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# Host-Parasite Interactions: Effects of Larval Habitat on Ascogregarina barretti Infection in Aedes triseriatus

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# Host-Parasite Interactions: Effects of Larval Habitat on *Ascogregarina barretti* Infection in *Aedes triseriatus*

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Throughout human history, mosquitos have been effective vectors of some of the most virulent human pathogens. In response, much research has investigated the relationship between mosquitoes and the pathogens they vector, but little is known about the role of parasite infection on mosquito fitness, which can indirectly influence vector competence. Parasite infection is fundamentally an ecological process; thus, we investigated the role of key ecological factors influencing pathogen infection rates and fitness in the native treehole mosquito, *Aedes triseriatus.* In their larval habitat, they can become infected by a non-lethal gregarine parasite (*Ascogregarina baretti*) that requires the mosquito to complete its life cycle to reproduce. We evaluated the effect of nutrient level and type on *Ae. triseriatus* larval survival, development time, and *A. baretti* infection by placing 30 individual larvae per level in 12 ml of water infused with 3 levels of ground crickets or leaf detritus. These nutrient resources mirror natural detritus present in larval aquatic habitats. Data collected provided insight into three aspects of the observed host-parasite relationship: First, in habitats with low concentrations of animal and leaf infusion, mosquito fitness declines and pathogen infection rate is low. Second, in high concentration animal infusion, mosquito fitness is high and pathogen infection rate is low. Third, in high concentration leaf infusion, although larvae mortality is rare, pathogen infection rate is significantly higher. These interactions indicate higher complexity pathogen/larval interactions such as a larval immune response in low nutrient environments where stress is high. Exploring how mosquitos interact with pathogens under different ecological and environmental conditions is fundamentally important to understanding how these ecological factors can effect mosquito and pathogen distribution and how vectored disease is spread. The relationship between *A. triseriatus* and *A. barretti* can act as a model to further understand how ecological factors influence pathogen-host interactions.