

**FROM THE LIFE OF THE TISZA-RESEARCH WORKING COMMITTEE,  
WHICH HAS BECOME INTERNATIONAL**

**Tisza-Research Conference XIV (1983)**

Compiled by

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As in the previous years, the Conference took place in the site of the Hungarian Academy of Sciences' Committee at Szeged, on April 28—29, 1983. Apart from the Hungarian co-workers, Soviet and Yugoslavian members were also participants on the event. During the course of the 2 days 22 reports were delivered, followed by discussions. A round table conference was also organized to co-ordinate the researches of complex nature.

In his presidential opening address GY. BODROGKÖZY spoke highly of the activities the retired Professor L. MÓCZÁR, honorary chairman, had exerted in the life of the Working Committee, expressing thanks to him for his kind efforts. He congratulated Professor I. BENEDECZKY, the new Professor and Head of the Zoology Department of the University, on the occasion of his election to honorary chairman.

**The thirty years of the researches at the Tisza-valley**

The research of the Tisza-valley has arrived to its 30th anniversary. During the course of these three decades, the research working process — which has become realized, or is before comming so by means of the moral and financial support of the Hungarian Academy of Sciences, the Ministry for Cultural Affairs, and the National Water Conservancy Office — could be divided into four periods.

Through the programme of the first period, the institution of the processing of the area became possible. This field-work took place in terms of the vegetation-survey at the Hungarian lower region of the Tisza flood-plain, at the beginning of the 50s. The geobotanic co-workers participating in this survey had determined on map-sheets the range of the natural and cultivated plant communities occurring at the given area, from Szolnok to Szeged. Although unfortunately this mapping has not been published to this day, the changes which had taken place at the processed area are well followable, and are therefore utilizable. This vegetation-mapping activity practically formed the core of the further increasingly expanding research programmes of the Tisza-valley.

The second period started in the second half of the 50s, when the studies were set on more expansive grounds. With the leadership of Professor G. Kolosváry and the support of the Water Conservancy Directorates, research expeditions began extending to the complete Hungarian section of the Tisza river. Water chemists,

hydrobiologists, botanists, as well as zoologists could all obtain review on the living-world and environmental-biological relations of the Tisza-valley.

The idea arose to issue a special periodical for solving the problems of publishing the essays prepared throughout the years. Under the editorship of KOLOS-VÁRY—BODROGKÖZY—HORVÁTH, the first volume of the Tisza was published in the year 1965. From this time, the papers about the Tisza-valley and its environs could appear in a separate publication series. Until now, 18 volumes have been put into the circulation of the international exchange of publications.

The third research period of the Tisza-valley commenced at the end of the 60s, when the management of the Working Committee was taken over by Professor I. HORVÁTH. The Tisza sections suitable for complex biocenological researches were determined during the course of his functioning; thus the registration of the living world at the area of the Kisköre Water Storage Tank for the succeeding generations, before inundation period. The continuous studying of the water at the filled up storage tank and its environment was accomplished with the collaboration of the co-workers of the Tisza II. water conservancy laboratory.

The realization of the research programme regarding the designated section of the Environment Protection Area at Mártély also fell to this period. The field activities were greatly facilitated by the operation of the research house and research motor-boat established on the site.

During the course of the 70s the researches at the Tisza-valley took on an international character. The Uzsgorod State University's biologists joined the studies at the Upper-Tisza region, and the biologists of the Novi-Sad University joined those at the lower region. Lectures are held by them regularly on the occasion of our annually organized conferences. The leading professors of these Universities are members of both the Executive Committee of the Tisza-Research Working Committee and the Editorial Board of the Tisza.

The fourth period started in the 80s through my assignment as acting chairman. Utilizing the competition prizes from the Hungarian Academy of Sciences, the Ministry of Cultural Affairs, and the National Office for Environment and Nature Protection, biocenological environmental-biological complex seasonal-dynamic researches are being carried out at four parts of the Hungarian Tisza section. Parallel with the objectives having pronouncedly theoretical nature, we wish to continue giving assistance to the nature- and environment protection; the cultivation of forests and meadows, as well as to other provinces of practice.

Research activities of such purpose are being carried out in the area of the Kisköre Water Storage Tank, at the site of the planned Tisza III. Storage Tank in the environs of Csongrád, and joined to this, at the marshland and environs at Tóserdő of the Kiskunság National Park, as well as at other sections of the river. Researches have also started at the area of Tokaj in connection with the environment and nature protection of Tisza-Bodrogszug.

