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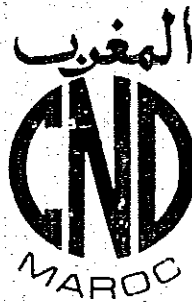
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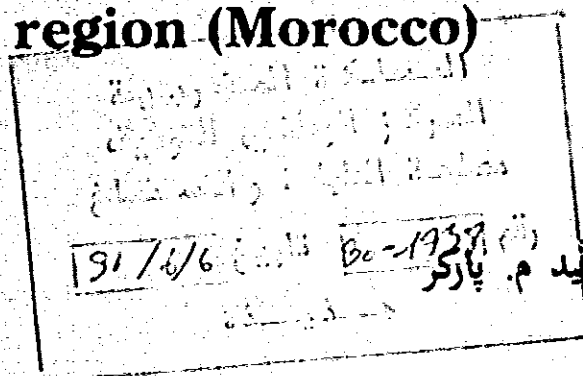


مصلحة الطباعة والتصوير
ص.ب 826 الرباط

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Checklist of Flora of the Khnifiss-Tarfaya region (Morocco)



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جون إدموندسون، أنغوس غون، أليسون ج. بورت ودافيد م. باركر

ملخص

لائحة النباتات بمنطقة خنيفيس - طرفاية. يعرض المقال لائحة أنواع النباتات الوعائية بضواحي طرفاية وخنيفيس، مع وصف موجز للوسط الذي تفضله وكذا لتوزيعها ومدى وفرتها في المنطقة. ويُعطى كذلك تقييم مختصر لدلول التركيبة النباتية بهذه الناحية.

SUMMARY

The higher plant species of the Tarfaya to Khnifiss Lagoon region are listed with a brief description of their habitat preference, distribution and abundance in the study area. The significance of the plant species composition of the region is briefly assessed.

RESUME

Liste floristique de la région de Tarfaya-Khnifiss. Il s'agit de la liste des espèces de plantes vasculaires de la région s'étendant de Tarfaya à la lagune de Khnifiss, accompagnée d'une description succincte de leur habitat préféré, et de leurs répartition et abondance dans la zone d'étude. La signification de la composition de la flore de cette région est évaluée brièvement.

INTRODUCTION

The Tarfaya to Khnifiss Lagoon region consists of several marine and desert biotypes, including reg and erg desert, brackish water and intertidal zones (see fig. 1). The distribution of biotypes and plant communities is described elsewhere (BURT, 1988). This paper lists the higher plant species found within those biotypes and includes a description of their ecology in terms of distribution, abundance, biotype preference and phytogeographical affinity.

METHODS

The collection of herbarium voucher specimens was made during the period April 1985 to June 1986. Specimens were transported to Liverpool Museum for identification or confirmation. Most material was named by reference to OZENDA (1977) or by comparison with named

material in the Liverpool Museum herbarium (LIV) which includes a sizeable collection of North African specimens. For those which were not treated in 'Flore du Sahara' the list for Tarfaya province (MATHEZ & SAUVAGE, 1974) was consulted. TUTIN & al. (1965-79) was the principal reference for updating the nomenclature; species not recorded from Europe were named according to GREUTER & al. (1984, 1986-).

RESULTS AND DISCUSSION

A total of 72 different species of flowering plant was identified from the study area. For each taxon, a brief statement of its distribution, preferred biotype and overall abundance in the study area is given, together with the herbarium reference number and its phyto-geographical affinity. Taxa are arranged in alphabetical order of family and genus; family circumscription follows TUTIN & al. (1965-79).

