INTRODUCTION

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The basin of River Tisza and its main tributaries – river Szamos, river Körös, river Maros – play very important role in the life of the Great Hungarian Plain. Most of the human activities are coupled with the water regime of the rivers and of their larger surroundings. The rivers also determine the natural vegetation and fauna of several habitats and affect the crop and livestock.

The human activity of the last decades or even centuries transformed substantially the landscapes of the Great Hungarian Plain causing heavy fragmentation and degradation of natural habitats and as a consequence, the loss of substantial natural values. 2010's is the Decade of biodiversity that emphasizes the importance of increasing knowledge on the biota of the Earth, a minor portion of which is the river basin of the Plain.

Large amount of historical and recent data exists on the flora and vegetation types (phytocenoses) of the rivers and the floodplain, but rarely summarized in a comprehensive book (some monographs devote substantial chapters for vegetation description but only for certain areas of river basins, e.g. Hamar and Sárkány-Kiss 1995, 1999, Sárkány-Kiss and Hamar 1997, Tuba 2008). Authors of this monograph decided to collect and evaluate published and unpublished cenological data recorded from the characteristic plant communities of the target area, and to reveal the main rules and relationships in the patterns of the floodplain vegetation. We intended to enumerate all the plant associations in cenotaxonomic order that have been found in and affected by the surroundings of Tisza and its tributaries. In the evaluation, we followed the phytocenological nomenclature of Borhidi (2003).

The total length of the river Tisza section – and also of the river basin – is 596 km in the region of Hungary. This large strip runs through rather different floristic regions therefore the floristic composition of the vegetation units may also differ. On the basis of previous knowledge and the data gathered, the studied area was divided into three sections, as follows: 1. North-Eastern border—Tokaj, 2. Tokaj—Szolnok, 3. Szolnok—Southern border.

Authors of the following chapters intended to collect and evaluate as many recent and historical data as possible. The result of their effort, however, very diverse indicating rather uneven surveys of both phytocenoses and geographical regions. Nearly 1500 cenological relevés were treated from 34 associations. Distribution of the relevés among associations ranges from 10 to 90, but the extremes are one relevé for an association, and the other extreme 429 relevé for an association. This emphasizes the scientific interest regarding the floodplain oak

forests. Therefore the cumulative species list is significantly larger in the case of extensively studied communities.

The vegetation of the Tisza river basin was analysed on the basis of recent and historical, published or unpublished relevés available. Time span of the records is also rather wide, the earliest data came from the late 1940-ies. Two types of records were used in the analyses: cover estimation of the plant species was made on A-D scale mainly in the earlier relevés while in the more recent ones percentage cover estimations were applied. The two types were treated separately only in the multivariate analyses since the transformation of data is either ambiguous or causes information loss.

Authors of this book give general description of each community and the habitat conditions on the basis of literature data and their own survey results that is followed by detailed floristic and cenological evaluation of the association according to the river sections distinguished.

The evaluation of the associations is completed by multivariate analyses. Principal component analyses (PCA) were carried out on percentage cover and A-D scale data separately. PCA was based either on covariance (centred PCA) or correlation (standardized PCA). Different traits – species composition, dominant species or geographic position – of the study sites were superimposed on the PCA scattergram to reveal the background of the cluster formation.

Data from the following major groups of associations have been found in the territory of river Tisza. Eleven association groups and 30 associations are evaluated in this book:

I. Duckweed covers – Lemnetalia minoris
  I.1. *Salvinio–Spirodeletum* (Slavnic 1956)
  I.2 *Wolffietum arrhizae* (Miyav. and J. Tx. 1960)
II. Bladderwort colonies – Lemno-Utricularietalia
  II.1. *Lemno–Utricularietum vulgaris* (Soó 1928)
III. Large pondweed beds – Potametalia
  III.1 *Potametum lucentis* (Hueck 1931)
  III.2 *Myriophyllo–Potametum* Soó (1934)
  III.3 *Nymphaeetum albo–luteae* (Nowinski 1928)
  III.4 *Trapetum natantis* (V. Kárpáti 1963)
IV. Small galingale swards – Nanocyperetalia Klika 1935
V. Reed beds – Phragmitetalia
  V.1 *Glycerietum maximae* (Hueck 1931)
  V.2 *Phragmitetum communis* (Soó 1927 em. Schmale 1939)
  V.3 *Sparganietum erecti* (Roll 1938)
VI. Water dropwort – Flowering rush communities – Oenanthetalia aquaticae
  VI.1 *Eleocharitetum palustris* (Ubrizsy 1948)
  VI.2 *Alismato–Eleocharitetum* (Máthé & Kovács 1967)

