P097

Ant differential response to nutrient addition in an Andean forest

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Ants in the tropics present a wide variety of diets and degrees of specialization that can be functionally categorized into feeding groups. Carbon (C), nitrogen (N) and phosphorus (P) are limiting in the leaf-litter food web, from microorganisms to arthropods. Our aim was to study the response of ant prey and competitors in terms of density to a nutrient addition, and the response of ants -according to their feeding group- in terms of density, taxonomic richness, taxonomic and feeding group composition. We performed a 6-month nutrient addition experiment (+CN and +CNP) in a premontane tropical forest in Ecuador. We distinguished different ant feeding groups, based on their isotopic signature and literature. Due to an increased microbial activity, litter volume in treated plots decreased significantly compared to control, leading to habitat loss. Among the mesofauna, Collembola density was enhanced by the treatment. The density of predatory ant competitors such as spiders generally increased. Ant taxonomic richness was similar in control and fertilized plots, although the taxonomic composition changed significantly. While the overall feeding group composition remained unchanged, the density of predatory ants decreased and the taxonomic dominance changed within each group. *Solenopsis*, the dominant genus among omnivores in control plots, was numerically replaced by *Pheidole* in nutrient-treated plots. The same trend was observed among fungus, nectar and honeydew-eaters, and predators. Our experiment had an impact on the structure of the whole leaf-litter food web. Our results showed a differential response of ants to fertilization according to their feeding group. Predatory ants seemed to be limited by habitat rather than by prey availability. While the feeding functions were maintained among the ant assemblage, a taxonomic shift occurred within each feeding group, suggesting that the functions are maintained in a changing environment even if they are fulfilled by other taxa.