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Larvicidal activity of Neem (*Azardirachta indica*) and Euphorbia against the Aedes aegypti

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ABSTACT :

The Mosquito is a common flying insect that is found around the world. There are about 2,700 species of mosquitoes. Mosquitoes can fly about 1 to 1.5 miles per hour. Females drink blood and the nectar of plants; the males only sip plant nectar. When female bites, she also injects an anticoagulant (anti-clotting chemical) into the prey to keeps the victim's blood flowing. She finds her victims by sight and smell, and also by detecting their warmth.

KEYWORDS : Neem (Azardirachta Indica), Euphorbia

INTRODUCTION:

The mosquito is often a carrier of diseases, such as malaria, encephalitis, yellow fever, dengue fever, West Nile virus, and many others. The females, who drink blood, can carry disease from one animal to another as they feed.Some individuals have weaker immune systems, and they are at greater risk of developing symptoms and health effects that are more serious, including meningitis, encephalitis Splenomegaly,Cerebral hematoma. Meningitis is inflammation of the lining of the brain or spinal cord. Encephalitis is inflammation of the brain itself.

For people with more severe illness, symptoms could include the rapid onset of severe headache, high fever, stiff neck, nausea, difficulty swallowing, vomiting, and drowsiness, and confusion, loss of consciousness, lack of coordination, muscle weakness and paralysis. Other symptoms that have been identified include movement disorders,

There are two types of pesticides used to control mosquitoes: *larvicides* and *Adulticides*. Larvicides are added to standing water, where mosquitoes breed. They kill the mosquito larvae before they become blood-feeding adults. Adulticides are sprayed into the air or applied to vegetation where mosquitoes rest. They work by killing adult mosquitoes. Larvicides are preferred to Adulticides because they target the mosquitos' right in their breeding areas.

In my Paper I would like to focus on to the Larvicidal activity on some medicinal plants. This is beginning of my research project because I have started the detail study of mosquitoes along with their life cycle and the laboratory experiment of Larvicidal activity on some medicinal plants. I have got satisfactory results but still up some results are under observation such as detail characterization of medicinal plants. I have given stored, stagnant water sample to State health Laboratory, Pune for chemical examination and checked its turbidity, alkalinity, total hardness and ph for the accuracy and I have mention the report of Water analysis in my project.

AIM AND OBJECTIVES:

1. To observe the Mosquito species and their various stages.

2. To investigate the causes of the diseases spread by the mosquitoes
3. To observe Larvicidal activity against some medicinal plants in brief

OBJECTIVES:

1. To observe causal organism biodiversity.
2. To find out the major causes of Mosquito spreading diseases
3. To evaluate the mosquito Larvicidal activity of plant extracts.

MATERIAL AND METHOD:

Larvae of *Aedes aegypti* obtained from the eggs which were collected from National Chemical laboratory (NCL) Pune, used for the tests conducted under laboratory conditions 28 to 30^{c} Stock solutions of various concentrations (ppm) of the formulation were prepared in DMSO Serial dilutions were subsequently made in the same solvent from the stock solutions. To obtain appropriate test dosages, 1ml of the serially diluted solution was added to 249 ml of water in 500 ml glass beakers and stirred vigorously to ensure complete mixing.

To each Petri dish six younger III instars larvae were introduced. The material was tested on three different occasions, at six different concentrations. In each test, each concentration was run in quadruplicate, and 4 beakers were left untreated as controls. In control runs, 1 ml of DMSO was added to 100 ml of water. Soon after treatment, larvae were given larval food (dog biscuit and yeast powder mixed in 6:4 ratios); 70-100 mg food per 6 larvae.

The larvae were exposed to various concentrations in different Petri dishes. The results were recorded for three days after every 24 hours intervals and LC50 values were recorded

***Data analysis*:** Mortality in the treated cups in a test was corrected against any mortality in the controls. The corrected mortality was subjected to log-probity regression analysis and median lethal concentration (LC50)

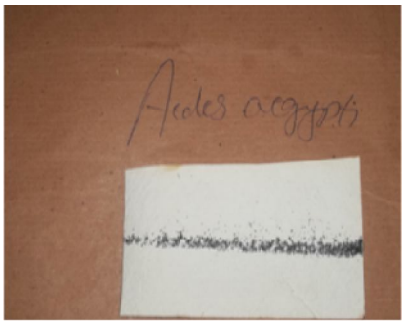

Fig. 1 Eggs of Aedes aegypti

Fig. 2. Larvae of Aedes aegypti

Fig.3. Neem Plant

Fig.4. Euphorbia tirucalli

Preparationof extracts of Neem and Euphorbia plants.

