

**STUDY OF DIFFERENT HOST PLANTS SUITABLE FOR THE GROWTH OF
*LEUCINODES ORBONALIS******VIVEK DIXIT AND J.K. AWASTHI¹**Department of Zoology ,
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Email :vivekjalaun73@gmail.com**Received : 18.03.2017; Accepted : 16.04.2017****ABSTRACT**

Different host plants (*Solanum melongena*, *Lycopersicon esculentum*, *Abelmoschus esculentus*, *Solanum tuberosum*, *Solanum nigrum*, *Cydonia indicum*, *Ocimum basilicum* and *Solanum indicum*) affect the weight of larva on 5th, 10th and 15th day of development differently. On these plants the larval weight on 5th day varies from 2.2 to 2.8 mg. . The tested plants affect the growth of larva on 10th day also. *Solanum melongena* reared larva was the heaviest (4.8 mg.) and the reared on *Ocimum basilicum* was the lightest (3.6 mg.) the larval weight on 15th day is also affected differently by different host plants. *Solanum melongena* produce the heaviest larva (9.8 mg.) and *Ocimum basilicum* both produced the lightest larva (7.4 mg.) However, the increase in larval weight with respect to the remaining plants was slightly less. The increase in the larval weight is possibly due to relative more feeding and more utilization of the ingested food and the differences in weight of larvae are mostly due to varying nutritive value of the tested plants .

Figures : 02

References : 13

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KEY WORDS : Host plants, Ingested food, *Leucinodes larva*, Nutritive value, Weight**Introduction**

Brinjal, Tomato, Pea, Potato, Makai, Tuls and other most important vegetable and medicinal crops are cultivated commercially in U.P. except on higher altitude³. There are many as 26 pests including insect pests of major importance. Among the various insect pests of different vegetables *Leucinodes orbonalis* is a serious polyphagous pest, which cause a heavy losses to these vegetable crop from seedling to fruiting stage¹³.

The larva bores inside the petiole, mid-rib and veins of larger leaves¹¹. Plant exhibits symptoms of dropping while fruits show holes on

their surface plugged with excreta. The infestation on these vegetables can be as high as seventy percent⁵.

Rainy season crop has been found to be infested more severely than the summer season crop¹⁰. Temperature and relative humidity play an important role in the development, survival and multiplication of insects².

L. orbonalis is a major pest of brinjal crop. On an average about 20.7 percent fruits were damaged by this shoot and fruit borer and even if the damaged portion of fruits were discarded, the loss in weight was 9.7 percent⁸. It was found that

