Trends in Biotechnology Research
An International Peer-Reviewed Journal
Online and Print Version
www.sciencejournal.in

STUDIES ON BIOACTIVITY OF SOME PLANTS AGAINST *AEDES EGYPTI* L.

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ABSTRACT
Ethanolic extracts of 09 plants were assessed against larvicidal, adulticidal and repulsion activities of Aedes e mosquito. The results at higher concentration of 2.5% excellent bioactivity have been shown by some plants example, *Pimpinella heyneana* shown 50% and *Ocimum americanum* shown 35% larvicidal mortality. While in ca adulticidal mortality the plants *Pimpinella heyneana* gave 73% mortality, *Ocimum americanum* gave 39% act *Andrographis paniculata* and *Vitex negundo* gave 36% activity; Euphorbia *tirucalli* gave 23 % activity. In ca repulsion activity plants such as, *Ocimum americanum; Pimpinella heyneana; Tephrosia purpurea Trigonellafoenum- graecum have shown repulsion activity against the mosquito.*

KEYWORDS: *Aedes egypti*, Bioactivity, mosquito, plant extracts.

INTRODUCTION

During last few decades, haphazard and constant increase in use of chemical insecticides/pesticides has resulted in several socio-economic problems and caused damage to environment. Environmental contamination is the main hazard for the sustainability of the biome due to the uncontrolled use of synthetic pesticides and therefore, plant extracts presents a safer solution to all these issues (Sagheer*et al.*, 2013). Due to over use of chemical insecticide and pesticide there is accumulation of toxic residues in food, health risks to the consumer and livestock and environment (Oparaeke, 2006; Egho, 2011) and as a consequence, the idea of use of plant based insecticide and pesticide has come into existence. The use of plants or part of them to control household insect-pest is being looked upon as a foremost source for safe, sound and eco-friendly insecticide or pesticide. Since, plant based insecticides or pesticides are biodegradable and have lesser or no harmful effects on non-target organisms including human beings (Sharma, et al, 2011a) and can be considered as a possible option to the chemical pesticides. Literature on traditional indigenous knowledge is evidenced that use of plant products to control or manage insects and pests is centuries old and it's still it is successfully practiced in many regions of the world.

Growing interest regarding biopesticides all over the globe is because of their benefits related with the environmental safety and efficacy. Consequently, biopesticide is one of the hopeful alternatives to manage the possible hazards. Indigenous information regarding control of household insects/pests is developed through the surveillances of the earlier people to overcome the problems created by insects and pests.

This knowledge has been tested and developed using the trial and error methods over a period of time through generations and authenticated to make the established wealthy legacy of knowledge. Thus, traditional indigenous knowledge varies from tribe to tribe or community to community and usually passes on to the next generations through verbal communication usually by the elders of the family.

India, with its great plant as well as cultural diversity and rich traditional knowledge about plants as resources of medicine, food and pesticides, is ahead of several other nations. In spite of enormous plant diversity in India, emphasized research on production of plant based pesticide or insecticide has not gained ground (Ignacimuthu, 2004). In the modern era of synthetic pesticides only few plants based natural pesticides have gained importance (Yong & Tang, 1988). This is due to lack of scientific awareness regarding pesticidal and insecticidal potential of plants.

In India, over 250 species of higher plants are being used traditionally for insect and pest management. (Sharma, et. al., 2011b; Sharma and Sawant, 2012) However, very few plants known as commercial success by way of field ready formulations has been very limited.

MATERIALS AND METHODS

During the present investigations plants were chosen from traditional leads obtained through field experience in different parts of the Maharashtra state and information from literature. The required plant material was collected and kept under shade for drying. Identification of plant was done using flora of Maharashtra (Singh *et al*, 2000; 2001). and Flora of Presidency of Bombay, (Cook, 1958).

Dried plant material ground in the form of coarse powder. Ethanolic extraction carried out by using Soxhlet apparatus by using 16 parts of ethanol to 1 part of plant powder. The extracts were stored at –18°C until further investigations.

1.Collection and rearing of mosquito: *Aedes egypti* mosquitoes collected from wet and dump sites and were reared in insectariums at 25 – 28^{0}C temperature. Mosquito adults and larvae were provided the food as per standard protocols.

2.*Larvicidal bioassay:* Assay was carried out by exposing twenty (III and IV instar) larvae of *Aedes ejypti*L. A chain of 5 different concentrations plant extracts (0.5%; 1.0%; 1.5%; 2.0% & 2.5 %) were exercised. The water temperature maintained at 25± 1^{o}C. For each experiment three beakers containing distilled water and test larvae but with no sample used as controls. Observation on mortality of the larvae recorded after about every 24 hours. of constant exposure and then was expressed as percent mortality.

3.*Adulticidal bioassay:* Adults mosquitoes of mixed sex were exposed to filter paper treated with plant extracts of different dilutions. The paper was put inside the beaker. Then beaker is covered by muslin cloth treated with plant extract. In case of control mosquitoes were exposed only to ethanol treated paper and muslin. Mortality counted after 24 hrs.

4. *Repellent bioassay**:*** Ethanolic extracts were assessed for repellent activity using the human – bait technique (Fradin and Day, 2002). For each study using different concentrations, 10 reared female mosquitoes were placed into separate cages. Helpers were asked to follow the testing protocol. Helpers conducted their test of each concentration by placing the treated and control arms alternatively into a same cage for 3-4 minutes.

