

OVICIDAL ACTIVITY OF SIX PLANT LEAF EXTRACTS ON THE EGGS OF *CORCYRA CEPHALONICA* STANTON (LEPIDOPTERA : PYRALIDAE)

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Leaf extracts of 6 plant species were evaluated for their ovicidal activity against *Corcyra cephalonica*. At S/10 dose level *Vinca rosea* shows 40% ovicidal activity followed by *Chenopodium album* and *Helianthus annuus* 3 - 4%. At S/100 dose level *Withania somnifera* exhibit 100% inhibition of hatching whereas *Vinca rosea*, *Cassia occidentalis*, *Chenopodium album*, *Argemone mexicana* and *Helianthus annuus* show 96.7%, 86.7%, 70.0%, 23.4% and 23.4% hatching, respectively.

INTRODUCTION

Corcyra cephalonica Stainton, commonly known as the rice moth, is a cosmopolitan pest attacking a number of stored products. It is particularly common as a pest of bagged and bulk stored sorghum in Sudan (Darling, 1952), especially in the more humid southern area. Besides, it serves as an excellent laboratory host for mass rearing of many parasites. Larval stages of *C. cephalonica* are most damaging stages as they feed on grains and spoil with their excreta.

Attempts have been taken to control the stored product pests by many workers using fumigants, pheromones, juvenile hormone analogue, Tricalcium phosphate, Triphenytin acetate and Hempa (Hodges, 1979; Bhargava & Devaraj, 1993; Dwivedi & Kumar, 1997). Synthetic insecticides, although have been tried but they are harmful to man and non-target animals. Hence more attention is being paid to natural products as insecticides. There is dearth of literature on the use of plant products for management of this pest. However, workers namely Chander & Ahmed (1986), Chauhan *et al.* (1987), Satpathi *et al.* (1991), Srivastava & Bhatt (1993) and Dwivedi & Kumar (1997) have evaluated some plants for their insecticidal properties. Therefore, keeping this in view an attempt has been made to evaluate the ovicidal property to some plant extracts against *Corcyra cephalonica*.

MATERIALS & METHODS

Experimental insects were reared in laboratory at $28 \pm 2^{\circ}\text{C}$ and 60-65% RH in transparent glass jar and were fed on dietary mixture of sorghum and yeast. Jars were covered with muslin cloth. The plant leaves were shade dried and ground to powder. The extracts were prepared by soxhlet method using petroleum ether.

The eggs were treated by contact method. A film of extracts was prepared in petridish by spreading 1ml of different concentration, viz. 10, 25, 50, 75 and 100 per cent of all the extracts. The solvent was allowed to evaporate by rotating the petridish. Thirty (30) freshly laid eggs (0-24 hrs old) were kept in contact with the films of different concentrations throughout their incubation period. In control the eggs were kept in contact with 1ml of solvent (petroleum ether) only. After hatching, the 1st instar larvae were counted. Three replications were run for each treatment.

RESULTS AND DISCUSSION

The results (Table 1) reveal that the hatching is considerably reduced when the eggs are kept in contact with different concentrations of plant extract films throughout their incubation period.

At S/10 dose level *Vinca rosea* shows 40% ovicidal activity and *Chenopodium album* and *Helianthus annuus* exhibit 3.4% ovicidal activity only. The ovicidal activity increases with the increase in the dose level.

Table I : Ovicidal activity of plant extracts against the eggs of *Corcyra cephalonica*.

