Notas do Herbário da Estação Florestal Nacional (LISFA): Fasc. XXIV

2. De Vegetatio Lusitana Notae- V

11. Two new endemic megaforb (*Galio-Urticetea*) vegetation types from North-western Portugal

Introduction

Nitrophilous vegetation, usually dominated by herbaceous (perennial and/or annual) plants, is one of the most common and diverse vegetation types in landscapes with moderate or strong human influence e.g. agricultural landscapes. Nitrophilous megaforb vegetation includes a wide diversity of community types having in common the fact of being dominated by large-sized hemicryptophytes. This type of vegetation usually includes abundant, relatively widespread *taxa*, so it is not given any priority for conservation. However, in a recent survey of megaforb vegetation occurring in mountain areas of North-western Iberian Peninsula, two types of formations were found to be dominated by endemic species, namely *Angelica laevis* (*Umbelliferae*) and *Paradisea lusitanica* (*Liliaceae*) (Honrado J., *Flora e Vegetação do Parque Nacional da Peneda-Gerês*, Unpub. Ph.D. thesis, 2003). These vegetation types (as defined on the basis of a phytosociological approach) are themselves endemic to the territory and have quite narrow distribution areas, as their circumscription is related to the occurrence of their endemic dominant *taxa* (Honrado, *op. cit.*).

An overview of class *Galio-Urticetea* in north-western Portugal

Overall, five associations are recognised within class *Galio-Urticetea*, two of which (*Allio scorzonerifolii-Angelicetum laevis* and *Cirsio palustris-Paradiseetum lusitanicae*) are reported here for the first time.

Within this class, two community-types typical of shaded sites (order *Galio-Alliarietalia*) occur in the territory, both belonging to alliance *Galio-Alliarion petiolatae*. In mid-altitude areas, shaded biotopes are colonised by dense formations dominated by *Pentaglottis sempervirens*,

Urtica dioica and *Lamium maculatum*, includable in association *Geranio robertiani-Caryolophetum sempervirentis* (suballiance *Alliarienion petiolatae*). On the contrary, in warm lowland areas, these sites are usually occupied by association *Allio triquetri-Urticetum membranaceae* (suballiance *Smyrnienion olusatri*; Alves *et al.*, *Studia Botanica* 22: 17-26, 2003), which includes a number of thermophilous exotic species (neophytes), like *Tradescantia fluminensis*, *Zantedeschia aetiopica* and *Allium triquetrum*.

Order *Calystegietalia* (nitrophilous communities of damp soils) is the best represented in the territory, since three associations are recognised and included in two alliances: *Filipendulion ulmariae* (vegetation of fresh to wet soils in exposed biotopes) and *Bromo ramosi-Eupatorion cannabini* (vegetation of permanently wet and seasonally flooded soils).

Within alliance *Filipendulion ulmariae*, association *Allio scorzonerifolii-Angelicetum laevis as. nova hoc loco* (Table 1; syntype: relevé n. 18) includes tall formations dominated by the Northwest-Iberian endemics *Angelica laevis* and *Senecio doria* subsp. *legionensis*, typical of fresh soils in semi-shaded biotopes of mountain areas. *Centaurea nigra* subsp. *rivularis*, *Cirsium filipendulum*, *Allium scorozonerifolium*, *Caltha palustris*, *Cirsium palustre* and some mesophytic grassland *taxa* (*Arrhenatherum elatius* subsp. *bulbosum*, *Rumex acetosa*, *Festuca nigrescens* subsp. *microphylla*) are other regular/abundant *taxa* in this new association, which is endemic to the Juresian sector.

Two associations are recognised within alliance *Bromo ramosi-Eupatorion cannabini*, and once more the discrimination is based on the climatic variations related to altitude. Association *Cirsio palustris-Paradiseetum lusitanicae as. nova hoc loco* (Table 1; syntype: relevé n. 2) includes dense formations dominated by the Northwest-Iberian endemic lily *Paradisea lusitanica*, typical of damp, litter-rich soils with seasonally flowing water, mostly along water-streams within mountain landscape mosaics rich in deciduous woodlands. Other frequent *taxa* are *Cirsium palustre*, *Lotus pedunculatus*, *Epilobium obscurum*, *Carex laevigata*, *Scrophularia balbisii* and *Crepis lampsanoides*. The potential range of this new association coincides with that of its dominant, characteristic taxon (*Paradisea lusitanica*), which is endemic to the hercynian mountain areas of North-western Iberian Peninsula. In lowland and mid-altitude areas, *Cirsio-Paradiseetum* is replaced by the *Eupatorium cannabinum* dominated communities of association *Picrido hieracioidis-Eupatorietum cannabini*, which are typical of river margins and other biotopes which are seasonally flooded by running water.

