ISSN: 1391-8796
Proceedings of 11th Ruhuna International Science & Technology Conference
University of Ruhuna, Matara, Sri Lanka
January 24, 2024

# *In vitro* evaluation of acute toxicity of citrus essential oils towards the parasitic mite *Tetranychus urticae*

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*Tetranychus urticae* is the most important parasitic mite on red worms negatively impacting vermicompost production. The efficiency of vermicompost beds can be severely affected by the occurrence of red spider mites. Although various chemicals with acaricidal effects have been used to control these mites, their frequent use may result in a negative effect on the environment. This study aimed to evaluate the effect of selected citrus peel extracts on the mite population and to assess their toxicity on *Eisenia fetida*. Essential oils were extracted from peels of four fruit species of citrus, namely, *Citrus limon* (lemon), *Citrus aurantiifolia* (lime), *Citrus reticulata* (mandarin), and *Citrus maxima* (pomelo), and tested for their acaricidal and repellent activities at five different concentrations (0.125, 0.25, 0.5, 1 and 2 mg/ml) using *Tetranychus urticae*. Five adult mites were gently transferred into a previously prepared tube using a small paint brush in three replicates for each concentration. Mite mortality, inactive stage, and active stage were assessed. A toxicity study was conducted using *E. fetida*. The findings showed that pomelo oil has the highest level of acaricidal and repellent activity against mites and mandarin oil recorded the lowest activity. Only 20% of mites were active after exposure to mandarin, lemon, and lime, whereas a maximum of 40% of mites were inactive after the treatment. No toxic symptoms were observed on earthworms treated with all types of citrus essential oils. The findings of the present study indicated that lime and pomelo can be suggested as potential agents for controlling mites on vermicomposting beds. These extracts can be formulated with additives and recommended to farmers.

**Keywords:** Acaricidal activity, citrus fruit, Eisenia fetida, red spider mite, steam distillation

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