

Mosquito larvicidal constituents from *Lantana viburnoides* sp *viburnoides* var *kisi* (*A. rich*) Verdc (Verbenaceae)

Ester Innocent¹, Cosam C Joseph, Nicholus K Gikonyo, Mainen J Moshi, Mayunga H H Nkunya, Ahmed Hassanali

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Abstract

Background & objectives: *Lantana viburnoides* sp *viburnoides* var *kisi* is used in Tanzania ethnobotanically to repel mosquitoes as well as in traditional medicine for stomach ache relief. Bioassay-guided fractionation and subtraction bioassays of the dichloromethane extract of the root barks were carried out in order to identify the bioactive components for controlling *Anopheles gambiae* s.s. mosquito larvae.

Methods: Twenty late III or early IV instar larvae of *An. gambiae* s.s. were exposed to various concentrations of the plant extracts, fractions, blends and pure compounds, and were assayed in the laboratory by using the protocol of WHO 1996. Mean mortalities were compared using Dunnett's test ($p < 0.05$) and lethal concentration calculated by Lackfit Inversel of the SAS programme.

Results: The crude extract ($LC_{50} = 7.70$ ppm in 72 h) and fractions exhibited different level of mosquito larvicidal activity with subtraction of some fractions resulting in activity enhancement. The active fractions contained furanonaphthaquinones regio-isomers ($LC_{50} = 5.48-5.70$ ppm in 72 h) and the lantadene triterpenoid camaric acid ($LC_{50} = 6.19$ ppm in 72 h) as active principles while the lupane triterpenoid betulinic acid ($LC_{50} < 10$ ppm in 72 h) was obtained from the least active fraction.

Interpretation & conclusion: Crude extracts and some fractions had higher or comparable larvicidal activity to the pure compounds. These results demonstrate that *L. viburnoides* sp *viburnoides* var *kisi* extracts may serve as larvicides for managing various mosquito habitats even in their semi-purified form. The isolated compounds can be used as distinct markers in the active extracts or plant materials belonging to the genus *Lantana*.