

Antifeedant activities of *Ageratum conyzoides* L. against *Hendeecasis duplifacialis* Larvae

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Abstract- The present investigation was carried out to screen various extracts of *Ageratum conyzoides* L. were tested. Among the chloroform extracts gave 75% screened for antifeedant activity against *Hendeecasis duplifacialis* larvae collected from *Jasminum sambac* L. In the toxicity effects of the other extracts were showed greater antifeedant activity at 25 and 50% within the same period, respectively. No mortality was noticed in control groups. *Ageratum conyzoides*, belongs to family Asteraceae, an endemic medicinal plant is used for the treatment of hepatitis, eczema, epilepsy, dizziness diarrhea, fever, intestinal worms and filariasis.

Keywords- *Ageratum conyzoides*, Antifeedant activity, *Hendeecasis duplifacialis*, *Jasminum sambac*.

I. INTRODUCTION

Plants offer an excellent source of biologically active natural compounds as pest control agents for crop protection (Carpinella *et al.*, 2002). The plant derived compounds have advantage over synthetic pesticides as they are easily biodegradable, non-toxic and insects do not develop resistance (Carpinella *et al.*, 2003). Antifeedant activities include treatment effects, which reduce or prevent feeding. Antifeeding can be of great value in protecting crops from insect attack (Tripathi *et al.*, 1990). In a tropical country like India, owing to climatic conditions and its particular environment, agriculture is suffering from severe losses due to pests (Balaraju *et al.*, 2011). In agriculture, insects affect directly the growing part of the crop and causes severe damage, resulting in revenue loss (Ferry *et al.*, 2004). Due to these problems, a search is going on to discover new, less damaging pest management tools (Kannaiyan, 2002).

The chemical pesticides have been used for several decades in controlling pests as they have a quick knock down effect. However, their indiscriminate use resulted in several problems such as resistance to pesticides, resurgence of pests, elimination of natural enemies, toxic residues in food, water, air and soil (Ignacimuthu and Jayaraj, 2003). In traditional medicine, a decoction or infusion of *Ageratum conyzoides*, belongs to family Asteraceae, an endemic medicinal plant is used for the treatment of hepatitis, eczema, epilepsy, dizziness

diarrhea, fever, intestinal worms and filariasis (Adewole and Okunade, 2002).

II. MATERIALS AND METHODS

Collection of plants

The whole plant of *Ageratum conyzoides* L. was collected from Veeramalai Kavandam Patty at Karur districts. The identification and authentication of the freshly collected plant was done by Dr. S. Soosai Raj, Assistant professor, Department of Botany, St. Joseph's College, Tiruchirappalli - 620 002.

Collection of larvae

Larvae *Hendeecasis duplifacialis* were collected from agricultural fields in the vicinity. The larvae were taken to the laboratory and placed individually and in batches in plastic boxes and fed with the buds of *Jasminum sambac* L. plant.

Preparation of plant extracts

Ageratum conyzoides L. dried leaf powder 10g was soaked with different solvent extracts such as chloroform, ethanol, petroleum, acetone and aqueous for 72 hrs at room temperature. The extracts were filtered through a funnel with Whatman No: 1 filter paper. The filtrate was evaporated to dryness under reduced pressure using rotary evaporator. The crude extract thus obtained was stored in sterilized amber colored bottles maintained at 4°C in a refrigerator.

Biological assays

Bud discs (4cm dia) of *Jasminum sambac* L. were used for bioassay tests, after washing it with tap water. The bud discs were sprayed with 1000 ppm concentration of the plant extract; air dried at room temperature and kept in petriplates (9cm dia). The pre starved (24h) larvae were allowed to feed on the treated bud discs for 24, 48 and 72 hours. For each treatment, ten replicates with one control were maintained. At the end of the experiment, the uneaten area of the leaf discs was measured with leaf area meter. Larval mortality and pupil deformities were also recorded.

Insect plant growth

Larvae were removed from Petridis glasses and measured every day until the end of larval stage. Their length was recorded and compared with the control.

Toxicity bioassay

The number of dead adults and larvae were counted every day during the bioassay. Larvae percentage and adult mortalities were calculated and compared it the control. Three replications were set up for each assay.

III. RESULTS AND DISCUSSION

In the present study, Antifeedant activity which involves the screening of various solvents leaf extract of *Ageratum conyzoides* L. was used. Among the various solvents extract assessed, the chloroform extracts showed high effective antifeedants against the *Hendeecasis duplifacialis* larvae the results as shown in Figure - 1. The extract exhibited the highest feeding deterrence of (75%) followed by ethanol and acetone extracts (50%). The petroleum ether and aqueous extracts showed in low feeding deterrence of (25%) the results as shown in Table - 1.

