Abstract

Newly created habitats present a unique model environment for the study of succession and related processes. Their relative isolation and the possibility to observe community assembly dynamics from the very beginning makes these experiments repeatable under controlled conditions. Planktic organisms with short generation cycles represent useful model organisms for the research of succession and related features like the influence of environmental variables or priority effect.

The thesis aims at describing the succession of phytoplankton in a set of 20 experimental ponds, where phytoplankton structure and environmental parameters have been observed for six years (2007−2012). The ponds are located in Liběchovka River-bed, which is a part of Kokořínsko Protected Landscape Area. The target locality is protected by the Ramsar agreement as a habitat for pulling birds and amphibians.

We used classical and multidimensional statistical methods (PCA, DCA, CCA) to analyse the variability in species composition and shifts in environmental variables. Metacomunity structure indices (α,ß,γ) showed a decrease of α diversity accompanied by an increase in ß diversity over the study period, which have been caused by a marked differentiation of communities in 2011−2012. γ diversity peaked in the middle of the study period (2009). Since 2010 persistent emergent macrophytes (*Lemna* sp.) have covered up to 90 % of most of the ponds surface.

There was a marked shift in phytoplankton species composition during the study period: green coccal algae (typically genera *Monoraphidium, Scenedesmus, Dictyosphaerium*) and euglenophytes (genera *Euglena, Trachelomonas, Lepocinclis)* were replaced by flagellated species communities, consisting of the genera *Chlamydomonas, Cryptomonas, Trachelomonas, Gymnodinium* and chrysophytes. We used variance partitioning to explain the influence of physico-chemical conditions, *Daphnia curvirostris*, time and season on phytoplankton species composition; these factors explained in total 10,7 % of the variability. The presence of *Daphnia curvirostris* was proved to have a minor importance, however, its high densities were negatively correlated with phytoplankton species richness.

We assume that the shift in phytoplankton species composition is in concordance with a shift between two stable states typical for shallow lakes because of intense emergent macrophyte growth of *Lemna sp*. The plant changed the light environment in the ponds, creating a habitat favourable for flagellated mixotrophs.