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Abstract Book



Heavy metals in pristine mountains: an emerging ecological stressor for aquatic biodiversity?

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Climate change affects the availability and quality of Alpine freshwaters, as the diminishing hydrological contribution from receding glaciers is paralleled by the increasing influence from mountain permafrost. In particular, rock glaciers (i.e., bodies of rock fragments with internal ice) have been addressed as significant water reservoirs, as their subsurface ice melts much more slowly than that of glaciers. As springs emerging from rockglaciers are quite cold even in glacier-free areas, they may also represent “climate refugia” for cold-adapted biodiversity within a context of global warming. Nonetheless, this crucial ecosystem service may be negatively affected by the release of trace metals/metalloids, which is enhanced by the permafrost thawing. In this study, we describe the physical and chemical conditions of a set of springs emerging from rock glaciers in deglaciating catchments of the Central European Alps. Concentrations of solutes and trace elements (As, U, Ni, Al, Mn) by far exceeded the environmental quality standards at several springs, in particular during late-summer. A detailed seasonal analysis on two of these springs revealed that the rise of solute concentrations can reach either a plateau during autumn, or peak during late-summer before declining towards winter. We suggest that the seasonal behaviour of solute export from rock glacier springs might be relevant for their potential ecological effects, and should be taken into account in future studies.