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VEGETATION OF THE “TĂUL FĂRĂ FUND” PEAT BOG FROM BĂGĂU VILLAGE (ALBA COUNTY, TRANSYLVANIA, ROMANIA)

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Abstract: Vegetation of the “Tăul fără fund” peat bog from the Băgău village (Alba County, Transylvania, Romania). The paper deals with the description and analysis of the vegetation cover from the „Tău fără fund” peat bog from Băgău village, investigated between 2002 and 2004. There have been identified six plant associations. Some of them are characteristic for the moss layer of transitory *Sphagnum*-bogs and exhibits rich *Drosera rotundifolia* population, one of the protected plants in Romania.

Most of the associations are represented by phytocoenoses covering small surfaces and contain just a few species. The analysis was focused on the ***Thelypteridi-Salicetum cinereae*** association described on the basis of seven relevés.

Most of the species are Eurasian and circumpolar, mesohydrophytes, hydrophytes, helohydatoxytes and hemicryptophytes. They occur mostly in natural habitats (2/3) or disturbed ones (1/3); are ruderal species (44%), tolerants (34%) or competitors (22%).

Key words: plant associations, peat bog, Transylvania, Romania

Introduction

“Tăul fără fund” peat bog lies at an altitude of 440 m a.s.l., 2 km North-North-East from the Băgău village, at few kilometers from the Eastern part of the Romanian Western Mountains (Munții Apuseni), on the left side of the Mureș river valley, at 9 km from Aiud city. Its shape is elliptical with a long axis of about 250 m, oriented South-East to North-West, the cross axis is 130 m long. The surface of the peat bog is 2.5-3 ha, the peat layer in its central part is 4-5 m thick [10]. During wet years due to the inflow water the surface of the peat bog might increase up to 5-6 ha. On the South-Western side of the bog there are several small pools and a larger shallow one with muddy water, contaminated by cattle. The peat bog shelters aquatic and paludal phytocoenoses. The bog is eutrophic at its border with a thin layer of peat overgrown by *Salix cinerea*. The central part of the peat bog is oligo-mesotrophic, with a layer of living *Sphagnum*, on which grow mixed populations of *Phragmites australis*, *Molinia coerulea*, *Populus tremula*, *Alnus frangula* and *Betula pubescens*. The pools with open water are inhabited by populations of *Potamogeton natans* and *Salvinia natans*. At the margin of pools *Thelypteris palustris* grows abundantly.

This peat bog was firstly recorded in 1896 by Csató [6] and subsequently studied by E. Pop [8, 9]. The algal communities were more recently investigated by Momeu and L. Ș. Péterfi [7].

Material and Methods

This study was performed between 2002 and 2004. The 19 relevés have been investigated according to the Central European phytosociological school [5].

The associations have been analyzed and characterized by using the relative ecological indicator values (UTR) [11, 12], according to their composition in biological forms (Bf) and floristic elements (Fe) [11, 12], as well as, based on relative soil trophicity indices (nitrogen

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behaviour - NB), light indices (LB), social behaviour types (SBT) and naturalness values (VAL), namely according to their preferences towards habitat naturalness and disturbances (either natural or anthropical influences; natural competitors, stress supporting species and ruderal ones) [1, 2].

Results and Discussions

The present study reveals the occurrence of phytocoenoses belonging to 6 plant associations included in the following coenotaxonomical conspectus:

PHRAGMITETEA AUSTRALIS R. Tx. et Pressing 1942

PHRAGMITETALIA W. Koch 1926

Phragmitium communis W. Koch 1926

Scirpo – Phragmitetum W. Koch 1926

Typhetum latifoliae G. Lang 1973

Glycerietum maximae Hueck 1931

OXYCOCCO-SPHAGNETEA Br.-Bl. Tx. ex Westoff et al. 1946

SPHAGNETALIA MAGELLANICI (Pawl. 1928) Moore 1968

Sphagnion magellanicum Kastner et Flosner 1933

Sphagnetum magellanicum (Malcuit 1929) Kastner et Flosner 1933

(syn. *Eriophoro vaginati-Sphagnetum* Pop et al. 1987)

