

Effects of flow events and nutrient addition on stream periphyton and macroinvertebrates: an experimental study using flumes



We used flume experiments to study the effects of a temporary increase in stream flow on macroinvertebrates, leaf litter breakdown and soft-bodied benthic algae; both as a single stressor and eventually in combination with an increase in nutrient supply. In order to understand how well the flumes reflected the nearby stream ecosystem, we compared species composition of macroinvertebrates and benthic algae between the flumes and the nearby stream from which the flumes were supplied with water. As single stressors, nutrient addition and an increased flow velocity from 1.3 to 2.8 cm s⁻¹ lead to an increase in the biomass of benthic algae, likely reflecting an improved transfer of nutrients into algal patches. However, the combined effect of flow and nutrient addition was smaller than the sum of both individual effects, likely because an increased biomass also was more susceptible to scouring. We found differences in macroinvertebrate and benthic algal taxon identity and abundance between stream and flumes. Since biodiversity is assumed to stabilize ecological functioning in response to disturbances and variation, we conclude that

care should be taken in applying results from small scale experiments to stream ecosystems.

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