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THE VEGETATION AROUND OSOI LAKE (BACĂU COUNTY)

OPREA ADRIAN [1], SÎRBU CULIȚĂ [2]

Abstract: A study about the flora and vegetation of the Osoi lake in Goşman-Tarcău Mountains (Eastern Carpathians, Romania) was made. Some of the vascular plants, previously cited in region, have been confirmed by us. Others species has not been identified, as the next ones: *Sparganium minimum*. We've made, also, a study over the communities settled down in and around this lake. Thus, we identified some associations, unmentioned before our study in the vegetation of Osoi lake, namely: *Thelypteridi-Alnetum glutinosae* Klika 1940, *Salicetum cinereae* Zólyomi 1931, *Typhetum angustifoliae* Pignatti 1953, *Carici pseudocyperi-Menyanthetum* Soó 1955, and *Junco inflexi-Menthetum longifoliae* Lohmeyer 1953.

Key words: plant communities, Osoi lake, Goşman-Tarcău mountains.

Introduction

This year (2009), we have made a field trip survey in the southern part of Goşman-Tarcău Mountains, in order to follow the trace of a pretty rare plant species in the flora of Romania, namely *Sparganium minimum* Wallr. (*S. natans* L.) [GOREA L., 2003]. Thus we reached the surroundings of Comăneşti town and Asău village, and finally the Osoi lake, where this plant has been cited from, few years ago [GOREA L., 2003].

The Osoi lake (called also "Lacul fără Fund") is located in the northern part of Comăneşti town and in the western part of Asău village. It is a natural lake, having a surface of ca 2 ha, situated in the southern part of the Goşman-Tarcău Mountains (Eastern Carpathians), in north-west part of Bacău county (Romania) (Fig. 1).

Geographic coordination: N 46º27'40,32"/E 26º22'48,42"/687 m.

The region of Comăneşti-Moineşti-Asău is intensely inhabited, being traversed by important roads and railways connecting Moldavia by Transylvania, along the Trotuş river valley. This area has mountainous features, being separated by the subCarpathians hills on the eastern side by Tazlăul Sărat valley.

Geology: the Goşman-Tarcău Mountains is overlapping on the flysch area on the outer part of Eastern Carpathians. The rock substratum are of Cretaceous and Palaeogene ages. There are a great variety of petrographic facies, like the next ones: clayes, marles, conglomerates, limestones, all of them having a major tectonics in drifting of alluvial deposits. The surface rocks are, in general, acid rocks (it explain the vast majority of the brown acid soils into the region), poor in calcic and ferro-magnesic minerals. The Osoi lake is located on the Preluca Tâlharului summit, delimited by the Asău river on the east side and Trotuş river on the west side. The substratum of this large summit is made by the *Gritstone of Tarcău*.

Relief: the area of Goşman-Tarcău Mountains belong to the middle mountains, concerning their altitude among other mountains in the Carpathian chain. The maximum

[1] Botanic Garden "A. Fătu", 7-9, Dumbrava Roşie Street, Iaşi, Romania, e-mail: aoprea@uaic.ro
[2] University of Agricultural Sciences and Veterinary Medicine Iaşi, Faculty of Agriculture, 3, Mihail Sadoveanu Street, Iaşi, Romania, e-mail: culita69@yahoo.com

altitude is of 1305 m, on Goşmanul Peak, but the altitudes at Asău and Comăneşti have hilly features, with altitudes between 500m and 600 m. Their relief energy vary between 600m and 800m in the central area and between 400m and 600m toward the eastern and western parts. All the interfluves are wavy, having blunted summits and gently backs.

