

BIOLOGICAL ATTRIBUTES OF COTTON LEAF ROLLER ON OKRA

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Okra, [*Abelmoschus esculentus* L. (Moench)], is an economically important vegetable crop grown in tropical and sub-tropical parts of the world. It is quite popular in India because of easy cultivation, dependable yield and adaptability to varying moisture conditions. Okra is cultivated for its fibrous fruits or pods containing round, white seeds. The fruits are harvested when immature and eaten as a vegetable. Insect pest infestation is one of the most limiting factors for accelerating yield potential of okra. The crop is ravaged by more than 45 species of insect-pests throughout its growth period (Nair, 1984). The crop is prone to damage by various insects, fungi, nematodes and viruses, although there is wide variability in their degree of infestation. Some of the important insect pest affecting the yield potential includes fruit and shoot borer, aphids, white flies. Cotton leaf roller, *Sylepta derogata* (Fab.) is one of the most important leaf feeding pests found in okra in which young growing larvae feed and defoliate the growing leaves. Therefore, the present research is focused to study the biological parameters of this leaf rolling pest in laboratory conditions.

Tender rolling leaves of okra containing first instars larvae of *Sylepta derogata* were collected during 2014 from the instructional farm of College of Agriculture, Vellayani (KAU), India (8°26' N latitude and 76°56' E longitude) and kept in the plastic beaker under ambient conditions [23±2°C Temp. and 85±5 % R.H.]. First instars larvae were released on the small okra leaf inside the plastic beaker. If necessary, larvae were transferred to another fresh okra leaf after every two days, ensuring fresh and sufficient food to the developing larva. After maturity, fully grown larvae were allowed to pupate inside the rearing cages. Observations on larval, pre-pupal and pupal period were recorded. After emergence, adult moths were separated and kept inside another plastic beaker [11x19 cm] for mating and oviposition. Honey based liquid diet was provided as food to the adults. The experiment was carried out in a laboratory condition having each rearing plastic beaker which was considered as a replication and each experiment was carried out in five beakers.

Table 1: Duration of various stages of Cotton Leaf Roller, *Sylepta derogata*

Biological Events	Mean ± SD (Days)	Range
I st Instar (Days)	1.0±0.0	0-1
II nd Instar (Days)	1.2±0.20	1-2
III rd Instar (Days)	1.6±0.24	1-2
IV th Instar (Days)	1.2±0.20	1-2
V th Instar (Days)	1.0±0.0	0-1
VI th Instar (Days)	1.8±0.20	1-2
VII th Instar (Days)	1.0±0.0	0-1
Total Larval period	9.8±0.24	9-10
Prepupal period	1.0±0.0	0-1
Pupal period	7.60±0.24	7-8
Pupal Length (mm)	14.0±0.31	14-15
Pupal Breadth (mm)	3.60±0.24	3-4
Pupal Weight (mg)	76.0±0.24	76-77
Longevity of Female Adult	5.20±0.20	5-6
Longevity of Male Adult	3.40±0.24	3-5
Total Life Cycle (Egg to adult)	21±1.14	21-23

In present study observed that adult moth is medium sized with yellowish wings having series of brown wavy markings. Wing span is 12.5 mm long and with wing expanse of 25 mm, head and thorax region having dotted black marking. Atwal and Dhaliwal (2013) observed that adult moths were yellowish-white, with black and brown spots on the head and thorax and they measure about 28-40 mm length when wings are spread and having a series of dark brown wavy lines on the wings. Adult moth measure about 2.8-4.0 cm across the spread wings and have series of dark brown wavy lines (Shrivastava and Dhaliwal, 2013). After mating, female laid round, smooth and pale white color eggs singly on the under surface of the leaves along the mid ribs and bigger. Females lay 200-300 eggs singly on the under surface of the cotton leaves and eggs hatch in 2-6 days as observed by Shrivastava and Dhaliwal (2013). After emergence, newly hatched larvae started feeding on lower surface of the leaves and as the larvae grown older larvae roll the leaves from the edges inward up to the midrib and feed on the leaf tissue inside. The young larva is glistening green in color and semi-translucent with dark brown head (Shrivastava and Dhaliwal, 2013). Larval period

of the young growing larvae was found to be 8.60 ± 0.24 days having seven larval instars [1.0 ± 0.0 , 1.2 ± 0.20 , 1.6 ± 0.24 , 1.2 ± 0.20 , 1.0 ± 0.0 , 1.8 ± 0.20 and 1.0 ± 0.0] in the laboratory condition. Full grown larvae pupate as a dark brown color pupa inside the rolled older leaf having average pupal weight is 76 ± 0.24 mg. The duration of the pupal stage lasted for 7.60 ± 0.24 days. Shrivastava and Dhaliwal (2013) and Atwal and Dhaliwal (2013) recorded the pupal period lasted for 6 to 12 days. The complete life cycle from larvae to adult of cotton leaf roller took 20 ± 1.14 days. Longevity of female and male adult is found to be 5.20 ± 0.20 and 3.40 ± 0.24 days respectively. Adult moth appears yellow in color with black wavy lines

on the wings. Complete life cycle in laboratory condition required around 20.0 ± 1.14 days. The pest population and biological parameters was significantly influenced by abiotic factors viz. relative humidity, maximum temperature and bright sunshine hours (Badiyala, 2011) whereas damp and cloudy weather are conducive to the growth and rapid multiplication of pest.

It can be concluded that Total larval period of the caterpillar ranged from 9.8 ± 0.24 days, where as pupal stage lasted for 7.60 ± 0.24 days. Longevity of female and male adult was found to be 5.20 ± 0.20 and 3.40 ± 0.24 days respectively. Complete life cycle required 21.14 ± 1.14 days.

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