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VEGETATION OF THE LOWER TISA RIVER

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Abstract

The preliminary results on the recent autochthonous vegetation of the lower part of the Tisa river are presented. The investigations included forest, marsh, meadow, and meadow-steppe vegetation types.

Introduction

The phytocenological aspect of vegetation of the floodplain of the lower Tisa river has been insufficiently examined. An intensive melioration and certain other anthropogenic factors have considerably disturbed natural vegetation bordering the Tisa river and reduced it to a narrow belt. In a limited portion of the Tisa river shore, most vegetation belongs to the anthropogenic forest phytocenoses (Euramerican poplar, willow, and American ash). With regard to the floral composition, no specific features are shown. Natural vegetation is recorded only in the form of small oases, and it has preserved its characteristics despite the strong anthropogenic influence.

This paper describes the most important characteristics of recent autochthonous vegetation along the Tisa river banks which is threatened with decline due to a permanent anthropogenic influence.

Materials and Methods

Investigation into plant covering of the floodplain of the Tisa river (from Horgoš and Martonoš to its mouth into the Danube) was performed according to the method of BRAUN-BLANQUET (1928, 1951). Plant material was determined according to Flora SR Srbije (1970—1977) and JÁVORKA (1925, 1975). Sintaxonomic location of vegetation units was presented according to Soó (1964—1980) and Prodromus phytocoenosum Jugoslaviae (1986).

Results and Discussion

List of vegetation units
Class: **Salicetea purpureae** MOOR (1958) 1960
Order: **Salicetalia purpureae** MOOR (1958) 1960

Alliance: *Salicion triadrae* Malcuit 1929, Müller et Görs 1958 (non Br.-Bl. 1956)
Ass.: *Salicetum triandrae* Malcuit 1929
Alliance: *Salicion albae* Soó (1930) 1940
Ass.: *Salicetum albae-amygdalinae* Slavnić 1952
(*Salicetum albae-fragilis* Soó 1971)
Class: **Querco-Fagetea** Br.-Bl. et Vlieg. 1937
Order: **Populetalia albae** Br.-Bl. 1931
Alliance: *Alno-Quercion roboris* Horvat 1938
Ass.: *Populetum nigrae-albae* Slavnić (1942) 1952
Class: **Phragmitetea** W. Koch 1926
Order: **Phragmitetalia** W. Koch 1926
Alliance: *Phragmition communis* W. Koch 1926
Ass.: *Scirpo-Phragmitetum* W. Koch 1926
subass. *typhetosum (angustifoliae-latifoliae)* Soó 1973
subass. *phragmitetosum* Schmalle 1939
subass. *bolboschoenetosum maritimi* Ubrizsy 1961
Ass.: *Glycerietum maximae* Hueck.1931
Order: **Magnocaricetalia** Pign. 1953
Alliance: *Magnocaricion* W. Koch 1926
Ass.: *Heleochareto-Caricetum nutantis* R. Jov. 1958
Alliance: *Caricion gracilis* (Neuhä. 1959, Bal-Tul. 1963) Oberd. 1967, Soó 1968
Ass.: *Caricetum gracilis* R. Tx. 1937
Class: **Molinio-Arrhenatheretea** R. Tx. 1937
Order: **Molinietalia** W. Koch 1926
Alliance: *Deschampsion caespitosae* Horvatić 1930
Order: **Arrhenatheretalia** Pawl. 1926
Alliance: *Arrhenatherion elatioris* Br.-Bl. 1925
Ass.: *Arrhenatheretum medioeuropaeum* (Scherr. 1925/non Br.-Bl. 1915/)
Horvatić 1941
Order: **Agrostietalia stoloniferae** Oberd. 1967
Alliance: *Agropyro-Rumicion cripsi* Nordh. 1940
Class: **Festuco-Brometea** Br.-Bl. et R. Tx. 1943
Order: **Festicetalia valesiacae** Br.-Bl. et R. Tx. 1943
Allianc: *Festucion rupicolae* (sulcatae) Soó (1940) 1964
Ass.: *Coronillo-Festucetum sulcatae* Parabućski 1982
Alliance: *Artemisio-Kochion* Soó 1959
Ass.: *Agropyro-Kochietum prostratae* Zólyomi 1958
subass. *thymetosum* Stojanović (1981) 1983
subass. *artemisietosum* Stojanović (1981) 1983

Forest vegatation

Ass. Salicetum triandrae. The stands of this pioneer forest phytocenosis occur near running waters, occupying very small areas. They are exposed to long-term floods, while during summer to a sudden natural draining. Such extremes affect their specific stratification: a stratum of small trees and shrubs and a stratum of herbaceous plants.

Salix triandra L. is a dominant species. Also frequent are *Amorpha fruticosa* L and *Salix alba* L. while scattered are *Fraxinus americana* L., *Fraxinus lanceolata* Borkh., *Populus alba* L. and *Populus nigra* L. (near Bečej).

