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NEW PLANT COMMUNITIES IN THE BAIA MARE DEPRESSION BELONGING TO THE CLASSES SALICETEA PURPUREAE MOOR 1958 AND POTAMOGETONETEA PECTINATI R. TX ET PRSG. 1942

Gheorghe Bârlea*, Aurel Ardelean, Monica Marian
Vasile Goldis University

ABSTRACT
The invetorying of the plant communities in the north-western area of the country has been a desideratum with a view to complete the componence of the plants-growth in Romania. In this area of the country the subject has been treated in only few disparate articles which, even so, hardly manage to cover the vast picture of the plant communities in the Baia-Mare Depression.
KEY WORDS: plant communities, Maramureş County, Baia Mare Depression, Myriophyllo verticillati-Nupharetum luteae, Salicetum triandrae.

INTRODUCTION

The Baia Mare Depression,which lies in the western part of the Maramureş County, represents an interesting area from an ecological and a botanic point of view. The climate in this region is warm and moist, which triggers about the appearance of a rich flora vegetation, unfortunately little spoken of in the literature of speciality. Besides the plant communities described in the literature of speciality in the Baia Mare Depression mainly by Mititelu D. am Dorca Mariana, we have discovered and described several new communities in the area under research, out of which we can mention Myriophyllo verticillati-Nupharetum luteae W. Koch 1926 and Salicetum triandrae Malcuit 1929.

MATERIALS

The materials used are represented by the data collected in the field through the phytosociologic survey, catalogues and special bibliography that is presented further on.

METHOD

The research methods used consisted in the studying, ordering and interpreting of the data (annotation) colected in the field with the ones in the literature of speciality.

Thus,the picking and determining of plants has been carried out in accordance with the works „*A Magyar flora kepekben*" Javorka *et al*., 1958; „*Flora R. P. România*, *R. S. România*", I-XIII, 1952-1976; „*Flora Europaea*", 1964-1980, I-IV, Ediţia a II-a, 1993; „*Flora ilustrată a României*", Ciocârlan, 2000 şi după „*Flora of North America*", 2008.

The analysis of the data has been carried out in accordance with the Central European phytosociology system Braun-Blanquet, indicated de Pop, 1982, Barkman *et al*., 1986, „*Code of phytosociological nomenclature*. *Vegetatio*", vol. 67, 3: 145-197, „*Conspectus of European vegetation*. *Folia Geobot*. *Phytotax*", Mucina, 1997-32: 117-172, Cristea *et al*., 2004, Sanda *et al*., 2001, Sanda *et al*., 2007, whereas the specific phytosociologic surveys achieved after: Mucina, 1997, Cristea *et al*., 2004, Sanda *et al*., 2001, Sanda *et al*., 2007. The bioform, the geoelement and the ecological factors (U, T, R) have been completed in accordance with the work „*Studii şi comunicări*" Supliment 25, Ştiinţe Naturale, 1983, written by Sanda *et al*., updated in accordance with the work „*Fitosociologie*", Cristea *et al*., 2004.

RESULTS AND DEBATES:

Cls. Potamogetonetea pectinati R. Tx et Prsg. 1942
Ord. Potamogetonetalia pectinati W. Koch 1926
Al. Nymphaeion albae Oberd. 1957
As. Myriophyllo verticillati-Nupharetum luteae W. Koch 1926

Correspondence: *Bârlea Gheorghe, Col. Naţ. „Gh. Şincai" Baia Mare, Str. Gheorghe Şincai, nr, 25, Baia Mare, România, Tel. +40-(362)-407098, 0728821723, e-mail: barlea.gheorghe@gmail.com*

