



Response of aquatic plants of peat pits to eutrophication processes resulted from intensive management and overdrying of surrounding them peat meadows

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Aquatic and wetland habitats belong to the most precious nature elements of rural environment. At the same time they are very sensitive to eutrophication and diverse impacts caused by intensive agriculture. If protected and well kept they may enrich plant diversity in agricultural landscape. One of the most important reasons of degradation of waters within the lowland landscape is intensive agriculture. Drainage of marshes, which was especially intensive in the last two centuries, has changed hydrological conditions and modified relationships in many aquatic and terrestrial ecosystems. This resulted in eutrophication of aquatic habitats.

The presented study are the part of investigations on the changes of aquatic and marsh vegetation during the last thirty years period within agricultural landscape of Gen. Chlapowski Landscape Park in Wielkopolska Region. Their goal was to analyse changes in aquatic plant communities within the peat pits, which are situated among the meadows. Vegetation of these ecosystems was first studied from 1976 to 1979 and investigations were repeated in 2007. This allowed to evaluate the transformation of vegetation during the last 30 years.

Analyses of the chemical composition of water showed a gradual increase in its trophic state. The strongest increase was observed in the concentrations of phosphates and ammonium nitrogen. It was a consequence of intensive management of the surrounding meadows and drainage, led to their overdrying in the 1980s, which simultaneously effected the transformation of meadow vegetation. These changes caused the acceleration of peat mineralization, which was the reason of the increased leaching of nutrients and enrichment of water stored in the peat pits.

The diversity of aquatic plant communities revealed significant transformations during the last 30 years. Species diversity, measured by the Shannon index (H') increased from 3.09 to 3.45. The increase in the number of identified plant species and associations was a result of human impact. It is accompanied, however, by retreat of plant species characteristic for waters with low nutrient concentrations and by expansion of plant associations, which are indicators of a high nutrient levels.

The most spectacular was the decline of plant associations, which were observed in the studied peat pits in the last few decades. Among them was the association *Stratiotetum aloidis*, which was very popular there in the 70s, as well as *Charetum aculeolatae* and *Myriophylletum verticillati*, which were less frequent. These communities belong to threatened with extinction on the area of Wielkopolska Region. Five stonewort species (*Chara aculeolata*, *Ch. contraria*, *Ch. jubata*, *Ch. polyacantha*, *Ch. vulgaris*) also disappeared from the studied water bodies. All of them are included in the red list of stoneworts in Poland. They disappeared, because as most species of Characeae they are characteristic for mesotrophic and slightly eutrophic water bodies, which in the last decades suffer from eutrophication.