

Ant predators control phylogenetic structure of termite assemblages in an Amazonian rainforest

Predators can have strong effects on prey communities by reducing abundance, altering the strength of competition, and modifying how prey species interact with their environment.

However, the importance of these processes in producing patterns of phylogenetic community structure is largely unstudied. We investigated the influence of generalist ant predators and environmental conditions on the phylogenetic structure of a species-rich termite community in a central Amazonian rainforest. Termite abundance was more similar among closely-related species, but lineages with high abundance have evolved repeatedly. The density of generalist ant predators was the single variable most strongly correlated with termite abundance, species density, and species turnover. Overall, the phylogenetic patterns of species co-occurrence could not be distinguished from random. However, phylogenetic structure among sample plots was correlated with predator density, and changed from overdispersed to clumped along a gradient of increasing predator density and increasing soil phosphorous concentration. In this system, generalist ant predators had a strong influence on termite communities by reducing prey density, which could potentially reduce the strength of interspecific competition or differentially remove lineages that lack anti-predator adaptations. In concert with environmental conditions, predators can affect species density and turnover and change the phylogenetic structure of prey communities.