Chart 1. The Myriophyllo verticillati-Nupharetum luteae community

					Nr. of annotation	**1**	**2**	**3**	**4**	**5**	
					Altitude	155	155	155	155	155	
					Exposure	-	-	-	-	-	**K**
					Slope	-	-	-	-	-	
					Coverage (%)	85	75	80	90	90	
Biof.	**Geoelem.**	**U**	**T**	**R**	**Area (m²)**	25	25	25	25	25	
					Char. Ass.						
Hh	Eua(M)	6	0	3,5	*Nuphar lutea*	4	4	5	5	5	V
Hh	Cp(bor)	6	0	4,5	*Myriophyllum spicatum*	1	-	+	1	-	III
					Potametalia						
G	Cosm	6	3	0	*Polygonum amphibium* f. *aquatica*	-	-	+	-	+	II
					Phragmitetalia						
Hh	Eua	6	3	0	*Butomus umbellatus*	+	+	+	-	-	III
Hh	Cp	5	3	4	*Glyceria maxima*	-	+	+	+	-	III
Ch	E	4	3	0	*Lysimachia nummularia*	-	-	+	-	-	I
H-Hh	Eua	5	0	0	*Lysimachia vulgaris*	-	+	-	+	-	II
Hh	Eua	5	3	0	*Lycopus europaeus*	-	-	-	-	+	I
H-Hh	Cosm	4	3	0	*Lythrum salicaria*	-	-	+	-	+	II
H-Hh	Eua	5	3	0	*Myosotis scorpioides*	+	-	-	-	-	I
Hh	Eua	6	3	0	*Oenanthe aquatica*	-	-	-	-	+	I
Hh	Cosm	5	0	4	*Phragmites australis*	-	-	-	-	1	I
H(G)	Cp(bor)	4	3	4	*Stachys palustris*	-	-	-	-	+	I
Hh	Cosm	6	3,5	0	*Typha latifolia*	+	-	+	-	-	II
					Magno-Caricetalia						
Hh	Cp(bor)	6	3,5	3,5	*Carex pseudocyperus*	-	-	+	+	-	II
H	Cp	5	3	0	*Galium palustre*	-	-	+	-	-	I
Hh-H	Cp(bor)	5	3	0	*Phalaris arundinaceea*	-	-	-	+	-	I
					Glycerio-Sparganion						
Hh	Cosm	6	0	0	*Alisma plantago-aquatica*	-	-	-	-	+	I
Hh-H	Cosm	5	3	0	*Glyceria fluitans*	+	-	-	-	-	I
Hh	Cp(bor)	6	3	0	*Leersia oryzoides*	+	1	+	+	-	IV
Hh	Eua	6	4	0	*Sparganium erectum* ssp. *neglectum*	-	-	+	+	-	II
					Variae syntaxa						
PhM	Eua	5	3	3	*Alnus glutinosa*	-	1	-	-	-	I
Th	Eua	5	0	0	*Bidens cernua*	-	-	-	+	-	I
H	Eua	4	3	4	*Calystegia sepium*	-	-	-	-	+	I
Th	Cosm	4	0	3	*Echinochloa crus-galli*	+	-	-	-	-	I
Phm	Eua	5	3	0	*Salix triandra*	-	1	+	-	-	II
-	-	-	-	-	*Spirogyra sp.*	-	-	-	-	+	I

The Spectrum of the bioforms: Hh-53,84%, H-23,07%, Th-7,69%, Ch-3,84%, PhM-3,84%, Phm-3,84%, G-3,84%.
The Spectrum of the geoelements: Eua-42,30%, Cp-26,92%, Cosm-26,92%, E-3,84%.
Location of the annotations: Lăpuşel, Lake Două Verevițe.

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The community **Myriophyllo verticillati-Nupharetum luteae** W. Koch 1926 is in evolution and was identified on the lake from Două Verește. The community covers rather vast expanses on this lake but I did not identify it on other lakes in the area. On the other hand, there are relatively few species involved in this community, most of them with a low frequency and constancy, some quite rare in the area. (*Carex pseudocyperus*). There is only one species with constancy V (*Nuphar lutea*), one species with constancy IV (*Leersia oryzoides*), three species with constancy III (*Butomus umbellatus*, *Glyceria maxima* and *Myriophyllum spicatum*), whereas the rest of the species have constancy I or II.The characteristic species are *Nuphar lutea* and *Myriophyllum spicatum*.

