

Mere Exposure Effects: Presence of parasitic mites induce a change in the metabolic rate of flies independent of infection

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Oral Presentation Abstract:

Parasites affect host physiology and populations in numerous ways including: increased mortality, decreased fecundity, and changes to host behavior. Many documented effects depend on infection to explain changes, for example: parasite blood feeding, tissue damage, and costs of immune responses. However, the effects that the mere presence of parasites have on their hosts is relatively unexplored. We study a fruit fly - mite model system. *Macrocheles Domesticae* is an ectoparasite that reversibly attaches to *Drosophila Hydei* as a means of transportation as well as feeding on host hemolymph. Since flies must move between resource patches, the effects of parasite infection on flight are significant. This system is can be used to illustrate host-parasite dynamics. We take an ecological physiology perspective and link physical changes in organisms to the larger scale processes of ecology; we deploy respirometry to compare energy consumption of flies under various conditions. Carbon Dioxide produced is measured as a flow, and linked to energy consumption by the cellular respiration equation. We hypothesize that host flight will be impaired by infection. Bioenergetic costs of infection imply this effect will be present even if mites are removed prior to flight. Results show that both flies carrying mites, and flies infected prior to flight, both hover for reduced lengths of time. Additionally, both actively resisting mites, as well as mere exposure to them, increases the Carbon Dioxide output of the host. These results have implications for host fitness and energy budgets in both the evolution and ecology of host-parasite interactions.

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