PHYTOCENOLOGICAL RESEARCHES ON THE GRASSLANDS OF LĂZĂRENI HILLS (NORTHWESTERN ROMANIA)

Lacatoş (Herman) Laura Mariana*

**University of Oradea, Faculty of Sciences: drd. Laura Mariana (Herman) Lacatoş, e-mail: lauralacatos@yahoo.com*

Abstract

This paper aims to describe an association, Cyperetum flavescentis, rarely met in the area studied. In Lăzăreni Hills, it was located in three localities (on the fringe of the Forest Comet-Lăzăreni, Sâmbăta and Duşeşti) and it comprises 26 species. The scientific newness lies in approaching a habitat that wasn't explored and in the result achieved, which involved the identification and the characterization of a rare and vulnerable association to various risk factors, including the anthropic one.

Key words: association, phytocoenosis, biological forms, floristic elements, ecological factors, surveys.

INTRODUCTION

Lăzăreni Hills, located in the western Romania, in the south central part of Bihor County, represent an integral subunit of the Western Hills Pop, Gr., (2005) (Fig. 1).

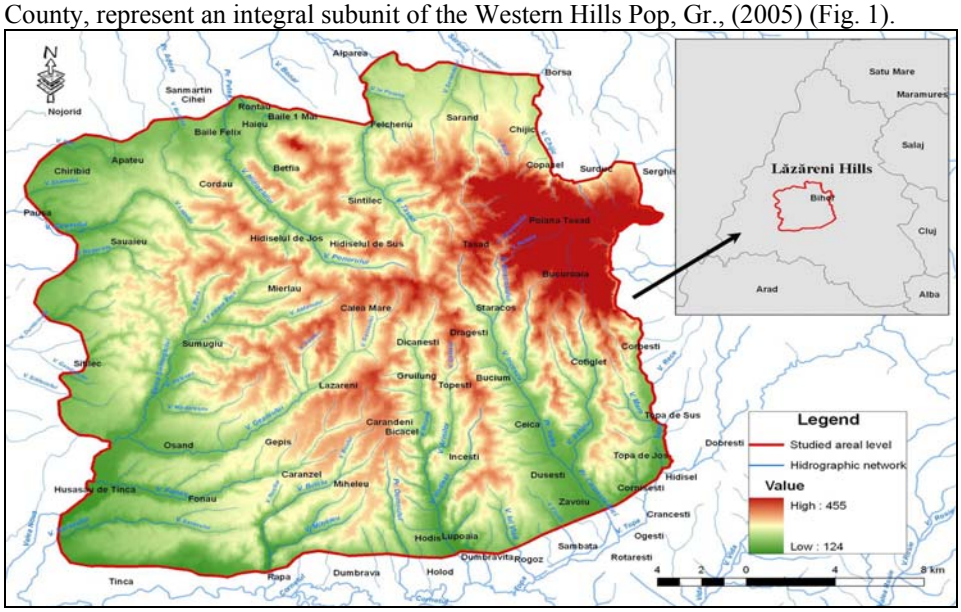

Fig.1. Geographical location of Lăzăreni Hills
(Source: Adaption after Pop, Gr., 2005)

With regard to the relief, Lăzăreni Hills were formed at the meeting of two major units of relief, the high space of Pădurea Craiului Mountains to east and in Pannonian Basin to west Cocean P., (2002), Posea Gr., (1997).

From the geological point of view, Lăzăreni Hills are made of pannonian deposits (clays and sands) Pop, Gr., (2005).

The analysis of potential climate of the habitat studies was made by using information from various specialty papers, namely: Cristea, M., (2004), Dragotă, C., (2006), Dumiter, A., (2007).

Soils were analyzed both as a support factor and in terms of its qualities to maintain life, by capitalizing various specialty papers, including those published by Sabău, N., Domuța, C., Berchez, O., (2002).

In the west of the country, this association was seen only in three places: Albiş Pool-Buduzlău Township, Ianca Lake-Diosig Township and Bottom Channel-Curtuişeni, Burescu P., (2003).

