PHYTOCOENOLOGICAL RESERCH IN SALTY VEGETATION TO THE IERULUI PLAIN

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Abstract

*Association **Juncetum effusi** Soó (1931) 1949, is distributed to* degraded, intensive grazed, compact substrate soils in *Ierului Plain. This study aims to analyze the phytoeoenoses of the **Juncetum effusi** Soó (1931) 1949 from phytocoenologic, floristic and economic points of view. Phytocoenoses association analysis present a scientific importance, with a total of 79 species.*

Key words: association, phytocenoses, floristic study, ecological indexis.

INTRODUCTION

From morphological point of view Ierului Plain is located in north-western Romania, the administrative territory of Satu Mare and Bihor countrys, is the lowest point of Western Plains compartiments.

Ierului Plain is presented as a remarkable depression corridor with a length of 107 km and a width of 4 and 14 km from is of tectonic origin, shaped by rivers that once had considerable debits. It has an area of 1,437 square kilometers, of which 65,000 ha is the total area of the riverbed itself.

Before performing the hydrotechnics works (started in 1968), Ierului Plain had the aspect of the interior delta, dominated by hydro-hygrophilic vegetation specific, optimally of the living for a very interesting flora and fauna. After has lost technical works dones, Ierului Plain has lost the previous character, favoring the appearance halomorfe soil.

In the researched area this phytocoenosis association it by populates the: microplateau with a substrate for impermeable clay, grasslands it by calloused of animals, for draining water canals, swamps, etc.. In these areas the water is stagnating to a surface for a long period of the year. The associatioan have been identified in the following places: Ghilești, Andrid spre Dindești, Căuaș, Ganaș și Piru Nou.

MATERIAL AND METHODS

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 struetured 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.), surface (m^2), 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 récognition or differentiation of the sub- alliance, alliance, order, class and environmental significance.

Synthetic phytocoenologic indicex of constancy (K) whose classes are included between I-V values, that expresses the degree of coenotic fidality compared to phytocoenoses environment of the each species to environment of phytocoenosis of the associations.

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 specie.

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.

For completion of the environmental study of the association, we have represented graphically the distribution of life forms, floristic elements and ecological factors.

RESULTS AND DISCUSSION

In the composition of the association (table 1), among a number of the 79 plants which represents a large biodiversity. Characteristic and enlightening species for the association is Juncus effusus with general coverage of 80,68% ADM maximum constant (K = V).

Within the association a total of 30 plants are subordinated of ***Juncenenion effusi*** suballiance, ***Potentillion anserinae*** alliance: *Mentha longifolia*, *Lythrum virgatum*; order ***Potentillo-Polygonetalia***: *Agrostis*

stolonifera, *Gratiola officinalis*, *Carex hirta* and class ***Molinio-Arrhenatheretea***: *Lysimachia nummularia*, *Juncus atratus*, *Rorippa islandica*, etc.

The remaining species are transgressive for the nearest classes: ***Puccinellio-Salicornietea***: *Teucrium scordium*, *Lotus tenuis*; ***Phragmitetea australis***: *Eleocharis palustris*, *Lycopus europaeus*, *Carex vulpina*, *Mentha aquatica*, etc.

Analysing the plants in terms of the spectrum of biological forms (fig. 1), shows that the most numerous grup is constituted of the hemicryptophytes (62,03%), followed by annual euterophytes (15,18%) and hydrophyte (10,13%).

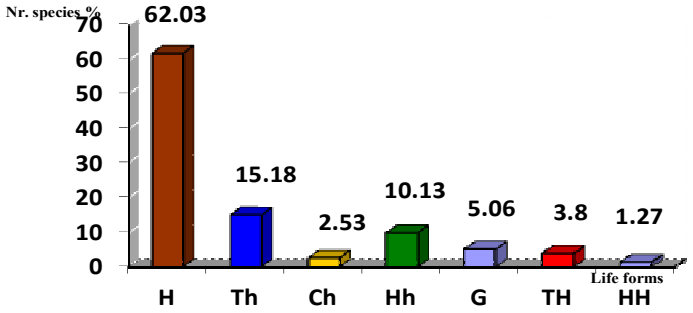

Fig. 1 The life forms of association *Juncetum effusi*
in Ierului Plain: H-Hemicryptophytes; Th-Euterophytes; Ch-Chamaephytes; Hh-Hydrophytes; G-Geophytes; TH- Hemiterophytes; HH- Helohydatophytes;

In terms of floristic elements (fig. 2), shows the dominace of eurasian species (62,03%), followed by the cosmopolitans (12,64%) and european (10,13%).

