Abstract

The area of the Jizera Mountains (northern Bohemia) was significantly affected by acid atmospheric deposition in the second half of the 20th century. This mountain area has a very sensitive geology and is characterized by the predominance of spruce stands, naturally acidic shallow soils of podzolic type, large areas of peat bogs in the upper plateau, a rough climate, and a very high annual rainfall. The frequent heavy rains and a low infiltration capacity of soils brought about floods in the past, very dangerous for the populated foothills. So in the early 20th century, for that reason, a plan was proposed to construct a system of reservoirs for a flood protection of the area. In the 1970s, the need for new sources of drinking water increased in the area. The Souš retention and recreation reservoir was rebuilt to a drinking water reservoir in 1974, and a new drinking water reservoir Josefův Důl was built in 1982. Both the water bodies have had a dystrophic character since the beginning, and the Souš reservoir suffers from naturally high concentrations of aluminum. Due to the anthropogenic acidification, the reservoirs were fishless until brook charr (Salvelinus fontinalis) were successfully (re)introduced in the 1990s, and the diversity and numbers of the zooplankton were very low. The phytoplankton were also significantly affected by acidification, despite the naturally acidic character of the water in the reservoirs, and their recovery from acidification is very slow. Since the 1980s, the dominating phytoplankton in both the reservoirs have been Dinophyceae, namely Gymnodinium sp., Peridinium uberrimum, and P. umbonatum. Minor groups in the total biomass of phytoplankton were Cryptophyceae, Chrysophyceae, and Chlorophyceae in the period of peaking acidification as well as during recovery from acidification. Recently, cyanobacteria (Merismopedia tenuissima) occur in the reservoirs, presenting a major concern for the drinking water treatment. As they may affect negatively the drinking water quality, new technologies are needed in the water treatment process.