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## ECOLOGY OF TWO RESERVOIRS (CENTRAL POLAND) AND WATER QUALITY OF VISTULA AND ITS TRIBUTARIES. PREFACE

This is the second volume of "Ekologia Polska" dealing with ecology of rivers and reservoirs in lowland central part of Poland. The first was published as volume 23 no. 3, in 1986, and dealt with the main Polish river — Wisła (Vistula), the Zegrzyński impoundment on Vistula main tributary — Narew, and some small rivers and their impoundments, or rivers flowing thorough lakes.

This volume contains 10 papers 2 of which deal with Vistula and the only at present reservoir at its lower reach — Włocławski Reservoir; the other 8 papers deal with the Zegrzyński Reservoir, at the Narew river, the main tributary to Vistula, at the very centre of Poland, near Warsaw.

The paper by Dojlido and Woyciechowska gives the general picture of pollution (according to the classification of rivers water purity applied in Poland) of Vistula and its tributaries, based on a number of main indices — parameteres measured in rivers. The total volume of sewage (and the share of those completely untraeated), to particular sections of Vistula, and also the volume discharched by main towns (including their industry), is also given. The picture is not encouraging; more than 50% of total length of rivers (Vistula and its tributaries under consideration) is beyond the classification. There is the urgent need for more sewage purification plants, and more modern purification technology, to decrease the load of various polluting substances (including common salt originating from mines). The present pollution status of these rivers brings damages in economy and health in Poland and even in other countries, by polluting the Baltic Sea.

The other extensive "Vistula paper" (by Giziński et al.) deals with Włocławski impoundment. This hypertrophic, about 70 km<sup>2</sup> large reservoir only few meters deep on most of its area, of simple "riverine" shape, shows however significant transversal differentiaton of chemical parametres, and especially zooplankton. In summer significant diurnal fluctuations of oxygen concentration occur, up to almost full oxygen deficit at the bottom in some areas. Bottom deposits, and their periodical resuspension play significant role in these processes.

Zooplankton and zoobenthos are abundant; the first is also qualitatively diverse. Both become more abundant with decreasing water flow. There are significant environmental and biological differences between middle and near-shore parts of the reservoir.



All the other 9 papers deal with Zegrzyński Reservoir on Narew river some 30 km from Warsaw. The reservoir is very important as one of the main water sources for Warsaw and also as recreational area; it also is a commercial and sport fishery area. The reservoir is about 30 km<sup>2</sup> large and mostly shallow (up to 3–4 m), with the maximal depth 9 m, at the dam. It is fed mainly by 2 rivers — eutrophic Narew, and hypertrophic Bug River, what makes its waters hypertrophic. Concentrations of total seston and total phosphorus decrease along the reservoir — the other chemical factors do not change significantly (Kajak and Dusoge). Two inflows and also wind action, result in diversification and changeability of distribution of water masses. The water retention time is low, from about 1 day at high waters to several weeks at low ones. Phytoplankton is moderately abundant and sedimentation processes dominate over its multiplication, so its biomass rather decreases towards the dam. Small diatoms and green algae are dominant both in rivers and the reservoir (Bubień).

Zooplankton, its relationships with phytoplankton and trypton, as well as its influence on phosphorus turnover time was studied in summer. Small rotifers are dominant, especially in more lotic part of the reservoir; due to quantitative and qualitative differences of zooplankton between more lotic and more lenitic (stagnant) parts of the reservoir, there are also significant differences in phosphorus retention time between these parts — it is longer in more lotic parts, due to less abundant zooplankton (Ejsmont-Karabin and Węgleńska, Bubień).

Next 2 papers deal mostly with “soft benthos”, in which Chironomidae and Tubificidae are dominant. In central parts of the reservoir (paper by Dusoge) *Chironomus plumosus*, *Glyptotendipes gripekoveni* and *Procladius* are dominant within Chironomidae, the peak numbers and biomass of which reach accordingly 40 thousands ind. and more than 600 g·m<sup>-2</sup>. The emergence of *Chironomus plumosus* takes place earlier in more lotic as compared to more stagnant parts; the size of larvae in the last ones is bigger. Two generations develop, with emergence in April-May and July-August. Some amounts of young larvae occur during all the vegetation season. All this is also true for *Glyptotendipes gripekoveni*. *Pothamotrix hammoniensis* and *Limnodrillus hofmeisteri* are dominant among Tubificidae.

The paper by Kuklińska deals with benthos of near-shore parts, at several stations where also observations of all fish occurring at these places were done (the papers on fish are to be published later). Maximal benthos biomass was found at the mouth of hypertrophic Bug River, minimal — at the mouth of eutrophic Narew River, intermediate — in central, broad part of the reservoir.

The last 3 papers (by Lewandowski et al. and 2 by Jurkiewicz-Karnkowska) deal with Mollusca, which are also very abundant — up to more than 4 kg·m<sup>-2</sup>, *Viviparus viviparus*, Sphaeridae, in some places (in rivers) *Lithoglyphus*, in others Unionidae, being dominant.

The research on the Vistula River and both reservoirs are being continued on all subjects dealt with here, as well as on bottom deposits, their resuspension and role for water chemistry and plankton, on mechanisms influencing phytoplankton abundance, on vertical distribution of benthos and feeding of *Chironomus plumosus* in the Zegrzyński Reservoir, on fish and birds abundance distribution and feeding.

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