54. DISTRIBUTION AND ECOLOGY OF SOME RARE PLANT SPECIES IN NORTHERN MOROCCO II. *STEMMACANTHA LONGIFOLIA* VAR. *ERICETICOLA*

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Zur Verbreitung und Ökologie seltener Pflanzen in Nordmarokko II - Stemmacantha longifolia var. ericeticola.

Key words. Fen community, endemic, Morocco, Tingitanian sector

Stichwörter. Moorgesellschaft, endemit, Marokko, Tingitanischer Sektor

Stemmacantha longifolia (Hoffmanns. & Link) Dittrich var. ***ericeticola*** (Font-Quer) Dittrich

Stemmacantha longifolia (= *Leuzea l.* = *Rhaponticum l.*) is endemic in Southern Portugal and Northern Morocco (Dittrich 1984). The variety *longifolia* colonizes humid heathland and moorland in the schisty mountains of the Algarve province. Detailed information about the ecology and plant sociology is not available.

The variety *ericeticola* is an endemic taxon of the Tangier region. It characterizes a moorland community with stagnant water, the *Stemmacantho-Schoenetum nigricantis*. Herbarium specimen come from some mountain ridges with cretaceous sandstone: from Jebel Sanduc between Meloussa and Ksar es Seghir, from Jebel Zem-Zem south of Meloussa and from Jebel Zem-Zem between Sebta and Tetouan (fig. 1).

Habitats with fens and brooks are rare in Morocco. Even in its northern and atlantic part they cover only very small and isolated places. These vegetation types shelter however the southernmost populations of boreal and atlantic geoelements and have therefore attracted many botanists. The distribution of some of these relictic outposts are mapped by Sauvage (1961) and by Dahlgren & Lassen (1972). First observations about the fen vegetation in northern Morocco were published by Dahlgren & Lassen (1972): They give lists about some fen and brook sites and sketch out the mire catena. Quezel *et al.* (1988) studied shrub communities in the Rif Mountains and the surrounding lowland and described the *Genisto anglicae (ancistrocarpae)-Ericetum ciliaris* Quezel *et al.* 1988 from Khemis Sahel near Larache.

In the surroundings of Tangier, *Erica ciliaris*-heathland is part of a vegetation complex with *Anagallido-Juncion*-communities, with the *Glycerio-Eleocharidetum palustris* and with other associations (Deil 1997). At very few places it is in contact to a fen-community, dominated and characterized by *Stemmacantha longifolia* var. *ericeticola* and by *Schoenus nigricans*, the ***Stemmacantho ericeticolae-Schoenetum nigricantis* ass. nov.** (tab. 1, type relevé no. 2). The *Stemmacantho-Schoenetum* can be enclosed into the *Molinio-Scirpoidion* Br.-Bl. 1947 em. Foucault 1984 *(Caricetea nigrae)* by the character species of the alliance and by the elements from higher syntaxa. A similar species composition, but without *Stemmacantha*, has been observed in Southwest France (*Scirpoidi holoschoeni-Schoenetum nigricantis* Gehu & de Foucault 1982)(Taxonomic nomenclature follows mainly Valdés *et al.* (1987), syntaxonomical nomenclature Deil (1997) and