Numerical analyses (both ordination and cluster analysis) of a set of 44 relevés segregated five groups of relevés matching these five phytosociological associations (not shown).The two new *Galio-Urticetea* associations described here occupy rather different biotopes: *Allio-Angelicetum* is typical of fresh, well-drained soils, whereas *Cirsio-Paradiseetum* mostly occurs on damp, litter-rich soils with seasonally flowing water. *Allio-Angelicetum* is more common in the neighbourhood

of mesophytic grasslands (*Arrhenatheretalia*) and therefore it always includes a considerable number of mesophytic grassland species. On the contrary, *Cirsio-Paradiseetum* occurs in sites with seasonally running water, usually in mosaic with rush-formations of order *Molinietalia*, and therefore it includes a number of differential hygrophilic species.

Nomenclature

Scientific names of plant taxa are mostly according to Castroviejo *et al.* (Flora Iberica, 1986-2003) as far as issued, and Franco and Franco & Rocha Afonso (Nova Flora de Portugal, 1971-2003) for other groups. Syntaxonomic nomenclature for higher groups and phytogeographic units are according to Rivas-Martínez *et al.* (*Itinera Geobotanica* 15, 2002).

Aknowledgements

The authors thank the Peneda-Gerês National Park (Portugal) for partially funding the field surveys.

Table 1 - *Cirsio palustris-Paradiseetum lusitanicae* (relevés 1-11) and *Allio scorzonerifolii-Angelicetum laevis* (relevés 12-21)

Relevé n.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Altitude (x10m)	74	74	85	115	91	87	95	99	108	76	87	103	95	85	70	85	115	95	105	108	93
N. of taxa	12	14	18	18	20	21	24	24	25	25	26	10	12	14	14	15	15	16	19	20	20
Area (m^2)	10	5	9	10	2	5	10	10	10	10	10	10	5	2	5	5	1	10	5	10	15
Characteristic and differential taxa																					
Charact. taxa of *Bromo-Eupatorion*																					
Paradisea lusitanica	5	5	2	3	3	4	3	3	2	+	2	.	.	.	.	.	1	1	.	.	2
Scrophularia balbisii	.	2	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.
Other diff. taxa of Cirsio-Paradiseetum																					
Carex laevigata	.	2	3	1	.	1	1	.	1	1	1	.	.	.	.	.	+	.	1	.	.
Dactylorhiza caramulensis	.	.	.	2	.	1	.	1	+	+	1	.	.	.	.	.	.	.	.	.	+
Epilobium obscurum	1	+	1	.	1	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Juncus acutiflorus	.		1	.	1	.	1	.	.	2	2	.	.	.	.	.	.		.	.	.
Peucedanum lancifolium	.	.	.	1	.	.	+	.	+	.	+	.	.		.	.	.	.	.	.	1
Potentilla erecta	.	.	.	1	1	+	.	1	.	..	1	.	.	.	.	.	.	.	.	.	.
Juncus effusus	.	.	2	.	1	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	.
Myosotis stolonifera	.	.	1	.	.	1	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.
Characteristic taxa of *Filipendulion*																					
Angelica laevis	.	.	.	.	.	.	.	.	.	.	.	3	3	3	3	3	3	3	3	2	4
Allium scorzonerifolium	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2	2	.	1	1	.	1
Senecio legionensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	3	.	.
Other diff. taxa of *Allio-Angelicetum*																					
Centaurea rivularis	.	.	1	.	.	.	.	.	.	.	.	1	2	4	2	3	3	2	2	2	2
Cirsium filipendulum	.	.	.	1	.	.	.	.	.	.	.	1	1	2		1	2	2	1	2	1
Arrhenatherum bulbosum	.	.	.	.	.	.	.	.	.	.	.	1	2	.	1	1	+	1	.	+	.
Rhinanthus minor	.	.	.	.	.	.	.	.	+	.	.	.	.	1	1	.	.	.	.	1	.
Achillea millefolium	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	1	.

Table 1 – Cont.

