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How does anthropization affect the functional characteristics of ant communities?

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Linking species diversity and traits to habitat properties and their effect on the rules governing community assembly is essential to understanding the impact of human activity on ecosystem functioning. Species coexistence is determined by a number of factors among which local adaptation and competition act in opposite ways. Indeed, whereas environmental filtering promotes trait convergence, competition favours niche divergence. We aimed to quantify the nutritional and foraging strategies of tropical ant communities to understand (i) how the ecological optima may contribute to species coexistence and (ii) how human-driven modifications to habitats affect species traits and thus community assembly and functioning. To that end, various food items representing different ecosystem functions were used to attract ants in forests and slash-and-burn croplands. Then, the most representative bait was offered (but displayed in different ways) to assess how species are able to discover and/or appropriate resources, and how the amount of food or the effect of a microhabitat act on their foraging strategies. We show that species diversity, as well as the composition and functional characteristics of the communities, differ greatly between habitats. Niche-overlap was greater in slash-and-burn croplands than in the forest where species differed more in their feeding and foraging optima. This may be linked to the heterogeneous conditions present in the forest due to habitat complexity and stratification. On the contrary, the simplified structure and homogeneous environmental conditions found in the croplands are likely to favour the high dominance of generalist species, regardless of bait type. We conclude that the conversion of forest areas to open and simplified habitats favours a limited guild of ant species adapted to such conditions. This has consequences for the functional structure of the ecosystem, although we did not observe a decline in most of the tested functions.