GAU Res. J. 1996. 21 (2) : 137-140

# Ovicidal Property of Some Indigenous Plant Extracts Against *Spodoptera litura* Fab.*

**V. B. Patel and J. R. Patel**

Department of Entomology, Gujarat Agricultural University, Anand Campus, Anand-388 110

Castor, *Ricinus communis* L. being grown extensively under rainfed condition. Of the various pests infesting castor, *Spodoptera litura* Fab. and *Achaea janata* L. are important insect pests. Chemical insecticides are often recommended to combat the infestation of these two pests. The use of such chemicals is not only uneconomical but leads to many hazards. Botanicals under such circumstances can be the best solution to above problems along with the encouragement of their egg parasites. The ovicidal property of botanicals have been reported by Patil (1989) and Rao *et al.* (1990) from Maharashtra and A. P. respectively but no information on local plant materials from Gujarat is available. Keeping all these points in mind, study was carried out on the bio-efficacy of locally available plant materials against the eggs of *S. litura*.

*TABLE 1*

**Ovicidal effects of various botanical materials (5%) on eggs of *S. litura*.**

| *Plants* | *Egg mortality (%)* | |
|---|---|---|
| Karen (*Nerium indicum* Mill) leaf (Y) | 38.53* | (38.30) |
| Matsyagandhati (*Gynandropsis pentaphylla* L.) leaf | 35.25 | (33.31) |
| Lilly (*Zephyranthus* spp.) bulb | 24.08 | (16.16) |
| Lilly leaf | 17.99 | ( 9.54) |
| Kadva giloda (*Coccinia indica* W. & A.) fruit | 17.51 | (9.05) |
| Kadva giloda leaf | 15.11 | (6.79) |
| Bitter gourd (*Momordica balsamina* L.) leaf | 13.17 | (5.19) |
| Karanj (*Pongamia glabra* Vent.) kernel | 11.22 | (3.79) |
| Mahuda (*Mahudha longifolia* L.) seed | 11.22 | (3.79) |
| Akda (*Calotropis gigantea* R. Br.) leaf | 11.22 | (3.79) |
| Piludi (*Solanum nigrum* L.) leaf | 8.81 | (2.34) |

*Part of M.Sc. (Agri.) thesis submitted by the ... Sardar Krushinagar.

| 1. | 2. | |
|---|---|---|
| S. Em. ± | 3.06 | |
| C. D. (P=0.05) | 8.99 | |
| C. V % | 28.95 | |
| *Plants* | *Egg mortality (%)* | |
| Ardusa (*Alianthus excelsa* Roxb.) leaf | 48.18* | (55.54) |
| Neem (*Azadirachta indica* A. Juss) kernel | 28.11 | (22.20) |
| Neem leaf | 26.77 | (20.29) |
| Damra (*Ocimum basillicum* L.) leaf | 19.46 | (11.10) |
| Karen leaf (P) | 8.82 | (2.35) |
| Fudina (*Mentha piperata* L.) leaf | 8.82 | (2.35) |
| Ardusi (*Adhatoda vasica* Nees.) leaf | 8.82 | (2.35) |
| Eucalyptus (*Eucalyptus globulus* Labill) leaf | 6.42 | (1.25) |
| Tulsi (*Ocimum sanctum* L.) leaf | 6.42 | (1.25) |
| Lantana (*Lantana camara* L.) leaf | 6.42 | (1.25) |
| S. Em. ± | 1.43 | |
| C. D. (P=0.05) | 4.20 | |
| C. V. % | 15.61 | |

*Arcsin $\sqrt{\text{percentage}}$.

Figures in parentheses are retransformed values.

To evaluate the ovicidal property of various plant materials (Table 1) against the eggs of castor leaf eating caterpiller, *Spodoptera litura*, laboratory experiments were conducted at Gujarat Agricultural University, Campus Anand during 1989-90 and 1990-91. Twenty four to thirty six hours old eggs were transferred with utmost care on the glass slide measuring 7.5 cm x 2.5 cm with the help of fine camel hair brush. The spray suspension at 5 or 3+2 per cent concentration of each plant material was applied with the help of Potter's tower at a constant air pressure of 22.5 kg/cm$^2$. Water spray was given in the control treatment. The glass slides were thoroughly dried under ceiling fan for 10 minutes and placed in a glass petridish containing tender castor leaf having water dipped cotton wool around petiole to prevent the damage by freshly emerged larvae to unhatched treated eggs.

