A STUDY OF THE EFFICIENCY OF *ORIUS ALBIDIPENNIS* REUT. WHEN FED ON EITHER EGGS OR NEWLY HATCHED LARVAE OF *HELIOTHIS ARMIGERA* HB. (HEMIPTERA-HETEROPTERA ANTHOCORIDAE ; LEPIDOPTERA : NOCTUIDAE)

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SUMMARY

Some biological informations on *Orius albidipennis* Reut. are reported in the present investigation. Its laboratory rearing is described at 27—30°C. and 60—70% R.H.

In association with *Heliothis armigera* Hb. eggs, the total nymphal period occupied the averages 10.8 and 10.9 days in nymphs that develop to male and female adults, respectively. The periods of the five nymphal stadia averaged 3.12, 1.70 1.50, 1.50 and 3.20 days, respectively. In association with newly hatched larvae, the total nymphal period occupied the averages of 11.7 and 11.5 days in nymphs that develop to male and female adults, respectively. The periods of the five nymphal stadia averaged 2.2, 1.7, 1.8, 2.0 and 4.0 days, respectively . Longevity of males and females averaged 10.2 and 16 days, respectively when fed on eggs ; 6.7 and 8.2 days, respectively when fed on newly hatched larvae.

Sex ratio was 1 : 1 in adults fed on eggs and newly hatched larvae.

The numbers of eggs consumed during the five nymphal stadia averaged 5.6, 3.4, 3.2, 4.7 and 6.4, respectively and an average total consumption of 21.2 eggs in the case of nymphs that develop to males and 25 eggs in those develop to females. The average numbers of newly hatched larvae consumed by the five nymphal stadia were 5.5, 5.2, 5.2, 7.6 and 12.6 larvae, respectively and an average total consumption of 34.5 larvae in case of nymphs that develop to males and 36.3 larvae in those develop to females. The average numbers of eggs consumed during the life of male and female adults were 40 and 70.4 eggs, respectively. The average numbers of newly hatched larvae consumed during the life of the two sexes were 27.5 and 47.6 larvae, respectively.

The reproductive capacity of females, pre—oviposition, oviposition and post-oviposition periods were determined when nymphs and adults were fed on eggs and newly hatched larvae.

INTRODUCTION

Orius albidipennis Reut. is very common in cotton, corn and clover fields all over the country. It is usually found in flowers and on plants infested with aphids, thrips and other small insects as a biological control agent . It was recorded in Egypt as a predator of thrips (Ghabn 1948), cotton leaf worm (Kamal, 1951) aphids (Hassan, 1957), mites, corn borers, the pink bollworm, *Pectinophora gossypiella* Saund. and the spiny bollworm, *Earias insulana* Boisd. (Tawfik and Atta, 1973). It was not recorded as a predator of *Heliothis armigera* Hb. in Egypt while recorded in South Africa (Parsons and Ullyett, 1943) and U.S.A. (MacGregor, 1942; Fletcher and Thomas, 1943).

The aim of this investigation is to study the efficiency of nymphs and adults of O. *albidipennis* when fed on eggs and newly hatched larvae of *H. armigera.* Also to study the effect of prey stage on the life cycle and reproductive capacity of the predator's females.

MATERIALS AND METHODS

Adults of *O. albidipennis* were collected from the field and confined in petri-dishes (8 cm in diameter) on moistened filter papers to provide humidity for insects. Feeding was provided daily with a sufficient amount of food, usually aphids. Small pieces of a fresh cabbage leaf were offered to the insects to serve as oviposition sites. Pieces with inserted eggs were transferred to petri-dishes to be placed on moistened filter papers. Soon after hatching, the nymphs were isolated singly in plastic capsules composed of two covers. They were provided daily with eggs or newly hatched larvae of *H. armigera.* The amount of prey was increased gradually as nymphs grew. Moulting and the daily amount of prey consumed were determined. After reaching the adulthood, the newly emerged adults were paired and each couple was transferred in a glass tube 7 x 2 cm, the opening of which was covered by a piece of muslin kept in position by a rubber band. The insects were provided daily with eggs or newly hatched larvae of *H. armigera.* The number of preys consumed and the number of eggs laid by the females were recorded. The experiment was continued till the death of the insects. This investigation was carried out at a room temperature of 27- 30° C. and 60 - 70% R.H.

DURATIONS OF DIFFERENT STAGES

Egg stage :

Eggs are usually laid singly and inserted in the plant tissues where the operculum is hardly seen. The colour of eggs is almost white when newly laid and changes gradually to pale pink colour especially towards the posterior pole. Later, this colour turns to pale yellow and about one quarter of the distance back from the operculum is deep brown coloured concentrations are visible. The incubation period ranges between 2 - 3 days with an average of 2.9 days at 27 - 30° C and 60- 70% R.H.