The stratum of herbaceous plants is characterized by certain floral luxuriance. Among others, *Poa palustris* L., *Agrostis alba* L., *Iris pseudacorus* L., *Lysimachia nummularia* L., and *Bidens tripartitus* L., are abundant to some degree.

Ass. Salicetum albae-amygdalinae. Of the natural forest phytocenoses found in the Tisa Basin, the most widespread are the stands of this association.

In the stratum of trees, owing to absolute domination of the species *Salix alba* L., very small numbers of other plant species are present. Considerably less frequent is *Salix triandra* L. while scattered are *Populus alba* L., *Populus nigra* L., *Fraxinus laceolata* BROKH., and *Fraxinus americana* L.

The stratum of shrubs is developed only in certain stands. Floristicly, it is a poor layer composed of *Farxinus lanceolata* Borkh., *Fraxinus americana* L., and *Amorpha fruticosa* L.

In the stratum of herbaceous plants the most frequent are *Rubus caesius* L., *Lysimachia vulgaris* L., and *Poa palustris* L. This layer is not developed in densily composed stands due to submergence by flood for a considerable length of time.

Ass. Populetum nigrae-albae. These forests have been almost completely declined and where replaced by the cultures of Euramerican poplar. They have been preserved only in the form of limited oases and recorded from raised areas, usually far from the river banks, at older alluvial deposits. They superseded oak forests which were cleared.

A dominant species in the stratum of trees is *Populus alba* L. In this layer also occur *Populus euramericana* (Dode) Guin., *Fraxinus americana* L., *Fraxinus lanceolata* BORKH., *Ulmus carpinifolia* GLED., *Ulmus laevis* PALL., and *Quercus robur* L.

In the stratum of shrubs a distinguished species is *Amorpha fruticosa* L. while certain such as *Morus alba* L., *Populus alba* L., *Ulmus carpinifolia* GLED. also occur.

The species *Rubus caesius* L. predominates in the layer of herbaceous plants.

Marsh vegetation

Ass. Scirpo-Phragmitetum. In the portion of the Tisa Basin studied, the stands of this phytocenosis are the most widespread and are developed at sites where backwater occurs during a considerable length of time.

Floral composition and other characteristics of the common reed localities analyzed, show certain variations depending upon habitat conditions. Only a very small number of species in stands belonging to the subassociation *Scirpo-Phragmitetum typhetosum (angustifoliae-latifoliae)* are observed owing to a permanent water during a year. At shallow water sites, drained during summer, the stands of the subassociation *Scirpo-Phragmitetum phragmitetosum* are developed. They are characterized by a relatively high percentage of marsh and meadow plant species. On slightly saline soils, among marsh and meadow species, the most distinguished is *Bolboschoenus maritimus* (L.) PALL. — subassociation *Scirpo-Phragmitetum bolboschoenetosum maritimi.*

Ass. Glycerietum maximae. In the ecological succession, these tall grasses are followed by stands of this association, being well developed near Sanad in the surroundings of Novi Kneževac. A characteristic of their composition is the presence of *Glyceria maxima* (HARTM.) HOLNOG. Of the marsh plants, considerable number and covering are observed in *Schoenoplectus lacustris* (L.) PALL. and *Lycopus europaeus* L. while less abundant are *Oenanthe aquatica* (L.) POIR., *Mentha aquatica* L., and *Lythrum salicaria* L.

Ass. Heleochareto-Caricetum nutantis. The stands of this phytocenosis are deve-

loped in the form of a narrow belt on somewhat more arid soils. They are in the immediate vicinty of stands of the association *Glycerietum maximae*.

The closest relationship with the association is shown with *Carex nutans* HOST. In all stands analyzed, this plant species is characterized by abundance and a considerable covering, in contrast to the species *Heleocharis palustris* (L.) R. BR., being relatively rare.

A certain specificity of these stands is indicated by the occurrence of the species *Stachys palustis* L., *Bolboschoenus maritimus* (L.) PALL., and *Glyceria maxima* (HARTM.) HOLMBG.

Ass. Caricetum gracilis. The stands of this community are found along the edges or open areas within autochthonous willow forests.

The most important characteristic species of the stands analyzed, is *Carex gracilis* CURT. In all stands the most abundant is the species *Sium latifolium* L., then *Stachys palustris* L., and *Oenanthe aquatica* (L.) POIR. On the organic-mineral substratum where stagnant water is retained, favourable conditions for certain aquatic plants such as the species of the genus *Lemma* and *Salvinia* are produced. At shallow depressions of the forest clearings, dense stands of this community representing the most luxuriant vegetation of the region, are found. In addition to a typical species *Carex gracilis* CURT., certain other species such as *Rumex hydrolapatum* HUDS. and *Senecio paludosus* L. are also distinguished. At the edge of the willow forests towards the levee, stands are characterized by an improverished floral composition. Most frequently predominates the species *Lysimachia vulgaris* L.

