

CONTRIBUTION TO THE FAMILIARIZATION WITH THE MEADOWS OF IERULUI FIELD

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Abstract

Association Achilleo-Festucetum pseudovinae (Magyar 1928) Soó (1933) 1945, is distributed to low salt solis in Câmpia Ierului. This study aims to analyze the phytocenoses of the Achilleo-Festucetum pseudovinae (Class Puccinellio-Salicornietea □opa 1939) from phytocenologic, floristic and economic points of view. Phytocenoses association analysis present a scientific importance, with a total of 45 species, which is a very rich biodiversity, some species are rare, vulnerable, and endemic and need to be protected. Meadows with Festuca pseudovina and Achillea setacea is important forage for both livestock grazing and harvesting land-mass hay. Meadows give this association a great phytomass production, but with low economic value. Because of human low biodiversity, flora and vegetation of these meadows have a natural character. Grassland maintains stable equilibrium and the ungrassed bush tend to phytocenoses progress.

Keywords: association, phytocenoses, floristic study, life form, ecological indexis.

INTRODUCTION

Ierului Field is located in the North – West of Romania, on the administrative territory of Satu Mare and Bihor counties, being one of the lowest sections of the Western Plain. In the East and North-East it neighbours Crasnei Plain and in the North-West Careiului Plain, in the West Nirului Plain, in the East the Santăului Plain and the Sălacea – Săcuieni Hillocks, but the great morphological and morphometrical resemblance with the neighbouring units makes it difficult its net geographical delimitation.

The altitude level of Ierului Plain varies between 125 m and 159 m in the North and North-East, decreasing to 100 m in the South, according to the flowing direction of Ier. The highest point it reaches is on the Cetății Hill from Otomani (159 m), and the lowest (100 m) on the actual valley at the border with Hungary. The annual average temperature distribution varies between 9, 7 °C in Carei, 10,3°C in Săcuieni and 10,2°C in Oradea. Analyzing the distribution of the annual average precipitation quantities, we find that they increase with altitude from 580,6 mm registered in Săcuieni, to 589,3 mm in Carei, reaching 620,1 mm the quantity registered in Oradea, the highest station from the studied area.

The *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945 association is present all over Ierului Plain, this type of meadow being

the most widespread on the researched area. It is shorter vegetation, rich in species, which can be found all over the salt marshes of white alkali soil type from the studied area.

MATERIAL AND METHODS

To realize this study, there were performed a total of 4 local incursions, and about 8 phytocoenologic sampling on natural grasslands. The sample surfaces, homogeneous in floristic and physiognomic terms, were chosen from the studied natural grasslands. Their size varies between 2-100 m².

The process used was phytocoenologic survey method drawn up by Braun-Blanquet.

Along with species recording, abundance and dominance (AD) were subscribed in relevées after Braun-Blanquet scale subsequently developed by Tüxen (1955) and Ellenberg (1974).

The association's synthetic table was structured after the methodology proposed by Braun-Blanquet (1964) and developed by Ellenberg (1974); therefore, in the column header of the table for the association analyzed the following have been entered: the serial number of land surveys, altitude (m.s.m.), slope, surface (m²), coverage (%).

The following have been considered in the structure of the phytocoenologic table: illustrating or dominant species, characteristic species of the association, species for the recognition or differentiation of the sub- alliance, alliance, order, class and environmental significance [21],

Synthetic phytocoenologic indicex of constancy (K) whose classes are included between I-V values, that expresses the degree of coenotic fidelity compared to phytocoenoses environment of the association has been entered and calculate don the right of the table.

After Braun-Blanquet & Pavillard (1928), the medium abundance and dominance (mAD) shows percentually the average coverage realized in the association's phytocoenoses by the phytoindividuals of each recorded species.

Differential species allowed us to set limits in the association for the taxons that are hierarchically superior to the alliance, order and class. The association's phytocoenoses are analyzed and characterized physiognomically, coenologically and ecologically.

In this respect particular attention has been given to the analysis of life forms, floristic elements and ecologic indices (UTR) through their graphical representation.

RESULTS AND DISCUSSION

The *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945 (Tab. 1) associations have been identified in the following places: Galoşpetreu, Tarcea, Otomani and Ghileşti. It forms semi-halophilic meadows distributed on slightly salty and moderately dry soils.

