Degradation of Nonpathogenic Iridovirus May Improve Food Nutrition in Insects

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Those involved in the citrus industry understand the ongoing struggle of warding off pests from their crop to ensure the best product. Diaphorina citri, or more commonly, the Asian citrus psyllid is a vector of Candidatus liberibactor, which is the bacterium that causes Huanglongbing or Citrus Greening Disease. The Iridovirus is a type of virus with double-stranded DNA genomes, and has not been shown to occur in psyllids or be pathogenic to insects. I decided to propose a solution in which the population of the Asian citrus psyllid is lowered, therefore decreasing the spread of Citrus Greening Disease. My previous study showed caffeine to be toxic to psyllids, so I wanted to test if virus mixed with caffeine would have an improved effect. Four treatments were ingested by separate groups of psyllids; the control (water), 0.05% Caffeine, Iridovirus, and a mix of Iridovirus and 0.05% Caffeine. Interestingly, the psyllids which ingested the virus had less mortality compared to those which ingested the caffeine and caffeine mixed with virus treatments. The Analysis of Variance (ANOVA) showed significant difference between the treatments at a 95% confidence interval, from which I concluded that my results happened due to the effect of the virus on the insect. Based on further research the Iridovirus most likely breaks down into proteins which are then absorbed through the plant and ingested by the psyllid, causing an immune response or an increased protein uptake by the psyllid. These results could develop into a natural solution to improve beneficial insect populations.

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