A PHYTOPLANKTON TAXONOMIC COMPOSITION IN THE NAREW RIVER AS AN ELEMENT OF THE ECOLOGICAL STATUS OF A RIVER

Frąk M., Grunert R., Stelmaszczyk M.

According to the Water Framework Directive 2000/60/EC (WFD), biological studies of ecological communities form main element in an assessment of the ecological status of a river. Phytoplankton abundance and composition are mentioned in WFD as important indicators of biological water quality studies. Phytoplankton seems to be the most useful for examining of the river status as it is sensitive to pollution due to a short life cycle and wide spread presence.

Following poster presents results of ecological status examination based on a phytoplankton composition studies carried out on the Narew river (North-East Poland). Research was conducted at the beginning of July 2005 in upper part of the Narew river – starting from the Siemianowka Water Reservoir, ending 143 km downstream. This reach was chosen due to change of the river's character, from highly modified condition of Siemianowka Reservoir to relatively undisturbed condition at the end of a section. Water samples and phytoplankton were collected in nine different locations. Measurements of water velocity, discharge, water temperature, electrical conductivity and pH were conducted on site. Laboratory tests included composition of phytoplankton and chemical parameters of water, such as: TOC, BOD, nutrients (ammonium, nitrite, nitrate, DIP, DOP), etc.

In the samples of phytoplankton taken from the examined section of the river, the following were found: cyanobacteria (mainly *Microcystis sp., Coelospinerium sp., Anabaena spiroides*), euglenoids (*Phacus sp.*), diatoms (mainly *Melosira sp., Fragilaria crotonensis*), and green algae (mainly *Pediastrum sp., Scenedesmus quadricauda, Chlorella sp., Chlorococcus sp.*). Phytoplankton composition as a biological quality element was compared with the results of physicochemical studies, as well as with hydromorphological measurements results.

Based on the results of the above analysis it has been concluded that directly downstream the dam, the phytoplankton is under significant influence of the Siemianowka Reservoir and their high trophy. Analysis of samples collected downstream the Reservoir shows that cyanobacteria are dominating taxa (the same situation occurs in the reservoir itself). The presence of some taxa such as *Microcystis* or *Anabaena*, which are not consistent with undisturbed conditions, come as a result of transport of their biomass with a flow of the water discharged from the Reservoir. Therefore, for this section of the river more reliable would be studies of different biological quality elements, ones which are not susceptible to passive transport with body of waters, such as: macrophytes and phytobentos or bentic invertebrate fauna. The dam disturbance of ecological status indicated by phytoplankton community changes can be observed even 120 km downstream. The domination of a several algae groups (diatoms and green algae) in this area indicates high water quality; therefore, one could classify water in this part as a β-mesosaprobic.