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CONTRIBUTIONS TO THE STUDY OF AQUATIC VEGETATION IN THE VASLUI RIVER BASIN

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Summary: This paper presents two associations from the ***Lemnetea minoris*** de Bolós et Masclans 1955 class and one from the ***Potametea pectinati*** Klika in Klika et Novák 1941 class identified in Vaslui river basin, described in a phytocoenological table and analysed from the point of view of bioforms, floristic elements, and ecological indices.

Key words: phytocoenology, aquatic vegetation.

Introduction

The basin of the river Vaslui is located between the city of Jassy and the town of Vaslui, in the central part of the Central Moldavian Plateau. The Vaslui river springs in the vicinity of the Păun Hill, at an altitude of 340 m, and flows into the Bârlad river, southwards Vaslui. The climate is temperate continental, with an average annual temperature of 10.2ºC and average annual precipitations of 560.8 mm.

After analysing some recent papers on phytosociological nomenclature and classification [7 – 13], the three associations have been included in the following phytocoeno-system:

LEMNETEA MINORIS de Bolós et Masclans 1955
LEMNETALIA de Bolós et Masclans 1955
LEMNION MINORIS de Bolós et Masclans 1955

Lemnetum minoris Oberd. ex T. Müller et Görs 1960

LEMNION TRISULCAE Den Hartog et Segal 1964

Lemnetum trisulcae Knapp et Stoffers 1962

POTAMETEA PECTINATI Klika in Klika et Novák 1941
POTAMETALIA Koch 1926
UTRICULARION VULGARIS Passarge 1964

Lemno-Utricularietum vulgaris Soó 1947

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Material and methods

For the identification of plant associations, we used phytosociological research methods according to the Central–European school. The establishment of the bioforms and floristic elements was made on the basis of *Flora ilustrată a României – Pteridophyta et Spermatophyta*, by V. Ciocârlan (2000). The ecological indices were noted having in mind the works of H. Ellenberg [4].

Results and discutions

Ass. ***Lemnetum minoris*** Oberd. ex T. Müller et Görs 1960
(Syn.: *Lemnetum minoris* Soó 1927, *Lemnetum minoris* Oberd. 1957)

This association populates both sedentary, and slow running waters, or ponds formed by abundant rains, with not very deep water, sometimes surrounded by paludous vegetation.

The characteristic and dominant species is the *Lemna minor*, fully covering the water surface. Other species are part of the *Phragmiti-Magnocaricetea* and *Bidentetea* classes (**Tab. 1**).

After the analysis of the relevées, we noticed the following:

- the **bioforms spectrum** shows the dominance of geophytes (29.41%) and terophytes (29.41%) in equal proportions, followed by hemicryptophytes (17.64%), hydrophytes (11.76%) and hydrohelophytes (11.78%);
- within the **phytogeographic spectrum**, one may notice the presence of a large number of cosmopolitan (41.18%) and Eurasian (41.18%) elements, followed by circumpolar (11.76%) and European ones (5.88%);
- within the **spectrum of ecological indices**, there is a predominance of species which have a low lever of tolerance for shade (7-43.75, 8-31.25%), amphitolerant towards the temperature indice (43.75%), with a spreading area in Central Europe (37.5%), hydrophilic (37.5%), preferring areas with a moderate content of mineral nitrogen (31.25%).

Observations: The association was first recorded in 1970, by C. Dobrescu, within the river Vaslui basin, but with no precise location. In 1975, it was also mentioned by D. Mititelu, but without attaching a table of floristic relevées, and C. Dobrescu (1978) mentions the association from the lacustrian complex at Poenita, presenting just a floristic list.

Table 1
Ass. ***Lemnetum minoris*** Oberd. ex T. Müller et Görs 1960

Number of relevé	1	2	3	4	5	6	
Altitude m s.m.	260	390	120	94	94	345	
Cover of the vegetation (%)	100	100	100	100	95	100	
Surface (m²)	15	10	20	20	10	15	
Number of species	4	1	6	5	10	3	K
Association's characteristics et Lemnion, Lemnetalia, Lemnetea							
Lemna minor	5	5	5	5	4	5	V
Potametea							
Myriophyllum spicatum	+	-	-	-	-	-	I
Phragmiti-Magnocaricetea							
Typha latifolia	+	-	-	+	+	+	III
Alisma plantago-aquatica	-	-	-	+	+	-	II

Phragmites australis	1	-	-	-	-	-	I
Carex vulpina	-	-	1	-	-	-	I
Bolboschoenus maritimus	-	-	+	-	-	-	I
Lycopus europaeus	-	-	-	-	+	-	I
Typha laxmannii	-	-	-	-	+	-	I
Schoenoplectus lacustris	-	-	-	-	-	+	I
Bidentetea							
Bidens tripartita	-	-	+	+	1	-	III
Polygonum minus	-	-	-	1	+	-	II
Bidens cernua	-	-	+	-	-	-	I
Echinochloa crus-galli	-	-	+	-	-	-	I
Variae syntaxa							
Trifolium pratense	-	-	-	-	+	-	I
Cyperus flavescens	-	-	-	-	1	-	I
Epilobium hirsutum	-	-	-	-	+	-	I

Date and place relevées: 1. Dobrovăţ, 23.08.2003; 2. Bârnova, 17.06.2003; 3. Codăeşti, 24.08.2003; 4,5. Vaslui, 20.08.2003; 6. Poieni, 27.07.2003

Ass. ***Lemnetum trisulcae*** Knapp et Stoffers 1962
(Syn.: *Salvinio natantis-Lemnetum trisulcae* Gehu et al. 1995, *Lemnetum trisulcae* Soó 1927, *Lemnetum trisulcae* Den Hartog 1963)

The association has been found in sedentary water ponds, with a high anthropo-zoological influence, that is, with a high level of nitrates, which ensures a rapid development of the *Lemna trisulca* species (**Tab. 2**).