Fig. 1. *Carex pseudocyperus* in the community Myriophyllo verticillati-Nupharetum luteae on the lake from Două Verește.

These are the reasons why the community must be considered as being in development, and what one can observe on the lake represents nothing but a stage in the evolution of the vegetation in this area. The community has been identified only on the lake from Doua Veverite, which means it is rare in the depression, where although there exist many lakes with various surfaces, it has not been detected.

Actually, taking into consideration the composition in the species, as one can observe from the annotations done, I consider that the community Myriophyllo verticillati-Nupharetum lutea only represents a stage in the development of the vegetation from this lake towards the communities from the Phragmition community. This is so because one can observe more species from the Phragmition order than from the community Nymphaeion or the order Potametalia. Since this community represents only an intermediary stage, it has not been so far described by other researchers who worked in the Baia-Mare Depression.

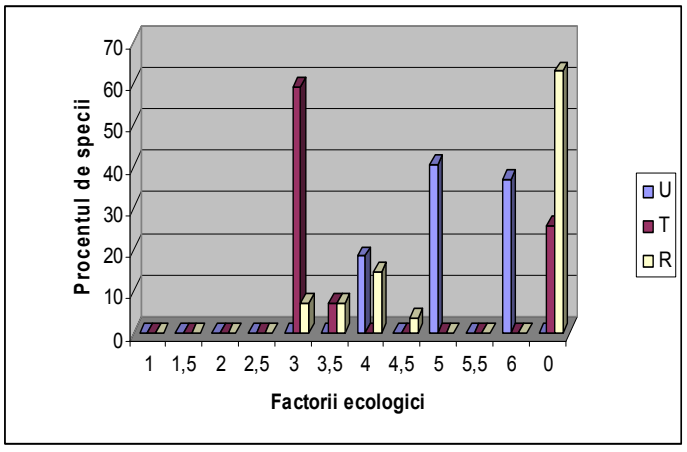

Fig. 2. Spectrum of the ecological factors in the community Myriophyllo verticillati-Nupharetum luteae.

As far as moisture is concerned, one can notice, just as it should normally be for a water community, a massive distribution of the species in the areas U_4-U_6, that is high requirements for moisture. The fact that there are no species with an intermediary value for moisture (ex. $U_{4,5}$) is a coincidence. However, it is interesting to notice the fact that in this community there are no species that might be considered indifferent to moisture, probably due to the evolution of vegetation from the lake.

Such a situation can be observed in the case of the factor temperature, to which 7 species are indifferent (25,92%), most species being mesophilous, which represents something common for the Baia-Mare Depression.

The analysis of the species in accordance with factor R, reveals, on the contrary, a major distribution, that is 17 species (62,96%) in the area of indifference to the reaction of the soil, the water in the area being generally speaking, calcareous and secondarily salty. The rest of the values of the R factor are poorly represented.

Cls. Salicetea purpureae Moor 1958
Ord. Salicetalia purpureae Moor 1958
Al. Salicion triandrae Müller Th. et Görs 1958
As. Salicetum triandrae Malcuit 1929

I have identified the **Salicetum triandrae** Malcuit 1929 community on the banks of the Lapus river. It grows the river edge. For the rest the area it covers is rather insignificant as the community can only be found on the edge of the water pools that exist in the area. It is a well-defined community, cosisting of 53 species of plants integrated in the ecosystem.

