

Alien plants of Fuerteventura, Canary Islands

Plantas extranjeras de Fuerteventura, Islas Canarias

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Abstract: The nowadays flora of Fuerteventura contains some 780 species. At least 119 species are aliens, some 150 further species of mediterranean and/or North African origin are probably introduced too. The estimated percentage of aliens therefore reaches 35 %.

Resumen: Esta publicación se ocupa de una primera colocación provisional de las plantas vasculares no indígenas de la isla Fuerteventura. Según presentes resultados, actualmente el total de las especies se aproxima a las 780. Aproximadamente 300 especies tienen su origen mediterráneo o norteafricano. Detalladamente es difícil definir su estado, si es una especie nativa o introducida.

La obra contiene una primera lista de especies de América, Asia, Australia o de origen tropical, que son neophytica (recien llegados) porque llegó a la isla después de 1500. Una segunda lista, cita especies de la zona tropical o del sur de África, algunas de éstas especies pueden ser indígenas. La tercera lista, menciona plantas cultivadas asilvestradas las cuales descenden del oeste de Asia o de Europa. La cuarta y última lista, encierra especies mediterraneas y con una distribución en África del Norte, existen problemas a la hora de definir su estado.

1. Introduction - Introducción

Fuerteventura is the second largest island of the Canary Islands. The surface covers an area of 1725 km². It is the lowest populated island of the archipelago [24 inhabitants per km²]. The shortest distance to Africa is only 100 km. As things are Fuerteventura is the oldest volcano island of the archipelago. Due to the long lasting erosion processes Fuerteventura has a smooth relief, only interrupted by the massif of the peninsula of Jandía with the Pico de la Zarza (807 m) and the massif of Betancuria (724 m). The climate is arid, only every 2-3 years there are 1-2 months showing some semiarid conditions. In general there is an average precipitation of 147 mm p.a. (HÖLLERMANN 1991). The mean average temperature is about 20°C. Small daily and yearly temperature deviations as well as no frost are characteristics of a marginal tropical climate.

Usually Fuerteventura is dealt as part of the Macaronesian region. Within this region Fuerteventura is said by KUNKEL (1993) to be part of the Central Macaronesian region. Based on comparisons of the nowadays flora of the basal regions the uniformity and the existence of this floral region is questioned by LÜPNITZ (1995). He therefore integrates the Canary Islands to the Saharo-Sindian region.

2. The development of the flora of Fuerteventura – El desarrollo de la flora de Fuerteventura

Colonizing of the island by plants is a dynamic process, which is in no way completed. The uncertainties of the classification of the species in respect to the time of introduction is relatively high, in so far a quantification is only provisory. Even the differentiation indigenous vs. adventive is problematical. The nowadays flora of Fuerteventura contains more than 300 species of mediterranean and/or North African origin, whereas just these species are dominating in the vegetation of the lower altitudes. Most of them are weeds or ruderals. The relatively high part of North African elements is at least partly promoted by man. Overgrazing destroyed the remnants of thermophilous shrub vegetation and promoted the desertification. Most of these plants seem to be introduced to the island after its conquest by the Europeans [at the beginning of the 15th century], some of them may be introduced already by the natives, others may be indigenous. Production of firewood and timber, overgrazing by goats caused during the last centuries a change in vegetation as well as the exploitation of ground water during this century. Nowadays urban spread and new roads reduce many areas grown by endemic plants.

During the last century nutrition plants and useful plants were first of all introduced to Fuerteventura. Together with these plants many weeds have been introduced unintentionally. Some of the useful plants run wild and became part of the flora e.g. the *Opuntia* and *Agave* species. During the second half of the 20th century the whole collection of the subtropical gardens has been imported. Irrigated areas around the hotels and borders along the streets are nowadays the main source for aliens.

3. State of the art – El estado de las especies

In contrary to the other Canary Islands the knowledge of the flora of Fuerteventura is still insufficient. KUNKEL published in 1977 a checklist containing 599 species; 258 of them (43,1 %) are classified as adventive or possibly introduced. As stated above the classification as adventive is not to prove in any case and therefore to some extent speculative. In 1993 KUNKEL reports 560 species and [only] 160 „introduced elements“ (27,6 %). Reasons for the reduction in the number of imported species are not given.

HANSEN & SUNDING (1993) reported 667 taxa for Fuerteventura without any differentiation between indigenous and alien. Our checklist contains some 780 species (BRANDES 2000).