ALNETEA GLUTINOSAE Br. – Bl. et Tx. ex Westhoff et al. 1946

SALICETALIA AURITAE Doing 1962

Salicion cinereae Th. Müll. et Görs ex Pass. 1961

Thelypteridi – Salicetum cinereae Samsak 1963

Salici cinereae-Sphagnetum recurvi (Zolyomi 1934) Soó 1955

Table 1: Ass. Scirpo – Phragmitetum W. Koch 1926 (syn. Phragmitetum communis (All. 1922) Pign. 1953)

Bf.	Fe.	Relevé	1	2
		Altitude (m)	440	440
		Cover (%)	80	85
		Surface (m ²)	50	100
Char. ass.				
HH	Cosm	Phragmites australis	4	4-5
Phragmitium – Phragmitetalia				
HH	Cosm	Schoenoplectus lacustris	-	+
HH	Eua	Lycopus europaeus	+	+
HH	Cosm	Typha angustifolia	-	+
HH	Eur	Rumex hydrolapathum	+	-
HH	Cosm	Bolboschoenus maritimus	+	-
HH	Cosm	Typha latifolia	+	-
H	Eua	Calystegia sepium	+	+
HH	Eua	Sium latifolium	+	-
H	Circ	Stachys palustris	+	-
H	Circ	Scutellaria galericulata	+	-
G	Cosm	Polygonum amphibium	+	+
HH	Circ	Glyceria maxima	-	+
Oenanthetalia				
HH	Eua	Alisma lanceolatum	+	+
HH	Cosm	Alisma plantago aquatica	+	+
Magnocaricetalia				
H	Circ	Poa palustris	-	+

H	Circ	Galium palustre	-	+
HH	Eua	Lysimachia vulgaris	+	-
HH	Eua	Mentha aquatica	+	+
HH	Eua	Carex acutiformis	1	-
Nasturtio – Glycerietalia				
HH	Cosm	Glyceria fluitans	-	+
H	Eua	Myosotis scorpioides	+	-
HH	Eua	Sparganium erectum	+	-
Potamion - Lemnetea				
HH	Cosm	Lemna trisulca	-	+
Molinietalia				
HH	Circ	Scirpus sylvaticus	+	-
G	Circ	Equisetum palustre	-	+
H	Cosm	Juncus effusus	+	-
Molinio – Arrhenatheretea				
H	Cosm	Lythrum salicaria	+	+
H	Eua	Eupatorium cannabinum	-	+
H	Eua	Sonchus arvensis	-	+
Companions				
H	Eua	Poa trivialis	+	-

Date of the relevés: 1: 03.07. 2002; 2: 13.07. 2004.

The phytocoenoses of the **Scirpo – Phragmitetum W.** Koch 1926 association (Table 1) are widespread in standing waters as well as in slowly running ones in the surrounding areas too. The characteristic species is *Phragmites australis*, growing together with *Typha angustifolia* and *T. latifolia* forming the highest layer of this phytocoenoses. Towards the margins are present *Lycopus europaeus*, *Schoenoplectus lacustris*, *Alisma plantago-aquatica* and *Mentha aquatica* forming the lower layer. There are also present several transgressive species coming from the adjacent communities such as *Lythrum salicaria* and *Scirpus sylvaticus*.

Table 2: Ass. Glycerietum maximae Hueck 1931 (syn. Glycerietum aquaticae W. Nowinski 1928)

Bf.	Fe.	Relevé	1	2
		Altitude (m)	440	440
		Cover (%)	100	90
		Surface (m ²)	50	25
Char. ass.				
HH	Circ	Glyceria maxima	5	4-5
Phragmition – Phragmitetalia				
HH	Eua	Lycopus europaeus	+	+
HH	Cosm	Phragmites australis	+	-
Ch	Eua	Solanum dulcamara	+	-
HH	Cosm	Typha latifolia	+	-
H	Circ	Scutellaria galericulata	+	-
H	Eua	Ranunculus repens	+	-
H	Eua	Ranunculus lingua	+	-
H	Eua	Calystegia sepium	+	-
HH	Eua	Sium latifolium	-	+
HH	Cosm	Schoenoplectus lacustris	+	+
H	Circ	Stachys palustris	+	+
H	Circ	Galium palustre	+	+
H	Circ	Epilobium parviflorum	-	+
G	Cosm	Polygonum amphibium	-	+
G	Eur	Iris pseudacorus	+	+
Magnocaricetalia				
H	Cosm	Lythrum salicaria	+	+
HH	Circ	Carex pseudocyperus	+	-

