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OBSERVATIONS ON THE PARASITISM OF *CHILO AGAMEMNON* BLES. EGG MASSES BY *TRICHOGRAMMA EVANESCENS* WEST. IN SUGAR-CANE RATOONS

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INTRODUCTION

Sugar-cane is one of the most important crops in Egypt, its cultivated area reaches about 250000 feddans yearly. It is noteworthy to mention that sugar-cane usually stays at the same field 2 - 3 years after plating season (spring or fall plantings), thus it has 2 - 3 ratoons.

The purple-lined borer, *Chilo agamemnon* Bles., is the major insect pest in sugar-cane fields in Egypt, causing considerable loss in the yield. Hanna and Atries (1968), El-Sherif (1970, 1974), Isa (1979) and Negm and Temerak (1979) reported that the egg-parasitoid, *Trichogramma evanescens* West., was very effecient biocontrol agent against this pest in sugar-cane fields, especially during the period between August and October, when its percentages of parasitism reached up to 80%.

The first fundamental breakthrough towards the blocontrol of this pest was studied by El-Sherif (1974). Afterwards, trials have been practiced since 1983 to utilize the parasitoid against it by releasing it in sugar-cane fields early in the season during May and June (Abbas *et al.*, 1987 & 1989 and El-Heneidy *et al.* 1989). Significant reduction in rates of infestation by the pest was obtained during the fore mentioned trials.

The present study aims to evaluate the natural role of the parasitoid as biomortality agent of *C. agamemnon* in different sugar-cane ratoons.

METHODS AND TECHNIQUE

An area of about 5 feddans from each of the sugar-cane ages, cultivated with the commercial variety C-9, was chosen at Abo-Qurqas district, Menia Governorate, for the study. Weekly examination of 100 plant/age was undertaken for about 36 weeks/season throughout the active period of the pest (April - December) in the four ages; spring planting, first, second and third ratoons, for the two successive seasons 1987 and 1988. Weekly total number of *Chilo* eggs-masses/100 plants was recorded as well as those parasitized, whether completely or partially, by the wasp.

RESULTS AND DISCUSSION

1 — *Season 1987 :*

Data presented in Table (I) and illustrated in Fig. (1) reveal taht :

— *Chilo* egg-laying started during May with 0.4 egg masses/100 plants. Number of egg masses increased gradualy to reach a peak of 5.6/100 plants in September and then decreased to 4.7 and I.I in October and November, respectively. No egg masses were found during December.

— Spring planting received relatively more egg masses compared to the other three ratoons, especially during the period, August-October.

— *Trichogramma evanescens* W. first records of parasitized egg masses were observed in the second and third ratoons during May and in the spring planting and first ratoon during June.

— Trend of natural parasitism increased gradually from June in all plots to reach a peak of 84.7% in November at the third ratoon.

TABLE I

General trend of rate of parasitism of *Chilo agamemnon* egg masses by *Trichogramma evanescens* in different ages of sugar-cane plants at Abo-Qurqas district, Menia Governorate during 1987 season.

Month	Spring planting		1st Ratoon		2nd Ratoon		3rd Ratoon		Mean	
	No. egg-masses	parasitism %	No. egg-masses	parasitism %	No. egg-masses	parasitism %	No. egg-masses	parasitism %	No. egg-masses	parasitism %
Apr.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.4	0.0	0.5	0.0	0.4	12.5	0.3	16.7	0.4	7.3
June	1.5	40.0	1.5	46.3	1.4	41.9	1.4	42.5	1.5	42.8
July	3.4	48.5	4.1	43.2	3.5	47.1	2.8	47.3	3.5	46.5
Aug.	7.0	64.8	3.9	65.1	3.6	67.7	3.7	58.8	4.5	64.1
Sept.	7.7	68.5	5.1	75.5	5.1	57.5	4.4	64.8	5.6	66.6
Oct.	6.8	77.7	4.3	77.4	3.5	71.7	4.1	75.7	4.7	75.6
Nov.	1.7	80.6	0.9	75.0	1.0	73.9	0.7	84.7	1.1	75.5
Dec.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data represent monthly means.