Differentiations based on the origin are not possible in every case as already mentioned in chapter 2. But it is sure that taxa originating from far continents (South and Central America, Australia, East Asia) are aliens. Most of them are deemed to be neophytic, because they have been introduced after the discovery of the respective sea-routes. A classification based on the degree of naturalization is not yet possible due to lack of ecological information. There is some need for further investigation, especially on the naturalization of trees and shrubs.

4. Checklist of plant species running wild introduced from America, Asia, Australia, and also of pantropical origin – Lista de las especies asilvestradas de América, Asia, Australia y orígenes tropicales:

| | |
|--|---|
| Acacia cyanophylla | Coronopus didymus |
| Acacia cyclops | Cucurbita pepo |
| Acacia farnesiana | Cyperus articulatus |
| Acacia saligna | Cyperus peruvianus |
| Acanthoxanthium spinosum | Cyperus rotundus |
| Agave americana | Datura innoxia |
| Agave attenuata | Datura metel |
| Agave fourcroydes | Datura stramonium |
| Agave sisalana | Dichondra micrantha |
| Albizia lophanta | Eucalyptus camaldulensis |
| Amaranthus deflexus | Euphorbia prostrata |
| Amaranthus muricatus | Euphorbia pucherrima |
| Amaranthus viridis | Euphorbia repens |
| Arundo donax | Euphorbia serpens |
| Asclepias curassavica | Furcraea foetida |
| Aster squamatus | Gnaphalium pensylvanicum |
| Atriplex semibaccata | Gossypium herbaceum |
| Atriplex suberecta | Helianthus annuus |
| Austrocyllindropuntia cylindrica | Heliotropium curassavicum |
| Austrocyllindropuntia exaltata | Hylocereus undulatus |
| Bidens aurea | Ipomoea indica |
| Bidens pilosa | Lantana camara |
| Bromus willdenowii | Lycopersicon esculentum |
| Caesalpinia gillesii | Maireana brevifolia |
| Caesalpinia spinosa | Mirabilis jalapa |
| Cassia bicapsularis | Morus nigra |
| Cassia tomentosa | Musa acuminata |
| Casuarina equisetifolia | Nicotiana glauca (Zoom) |
| Chenopodium ambrosioides | Nicotiana tabacum |
| Chenopodium giganteum | Oenothera rosea |
| Conyza bonariensis | Opuntia dillenii |

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| Opuntia ficus-indica | Schinus molle |
| Opuntia tomentosa | Schinus terebinthifolius |
| Opuntia vulgaris[= Opuntia spec. (KUNKEL 1977) ?] | Sclerophylax spinescens (Zoom) |
| Oxalis latifolia | Sesuvium portulacastrum |
| Parkinsonia aculeata | Solanum tuberosum |
| Phoenix dactylifera | Stenotaphrum secundatum |
| Punica granatum | Tropaeolum majus |
| Salpichroa organifolia | Washingtonia cf. robusta |
| | Zea mays |

Notes:

- (1) Nicotiana glauca is the only invasive plant of greater importance (see BRANDES & FRITZSCH 2000).
- (2) Xanthium strumarium ssp. italicum is probably also originating from America.

5. Plant species running wild introduced from tropical and South Africa – Especies asilvestradas de la región tropicana y Sudafricana:

| | |
|--|--|
| Aloe vera [= A. barbadense (KUNKEL 1977)] | Gazzania spec. |
| Anredera cordifolia | Gomphocarpus fruticosus |
| Aptenia cordifolia | Ipomoea batatas |
| Calotropis procera | Ipomoea cairica |
| Carpobrotus edulis | Oxalis pes-caprae (Zoom) |
| Cassia didymobotrya | Oxalis purpurea |
| Catharanthus roseus | Pelargonium inquinans x zonale |
| Commicarpus helenae (Zoom) [? = | Pelargonium x hybridum |
| Boerhavia verticillata (HOHENESTER & WELB 1993)] | Pennisetum setaceum |
| Cyperus longus | Ricinus communis |
| Cyperus mundtii | Zantedeschia aethiopica |

Note:

There is also some evidence, that Mesembryanthemum crystallinum, which is nowadays very frequent, may be introduced from South Africa as well. However that may be, Mesembryanthemum crystallinum was promoted by man, especially for producing soda.

