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A new *Erica lusitanica* Rudolphi heathland association to the Iberian south-west

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Soci  t   botanique de France

A new *Erica lusitanica* Rudolphi heathland association to the Iberian south-west

Une nouvelle association aux landes d'*Erica lusitanica* Rudolphi pour le sud-ouest Ib  rique

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Abstract: As result of several field trips following doctoral research in Marianic-Monchiquensean Sector, we describe a new heathland named *Lavandulo viridis-Ericetum lusitanici ass nova hoc loco* (*Genistion micrantho-anglicae*, Rivas-Mart  nez 1979) as a thermomediterranean to lower mesomediterranean, upper dry to humid, schistose association. The analysis of 11 relev  s, following Braun-Blanquet methodology shows the floristic identity of this new association as well as the chorological segregation of its area of occurrence. Finally, despite these communities already being relatively well known and although they are poor in species number, such heathlands show floristic singularity and own sinecology, with a large and distinct geographical area of distribution, so we emphasized its integration within Atlantic wet heaths priority habitat (*4020 – Annex B-I from Council Directive 92/43/EEC of 21 May 1992).

Keywords: *Erica lusitanica*; heathlands; Iberian southwest; phytosociology; shrub-association

R  sum  :    la suite de visites sur le terrain qui ont suivi des recherches en doctorat sur le secteur «Marianico-Monchiquense», nous d  crivons une bruy  re nomm  e *Lavandulo viridis-Ericetum lusitanici ass nova hoc loco* (*Genistion micrantho-anglicae*, Rivas-Mart  nez 1979) comme une association schisteux thermom  diterran  ene a mesom  diterran  ene inf  rieur, s  che sup  rieur a humide. L'analyse de 11 relev  s,    la suite de la m  thodologie de Braun Blanquet montre l'identit   floristique de cette nouvelle association, ainsi que la s  gr  gation chorologique de sa distribution. Enfin, en d  pit de ces communaut  s sont d  j   relativement bien connus et bien qu'ils soient pauvres floristique, les bruy  res tels montrent la singularit   floristique et sinecology propres, avec une grande zone g  ographique distincte de sa distribution, si nous avons insist   sur son int  gration au sein de les Landes humides atlantiques temp  r  es (habitat 4020* - Annexe B-I de la Directive 92/43/CEE du Conseil du 21 mai 1992).

Mots cl  s: association; bruy  res; buissons; *Erica lusitanica*; phytosociologie; Sud-Ouest Ib  rique

Introduction

Following the fieldwork undertaken for a doctoral thesis on the vegetation of the Monchique mountains in southern Portugal and scientific exchanges between   vora University and Ja  n University, an edaphohygrophilous heathland was recognized, dominated by *Erica lusitanica* and *Ulex minor* var. *lusitanicus*.

Such formations acquire regional importance because *Erica lusitanica* is an exclusive taxon to the occidental regions of the Iberian Peninsula and barely reaching France Castroviejo et al. (1986-2010). Despite it being typically silicolous it also occurs on limestones with high decarbonation, as shown by Pinto-Gomes and Paiva-Ferreira (2005).

These heathlands are a constant presence on pseudogleyed schistose soils, especially in canyons and flatter areas with hydromorphism, particularly in the most oceanic areas of Monchiquense District.

This territory has a rolling topography with gentle slopes interrupted by the Monchique syenitic massif. It is mainly a Palaeozoic substrate warped by tectonic activity. The lithology is dominated by shales, siltstones and greywackes that form the Baixo Alentejo flysch group in the Mira Geological Formation (Granja 1984).

Following Rivas-Mart  nez et al. (2002). and Monteiro-Henriques (2010), the study area lies in the upper dry

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Table 1. *Lavandulo viridis-Ericetum lusitanici* ass. nova hoc loco (*Genistion micrantho-anglicae*, *Ulicetalia minoris*, *Calluno-Ulicetea*).Tableau 1. *Lavandulo viridis-Ericetum lusitanici* ass. nova hoc loco (*Genistion micrantho-anglicae*, *Ulicetalia minoris*, *Calluno-Ulicetea*).

