



SEFS 12
Symposium for
European Freshwater Sciences

VIRTUAL CONFERENCE | 25–30 JULY 2021 | #SEFS12

Abstract Book



Flow intermittence and functional processes: are artificial flumes and field data comparable?

Laura Gruppuso^{1,2}, Alberto Doretto^{2,3}, Elena Piano^{1,2}, Elisa Falasco^{1,2}, Dr Maria Cristina Bruno⁴, Francesca Bona^{1,2}, Prof Stefano Fenoglio^{1,2}

¹University Of Turin, DBIOS, ²ALPSTREAM, ³University of Piemonte Orientale, DISIT, ⁴Edmund Mach Foundation, Department of Sustainable Agro-ecosystems and Bioresources, Research and Innovation Centre

5B_RS11 Fundamental and applied freshwater ecology, July 27, 2021, 13:15 - 14:45

Because of the effects of climate change and human pressures, streams of the Alpine area are increasingly facing flow intermittence and specifically riverbed drying. In this context, the high unpredictability of intermittent streams flow regimes and interactions among multiple environmental factors make the study of these systems extremely complex. Therefore, the use of laboratory and field-based mesocosms produces considerable advantages. Nevertheless, the results obtained with these simulations require evaluation and calibration with field data. We compared an intermittent condition (in which the channel or streambed dried) with a control treatment with perennial flow in (a) an artificial flume system fed by a mountain stream and (b) two mountain streams. In both experiments, we sampled the macroinvertebrate community and measured leaf decomposition rates at comparable time intervals, to assess the applicability of manipulative experiments to natural conditions. Consistent patterns in total β -diversity and leaf mass loss were observed between the two experimental conditions, despite differences in shredder abundance. Leaf litter decomposition was more efficient where water was present during the whole experiment, along with a more stable and diverse macroinvertebrates community, in both mesocosm and field studies. This result highlights the impact of drying events and the opportunity to study this phenomenon through flume simulations, which can provide an effective proxy for naturally occurring processes in stream ecosystems.