CONTRIBUTIONS TO THE KNOWING OF THE GRASSLAND VEGETATION SURROUNDING REMEŢI VILLAGE (BIHOR COUNTY)

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Abstract

This paper represents a phytocoenologic and ecological study on acidophilic grassland vegetation surrounding Remeţi village, Bihor County.

As a result of carrying out 8 relevées we have identified two plant associations namely: Festuco rubrae-Agrostetum capillaris Horvat 1951 and Violo declinatae-Nardetum Simon 1966. For the two identified associations I made out synthetic tables in which there was entered information on the species of the floristic composition of the phytocoenoses as well as life forms and floristic elements. I realized for each association a graphic interpretation of the spectrum of life forms and floristic elements.

Key words: phytocoenoses, association, vegetation, grassland, floristic elements, life forms.

INTRODUCTION

The phytocoenologic study is located in the Vlădeasa Mountains, a special group of the Apuseni Mountains. Meadows studied are located near Remeţi village in Bihor County, in the area between Iadului Valley and Drăganului Valley (figure 1).

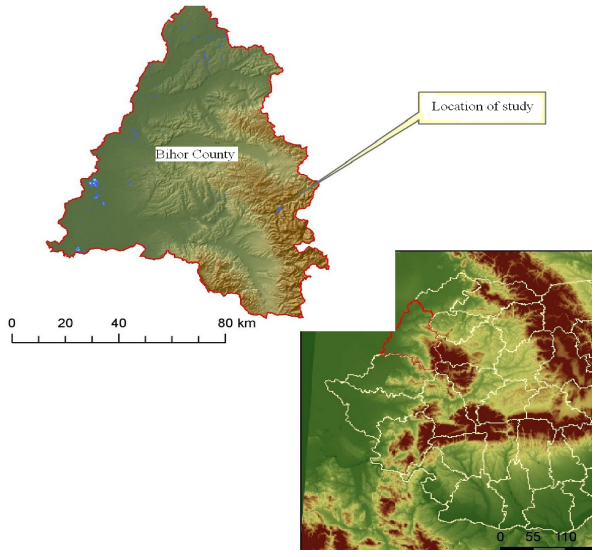

Fig. 1 Location of study
(http://1.bp.blogspot.com/-_fxAhVtieho/TWS_CljCNoI/AAAAAAAAAGA/8jMB1hE4uZ8/s1600/img+1.jpg)

The litologic substrate is formed of igneous rocks, the sedimentary limestone rocks are found in the South of Remeți village in Iadului Valley. Although the relief is very fragmented it has a solid character. The greater heights are dominated by large peaks, ridges and rounded peaks, which is due to the homogeneous and geological structure of the processes carried out by erosion over time. Vlădeasa Mountains rise like a barrier in front of the masses of air coming from the West, for this reason, significant precipitations fall in this zone.

Meadows belonging to *Festuco rubrae-Agrostetum capillaris* associations Horvat 1951 and *Violo declinatae-Nardetum* associations Simon 1966 are commonly found in our country, being cited in some recent work by Resmeriță (1970, 1975, 1977), Popescu et al. (2001), Mihăilescu (2001), Sămărghițan (2005), Niculescu (2006), Chifu et al. (2006), Răduțoiu (2006), Zamfirescu (2007), Groza (2008), Oprea and Sârbu (2009), Păşcuț (2012).

MATERIAL AND METHODS

Phytocoenologic study of the acidophilic grassland in the vicinity of Remeți village was carried out in 2014. The carry out technique of phytocoenologic relevées was according to the indications provided by Cristea et al. (2004). The size of the sample areas adopted was 100 m². In the ground sheet there were recorded data relating to GPS location (latitude, longitude, altitude), the exposition, the slope, and vegetation coverage.

The nomenclature of the species is carried out by Sârbu et al. (2013). The classification of the associations was made in accordance with the ecological-floristic arrangements drawn up by the Coldea et al. (1997) and Sanda et al. (2008).

In this paper, we used the following abbreviations:

- Life forms (L.f.): mezophanerophytes (mPh); nanophanerophytes (nPh); hemicryptophytes (H); camephytes (Ch); geophytes (G); annual terophytes (Th); biannual terophytes (TH).
- Floristic elements (F.e): circumpolar (Cp); eurasian (Eua); european (E); central european (Ec); cosmopolitan (Cosm); ponto-panonian(Ppn); carpathian. (Carp); mediterano-pontic (Mp).

