

Title: Host Recognition in *Leptopilina heterotoma* and Its Interaction with Symbiont-Infested *Drosophila* Larvae

Parasitoid wasps such as *Leptopilina heterotoma* (Hymenoptera, Figitidae) develop within other arthropods, killing their hosts as part of their life cycle. Successful reproduction in these wasps' hinges on finding and recognizing compatible hosts, which is central to their survival. The constant evolutionary arms race between hosts and parasitoids is well illustrated by the interaction between *Drosophila* larvae and *L. heterotoma*, aligning with the Red Queen hypothesis. *Drosophila* larvae resist parasitoid attacks through innate immune responses. However, *L. heterotoma* has evolved mechanisms to bypass these defenses.

An additional layer of protection for *Drosophila* comes from the bacterial symbiont *Spiroplasma*, transmitted maternally, which resides in the hemolymph and secretes a toxin lethal to parasitoid larvae. Although *Spiroplasma* offers near-total protection under laboratory conditions, it is found at low frequencies in natural populations. This suggests that *L. heterotoma* might avoid these protected hosts by selectively ovipositing in symbiont-free larvae. A potential mechanism for detecting such hosts could involve differences in cuticular hydrocarbons (CHCs), which are crucial for host recognition in *L. heterotoma* and may vary depending on symbiont presence.

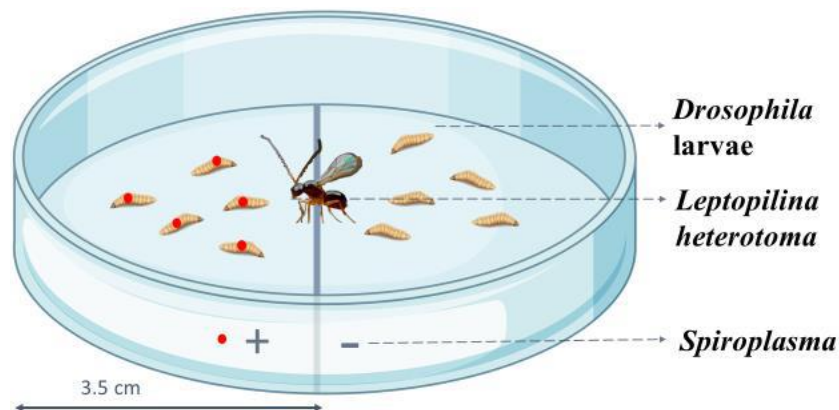


Figure1. Host choice assay (details in text)

We plan to determine if *L. heterotoma* can differentiate between *Drosophila* larvae with and without protective *Spiroplasma* symbionts; and to assess whether *Drosophila* larvae with and without symbionts show differences in their CHC profiles.

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