Joined to these, studies with similar programme are also performed at the Soviet and Yugoslavian regions of the Tisza. 60 Hungarian, 6 Soviet and 10 Yugoslavian researchers of the Tisza-valley Research Working Committee work at the listed areas, who are the co-workers or pensioners of Universities, Colleges, Water Conservancy organs, Museums, Nature and Environment Protection Agencies, as well as Technical- and Secondary Schools. The Working Committee does not have any full-time co-workers.

The presidential address was followed by the secretary's report given by Gy.

CSIZMAZIA, which is published as a separate part. In the fore-going brief summaries are given of the lectures delivered during the course of the two days:

#### **I. Preliminary investigations at the area of Tőserdő belonging to the Kiskunság National Park and at the Alpár basin**

**FEKETE, E.:**

Studies on the heavy metals having effect on the water biocenosis in the backwaters at Lakitelek and Alpár

The heavy metals showing effect on the aquatic living world were determined monthly during the course of 1982 in the backwaters at Lakitelek and Alpár. The studies were aimed at the determination of the waters' copper-, cadmium-, zinc-, chromium-, and mercury-contents. On the basis of the obtained data image is given of the seasonal changes and the possibilities of certain contamination sources, respectively, observed at the two backwaters.

**KOVÁCS, KATALIN and DOBLER, ENIKŐ**

Studies on the qualitative and quantitative composition and seasonal changes of phytoplankton at three sampling sites of the dead-Tisza at Lakitelek

Phytoplankton studies were carried out at three sampling sites of the dead-Tisza at Lakitelek, which area is under nature protection. During the processing of the samples taken monthly throughout a year studies extended to the qualitative and quantitative composition, as well as the seasonal changes of the phytoplankton. On the basis of the total algal number the biomass and diversity of phytoplankton was calculated. With the help of cluster analysis answer was sought for to the question, what similarities are shown in time and space regarding the algal communities at the three sampling areas? In Summer, following the homogeneity of the water areas at Spring, the changes in the phytoplankton composition showed differences at the three sampling sites. In the Autumn and Winter months the connection of the samples from the 2nd and 3rd sampling sites was tight, the phytoplankton composition was similar. The detaching Northern section of the backwater was characterized by plankton communities of varying composition throughout the year.

**DOBLER, ENIKŐ and KOVÁCS, KATALIN:**

Results of the preliminary studies on the algal communities at the Alpár backwater

The lecture provided a brief summary on the results of studies performed at the backwater between 1976—1980. With these studies the biological water quality of the backwater was determined. At the same time, the seasonal changes characteristic to the zone were also observed on the basis of the algal community compositions. The tendency of the changes was similar in the examined years, at times, however, the effect of the changes in weather (flood, cooler Spring, and colder Winter, respectively) resulted slighter shifts.

In 1982 a more detailed study was started at the Alpár backwater, in the frame of which the composition of phytoplankton was invariably examined to species level. The Czekanowski similarity index was applied for demonstrating the seasonal changes in the algal communities. The phytoplankton diversity of the water area was also studied, using the Shannon-index.

The chlorophyll-a and pheophytin-a concentrations were determined from the monthly taken samples. The aliment supply at the water area was followed with attention by determining the various phosphorus forms. Furthermore, the most essential chemical studies were also accomplished, limiting to the oxygen circulation and ionic dynamism.

KISS, I.:

#### *Euglena*-mass production in the waters of the Alpár basin

From the algological studies of the stagnant waters at the Tisza-valley carried out in the year 1982, the mass production of two *Euglena* species deserves special attention. On August 4, 1982, at the boat-harbour section of the backwater at Töserdő, the spectacular vegetation colouring of the *Euglena Ehrenbergii*; and on October 24, at the marsh cow-track at Bokros, that of *Euglena sanguinea* was seen. At the Töserdő backwater the *E. Ehrenbergii* could not be demonstrated at all during the course of the earlier studies carried out throughout the course of several years; and on August 4, its biomass surpassed the total mass of the other algal species. In the cow-track sodifying marsh of Bokros, the shallow water and the base coming to the air were coloured yellowish pale-green by the neuston-like masses of the *E. sanguinea*. During the course of the five decades, this species had only been observed on four occasions in the Hungarian sodic areas, and always in waters polluted by organic matter. The cells of the material found at Bokros were green, and the hematochromic coagulation could only rarely be seen in them. In day-light the effusion of the hematochrome could only be detected after several hours, but even then it did not result the complete red colouring of the cell. On the effect of shade, the clustering of the diffused hematochrome required several hours. This means a significant deviation from the characterization found in the special literature, and it may perhaps be explained by the effect of the strongly alkaline environment (pH 9). However, the existence of biotypic variation may also be assumed.

