

## **The role of *Phragmites australis* in the nutrient retention at Hungarian part of Lake Fertő/Neusiedler See**

Dinka M. – E. Ágoston-Szabó – K. Schöll - A. Kiss

*Danube Research Institute of the Hungarian Academy of Science, Vácrátót, Hungary*

The nutrient concentrations of the aboveground and belowground reed organs, surrounding water and sediment interstitial water were analysed in an inhomogen reed stand of Lake Fertő/Neusiedler See, situated near the Fertőrákos Bay, where a 7.5 ha reed area was used for subsequent cleaning of the pre-treated wastewater. A quantity of 250 m<sup>3</sup> day<sup>-1</sup> and in summer 300 m<sup>3</sup> day<sup>-1</sup> wastewater was let to this area, which developed a 5 respectively 25 cm water cover. However the soil surface of the stand was uneven, the natural inclination of the area, situated between the inflow and outflow, allowed the slow, non-uniform throughflow of the water. The investigations started in 2003 before the introduction of the wastewater and lasted until 2004. The reed was harvested in winter of 2003/2004. Before the introduction of the wastewater there was no water-cover on the reed parcel.

The nitrate, dissolved organic nitrogen concentration of the water was higher in the inlet than in the outlet, the phosphate concentration decreased in the function of the increasing distance from the inlet area. The nitrogen and phosphorus concentration of the aboveground parts (leaves, culms and flowers) and the phosphorus concentrations in the belowground parts (root and rhizome) of *Phragmites australis* were higher in 2004 than in 2003, which indicated that more nitrogen and phosphorus was taken up and stored in reed tissues. Our results demonstrate the nutrient retention capacity of *Phragmites australis* and give a concrete bases about the functioning of a root zone wetland, created by little modification of the natural conditions and they are also important in respect with the protection of the natural values of the Lake Fertő/Neusiedler See. However the use of an almost natural reed parcel for phytoremediation needs further investigations because the excess of nutrients can exert a negative effect on the reed metabolism and may affect the health condition of the reed stands.