It can be concluded that the maximum antifeedant activity against the *Hendeecasis duplifacialis* larvae assessed the chloroform extracts of *Ageratum conyzoides* were reported. This is in concordance with the results reported in the plant species such as *Heliotropium indicum* and *Spilanthes calva* against *Helopeltis theivora* larvae by Dolui and Debnath, (2010).

Table -1
Feeding on different solvent extracts of *Ageratum conyzoides* against *Hendeecasis duplifacialis* larvae

S	Plant extracts (1000 ppm)	Immersion Time (hrs)			% of efficacy in extracts	Control (Solvents 1000 ppm)
		24	48	72		
1	Chloroform	++	++	+++	75	-
2	P.ether	-	-	++	50	-
3	Acetone	-	+	++	50	-
4	Ethanol	+	++	+++	75	-
5	Aqueous	-	-	+	25	-

Note:

: No antifeedant activity, + : Antifeedant activity 25%, ++: Antifeedant activity 50%, +++: Antifeedant activity 75%.

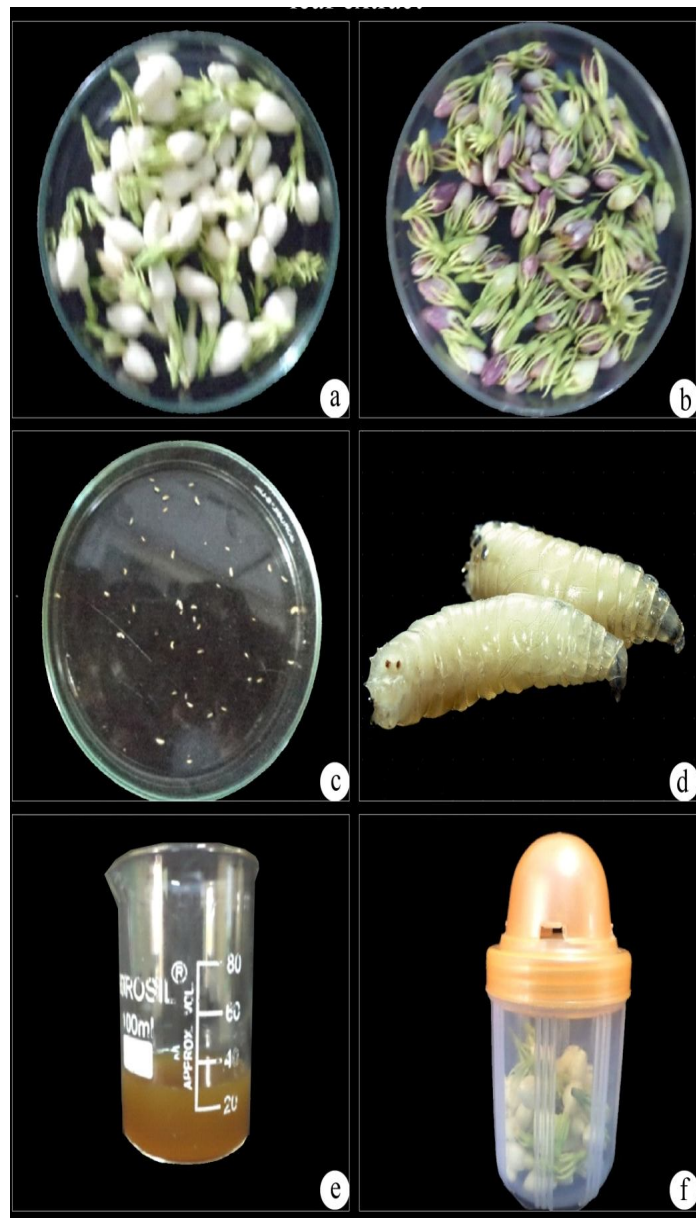


Figure -1: Feeding on different solvent extracts of *Ageratum conyzoides* against *Hendeecasis duplifacialis* larvae

a. Normal flower, b. Infected flower, c. Collection of *Hendeecasis duplifacialis* larvae from *Jasminum sambac*, d. *Hendeecasis duplifacialis* larvae, e. Plant extracts, f. Treatment.

IV. CONCLUSION

In generally, antifeedants has profound adverse effects on insect feeding behavior the extracts reduced larval growth against *Hendeecasis duplifacialis*. Discovery of antifeedants from *Ageratum conyzoides* leaf extracts has been recently emphasized as a potential method for the development of ecologically safe natural pesticides, any substance that reduces food consumption by an insect can be considered as an antifeedant.

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