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EFFICACY OF AGERATUM CONYZOIDES AGAINST THE CONTROL OF MOSQUITOES

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ABSTRACT

Mosquitoes transmit serious human diseases causing millions of deaths every year. Phytochemistry has proven that there are potential mosquito control agents and also alternatives to synthetic insecticides. The present paper reports *Ageratum conyzoides* commonly known as Kubhi in Hindi of family Astereaceae. The plant after proper identification was collected shade dried and powdered to the fine mesh size. 5 different concentrations were used against IInd and IVth instar of *Anopheles stephensi*. Larvicidal and growth inhibitory activity of *Ageratum conyzoides* exhibited in the II and IVth instar larvae of the *Anopheles stephensi*. After 24 hours, LC₅₀ value was determined using probit analysis method. It was notice that the LC₅₀ value for IInd and IVth instar larvae were 238.65 and 228.54 ppm respectively. The result indicate that fourth instar larvae are more susceptible then second instar larvae .the result obtained suggest that bioactive compound of *Ageratum conyzoides* could be used in the search for new larvicidal compound of plant origin.

Keywords:

Premixed preparations,
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Efficiency,
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INTRODUCTION: Vector control holds the key to success in controlling a number of parasites diseases like malaria, filaria, dengue and encephalitis. With the increased development of resistance in the adult mosquitoes against the existing insecticidal synthetic agents like DDT, BHC and cyonofluorithin and also due to the side effects of these, there is an emergent need to develop an environment friendly control for curtailing the vector menace responsible for the majority of tropical diseases.

Humans have used plant parts, products and metabolites in pest control since early historical time. Plants are the chemical factories of nature, producing many chemical, some of which have medical and pesticidal properties. By using plant extracts and concentrated components in more recent times, man has been able to control certain pests with these remedies quite successfully.

Ageratum conyzoides Linn. (Astereaceae) commanly known as Kubhi in hindi and distributed throughout India. This plant is quite useful in fever and the root of this plant posse's antihelmintic and anti-dysenteric properties. Isolation of new isoflavonoid compound from the stem of this plant have been tested against growth inhibitory activity of second and fourth instar larvae of *Anopheles stephensi*¹(Saxena et al., 1993). The present paper reports the analysis of stastical data of *Ageratum conyzoides* crude extract against second and fourth instar larvae of *Anopheles stephensi*.

MATERIALS AND METHODS: The plant after proper identification was collected shade dried and powdered to the fine mesh size. 5 different concentrations were used against IInd and IVth instar larvae of mosquitoes. Larvicidal and growth inhibitory activity was noticed along with LC₅₀ value of the *Ageratum conyzoides* extract.

Experimental Procedure: IInd and IVth instar larvae of laboratory stock were used for the present study. Growth disrupting activity was noticed with deformities such as larval-pupal intermediate, half ecdysed adult and failure of ecdysis.

Statistical Method: Probit analysis of Finney (1971) was used and the level of significance $p < 0.05$ was calculated.

TABLE 1: STATISTICAL DATA OF *AGERATUM CONYZOIDES* EXTRACT TREATED ON SECOND AND FOURTH INSTAR LARVAE OF *ANOPHELES STEPHENSI*

Larval state	Conc. (ppm)	24 hr Mortality	Regression equation (y=a+bx)	x ² =(n-2) Heterogeneity	LC ₅₀ (ppm)	Variance V	95% Fiducial limits (ppm)
II nd instar	50	8	y=0.35+2.35x	1.54	238.65	.00529	lower=143.87
	100	20					upper=272.52
	200	38					44
	300	62					
	Control	4					
	Untreated	0					0
IV th instar	50	12	y=0.4+1.95x	2.02	228.54	0.00602	Lower=140.6
	100	22					Upper=285.13
	200	44					
	300	65					
	Control	4					
	Untreated	0					

Twenty five second and fourth instar larvae were taken at each concentration in average of three replicates. The value were significantly different ($p < 0.05$) from the control and untreated groups.

Growth disrupting activity: Effect of the crude extract was also seen on the growth, metamorphosis and development of fourth and second instar larvae. It was observed that maximum fall in population was observed in 300 ppm concentration (**table 2**). The growth inhibitory activity was also observed as mentioned in table showing half ecdysed adult and larval pupal intermediate. The results are quite

RESULT AND DISCUSSION:

Larvicidal Activity: **Table 1** shows the statistical data of second and fourth instar larvae for insecticidal activity. The LC₅₀ value for second and fourth instar larvae were 238.65 and 228.54 ppm respectively. The result indicates that fourth instar larvae are more susceptible than second instar larvae.

comparable to the larvicidal activity of Neem oil². Kalyansundrum and Babu have also observed some juvenomimetic effects against plant treated Anopheles larvae³. Similar results have been reported by Vasudevan *et al.*, 2009⁵. The present results are quite comparable to our previous reports Saxena *et al.*, (1993) who isolated a mosquito growth inhibitory compound; *Spheranthus indius*.

TABLE 2: EFFECT OF THE CRUDE EXTRACT OF *AGERATUM CONYZOIDES* ON DEVELOPMENT, MOULDING AND METAMORPHOSIS OF *ANOPHELES STEPHENSI*

Conc. (ppm)	Average larval period (days)	Larval mortality (%)	Average pupal Period (days)	Pupal Mortality (%)	Adult Emergence (%) (a)	Average development period (b)	Fall in population (%)	Growth index (a/b)
50	12	68	1.5	4	52	13.5	48	3.85
100	12.5	60	1.5	6	34	14	76	*1.71
200	13	70	1.5	16	14	14.5	86	*0.97
300	13	74	2	18	8	15	92	*0.53
Control	14	4	2.5	0	96	16.5	4	5.82
Untreated	14	0	2.5	4	96	16.5	4	5.82

Twenty five second instar larvae were treated at each concentration in an average of 3 replicates. *Growth index was significantly different from those for the control and untreated groups ($p < 0.05$).

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