Chart 2. The Salicetum triandrae community

					Nr. of annotation	**1**	**2**	**3**	**4**	**5**	**K**
					Altitude	160	160	160	160	160	
					Exposure	-	-	-	-	-	
					Slope	-	-	-	-	-	
					Coverage (%)	100	100	100	100	100	
Biof.	**Geoel.**	**U**	**T**	**R**	**Area (m²)**	30	30	30	30	30	
					Char. Ass.						
Phm	Eua	5	3	0	*Salix triandra*	3	4	2	3	2	V
					Salicion triandre						
Phm	Eua	4,5	3	4	*Salix fragilis*	1	-	-	-	-	I
Phm	Eua	5	3	4,5	*Salix purpuraea*	-	1	+	-	-	II
					Salicetalia purpureae						
PhM-Phm	Eua	4	2	4	*Alnus incana*	-	-	-	+	-	I
Phm	Adv	3	4	0	*Amorpha fruticosa*	-	+	-	2	3	III
H	Eua	3,5	3	4	*Humulus lupulus*	-	+	-	+	+	III
PhM-Phm	Eua	3,5	3	3	*Populus alba*	+	-	-	+	-	II
PhM	Eua	4	3	4	*Populus nigra*	-	-	+	-	-	I
H	Eua(M)	4	0	0	*Ranunculus repens*	+	-	-	-	-	I
H	Eua(M)	4,5	3	4	*Rubus caesius*	+	-	+	+	+	IV
PhM	Eua	5	3	4	*Salix alba*	1	-	1	-	+	III
Phm	Ec	4	3	4,5	*Salix eleagnos*	-	-	+	-	-	I
H	Adv	3,5	3	3	*Solidago gigantea ssp. serotina*	-	+	-	-	-	I
H-G	Cosm	3	3	4	*Urtica dioica*	-	-	+	+	-	II
					Calystegion						
TH-H	E(cont)	4	3,5	4,5	*Chaerophyllum bulbosum*	+	-	+	-	-	II
Th	Adv	4	0	4	*Echinocystis lobata*	+	+	+	-	+	IV
Th	Adv	4	0	4	*Erigeron annuus*	-	-	-	+	-	I
H	Adv	4	3	4	*Helianthus tuberosus*	+	+	1	1	1	V
G	Adv	3,5	0	2,5	*Reynoutria japonica*	+	-	-	-	-	I
					Alno-Padion						
H(G)	Eua	3,5	3	3	*Aegopodium podagraria*	-	-	+	-	-	I
PhM	Eua	5	3	3	*Alnus glutinosa*	-	+	-	+	-	II

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H	Eua(M)	4	3	0	*Eupatorium cannabinum*	+	-	-	+	-	II
H	Eua	4	3	0	*Symphytum officinale*	-	-	-	+	-	I
					Variae syntaxa						
H	Cp(bor)	4	0	0	*Agrostis stolonifera*	+	-	+	+	+	IV
H-G	Ec(M)	2,5	3,5	5	*Aristolochya clemetitis*	+	-	-	-	-	I
H-Ch	Cp(Bor)	3	3	4	*Artemisia vulgaris*	+	-	-	+	+	III
Th	Adv	5	0	0	*Bidens vulgata*	-	+	-	-	-	I
H(G)	Eua(M)	2	3	0	*Calamagrostis epigeios*	+	-	+	-	-	II
H	Eua	4	3	4	*Calystegia sepium*	+	-	-	-	-	I
G	E(M)	0	3	0	*Carex hirta*	-	-	-	-	+	I
H	Ec(cont)	3,5	3	3	*Chaerophyllum aromaticum*	+	-	-	-	-	I
Phn-Ep	Ec(M)	3	3	3	*Clematis vitalba*	-	-	-	+	-	I
Phm	Ec	3	3	4	*Cornus sanguinea*	-	-	-	-	+	I
H	Eua(M)	3	0	4	*Dactylis glomerata*	+	-	-	-	-	I
G	Eua	0	0	0	*Elymus repens*	+	+	+	-	+	IV
G	Cosm	3	3	0	*Equisetum arvense*	-	-	-	+	-	I
PhM	Adv	-	-	-	*Fraxinus americana*	-	-	+	+	+	III
H	Eua	3,5	3	0	*Holcus lanatus*	-	-	-	+	+	II
G-Hh	E	5,5	0	0	*Iris pseudacorus*	-	-	-	+	-	I
Hh	Eua	5	3	0	*Lycopus europaeus*	-	-	-	-	+	I
H-Hh	Cosm	4	3	0	*Lythrum salicaria*	+	-	-	-	+	II
Th-TH	Eua	3	3	0	*Malva sylvestris*	-	-	-	-	+	I
Th-TH	Eua	2,5	3	0	*Melilotus alba*	+	-	-	-	-	I
Th-TH	Eua(M)	4	3	0	*Myosoton aquaticum*	-	+	-	-	-	I
Hh-H	Cp(bor)	5	3	0	*Phalaris arundinacea*	+	-	+	+	+	IV
H	Eua	3	0	0	*Plantago major*	-	-	-	-	+	I
PhM-Phm	Eua	3,5	3	3	*Populus x canadensis*	-	+	-	-	+	II
H	Eua(M)	3	3	4,5	*Sambucus ebulus*	-	-	-	+	-	I
H	Eua	3	3	0	*Tanacetum vulgare*	-	+	+	+	-	III
H	Eua(M)	3	0	0	*Taraxacum officinale*	-	-	-	-	+	I
H	Eua	3,5	0	0	*Trifolium repens*	-	-	-	-	+	I
Hh	Cosm	6	4	0	*Typha angustifolia*	-	-	-	-	+	I
Th	Eua	3,5	3,5	4	*Xanthium strumarium*	+	-	-	-	-	I