RESULTS AND DISCUSSION

We have identified the following associations: *Festuco rubrae-Agrostetum capillaris* Horvat 1951 and *Violo declinatae-Nardetum* Simon 1966.

From the point of view of coenotaxonomic classification, the two associations are as follows:

- Class *Molinio-Arrhenatheretea* R. Tüxen 1937
  Order *Arrhenatheretalia* R. Tüxen 1931
  Alliance *Cynosurion* R. Tüxen 1947
  Asociation *Festuco rubrae-Agrostetum capillaris* Horvat 1951
- Class *Nardo-Callunetea* Preising 1949
  Order *Nardetalia* Oberdorfer 1949
  Alliance *Potentillo-Nardion* Simon 1959
  Asociation *Violo declinatae-Nardetum* Simon 1966

1. The phytocoenoses of *Festuco rubrae-Agrostetum capillaris* association Horvat 1951, have been identified in the following places: Peak of Seniu Mare, La Leordişte, Fericele, Peak of Scoroşeţului and Săcătura Zăngăr.

The phytocoenoses of *Festuca rubra* with *Agrostis capillaris* in the studied area, are encountered on land with high slopes inclination (16-30°), with North-Western, Western and Northern expositions. The existing soils are of districambosol medium deep, acidic type. The floristic composition of these phytocoenoses summarizes a number of 58 species. Apart from the enlightening species, in the floristic composition of the association there are some characteristic species of the *Cynosurion* alliance, *Arrhenatheretalia* order and *Molinio-Arrhenatheretea* class, such as: *Cynosurus cristatus*, *Hypochaeris radicata*, *Trifolium repens*, *Leontodon autumnalis*, *Bellis perennis, Achillea millefolium*, *Alchemilla vulgaris*, *Lotus corniculatus*, *Stellaria graminea*, *Anthoxanthum odoratum*, *Cerastium holosteoides*, *Juncus effusus* (table 1).

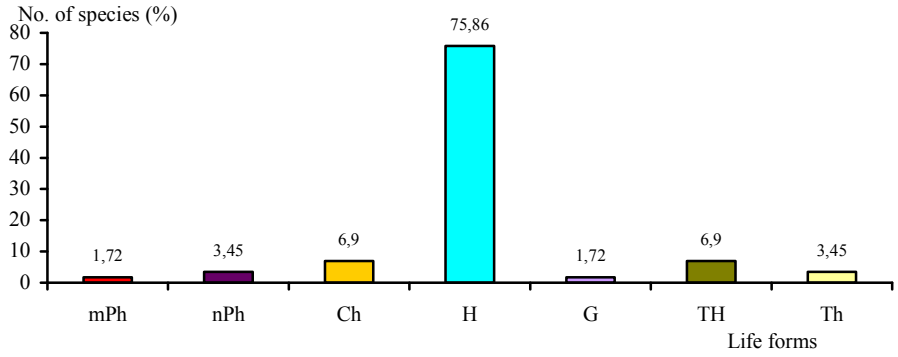

Fig. 2 The life forms spectrum of *Festuco rubrae-Agrostetum capillaris* association Horvat 1951

The bioforms spectrum (figure 2) shows the predominance of hemicryptophytes (75.86%), followed by terophytes (10.35%) and camephytes (6.9%).

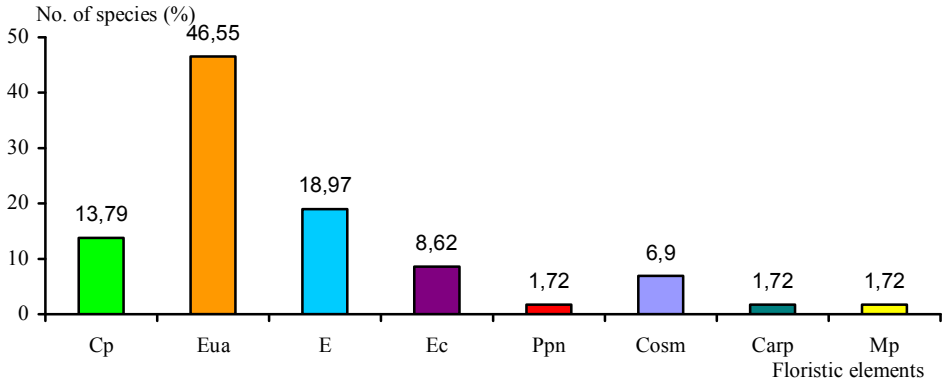

Fig. 3 Spectrum of floristic elements of *Festuco rubrae-Agrostetum capillaris* association Horvat 1951

Floristic elements which dominate are eurasian (46.55%), followed by European (18.97%), circumpolar (13.79%), central European (8.62%) and cosmopolitan (6.9%) (figure 3).

