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High competition between ant species at intermediate temperatures

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Abstract

Living organisms have been moving rapidly toward their favorable thermal regions as climate warms. Their competitive interactions will change significantly as a result of changes in distribution, abundance, and species composition. This study examines the relationship of competition intensity (frequency of competitive interactions) with temperature and the influence of competition on the occurrence of ant species.

Competition between ants was surveyed at six different temperature sites using baits and the abundance of ants was surveyed using pitfall traps. The intensity of interspecific competition (abundance-corrected bait species displacement) was high at intermediate temperature sites (unimodal). Ant species are hierarchically organized in behavioral dominance. Two low-temperature ant species had decreased in the rank of behavioral dominance at warmer temperature sites because of the abundance of dominant intermediate temperature ant species. Ant species co-occurred randomly at the local scale. However, they were segregated at regional scale because of environmental filtering (temperature). Ant competition did not influence the occurrence of ant species at local or regional scale. These results suggest that the influence of changes in interspecific competition because of climate warming might not be great for ants in

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