


A new prickly juniper edaphoxerophytic relict community (*Juniperus badia*, Cupressaceae) from the Tiétar valley (Gredos range, Iberian Central System, Ávila, Spain)

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Abstract. A new community is proposed for the checklist of Iberian Peninsula vegetation: *Erico arboreae-Juniperetum badiae*. This forest vegetation type is described from rocky landscapes of the southern slopes of the Gredos range (Tiétar valley, Ávila), having an edaphoxerophilous and relict character.

Keywords. Rocky habitats, Phytosociology, Iberian Peninsula vegetation.

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Introduction

Juniperus badia (H. Gay) Rivas Mart., Molero Mesa, Marfil & G. Benítez is a drought-tolerant species (Willson *et al.*, 2008; Jovellar *et al.*, 2013) restricted to Spain, Portugal and north Africa on both acid and basic hard substrates (Amaral-Franco, 1986; Rivas-Martínez *et al.*, 2020; Cano-Ortiz *et al.*, 2021; Gutiérrez-Larruscain *et al.*, 2024). The forest formations that this species structures in central Iberia have been considered permanent communities with a marked edaphoxerophilous character, which is imposed by the rocky substrate caused by soil loss (Sánchez-Mata, 1999; Cano *et al.*, 2007, 2019).

In central Spain only two plant communities dominated by the prickly juniper have been reported so far: i) the supramediterranean formations of Gredensean mountain territories (East Gredos Sierran district, Bejar and Gredos Sierran sector, Carpetanian and León subprovince, West Iberian Mediterranean province), corresponding to the association *Festuco merinoid-Juniperetum badiae* (Rivas-Martínez & Sánchez-Mata 1989) Sánchez-Mata 1999 *corr.* Rivas-Martínez & Sánchez-Mata 2011 *nom. corr.* Cano *et al.* 2019 (Sánchez-Mata, 1989, 1999; Rivas-Martínez *et al.*, 2011; Cano *et al.*, 2019; López-Sáez, 2023); and, ii) the mesomediterranean formations of Montes de Toledo and Sierra de San Vicente mountain areas (Talavera district, Oretana Range and Tajo sector, Lusitania and Extremadura

subprovince, West Iberian Mediterranean province), corresponding to the association *Pistacio terebinthi-Juniperetum badiae* Cano *et al.* 2007 *nom. corr.* Cano *et al.* 2019 (Cantó, 2004; Cano *et al.*, 2007, 2019; Rodríguez-Torres, 2015). These two forest formations grow on steeply sloping rocky areas with little edaphic development on very shallow soils (Cano *et al.*, 2019).

Nevertheless, for some years we have been studying the area covered by prickly juniper tree (*Juniperus badia*) forest formations growing on steep slopes and rocky environments in the Tiétar valley (southern Gredos range), and we have found different juniper formations to the two mentioned above, specifically in the Vera district (Oretana Range and Tajo sector, Lusitania and Extremadura subprovince, West Iberian Mediterranean province) located in the westernmost area of the valley (Figure 1). Our contribution is the first documented reference to prickly juniper communities growing in areas with lower mesomediterranean thermotype.

We propose to frame these new prickly juniper communities in a new association: *Erico arboreae-Juniperetum badiae* *ass. nova hoc loco* (Table 1; *holotypus*, relevé no. 6), within the edaphoxerophilous *Juniperion badiae* forest alliance (Cano *et al.*, 2007, 2019; Mucina *et al.*, 2016). This new association corresponds to very dense and permanent edaphoxerophilous and lower mesomediterranean communities with