Fig5. Making Powder of Neem and Euphorbia Plants

Fig.6 Measurement of Neem extract

Fig. 7- Stock solution of Neem

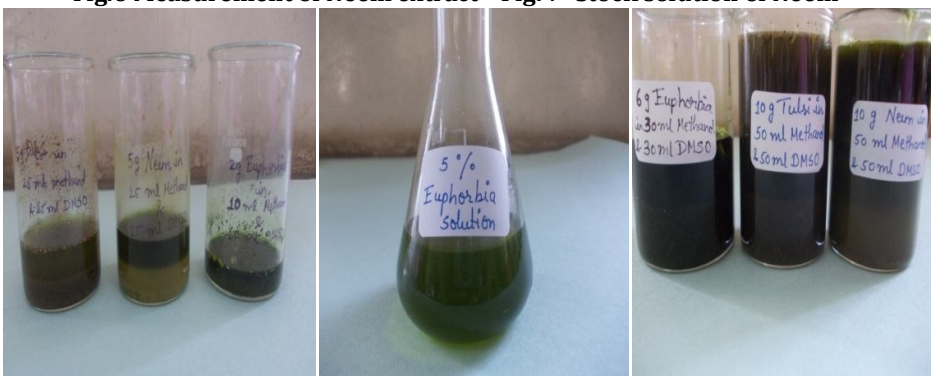

Fig. 8 Stock solution of Neem and Euphorbia

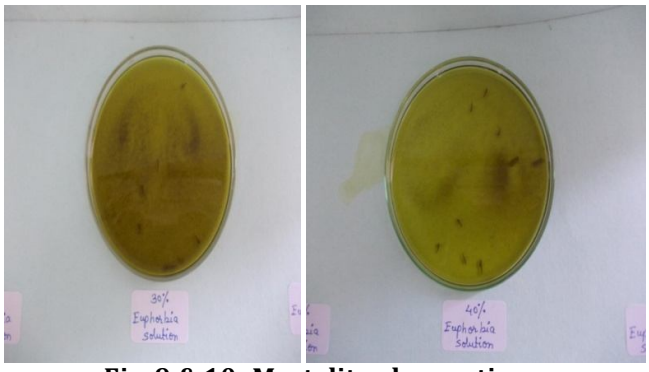

Fig. 9 & 10- Mortality observations

Fig. 11- Full set up of the Experiment

DISCUSSION:

India is considered to be a storehouse of medicinal plants, it harbours over 2000 medicinal plant species of which 443 have been recorded for the state of Maharashtra (Lakshminarasimhan & Moorthy, 2000). Survey of plant wealth of Kolhapur district resulted in enumeration of over 600 plant species of some therapeutic value. One of the medicinal plant found comprise *Azadirachta indica.*

Neem trees are found throughout India and it is used as medicine as well as pest control Neem based pesticides are now extensively used agricultural practices all over the world. It contains Azardirachta which is predominant insecticidal active ingredient having antecedents, ovipositional deterrence repellency, growth disruption, sterility and lavicidal action against insect. Neem extract with distilled water and DMSO, Methanol was found to be effective in controlling breading of Aedes aegypti where as an application of Neem powder resulted indrastic reduction in the late instars larvae of Aedes aegypti. Neem based biopesticides and Neem extract have a wide range of effects against insects. Azardirachta, nimbin, nimbidin, nimbolides, nimolicacid, salami, and azadirachtol present in Neem affect the biochemical and physiological processes of insect system and nullify the insect detoxification mechanism thereby not allowing the pest to develop. The methanolicextract of leaves of Neem and euphorbia rothiana has been found possess various activities such as Larvicidal activity against the mosquito vector Aedes aegypti**.**

OBSERVATIONS:

The observe biological activity of the plant extract might be due to the alkaloid reported in these plants. The crude extract of Neem and Euphorbia produced higher mortality in larvae of Aedes aegypti. methonolic extract of leaves of neem (Azardirachta indica) and Euphorbia tirucalli were evaluated for larvicidal activity against immature stages of aedes aegypti **in the laboratory of Zoology department of Abasaheb Garware College, Pune.** Insect growth resulting activity of this extract was more pounced against Aedes aegypti. The extract of these both plants was found safe to aquatic mosquito predator Gambussia affine.Products out of Neem tree for use in agriculture in field and storage and medicine. For Centuries, parts of Neem have been used as allele chemicals in plant protection, soap, dentifrice and medicines. Scientists at the National Institute of Immunology, New Delhi discovered that Neem oil has principles that can be used as Spermicidal and Abortefacients. This has subsequently resulted in patents in India. The tree's most important use is as biopesticides. Neem has more than 60 valuable compounds, among which the widely used is Azadrrachtin-A which has been identified as the key compound which acts as an insect antifeedant, repellent and an inhibitor of ecdysis and growth. About 300 insect species can be managed with the Aza-A . It is therefore observed that Azardirachta can be a suitable alternative to the chemical pesticides. Studiesconducted in the past 20 years revealed that Neem has diverse biological effects on insects. It acts as a repellent in feeding and oviposition, deterrentarrests growth of developing stages, causes, sterility and also has mild direct 7 toxicity. No other plant / synthetic substance are known to have such a diverse activity against insects. Experiments revealed that more than 250 insect species have already been reported susceptible to Neem extracts. In India alone, Neem has been evaluated against 105 insects species of the various

biological effects of Neem on insects. Neem has also been found to possess nematicidal and fungicidal properties. About a dozen nematodes have already been reported to be susceptible to Neem. Soil treatment with Neem Cake, has given effective control of meloidogyne incognita in tomato. Cardamom growers regularly use Neem cake for management of nematodes. It is use to observe lavicidal activity against the mosquito vectors.

Any effort in conserving the Soil moisture in Neem plantations on waste lands will improve the seed yield which will be a sustainable source of income for the rural people. Sensing the value of Neem by its invaluable and incomparable chemical molecules useful in pest control and health..

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