

PHYTOCHEMICAL SCREENING AND EVALUATION OF FRUIT PARTS OF *CUCUMIS CALLOSUS*(ROTTL.) COGN FOR MOSQUITOCIDAL ACTIVITIES.

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Abstract:

The plant species of Cucurbitaceae family is used in various methods of traditional medicine to treat various diseases. In the present investigation Fruit parts of *Cucumis callosus*(Rottl.) Cogn of family Cucurbitaceae was used against two mosquito vector. In traditional literature *Cucumis callosus* (Rottl.) Cogn has been claimed to be valuable against a variety of diseases. Screening of phytochemicals for alkaloids, saponins, flavonoids and tannins were made by HPTLC method. The fruit extract of *Cucumis callosus*(Rottl.) Cogn show greater mortality percentage on 4th instar larvae of *Cucumis callosus*(Rottl.) Cogn on species *Culex quinquefasciatus* Say and *Aedes aegypti* Linn. The inhibitory effect might be due to the excessive presence of alkaloids, saponins, flavanoids and tannins which acts as mosquitocidal.

In the present investigation it is confirmed that the fruit of *Cucumis callosus*(Rottl.) Cogn is effective in mortality of mosquito.

Keywords: HPTLC, fruit of *Cucumis callosus*(Rottl.) Cogn, *A. aegypti* (L), *C. quinquefasciatus* Say, methanol extract, petroleum ether extract.

Introduction:

Mosquito is a significant group of insects, which lives in freshwater habitats. They transfer different types of parasitic and viral diseases such as filariasis, dengue, malaria and chikungunya fever. *Aedes aegypti*(L) mosquito transfers the dengue disease which is distributed in tropical as well as the subtropical regions. A Number of chemical controls are available and it is very effective against mosquitoes. However, if the same chemicals are used for many generations of mosquitoes in a large area, the mosquitoes have genes that make them less susceptible to toxins.

Plants are a rich source of bioactive organic chemicals and offer advantages over synthetic pesticides because they are easily biodegradable, less likely to develop resistance, and less toxic. Many shrubs and herbs have potential medicinal properties, repellent properties, and mosquito larvicidal activity. Many of the shrubs and herbs are found to have mosquito repellent properties and mosquito larvicidal activity.

In the present study plant species, *Cucumis callosus*(Rottl.) Cogn has been selected from Cucurbitaceae family to carry out a guanine mosquitocidal compound. The Cucurbitaceae family is mainly distributed around the tropic area, where edible fruits bearing plants were among the earliest grown in World.

Cucurbitaceae family consists of various melons, squashes, and gourds, including some crops such as watermelons, luffas, cucumber, and pumpkins. *Cucumis callosus* (Rottl.) Cogn, is a perennial, and monoecious plant. Stems are 1-2 m long, slender, angled, and rough with short rigid hairs. The parts of *Cucumis callosus*(Rottl.) Cogn are used against a variety of diseases. Now a days there is growing trend towards herbal formulation

which is known to be effective against a large list of ailments and diseases. Most importantly, they are not known for any significant offensive effect and readily available at reasonable prices. Plant based remedies are more effective and ecofriendly, provided that if they are properly selected and taken under proper medical direction.

Materials and Methods:

Preparation of plant extract:

Fruit extract:

The greenish mesocarp of the fruits which contain juicy mild-flavored tissues and seeds is carefully removed from the pericarp by using a spatula, and shaken well to separate the yellowish fibrous parts that will be dried in more sun. The dried fruit (500gm) can be finely powdered using stainless steel blender and extracted with petroleum ether and methanol in a soxhlet apparatus.

Selection of mosquito species:

For the present investigation two important vector species of mosquitoes was selected these are *Aedes aegypti* (L) and *Culex quinquefasciatus*.

Larvicidal bioassay:

For the bioassay test early fourth stage larvae of selected mosquitoes species is used. Experiment was conducted in a glass jar for 24hrs. 60 larvae can be exposing in five concentrations and one control at triplicate form of 10 larvae each. After 24 hr recorded the numbers of dead larvae and then reported the mortality comparing with the control.

Phytochemistry:

Preliminary phytochemical tests were carried out for the confirmation of starch, proteins, phenols, tannins, saponins, reducing sugars, carbohydrates, alkaloids, glycosides, steroids or terpenoids, flavonoids, fixed oil and fats in different extractives.

HPTLC:

By the methods of Passera, *et. al.*, 1964, HPTLC technique was followed for the qualitative analysis of *Cucumis callosus* (Rottl.) Cogn and the confirmation of mosquitocidal chemicals present in the studied plants

Statistical Analysis:

Data were analyzed by one-way ANOVA method with the help of SPSS software.