VI.3 *Oenantho aquaticae–Rorippetum amphibiae* (Lohmeyer 1950)
VI.4 *Butomo–Alismatetum lanceolati* ([Tímár 1947] Hejny 1969)
VII. Tall herb communities – Molinietalia
VII.1 *Carici vulpinae–Alopecuretum pratensis* (Máthé & Kovács M. 1967 Soó 1971 corr. Borhidi 1996)
VIII. Pannonic saline meadows – Scorzonero-Juncetalia gerardii
VIII.1 *Agrostio stoloniferae–Alopecuretum pratensis* Soó 1933 corr. Borhidi 2003
VIII.2 *Agrostio stoloniferae–Beckmannietum eruciformis* Rapaics ex Soó 1930
VIII.3 *Agrostio stoloniferae–Glycerietum pedicellatae* Magyar ex Soó 1933 corr. Borhidi 2003
VIII.4 *Agrostio–Caricetum distantis* Rapaics ex Soó 1938
VIII.5 *Eleochari–Alopecuretum geniculati* (Ujvárosi 1937) Soó 1947
VIII.6 *Rorippo kerneri–Ranunculetum lateriflori* (Soó 1947) Borhidi 1996
IX. Willow scrubs and galleries – Salicetalia purpureae
IX.1 *Rumici crispi–Salicetum purpureae* Kevey in Borhidi & Kevey 1996
IX.2 *Polygono hydropiperi–Salicetum triandrae* Kevey in Borhidi & Kevey 1996
IX.3 *Salicetum albae–fragilis* Soó 1957
X. Mezophilous deciduous forests – Fagetalia sylvaticae
X.1 *Paridi quadrifoliae–Alnetum* Kevey in Borhidi et Kevey 1996
X.2 *Fraxino pannonicae–Ulmetum* Soó in Aszód 1935 corr. Soó 1963
X.3 *Circaeo–Carpinetum Borhidi* 2003
XI. Subcontinental submediterranean dry deciduous forests of Southeast Europe – Quercetalia cerris
XI.1 *Convallario–Quercetum roboris* Soó (1937) 1958
XI.2 *Galatello-Quercetum roboris* Zólyomi et Tallós 1967
XII. Alder swamp woods – Alnetalia glutinosae
XII.1 *Fraxino pannonicae–Alnetum* (Soó & Járai-Komlódi 1958)

In the second half of the book we summarize the known cenological data for each association, and distinguish the vegetation of each river section and, if available, that of the major tributaries. We also indicated separately A-D and percentage data.

References

Borhidi, A. Magyarország növénytársulásai. Plant communities of Hungary.Akadémiai Kiadó, Budapest 2003.

Hamar, J. & Sárkány-Kiss, A. (eds): The Maros/Mureş River Valley. A study of the geography, hydrobiology and ecology of the river and its environment. Szolnok - Szeged - Tîrgu Mureş, 1995.

Hamar, J. & Sárkány-Kiss, A. (eds): The Upper Tisa Valley. Preparatory proposal for Ramsay site designation and an ecological background Hungarian, Romanian, Slovakian and Ukrainian co-operation. Szeged, 1999.

Makra, O. (2005): Checklist of the associations of the Hungarian section of Tisza basin – Tiscia 35, 9-16

Sárkány-Kiss, A. & Hamar, J. (eds): The Criş/Körös River Valley. A study of the geography, hydrobiology and ecology of the river system and its environment. Szolnok - Szeged - Târgu Mureş, 1997.

Tuba, Z. (ed.): Bodrogköz. A magyarországi Bodrogköz tájmonográfiája. Gödöllő-Sárospatak 2008