COENOLOGICAL INTEGRATION OF *SAPONARIA PUMILIO* FROM IEZER-PĂPUŞA MOUNTAINS

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Abstract
Saponaria pumilio is an alpine, herbaceous species from Caryophyllaceae family. It occurs dispersed in Eastern Alps and Romanian Carpathians (Iezer-Păpuşa and Făgăraş Massif). It was integrated in Potentillo chrysocraspedae–Festucetum airoidis association, class Juncetea trifidi KLIKA et HADAC 1944, order Caricetalia curvulae Br.-Bl. 1926, alliance Caricion curvulae Br.-Bl. 1925 Boşcaiu 1971. In this paper we present some aspects of S. pumilio coenological integration in Iezer-Păpuşa Mountains. The Potentillo chrysocraspedae–Festucetum airoidis association was characterized based on some phytocoenological investigations made in this Massif. The identified relevés from Iezer-Păpuşa Massif were included in a phytocoenological table and the data were calculated by the Diemont method. Using this method we observed that bioforms are well represented by hemicryptophytes, followed by camephytes. With regard to phytogeographic elements, the Carpathian-Balkan, Eurasian and European-Arctic-Alpine are prevalent. The presence of Potentilla ternata species indicated the affiliation of this association to Carpathian-Balkan area.

Keywords: Saponaria pumilio, bioforms, phytogeographic elements

1. INTRODUCTION

Iezer-Păpuşa Mts. is situated in the south-east part of Făgăraş Mountains, being delimited by Oticului Lane. This Massif is characterized by high picks and large alpine areas, covered by herbaceous vegetation (Alexiu, 1998).

Saponaria pumilio (L.) Fenzl. Ex. A. Braun (Figure 3) (sin. *Cucubalus pumilio* L., *Saponaria pumila* (St. Lager) Janch) is a tertiary relict from Caryophyllaceae family that occurs dispersed in the Eastern Alps and Romanian Carpathians. It has short, one-flower stems tightly packed in shrubs. Its leaves are linear, wide towards the top, obtuse. The big purple flowers are placed in the top of the stems having either a short stalk, or no stalk at all. The bell-shaped tubular calyx is slightly rounded, up to 15 mm long, obtuse, denticulate, puffy, green, reddish (more often than not). The reddish petals have bifid bodies. The 7 to 9 cm long lamina is positioned towards the exterior. The flower has three thread-shaped pistils. The capsule is smaller than the calyx. It has VII-IX 2mm-wide, brown seeds (Max, 1989; Bojňanský and Fargašová, 2007). *S. pumilio* was integrated in *Potentillo chrysocraspedae–Festucetum airoidis* association, class *Juncetea trifidi* KLIKA et HADAC 1944, order *Caricetalia curvulae* Br.-Bl. 1926, alliance *Caricion curvulae* Br.-Bl. 1925 Boşcaiu 1971 (Zamfirescu et al., 2007).

Hoffman was the first one to find this plant in the Iezer-Păpuşa Massif in 1862. In 1993 Stancu and associates carried on a study regarding the distribution of the *Saponaria pumilio* in this massif. The result of this study was identifying the species in: Iezer Mare area, Iezer Mic circus, Iezer Mic peak, Crucea Ateneului, Iezer Mare, Vârful Roşu and Bătrâna peaks, Mount Bătrâna. Considering the restricted and discontinuous area where this cryophilic species grows, it was proposed to be included among the endangered species protected by the law of our country (Stancu et al., 1993).

This work presents the phytocoenological analysis of *Potentillo chrysocraspedae–Festucetum airoidis* association from Iezer- Păpuşa Mountains**.**

2. MATERIAL AND METHOD

The phytocoenological table of *Potentillo chrysocraspedae–Festucetum airoidis* association (Table 1) contains a list of species from identified relevés in Iezer-Păpuşa Massif (Alexiu, 1998;

Andronescu, 2011). The methods elaborated by Central-European school of Zürich-Montpellier were used for the relevés study.
The identified relevés from Iezer-Păpuşa Massif were included in a phytocoenological table and the data were calculated by the Diemont method. This method uses average abundance-dominance (a phytocoenological synthetic index which expresses the average coverage of a species as a percentage) from each identified species.
The plant nomenclature follows Ciocârlan, 2009.

