

Publication

A macroecological perspective of trait patterns in stream communities

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 2288314**Author(s)** Heino, Jani; Schmera, Denes; Eros, Tibor**Author(s) at UniBasel** [Schmera, Dénes](#) ;**Year** 2013**Title** A macroecological perspective of trait patterns in stream communities**Journal** Freshwater biology**Volume** 58**Number** 8**Pages / Article-Number** 1539-1555**Keywords** community organisation, fish, geographical gradients, habitat templates, invertebrates, species traits

Other than some classical ideas, large-scale approaches to understand variation in organismal traits (or the trait composition of an ecological community) across stream ecosystems are rather recent. Recent case studies and review papers show clear evidence for the usefulness of trait-based analyses in bioassessment, but how community traits vary along natural gradients at large scales has not yet been synthesised. Here, we attempt to fill this gap by providing a synthesis of trait patterns of stream communities from a macroecological perspective. We argue that although both natural and anthropogenic filters shape community traits, examination of poorly understood natural filters, including those acting at large scales, should receive increasing attention. Such knowledge is vital for reliably inferring anthropogenic impacts on stream communities and ecosystems. We synthesise knowledge of two large-scale spatial patterns of stream communities: among drainage basins (i.e. geographical variation) and within drainage basins (i.e. longitudinal variation). We also examine the temporal dimension of organismal traits. Our review highlights clear evidence for large-scale influences on the trait composition in stream systems. For example, despite previous contentions that organismal traits should vary negligibly across large geographical gradients, there is actually clear geographical variation across near-pristine systems. Furthermore, in accordance with theory, organismal traits in actual data sets vary along the longitudinal gradient of stream systems. We provide an overview of empirical and statistical approaches to understanding the trait composition of stream communities in macroecological studies and conclude that the methodology should be carefully considered in comparisons among studies, because contrasting results may reflect not only ecological differences but also differences in methodology (e.g. choice of species traits, trait quantification and analytical methods). We conclude that the question of how the trait composition of stream communities varies along geographical and environmental gradients is far from settled. A challenge for large-scale stream ecology is to provide a more specific view of trait variation in multiple taxonomic groups (e.g. do traits vary similarly in different organisms groups?), along major environmental gradients (e.g. is trait variation similar along the same environmental gradients in different regions?) and among different regional entities (e.g. do the traits vary, on average, among different regions?).

Publisher Blackwell**ISSN/ISBN** 0046-5070**edoc-URL** <http://edoc.unibas.ch/dok/A6205532>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1111/fwb.12164**ISI-Number** WOS:000329212300001

