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## Screening of Thai Local Plant Extracts for their Insecticidal Effectiveness and the Effect of its Active Compound on Diamondback Moth Larvae

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### Abstract

The application of botanical insecticides is one of alternative ways to reduce the use of harmful insecticides in agricultural pest management. Nine species of Thai local plant extracts with known insecticidal properties i.e. *Acorus calamus*, *Eugenia caryophyllus*, *Mammea siamensis* and 6 species of *Stemona* (*S. curtisii*, *S. tuberosa*, *S. burkillii*, *S. kerrii*, *Stemona* unknown 1 and *Stemona* unknown 2) were screened for the highest insecticidal activity by the Brine Shrimp Lethality Test (BST). *M. siamensis* expressed a very strong toxic effect on brine shrimp with the lowest 24 hour LC<sub>50</sub> value of 0.072 mg L<sup>-1</sup>. The purification of its active compound was conducted using chromatographic methods and the BST to select the most effective fraction. The spectroscopic method i.e. MS, IR and NMR were used for the identification of the active compound. Surangin B was finally identified as the active compound. Its insecticidal effectiveness on the 3<sup>rd</sup> instar larvae of diamondback moth was investigated by topical application and leaf dipping methods in comparison with methomyl. The results indicated that surangin B demonstrated a higher contact activity than methomyl with 24 hour LC<sub>50</sub> values of 0.07 and 0.51 g L<sup>-1</sup>, respectively. Moreover, surangin B also had a stronger antifeedant activity than methomyl with the percent of leaf area damaged of 0.83 and 0.14 % for the surangin B concentration of 0.5 and 1.0 g L<sup>-1</sup>, respectively. However, methomyl exhibited a lower toxicity with 3.19 and 1.65 % leaf area damaged for the methomyl concentration of 0.5 and 1.0 g L<sup>-1</sup>, respectively. From the results it can be concluded, that mammea extract might be one of the natural insecticides for the diamondback moth management. However, before the future promotion, its efficiency under field conditions, effects on agricultural products and the ecosystem should be tested for confirmation of its insecticidal effectiveness and safety.

**Keywords:** Botanical insecticide, diamondback moth, plant extract, surangin B