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Research Article

INSECTICIDAL ACTIVITY OF "TULSI" ON 6TH INSTAR OF *SPODOPTERA LITURA*

***Sudha Summarwar and Jyotsana Pandey**
Department of Zoology, S.D. Government College Beawar, M.D.S University Ajmer (Raj.)
**Author for Correspondence*

ABSTRACT
Since there is paucity of documented information on the use of plant extract mixtures in pest control, this study was aimed at assessing the insecticidal activity of leaf extract of Tulsi" *Ocimum sanctum*" on 6th instar of *Spodoptera litura.* Results show that leaf extract of *O. sanctum* was less effective in inducing mortality in treated pupae. Pupae of *S.litura* when treated with 2.0% of extract showed 77.30 percent mortality. At other concentrations of 0.1, 0.5, 1.0 and 1.5% pupal mortality observed was 21.33, 29.33, 41.33 and 57.33 percent respectively.

Keywords: *Mortality, Pupae, Instar, Leaf Extract, Insecticidal Activity*

INTRODUCTION
In agriculture, insect effect directly the growing part of the crop and causes severe damage. In a tropical country like India, owing to climatic condition and its particular environment, agriculture is suffering from severe losses due to pest. In this manner, Tobacco caterpillar *Spodoptera litura* (Feb) (Lepidoptera Noctuidae) is a cosmopolitan and polyphagous pest, effecting several crop like pulse, oil seeds vegetables or ornamental plant and weed species. There are six larval instars and after 3rd instar the larvae are very active and are voracious feeders. Fully grown 6th instar larvae have characteristics dark spot lines and patches on their body.
Ocimum sanctum (holy basil), also called Tulsi in India has high medicinal value. Batta and Santhakumari (1970) reported the antifertility effect of *Ocimum sanctum.* Tulsi has been used to treat malarial fever, ringworms and other infections (Butani, 1982).
Since there is paucity of documented information on the use of plant extract mixtures in pest control, this study was aimed at assessing the Insecticidal activity of Leaf extract of Tulsi" *Ocimum sanctum*" on 6th instar of *Spodoptera litura.*

MATERIALS AND METHODS
To assess the pupicidal action of plant extracts, late sixth instar larvae (pre-pupal stage) were treated by topical method. Pupicidal activity was calculated by substracting the number of emerging adults from the total number of pupae treated.
Topical Application: Larvae were collected from rearing stock and were kept in ventilated plastic containers (20 cm diameter and 8 cm in height) for the bioassay. For topical application, 2 ul of the solvent extract was applied topically on each larva with the help of a micropipette. After treatment the larvae were released in the plastic container containing cabbage leaves. Three replicates were run for each concentration per solvent extract and controls treated with solvent were kept in each experiment. Ten larvae were treated in each replicate. Larval mortality was observed after 48 hours of treatment. Percent mortality was calculated and corrected using Abbott's formula (Abbott, 1925). The correction was done only when the death in control groups was between 5-20%.

RESULTS AND DISCUSSION
Results show that leaf extract of *O.sanctum* was less effective in inducing mortality in treated pupae. Pupae of *S.litura* when treated with 2.0% of extract showed 77.30 percent mortality. At other concentrations of 0.1, 0.5, 1.0 and 1.5% pupal mortality observed was 21.33, 29.33, 41.33 and 57.33 percent respectively. In control experiment pupal mortality observed was 2.55 percent (Table 1).

Percent mortality in emerged adults was 70.47 when pre-pupae were treated with 2.0% extract. 26.38, 35.83 45.39 and 69.69 percent adult mortality was observed at the concentrations of 0.1, 0.5, 1.0 and 1.5 % respectively. In control 3.25 percent adults emerged from the pupae.

Pathak *et al.,* (2000) reported the larvicidal action of essential oil from plants including *Ocimum sanctum* against vector mosquitoes. Keita *et al.,* (2001) evaluated the efficacy of essential oils of *Ocimum basilicum* L. and *O.gratissimum* L. applied as an insecticidal fumigant and powder to control *Callosobruchus maculatus* (Fab). Larvicidal action of *Ocimum sanctum* against *Aedes aegypti* and *Culex quinquefaciatus* has been reported by Mohamed Anees (2008). Thangamathi *et al.,* (2009) evaluated the repellant activity of *Ocimum sanctum* against *Culex quinquefaciatus.*

Table 1: Toxicity of *O. Sanctum* to Pupae of *Spodoptera litura* Treated by Topical Application Method

Doses %	*Ocimum sanctum* Leaf Extract	
	Percent Pupal Mortality	**Percent Adult Mortality (within 24 hrs)**
0.1	21.33	26.38
0.5	29.33	35.83
1	41.33	45.39
1.5	57.33	69.69
2	77.3	70.47
Control	2.55	3.25
F-Value	235.5	234
CV at 5 %	3.34	3.61

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