

ASS. FESTUCO RUBRAE - AGROSTIETUM CAPILLARIS HORV. 1951 SUBAS. AVENULETOSUM PLANICULMIS NOM. NOV. IN THE MEADOWS NEAR THE SOURCES OF THE OITUZ AND TROTUȘ RIVERS

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Key words: *avenuletosum paniculmis*

INTRODUCTION

Avenula planiculmis is a Carpathian-Balkan species, present on the territory of Romania along the Eastern and Southern Carpathians. In the Eastern Carpathians it is present in the Rodna, Bistrița, Hășmaș, Ciucului and Nemira Mountains, as well in the Bicaz Gorge, in Ocloș, and in Valea Uzului-Dărmănești (Oprea Ad., 2005).

The study of this plant was motivated by the identification of a large phytocoenoses, of up to 10 ha, next to the source of the Oituz river, between the Mușat Mountains and the Black Mountain of the Nordic part of the Vrancea Mountains, also known as the Brețcu Mountains. At the source of the Trotuș River, there are more such phytocoenoses of 0,5- 2 ha.

The observations regarding the disruptive factors have been conducted over the course of seven years, sometimes towards the end of summer, in the month of August, when these fields, belonging to ROSCI 0130 Oituz – Ojdula, are partially grazed, at medium intensity. The analysed phytocoenoses situated between the Uz River and Izvorul Trotușului are used as meadows, do not have any disruptive factors and belong to the ROSCI 0343 Ciucului de Jos site.

MATERIAL AND METHOD

The sampling and some of the observations were made using the phytosociological approach during fieldwork activities. The analysis of the ecological information was made with regard to the indicator species.

RESULTS AND DISCUSSION

The alpine meadows in these regions are dominated by *Festuca rubra* and *Agrostis capillaris* which have a great phenotypic plasticity, offering the landscapes their well-known rust shade.

Avenula planiculmis is very tall, the stem often being taller than 1-meter high (around 80- 120

(140) cm). Among the high weeds, besides this species there are also specimens of *Polygonum bistorta*, *Phyteuma tetramerum*, *Briza media* etc. In the middle layer, with a coverage in some phytocoenoses of about 60% are: *Campanula serrata*, *Agrostis tenuis*, *Centaurea carpatica*, *Trolius europaeus*, *Gymnadenia conopsea*, *Luzula luzuloides*, *Leucanthemum vulgare*, *Trifolium pannonicum*, etc. In the lower layer of vegetation one can also find *Stellaria graminea*, *Potentilla argentea*, *P. erecta*, *Rhinanthus minor*, *Plantago media*, *Cerastium glomeratum*, *Nardus stricta*, *Alchemilla xanthochlora*, *Primula veris*, *Carlina aculis*, *Linum catharticum*, etc.

The plant litter under the *Avenula* bushes is 10-15 cm thick and no longer allows the development of other plants, so it is a perennial plant, stable in its competition with other species over the years.

The nucleus of vegetation is crystallised around the species of the *Molinio-Arrhenatheretea* class, although other accompanying species of other vegetation classes participate, the latter will not be able to change the physiognomy and structure of the vegetation except with a prolonged brutal intervention by grazing. From this point of view, we do not know if there are such phytocoenoses in the vicinity, where the land is constantly used as a pasture (Table 1).

The analysis of life forms highlights the following categories of plants: 73% hemicryptophytes, 10% geophytes, 8% chamaephytes, 4% hemitherophytes and only 5% therophytes. It is a natural vegetation.

The analysis of the geographical elements reveals the following categories of plants: Eurasian 44%, European 27%, Central European 13%, circumpolar 7%, endemic 5%, cosmopolitan 2% and Ponto-Mediterranean 2%. Carpathian endemics include *Viola declinata*, *Centaurea carpatica*, *Scabiosa lucida*, *Phyteuma tetramerum* and *Primula elatior* ssp. *leucophylla*.

The indicator species were analysed for ecological factors.

Table 1. *Festuco rubrae* - *Agrostietum capillaris* Horv. 1951 subas. *avenuletosum planiculmis* subass. nov.