3. RESULTS AND DISCUSSIONS

The association *Potentillo chrysocraspedae-Festucetum airoides* Boşcaiu 1971 is classified in the class Juncetea trifidi Klika et Hadac 1944, order Caricetalia curvulae Br.-Bl. 1926, alliance Caricion curvulae Br.-Bl. 1925 and is present in almost all Carpathians Massive**.**
The phytocoenological investigation based on the relevés analysis shows that the presence of *Potentilla ternata*, along with other geographical differential species (*Poa media* and *Campanula patula ssp. abietina)* affiliates this association to Carpathian-Balkan area.
Using the Diemont method we observed that bioforms are well represented by hemicryptophytes, followed by camephytes. (Fig.1)
With regard to phytogeographic elements, the Carpathian-Balkan, Eurasian and European-Arctic-Alpine are prevalent. (Fig.2)

Table 1. Potentillo chrysocraspedae-Festucetum airoides Boşcaiu 1971 association

		Relevés	1	2	3	4	5	6	7	8	9	10	ADm (%)
		Char.ass.											
H	Eua-Arc-Alp	*Festuca supina*	3	1	1	+	2	2	2	1	1	1	11.55
H	Carp-Balc	*Potentilla ternata*	1	+	+	1	+	+	1	3	4	3	15.45
		Carcion et Caricetalia curvulae											
Ch-H	Alp-Carp-Eur	*Primula minima*	1	1	1	2	+	1	1	-	-	-	4.3
H	Alp-Carp-Balc	*Phyteuma confusum*	+	+	-	+	+	+	+	+	+	-	0.4
H	Alp-Eur	*Agrostis rupestris*	1	+	-	+	1	+	+	-	-	+	1.25
H	Alp-Carp	*Campanula alpina*	+	-	+	+	-	+	-	-	-	-	0.2
H	Alp-Eur	*Carex curvula*	-	-	-	-	-	-	+	-	+	-	0.1
		Juncetea trifidi											
H	Circ-Arc-Alp-Carp	*Juncus trifidus*	+	+	+	1	+	1	-	+	-	-	1.25
H	Carp-Balc	*Poa media*	-	+	1	+	+	+	-	-	-	-	0.7
		Loiseleurio-Vaccinion											
Ch-nPh	Circ-Arc-Alp	*Vaccinium gaultherioides*	2	-	-	-	-	-	-	-	-	+	1.8
Ch	Circ-Arc-Alp	*Loiseleuria procumbens*	+	-	-	-	-	-	-	-	-	+	0.1
		Potentillo-Nardion											
H	Alp-Eur	*Geum montanum*	-	-	+	+	+	+	+	-	+	-	0.3
H	Eua (Circ.)	*Nardus stricta*	-	4	1	1	3	1	+	1	+	-	12.1
Th	Carp-Balc	*Campanula patula ssp. abietina*	-	-	+	+	+	+	-	+	+	-	0.3
H	Eur	*Festuca nigrescens*	-	1	+	2	-	+	-	-	-	-	2.35
H	Circ-Alp	*Phleum alpinum*	-	+	+	-	+	-	-	+	-	-	0.2
H	Alp-Eur	*Ligusticum mutellina*	-	+	-	-	+	-	-	-	-	-	0.1
H	Alp-Eur	*Homogyne alpina*	-	-	-	-	-	-	-	+	+	-	0.1
		Salicetalia herbaceae									-		
Ch	Alp-Eur	*Sedum alpestre*	-	-	-	+	+	+	-	-	-	-	0.15
		Varia syntaxa											
Ch	Alp-Carp	*Saponaria pumilio*	-	1	1	2	1	1	+	-	-	-	3.8
H	Alp-Carp	*Oreochloa disticha*	-	-	+	-	+	-	-	-	-	-	0.1
nPh	Alp-Carp	*Rhododendron myrtifolium*	+	-	1	+	-	-	-	-	-	+	0.65
mPh	Arc-Alp	*Juniperus communis ssp.alpina*	-	-	+	+	-	-	-	+	+	-	0.2
Ch/Ph	Circ	*Vaccinium vitis-idaea*	-	-	-	-	-	-	-	+	+	-	0.1
H	Circ	*Deschampsia flexuosa*	-	-	-	-	-	+	-	-	+	-	0.1