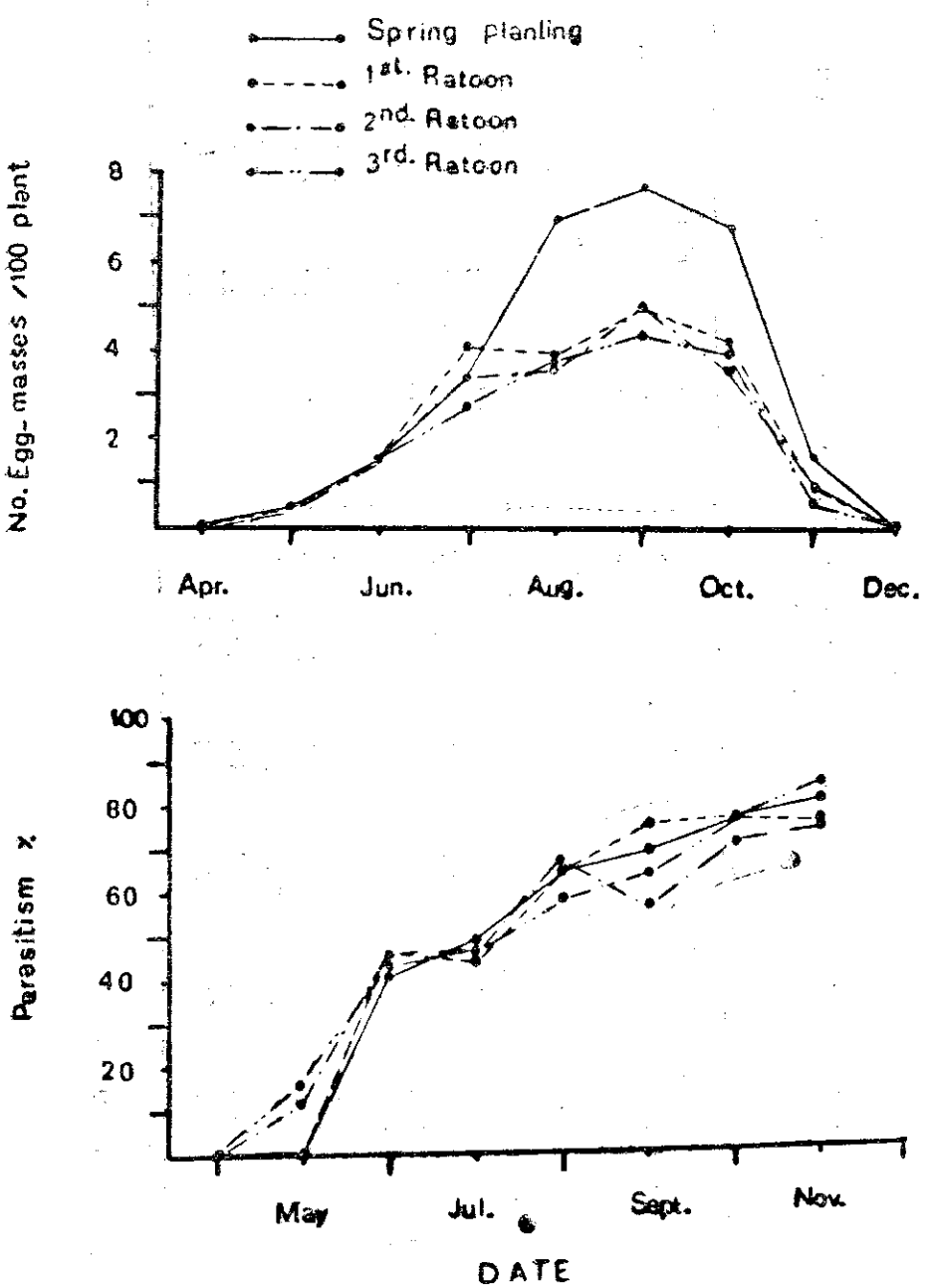

Fig. 1. Monthly means of total numbers of *Chilo* egg-masses/100 pants and parasitism % by *Trichogramma* in different ages of sugar-cane plants at Abo-Qurgas district, Menia Governorate during 1987 season.