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H	Circ	Epilobium palustre	+	-
HH	Eua	Mentha aquatica	-	+
HH	Eua	Lysimachia vulgaris	-	+
HH	Eua	Carex acutiformis	-	+
HH	Eua	Carex riparia	-	+ -1
Alnion glutinosae				
H	Circ	Dryopteris thelypteris	+	-
H	Dac	Oenanthe banatica	+	-
Nasturtio-Glycerietalia				
HH	Eua	Sparganium erectum	+	+
H	Atl	Epilobium obscurum	+	-
HH	Cosm	Glyceria fluitans	-	+
Bolboschoenetalia				
G	Cosm	Eleocharis palustris	-	+
Oenanthetalia				
HH	Eua	Butomus umbellatus	-	+
HH	Eua	Oenanthe aquatica	+	+
HH	Eua	Alisma lanceolatum	-	+
HH	Cosm	Alisma plantago-aquatica	+	+
Molinio – Arhenatheretea				
G	Circ	Equisetum palustre	-	+
H	Eur	Caltha palustris	-	+
H	Circ	Juncus articulatus	-	+
H	Circ	Agrostis stolonifera	-	+
Companions				
Th	Eua	Stellaria aquatica	+	-
M	Eua	Salix cinerea	+	-
H	Eua	Taraxacum officinale	+	-
TH	Eua	Cirsium vulgare	+	-
H	Cosm	Urtica dioica	+	-
Th	Eua	Medicago lupulina	+	-
Th	Eua	Bidens tripartite	+	-
H	Eua	Sonchus arvensis	+	-
Th	Eua	Galeopsis speciosa	+	-
Th	Eua	Caucalis platycarpos	+	-
Th	Eua	Cyperus fuscus	-	+

Date of relevés: 1, 2: 14.08.2004.

The phytocoenoses of the **Glycerietum maximae** Hueck 1931 association (Table. 2) are frequent all over the country. They occur in depressions, at the shore of running waters and eutrophic ponds, forming a bordering belt at the periphery of the reed plots.

The characteristic and dominant species is *Glyceria maxima*, intolerant towards the oscillation of ground water level. If the humidity conditions are favorable, this specie covers entirely the surface of the ground, but if the water level decreases it gives up the place to other species. Besides the dominant species there are present other plant populations, for example *Lycopus europaeus*, *Phragmites australis*, *Typha latifolia*, *Schoenoplectus laustris* and *Galium palustre*. There may also be present species from neighboring grasslands: *Agrostis stolonifera*, *Equisetum palustre* etc.

The phytocoenoses of **Typhetum latifoliae** G. Lang 1973 (Table 3.) inhabit shallow waters with nutrient rich substratum. They are tolerant against the fluctuations of water level and can settle shortly in deep muddy stands. The dominant species *Typha latifolia* is accompanied by the characteristic elements of the alliance and order, such as: *Glyceria maxima*, *Phragmites australis*, *Lycopus europaeus*, *Calystegia sepium* which are familiar species also in **Typhetum angustifoliae** coenoses. *Typha latifolia* forms well defined phytocoenoses although many authors include these as belonging to a subassociation of *Scirpo-Phragmitetum*.

Table 3: Ass. Typhetum latifoliae G. Lang 1973

Bf.	Fe.	Relevé	1	2
		Altitude (m)	240	240
		Cover (%)	70	60
		Surface(m ²)	50	50
Char. ass.				
HH	Cosm	Typha latifolia	4	3
Phragmition - Phragmitetalia				
HH	Circ	Glyceria maxima	+	+
HH	Cosm	Phragmites australis	-	+
HH	Eua	Lycopus europaeus	+	-
H	Eua	Calystegia sepium	+	-
HH	Eua	Mentha aquatica	-	+
Lemnetea et Potametea				
HH	Cosm	Lemna minor	1	2
Magnocaricion				
H	Eua	Symphytum officinale	-	+
H	Cosm	Lythrum salicaria	-	+
Companions				
	Circ	Rumex conglomeratus	+	+
N	Eua	Solanum dulcamara	-	+

Date of the relevés: 1-2: 19. 07. 2004.

