

Giving-up diversity (GUDiv): top-down effects of foraging decisions on local, landscape and regional biodiversity of resources

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January 20, 2021

Abstract

Foraging by consumers has direct effects on the community of their resource species, and may serve as a biotic filtering mechanism of diversity. Determinants of foraging behaviour may thus have cascading effects on abundance, diversity, and functional trait composition of the resource community. Here we propose giving-up diversity (GUDiv) as a novel concept and simple measure to quantify community effects of foraging at multiple spatial diversity scales. GUDiv provides a framework linking theories of adaptive foraging behaviour with community ecology. In experimental resource landscapes we showcase effects of patch residency of foraging wild rodents on α -GUDiv, β -GUDiv and γ -GUDiv, and on functional trait composition of resources. Using GUDiv allows for prediction-based investigation of cascading indirect predation effects (ecology of fear) across multiple trophic levels, of feedbacks between functional trait composition of resource and consumer communities, and of effects of inter-individual differences among foragers on the diversity of resource communities.

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