

# The lack of simple biodiversity–ecosystem function relationships for the eastern and central Tibetan grasslands

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May 5, 2020

## Abstract

The combinations of taxonomic, functional and phylogenetic method have been frequently advocated to assess how changes in biodiversity affect community structure and ecosystem function. Using a large grassland community database involving 917 species and 118 sites across the eastern and central Tibetan plateau, we found an overall positive biodiversity-productivity relationship in species', functional and phylogenetic space. The relationship, however, was nonlinear, in which biodiversity explained better the variation in community biomass when species diversity was more than a threshold, showing a weak effect of biodiversity on ecosystem function in low species diversity communities. We also found a filled triangle for the limit of the relationship between species' and functional diversity, implying that functional diversity differs significantly among communities when their species diversity is low but finally converges to be a constant with increasing communities' species diversity. Our research suggests that multiple niche processes may structure the Tibetan grassland communities, and their forces tend to balance in high-biodiversity communities.

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