Short communication

Irrigation supports the spreading of alien weeds on Fuerteventura

Dietmar Brandes

Fuerteventura (1.700 km²) is the second largest of the Canary Islands. It lies close to Africa, the climate is arid (mostly < 200 mm), the landscape of Fuerteventura is therefore dominated by semideserts. The potential natural vegetation Rodríguez Delgado et al. (2000) has been almost destroyed, communities of Pegano-Salsoletea displaced the crassicaule vegetation due to their greater preadaptations to disturbances by agriculture, by cattle (goats) and even by caterpillars (Brandes 2011). Some 18 of the shrubby species of the class Pegano-Salsoletea are indigenious, further 7 species are aliens.

In the infracanarian zone the cultivation of trees (Phoenix canariensis, Casuarina equisetifolia, Schinus terebinthifolius, Olea europaea or other species of subtropical origin) is only possible by irrigation. In the vicinity of many village rows of Phoenix canariensis are planted as copies of avenues. Greater reforestation projects are undertaken in the surroundings of Costa Calma and Rio Canada for touristic purposes with the aim, to promenade in a green shaded area.

We studied the weedy vegetation around the stems of the watered trees. We found some 100 weeds, with a significant accumulation of alien species:

Species	Family	Status
Amaranthus deflexus	Amaranthaceae	IS
Amaranthus muricatus	Amaranthaceae	IS
Amaranthus viridis	Amaranthaceae	IS
Aster squamatus	Asteraceae	IS
Atriplex semibaccata	Chenopodiaceae	IS
Atriplex semilunaris	Chenopodiaceae	IS
Bidens pilosa	Asteraceae	IS
Chenopodium murale	Chenopodiaceae	IP
Conyza bonariensis	Asteraceae	IS
Conyza sumatrensis	Asteraceae	IS
Cynodon dactylon	Poaceae	II
Datura innoxia	Solanaceae	II
Datura stramonium	Solanaceae	II
Heliotropium curassavicum	Boraginaceae	IS
Nicotiana glauca	Solanaceae	II
Portulaca oleracea	Portulacaceae	IS
Salpichroa origanifolia	Solanaceae	IS
Sesuvium portulacastrum	Aizoaceae	IS

The categorisation follows Izquierdo et al. (2004). Abbriaviations: IS: Introducida Seguro, II: Introducida Invasora, IP: Introducida Probable.

Weed communities with alien species like Atriplex semilunaris (Brandes & Garve 2005), Bidens pilosa (Brandes 2001) and Nicotiana glauca (Brandes 2001) have been studied by us in the past and are therefore not mentioned in this paper. Tab. 2 shows the species combination of the Portulaca oleracea – Patellifolia patellaris community.

Table 2: Portulaca oleracea - Patellifolia patellaris community

Number of the relevée 2000-FV-	69	70	71	73	74
Area of the relevée [m²]	4	8	8	8	10
Vegetation cover [%]	90	70	60	40	80
Species number of the relevée	10	9	8	5	12
Portulaca oleracea	2.3	2.2	1.2	2.2	3.3
Patellifolia patellaris	2.3	2.2	4.4	3.3	4/3.3
Sonchus oleraceus	1.2	1.2	1.2	2.2	1.2
Malva parviflora	1.2	1.2	1°.2	.	+
Amaranthus gracilis	2.2	1.2	.	1.2	2.2
Sisymbrium irio	2.2	3.2	+°	.	.
Mesembryanthemum nodiflorum	+	.	.	.	1.2
Setaria adhaerens	.	1.2	+.2	.	.
Atriplex semilunaris	.	.	+.2	.	+.2
Solanum nigrum	.	.	.	1.2	+
Sisymbrium erysimifolium	+	.	.	.	.
Chenopodium murale	+.2	.	.	.	.
Spergularia fallax	.	+	.	.	.
Reichardia picroides	.	.	.	.	+
Asphodelus fistulosus	.	.	.	.	+
Senecio leucanthemifolius subsp. falciformis	.	.	.	.	+
Cynodon dactylon	+.2	1.2	.	.	.
Nicotiana glauca (shrub)	.	.	1.2	.	1.1

Tab. 3 describes stands with Sesuvium portulacastrum. Sesuvium portulacastrum L. is an element of the tropical flora of Africa and America. There are no recent records for this species in Europe, formerly it was naturalized on maritime sands near Lisboa (Tutin et al. 2010)

Furthermore many widespread weeds of mediterranean origin are found in irrigated tree stands- It can be assumed that they are not native to the Canary Islands. Often small banks are built straight around the stems of Phoenix dactylifera, the aim of which is to hold the irrigation water till it is seeped away. Small-area stands of Chenopodio muralis-Malvetum parviflorae with the diagnostic species Sisymbrium irio, Chenopodium murale and Malva parviflora are to be found (tab. 4).