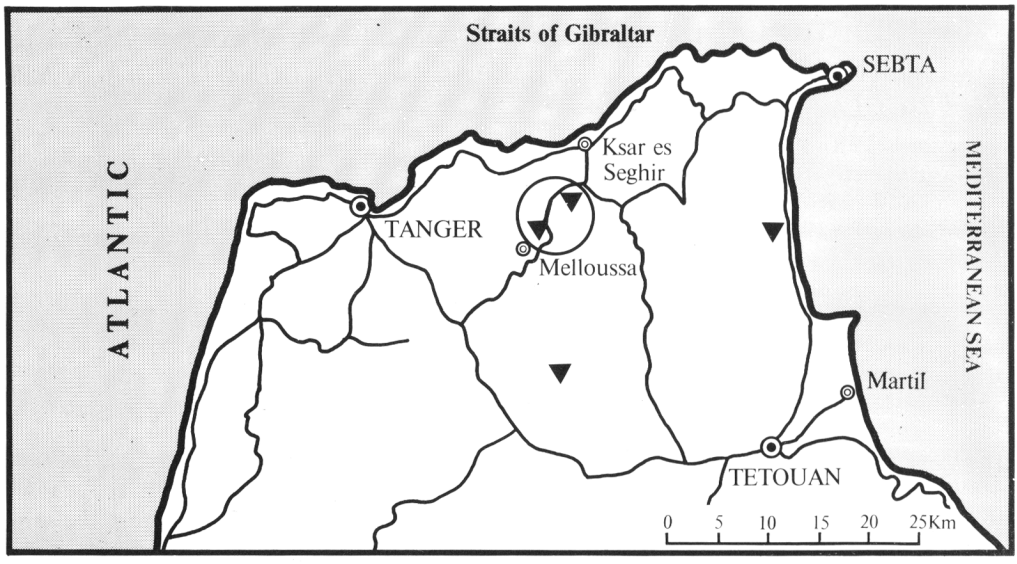

Figure 1: Distribution of the species and location of the sampling sites.

Julve (1993)).

The shrubs are transgressive species from the contact communities (*Ericion umbellatae* Br.-Bl. *et al.* 1952 em. Rivas-Martinez 1979, *Erica ciliaris*-heathland, *Cistus crispus*-dwarf shrub heath, *Myrto-Quercetum suberis* Barbero *et al.* 1981 and the constant companion *Dittrichia viscosa*). The complete species composition can be seen from table 1, the contact series from table 2. Details to the localities and the site conditions are given at the end of table 1. The *Stemmacantho-Schoenetum* shows a highly constant species composition (columns 1-12). Relevé 13 is a transition to the *Laurentio-Juncetum hybridi* Rivas Goday & Borja in Rivas Goday 1968 *pinguiculetosum lusitanicae* Deil 1997.

To study the ecological and floristical variability along a gradient of soil hydromorphy, inclination and water supply, continuous sampling of the floristic composition was made along a 31m transect from a drained sandy slope through temporal moist flat ground to permanent wet swamp along a small water runnel (tab. 2). The location of the transect is at Jebel Sanduc (Meloussa)(see figure1). The transect shows the transition from the *Erica umbellata*-heathland with *Teucrium afrum* ssp. *rubriflorum* (sectors 1-15) on the drained slope through the *Erica ciliaris*-heathland (an impoverished *Genisto-Ericetum ciliaris* Quezel *et al.* 1988) in the periodically moist fringe of the depression (sectors 16-25) to the permanently wet centre of the depression (sectors 26-31) with the *Stemmacantho-Schoenetum* fen. Along the water course (sectors 28-31), *Baldellia ranunculoides* enters the fen-community. *Cicendion-* (*Laurentio-Juncetum*) and *Tuberarion*-elements are scattered throughout the depression.

column	1	2	3	4	5	6	7	8	9	10	11	12	13
CS Stemmacantho-Schoenetum													
	1	1	1	+	3	2	1	+	2	1	2	1	.
Schoenus nigricans	2	+	3	1	3	2	1	1	3	2	2	2	2
CS Molinio-Scirpoidion holoschoeni and higher units													
Molinia caerulea arundinacea	.	.	.	.	.	.	1	.	1	.	+	.	.
Scirpus holoschoenus	.	.	.	.	.	.	+	1	+	2	2	1	.
Juncus effusus	2	2	.	.	.	.	+	+	.	.	.	.	.
further wetland species													
Pinguicula lusitanica	.	.	.	.	.	.	.	.	.	.	.	.	1
Festuca arundinacea atlantigena	.	1	+	.	.	.	.	.	.	.	.	.	.
Juncus striatus	.	.	1	.	2	.	.	.	1	+	.	.	.
Panicum repens	.	.	.	.	.	.	.	.	.	+	1	.	.
Lythrum junceum	.	.	.	.	1	.	.	.	.	+	.	.	.
Mentha pulegium	.	.	.	.	2	.	.	.	.	.	1	+	.
Isoetes histrix	.	.	.	.	.	.	+	+	.	.	.	.	.
Scirpus cernuus	.	.	.	.	1	.	+	.	.	.	.	.	.
CS Geniston micranthae-anglicae, Ericion umbellatae													
Euphorbia transtagana	+	1	1	+	.	.	.	.	.	.	.	.	.
Erica ciliaris	.	+	1	2	.	+	1	1	2	2	3	.	.
Erica umbellata	1	1	.	+	.	.	+	+	.	+	.	1	.
Erica scoparia	3	3	2	1	+	1	3	3	2	2	+	2	.
Calluna vulgaris	2	2	3	+	.	.	1	1	2	1	1	1	.
Simethis planifolia	.	.	1	.	.	1	+	+	.	.	.	.	.
Danthonia decumbens	.	+	.	1	.	+	2	+	.	+	1	+	1
Pedicularis sylvatica lusitanica	1	+	.	.	.	.	.	.	.	.	.	.	.
Romulea major	.	.	.	.	.	.	1	+	1	.	.	.	+
Ornithogalum broteroi	.	1	.	.	.	+	+	.	+	.	.	.	+
Agrostis curtisii	.	.	.	1	.	.	.	.	.	+	+	.	.
Stachys officinalis	.	+	.	.	.	.	1	+	.	.	.	+	.