The Spectrum of the bioforms: H-43,39%, PhM-13,20%, Th-13,20%, Phm-11,32%, G-9,43%, Hh-5,66%, Phn-1,88%, TH-1,88%.
The Spectrum of the geoelements: Eua-56,60%, Adv-15,09%, Ec-9,43%, Cosm-7,54%, E-5,66%, Cp-5,66%.
Location of the annotations: The banks of the Lăpuş River in Lăpuşel.

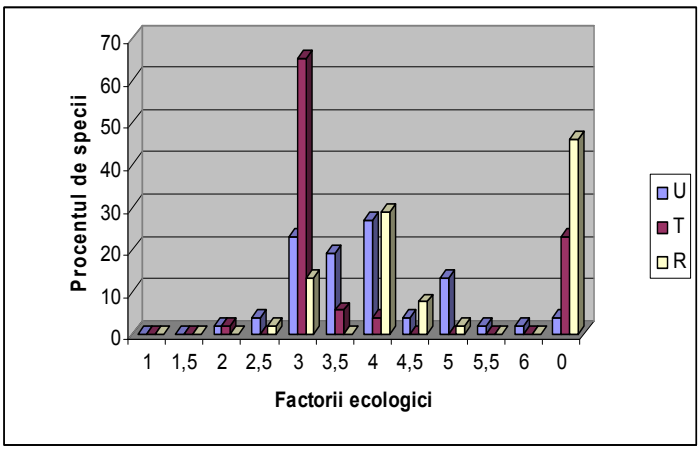

Fig. 3. The spectrum of the ecological factors in the Salicetum triandrae community

The dominant species with constancy V are only two (*Salix triandra* which defines the community and the *Helianthus tuberosus* which is very wide-spread in the area), but there are 11 species with constancy III and IV, which give volume to the biomass. The other 40 species have constancy I and II, and a smaller coverage. It is interesting to observe the presence of the adventive species *Amorpha fruticosa* which occupies larger and larger territories in the Baia Mare Depression and which, in this community has in certain annotations A-D 2 or even 3. The expansion of this species is in accordance with the spreading of other adventive species which cover other territories in the area, such as: *Solidago graminifolia* and *Reynoutria japonica*.

As can be noticed, most species are hemicryptophytes, which is quite normal even in a Salicetum triandrae community. The mega-phanerophytes and the mezo-phanerophytes represent 24,52% within a normal situation in a thicket.

Just like all over the Baia-Mare Depression, most species are of a Euro-Asian origin (56,60%), followed by the adventive species (15,09%) , which, as I have mentioned before ocupy larger and larger areas.

The demands for moisture in the Salicetum triandrae community can be considered to be within the ordinary limits for the Baia-Mare Depression, that is most (69,22%) range between U_3 şi U_4.