MATERIAL AND METHODS

For the study of *Cyperetum flavescentis* association from Lăzăreni Hills, we used the phytosociological research method of the European Central School, based on the principles and methods elaborated by Braun-Blanquet, J., (1964) and adapted by Borza A., Boşcaiu N., (1965) to the particularities of the vegetation carpet from our country.

We made a number of 116 field works during the years 2008-2010, resulting with the registration of 417 surveys in various stations as on edaphic layer, altitude, exposition, slope inclination, located on the slopes from the depths of the streams and the little valleys from Lăzăreni Hills.

From these outputs, only 8 phytocenological lifts are characteristic for *Cyperetum flavescentis* association (Fig. 2), having homogeneous sample areas from floristic and physiognomical points of view with the size between 1 m² and 4m².

Fig. 2 *Cyperetum flavescentis* Koch ex Aichinger 1933

We collected botanical material for the herbarium, while the identification of new taxons seen on site was made based on specialty determiners from the volumes „Flora România" (1952-1976) and „ Flora ilustrată a României" by V. Ciocârlan (1988-1990).

From the 8 surveys were selected 5, grouped in an association table.

The summary table includes information about the species entering in the flora composition of the association, the biological form, the flora element, ecological factors (humidity, temperature, chemical reaction of soil), the order number of the survey, the altitude (m.s.m.), exposition, tilt, herbaceous layer cover (%) and the surface (m²).

Participation of each species to the association table was made with the help of the index of abundance–dominance after the evaluation system of J. Braun-Blanquet and J.

Pavillard (1928). To the end of the table was registered and calculated the constancy (K), the phytocenotical index whose class is between I-V and expresses the coenetic fidelity degree of each species to the ambiance of the association's phytocoenoses.

At the bottom of the table was registered the locality where it was met and the date of surveys.

For ordering and grouping the species in the association table (Table 1), to superior cenotaxons, sub-alliance, alliance, order and class were considered the traditional ecological and floral systems of the authors Braun-Blanquet, J., (1964), Braun-Blanquet, J., Pavillard, J., (1928), Tüxen, R., (1955), Pop I., (1962), Ellemberg H., (1974), Soó, R., (1964-1980) and also the works recently appeared belonging to the signatories of the authors Mucina L., Grabherr G., Ellmaner T., (1993), Mohan Gh., Ardelean A., Georgescu M., (1993), Pott R., (1995), Borhidi A., (1996), Oprea, A., (2005), Sanda V., Öllerer, K., Burescu, P., (2008).

