SURVEY OF THE LESSER COTTON LEAFWORM *SPODOPTERA EXIGUA* HBN. ASSOCIATED PARASITES IN MAIZE FIELDS

BY

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Abstract

Biweekly samples of *Spodoptera exigua* Hbn. larvae were collected from maize fields in Fayoum and Qalubia Governorates during two successive seasons (May - September) 1982 and 1983. Species and numbers of emerged parasites and their percentages of parasitism were recorded.

The obtained results showed the occurrence of the following five parasite species during the study:
Microplitis rufiventris Kok.
Meteorus sp. (solitary species)
Meteorus sp. (*laeviventris* ?) (gregarious species)
Apanteles ruficrus Hal. (gregarious species)
Barylypa humeralis Brauns.

The first two species frequently occurred in the two seasons and in the two localities.

In Fayoum the total percentages of parasitism were 13.7 and 12.5 in 1982, and 1983, respectively, while in Qalubia it was 13.9 in 1982 and dropped to 5.9 in 1983.

INTRODUCTION

Spodoptera exigua Hb., the lesser cotton leafworm, is considered one of the minor insect pests in maize fields and in most cases, it needs no chemical applications for its control. Its controlled population on maize plants may be due to the role of natural enemies as one of the regulating factors.

The previous biocontrol studies in Egypt revealed only general survey of its parasites (Hafez 1947, and Afify *et al.* 1970) and some laboratory experiments (Hammad *et al.* 1966, El-Minshawy and Hegazi 1980, and Tawfik *et al.* 1977).

The present investigation aimed to survey *S. exigua* associated parasites and to estimate percentages of parasitism in maize throughout two successive seasons (May -

September) 1982 and 1983 in two different ecosystems (Fayoum and Qalubia Governorates).

MATERIALS AND METHODS

Samples of *S. exigua* larvae were collected biweekly from different infested maize fields in Fayoum and Qalubia Governorates during two successive seasons (May - September) 1982 and 1983. The larvae were placed individually in glass vials covered with cotton wool and fed on semi-synthetic diet prepared in the laboratory (Shorey and Hale 1965) until the emergence of parasites. Species and numbers of the emerged parasites were recorded.

RESULTS AND DISCUSSION

Results obtained from Fayoum and Qalubia Governorates are summarized in Tables 1 and 2. The results seem to indicate the following:

Fayoum (season 1982):

Microplitis rufiventris Kok. was recorded only from three samples (May and July). Its percentage of parasitism ranged between 5.4-14.3 and it was high in May.

Meteorus sp. (solitary parasite) was obtained from 6 samples during the period June - September, 82 in oscillating percentages that ranged between 2.3-30.1%. The highest percentage was found in the first half of June (18.9 and 30.1%), the lowest at the end of June and the end of July (2.3%).

Total percentage of parasitism reached by *Meteorus* about 5 times that of *Microplitis*.

Barylypa humberalis Brauns (a larval - pupal parasite) was recorded only once on 29 June with 2.3% percentage of parasitism.

Fayoum (season 1983):

M. rufiventris was reared from eight *S. exigua* samples during the season (May - September) 1983. The highest percentages of parasitism were recorded in mid-May (16.7%) and early September (15.4%).

The solitary parasite *Meteorus* sp. occurred only in 5 samples in seasons 1983 but with high percentage of parasitism, especially on 19 July and 2 September and reached 23.1%.

Total percentage of parasitism in the two species was nearly the same (5.2 and 6.4%), in spite of the frequent occurrence of *M. rufiventris*.

Table 1. Biweekly numbers of *Spodoptera exigua* Hb. and its parasites in maize fields at Fayoum Governorate, seasons 1982 and 1983.

1982					1983				
Date of sampling	No. of host larvae	No. of parasitized larvae and % parasitism			Date of sampling	No. of host larvae	No. of parasitized larvae and % parasitism		
		Mic.	Met.	Total			Mic.	Met.	Total
—	—	—	—	—	4 May	22	2 (9.1%)	—	2 (9.1%)
18 May	14	2 (14.3%)	—	2 (14.3%)	19 May	12	2 (16.7%)	—	2 (16.7%)
1 June	37	2 (5.7%)	7 (18.9%)	9 (24.3%)	2 June	32	2 (6.3%)	2 (6.3%)	4 (12.5%)
15 June	26	—	6 (30.1%)	6 (30.1%)	16 June	40	1 (2.5%)	4 (10.0%)	5 (12.5%)
29 June	44	—	1 (2.3%)	1 (2.3%)	30 June	39	1 (2.6%)	—	1 (2.6%)
13 July	30	—	4 (13.3%)	4 (13.3%)	19 July	26	—	6 (23.1%)	6 (23.1%)
30 July	13	1 (7.7%)	—	1 (7.7%)	3 August	28	1 (3.6%)	—	1 (3.6%)
19 August	34	—	5 (14.7%)	5 (14.7%)	18 August	32	2 (6.3%)	—	2 (6.3%)
6 September	24		2 (8.3%)	2 (8.3%)	2 September	13	2 (15.4%)	3 (23.1%)	5 (38.5%)
19 September	4	—	—	—	13 September	5	—	1 (20.0%)	1 (20.0%)
Total	226	5 (2.2%)	25 (11.1%)	30 (13.3%)	Total	249	13 (5.2%)	16 (6.4%)	29 (11.6%)

Table 2. Biweekly numbers of *Spodoptera exigua* Hb. and its parasites in maize fields at Qalubia Governorate, seasons 1982 and 1983.