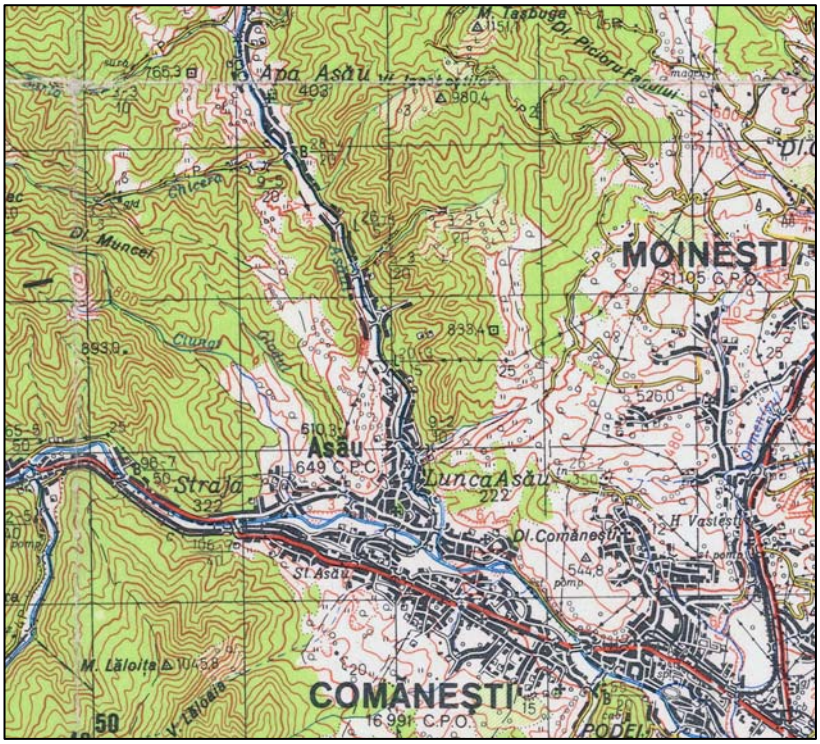

Fig. 1. Physico-geographic map of Comăneşti – Asău region (from DRAGOMIR & al., 1981)

Hydrography: the entire hydrographic net is tributary to Asău and Trotuş rivers. Those two river basins are characterized by the lack of the winter high floods, but the floodings are present during the summer time, especially in July and August. Their supplying through the rains is prevalently, with showers having torrential features. The water supplying of the rivers are supraterraneous (70-80%) and subterraneous (20-30%). The waters of Osoi lake has a double origin: from the springs as well as from pluvial and nival precipitations. The waters are oligomesotrophic, having a pH moderately to weak acid.

Climatology: the closest meteo station is at Tg. Ocna, thus we can presume that climatic data are more or less the same in surroundings of the Osoi lake. The climate has temperate-continental features, with the next characteristics: the yearly average temperature is of 8.4 ºC; the average temperature of the coldest months (January and February) is of –4 ºC, and the average temperature of the warmest months (July and August) vary between 16 ºC and 19 ºC. The dominant winds are coming from west and north-west, with a foehnisation of the air masses reaching the slope bases towards the east and south-west aspects. Frequently fogs along the valleys during the cold seasons are to be met.

The greatest cloudiness period is registered between May and June (6.5 – 7.5) and the smallest cloudiness period is in August and September (5 – 5.6). The average length of the sun shine is of ca 1800 hours/year.

Precipitations: the yearly average is of 690 mm at Asău, most of them falling between May and June (ca 380 mm), the most rainy month being June (with 150-170 mm); the dryest month is December (30 mm).

Most of the winds are registerd along the Asău valley. The average relatively humidity of the air is of 79%.

The area of Preluca Tâlharului summit (where the Osoi Lake is situated) has a humid climate, and the yearly average of precipitations surpassing the potential evapotranspiration with 10% to 40%; but the drought periods are rare and quite shorts.

Soils: the soils has hydromorphic characteristics in the area of Osoi lake.

Vegetation of this region is dominated by the beech communities on the sunny slopes (Ass. *Pulmonario rubrae-Fagetum* (Soó 1964) Taüber 1987) and by the spruce communities on the shady ones (Ass. *Hieracio rotundati-Piceetum* Pawł. et Br.-Bl. 1939). The meadows are dominated by the phytocoenoses of the Ass. *Festuco rubrae-Agrostietum capillaris* Horvat 1951 (Fig. 2).

