THE STUDY OF *VERATRETUM ALBI* ASSOCIATION IN VAŞCĂU PLATEAU (CODRU-MOMA MOUNTAINS)

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Abstract

In this paper a phytocoenological study of Veratretum albi association is presented (Puşcaru et al. 1956) Buia et al. 1962, found in Vaşcău Plateau in Codru-Moma Mountains.

In the synthetic table there has been introduced some information regarding the species which are within the floristic composition of the association, life form, floristic element, ecological indices, serial number of the phytocoenologic relevées, altitude, exposition, vegetation coverage, slope and area. For the phytocoenoses identified there are presented the life forms spectrum, the floristic elements spectrum and the diagram of ecological indices.

Key words: association, phytocoenoses**,** life forms, floristic elements, ecological indices.

INTRODUCTION

Vaşcău Plateau is a vast limestone plateaux, karstified and located at the meeting point of Codru-Moma Mountains and Beiuş Depression, with the given geographic coordinates: 46°25'50'' North latitude and 22°26'49'' East longitude.

Vaşcău Plateau is a vast limestone plateaux that stretches from an altitude of 600-700 m. It includes the most spectacular Karst relief in the country, thanks to the impressive number of Sinkholes and closed pools. Many sinkholes are home to puddles, called „tăuri'', formed due to the weatherproofing of slopes with clay of decalcification, tinged red-violet. To the West and South the Vaşcău Plateau presents a chain of closed depressions without rivers, whose slopes are carved into foibe.

The hydrography in Vaşcău Plateau is characterized by precipices, which capture the permanent waters. In Vaşcău Plateau there are three springs which must be mentioned: the spring from Boiu, near the town of Vaşcău, at the bottom, a spring from Briheni Valley and one at Călugări, once famous for double discontinuity.

Climatic conditions fall into the moderate-continental type. The average yearly temperature decreases from 10 °C to 8 °C; the average air temperature in January decreases from -2 °C to -4 °C, and in July, from 20 °C to 18 °C. Precipitation (annual average quantities) are 700 mm up to

1.000 mm. The most widespread soils on the territory of the plateau are rendzinic followed by brown eumesobasic and brown acid ones.

MATERIAL AND METHODS

The study of *Veratretum albi* association (Puşcaru et al., 1956; Buia et al. 1962) in Vaşcău Plateau, is based on personal research, observations, descriptions, measurements taken in the field during 2011.

In the phytocoenological and environmental study of the associations we have paid special attention to the analysis and composition of phytocoenoses in life forms, floristic elements, in ecological categories considering the moisture, temperature, chemical reaction of the soil, the results obtained in the analysis performed being graphicly represented in the histograms and diagrams spectra form. The sample surfaces which are floristically homogeneous were chosen in characteristical phytocoenoses snippets, their size is 50 m².

The phytocoenological table of the association was structured on Braun-Blanquet (1964) methodology.

While considering the classification of the association in the superior coenotaxonomic units as well as its nomenclature, there were taken into account the traditional ecologico-floristic systems belonging to authors Braun-Blanquet (1964), Soó (1964-1980), Borza, Boşcaiu (1965) and more recently published works belonging to researchers Mucina et al. (1993), Pott (1995), Borhidi (1996), Coldea et al. (1997), Rothmaler (1994-2000), Sanda et al. (2008).

RESULTS AND DISCUSSION

The phytocoenoses erected by *Veratrum album* grows in meadows near forest edges in places grazed excessively where the animals are kept during the day. This takes the form of clumps, at altitudes of 600-800 m, on the shaded exposition (N, NW), the dominant and characteristic species is *Veratrum album* with a coverage of 82,5% (Table 1).

As the life form spectrum shows (Fig. 1) there is a dominance of hemicryptophytes (63,79%), followed by phanerophytes (10,34%) and geophytes (20,69%).

The dominant floristic elements are Eurasian (44,83%), followed by European (27,58%) and Central European (15,52%) (Fig. 2).

Analyzing the phytocoenoses of the associantion after the main ecological indices (Fig. 3), we find that most species, in relation to moisture requirements, are mesophytes (70,69%) and compared to the temperature factor, the largest percentage belongs to micro-mesothermophylous species (63,79%). In relation to the chemical reaction of the soil, we note that the

largest percentage is represented by acid neutrophylous species (37,93%), followed by the acid neutrophylous species (31,03%) and amphitolerant species (20,69%).

