

Applying benthic communities to monitor heavy metal and organic matter in Baiyangdian Lake

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The role of macroinvertebrate and periphyton as bioindicator for heavy metal and organic matter was investigated by assessing both biotas along a heavy metal gradient in Baiyangdian Lake, China. Macroinvertebrate and periphyton were sampled in late June 2009, late August 2009, early November 2009, and early April 2010. Redundancy analysis (RDA) indicated Cr, Cu, Zn, and Total Organic Carbon (TOC) as the significant sediment environmental variables explaining each respectively 47.2%, 23.8%, 14.2%, and 7.8% of the macroinvertebrate community composition. Based on physical-chemical differences and community structure and function, four clusters could be separated. Cr, Pb, Cu, and TOC turned out to be significant sediment environmental variables explaining 94.7% of the total periphyton structure and function. Based on physical-chemical differences and community structure and function, three different groups could be separated. In conclusion, the macroinvertebrate community better reflected the metal gradient. It is important to note that the Hilsenhoff Biotic Index (HBI), Community Similarity Index (CSI), and Alkaline Phosphatase (APA), which will be used in the future for the assessment of the heavy metal in sediment quality based on macroinvertebrate and periphyton in Baiyangdian Lake.

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