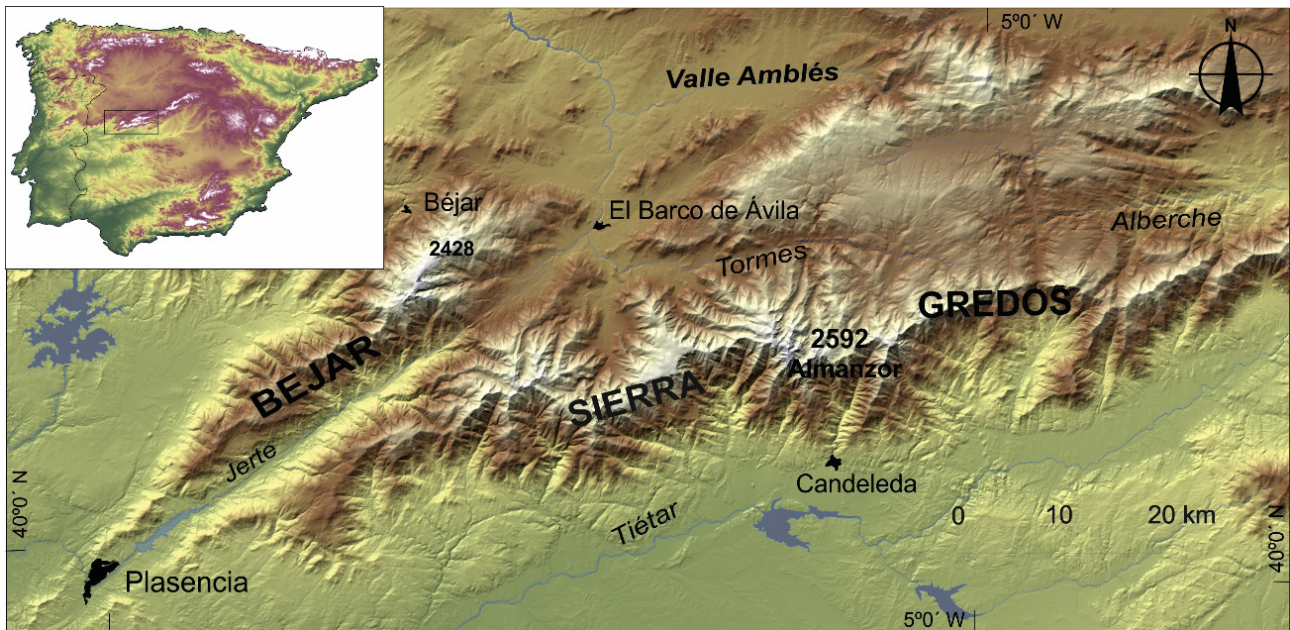


Figure 1. Location of the study area.



Figure 2. Lower mesomediterranean *Erico arboreae*-*Juniperum badiae* communities in the Vera district (Oretana Range and Tajo sector, Lusitania and Extremadura subprovince, West Iberian Mediterranean province). Westernmost Tiétar valley, southern Gredos range, Ávila province.

high biomass, dominated by prickly junipers and heathers (*Erica arborea*, *E. umbellata* and *Calluna vulgaris*), located on steep slopes and rocky environments in exclusively southern orientations and upper sub-humid ombrotype in the Vera district (Figure 2). Unlike the previous supramediterranean association (*Festuco merinoi*-*Juniperetum badiae*), this new mesomediterranean community lacks characteristic elements in the former as *Festuca elegans* subsp. *merinoi*, *F. gredensis* or *Cytisus oromediterraneus*; although their location in

step topography means that *Cytisus striatus* subsp. *eriocarpus* and *Erica arborea* are also frequent. Unlike the *Pistacio terebinthi*-*Juniperetum badiae* association described above, the new proposed association does not include *Quercus rotundifolia* or *Pistacia terebinthus*, but does include other western Iberian elements such as *Arisarum simorrhinum*, *Cytisus striatus* subsp. *eriocarpus*, *Erica australis*, *E. umbellata* and *Calluna vulgaris*. Some species are common with the other two central Iberian known prickly juniper communities

such as *Cistus ladanifer*, *Daphne gnidium*, *Lavandula sampaioana*, *Rubus ulmifolius* or *Thymus mastichina*, and even some rupicolous elements such as *Antirrhinum graniticum* and *Digitalis thapsi*.

The new prickly juniper tree formation points to a dynamic community related with Pyrenean oak (*Quercus pyrenaica*) and strawberry tree (*Arbutus unedo*) forest formations in mesomediterranean lowlands and foothills of the western territories of the Gredos range (*Arbutus unedo*-*Quercus pyrenaica* Sigmetum).

Nomenclature

Taxonomic nomenclature and authorities follow the published volumes of *Flora iberica* (Castroviejo *et al.*, 1986–2021) and the compilations of *Flora Europaea* (Tutin *et al.*, 1964–1980) for taxa not included in the former; the exceptions are specifically mentioned in the floristic appendix.