The mosquitoes that landed and attempted to bite or suck blood were recorded. If no mosquito bites take place in the initial 3-4 minutes, the arm was withdrawn from the cage and retested every 15 minutes. Each test concentration was replicated 5 times and in each replicate subject different helper to cancel out any effect of colour of the skin on repellent.

RESULTS AND DISCUSSION

As shown in the table 1. and graph 1 following are the larvicidal and adulticidal and repulsion assays.

Larvicidal bioassay: *Aedes egypti*L.

The obtained data clearly showed that the extract slightly effective at low concentrations in the range of 0.5 to 1.5%, however, at higher concentration of 2.5% better bioactivity have been shown by some plants. For example, *Pimpinella heyneana* shown 50% mortality, *Ocimum americanum* shown 35% mortality.

While some other plants exhibit notable activity are, *Vitex negundo* shown 27% activity; *Andrographis paniculata* 23%; *Trigonella foenum- graecum* 19%; *Euphorbia tirucalli* 17%; *Pongamia pinnata* 13% *and other plants shown less than 10%* larvicidal activity.

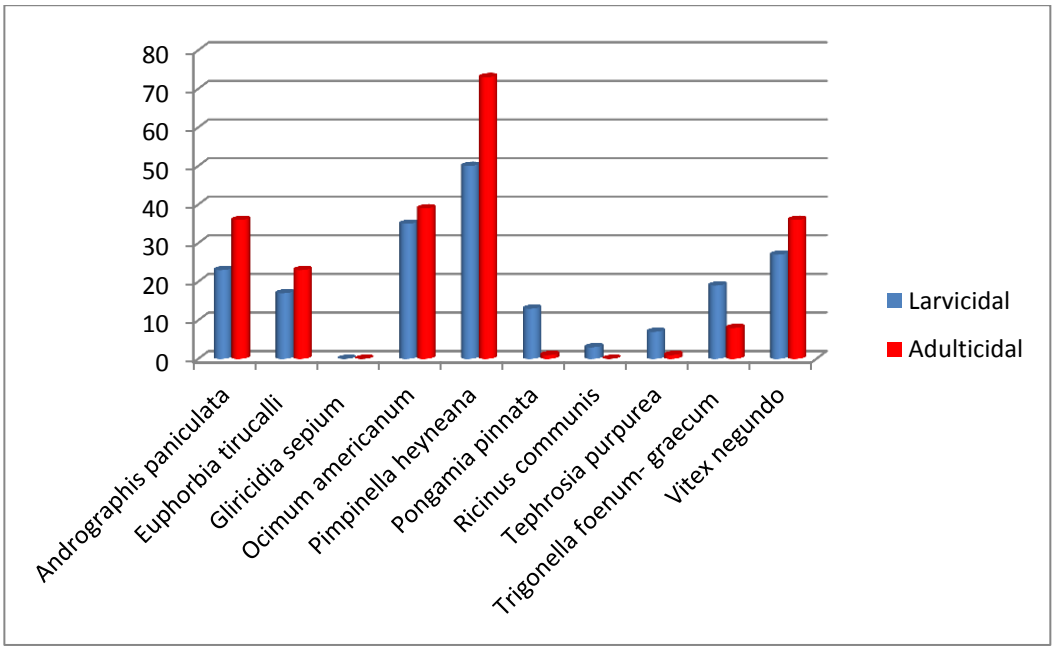
Adulticidal bioassay: *Aedesegypti*L.

Pimpinella heyneana gave 73% mortality against mosquito. *Ocimum americanum* gave 39% activity; *Andrographis paniculata* and*Vitex negundo* gave 36% activity; Euphorbia *tirucalli* gave 23 % activity. While some other plants shown less than 10% activity.

Repulsion: Plants such as, *Ocimum americanum; Pimpinella heyneana; Tephrosia purpurea and Trigonellafoenum-graecum have shown repulsion activity against the mosquito.*

Table. 1: Bioactivity against *Aedes ejypti*L. with percentage of Mortality.

Plant name	Plant part	% mortality at 2.5% concentration		Repulsion
		Larvicidal	Adulticidal	
Andrographis paniculata(Burm.f.) Wall ex Nees	Whole Plant	23	36	-Ve
***Euphorbia tirucalli* L.**	Leaves & Stem	17	23	-Ve
***Gliricidia sepium* (Jacq.)Kth. ex Walp**	Leaves	00	00	-Ve
Ocimum americanum L.	Whole plant	35	39	+Ve
Pimpinella heyneana(Wall.)Kurz.	Whole plant	50	73	+Ve
Pongamia pinnata (L.) Pierre.	Seed	13	01	-Ve
Ricinus communis L.	Leaves, seed	03	00	-Ve
Tephrosia purpurea (L.)Pers.	Whole plant	07	01	+Ve
*Trigonellafoenum- graecum*L.	Whole plant	19	08	+Ve
Vitex negundo L.	Leaves	27	36	-Ve



Graph 1: Larvicidal and Adulticidal activity against *Aedes egypti* L. in percentage

CONCLUSION

Plants have tremendous potential as far as pesticidal and insecticidal properties are concerned. The plants shown positive larvicidal, insecticidal and repulsion activity must be tried further by studying their synergistic effects after using them in different combinations.

ACKNOWLEDGEMENT

Authors are thankful to the Secretary, Marathwada Shikshan Prasarak Mandal, Aurangabad, (M.S.), India, for constant support and encouragement. P. A. Deshpande and P. P. Sharma are thankful to Principal Shri Muktanand College, Gangapur for facilities.

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