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BETA-DIVERSITY AND STRUCTURING FORCES OF DIATOM COMMUNITIES IN SMALL LAKES OF THE CARPATHIAN BASIN

Kovaalga közösségek beta-diverzitása és alakító tényezői Kárpát-medencei kis tavakban

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Investigating the dynamics beyond the patterns (structure, diversity) of microbial communities at regional level in different spatial scales has been a developing area in ecology and studies on diatoms with such approach receive increasing scientific interest. In this study, phytobenthos samples were collected from 41 lakes (<7 km²) in the Carpathian Basin in August 2010 and physical and chemical parameters were also determined simultaneously. Our aim was to quantify the regional species pool (γ -diversity), the local species richness (α -diversity), the dissimilarity among diatom communities (β -diversity) and to assess whether β -diversity is supported by species replacement or richness differences (nestedness). Furthermore, we investigated the local contribution to β -diversity (LCBD) of our sampling sites and that which factors play a key role in establishment of β -diversity. In the study region, we experienced high γ - (a total of 302 diatom species) and α -diversity (average species richness of 45 ± 13). The diatom community was characterised by high β -diversity (> 0.93 multiple-site Sørensen dissimilarity) which was explained mainly by species turnover. Although deterministic processes were more decisive based on null model analyses, stochasticity can also take part in community assembly. The degree of β -diversity (and thus assembly of communities, as well) was related significantly to the local environmental variables, especially to TP content and to the geographical distance between sampling sites. Samples from Kun-Fehér-tó, Pirtői Nagy-tó, Sárkány-tó and Vadása-tó showed significant relative contribution to β -diversity. Cl⁻ and HCO₃⁻ content were determining factors for LCBD, whereas local species richness was related to HCO₃⁻ and water temperature. Moreover, we found a decline in LCBD with the increase of species richness.

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