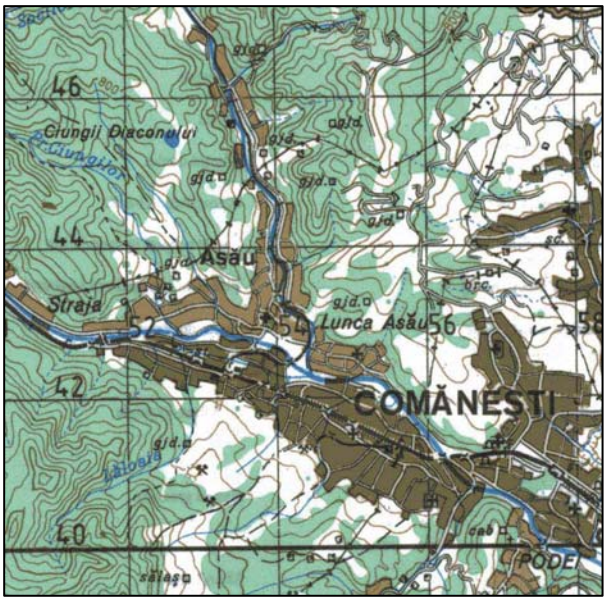

Fig. 2. Vegetation map of Comăneşti area–(from DRAGOMIR & al., 1981

History: [BRÂNDZĂ, 1879-1883], cited some plant species from the village of Asău, namely: *Taxus baccata* and *Ribes alpinum*.

[GRECESCU, 1898] cited from the same place other plants: *Equisetum sylvaticum*, *Caltha palustris*, *Scorzonera humilis*.

[IACOVLEV, 1961] cited *Pinus sylvestris* from the Asău hill.

Lately on [MITITELU & BARABAŞ, 1969, 1974] cited other plants from the same locality and in surroundings: *Brassica nigra, Rubus saxatilis, Galium rotundifolium, Vallisneria spiralis, Agrostis canina*.

[GOREA, 2003] made her PhD in the region of Asău, Camenca, and Tărhăuş water basins, where from she cited other plants in the surroundings of Osoi lake, as the next ones, growing in marsh and water: *Alisma plantago-lanceolata, Alnus glutinosa, A. incana, Bidens tripartita, Blysmus compressus, Callitriche cophocarpa, Caltha palustris, Cardamine pratensis* subsp. *matthiolii, Carex davalliana, C. distans, C. echinata, C. serotina, C. vesicaria, C. vulpina, Catabrosa aquatica, Ceratophyllum demersum, Cyperus flavescens, C. fuscus, Dactylorhiza incarnata, D. maculata, Dryopteris carthusiana, Eleocharis palustris, Epilobium palustre, Equisetum palustre, Eriophorum latifolium, Frangula alnus, Galega officinalis, Galium palustre, Glyceria plicata, Juncus effusus, J. inflexus, Lemna minor*, *Lychnis flos-cuculi, Lycopus europaeus, L. exaltatus, Lythrum virgatum, Mentha aquatica, M. longifolia, Menyanthes trifoliata, Myosotis sparsiflora, Myriophyllum verticillatum, Polygonum hydropiper, Potamogeton crispus, P. pectinatus, Ranunculus repens, R. sceleratus, Rumex palustris, Salix cinerea, Scirpus setaceus, S. sylvaticus, Sparganium erectum* subsp. *neglectum, S. minimum, Stellaria palustris, Thelypteris palustris, Triglochin palustre, Typha shuttleworthii, Utricularia vulgaris, Veronica angallis-aquatica, V. beccabunga* etc. On the Asău hill, she also cited: *Juniperus communis* and *Impatiens parviflora* (this last species has also been cited from Preluci and Lunca Asău). From Asău villages, she cited *Althaea rosea* and *Armoracia rusticana* (as subspontaneous plant species). From the villages of Beleghetul Mare and Tărhăuş is cited *Sisyrinchium angustifolium*. In the same PhD thesis, the author [GOREA, 2003] cited some communities from the Osoi lake, namely: Ass. *Lemnetum minoris*, Ass. *Batrachio trichophylli-Callitrichetum cophocarpae*, Ass. *Carici echinatae-Sphagnetum*, Ass. *Carici flavae-Eriophoretum latifolii*, Ass. *Typhetum shuttleworthii*, Ass. *Caricetum vulpinae*, Ass. *Caricetum vesicariae*, Ass. *Eleocharitetum palustris*, and Ass. *Bidenti-Polygonetum hydropiperis*.

