

Egg susceptibility of brinjal pest *Leucinodes orbonalis* Guene to neem extracts

V.S. KAVITHA¹, N. REVATHI² AND S. KINGSLEY^{3*}

¹Department of Zoology, Vellalar College for Women, ERODE (T.N.) INDIA

²Department of Advanced Zoology and Biotechnology, Loyola College, CHENNAI (T.N.) INDIA

³Entomology Research Institute, Loyola College, CHENNAI (T.N.) INDIA

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The present study reports the bioefficacy of neem oil, neem cake extract and carbaryl at different concentrations on the eggs of *Leucinodes orbonalis* at two stages; after 0 to 24 and 24 to 48 hrs old eggs. Both neem oil and neem cake extract had ovicidal effect. Neem oil had higher ovicidal effect than neem cake extract and carbaryl. Egg mortality was found to be lesser on the eggs of older age. An increase in the concentration of test solutions resulted in an increase in the rate of mortality of eggs.

Key words : *Leucinodes orbonalis*, *Azadirachta indica*, Ovicidal effect, Brinjal.

INTRODUCTION

Synthetic pesticides have been a threat to human health and the environment, causing among other undesirable effects, phytotoxicity, pollution, development of insecticide resistance, or negative effect on non-target organisms. One alternative to conventional insecticides is the use of new botanicals such as neem, which has evoked a great deal of interest because of its bioefficacy and biodegradability (Isman, 1999). This consideration is behind the present study in evaluating the bioefficacy of neem extracts on the eggs of brinjal pest *Leucinodes orbonalis*. Saxena *et al.* (1981) first observed the ovicidal effect of neem on the eggs of *Cnaphalocrocis medinalis*. Ovicidal effect of neem was also observed earlier by Usha and Patel (1997) on *Helicoverpa armigera*, Sahayaraj and Paulraj (1998) on *Amsacta albistriga* and Uma Maheshwari *et al.* (2007) on *Dysdercus cingulatus*.

Shoot and fruit borer *Leucinodes orbonalis* Guene (Lepidoptera : Pyralidae) is a most destructive pest of brinjal *Solanum melongena* Linn. (Lefroy, 1990). Brinjal is one of the main vegetable crops of Erode district of Tamil Nadu. The Larvae of *L. orbonalis* bore into shoots and fruits of brinjal. The infested fruits become distorted and unfit for human consumption. The objective of the present study is the management of the brinjal pest *L. orbonalis* with the use of ecofriendly botanical pesticides- the neem extract.

MATERIALS AND METHODS

The larvae of *L. orbonalis* collected from the infested

fruits were kept in a container (30x25cm) and fed with fruit bearing twigs of brinjal. The emerged adults were separated out and kept in ten glass jars, containing a male and a female. For oviposition, fresh brinjal twig was kept inside the jars. Adults were fed with 5% honey solution soaked in cotton was also kept in the jars. The jar was covered with muslin cloth. Freshly laid eggs of *L. orbonalis* were spread over on a watch glass in groups, each group having twelve eggs. Neem oil at 0.5, 1.5, 2.5 and 3.5%, neem cake extract at 0.5, 1.5, 2.5 and 3.5% and carbaryl 0.15% were evaluated for the ovicidal effect. A mixture of distilled water and teepol was used as control. The eggs dipped in test solutions were dried for 30 minutes. Observations on the mortality of eggs were recorded at two stages after 0-24 and 24-48 hours old eggs. Each experiment was replicated thrice at room temperature (30±28°C).

RESULTS AND DISCUSSION

Results presented in the Table 1 revealed both neem oil and neem cake extract had ovicidal effect on 24 and 48 hours of old eggs. Neem oil had higher ovicidal effect than neem cake extract. This is in accordance with the earlier findings of Thenmozhi and Kingsley (2004) on *Plusia peponis*, Meena and Bhargava (2005) on *Corcyra cephalonica*, Revathi and Kingsley (2007) on *Pericallia ricini*. Neem oil 0.5 and 3.5% concentrations had 66.66 and 94.44% of ovicidal effect on the 24 hrs old eggs, respectively and 58.33% and 88.88% ovicidal effect on the 48 hrs old eggs. With neem cake extract 0.5% and 3.5%, the ovicidal effect on 24 hrs aged eggs were 61.10

* Author for correspondence.

Table 1 : Efficacy of neem oil, neem cake extract and carbaryl on the eggs of *leucinodes orbonalis*

Treatment	Concentration (%)	Egg mortality (%)		Mean
		Age of eggs (hrs)		
		0-24	24-48	
Neem oil	0.5	66.66 (54.84)c	58.33 (49.79)d	62.49
Neem oil	1.5	75.00 (60.00)bc	69.44 (56.48)c	72.22
Neem oil	2.5	83.33 (66.37)b	80.55 (63.93)b	81.94
Neem oil	3.5	94.44 (78.80)a	88.88 (70.77)a	91.66
Neem cake extract	0.5	61.10 (51.44)c	55.55 (48.19)c	58.32
Neem cake extract	1.5	69.44 (56.48)b	63.88 (53.08)bc	66.66
Neem cake extract	2.5	72.22 (58.24)b	72.22 (58.24)b	72.22
Neem cake extract	3.5	91.66 (73.21)a	86.10 (68.33)a	88.88
Carbaryl	0.15	63.88 (53.19)c	52.77 (46.59)b	58.32
Control		0.00 (0.19)d	0.00 (0.19)e	0.00

Values mean of three replications

Means followed by a common letter are not significantly different at the 5% level by DMRT.

and 91.66%, respectively. On 48 hrs aged eggs, the effect was 55.55 and 86.10%, respectively. It was inferred from these results, there was a corresponding decrease of ovicidal effect with an increase in the age of eggs. This corroborates with the findings of Bhathal *et al.* (1991) on *Dysdercus koenigii*, Gupta *et al.* (1999) on *Helicoverpa armigera*, Shanmugapriyan and Kingsley (2003) on *Epilachna vigintioctopunctata* and Sahayaraj *et al.* (2006) on *Dysdercus cingulatus*. In the present study it was observed, neem oil 3.5% had higher ovicidal effect than neem oil 0.5%. An increase in the concentration of the test solutions resulted in an increase in the rate of mortality of eggs of *L. orbonalis*. The present findings correlate with earlier findings on *Helicoverpa armigera* (Jhansi and Singh, 1993), on *Spodoptera litura*, (Jeyakumar and Gupta, 1999), on *Tabernaemontanae livaricate* (Dwivedi and Pareek, 2003), on *Spodoptera litura* (Pavunraj *et al.*, 2006) and on *Pericallia ricini* (Revathi and Kingsley, 2007). Carbaryl 0.15% had lower ovicidal effect than neem oil and neem cake extract. Same findings were also observed on *Cnaphalocrocis medinalis* (Raju *et al.*, 1990) and on *Helicoverpa armigera* (Kathuria *et al.*, 2000).

In the present investigation it was clearly observed both, neem oil and neem cake extract had ovicidal effect. If these neem extracts could retain their ovicidal effect in the field trials, then it will become an efficient and non-hazardous substitute for the management of *L. orbonalis*.

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