

Littoral chironomids of a large Alpine lake: spatial variation and variables supporting diversity



Chironomidae are a major group of littoral secondary producers whose spatial changes in assemblage structures are shaped by diverse variables. Using their subfossil remains, we aimed at disentangling the relative impact of environmental, topographic, littoral occupation and hydrodynamic variables on the littoral assemblages as well as identifying taxa and sites of primary importance for the β -diversity in a large lake (Lake Bourget). A redundancy analysis coupled with a variance partitioning indicated that 22 % of the assemblage variability was explained by slope, carbonate concentration and littoral occupation. A non-negligible fraction of non-separable variance among these variables likely highlights the topographic constraint on anthropogenic development and environmental conditions. Taxonomic turnover overwhelmingly (93.2 %) dominated the assemblage changes indicating site-specific taxonomic composition. The taxa contribution to β -diversity was positively correlated with their mean abundances. The local abundances were either positively or negatively correlated with local contribution of sites to β -diversity (LCBD)

providing evidence for different contributions of taxa to β -diversity. A couple of taxa (i.e. *Cricotopus* spp., *Microtendipes* sp. and *Cladotanytarsus* sp.) and sites (i.e. LB57, LB31, LB2) clearly supported the major variations of β -diversity and are therefore identified as being of primary importance regarding conservation programs. Both LCBD variations and taxa spatial autocorrelations suggest that chironomid assemblages were the most variable at a spatial-scale ranging from 500 m to 1 km, characterizing the spatial successions of littoral contexts. These results illustrate the need for considering short spatial scales to reveal the extent of the benthic diversity in the littoral areas of large lakes.

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