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Survey of the parasitoids of the Greasy Cutworm, *Agrotis ipsilon* Rott. (Lepidoptera, Noctuidae) in Egypt

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With one figure

Abstract

Weekly samples of the cutworm, *Agrotis ipsilon* Rott. larvae were collected for 3 successive seasons 1983/84—1985/86 from 3 Governorates in middle Egypt to survey and evaluate the role of parasitoids in suppressing the pest population.

Two gregarious internal larval parasitoids were recorded, *Apanteles ruficrus* Hal. and *Meteorus rubens* Nees. (Hymenoptera, Braconidae). Percentages of parasitism were estimated. They reached 20.2, 22.2 and 24.7% in seasons 1983/84, 1984/85 and 1985/86, respectively, with an average of 22.5% (10.3% *A. ruficrus* and 12.2% *M. rubens*). The highest rates of parasitism were recorded in March and April.

1 Introduction

Cutworms are economically an important group of lepidopterous pests. In Egypt, they attack many field crops such as wheat, faba bean, Egyptian clover, maize, cotton and some vegetables, their damage is of frequent occurrence all over the country (ZAAZOU et al., 1974). *Agrotis ipsilon* Rott. is the most abundant species of cutworms in Egypt, while other species are less abundant and sometimes of rare occurrence.

BISHARA (1932), WILLCOCKS and BAHGAT (1937), HAFEZ (1947) and EL-MINSHAWY (1971) recorded *Apanteles ruficrus* Hal., *Gonia capitata* Deg., *Microplitis* sp., *Eulimneria xanthostoma* Grav. and *Meteorus laeviventris* Wsm. as parasitoid species on *A. ipsilon* in Egypt. *Meteorus rubens* Nees. was recently recorded by the authors on *A. ipsilon* larvae, for the first time in Egypt (EL-HENEIDY and HASSANEIN, in press). The same species was found on *A. ipsilon* by KIM et al. (1982) in South Korea and by FOSTER and RUESINK (1984) in USA.

The present study was designed to survey and evaluate the role of parasitoids in suppressing the pest population in middle Egypt.

2 Methods and Technique

Weekly samples of *A. ipsilon* larvae were collected all over the active season of the pest (October—May) from different infested fields of faba bean, Egyptian clover as well as vegetable crops mainly in Fayoum and Beni-Suef and partly in Giza Governorates (middle Egypt) during the three successive seasons 1983/84, 1984/85 and 1985/86. The larvae were placed individually in glass vials (to avoid cannibalism), fed on fresh

parts of clover plants or castor leaves and kept under laboratory conditions till emergence of parasitoids, that were identified and counted. Percentages of parasitism by each parasitoid species was estimated.

3 Results

Survey of *Agrotis* parasitoids demonstrated that the active season of the pest in the 3 considered Governorates of middle Egypt lasted from October to May yearly.

In spite of the difficulties of collecting *Agrotis* larvae, due to its behaviour and habitat, about 700 larvae (represent 75 samples) were collected during the 3 seasons of work. The total number of parasitized larvae was 155 (22.5 %).

Agrotis larvae were collected from the field crops: faba bean and Egyptian clover as well as the vegetable crops: spinach, okra, cabbage, beans, cowpea, tomato, eggplant, Jew's mallow and lettuce. Highest population of *Agrotis* was observed in faba bean fields (represent 50 samples), also highest percentages of parasitism were recorded in too.

Two gregarious internal larval species of parasitoids were secured from *A. ipsilon* larvae during the 3 seasons of work. They were *Apanteles ruficrus* Hal. and *Meteorus rubens* Nees. (Hym., Braconidae).

Monthly percentages of parasitism showed great fluctuations, they were 45.5, 17.9, 15.2, 16.7, 12.0, 22.2 and 38.9 % in the successive months from November till May of season 1983/84, respectively. In season 1984/85, they were 0.0, 11.4, 27.8, 24.2, 26.0, 24.2 and 0.0 %, while they were 0.0, 17.0, 20.0, 28.6, 44.8, 36.6 and 5.0 % in season 1985/86 in the considered successive months.

Seasonal percentage of parasitism was 20.2 % (11.2 % *Apanteles* and 9.0 % *Meteorus*) in season 1983/84, then raised up to 22.2 (8.4 % *Apanteles* and 13.8 % *Meteorus*) in season 1984/85 and reached 24.7 % (11.9 % *Apanteles* and 12.8 % *Meteorus*) in season 1985/86.

