

**Biology and Estimation of
Incidence of Groundnut Leaf-
Miner, *Stomopteryx Subsecivella*
Zell. (Gelechiidae:Lepidoptera)**

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Groundnut leaf-miner, *Stomopteryx subsecivella* (Zell) is found in India, Ceylon, Pakistan, and Burma (Pruthi, 1969 and Nayar, *et al.* 1976). This pest has also been recorded on other crops such as soybean, red gram and a wild shrub (*Psorales corylifolia*) (Narayanan, 1962 and Nayar, *et al.* 1976). The severe incidence of this pest was observed in rabi groundnut crop during 1978-79 at the Main Oilseeds Research Station, Junagadh. This is the first record of this pest from Gujarat State. The study on biology of this pest was, therefore, undertaken in the laboratory conditions at room temperature of 22.8° to 24° C.

The laboratory culture was obtained by collecting the pupae of groundnut leaf-miner from the field of ground-

nut crop. The pupae collected were placed in petri dishes (9 cm x 2.5 cm) for emergence of adults. The newly emerged adults were used for further studies. They were kept for pairing in glass jars (15 cm x 11 cm) and the mouth of jars were covered with the muslin cloth with the help of rubber band. Total 15 pairs were studied for biological studies. The twigs of groundnut plant were provided for oviposition and resting for the adults. Five per cent sugar solution was also provided as food for the adults. The twigs were changed daily and the eggs laid on them were carefully counted. Daily observations on hatching of eggs were recorded to find out the egg period. The newly hatched larvae were reared individually on the tender leaf of groundnut. The petiole of leaf was wrapped with wet cotton wool to keep the leaf fresh and turgid. The food was changed regularly at an interval of three days. The larval instars were studied on the basis of head capsule present in the mines. The biological results thus obtained are presented in Table 1.

TABLE 1

Duration of different stages of *Stomopteryx subsecivella* (Zell.) on groundnut.

Stage	Numbers observed	Duration in days
Egg:	45	6-8 (7.45)*
Larva:		
First instar	25	7-14 (9.16)
Second instar	25	2-5 (2.84)
Third instar	25	4-9 (6.46)
Pupa:	30	6-13 (9.93)
Adult:		
Male	15	2-7 (5.47)
Female	15	2-17 (2.27)

*Figures in paranthesis are the average values.

A study was, also undertaken to estimate the incidence of this pest on groundnut variety GAUG-1 under field conditions.

In this experiment, 20, 40, 60 and 80 leaves per plant from different levels of infestation were observed for leaf-miner incidence. In each replica-

tion five plants were selected randomly in different sample size and it was repeated for five times. The incidence was graded as low if the percentage of leaves damaged upto 30 per cent, medium between 30 to 60 and high means above 60 per cent. The results obtained are presented in Table 2.

TABLE 2

Effect of sample size for determining the incidence of groundnut leaf-miner at different levels of infestation.

Number of leaves/ plant observed	Levels of infestation (Average % leaves damaged)		
	Heavy	Medium	Low
20	91.00(72.62)*	39.20(38.77)	9.25(17.64)
40	91.41(73.07)	44.60(41.91)	15.50(23.64)
60	91.01(73.38)	46.46(42.98)	17.40(24.57)
80	92.55(74.19)	45.62(42.50)	16.50(23.86)
S.Em.	(0.67)	(0.28)	(0.32)
C.D.5%	(N.S.)	(0.83)	(0.97)
C.V.%	(2.05)	(1.48)	(3.22)

* After angular transformation.

The eggs were laid singly on the lower surface of leaves as well as on petioles. The freshly laid egg was whitish in colour and changed to yellow before hatching. The egg period varied from 6 to 8 days with an average of 7.45 days. According to Pruthi (1969) and Nayar *et al.* (1976), the incubation period was 2 to 3 days. There were three larval instars and duration of each instar was 7 to 14 days with an average of 9.16, 2 to 5 days with an average of 2.84 days and 4 to 9 days with an average of 6.46 days, respectively. The full grown larva was green in colour and larval stage varied from 14 to 23 days with an average of 18.48 days. According to Nayar *et al.* (1976) the larval period varied from 9 to 17 days. The larva mines the leaf from its lower surface and feeds on the leaf tissue.

The mined leaf portion looks like a pale blotch from the upper surface and gives burning appearance. The larva has a habit of bring together the adjacent leaves for feeding and pupation. The freshly formed pupa was pale yellow in colour and changed to reddish brown before imergence of adult. The pupal period varied from 6 to 13 days with an average of 9.93 days. Nayar *et al.* (1976) reported that the adult emerged from the pupa in 3 to 7 days. The pre-oviposition, oviposition and post-oviposition period was on an average 2.27, 3.40 and 2.00 days, respectively. The number of eggs laid by a single female varied from 28 to 191 with an average of 109.93. Nayar *et al.* (1976) reported that a single female laid on an average 186 eggs, the maximum being 473 eggs. The male and female moth

lived for 2 to 7 days with an average of 5.47 days and 2 to 17 days with an average of 7.27 days, respectively.

The data presented in Table 2 revealed that there were significant differences in different sample sizes in medium and low incidence of leaf-miner, while difference was non-significant in heavy incidence. Therefore, it can be said that the incidence can be assessed by observing 20 leaves per plant if incidence is heavy. In case of medium and low incidence, there were significant differences. From the data it can be said that if the incidence is medium and low, then the optimum number of leaves to be observed for assessing the percentage of incidence should be 60 leaves.

Thus from the observations recorded, it can be concluded that the sample size for measuring the leaf-miner incidence should be 60 leaves under low, medium or heavy infestation.

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REFERENCES

- Narayanan, E. S., 1962. Insect pests of groundnut and methods of their control, Groundnut Monograph, PP. 223.
- Nayar, K.K., T.N. Ananthakrishnan and B. N. David, 1976. General and applied Entomology. Tata Mc-Graw Hill publishing company Pvt. Ltd., New Delhi, pp. 229-230.
- Pruthi, H. S., 1969. Textbook on Agricultural Entomology, Job press Pvt. Ltd., pp. 659.