

Publication

Discharge variability and its effect on faunistic assemblages in springs

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 1335901**Author(s)** von Fumetti, Stefanie; Nagel, Peter**Author(s) at UniBasel** [von Fumetti, Stefanie](#) ; [Nagel, Peter](#) ;**Year** 2012**Title** Discharge variability and its effect on faunistic assemblages in springs**Journal** Freshwater science**Volume** 31**Number** 2**Pages / Article-Number** 647-656**Keywords** disturbance, gypsum dissolution method, discharge measurement, macroinvertebrates, diversity, climate change

Discharge variability is an important disturbance factor, and its effect on macroinvertebrate assemblages has been widely studied in river ecosystems. In comparison, few researchers have investigated discharge variability in springs because they are thought to be relatively stable ecosystems and because discharge is not easy to measure in springs. We used the gypsum-dissolution method to assess the discharge regime of 5 natural perennial springs during a 1-y study. We calculated discharge from the mass loss of gypsum spheres at a given temperature after calibration of the method in the laboratory. We also collected seasonal macroinvertebrate samples during the study period to assess the effect of discharge variability on the composition of macroinvertebrate assemblages in the springs. The calibration experiments revealed significant linear relationships between mass loss and discharge. In the field experiments, we were able to differentiate springs with high discharge variability from springs with low discharge variability. Species richness was highest in springs with highest maximum discharge. Seasonal variability in macroinvertebrate assemblages was higher in these springs than in springs with low discharge variability. Discharge variability (disturbance intensity) did not influence the diversity and number of spring specialists. We found no evidence for highest diversity at an intermediate level of disturbance as predicted by the intermediate disturbance hypothesis. The gypsum dissolution method is an appropriate method for assessing short-and medium-term discharge variability in springs. The importance of discharge variability as flow-associated disturbance is expected to increase in the context of the predicted effects of changes in global climate and land use, i.e., increasing drought periods and flood events.

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