

Transcriptional Responses of Honeybee Larvae Due to Inert Spray Tank Adjuvant and Virus Synergism

Julia Fine

Honey bees (*Apis mellifera*) provide valuable pollination services and their declining populations continue to threaten worldwide agriculture. Both pesticides and viral pathogens are among the suspected causal agents of this decline; however, neither has been linked definitively with colony failure. Researchers are beginning to suspect that chemical and viral stressors may be interacting. Our recent research has found a synergistic increase in the mortality of honeybee larvae when exposed to a widely used but under studied organosilicone spray-tank adjuvant (OS) and a virus inoculum containing Israeli Acute Paralysis Virus (IAPV). Here, I propose to determine the molecular basis of this synergism between the pesticide adjuvant and viral infection. Using next generation sequencing methods, this project will sequence the transcriptome of larvae collected during the initial experiment and analyze the data for differentially expressed genes to determine if common genetic pathways are impacted by these two stress factors. This project will help to understand how IAPV and OS impact honeybee health independently and in combination, and will identify target genes for future studies in honeybees and other pollinators. This data is expected to be important in protecting the health of pollinators.