

Publication**Temperature variability and its influence on macroinvertebrate assemblages of alpine springs****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 3999133**Author(s)** von Fumetti, Stefanie; BieriWigger, Fabian; Nagel, Peter**Author(s) at UniBasel** [von Fumetti, Stefanie](#) ; [Wigger, Fabian](#) ; [Nagel, Peter](#) ;**Year** 2017**Title** Temperature variability and its influence on macroinvertebrate assemblages of alpine springs**Journal** Ecohydrology**Volume** 10**Number** 7**Pages / Article-Number** 10.e1878**Keywords** crenobiontic species

Constant water temperature is thought to be a key factor for macroinvertebrates inhabiting springs. Springs in low mountain ranges are usually fed by deep groundwater. At high altitudes, they are, to a certain degree, fed by nearsurface aquifers and are influenced by snow and permafrost meltwater. This may alter temperature constancy. In this study, we examined 13 springs in the Bernese Alps in Switzerland during 1äyear. The aim was to investigate the variability of water temperature and its influence on macroinvertebrate assemblages of alpine springs at different altitudes. Water temperature and solar radiation were continuously monitored; electrical conductivity, pH, and oxygen were measured; and a quantitative sampling of the macroinvertebrates was conducted 3 times from June 2010 to July 2011. Using linear correlation analysis, we detected a significant decrease of the variability of water temperature along the altitudinal gradient. Electrical conductivity was significantly lower in springs at high altitude. This might indicate an influence of snow and permafrost meltwater. The percentage of alpine species significantly increased with altitude. Taxon richness and the percentage of crenobiontic species were not significantly correlated with any physicochemical parameter. Monthly temperature amplitude and snow cover had a significant influence on the composition of macroinvertebrate assemblages, distinguishing high alpine springs from those at lower altitude. Harsh environmental conditions with low but constant water temperatures fostered alpine rhithrobiontic species, also directly at the outflow, that is, in springs. A loss of such highly adapted species is predicted due to climate change.

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