Table 1

Festuco rubrae-Agrostetum capillaris association Horvat 1951

L.f.	F.e.	Number		1	2	3	4	5	K
		GPS coordonates	Altitude (m)	1056	949	920	1148	1091	
			Lat. N	46.85058	46.84575	46.85703	46.85817	46.86124	
			Long. E	22.70518	22.70132	22.73288	22.74581	22.75113	
		Vegetation coverage (%)		100	100	100	100	90	
		Exposition		V	NV	NV	NV	N	
		Slope (°)		16	28	30	25	16	
		Area (m²)		100	100	100	100	100	
0	*1*	*2*		*3*	*4*	*5*	*6*	*7*	*8*
H	Cp	As. *Festuca rubra*		4	3	4	4	4	V
H	Cp	As. *Agrostis capillaris*		2	2	1	2	2	V
		Cynosurion							
H	E	*Cynosurus cristatus*		·	+	+	+	·	III
H	E	*Hypochaeris radicata*		+	·	·	+	·	II
H	Eua	*Trifolium repens*		+	+	+	·	+	IV
H	Eua	*Leontodon autumnalis*		+	·	·	·	·	I
H	E	*Bellis perennis*		+	+	·	·	·	II
		Arrhenatheretalia							
H	Eua	*Achillea millefolium*		+	+	+	·	+	IV
H	Ec	*Alchemilla vulgaris*		·	+	+	·	+	III
H	Eua	*Leontodon hispidus*		·	+	+	·	·	II
H	Eua	*Lotus corniculatus*		·	+	+	+	·	III
H	Eua	*Briza media*		·	+	·	+	·	II
H	Eua	*Holcus lanatus*		·	+	·	·	·	I
H	Eua	*Stellaria graminea*		+	·	+	·	+	III

0	1	2	3	4	5	6	7	8
Ch	Ec	*Thymus pulegioides*	+	·	·	+	·	II
H	Eua	*Leucanthemum vulgare*	·	·	+	·	·	I
		Molinio-Arrhenatheretea						
H	Eua	*Anthoxanthum odoratum*	+	·	·	+	+	III
H	Ec	*Centaurea phrygia*	·	+	·	+	·	II
TH	E	*Campanula patula*	·	·	+	·	·	I
H	Eua	*Plantago lanceolata*	·	·	·	+	+	II
H	Cosm	*Rumex acetosa*	+	·	·	+	·	II
H	Cosm	*Cerastium holosteoides*	+	+	+	+	+	V
H	Cosm	*Juncus effusus*	+	+	·	1	+	IV
H	Eua	*Polygala vulgaris*	·	+	+	·	·	II
H	Eua	*Ranunculus polyanthemos*	·	1	+	+	·	III
H	Eua	*Mentha longifolia*	·	+	·	·	·	I
H	Cp	*Poa pratensis*	·	+	+	·	+	III
H	E	*Trifolium hybridum*	·	+	+	·	·	II
		Festuco-Brometea						
H	Eua	*Galium verum*	·	+	·	·	·	I
H	Eua	*Hypericum perforatum*	+	·	·	·	+	II
Ch	Ppn	*Thymus glabrescens*	+	1	1	·	·	III
Th	Ec	*Euphrasia stricta*	+	+	·	·	·	II
TH	Eua	*Carlina vulgaris*	·	+	·	·	·	I
H	Eua	*Trifolium montanum*	·	+	+	·	·	II
		Nardo-Callunetea						
H	Eua	*Potentilla erecta*	+	1	1	1	+	V
H	E	*Danthonia decumbens*	+	+	+	·	·	III
H	E	*Hieracium pilosella*	+	+	·	·	+	III
H	E	*Nardus stricta*	+	1	1	+	·	IV
H	Eua	*Hypericum maculatum*	+	·	+	+	·	III
Ch	Eua	*Veronica officinalis*	·	+	·	·	·	I
H	Eua	*Viola canina*	·	·	+	·	+	II
		Vaccinio-Piceetea						
nPh	Cp	*Vaccinium myrtillus*	+	·	·	·	·	I
nPh	Eua	*Calluna vulgaris*	·	1	·	·	·	I
H	Cp	*Deschampsia flexuosa*	+	·	1	·	·	II
H	E	*Luzula luzuloides*	·	+	·	·	·	I
H	Carp	*Campanula abietina*	·	+	·	·	·	I
		Variae Syntaxa						
mPh	Cp	*Juniperus communis*	+	+	+	+	·	IV
H	Ec	*Gentiana asclepiadea*	·	+	+	·	·	II
H	Eua	*Calamagrostis arundinacea*	·	+	·	·	·	I
TH	E	*Carduus acanthoides*	·	+	·	·	·	I
H	Eua	*Cruciata glabra*	·	·	+	·	·	I
Th	Eua	*Filago minima*	+	·	·	·	·	I
H	Eua	*Fragaria vesca*	+	+	+	+	+	V
H	Mp	*Glechoma hirsuta*	·	+	·	·	·	I
H	Cp	*Gnaphalium sylvaticum*	+	·	·	·	+	II
Ch	Cp	*Minuartia verna* ssp. *verna*	·	+	·	·	·	I
G	Cosm	*Pteridium aquilinum*	1	·	·	·	·	I
TH	E	*Verbascum phlomoides*	·	+	·	·	·	I