TABLE II

General trend in rate of parasitism of *Chilo agamemnon* egg masses by *Trichogramma evanescens* in different ages of sugar-cane plants at Abo-Qurqas district, Menia Governorate during 1988 season.

Month	Spring planting		1st Ratoon		2nd Ratoon		3rd Ratoon		Mean	
	No. egg-masses	para-sitism %	No. egg. masses	para-sitism %	No. egg-masses	para-sitism %	No. egg. masses	para-sitism %	No. egg-masses	para-sitism %
Apr.	0.0	0.0	0.25	0.0	0.5	0.0	0.25	0.0	0.25	0.0
May	2.0	0.0	2.0	0.0	2.3	20.0	2.6	50.0	2.2	17.5
June	3.0	40.0	3.5	42.9	4.5	43.2	2.5	33.3	3.4	39.9
July	5.0	75.0	7.0	70.8	8.0	66.7	7.5	77.5	6.8	72.5
Aug.	6.0	87.5	5.5	59.8	6.0	64.0	6.0	63.0	5.9	68.6
Sept.	3.5	94.4	5.0	93.0	6.0	90.2	4.5	89.6	4.8	91.8
Oct.	1.5	100.0	1.0	100.0	2.0	100.0	0.5	100.0	1.4	100.0
Nov.	2.0	100.0	2.0	100.0	2.0	100.0	0.5	100.0	1.8	100.0
Dec.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Data represent monthly means