Nymph stage :

The nymph has five stadia. The duration of these stadia differs with different types of food material. The durations of the five nymphal stadia were estimated by feeding the nymphs on eggs or newly hatched larvae of *H. armigera* at 27 - 30°C and 60 - 70% R.H. Results are recorded in table 1.

TABLE 1. **Rate of nymphal development of *O. albidipennis* in association with eggs and newly hatched larvae of *H. armigera* (at 27-30-°C. and 60-70 % R.H.)**

Nymphal Stadia	Durations of nymphal stadia (A) in days and No. of individuals consumed during each stadium (B) by feeding on				Average No. of individuals consumed	
	Eggs		Newly hatched larvae		Eggs	Newly hatched larvae
	(A)	(B)	(A)	(B)		
I	3.12	5.60	2.20	5.50	1.80	2.50
	(3—4)	(3—9)	(2—3)	(3—10)		
II	1.70	3.40	1.70	5.20	2.00	2.10
	(1—3)	(1—8)	(1—2)	(3—8)		
III	1.50	3.20	1.80	5.20	2.10	2.90
	(1—2)	(1—8)	(1—3)	(3—10)		
IV	1.50	4.70	2.00	7.60	3.10	3.80
	(1—2)	(1—9)	(1—3)	(3—10)		
V	3.20	6.40	4.00	12.60	1.90	3.10
	(3—4)	(2—12)	(3—5)	(8—20)		
Total nymphal	10.80	21.20	11.70	34.50		
Period (Male)	(9—13)	(16—25)	(11—15)	(32—37)		
Total nymphal	10.90	25.00	11.50	36.30		
Period (Female)	(10—13)	(20—31)	(11—14)	28—50		

The data shown in table 1 indicate that, in association with eggs, the total nymphal period occupied the averages of10.8 and 10.9 days in nymphs that develop to male and female adults, respectively. The five nymphal stadia averaged 3.12, 1.70, 1.50, 1.50 and 3.20 days, respectively. In association wjth newly hatched larvae, the total numphal period occupied the averages of 11.7 and 11.5 in nymphs that develop to male and female adults ,respectively. The five numphal stadia averaged 2.20,1.70, 1.80, 2.00 and 4.00 days, respectively. Apparently eggs are more appropriate preys for the development of this predator than the newly hatched larvae since the nymphal period and durations of the nymphal stadia become obviously longer in association with feeding on newly hatched larvae. The data also indicate that the *5th* nymphal stadium is the longest one followed by the I*st* stadium feeding on both eggs and newly hatched larvae.

It was noted that under laboratory conditions, that the rate of death in nymphs was increased when fed on newly hatched larvae compared with those fed on eggs. This rate of nymphs' death has decreased as the nymphs got older. The rate of death in nymphs reached 8% in early stadia and 4% in older ones when fed on eggs, while it was 40% and 8% in early and older stadia, respectively when fed on newly hatched larvae. This high rate of death in the case of feeding on newly hatched larvae, especially in early stadia, could be attributed to the secretion of silk threads which affects the delicate nymphs especially during moulting. This did not occur in the case of feeding on eggs.

Adult stage :

The adult life-span was estimated at 27 - 30 °C. and 60 - 70% R.H. When the males were fed on eggs of *H. armigera*, longevity ranged between 6 - 17 days with an average of10.2 days. On the other hand, longevity of males ranged between 3- 12 days with an average of 6.7 days when they were fed on newly hatched larvae. Longevity of females ranged between 4-31 days with an average of 16 days when they were fed on eggs and between 3-14 days with an average of 8.2 days when fed on newly hatched larvae (Table 1).

Sex ratio :

The sex ratio in adults fed on eggs or newly hatched larvae was 1:1.

As seen in table 2, the male lived shorter than the female when fed on either eggs or newly hatched larvae. It can also be noted that the life-span of both male and female was shortened when fed on newly hatched larvae than when fed on eggs.

is a marked difference in the oviposition periods when females were fed on eggs and newly hatched larvae resulting in a greater number of eggs laid by females fed on eggs than number of eggs laid by females fed on newly hatched larvae. The average number of eggs laid by the female, during its life, was 61.7 and 14 eggs in the two cases of feeding, respectively.

Post-oviposition period :

This period was found to range between 1 - 2 days with an average of 1.3 days in females fed on eggs and between 0- 1 day with an average of 0.66 day in females fed on newly hatched larvae.

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