



ELSEVIER

Available online at www.sciencedirect.com
SciVerse ScienceDirect

Procedia Engineering 53 (2013) 20 – 28

**Procedia
Engineering**

www.elsevier.com/locate/procediaMalaysian Technical Universities Conference on Engineering & Technology 2012, MUCET 2012
Part 3 - Civil and Chemical Engineering

The Susceptibility of Aphids, *Aphis gossypii* Glover to Lauric Acid based Natural Pesticide

Sharifah Fathiyah Sy Mohamad^a, Shahril Mohamad^a, Azila Abdul Aziz^b^aFaculty of Chemical & Natural Resources Engineering, Universiti Malaysia Pahang, Kuantan, Pahang^bFaculty of Chemical Engineering, Universiti Teknologi Malaysia, Skudai, Johor

Abstract

The susceptibility of aphids to lauric acid, a type of middle-chain fatty acids, based pesticide formulation was investigated. The insecticidal properties of lauric acid based pesticide formulation against aphids were evaluated through the three main routes of exposure: topical application, leaf-dipping (ingestion) and inhalation. Surface tension dependent aphids toxicity was also investigated by measuring the surface tension value of each formulation prepared. The relationship of surface tension and formulation toxicity was then observed on aphid tested. The obtained results indicate that all tested formulations had insecticidal activity against tested aphids depending on exposure method and lauric acid concentration. The topical application method recorded 100% mortality rates compared to the other two methods. With topical application method, most of the aphids died soon after treatment. Toxicity symptoms from lauric acid to aphids included unusual abdominal contractions which caused quick loss of coordination and decreased activity, and finally dehydration and necrosis within 24 hours. Results from surface tension study revealed close connection between toxicity and surface tension. This might lead to the conclusion that toxicity was possibly related to aphid suffocation in the highly wettable solution. Results from this research also demonstrated that there were possibility that lauric acid do not only kill aphids by suffocation, but also through change of cuticle and cell permeability and desiccation that lead to speedy death due to the chemical nature of lauric acid. Overall, the results recommend that lauric acid based pesticide formulation has both physical and chemical mode of action on aphids.

© 2013 The Authors. Published by Elsevier Ltd.

Selection and peer-review under responsibility of the Research Management & Innovation Centre, Universiti Malaysia Perlis

Keywords: *Aphis gossypii*; lauric acid; toxicity; surface tension.