

ASPECTS REGARDING THE HALOPHILOUS VEGETATION FROM THE SALONTEI PLAIN - CAMPHOROMETUM ANNUAE RAPAICS EX SOÓ 1933 -

Codrin GAVRA^{1#}

¹ University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410078, Oradea, Romania

RESEARCH ARTICLE

Abstract

This work represents a phytocoenological study of the halophilic association *Camphorosmetum annuae Rapaics ex Soó 1933*, which is classified from the coenotaxonomic point of view in the class *Puccinellio-Salicornietea Țopa 1939*.

In the studied region, the phytocenoses of this association were identified on the edge of the roads that cross the meadows in the vicinity of the Ciumeghiu locality. It settles in salt marshes with higher salinity, forming a dwarf vegetation with a gray, reddish appearance during the summer.

Camphorosmetum annuae association, was analyzed in terms of floristic composition, life forms, floristic elements, ecological indices and karyotype.

Keywords: environment. phytocenoses, halophilous vegetation, floristic composition, ecological indices.

#Corresponding author: gavracodrin@gmail.com

INTRODUCTION

Chorology: the phytocoenosis of this association were mentioned in our country from Muntenia (Șerbănescu, 1965; Sanda et Popescu, 1984; Sanda et al., 1978; Popescu et al., 1984); Crișana (Pop, 1959, 1968); Moldova (Țopa, 1939); Banat (Coste et al., 1993).

This study aims to analyze the phytocoenoses of the *Camphorosmetum annuae* association, from the point of view of the floristic composition, and by analyzing the floristic elements, life forms, ecological indices and karyotype.

MATERIAL AND METHODS

Framing the association to the corresponding cenotaxonomic units - alliance, order and class was made according to the traditional ecological and floristic systems elaborated by Tüxen (1955), Braun-Blanquet (1964), Borza et Boșcaiu (1965), Soó (1964-1980), as well as on the basis of the most recent works belonging to Mucina (1997), Rothmaler (1994, 2000), Borhidi (1996, 2003), Coldea et al. (1997); Sanda et al. (2008).

The study of the halophilic vegetation of the grasslands from the lower basin of Crișul Negru River was made taking into consideration the phytosociological research method of the European Central School, based on the principles and methods elaborated by Braun-Blanquet (1964) and adapted by Borza and

Boșcaiu (1965) to the particularities of the vegetation carpet from our country.

The taxa identified in the field have been recognized by specialty catalogues "Romania's Illustrated Flora" (Ciocârlan, 2009), in conjunction with the information provided by the "International Code of Botanical Nomenclature" (Code de Tokyo, 1993).

The association 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.), area (m²), coverage of grass layer (%). At the end of the table, the last two columns included the synthetic phytocoenological indices, constancy (K) and abundance-dominance index (ADm).

The constancy highlights the extent of coenotic fidelity of each species to the phytocoenosis environment of the association, according to the Braun-Blanquet et Pavillard methodology (1928). The abundance and dominance highlight the percentage of average coverage achieved by phyto-individuals of a phytocoenosis.

Establishment of the values for ecological indices, life forms, floristic elements and karyotype were made after the synthesis works elaborated by Raunkiær (1937), Braun-Blanquet (1951), Meusel et Jäger (1992), Ellenberg (1974), Ellenberg et al. (1992), Soó

(1964-1980), Májovsky et Murin (1987), Pop (1982), Ciocârlan (2009).

RESULT AND DISCUSSION

Camphorosmetum annuae phytocenoses develop in microdepressions with excess moisture in spring and severe dryness in summer. They develop on compact, arid, highly saline solonets, on bare, eroded land surfaces with visible salt crusts, occupying areas of 8–15 m² (Figure 1).



Figure 1 *Camphorosmetum annuae* (Ciumeghiu locality)

The edifying species is *Camphorosma annua*, accompanied by *Plantago maritima*, *Lepidium ruderales*, *Puccinellia limosa*, *Pulicaria*

vulgaris, *Polygonum aviculare*, etc., halophilic species that subordinate the association to the *Puccinellion limosae* alliance, *Puccinellietalia limosae* order and *Puccinellio-Salicornietea* class.