Monthly average numbers of each species of parasitoid in proportion to the host's numbers during the whole period of work are illustrated in fig. 1. As shown in the

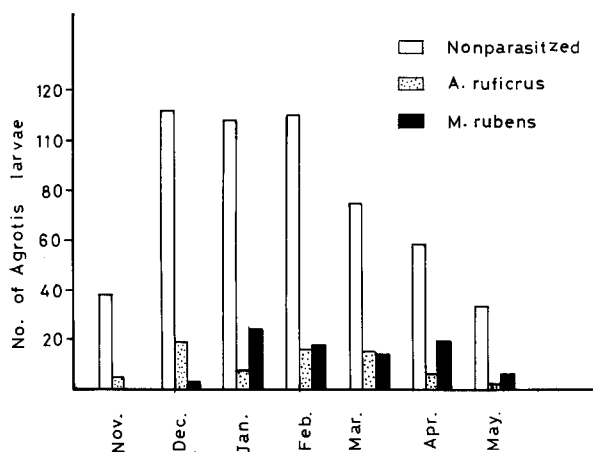


Fig. 1. Total monthly numbers of parasitized and non-parasitized larvae of *Agrotis ipsilon* Rott. during 1983/84–1985/86 seasons in middle Egypt

figure, *A. ruficrus* was the abundant species during November and December, then *M. rubens* exceeded in January. Approximately equivalent numbers of the two recorded parasitoids were observed during February and March. In April and May exceeded *Meteorus* species again.

Gradual increase was observed in the monthly average percentages of parasitism. They were 11.4, 16.4, 22.9, 23.6, 27.9, 30.1 and 19.5 % in the successive months from November to May, respectively. The period January–April represented the highest rates of parasitism, when approximately 23–30 % of *Agrotis* larvae were parasitized.

Field collection of *Agrotis* larvae showed that the average number of *Apanteles* larvae to come out from a single host was 63 with a maximum of 124 and a minimum of 22, while in case of *Meteorus*, it was 26 with a maximum of 45 and a minimum of 15.

4 Conclusion and Discussion

Two gregarious internal larval species of parasitoids were obtained during the 3 seasons of survey, *Apanteles ruficrus* H. and *Meteorus rubens*. The first one was reported previously by BISHARA (1932), WILLCOCKS and BAHGAT (1937) and HAFEZ (1947) as an important parasitoid species on *A. ipsilon* in Egypt. The second species was recorded by the authors (EL-HENEIDY and HASSANEIN, 1984), for the first time in Egypt, as a parasitoid on *A. ipsilon* as well as some other noctuids.

Among the 700 collected *Agrotis* larvae, parasitized larvae were 155 (71 *A. ruficrus* = 10.3 % and 84 *M. rubens* = 12.2 %) represented 22.5 % parasitism.

A. ruficrus occurred first during November and December then followed by *M. rubens*. The later was the most abundant in the next months till the end of the season.

The highest monthly percentage of parasitism was recorded in May 1983/84 and in March and April 1985/86, it reached 38.9, 44.8 and 36.6 %, respectively.

Gradual increase was observed in the seasonal percentage of parasitism, when it reached its maximum of 24.7 % in season 1985/86. The same graduation was in the monthly average percentages of parasitism, when it reached its peak of 30.1 % in April.

In general, obtained results were in agreement with the findings of HASSANEIN (1956) and ZAAZOU et al. (1974), that the active season of the pest in middle Egypt lasted from October and May and with that of BISHARA (1932) and HAFEZ (1947), that percentages of parasitism reached their maximum during March and April (about 30 %) to coincide with the spring peak of abundance of *Agrotis* population.

It is noteworthy to come to the conclusion that parasitoid species contributed in suppressing about 20–25 % of *A. ipsilon* population in middle Egypt.

Zusammenfassung

Zur Parasitierung der Ypsilon-Eule, *Agrotis ipsilon* Rott. (Lep., Noctuidae) in Ägypten

Wöchentliche Aufsammlungen der Raupen von *A. ipsilon* während der Jahre 1983/84 bis 1985/86 im mittleren Ägypten

erbrachten zwei gregäre Endoparasitoiden, *Apanteles ruficrus* Hal. und *Meteorus rubens* Nees. (beide Hym., Braconidae). Sie erreichten zusammen in den 3 Jahren 20,2, 22,2 und 24,7%, i.M. 22,5% (*A. ruficrus* = 10,3% und *M. rubens* = 12,2%). Die höchsten Parasitierungsraten wurden im März und April festgestellt.

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