Some contributions on Commicarpus helenae (Roemer & Schultes) Meikle on Fuerteventura (Canary Islands, Spain)

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Commicarpus helenae occurs on the Canary Islands only on Fuerteventura; it is classified as alien (IZQUIERDO, I., J. L. MARTIN, N. ZURITA & M. ARECHAVALETA 2004: "introducida seguro").As our working group is very interested in alien plant species, I studied the community ecology of this neophytic species, This paper is a further contribution on vegetation ecology and invasiveness of alien plant species on Fuerteventura (BRANDES & FRITZSCH 2002). The following species are studied in Fueterventura within our project till now: Atriplex semilunaris (BRANDES & GARVE 2005), Bidens pilosa (BRANDES 2001b), Calotropis procera (BRANDES 2005), Maireana brevifolia (BRANDES 2002), and Nicotiana glauca (BRANDES 2001a).

Within the family Nyctaginaceae the Commicarpus species are similar to those of the genus Boerhavia. They are seperated from each other by their habit and by the fruits. Commicarpus species are scrambling or climbing (STRUWIG & SIEBERT 2013), their fruit is a 10-ribbed anthocarp with large viscid glands. The genus Commicarpus comprises some 30-35 species, which are growing in the tropical and subtropical regions, especially in Africa and western Asia (DOUGLAS & SPELLENBERG 2010). The center of diversity of our genus is northeastern Africa and southern Arabia, according to THULIN (1990), a secondary center of diversity is in southern Africa.

According to IPNI the correct name of our species is Commicarpus helenae (Roemer & Schultes) Meikle). We only found the var. helenae of Commicarpus helenae on Fuerteventura, the var. barbatus is obviously distributed to tropical Africa (STRUWIG & SIEBERT 2013).

Distribution and use

Commicarpus helenae var. helenae occurs in a wide region from Southern Arabia incl. Oman), Iran, Palestine, to South Africa, Namibia, tropical Africa, St. Helena and Cape Verde Islands. The Gabra people use Commicarpus helenae as food for camels,goats and

also for veterinary purposes in the Chalbi Desert area, the driest part of East Africa (STILES & KASSAM 1991).

TUTIN et al. (1993) don't mention the species for Europe; only Commicarpus plumbagineus was found in south eastern Spain.

Fig. 1: Commicarpus helenae var. helenae on Fuerteventura (1999).

Ecology

We found Commicarpus helenae first in 1996 in rocky ditches of roads and steep slopes above them near Tarajalejo and La Lajita. At local level we can distinguish two communities:

(1) Commicarpus helenae – community with dwarf shrubs
(2) Commicarpus helenae – Tribulus terrestris community

Most stands of our species belong to the Commicarpus helenae – community with dwarf shrubs and perennual species of the class Pegano-Salsoleta (table 1). Most frequent species are: Cenchrus ciliaris, Stipa capensis, Patellifolia patellaris, Salvia aeqyptiaca, and Launeaea arborescens. This community has an intermediate position between both classes Pegano-Salsoletea und Stellarietea: perennial species build up a scattered vegetation, whereas the small therophytes use the gaps especially in the spring time. The amount of therophytes rises significantly in the second community, which is predominantly characterized by annual species of class Stellarietea resp. alliance Carrichtero-Amberbion, species of Pegano-Salsoletea have only low relevance.

Fig. 2: Commicarpus helenae and Cuscuta planiflora on steep slopes in the valley of Giniginamar (2015).

Our knowledge on the vegetation ecology of Commicarpus helenae is very poor: the species grows in Saudi-Arabia: (Wadi Al-Noman in Mecca) in the Aristolochia bracteolata-Cucumis prophetarum community (Abedel-Kalik et al. 2013), whereas it is a member of weed vegetation of coastal farms in Salalah (Oman) (El-Sheikh 2013).

The occurrence of Commicarpus helenae on steep slopes may be caused by dispersal of the sticky fruits by goats and possibly also by road constructing. Commicarpus helenae is very often parasited by Cuscuta planiflora, This may limit its vitality.