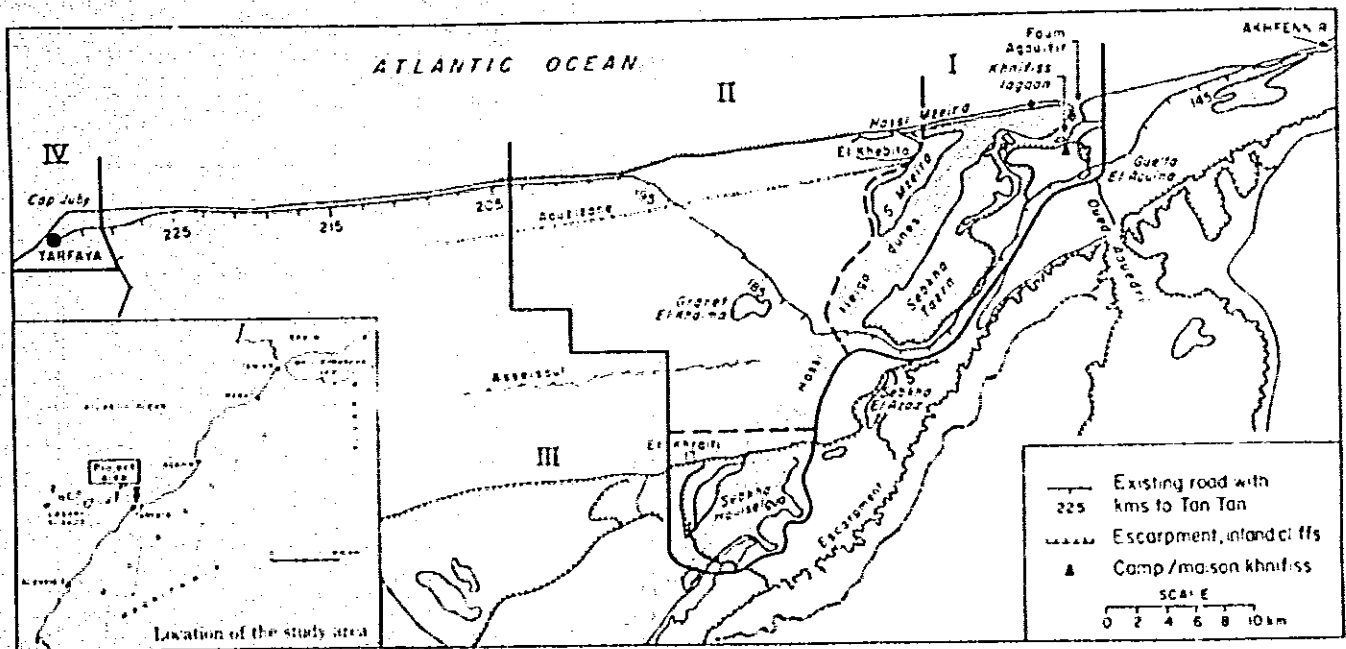


Figure 1. The region referred to by the checklist of flora and from which herbarium samples were collected

The inclusion in the list of a number of species endemic to Morocco is noteworthy. Although the exact distribution of these species is incompletely known, their occurrence is thought to be restricted to a narrow «oceanic» Saharan zone in southern Morocco. This zone extends into the northern coastal belt of Mauritania and is the only location for species with an Oceanic-Saharan affinity.

The floristic composition of part of the study area has much in common with WHITE's (1983) azonal «halophytic vegetation» which he describes as being relatively rich but little known. Away from areas with enhanced salinity the flora can be classed with WHITE's «Atlantic coastal desert». Our observations do not support the southern limit of the «sub Mediterranean grassland» drawn in WHITE (1983) since the absence from the study area of species such as *Stipa tenacissima* and *Artemisia* spp. seems to place the limit further to the north, although another characteristic species of sub Mediterranean grassland is found, i.e. *Lygeum spartum*.

The occurrence of *Zygophyllum gactulum*, *Frankenia corymbosa*, *Lyceum intricatum* and *Launca arborescens* is significant as these are characteristic halophilous species of the Atlantic Saharan zone. Also remarkable is the presence of temperate West European coastal species such as *Spartina maritima* and *Zostera*

noltii and a species of *Apocynum* long regarded as endemic to the Canary Islands, *Astydammia latifolia*.

