

Asian Lady Beetles...Infestation or Curation? A Novel Study to Evaluate the Efficacy of *Harmonia axyridis* Hemolymph as a Pesticide to Control *Diaphorina citri* (Asian Citrus Psyllid), and as an Antibiotic against the Huanglongbing Disease Causing *Liberibacter*!

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Huanglongbing (HLB) disease causes worldwide losses in citrus industry worth billions of dollars every year. The causative bacteria of HLB, *Candidatus Liberibacter* is transmitted by the Asian Psyllid. The current treatments for HLB are not effective and involve mostly preventive measures. Recently, Asian beetles have been used to control psyllid infestation. Our studies investigated the effects of *Harmonia axyridis* beetle hemolymph on the cause (psyllids) and the causative agent (*C. Liberibacter*) of HLB in an attempt to find novel treatments for the disease. We hypothesized that the beetle hemolymph will act as a pesticide against psyllids and as an antibiotic against *Liberibacter*. Hemolymph was extracted from dried and live beetles, and by soaking beetles in different solvents. The extracts were tested for pesticidal activity against ants and aphids, and as an antibiotic against *E. coli* and *Liberibacter*. Beetle extracts showed potent pesticidal activity. The extract either killed or drastically slowed pests activity. Hemolymph collected from live beetles, in methanol, or in water was more effective as pesticide than that collected in saline or from dried beetles. Results of antibiotic efficacy assessment of the hemolymph on *E. coli* suggested that extracts possess strong antibiotic properties. Hemolymph extracted in methanol was the most effective in inhibiting the growth of *E. coli* followed by water extract, and the saline extracts. The least effective was the extract from live beetles. Testing on *L. crescens* indicated that wild extract was the most effective. Saline and Methanol extracts, however, showed minimal antibiotic properties. Taken together, our data strongly suggest that beetles hemolymph could further be explored as a possible and a novel treatment for HLB.

Awards Won:

Third Award of \$1,000