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Biological and Ecological studies on Sugar – beet moth, *Scrobipalpa ocellatella*

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Abstract : Some ecological studies on sugar-beet insect pests were conducted in Shobra bedin -El-Mansoura Station, El-Dakahlia Governorate, to studies biological and ecological on *Scrobipalpa ocellatella*. The results revealed that infestation by *S. ocellatella* observed in the 4th week of November in the first season and in 3rd of November in the second season. The population increased from November to May from 4 to 115 larvae / 80 plants.
The eggs deposited in groups, each of a single layer consisting of 2-11 eggs arranged in one or two rows. The duration of the pre-pupal stage was 2-3 days with an average 2.0±0.2 days. The average duration of pupal stage ranged from 6-7 days with an average of 6.9±0.6 days.
The average period of pre- oviposition, oviposition and post- oviposition lasted 4.7±0.8, 7.9±0.5 and 4.0±0.7 days, respectively.
Keywords : sugar-beet, *Scrobipalpa ocellatella*, Egypt.

Introduction-

In Egypt, sugar -beet, *Beta vulgaris* L. (Family: Chenopodiacea) is considered the second important sugar crop after sugarcane. In 2009, the total cultivated area 248871 feddan in the old and newly lands, produced about 5138190 ton with an average yield of 20.646 ton/fed. (Sugar Crops Council Report, Jan. 2010). Under Egyptian ecosystem, sugar beet plants are subjected to be attacked by numerous insect pests during its different group stages. So many authors are attracted to study a group of insect pests cause serious problems for growers and cause yield reductions, [1-4].

In recent years, the sugar beet moth, *Scrobipalpa ocellatella* has become serious pests of the sugar-beet, [5]. Biological control of some sugar beet insect, [6].

The aim of this study is studies the biology and ecology to choose the best method to control the best because *Scrobipalpa ocellatella* is the most serious pest attached the sugar beet in Egypt.

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Materials and Methods

Biology studies of sugar beet moth, *Scrobipalpa ocellatella*:

A culture of *Scrobipalpa ocellatella* was started in the laboratory from larvae collected from the field and kept in glass jars (two litre) with fresh sugar beet leaves. The emerged adult moths were removed into a glass cage (50x 100 cm.) containing sugar beet plant as an oviposition site. Eggs laid on leaves were collected daily and transferred to petri-dishes (2x15 cm.) under the laboratory condition at 22±2°C and 65±2 % R.H.

Field studies of sugar beet moth, *Scrobipalpa ocellatella*:

Field studies were carried out at Shobra bedin Station, El-Dakahlia Governorate during two successive seasons to studies biology and ecology of *S. ocellatella*. The experimental area was divided into plots each of 42 m^2 (1/100 feddan). No chemicals were used for controlling sugar-beet insect pests throughout the whole period of the study; Sampling started one month after sowing and continued until harvesting. The plants were visually examined and the insect pests were counted and recorded bi-weekly on 80 plants (20 plants / plantation) selected randomly.

Results

Biology of sugar beet mining moth, *Scrobipalpa ocellatella*

The egg stage

The eggs were deposited in groups, each of a single layer consisting of 2-11 eggs arranged in one or two rows. Most of the eggs are laid on the petioles, while few on the leaf surfaces or on the root collar. The newly deposited egg is oval shaped creamy yellow in colour and darkening to yellowish green shortly before hatching.

Table (1): Average duration of the immature stage of the Sugar beet moth, *Scrobipalpa ocellatella* (Boh.) at 22±2°C and 65±2 % R.H.

Stages	*Eggs incubation period (days	% Hatch.	**larval duration(days)					Pre-pupal stage (days)	*** pupal stage (days)	Total duration (days)
			1st	2nd	3rd	4th	Total			
Average	4.5±0.3	90.7	4.5±0.9	3.0±0.6	3.5±0.6	4.5±0.6	15.5±0.7	2.0±0.2	6.9±0.6	4.39±0.66
Range	3-6		4-6	3-4	3-4	4-6	14-20	2-3	6-7	

* Total no. of 100 eggs
**Total no. of 100 larvae
***Total no. of 100 pupae

The pupal stage

The full grown larvae stops feeding then transforms to the pre-pupal stage which appears pale brown in colour and usually takes place inside the larval tunnels in the leaves or root. A small number of individuals pupate among the fallen dry leaves. The duration of the pre-pupal stage was 2-3 days with an average 2.0±0.2 days. Pupa is dark brown and rectangular oval in shape with narrow end. The average duration of pupal stage ranged from 6-7 days with an average of 6.9±0.6 days table 1.

