



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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<b>Project Title</b>  <b>Honey! Why Can't My Bees Fly? Investigating the Accuracy of Varroa Mite Treatments</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this study is to see if different Varroa Mite (Varroa Destructor, parasitic mites) treatments that beekeepers are using are effectively killing and containing the mite infestations that are in my hives while keeping them strong for pollination, overwintering, and not contaminating my honey. While combating deformed wing virus and other new bacteria that is in the hive that can kill the bees.</p> <p><b>Methods</b> Tested different chemicals on treating Varroa mites to find the most natural way to treat the mites and keep the bees healthy. Used HopGuard (natural beer hops), Apistan strips, Apiguard, Apivar, and the Varroa Gate to treat the Varroa mites in a natural way on my 100 of 120 hives of bees. The other 20 hives were the control group to compare the treatments. Comparing the toxicities and efficacies of five acaricidal to both the Varroa mites and host bees.</p> <p><b>Results</b> The testing of the Varroa was compared to the control group after the chemicals were applied. There was a tremendous drop of mites in the hives after 14 days but the chemicals were detected in the honey. When using natural HopGuard the first application was 91.11% efficient, the second application (28 days) was 99.95% efficient. The Varroa Gate on the other hand was 96.52% efficient and at 28 days it was 99.97% efficient. The beta acids in HopGuard II cause death to the mites by asphyxiation by penetration of the pest's thin exoskeleton. The Varroa Gate on the front of the hives with the embedded acaricide in the plastic and works like a dogs flea collar.</p> <p><b>Conclusions</b> The Varroa Gate and HopGuard treatments killed only the mites, not the bees. It was 99.95% efficient in killing the mites and Colony Collapse was minimal or eliminated 100%. I found HopGuard used beta plant acids from hop plants and does not harm bees or brood, and leaves no residue in the honey. The Varroa Gate acts almost like a flea collar on a dog and transfers the treatment to the bees as they crawl through the gate and does not leave residue in the honey. My hives were stronger when overwintering and leading into pollination. When using chemicals to treat my bees I found it had neonicotinoides which are found in chemicals the farmers are spraying on their orchards, this is taken back into the hives and causes bee deaths and deformities.</p>	
<b>Summary Statement</b>  My project showed how using different Varroa mite treatments affect the bees and how to eliminate them from the hive.	
<b>Help Received</b>  My mom worked with me as she is a beekeeper, and I had the University of Maryland Bee Diagnostic Team help with my testing.	