



The role of hydromacrophytes in the creation of organic sediments in a small midfield pond

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In water reservoirs, since the beginning of their existence, there takes place a process of organic and none-organic sedimentation of different origin particles. Dead organic substances originating from auto- and allochthonic sources are deposited on the bottom creating a mud layer. It develops in result of partially decomposed plant and animal organism rests, the degree of the surrounding environmental snugness as well as in consequence of the development and density of macrophytes which stabilize the bottom and limit the resuspension of deposits. Water plants contribute also to the increase of organic substance sedimentation causing its accumulation in the deposits.

In the years 1997-2004, studies were carried out in a small midfield pond located on the area of Leszno Lakeland (Wielkopolska). This reservoir was reconstructed in the pace of a formerly existing completely overgrown pond. It was done within the actions aiming at a renewal of the retention network on areas of intensive agricultural use.

The studies were intended to trace the rate of bottom sediment formation, to determine the role played in this process by hydromacrophytes, and to identify the total nitrogen and phosphorus accumulation in the sediments.

Since the origin of the pond in 1995, a course of succession changes was observed there. In the first years of the reservoir existence, there dominated stoneworts *Chara hispida* and *Chara fragilis* which some time later started to successively retreat because of the development of plants with floating leaves. The emerged vegetation in-gressed very slowly creating narrow patches at the borders of the reservoir. In the last year of studies, almost one half on the pond surface was covered by plant community with floating leaves *Potametum natantis*, and among emerged vegetation, there dom-

inated a community of cattail, *Typhetum agustifoliae* which occupied 30% of pond surface. In the building of rush phytocoenoses, there also participated in a smaller degree *Phragmitetum* and *Typhetum latifoliae*.

Analyses carried out in 1997 showed that on the bottom of the reservoir, a 0,7 cm layer of deposits was created. Its thickness kept increasing during the past years and in 2004, it reached thickness of 10 cm. In the first year of studies, the dry matter of deposits in the whole pond amounted to 1,6 ton, and the organic substance contained in it made 9,5%. In the last year of studies, the dry matter of sediments covering the pond bottom reached 19,5 ton with a small increase of organic substance content amounting to 11,3%. The quick rate of sediment creation was caused primarily by changes which had taken place in the submerged vegetation. Expansion of plants with floating leaves caused the disappearance of stonewort meadows. Domination in the water depth of pond-weeds being short-life plants caused the deposition of great amounts of leaf biomass on the reservoir bottom.

The total amount of nitrogen and phosphorus accumulated in the bottom deposits increased also several times. In the discussed period, the accumulation of these nutrients in the sediments of the total pond increased from 7,7 kg N (1997) to 76,1 kg N (2004) and from 1 kg P to 16,7 kg P, respectively.