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BIOLOGICAL STUDIES OF STOMOPTERYX SUBSECIVELLA ZELLER (LEPIDOPTERA: GELECHIIDAE)

Ranjit Kumar Singh andSunil Kumar Singh*
Deptt. of Zoology, Dr. V.K.S. College, Rafiganj, Aurangabad
*P.G. Deptt. of Zoology, M.U. Bodh Gaya
[email: rksinghdubhal@gmail.com and Corresponding author* email: sks_mu@rediffmail.com]

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Soybean is relatively a new name in the list of economically important cultivated crop in India and its large scales cultivation is only for four decades old. Biology was studied in laboratory at prevailing room temperature at 24^{0}C -25^{0}C during August and 32^{0}C -33^{0}C during April, while relative humidity was 83%-84% and 32%-33% respectively. The freshly laid egg was glistening white, and measured 0.35 mm in length. There were four larval instars, in each instars size and colour differed. Adult *Stomopteryx subsecivella* Zeller (general colouration dark brown) have the fore wing darken than hind wing and had a white speck on the coastal margin towards the distal end. During the present investigation female moth was observed to be larger in size (10.2mm, wing span) than the male (9.2 mm, wing span). Moths were observed mating during morning hours between 9 and 10:30A.M, while oviposition during dusk and dark. The present research reveals that female laid 189 eggs, which may vary under the different ecological conditions and state of the host plant.

Stomopteryx subsecivella Zeller is a very important pest of groundnut and soybean plant. Soybean/Groundnut is widely used for oil extraction and deoiled cake which is very rich source of protein and utilized for supplementing protein dietary requirement of human being and domestic animals also. This valuable crop is variously attacked by a number of insect pests and diseases. About 275 insect pest species have been recorded attacking soybean in India. Sastawa *et al.*[1] reported that the number of insect defoliaters and pod sucking bugs were significantly higher in soybean sown in 31 July in 2001 and on 28 August in 2002. Grain yield were higher in early sown soybean.

MATERIALS AND METHODS

Living *Stomopteryx subsecivella* Zeller were collected from soybean and groundnut plants from Rasalpur in Manpur block and Kharkhura in Chandwati block, which is15 to 20 km away from M.U. Bodh Gaya. The soft body of insect was preserved by 70% alcohol and stored in entomological boxes for further Biological studies 4th instar larvae of *Stomopteryx subsecivella* Zeller were collected from soybean/groundnut fields and reared in the laboratory in petridishes (15 cm diameter). Adults emerged from pupae were confined in glass chimneys top covered with muslin cloth along with potted soybean for egg laying. Fresh leaves were provided every 3rd day. Observation on eclosion, larval development, behavior of feeding, pupal period, and mortality during the development were recorded daily. Size of different stages was measured with the help of micrometer.

RESULT AND DISCUSSION

Biology of *Stomopteryx subsecivella* Zeller was studies in the laboratory and all such observation and recording were under taken at a mean room temperature 24^{0}C to 25^{0}C during (August) and 32^{0}C to 33^{0}C during April, while relative humidity was 83% to 84% and 32% to 33% respectively.

Eggs:- The freshly laid egg was minute, shiny white in colour and elongated, oval in shape. The length and width of eggs ranged between 0.34 to 0.36 mm (mean 0.35 + 0.002mm and) 0.15 to 0.25mm (mean 0.19+0.007) (Fig -1, Table -1).

The eggs showed characteristic changes in colour pattern. One day egg became light yellow in colour. Small black marking appeared at the anterior end of the head. After 3 to 4 days egg became matured and length was measured about 0.39+0.002mm and width about 0.2+ to 0.005 mm. At this stage the tail of the embryo reach to the thoracic region by making 'U' shaped turn. (Fig-2) The main incubation period was 3 days in April and 4 to 5 days in August.