The oligotrophic phytocoenoses (Table 4) edified by *Sphagnum magellanicum* and *Eriophorum vaginatum* are frequent in the central part of the peat bogs in the montane belt.

The thick peat layer of this phytocoenoses is characterized by lower quantity of nutrients and acid pH.

In “Tăul fără fund” from Băgău, this association is restricted to the central part of the peat bog and is partially destroyed by wild boars.

Table 4: Ass. Sphagnetum magellanicum (Malcuit 1929) Kostner et Flossner 1933

Bf.	F.e.	Relevé	1	2	3
		Altitude (m)	440	440	440
		Cover (%)	95	95	95
		Surface (m ²)	25	25	50
Char. ass.					
Brr	Circ	Sphagnum magellanicum	4-5	4-5	4-5
H	Circ	Eriophorum vaginatum	1-2	1-2	1-2
Sphagnion-Sphagnetalia					
H	Circ	Drosera rotundifolia	+1	+1	+
Molinion					
H	Eua	Molinia coerulea	+1	+	+
G	Eua	Epipactis palustris	-	+	+
Phragmition-Phragmitetea					
HH	Cosm	Phragmites australis	+	+	+1
HH	Eua	Lycopus europaeus	+	-	+
Alnetea					
MM	Eua	Betula pubescens	+1	+1	+1
H	Cosm	Juncus effusus	+	-	+
MM	Eua	Populus tremula	+	-	-
Companion					
Brr	Circ	Polytrichum commune	+	+	+1
Brr	Circ	Climacium dendroides	-	+	+
Brr	Circ	Pleurosium schreberi	+	-	+

Date of relevés: 1, 3: 14. 08. 2004.

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The characteristic species *Sphagnum magellanicum* and *Eriophorum vaginatum* form the herb layer. This layer shelter well developed individuals of the species *Drosera rotundifolia*. There are also present *Betula pubescens* and *Populus tremula*, as well as *Phragmites australis* but with low abundances, comparatively with neighboring association.

The phytocoenoses of the **Thelypteridi – Salicetum cinereae** Samsak 1963 association (Table 5) are settled in depressions with high humidity, at the border of lakes and bogs. The phytocoenoses of this association are compact and grow usually on organic soils with high peat content. In the studied area this association is present in the northern and eastern part of the water pools and at the margin of the bog. This association has been recently recorded also in the North-West of Romania [3].

One of its characteristic species, namely *Salix cinerea* forms the arborescence layer, the other one – *Thelypteris palustris* the herb layer. In the floristic structure of the phytocoenoses are well represented the hygrophilous species, like: *Galium palustre*, *Lycopus europaeus*, *Carex pseudocyperus*, *Solanum dulcamara*, *Stellaria aquatica* and *Iris Pseudacorus*. From the **Phragmitetea** class there are present more frequently: *Stachys palustris*, *Typha latifolia*, *Alisma plantago-aquatica* and *Oenanthe banatica*.

Table 5: Ass.Thelypteridi – Salicetum cinereae Samsak 1963

Bf.	F.e.	Relevé	1	2	3	4	5	6	7	K
		Altitude (m)	440	440	440	440	440	440	440	
		Height (m)	2-8	2-8	2-8	2-8	2-8	2-8	2-8	
		Thickness (cm)	5-15	5-15	5-15	5-15	5-15	5-15	5-15	
		Cover (A) (%)	2	1	2	1	2	3	1	
		(B)	63	38	75	63	50	38	50	
		(C)	15	45	13	18	32	10	23	
		Surface (m ²)	250	200	200	200	200	200	200	
Char. ass.										
M	Eua	<i>Salix cinerea</i>	4	3	4-5	4	3-4	3	3-4	V
HH	Circ	<i>Thelypteris palustris</i>	1	3	+	1	1-2	1	2	V
Salicion cinerea , Salicetalia auritae										
H	Circ	<i>Galium palustre</i>	-	+	+	+	+	+	+	V
HH	Circ	<i>Lycopus europaeus</i>	+	+	-	+	+	-	+	IV
M	Eua	<i>Frangula alnus</i>	-	+	-	+	-	+	+	III
MM	Eua	<i>Betula pubescens</i>	+	-	+	-	+	+1	-	III
H	Eua	<i>Molinia coerulea</i>	+	+	-	-	-	+	-	III
HH	Eua	<i>Carex gracilis</i>	-	-	-	+1	-	-	-	I
Alnetea glutinosae										
N	Eua	<i>Solanum dulcamara</i>	+	+	-	+	+	+	+	V
HH	Circ	<i>Carex pseudocyperus</i>	+	+	-	+	+	+	+	V
Th	Eua	<i>Stellaria aquatica</i>	+	+	+	-	-	+	+	IV
G	Eur	<i>Iris pseudacorus</i>	+	-	+	-	+	+	+	IV
HH	Cosm	<i>Lythrum salicaria</i>	+	+	-	+	-	+	-	III
HH	Eua	<i>Carex acutiformis</i>	+	-	-	+	+	-	-	III
H	Eua	<i>Eupatorium cannabinum</i>	+	+	-	-	+	-	-	III
HH	Eua	<i>Lysimachia vulgaris</i>	+	-	-	+	+	-	-	III
H	Circ	<i>Poa palustris</i>	+	-	+	-	+	-	-	III
H	Circ	<i>Prunella vulgaris</i>	-	-	-	+	+	-	-	II
HH	Eua	<i>Cicuta virosa</i>	-	-	+	-	-	-	-	I
Phragmitetea										
HH	Dac	<i>Oenanthe banatica</i>	-	+	-	-	-	+	+	III
HH	Cosm	<i>Typha latifolia</i>	+	-	+	-	+	-	-	III