Having in mind those vascular plants already cited in various papers and many others identified by us in the field survey, we can made an assumption that this region does belong to the Euro-Siberian floristic region, Central European East-Carpathian Province, and the Circumscription of Tarcău-Tazlău-Nemira Mountains.

Methodology

The plant nomenclature follow "Flora Europaea" (http://rbg-web2.rbge.org.uk/FE/fe.html). The vegetation was studied using the principles of Central-European geobotanical school of surveying the vegetation (Braun-Blanquet Central European School/School Zürich-Montpellier [BRAUN-BLANQUET, 1964]). We made relevées on definetely surfaces, ordering the plants according to various systems in use into the Romanian references [SANDA & al., 1983].

The phytocoenologic framing of the vegetation follow various authors [SANDA & al., 1997] and [COLDEA, 1991], [COLDEA (ed.) & al., 1997].

The abbreviations used in this paper have the next significations:

CLAS. PAL. = the code of each natural habitat, sensu "Classification of the Palaearctic habitats" [DEVILLERS & DEVILLERS-TERSCHURENS, 1993] (after "Interpretation Manual of European Union Habitat", following the Habitat Directive 92/43/EEC, v. EUR 27/2007).

Results & discussions

a. **Results**

Though we made a special field survey over that region, we are not able to say that some of plants, like: *Sparganium minimum* [GOREA, 2003] are still existing in the Osoi lake or its surroundings. We think this plant is missing now due to the alteration in water regime of Osoi lake, namely a strong and rapidly silting from the edges toward the centre of it (it worth to mention that in the past this lake had about 29 m in depth and almost the entire surface of water was free of vegetation; nowadays, the water depth is much more reduced, as well as the free water surface – there are a thick and compact stratum of vegetation, made of floating vegetation islet, which advance from the edge towards the centre of the lake; right now, approximately a 1/3 of the water surface is free of the vegetation, only – Fig. 3).

Fig. 3. Osoi lake (vue on left side) (photo A. Oprea)

We can confirm some of the associations already cited by [GOREA, 2003] from Osoi lake. But in our field survey we identified other plant communities having a much more dominance (coverage) in the vegetation of that lake.

Thus, the vegetation spread on the western and part of the southern edges of Osoi lake is edified by the phytocoenoses with *Alnus glutinosa* and *Theylpteris palustris*. On the same edge of the Osoi lake, there is installed, on relatively small areas, communities with *Salix cinerea*. The other part of the southern edge and the eastern edge is edified by the plant communities with *Typha angustifolia* and *Theylpteris palustris*. The inner communities are edified by a dense vegetation with *Menyanthes trifoliata* and *Thelypteris palustris*. This last communities made as a matter of fact those already mentioned floating vegetation islets, very characteristic here, reminded us to the Danube Delta Biospere Reserve vegetation. Only on the eastern outer edge one could discover some small communities with *Juncus effusus* and *Juncus inflexus*. On the northern edge there are some trifling patches with *Lemna minor* and *Callitriche cophocarpa* [GOREA, 2003].

We used the next framing of the plant communities, from the phytocoenotic point of view:

ALNETEA GLUTINOSAE Br.-Bl. et Tx. 1943
Alnetalia glutinosae Tx. 1937 em. Th. Müll. et Görs 1958
Alnion glutinosae Malcuit 1929 em. Th. Müll. et Görs 1958
Thelypteridi – Alnetum glutinosae Klika 1940
Salicion cinereae Th. Müll. et Görs 58
Salicetum cinereae Zólyomi 1931
PHRAGMITI – MAGNOCARICETEA Klika in Klika et Novák 1941
Phragmitetalia Koch 1926
Phragmition communis Koch 1926
Typhetum angustifoliae Pignatti 1953
Magnocaricetalia elatae Pignatti 1953
Magnocaricion elatae Koch 1926
Caricenion rostratae (Bálátová - Tuláčková 1963) Oberd. et al. 1967
Carici pseudocyperi – Menyanthetum Soó 1955
MOLINIO – ARRHENATHERETEA R. Tx. 1937
Potentillo – Polygonetalia R. Tx. 1947
Potentillion anserinae R. Tx. 1947
Junco inflexi – Menthetum longifoliae Lohmeyer 1953

