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LARVICIDAL EFFICACY OF OILS AND LEAF EXTRACTS OF SELECTED WILD PLANTS

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ABSTRACT:

Mosquitoes are transmitting serious human life threatening diseases causing millions of deaths every year.This dictates the need to develope environmentally safe, cost effective and preferably locally available agents for mosquitoe control. Eliminating the source of infection is an essential step in the control of mosquito borne diseases. Most of the mosquito control programs target on the larval stage at breeding sites, as adulticides may only reduce the adult population temporarily. Plant products may be the alternative sources of the mosquito control without any hazard to human being. The present study emphasized the study of insecticidal properties of indigenous plant products.All the plant extracts used in this study, showen that no mortality of mosquitoes occure significantly. The effects of various concentrations of were studied in a dose dependent manner. The methanol and *Pongamia* oil was found to have rate of larvicidal rate against mosquitoes.

Key words: - *Plant oils, crude extract, Mosquito Larvae.*

INTRODUCTION:

The mosquitoes constitute a worldwide public health problem as vectors of serious human diseases. The control of mosquitoes born diseases are thus becoming increasingly difficult, and the mosquitoes contribute significantly to poverty and social debility in developing countries, like India. (Shyampada Mandal 2015). Natural products are best option they are less harmful to environment and non-target organisms. Several extract and compounds from different plants families have been evaluated for new and promising larvicides. (Ester Innocent *et.al.*2008). A wide selection plants from herbs, shrubs, and large trees was used for extraction of mosquito toxins. Plants produce numerous chemicals, many of which have medicinal and pesticidal properties. (Anupam Ghosh *et.al.*2012)**.** Many approaches have been developed to control mosquito menace. One such approach to prevent mosquito borne disease is by killing mosquito at larval stage. The current mosquito control approach is based on synthetic insecticides.Even though they are effective they created many problems like insecticide resistance. (Liu.*et.al.*2005). Cheng *et.al.* (2003) reported the bioactivity of fourteen essential plant oils against the yellow fever mosquito larvae and all essential oils screened was found to be effective. Over two thousand species of plants are known to possess insecticidal activity. (Klocke JA. (1989). Karanja oil and neem oil were also proven to be potential larvicides against mosquito (Renapurkar DM *et.al.*2001). Besides the karanja extract from the trees of *Pongamia* has been suggested as a new synergist (Rao GR et.al.1997 and Parmar BS et.al.1987). Neem has been acknowledged as a prominent biopesticide in recent years. However, as the mosquito larvicidal and growth regulating activity of neem has been widely established, it has also been emphasized that if used indiscriminately in blanket sprays, they may induce resistancein the pests and can be rendered ineffective within a few years. (Ruskin FR et.al.1992).

MATERIAL AND METHODS:

Name Of the plants:

1. *Azadirachta indica* oil and leaf extract.
2. *Pongamia glabra* oil and leaf extract.
3. *Eucalyptus glabulus* oil and leaf extract.
4. *Castor oil.*
5. *Lantana camara* leaf extract.
6. *Jatropha curcas* leaf extract.

Chemicals: Methanol**.**

METHODS:

(Aqueous as well as methanol)

1. The leaves of selected plant species collected from healthy plants and brought to the laboratory.
2. Material was washed thoroughly by using tap water and shade dried at room temperature for one week. Shade dried leaves of selected plants were powdered to fine powder and stored in air tight plastic containers.
3. Aqueous as well as methanol extracts of all plants were prepared by taking 20gm of dried leaf powder in separate containers. The 250 ml of methanol was added in all containers and kept for 24hrs. Periodic shaking was done then filtered and filtrate was collected.
4. Same procedured followed by using distilled water to prepare aqueous extracts. The pooled methanol as well as distilled water extract were concentrated and separated by rotary vacuum evaporator at 40° C and evaporated to dryness and stored at 4˚C in air tight bottles.
5. The solution has been prepared with methanol and distilled water and plant oils in different concentration likewise controlled, 50ppm,75ppm,and 100ppm. Solutions were filled in beakers about 2.5 to 7.5cm depth. The eight beakers were used in setting bioassay experiment.