H	Circ	Stachys palustris	+	+	-	+	+	-	-	III
HH	Cosm	Alisma plantago-aquatica	+	+	-	-	+	+	-	III
HH	Circ	Glyceria maxima	+	-	-	-	+	-	-	II
HH	Eua	Carex riparia	-	-	-	+	-	+	-	II
HH	Eua	Sparganium erectum	+	-	-	-	+	-	-	II
HH	Eua	Oenanthe aquatica	-	+	-	-	+	-	-	II
H	Atl	Epilobium obscurum	-	-	-	+	-	-	-	I
Molinio – Arrhenatheretea										
H	Cosm	Juncus effusus	+	+	-	-	-	+	+	III
H	Circ	Agrostis stolonifera	-	+	+	-	+	-	-	III
G	Circ	Equisetum palustre	-	-	+	-	+	-	-	II
H	Circ	Mentha arvensis	-	-	+	+	-	-	-	II
H	Eua	Ranunculus acris	-	-	-	+	-	-	-	I
Companions										
HH	Cosm	Lemna minor	-	-	-	+	-	+	+	III
HH	Eua	Hydrocharis morsus-ranae	+	+	+	-	-	-	-	III
Th	Cosm	Polygonum lapathifolium	+	+	-	+	+	-	-	III
Th	Eua	Caucalis latifolia	-	-	+	+	+	-	-	III
G	Eua	Juncus compressus	-	+	-	+	-	-	-	II
HH	Cosm	Spirodela polyrhiza	-	-	-	-	+	-	-	I
TH	Eua	Cirsium vulgare	-	-	-	+	-	-	-	I
H	Eua	Sonchus arvensis	-	-	-	-	+	-	-	I

Date of relevés: 1-7: 14. 08. 2004.

Considering that the peat bog is surrounded a forest edified by *Quercus petraea*, the characteristic species for **Molinio-Arrhenatheretea** there are poorly represented. Higher constancy values have *Juncus effusus* and *Agrostis stolonifera*.

The analysis of the dendrogram (Fig. 1) shows a relative uniformity of the floristic composition of the association, excepting relevés 3 and 4, which are somewhat different from the others probably due to their localization, near a pathway.

The analysis of ecological indices (Fig. 2) of this association shows the dominance of mesohydrophytes (31.8%) and hydrophytes (29.3%); mesotherms (60.9%) and amphotolerants (24.3%), as well of the euryionic species (53.6%).

The spectrum of biological forms (Fig. 3) exhibits the predominance of helohydatophytes (45%) and hemicryptophytes (30%).

The analysis of floristic elements (Fig. 4) shows the predominance of Eurasian (50%) and circumpolar (27%) elements.

The analysis of social behavior types (Fig. 5) reveals that two third of the species grows in natural habitats (65%) and one third (35%) are characteristic for disturbed habitats. There are present many ruderal plants (44%), but the tolerant ones (34%) and natural competitor (22%) are also well represented.