column	1	2	3	4	5	6	7	8	9	10	11	12	13
CS Cisto-Lavanduletea													
Cistus crispus	+	2	+	.	.	+	2	+	.	+	.	1	.
	1	1	1	+	.	.	+	.	1	.	+	1	.
Cytinus hypocistis macranthus	1	1	.	.	.	.	1	.	+	.	.	.	.
Lavandula stoechas s.str.	1	.	+	+	+	.	.	.	+	.	.	.	.
Cistus monspeliensis	.	+	.	.	.	.	+	.	.	+	.	1	.
Tuberaria lignosa	.	+	.	.	.	.	+	.	.	.	.	.	.
CS Quercetea ilicis													
Myrtus communis	1	1	1	1	+	.	1	1	2	2	2	2	.
Phillyrea angustifolia	+	.	.	.	.	.	1	.	1	1	.	+	.
Quercus lusitanica	.	.	.	+	.	.	.	+	+	.	.	.	.
Quercus suber	.	.	.	+	.	.	.	.	.	+	.	.	.
Sanguisorba minor magnolii	+	+	.	.	.	+	.	+	+	.	.	.	.
Calicotome infesta intermedia	+	.	.	.	.	.	.	.	.	+	.	.	.
companions													
Dittrichia viscosa	1	.	1	1	2	1	1	1	2	1	1	1	.
Linum bienne	+	.	.	.	1	.	1	+	.	.	.	.	.
Carex flacca serrulata	.	.	.	.	2	1	.	.	.	1	+	+	.
Pulicaria odora	1	1	1	.	+	.	1	.	+	.	.	.	.
Carex depressa	.	.	.	+	.	.	1	+	1	+	.	1	+
Lotus parviflorus	.	+	.	.	1	+	1	.	.	+	+	.	.
Briza minor	.	.	.	.	.	.	.	.	.	+	.	1	+
Bellis sylvestris	.	+	+	.	.	.	1	.	.	.	.	.	.
Agrostis castellana	.	.	.	1	.	.	.	.	.	1	.	2	.
Leontodon longirostris	.	.	.	.	1	.	.	.	.	+	.	.	.
Festuca triflora	1	.	.	.	.	+	.	.	.	.	.	.	.
Pinus pinaster (planted)	.	.	+	+	.	.	.	.	.	.	.	.	.

Further rare species: in 1: Scilla monophyllos +; **in 2:** Tolpis barbata +; Festuca caerulescens +; Smilax aspera +; **in 3:** Urginea maritima +; **in 4:** Stauracanthus boivinii +; Genista tridentata +; **in 5:** Juncus articulatus 2; Iris juncea 1, Ranunculus macrophyllus +; Anagallis arvensis 1; Sonchus oleraceus 1; Hypericum pubescens +; **in 6:** Plantago coronopus +; Cynara humilis +; Ranunculus paludosus +, Plantago bellardii +; Trifolium angustifolium +; Tuberaria guttata +; Moenchia octandra +; **in 7:** Teucrium afrum rubriflorum +; Lithodora prostrata lusitanica +; **in 9:** Cistus populifolius mayor +; Crepis tingitana 1; Hyparrhenia podotricha +; **in 10**: Cistus salvifolius r; Juncus conglomeratus +; Calamintha nepeta glandulosa +; Helictotrichon albinerve +; Chamaerops humilis r; **in 11:** Holcus grandiflorus 1; Exaculum pusillum +; Juncus tenageia +; Eleocharis multicaulis +; **in 12:** Hypericum tomentosum +; Calamintha sylvatica adscendens 1; Rostraria salzmanii 1; Tolpis nemoralis 1; Holcus mollis 1; Brachypodium phoenicoides +; **in 13:** Allium triquetrum 1; Solenopsis laurentia +; Holcus mollis +; Ranunculus paludosus 1; Radiola linoides 1; Asterolinon linum-stellatum +; Selaginella denticulata +; Erica multiflora +; Serapias lingua +.

