

Development of a novel natural-based product as an insecticide, miticide and fungicide, using *Myzus persicae*, *Tetranychus urticae* Koch, and *Botrytis* as test organisms

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Background

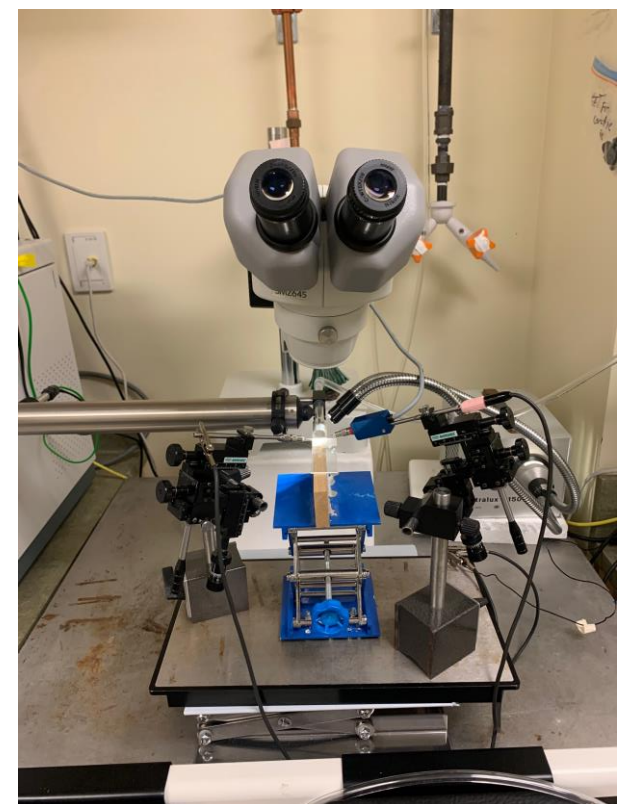
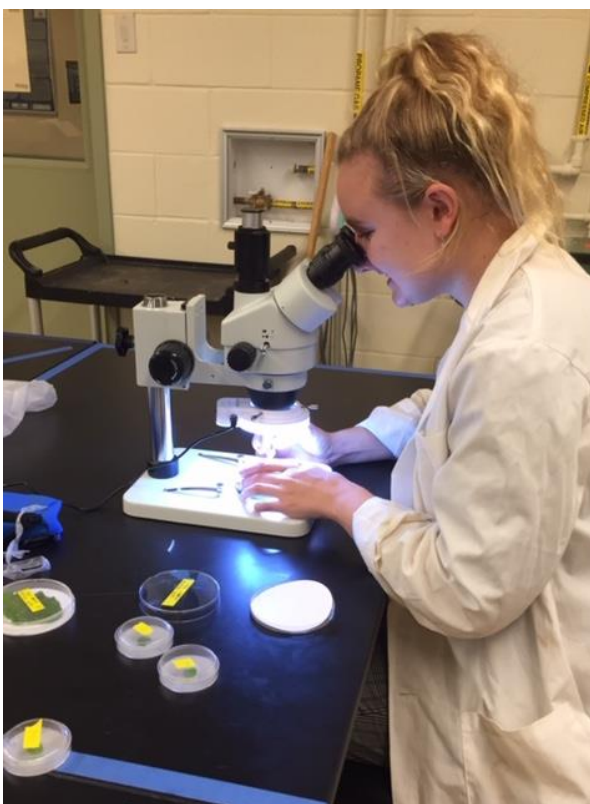
Insect pests present a significant threat to global economies through crop damage and causing adverse effects on human health. Synthetic pesticides are most often used to control insect pests. However, the long-term and extensive use of synthetic pesticides can impact human health, disrupt ecosystems and harm other beneficial insects. Plant essential oils (EOs) have been recognized as a viable natural source of pest control that reduces the impact to the environment and human health.

The Study

This study is in partnership with the Canadian company Nutrilife Plant Products Ltd. Nutrilife's product 102 is the most effective of their pesticides for control of green peach aphids and spider mites. The main goal of this project will be to improve the efficiency of product 102 by modifying the formula and dosage, and investigating the mechanism of action of the pesticide. In addition, the project will assess the impact of the pesticide to beneficial species, such as honey bees, test phytotoxicity, and explore the potential of the product as a fungicide.

Methods

Mortality testing will be conducted in two formats: 1) topical – spraying aphids/mites directly, 2) residual – spraying foliage and placing the insects/mites on the foliage. In both formats, 4 different products will be sprayed: 1) control/water, 2) Vegol (competing product), 3) Nutrilife product 102, 4) modified product 102. Modifications to product 102 will consist of replacing coriander (current essential oil) with each of the following essential oils: lavender, thyme, eucalyptus, basil and neem.



Radish Phytotoxicity Testing

To investigate the mechanism of action for product 102, and modified products, volatiles from the sprayed plants will be collected. Collected volatiles will be tested for sensitivity to green peach aphids and spider mites using gas chromatography linked electroantennographic detection (EAD).