Number	7	9	13	5	1	11	12	18	4	8	14	P
Exposure	SW	NE	SW	NW	NE	E	W	N	W	SW	SW	R
Area (sq.m)	100	100	200	100	100	200	200	80	150	200	150	E
Slope (°)	5	5	10	3	10	10	10	3	15	15	10	S
Cover (%)	100	100	95	100	100	95	95	100	100	100	100	E
Average height (m)	2	2,5	2	2	2	2	2,5	1,5	1,5	2,5	2,5	N
Altitude (m)	160	356	350	180	160	405	190	180	125	270	220	Ç
Ordinal Number	1	2	3	4	5	6	7	8	9	10	11	A
Association and higher units characteristics												S
<i>Erica lusitanica</i>	4	4	4	3	4	4	3	4	4	5	4	V
<i>Lavandula viridis</i>	1	1	+	-	1	2	1	-	-	1	1	IV
<i>Ulex minor</i> var. <i>lusitanicus</i>	-	-	-	4	3	-	-	3	+	-	-	II
<i>Erica scoparia</i>	-	-	+	-	-	1	1	-	-	-	-	II
<i>Lavandula x alportelensis</i>	-	-	-	-	-	-	-	+	+	+	+	II
<i>Genista triacanthos</i> var. <i>scorpioides</i>	-	-	-	-	-	-	-	1	-	1	+	I
<i>Calluna vulgaris</i>	-	-	-	-	-	-	-	-	-	-	+	I
Companions												
<i>Scirpoides holoschoenus</i>	1	1	1	2	1	+	+	+	1	+	1	V
<i>Rubus ulmifolius</i>	1	1	1	-	2	1	+	2	1	1	1	V
<i>Arbutus unedo</i>	-	-	1	-	-	+	1	+	+	+	1	III
<i>Oenanthe croccata</i>	-	+	+	-	-	+	+	1	-	+	-	III
<i>Festuca ampla</i>	+	1	1	-	+	-	+	-	-	-	-	III
<i>Daphne gnidium</i>	+	-	-	+	+	-	-	+	+	+	+	III
<i>Dittrichia viscosa</i> subsp. <i>revoluta</i>	1	-	-	+	+	-	-	+	+	-	-	III
<i>Sanguisorba hybrida</i>	-	-	-	-	+	+	-	-	+	+	-	III
<i>Cistus salviifolius</i>	-	-	+	-	+	-	+	-	-	+	+	III
<i>Salix salviifolia</i> subsp. <i>australis</i>	-	-	+	-	-	+	+	+	+	+	-	III
<i>Lonicera periclymenum</i> subsp. <i>hispanica</i>	-	-	-	1	-	-	-	2	+	+	-	II
<i>Ranunculus bulbosus</i> var. <i>adscendens</i>	-	-	-	+	+	-	-	+	+	-	-	II
<i>Rosa canina</i>	-	-	+	-	-	-	+	-	-	+	+	II
<i>Leontodon tuberosus</i>	+	+	-	-	-	-	-	+	-	-	-	II
<i>Phlomis purpurea</i>	-	-	-	+	-	+	+	-	-	-	+	II
<i>Rubia peregrina</i> subsp. <i>longifolia</i>	-	-	-	-	-	+	+	-	-	+	+	II
<i>Cistus populifolius</i>	-	-	+	-	-	+	-	-	-	+	+	II
<i>Nerium oleander</i>	-	-	+	-	-	+	-	-	-	+	+	II
<i>Agrostis castellana</i>	-	-	+	-	+	-	+	1	-	-	-	II
<i>Rosa pouzinii</i>	+	-	+	-	-	+	-	-	-	-	-	II
<i>Viburnum tinus</i>	-	-	-	-	-	-	+	-	-	+	+	II
<i>Myrtus communis</i>	-	-	-	-	-	-	+	-	-	+	+	II
<i>Lonicera implexa</i>	-	-	+	-	-	-	+	-	-	+	-	II
<i>Prunella vulgaris</i>	-	-	-	-	+	-	-	-	-	-	-	I
<i>Sanguisorba minor</i>	+	-	-	-	-	-	-	-	+	-	-	I
<i>Juncus inflexus</i>	+	-	-	-	+	-	-	-	-	-	-	I
<i>Pistacia lentiscus</i>	-	-	-	-	-	+	-	-	-	+	-	I
<i>Lotus uliginosus</i>	-	-	-	-	-	+	-	+	-	-	-	I
<i>Asphodelus aestivus</i>	-	+	-	-	-	+	-	-	-	-	-	I
<i>Salix atrocinerea</i>	-	-	-	+	-	-	-	+	-	-	-	I
<i>Lythrum salicaria</i>	-	-	-	+	-	-	-	+	-	-	-	I
<i>Pteridium aquilinum</i>	-	-	-	-	+	-	-	+	-	-	-	I
<i>Holcus lanatus</i>	-	-	-	-	-	-	+	+	-	-	-	I
<i>Pyrus bourgaeana</i>	-	-	-	-	-	+	-	+	-	-	-	I
<i>Brachypodium phoenicoides</i>	-	-	-	-	-	-	-	+	-	+	-	I

Other taxa: *Senecio foliosus* +; *Juncus acutus* +, (1); *Crataegus monogyna* +; (3); *Hypericum perforatum* +; *Pteridium aquilinum* +; *Cynodon dactylon* +; *Carlina corymbosa* +; *Hypericum undulatum* +; *Asparagus aphyllus* +; *Samolus valerandi* +; *Mentha suaveolens* + (5); *Fraxinus angustifolia* +; *Clematis flammula* +; *Cyperus longus* subsp. *badius* +; *Tamus communis* + (6); *Ruscus aculeatus* + (7); *Cynara algarbiensis* +; *Erica arborea* +; *Dactylis hispanica* subsp. *lusitanica* +; *Bellis sylvestris* + (8); *Vitis vinifera* subsp. *sylvestris* +; *Scrophularia canina* + (9).