CHECKLIST

AIZOACEAE

Opophytum gaussonii (Leredde) Greuter & Burdet (syn *Mesembryanthemum gaussonii* Leredde).
Stony reg; common by roads and tracks.
No. 16. (Saharan endemic)

Mesembryanthemum nodulosum L.
Reg; less common than *O. gaussonii*. Damp sand; Guelta el Aouina.
No. 41, 65, 91. (Mediterranean)

Sesuvium portulacastrum L.
Moist sand, dune forming; highly localised, Sebkhia Tazra.
No. 6. (Pantropical)

ANACARDIACEAE

Rhus tripartita (Ucria) Grande
Reg; common.
No. 74, 91, 127. (Mediterranean)

APIACEAE

Astydammia latifolia (L. F.) O. Kuntze
Coastal rocky cliffs; uncommon.
No. 36. (Macaronesian)

Cakile maritima L.
Coastal sand, Guelta el Aouina; uncommon.
No. 10, 66. (Cosmopolitan)

Pitaranthus scoparius (Coss. et Dur.) Benth. et Hook.
Reg; uncommon, more frequent inland.
No. 122. (N. African)

ASCLEPIADACEAE

Periploca angustifolia Labill. (syn. *P. laevigata* Ait.)
Reg; most common S. of Asselsoul.
No. 124. (Saharo-Mediterranean).

ASPARAGACEAE

Asparagus allissimus Munby
Sandy cliffs; perimeter of Lagune de Khnifiss, uncommon.
No. 230. (Saharan endemic).

ASTERACEAE

Anvillea radiata Coss. & Durand var. *australis*
Reg; common and widespread.
No. 23, 88, 148. (Saharan endemic).

Senecio gallicus Chaix subsp. *coronopifolius* (Desf.)
Sandy cliffs, perimeter of Lagune de Khnifiss and Sebkh
Tazra; locally abundant.
No. 222. (Mediterranean).

Ifloga spicata (Forssk.) Schultz-Bip.
Sandy reg; uncommon.
No. 106. (Saharo-Sindian).

Inula lozanoi Caball.
Reg adjoining cliffs to S. & E. of Sebkh
Tazra; locally common.
No. 13, 40. (Oceanic Saharan endemic).

Launaea arborescens (Batt.) Maire
Reg; common and widespread.
No. 22, 80. (Mediterranean).

Launaea nudicaulis (L.) Hook.
Reg adjoining cliffs to S. of Sebkh
Tazra.
No. 132. (Mediterranean).

Launaea resedifolia (L.) O. Kuntze
Sandy cliff at S. end of Sebkh
Tazra.
No. 131. (Mediterranean).

BORAGINACEAE

Echiochilon chazalici (Boissieu) Johnst.
Reg, common & widespread.
No. 11, 21. (Oceanic Saharan endemic).

Heliotropium bacciferum Forsk. (incl. *H. antiatlanticum*
Emberger)
Reg, common & widespread.
No. 41, 76. (Saharo-Sindian).

CHENOPODIACEAE

Arthrocnemum macrostachyum (Moric.) Moris (syn. *A.*
indicum subsp. *glaucum* Maire & Weiller)
Sand, margins of Sebkh
Tazra; forms dunes.
No. 151. (Mediterranean).

Atriplex parvifolia Lowe (syn. *A. glauca* L. var. *ifniensis*
(Caball.) (Maire)
Sandy cliffs and dunes bordering S. side of Lagune de
Khnifiss.
No. 28, 77, 159. (Macaronesian).

Atriplex portulacoides L. (syn. *Halimione portulacoides* (L.)
Aellen) salt marsh, Lagune de Khnifiss; widespread and
common.
No. 52, 147. (Cosmopolitan). Possibly a local morphological
variant.

Bassia tomentosa (Lowe) Maire et Weiller
Reg. and cliffs to S. of Sebkh
Tazra; very local and
uncommon.
No. 129. (Macaronesian).

Chenopodium sp.

Guelta al Aouina, base of cliffs in Lagune; locally common.
No. 165.

Halocnemum strobilaceum (Pallas) Bieb.
Commonly found with *Arthrocnemum*.
No. 51, 53, 84. (Mediterranean).

Salicornia fruticosa ? L.
High salt marsh, Lagune de Khnifiss.
No. 55, 83. (Cosmopolitan).

Salicornia sp. ?
Intertidal areas, abundant in salt marsh, pioneer colonist of
sand flats; Lagune de Khnifiss.
No. 5, 45, 49/50.

Salsola baryosma (Schultes) Dandy (syn. *S. foetida* Sprengel)
Sandy reg; abundance uncertain.
No. 241b - (Saharo-Sindian & Sudano - Deccaman)

Salsola glomerata (Maire) Brullo (syn. *S. serbeni* auct.)
Reg; abundant, especially in deep sand and sheltered areas.
No. 32, 156. (Saharan endemic)

Salsola tetragona Del.
Reg; confused with *S. vermiculata*, but less common
No. 34, 107, 150. (Saharo-Mediterranean).