Survey number	1	2	3	4	5	6	7	8	9	10	K
Exhibition	SV	SV	N	SV	NE	NE	E	NE	NE	NV	
Tilt (°)	15	10	15	30	10	10	10	20	20	25	
Altitude	1100	1150	900	950	1000	1100	1200	1180	1100	1050	
Vegetation coverage (%)	100	80	95	100	90	80	100	100	98	100	
Surface (m ²)	100	100	100	100	100	100	100	100	100	100	
Carr. Ass											
<i>Festuca rubra</i>	+	.	1	2	.	.	.	+	.	2	III
<i>Agrostis capillaris</i>	+	+	+	+	1	+	+	1	1	1	IV
Diff. sub-ass.											
<i>Avenula planiculmis</i>	5	4	4	4	4	4	5	5	4	4	V
Cynosurion											
<i>Hypochoeris radicata</i>	+	+	+	+	+	+	.	+	.	.	IV
<i>Centaurea phrygia</i>	.	+	+	+	+	.	+	.	+	+	IV
<i>Trifolium pannonicum</i>	.	.	+	1	1	.	.	+	+	1	IV
<i>Potentilla erecta</i>	+	.	.	+	.	+	.	+	+	+	III
<i>Phyteuma tetramerum</i>	.	.	+	.	.	.	.	+	+	.	II
<i>Botrychium lunaria</i>	+	.	+	.	.	.	.	.	.	.	I
<i>Polygala amara</i>	.	.	.	+	.	.	.	.	+	.	I
Polygono - Trisetion											
<i>Trollius europaeus</i>	+	.	+	.	+	.	+	+	+	.	III
<i>Orchis globosa</i>	.	+	.	.	.	.	+	.	.	.	I
<i>Laserpitium prutenicum</i>	.	.	.	.	+	+	.	.	.	+	I
<i>Hypochoeris maculatum</i>	.	.	.	.	.	.	.	.	+	.	I
Phyteumo-Trisetion											
<i>Veratrum album</i>	.	+	.	.	.	.	.	+	+	.	II
Arrhenatheretalia											
<i>Stellaria graminea</i>	+	+	+	+	+	.	+	.	.	+	IV
<i>Carlina acaulis</i>	+	+	+	.	+	.	.	+	+	+	III
<i>Alchemilla xanthochlora</i>	+	.	.	+	.	.	+	.	+	.	II
<i>Thymus pulegioides</i>	.	+	.	+	.	+	.	.	.	.	II
<i>Luzula campestris</i>	+	.	+	+	.	.	.	.	.	.	II
<i>Campanula glomerata</i>	.	.	.	+	.	+	+	+	.	.	I
<i>Orchis ustulata</i>	+	.	.	.	.	.	.	.	.	.	I
<i>Veronica chamaedrys</i>	.	.	+	.	.	.	.	.	.	.	I
<i>Knautia arvensis</i>	.	.	.	.	.	.	.	+	.	.	I
<i>Plantago lanceolata</i>	.	.	.	.	.	.	.	+	.	.	I
Molinion											
<i>Briza media</i>	.	+	+	+	+	.	.	.	.	+	III
<i>Festuca nigrescens</i>	+	.	+	.	.	.	.	1	.	.	II
<i>Stachys officinalis</i>	.	.	.	.	+	+	.	.	.	+	II
<i>Succisa pratensis</i>	+	+	.	.	.	.	+	.	.	.	I
<i>Dactylorhiza incarnata</i>	+	.	.	.	.	.	.	.	.	.	I
<i>Serratula tinctoria</i>	.	.	.	.	.	.	+	.	.	.	I
Molinietalia											
<i>Gymnadenia conopsea</i>	.	+	+	1	+	.	+	+	.	.	III
<i>Achillea ptarmica</i>	.	+	.	.	.	.	.	.	.	.	I
<i>Polygonum bistorta</i>	.	.	+	.	.	.	.	.	.	.	I
<i>Genista tinctoria</i>	.	.	+	.	.	.	+	.	.	.	I
<i>Linum catharticum</i>	.	.	.	+	.	.	.	.	.	.	I
Molinio - Arrhenatheretea											
<i>Campanula serrata</i>	.	+	+	.	+	+	+	+	+	.	IV
<i>Leucanthemum vulgare</i>	+	+	.	.	.	+	+	.	+	.	III
<i>Lotus corniculatus</i>	.	+	.	.	+	+	+	+	+	.	III
<i>Prunella vulgaris</i>	+	.	+	.	.	.	.	.	.	.	I
<i>Leontodon autumnalis</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Cerastium fontanum</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Anthoxanthum odoratum</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Achillea millefolium</i>	+	.	.	.	.	.	.	.	.	+	I
<i>Taraxacum officinalis</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Rhinanthus minor</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Plantago media</i>	.	.	+	+	.	.	.	.	.	.	I
<i>Trifolium repens</i>	.	.	+	.	.	.	.	.	.	.	I
<i>Ranunculus acer</i>	.	.	+	.	.	.	.	.	.	.	I
<i>Carex palescens</i>	+	.	.	.	.	.	.	.	.	.	I
Cirsio - Brachypodion											
<i>Helianthemum nummularium</i>	+	.	.	.	+	.	+	.	.	+	II
<i>Trifolium alpestre</i>	+	.	.	+	.	+	+	.	.	.	II
<i>Chrisanthemum corymbosum</i>	.	.	.	.	.	+	.	+	+	+	II
<i>Hypochoeris maculata</i>	+	.	.	+	.	.	.	.	+	.	II

