

## Honey bee hive collapse associated with invasive Argentine ants and viral pathogens

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Eligible for student prize

Invasive species, emerging infectious diseases and their interaction are major threats to global biodiversity. Following reports of heavy ant infestation in honey bee (*Apis mellifera*) hives in the Northland region, we highlight the role of the widespread and invasive Argentine ant (*Linepithema humile*) in the mortality and disease dynamics of honey bees. Over a six-month period, hive survival in apiaries with Argentine ants was 52.8% compared to 89.5% in apiaries without ants. Bees within these hives were afflicted with *Deformed wing virus*, a globally widespread pathogen contributing to honey bee colony losses. Average *Deformed wing virus* infection levels were always higher in bees when Argentine ants were present. Bees in apiaries with ants acquired viral infections up to 220-fold higher than the maximum infection in apiaries without ants. Argentine ants are likely contributing to honey bee hive collapse through the combined effects of predation, hive robbing, and disease. Invasive species can have known substantial effects as predators, but may also have a significant role in disease dynamics.