The two *Euglena* mass productions indicate that the eutrophized site-water also contains amino-acids and biocatalyzers (auxin, vitamin C).

HEGEDŰS, MÁRIA and ZSIGÓ, MARGIT:

#### Results of the hygienic bacteriological studies at the backwaters of the Tisza river

Samples were taken regularly throughout the course of the past six years from the four backwaters found at the Southern region of the Tisza river.

It has been determined that:

1. The water quality of the backwater at Lakitelek and Alpár was of Ist class "clear" in most of the studied time-points.
2. The hygienic water quality of the backwater at Serházzug was the most unfavourable, of 3rd class, "polluted".
3. On the basis of the results of the hygienic bacteriological studies, the backwater at Atka improved by one category within the last three years.
4. The hygienic water quality parameters were also classified at each water area.

It was established that the study results of the coliform number indicated water quality of Ist class in 17—67%; and on the basis of the values per ml of the total thallus-forming bacteria, the water quality at the studied Tisza backwaters was of Ist class, in 70—100%.

The aim of the studies was to call attention to the preservation of the water at the Tisza backwaters which is favourable regarding quality, even from hygienic point of view.

GÁL, D.:

#### Seasonal changes in the zooplankton of the Tisza backwater at Alpár

Both in respect to species and individual number, the Rotatoria dominate in the zooplankton of the backwater (cc. 25% Protozoa, 60% Rotatoria, 15% Entomostraca).

Two maximums are observed yearly regarding the total individual number; one in May, the other — somewhat slighter — in September. At the time of the minimum the total individual number is 6—8000 ind/10 l., and at the time of the maximums: 65—80 000 ind/10 l.

The saprobiological quality of the backwater also shows essential changes during the course of the year. The water quality is the best in the Winter — Spring months, when mainly the oligo-, beta-, and beta-mesosaprobic organisms are dominant (saprobity index: 2,0—2,3). Later, during the course of Summer, there is an increase in the beta- and beta-alpha-mesosaprobic organisms, resp. (saprobity index: 2,4—2,7, rarely 2,9).

BÁBA, K.:

#### Mollusca groups in the area of Tőserdő and Alpár

Studies were continued at two terrestrial forest areas, one at a marsh-forest and one at the Tőserdő backwater, in 100—100 contiguous quadrates with monthly repeats. The biotopes at Tőserdő are under nature protection.

It can be determined that the water fauna of the backwater section utilized for the purposes of bathing and boating shows a 34% impoverishment compared to the studies of the years 1958—60. The distribution of the species is in the form of islands. The drying, filling up and partial lumbering at the fen-wood caused a 90% decrease in species number in the water fauna compared to 1958.

At the willowy-poplar areas and gallery forest, and in the 4 underwood types of the latter, 13 species were manifested, characteristic of the flood-plain forests between the Danube and the Tisza. The development of the species composition is limited by the moisture conditions. With the changes in the moisture condition, on the basis of the monthly samplings, there is also a change in the dominance values and distribution relations. The changes taking place in the reproduction period and the speed of the ontogenesis of the certain species (steepness of the regression level) play role in the development of the oscillation course.

FARKAS, Á.:

#### Ichthyological study of the dead-Tisza branch at Tiszaalpár

In 1982 studies were started in the area of Tiszaalpár—Tőserdő. The surveying of the fish fauna was accomplished with the help of 10×10 mm trawl-net, and 50, 29 and 39 mm gill-net. In such way attempt was made to avoid the negative selection.

14 fish species were found in the backwater. The surveys were carried out in May, June and July. The sampling sites were at 3 various places of the backwater.

The 1982 material was made up of 441 individuals. From these, 22 were *Tinca tinca*, 37 were *Amiurus nebulosus*.

On the basis of the surveying it could be determined that while at the lower section of the Tisza the tench and the bullhead pout occurred sporadically, these were relatively frequent in the backwater at Lakitelek.

The rich plant vegetation at the backwater ensures favourable roeing conditions for the species of the Cyprinidae family, at the same time, the muddy section of the riverside sector provides rich aliment sources for the breeding of the progeny.

CSIZMAZIA, GY.:

#### Preliminary mammological studies at Tőserdő

During the course of the years 1981—1982 (in the Spring of 1982) small mammals were caught by means of surface traps at the biotopes of Tőserdő. The results were compared to the trappings in the year 1968. In contrast to the 24 species trapped and studied in 1968, the presence of 12 species was proved in this period. The data at disposal are suitable for faunistic evaluation. Studies on the space structure of the cenoses were carried out in 1983 by means of live-trapping with the method of capturing, labelling and holding in. Even during the course of the studies and analysis of cast (*Asio otus*) scantiness was evidenced in the small mammal fauna (mainly the *Microtus arvalis* and *Apodemus* sp. occurred in 90%). There was a change in the alimentary habit of the ondatra at this area — it has turned to the increased consumption of mullusc. At the same time, its amount fell back to the quarter.

