

Dear Students!

The Department of Hydrobiology provides thesis opportunities in the following topics. If you want to prepare your dissertation or diploma thesis in connection with a field of hydrobiology, and you are interested in any of the indicated topics, please apply to the mentioned lecturer of the Department of Hydrobiology.

From the topics, the specific topic can be selected only on the basis of personal consultation with the lecturers!

Applications are constantly welcome, but we also often organize meetings, the dates of which are always notified to the audience in advance.

Dissertation and diploma thesis topics at the Department of Hydrobiology:

Depending on the chosen topic, the dissertation may be prepared in the form of literature review, as a result of joining an ongoing research activity at the department, or as a result of continuing research activities already related to water.

A diploma thesis can also be prepared based on the above mentioned, but in order to prepare it, the student's active work, summary and analytical activities based on his/her own results are necessary.

Topics preferred by the Department of Hydrobiology (name of the supervisors are in brackets):

General hydrobiological topics (László Antal, István Bácsi, Csaba Berta, István Grigorszky, István Gyulai, Krisztián Nyeste, Imre Somlyai, Dóra Somogyi)

Preparation of a comprehensive analysis in any subject of hydrobiology based on literature sources – for BSC students – with the knowledge of a world language. Characterization and effects of climate change on a global, regional, or local scale. Evaluation of studies for action plans for environmentally friendly development and wise use, in particular for flood protection, ecotourism, fisheries and angling. Analysis of conflicts between economic and ecological interests, with particular reference to the importance of ecosystem services. Analysis of physical, chemical and zoological (aquatic macroinvertebrates, fish) studies of small watercourses. Evaluation of the monitoring of aquatic and water-related organisms, exploration of its ecological features in global and Hungarian surface water bodies.

Algology (standing water bodies and water courses, István Grigorszky and Imre Somlyai)

Formation of algal plankton communities in Hungarian standing water bodies and water courses, study of the factors influencing their composition and distribution, as well as the factors causing their changes. To get to know the characteristically occurring algal taxon form types in different water bodies, as well as to interpret the water body and to explore its significance partly on the basis of algological, partly hydrological, physical and chemical variables. Interaction relationships of algal plankton-forming species based on spatial-temporal changes of populations of different taxa observed under field conditions and analysis of laboratory experiments.

Algology (laboratorial algal-physiology studies, István Bácsi, Aida Figler, Kamilla Márton)

Effects of environmental changes, organic and inorganic pollutants on the physiological processes of algae (nutrient uptake, life cycle, accumulation of metabolic products); biotechnological applications of algae (bioremediation); algal interactions (nutrient competition, allelopathy, toxicity).

Fish- and fisheries biology (László Antal, Krisztián Nyeste, Dóra Somogyi)

Fish biological and fishery research in fishponds, natural water bodies and water courses. The studied topics are structured along two main lines. The first line analyses the fish assemblage, species composition and the changes of regularities in natural standing water bodies and courses. Within this, we investigate the interactions like competition and predation between the invaded and native fauna elements to control the reduction of native elements population protected by natural conservation. Observing the accumulation of several trace elements like heavy metals in fish organs. Another aspect of the topic is the examination of the reproduction-; biology-; stock- and fish-farming of the economically important fish species, the possibility, and limitations of providing natural food, the ways of increasing the natural yield in extensive, semi-extensive, intensive, and super-intensive systems.

Macrophytes (Csaba Berta)

Analysis of the role of aquatic plant species from the point of view of water management in small watercourses (literature review and/or field survey and monitoring). The role of macrovegetation in the design, maintenance and restoration of structural and functional characteristics of wetlands. A review of the literature on hypotheses about the distribution patterns of aquatic and riparian vegetation and their causes. Classification of water bodies based on the characteristics of marsh and riparian vegetation. Assessment and evaluation of macrovegetation from a conservational ecological point of view. Monitoring if interventions from the restoration of wetlands (rehabilitation, reconstruction). Analysis of the distribution pattern and dynamics of invasive species associated with wetlands. Clarification of the possible role of allelopathy and other factors in the success of invasive species.

Research on land use and vegetation change in the floodplain of the Upper Tisza Region (Imre Somlyai, Csaba Berta)

Exploration and investigative analysis of the state change of the Upper Tisza floodplain. The work is based on field studies and the processing of remote sensing methods (aerial and space imagery), maps, literature data, as well as evaluation work based on CORINE and NÉR (National Habitat-classification System). The aim is to analyze the changes in the state of the floodplains, to monitor the changes in the spatial-temporal composition and diversity of the living world for human effects, depending on land use and regional economic processes. Analysis of the impacts on the wildlife of the floodplain habitats (forests, meadows, backwaters, moors, swamps, and material pits), examination of the possibilities of conserving natural biodiversity.

Water qualification and water quality (László Antal, Imre Somlyai, Krisztián Nyeste, Csaba Berta, István Grigorszky)

Ecological water qualification, based on organisms (macrophytes, plankton and nekton, sediment dwellers) and ecological variables (hydrological, physical, chemical characteristics of water and sediment) included in the classification system of the EU WFD (European Water Framework Directive) and RESI (River Ecosystem Service Index). The aim is to produce surveys that are suitable for exploring the ecological status of different water bodies through the analysis of the ecological water quality of different aquatic and wetland habitats, keeping in mind the clear boundary between the interpretation of water quality and water merit. The works can be aimed at determining the ecological water quality of a specific water body, a comparative analysis of different water bodies, or a detailed, exploratory analysis of a specific indicator or group of indicators of ecological water quality. Study of the phenomenon of ecological, biological, physical, and chemical stratification of water quality data sets in Hungarian oxbow lakes and other backwaters, possibilities of analysis and evaluation. Monitoring in domestic surface water bodies.

Material budget (matter circulation and energy flow) of aquatic ecosystems (István Bácsi, Imre Somlyai, István Gyulai)

Ecosystems can be interpreted as open systems, an important feature of which is that they are in intensive contact with their surroundings through the matter circulation and energy flow. During the elaboration of the topic, the material peculiarities of certain aquatic and wetland habitats should be explored, primarily by monitoring the circulation of biogenic elements. The development of the topic may include the analysis of the appearance, possible accumulation of essential and non-essential heavy metals, the occurrence and movement of organic micro-pollutants, and the preparation of material balances, in line with the EU WFD river basin management. An analysis of the role and significance of living organisms in the matter circulation of aquatic ecosystems may be emphasized.

Zooplankton studies (István Gyulai, Csaba Berta)

Faunistic survey of zooplankton in standing water bodies; analysis of the spatial and temporal pattern of zooplankton in a given water body; comparison of metaphytic Cladocera fauna of different macrophytes stands; population dynamics and production biology of a given species; assessment of anthropogenic activities (swelling, water extraction, water inlet, sewage discharge, fishing, sediment dredging, vegetation removal) on the structure of zooplankton.