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

Prof. Jana Eccard

Animal Ecology, University of Potsdam, Germany

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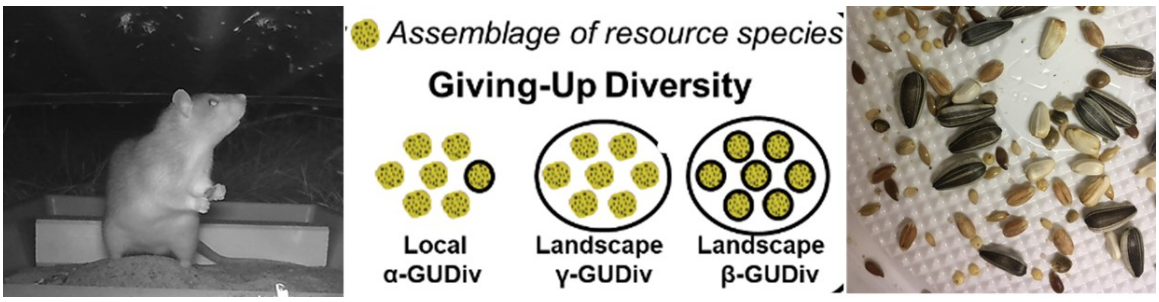
Foraging by consumers has direct effects on the community of their resource species, and may serve as a biotic filtering mechanism of diversity. Determinants of foraging behaviour therefore have cascading effects on abundance, diversity, and functional trait composition of the resource community. The diversity of food species when a forager gives up foraging in a patch (GUDiv) may serve as a simple measure to quantify community effects of foraging at multiple spatial diversity scales. Effects of residency in food patches and across entire food landscapes can be measured as the local diversity (alpha), and landscape wide as gamma (cumulative) and beta diversity (differences among sites) of a landscape containing these food species. In a feedback loop, functional traits and trait composition of food species also affect depletion dynamics on different spatial diversity scales as well. GUDiv may thus allow for prediction-based investigation of cascading indirect predation effects (ecology of fear) across multiple trophic levels, and of effects of inter-individual differences among foragers on the diversity of resource communities. I will introduce the GUDiv approach and show experimental data on wild foragers where we found cascading landscape of fear effects on α-GUDiv, ß-GUDiv and γ-GUDiv. While α- and γ-GUDiv are reduced with safety of the forages, ß-GUDiv increases with safety. Only in safety foragers express food selection, affecting GUDiv dynamics relative to GUD. Thus, the GUDiv approach has the potential to link aspects of foraging behaviour to the diversity of remaining food communities.



eccard@uni-potsdam.de; https://www.uni-potsdam.de/de/ibb-tieroekologie/mempage/jaeccard;
@EccardLab