

EVALUATION THE ROLE OF THE ASSASSIN BUG, *CORANUS AFRICANA* EL-SEBAEY (REDUVIIDAE : HETEROPTERA) IN SUPPRESSION OF DIFFERENT INFESTATION LEVELS OF *APHIS GOSSYPII* GLOVER IN CUCUMBER AND SQUASH FIELDS

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(Manuscript received 8 June 2006)

Abstract

The evaluation of the role of the assassin bug, *Coranus africana* El-Sebaey was studied for suppression of different populations of the cotton aphid, *Aphis gossypii* Glover in cucumber and squash fields at Fayoum governorate during the successive years, 2005 and 2006. *C. africana* was released in the ratio of one predator / plant against three levels of *A. gossypii* infestation in cucumber and squash fields. Reduction percentage of *A. gossypii* infestation differed according to the release of predator in each treatment. In case of high infestation, the reduction was (99.9 & 92.86 %) during the first and the second years, of the investigation, respectively in cucumber field opposed to (88.6 % and 90.1 %) in squash field throughout the two successive years of the study. Complete eradication of the pest population was achieved when, the infestation level was low or moderate in two crops. The basic yield parameters expressed as the weight of fruit and number of fruits / plant during the two years of the investigation in the two crops.

INTRODUCTION

The possibility of reduviid augmentation in several economic crops as cotton, tomato, cucumber in agro-ecosystems has been reflected from various publications (Ambrose, 1996, Ambrose & Claver, 1999, El-Sebaey, 2001, El-Sebaey *et al*, 2002 b, 2004 and El-Sebaey & Abd El-Wahab 2003).

The predator, *Coranus africana* El-Sebaey, has been recently recorded in Egyptian fauna. It was found to be one of the most important predators of various insect pests of tomato, cucumber, clover and cotton (El-Sebaey, 2002, El-Sebaey *et al*, 2002a). This reduviid bug was released in a cucumber green house (500 m²) against *Bemisia tabaci* (El-Sebaey *et al*, 2002b). On the other hand, it was released in tomato field plots against three tomato pests namely *B. tabaci* (Genn.), *Aphis gossypii* Glov. and *Spodoptera littoralis* (Bosid.) (El-Sebaey & Abd El-Wahab, 2003). Also the evaluation of its ability in suppression of *B. tabaci* under three levels of infestation was conducted in tomato plants (El-Sebaey *et al*, 2004).

The present work aimed to evaluate the role of the predator, *Coranus africana* El-Sebaey in suppression of the cotton aphid at different infestation levels of The cotton aphid *A. gossypii* Glover in squash and cucumber fields.

MATERIALS AND METHODS

The predator, *Coranus africana* El-Sebaey (Heteroptera : Reduviidae) was collected from clover fields, located in Wadi El-Natroun district in the western desert of Egypt. Laboratory mass rearing was conducted at 30 C° & 70% R.H on larvae of *Anagasta kuehnila* Zell as reported by (El-Sebaey & El-Bishry, 2001, El-Sebaey & El-Shazly, 2002). Laboratory emerged adult predators were used for their biocontrol assassin potential in cucumber and squash fields.

The experiments were conduct at Fayoum governorate, (Egypt) in cucumber field (1050 m² for three infestation levels) in Nile loop, each level was 324 m² and surrounded by 26 m² border of maize to creat a barrier (Biever & Chauvin, 1992) and reduce the movement of pests and predators. The area of each level was divided into three replicate, randomly and other three for control (replicate = control = 50 m²), each plot was separated from other by (4 m²) (El-Sebaey *et al*, 2002b, 2004 and El-Sebaey & Abd El-Wahab 2003). The following treatments were evaluated at separate plots:-

Control (A): Cucumber plants infested with high level infestation of *Aphis gossypii* Glover (3 plots).

Control (B): Cucumber plants infested with moderate level infestation of *A. gossypii* (3 plots).

Control (C): Cucumber plants infested with low level infestation of *A. gossypii* (3 plots).

Experiment (A): Cucumber plants infested with high level (21-40 individual/leaf) of *A. gossypii* with one adult predator / plant, (3 plots).

