

## Biology of *Leucinodes orbonalis* : An Important Pest of Brinjal

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### SUMMARY

The pre-oviposition, oviposition and post-oviposition periods of *Leucinodes orbonalis* were found  $7.1 \pm 0.29$  hours,  $2.3 \pm 0.21$  and  $1.5 \pm 0.18$  days, respectively. The larvae passed through five instars. The incubation, larval and pupal periods were  $3.8 \pm 0.18$ ,  $13.8 \pm 0.70$  and  $10.2 \pm 0.36$  days, respectively. The pupation took place on the glass jars, soil, muslin cloth, sometimes inside the fruits and on the leaves of the plants. The longevity of male moth was  $1.7 \pm 0.17$  days while female lived for  $3.3 \pm 0.32$  days. The mean time taken from egg to adult stage was  $27.8 \pm 1.24$  days. Number of eggs laid by a female was with an average of  $120.3 \pm 3.04$ .

### Key words :

*Leucinodes orbonalis*  
Guenee, Biology  
and brinjal

**B**rinjal, the king of vegetable is an important crop because of its nutritional, medicinal as well as commercial value. Of 26 pests recorded on brinjal crop (Vevai, 1970), brinjal shoot and fruit borer, *Leucinodes orbonalis* Guenee is the most destructive pest of brinjal (*Solanum melongena* L.). The larvae bore into petiole and midribs of large leaves or young growing shoots (Pradhan, 1969) close the opening with their frass and feed within. In the later stages, caterpillars bore into flower, buds and fruits entering from under the calyx having no visible sign of infestation and feed inside the fruits (Butani and Verma, 1976). Such fruits lose their market value. So, the sufficient knowledge about the biology of an insect is necessary for adopting suitable control measure.

### MATERIALS AND METHODS

The biology of *L. orbonalis* was studied at room temperature in the laboratory of Department of Entomology, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri during *kharif*, 2008. The larvae of brinjal fruit borer were collected in large numbers from the infested fruits from Rahuri market, Dist. Ahmednagar. These larvae were reared separately in clean plastic vials. The slices of fresh fruits of brinjal were cut and provided daily in the vials to serve as food for developing larvae. The mouths of each vials was closed. Freshly formed pupae within cocoons were transferred daily into Petridishes for emergence of adults. A pair of newly

emerged male and female moths were released in a rearing apparatus containing fresh twig of brinjal plant for egg laying. A fresh brinjal twig with 3 to 4 leaves - was kept in a small conical flask containing water and placed within the rearing apparatus and it was replaced daily and piece of polythene sheet was used to summon the stem of the twig, which served as covering to protect the fall of adults in it. Two cotton swabs soaked in 10 per cent glucose solution one at bottom and other was kept hanging in the rearing apparatus were provided as food. The eggs laid on twigs were removed with a fine camel's hair brush and transferred into clean Petridishes having blotting paper. The observations on the duration of different stages *i.e.* egg, larvae, pupa and adult were recorded with the help of a binocular microscope.

### RESULTS AND DISCUSSION

The pre-oviposition, oviposition and post-oviposition period were found 5 to 9 hours, 1-3 and 1-2 days, respectively (Table 1). Ali and Sanghi (1962) reported that pre-oviposition period was fairly short. These results are in agreement with that of Mehto *et al.* (1983) who reported oviposition period from 1.4 to 2.9 days. Jat *et al.* (2003) reported that pre-oviposition, oviposition and post oviposition periods of *L. orbonalis* were found 7.40 hours, 2.43 and 1.26 days.

### Egg:

The eggs were generally laid singly or in

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**Table 1 : Biological parameters of brinjal shoot and fruit borer, *Leucinodes orbonalis* (Guenee)**

Sr. No.	Parameters	Range	Mean
1.	Pre-oviposition period (hours)	5-9	7.12=0.29
2.	Oviposition period (days)	1-3	2.32=0.21
3.	Post-oviposition period (days)	1-2	1.52=0.18
4.	Fecundity (No. of eggs/ female)	27-211	120.3 ± 3.04

batches of 2 to 3 near the veins on the under surface of the leaves ranged from 27-211 with an average of 120.3, this result is agreed with Singh and Singh (2001). The incubation period completed within 3 to 5 days (Table 2), confirming the finding of Allam *et al.* (1982) and Mehto *et al.* (1983). The freshly laid eggs were oval or somewhat elongated in shape and creamy white in colour which changed to orange with a prominent black spot before hatching.

#### Larvae:

The newly emerged larvae were dirty white in colour which changed to pinkish within 3 to 5 hours with a prominent dark brown head, three pair of thoracic legs and five pair of prolegs. The larvae passed through five instars. First instar lasted for  $1.8 \pm 0.15$  days, then second instar larvae came out, which resembled the first instar except larger size and slightly dark colour. This instar lasted for  $2.3 \pm 0.13$  days. The third instar larva was much longer and darker than the preceding instars, in  $2.7 \pm 0.13$  days. It changed in to fourth instar larvae which is slightly pinkish in colour. It took 2-4 days to change into fifth instar. The fifth instar larvae were cylindrical in shape and pinkish brown in colour having three distinct segments of thorax and five pair of well developed prolegs, took 3 to 4 days for pupation. The larvae passed through five instars agreeing with the findings of Jat *et al.* (2003), Singh and Singh (2001) and Atwal and Dhaliwal (1997). The total larval period ranged from 10-16 days with an average of  $13.8 \pm 0.70$  days (Table 2).

#### Pupae:

The dark brown pupa with wider cephalic and narrow anal and having eight hook shape fine spines at the posterior end of abdomen. The pupal period lasted for 7 to 14 days (Table 2). The result is agreement with Singh and Singh (2001) and Allam *et al.* (1982). Pupation took place on the glass jars, soil, muslin cloth, some times inside the fruits and on the leaves of the plants.

#### Adult:

The moth was white in colour with blackish brown head and thorax. The whitish wings had pinkish brown

**Table 2 : Developmental period of different stages of brinjal shoot and fruit borer, *Leucinodes orbonalis* (Guenee)**

Sr. No.	Stage	Duration (days)	
		Range	Mean
1.	Egg	3-5	$3.8 \pm 0.18$
2.	Larval		
	I <sup>st</sup>	1-2	$1.8 \pm 0.15$
	II <sup>nd</sup>	2-3	$2.32=0.13$
	III <sup>rd</sup>	2-3	$2.72=0.13$
	IV <sup>th</sup>	2-4	$3.32=0.17$
	V <sup>th</sup>	3-4	$3.72=0.12$
	Total larval period	10-16	$13.8 \pm 0.70$
3.	Pupa	7-14	$10.2 \pm 0.36$
4.	Adult		
	Male	1-2	$1.7 \pm 0.17$
	Female	2-4	$3.3 \pm 0.32$
5.	Total period taken from egg to adult emergence	20-35	$27.8 \pm 1.24$

markings which were bigger on the forewings. The male moths lived for 1 to 2 days while the female moths for 2-4 days. The life cycle of the pest was completed in 20 to 35 days with an average of  $27.8 \pm 1.24$  days (Table 2). Confirming the findings of Lall and Ahmed (1965), Allam *et al.* (1982), Singh and Singh (2001) and Jat *et al.* (2003).

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