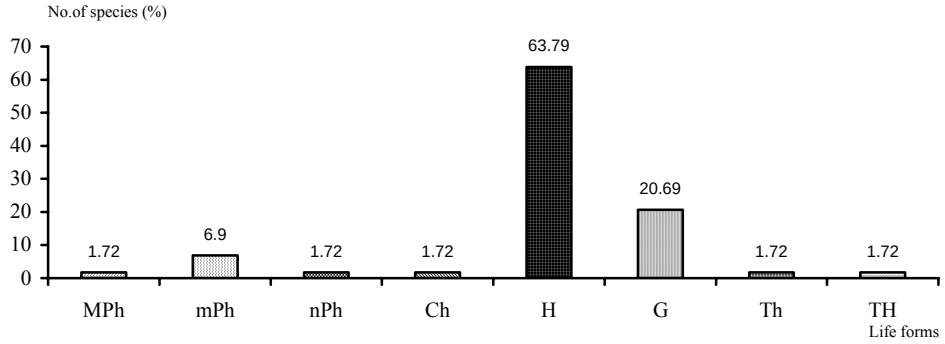

Fig. 1. The life forms spectrum of the *Veratretum albi* association

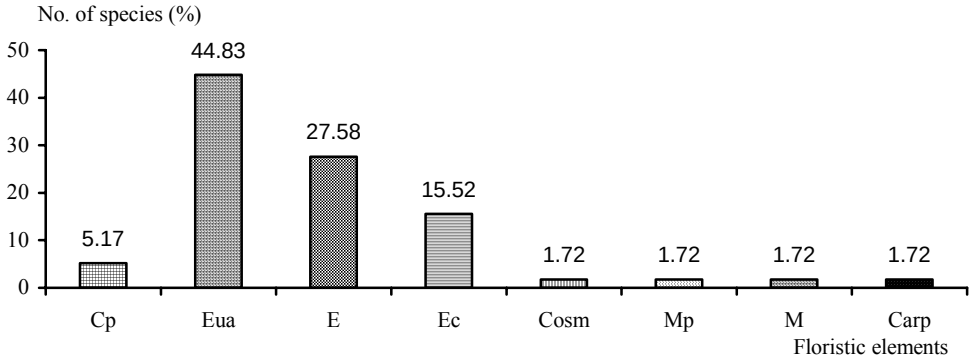

Fig. 2. Spectrum of floristic elements of the *Veratretum albi* association

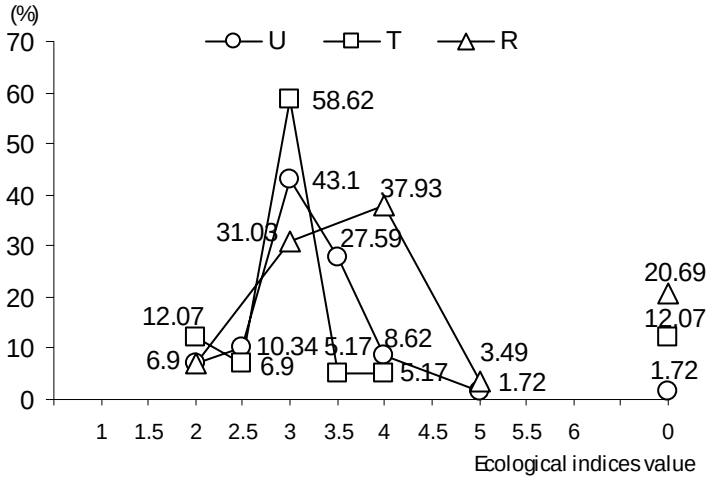

Fig. 3. Diagram of ecological indices for the *Veratretum albi* association

Table 1

Veratretum albi (Puşcaru et al., 1956; Buia et al., 1962)