b. **Discussions**

Ass. ***Thelypteridi – Alnetum glutinosae*** Klika 1940

The phytocoenoses with *Alnus glutinosa* represent those communities situated along the flooded meadows of rivers, in the plain and hill regions in Southern-Eastern part of Romania. The phytocoenoses are located in depressions, having an excess of humidity and the water table just under the soil surface.

In Romania, this association has also been cited from the Biosphere Reserve of Danube Delta, in Erenciuc lake edges [MITITELU & al., 1997; SANDA & al., 1999], but also from other regions.

In the area of Osoi lake, the coverage of the tree stratum, edified by *Alnus glutinosa* vary between 70% and 95%. The other species has a small coverage of the soil surface (between 5% and 20%). In the shrub layer there are other species, sporadically spread, like: *Viburnum opulus*, *Picea abies* (juvenile trees), *Betula pendula*. Among the herbaceous species, some of them have a greater coverage (e. g. *Carex vesicaria* and *Scirpus sylvaticus*) (Tab. 1).

Tab. 1. Ass. ***Thelypteridi – Alnetum glutinosae*** Klika 1940

Surface of relevée (sq. m)	100	100	100	100	100	
Tree layer coverage (%)	80	95	90	85	70	
Shrubs layer coverage (%)	1	1	1	1	1	V
Herbaceous layer coverage (%)	20	5	10	10	10	
No. of relevée	1	2	3	4	5	
Char. ass.						
Alnus glutinosa	5	5	5	5	4	V
Thelypteris palustris	+	+	+	+	+	V
Alnion et Alnetalia glutinosae						
Carex remota	+	-	+	+	+	IV
Salix cinerea	+	+	+	-	-	III
Frangula alnus	+	+	+	-	-	III

Viburnum opulus	+	-	+	+	-	III
Cardamine amara	+	-	+	-	+	III
Dryopteris carthusiana	+	+	-	-	-	II
Poa palustris	+	-	+	-	-	II
Athyrium filix-femina	+	+	-	-	-	II
Phragmito-Magnocaricetea						
Lysimachia vulgaris	+	+	-	+	+	IV
Scirpus sylvaticus	1	-	+	+	1	IV
Carex vesicaria	1	+	+	1	-	IV
Typha angustifolia	+	+	-	-	+	III
Galium palustre ssp. palustre	-	+	+	-	+	III
Scutellaria galericulata	-	+	+	+	-	III
Eupatorium cannabinum	+	-	+	-	+	III
Solanum dulcamara	+	-	+	+	-	III
Carex acutiformis	-	+	+	+	-	III
Carex riparia	+	-	+	+	-	III
Equisetum palustre	+	-	+	+	-	III
Sparganium erectum subsp. erectum	+	-	-	-	+	II
Caltha palustris	+	-	+	-	-	II
Carex echinata	-	+	-	-	-	I
Carex paniculata	+	-	-	-	-	I
Bidentetea						
Polygonum hydropiper	+	-	+	+	+	IV
Bidens tripartita	+	-	+	-	-	II
Alisma plantago-aquatica	+	-	-	-	-	I
Ranunculus sceleratus	+	-	-	-	-	I
Molinio-Arrhenatheretea						
Carex pallescens	-	+	+	-	-	II
Agrostis stolonifera	+	-	+	-	-	II
Eriophorum latifolium	+	-	-	-	-	I
Aliae						
Betula pendula	+	-	-	+	1	III
Picea abies (juv.)	+	-	-	+	+	III

Place and date of relevées: Osoi lake, 28th of June, 2009

Ass. ***Salicetum cinereae*** Zólyomi 1931

This is a very disputed association as concerning its coenotaxonomic position. It is given under the name *Calamagrostio-Salicetum cinereae* Soó et Zólyomi (1934) 1955 in some papers [e. g. COLDEA, 1991; SANDA & al. 1980; 2001], while in others [e. g. OROIAN, 1998] under the name *Salicetum cinereae* Zólyomi 1931; other authors [e. g. CHIFU & al. 2006] considers those two names as synonymous. We think the phytocoenoses from the vegetation of Osoi lake could be framed under the name *Salicetum cinereae* Zólyomi 1931, since *Calamagrostis canescens* is missing in the floristic structure on the wholly.

