A Study on Larvicidal Activity of The Leaf Extracts of Murraya Konigii, Sprenge.; Against Culex Sps.,

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Abstract- *Today's research mainly focused on medicinal plants because of th e presence of bioactive compounds and their medicinal properties. These Phytochemicals has great antibacterial activity leading to the larvicidal activities. The study focuses on larvicidal activity of plant extract against Culex sps. The plant extract used in this experiment is Murraya konigii, Sprenge.; The Phytochemicals screening of methanol extract of analyzed by standard methods and shown various phytochemical constituents such as saponins, phenols, alkaloids, protein, tannins, flavonoids, carbohydrates and terpenoides etc., Larvicidal bioassay done and number of mortality of larvae was observed, including in the control (0%) during of two days. The plant is easily available and has high content of phytochemical constituents. So the aim is to prove in this study the presence of high amount of active principles Murraya konigii, Sprenge.; shows hundred percentage of mortality after two days against mosquito larvae.*

Keywords- phytochemical, Larvicidal bioassay.

I. INTRODUCTION

Plants that possess therapeutic properties or exert beneficial pharmacological effect on human body are generally designated as medicinal plants. Medicinal plants naturally synthesize and accumulate some secondary metabolites like alkaloids, sterols, terpenoides and flavonoids (Motaleb *et al.,* 2011) current research trends use variety of plant extracts as alternative larvicides because they contain various phytochemicals. Phytochemicals are the chemicals that present naturally in plants. Now a day these phytochemical become more popular due to their countless medicinal use. Phytochemical play a vital role against number of diseases such asthma, arthritis, cancer etc. Unlike pharmaceutical chemicals these phytochemicals do not have any side effects. Since the phytochemicals cure diseases without causing any harm to human beings. These can also be considered as "man friendly medicines" (Sahira banu and Cathrine, 2015).

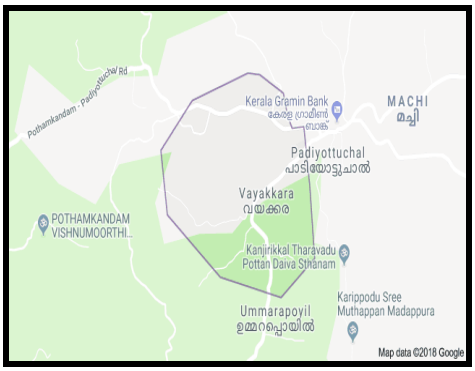
Mosquitoes are small flies that constitute the family Culicidae. Mosquitoes act as a vector for most of the life threatening diseases like malaria, yellow fever, dengue fever, chikungunya fever; filariasis etc., WHO has declared the mosquitoes as "public enemy number one". Mosquito borne diseases are prevalent in more than 100 countries across the world, infecting over 700,000,000 people every year globally and 40,000,000 of the Indian population (Anupam Ghosh *et al*., 2012). Like all flies mosquitoes go through four stages in their life cycle, egg, larva, and adult. Most species, adult females lay their eggs in stagnant water. Mosquitoes control strategies have depended primarily on the use chemical insecticides however, the unfriendly effect of most of the past advocated synthetic chemical insecticides leads the insect pest managers of the world. Also long term stability of many of these chemical insecticides and their tendency to bioaccumulation in non targeted organism have fostered many environmental and human health concerns such as threats faced due to the development of resistance to chemical insecticide by the mosquitoes, resulting rebounding vectorial capacity (Arivoli *et al.,* 2015).

II. MATERIALS AND METHODS

Study Area: (Plate - 1)

Kerala is one of the 28 states in India. Its capital is Thiruvananthapuram. It has 600 km of Arabian Sea shoreline to west and Western Ghats to the east. Vayakkara is a small village in kannur district in kerala which has a pleasant climate due to the presence of Karnataka forest to the east and Arabian Sea to west. The *Murraya konigii,* Sprenge., the plant sample is selected from Vayakkara.

Study Area: Plate -1



Systematic position

Culex sps., (Mosquitoe larvae)

Class	:	Insecta
Order	:	Diptera
Family	:	Culicidae
Genus	:	***C. sps.* L.;**

Culex sps. L.; is commonly referred to as the house mosquito. It is a vector for diseases including Japanese encephalitis, Wile nilevirus, St. Louis Encephalitis etc., and also great human nuisance due to biting. Stagnant water mosquitoes tend to lay egg in clumps, called rafts, of 50 to 300 on the surface of standing water at the edges of lakes and ponds and among the vegetation in swamps and marshes. *Culex sps.* develop mainly in habitats containing highly polluted water rich in organic matter that the larvae can use the nourishment. The duration of larval stages varies in male and female mosquitoes.The larval stages lasted between 6 and 8 days and pupal stages about 40 hrs (Sajal Bhatacharya, *et al*., 2016).