Type relevé column Nr. 2, 10.4.1990 on western slopes of Jebel Sanduc (Meloussa, Tanger province).

Localities and physical conditions of the relevé-sites: The relevés 1-11 date from april and june 1990 from Jebel Sanduc (Meloussa, Tanger province), relevé 12 from june 1992 from Jebel Sidi Ali (Melousssa, Tanger province) and relevé 13 from mai 1993 from Ras Cirrhes (Province of Tetouan); 250' - 400 asl.; flat to 5° inclination; western to northern exposition; mid slope position; along permanent to periodical water runnels and around small fen areas; on poorly drained hydromorphous soils with stagnant to slow flowing water, over cretaceous sandstone and silt (Tanger- and Beni Ider-unit); total cover 70-80%, shrubs 50-70%, herbs 10-30%; open water 0-20%; in contact to Genisto-Stauracanthetum and open Myrto-Quercetum suberis; often subjected to heavy grazing.

Table 1: *Stemmacantho ericeticolae-Schoenetum nigricantis* ass. nov.

transect sector	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
open soil, sandy gravel in 10%	2	3	3	5	7	5	6	7	1	1	2	8	8	6	5	1	1	3	4	1	1	0	2	1	1	2	3	2	7	7	7
Erica umbellata	2	2	1	1	.	2	1	1	1	2	2	2	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Teucrium afrum rubriflorum	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Euphorbia transtagana	.	.	1	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tolpis nemoralis	1	.	2	2	2	1	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	.	.	.	.	.	.	.	.	.	.
Polygala baetica	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2	1	.	.	.	.	.	.	.	.	.	.
Scilla monophyllos	.	.	1	2	1	.	1	1	1	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.
Crepis tingitana	.	2	1	1	.	1	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Agrostris curtisii	2	1	.	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Helictotrichon albinerve	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Satureja salzmanii	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.
Tuberaria lignosa	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ornithogalum broteri	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.
CS Genistion micranthae-anglicae																															
Erica ciliaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	2	3	3	3	2	2	3	3	2	2	.	.	1	.
Danthonia decumbens	.	.	.	.	.	.	1	.	1	.	1	.	.	.	.	.	2	.	.	.	.	.	2	2	1	2	2	2	2	2	2
Pedicularis sylvatica lusitan.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.
CS Calluno-Ulicetea																															
Calluna vulgaris	2	2	3	2	2	2	3	3	2	2	2	2	2	2	2	1	1	.	2	2	2	1	1	.	.	2	2	.	.	.	1
Erica scoparia	2	.	2	2	2	1	.	1	2	2	2	1	.	.	2	3	3	2	2	3	2	3	3	3	2	2	2	2	2	1	1
CS Stemmacantho-Schoenetum																															
Stemmacantha longifolia ericet.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	3	3	.	1	2
Schoenus nigricans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1
CS Hydrocotylo-Baldellion																															
Baldellia ranunculoides	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2
CS Agrostio-Arrhenateretea, Caricetea nigrae and wetland species																															
Eleocharis multicaulis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	2	2	1	.	.	2	2	2	2	2	2	2	2	2
Agrostis stolonifera	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	2	2	2	2	2	1	2	2	2	2	.	.	2
Carex distans	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	2	2	.	1	.	1	2	2	2	.	2	.	1	.
Carex flacca serrulata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	1	2	2	2	.	2	2	2	2	2	2	2
Centaurium maritimum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2	2	.	.	.	.	.	.	.	.	2	2	2	2
Scirpus holoschoenus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	2	.	.	.	.	.	.	.	.	1	.	.	.	.
Juncus articulatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	1	.	.	.	.	.
Juncus conglomeratus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	1	2	.	.	.
Juncus striatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2	2	2
Stachys officinalis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.
Holcus mollis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	2	.	.	.	.	.
Prunella vulgaris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2	.	2	.	.	1	1	.
Mentha pulegium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	2	2
CS Cicendion and Tuberarion																															
Radiola linoides	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	2	.	.	1	.	1
Scirpus pseudosetaceus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	2	2	1	2	.	1
Juncus tenageia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	2	2	1	2	2	1
Cicendia filiformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	2	.	.	.	.	.	.	1	1	1	2	2	2
Juncus hybridus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	2	2	2
Solenopsis laurentia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	2
Juncus capitatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1
Lotus parviflorus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	1	.	1
Briza minor	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	2	2
Kickxia cirrhosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.
CS Cisto-Lavanduletea																															
Cistus crispus	.	.	.	.	1	1	.	1	2	1	.	.	2	2	2	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Lavandula stoechas	.	.	.	.	.	2	.	1	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Halimium halimifolium	1	.	.	2	1	2	2	1	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Romulea major	.	.	.	1	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
CS Quercion lusitanicae/Quercetea ilicis																															
Quercus lusitanica	.	.	.	.	.	.	.	2	3	3	3	.	.	.	.	.	.	.	.	.	1	1	2	1	.	.	.	.	.	.	.
Myrtus communis	2	2	2	.	.	.	.	.	.	.	.	.	.	.	.	3	2	2	2	2	3	2	2	2	3	2	2	3	2	1	1
companions																															
Dittrichia viscosa	.	.	1	.	1	.	.	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	1	.	.	1	2	.	2	2	2
Pulicaria odora	2	1	1	2	1	2	1	.	.	.	1	.	.	.	.	1	1	2	.	.	.	1	.	.	.	.	.	.	.	.	.
Carex depressa	2	2	2	2	1	2	2	1	1	.	2	.	.	2	2	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinus pinaster (planted)	.	1	2	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Filago lutescens	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Anagallis arvensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	1
Cynodon dactylon	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	1
Scorpiurus vermiculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.
Sanguisorba minor	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Cover/abundance values: 1 = rare; 2 = common; 3 = abundant. **Further rare species**: **in 1:** Genista tridens 1; **in 7:** Briza maxima 1; **in 10:** Erica australis 1; **in 12:** Andryala integrifolia 1; **in 15:** Bellis sylvestris 1; **in 19:** Vulpia geniculata 1; **in 22:** Euphorbia exigua 1; **in 29:** Ranunculus macrophyllus 1; Parentucellia viscosa 1; **in 30:** Hypericum pubescens 2; **in 31:** Pistacia lentiscus 2; Trifolium isthmocarpum 1; Trifolium squarrosum 1.**Transect sampling** at 21/5/1993 on the western slopes of Jebel Sanduc (Meloussa, Tanger province); 31 neighbouring sectors of 1x1m size.

