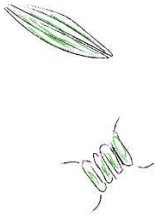
ABSTRACT BOOK



SS12_P2_Use of semiartificial flumes in stream ecology: an overview of simulations to assess anthropic impacts on alpine streams

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The assessment of the ecological impacts of anthropic alteration of stream ecosystems is often difficult due to the presence of confounding and interacting factors. Starting in 2008, we have been using a set of five open-air, stream-side steel flumes, directly fed by a 2nd order gravel-bed Alpine stream (Trentino, NE Italy). The system diverts water directly from the river via a weir into a collecting tank, and the tank feeds five 30 cm wide, 20 m long U-frame metal flumes that contain a sluice gate at the upstream end to control discharge. Hence, periphyton and benthic invertebrates can colonize the substrate naturally and complete their life cycles in the flumes. We have been conducting sets of simulations to disentangle the effects on macroinvertebrates and periphyton of: 1) sudden changes in discharge (hydropeaking) caused by hydropower plant operations; 2) sudden changes of temperature (thermopeaking) associated to hydropeaking; 3) fine sediment waves caused by dam flushes; 4) light pollution; 5) flow intermittency; 6) minimum vital flows. We present the setting of the different simulations, and the main results achieved in terms of alterations of microbenthic communities abundances, composition, and functional groups; of periphytic communities biomass, composition, and nutritional quality.