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THE VEGETATION AROUND THE ACCUMULATION LAKES OF THE ARGEŞ RIVER. THE ROLE OF VEGETATION IN THE BIRDS LIFE

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ABSTRACT. The paper presents the vegetation around the accumulation lakes of the Argeş River and the role of the vegetation in the bird`s life. There are described the most important vegetal associations and the main accumulation lakes, including their role in bird`s life.

Key words: accumulation lakes, Argeş River, vegetal associations, aquatic vegetation.

REZUMAT. Vegetația din jurul lacurilor de acumulare de pe râul Argeș. Rolul vegetației în viața păsărilor. Lucrarea prezintă vegetația din jurul lacurilor de acumulare de pe râul Argeș și rolul ei în viața păsărilor. Sunt descrise cele mai importante asociații vegetale și principalele lacuri de acumulare, incluzând și rolul acestora în viața păsărilor.

Cuvinte cheie: lacuri de acumulare, râul Argeș, asociații vegetale, vegetație acvatică.

INTRODUCTION

In the food chain birds proved to be very sensitive indicators of the health of ecosystems. Birds feel and react more sensitively to the changes of the landscape; the existence of each species is related to certain environmental conditions. If food resources or places of nesting disappear, birds are forced to abandon that territory (Doniță et al. 2005).

MATERIALS AND METHODS

Zigoneni Lake

The surrounding hills are covered with forests of beech (*Fagus sylvatica* L.) and hornbeam (*Carpinus betulus* L.), oak (*Quercus robur* L.) and sessile oak, *Quercus petraea* (Mattuschka) Liebl., fruit orchards and crops. The paludous vegetation is quite scanty being present mainly to the end of the lake. On the right, there is a reminiscence of the former water meadows in the area.

Vâlcele Lake

The surrounding hills and meadows are covered with deciduous forests, fruit orchards and crops. Paludous typical vegetation is scanty and covers small areas from the end of the lake.

Budeasa Lake

The surrounding hills and meadows are covered with deciduous forests, fruit orchards and crops. Paludous typical vegetation is scanty and covers small areas from the end of the lake.

Bascov Lake

The middle parts of the right and left banks have swamp areas with aquatic vegetation consisting of species belonging to the genera: *Phragmithes*, *Typha*, *Carex*, *Juncus*, forming thicket and reeds; on the left bank the area that they cover represents a passage towards the riverside coppice. Here there are species of *Salix* sp., *Alnus* sp. and *Populus* sp. towards the end of the lake; on the left we find a cluster of coniferous trees (*Pinus* sp.).

Inside the basin the accentuated clogging allowed the formation of clogging portions of land, and consequently in the middle of the lake appeared an island characterized by hygro-hydrophilic vegetation species such as: *Carex* sp., *Juncus* sp., *Phragmites* sp., *Typha* sp., and copies of : *Salix* sp., *Alnus incana* (L.) Moench, *Populus alba* L.

The end of the lake is invaded by specific paludous vegetation. Among the submerged species we mention: *Ceratophillum* sp. (sickle), *Myriophyllum* sp., species of green algae etc.

Pitești Lake

The paludous vegetation is represented by species of the genera: *Carex*, *Juncus*, *Phragmites*, *Typha*., *Salix*, *Alnus* etc., plus, in some areas, isolated specimens of *Populus* sp. and *Juglans* sp., (Combroux & Schwoerer,. 2007).

Golești Lake

On the left bank of Golești Lake, there is cultivated vegetation (wheat, corn, vegetables) accompanied by uncultivated herbaceous plants, representing shelter and stopover for birds such as *Coturnix coturnix* (Linnaeus, 1758) which nest among the cornfields, being protected from predatory species. In this area we find especially species of the order *Passeriformes.* Hygro-hydrophilic vegetation (represented by species of the genera *Carex*, *Juncus*, *Phragmites*) was installed in small numbers; they are seen especially to the end of the lake. The right bank is bordered by the Pitești ring road (motorway regime) and an area of grass and woody vegetation that represents a good place for shelter and brooding. Towards the end of the lake there are a few mature alders grown, where species as *Corvus monedula* Linnaeus, 1758 and *Corvus frugilegus* Linnaeus, 1758 can be found