Table 1

As. *Cyperetum flavescentis* Koch ex Aichinger 1933

L.f.	F.e.	U.	T.	Cr.	Nr. Land Surveys Altitude (m.s.m.) Exposition Slope Surface (m²) Coverage (%)	1 80 N 1 100 3	2 90 E 2 90 4	3 60 S 3 80 1	4 80 E 5 70 1	5 100 NE 4 75 4	K
Th	Cosm	4.5	0	4	*Cyperus flavescens*	5	3	2	2	3	V
					Nanocyperion						
Th	Eua(Med)	6	3	4	*Cyperus fuscus*	5	2	1	1	1	V
H	Eua(M)	4	3	4	*Mentha pulegium*	+	+	+	+	+	V
H	Cp	5	3	4	*Alopecurus aequalis*	+	+	+	+	+	V
H	Cp	5	2	0	*Juncusm articulatus*	+	+	.	+	+	IV
Th	Eua	4	0	2	*Hypericum humifusum*	+	+	+	.	.	III
G	Eua	4.5	3	3	*Scirpus radicans*	.	+	+	.	.	II
					Nanocyperetalia; Isoëto-Nanojuncetea						
Th	Eua	2	3	2	*Gypsophyla muralis*	+	+	+	+	+	V
Ch	Eua	3	3	2	*Veronica serpyllifolia*	+	+	+	+	+	V
H	Eua	4	3	4	*Mentha pulegium*	+	+	+	+	+	V
G(Hh)	Cosm	5	0	4	*Eleocharis palustris*	+	+	+	.	+	IV
					Bidentetea						
Th	Eua	5	0	0	*Bidens cernua*	+	+	+	+	+	V
Th	Cosm	4	0	3	*Polygonum lapathifolium*	1	+	+	+	+	V
Th	Cosm	4	0	3	*Echinochloa crus-galli*	+	+	+	+	+	V
H	Cosm	4.5	3	3	*Juncus effusus*	+	1	+	+	+	V
					Phragmitetea australis						
Hh	Eua	5	3	0	*Mentha aquatica*	1	+	+	+	+	V
Hh	Eua	6	0	4	*Alisma lanceolatum*	+	+	+	+	+	V
Hh	Eua	5	3	0	*Lycopus europaeus*	+	+	+	+	+	V
					Accompanying						
H	Eua	4	4	4	*Juncus inflexus*	+	+	+	+	+	V
H	Cp	5	0	2	*Epilobium palustre*	+	+	+	+	.	IV
G	Cp	3.5	2	0	*Equisetum maximum*	+	+	+	.	.	III
H	Eua(Med)	3.5	0	0	*Ranunculus acris*	+	.	+	.	+	III
Hh	Cosm	5	3	0	*Glyceria fluitans*	+	+	+	.	.	III
Hh	Eua(Med)	5	4	4	*Carex riparia*	.	+	.	+	.	II
Th	Cosm	2.5	4	0	*Setaria glauca*	.	.	+	.	+	II
Th	Alt-Med	1.5	4	4	*Trifolium micranthum*	.	+	.	+	.	II

Localities: 1, 2, marsh vegetation on the fringe of the Forest Comet-Lăzăreni, 31.05.2009; 3, 4 Salina-Sâmbăta, 20.08.2010; 3, Salina-Duşeşti 20.08.2010.

RESULTS AND DISCUSSION

In order to register the phytocenological and ecological study of the association *Cyperetum flavescentis,* we graphically represented, in the form of spectra, the repartition of biological forms, floral elements and ecological factors in phytocoenosis analyzed.

It is a pioneer association, phytocoenosis occupying wetlands in spring and drained to the end of vegetation period. The substrate is sandy, sandy-loamy, hardened around lakes, pools and bottom channels.

The association comprises 26 species, covering, in a large measure, the phytocoenosis.

From the life forms spectrum (Fig. 3) it results the dominance of therophytes (40%), followed by hemicryptophytes (28%) and helohydatophytes (20%).

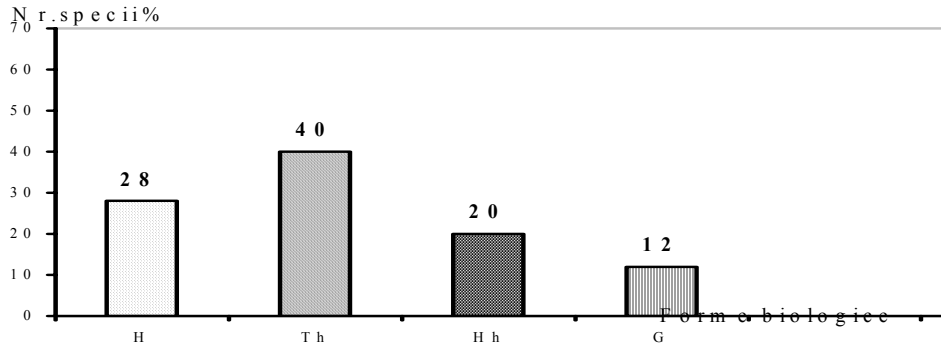

Fig. 3 life form spectrum of the association *Cyperetum flavescentis* from Lăzăreni Hills, we have: H = hemicryptophytes; Th = therophytes; Hh = helohydatophytes; G = geophytes.

Floristic elements (Fig. 4) are dominated by the Euro-Asiatic (52%), followed by cosmopolitans (28%) and circumpolars (16%).

