclepiadaceae

Glossonema varians (Stocks) Hook.f., Wadi Kalban (S-Masirah), 1517.

Pentstemon nivalis (J.F. Gmel.) Field and Wood, Wadi Zamji (NE-Masirah), 1382; Wadi Zamji, OM91-53.

Pergularia tomentosa (L.), Wadi Zamji (NE-Masirah), 1379; OM91-47.

Asteraceae (Compositae)

Acanthospermum hispidum DC., RAF camp, Radcliffe-Smith 4247 (K).

Launea mucronata (Forsskal) Muschl., Rounders Bay (S-Masirah), OM91-2.

Pluchea arabica (Boiss.) Qaiser and Lack, Wadi Dawwah (NW-Masirah), 1344, 1351; Rounders Bay (S-Masirah), OM91-12.

Pulicaria glutinosa (Boiss.) Jaub. and Spach, Wadi Dawwah (NW-Masirah), 1342; NW-Masirah, OM91-220; Jabal Suwayr (S-Masirah), OM91-15.

P. omanensis Gamal-Eldin, Wadi Qitara (SW-Masirah), 1372b.

Vernonia arabica F.G. Davis, Jabal Shabah (NE-Masirah), OM91-264.

Boraginaceae

Echiochilon jugatum I.M. Johnston, Wadi Zamji (NE-Masirah), 1352; Rounders Bay (S-Masirah), OM91-3.

Heliotropium kotschy (Ledeb.) Guerke, Wadi Qitara (SE-Masirah), 1373; Jabal Suwayr (S-Masirah), OM91-259.

H. bacciferum Forsskal, S-Masirah, OM91-260; Wadi Thumi, OM91-48.

H. calcareum Stocks, Wadi Shaghaf (NW-Masirah), s.n.; Wadi Dawwah (NW-Masirah), OM91-40.

Caesalpinaceae

Senna holosericea (Fresn.) Greuter, Wadi Qitar (SW-Masirah), 1370, 1377.

Capparaceae

Cleome cf. *brachydenia* O. Schwartz, Wadi Firay, 1381.

C. droserifolia (Forsskal) Del., S-Masirah, OM91-222.

C. scaposa DC. S-central Masirah, OM91-282.

Caryophyllaceae

Polycarpha spicata Wight and Arn., Wadi Qitara (SW-Masirah), 1368.

Sphaerocoma aucheri Boiss., Wadi Kalban (S-Masirah), 1516; Rounders Bay (SW-Masirah), OM91-275; Shaghaf, OM91-31.

Chenopodiaceae

Arthrocnemum macrostachyum (Moriq.) Moris and Delp., Shaghaf 1364; Shaghaf, OM91-30.

Atriplex coriacea Forsskal Shaghaf 1353.

A. farinosum Forsskal Shaghaf 1357; Khawriyah (W-Masirah), 1354; Shaghaf, OM91-33.

Halopeplis perfoliata (Forsskal) Bunge, Shaghaf 1363, 1360; Shaghaf, OM91-35.

Salsola baryosoma (Roem. and Sch.) Dandy, Shaghaf, s.n.; N-Masirah, OM91-267.

Salsola cf. imbricata Forsskal Shaghaf 1349.

Suaeda fruticosa Forsskal ex Gmel., Shaghaf, OM91-28.

Suaeda monioca Forsskal Shaghaf 1358.

Suaeda moschata A.J. Scott, Shaghaf 1361; B.E.R.S. camp (N-Masirah), OM91-272.

S. vermiculata Forsskal, Shaghaf 1355; Shghaf, OM91-29, OM91-34.

Convolvulaceae

Cressa cretica (L.), Wadi Qitar (SW-Masirah), 1546.

Ipomoea pes-carpa (L.) R. Br., Wadi Ra'siyah, OM91-262.

Cucurbitaceae

Citrullus colocynthis (L.) Schrad., Wadi Kalban (S-Masirah) 1534; SW-Masirah, OM91-277.

Cucumis prophetarium L., Palm Wadi, **Mcleish** s. n. (E,ON).

Euphorbiaceae

Euphorbia masirahensis S.A. Ghazanfar, Wadi Zamji (NE-Masirah), 1374, 1515, 1551; NE-Masirah, OM91-266; OM91-54.

E. granulata Forsskal, SW-Masirah, OM91-281.

Charozophora oblongifolia (Del.) Adr. juss. ex Spreng., Wadi Kalban (S-Masirah) 1523; S-Masirah, OM91-250.

Fabaceae

Crotolaria aegyptiaca Benth., Wadi Qitara (SW-Masirah), 1367, 1349; Jabal Suwayr (S-Masirah), OM91-237.