Likewise, *Salicion cinereae* alliance, from *Salicetalia auritae* order, is framed by some of the authors [e. g. MUCINA & al. 1993; SANDA & al. 2001] in *Alnetea glutinosae* class (like we did in this paper), while other authors [e. g. POTT, 1995; RODWELL & al. 2002; CHIFU & al. 2006] in *Franguletea alni* class.

This association has been cited in all the regions, from the Danube Delta [SANDA *et al*., 1999] to the mountain valleys of the Carpathian Mountains [COLDEA, 1991].

In our study we identified that only a relatively small surface of Osoi lake is occupied by the phytocoenoses with *Salix cinerea*, on the north-west part of it, in those places where the water layer does not exceed 20-30 cm in depth. Grey willow made communities with coverages between 85% and 90% of the ground surface, in this case. The characteristic species, *Salix cinerea*, is also the dominant one in our phytocoenoses. The

characteristic species for the higher coenotaxa is lacking at all at the Osoi lake. But there are plants from other coenotaxa, like *Carex acutiformis*, *Carex riparia*, and so on, from the vegetation of marshes (*Phragmiti-Magnocaricetea*), or *Alnus glutinosa*, *Thelypteris palustris*, etc. from the vegetation along the rivers (*Alnion incanae*) (Tab. 2).

Tab. 2. Ass. ***Salicetum cinereae*** Zólyomi 1931

Surface of relevée (sq. m)	50	50	50
Tree layer coverage (%)	90	85	80
Herbaceous layer coverage (%)	35	10	3
No. of relevée	1	2	3
Char. ass.			
Salix cinerea	5	5	5
Salicion cinereae et Alnetalia glutinosae			
Thelypteris palustris	2	+	+
Alnus glutinosa	+	+	-
Frangula alnus	+	+	+
Phragmiti-Magnocaricetea			
Scirpus sylvaticus	2	1	+
Carex riparia	+	+	+
Lythrum salicaria	+	+	+
Menyanthes trifoliata	+	+	+
Carex acutiformis	+	+	-
Aliae			
Utricularia vulgaris	+	+	-

Place and date of relevées: Osoi lake, 28th of June, 2009

Ass. ***Typhetum angustifoliae*** Pignatti 1953 (Syn.: *Typhetum angustifoliae* Soó 1927; *Typhetum angustifolio-latifoliae* Schmale 1939 p.p.)

The phytocoenoses of this association are settled down on the southern and eastern edge of the Osoi lake, only. The coverage are between 85% and 90% in our relevées.

The characteristic species, *Typha angustifolia*, is also the dominant one, having coverage indices between 65% and 85%. Other plants with a greater frequence are: *Thelypteris palustris* and *Lysimachia vulgaris* from al. *Magnocaricion elatae* (the vegetation from the same aquatic conditions) or *Equisetum arvense* and *Juncus effusus* from cl. *Molinio-Arrhenatheretea* (the vegetation of the zonal wet meadows) (Tab. 3).

Tab. 3. Ass. ***Typhetum angustifoliae*** Pignatti 1953

Surface of relevée (sq. m)	30	30	30	30
Coverage (%)	85	85	90	75
No. of relevée	1	2	3	4
Char. ass.				
Typha angustifolia	4	4	5	4
Glycerio-Sparganion				
Sparganium erectum subsp. erectum	+	-	+	-
Magnocaricion elatae				
Lysimachia vulgaris	+	+	+	1
Thelypteris palustris	2	2	-	1
Scutellaria galericulata	-	+	+	-
Phragmiti-Magnocaricetea				
Lythrum salicaria	+	-	+	+
Galium palustre subsp. palustre	+	-	+	+
Carex riparia	-	+	+	+
Scirpus sylvaticus	+	-	-	+
Carex vesicaria	+	+	-	-

