

## THE VEGETATION OF THE ACCUMULATION LAKE SÂNANDREI (TIMIȘ COUNTY)

### VEGETAȚIA LACULUI DE ACUMULARE SÂNANDREI (JUDEȚUL TIMIȘ)

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**Abstract:** The accumulation lake Sânandrei was founded in 1971, on the course of the brook Valea Lacului, at an altitude of 117 m, on a surface of 50 ha. At present, the lake is leased to a trading company, which exploits it for fishing and recreation. Our research (performed in the period 2004 – 2007) consisted of several trips in the lake area, in various periods, in order to better render the structure of the phytocoenoses. The data processing implied identifying the vegetal associations, following the centralization and analysis of the samples of vegetation collected on the field, drawing up the summary of the cenotaxonomic units and the analysis of the vegetal associations, having several viewpoints in mind. The study is based upon the principles of the Central-European floristic phyto-coenologic school. There have been identified and analyzed 13 vegetal associations, in accordance with the mentions above.

**Rezumat:** Lacul de acumulare Sânandrei a fost înființat în anul 1971, pe cursul pârâului Valea Lacului, la 117 m altitudine, pe 50 ha. În prezent, lacul este concesionat unei societăți comerciale, care îl exploatează pentru pescuit și agrement. Cercetările noastre (întreprinse în perioada 2004 – 2007) au constat în deplasări repetate în perimetrul lacului, în perioade diferite, pentru a putea surprinde cât mai bine structura fitocenozelor. Prelucrarea datelor a presupus identificarea asociațiilor vegetale, în urma centralizării și analizei eşantioanelor de vegetație întocmite pe teren, realizarea conspectului unităților cenotaxonomice și analiza asociațiilor vegetale prin prisma mai multor aspecte. Studiul are la bază principiile școlii fitocenologice floristice central-europene. Au fost identificate și analizate conform mențiunilor de mai sus, 13 asociații vegetale.

**Key words:** phytocoenosis, vegetal association, aquatic and paludicolous vegetation, biodiversity, preservation

**Cuvinte cheie:** fitocenoză, asociație vegetală, vegetație acvatică și palustră, biodiversitate, conservare

#### INTRODUCTION

It is known that in the old days Banat used to be a marshy area. Following the extensive hydro-improvement works performed throughout the ages, there have disappeared from Banat territory a series of natural humid areas (marshes, flooded areas, humid hayfields, etc.), and others have considerably decreased in surface. As these areas got smaller, there have been created artificial developments on considerable surfaces. Thus, in 1971 it was founded along the brook Valea Lacului the accumulation lake Sanandrei.

#### MATERIAL AND METHODS

The study of the vegetation of accumulation lake Sanandrei was performed in the period 2004-2007, Thus, we have undergone several trips in the field, in order to better catch the vegetation particularities. The research is based upon the principles of the Central-European Phytocoenologic School, applied for the first time in our country by BORZA (1934), according to whom the fundamental unit in the study of vegetation is the vegetal association.

We have thus performed phytocoenologic sampling and after the data processing, examining the specialized references, we established the vegetal associations. We had in view the accomplishment of the summary of cenoetaxonomic units and the analysis of the vegetal associations from various points of view (chorology, floristic composition and sinmorphology, sinecology, cenoetaxonomy, sindynamics, significance, conservative value). There were identified and analyzed in keeping with the notes above 13 vegetal associations.

## RESULTS AND DISCUSSION

Following the processing of the field data, we identified in the area studied 13 vegetal associations, most of which were aquatic and paludicolous. The aquatic phytocoenoses are spread upon considerable surfaces, are scarce in species, but the edifying species are represented by populations with a large number of individuals. The paludicolous phytocoenoses are disposed in the shape of strips or clumps at the border between water and land, taking over small areas, most of them representing a nesting place for many species of birds. The number of samples performed on the field (37) we consider to be enough to have an overview of the vegetation. In what follows, it is presented the summary of the vegetation units and then briefly presented the vegetal associations.

The summary of the main cenoetaxonomic units:

- Cls. LEMNETEA W. Koch et Tx. 1934
- Ord. *Lemnetalia* W. Koch et Tx. 1954
- Al. *Lemnion minoris* W. Koch et Tx. 1954
- Lemnetum minoris* (Oberd. 1957) Müller et Görs 1960
- Cls. POTAMOGETONETEA PECTINATI R. Tx. et Prsg. 1942
- Ord. *Potamogetonalia pectinati* W. Koch 1926
- Al. *Potamogeton pussili* Vollmar em. Hejný 1978
- Myriophyllo – Potametum* Soó 1934
- Cls. POTAMETEA Tx. et Prsg. 1942
- Ord. *Potametalia* W. Koch 1926
- Al. *Nymphaeion* Oberd. 1957 emend. Neuhäusl 1959
- Polygono – Potametum natantis* Soó 1964
- Cls. PHRAGMITETEA Tx. Et Prsg. 1942
- Ord. *Phragmitetalia* W. Koch 1926 emend. Pign. 1953
- Al. *Phragmition australis* W. Koch 1926
- Scirpo – Phragmitetum* W. Koch 1926
- Typhaetum angustifoliae* Pignatti 1953
- Typhaetum latifoliae* G. Lang 1973
- Glycerietum maximae* Hueck 1931
- Ord. *Magnocaricetalia* Pign. 1953
- Al. *Magnocaricion elatae* W. Koch 1926
- Phalaridetum arundinaceae* (Horvatič 1931) Libbert 1931
- Caricetum ripariae* Knapp et Stoffer 1962
- Cls. ATREMISIETEA Lohm., Prsg. Et Tx. 1950
- Ord. *Artemisietalia* Lohm. Et Tx. 1947
- Al. *Arction lappae* Tx. 1937 emend. Siss. 1946
- Sambucetum ebuli* (Kaiser 1926) Felföldy 1942
- Cls. SALICETEA PURPUREAE Morr 1958
- Ord. *Salicetalia purpureae* Morr 1958
- Al. *Salicion albae* (Soó 1930 n.n.) Müller et Görs 1958
- Salicetum albae* Issler 1924 s.l.

Cls. ALNETEA GLUTINOSAE Br.-Bl. et Tx. ex Westhoff et al. 1946  
Ord. *Salicetalia auritae* Doing 1962  
Al. *Salicion cinereae* Müller Th. et Görs ex Pass. 1961  
*Rubo – Salicetum cinereae* Sonasak 1963  
Cls. QUERCETEA PUBESCENTI-PETRAEAE (Oberd. 1948) Jakucs 1060  
Ord. *Prunetalia* Tx. 1952  
Al. *Prunion spinosae* Soó (1930, 1940) 1950  
*Pruno spinosae – Crataegetum* Heuck 1931

*The association of duckweed* (1 phytocoenosis described) is frequent in Banat as in all aquatic areas in our country. Still, in the last period it has recorded an obvious regressive tendency. It is known that this community shows a reduced kenotic diversity, but an impressive number of individuals, forming a compact stratum on the water surface. It grows well in clearings but also under the protection of reeds, rush and manna grass. In Sanandrei it develops well due to the high nutrient content in the water. The biomass represents a food source for water birds.

*The association of water milfoil with arrow grass* (1 phytocoenosis described) also has a low floristic diversity. It is constituted almost entirely of *Potamogeton crispus*. Its excessive development shows a deficit in oxygen in the water and significant accumulations of organic material, a fact proved by the chemical analysis of the water. The association sometimes represents shelter and food source for some fish.

We have identified *the association of arrow grass with pond smartweed* (2 phytocoenosis described) with the sub-association *potametosum natantis*. *Potamogeton natans* is abundant, edifying technically by itself these communities, while *Polygonum amphibium* is rare. The association occupies considerable surfaces in Sanandrei, mainly in areas with still waters, with optimal lighting, but also under the cover of willows. Due to the fact that it is a natant species, the arrow grass hinders the emergence of other communities. It prefers waters rich in nutrients, which explains its abundance in Sanandrei.

*The reed plots* (4 phytocoenosis described) are present in most stagnant water accumulations in the country. In Banat, they used to occupy large areas, but today, because of the extensive hydro-improvement works performed in the area, they appear isolated and under greatly changed ecological conditions, a fact which influenced their floristic composition (NEACȘU *et al.*, 2008). The reeds mainly ensure the protection and consolidation of aquatic pool shores. It is also known their capacity of concentrating heavy metals, being successfully used for ecological restoration through phyto-improvement. They are also used in cellulose and paper industry and for light construction works. They represent a well protected shelter and nesting place for birds.

*The reeds* (7 phytocoenosis described) are very frequent in all country regions, developing luxuriantly on lake and pond shores, along channels with stagnant water. Although it resists well to water level modifications, it still prefers 0.5-0.8 m – deep waters, at their shelter aquatic phytocoenosis developing well. In the structure of the phytocoenosis analyzed by us, we have identified many species, most being characteristic for the association. Just as well represented are the communities of *Typha angustifolia* as well as those of *T. latifolia*. Considering its importance, the reed is sometimes used in household industry, for knitting.

*The edified phytocoenosis of manna grass* (7 phytocoenosis described) grow on soils rich in nutrients, in areas where the water does not exceed 50 cm. In Sanandrei they are arranged in the shape of narrow bands at the border of rush representing an association passing to land vegetation. The value of these phytocoenosis is still reduced, sometimes the biomass is

used as hay, but it has a low quality. For these reasons, drainage is often performed to hasten the succession to other phytocoenoses.