The relief on which these soils have formed is plane or slightly depressed, with predominantly fine deposits, argillaceous earths and clay. The specific soils for this phytocenosis are the white alkali soils which depend on the presence of the mineralized subsoil waters at depths which influence the genesis and evolution of the soil.

The phytocenosis of the association reunite a number of 45 species which indicate a low biodiversity. The small number of species is a result of the extreme life conditions, respectively the large quantities of salt resulted from the penetration of the exchangeable sodium in the adsorptive complex. At the surface of the lands it may appear as a white crust which the plants cannot absorb.

The characteristic species of the *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó (1933) 1945 association are *Festuca pseudovina* and *Achillea setacea*, they have a maximum constancy and a high abundance and dominance, especially *Festuca pseudovina* (67,5%).

The alliance and order of *Festucion pseudovinae* Soó 1933 reunites a number of 4 species of which we mention: *Limonium gmelinii*, *Artemisia santonica*, *Bupleurum tenuissimum*, *Lotus angustissimus*.

The order *Puccinellietalia limosae* contains a smaller number of species: *Scorzonera cana*, *Puccinellia distans*, *Hordeum hystrix*.

From the class *Molinio-Arrhenatheretea* limitrophe to the phytocenosis of the association *Achilleo-Festucetum pseudovinae* penetrates a number of approximately 19 species of which we mention: *Agrostis capilaris*, *Cichorium intybus*, *Centaurea pannonica*, *Festuca pratensis*.

The spectrum of bioforms (Fig. 1), points out the preponderancy of the hemicryptophytes in the association (62.22%), followed by annual terophytes (20%). From the floral elements (Fig. 2) the distinguished species is the eurasian one (64.44%), the cosmopolitan (8.89%) and circumpolar (6.67%) species are not as much.

Analyzing the phytocenoses of the association in relation with the humidity (Fig. 3) we find that most of the species have a xeromesophilous characteristic (48, 88%), followed by the mesophilous species (26.67%) and the euryhydric ones (8.89%), which also shows in the floral structure. Considering the temperature, the species from the association are micro-

mesotherms (44.44%). As for the chemical reaction of the soil in the association there are dominance disputes between the euriionic species (44.44%) followed closely by the slightly acid-neutrophyle ones (26,67%).

In the cardiologic spectrum (Fig. 4) there are polyploid (40%), diploid (37.78 %), diplo-polyploide (20%) and unknown karyotype (2.22%) species.

These types of pastures populate the 2nd degree dry salt marshes, which are pastured by sheep. Generally it is pretty resistant when stepped on (and especially the tufts formed by *Festuca pseudovina*). Once the salinisation increases and the soil becomes more settled (compact), the rest of the graminaceae start to disappear from the vegetation carpet. On the lands with a higher humidity you can observe a quite large production green mass, but in most cases we have analyzed, the vegetation carpet reflects the increasing dryness of the populated stations, and lately we can observe the appearance of many empty spaces on these meadows, due to the substantial level decrease of the subsoil waters.

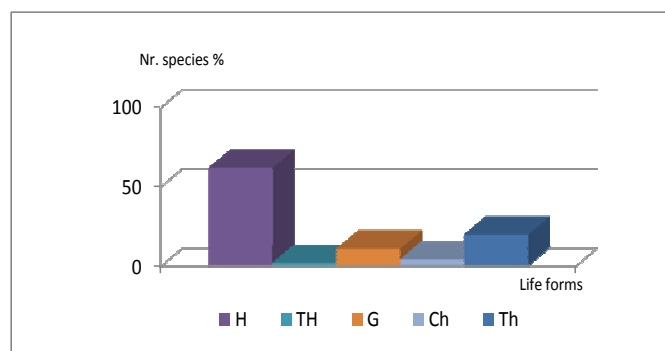


Fig. 1. The life forms of association *Achilleo-Festucetum pseudovinae* in Câmpia Ierului: H - Hemicryptophytes; TH - Hemiterophytes; G - Geophytes; Ch - Chamaephytes; Th - Euterophytes;

