Chemical pollution of mountain lakes

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Biofilm community composition is changing in remote mountain lakes with a relative increase in potentially toxigenic algae

Mountain lakes provide clear drinking water to humankind but are strongly impacted by global change. Benthic biofilms are crucial for maintaining water quality in these oligotrophic lakes, yet little is known about the effects of global change on mountain biofilm communities. By combining analyses of metabarcoding data on 16S and 18S rRNA genes with climatic and environmental data, researchers from the University of Toulouse III Paul Sabatier investigated global change effects on the composition of biofilm prokaryotic and micro-eukaryotic assemblages in a five-year monitoring program of 26 Pyrenean lakes (2016-2020). Using time-decay relationships and within-lake dissimilarity modelling, they show that the composition of both prokaryotic and micro-eukaryotic biofilm communities significantly shifted and their biodiversity declined from 2016 to 2020. In particular, analyses of temporal trends with linear mixed models indicated an increase in the richness and relative abundance of cyanobacteria, including potentially toxigenic cyanobacteria, and a concomitant decrease in diatom richness and relative abundance. While these compositional shifts may be due to several drivers of global change acting simultaneously on mountain lake biota, water pH and hardness were, from their data, the main environmental variables associated with changes for both prokaryotic and micro-eukaryotic assemblages.

Biofilm community composition is changing in remote mountain lakes with a relative increase in potentially toxigenic algae, Dirk Schmeller et al. -Â Water ResearchÂ