

## A REVIEW ON: INSECTICIDAL PROPERTY OF LANTANA CAMARA

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### ABSTRACT

The resistance of many chemical or synthetic insecticides among mosquito species has led to formulation issues. Consequently, resistance in the formulation may contribute to various vector-borne diseases such as malaria, swine flu, fever, dengue, and chikungunya. Insecticides pose disadvantages to humans and children, causing issues like rashes and irritation. *Lantana camara aculeata* exhibits significant action against *Aedes aegypti*, *Anopheles Stephenson*, and *Culex quinquefasciatus*. Additionally, *L. camara* demonstrates insecticidal activity in controlling maize grain weevils. Moreover, *Lantana camara* has historical use as a medicinal plant, recommended for its vulnerary, diaphoretic, carminative, and antispasmodic properties.

**Keywords:** *Lantana Camara*, Insecticidal, Natural Insecticide, Vector Born Diseases, Medicinal Plant.

### I. INTRODUCTION

"*Lantana*, a genus comprising around 150 species of perennial plants, is ornamental with various medicinal values[1]. *Lantana Camara* Linn. Is a shrub belonging to the Verbenaceae family[2]. It serves a rich source of bioactive molecules, and identification and isolation studies indicate the presence of flavonoids, triterpenes, phenylethanoid glycosides, iridoid glycosides, and steroids[3,4]. This woody plant features rectangular stems and branches with spines and exhibits flowers in various colors such as pink, red, white, yellow, and violet[5]. Claimed to have larvicidal, antibacterial, antifungal, and insecticidal activities[6], compounds with insecticidal properties in *Lantana Camara* include sesquiterpenes, germacene, davanone, beta-humulene, and beta-caryophyllene, predominantly present in the leaves[7]. *Lantana Camara* proves advantageous over chemical insecticidal formulations due to minimal side effects. It is used to kill insects like *Ae. Aegypti*, *Anopheles Stephenson*, and *Culex* mosquitoes. Mosquito bites may also lead to the development of other diseases, such as lymphatic filariasis, also known as elephantiasis, caused by an infection with filarial worms that enter the human body through mosquito bites[8].

### II. MATERIAL AND METHOD

1. Collection of *Lantana camara* leaves from the field involves washing them with distilled water to remove dust particles.
2. Essential oil is prepared by hydrodistillation, and the distillate is extracted using n-hexane as the organic phase for 5 hours[9].
3. GC-MS analysis is performed on the obtained essential oil.
4. Phytocompounds in the leaves of *Lantana camara* are identified[10]
5. After extraction, the solvent is removed from the distillate using a vortex evaporator.
6. The essential oil should be stored at 24-28°C in a closed container or vial for up to 6 months[11].
7. The stability of the fraction or essential oil can be determined at 0, 1, 3, and 6 months time intervals[12].



**Figure 1:** plant parts of *Lantana camara*.

**METHOD**

The extract undergoes phytochemical screening by standard procedures, revealing the presence of numerous phytochemicals. Bioactive compounds are separated using TLC, followed by GC MS analysis and statistical analysis. Average mortality data is calculated through probit analysis for LC50 and LC90. Identification of compounds is done through GC MS. Mosquito species, including *Ae. aegypti*, *An. Stephenson*, and *Cx. Quinquefasciatus*, are selected. Mosquito culture involves maintaining cyclic generations at 24-29°C in insectariums with larvae provided proper feeding. Larvicidal bioassays, toxicity assays, and larval susceptibility tests are conducted separately for the crude extract, following standard WHO procedures[13].

**III. DISCUSSION**

The use of plant-based larvicides is considered a viable and preferred alternative in community mosquito species control, serving as a major component in the management of vector-borne diseases.

Few plant products have shown practical utility for mosquito control, despite a large number of reported plant extracts exhibiting mosquitocidal or repellent activities against mosquito vectors.[14]. At a given season, *Lantana camara* harvesting may lead to low quantities of plant materials, which did not allow an accurate amount of the essential oil yields (e.g., flowers in January of the first harvest period). It should be noted that its high variability might arise from climatic and seasonal parameters. Leaf essential oil yields obtained in this study (0.04–0.12%, v/w) were lower than those of *L. camara* leaves from Egypt (0.36% v/w) [15] but were close to the yield of *L. camara* fresh leaves from Brazil (0.1% v/w)[16].The field experiment evaluating the insecticidal activity of *L. camara* has revealed its effectiveness, comparable to that of phosphamidon (0.1%), establishing it as a plant-origin insect growth regulator.[17].

