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## Effects of temperature fluctuation on interactions between generalist insect predators

Amanda N. Laubmeier  
*Texas Tech University, amanda.laubmeier@ttu.edu*

Nusrat Tabassum  
*Texas Tech University*

Brigitte Tenhumberg  
*University of Nebraska - Lincoln*

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Amanda N. Laubmeier, Nusrat Tabassum, Brigitte Tenhumberg

Natural communities of generalist insect predators play an important role in suppressing agricultural pests. However, the overall pest control by a natural insect community is influenced by a dense network of predator-predator interactions, which are further shaped by species traits and environmental factors. Understanding how these interactions combine to determine pest control is especially important in the context of changing global temperatures, as empirical work has shown that insect behavior is strongly influenced by temperature. To explore the expected consequences for pest control, we utilize an ordinary differential equation model for predator-prey interactions, which is parameterized by body size and habitat preference. We incorporate terms for the effect of temperature on habitat preference and foraging activity. We apply the model to empirically observed insect communities in ten agricultural fields to investigate how temperature-dependent behaviors change the anticipated pest control by the insect predators. We also identify the optimal predator composition for pest control and evaluate how this composition changes with increasing variability in daily temperature. This allows us to assess the effect of climate change on pest control by natural insect predators.