(Bruun, 1999). Between the woody vegetation & the lake there is a long area of sand and gravel; its width varies during the year: it is lower during periods when the river flow reaches high levels and higher during periods of drought. Both, the woody vegetation and the grass, represents a shelter for various species of birds, being a proper environment for the life of the birds. The floating aquatic vegetation is present especially to the end of the lake which is not cemented; it could never be found on the whole water surface. In the accumulation lakes zone, the most present species are the hydrophilic, supernatant, terrestrial or frequently submerged herbaceous plants (*Myriophyllum verticillatum* L.) having a circumpolar or cosmopolitan center of spreading, predominantly Eurasian (*Sparganium erectum* L.) or European (*Mentha aquatic* L., *Polygonum mite* L.); in our country these species can be commonly found in ponds and marshes and steppe to the mountain beech forest floor. The ecological spectrum highlights the environmentally adapted species to the humidity conditions (hydrophilic) specific to the banks (*Typha* sp.) and to the still or slow flowing water (*Myriophyllum verticillatum* L., *Lemna minor* L. etc.) shallow (less than 2 m.), having high demands for the supply of nutrients (eutrophic-mesotrophic), sometimes nitrophos (*Polygonum mite* L., *Urtica dioica* L.). There could be also met species adapted to acid ph (*Lemna minor*) or moderately acidic (*Lythrum salicaria* L.). On the banks covered by forest, I noticed *Alnus glutinosa* (L.) Gaertn. formations, frequently accompanied by *Prunus spinosa* L., *Crataegus monogyna* Jacq., *Rubus caesius* L., etc. Among herbaceous species are to be mentioned: *Agrimonia eupatoria* L., *Carex sylvatica* Huds., *Urtica dioica* L., *Lysimachia nummularia* L. etc. The phytocoenosis have an average degree of closure (the layer covering the tree is 60%) which favored the development of shrubs (45% coverage) and grasses (75% coverage).

From a phytocoenology viewpoint there were identified nine plant associations that are grouped as follows:

LEMNETEA O. de Bolos et Masclans 1955.
LEMNETALIA MINORIS O. de Bolos et Masclans 1955.
Lemnion minoris O. de Bolos et Masclans 1955.
- *Lemnetum minoris* Müller et Görs 1960.

POTAMETEA Klika in Klika et Novak 1941.
POTAMETALIA Koch 1926.
Ceratophyllion demersi Den Hartog et Segal ex Passarge 1996.
- *Potamo – Ceratophylletum submersi* Pop 1962.

ISOETO – NANOJUNCETEA Br.-Bl. et R. Tx. 1946.
NANOCYPERETALIA Klika 1935.
Nanocyperion Koch ex Libbert 1932.
- *Juncetum bufonii* Felföldy 1942.

PHRAGMITETEA R. Tx. et Preising 1942.
PHRAGMITETALIA Koch 1926.

Phragmition australis Koch 1926.

- *Phragmitetum australis* Schmale 1939.
- *Typhetum angustifoliae* Pignatti 1953.
- *Typhetum latifoliae* Lang 1973.

BIDENTETEA TRIPARTITAE R. Tx. et al. In Tx. 1950.

BIDENTETALIA Br.-Bl. et Tx. ex Klika et Hadac 1944.

Bidention tripartitae Nordhagen 1940 em. R. Tx. In Poli et Tx. 1960.

- *Polygono hydropiper-Bidentetum* Lohm. 1950.

STELLARIETEA MEDIAE R. Tx. et al. ex von Rochow 1951.

SYSYMBRIETALIA J. Tx. In Lohmeyer et al. 1962.

Sysymbrion officinalis R. Tx., Lohmeyer et Preising in R. Tx., 1950.

- *Hordeetum murini* Libbert 1932 em Passarge 1964.

ARTEMISIETEA VULGARIS Lohmeyer et al. In R. Tx. 1950.

ONOPORDETALIA ACANTHII Br.-Bl et R. Tx. ex Klika et Hadač 1944.

Arction lappae R. tx. 1937.

- *Conietum maculati* I. Pop 1968.

RESULTS AND DISCUSSION

Description of associations:

- ***Lemnetum minoris*** Müller et Görs 1960.

The association was found in the evacuation canals of Budeasa Lake, around the clogged ponds and ponds resulted after heavy rains. The phytocoenosis of this association are double layered, growing in the waters of lakes, ponds, and canals. They are dominated by *Lemna minor*, which is also the characteristic species, with coverage of 80%, accompanied by characteristic species for Lemnion alliance, order Lemnetalia and class Potametea: *Galium palustre* L., *Alisma lanceolatum* With., *Juncus effusus* L. etc.

The submerged layer consists of the following species: *Ceratophyllum demersum* L., *Myriophyllum spicatum* L., *Potamogeton crispus* L. The association is found in open spaces and under the paludous vegetation. The submerged layer is mainly composed of *Ceratophyllum demersum*. The syndynamic trend association is marked by the presence of many species characteristic for Phragmitio-Magnocaricetea and Bidentetea. The association has not been cited so far in Lake Budeasa (Sanda et al., 1995).

- ***Potamo – Ceratophylletum submersi*** Pop 1962.

The phytocoenosis of the association grow in Vâlcele, Zigoneni, and Budeasa Lakes at shallow depths of 60-120 cm. The substrate is a clay soil, rich in nutritive salts with neutral or slightly basic reaction. *Ceratophyllum submersum* is the dominant & characteristic species; it is accompanied by the characteristic

elements of the alliance and order Potamogetonetalia pectinates. In the structure of the association are also met submerged & floating of Lemnion and Hydrocharition which make the position of these syntaxonomical groups difficult to be set.

- ***Juncetum bufonii*** Felföldy 1942.