Place and date of relevées: 1 – Peak of Seniu Mare (Bihor County) 14.08.2014; 2 – La Leordişte (Bihor County) 14.08.2014; 3 – Fericele (Bihor County) 19.08.2014; 4 – Peak of Scoroşeţului (Bihor County) 19.08.2014; 5 – Săcătura Zăngăr (Cluj County) 19.08.2014.

2. The *Violo declinatae-Nardetum* association Simon 1966 has been identified in the studied area at La Leordişte, Peak of Seniu Mic and Săcătura Naiului. Meadows of *Nardus stricta* and *Viola declinata* are found at altitudes between 911-1097 m on land with Western and Northern expositions, with high slope (20-30°). These phytocoenoses love acidic and calloused soils, poor in nutrients and with variable humidity.

Floristic inventory integrates a number of 35 species. In the floristic composition of the association there are recognition species for the *Potentillo-Nardion* alliance, *Nardetalia* order, as follows: *Hypericum maculatum*, *Alchemilla vulgaris*, *Campanula abietina*, *Polygala vulgaris* and *Nardo-Callunetea* class: *Calluna vulgaris*, *Potentilla erecta*, *Danthonia decumbens*, *Hieracium pilosella*, *Veronica officinalis*, *Lycopodium clavatum*, *Lycopodium annotinum* (table 2).

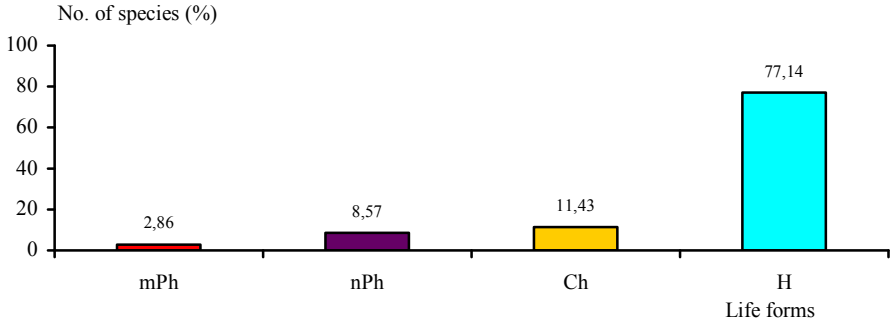

Fig. 4 The life forms spectrum of *Violo declinatae-Nardetum* association Simon 1966

It is observed that life forms are represented by a very high percentage of hemicryptophytes (77.14%), plus a smaller percentage of phanerophytes (11.43%) and camephytes (11.43%) (figure 4).

