University of Zabol
Graduate school
Faculty of Agriculture
Department of Plant Protection

The Thesis Submitted for The Degree of Master of Science
(In The Field of Agricultural Entomology)

Title:

Evaluation of Biological Activity and Chemical Components Essential Oils of *Psidium guajava* and *Vitex agnus-castus* Against three Stored Product Pests

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Abstract:

In recent years essential oils have received much attention as pest control agents because of their insecticidal, repellent or antifeedant properties. In this research, the contact toxicity, ocular toxicity, dispersal, oviposition, inhibition of spawning and durability of the essential oil of two guava and chaste tree on three types of storage pests, *sitophilus oryzae*, *tribolium confusum* and *tribolium castaneum* in a factorial experiment base on completely randomized design in the laboratory. The results showed that both essential oils have insecticidal effects and the mortality rate of the examined insects increased with the increase in the concentration of essential oils. In the contact toxicity test on whole insects, it was found that the essential oil of chaste tree caused the most toxicity on *tribolium confusum* and *tribolium castaneum*. While the highest death rate in *sitophilus oryzae* was achieved with the use of guava essential oil. The results of the respiratory toxicity test showed that the highest concentration of chaste tree essential oil resulted in the loss of 87.00 and 92.30% of *tribolium confusum* and *tribolium castaneum* The results also showed that the 5-day-old larvae of all three investigated pests showed the highest sensitivity to contact and respiratory toxicity of essential oils. The results of investigating the repellent effect of essential oils on insects showed that the repellent effect against all three pests increased by increasing the concentration and time of application of essential oils. The results of investigating the effect of essential oils on spawning showed that increasing the concentration of both types of essential oils significantly reduced the egg hatching rate. The highest rate of egg laying of *sitophilus oryzae* was related to the use of guava essential oil. In the essential oil durability test, the death rate increased with the increase of the essential oil concentration, but with the increase of the duration, the essential oil durability showed a decreasing trend, so that the lowest percentage of the essential oil durability of all treatments was observed in the period of 48 hours. Although the LT50 duration of five finger essential oil was lower than that of guava essential oil, five finger essential oil had a more toxic effect on the oviposition and larvicide of pests.

Keywords: Guava, Vitex, Essential oil toxicity, *Tribalum confusum, Tribalium castaneum, Sitophilus oryzae*