

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 descienden 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 subrecta	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

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

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

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

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Acacia farnesiana



Acanthoxanthium spinosum



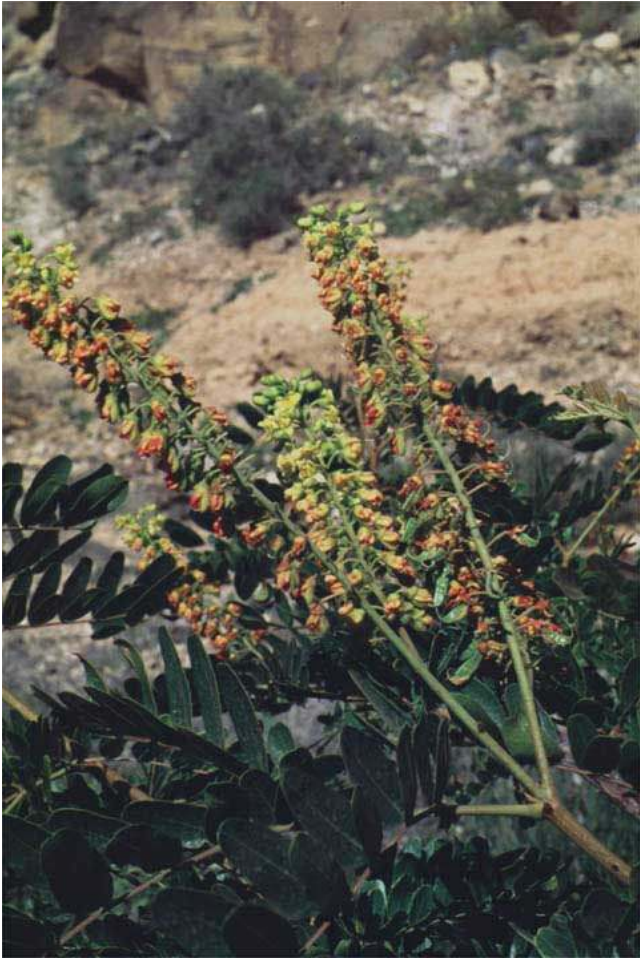
Atriplex semibaccata



Atriplex suberecta



Caesalpinia gillesii



Caesalpinia spinosa



Chenopodium giganteum



Datura innoxia



Datura stramonium



Dichondra micrantha



Heliotropium curassavicum



Nicotiana glauca



Nicotiana glauca



Opuntia dillenii



Parkinsonia aculeata



Salpichroa organifolia



Sclerophylax spinescens



Sclerophylax spinescens



Sesuvium portulacastrum



Aptenia cordifolia



Calotropis procera



Commicarpus helenae



Commicarpus helenae



Oxalis pes-caprae



Oxalis pes-caprae



Pennisetum setaceum



Chrysanthemum coronarium



Lavatera arborea



Moricandia arvensis



Maireana brevifolia



Parietaria judaica



Salvia verbenaca



Sonchus tenerrimus