Indigofera arabica Jaub. & Spach, RAF camp, Gallagher 6864/9.

I. argentea Burm.f. S-Masirah, OM91-253,254.

I. intricata Boiss. Wadi Shaghaf (NW-Masirah), s.n.; Wadi Dawwah (NW-Masirah), OM9-55; Hatm (W-Masirah), OM91-27.

I. oblongifolia Forsskal, Wadi Shaghaf, s.n.

Taverniera spartea (Burm.f.) DC., Wadi Dawwah (NW-Masirah), 1385, 1343; Jabal Suwayr (S-Masirah), OM91-256.

T. lappacea (Forsskal) DC., Palm Wadi, **Mcleish** s.n. (E,ON).

Tephrosia apollinea (Del.) Link, Wadi Dawwah, (NW-Masirah), 1378, 1347; NW-Masirah, OM91-51.

Lamiaceae

Lavandula macra Baker, RAF camp, **Radcliffe-Smith** (K).

Malvaceae

Thespesia sp., Palm Wadi (NE-Masirah) 1380; Wadi Zamji (Palm Wadi), OM91-52; escape from cultivation.

Mimosaceae

Acacia tortilis (Forsskal) Hayne, Wadi Kalban (S-Masirah) 1519.

Prosopis cineraria (L.) Druce, Palm wadi, Mcleish s.n. (E,ON).

Nyctaginaceae

Commicarpus boissieri (Heimerl.) Cufod. Wadi Kalban (S-Masirah), 1520; S-Masirah, OM91-249.

Orobanchaceae

Cistanche tubulosa (Schrenk) Hook. f., Shaghaf (parasitic on *Suaeda* bushes), OM91-32.

Plumbaginaceae

Limonium stocksii (Boiss.) Kuntze, Shaghaf, 1355; Rounders Bay (S-Masirah), OM91-4.

Polygalaceae

Polygala erioptera DC., Wadi Dawwah, s.n.

Portulacaceae

Portulaca oleracea L., B.E.R.S. camp (N-Masirah), OM91-271.

Rhamnaceae

Ziziphus spina-christi (L.) Desf., S. Masirah, 1521; Wadi Huqf (SE-Masirah), OM91-283; Wadi Qarin (SW-central Masirah), OM91-286.

Rubiaceae

Kohautia retrorsa (Boiss.) Brem., Wadi Qitar (SW-Masirah) 1540; Jabal Shabah (NE-Masirah), OM91-265.

Scrophulariaceae

Campylanthus sedoides A. Miller, Rounders Bay (SW-Masirah), OM91-236.

Lindenbergia cf. *fruticosa* Benth., Wadi Dawwah, 1376; SW-Masirah, OM91-278.

Schweinfurthia imbricata Miller, RAF camp, Callagher 6361/1 (ON).

Tamaricaceae

Tamarix arabica Bunge, S-Masirah, 1522; Huqf (SE-Masirah), 1350; SW-Masirah, OM91-279, 280.

Tiliaceae

Corchorus depressus (L.) Stocks, Wadi Kalban (S-Masirah) 1537; S-Masirah, OM91-252.

Verbenaceae

Avicennia marina (Forsskal) Vierh., Shaghaf, 1365; W-Shaghaf, OM91-36.

Zygophyllaceae

Fagonia indica Burm.f., Wadi Shaghaf (NW-Masirah, 1346; Hatm (W-Masirah), OM91-25.

Zygophyllum qatarense Hadidi, Wadi Shaghaf (NE-Masirah), 1345, 1348; Rounders Bay (S-Masirah), OM91-1

Zygophyllum simplex L., B.E.R.S. camp (N-Masirah), OM91-273.

Monocotyledons

Cymodoaceaceae

Halodule uninevris Boiss., Shaghaf, *Schleleck s.n.*

Cyperaceae

Cyperus conglomeratus Rottb., Wadi Shaghaf (NW-Masirah), *s.n.* Wadi Kalban (S-Masirah), 1529; Rounders Bay (S-Masirah), OM91-5.

Hydrocharitaceae

Halophila ovalis (R.Br.) Hook.F., Shaghaf, *Schleleck s.n.*

Juncaceae

Juncus rigidus Desf., Wadi Zamji (NE-Masirah), OM91-49.

Liliaceae

Dipcadi sp., around Hilf (N-Masirah), Bryan *s.n.* (SQUH).

Poaceae (Gramineae)

Aeluropus lagopoides (L.) Trin. ex Thwaites, Sur Masirah, *s.n.*; Wadi Thumhi (NE-Masirah), OM91-44.

Chloris barbata Sw., B.E.R.S. camp (N-Masirah), OM91-270.

