Estimating the LC50 of 1-Naphthyl-N-methylcarbamate in an Insecticide Using Different Percentages of Concentration on Apis mellifera

Xu, Justine (School: St. John's School)

Pesticides pose an increasing issue in the survivorship of bees in their normal lives, so this project can help solidify the fact that dangerous chemicals should not be as easily accessible to the common public as it is right now, and different solutions should be created that will take better account of non-targeted victims. The purpose of my project was to find the LC50 of 1-naphthyl-N-methylcarbamate, a highly toxic insecticide, in a commercial insecticide on honeybees on Guam. Bees are currently an endangered species so this project aims to save their population by discovering the actual lethality of the solution and what the concentration of the solution that kills 50% of the bees after the observation time is. Different percentages of stock concentration with the carbaryl concentration were mixed in with honey and ingested by the bees. Using a serial dilution, the percentages of concentration of a commercial insecticide to water tested were 100%, 75%, 50%, 25%, 12.5%, 6.25%, and 0%, which corresponded to their respective carbaryl concentrations. Observations were made after 24 hours and 48 hours, and all data was collected and fitted to an exponential decay function (y = 80.5e^-6.73x for the first day). The LC50 found was much smaller than what was anticipated, 0.0000889% of carbaryl after the first day and 0.0000436% of carbaryl after the second day of observation, signaling the toxicity of an insecticide and just how dangerous it is to bees at the current state, given how easy it is for one without a pesticide license to obtain and use it. Therefore, I concluded that pesticides such as the commercial insecticide used should have more restrictions imposed on who gets to purchase and use it for the reasons of negatively affecting non-targeted organisms such as the threatened species, Apis mellifera.

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