*Phalaridetum arundinaceae* (3 phytocoenoses described) is a community frequently mentioned in our literature. In Sanandrei it is common, growing abundantly at the water shore. Although it is good fodder, because of the lands improper for pasturage on which it grows, the species is not exploited in this respect. Considering its importance, it often represents shelter for some aquatic species, and, recently, the species has been grown for its use as ornamental plant.

*The sedge* (7 phytocoenoses described) are very frequent both in the country and in Banat. They grow on the shore, on humid soils, frequently flooded in the spring. It represents a community which prefers the light, withdrawing from dark places. These meadows are sometimes a shelter and nesting place for birds. Considering its economic importance, the quality of the fodder is low.

*Danewort weeds* (2 phytocoenoses described) are frequent on lands rich in organic substances, on the edge of the road, on vacant lands, where the animals had stayed. They often appear on water shores, over extended areas, with a rich content of nutrients. In this situation are found the two phytocoenoses analyzed by us in Sanandrei, installed near a former animal farm. Among the species characteristic for the association we have noted *Urtica dioica*, *Artemisia vulgaris*, *Galium aparine*, together with which appear other weeds such as pigweed, bindweed, wormwood, black nightshade, etc. Their presence shows the tendency of the vegetation to become ruderal. Considering its importance, because of the well developed radicular system, the danewort participates in consolidating shores, while the roots and the rhizomes have medical uses.

In our country *the crack willow* (1 phytocoenosis described) is mostly present in the Danube meadow, but it also appears in the meadows of other rivers. It grows in conditions of excessive humidity, forming genuine forests of willows and poplar trees. Although the specific diversity within the phytocoenoses is high, the phytocoenosis in Sanandrei does not observe this description, *Salix alba* and *S. cinerea* have a significant participation, in the herbaceous stratum only finding *Symphytum officinale*, *Lythrum salicaria*, *Lysimachia vulgaris* and a few specimens of horsetail and sedge. We signal the absence of the species of poplar tree. Considering the importance, these communities ensure the strengthening of the shores, protecting the soils against erosion, they represent a shelter for water birds, sometimes the biomass is used as source of firewood for certain light buildings. The bark is used in popular medicine, due to its anti-fever and anti-rheumatic qualities. We should not omit the landscape value which they have. The evolution tendency, under conditions of soil draining, is towards forest associations.

*The osier brushwood* (1 phytocoenosis described) is not widely spread. In Sanandrei, we analyzed a almost entirely edified phytocoenoses of *Salix cinerea*, in the herbaceous stratum also participate *Carex riparia* and *Lythrum salicaria*. These communities ensure a shelter and nesting place for birds. Under normal conditions, the evolution tendency is towards forest associations, but as the lake is strongly anthropized, this direction is excluded.

*The blackthorn* (2 phytocoenoses described) are frequently encountered in forest clearings, on sunny slopes, on cleared lands. Normally, these communities move towards forest vegetation. In the area of the accumulation lake, they occupy insignificant surfaces, being often cleared, appearing in their place associations of specific weeds. Regarding the physiognomy, these bushes are arranged in two strata: a shrubby one, dominated by blackthorn, and a herbaceous one, invading the former. It represents a shelter and nesting place for birds and they have an anti-erosion importance. The blackthorn also has medical uses (mainly the flowers).

Regarding the conservative value, we mention that the associations *Salicetum albae* and *Potametum natantis* are part of habitats with a high conservavtive value, while the associations *Lemnetum minoris*, *Phalaridetum arundinaceae*, *Glycerietum maximae*, *Scirpo-Phragmiteum* and *Caricetum ripariae* have a moderate conservative value, but which tends to become high, under the conditions of the threat of extinction of several species. The other associations are common.

(Because of their scale, the synthetic tables for the associations could not be included in the paper. The authors may offer them to those interested in analyzing them.)

### CONCLUSIONS

Following the research performed in the area of the accumulation lake Sanandrei, we have identified 13 vegetal associations. From the point of view of their conservative value, the associations *Salicetum albae* and *Potametum natantis* are part of habitats with a high conservavtive value, while the associations *Lemnetum minoris*, *Phalaridetum arundinaceae*, *Glycerietum maximae*, *Scirpo-Phragmiteum* and *Caricetum ripariae* have a moderate conservative value. As for their importance, these communities represent mainly a dwelling a food source for aquatic fauna (insects, fish, birds, etc.), they contribute to consolidating the shores and they have economic significance because some of their biomass is industrially or medically used. The geo-botanical, landscape and recreation relevance must not be left out. All in all, we consider it necessary to preserve the biodiversity of the accumulation lake Sanandrei and its adequate management in order to prevent the damage and decrease of its resources.

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