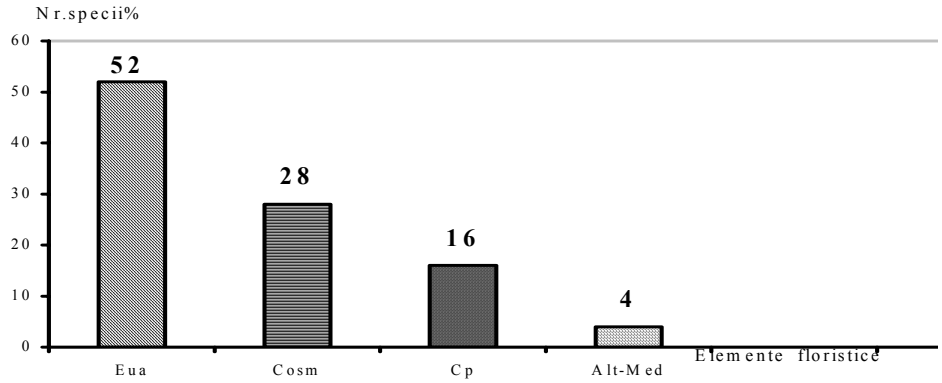

Fig. 4 Floristic elements spectrum of the association *Cyperetum flavescentis* from Lăzăreni Hills, we have: Eua=Euro-Asiatic; Cosm=Cosmopolitans; Cp=Circumpolars; Alt-Med=Atlantic-Mediterranean.

Analyzing the phytocoenosis of the association after the main ecological factors (Fig. 5) it is found that most species are hydrophilic (36%) and mesohydrophilic (20%).

Depending on the temperature, there are micromesothermal (40%) and eurithermal (36%).

Chemical reaction of soils indicates the dominance, within the association, of weak-acid-neutrophiles species (36%), followed by the euri-ionic species (32%).

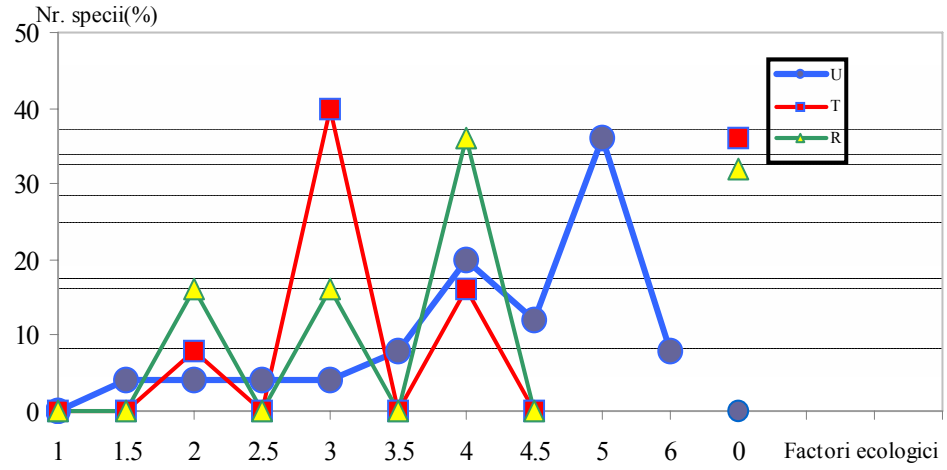

Fig. 5 Ecological factors spectrum of the association *Cyperetum flavescentis* from Lăzăreni Hills, we have: U=humidity; T=temperature; R=chemical reaction of soil.

Under natural condition, when it is no flooding for several years, the association develops to the phytocoenosis of the alliance *Agrostion stoloniferae.*

If, by the soil batting by the animals, it is enriched with organic material, this association tends to install the phytocoenosis from *Bidentetea* and *Phragmitetea* class.

The phytocoenosis of the association analyzed are important, from the scientifical point of view, because it is rare, vulnerable and needs to be protected. It has a number of 26 species, representing a relatively rich biodiversity.

CONCLUSIONS

It is a pioneer association, which doesn't survive to flooding lands during the year or to dry periods.

The phytocoenosis of the association *Cyperetum flavescentis* occupies wetlands in spring and dried to the end of vegetation period.