<i>Prunella grandiflora</i>	.	.	.	.	.	+	.	.	.	.	.	I
<i>Campanula persicifolia</i>	.	.	.	.	.	.	.	.	.	.	+	I
Trifolium medii												
<i>Astrantia major</i>	.	.	+	+	.	.	+	+	.	.	.	II
<i>Achillea distans</i>	.	+	.	.	.	.	.	.	.	+	+	II
Geranium sanguineum												
<i>Trifolium alpestre</i>	+	1	+	+	.	+	+	.	.	.	.	III
Filipendula												
<i>Hypericum tetrapetrum</i>	.	+	+	.	.	.	.	.	.	+	.	III
Potentilla ternata - Nardion												
<i>Nardus stricta</i>	+	.	1	+	1	+	.	+	.	+	.	IV
<i>Scorzonera rosea</i>	+	.	+	.	.	1	+	+	+	.	.	III
<i>Thesium alpinum</i>	.	.	1	+	+	.	.	.	.	+	.	II
<i>Hypochoeris uniflora</i>	.	.	.	+	.	+	+	+	.	.	.	II
<i>Viola declinata</i>	+	.	.	.	.	.	.	.	.	.	.	I
<i>Veronica officinalis</i>	+	+	.	.	.	.	.	.	.	.	.	I
<i>Gentiana praecox</i>	.	.	+	.	.	.	.	.	.	.	.	I
<i>Arnica montana</i>	.	+	.	.	.	.	.	.	.	.	.	I
Festucetalia valesiacae												
<i>Cruciatia pedemontana</i>	.	.	+	+	.	+	.	.	.	+	.	II
Festuco -Brometia												
<i>Galium verum</i>	.	.	+	.	.	+	+	.	.	.	+	II
<i>Anthyllis vulneraria</i>	.	.	+	1	.	+	.	.	.	.	.	II
<i>Pimpinella saxifraga</i>	.	.	+	.	.	+	.	.	.	+	.	II
<i>Potentilla argentea</i>	.	.	+	.	.	.	.	.	.	.	.	I
<i>Potentilla recta</i>	.	.	.	+	.	.	.	.	.	.	.	I
<i>Scabiosa columbaria</i>	.	.	.	+	.	.	.	.	+	.	.	I
Elino- Seslerietea												
<i>Pedicularis comosa</i> ssp. <i>campestris</i>	.	.	+	.	+	.	.	+	+	.	.	II
<i>Scabiosa lucida</i>	.	.	+	.	.	.	.	.	.	.	.	I
<i>Anemone narcissiflora</i>	.	.	.	.	.	.	.	+	+	.	.	I
Symphyto - Fagion												
<i>Hypericum montanum</i>	.	.	.	.	.	+	.	.	.	.	.	I
<i>Primula elatior</i> ssp. <i>leucophylla</i>	.	.	.	.	.	.	.	+	.	.	.	I
Fagetalia												
<i>Viola reichenbachiana</i>	+	.	.	+	.	.	.	.	.	.	+	II
<i>Cirsium erisithales</i>	.	.	.	.	.	+	.	.	.	+	.	I
<i>Fragaria vesca</i>	.	.	.	.	.	+	.	.	.	.	.	I
<i>Myosotis sylvatica</i>	.	.	+	.	.	.	.	.	.	.	.	I
<i>Lilium martagon</i>	.	.	.	.	+	.	.	.	.	.	.	I
Quercu- Fagetea												
<i>Primula veris</i>	.	.	.	+	.	.	.	.	.	.	.	I
<i>Campanula rapunculoides</i>	.	.	.	.	+	.	.	.	.	.	.	I
Dicrano - Pinion												
<i>Vaccinium myrtillus</i>	.	.	.	.	.	.	.	1	.	.	.	I
<i>Vaccinium vitis-idaea</i>	.	.	.	.	.	.	.	+	.	.	.	I
Abieti - Piceion												
<i>Picea abies</i> (juv.)	.	.	.	.	.	.	.	+	.	.	.	I
Piceetalia												
<i>Luzula luzuloides</i>	+	+	+	.	.	+	1	1	1	+	.	IV