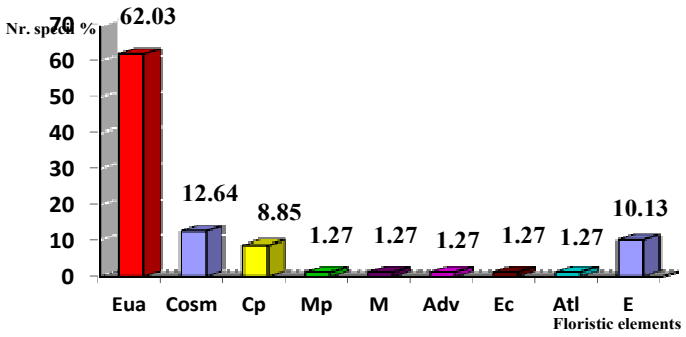

Fig. 2 The spectrum of floristic elements of association *Juncetum effusi* in Ierului Plain: Eua-Eurasian; Cosm-Cosmopolitan; Cp-circumpolar; Mp-Pontic-mediteraneano; M-Mediterranean; Adv-Adventiv; Ec-Ecvatorial; Atl-Atlantic; E-Europian;

Analyzing the phytocenoses of the association in relation with the humidity (fig. 3) we find that most of the species have a mesophilous characteristic (30,38%), followed by the meso-hydrophilic species (27,85%) and hydrophilic (20,25%). Function of temperature, most species of the association are micro-mesotherms (63,28%), fallowed to euritem (27,85%). Towards the chemical reaction of the soil in the association, favors the euriionic species (50,62%) followed by a low acid-neutrophyle (37,98%), and acid-neutrophyle (6,33%).

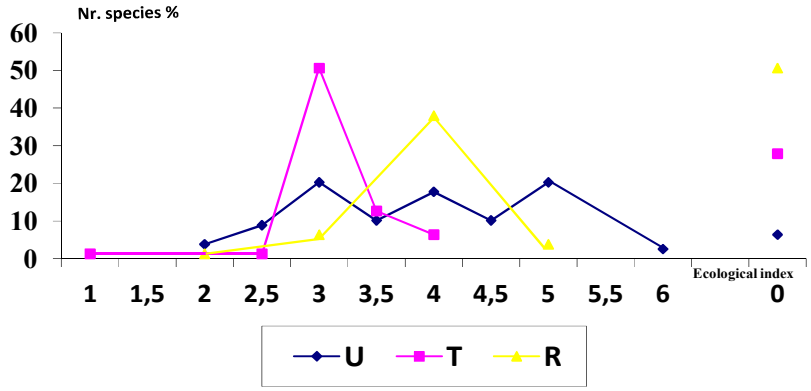

Fig. 3 The diagram of ecologic indices of associacion *Juncetum effusi* in Ierului Plain where: U-humidity, T-temperature, R-the chimical reaction of the soil

In the cariology spectrum (fig. 4), is highlight the large number of polyploid species (56,96%), followed by diploid (31,64%), diplo-polyploid (10,13%) and karyotype unknown (1,27%). Diploids index has a value of 0,56.

Grasslands the association are of inferior quality from economic point of view. The plant itself can mow and used as bedding under animals.

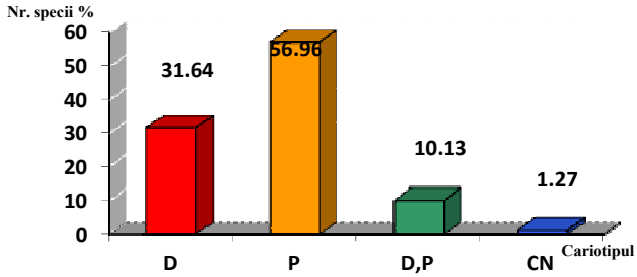

Fig. 4 Cariology spectrum of associacion *Juncetum effusi* in Ierului Plain: D-Diploid, P-Poliploid, DP-Diplo-poliploid, CN-Unknown-karyotype

Table 1.