6. Cultivated plants originating from West Asia and Europe and probably running wild – Plantas cultivadas que descienden de la zona del oeste de Asia o de Europa, tal vez asilvestradas:

| | |
|-----------------------|----------------------|
| Allium cepa | Lactuca sativa |
| Allium sativum | Lens culinaris |
| Althaea rosea | Medicago sativa |
| Avena sativa | Nerium oleander |
| Brassica cf. oleracea | Papaver setigerum |
| Centranthus ruber | Papaver somniferum |
| Ceratonia siliqua | Petroselinum crispum |
| Cicer arietinum | Pisum sativum |
| Coriandrum sativum | Prunus dulcis |
| Cymbalaria muralis | Sinapis alba |

7. Checklist of further species probably introduced to Fuerteventura [mostly weeds and ruderals from the Mediterranean Area and North Africa] compiled with special regard to KUNKEL (1977) – Lista de otras especies que pueden ser nativas o bien haber sido introducidas en Fuerteventura (en general malas hierbas o ruderales) por regiones mediterraneas o Nortfricanas (véase también KUNKEL 1977):

| | |
|--------------------------------------|--|
| Achyranthes aspera | Carduus tenuiflorus |
| Achyranthes aspera L. var. sicula L. | Carthamus lanatus |
| Agrostis castellana | Carthamus tinctorius |
| Agrostis semiverticillata | Centaurea calcitrapa |
| Amaranthus lividus | Centaurea melitensis |
| Anacyclus radiatus | Cerastium glomeratum |
| Anagallis arvensis | Chamomilla recutita |
| Anchusa azurea | Chenopodium album |
| Andrachne telephioides | Chenopodium murale |
| Anthemis arvensis | Chrysanthemum coronarium |
| Anthemis cotula | Cichorium endivia ssp. divaricatum |
| Atriplex tatarica | Coleostephus myconis |
| Avena fatua | Convolvulus althaeoides |
| Borago officinalis | Convolvulus arvensis |
| Briza maxima | Coronopus squamatus |
| Bromus diandrus | Cynara cardunculus |
| Bromus lanceolatus | Cynodon dactylon |
| Bromus rigidus | Dittrichia viscosa (?) |
| Calendula bicolor | Echinochloa crus-galli |
| Capsella bursa-pastoris | Emex spinosa |
| Carduus pycnocephalus | Erodium botrys |

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| Erodium cicutarium | Melilotus sulcata |
| Erodium moschatum | Mentha x rotundifolia [KUNDEL 1977] [= |
| Eruca vesicaria ssp. sativa | M suaveolens Ehrh.] |
| Euphorbia exigua | Mercurialis annua |
| Euphorbia helioscopia | Moriscandia arvensis |
| Euphorbia peplus | Nasturtium officinale |
| Euphorbia serrata | Ononis pendula |
| Euphorbia sulcata | Ornithogalum narbonense |
| Foeniculum vulgare ssp. piperitum | Oxalis corniculata |
| Fumaria bastardii | Pallenis spinosa |
| Fumaria capreolata | Papaver argemone |
| Fumaria parviflora | Papaver dubium |
| Fumaria vaillantii | Papaver rhoeas |
| Galium anglicum | Parietaria debilis |
| Galium aparine | Parietaria judaica |
| Galium murale | Phalaris canariensis |
| Galium parisiense | Phalaris paradoxa |
| Galium tricornutum | Plantago albican* |
| Geranium molle | Plantago major |
| Geranium rotundifolium | Poa annua |
| Gladiolus italicus | Polycarpon tetraphyllum |
| Glaucium corniculatum | Polygonum aviculare |
| Hedera helix | Populus alba |
| Helminthotheca echioides | Portulaca oleracea |
| Hirschfeldia incana | Raphanus raphanistrum |
| Hordeum murinum ssp. leporinum | Raphanus sativus |
| Hordeum vulgare | Rapistrum rugosum |
| Hyoscyamus albus | Rhagadiolus stellatus |
| Juncus bufonius | Rumex acetosella ssp. angiocarpus |
| Kochia scoparia | Ruta chalepensis |
| Lactuca serriola | Salvia verbenaca |
| Lamium amplexicaule | Sansevieria trifasciata |
| Lathyrus clymenum | Scandix pecten-veneris |
| Lathyrus sativus | Scolymus hispanicus |
| Lathyrus tingitanus | Scolymus maculatus |
| Launea capitata* | Sedum cf. dendroideum |
| Lavatera arborea | Senecio vulgaris |
| Lavatera cretica | Setaria adhaerens |
| Leopoldia comosa | Sherardia arvensis |
| Limonium sinuatum | Silene gallica |
| Lolium multiflorum | Silene nocturna |
| Marrubium vulgare | Silene vulgaris ssp. commutata |
| Melilotus indica | Silybum marianum |