Salsola vermiculata L.
Reg; widely distributed, common.
No. 203, 241a (Saharo-Sindian & Mediterranean).

Suaeda vera J. F. Gmelin (syn. *S. frutescens* (L.) Forssk.)
Reg adjoining southern cliffs of Lagune de Khnifiss and
Sebkh
Tazra; very local and rare.
No. 79, 108. (Cosmopolitan)

Suaeda ifniensis Caball
High saltmarsh, Lagune de Khnifiss, abundant
No. 46, 146. (Endemic, Saharan littoral zone)

Suaeda mollis (Desf.) Del.
Reg, common.
No. 33, 71. (Saharo-Sindian).

Traganum nudatum Del.
Coastal sand, edge of Lagune de Khnifiss and Atlantic
coast; locally common.
No. 57. (Saharo-Sindian)

CISTACEAE

Helianthemum ellipticum (Desf.) Pers
Reg 10 km W. of Garet el Khauma, rare.
No. 140. (N.W. Saharan endemic).

CYNOMORIACEAE

Cynomorium coccineum L.
Locally common (parasitic) areas of Tamarisk and small
dunes bordering Sebkh
Mzeira, Sebkh
Tazra and Lagune
de Khnifiss.
Obs. (Mediterranean).

CYPERACEAE

Cyperus capitatus Vandelli (syn. *C. kullii* (Forssk.) Murb.)
Sandy reg.
No. 39. (Mediterranean & sub-tropical)

Scirpus litoralis Schrad.
Brackish flush, Hassi Mzeira.
No. 154. (Cosmopolitan).

EUPHORBIACEAE

Euphorbia paralias L.
Coastal sand and sandy reg; locally common.
No. 37. (Mediterranean).

FABACEAE

Astragalus hamosus L.
Reg; rare, S. Sebkhaz Tazra.
No. 118. (Mediterranean).

Hedysarum argentatum Maire
Sandy reg around Tazra and W. Hassi Fleiga dunes.
No. 38. (Oceanic Saharan endemic).

Lotus chazaliei Boissieu
Reg; widespread and common.
No. 9, 25. (Saharan endemic).

Ononis nat-ix L.
Reg; widespread.
No. 27, 149. (Mediterranean).

Ononis serrata Forssk.
Reg; most common in species-rich reg inland from rocky coastal cliffs.
No. 15, 89. (Saharo-Sindian).

FRANKENIACEAE

Frankenia corymbosa Desf.
Reg; widespread and abundant.
No. 7, 26, 61, 75, 99, 103, 116. (Saharo-Mediterranean).

ILLECEBRACEAE

Gymnocarpus decander Forssk.
Reg; widespread and common.
No. 98. (Saharo-Sindian).

Herniaria fontanesii J. Gay
Reg; rare, W. of Graret el Khaima.
No. 97, 141. (W. Mediterranean-Macaronesian).

Polycarpacea niva (Ait.) Webb
Reg; widespread & common.
No. 14, 29, 139. (Oceanic Saharan endemic).

JUNCACEAE

Juncus maritimus Lam.
Brackish flush at Hassi Mzeira; a few plants only.
No. 154. (Mediterranean/N. Atlantic).

LAMIACEAE

Teucrium chardonianum Maire et Wilczek
Reg; widespread & common.
No. 30, 78. (Oceanic Saharan endemic).

Teucrium helichrysoïdes (Diels) Greuter & Burdet (syn. *T. polium* (L.) Briquet subsp. *chevalieri* Quezel & Santa
Rare; Graret el Khaima.
No. 144. (Saharan endemic).

LILIACEAE

Dipcadi panousei Sauvage & Veillex
Reg; local and rare.
No. 193. (Oceanic Saharan endemic, known only from Tazra province).

OROBANCHACEAE

Cistanche phelypaea (L.) P. Cout.

Salt marsh and intertidal sand, Lagune de Khnifiss; locally common.
No. 3, 56. (Saharo-Sindian & Mediterranean).