1982					1983				
Date of sampling	No. of host larvae	No. of parasitized larvae and % parasitism			Date of sampling	No. of host larvae	No. of parasitized larvae and % parasitism		
		Mic.	Met.	Total			Mic.	Met.	Total
—	—	—	—	—	7 May	29	1 (3.4%)	—	1 (3.4%)
25 May	24	2 (8.3%)	3 (12.5%)	5 (20.8%)	21 May	20	1 (5.0%)	1 (5.0%)	2 (10.0%)
8 June	47	4 (8.5%)	4 (8.5%)	8 (17.0%)	9 June	26	—	2 (7.7%)	2 (7.7%)
22 June	26	—	2 (7.7%)	2 (7.7%)	23 June	47	3 (0.4%)	—	3 (6.4%)
6 July	21	—	4 (19.0%)	4 (19.0%)	8 July	50	2 (4.0%)	1 (2.0%)	3 (6.0%)
21 July	6	—	—	—	19 July	47	2 (4.3%)		2 (4.3%)
5 August	43	5 (11.6%)	—	5 (11.6%)	12 August	15	1 (6.7%)	—	1 (6.7%)
29 August	11	—	2 (18.2%)	2 (18.2%)	25 August	11	1 (9.1%)	—	1 (9.1%)
13 September	9	—	—	—	7 September	8	—	—	—
Total	187	11 (5.9%)	15 (8.0%)	26 (13.9%)	Total	253	11 (4.3%)	4 (1.6%)	15 (5.9%)

On 4 May, two gregarious larval parasites, *Meteorus* sp. (*M. laeviventris*?) and *Apanteles ruficrus* Hal., were recorded for the first time in the study from the same sample and with the same percentage of parasitism 4.5%.

Qalubia (season 1982):

M. rufiventris was observed only three times during May, June and August (about the same time of its occurrence in Fayoum, 1982) but with nearly steady percentages of parasitism.

Meteorus sp. (solitary parasite) was reared from five samples of *S. exigua* from the end of May till the end of August in oscillating percentages (7.7-19.0%) and reached its peak 19.0% on the 6th of July.

Total percentage of parasitism was higher in *Meteorus* than in *Microplitis.*

Qalubia (season 1983):

M. rufiventris was found 7 times in 1983 during the whole period of sampling with nearly steady percentages of parasitism. Its peak was 9.1% at the end of August.

Meteorus sp. (solitary parasite) was found only three times during May, June and July in low percentages of parasitism (2.0% - 7.7%).

Total percentage of parasitism in *Microplitis* was about 3 times that of *Meteorus* recorded in season 1982.

The total percentage of parasitism was nearly the same in Fayoum (13.7 and 12.5% in 1982 and 1983, respectively) and in Qalubia (13.9%) in 1982, but dropped drastically to 5.9% in 1983 in spite of the increase of samples numbers. This phenomenon may reflect the relative stability of natural balance which is recogonized in the last few years in Fayoum Governorate.

In general, the current results are in agreement with those obtained by Hafez (1947), Hammad (1965), Afify (1970), El-Minshawy (1980), and Tawfik (1977).

Meteorus sp. were recorded as parasites of *S. exigua* for the first time in Egypt by El-Heneidy (in press).

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التطفل على دودة ورق القطن الصغرى *Spodoptera exigua* Hbn.

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معهد بحوث وقاية النبات ، مركز البحوث الزراعية .

جمعت عينات كل أسبوعين من يرقات دودة القطن الصغرى من حقول الذرة الشامية بمحافظتى الفيوم والقليوبية خلال موسمين زراعيين متتاليين (مايو / سبتمبر) ١٩٨٢ ، ١٩٨٣ ، وسجلت اعداد وانواع الطفيليات وكذلك نسب التطفل فى هذه العينات .

وأوضحت النتائج المتحصل عليها ظهور خمسة انواع من الطفيليات كان اكثرها تكرارا فى الموسمين وفى المنطقتين هما : طفيل الميكروبليتس وطفيل الميتورس .

وكانت نسبة التطفل الكلية متقاربة بمحافظة الفيوم فى الموسمين حيث بلغت ١٣,٧ ٪ عام ١٩٨٢ ، ١٢,٥ ٪ عام ١٩٨٣ ، بينما فى محافظة القليوبية بلغت نسبة التطفل ١٣,٩ ٪ موسم ١٩٨٢ ، ٥,٩ ٪ فى موسم ١٩٨٣ بالقليوبية .