| Plant extract in Pet-ether | Conc. of extract (in %) | Incubation period (in days) | Number of eggs hatched | Hatching (%) | Percentage inhibition hatching |
|----------------------------------|-------------------------------|-----------------------------------|------------------------------|-----------------|--------------------------------------|
| <i>Withania somnifera</i> | S/10 | 0-5 | 30 | 100.0 | -- |
| | S/25 | 0-5 | 15 | 50.0 | 50.0 |
| | S/50 | 0-5 | 08 | 26.6 | 73.4 |
| | S/75 | 0-5 | 06 | 20.0 | 80.0 |
| | S/100 | 0-5 | -- | -- | 100.0 |
| | Control | 0-4 | 30 | 100.0 | -- |
| <i>Vinca rosea</i> | S/10 | 0-5 | 18 | 60.0 | 40.0 |
| | S/25 | 0-5 | 10 | 33.0 | 66.7 |
| | S/50 | 0-5 | 05 | 16.6 | 83.4 |
| | S/75 | 0-5 | 03 | 10.0 | 90.0 |
| | S/100 | 0-5 | 01 | 3.3 | 96.7 |
| | Control | 0-4 | 30 | 100.0 | -- |
| <i>Cassia occidentalis</i> | S/10 | 0-5 | 30 | 100.0 | -- |
| | S/25 | 0-5 | 21 | 70.0 | 30.0 |
| | S/50 | 0-5 | 11 | 36.6 | 63.4 |
| | S/75 | 0-5 | 08 | 26.6 | 73.4 |
| | S/100 | 0-5 | 04 | 13.3 | 86.7 |
| | Control | 0-4 | 30 | -- | -- |
| <i>Chenopodium album</i> | S/10 | 0-5 | 29 | 96.6 | 3.4 |
| | S/25 | 0-5 | 29 | 96.6 | 3.4 |
| | S/50 | 0-5 | 20 | 66.6 | 33.4 |
| | S/75 | 0-5 | 15 | 50.0 | 50.0 |
| | S/100 | 0-5 | 09 | 30.0 | 70.0 |
| | Control | 0-4 | 30 | 100.0 | -- |
| <i>Argemone mexicana</i> | S/10 | 0-5 | 30 | 100.0 | -- |
| | S/25 | 0-5 | 30 | 100.0 | -- |
| | S/50 | 0-5 | 29 | 96.6 | 3.4 |
| | S/75 | 0-5 | 25 | 83.3 | 16.7 |
| | S/100 | 0-5 | 23 | 76.6 | 23.4 |
| | Control | 0-4 | 30 | 100.0 | -- |
| <i>Helianthus annuus</i> | S/10 | 0-5 | 29 | 96.6 | 3.4 |
| | S/25 | 0-5 | 28 | 93.3 | 6.7 |
| | S/50 | 0-5 | 28 | 93.3 | 6.7 |
| | S/75 | 0-5 | 24 | 80.0 | 20.0 |
| | S/100 | 0-5 | 23 | 76.6 | 23.4 |
| | Control | 0-4 | 30 | 100.0 | -- |

At S/25 dose level *Vinca rosea* exhibit 66.7% followed by *Withania somnifera*, *Cassia occidentalis*, *Helianthus annuus* and *Chenopodium album* which show 50%, 30%, 6.4% and 3.4% inhibition of hatching respectively. However in *Argemone mexicana* the ovicidal activity was not recorded. At S/50 dose level *Vinca rosea* has highest ovicidal activity by 83.4%. In *Withania somnifera*, *Cassia occidentalis*, *Chenopodium album*, *Helianthus annuus* and *Argemone mexicana* the ovicidal activity recorded was 73.4%, 63.4%, 33.4%, 6.7% and 3.4% respectively. In S/75 *Vinca rosea* shows 90% ovicidal activity whereas *Withania somnifera*, *Cassia occidentalis*, *Chenopodium album*, *Helianthus annuus* and *Argemone mexicana* exhibit 80%, 73.4%, 50%, 20% and 16.7% respectively.

Table II : Ovicidal activity of plant extracts arranged in descending order.

| Dose level | | | | | |
|------------|------------------------------|---|-------------------------------|---|----------------------------------|
| S/10 | <i>V. rosea</i> (40) | > | <i>C. album</i> (3.4) | > | <i>H. annuus</i> |
| S/25 | <i>V. rosea</i> (66.7) | > | <i>W. somnifera</i> (50) | > | <i>C. occidentalis</i> (30) |
| | <i>H. annuus</i> (6.7) | > | <i>C. album</i> (3.4) | | |
| S/50 | <i>V. rosea</i> (83.4) | > | <i>W. somnifera</i> (73.4) | > | <i>C. occidentalis</i> (63.4) |
| | <i>C. album</i> (33.4) | > | <i>H. annuus</i> (6.7) | > | <i>A. mexicana</i> (3.4) |
| S/75 | <i>V. rosea</i> (90) | > | <i>W. somnifera</i> (80) | > | <i>C. occidentalis</i> (73.4) |
| | <i>H. annuus</i> (20) | > | <i>A. mexicana</i> (16.7) | | |
| S/100 | <i>W. somnifera</i> (100) | > | <i>V. rosea</i> (96.7) | > | <i>C. occidentalis</i> (86.7) |
| | <i>C. album</i> (70) | > | <i>H. annuus</i> (23.4) | > | <i>A. mexicana</i> (23.4) |

Figures given in parenthesis are per cent ovicidal action.

At S/100 dose level *Withania somnifera* has highest ovicidal activity (100%). *Vinca rosea*, *Cassia occidentalis* and *Chenopodium album* show 96.7, 86.7 and 70% ovicidal activity respectively. However, in *Argemone mexicana* and *Helianthus annuus* only 23.4% ovicidal activity has been recorded.

High ovicidal activity in *Vinca rosea* and *Withania somnifera* may be due to the presence of Vincain and Withanin chemicals respectively. These chemicals cause disturbances in embryonic development of *Corcyra cephalonica*.

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