Potential elementary ecotone structures: basic data for a synoptic analysis of backwater-system processes (Module 3, ÖDM – MaB)

By M. T. DOKULIL, G. A. JANAUER and G. KUM

With 4 figures in the text

Abstract

The task of Module 3 in the MaB-project ÖDM (Ecotones Danube and March) is the exploration of ecotones in oxbow lakes, and between oxbow lakes and adjacent semi-terrestrial systems. Studies focus on phytoplankton, phytobenthos and macrophytes. Hydrology, sediment composition and water chemistry provide fundamental data for understanding the distribution of the plants. The results will be used for a synoptic analysis of system processes in backwaters.

Introduction

In a global context most ecotones studied so far are dominated by horizontal processes and interactions. This concerns a wide scope of scales, from mega-ecotones equal to the whole fluvial corridor of large rivers to micro-ecotones like invertebrate habitats in plant stands (NAIMAN & DECAMPS 1990). Vertical interactions may be of similar importance to some spatial habitat fractions. Groundwater/surface water processes are seen here as the main objective.

The River Danube was regulated in the last third of the 19th century. Due to the construction of the shipping lane and its system of dams and levees, most side-arms were separated from the main river. Today, the hydrological regime of the backwater system is coupled to the main channel of the Danube, predominantly through groundwater dynamics (JANAUER 1995a). Only in the case of floods are the former side-arms directly connected to the river. Discharges higher than 5200 m³/s flood the entire riverine landscape between the flood protection dam in the north and the steep high bank in the south.

The effect of the regulation was more severe on the northern bank, reducing the hydrological dynamics to a great extent. However, the macrophyte vegetation was largely stimulated by the less dynamic conditions (SCHIEMER & JANAUER 1994).

Module 3, Flood Plain Waters, of the ÖDM-Ecotones Danube and March-Project, deals with the exploration of ecotones within and between oxbow lakes and adjacent semi-terrestrial systems (JANAUER & HARY 1994, JANAUER 1995b). Interest is focused on phytoplankton (EISINGER 1994) and phytobenthos in their role as primary produc-