Results and Discussion

In the present investigation it was found that major toxicity observed in 25 ml fruit extract of *Cucumis callosus* (Rottl.) Cogn on both mosquito larvae species i.e. *Culex quinquefasciatus* (Say) and *Aedeis aegypti* (L). This extract was divided into two parts i.e. methanol and petroleum ether extract. Methanol fruit extract was found greater mortality percentage in 25 ml (100%) as compared to 5ml, 10ml, 15ml and control. In control the mortality percentage was nil.

Govindarajan, 2010 also observed the same results with larvicidal and ovicidal activity of crude hexane, ethyl acetate, benzene, chloroform and methanol extracts of three plants, *Eclipta alba* (L), *Cardiospermum halicacabum* (Linn) and *Andrographis paniculata* (Burm.f.) which were tested against the early 3rd instar larvae of *An.stephensi*.

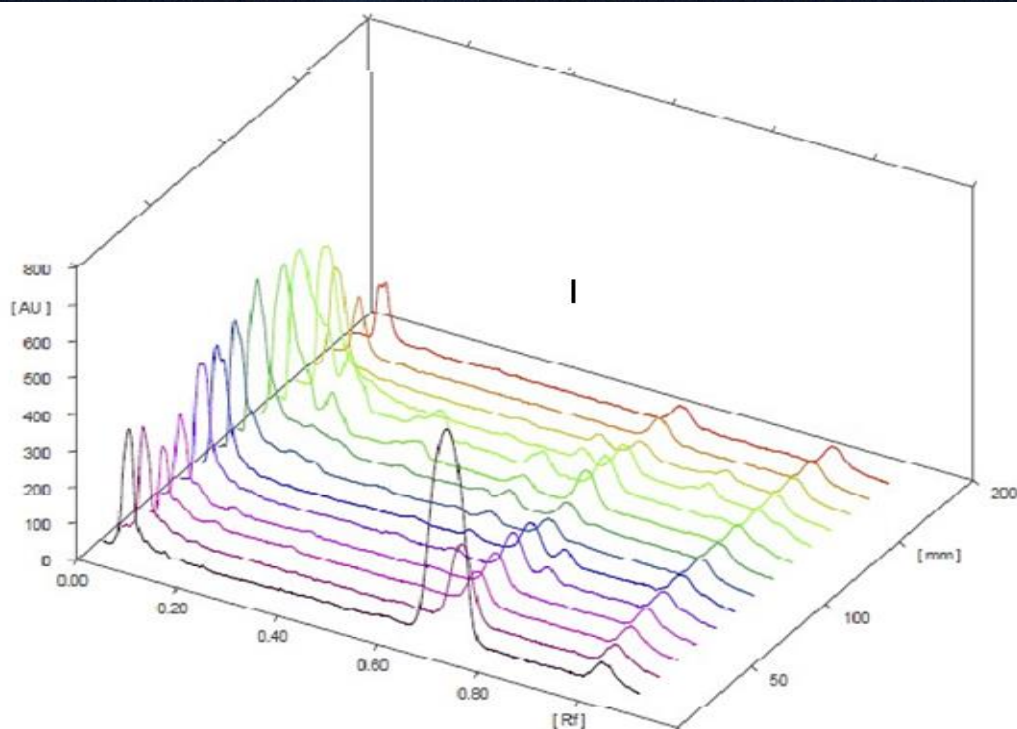
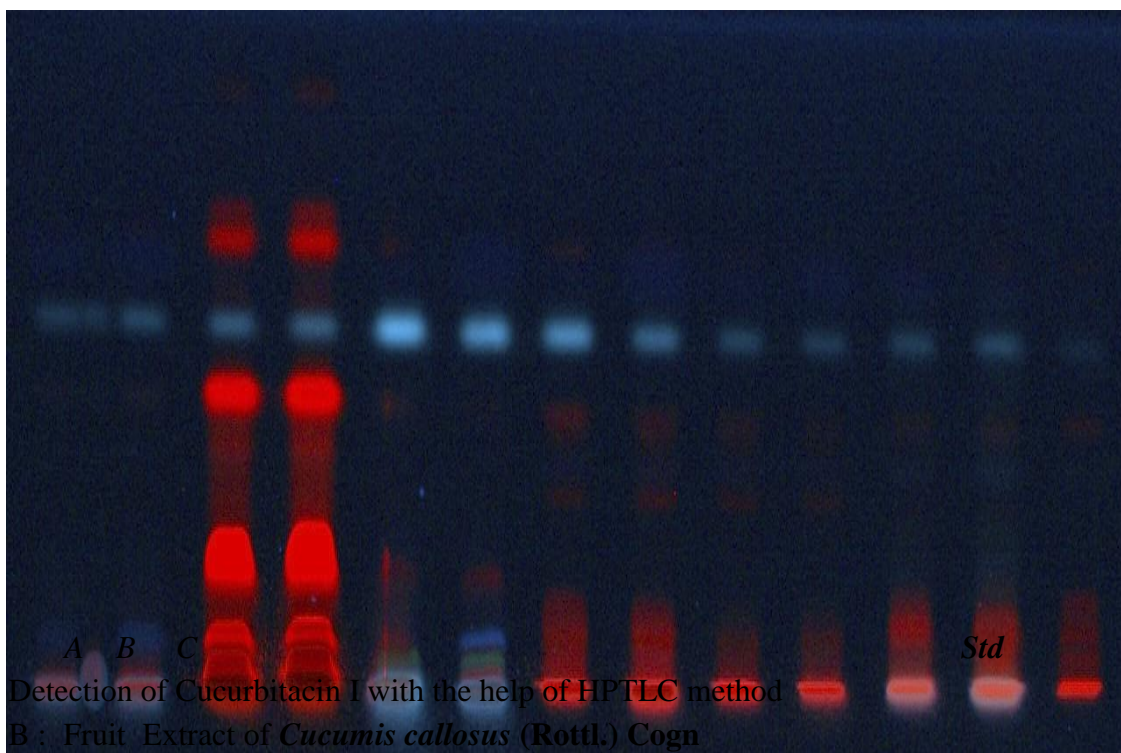
According to Sukumar, *et al.*, in 1991 various plant substances have been evaluated for their repellents against mosquitoes, In Iran the Lemon citrus and Melissa plants have been used in ancient medicine as a natural repellents. The plant species selected for the present work contain active secondary metabolite component which shows different quality and quantity. This herb is distributed throughout the India. Sambandam and Chelliah, 1972 reported that, *Cucumis callosus* (Rottl.) Cogn, is an untamed species of India, paying attention by the plant breeders, is reported to have genes resistance to fruit fly and leaf-eating caterpillars. Tara Chand, *et. al.*(2012) carried out physicochemical and photochemical study of seeds of *Cucumis callosus* (Rottl.) Cogn.

