

**BIOLOGICAL NOTES ON *METEORUS RUBENS* NEES.  
(HYMENOPTERA: BRACONIDAE), A LARVAL PARASITOID  
OF THE GREASY CUTWORM, *AGROTIS IPSILON* ROTT.**

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*Abstract*

The biology of the gregarious parasitoid, *Meteorus rubens* Nees, parasitizing the greasy cutworm, *Agrotis ipsilon* Rott. was studied under laboratory conditions at  $21 \pm 2^\circ\text{C}$  and  $65 \pm 5\%$  RH.

The average duration of the eggs, larval, and pupal stages was 2, 10, and 11 days, respectively. Total developmental period of different stages from egg deposition to adult emergence occupied 20-24 days, with an average of 21 days. Superparasitism commonly occurs in *M. rubens* because the parasitoid females deposit more than one egg/sting and sting the host larva several times. Number of *Meteorus* wasps emerged from a single host larva ranged between 15 and 46 individuals. Longevity and sex ratio were estimated.

**INTRODUCTION**

*Meteorus rubens* Nees. is a gregarious larval internal parasitoid and was recently recorded in Egypt by el-Heneidy and Hassanein (1987, *in press*) mainly parasitizing *Agrotis ipsilon* Rott. and partly *Spodoptera exigua* Hbn., and *Sesamia cretica* Led.

Available literature revealed that *M. rubens* was recorded parasitizing many cutworms in several parts of the world (Baggiolini *et al.* 1966, Kisakurek 1972, Monago *et al.* 1977, Kim *et al.* 1980, Foster and Ruesink 1984).

The present investigation aims at studying the biology of the parasitoid on its main host *A. ipsilon* under laboratory conditions.

## MATERIALS AND METHODS

The following technique was used for rearing the parasitoid and its host, *A. ipsilon* under laboratory conditions of  $21 \pm 2^\circ\text{C}$  and  $65 \pm 5\%$  RH.

Larvae of *A. ipsilon* were collected from infested fields of clover, faba bean, and vegetable crops during winter season. The larvae were individually placed in glass vials (to avoid cannibalism), fed on fresh parts of clover plants or castor leaves until pupation. The pupae were kept under the laboratory conditions till emergence of adults. Pairs of moths were confined in glass chimney, covered with muslin and settled on a petri-dish. Inside each chimney, the moths were provided with honey as food and a strip of tissue paper was hanged to the top of the chimney for egg-laying.

Adults of *M. rubens* were obtained from parasitized larvae of *Agrotis* collected from the fields. The adults were paired and confined to glass vials (5 X 12 cm) covered with muslin. Small droplets of honey were scattered on the vials wall to serve as food. Larvae of *Agrotis* in the 2nd and 3rd instars were introduced to the females of the parasitoid for 24 h after which the larvae were removed. New larvae were then substituted and so on till the death of parasitic wasps. Parasitized larvae were fed on fresh parts of clover or castor leaves and reared under the laboratory conditions until emergence of parasitic adults.

## RESULTS AND DISCUSSION

### Copulation and oviposition:

Copulation usually occurs few hours after emergence, and takes about 30 seconds ranging between 15-40 seconds. In most cases, the female accepted more than one mating throughout her life span. Also males were able to mate more than once throughout their lives.

Oviposition mostly occurs at daylight. Within few hours of emergence from cocoons, parasitised females are ready to deposit their eggs once the host larvae are offered to them. The phenomenon of super-parasitism commonly occurs in case of *M. rubens*, not only because the parasitoid females deposit more than one egg/sting but also they may sting the host larva several times. Therefore, more than one develops from one host larva.

### Immature stages and their durations:

Under laboratory conditions of  $21 \pm 2^\circ\text{C}$  and  $65 \pm 5\%$  RH, durations of different stages of *M. rubens* were estimated. Egg appears oval with rounded poles. The chorion is thin, transparent, and colourless. Just before hatching, the larva could be easily detected

through the translucent chorion with its head and caudal evagination. Egg incubation period lasted 1-3 days, with an average of about 2 days.

Throughout its development, the larva of the braconid, *M. rubens*, passes through three larval instars. The first instar larva is colourless and translucent. It is characterized by the presence of a long and well distinct tail at caudal end. The first instar took 2-3 days, with an average of about 2.5 days.

The second instar is creamy. Its anal vesicle is very clear and becomes thick walled and blunt. The second instar continued for 3-5 days, with an average of about 3.5 days.

The third instar larva appears creamy and cylindrical. Development of the anal vesicle gradually becomes smaller towards the end of the instar. The third instar lasts for 4-6 days with an average of about 4.5 days.

Total larval period lasted 9-12 days, with an average of about 10 days. Mature larvae spin their cocoons usually close to the body of their host and the process of spinning lasted less than 24 h.

The cocoon appears brown reddish, cylindrical, and spindle shaped, with two rounded poles at both ends. The cocoon measures about 5-6 mm long and 2-3 mm at its greatest width.

After a period ranging from few hours to one day, the prepupa changed to pupa. The newly formed pupa is creamy and typically of the free type. It always lies inside the cocoon. The pre-and pupal stages lasted 10-12 days, with an average of 11 days.

Total developmental period of the different stages of *M. rubens*, from egg deposition to adult emergence took 20-24 days, with an average of about 21 days, whereas longevity of the parasitoid female ranged between 3 and 8 days, with an average of 5.7 days, and that of the male ranged between 3-7 days, with an average of 5 days.

Sex ratio of *M. rubens* emerged from *Agrotis* larvae collected from the fields was 1.5 females:1 male, while under laboratory conditions, it averaged 1.9 females:1 male.

Collections of *Agrotis* larvae from the field showed that the average number of *Meteorus* larvae to come out from a single host was 32 with a maximum of 46 and a minimum number of parasitoid larvae to come out from a single host larva obtained from rearing under the laboratory conditions was 36 individuals.

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ملاحظات بيولوجية على الطفيل *Meteorus rubens* Nees.  
المتطفل على يرقات الدودة القارضة

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معهد بحوث وقاية النباتات ، مركز البحوث الزراعية ، الدقى .

أجريت دراسة بيولوجية على الطفيل الجماعى *Meteorus rubens* Nees والذى يتطفل على الدودة القارضة *Agrotis ipsilon* Rott. تحت الظروف المعملية  $21 \pm 2$  م° ،  $65 \pm 5$  % رطوبة نسبية . وقدرت فترة حياة الأطوار غير الكاملة للطفيل . ووجد أن متوسط فترة كل من الأطوار : البيضة ، واليرقة ، والعذارى كان ٢ ، ١٠ ، ١٦ يوما على الترتيب . وبلغت فترة النمو الكلية للأطوار المختلفة من وضع البيض إلى خروج الحشرة الكاملة ٢٠ - ٢٤ يوما بمتوسط قدره ٢١ يوما .

وتظهر ظاهرة التطفل المتزايد في حالة الطفيل إذ أن إنثاه تضع أكثر من بيضة / وخزة ، كما توخر يرقة العائل عدة مرات . وتراوح عدد أفراد الطفيل التى خرجت من يرقة واحدة من العائل بين ١٥ ، ٤٦ فردا . وقدرت فترة حياة الحشرة الكاملة والنسبة الجنسية للطفيل .