Preparation of oil concentrations:

1. The solution has been prepared with methanol with different concentration likewise controlled, 50ppm, 75ppm and 100ppm. Auto disposal syringe of 0.1ml, 0.5ml and 1.00ml were use for maintaining purity and solution has put in the refrigerator as stock maintain its original potency.
2. The plant oil has been purchased from open market.
3. The larvae were collected from clean water to domestic containers like coolers, cement tank and other discarded pots.
4. Solutions were filled in beakers about 2.5 to 7.5cm depth
5. The four replicate beakers were used for each concentrations this experiment.
6. The 20 larvae were poured in controlled and different concentrations solutions upto 24 hrs after that these larvae were screened from it and observed the mortality statically calculated by the Abbotts formula (1925)

$$\% \text{ mortality} = \frac{\% \text{ Test mortality} - \% \text{ control mortality}}{100 - \% \text{ control mortality}} \times 100$$

Observations were made at an interval of 8 hrs up to 24 hrs duration.

Table 1: Shown that larvae treated with methanol extract of *Eucalyptus* shown highest mortality in 100 ppm concentration (16-18) followed by 75 ppm (11-13) and 50 ppm (8-10) observed no mortality in control.

Table 2: Shown that larvae treated with methanol extract of *Azadirachtin* shown highest mortality in 100 ppm concentration (17-19) followed by 75 ppm (16- 18) and 50 ppm (10-12) observed no mortality in control. The larvae treated with methanol extract of *Castor* shown mortality in 50 ppm concentration (3-4) no

mortality observed in control, 75ppm and 100ppm concentrations. The larvae treated with methanol extract of *Pongamia* oil shown highest mortality in 100 ppm concentration (18-20) followed by 75 ppm (16- 18) and 50 ppm (16-18) observed no mortality in control.

CONCLUSION:

Conclusion drawn from present investigation is that methanol extract of *Pogamia* oil, *Azadirachtin* and *Eucalyptus* oil shows excellent mortality rate of Mosquito larvae at 100 ppm, Castor oil is not effective in mortality of mosquito. In developing countries like India mosquito borne diseases are the alarming issues in the public health. These three plants can be effectively use as alternative source to control mosquito population.

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RESULTS AND DISCUSSION:

Table 1 : Rate of mortality of larvae exposed to methanol extract of *Eucalyptus* oil. (Non-Fixed oils).

S. No.	Time Taken in hrs.	Solution with Methanol	Larvae exposed with different concentrations				
			Sol. In ppm	No. of Larvae In Solution		% Mortality	
				Treated	Mortality	Lower limit	Upper Limit
1.	24hrs.	H_2O+Methanol	-	20	0	0	0
2.		*Eucalyptus* oil	50	20	8-10	40	50
			75	20	11-13	55	65
			100	20	16-18	80	90

Table – 2: Rate of mortality of larvae exposed to methanol extract of *Azadirachtin, Castor* and *Pongamia* oils (Fixed oils).

Sr. No.	Time Taken in hrs.	Treatment	Larvae exposed with different concentrations				
				No. of Larvae In Solution		% Mortality	
				Treated	Mortality	Lower limit	Upper limit
1		H_2O+Methanol	-	-	20	0	0
2		*Azadirachtin* oil	50	50	20	10-12	50
			75	75	20	16-18	80
			100	100	20	17-19	85
			-	-	20	0	0
3		*Castor oil*	50	50	20	3-4	15
			75	75	20	0	0
			100	100	20	0	0
			-	-	20	0	0
		Pongamia oil	50	50	20	16-18	80
4			75	75	20	16-18	80
			100	100	20	18-20	90