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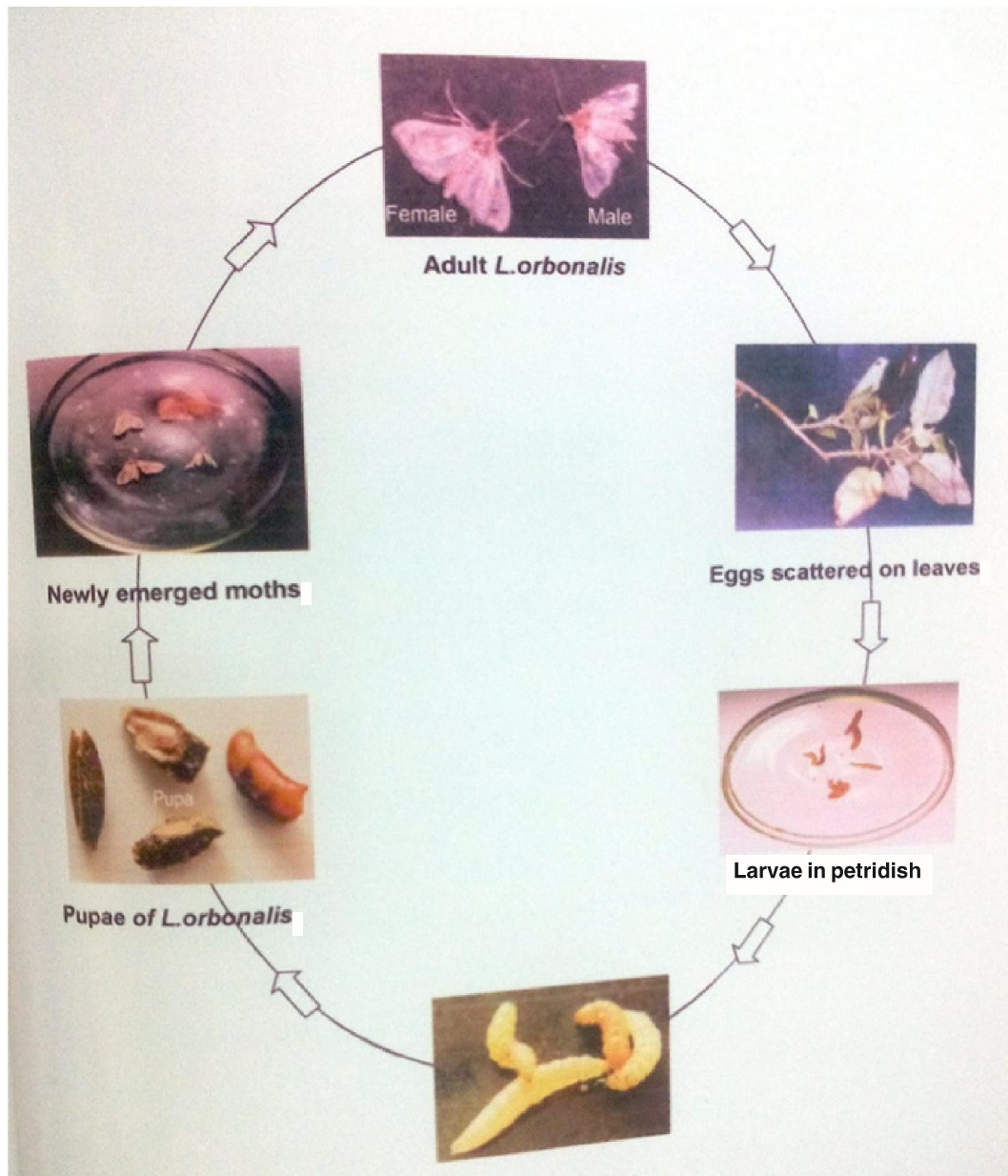


Fig. 1 : Life cycle of *L. orbonalis*

damaged fruits contained less vitamin C¹. This pest also infest *Solanum tuberosum*, *Solanum xanthocarpum*, *Solanum indicum*, *Solanum nigrum*, Pea pods, Doobgrass etc. and cause mild

to sever loss^{4,7}.

Food plants are known to be an important biotic factor for the growth and development of an insect and potentiating the out breaks under the

TABLE -1 : Effect of different host plants on the growth of larva in *Leucinodes orbonalis*

S. No.	Host Plants	Average larval weight acquired (mg) \pm S.E. on		
		5 th Day	10 th Day	15 th day
1.	<i>Solanum melongena</i>	28 \pm 0.04	4.8 \pm 0.06	9.8 \pm 0.07
2	<i>Lycopersicon esculentum</i>	27 \pm 0.03	4.6 \pm 0.04	9.6 \pm 0.06
3	<i>Abelmoschus esculentus</i>	26 \pm 0.03	4.4 \pm 0.03	8.8 \pm 0.04
4	<i>Solanum tuberosum</i>	2.5 \pm 0.02	4.2 \pm 0.06	8.1 \pm 0.02
5	<i>Solanum nigrum</i>	2.4 \pm 0.02	4.1 \pm 0.07	8.6 \pm 0.01
6	<i>Cynodori indicum</i>	2.3 \pm 0.03	4.0 \pm 0.04	7.8 \pm 0.04
7	<i>Ocimum basilicum</i>	2.2 \pm 0.03	3.6 \pm 0.56	7.4 \pm 0.02
8	<i>Solanum indicum</i>	2.2 \pm 0.04	3.6 \pm 0.06	7.4 \pm 0.04

favorable set of climatic condition¹². Hence an attempt will also be made to study its growth and reproductive potential in relation to different food plants .