Cymbopogon sp., Jabal Suwayr (S-Masirah), OM91-16.

Dactyloctenium aegyptium (L.) Beauv., B.E.R.S. camp (N-Masirah), OM91-269.

Dicanthium foveolatum (Del.) Roberty, RAF camp, Gallagher 6864/8 (ON).

Eragrostis mahrana Schweinf., S-Masirah, OM91-231.

Lasiuris scindicus Henrard, Wadi Kalban (S-Masirah), 1532; SW-Masirah, OM91-284.

Panicum turgidum Forsskal, Wadi Dawwah (NW-Masirah), 1383; Hatm (W-Masirah), OM91-26.

Pennisetum sp., Shaghaf village (W-Masirah), 1550.

Phragmites australis (Cav.) Trin. ex Steud., Wadi Zamji (NE-Masirah), 1384; Palm Wadi (NE-Masirah), OM91-57.

Sporobolus ioclados (Nees ex Trin.) Nees, Rounders Bay (SW-Masirah), OM91-235; Jabal Suwayr (S-Masirah), OM91-255.

S. spicatus (Vahl) Kunth, Wadi Qitara (SW-Masirah), 1369; B.E.R.S. camp (N-Masirah), OM91-268.

Stripagrostis masirahensis H. Scholz, S-Masirah, OM91-233; Jabal Shabah (NE-Masirah), OM91-263.

Ruppiaceae

Ruppia maritima L., Wadi Qitara (Blue Grotto) (SW-Masirah), 1372; SW-Masirah, OM91-45.

Typhaceae

Typha domingensis Pers., Wadi Zamji (NE-Masirah), OM91-56.

Cultivated trees

Albizia lebbek (L.) Benth.

Casuarina sp.

Cordia sp.

Mangifera indica L.

Prosopis juliflora (Swartz) DC.

Punica granatum L.

Terminalia catappa L.

Ziziphus spina-christi (L.) Desf.

Lichens

Arthonia sp., Jabal Suwayr (S-Masirah),
OM91-240e.

Buellia sp., Jabal Suwayr (S-Masirah), OM91-
242a.

Caloplaca sp., Jabal Suwayr (S-Masirah)
OM91-241b.

C. cf. *decipiens*, Jabal Suwayr (S-Masirah),
OM91-164a.

Dirina massiliensis Durieu et Mont, Jabal
Suwayr (S-Masirah), OM91-261b.

Diploica canescens (Dicks.) Massal., Jabal
Suwayr (S-Masirah), OM91-257a.

Gloeoheppia sp., Jabal Suwayr (S-Masirah),
OM91-258c.

G. turgida (Ach.) Gyeln., Jabal Humr (N-
Masirah), OM91-58.

Polycoccum opulentum (Th. Fr. et Almq.)
Arnold, Jabal Suwayr (S-Masirah), OM91-257c.

cf. *Psorotichia* sp., Jabal Suwayr (S-Masirah),
OM91-257b.

Ramalina sp., Jabal Suwayr (S-Masirah),
OM91-244.

Rocella balfourii Muller-Arg., Jabal Suwayr
(S-Masirah), OM91-247.

Roccellographa cretacea J. Steiner, Jabal
Suwayr (S-Masirah), OM91-248a.

Simoyella variegata j. Steiner, Jabal Suwayr
(S-Masirah), OM91-248b.

Verrucaria sp., Jabal Suwayr (S-Masirah),
OM91-242c.

الغطاء العشبي لجزيرتي مصيره والشغاف - سلطنة عمان

شاهينا غزنفر^١ و دايترا رابنهوور^٢

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لقد تم في هذه الدراسة تصنيف الغطاء العشبي لجزيرتي مصيره والشغاف وهو يشبه الغطاء العشبي لبر الحكمان في (شرق وسط سلطنة عمان) والمناطق المجاورة. ولقد توصلت الدراسة الى أن هناك ثمانية أنواع من الغطاء العشبي في الجزر لها علاقة وثيقة بأنواع التربة وتضاريس الأرض. وكذلك تبين من الدراسة بأن أعلى نسبة من أنواع الغطاء العشبي توجد في سلسلة الجبال التي تتوسط جزيرة مصيره كما وأن أعلى نسبة من النباتات الملحية توجد في جزيرة الشغاف.

وقد دلت الدراسة أن نباتات *Euphorbia* و *Stipagrostis masirahensis* و *masirahensis* تتوسط المنطقة، كما ان أشنات *Poecilohydric* التي لا تعرف في المناطق الداخلية لسلطنة عمان فهي تتواجد وتنمو في الأحجار الجيرية في شمال وجنوب الجبال التي تتوسط جزيرة مصيره.