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|------------------------------------|---|
| <i>Sinapis arvensis</i> | <i>Trifolium stellatum</i> |
| <i>Sisymbrium officinale</i> | <i>Trifolium striatum</i> |
| <i>Solanum luteum</i> | <i>Urospermum picroides</i> |
| <i>Solanum nigrum</i> | <i>Urtica membranacea</i> |
| <i>Sonchus oleraceus</i> | <i>Urtica urens</i> |
| Sonchus tenerrimus | <i>Verbena officinalis</i> |
| <i>Spergula arvensis</i> | <i>Verbena supina</i> |
| <i>Stachys arvensis</i> | <i>Veronica arvensis</i> |
| <i>Stachys ocymastrum</i> | <i>Vicia benghalensis</i> |
| <i>Stellaria media</i> | <i>Vicia lutea</i> |
| <i>Taraxacum officinale</i> | <i>Vicia sativa</i> ssp. <i>nigra</i> |
| <i>Torilis leptophylla</i> | <i>Xanthium strumarium</i> ssp. <i>italicum</i> [see chapter 4] |
| <i>Torilis nodosa</i> | |
| <i>Trifolium angustifolium</i> | |

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Alien plants of Fuerteventura



Acacia farnesiana



Acanthoxanthium spinosum

Alien plants of Fuerteventura



Atriplex semibaccata



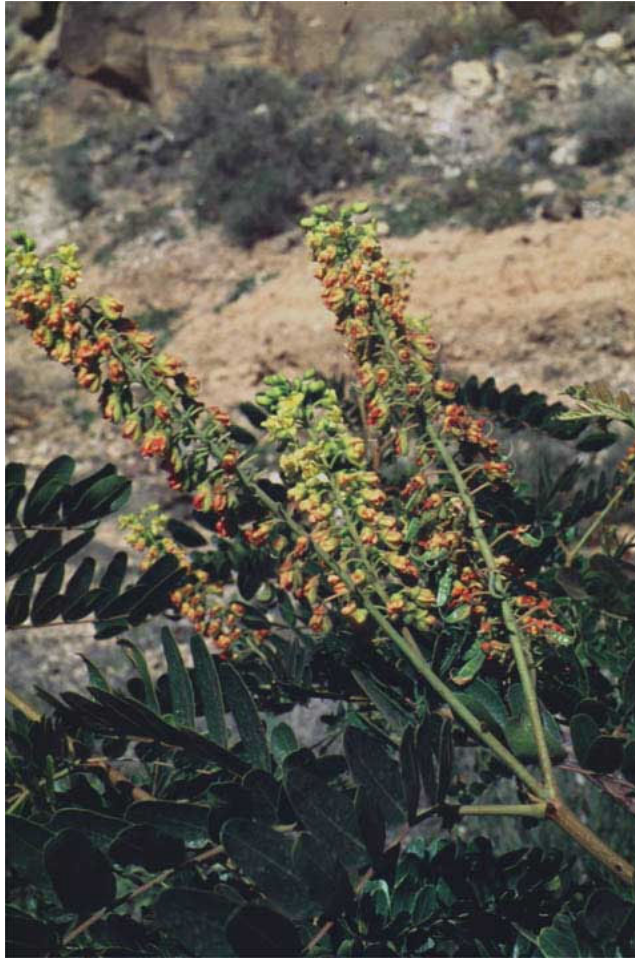
Atriplex suberecta

Alien plants of Fuerteventura



Caesalpinia gillesii

Alien plants of Fuerteventura



Caesalpinia spinosa



Chenopodium giganteum

Alien plants of Fuerteventura



Datura innoxia



Datura stramonium

Alien plants of Fuerteventura



Dichondra micrantha



Heliotropium curassavicum

Alien plants of Fuerteventura



Nicotiana glauca



Nicotiana glauca

Alien plants of Fuerteventura



Opuntia dillenii



Parkinsonia aculeata

Alien plants of Fuerteventura



Salpichroa organifolia



Sclerophylax spinescens

Alien plants of Fuerteventura



Sclerophylax spinescens



Sesuvium portulacastrum

Alien plants of Fuerteventura



Aptenia cordifolia



Calotropis procera

Alien plants of Fuerteventura



Commicarpus helenae



Commicarpus helenae

Alien plants of Fuerteventura



Oxalis pes-caprae



Oxalis pes-caprae

Alien plants of Fuerteventura



Pennisetum setaceum



Chrysanthemum coronarium

Alien plants of Fuerteventura



Lavatera arborea



Moricandia arvensis

Alien plants of Fuerteventura



Maireana brevifolia



Parietaria judaica

Alien plants of Fuerteventura



Salvia verbenaca



Sonchus tenerrimus

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