Relevé n.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Companion taxa																					
Other charact. taxa of Galio-Urticetea																					
Cirsium palustre	3	2	3	1	2	2	2	3	3	4	3	1	.	1	1	.	.	+	2	.	1
Heracleum sphondylium	.	.	.	.	.	.	.	.	.	2	.	.	.	1	2		.	.	.	3	.
Galium aparine	.	.	.	.	.	.	.	.	.	.	+		.	.	.	1	.	.	.	.	.
Companion taxa																					
Lotus pedunculatus	1	1	3	2	1	+	.	1	1	2	2	.	.	1	1	.	1	.	1	.	.
Holcus lanatus	.	+		.	.	+	1	.	+	1	1	.	1	.	.	1	1	.	.	2	.
Rumex acetosa	.	.	+	.	.	.	+	+	.	1	.	.	2	.	.	1	.	1	1	1	1
Dactylis lusitanica	.	+	.	.	.	.	.	+	.	.	+	1	1	1	1	+	1	.	.	.	.
Caltha palustris	.	.	.	.	.	.	2	1	1	.	.	.	2	+	.	.	.	3	1	.	2
Crepis lampsanoides	.	1	.	1	.	.	.	2	.	.	.	+	.	.	1	1	+	.	2	.	.
Festuca microphylla	.	1	.	2	.	1	.	2	.	1	.	1	.	.	.	.	1	.	.	.	2
Ranunculus repens	.	1	1	.	.	.	+	2	.	1	1	.	.	.	+	.	.	.	1	.	.
Digitalis purpurea	+	.	+	+	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	1	.
Anthoxanthum odoratum	.	1	.	.	.	+	1	2	.	.	.	.	.	.	.	.	.	.	.	+	.
Euphorbia dulcis	.	.	.	.	.	.	+	2	.	1	.	.	.	.	.	.	+	.	1	.	.
Plantago lanceolata	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	1	.	.	+	.	1
Rubus sp. pl.	.	.	.	1	1	.	.	1	.	2	.	.	.	.	.	.	.	.	.	.	1
Agrostis x fouilladei	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	1	.	.	+	.
Deschampsia gallaecica	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	2
Omphalodes nitida	.	+	.	.	1	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Poa trivialis	.	.	.	.	.	.	1	.	+	1	.	.	.	.	.	.	.	.	.	.	2
Pteridium aquilinum	.	.	.	.	.	.	.	.	+	.	.	1	.	.	.	1	.	.	.	.	1
Salix atrocinerea	.	.	+	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Carex binervis	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	1
Carum verticillatum	.	.	.	.	.	.	.	.	.	.	+	.	.	1	.	.	.	1	.	.	.
Crepis capillaris	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	+	.	+	.
Echium lusitanicum	.	.	+	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.
Teucrium scorodonia	+	.	.	.	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.
Trifolium pratense	.	.	.	.	.	.	+	.	+	.	1	.	.	.	.	.	.	.	.	.	.
Blechnum spicant	.	.	.	1	2	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hypericum undulatum	.	.	.	.	.	.	.	.	+	1	1	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	1	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oenanthe crocata	.	.	2	.	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	.
Carex echinata	.	.	.	1	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex leporina	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.
Galium broterianum	.	.	.	.	.	.	.	1	.	.	2	.	.	.	.	.	.	.	.	.	.
Luzula henriquesii	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Scutellaria minor	.	.	.	.	.	.	.	.	.	+	2	.	.	.	.	.	.	.	.	.	.
Asphodelus arrondeaui	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.
Stellaria holostea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1
Wahlenbergia hederacea	.	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
Arnica atlantica	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	.
Athyrium filix-femina	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.
Brachypodium rupestre	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Cytisus scoparius	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
Erica arborea	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Erica tetralix	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rothmalerii	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.
Galium mollugo	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Holcus mollis	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.
Mentha suaveolens	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.
Myosotis secunda	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.
Primula acaulis	+	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Prunella vulgaris	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
Ranunculus gallaecicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2
Viola palustris	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.