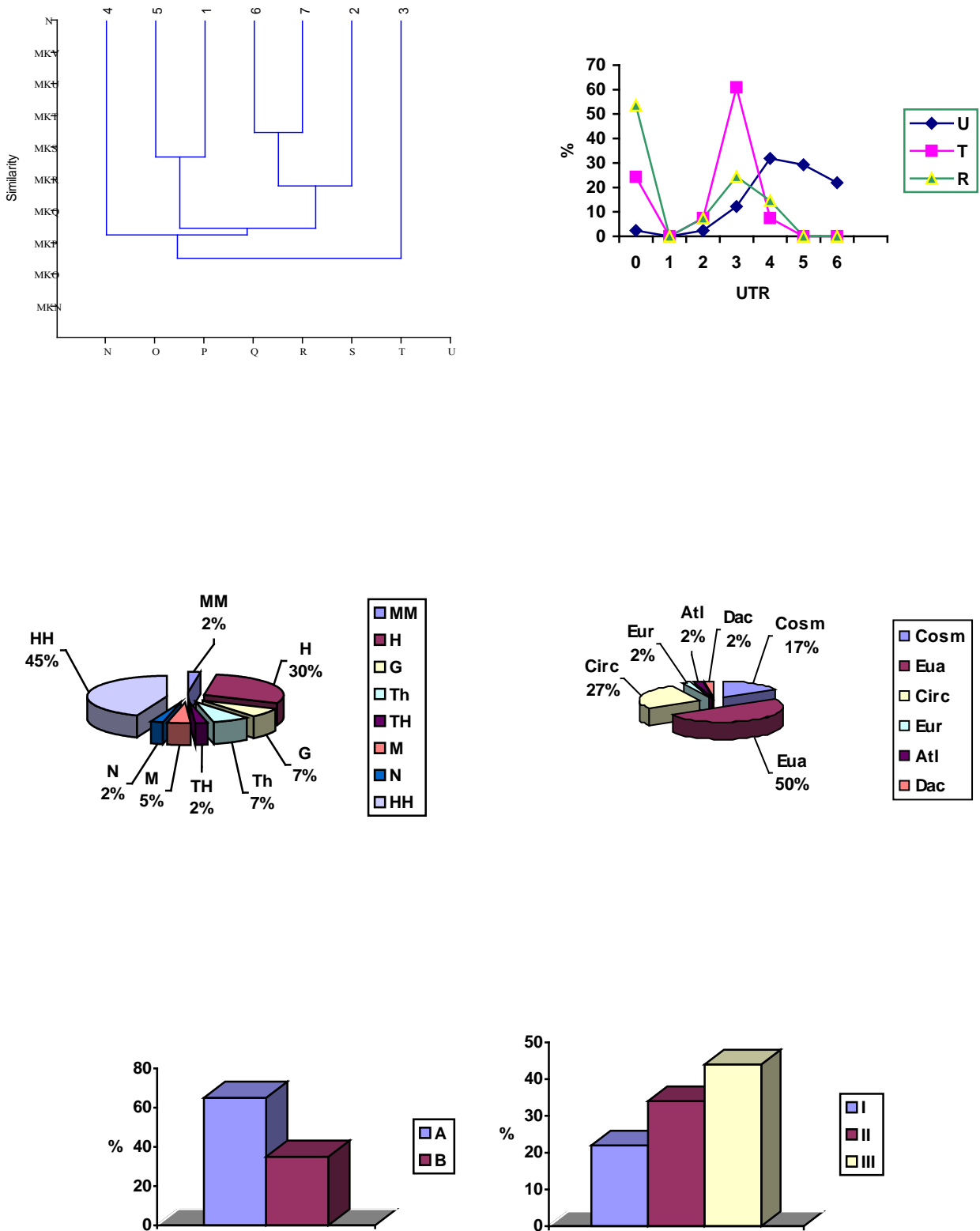


Fig. 5: Distribution of social behavior types in phytoenoses of the *Thelypteridi – Salicetum cinerea* association