H	Alp-Carp-Balc	*Anthemis carpatica*	-	-	+	-	-	-	+	-	-	-	0.1
nPh	Carp-Balc	*Bruckenthalia spiculifolia*	-	+	-	+	-	-	-	-	-	-	0.1
Ch	Circ-Arc-Alp-Euram	*Silene acaulis*	-	-	-	+	+	-	-	-	-	-	0.1
H	Carp(end)	*Chrysosplenium alpinum*	-	-	-	+	+	-	-	-	-	-	0.1
H	Circ-Arc-Alp	*Veronica alpina*	-	-	-	-	-	-	-	+	+	-	0.1
G	Circ-Arc-Alp	*Polygonum viviparum*	-	-	-	+	-	-	-	+	-	-	0.1
Ch	Circ-Arc-Alp	*Cerastium cerastoides*	-	-	+	-	-	+	-	-	-	-	0.1
-	Lich Cp	*Thamnolia vermicularis*	1	1	1	1	1	-	1	-	-	-	3
-	Lich Cp	*Cetraria islandica*	+	+	+	+	-	+	-	-	+	-	0.3

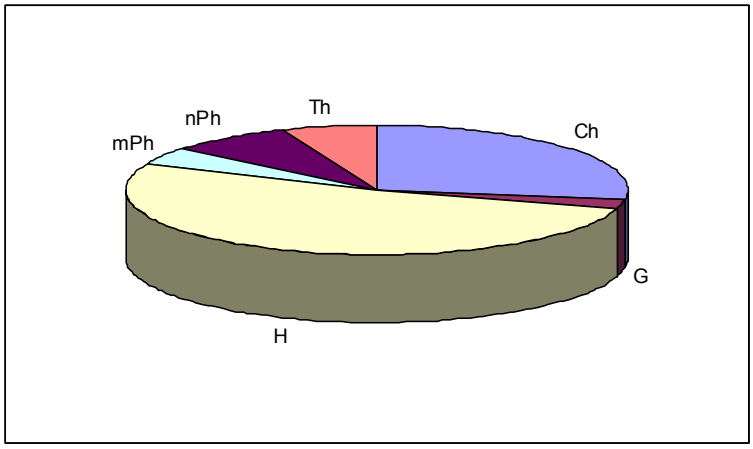

Figure 1. Bioforms of the phytocoenoses of Potentillo chrysocraspedae-Festucetum airoidis associations

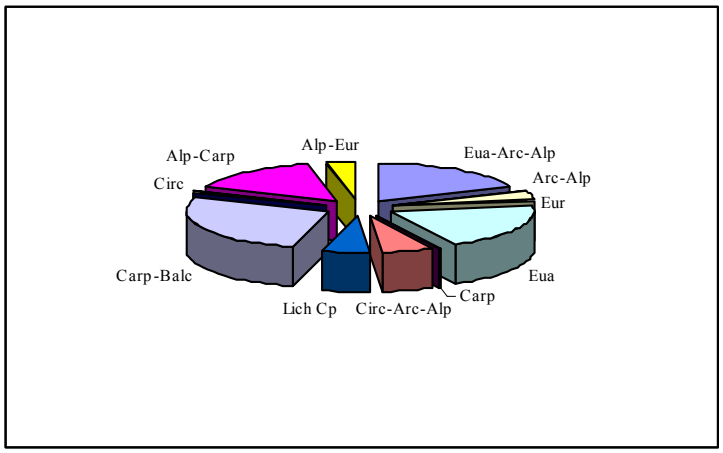

Figure 2. Geoelements of the phytocoenoses of Potentillo chrysocraspedae-Festucetum airoidis associations

4. CONCLUSIONS

The *Potentillo chrysocraspedae-Festucetum airoidis* association is classifies in the *Juncetea trifidi* class, *Caricetalia curvulae* order, *Caricion curvulae* and is affiliated to Carpathian-Balkan area.
The spectrum of bioforms and phytogeographic elements was calculated by the Diemont method and has shown that bioforms are well represented by hemicryptophytes and phytogeographic elements by Carpathian-Balkan species.

5. ACKNOWLEDGEMENTS

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Figure 3. Saponaria pumilio