Juncetum effusi Soó (1931) 1949

Bio.	E. f.	U.	T.	R.	2 n	Nr. Land Surveys	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**K**	**ADm**
						Altitude (m.s.m.)	122	122	122	113	113	113	120	120	145	145	111		
						Surface (m^2)	25	36	20	30	20	20	15	35	100	60	20		
						Coverage (%)	85	80	95	90	95	100	100	95	100	100	100		
H	Cosm	4,5	3	3	D	Juncus effusus	4	4	5	4	5	5	5	5	5	5	5	V	80,68
						Juncenenion effusi, Potentillion anserinae													
H(G)	Eua(M)	4,5	3	0	P	Mentha longifolia	.	.	.	+	+	+	.	.	.	.	.	II	0,14
H-Hh	Eua(M)	4,5	3,5	4	P	Lythrum virgatum	+	.	.	.	.	.	.	.	+	+	.	II	0,14
						Potentillo-Polygonetalia													
H	Cp	4	0	0	P	Agrostis stolonifera	+	+	+	+	+	.	+	1	1	+	+	V	1,27
H	Eua	4,5	3	4	P	Gratiola officinalis	2	+	.	.	.	.	.	.	+	+	.	II	1,73
G	E(M)	0	3	0	P	Carex hirta	.	.	.	+	+	.	.	+	.	.	.	II	0,14
H	Cosm	3,5	0	4	P	Potentilla reptans	.	.	+	.	+	.	.	.	+	+	.	II	0,18
H	Eua(M)	4	0	0	P	Ranunculus repens	.	.	.	+	+	.	.	+	.	.	+	II	0,14
H	Eua(M)	3	0	4	P	Dactylis glomerata	.	.	.	.	.	+	.	+	.	.	.	I	0,09
Th	E	0	3	0	P	Bromus commutatus	+	+	.	.	.	.	.	.	.	.	.	I	0,09
H	Cosm	2,5	3,5	3	P	Potentilla anserina	.	.	.	.	.	.	+	.	.	.	1	I	0,50
G	Eua	0	0	0	P	Agropyron repens	.	.	+	.	.	+	.	.	.	.	.	I	0,09
H	Eua	4,5	3	0	P	Epilobium tetragonum	.	.	+	.	.	.	+	.	.	.	.	I	0,09
H	Eua(M)	4	3	4	P	Mentha pulegium	.	.	.	.	.	.	.	.	+	+	.	I	0,09
						Arrhenatheretalia													
H-TH	Eua	3,5	0	0	P	Trifolium repens	+	+	.	2	.	+	.	.	.	.	.	II	1,73

Bio.	E. f.	U.	T.	R.	2 n	Nr. Land Surveys	1	2	3	4	5	6	7	8	9	10	11	K	ADm
H	Eua	2,5	0	0	P	Lotus corniculatus	.	.	.	+	+	.	+	.	.	.	.	II	0,14
Th-H	Eua(M)	2,5	3	0	D	Daucus carota ssp carota	.	.	.	.	.	+	.	+	.	.	.	I	0,09
H	Eua	3	0	0	P	Achillea millefolium	.	.	.	.	+	.	.	.	.	.	+	I	0,09
H	Eua(M)	3	0	0	P	Taraxacum officinale	.	.	.	+	.	+	.	.	.	.	.	I	0,09
						Molinio-Arrhenatheretea													
Ch	Eua	4	3	0	P	Lysimachia nummularia	+	+	+	+	+	+	.	.	+	.	.	IV	0,32
H	Eua(C)	4	3	4	P	Juncus atratus	.	.		+	+	.	.	.	.	.	+	II	0,14
Th-TH	Cosm	5	3	4	D,P	Rorippa islandica	.	.	+	.	+	.	.	.	+	.	.	II	0,14
H	Eua	3,5	2,5	0	D	Lychnis flos-cuculi	.	+	.	.	.	.	.	+	.	.	.	I	0,09
H	Eua	3	0	3	D,P	Vicia cracca	.	+	.	.	+	.	.	.	.	.	.	I	0,09
H	Adv	2	3	5	P	Medicago sativa	.	.	.	+	+	.	.	.	.	.	.	I	0,09
Hh	Eua(C)	5	3	0	D	Lycopus exaltatus	+	+	.	.	.	.	.	.	.	.	.	I	0,09
H-G	E	4	3	4	P	Rorippa sylvestris ssp. kerneri	+	.	.	.	.	+	.	.	.	.	.	I	0,09
H	M	5	3,5	0	D	Oenanthe silaifolia	+	+	.	.	.	.	.	.	.	.	.	I	0,09
Ch-H	E(C)	3	4	0	D,P	Ononis arvensis	.	.	.	+	+	.	.	.	.	.	.	I	0,09
H	E	3	0	0	D	Trifolium pratense	+	+	.	.	.	.	.	.	.	.	.	I	0,09
Bio.	E. f.	U.	T.	R.	2 n	Nr. Land Surveys	1	2	3	4	5	6	7	8	9	10	11	K	ADm
Hh	Eua	5	3	0	D	Lycopus europaeus	.	.	.	.	.	.	+	.	+	+	+	II	0,18
Hh-H	Eua(M)	4	3	4	D	Carex vulpina	.	+	+	.	.	.	1	+	.	.	.	II	0,59
Hh-H	Eua	5	3	0	P	Mentha aquatica	+	+	.	.	+	.	.	.	.	+	.	II	0,18
H(G)	Cp	4	3	4	P	Stachys palustris	.	.	.	.	.	.	.	.	+	+	.	I	0,09
H	Cp	5	3	4	P	Poa palustris	.	.	.	.	.	.	.	.	+	+	.	I	0,09
H-Hh	Eua	5	3	0	P	Carex otrubae	.	+	.	.	.	.	.	.	.	.	+	I	0,09
						Însoțitoare													