Culex sps., (Mosquitoe larvae Plate -3)

Sample-2: *Murraya konigii,* Sprenge**.; -** (Plate-7)

SYSTEMATIC POSITION

Kingdom	:	Plantae
Division	:	Angiosperms
Class	:	Magnoliopsida
Order	:	sapindales
Family	:	Rutaceae
Genus	:	*Murraya*
Species	:	***M. konigii,* Sprenge.;**

The plant is distributed and cultivated throughout India. It is found wild from Sikkim to Garhwal, Bengal, Assam, Western Ghats and Travancore- Cochin. Propagation is done by seeds, which germinate freely under partial shade. *M. koenigii,* Sprenge.; is an unarmed, semi deciduous aromatic shrub or small tree with slender but strong woody stem and branches covered with dark grey bark, leaves are imparipinnate, glabrous, and very strongly aromatic. Leaflets 9-25 or more, short stalked, alternate, gland dotted and strongly aromatic. Fresh leaves, dried leaf powder and essential oil are widely used for flavoring soups, curries, fish and meat dishes, eggs dishes, traditional curry powder blends, seasoning and ready to use other food preparations. The essential oil is also utilized by soap and cosmetic aromatherapy industry. Curry leaves are boiled with coconut oil till they are reduced to blanked residue which is then used as an excellent hair tonic for retaining natural hair tone and stimulating hair growth. It is traditionally used as a whole or in parts as antiemetic, antidiarrheal, febrifuge, blood purifier, antifungal, depressant, anti-inflammatory, body aches, for kidney pain etc., (Vandana Jain *et al.*, 2012).

PREPARATION OF PLANT EXTRACTS:

The leaves were dried for 7-14 days in the shade at the environmental temperatures (27-37^{0}c day time). These dried parts were powdered using pulverizer. 15 grams of each pulverized part were placed in separate flasks; 100 ml of distilled water was added and mixed vigourously. The mixture was kept in shaker system for 48 hours with occasional shaking.

I. PRELIMINARY PHYTOCHEMICAL ANALYSIS

The phytochemical screening of methanol extract of analysed by standard methods and shown various phytochemical constituents such as saponins, phenols, alkaloids, protein, tannins, flavonoids, carbohydrates and terpenoids.

II. LARVICIDAL BIOASSAY:

Mosquitoes were collected from plant pots with stagnant water which contain leaf detritus and other degraded algae. Then enough number of larvae was collected using collecting bottles. 10 larvae of one to fourth in stars were placed in petridish containing 100 ml treatment solution. Each

concentration (1ml, 2ml, 3ml, and 4ml) of plant extract is adding to the petridish containing 100 ml treatment solution with twenty larvae in each petridish. Then petridish containing the larvae were kept in the growth room maintained at room temperature. The effects of extracts were monitored by counting the number of dead larvae each day up to three days. Number of mortality of larvae was observed, including in the control (0%) during the three days.

III. RESULTS AND DISCUSSION

Vector control is facing a series threat due to the emergence of resistance in vector mosquitoes to conventional synthetic insecticides or development of newer insecticides. However due to the continuous increase in resistance of mosquitoes to familiar synthetic insecticides, better alternative means are sought. A considerable number of plant derivatives have been screened effective against mosquitoes (Hima, *et al.*, 2014). The research was carried out to investigate the larvicidal activity of methanolic extract of *Murraya konigii*, Sprenge.**;** Larvicidal activity of plants and successive isolation of their botanical compounds depend upon the type of solvent used in the extraction procedure.

For better extraction methanol is used in the investigation. Methanol extract of *Murraya* shows maximum and high percentage of death in all concentrations. It shows 96.66 % death in 2ml and all other four extract shows hundred percentage of mortality. After three days also it shows same mortality percentage with least standard deviation. It consists of strong presence of proteins and terpenoids. The other phytochemicals such as carbohydrates, amino acids, steroids, glycosides are moderately present. saponins, tannins, alkaloids, flavanoids also present in smaller amounts. *Murraya koenigii* plant extract was prepared using the solvent chloroform.

The plant extract was tested against the various developmental stages of mosquito, *Aedes aegypti*. The level of the toxicity of *Murraya koenigii* was expressed in terms of LC50/24 hour's values. The LC50 values of chloroform leaf extract for I, II, III & IV instar larvae of Aedes aegypti were 1.263%, 1.871%, 2.446% and 3.168% respectively. In the present study the preliminary phytochemical analysis showed the presence of flavanoids, alkaloids, glycosides, saponins and steroids in the chloroform leaf extract of *Murraya koenigii* (Hima, *et al.*,)

Table 1: Qualitative analysis of phytochemicals present in the methanolic leaf extracts.

Phytochemicals	***Murraya konigii***
Carbohydrates	++
Proteins	+++
Aminoacids	++
Steroids	++
Glycosides	++
Flavonoids	+
Alkaloids	+
Tannins	+
Saponins	+
Terpenoids	+++

(+++ indicates strongly present, ++ indicates moderately present, + indicates less presence, - indicates absent)

Table 2: Larvicidal activity of plant extract after 2 days

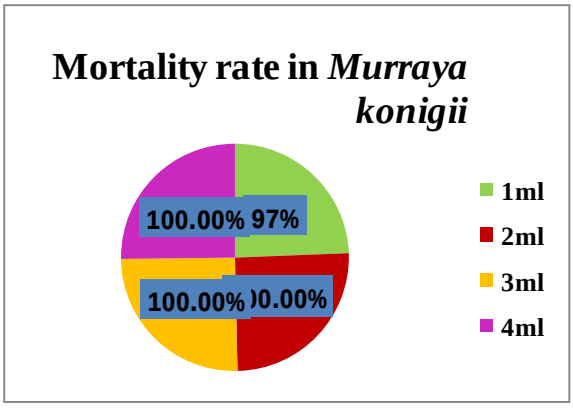
Samples	**Concentrations**			
	1ml	2ml	3ml	4ml
Murraya koenigii	9.66±0.577	10±0	10±0	10±0

(Mean ± standard deviation)

Table 4: Percentage of mortality

Sample	**Concentration**	**Percentage of mortality after 2 days**
Murraya konigii	1ml	96.66 %
	2ml	**100%**
	3ml	**100%**
	4ml	**100%**

Chart- Percentage of mortality



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