Table 2: Transect from heathland to moorland.

The hierarchical syntaxonomical system is a result of the different ecological value of the plant species. The table 2 shows very clearly, that even within this transect (at a distance of 30m and within a relief difference of 2m), the character species of associations are adapted to more specific habitats (compare for example *Erica umbellata* (*Ericion umbellatae*) and *Erica ciliaris* (*Genistion micranthae-anglicae*)) than the character species of higher syntaxonomical units (for example *Erica scoparia* and *Calluna vulgaris* as *Calluno-Ulicetea*-species). *Cicendion*-species are independent of lateral water supply and can occur as shortliving temporal units within different perennial plant communities.

The *Stemmacantho-Schoenetum* is threatened by heavy grazing pressure and by trampling. Draining and other water managements will extinct the populations irreversibly.

SYNTAXONOMICAL SCHEME OF THE MENTIONED COMMUNITIES

CARICETEA NIGRAE den Held & Westhoff 1969 em. de Foucault 1984
- *Molinio-Caricenea nigrae* (Julve 1983) de Foucault 1984
  - *Molinio-Caricetalia davallianae* Julve 1983 em. de Foucault 1984
    - *Molinio caeruleae-Scirpoidion holoschoeni* Br.-Bl. 1947 em. de Foucault 1984
      - *Stemmacantho ericeticolae-Schoenetum nigricantis* **ass. nov.**

CALLUNO-ULICETEA Br.-Bl. & R.Tx. 1943
- *Calluno-Ulicetalia* (Quantin 1935) R.Tx. 1937 em. Rivas-Martinez 1979
  - *Genistion micrantho-anglicae* Rivas-Martinez 1979
    - *Genisto anglicae-Ericetum ciliaris* Quézel *et al.* 1988

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