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Trophic functions, a structuring trait for tropical ant assemblages.

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Interspecific competition is high in ants, with few species dominating food resources and displacing other species. Therefore, niche differentiation is an important mechanism to maintain the high local species richness, which is typical for tropical communities. Species composition and the ecosystem functions performed by ant communities can drastically change with habitat disturbance. However, detailed information on the functional niches is only available for a few ant species, hampering our understanding of the importance of niche differentiation in ant communities in general. To assess community structure in relation to trophic functions performed by ants we conducted studies in primary and secondary rainforests of the neo- and paleotropics. We used eight bait types that reflected different natural resources. On a grid system, each type of bait was offered night and day, in order to estimate niche position and breadth for each ant species. Our results demonstrate that ant communities consist of a range of dietary and temporal specialists and generalists. Functional diversity and functional redundancy increased with ant diversity, indicating that the alteration of community structure does not invariably lead to a degradation of trophic functions. Some ant species play key roles in structuring the food webs of tropical rainforests and we can show that this is due to their numerical abundance, type of food specialization and temporal breadth. Our findings furthermore indicate that taxonomically related species can exhibit highly distinct trophic niches. Overall, we discovered clear parallels between the ant communities in the neo- and paleotropics in the trophic functions and their role in shaping community structure.