Therefore, according to the previous studies, a considerable decrease in species number was experienced in the mammal fauna at the Tőserdő region, the cause of which is unknown. The further step in research is the revelation of the competition and predational relations, since these result demographic and selective effects.

VÉGVÁRI, P.:

#### The role of the River Barrage at Kisköre in the prevention of the extreme water contamination

The River Barrage at Kisköre offers unique possibility for the prevention of the extreme water contaminations. The demonstration of the oxygen uptake of the water led through by upper overturning at the Barrage was given in the lecture. On the basis of the measured data it could be determined that the amount of oxygen led in is considerable even in the case of the relatively great oxygen-saturated arriving water. In the knowledge of the results, such a water quality damage-averting technology was suggested, by which the water contamination causing oxygen deficiency could be successfully avoided.

BANCSI, I.:

#### The development of the Rotatoria- and Entomostraca fauna in the storage tank at Kisköre

At the area of the Kisköre storage tank, large contiguous water surfaces developed in 1978. On the basis of the data concerning the studies during the course of the last five years an analysis is given of the Rotatoria- and Entomostraca fauna of the smaller units at the storage tank — Abádszalóki-bay, banked up Tisza, Small-Tisza, Sarudi-basin, Poroszlo-basin. The lecture deals with the questions of the population- and alimentary relationships connected to the project regarding the utilization of the storage tank.

KOZMA, A. and TÖLGYESI, GY.:

Mineral substances of the reed-grass vegetation at the Kisköre storage tank

Extending the previous studies at the area of the Kisköre storage tank carried out at the end of June, 1982, 72 plant samples were analysed for 11 chemical elements. Apart from the species of the littoral zone, the retraceable species of *Myriophyllum* and *Nymphaeum albo-lutae* were also evaluated. Comparing the complete vegetation with that in other areas of Hungary, it could be determined that at these areas periodically being inundated with fresh water, as well as in the water of the storage tank itself, as yet there is no such salt accumulation which would cause alarm. At the littoral zone the concentrations of the elements judged as being more critical were as follows: P 2,0 g/kg; Na 0,8 g/kg; Zn 42,6 mg/kg and Cu 7,5 mg/kg. Although the members of the reed-grass communities evidenced outstanding values in respect of sodium, manganese and zinc, this phenomenon can only be led back to the phylogenetically determined biochemical habits, and not to the advanced stage of water contamination.

The lesson from the studies is that the aliment-accumulation dynamic of the terrestrial plants located at the edge of the storage tank and appearing in the form of islands within the storage tank is differing. Therefore, it seems necessary to perform comparative studies with similar methods in the future, at the whole area being under the effect of the water.

KISS, K. T.:

Relationship between the chemical oxygen demand, suspended matter content and algal count in the Eastern Main Canal

The results of the studies performed between 1968—1975 at the section between Tiszalök and Balmazújváros of the Eastern Main Canal demonstrated that depending on the flood at the Tisza river and the water velocity in the Main Canal, the amount of suspended matter changed from 5—6 mg to 500—700 mg, the value of the chemical oxygen demand ( $COD_{sMn}$ ) ranged between 3—15 mg, and the algal count varied from 30—50 thousand to 15—20 million ind/l.

The lecture reported on the degree to which the COD values were determined by the suspended matter content and the algal count, respectively. Carrying out path-analysis, it could be determined that in the case of high suspended matter content — when algal count is low — the COD is determined by the amount of suspended matter in 40—70%, and by the algal count in 0,5—0,6%. Besides low suspended matter content — when algal count is high — the values of the COD are determined in 4—10% by the amount of suspended matter content, and in 15—21% by the algal count.

BODROGKÖZY, GY.:

Hydroecological species-component analyses in protection-embankment grass communities

(The manuscript of the lecture will appear in the 1984 volume of the Tiscia.)

GASKÓ, B.:

The main groups of the Cerambycides living in the flood-plains of the Tisza and Maros rivers

At the flood-plains of the Tisza and the Maros rivers in Csongrád county the *Salicetum alba-fragilis* and the *Salicetum triandrae* communities are dominating, together with various culture consociations.