Table 1: Commicarpus helenae community with dwarf shrubs

Number of relevée	968	969	1008	1010	4061	4062	1012	1017	1018	1019	1020	1021	1022	1023	1024	1025
Area of relevée [m²]	5	12	8	8	10	8	20	30	20	30	60	40	30	40	40	80
Exposition	NW	NW	.	.	SW	SW	O	W	SW	S	.	S	S	S	.	S
Inclination [°]	10	15	.	.	40	40	15	30	20	10	.	15	10	5	.	15
Vegetation cover [%]	75	40	35	10	15	15	20	35	20	20	40	30	25	25	35	25
Number of species of the relevée	11	14	8	9	10	13	15	12	10	15	17	16	17	21	15	24
Commicarpus helenae	3.3	2/3.2	2.2	2.1	2.2	2.1	1.1	2.2	1.1	2.2	2.2	2.2	3.2	2.2	3/2.2	2.2
Stipagrostis ciliata	.	.	.	.	.	.	2.2	2.2	2.3	2/3.3	3.3	2.2	2.2	1.1	.	1.2
Cuscuta planiflora (on Commicarpus helenae)	.	.	.	.	2.3	(1.2)	.	.	.	1.2	2.2	2.2	2.3	2.3	.	1.2
Dwarf shrubs and perennial species (P.-S. = class Pegano-Salsoletea)																
Species of class Pegano-Salsoletea																
Cenchrus ciliaris	.	+	+.2	+	+.2	+	+	1.2	.	1.2	1.2	2.2	1.2	1.2	1.2	1.2
Salvia aegyptiaca	1.2	1.2	.	.	(+)	.	+	.	.	1.1	1.1	1.1	.	1.1	2.2	1.1
Launaea arborescens (P.-S.)	2.2	2.2	1.1	.	1.1	1°.1	.	1.1	1.1	.	1.1j	1.1	1.1	1.1	.	.
Kickxia sagittata P.-S.)	.	+	.	.	.	.	.	.	.	.	+	+	+	+	.	+
Forsskaolea angustifolia (P.-S.)	.	.	1.2	.	.	.	.	.	+.2	.	+	.	+	.	.	.
Phagnalon purupurascens	.	.	.	.	.	.	.	.	.	.	1.2	+	+	.	1.2	.
Heliotropium ramosissimum (P.-S.)	.	.	.	.	.	.	.	.	.	+	+	+	r	.	.	.
Aristida adscensionis subsp. caerulescens	.	.	.	.	.	.	+	.	1.2	.	.	.	.	+.2	.	.
Helianthemum canariense	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salsola vermiculata (P.-S.)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lycium intricatum (P.-S.)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.2
Annual species of class Stellarietea (C.-A. = Carrichtero-Amberboion)																
Stipa capensis (C.-A.)	1.1	1.1	1.2	+.2	+	1.2	1.2	2.2	1.2	1.2	2.2	2.2	2.2	2.2	1.2	1.2
Patellifolia patellaris	1.2	+j	+	+	+°	+°	1°.1	1.1	r	.	+°	+	+°	+°	+°	+°
Medicago laciniata (C.-A.)	.	+	.	1.2	.	.	1.1	.	1.2	+	1.1	1.2	2.2	1.2	1.2	1.2
Aizoon canariense	.	.	.	1.2j	+°	+.2	+.2	+.2	.	+	.	.	1.2	1.2	+.2	1.2
Lotus glinoides (C.-A.)	+.2	+	.	1.2	.	.	.	+	.	.	1.2	.	.	.	.	2.2
Rumex vesicarius	.	+°	2.2	.	.	.	r	.	.	r	+°	+	+	1.1	+	+
Reichardia tingitana (C.-A.)	+	+	.	.	.	+	.	+	.	.	.	.	r	.	.	+
Asphodelus tenuifolius (C.-A.)	1.2	.	.	.	.	1.2	.	.	.	+	.	.	1.1	+	+	1.2
Astragalus hamosus	.	1.2	.	+	.	.	1.1	1.2	+	.	.	+	.	.	.	+
Mesembryanthemum nodiflorum	.	+.2	.	+.2j	.	.	+.2	.	.	+°	+	.	.	.	.	.
Ammodaucus nanocarpus	.	.	.	.	.	1.2	.	.	+	+	.	.	.	+	+	+.2
Notoceras bicorne (C.-A.)	.	.	.	.	r	.	1.1	.	.	.	.	.	+	.	+.2	.
Calendula aegyptiaca (C.-A.)	.	.	.	.	r	.	.	+	.	.	+	.	.	+.2	.	+.2
Rostraria pumila (C.-A.)	.	.	.	.	.	.	.	.	.	.	.	1.2	.	+.2	.	r
Linaria arvensis	.	.	. .	.	.	.	.	.	.	.	.	.	.	+	2.2	+.2
Ifloga spicata (C.-A.)	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Erodium neuradifolium	.	.	.	.	.	1.2	.	+	.	.	.	.	.	.	.	.
Launaea nudicaulis (C.-A.)	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.
Brachypodium distachyon	.	.	.	.	.	.	.	.	.	+	.	.	.	r	.	.
Plantago ovata (C.-A.)	.	.	.	.	.	.	.	.	.	.	.	1.2	.	.	.	1.2
Trigonella stellata (C. A.)	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
Chrysanthemum coronarium	1.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carrichtera annua (C.-A.)	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Echium bonnetii (C.-A.)	.	.	.	.	.	.	.	.	.	.	.	.	.	+.2	.	.
Lamarckia aurea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Emex spinosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
Chenopodium murale	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r

Nr. 1008: + Limonium thuinii; Nr. 1024: +.2 Dipcadi serotina; Nr. 1025: + Dipcadi serotina.
Nr. 4062: 1.2 Plantago amplexicaule, +° Senecio spec.