With the help of HPTLC technique, five phyto-constituents have been identified and confirmed from fruit of studied plants. Cucurbitacin I was identified and confirmed from fruit of *Cucumis callosus* (Rottl.) Cogn. Similar results were compared with the experiments of Ripperger and Seifert (1975) and Sturm and Stuppner (2000), in their investigation Cucurbitacins were found in *Citrullus colocynthis* (L) that is cucurbitacin E, glucoside, and minor amounts of glucosides of Cucurbitacins I, K, L and B. Yaniv, *et al.*, 1999, also reported the active ingredients such as saponin, alkaloids and glycosides from *Citrullus colocynthis* (L) contain an active insecticidal potency, the results are in conformity with the findings of present study.

S. No.	Extract Conc. in (500ml Vol. of Water)	No. of Larva Exposed	Petroleum ether Fruit Extract		Methanol Fruit Extract	
			Mortality of Larvae Mean \pm SE	% Mortality	Mortality of Larvae Mean \pm SE	% Mortality
1.	Control	20	Nil	Nil	Nil	Nil
2.	5ml	20	2 \pm 0.01 ^{ab}	10%	5 \pm 0.03 ^b	23.33%
3.	10ml	20	7 \pm 0.02 ^{cd}	30%	10 \pm 0.02 ^{ab}	31.67%
4.	15ml	20	10 \pm 0.01 ^c	31.67%	14 \pm 0.05 ^c	68.33%
5.	20ml	20	14 \pm 0.03 ^a	68.33%	18 \pm 0.02 ^{bc}	88.33%
6.	25ml	20	17 \pm 0.02 ^d	83.33%	20 \pm 0.01 ^{ac}	100%

S. No.	Extract Concentration in (500 ml vol. of Water)	No. of Larva Exposed	Petroleum ether Fruit Extract (PEFE)		Methanol Fruit Extract (MFE)	
			No. of Larva died after 24hr. Mean \pm SE	% Mortality	No. of Larva died after 24hr. Mean \pm SE	% Mortality
1.	Control	20	Nil	Nil	Nil	Nil
2.	5ml	20	3 \pm 0.02 ^a	13.33%	6 \pm 0.02a	28.33%
3.	10ml	20	9 \pm 0.03 ^c	28.33%	10 \pm 0.04a	48.33%
4.	15ml	20	12 \pm 0.01d	58.33%	13 \pm 0.04c	63.33%

5.	20ml	20	17±0.04b	83.33%	19±0.03b	93.33%
6.	25ml	20	18±0.02b	86.66%	20±0.02a	100%



- Graph: Estimation of Cucurbitacin I fruit of *Cucumis callosus*

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