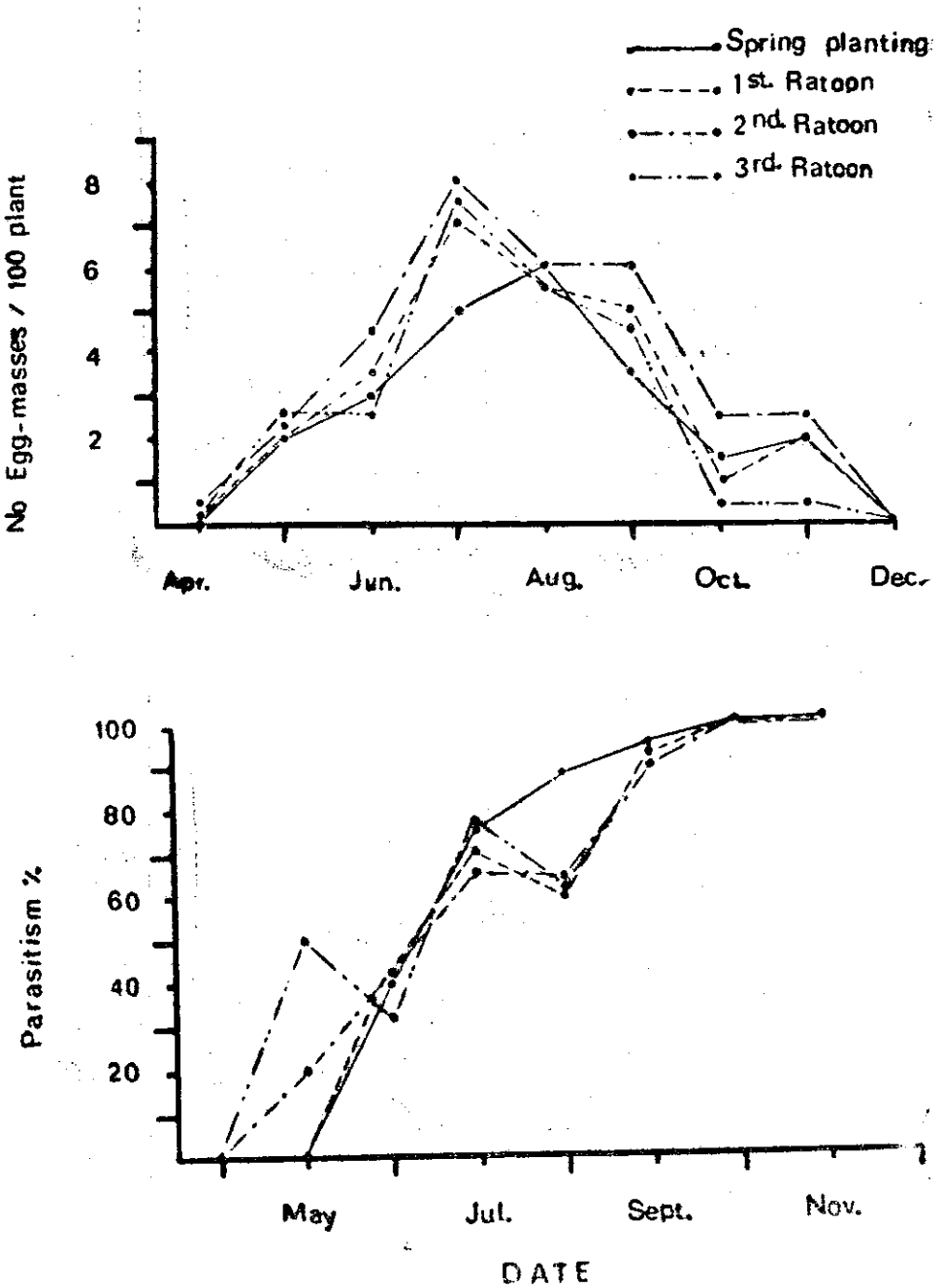

Fig. 2. Monthly means of total numbers of *Chilo* egg-masses/100 plants and parasitism % by *Trichogramma* in different ages of sugar-cane plants at Abo-Qurqas district, Menia Governorate, during 1988 season.

2 — *Season 1988* :

Data presented in Table (II) and ilustrated in Fig. (2) reveal that :

— *Chilo* egg-laying started in April with an average of 0.25 - 0.50 egg-masses/100 plants in the ratoons. Number of egg-masses increased gradually to reach a peak of 6.0 - 8.0/100 plants during the period from July to September in the three ratoons and then decreased gradually to reach a minimum of 0.5 - 2.0/100 plants in October and November. No egg-masses were found in December.

— Second ratoon received relatively more *Chilo* egg-masses compared to the other ages, especially during the period, June-September.

—*T. evanescens* first records of parasitized egg-masses were observed in the second and third ratoons during May and in the spring planting and first ratoon during June.

— Trend of natural parasitism increased gradually from June in all plots to reach maximum of 100% in all ages of sugar-cane plants in October and November.

3 — In general, the performance of *Trichogramma* was equally similar on sugar-cane ages and, therefore, plant factor (plant age) doesn't seem to play a role in the parasitoid's efficiency. Negm and Temerak (1979) also concluded that sugar-cane varieties (host plant) have no appreciable effect on the rate of parasitism.

— Average numbers of *Chilo* egg masses as well as parasitism % in the four ages of sugar-cane plants were higher in season 1988 than 1987.

— The active period of the parasitoid coincided with the strong generations of the pest, usually during July - Navember in the four ages of sugar-cane plants. Parasitism % was always over 50% from July till November and reached 80 - 100% in some periods.

SUMMARY

The present study aimed to obtain basic information about natural activity of the egg-parasitoid, *Trichogramma evanescens* West., on the purple lined borer, *Chilo agamemnon* Bles., in different ages of sugar-cane plants at Abo-Qurgas district, Menia Governorate during 1987 and 1988 seasons. Number of *Chilo* egg masses and percentages of parasitism in the four ages of sugar-

cane plants; spring planting, first, second and third ratoons, were estimated weekly. Highest numbers of *Chilo* egg masses and parasitism % were recorded during the period August-November, regardless to the age of sugar-cane plants. Results showed no differences among the sugar-cane ages receiving *Chilo* egg masses and percentages of parasitism in the two seasons of study.

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