The eggs were observed everyday under binocular stereoscopic microscope and the larvae half way out at the egg shell were considered as hatched. Observations on egg hatching for each

*TABLE 2*

**Ovicidal effect of various combinations of botanical materials (3+2) on eggs of *S. litura*.**

| *Plants* | *Egg mortality (%)* | |
|---|---|---|
| Karen (Y) + Matsyagandhati leaf | 39.96* | (41.24) |
| Ardusa leaf + Neem Leaf | 39.80 | (40.97) |
| Ardusa leaf + Fudina leaf | 36.57 | (35.49) |
| Ardusa leaf + Matsyagandhati leaf | 33.28 | (30.11) |
| Ardusa leaf + Lantana leaf | 33.22 | (30.01) |
| Ardusa leaf + Neem kernel | 28.44 | (22.68) |
| Ardusa leaf + Damra leaf | 24.77 | (17.55) |
| Ardusa leaf + Karen leaf (Y) | 19.05 | (10.65) |
| S. Em. ± | 2.54 | |
| C. D. (P=0.05) | 7.43 | |
| C. V. (%) | 13.83 | |

*Arcsin $\sqrt{\text{percentage}}$

Figures in parentheses are retransformed values.

treatment were recorded for 10 days. Eggs which did not hatch over in this period were considered to betoxified i.e. dead. The percentage mortality of eggs was worked out by using following modified Abott's formula (Abott, 1925).

*TABLE 3*

**Ovicidal effect of various combinations of botanical materials (3+2) on eggs of *S. litura*.**

| *Plants* | *Egg mortality (%)* | *Plants* | *Egg mortality (%)* | |
|---|---|---|---|---|
| Matsyagandhati leaf + Karen leaf (Y) | 35.25* (33.31) | Fudina leaf + Lantana leaf | 34.90 | (32.73) |
| Lilly bulb + Karen leaf (Y) | 26.77 (20.29) | Lantana leaf + Damra leaf | 19.69 | (11.35) |
| Lilly bulb + Matsyagandhati leaf | 17.51 (9.05) | Fudina leaf + Karen leaf (P) | 10.63 | (3.40) |
| Karen leaf (Y) + Piludi leaf | 13.17 (5.19) | Fudina leaf + Damra leaf | 8.13 | (1.20) |
| Matsyagandhati leaf Piludi leaf | 11.22 (3.79) | | | |
| S. Em. ± | 2.26 | 2.90 | | |
| C. D. (P = 0.05) | 7.13 | 9.14 | | |
| C. V. % | 18.86 | 31.74 | | |

*Arcin $\sqrt{\text{percentage}}$.

Figures in parenthesis are retransformed values.

$$\text{Percentage mortality} = 1 - \frac{Ta \times Cb}{Tb \times Ca} \times 100$$

where,

Ta = Nos. in treatment after application

Tb = Nos. in treatment before application

Ca = Nos. in check after application

Cb = Nos. in check before application

The data recorded on egg hatching were compiled and statistically analysed by adopting standard statistical procedure on computer.

Among the various botanicals studied for their ovicidal properties against the eggs of *S. litura* the 5% leaves extract suspension of yellow flower karen (*Nerium indicum* Mill), matsyagandhati (*Gynandropsis pentaphylia* L.) and ardusa (*Alianthus excelsa* Roxb.) showed good ovicidal properties. Ardusa leaves showed higher ovicidal effect than neem (*Azadirachta indica* A. Juss) seed kernels and neem leaves.

Among the various combinations the leaves extract mixtures of yellow flower karen (3%) with matsyagandhati (2%), ardusa (3%) with neem (2%) as well as fudina (*Mentha piperata* L. 2%) and fudina (3%) with lantana (*Lantana camara* L. 2%) gave higher egg mortality of *S. litura* (Table 2). However, except a mixtures of fudina (3%) with lantana (2%) and karan (3%) with matsyagandhati (2%) none of the mixture could showed thier additive ovicidal property against the eggs of *S. litura*.

*(Received on 4th Octo., 1994)*

## REFERENCES

Abott, W. S. 1925. A method of computing the effectiveness of an insecticide *J. Econ. Ent.*, 18 : 265-267.

Patil, A. P. 1989. Mortality and ovicidal property of *Parthanium hysterophorus* and *Acorus calamus* on *Spodoptera litura*. *Environ. Ecol.*, 7 (3) : 763-766.

Rao, R. G., Raghavaiah, G, and Nagalingam, B. 1990. Effect of botanicals on certain behavioural responses and on the growth inhibition of tobacco caterpiller, *Spodoptera litura* F. Paper presented at National Symposium on "Problems and Prospects of Botanical Pesticides in Integrated Pest Management", CTRI, Rajahmundry (A.P.), January, 12-13.