Table-1.Measurements of eggs to adult stages of *Stomopteryx subsecivella* Zeller

	Length (mm)				Width (mm)			
Stage	Range	Mean*	±	SEm	Range	Mean*	±	SEm
Freshly laid egg	0.34-0.36	0.35	±	0.002	0.15-0.25	0.19	±	0.007
Matured egg	0.38-0.40	0.39	±	0.002	0.20-0.25	0.22	±	0.005
1st Instar larva	0.60-0.85	0.72	±	0.029	0.10-0.15	0.13	±	0.007
2nd Instar larva	1.20-1.28	1.22	±	0.008	0.20-0.25	0.23	±	0.007
3rd Instar larva	2.25-2.40	2.34	±	0.017	0.34-0.40	0.38	±	0.006
4th Instar larva	4.00-5.00	4.46	±	0.110	0.57-0.62	0.59	±	0.004
Full grown larva	6.00-7.50	6.77	±	0.150	1.00-1.20	1.10	±	0.032
Male pupa	3.50-4.20	4.02	±	0.640	1.10-1.40	1.14	±	0.040
Female pupa	4.00-4.50	4.32	±	0.520	1.00-1.40	1.23	±	0.040
Female adult	5.00-5.50	5.32	±	0.072	9.50-10.5**	10.20	±	0.126**
Male adult	4.50-5.00	4.78	±	0.745	8.50-10.0**	9.20	±	0.189**

* Mean of 10 individuals

** Width

1st instar larvae:-1st instar larva was minute and appeared as a typical Lepidoptera caterpillar. It was polypod, white in colour, having dark brown head. The 1st instar larva was measured 0.60 to 0.85 mm in length and 0.10 to 0.15 mm in width (Table-1,Fig-3) The 1st moulting of the larvae (in April) was noted after 1 to 2 days of studied period (1 to 7 days) during April and (2 to 3 days) during August.

Second instar larvae :-The second instar larvae were 1.20 to 1.28 mm long and 0.20 to 0.25 mm wide. The mean values were recorded 1.22 + 0.008 mm for length and 0.23 + 0.007 mm for width (Table-1, Fig-4). The larval body was light yellow and comprising white hairs.

Third instar larvae:- This stage remains 3 to 4 days (3.4 to 3.4 + 0.15 days), 2 to 3 days (2.6 + 0.15 day) during August and April respectively. This stages of larvae were further elongated and measured to about 2.34 mm long and 0.38 mm width (Table-1, Fig-5)

In general the body was initially light in colour but after 24 hours, it changed into dark green, at this stage the larvae were well built polypod caterpillar with distinct head, thorax and broad abdomen

At this stage the larvae used to form radiating multidimensional galleries within the leaves and if the larva were detached from the mines the movement became faster.

Fourth instar larvae:- The 4th instar larvae were measured to about 4.46 + 0.110 mm and 0.59 + 0.004 mm in length and width respectively (Table-1, Fig-6). The larvae body was greenish grey in colour and sex differentiation appeared in this stage and male gonads became violet from light brown. The fourth instar larvae became full grown after 3 to 4 days during August and after 2 to 3 days during April.

Full grown larvae:-The full grown larvae were measured 6.77 + 0.150 mm long and 1.10 + 0.32 mm wide (Table -1). General colouration of body was dirty green with distinct black chitinised hypognathous head.

Adult:-The Adult moth was small dark having shiny bronze appearance once in bright light. Head with vertex roughly scaled with light brown scales. Eyes were prominent and black

in colour. There was a white spot observed on the costal region at about 2/3 distance from the base towards the distal end of the forewing. The hind wings were observed comparatively lighter in colour, were highly fringed with light brown hair on the inner and outer margins. The thorax and abdomen decorated with light brown scales dorsally and ventrally. The abdomen was slightly tapering posteriorly. The male was smaller in size than female moth. The detailed life span, body length, width both male and female is mentioned in (Table-1, Fig-7, 8)

The freshly laid egg was glistening white and measured 0.35 mm length. This is very similar to the observation of earlier workers[2-4], except that the size of egg reported by them varied from 0.5 to 0.8 mm in length. Extended larval and pupal period, were observed on ground nut by Kapadia *et al*.[5]. Similar observations were also made by few others[6-9]. Adult *Stomopteryx subsecivella* (general colouration dark brown) have the fore wings darker than the hind wings and had a white steak on the costal margin towards the distal end. Our results are in conformity to those of earlier workers[10-12]. During the present investigation Female moth was observed to be larger in size. The moth measured 9.2 mm to 10.2 mm (wing span), and total developmental period is observed to be 23.3 days in August and 17.7 days in April.

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