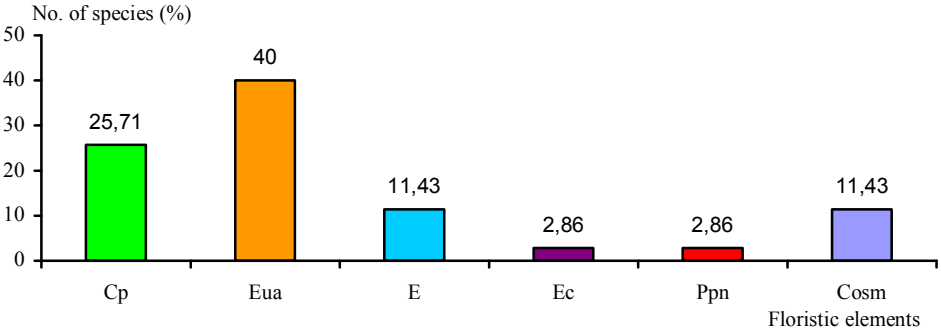

Fig. 5 Spectrum of floristic elements of *Violo declinatae-Nardetum* association Simon 1966

In these phytocoenoses, the share of the largest floristic elements is represented by the eurasians (40%), followed by circumpolars (25.71%), Europeans (11.43%) and cosmopolitans (11.43%) (figure 5).

Table 2

Violo declinatae-Nardetum association Simon 1966

L.f.	F.e.	Number		1	2	3
		GPS coordonates	Altitude (m)	911	1097	1024
			Lat. N	46.84143	46.85166	46.86438
			Long. E	22.69571	22.74320	22.74763
		Vegetation coverage (%)		100	90	100
		Exposition		N	V	V
		Slope (º)		25	30	20
		Area (m²)		100	100	100
H	E	As. *Nardus stricta*		5	4	5
H	Carp	As. *Viola declinata*		+	+	+
		Potentillo-Nardion, Nardetalia				
H	Eua	*Hypericum maculatum*		·	+	+
H	Ec	*Alchemilla vulgaris*		·	+	+
H	Carp	*Campanula abietina*		+	·	+
H	Eua	*Polygala vulgaris*		+	·	·
		Nardo-Callunetea				
nPh	Eua	*Calluna vulgaris*		·	+	·
H	Eua	*Potentilla erecta*		+	1	+
H	E	*Danthonia decumbens*		+	+	·
H	E	*Hieracium pilosella*		+	+	+
Ch	Eua	*Veronica officinalis*		+	·	+
Ch	Cosm	*Lycopodium clavatum*		·	+	·
Ch	Cp	*Lycopodium annotinum*		·	+	+
		Molinio-Arrhenatheretea				
H	Cp	*Agrostis capillaris*		+	·	·
H	Cp	*Festuca rubra*		+	+	·
H	Eua	*Achillea millefolium*		+	+	+
H	Cosm	*Cerastium holosteoides*		·	+	+
H	Eua	*Holcus lanatus*		·	+	·
H	Cosm	*Juncus effuses*		·	·	+
H	Eua	*Ranunculus polyanthemos*		·	+	·
H	Cosm	*Rumex acetosa*		+	·	·
H	Eua	*Anthoxanthum odoratum*		·	·	+
H	Cp	*Poa pratensis*		·	·	+
H	Eua	*Stellaria graminea*		·	+	+
		Vaccinio-Piceetea				
H	Cp	*Deschampsia flexuosa*		+	1	+
nPh	Cp	*Vaccinium vitis-idaea*		+	+	+
H	E	*Luzula luzuloides*		·	+	+
nPh	Cp	*Vaccinium myrtillus*		·	1	+
		Variae Syntaxa				
mPh	Cp	*Juniperus communis*		+	·	·
H	Eua	*Calamagrostis arundinacea*		+	·	·
H	Eua	*Cruciata glabra*		·	+	·
H	Eua	*Fragaria vesca*		·	+	+
H	Cp	*Gnaphalium sylvaticum*		+	·	+
Ch	Ppn	*Thymus glabrescens*		1	·	·
H	Eua	*Trifolium montanum*		·	+	·

Place and date of relevées: 1 – La Leordiște (Bihor County) 14.08.2014; 2 – Peak of Seniu Mic (Bihor County) 19.08.2014; 3 – Săcătura Naiului (Bihor County).

CONCLUSIONS

Acidophilic meadows in the vicinity of Remeți village presents a fairly broad ecological amplitude, occupying the slopes with high inclination and shady expositions in general. These grasslands develop on acidic districambosol soils with moderate moisture and fertility.

In the floristic composition of these grasslands the acidophilic species have a large proportion of participation have, as they produce the subsidence of the soil and these are: *Nardus stricta*, *Deschampsia flexuosa*, *Vaccinium vitis-idaea*, *Vaccinium myrtillus*.

From the point of view of life forms the dominant species in these two associations are hemicryptophytes, indicating the affiliation of this zone to the temperate climate. Floristic elements with the largest share are the eurasians, this fact confirming the affiliation of this area to the Euro-Siberian subregion.

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