

Impact of Neem Oil to Controls *Aedes Aegypti* Mosquito Larvae

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Abstract: Dengue is one of the major health problem in many countries. The genus *Aedes* in which *Aedes aegypti* (Family: Culicidae) mosquito belongs to, is the major vector of dengue fever disease. The aim of this study is to investigate the toxic effect of of Neem, genus *Azadirachta* of *Azadirachta indica* (Family: Meliaceae) against *A. aegypti* larvae. Larvicidal effect of neem (*Azadirachta indica*) was studied against mosquito species. The neem Oil Formulation was tested for larvicidal activity against 30 numbers of third instar larvae of *Aedes aegypti*, The effect of different concentration of the neem oil formulation 25, 50, 100, 200 and 400 ppm on the Larvicidal activity against *Aedes aegypti*. The results recorded in the present study that neem oil was less economic, less hazardous to the environment and it was effective to control the *Aedes aegypti*.

Keywords: Neem oil, dog biscuits and yeast powder, *Aedes aegypti* mosquito larvae and *Azadirachta*

1. Introduction

Mosquitoes are vectors of many human diseases. According to¹ and ². there are over 3000 different species of mosquitoes throughout the world. About 1,900 species occur in the humid tropics and subtropics, where the climatic conditions are favourable for rapid immature stages development and adult survival. Global efforts to reduce the number of mosquitoes usually are due to the deadly diseases they transmit to man and animals. The mosquitoes are a serious threat to public health, since they are known vector of many life-threatening diseases like malaria, filariasis, Japanese encephalitis, chikungunya and dengue fever, which are transmitted by the species of three mosquito genera: *Anopheles*, *Culex* and *Aedes*. Repellency is an important way of preventing vector-borne diseases by reducing man-vector contact by using a natural medicinal value neem. The widespread use of synthetic insecticides for the control of pests as well as human disease vectors has led to concerns about their toxicity and environmental impact³. Neem has been used as insecticides even before the advent of synthetic organic insecticides⁴.

In the effort to explore biological effects of neem products, the current research was initiated to investigate the toxicity, to control the third instar larvae of *A. aegypti*.

2. Materials and Methods

Study Area

These investigations were carried out in the campus Kovai Vidya Mandhir School, Coimbatore, Tamil Nadu.

Rearing of Mosquito Larvae

Eggs of *Aedes aegypti* were obtained from the Kovai Vidya Mandhir School, Coimbatore, and Tamil Nadu. They were hatched and reared in the laboratory condition. The eggs were placed in transparent plastic containers containing 500mls of distilled water and allowed to hatch into 1st instar larvae and further kept to reach the 3rd instar. The larvae were fed with larvae were fed with finely ground mixture of yeast and dog biscuits in 3: 1 ratio the feed was

supplied every other day for normal development of the larvae.

Neem oil

The neem oil were obtained from the Ayurveda stores Gandhipuram, Coimbatore, Tamil Nadu and formulated for the experiment.

Bio pesticide Source

Neem oil was used as a bio pesticides in the present study it was prepared by dissolving concentrations of 25ppm, 50ppm, 100ppm, 200ppm, and 400ppm (ppm-parts per million) and then it dissolved in distilled water and shake for 5 minutes to evaluate a range of biological effects on 3rd instar larvae of *Aedes aegypti*. Thirty larvae of *Aedes aegypti* were introduced in different test concentration of neem oil, (25 – 400 ppm) with a set of control containing distilled water without any test solution. After introducing larvae in a beaker were kept in laboratory at room temperature. By counting the number of dead larvae at 24 hrs of exposure the mortality rate of larvae were calculated. Three replications were maintained for each one. Dead larvae were removed as soon as possible in order to prevent decomposition which may causes rapid death of remaining larvae.

The statistical tools were used in the present studies are mean and standard deviation.

3. Results

The efficacy of different concentration of the neem oil formulation 25, 50, 100, 200 and 400 ppm on the larvicidal activity against *Aedes aegypti* was furnished in Table 1 and 2, and Figure. 1, 2.

The results clearly indicated that highest of 93.3% larval mortality was observed at 400 ppm concentration of the neem oil formulation. Whereas the lowest mortality of 50% was recorded at the 25 ppm concentration. The larval mortality of 70.8%, 75% and 85% were observed at 50, 100 and 200 ppm concentration respectively. As the concentration of the neem plant oil formulation increases the

total mortality of *Aedes aegypti* was also found to be increased.

