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Assessment of Macroinvertebrate Trait Affinities along a Gradient of Streamflow Permanence in the Xeric Region of California, USA

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Abstract

Understanding biotic community distributions and dynamics along a gradient of streamflow permanence is important for conservation of biodiversity. We sampled macroinvertebrate assemblages at 27 streams in April 2014, in the Xeric Region of California, USA. Streams ranged from perennial to intermittent sites and had a median of 162 zero-flow days per year. We analyzed 58 macroinvertebrate traits on both a richness and abundance basis. Traits were analyzed as subsets characterized as life history, mobility, morphology, and ecology. We constructed traits space-resemblance matrices and tested for association with groups of environmental factors characterized as water chemistry, stream habitat, and stream flow metrics. Abundance-based traits generally had stronger associations with environmental factors compared to richness-based traits. No significant relations were found with water chemistry for either abundance- or richness based traits. Abundance-based traits of life history, mobility, morphology, and ecology had significant relations with stream-flow metrics, and excluding ecology, all the same traits were significantly related to habitat variables. Understanding the trait relations to environmental factors is vital for protecting and conserving biodiversity in intermittent streams within arid regions of the world.