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Part 1 – Abstracts

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Toxic effect of volatiles from five plants on *Sitotroga cerealella* (Oliver) (Lepidoptera: Gelechiidae) in stored paddy

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Sitotroga cerealella (Oliver) (Lepidoptera: Gelechiidae) is one of the most destructive and common insect pest in stored paddy. The objective of the present study was to evaluate the insecticidal activity of the essential oils of five plants, *Cymbopogon citratus* (Lemongrass), *Cymbopogon nardus* (Citronella), *Cinnamomum zeylanicum* (Cinnamon) leaves, *Alpinia calcarata* (Heen araththa) rhizome, *Murraya koenigii* (Curry leaves) and a synthetic insecticide Pirimiphos methyl (Actellic[®]) when used as a fumigant and as a contact toxicant against *S. cerealella*.

The highest fumigant effect was shown by the essential oil of *A. calcarata* and its LC₅₀ value was 3.7 mg/L and in the contact toxicity bioassay the highest efficacy was indicated by the essential oil of *C. nardus* leaves and the LC₅₀ value was 4.8 mg/L. The lowest toxic effects were shown by the essential oil of *M. koenigii* with the LC₅₀ values of 41.8 and 82.0 mg/L for the fumigant and contact toxicity bioassays respectively. The LC₅₀ values for Pirimiphos methyl due to the fumigant and contact toxicity effects were 0.56 and 0.62 mg/L respectively. This study reveals that the five essential oils could be developed as botanical pesticides to control *S. cerealella* in stored paddy.

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The efficacy of the methanol extracts of leaves of Lemongrass- (*Cymbopogon citratus* D.C. Stapf) and Curry leaf- (*Murraya koenigii* Spreng) on cowpea bruchid- (*Callosobruchus maculatus* F.)

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The methanol extracts of leaves of lemongrass and curry leaf were evaluated for their insecticidal properties against cowpea seed bruchid - *Callosobruchus maculatus* using residual film exposure and treated seed bioassays. An appropriate dose of each plant was dissolved in acetone and mixed with 50 cowpea seeds separately. The seeds were kept for 10 min. to evaporate the solvents and placed in a glass vial (60 ml) for treated seeds bioassay. The inner surface of a glass vial was treated with the methanol extract of each plant separately and used for the residual film assay. Five pairs of 5-10 h old bruchid were introduced to each treatments and the mortality was observed after 24 h exposure period. In residual film assay, 100 % mortality of bruchid was observed at doses of 22.3×10^{-3} and 40.0×10^{-3} mg of lemongrass and curry leaf extracts respectively. The percentage mortality was about 81 at the dose of 140.0×10^{-3} mg in treated seed bioassay. The oviposition and F₁ adult emergence were significantly reduced in appropriate doses. The LC₅₀ values of lemongrass, curry leaf and pirimiphos methyl (Actellic) were, 0.120 g/l and 0.167 g/l and 8.550×10^{-3} g/l respectively. There was no effect of both lemongrass and curry leaf extracts on seed viability. These findings indicate the possibilities of using the methanol extracts of both lemongrass and curry leaf as a bio pesticide to control *C. maculatus* in stored cowpea. The active ingredients of these extracts should be further studied.

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