Pretenţiile faţă de temperatură se încadrează de asemenea în limitele normale ale regiunii, adică cele mai multe specii (65,38%), grupate la valoarea T_3. Speciile indiferente reprezintă 23,07%, ceea ce înseamnă o valoare considerabilă faţă de alte asociaţii din regiune, cum ar fi asociaţia Myriophyllo verticillati-Nupharetum lutea.

Pretenţiile faţă de reacţia solului se încadrează în tendinţa obişnuită pentru regiune, adică majoritatea speciilor (50%) sunt grupate între valorile R_3 şi $R_{4,5}$. Ca şi în cele mai multe cazuri, ponderea speciilor indiferente faţă de reacţia solului este mare şi anume 46,15%.

The demands for temperature are also within the ordinary limits in the area, that is most species (65,38%), are grouped at value T_3.

CONCLUSIONS

The communitie Myriophyllo verticillati-Nupharetum luteae W. Koch 1926 and

Salicetum triandrae Malcuit 1929 stand for the warm and moist climate of the Baia Mare Depression.

The community Myriophyllo verticillati-Nupharetum lutea represent only a stage in the evolution of vegetaţiei on this lake towards the communities from the Phragmition community.

In the Myriophyllo verticillati-Nupharetum lutea communities prevail the helohydathophytes, the latter being an aquatic community, the Euro-Asian and the cosmopolitan species just like anywhere in the Baia Mare Depression.

Most species from the Myriophyllo verticillati-Nupharetum luteae community are mesophyll, which is something ordinary for the Baia Mare Depression, while 25,92% are indifferent to temperature and 62,96% are indifferent to the reaction of the soil.

In the Salicetum triandrae community, Malcuit 1929, *Helianthus tuberosus* şi *Amorpha fruticosa* represent the adventive elements which massively overrun the territory of the Baia Mare Depression.

In the Salicetum triandrae community, Malcuit 1929 most species are sunt hemicryptophytes of a Euro-Asian origin, mesophyll, mesotherme and acido-neutrophylous.

REFERENCES

Barkman J.J., Moraveç J., Rauschert S., Code of phytosociological nomenclature. Vegetatio. Upsala, vol. 67,3: 145-197, 1986.

Ciocârlan V., Flora ilustrată a României. Editura Ceres, Bucureşti, 2000.

Cristea V., Gafta D., Pedrotti F., Fitosociologie, Editura Presa Universitară Clujeană, Cluj-Napoca, 2004.

Javorka S., Csapody Vera, A Magyar flora képekben. Editura Studium Budapest, 1934, Erdö mezö virágai. Ed. III. Budapest, 1958.

Mititelu D., Dorca M., Flora şi vegetaţia din împrejurimile Băii Mari. Contribuţii botanice, Cluj Napoca, 1987.

Pop I., Plante spontane şi subspontane cu valoare economică din flora R. S. România. Contribuţii Botanice Cluj-Napoca, Universitatea Babeş-Bolyai din Cluj-Napoca, Grădina Botanică., 1982.

Mucina L., Conspectus of European vegetation. Folia Geobot. Phytotax,. 32: 117-172, Praha, 1997.

Sanda V., Popescu A., Doltu M., Doniţă N., Studii şi Comunicări supliment 25 Ştiinţe Naturale. Editura Muzeului Brukenthal, Sibiu1983.

Sanda V., Popescu A., Stancu Daniela Ileana, - Structura cenotică şi caracterizarea ecologică a fitocenozelor din România. Editura Conphis, Râmnicu Vâlcea, 2001.

Sanda V., Răduţoiu D., Burescu P., Balaj-Irimia Irina, Breviar fitocenologic, partea a IV-a. Editura Sitech, Craiova, 2007.

*** Flora Europaea, 1964-1980, Cambridge University Press, I-V, Ediţia a II-a, Cambridge, 1993.

*** Flora of North America, 2008.

*** Flora R. P. România, R. S. România, I-XIII, Editura Acad. Române, Bucureşti, 1952-1976.