Experiment (B): Cucumber plants infested with moderate level (11-20 individual/leaf) of *A. gossypii* with one adult predator / plant, (3 plots).

Experiment (C): Cucumber plants infested with low level (7-10 individual/leaf) of *A. gossypii* with one adult predator / plant, (3 plots).

On the other hand, the brevous mentioned design was done in the squash field (1050m²).

A. gossypii attacked cucumber and squash plants before and through out the experimental peroid were carried out according to Metwaly *et al*, 1994. The adult predator, *C. africana* was released (plant age = 35days) manually between the rows (one adult predator / plant). After release, the plants were examined and the counts of *A. gossypii* were recorded weekly (Ambrose & Claver, 1999).

Comparison between the yield in the treated and control plots were determined, according to El-Sebaey *et al*, 2002b.

The statistical equation of Henderson and Tilton (1955) was applied to calculate the reduction percentage in the population of different levels of *A. gossypii* Glover in cucumber and squash plants. The data of the weight of fruit and number of fruit/plant were statistically analyzed according to sendecor and cochran (1967).

RESULT AND DISCUSSION

In the different treatments, of the predator *Coranus africana* El-Sebaey were significantly suppressed the population of *Aphis gossypii* Glover in cucumber and squash fields during the two years of release (2005-2006).

In cucumber field, the high level infestation of *A. gossypii* was reduced by 99.9% and 92.86% during the first and the second years, respectively (Table 1). The complete eradication of the pest population was achieved in case of moderate and low infestation levels when using one predator/plant.

In squash field, the suppression percentage of *A. gossypii* at (high infestation level) were 88.6% and 90.1% during the first and the second years, respectively. At moderate and low levels of infestation, the pest was completely eradicated by using *C. africana* (one predator/plant).

The release of *C. africana* reduced the damage caused by *A. gossypii* in the three levels as indicated by the fruit weight and number of fruit/plant. It was highly significant reduced ($P > 0.005$).

In the treatments, the weight of cucumber fruit increased from 0.4 to 0.46, 0.69 and, 0.8 Kg/plant, at the three levels of infestation, respectively during the first year, while the increasing was from 0.39 to 0.43, 0.7 and 0.82 Kg./plant during the second year. Also the number of fruits/plant increased as a result especially at low and moderate level of infestations (Table 1).

On the other hand, the weight of squash fruit increased from 0.7 to 0.79, 01.9 and 2.3 Kg/plant, at the three levels of infestation, respectively during the first year, while it increased from 0.69 to 0.73, 1.09 and 1.2 Kg./plant) during the second year of the study, respectively.

The reduviid bug is a promising group of natural enemies that could be augmented for release in pest management programs. Thus, the reduction of infestation of *Spodoptera lituralis*, *Mytabris pustulata* and *Dysdercus cingulatus* in cotton field cages by the reduviid *Rhynocoris marginatus* F. have recently been documented by Ambrose and Calver, 1999). Ambrose, (1996) reported that more than 50% suppression of *Helicoverpa armigera* Hubner, *S. Lituralis* and *D. cinglatus* was achieved by four reduviid predators, *Acanthaspis pedestris* stal, *Catamiartus brevipennis* Serville, *R. marginatus* and *R. Kumarii*.

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On the other hand El-Sebaey *et al.*, (2002b) mentioned that *Coranus africana* reduced the level of infestation of *Bemisia tabaci* in cucumber green house with increasing of early and total yield. Also El-Sebaey & Abd-El-Whab, (2003) reported that *C. africana* suppressed *B. tabaci*, *A. gossypii* and *S. littoralis* in tomato fields with increasing the obtained yield. The reduction rates of *B. tabaci* infestation levels differed to according the numbers of predator, also the parameters of yield. (El-Sebaey *et al*/2004).

Table 1. Effect of the predatory assassing bug, *Coranus africana* on cucumber plants infested with *Aphis gossypii* Glover and yield in Nile loop during the two successive years of investigation, 2005 and 2006 at Fayoum Governrate, Egypt.