PLUMBAGINACEAE

Limoniastrum weygandiorum Maire et Wilczek
Inland rocky reg; locally common.
No. 128. (Oceanic Saharan endemic).

Limonium asperium Maire
Rocky reg, Er Rekani; rare and localised
No. 17, 111, 123, 126. (Oceanic Saharan endemic).

Limonium chrysopotamicum Maire
Coastal reg; uncommon.
No. 24, 42, 96, 143. (Oceanic Saharan endemic).

Limonium tuberculatum (Boiss.) O. Kuntze
Abundant in salt marsh, Lagune de Khnifiss, blown sand, Sebkhaz Tazra and escarpment Oued Aouedri.
No. 12, 47/48, 101, 102, 115. (Oceanic Saharan endemic).

POACEAE

Aeluropus littoralis (Gouan) Parl.
Coastal reg; locally common.
No. 35, 63, 133. (Mediterranean).

Lygum spartum L.
Reg; local.
No. 95. (Mediterranean).

Phragmites australis (Cav.) Trin. et Steud.
Brackish flush at Hassi Mzeira; locally common.
No. 158. (Cosmopolitan).

Spartina maritima (Curt.) Fernald
Salt marsh channels, mudflats, Lagune de Khnifiss.
No. 4, 51, 145. (Cosmopolitan).

Sporobolus pungens (Schreber) Kunth
Beneath Tamarisk, W. edge of Sebkhaz Mzeira; locally abundant.
No. 134, 157. (Mediterranean).

POLYGONACEAE

Rumex vesicarius L.
Quarry bottom in reg desert by Tazra → Tan-Tan road; locally abundant.
No. 196. (Saharo-Sindian).

RESEDACEAE

Oligomeris linifolia (Vahl) Macbride (syn. *O. subulata* (Del.) Webb)
Reg. Tazra; local.
No. 85. (Saharo-Sindian/Californian disjunct).

ROSACEAE

Neurada procumbens L.
Sandy cliff on S. side of Lagune de Khnifiss and Sebkhaz Tazra; locally abundant.
No. 223. (Saharo-Sindian).

SOLANACEAE

Lycium intricatum Boiss. subsp. *intricatum*
Reg and sandy cliffs near Lagune de Khnifiss; local.
No. 113. (Mediterranean).

TAMARICACEAE

Tamarix gallica L.

Associated with water table close to or above ground level, sandy soils;
Sebkha Mzeira, Sebkha Houiselgua, Lagune de Khnifiss; common.
No. 19, 58, 62, 138, 155. (Mediterranean & Saharo-Sindian).

Tamarix pauciovulata J. Gay
Dunes, Lagune de Khnifiss; much less common than *T. gallica*.
No. 112. (Mediterranean & Saharo-Sindian).

ZANNICHELLIACEAE

Athenia filiformis Petit
Submerged, Guelta el Aouina.
No. 18, 68. (Mediterranean).

ZOSTERACEAE

Zostera noltii Hornem. (syn. *Z. nana* Roth)
Intertidal mudflats, Lagune de Khnifiss; abundant.
No. 166. (Mediterranean/N. Atlantic).

ZYGOPHYLLACEAE

Nitraria retusa (Forssk.) Asch.
Salt marsh, sand dunes, reg; locally abundant in Sebkha Tazra.
No. 8, 117. (Saharo-Sindian).

Zygophyllum gaetulum Emb. & Maire
Reg. coastal dunes, extremely common and widespread.
No. 1, 2, 31, 59, 60, 92, 109, 120. (Coastal Saharan endemic).

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3

009 9 / EN 009 9 / ES 009 9 / FR

Code de langue des descripteurs (cocher obligatoirement celui qui convient)

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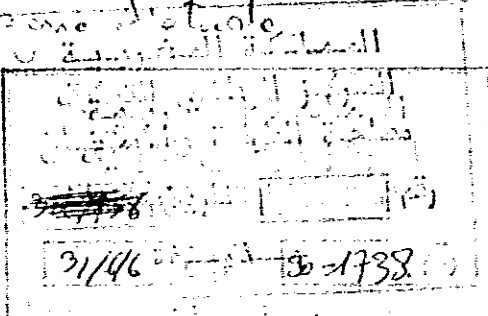
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FIN

النهاية

9

مشاهد

VUES