Within these phytocenoses, transgressive species belonging to the *Festuco-Brometea* class also penetrate: *Trifolium campestre*, *Achillea pannonica*, *Euphorbia cyparissias* (Table 1).

The life forms spectrum (Figure 2) illustrates the close values of annual therophytes (53.84%) and hemicryptophytes (46.16%).

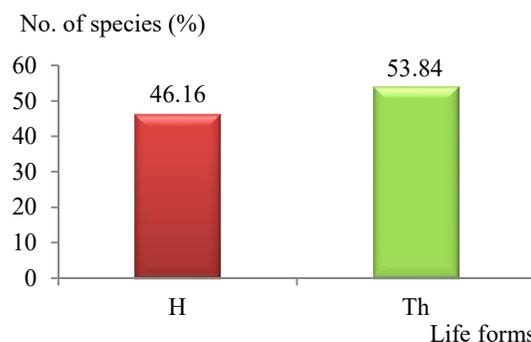


Figure 2 Life forms spectrum of *Camphorosmetum annuae* association, where: H – hemicryptophytes, Th – annual therophytes

Table 1

Camphorosmetum annuae Rapaics ex Soó 1933

L. f.	F. e.	W	T	Sr.	2n	No. Land Surveys	1	2	3
						Altitude (m.s.m.)	92	92	92
						Area (m ²)	8	15	10
						Coverage of grass layer (%)	70	90	70
Th	Ppn	2	4	5	D	<i>As. Camphorosma annua</i>	4	5	4
						<i>Puccinellion limosae, Puccinellietalia limosae, Puccinellio-Salicornietea</i>			
H	Eua(M)	4	0	5	D	<i>Plantago maritima</i>	1	+	1
Th-TH	Eua	2	3,5	0	P	<i>Lepidium ruderales</i>	+	.	+
H	Pn	3,5	0	5	P	<i>Puccinellia limosa</i>	+	.	+
Th	Eua(M)	4	3	3	D	<i>Pulicaria vulgaris</i>	+	.	.
Th	Cosm	2,5	0	3	P	<i>Polygonum aviculare</i>	+	.	.
Th(TH)	Eua	2	0	4	D	<i>Scorzonera laciniata</i>	.	+	.
H	Eua(C)	2	3	5	D	<i>Achillea setacea</i>	.	+	.
						<i>Festuco-Brometea</i>			
Th-TH	E	3	3	0	D	<i>Trifolium campestre</i>	.	+	.
H	Ec	2	4	3,5	P	<i>Achillea pannonica</i>	+	.	.
H	Eua	2	3	4	DP	<i>Euphorbia cyparissias</i>	+	.	.
						<i>Variae syntaxa</i>			
Th	Eua(M)	3	3,5	0	D	<i>Matricaria recutita</i>	.	+	.
H	Eua	3	0	0	P	<i>Taraxacum officinale</i>	.	+	+

Phytocoenological table of *Camphorosmetum annuae* association, where: L. f. - life forms; F. e. - floristic elements; W - soil wet; T - temperature; S. r. - chemical reaction of the soil; 2n - karyotype; Th – Annual Therophytes; H – Hemicryptophytes; G – Geophytes; Ppn – Ponto-Pannonian; Eua – Eurasian; Cosm – Cosmopolitan; E – European; Ec – Central European; D – diploidy, P – polyloidy, DP – diplo-polyloidy.

Place and date of surveys: 1 – 3 Ciumeghiu locality (Bihor County).

The spectrum of floristic elements indicates the dominance of Eurasian species

(61.53%), followed at a great distance by cosmopolitan, European, Pannonian, Ponto-

Pannonian and Central European, each with a share of 7.69% (Figure 3).

