
Consumer-resources interactions Driving Ecosystem processes in a Mediterranean specific rich rangeland in southern France

Elena Kazakou^{*1}, Iris Bumb , Jules Segrestin , Eric Garnier , Johanne Nahmani , and Sylvain Coq

¹Centre d'Ecologie Fonctionnelle et Evolutive (CEFE) – Campus CNRS, UMR 5175, Montpellier SupAgro – 1919 route de Mende;34293;Montpellier Cedex 5, France

Abstract

There is an increasing recognition that aboveground belowground components of terrestrial ecosystems are strongly linked through a variety of both direct and indirect interactions that operate across multi-trophic levels, mostly the consumers and the primary producers. The general objective of the present study was to understand the response of plant-soil system to herbivory with a trait-based approach. We addressed the following questions:

(1) What is the effect of different management practices (herbivory pressure and nutrient disponibility) to plant species adaptative strategies?

(2) Does different management practices influence soil biota and then soil processes by affecting the quantity and quality of resources produced by plants?

We studied 16 species with contrasting growth forms from a Mediterranean rangeland in southern France grazed by sheep and subject to two management regimes: fertilization and intensive grazing vs. non-fertilization and moderate grazing. Dry matter digestibility and decomposability were estimated at peak standing biomass, as well as functional traits measured both on green and litter plants. Litter palatability was tested by a cafeteria experiment with three common litter-feeding millipedes.

Dry matter digestibility was significantly positively related to decomposability. Several traits of green leaves related to physiological and protective features persist through senescence, affected affect leaf digestibility and litter decomposition. This is the case for the physical strength of leaves, leaf dry matter content and fibre content. Our results demonstrated the strength of a trait based approach to predict changes in ecosystem processes as a result of species shifts in ecosystems

Keywords: traits, decomposition, digestibility, after, life effect, herbivory, fertilisation

*Speaker