Table 1: Larval mortality of 3rd instar larvae of *Aedes aegypti* exposed for 24 hours to different concentrations of neem oil (*Azadirachta indica*)

DOSE/PPM	24 Hrs
25	60
50	85
100	90
200	102
400	112
Untreated control	0
Mean±	89.8±19.70

Table 2: Percentage mortality of 3rd instar larvae of *Aedes aegypti* treated with neem oil

DOSE/PPM	24 Hrs	% of larval mortality
25	60	50%
50	85	70.8%
100	90	75%
200	102	85%
400	112	93%
Untreated control	0	0
Mean±	89.8±19.70	74.8±16.4

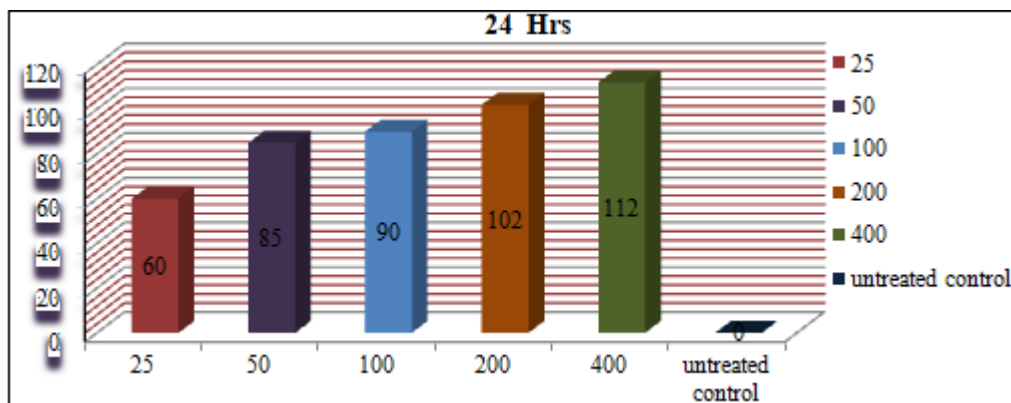


Figure 1: Larval mortality of 3rd instar larvae of *Aedes aegypti* exposed for 24 hours to different concentrations of neem oil (*Azadirachta indica*)

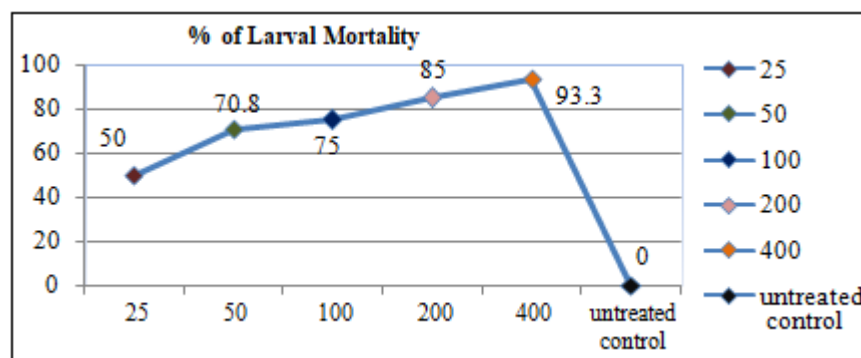


Figure 2: Percentage mortality of 3rd instar larvae of *Aedes aegypti* treated with neem oil

4. Discussion

The continuous use of various kinds of insecticides has increased mosquitoes' resistance. This action causes low insecticidal susceptibility in the mosquitoes and thus contributes to further development of their population. *Meliaceae* plant family of *A. indica* has been used as growth regulator against many insect pests. The oil of *A. indica* has been reported to be eco-friendly and non-toxic to vertebrates. The plant crude or partially purified plant or botanical extracts are less expensive and highly effective for the control of mosquitoes that contribute to many serious vector-borne diseases rather than the purified compounds or extracts of the plant.^(5,6,7)

5. Conclusion

The results of the present investigation proved that the selected plant essential oil (Neem) can be effectively used to control the larvae of medically important elements in an integrated vector control programme. The data obtained in the present investigation on mosquito larvae about the neem oil formulation against mosquito larvae. Further future studies will throw more light on the mechanism of essential oil's disturbance with diseases causing mosquito larvae.

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