

Abstracts: Poster

4.6.P Honeybee viruses in novel hosts – Studying agrochemical-pathogen stress combination in wild bees

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Abstract

It has been theorized that agrochemicals can impact the immune response in honeybees, leading to increased sensitivity to pathogens. The link between neonicotinoids and increased severity of gut-parasite *Nosema ceranae* infection has been experimentally established, while the link between viral pathogen infection outcome and agrochemical exposure remains unclear. Viruses first discovered in honeybees have been found in wild-caught individuals of a variety of bee species, proving the potential of spillover from honeybees to wild bees and may act as pathogens in these novel hosts. As wild solitary bees share the environment with honeybees, they are potentially exposed to similar combinations of pathogen and agrochemical stress. No study has so far tested the combined effects of agrochemical exposure and pathogen pressure on solitary bees. In order to study this relationship, experimental pathogen infection must first be established for the novel hosts. In this study, two wild bee species (*Osmia bicornis* and *Anthophora plumipes*) were injected with a fixed titre of three viral honeybee pathogens commonly found across Europe, with the aim to observe if the viruses would replicate in these novel hosts. This pathogenic stressor can then be experimentally combined with agrochemical exposure, in order to locate potential synergistic interaction between pathogen and pesticide. Further experiments will combine infection with gut parasites *Apicystis bombi* and *Crithidia mellificae* with exposure to the novel insecticide sulfoxaflor to further evaluate the fitness effect of these combined stressors that wild bees encounter in the agricultural landscape.

4.7.P Is *Apis mellifera* a good model for toxicity tests in Brazil?

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Abstract

Exposure to pesticides are among the contributing factors related to the reducing pollinators. To register these molecules and release for them use in Brazil, the bee used in toxicity tests is the *A. mellifera* species, which is a non-native bee. There are questions about whether we should use this species as a model. Thus, it is important to establish the toxicity in different species of bees to verify whether there are differences in the sensitivity to these compounds among the bees. The present study compared oral toxicity (OECD, 213) of thiamethoxam among two species of stingless bees (*Melipona scutellaris* and *Scaptotrigona postica*) and *A. mellifera* by determining the mean lethal concentration (LC₅₀). The results showed that the stingless bees are more sensitive to the insecticide with a lower LC₅₀ of 0.0543 ng active ingredient (a.i./μL) in *M. scutellaris*, 0.14 ng a.i./μL in *S. postica* compared to 0.227 ng a.i./μL in *A. mellifera*. These results show that could be harmful to use *A. mellifera* as model for toxicity tests in Brazil. Thus, the current challenge is to establish the maximum concentrations or limits of environmental contaminants that protect the diversity of bee species in Brazil, comparing the data obtained for *A. mellifera* to stingless bees, and verify if toxicity tests for a model species are safe and effective at inferring effects on the ecosystem as a whole.