H	Eua	4	3	0	P	Rumex crispus	+	+	+	.	.	+	+	+	.	.	.	III	0,27
TH-H	Eua	3	4	4	D	Pastinaca sativa	.	.	.	+	+	.	.	+	.	.	.	II	0,14
Th-TH	E	3	3	0	D	Trifolium campestre	+	.	.	+	.	+	+	.	.	.	.	II	0,18
Th	Eua	2	3,5	4,5	P	Polygonum persicaria	.	.	.	.	.	.	+	+	.	.	+	II	0,14
H	Eua(M)	2,5	3,5	4	P	Verbascum blattaria	.	.	.	.	.	.	+	+	.	.	.	I	0,09
Th	Eua	4,5	3	0	P	Bidens tripartita	.	.	.	.	.	.	.	.	+	.	+	I	0,09
Th	Eua(M)	4	0	0	D	Polygonum hydropiper	.	.	.	.	.	.	.	.	+	+	.	I	0,09
Th	Cosm	4	3	0	P	Lythrum hyssopifolia	.	.	.	.	.	.	+	+	.	.	.	I	0,09
H	Mp	4,5	3	4	D	Galega officinalis	.	.	+	.	.	.	.	+	.	.	.	I	0,09

Have been identified only in one releveu: Festuca pratensis (1); Calamagrostis epigeios (9); Lathyrus pratensis (11); Senecio aquaticus ssp. barbareifolius (10); Leontodon hispidus (7); Trifolium hybridum (3); Lythrum salicaria (11); Alopecurus pratensis (11); Centaurea jacea (5); Centaurium pulchellum (9); Hordeum hystrix (1); Cichorium intybus (6); Inula Britannica (9); Typha laxmannii (9); Phragmites australis (5); Myosotis scorpioides (9); Glyceria fluitans (3); Oenanthe aquatica (3); Carex acutiformis (10); Veronica anagallis-aquatica (11); Galium palustre (10); Urtica dioica (6); Cirsium eriophorum (7); Tanacetum vulgare (2); Xanthium strumarium (11); Alopecurus aequalis (11); Cirsium arvense (6); Lathyrus nissolina (2);

Studied places: 1-3. Loc. Ghileşti (25.06.2010); 4-6. Loc. Andrid spre Dindeşti (31.06.2010); 7-8. Loc. Căuaş (29.07.2011); 9-10. Loc. Ganaş (10.07.2011); 11. Loc. Piru Nou (31.07.2010);

REFERENCES

1. Boşcaiu N., Coldea GH., Horeanu CI.,(1994) - Lista roşie a plantelor vasculare dispărute, periclitate, vulnerabile şi rare din flora României, Ocrot. Nat. şi a Med. Inconj., Bucureşti.38,1: 45-56
2. Braun-Blanquet, J., (1964) - Pflanzensoziologie, Springer Verlag, Wicn-Mew York, 3, Aufl.
3. Braun-Blanquet, J., Pavillard, J., (1928) - Vocabulaire de Sociologie Vegetale, ed. 3. Impr. Lemaire - Ardres.
4. Burescu P., (1994), Contribuţii la cunoaşterea florei de baltă de la Sălacea (Bihor), Analele Univ. din Oradea fasc. Agric.-Silvic, 1:145-159
5. Burescu P., Flora şi vegetaţia zonelor umede din nord-vestul României, Editura Academiei Române, Bucureşti, 474p, 2003
6. Ciocârlan V., (1988. 1990) - Flora ilustrată a României, I, II. Ed. Cereş Bucureşti.
7. Karácsonyi C., (1990), Vegetaţia terenurilor cu exces de umiditate din Câmpia Erului,Crisia, Muz. "Ţării Crişurilor" Oradea, XX, 603-611
8. Kerner A., (1867 1869. 1872) Die Vegetations - Verhältnisse des mittleren und östlichen Ungarns und angrenzenden Siebenbürgens. OBZ, Wien, 17, 19, 22: 189-193
9. Stângă N., Colibaş I.,(1970), Rezultate parţiale privind caracterizarea solurilor slab productive din valea Ierului. Dare de seamă, I.C.P.A., Bucureşti, manuscris
10. Tüxen R. (1937) - Die Pflanzengeslhchaften, Mht. Florist. - Sociol. Arbeitsgem., Niedersachsen Hannover, 3:1-170.
11. Tüxen R. (1955) - Das System der nordwesideutschen Pflanzengesellschaften, Mitt. d. Fior.soz. Arbeit., n. Folge. 5: 155-176.
12. Daniel D., Pavol E., Marek S. – Camphorosmetum annuae Rapaics ex Soó 1933 – Vanishing plant community of saline habitats in Slovakia, Thaiszia – J. Bot., Košice, 18: 9-20, 2008