**IV. CONCLUSION**

*Lantana camara*, with its essential oil and identified individual compounds, was tested on target sites such as *Ae. Aegypti*, *An. Stephensi*, and *Culex* mosquitoes in a bioassay. The results indicate the efficacy of the essential oil on the target pests. *L. camara*, based on the studies, holds the potential for formulating various biopesticides and insecticides. Additionally, it is essential for its various pharmacological activities like anti-inflammatory, analgesic, antihypertensive, and cytotoxic effects. The study proves that plant products have the potential to be a source of mosquito control.

**V. REFERENCES**

- [1] E.L. Ghisalberti, *Fitoterapia*. 2000, 71, 467-486.
- [2] *Lantana camara* L.". Germplasm Resources Information Network. United States Department of Agriculture. 2007.
- [3] J.T. Barre, B.F. Bowden, J.C. Coll, J. De Jesus, V. De La Fuente, G.C. Janairo, C.Y.A. Ragasa, *Phytochemistry*, 1997, 45, 321.
- [4] D. K. Verma, S. K. Singh, G. Nath, V. Tripathi, *Indian Drugs.*, 1997, 34, 390.
- [5] E.L Ghisalberti, *Fitoterapia* 71, 462-487(2000).
- [6] S.Kalita, G Kumar, L.Karthik, and K.V. B Rao, *Research J. Pharm tech* 5[6],711-715 (2012).
- [7] Zhu, F.; Lu, W.; Pan, J.; Huang, M.; Wu, J. Chemical composition and antibacterial activity of essential oils From the leaves, fruits and stems of *Lantana camara* L.from the South China. *Adv. Mater. Res.* 2013, 781–784,1060–1063.
- [8] Llorera, Daisyl Ann L. , Lugo, Lucila O., Macatangay, Maica R., Magpantay, Janssen C., Ogbuji, Cynthia C., Sheshe, Nasiru M.D[9]G. Singh, I.P.S. Kapoor, O.P. Singh, G.P. Rao, Y.R. Prasad, P.A. Leclercq and N. Klinkby, *Flavour Fragr J*, 2000,15:278-280.
- [9] G. Singh, I.P.S. Kapoor, O.P. Singh, G.P. Rao, Y.R. Prasad, P.A. Leclercq and N. Klinkby, *Flavour Fragr J*, 2000,15:278-280.
- [10] G. Singh, I.P.S. Kapoor, O.P. Singh, G.P. Rao, Y.R. Prasad, P.A. Leclercq and N. Klinkby, *Flavour Fragr J*, 2000,15:278-280.
- [11] World Health Organization. Instructions for determining The susceptibility or resistance of adult mosquitoes to Organochlorine, organophosphate and carbamate insecticides: Diagnostic test. Geneva: WHO. 1981; WHO/VBC/81.807.

- [12] Adam RP. Identification of essential oil components by gas Chromatography / mass spectrometry. Illinois, USA: Allured Publishing Corp.; 1995
- [13] Larvicidal activity of *Lantana camara aculeata* Against three important mosquito species : Hemalatha, Devan Elumalai, Arumugam Janaki, Muthu Babu, Kuppan Velu, Kanayairam Velayutham, Patheri Kunyil Kalee.
- [14] Vanilla fragrans. Journal of Agricultural and Food Chemistry
- [15] Abdelgaleil, S.A.M. Chemical composition, insecticidal and fungicidal activities of essential oils isolated from *Mentha microphylla* and *Lantana camara* growing in Egypt. Alex. Sci. Exch. 2006, 27, 18.
- [16] Sousa, E.O.; Barreto, F.S.S.; Rodrigues, F.F.G.; Campos, A.R.; Costa, J.G.M. Chemical composition of the essential oils of *Lantana camara* L. and *Lantana montevidensis* Briq. And their synergistic antibiotic effects on aminoglycosides. J. Essent. Oil Res. 2012, 24, 447-452.
- [17] Bhide NK, Akhter MH. Study of some antidotes in experimental *Lantana camara* Poisoning in albino rats. Ind Veterinary J 1991; 68(12): 1122-1125.