Floristic appendix (see Nomenclature)

Cytisus striatus (Hill) Rothm. subsp. *eriocarpus* (Boiss. & Reut.) Rivas Martínez

Festuca elegans Boiss. subsp. *merinoi* (Pau) Fuente & Ortúñez

Juniperus badia (H. Gay) Rivas Mart., Molero Mesa, Marfil & G. Benítez

Lavandula sampaioana (Rozeira) Rivas-Martínez, T.E. Díaz & Fernández-González

Syntaxonomical scheme

QUERCETEA ILICIS Br.-Bl. Br.-Bl. ex A. Bolòs et O. Bolòs in A. Bolòs et Vayreda 1950

Pistacio lentisci-Rhamnetalia alaterni Rivas-Martínez 1975

Juniperion badiae Cano *et al.* 2007 ex Mucina *et al.* 2016 *nom. corr.* Cano *et al.* 2019

Pistacio terebinthi-Juniperetum badiae Cano *et al.* 2007 *nom. corr.* Cano *et al.* 2019

Festuco merinoi-Juniperetum badiae (Rivas-Martínez & Sánchez-Mata 1989) Sánchez-Mata 1999 *corr.* Rivas-Martínez & Sánchez-Mata 2011 *nom. corr.* Cano *et al.* 2019

Erico arboreae-Juniperetum badiae Sánchez-Mata & López Sáez *ass. nova hoc loco*

Table 1. *Erico arboreae-Juniperetum badiae ass. nova* (*Juniperion badiae*, *Pistacio lentisci-Rhamnetalia alaterni*, *Quercetea ilicis*)

	410	470	450	415	520	440
Altitude (m a.s.l.)	410	470	450	415	520	440
Area (m ²)	40	40	40	40	40	40
Aspect	SW	SE	SW	SW	SE	SW
N. species	16	17	18	20	20	22
Relevé N.	1	2	3	4	5	6
Characteristics						
<i>Juniperus badia</i>	3	4	5	4	5	5
<i>Erica arborea</i>	1	3	4	2	2	3
<i>Calluna vulgaris</i>	+	2	1	1	1	2
<i>Cytisus striatus</i> subsp. <i>eriocarpus</i>	1	+	1	1	+	1
<i>Cistus ladanifer</i>	2	2	1	+	+	+
<i>Lavandula sampaioana</i>	2	1	1	1	+	1
<i>Daphne gnidium</i>	1	+	1	+	+	1
<i>Thymus mastichina</i>	+	1	1	1	+	1
<i>Petrosedum forsterianum</i>	+	1	+	1	1	+
<i>Erica australis</i>	.	1	+	+	+	+
<i>Helichrysum stoechas</i>	+	.	+	1	+	+
<i>Pteridium aquilinum</i>	1	.	+	1	1	+
<i>Arisarum simorrhinum</i>	.	+	.	+	+	1
<i>Erica umbellata</i>	.	1	1	+	.	+
Other species						
<i>Dactylis glomerata</i>	+	+	+	+	+	+
<i>Antirrhinum graniticum</i>	.	+	+	+	+	+
<i>Pteridium aquilinum</i>	1	.	+	1	1	+
<i>Briza maxima</i>	+	.	+	+	+	+
<i>Umbilicus rupestris</i>	+	1	+	.	+	+
<i>Digitalis thapsi</i>	.	+	.	+	+	+
<i>Rubus ulmifolius</i>	+	.	.	+	+	+
<i>Centaurea alba</i>	+	.	+	.	+	+
<i>Vicia tenuifolia</i>	.	+	.	+	.	+

Localities: All localities from Ávila province. 1, 4: Candeleda, El Raso, Las Atalayas (40°09'37.17"N, 5°18'35.71"W; 40°09'36.10"N, 5°18'38.29"W); 2, 3, 6: Candeleda, La Hoz, *holotypus ass. rel.* 6 (40°09'36.75"N, 5°18'30.77"W; 40°09'38.30"N, 5°18'31.66"W; 40°09'36.45"N, 5°18'32.74"W); 5: Candeleda, Vega del Toril (40°11'32.76"N, 5°21'54.32"W).

Authorship

JALS, DSM: Conceptualization, fieldwork, formal analysis and investigation, writing, review and editing.

Conflict of interest

None.

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