

A positive relationship between ant biodiversity (Hymenoptera : Formicidae) and rate of scavenger-mediated nutrient redistribution along a disturbance gradient in a south-east Asian rain forest

Abstract

Human modification of pristine habitats almost always leads to the local extinction of a subset of the species present. This means that the ecosystem processes carried out by the remaining species may change. It is well documented that particular species of ants carry out important ecosystem processes. However, while much work has been carried out to investigate the link between biodiversity and ecosystem functioning in other taxa, this has received relatively little attention for ant communities. In particular, no attempt has been made to link levels of ant diversity with the rates of nutrient redistribution carried out by scavenging species. Here we investigate the impacts of anthropogenic disturbance on the rate of scavenger-mediated nutrient redistribution, using bait-removal rate as a surrogate measure. We found that although ant species richness, diversity, biomass and rates of bait removal did not change systematically across the disturbance gradient, the rate of bait removal was related to ant species richness. Sites with more ant species experienced a faster rate of bait removal. This is the first documented positive relationship between ant species richness and the rate of an ecosystem process. If these results are applicable at larger spatial scales for a wider range of nutrient sources, loss of ant species could lead to important changes in the way that ecosystems function.