Larvicidal Activity of Leaf Extract of Lime (*Citrus aurantifolia* (Christ.) Swingle) and Synthetic Pesticide Spinosad against Diamond Back Moth, *Plutella xylostella* L. (Lepidoptera: Plutellidae) on Cabbage

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Diamond back moth, *Plutella xylostella* (L.) is one of the major pests of cruciferous crops in SriLanka. The larvae feed on the leaves resulting in a severe loss of yield. Long-term application of synthetic pesticides have adverse effects on non-target organisms, ecosystem and human health. Use of plant extracts could be an alternative to synthetic pesticides for insect pest management. This study was aimed to evaluate and the potential use of leaf extract of *Citrus aurantifolia* as a larvicide against 3rd instar larvae of *Plutella xylostella* compared to synthetic pesticide Spinosad under laboratory conditions. Methanol leaf extract (MeLE) at 0.05 g/mL, 0.125 g/mL and 0.2 g/mL and aqueous leaf extract (AqLE) at 0.05 g/ml, 0.15 g/mL, and 0.2 g/mL were tested against 3rd instar larva of *P.xylostella* using leaf dipping bio assay. Five larvae were exposed per cabbage leaf discs (6.4 cm diameter) and treated with leaf extracts along with solvent controls (methanol, water and synthetic pesticide). Dead larvae were removed and counted every 24 hours. Survived larvae were reared until adult emergence. This was replicated four times. Data analysis was carried out performing ANOVA using Minitab (ver.17) software. All concentrations of the leaf extracts caused significant ($p<0.05$) larval mortality of *P. xylostella*. Larvicidal effect of leaf extract of *C. aurantifolia* was increased with the increase of concentrations of MeLE and AqLE and time. All the concentrations of MeLE and AqLE showed 60%-95% larval mortality after 72 hours of exposure comparable with solvent controls while all concentrations of synthetic pesticide except 5 g/L showed 100% larval mortality after 24 hours of treatment. Pupal deformities at 0.2 g/mL of MeLE and curled wing adults at 0.2 g/mL of AqLE were also observed. Further field study is needed to confirm the findings. The result of the present study would be useful in promoting research aiming at the development of new agents for insect pest control based on natural products.

Keywords: Cabbage, *Citrus aurantifolia*, Leaf extract, Larvicide, *Plutella xylostella*