The adult stage

The newly emerged adult is generally blackish grey, while the hind wings are whitish grey. The two sexes could be differentiated by the abdominal sternites colour which are blackish in the male and white in the female.

The fecundity and longevity:

Table (2): Average duration of adult stage of the beet moth, *Scrobipalpa ocellatella* (Boh.) at 22±2°C and 65±2 % R.H

Pre- oviposition period	oviposition period	Post-oviposition period	Female longevity	Average number of eggs/ female
4.7±0.8	7.9±0.5	4.0±0.7	15.6±0.6	52.4±2.5
4-6	6-8	3-5	14-16	44-54

A total no. of 100 adults were tested

The average period of pre- oviposition, oviposition and post- oviposition lasted4.7±0.8, 7.9±0.5and 4.0±0.7 days, respectively. The female usually lives longer than the male According, [7]. The longevity of female of *Scrobipalpa ocellatella* ranged from 14-16 days with an average 15.6±0.6days. the number of deposited eggs per female ranged from 44 to 54 Eggs with an average of 52.4±2.5 eggs/ female.

Ecology of sugar beet mining moth, *Scrobipalpa ocellatella*

- **The first Season**

The larvae of *Scrobipalpa ocellatella* were observed on the 4th week of November with low number (4 larvae / 80 plants) in the first plantation (P1), the population increased to 28 larvae / 80 plants by the end of December in the second plantation (P2). This population increased until February and reached to 53 larvae / 80 plants in P3 and continuous in increased to reach 115 larvae / 80 plants in 4th May P1.

- **The second Season**

The larvae of *Scrobipalpa ocellatella* were observed on the 3th week of November with low number (5 larvae / 80 plants) in the 3rd plantation (P3), the population increased to 23 larvae / 80 plants by the end of December in the 3rd & 4th plantations (P3 & P4). This population increased until February and reached to 45 larvae / 80 plants in the 3rd & 4th plantations (P3 & P4) and continuous in increased to reach 90 larvae / 80 plants in 2nd & 4th May P2 & P4.

Table (3): Weekly number of *Scrobipalpa ocellatella* larvae per 80 plants at Shobra bedin - Elmansoura

Sampling date		The first season				The second season			
		Plantations							
		P1	P2	P3	P4	P1	P2	P3	P4
Nov.	3nd	0	0	0	0	2	4	5	3
	4th	4	7	2	5	3	3	4	5
Total		4	7	2	5	5	7	9	8
Dec.	1st	10	11	9	12	7	8	8	10
	2nd	20	19	18	18	13	12	15	12
	3nd	22	25	17	21	17	15	18	17
	4th	15	28	20	25	20	18	23	23
Total		67	83	64	76	67	53	64	62
Jan.	1st	35	30	28	27	22	25	25	21
	2nd	40	35	33	37	25	25	28	23
	3nd	45	43	42	42	33	27	33	35
	4th	47	45	45	44	35	37	35	33
Total		167	153	148	150	115	114	121	112
Feb.	1st	42	43	45	43	33	40	39	35
	2nd	45	45	47	45	37	40	40	38
	3nd	47	48	47	47	40	42	43	45
	4th	50	52	53	52	43	43	45	45
Total		184	188	192	187	153	165	167	163
Mar.	1st	52	53	53	54	44	44	43	50
	2nd	55	60	55	55	50	53	50	50
	3nd	63	60	66	64	51	51	50	52
	4th	60	59	65	66	50	50	52	53

Total		230	232	239	239	195	198	195	205
April	1st	70	72	73	75	60	63	65	63
	2nd	75	77	75	76	63	66	66	67
	3nd	78	78	78	77	65	65	67	66
	4th	80	84	80	85	70	70	72	73
Total		303	311	306	313	258	264	270	269
May	1st	100	95	97	97	73	75	87	82
	2nd	105	110	100	112	77	77	85	85
	3nd	111	110	103	105	80	87	88	83
	4th	115	112	113	100	83	90	87	90
Total		431	427	413	414	313	329	347	340
General total		1386	1401	1364	1384	1106	1130	1173	1159
General mean		198	200.14	194.9	197.7	158	161.4	167.6	165.6

Discussion:

The data revealed this study according,[7, 8] , but different in degree centigrade due to the duration elongated than [7], this thing is nature in the life cycle in insects. This study in biology at 22±2°C and 65±2 % R.H because it almost in shobra bedin.

When the author studies the ecology select 80 plants to can examination the plants very good where check and numbered the insect in the field.

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