UC RIVERSIDE | DEPARTMENT OF ENTOMOLOGY

ENTM250 Series Webinar

Speaker:

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Date: Monday, Jan. 10, 2022
Time: 4:00 pm - 4:50 pm
Zoom: 948 0131 1028
Passcode: 347039

Title:
"Mitey Behavior: Using the behavior of facultatively parasitic mites to begin uncovering the mystery of how some parasitic lifestyles evolved"

Abstract:
My research focuses on one broad question: how do parasitic strategies evolve? More specifically, what role does parasitic behavior play in parasite evolution and how is variation in parasite behavior maintained? I developed a research program studying the facultatively parasitic mite, Macrocheles muscaedomesticae and one of its hosts, Drosophila hydei. Using this mite-fly system, I tested a common hypothesis for how parasitic life strategies may have evolved: what I call the 'stepping-stone hypothesis'. This hypothesis posits that intermediate life history strategies with transient associations between symbiont and host served as stepping-stones for the evolution of obligate parasitism. Although its commonly assumed to be the route by which parasitic strategies have evolved, most aspects of the hypothesis have yet to be tested. First, I tested the assumption that parasitic behavior is heritable by experimentally evolving the mites. I generated mite populations that exhibited significantly increased levels of parasitic behavior and the additive genetic variation for the trait was estimated to be about 16.6%. I then began investigating sources for variation in parasitic behavior. Evolutionary trade-offs associated with increased expression of parasitic-behavior and phenotypic plasticity were hypothesized sources for variation. Both selected and control mite populations exhibited similar life-history traits and nearly identical levels of phenotypic plasticity in their parasitic-behavior. These results did not support the presence of trade-offs but indicate phenotypic plasticity as a source for variation. More recently, my research focused on quantifying consistent individual differences in parasitic behavior within and among mite populations. By assaying individual mites, I have revealed repeatability in individuals' attachment behavior, where some individuals consistently attach to hosts upon repeated exposure, while others never attach to a host. Future research will continue with the quantification of parasitic behavior in individual mites as well as exploring genetic variation in individual mites.