Efficacy of aqueous leaf extract of *Annona squamosa* as antifeedant against Soybean pest *Diacrisia oblique* (W.)

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**ABSTRACT**

*Diacrisia obliqua* is a polyphagous insect pest causing serous damage to Soybean Crop. In the present study different concentrations of *Annona squamosa* (Leaves) in water were presented anti antifeedant activity against *Diacrisia oblique* was noticed. The activity was found to be concentration dependant.

**Key words:** *Annona squamosa, Diacrisia oblique, Soybean.*

**INTRODUCTION**

Insect pest management activities depend on chemical insecticides or xenobiotics. These chemicals cause environmental pollution and by their long term use, they can create high toxicity, bioaccumulation in animal tissues and finally biomagnifications in the food chain of ecological system. In order words they are inclined to be ecologically disastrous (Lahir, 2009). In search of safer and effective alternatives, attention has been focussed on herbal biopesticides or plant extracts. Herbal products reveal every imaginable biological activity. They may be repellents, antifeedants (Phagodeterent), ovicidal, and insecticidal to the insects. Thousand of secondary metabolites derived from plants and only few of them have so far been identified. Some of these compounds have already been exploited commercially as insect control agents e.g. Neem elixer, Derisome, Pyrethrum etc. (Khanna 1992, Banerjee 1995, Soni & Kumar 2001 and Hussain 2003).

*Annona squamosa* is a shrub or small tree common in forest of Madhya Pradesh. The plants are largely cultivated for the roto were reported (Sabnis, 1990 and Gupta *et al.*, 2005). The seeds and leaves are used to remove lice in head and havign insecticidal property (Cheema *et al.*, 1985). Thus, in the present study, an attempt has been made for it's scientific verification.

**MATERIAL AND METHODS**

The leaves *Annona squamosa* were collected from the area of Bhopal district. The air dried plant parts (leaves) were grinded to powder about 40-60 mesh size. This powder was extracted with soxhlet apparatus using various solvents and water (Harborne, 1984). The obtained extract was concentrated in rotavapor below 40°C.

Soyabean pests, *Diacrisia obliqua* were collected from the field and were placed in insectory to maintain their life cycle. The antifeedant activity was measured on the average area of leaves consumed by larval (Cm²) in 48 hrs. duration. To observe the antifeedant activity of crude aquous extract of *Annona squamosa* (Leaves) against *D. obliqua*, four different concentrations of plant extract were prepared and the soyabean leaves were treated with. These concentrations in petridishes.
In every petridish 15 larvae were allowed to feed on treated leaves at 48 hrs. The area of leaf measured initially and at the end of experiment that is after 48 hrs. Antifeedant index (%) was applied on the observed values. Antifeedant index was based on consumed area of leaf by larvae in the treatment and control.

\[
\text{A.I.} = \frac{C - T}{C + T} \times 100
\]

C = Area consume in control leaf
T = Area consume in treated leaf
A.I. = Antifeedant index

The obtained values (result) were statistically analysed.

### RESULTS

The maximum antifeedant activity was noticed on 1.25% concentration (Table No. 1, graph No 1). At this concentration the consumed average area of Soyabean leaves was 7.10 cm², while the lowest activity observed at 0.25 percent concentration where the consumed leaf area was 20.10 cm². The 1.25 percent concentration of aqueous extract causes significant feeding deterrent activity. The 't' value was calculated 12.65, Thus, show that the result are highly significant (P <0.05).

<table>
<thead>
<tr>
<th>Plant part extract</th>
<th>Conc. %</th>
<th>Average area consumed by one larvae (cm²)</th>
<th>Antifeedant index %</th>
<th>Mean ±SE</th>
<th>&quot;t&quot; Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annona squamosa</td>
<td>0.25</td>
<td>20.10</td>
<td>50.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(leaves) in Distilled water (H₂O)</td>
<td>0.50</td>
<td>12.75</td>
<td>61.00</td>
<td>62.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.00</td>
<td>9.20</td>
<td>72.16</td>
<td>±5.23</td>
<td>12.65</td>
</tr>
<tr>
<td></td>
<td>1.25</td>
<td>7.10</td>
<td>80.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>80.12</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Result based on three replicates

![Fig. 1: Showing antifeedant activity of aqueous extract (leaf) of A. squamosa against paste](image)
DISCUSSION

Although *A. squamosa* is reported to possess varied medicinal properties such as nutritional, autiovulatory and antitumor activities (Gupta et al., 1985 and Vohora et al., 1975). Insecticidal properties of the seeds oil of *A. squamosa* have been studied (Cheema et al., 1985) but no one has paid attention on the property of leaf extract as an insecticidal agent. In the present study antifeedant activity of *A. squamosa* (aquous extract of leaves) have been noticed against pest (*D. oblique*) attacking on Soyabean Crop. During the last few year, various plant products have been evaluated on feeding deterrent (antifeedant) activity against phytophagous insects (Sundrajan et al., 2001).

CONCLUSIONS

The aquous leaf extract of *Annona squamosa* found to be an effective antifeedant agent. Since the antifeedant activity was concentration dependent, probably the leaf contains flavinoids thus, it needs to be further explored.

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REFERENCES