Considering this fact the following studies have been planned with *Leucinodes orbonalis* .

- ❑ Effect of different host plants on growth of *Leucinodes orbonalis* .
- ❑ Growth in terms of weight acquired . (Weight of larvae at regular intervals)

Material and Method

For the studies mentioned above male and female *L.orbonalis* were collected and were brought to the laboratory, Department of Zoology, Narain College Shikohabad for rearing to obtain adults and developmental stages throughout the tenure of this

investigation .

The moths are medium sized with white wings having triangular brown and red marking on the fore wings. Males and females are usually identical in appearance, the females are slightly bigger than males, the female lays the flat white eggs on lower surface of leaves preferably. Female lay about 250 eggs during her life time. Newly hatched larvae are very small measure from 16 to 20 mm. Larval period is about 15 days, pupal periods is about 6-8 days . The life cycle is completed in 4 to 5 weeks .

Host plants and damage –

The larvae bore into petiole and midrib of large leaves and tender shoots and cause “ Dead Heart “ in the later stage. Larvae also bore into flower buds and fruits .

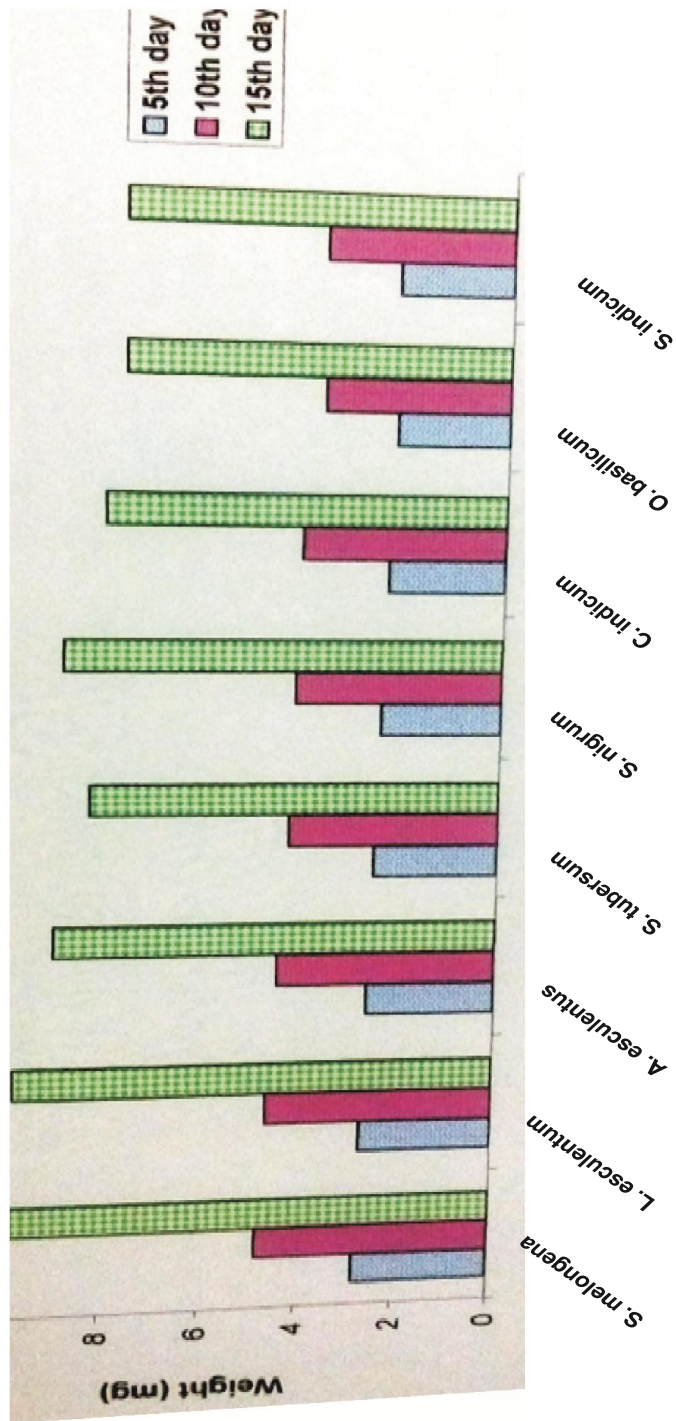


Fig.2: Showing the growth in larva of *L. orbonalis* under effect of different host plants

***L. orbonalis* infested on following host plants
viz. –**

- 1- *Solanum melongena* (Brinjal)
- 2- *Solanum tuberosum* (Potato)
- 3- *Lycopersicon esculentum* (Tomato)
- 4- *Abelmoschus esculentus* (Lady's finger)
- 5- *Cynodon indicum* (Doob grass)
- 6- *Solanum indicum* (Bari katai)
- 7- *Solanum nigrum* (Makoi)
- 8- *Ocimum basilicum* (Tulsi)

The growth supporting capacity of a plant was assessed on the basis of weight gained by the larvae on that plant species . This was tested by three experiments with tested host plant species which elicited the feeding response of the larvae . In the first experiment 20 newly hatched larvae of *L.orbonalis* per replicate were reared on leaves of different food plants in petridishes separately. The tender and fresh leaves of host plants were supplied to larvae once in the morning and once in the evening every day until they pupated. During rearing the petridishes remained covered by fine muslin cloth to prevent the escape of the larvae . The weight of larvae was recorded on 5th , 10th and 15th day of larval period .