Companion taxa in one relevé: Rel.1: 1*Alnus glutinosa*, 1*Chrysosplenium oppositifolium*, 1*Picris hieracioides*. Rel. 3: +*Carex divisa*; Rel. 4: 1*Asphodelus ovoideus*, 2*Sphagnum* sp; Rel: 5: +*Anagalis tenella*, 1*Carex demissa*, 1*Frangula alnus*, +*Lobelia urens*, 1*Ulex minor*; Rel. 6: +*Anthoxanthum amarum*, +*Erica ciliaris*, +*Galium rivulare*, +*Osmunda regalis*, +*Pseudoarrhenatherum longifolium*, +*Stellaria alsine*; Rel. 7: 1*Ajuga reptans*, +*Aquilegia dichroa*, +*Epilobium lanceolatum*, +*Thalictrum speciossimum*; Rel. 8: 2*Chaerophyllum temulum*, 1*Saxifraga spathularis*, +*Veronica officinalis*; Rel. 9: +*Cardamine hirsuta*, +*Cerastium vulgare*, +*Montia amporitana*, +*Narcissus nobilis*, +*Ranunculus ficaria*; Rel. 10: 1*Galium palustre*; Rel. 11: 2*Chamaemelum nobile*, 1*Galium helodes*, 2*Mentha pulegium*, 1*Ranunculus flammula*; Rel: 13: 1*Rumex obtusifolius*; Rel. 14: 2*Arrhenatherum baeticum*; Rel. 16: +*Conopodium pyrenaeum*; Rel. 19: 1*Bromus hordeaceus*, +*Cynosurus cristatus*; Rel. 21: 1*Ajuga pyramidalis*.

Relevé sites: 1-MONTALEGRE: between Paradela and Outeiro, near the bridge over the Cávado river, 29TNG8825. 2-MONTALEGRE: between Paradela and Outeiro, near the bridge over the Cávado river, 29TNG8825. 3-MONTALEGRE: between Paradela and Ponteira, 29TNG8722. 4-MONTALEGRE: Travassos, head of Rio Mau rivulet, 29TNG9233. 5-MONTALEGRE: close to the Rio Mau rivulet, 29TNG9129. 6-ARCOS DE VALDEVEZ: between Lamas de Mouro and Branda da Bouça dos Homens, 29TNG6452. 7-MONTALEGRE: Sezelhe, 29TNG9329. 8-CINFÃES: Alhões, 29TNF8338. 9-GOUVEIA: between Prados and Videmonte, 29TPE3687. 10-MONTALEGRE: Paradela, exit to Outeiro, 29TNG8724. 11-LAMEGO: bridge over the Balsemão river, EN -2, 29TNF9442. 12-ARCOS DE VALDEVEZ: Branda da Bouça dos Homens, 29TNG6149. 13-MELGAÇO: Varzea, Porto dos Carros, 29TNG6954. 14-ORENSE (SPAIN): Close to Lapela, 29TNG6858. 15-MELGAÇO: Fiães, close to Mosteiro, 29TNG6561. 16-MELGAÇO: close to Viso, 29TNG6955. 17-MELGAÇO: Between Seara and Giras, Padroçouro, 29TNG7253. 18-MELGAÇO: Porto dos Carros, 29TNG6954. 19-MELGAÇO: Castro Laboreiro, between Teso and Campelo, 29TNG7154. 20-MONTALEGRE: Above Tourém, 29TNG9238. 21-MELGAÇO: between Portelinha and Lamas de Mouro, 29TNG6856.

Syntaxonomical scheme

GALIO-URTICETEA Passarge ex Kopecký 1969
Galio aparines-Alliarietalia petiolatae Görs & Müller 1969
Galio-Alliarion petiolatae Oberdorfer & Lohmeyer in Oberdorfer, Görs, Korneck, Lohmeyer, Müller, Philippi & Seibert 1967
Smyrnienion olusatri Rivas Goday ex Rivas-Martínez, Fernández-González & Loidi 1999
Allio triquetri-Urticetum membranaceae P. Alves, Honrado & Barreto Caldas 2003
Alliarienion petiolatae Rivas-Martínez, Fernández-González & Loidi 1999
Geranio robertiani-Caryolophetum sempervirentis Izco, Guitián & Amigo 1986
Convolvuletalia sepium Tüxen 1950 em. Mucina 1993
Filipendulion ulmariae Segal 1966
Allio scorzonerifolii-Angelicetum laevis as. nova
Bromo ramosi-Eupatorion cannabini O. Bolòs & Masalles in O. Bolòs 1983
Cirsio palustris-Paradiseetum lusitanicae as. nova
Picrido hieracioidis-Eupatorietum cannabini Loidi & C. Navarro 1988

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