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ABSTRACT

Major: Biology Poster

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Potential interactions between two tick species on Peromyscus leucopus

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Vector-borne diseases and their impacts on human well-being are important public health issues in the United States. White-footed mice (Peromyscus leucopus) are important reservoirs of pathogens that can cause tick-borne diseases (TBDs) in humans. In this study, we identified tick species infesting western IL P. leucopus to understand human risk for TBDs. Mice were collected in 2022 and 2023 from forest habitats at Western Illinois University´s Kibbe Life Science Station near Hamilton, IL. Mice were live-trapped and then euthanized in the laboratory. Mice were examined for ticks, which were removed, placed in 80% ethanol, and later identified as Dermacentor variabilis (American dog tick) or Ixodes scapularis (deer tick) using morphological keys. Non-parametric statistical tests were performed to understand the overall and annual population sizes (i.e., ticks collected from mice) of each species. We tested for interactions between the species by examining patterns of co-infestation (presence/absence) and counts of each species on individual mice. From 135 P. leucopus, we identified 972 larvae. The total number of D. variabilis was significantly higher than I. scapularis (754 vs 219). The relative numbers of both species were significantly different over time (approximately equal numbers in 2022, but far more D. variabilis in 2023). Patterns of co-infestation by both species were random. However, there was a significant negative (rank) correlation between the counts of each species on individual hosts, suggesting a negative ecological interaction. More work is now required to understand the determinants of total numbers and how ticks affect each other on hosts.