Also, the anthropic impact exercised by human, by practicing agriculture (plants culture and animal breeding) has an important role.

This association is rare, vulnerable and needs to be protected.

REFERENCES

1. Borhidi A., 1996, Critical revision of the Hungarian plants communities, Janus Pannonius University, Pécs, pp. 43-94.
2. Borza A., Boşcaiu N., 1965, Introducere în studiul covorului vegetal, Romanian Academy Publishing House, Bucharest, 340 p.
3. Braun-Blanquet, J., 1964, Pflanzensoziologie, Spinger Verlag, Wien-New-York, 3, Aufl, pp. 12-24.
4. Braun-Blanquet, J., Pavillard, J., 1928, Vocabulaire de Sociologie Vegetale, Ed. 3, Impr. Lemair-Ardres, pp. 15-18.
5. Burescu P., 2003, Flora şi vegetaţia zonelor umede din nord-vestul României, Romanian Academy Publishing House, Bucharest 474p.
6. Ciocârlan V., 1988-1990, Flora ilustrată a României, I, II, Ceres Publishing House, Bucharest, 382 p.
7. Cocean P., 2002, Geografie Regională, Cluj University Press Publishing House, Cluj Napoca, 189 p.
8. Cristea Maria, 2004, Riscurile climatice din bazinul hidrografic Crişuri, Abaddaba Publishing House, Oradea, 198 p.
9. Dragotă Carmen 2006, Precipitaţiile excedentare în România, Romanian Academy Publishing House, Bucharest 174 p.
10. Dumiter, A., 2007, Clima şi topoclima oraşului Oradea, University of Oradea Publishing House, Oradea, 230 p.
11. Ellemberg H., 1974, Zeigerwerte der Gefässpflanzen Mitteleuropas. Scripta Geobotanica, 9:1-97, Göttingen, 9:1-97.
12. Mohan, Gh., Ardelean, A., Georgescu, M., 1993, Rezervaţii şi monumente ale naturii din România, Scaiul Publishing House, Bucharest, 359 p.
13. Mucina L., Grabherr G., Ellmaner T., 1993, Die Pflanzengesellschaften Österreich, teil I. Anthropogene Vegetation, (Gustav Fischer) Verlag, Jena-Stuttgart-New-York, pp. 68-72.
14. Oprea, A., 2005, Lista critică a plantelor vasculare din România, University Al. I. Cuza Publishing House, Iaşi, 398. p.
15. Pop, Gr., 2005, Dealurile de Vest şi Câmpia de Vest, University of Oradea Publishing House, Oradea, 176 p.
16. Pop I., 1962, Vegetaţia acvatică şi palustră de la Salonta (reg. Crişana). Şt. şi cerc. biol., Cluj, VIII, pp. 32-39.
17. Posea Gr., 1997, Câmpia de Vest a României, Edit. Fundaţiei „România de Mâine", Bucharest, 235. p.
18. Pott R., 1995, Pflanzengesellschaften Deutschlands, 2 Aufl., Ulmer Verlag, Stuttgart, pp. 124-128.
19. Sabău, N., Domuţa, C., Berchez, O., 2002, Geneza, degradarea şi poluarea solului. University of Oradea Publishing House, Oradea, pp. 178-183.
20. Sanda V., Öllerer, K., Burescu, P., 2008, Fitocenozele din România, sintaxonomie, structură, dinamică şi evoluţie. Ars Docendi Publishing House, Bucharest, 570 p.
21. Soó, R., 1964-1980, A magyar flora és vegetacio rendszrtani, növényföldrajzi kézikönyve, Akad. Kiadó, Budapest, 1-6, 14(3): 65-72.
22. Tüxen, R., 1955, Das System der nordwestdeutschen Pflanzengesellschaften. Mitt. D. Flor. Soz. Arbeit.,n. Folge, 5: 155-176;
23. *** 1952-1976, Flora R. P. România R. S. România, I-XIII, Romanian Academy Publishing House, Bucharest, 6: 105-111.