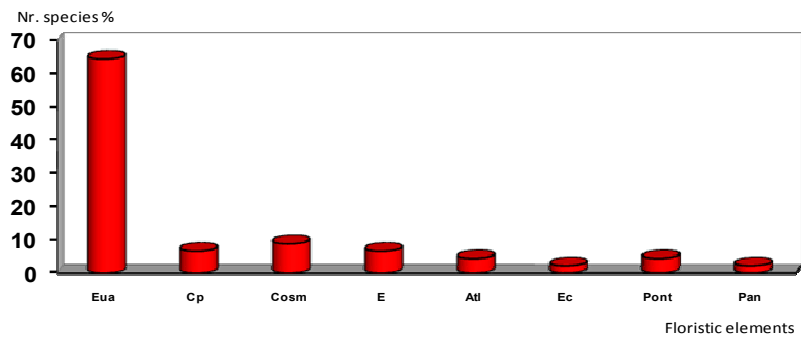


Fig. 2. The spectrum of floristic elements of association *Achilleo-Festucetum pseudovinae* in Câmpia Ierului: Eua - Eurasian; Cp - Circumpolar; Cosm - Cosmopolitan; E - European; Atl - Atlantic; Ec - Ecvatorial; Pont - Pontic; Pan - Pannonian

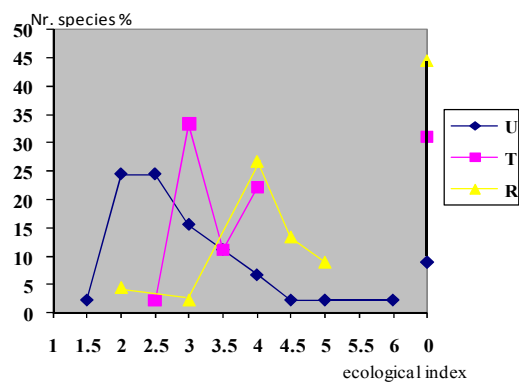


Fig. 3. The diagram of ecologic indices of asociacion *Achilleo-Festucetum pseudovinae* in Câmpia Ierului where: U-humidity, T-temperature, R-the chemical reaction of the soil

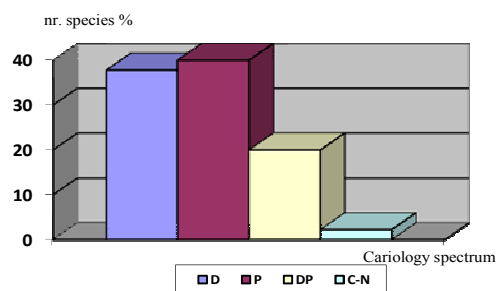


Fig. 4. Cariology spectrum of association Achilleo-Festucetum pseudovinae in Ierului Field: D-Diploid, P-Poliploid, DP-Diplo-poliploid, C-N-Unknown karyotype

Table 1.

Achilleo-Festucetum pseudovinae (Magyar 1928) Soó (1933) 1945
(natural grassland from Ierului Field, Bihor and Satu-Mare County)