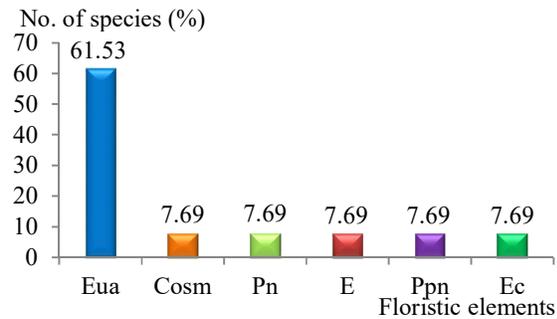


Figure 3 Floristic elements spectrum of the *Camphorosmetum annuae* association, where: Eua – Eurasian, Cosm – Cosmopolitan, Pn – Pannonian, E – European, Ppn – Ponto-Pannonian, Ec – Central European

The ecological index diagram (Figure 4) indicates that, in terms of moisture requirements, xeromesophilic species are dominant (53.84%), followed by mesophilic ones (30.76%). Depending on the temperature, the higher share is held by micro-mesothermic species (45.76%), respectively eurithermal ones (38.46%). The chemical reaction of the soil favors the development of neutro-basiphilic and euryionic species, each having 30.76%.

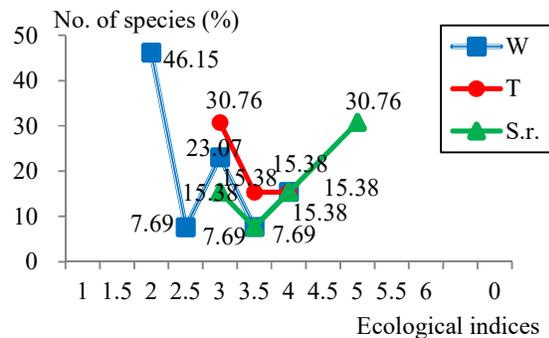


Figure 4 – Diagram of ecological indices for the *Camphorosmetum annuae* association, where: W – soil wet, T – temperature, S. r. – chemical reaction of the soil

The karyotype spectrum (Figure 5) illustrates the dominance of diploid species (53.84%), followed by polyploids (38.46%) and diplo-polyplod (7.69%). The diploidy index has a value of 1.39.

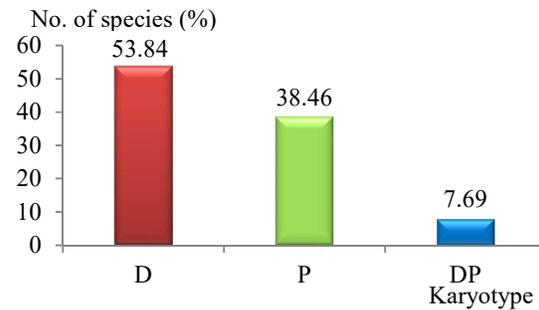


Figure 5 Karyotype spectrum of *Camphorosmetum annuae* association, where: D – diploidy, P – polyploidy, DP – diplo-polyplod

CONCLUSIONS

Camphorosmetum annuae is a halophilic association, being an excellent indicator for authentic saline soils with natural hydrology and preserving specialized, rare or regionally endemic floristic elements, the vegetation is generally sparse and poor in species, dominated by halophytes adapted to salt and water stress.

Camphorosmetum annuae is a highly specialized relict plant community, in an accelerated process of extinction due to anthropogenic changes to saline soils. Its survival depends on the strict conservation of the small remaining fragments and the protection of the hydrological regime and salinity. In many areas of Western and Northwestern Romania, the association is much degraded, replaced by *Festucion pseudovinae* phytocenoses or other mesophilic communities if the soil is improved.

Also, the west pontic communities with *Camphorosma annua*, *Plantago maritima*, *Puccinellia limosa*, *Scorzonera laciniata*, *Achillea panonica*, have a very high conservation and ecoprotective value, as they define rare, endangered, even degraded natural ecosystems that need to be protected.

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