Since the plant inhibitors of the *Salix alba* mean an exhaustive factor in some cases, with all probability the polyphage, and not the stenoc oligophage species are settled here. The properly so-called xilophage group can be divided further to forest and forest-steppe elements. Those long-horned beetles can be listed to the latter group, which do not further belong to the forest biocenosis as imagos. Their common characteristic is that more or less they are xeroterms, nectar- or pollenconsumers, and their copulation also takes place on one of the flowers of the steppe-community. Here, many times the animal favours determined species. In the Carpathian basin these species reach their highest density in the forest-steppe zone.

The situation is more complex in the case of the Cerambycides living in the pliant-stalked plants.

The Dorcadians can be collected in masses at the top plane of the dam, at the sections of Southern exposition. The *Phytoecia scutellata* FABR. is by far more rare. Only a total of two individuals were found within the period of 10 years. It is of interest that the *Calamobius* phylum Rossi and the *Theophilea cylindricollis* PIC., the two steppe-species being under protection and held earlier as being explicitly xeroterms, were found to swarm rather at the cooler and more humid dam bases. This same shift can also be observed in the case of a few highly tolerant and wide-spread species, like the *Agapanthia Dahli* RICHT., *Phytoecia pustulata* SCHRANK, *Plagionotus floralis* PALL., etc.

At the dam-verge of the flood-plain forests, the *Oberea euphorbiae* GERM. characteristic of the marshy meadows and — probably due to the large quantities of the nutriment plants — the *Phytoecia coerulescens* occur in masses. These are the two species which can regularly be found also within the willow-zone. The rest of the long-horned beetles developing in the softstalked plants mainly show seasonal spread. Their long-lasting settlement can only be counted upon after two or three years without floods (depending on the change of generation).

MOLNÁR, GY.:

Niche studies on the stock of starlings (*Sturnus vulgaris*) at the flood-plain forest communities

The number of nesting starling pairs was calculated between 1978—1981 near Szeged at the section of the Tisza flood-plain. The tree-sparrow also nests at the area in hollows, the alimentary area of which is also similar to that of the starling. The question arose whether there is any competition between the two species? Attempt was made to find an answer to this from the data applying a four-dimensional analysis. From the data of the dimensions, the niche-width and the niche-overlapping was calculated, the latter was also controlled by computer method. Despite the significant overlapping, there is probably no competition between the two species.

KOVÁCS, S.:

The occurrence of a water-moth (*Acentropus niveus* OLIV.) at the environs of Mártély

(The paper of the lecture will be published in the 1984 volume of the Tiscia.)



MOLNÁR, GY.:

Niche studies in the stock of starlings (*Sturnus vulgaris*)

The number of the nesting starling pairs was calculated between 1978—1981 at a designated section of the Tisza flood-plain. During the course of the observations, the question arose whether there is any competition regarding habit between the starling and the tree-sparrow, also nesting in hollows. Calculations were accomplished in the case of both species in four niche-dimensions: diameter of hollow opening; height of hollow; volume of animal nutriment; and the time passing between feedings. The niche width and the niche overlapping were calculated from the data, the latter was also controlled with the help of a method using computer. Despite the significant overlapping, no competition was found between the two species. The environmental capacity of the flood-plain forest is so great that the populations of the two species are kept well here.

KOMENDAR, W. I.:

The vegetation at the White Tisza-valley

(The paper of the lecture will be published in the 1984 volume of the Tiscia.)

FODOR, I.:

The floristic and geobotanic relations of the Black Tisza-valley

(The paper of the lecture will be published in the 1984 volume of the Tiscia.)

PUJIN VLASTA, RATAJAC RUŽICA and DJUKIČ NADA:

Zooplankton and bottom fauna composition and dynamics of the Lower Tisza section

(The paper of the lecture will be published in the 1984 volume of the Tiscia.)

BUDAKOV LJILJANA and MALETIN, S.:

The Bloch body length and weight increase dynamics of the *Esox lucius* L., *Blicca bjoerkna* L. and *Carassius auratus gibelio* at the Tisza river

(The paper of the lecture will be published in the 1984 volume of the Tiscia.)

MIKES, M.:

The digging activity of the mole (*Talpa europaea* L.) at the Tisza dam

The mole is the characteristic therobiont representative of the insectivore. Due to its characteristic way of life, it has significant role in the soil of the various biotopes (forest, field, plough-land, and grazing-land), bot of the lowland and the hill-country. Its habit of feeding stands in direct relationship with its digging activity, forming newer mole-hills whilst expanding its underground passages.

The activity of the mole colony was mapped and the obtained data were processed statistically. The circumference lines of the mole colonies, the individual area measurements, as well as the digging activity in relation to time and space were followed with attention within the range of the study.