



XXVI Colloque annuel de la section française de l'UIEIS

Banyuls-sur-mer 13-15 avril 2011



Differential response of leaf litter ants to nutrient addition in a tropical Brown Food Web

Justine Jacquemin^{1,3}, Mark Maraun², Yves Roisin¹, Maurice Leponce³

¹ Evolutionary Biology & Ecology, Université Libre de Bruxelles, Belgium

² J.F. Blumenbach Institute of Zoology and Anthropology, Animal Ecology, Georg August University of Göttingen, Germany

³ Biological Evaluation Section, Royal Belgian Institute of Natural Sciences, Belgium
(Justine.Jacquemin@naturalsciences.be)

Tropical Brown Food Webs (BFW) convert leaf litter into tissue, soil organic matter and CO₂ under the effect of microbes, microbivores and their predators. Ants are usually considered as generalist consumers, playing a key role in the BFW as top predators. However, ants present a wide range of diets, and other taxa of the megafauna (e.g. spiders) are also important predators of litter mesofauna.

We performed a 6-months nutrient addition experiment (+CN and +CNP) in a montane tropical forest of Southern Ecuador to study the effects of nutrient supply on the arthropod community, from microbivores to predators, in terms of density and composition. We distinguished different trophic groups of ants, based on their isotopic signature and on literature, to compare the response of predaceous ants to that of the other trophic groups.

Due to an increased microbial activity, litter volume in treated plots decreased significantly compared to control, leading to a loss of habitat. Among the mesofauna, Collembola density was enhanced by the +CNP treatment. Ants responded differentially according to their trophic group: omnivorous, fungus-growing and honeydew/nectar-eating species density didn't change with the nutrient supply, but predaceous species in general and Collembola hunters were negatively affected by both treatments (+CN and +CNP). By contrast, the density of other predators of the megafauna, spiders in particular, generally increased.

Our experiment had an impact on the structure of the whole leaf litter arthropod community, at each level of the trophic web. This impact was specially strong at the predator level with an opposite change in predaceous ant and spider densities, both taxa playing a key role as top predators in the leaf litter system. Predaceous ants seemed to be limited by habitat rather than by prey availability, and to be more affected by the loss of habitat than their prey, other ant trophic groups and other taxa of the litter megafauna.