Tabel 3: Sesuvium portulacastrum stands around the trunks of Phoenix canariensis

Number of relevée 1999-FV-	6	7	10
Area of the relevée [m²]	15	20	25
Vegetation cover [%]	40	40	35
Species number of the relevée	8	13	7
Sesuvium portulacastrum	2.2	2.2	2.2
Patallifolia patellaris	1.2	2.2	2.3
Aizoon canariense	+	1.2	.
Emex spinosa	+	+	.
Stipa capensis	+	+	.
Asphodelus tenuifolius	.	1.2	.
Mesembryanthemum nodiflorum	.	.	1.2
Sonchus oleraceus	.	.	+
Lotus glinoides	.	.	.
Medicago laciniata	.	.	.
Salsola vermiculata	+	1.1	2.2
Atriplex semibaccata	1.2	2.2	2.2
Launaea arborescens	1.1	.	+
Nicotiana glauca juv.	.	2.1	.
Salsola divaricata	.	rj	.
Salsola tetrandra	.	+j	.
Lavatera spec.	.	1.2	.
Heliotropium ramosissimum	.	1.2	.

Table 4: Chenopodio muralis-Malvetum parviflorae Oberdorfer ex Lohmeyer &Trautmann 1970

Number of relevée	454	456	458	457	459
area [m²]	1,5	2	2	2	2
Vegetation cover [%]	40	30	55	35	30
Number of species	6	3	4	7	6
Sisymbrium irio	2.2	2.2	3.2	2.2	2.2
Malva parviflora	+	2.2	+	+	.
Chenopodium murale	r	1.2	3.3	.	.
Patellifolia petellaris	2.2	.	.	1.1	2.2
Setaria adhaerens	.	.	+	2.2	1.2
Amaranthus viridis	+	.	.	.	+
Sonchus oleraceus	.	.	.	+	+
Portulaca oleracea	+	.	.	.	.
Mesembryanthemum crystallinum				+	
Mesembryanthemum nodiflorum				+	
Datura stramonium					+

Watered soil around the trunks of Phoenix canariensis (Costa Calma 2001).

References

Brandes, D. (2001): Bidens pilosa und ihre Einbürgerungschancen in den Ländern der Europäischen Union. – Braunschweiger Geobotanische Arbeiten, 8: 59-71.

Brandes, D. (2001): Nicotiana glauca als invasive Pflanze auf Fuerteventura. – Braunschweiger Geobotanische Arbeiten, 8: 39-57.

Brandes, D. (2011): Halo-nitrophilous shrubs (Pegano-Salsoletea) on Fuerteventura. – Braunschweig. 45 p. – www.researchgate.net/publication/235623445_Halo_nitrophilous_shrubs

Brandes. D. & E. Garve (2005): Atriplex semilunaris – neu für die Kanarischen Inseln. – Tuexenia, 25: 307-315.

Izquierdo, I., J. L. Martín, N. Zurita & M. Arechavaleta (eds.) (2004): Lista de species silvestres de Canarias (hongos, plantas y animals terrestres). – La Laguna. 500 p.

Rodríguez Delgado, O., A. García Gallo & J. A. Reyes Betancort (2000): Estudio fitosociológico de la vegetation actual de Fuerteventura (islas Canarias). – Vieraea, 28: 61-98.

Tutin et al. (eds.)(2010): Flora Europaea, vol.1. – Cambridge. XLVI, 581 p. (Paperback printing).

Address of the author:
Prof. Dr. Dietmar Brandes
Institute of Plant Biology, Working Group for Vegetation Ecology
Technische Universität Braunschweig
Mendelssohnstraße 4
D- 38106 Braunschweig

d.brandes@tu-bs.de