L.f.	F.e.	U.	T.	R.	2 n	Nr. Land Surveys	1	2	3	4	5	6	7	8	K	A	Dm
						Slope	1	1	1	1	1	1	1	1			
						Altitude (m.s.m.)	128	127	123	130	129	132	128	161			
						Surface (m ²)	100	4	10	2	16	50	100	25			
						Coverage (%)	100	80	90	80	95	100	100	95			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
H	Eua(C)	2	4	4	DP	As. Festuca pseudovina	5	2	1	2	5	5	5	4	V	67.5	
H	Eua(C)	2	3	5	D	As. Achillea setacea	+	+	+	1	1	+	1	1	V	2.75	
Festucion pseudovinae, Artemisio- Festucetalia pseudovinae																	
H	Eua(C)	3,5	4	4	DP	Limonium gmelinii	+	.	.	1	.	+	.	.	II	0.75	
Ch(H)	Eua(C)	2,5	3	4,5	D	Artemisia santonica	.	.	.	+	.	+	+	+	III	0.25	
Th	Atl-Med	0	3,5	4,5	D	Bupleurum tenuissimum	.	.	.	.	+	.	.	.	I	0.063	
Th	Pont-Med	2	4	4	D	Lotus angustissimus	.	.	.	.	.	+	.	.	I	0.063	
Puccinellietalia limosae																	
H(TH)	Pont-M	2	4	4,5	D	Scorzonera cana	+	.	.	+	.	+	.	+	III	0.25	
H	Eua(C)	3,5	0	5	P	Puccinellia distans	.	.	.	.	+	+	.	.	II	0.13	
Th	Eua	2	4	5	D	Hordeum hystrix	.	.	.	.	.	.	.	+	I	0.063	
Puccinellio-Salicornietea																	
H	Eua(M)	4	0	4	D	Plantago maritima	.	+	.	.	.	.	+	.	II	0.13	
Molinio-Arrhenatheretea																	
H	Eua	3	3	0	P	Inula britannica	+	.	.	.	.	+	.	.	II	0.13	
H	Cp	4	0	0	P	Agrostis stolonifera	+	.	.	.	.	+	.	.	II	0.13	
H	Cp	0	0	0	P	Agrostis capillaris	+	.	.	.	.	+	+	.	II	0.19	
H	Eua(M)	3	0	0	P	Taraxacum officinale	.	.	.	.	.	.	.	+	I	0.063	
G	Eua	0	0	0	P	Agropyron repens	.	.	.	.	.	1	.	.	I	0.63	
Th-TH	Eua	2,5	2,5	4,5	D	Cichorium intybus	.	.	.	.	.	.	.	.	II	0.13	
H	Eua(M)	2,5	4	4,5	D	Lolium perenne	.	.	.	.	.	+	.	+	II	0.13	
H	Eua	3,5	0	0	D	Festuca pratensis	.	.	+	+	.	+	.	.	II	0.19	
G	Cp	4,5	3	5	P	Juncus gerardi Loisel	+	.	.	.	+	.	+	+	III	0.25	
H	Eua	2,5	0	0	D	Leontodon hispidus	+	+	+	+	.	.	.	.	IV	0.31	
Th-TH	E	3	3	0	D	Trifolium campestre	.	.	.	.	.	.	.	+	I	0.063	
H	Eua	3,5	0	0	P	Trifolium repens	.	.	.	.	.	.	.	+	I	0.063	
Th	Eua	2,5	0	0	P	Lotus corniculatus	.	.	.	.	.	.	+	.	I	0.063	

Th	Atl-M-Ec	0	3	4	-	Trifolium strictum	+	.	.	.	+	+	.	.	II	0.19
Festuco-Brometea																
H	Eua	2,5	2,5	0	P	Galium verum	+	.	+	.	+	+	.	.	III	0.25
H	Eua(C)	1.5	4	4	P	Festuca rupicola	.	.	.	.	.	+	+	.	II	0.13
H	Pan	5	4	2	DP	Eryngium campestre	.	.	.	.	.	.	+	+	II	0.13
G	E(M)	2	3	4	DP	Allium scorodoprasum	.	.	.	.	.	+	.	.	I	0.063
H	Eua	2	4	2	D	Potentilla argentea	.	.	.	.	.	+	.	.	I	0.063
H	Eua	2,5	3	4	P	Agrimonia eupatoria	+	.	.	.	.	.	.	.	I	0.063
H	Eua	2.5	0	4.5	DP	Plantago media	.	.	.	.	+	.	.	.	I	0.063
Bidentetea																
H	Eua(M)	4	3	4	P	Mentha pulegium	.	.	.	.	+	.	.	.	I	0.063
Th	Eua	3	3.5	4	P	Centaureum pulchellum	.	.	.	.	.	+	.	.	I	0.063
Sisymbrietalia																
G(H)	Cosm	2	3.5	0	DP	Cynodon dactylon	+	3	4	2	1	+	+	+	V	15.56
Th	Eua	2	3.5	0	P	Lepidium ruderalis	.	.	.	.	+	.	+	+	II	0.19
Variaesyntaxa																
Th	Cosm	3	3	0	DP	Chenopodium album	.	.	.	.	.	+	.	.	I	0.063
G-Hh	Cosm	6	3	0	P	Polygonum amphibium f. Terr	.	.	.	.	+	.	.	.	I	0.063
Th	Cosm	2.5	0	3	P	Polygonum aviculare	.	.	.	.	.	.	.	+	I	0.063
H	Eua	3	0	0	D	Plantago major	.	.	.	.	.	.	.	+	I	0.063
TH	Eua(M)	2	3	0	D	Carduus acanthoides	+	.	.	.	+	.	.	.	II	0.13

Studied places: 1-4. Galoşpetreu (15.06.2010); 5-6. Tarcea (17.06.2010); 7. Otomani (16.06.2010); 8. Ghileşti (02.07.2010);

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