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Effects of Fungal Biopesticide Doses on Mortality in Bumble Bees

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Effects of fungal biopesticide doses on mortality in bumble bees

Abstract:

Agricultural practices often include the use of pesticides to produce meaningful crop yields. While the pesticide may be used to target “pest” insects (e.g. thrips, aphids, whiteflies), it can also have negative effects on important pollinating insects such as bees. Neonicotinoid pesticides have been found responsible for widespread decline in bee biodiversity, and were even banned in Europe (Sgolastra *et al.* 2020). *Beauveria bassiana*, sold as Botanigard, on the other hand, is a fungal biopesticide that is marketed to be a safer alternative for bees, and has been found to have other possibly harmful effects to the inner workings of the hive in honey bees (Carlesso *et al.* 2020). I challenged this notion that *B. bassiana* has little to no effect on bee mortality, by testing individual bees of the species *Bombus impatiens*. By dosing bees in a range of concentrations of Botanigard, I can see how they are individually affected by *B. bassiana* inoculation. I collected death per day and average survival time post dose, thorax width, and mycosis assessments (death due to fungal exposure). Bumble bees are of interest in addition to honey bees due to their more widespread and native ranges. Determining the impacts related to their thorax sizes could show important differences in resilience. This data will ultimately confirm dosage methods for the main experiment looking at sublethal impacts on the same system.