Locations: 1. Monte da Renda; 2. Curvatos; 3. Barranco das Taipas; 4. Ribeiro dos Carapetos; 5. Fonte das Partilhas; 6. Barranco do Vale Formosil; 7. Ribeira dos Carunchos; 8. Vale de Meadas; 9. Casal das corgas bravas; 10. São Barnabé; 11. Ribeira do Centianes.

to humid, upper thermomediterranean to lower mesomediterranean bioclimatic stages.

Fieldwork allowed to substantiate the particular floristic elements of this community, namely compared with

Cisto psilosepali-Ericetum lusitanicae (Rivas-Martinez, 1979), described for similar substrates but biogeographically distinct (Toledan-Taganean Sector), consisting the unique *Erica lusitanica* association described.



Field surveys were conducted from January to March 2010, allowing a floral analysis as the biophysical characterization of these heathlands.

The taxa identification was made mainly from the following Floras: *Flora iberica* (Castroviejo et al. 1986–2010), *Nova Flora de Portugal* (Franco 1971–1984; Franco and Rocha Afonso 1994–2003), *Flora de Portugal* (Coutinho 1939) and *Flora vascular de Andalucía Occidental* (Valdés et al. 1987). Taxonomical nomenclature followed Rivas-Martínez et al. (2002), Castroviejo et al. (1986–2010 and Coutinho (1939), and syntaxonomical nomenclature followed Rivas-Martínez et al. (2002).

Results and discussion

stages such as *Salix salviifolia* subsp. *australis*, *Salix atrocinerea* and *Vitis vinifera* subsp. *sylvestris*. These last species demonstrate the catenal and dynamic relationship of this association, whether in riverine forests, representing a regression stage of willow woodlands from *Salicetum atrocinereo-australis*, or in a permanent community. It also occurs in contact with the *Ericion arborae* scrublands that belong to the *Quercetea ilicis* climactic vegetation dynamics, namely *Lavandulo viridis-Quercus suberis* sigmetum (Quinto-Canas et al. 2010).

This new association occurs mainly in the southern territories of Marianic-Monchiquensean Sector (Figure 1), in Monchiquense District, with exclusive schistose substrate, under upper dry to humid, upper thermomediterranean to lower mesomediterranean bioclimatic stages and above deep pseudogley soils.

The patrimonial value of this heathland incorporates the Southern Atlantic wet heaths habitat (4020*), from Annex I of Council Directive 92/43/EEC of 21 May 1992. It possesses in its midst species with higher patrimonial value, such as *Lavandula viridis*, *Ulex minor* var. *lusitanicus*, *Salix salviifolia* subsp. *australis* (Annex B-II from Council Directive 92/43/EEC of 21 May 1992) and *Cynara algarbiensis* among others.

The originality of this community and the phytosociological analysis of the 11 relevés carried out in this study, allow us to propose a new Marianic-Monchiquensean association, from schistose soils, especially in canyons

and flattened areas with temporal waterlogging, having as bioclimatic stage the upper thermomediterranean to lower mesomediterranean upper dry to humid.

The differentiation of this new association from the work of Rivas-Martínez (1979) with the relatively distinct biogeographical territories (Toledan-Taganean Sector), occurs mainly through the constant presence of *Ulex minor* var. *lusitanicus*, the southwest endemism *Lavandula viridis* and a total absence of *Cistus psilosepalus* and *Erica australis* subsp. *aragonensis*, beside the presence of companion species such as *Cynara algarbiensis* and *Dittrichia viscosa* subsp. *revoluta*, which are exclusively from these southwest territories.

Belonging to Southern Atlantic wet heaths habitat (4020*), from Annex I of the Council Directive 92/43/EEC of 21 May 1992, and essentially consisting of fringes of edaphohygrophilous climactic woodlands, this formation's conservation depends on human action. It therefore becomes important to manage the vegetal land cover favouring its species, namely by clearing thick woodlands and so forcing development of heliophilous stages.

The description of this association in the southwest region of Portugal, suggests the expansion of future and deeper studies of these heathlands to the entire national territory.

Syntaxonomical scheme

The syntaxonomical proposal is in accord with the guidelines of the International Code of Phytosociological Nomenclature (Weber et al. 2000).

Calluno-Ulicetea Br.-Bl. & Tüxen ex Klika & Hadač 1944

* *Ulicetalia minoris* Quantin 1935

- *Genistion micrantho-anglicae* Rivas-Martínez 1979

1. *Cisto psilosepali-Ericetum lusitanicae* Ladero ex Rivas-Martínez 1979

2. *Lavandulo viridis-Ericetum lusitanici* ass. nova hoc loco

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