L.f.	F.e.	U.	T.	R.	Number	1	2	3	4	5	K	ADm
					Altitude (m.s.m.)	680	740	750	800	600		
					Vegetation coverage (%)	100	85	100	100	100		
					Exposition	N	N	N	NV	NV		
					Slope (º)	20	15	5	20	10		
					Area (m²)	50	50	50	50	50		
G	Eua	4	2,5	4	As. *Veratrum album*	5	4	5	5	5	V	82,5
					Rumicion alpine, Lamio albi-Chenopodietalia Boni-Henrici							
H	Eua	3,5	3	3	*Aegopodium podagraria*	+	·	+	·	+	III	0,3
H	Eua	3	3	4	*Geum urbanum*	·	+	+	·	·	II	0,2
H	E	3,5	0	4	*Lamium maculatum*	+	·	·	+	·	II	0,2
H	Eua	3	3	4,5	*Sambucus ebulus*	·	·	·	·	+	I	0,1
					Galio-Urticetea							
H	Eua	3,5	3	4	*Salvia glutinosa*	+	+	·	+	·	III	0,3
Th	Cp	3	3	3	*Galium aparine*	+	·	·	·	+	II	0,2
H-G	Cosm	3	3	4	*Urtica dioica*	+	·	+	·	·	II	0,2
H	Ec	4	3	3	*Geranium phaeum*	·	·	+	·	·	I	0,1
					Querco-Fagetea							
H	E	2,5	2,5	2	*Luzula luzuloides*	+	+	+	+	+	V	0,5
G	E	3,5	4	0	*Anemone nemorosa*	+	1	+	+	·	IV	1,3
H	Eua	3	2	2	*Cruciata glabra*	+	·	+	+	+	IV	0,4
H	Carp	2,5	3	4	*Helleborus purpurascens*	·	1	+	+	+	IV	0,5
H	Eua	3	2	5	*Primula veris*	·	+	+	·	+	III	0,3
G	E	3,5	3	4	*Scilla bifolia*	·	+	+	+	·	III	0,3
G	Ec	3	3	4	*Dentaria bulbifera*	·	+	+	·	·	II	0,2
Ch	E	3	3,5	4	*Euphorbia amygdaloides*	+	·	+	·	·	II	0,2
H-Ch	Mp	2,5	3	4	*Glechoma hirsuta*	·	+	+	·	·	II	0,2
H	Eua	3	3	3	*Lathyrus vernus*	·	·	+	·	+	II	0,2
H-G	E	3,5	3	4	*Mercurialis perennis*	·	·	+	·	+	II	0,2
G	Eua	2	3	4	*Polygonatum odoratum*	·	·	·	+	+	II	0,2
H	E	3,5	3	3	*Pulmonaria officinalis*	·	+	·	+	·	II	0,2
H-Ch	Eua	3	3	0	*Stellaria holostea*	·	1	+	·	·	II	1,1
MPh	Eua	3	2	2	*Betula pendula*	·	·	·	·	+	I	0,1
H	Ec	4	2,5	4	*Aconitum vulparia*	·	·	·	·	+	I	0,1
G	E	3,5	3	4	*Anemone ranunculoides*	·	·	+	·	·	I	0,1
G	Eua	3,5	3,5	4	*Erythronium dens-canis*	·	·	·	+	·	I	0,1
G	E	3,5	3	4	*Galanthus nivalis*	·	·	·	+	·	I	0,1

