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# Stoichiometry as an interaction trait in a multitrophic system

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## Abstract

Herbivores and decomposers are key actors of biogeochemical cycles. Among them, phytophagous insects and soil decomposers feeding on litter are particularly important actors of the carbon and nutrient fluxes. Because the quality of the litter is linked to the characteristics of the plants that produced them, the plants/insects and litter/detritivores trophic networks connect the aboveground and belowground parts of ecosystems. In each trophic level that builds up this multitrophic system, the consumers and their resources are linked by interaction traits. These interaction traits include mechanical, chemical, physiological and stoichiometric characteristics of the consumers and their resources, which control the strength of the trophic relationships. Their stoichiometry (i.e. the elemental ratio between elements) deserves particular attention, because the nutritional requirements of consumers may lead to the selection of resources by consumers.

Additionally, grazing by domestic and wild herbivores has direct and indirect impacts on soil resource levels, plant community composition, and therefore affects the quantity and amount plants and litter.

In this presentation, we will explore the following questions

- How does herbivory by sheep impact soil nutrient availability and the stoichiometry of live plants and litter?
- Does this change affect the stoichiometry of their consumers?
- Does the stoichiometric mismatch between resources (plants or litter) and their consumers

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(Insect herbivores/decomposers) affect the diet of individual consumers?  
Using grasshopper and macrodetritivores as model phytophagous insects and decomposers, respectively, we combined the study of community structures, CNP analyses and diet analyses to disentangle how ecological stoichiometry may help understanding multitrophic networks.

**Keywords:** Grasshopper, stoichiometry, grazing, macrodetritivores, trophic networks, metagenomics