Meadow vegetation

Deschampsion caespitosae. Vegetation of wet, flood meadows is observed fragmentarily in the form of small oases surrounded by willow forests. The most important characteristic is imposed by the presence of *Scutelaria hastifolia* and *Lysimachia vulgaris* L. while somewhat less frequent are *Thalictrum flavum* L., *Thalictrum lucidum* L., *Polygonum aviculare* L. ssp. *heterophyllum* LINDM., *Stachys palustris* L., *Equisetum palustre* L., and *Calystegia sepium* (L.) R. BR.

Ass. Arrhenatheretum medioeuropaeum. Stands of this community of valley meadows are widespread in the Tisa Basin, mostly at levees. They are characterized by certain floral richness and a high percentage of the species *Arrhenatherum elatius* PRESL. somewhat lower percentage is found wiht *Pastinaca sativa* L., *Dactylis glomerata* L., *Lotus corniculatus* L., *Galium mollugo* L., *Daucus carota* L., *Vicia cracca* L., *Vicia hirsuta* (L.) S. F. GRAY, *Trifolium pratense* L., *Trifolium repens* L., and *Achillea millefolium* L.

Agropyro-Rumicion crispi. Vegetation of pastures which are periodically covered with flood water. In the region investigated it is spreading owing to the anthropogenic influence. The most important characteristics of stands of the vegetation described are imposed by the species *Alopercurus geniculatus* L., *Rumex crispus* L., *Rorippa sylvestris* (L.) BESS., *Rorippa austriaca* (CR.) BESS., *Mentha pulegium* L., *Agropyron repens* (L.) BEAUV., *Carex vulpina* L., and *Inula britannica* L.

Meadow-steppe vegetation

Ass. Coronillo-Festucetum sulcatae. Scattered stands in which *Coronilla varia* L. and *Astragalus cicer* L. are the most distinguished species growing at the highest points of the raised area bordering the river. Also numerous are *Festuca valesiaca*

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A Tisza alsó szakaszának vegetációja (Jugoszlávia)

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Kivonat

A Tiszavölgy alsó szakasza növénytakarójának eddigi fitocönológiai vizsgálata hiányos. Az intenzív meliorációs és egyébb antropogén hatás következtében az autochton növénytakaró még a hullámtéren is szegényes. A keskeny sávban húzódó hullámtér vegetációja elsősorban ültetett erdősáv, amelyet euro-amerikai nyár, fűz és amerikai kőris homogén monokultúrái képeznek, kizárva az összetettebb florisztikai jelleget. A természetes vegetáció csak fragmentálisan jelentkezik, és autochton jellegét csak kisebb, oázisszerűen fennmaradt foltokon őrizte meg.

A dolgozat a Tiszavölgy recens autochton vegetációjának alapvető jellegét ismerteti. Az állandó antropogén hatás feltételezi a még fennmaradt természetes vegetáció teljes felszámolását.

Растительность нижнего течения р. Тиса (Югославия)

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Резюме

Растительность инундационного района нижнего течения р. Тиса до настоящего времени фитоценологическими испытаниями была недостаточно изучена. Интенсивные мелиоративные мероприятия и другие антропогенные влияния в непосредственной близи р. Тиса привели к значительному нарушению природной растительности и ее сохранению на неширокой полосе. В ограниченном прибрежном поясе Тисы самая большая часть растительности относится к лесным фитоценозам антропогенным, включающим: европейско-американские тополя, ивы и американский ясень, не характеризующиеся особенностями в отношении состава растений.

Природная растительность обнаруживается в виде небольших оазисов, которые несмотря на антропогенные влияния, сохранили свои основные особенности.

В настоящей работе указываются основные, важные характеристики рецентной автохтонной растительности вдоль р. Тиса, которая учитывая антропогенные влияния, стоит пред угрозой полного исчезновения.

Vegetacija donjeg toka Tise

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Izvod

Vegetacija u inundacionom području donjeg toka Tisa dosadašnjim fitocenološkim istraživanjima nije bila dovoljno proučena. Usled intenzivnih meliorativnih zahvata i drugih antropogenih uticaja, prirodna vegetacija neposredno uz Tisa je u velikoj meri narušena i scedena na uzan pojas. U ograničenom priobalnom pojasu Tise najveći deo vegetacije zauzimaju antropogene šumske fitocenoze, koju čine: euro-američke topole, vrbe i američki jasen i u pogledu floristićkog sastava nemaju nekih posebnih odlika. Prirodna vegetacija je konstatovana samo u vidu manjih oaza, koje su i pored antropogenih uticaja sačuvale svoja osnovna obeležja.

U ovom radu se iznose osnovne i bitne karakteristike recentne autohtone vegetacije duž Tise, kojoj usled daljih antropogenih uticija preti potpuno isčezavanje.