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ORIGINAL ARTICLE

EFFECT OF SOME CUCURBITACIOUS PLANT LEAF EXTRACTS AGAINST CULEX QUINQUE FASCIATUS LARVA (SAY)

Karthik Saravanan

Department of Zoology,Annamalai University,Chidambaram,Cuddalore Dist-608002,Tamilnadu

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ABSTRACT

Larvicidal efficacies of extracts of five species of Cucurbitacious plants, Momordica charantia, Trichosanthes anguina, Luffa acutangula, Benincasa cerifera and Citrullus vulgaris were tested against the late third larval age group of Culex quinque fasciatus.The larval mortality was observed after 24 hr exposure. The LC50 values of M. charantia, T. anguina, L. acutangula, B. cerifera and C. vulgaris were 465.85, 567.81, 839.81, 1189.30 and 1636.04 ppm respectively.

Keywords: *Cucurbitacious, Culex Quinque Fasciatus*

1.INTRODUCTION

The vector-borne diseases (VBDs Malaria,Filariasis,Japanese encephalities,Dengue,etc. ,are increasing and have been spreading to newer areas recently due to the increased risk of transmission fuelled by developmental activities,demographic changes and introduction of new products. All over the world,more than 50% of persons with filariasis receive their infections from the bites of mosquitoes, very particularly Culex quinque fasciatus (Southgate,1984). This species of mosquito and the incidence of filariasis are quite abundant in India, particularly in Chidambaram town of Tamil Nadu. Synthetic insecticides have created a number of ecological problems, such as the development of resistant insect strains, ecological imbalance and harm to mammals. Hence there is a constant need for developing biologically active plant materials as larvicides, which are expected to reduce the hazards to human and other organisms by minimising the accumulation of harmful residues in the environment. Natural products are generally preferred because of their less harmful nature to non-target organisms and due to their innate bio degradability.

The present study was an attempt to assess the larvicidal properties of leaf extracts of five Cucurbitacious plants against C. quinque fasciatus.

Corresponding author Dr. Karthik Saravanan
, Asst. Professor, Dept. Of Zoology, Annamalai University-608002

2.MATERIALS AND METHODS

Plant collection and extraction for larvicides the plants of Momordica charantia, Trichosanthes anguina, Luffa acutangula, Benincasa cerifera and Citrullus vulgaris were collected from in and around AnnamalaiUniversity campus,AnnamalaiNagar,TamilNadu (11_,24 0 N latitude and 79_, 50 E longitude 5.79 m MSL). The leaves were washed with tap water, shade dried, and powdered. Each sample was extracted with methanol using a soxhlet apparatus (Vogel,1978). The solvent from the extracts was removed using a vacuum evaporator. Standard stock solutions were prepared at 1% by dissolving the residues in methanol. The solution was used for assaying mosquito larvicidal activity.

Preparation of plant larvicide concentration. One gram of the plant residue was dissolved in 100 ml of methanol (stock solution). From the stock solution different concentrations; 62.5, 125, 250, 500 and 1000ppm,were prepared.

3.RESULTS AND DISCUSSION

Larvicidal bioassay

A laboratory colony of C. quinque fasciatus was used for the larvicidal activity. The larvae were reared in dechlorinated water and fed with dog biscuits and yeast tablets at the ratio of 3:1. They were maintained at 28 ±2 _C,75–85% RH, under 14L: 10D photoperiod cycles. Larvicidal activity of C. quinque fasciatus was assessed by using the Standard method (WHO,1996). Twenty five larvae of early third instar were

released in a 500 ml glass beaker containing 249 ml of dechlorinated water and 1.0 ml of the desired plant extract concentration. Five replicates for each concentration were run at a time. The control solutions were setup with 1.0 ml of methanol in 249 ml of dechlorinated water. Mortality counts were made using Abbott's formula (Abbott, 1925) after 24 hr of the treatment and the LC50,LC 90, regression equation and the 95% confidence limit of upper confidence limit (UCL) and lower confidence limit (LCL) and chi-square values were calculated by using probit analysis (Finney,1971).

The toxicity of the late third instar larvae of C. quinque fasciatus to Methanolic leaf extract of M. charantia, T. anguina, L. acutangula, B. cerifera and C. vulgaris was noted and the statistical data regarding the LC50, LC 90, regression equation, chi-sq uare and 95% fiducial limits were calculated. The data are presented in Table 1. The LC50 values were 465.85, 567.81 , 839.81, 1189.30 and 1636.04 ppm for M. charantia, T. anguina, L. acutangula, B. cerifera and C. vulgaris respectively. Chi-square values were significant at P < 0:05 level for the extract of M. charantia, T. anguina and L. acutangula. Pandiyan et al. (1994) have reported Menthapiperita to be highly effective in controlling the larvae C. quinque fasciatus. In the same way, Croton sparisflorus has proved effective against C. quinque fasciatus (Kalyanasundaram and Das,1985). The Methanolic extracts of Solanum suratense, Azadirachta indica and Hydrocotylja vanica exhibited larvicidal activity against C. quinque fasciatus (Muthukrishnan et al.,1997; Babu and Murugan,1998; Venkatachalam and Jebanesan,2001; Jaswanth et al.,2002). The present study reveals that there is a scope to use M. charantia to control the mosquito larvae C. quinque fasciatus. The extract of M. charantia can be used in mosquito coil formulation by the present study.

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Table 1: Larvicidal activity of methanolic leaf extracts of some Cucurbitacious plants against Culex quinque fasciatus.

S. No	Name of the plant	LC50 (ppm)	Log LC50	LC90 (ppm)	Regression equation	95% Fiducial limit (ppm)		Chi-square value
						UCL	LCL	
1.	*Momordicacharantia*	465.85	2.66	2421.46	Y-0:222+ 1:790X	738.66	293.80	7.84*
2.	*Trichosanthesanguina*	567.81	2.75	915.48	Y-3:117 +1:80X	944.44	341.37	8.21*
3.	*Luffaacutangula*	839.81	2.92	3286.25	Y- 1:33 + 2:16X	1469.00	480.12	8.96*
4.	*Benincasacerifera*	1189.30	3.07	6528.5	Y-0:330+ 1:733X	1618.76	873.77	5.62*
5.	*Citrullusvulgaris*	1636.04	3.21	11473.92	Y-0:130+ 1:515X	2516.87	1063.47	1.21*

*Significant at P < 0:05 level.