Table 2: Commicarpus helenae - Tribulus terrestris community

Number of relevée	1788	1789	1790	1791	1792
Area of relevée [m²]	15	15	10	15	40
Exposition	-	SO	OSO	ONO	ONO
Inclination	-	25°	35°	30°	40°
Vegetation cover [%]	85	15	15	20	35
Number of species of the relevée	12	12	11	13	14
Commicarpus helenae	4.4	2.1	2.1	2.1	3.2
Tribulus terrestris	.	1.1	.	1.2	2.1
Cuscuta planiflora (on Commicarpus helenae)	.	.	1.2	+	2.2
Cenchrus ciliaris	2.2	.	.	.	+.2
Annual species predominantly of class Stellarietea (C.-A. = alliance Carrichtero-Amberboion)					
Lotus glinoides (C.-A.)	+.2	+.2	.	+	+
Asphodelus tenuifolius (C.-A.)	1.2	.	1.1	+	+.2
Senecio flavus	+	1.2	1.1	+	.
Erodium touchyanum	+	1.1	1.2	.	1.2
Notoceras bicorne (C.-A.)	.	1.2	1.1	+	1.2
Rumex vesicarius	+.2	+	.	.	+
Calendula aegyptiaca (C.-A.)	+.2	+.2	.	+.2	.
Aizoon canariense	.	1.1	+	.	1.2
Rostraria pumila (C.-A.)	.	1.2	+.2	.	1.2
Patellifolia patellaris	.	.	+°	+°	1°.2
Launaea nudicaulis (C.-A.)	1.2	+	.	.	.
Medicago laciniata (C.-A.)	+	.	.	+	.
Astragalus hamosus	.	+	+	.	.
Dipcadi serotina	.	.	+	.	.
Ammodaucus nanocarpus	.	.	.	1.2	.
Plantago ovata (C.-A.)	.	.	.	r	.
Ifloga spicata (C.-A.)	.	.	.	+.2	.
Malva parviflora	.	.	.	.	+°
Stipa capensis (C.-A.)	.	.	.	.	+

Also in No. 1: 1.1 Launaea arborescens, 1.2 Forsskaolea angustifolia.

Commicarpus helenae is often associated with Stipagrostis ciliata, a species with a similar wide distribution in the arid regions of Africa and Arabia. Pure Stipagrostis ciliata stands are growing in broad barrancos and little inclinated slops. These stands are very attractive, especially in backlight.

Table 3: Stipagrostis ciliata- Cenchrus ciliaris communitiy in broad barrancos in the vicinity of La Lajita

Number of the relevé	999	1000	1001	1002	1003
Area [m²]	100	100	100	100	100
Vegetation cover [%]	10	15	25	20	15
Species number	16	13	18	15	14
Stipagrostis ciliata	2.2	2.2	2/3.2	2/3.2	2.2
Cenchrus ciliaris	+	.	1.2	+	+
Helianthemum canariense	+	.	1°.1	1.2	1.1
Salvia aegyptiaca	+	.	+	+	.
D Limonium thuini	1.2	1.1	.	.	.
Species of Pegano-Salsoletea:					
Launaea arborescens	1.1	1.1	2.1	1.1	2.1
Forsskaolea angustifolia	+	.	.	+	+.2
Heliotropium ramosissimum	.	.	+.2	+.2	1.2
Species of Carrichtero-Amberboion and other communities of Stellarietea:					
Patellifolia patellaris	1°.2	+	1.2	+	+
Rumex vesicarius	+	1.1	+	+	+
Astragalus hamosus	+	+	.	+	+
Aizoon canariense	.	+	1.2	1.2	+.2
Stipa capensis	+	+	1.2	.	.
Ifloga spicata	+	.	1.2	+	.
Notoceras bicorne	+	.	+	+	.
Mesembryanthemum nodiflorum	1.2	1.2	.	.	+.2
Senecio flavus	+	+	.	.	+
Lotus glinoides	+	+	.	.	1.2
Reichardia tingitana	.	+	+	.	.
Launaea nudicaulis	.	.	.	+	+.2
Calendula aegyptiaca	.	+	.	.	.
Senecio coronopifolius	.	.	+	.	.
Erodium neuradifolium	.	.	1.2	.	.
Echium bonnetii	.	.	+	.	.
Carrichtera annua	.	.	+.2	.	.
Medicago laciniata	.	.	+	.	.
Cuscuta planiflora (on Helianthemum canariense)	.	.	.	+.2	.

Fig. 3: Stipagrostis ciliata near La Lajita (2015).

Fig. 4: Stipagrostis ciliata near the FV-520 (2015).

Stipagrostis ciliata (IZQUIERDO et al. 2004: native possible) is common in the south of the main part of the island in the surroundings of Gran Tarajal – Tarajalejo – Cardon – Tuineje east of the Istmo de La Lared.

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