Year of treatment release		Effect of <i>C. africana</i> on the plants		Effect of <i>C. africana</i> on the yield			
		No. of <i>A. gossypii</i> leaf		Weight of fruit (Kg.)/plant	No. of fruits/plant	Reduction of fruit numbers/plant	Reduction percentage of fruit numbers (%)
		Before release	After release				
The First year, 2005	A. High level	21.3±1.2	3.06±0.18 (99.9)	0.46±0.007	5.1±0.06	1.7±0.04	25%
	B-Moderate level	12.0±0.82	-	0.69±0.005	5.9±0.11	0.9±0.045	13.2%
	C-low level	8.5±1.1	-	0.83±0.04	6.8±0.04	-	-
	Control	19.0±0.71	26.2±0.59	0.4±0.03	5.03±0.41	1.8±0.03	26.3%
The Second year, 2006	A- High level	32.1±0.41	3.6±0.17(92.86%)	0.43±0.01	5.2±0.14	1.83±0.02	20%
	B- Moderate leve	14.05±0.17	-	0.701±0.03	6.1±0.23	0.41±0.02	6%
	C- low level	9.99±0.29	-	0.81±0.02	6.5±0.26	-	-
	Control	25.03±0.34	38.13±0.29	0.39±0.02	4.9±0.2	1.59±0.2	24.6%

Table 2. Effect of the predatory assassing bug, *Coranus africana* on squash plants infested with *Aphis gossypii* Glover and yield in Nile loop during the two successive years of investigation, 2005 and 2006 at Fayoum Governrate, Egypt.

Year of treatment release		Effect of <i>C. africana</i> on the plants		Effect of <i>C. africana</i> on the yield			
		No. of <i>A. gossypii</i> leaf		Weight of fruit (Kg.)/plant	No. of fruits/plant	Reduction of fruit numbers/plant	Reduction percentage of fruit numbers (%)
		Before release	After release				
The First year, 2005	A. High level	38.06±0.24	4.35±0.22 (88.6%)	0.79±0.04	7.1±0.11	0.0±0.12	23.6%
	B-Moderate level	19.97±0.26	-	1.9±0.03	9.1±0.05	0.21±0.02	2.3%
	C-low level	8.01±0.36	-	2.3±0.05	9.3±0.14	-	-
	Control	43.93±0.34	49.59±0.47	0.71±0.01	6.9±0.06	2.4±0.03	25.8%
The Second year, 2006	A- High level	48.9±0.25	5.15±0.23 (90.1%)	0.73±0.03	6.8±0.08	2.5±0.13	26.8%
	B- Moderate leve	25.05±0.28	-	1.59±0.02	8.9±0.10	0.4±0.01	4.3%
	C- low level	10.03±0.27	-	1.2±0.17	9.3±0.13	-	-
	Control	47.01±0.3	56.06±0.30	0.69±0.02	6.10±0.11	3.2±0.07	34.4%

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تقييم دور المفترس *Coranus africana* El-Sebaey (رتبة نصفية الأجنحة - فصيلة البق السفاح) في خفض تعداد المن *Aphis gossypii* في حقول الخيار والكوسة

إيمان إبراهيم عبد الرحمن السباعي ، حورية على عبد الوهاب

معهد بحوث وقاية النباتات - مركز البحوث الزراعية - دقى - جيزة - مصر

تم إطلاق المفترس *Coranus africana* El-Sebaey بمعدل (فرد/ نبات) فى مستويات الإصابة المختلفة لمن القطن *Aphis gossypii* (مرتفع - متوسط - منخفض) بحقول الخيار والكوسة على مدار عامى ٢٠٠٥، ٢٠٠٦. إنخفض تعداد المن فى الإسيوع الأول بعد الإطلاق بحقول الخيار بنسبة ٩٩,٩% ، ٩٢,٨٦% فى العام الأول والثانى على التوالى بينما كانت هذه النسبة بحقول الكوسة ٨٨,٦% ، ٩٩,١% على التوالى. كما تم تقييم كلا المحصولين من حيث عدد الثمار/ نبات، وزن الثمار/ نبات خلال العامين وأظهرت الدراسة إرتباط معدلات الخفض فى تعداد المن بزيادة إنتاجية المحصول.