G	Ec	3	3,5	3	*Isopyrum thalictroides*	·	+	·	·	·	I	0,1
G	Eua	3	0	4	*Lilium martagon*	·	·	·	+	·	I	0,1
H	Eua	3,5	3	3	*Myosotis sylvatica*	·	+	·	·	·	I	0,1
H	Eua	3,5	3	0	*Scrophularia nodosa*	+	·	·	·	·	I	0,1
H-G	Ec	3	3	3	*Symphytum tuberosum* ssp. *nodosum*	·	·	+	·	·	I	0,1
					Molinio-Arrhenatheretea							
H	Eua	3	0	0	*Achillea millefolium*	·	·	+	+	+	III	0,3
H	Cp-Bo	3	0	0	*Festuca rubra*	·	·	+	+	+	III	0,3
H-Ch	Eua	3	0	0	*Veronica chamaedrys*	+	·	·	+	+	III	0,3
H	Cp-Bo	5	3	0	*Cardamine pratensis* ssp. *matthiolii*	·	·	·	+	+	II	0,2
G	E	3,5	3	4	*Colchicum autumnale*	+	·	·	·	+	II	0,2
H	Eua	2,5	3	3	*Ranunculus polyanthemos*	+	·	·	·	+	II	0,2
H	Eua	3,5	2	0	*Vicia sylvatica*	·	+	·	+	·	II	0,2
TH	Eua	2,5	3	0	*Viola tricolor* ssp. *tricolor*	+	·	·	+	·	II	0,2
H-Ch	E	3,5	0	0	*Ajuga reptans*	·	·	·	+	·	I	0,1
H	Ec	3	2,5	3	*Centaurea phrygia*	+	·	·	·	·	I	0,1
H	Eua	4	3	2	*Hypericum maculatum*	·	·	·	·	+	I	0,1
H	Eua	0	0	0	*Plantago lanceolata*	+	·	·	·	·	I	0,1
					Festuco-Brometea							
H	Eua	3	3	4	*Gentiana cruciata*	·	·	+	+	+	III	0,3
H	E	2	4	3	*Fragaria viridis*	+	·	+	·	·	II	0,2
H	Eua	3	3	0	*Hypericum perforatum*	·	+	+	·	·	II	0,2
H	Eua	2	3	4	*Viola hirta*	·	+	·	·	·	I	0,1
					Rhamno-Prunetea							
mPh	Eua	3	3	3	*Salix capraea*	·	·	+	+	+	III	0,3
mPh	E	3	3	3	*Sambucus nigra*	+	+	·	+	·	III	0,3
mPh	E	3	3	3	*Corylus avellana*	·	+	·	+	·	II	0,2
mPh	E	2,5	3	3	*Crataegus monogyna*	+	+	·	·	·	II	0,2
nPh	E	2	3	3	*Rosa canina*	·	·	·	·	+	I	0,1
					Variae Syntaxa							
H	Ec	3,5	2	3	*Doronicum austriacum*	·	+	+	+	+	IV	0,4
G	Ec	3	2	3	*Dactylorhiza sambucina*	+	+	·	·	+	III	0,3
H	Ec	4	2	4	*Gentiana asclepiadea*	·	·	·	+	+	II	0,2

where: L.f. - life forms; MPh - Megaphanerophytes; mPh - Mezophanerophytes; nPh – Nanophanerophytes; Ch - Camephytes; H - Hemicryptophytes; G - Geophytes; Th - Annual terophytes; TH – Biannual terophytes; F.e. - floristic elements; Cp – Circumpolar; Cp-Bo – Circumpolar boreal; Eua-Eurasian; E-European; Ec-Central European; Cosm-Cosmopolitan; Mp - Mediterano-Pontic; Carp - Carpathian. U - humidity, T - temperature, R - the chemical reaction of the soil; K – constancy; ADm - abundance and dominance medium.

Species that occur in a single relevé: *Astragalus glycyphyllos* (1); *Calamagrostis arundinacea* (5); *Cirsium oleraceum* (1); *Fragaria vesca* (1); *Genistella sagittalis* (1); *Luzula campestris* (1); *Malus sylvestris* (3); *Stachys sylvatica* (2); *Verbascum nigrum* (2); *Vaccinium myrtillus* (5); *Vicia sylvatica* (3).

Place and date of relevé: 1 – Lung Hill (Bihor county) 30.04.2011; 2 – Summit of Caprei (Bihor county) 30.04.2011; 3 – Ronțaru Hill (Bihor county) 30.04.2011; 4 – Ponoare Glade (Bihor county) 07.05.2011; 5 – Arinda (Bihor county) 11.05.2011.

CONCLUSIONS

Apart from the edifying species, in the floral composition of the association there are some species characteristic of the *Rumicion alpine* alliance, *Lamio albi-Chenopodietalia Boni-Henrici* order and *Galio-Urticetea* class, which make the association, such as *Aegopodium podagraria*, *Geum urbanum*, *Lamium maculatum*, *Sambucus ebulus*, *Galium aparine*, *Geranium phaeum*, *Salvia glutinosa*, *Urtica dioica*.

The floristic composition comprises 58 species, among which there are some which are transgressive from the *Querco-Fagetea* class, the highest frequency being represented by *Anemone nemorosa*, *Cruciata glabra*, *Helleborus purpurascens*, *Luzula luzuloides*, *Primula veris*, *Scilla bifolia* of meadows, mainly from the *Molinio-Arrhenatheretea class*: *Achillea millefolium*, *Festuca rubra*, *Veronica chamaedrys* and *Festuco-Brometea* class: *Gentiana cruciata*, *Fragaria viridis*, *Hypericum perforatum*, a number of shrubs belonging to the *Rhamno-Prunetea* class: *Salix capraea*, *Sambucus nigra*, *Crataegus monogyna*.

These phytocoenoses appear only in habitats with nitrogen and when excessive grazing stops they gradually evolve towards meadows of *Festuca rubra* with *Agrostis capillaris*.

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