

## Larvicidal and ovicidal activity of *Citrus aurantifolia* (Christm.) Swingle leaf extract against dengue vectors

MO Galappaththi, AA Jabeer, F Noordeen

**Introduction and objective:** *Aedes aegypti* and *Aedes albopictus* are the main vectors of dengue viral transmission. The main approach to control dengue involves targeting the oval and larval stages of the *Aedes* mosquito vectors. The use of synthetic larvicides cause several environmental and health concerns and may lead to the development of resistance. Thus plant-based novel strategies are needed for the control of dengue mosquito vectors. This study aimed to test the ovicidal and larvicidal activity of *Citrus aurantifolia* leaf extract against *Ae. aegypti* and *Ae. albopictus*.

**Methods:** *C. aurantifolia* mature leaves were ground using a laboratory mortar and pestle. Different concentrations of the extract (5%, 10%, 15%, 20% (v/v)) were prepared using fresh extract and distilled water. Hatched egg numbers were recorded after 12 hours. The larvicidal activity was tested against the fourth instar larvae (eggs hatched into fourth instar larvae within 3-4 days) and eggs were maintained in spring water containers at room temperature. The number of dead larvae was recorded every 12 hours up to 48 hours. Four replicates with 25 eggs and 25 larvae were used separately for each experiment. Percentage larval mortality, oval mortality, LC<sub>50</sub> and LC<sub>90</sub> values were calculated using SPSS-Probit analysis.

**Results:** According to the larvicidal test results, 100% mortality was observed for both *Ae. aegypti* and *Ae. albopictus* larvae after 12 hours at the highest concentration (20% (v/v)). For *Ae. aegypti*, the LC<sub>50</sub> and LC<sub>90</sub> values were 2.93% (v/v) and 6.84% (v/v), respectively. For *Ae. albopictus*, the LC<sub>50</sub> and LC<sub>90</sub> values were 4.74% (v/v) and 11.10% (v/v), respectively. For the ovicidal test, 100% mortality was observed for both *Ae. aegypti* and *Ae. albopictus* after 12 hours at the highest concentration (20% (v/v)). For *Ae. aegypti*, the LC<sub>50</sub> and LC<sub>90</sub> values were 1.36% (v/v) and 5.19% (v/v), respectively. For *Ae. albopictus*, the LC<sub>50</sub> and LC<sub>90</sub> values were 1.06% (v/v) and 4.49% (v/v), respectively.

**Conclusions:** *C. aurantifolia* leaf extract showed 100% ovicidal and 100% larvicidal activity against *Ae. aegypti* and *Ae. albopictus* after 12 hours at the 20% (v/v) highest concentration. These results showed that the *C. aurantifolia* leaf extract can act as an eco-friendly larvi-/ovicide against the dengue vectors. Experiments on testing synergistic larvicidal/ovicidal activity of different plant leaf extracts are in progress.

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