After the analysis of the relevées, we noticed the following:

- within the **bioforms spectrum**, one may notice the presence of a large number of terophytes (40%), due to the anthropic influence, followed by hemicryptophytes (30%), hydrophytes (20%) and geophytes (10%);

- within the **phytogeographic spectrum**, the dominance of Eurasian elements is noticeable (50%), followed by cosmopolitan (40%) and circumpolar ones (10%);

- within the **spectrum of ecological indices**, the species growing in this type of association need a lot of light (60%); they are also amphitolerant towards the temperature index (50%), they have a spreading area in Central Europe (40%), they are hydrophilic (8-30%, 9-30%), and prefer areas with a high content of mineral nitrogen (30%).

Observations: The association has been recorded in this area within a study written by D. Mititelu and his contributors (1995), but without presenting a table of floristic relevées.

Table 2
Ass. ***Lemnetum trisulcae*** Knapp et Stoffers 1962

Number of relevé	1	2	3	4	5	
Altitude m s.m.	196	196	196	196	196	
Cover of the vegetation (%)	100	100	100	95	100	
Surface (m²)	10	10	10	10	10	
Number of species	6	3	4	3	2	K
Association's characteristics						
Lemna trisulca	5	5	5	5	5	V
Lemnion et Lemnetalia						
Lemna minor	1	-	-	-	+	II
Phragmiti-Magnocaricetea						
Lycopus europaeus	-	-	+	+	-	II
Veronica anagallis-aquatica	+	-	-	-	-	I
Phragmites australis	-	-	-	+	-	I

Bidentetea						
Bidens tripartita	+	-	+	-	-	II
Polygonum hydropiper	+	+	-	-	-	II
Bidens cernua	+	-	-	-	-	I
Echinochloa crus-galli	-	-	+	-	-	I
Galio-Urticetea						
Myosoton aquaticum	-	+	-	-	-	I

Date and place relevées: 1-5. Dobrovăţ, 23.08.2003

Ass. ***Lemno-Utricularietum vulgaris*** Soó 1947
(Syn.: *Lemno-Utricularietum vulgaris* Soó 1928)

This association grows in sedentary waters, strongly mudded, rich in disintegrating organic substances.

Floating species, such as *Lemna minor*, grow on the water surface, and *Utricularia vulgaris* develops within the submerse stratum; thus, one may notice a bistratified structure. In addition to these, one can also find species belonging to the *Phragmiti-Magnocaricetea* class (**Tab. 3**).

After the analysis of the relevées, we noticed the following:

- the **bioforms spectrum** shows the dominance of hemicryptophytes (30%), followed by hygrophytes (20%), hydrohelophytes (20%), geophytes (20%) and phanerophytes (10%);

- the **phytogeographic spectrum** indicates the predominance of circumpolar elements (40%), followed by cosmopolitan (20%), Eurasian (20%) and European ones (20%);

- the **spectrum of ecological indices** reveals a dominance of species in need of a lot of light (70%), moderately termophilic (40%), up to amphitolerant towards the temperature indice (40%), with a spreading area in Central Europe (50%), hydrophilic (40%), preferring areas with a moderate content of mineral nitrogen (30%).

Observations: In 1970, C. Dobrescu presented a floristic list of this association but omitted to mention a precise location. In 1978, he presented a floristic list of the Poenita Lake.

Table 3
Ass. ***Lemno-Utricularietum vulgaris*** Soó 1947

Number of relevé	1	2	3	4	5	
Altitude m s.m.	290	290	290	290	290	
Cover of the vegetation (%)	90	70	60	100	70	
Surface (m²)	10	10	10	10	10	
Number of species	6	3	6	4	7	K
Association's characteristics						
Lemna minor	4	3	2	5	4	V
Utricularion, Potametalia et Potametea						
Utricularia vulgaris	1	2	1	1	+	V
Phragmiti-Magnocaricetea						
Typha angustifolia	1	-	2	-	+	III
Lythrum salicaria	+	-	+	-	-	II
Carex vulpina	+	-	+	-	-	II
Carex elata	+	-	-	-	+	II
Phragmites australis	-	+	-	-	+	II
Alisma plantago-aquatica	-	-	+	+	-	II

Variae syntaxa						
Salix cinerea	-	-	-	+	1	II
Calamagrostis canescens	-	-	-	-	+	I

Date and place relevées: 1-5 Poenița Lake, 10.08.2004

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