The pioneer coenoses of bufonus vegetate in ditches, besides roads, where the soil was denuded of vegetation or where they accumulated alluvia. The coverage is relatively low and the edified layer of *Juncus bufonius* L. is short. The characteristic species for the superior cenotaxons are poorly represented. An important weight has the grassland mezohygrophilous species characteristic for Molinio-Arrhenatheretea, a fact which shows the evolution towards the associations of this class. The association has not been cited so far in Budeasa Lake.

- ***Phragmitetum australis*** Schmale 1939.

The association was seen on the edge of Budeasa Lake and in a marshy place next to it. *Phragmite australis* (Cav.) Trin. ex Steud. (cane) is the characteristic & dominant species; it is 2-3 m tall; they form homogeneous cenosis having the aspect of a miniature forest. This fact allows the development of a small number of species in the lower layer. Sometimes *Lemna minor* species or *Scirpus sylvaticus* L. can be more developed; they cover up to 20%.

- ***Typhetum angustifoliae*** Pignatti 1953.

The association was seen on Budeasa Lake up to 1 m deep. It is also spread near ponds, marshes and along smooth flow water canals. The phytocoenosis of the association are usually found between the aquatic associations of the lakes and Phragmitetum communis. It prefers waters up to 1 m deep; they can move towards aquatic basins of up to 1.5 m. deep.

The phytocoenosis of this association tend to replace reed plots in territories where man intervenes repeatedly. The floristic inventory of the association totalizes a big number aquatic and wetlands cormophyte species. The dominant feature is *Typha angustifolia* L. which forms a 2 meters high even layer. The hydrophilic plants such as *Oenanthe aquatica* (L.) Poir., *Alisma lanceolatum* With., *Alisma plantago-aquatica* L., *Myosotis scorpioides* L., *Sparganium erectum* L., *Glyceria fluitans* (L.) R. Br. play an important coenotic role in the floristic composition of the association.

The economic importance: narrow-leaved bulrush is harvested and used by locals in the domestic industry for making wickerwork. The association contributes to clogging water basins because it can resist to big fluctuations of the water level.

- ***Typhetum latifoliae*** Lang 1973.

This association grows in some ponds from Budeasa Lake area. *Typha latifolia* L. edyfies phytocenosis that develops as patches at the edge of ponds,

canals, and swampy areas where the bogs during the entire season of vegetation, not exceeding a depth of 40-50 cm. It prefers still eutrophic waters, with recent bioaccumulation, on soils rich in nutrients.

The floristic composition of the phytocoenoses of this associations gathers hydrophilic, hydrophilic and mesohydrophyll plant species. The dominant characteristic species *Typha latifolia* (rush) which forms even layer of 1.5-2 m. The presence in the floristic composition of species in other classes (Bidentetea, Lemnetea, Potametea) points out the sindynamic of association and the relationship with vegetal groups of these classes. Often, *Lemna minor* has a high coverage, forming a natant facies.

- ***Polygono hydropiper-Bidentetum*** Lohm. 1950.

The phytocoenosis this association installs as strips or clusters, along riverbanks, lakes, ponds, and dammed canals. It vegetates on alluvial soils flooded in spring and tending to get dry in summer. It is a meso-hygrophyll, heliophyll association that develops in summer and reaches its apex in autumn.

The association was identified at the edge of puddles or clogged irrigation canals vegetating on sandy alluvia rich in decaying organic material. It is a pioneer nitrophyll & hydrophyll association of annual weeds. The physiognomy of this association is given by *Polygonum hydropiper* as the dominant characteristic species having maximum constancy and *Bidens tripartita* characteristic co-dominant species that also has maximum constancy.

- ***Hordeetum murini*** Libb. 1932.

The association was identified on roadsides, on garbage plots and on plots of land situated next to railways. The characteristic & edifying species *Hordeum murinum* L. forms a compact 25 cm high carpet which covers over 75-90% of the surface. It is often accompanied by *Bromus tectorum* L., which becomes co-dominant. Among the most frequent accompanying species are: *Atriplex tatarica* L., *Cynodon dactylon* (L.) Pers., *Lepidium ruderale* L. The phytocoenosis of this association prefers sunny areas and sandy soils. The association was met Budeasa at the aquatic club near the canal from the Little Budeasa and in the canal along the road to Budeasa.

- ***Conietum maculati*** I. Pop 1968.

The Association was identified in places where garbage was collected. The characteristic and edifying species is *Conium maculatum* L. which forms 2 m high clumps that cover the other species that disappear from the respective coenoses. However, in the studied area there is a high weight of ruderal & annual species which are characteristic for Stellarietea mediae - Sisymbrietalia, such as *Atriplex tatarica* L., *Amaranthus retroflexus* L., *Plantago major* L., *Convolvulus arvensis* L., *Arctium lappa* L., *Artemisia vulgaris* L., *Solanum nigrum* L.. The nitrophyll hemlocks are toxic and stinky because of the Coniine alkaloid and can

cause poisoning to animals that eat it. The association was found near the dam of Budeasa.

CONCLUSIONS

There were described 6 accumulation lakes of the Argeş River and 9 vegetal associations which has a very important role in bird`s life and offer food resources or places of nesting.

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