Submitted Abstract

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Abstract

Freshwater ecosystems host a high biodiversity, which is crucial for the functioning of riverine systems and for the preservation of ecosystem services from a broader perspective. Especially running water habitats in mountainous regions face threats of ecological deterioration through changes in anthropogenic land use, habitat loss and degradation. In these environments, stream benthic macroinvertebrates are largely used as indicator organisms for assessments of riverine ecosystem health. However, as several studies have shown taxa richness and density of macroinvertebrates are highly dependent on physical environmental variables and substrates. Here, we summarize and discuss some results of the first sampling season of benthic macroinvertebrates within the project “Biodiversity Monitoring South Tyrol”. In 48 sites located across the Northern Italian province of South Tyrol, stream benthic macroinvertebrates and abiotic water parameters were collected and measured, and changes in macroinvertebrate assemblages and community structure across sites and among microhabitats were investigated. Higher abundances and taxa richness were found at lower elevations and in streams with high velocity and more natural streambed structure, whilst taxa richness and density of individuals were lower at higher elevations and on artificial surfaces. Overall, different substrates hosted distinct assemblages and therefore increased substrate diversity generally led to increased diversity of macroinvertebrate assemblages. We found that differing substrate availability at patch level is highly important for the distribution and composition of benthic macroinvertebrate assemblages in different types of mountainous streams. This could be an important aspect for assessing long-term biodiversity variations in monitoring programs, but also for potential actions dealing with ecological restoration.