Alisma plantago-aquatica	+	-	-	-
Potametea				
Callitriche cophocarpa	+	-	-	+
Alnion glutinosae				
Alnus glutinosa (juv.)	+	+	-	-
Salix cinerea (juv.)	-	+	-	-
Frangula alnus (juv.)	-	+	-	-
Molinio-Arrhenatheretea				
Equisetum arvense	+	+	+	+
Juncus effusus	+	-	+	+

Place and date of relevées: Osoi lake, 28th of June, 2009

Ass. ***Carici pseudocyperi – Menyanthetum*** Soó 1955

Phytocoenoses of this association have been described from various regions in Romania, especially in the mountains area, where they are settled down along the valleys, occuring in bogs and marshes; sometimes the phytocoenoses with buckbean (*Menyanthes trifoliata*) are met also in the hilly areas, out of the mountains (e. g. in the Nature Reserve Lozna-Dersca, Botoşani county, or in Bahna Mare-Bălăneşti, Neamț county, and so on).

The communities with *Menyanthes trifoliata* are predominantly around the inner edge of Osoi lake, being the most prevalently vegetation in here, made also the floating vegetation islets, with a quite thick stratum of vegetation and rhizomes, so that it can even sustain a man upon it. The characteristic species is *Carex pseudocyperus*, a constantly species in our relevées; *Menyanthes trifoliata* is the dominant species, with coverages between 85% and 100% of the ground soil and water layer. This association has also been mentioned from Osoi lake [GOREA, 2001], but in the coenotic nucleus of association presented in the phytosociologic table the characteristic plant, *Carex pseudocyperus*, is missing at all. Nevertheless, we have identified this species, in all of our relevées (Tab. 4).

Tab. 4. Ass. ***Carici pseudocyperi – Menyanthetum*** Soó 1955

Surface of relevée (sq. m)	20	20	20	20	20	V
Coverage (%)	100	80	100	100	90	
No. of relevée	1	2	3	4	5	
Char. ass.						
Menyanthes trifoliata	5	4	5	5	5	V
Carex pseudocyperus	+	+	+	+	+	V
Magnocaricion elatae						
Carex riparia	+	1	+	+	+	V
Carex vesicaria	+	-	1	+	-	III
Thelypteris palustris	-	1	+	-	-	II
Scutellaria galericulata	-	-	+	-	+	II
Carex paniculata	-	-	-	+	-	I
Magnocaricetalia elatae et *Phragmiti-Magnocaricetea*						
Lysimachia vulgaris	+	+	+	+	-	IV
Lycopus europaeus	+	+	-	-	+	III
Typha angustifolia	+	+	-	+	-	III
Lythrum salicaria	-	-	+	+	-	II
Galium palustre subsp. palustre	-	+	+	-	-	II
Sparganium erectum	1	-	-	-	+	II
Glyceria nemoralis	+	-	-	+	-	II
Eleocharis palustris	+	-	-	-	-	I
Typha latifolia	-	-	+	-	-	I
Bidention						
Alopecurus aequalis	+	+	-	-	+	III
Alisma plantago-aquatica	+	-	-	+	-	II
Molinio-Arrhenatheretea						

Lysimachia punctata	+	-	+	+	-	III
Lythrum virgatum	+	+	-	-	-	II
Juncus effusus	-	-	-	+	+	II
Salicion et Salicetalia						
Salix purpurea subsp. purpurea	-	+	+	-	-	II
Salix cinerea	-	-	-	+	-	I
Alnion glutinosae						
Frangula alnus	-	-	+	+	-	II
Alnus glutinosa	-	-	-	+	-	I
Aliae						
Utricularia vulgaris	+	+	+	+	-	IV
Callitriche cophocarpa	+	+	+	-	-	III
Eriophorum latifolium	-	-	-	+	+	II
Lemna minor	+	+	-	-	-	II
Veronica scutellata	+	-	-	-	-	I

