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# Ecosystem functioning and species extinctions

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## Abstract

Session: Perspectives on Extinction (Julien Delord, David Sepkoski, Marco Tamborini, Derek Turner)

I would like to propose an epistemological typology of the different explanations relating species extinctions to ecosystem functioning. Indeed, the evaluation of biodiversity effects on ecosystem services such as gas regulation, food and fiber supply, soil regeneration, relies on the impact attributed to species or population extinctions on the functioning of ecosystem. This major research program in ecology, sometimes called the "Biodiversity-Ecosystem Functioning (BEF) paradigm", aims at predicting the effect of species richness and characteristics on ecosystems and at backing new conservation strategies on scientific evidence.

Considering the extinction problem, the loss of species can affect the functioning of the ecosystem and on the reverse, a disturbed ecosystem can cause the extinction of some of its constituting species. This reciprocal relationship need to be studied on an homogeneous epistemological background. I show that three main paradigms allows to conceive ecosystemic and populational dynamics on a par in the BEF paradigm: probabilism, mechanicism, and organicism. I then discuss the limits of this approaches regarding the predictions of extinction dynamics and I suggest that species should be replaced by ecological traits as the focus entities of ecosystem functioning studies.

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