Table 6: Ass. Salici cinerea – Sphagnetum recurvi (Zólyomi 1934) Soó 1955

Bf.	F.e.	Relevé	1	2	3
		Altitude (m)	440	440	440
		Height (m)	2-8	2-8	2-8
		Thickness (cm)	5-15	5-15	5-15
		Cover (A) (%)	5	5	5
		(B)	75	70	75
		(C)	15	10	15
		Surface (m ²)	250	250	250
Char. ass.					
M	Eua	<i>Salix cinerea</i>	4-5	2-3	4-5
Brr	Circ	<i>Sphagnum recurvum</i>	1-2	4-5	1-2
Alnetea – Alnion glutinosae					
MM	Eua	<i>Populus tremula</i>	+	+	+
HH	Circ	<i>Thelypteris palustris</i>	2-3	2	1-2
M	Eua	<i>Frangula alnus</i>	+	+	+
H	Cosm	<i>Juncus effusus</i>	-	+	-
MM	Eua	<i>Betula pubescens</i>	1	+	+
HH	Circ	<i>Carex pseudocyperus</i>	+	-	+
Sphagnion - Sphagnetalia					
H	Circ	<i>Drosera rotundifolia</i>	+	+	+
H	Circ	<i>Eriophorum vaginatum</i>	+	+	-
Phragmitetea					
HH	Circ	<i>Scirpus sylvaticus</i>	-	+	+
HH	Cosm	<i>Phragmites australis</i>	+	-	+
H	Eua	<i>Lysimachia vulgaris</i>	+	-	+
H	Cosm	<i>Lythrum salicaria</i>	+	-	+
Ch	Eur	<i>Lysimachia nummularia</i>	+	+	-
Hydrocharition					
HH	Eua	<i>Hydrocharis morsus-ranae</i>	+	-	+
HH	Eua	<i>Salvinia natans</i>	+	-	+
Molinion					
H	Eua	<i>Molinia coerulea</i>	+	-	
Companions					
Brr	Circ	<i>Plagiomnium rostratum</i>	+	+	
Brr	Circ	<i>Brachythecium rutabulum</i>	+	+	
Brr	Circ	<i>Climacium dendroides</i>	±	±	

Date of relevés: 1, 3: 14. 08. 2004.

The phytocoenoses of this association (Table 6) were identified on nutrients poor substratum forming a belt around the peat bog. In the tree layer *Populus tremula*, in the shrub layer *Salix cinerea* are present.

The tree layer is very dense, which makes almost impossible to cross the central part of the peat bog. It shelters, here and there, small water pools populated by *Hydrocharis morsus-ranae*. The herb layer is formed mainly of *Thelypteris palustris*, *Sphagnum recurvum*, and other bryophytes, for example *Plagiomnium rostratum* and *Brachythecium rutabulum*. The phytocoenoses of this association cover large surfaces in the peat bog. The species *Drosera rotundifolia* is rare.

Conclusions

This study reveals that in the “Tăul fără fund” peat bog from Băgău the vegetation is rich and various. On a relative small surface, about 2.5-3 ha, could be identified 6 plant associations, some of them characteristic for peaty substratum.

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**VEGETAȚIA MLAȘTINII DE TURBĂ „TĂUL FĂRĂ FUND” DE LA BĂGĂU
(JUD. ALBA, TRANSILVANIA, ROMÂNIA)**

(Rezumat)

Lucrarea de față prezintă descrierea și analiza vegetației mlaștinii de turbă „Tăul fără Fund” de la Băgău (jud. Alba). Identificarea asociațiilor vegetale s-a făcut în anii 2002 și 2004. În urma investigațiilor au fost identificate 6 asociații vegetale, dintre care unele sunt asociații specifice substratului turbos, în cadrul cărora vegetează planta ocrotită *Drosera rotundifolia*. Majoritatea asociațiilor ocupă suprafețe mici și sunt sărace floristic.

Analiza detaliată a fost efectuată pe bază de 7 relevee asupra fitocenozelor raportate la asociația ***Thelypteridi-Salicetum cinerea***. Analiza efectuată pe bază de indici ecologici a relevat dominarea mezohidrofitelor și hidrofitelor. Dintre formele biologice cele mai numeroase sunt helohidatofite și hemicriptofitele, iar dintre elementele fitogeografice domină plantele eurasiatice și circumpolare. În ceea ce privește comportamentul social, două treimi sunt caracteristice biotopurilor naturale și doar o treime celor perturbate. Pe lângă plantele ruderales (44%), domină speciile tolerante (34%), competitorile fiind mult mai puține (22%).