

# Hydrobotany

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The Department of Hydrobotany, established in 1977, is engaged in teaching and research in most fields of Hydrobotany and the botanical part of Limnology. The scientific staff and about 20 students work on two main groups of aquatic organisms: *algae* and *macrophytes*.



## Research

### *Algae* (E. Kusel-Fetzmann)

30 years ago a culture collection of algae was established, now including more than 300 unialgal strains, available for research and teaching. Various aspects of the systematics, ultrastructure, biology and physiology of selected freshwater algae are currently studied (Oocystaceae, Volvocales, Chrysophytes, Bluegreen Algae). The distribution

of pigments in various groups of algae is measured using HPLC. An analysis of the chromatic adaptation of selected cyanophyceae under various light conditions and some aspects of the nitrogen fixation in cyanophyceae will be part of future studies.

A major research topic is the ecology and distribution of algae. The xanthophycean genus *Vaucheria* is being mapped in the province of Lower Austria. The succession of algal communities, the primary production and the influence of abiotic factors on the biomass are examined in a large man made channel near Vienna. Another project deals with the zonation of algae in a peat bog and the physical and chemical parameters dominating it. Intensive studies are concerned with experiments on phytoplankton - zooplankton - interactions.

### *Macrophytes* (Georg A. Janauer)

Since the end of the 1970ies stronger emphasis was laid on macrophytes and the corresponding additional working group established. Starting out from ecophysiological topics this field ranges over a wide scope of ecological and applied research today.

At present one of our main research fields are ecotones in the Danube flood plain. This research is part of the international UNESCO *Man and Biosphere* program. The structure of macrophyte beds is one of the most important factors for many aquatic animals in the backwater system of the Danube. We therefore investigate structural variables like the vertical stratification of biomass or the distribution of morphological modules. These parameters can be correlated with light distribution patterns and problems related to photosynthetic pigments.

Another focus of our work is the distribution of flow velocities in macrophyte beds. This research was re-initiated by this working group using spe-

cially adapted equipment and is carried out today in cooperation with groups at the Agricultural and the Technical University of Vienna, respectively.

The succession of higher aquatic vegetation is studied in a large man-made irrigation system. Part of a long-term program on flood plain waters of the Austrian Danube an inventory of the macrophyte vegetation is close to completion. Similar studies in several other countries on the Danube are coordinated by one of the scientists at the Department.

## Teaching

Ecology of aquatic and wetland plants (L+P)

Field courses on ecological methods (P+S)

Aquatic plant habitats (field course) (P)

Interdisciplinary courses on water quality (P+S)

Ecology of Large Rivers-macrophyte-aspects (L)

Ecology and systematics of algae (L+P)

Ecophysiology of algae (L+P) - Anatomy of higher

aquatic plants (L+P) - Introduction to waste water

biology (L) - The botanical part in limnological

courses and limnological excursions in Austria and

abroad (France, Italy, Hungary, Romania, Greece)

- National and international excursions.

## International Cooperations

- International Association for Danube Research: Phytoplankton - Phytobenthos group (Center of organisation), Macrophyte group (Center of organisation);

- UNESCO *Man and Biosphere* program; Bulgarian Academy of Sciences, Sofia; Hungarian Institute for Water Research, Baja; Sammlung von Algenkulturen der Universität Göttingen; Slovak Academy of Science, Bratislava; Czech Academy of Science, Brno and Trebon; Agricultural University at Hohenheim (Germany)

## Selected References

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