Place and date of the survey: 1, 2 – The Oituz river source (07.07.2011); 3- Cinod (Uz Pass; 08.08.2011); 4- Ghiurche (Ciuc village; 08.08.2011); 5- upstream the Uz Pass (08.08.2011); 6 –Făgetel Ridge, upstream of the Ruta Brook (Izvorul Troțuș; 08.08.2011); 7, 8 – Culmea Făgetel, upstream of Gheza's Brook (Izvorul Troțuș; 08.08.2011); 9 – Culmea Făgetel, (Izvorul Troțuș; 08.08.2011); 10- Ghimeș Pass, at the monument (08.08.2011)

For the light factor, there are 40% light species that cannot withstand shading, 40% light species that can endure shading for a short period of time, 3% species adapted to full lighting and the rest are species that support different degrees of moderate shading.

With regard to temperature, the categories are: 42% eurytherms, 24% mountain climate (this includes *Avenula planiculmis*) to subalpine species, 18% of submontane climate, 6% alpine, the rest specific to hilly areas.

When it comes to humidity, the species are grouped in: 41% species needing dry to moderately moist soil (this includes *Avenula planiculmis*), 24%

species adapted to moderately moist soil, 10% damp soil, 11% eurhydrates; the rest are companion plants or transgressive, fit to grow on both dry or wet soil.

For p-H a large number of categories have been assembled, only the alkaline soil plants which formed on limestone are missing. Among these categories, eurionomic species amount to 35%, moderately weak acidic soil species make up 24%, species preferring weak acidic to acidic soil 11% and the rest are species thriving on soil with neutral p-H. The species analysed in this context prefers soils with neutrally weak alkaline p-H.

Plants adapted to nitrogen deficiency were grouped by the amount of mineral nitrogen

supported. There are 28% species that can grow on very low nitrogen soils, 21% on low nitrogen soils, 20% euriionic, some of them do not have any preferences. For this factor, the species *Avenula planiculmis* is very well adapted to nitrogen-poor soils.

CONCLUSIONS

The diversity of these phytocoenoses is high in places that have not been exploited as pastures. More than 100 species have been identified, 5 of which are endemic to the Carpathians. Although the ecological conditions are harsh, the amount of phytomass is of economic interest.

ABSTRACT

This article analyses natural and seminatural meadows containing *Avenula planiculmis* falling within the *Festuco rubrae* - *Agrostietum capillari* Association, Horv. 1951 subas. *avenuletosum planiculmis* subass. nov.

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