The second experiment was designed to assess the supporting capacity of tested host plant with reference to the length and weight gained by different instar of larvae in response to rearing on different host species the pattern of rearing in this experiment was similar to that of above experiment.

In the third experiment all arrangements were made as experiment first and to obtain adults, matured larvae were transferred to pneumatic troughs with 10 cm thick soil bottom for population pupae were placed in cage for emergence , when moths obtained, their longevity, body weight, body length and wing expanse were recorded .

Results and Discussion

The data pertaining to influence of different host plants on the growth of *L.orbonails* have been presented (Fig.1 & Table-1).

Larva attained maximum weight 2.8 mg. on fifth day of development when reared on *Solanum melongena*. The other host plants viz . *Lycopersicon esculentum* (2.7 mg) *Abelmoschus esculentus* (2.6 mg) *Solanum tuberosum* (2.5 mg) *Solanum nigrum* (2.4 mg) *Cynodon indicum* (2.3 mg) *Ocimum basilicum* (2.2 mg) and *Solanum indicum* (2.2 mg) *S.indicum* induced for less and the minimum growth as larva acquired only (2.2 mg) weight on both host plant on the 5th day .

On 10th day also the larva acquired the highest growth on *S. melongena*. weighting 4.8 mg on this plant. *O.basilicum* and *S. indicum* which offered the minimum growth support (3.6 mg) among different host species supported the growth *L.escumentum* (4.6 mg) *A.esculentus* (4.4 mg.) *S.tuberosum* (4.2 mg) and *C.Indicum* (4.0 mg) approached *S.melongena* in growth inducing on 10th day . these plant show growth of larva in better way in comparison to *S. indicum* and *basilicum* (3.6 mg).

The larval weight on the 15th day . on all host plants used in this investigation showed better growth of larva. The larval growth showed about 1.5 fold increase to the weight in comparison of the weight on 10th day on all used host plants but the increase in larval weight on 15th day on *S.indicum* and *O.basilicum* was considerably depressed . The weight of larva (9.8 mg) was maximum when reared on *S.melongena* while the minimum weight (7.4 mg) was acquired by larva when reared on *S.indicum* and *O.basilicum*. Other host plants supported the larval growth in better way in comparison of *S.indicum* and *O.basicicum* .

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