Place and date of relevées: Osoi lake, 28th of June, 2009

Ass. ***Junco inflexi – Menthetum longifoliae*** Lohmeyer 1953 (Syn.: as. *Mentha longifolia – Juncus inflexus* Passarge 1964)

The phytocoenoses of this association are settled down as a narrow strip on the eastern edge of the Osoi lake, only. The phytocoenoses are established on soils having waters in excess, on water bogging soils, or even swampy soils (being flooded during the spring time), with a weak acid *p*H at the surface. The edificator species of the association, *Juncus effusus*, made densely clusters, among them being placed small clusters of *Juncus inflexus*, as well as *Mentha longifolia*, here and there. On some spots other species could became dominant into the phytocoenoses (e. g. *Agrostis stolonifera* subsp. *stolonifera, Galium palustre* subsp. *palustre*, *Ranunculus repens*, or *Lysimachia nummularia* etc.). Because the soil is humid all the time there are to be met a lot of hydro- and hygrophilous plants, from *Phragmiti-Magnocaricetea*, as they are: *Sparganium erectum*, *Juncus articulatus*, *Typha angustifolia*, *Lycopus europaeus*, etc. (Tab. 5).

Tab. 5. Ass. ***Junco inflexi – Menthetum longifoliae*** Lohmeyer 1953

Surface of relevée (sq. m)	20	20	20
Coverage (%)	95	95	85
No. of relevée	1	2	3
Char. ass.			
Juncus effusus	5	5	4
Juncus inflexus	-	+	2
Mentha longifolia	+	+	+
Potentillo-Polygonetalia et *Molinio-Arrhenatheretea*			
Ranunculus repens	+	+	+
Agrostis stolonifera subsp. stolonifera	+	+	+
Mentha aquatica	+	-	+
Lysimachia nummularia	+	+	-
Rumex conglomeratus	+	-	-
Molinietalia			
Scutellaria galericulata	-	+	-
Equisetum palustre	-	+	-
Bidention			
Alisma plantago-aquatica	-	+	+
Bidens tripartita	-	+	+
Phragmiti-Magnocaricetea			
Juncus articulatus	+	+	+
Sparganium erectum	+	+	-
Typha angustifolia	+	-	+
Galium palustre subsp. palustre	+	+	-

Carex vesicaria	+	-	+
Carex riparia	+	-	+
Lycopus europaeus	-	+	-
Aliae			
Callitriche cophocarpa	+	+	-
Veronica scutellata	+	-	-

Place and date of relevées: Osoi lake, 28th of June, 2009

Concerning the framing under the Habitat Directive 92/43/EEC the vegetation of this lake could be done like this:

- 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae, Salicion albae*). CLAS. PAL.: 44.3, 44.2 şi 44.13 (ass. *Thelypteridi – Alnetum glutinosae* Klika 1940; ass. *Salicetum cinereae* Zólyomi 1931);
- 6430 Hydrophilous tall-herb fringe communities of plains and of the montane to alpine levels. CLAS. PAL.: 37.7 şi 37.8 (ass. *Typhetum angustifoliae* Pignatti 1953; ass. *Junco inflexi – Menthetum longifoliae* Lohmeyer 1953);
- 7140 Transition mires and quaking bogs. CLAS. PAL.: 54.5 (ass. *Carici pseudocyperi – Menyanthetum* Soó 1955.)

Conclusions

- There have been identified phytocoenoses belonging to five associations on and around Osoi lake, which have not been cited before our study in there
- The dominant vegetation of the Osoi lake is made by the phytocoenoses of the next associations: *Thelypteridi-Alnetum glutinosae* Klika 1940, *Salicetum cinereae* Zólyomi 1931, and *Carici pseudocyperi-Menyanthetum* Soó 1955
- Other two associations, namely *Typhetum angustifoliae* Pignatti 1953, and *Junco inflexi-Menthetum longifoliae* Lohmeyer 1953, has a lesser coverage in the vegetation of the Osoi lake
- Three vascular plant species, namely *Sparganium minimum, Blysmus compressus,* and *Carex davalliana*, has not been identified in the Osoi lake waters as they were cited in the references
- Those five plant's communities could be framing onto three natural habitats, as they are: 91E0*, 6430, and 7140.

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