

**EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR  
CORANS AFRICANA EL-SEBAEY (HEMIPTERA: HETEROPTERA)  
ON THE POPULATION OF *BEMISIA TABACI* GENN IN TOMATO  
FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES**

**IMAN, I.A. EL-SEBAEY AND HOURIA A. ABD EL-WAHAB**

*Plant Protection Research Institute ARC, Dokki, Giza*

(Manuscript received 25 November 2009 )

---

**Abstract**

The effect of different stages of predator *Coranus africana* EL-Sebaey was evaluated in suppression for different populations of the white fly *Bemisia tabaci* Genn. in tomato field at Qalubia and Bani-Swif Governorates during two successive years 2007 & 2008, different stages of the predator *C. africana* were released by one predator/plant against *B. tabaci* infestation. Reduction percentage of *B. tabaci* infestation differed according to the release of predator in each treatment. In case of release of the adult stage, the reduction in the second week of release was 93.4% & 100% for adult and immature stage respectively at Qalubia during the first year. On the other hand this reduction was (94.8% & 97.1%) during the second year. However the percentage reduction at Bani-Swif was (97.4% & 92.7%) and (99.2% & 91.2%) during two years respectively. The basic yield parameters expressed as weight of fruit and number of fruits/plant during the two years of the investigation at Qalubia and Bani-Swif in the crop.

**INTRODUCTION**

The reduviids are the assassin bug in different habitat of Egyptian fauna. They are predaceous upon various insect pests with different economic plants by (Afifi *et al.*, 1994, El-Sebaey 1996, 1997 and 2001).

The predator *Coranus africana* El-Sebaey (Reduviidae-Hemiptera) is described for the first time from Egypt (El-Sebaey 2002). Biological aspects and predation rates of different stages on the laboratory preys *Anagasta kuehniella* and *Corcyra cephalonica* are investigated by El-Sebaey & El-Bishry 2001. Also biological studies of this predator on the cotton pests *Spodoptera littoralis* Bosid and *Agrotis ypsilon* Rott are recorded by (El-Sebaey 2001). The effect of containers size on the development and mass rearing are studied by El-Sebaey & El-Shazly 2002). The effect of the prevailing physical environmental factors on the population density and life table parameters are given by El-Sebaey *et al.*, 2002a). This predator is considered a very important bio-agent in biological control programs (EL-Sebaey *et al.*, 2002b, 2004 and El-Sebaey & Abd EL-Wahab 2003& 2007.

The present work was conducted to evaluate the role of different stages of the predator *C. africana* in the suppression of *Bemisia tabaci* Genn. population in Qalubia (Delta) comparatively with Bani-Swif (Upper Egypt.)

## MATERIALS AND METHODS

The assassin bug, *Coranus africana* El-Sebaey (Heteroptera: Reduviidae) was collected from clover, tomato, egg plant and some wild plants, as *Echinochloa colonum* and *Cydom doctylon* in wadi El-Natroun district in the western desert of Egypt. Laboratory mass rearing was conducted at  $30_{+2}C^{\circ}$  &  $70_{+5}\%$  R.H) in plastic troughs on larvae of *Anagasta kuehniella* Zell as reported by EL-Sebaey 2001b, EL Sebaey & EL-Bishry 2001 and EL-Sebaey & EL-Shazly 2002).

Experiments were conducted at Qalubia and Bani-Swif Governorates, Egypt in field area (3180m<sup>2</sup> divided to six treatments), each treatment was 500m<sup>2</sup> and surrounded by 30m<sup>2</sup> as a border of maize to create barrier and reduce movement of pests and predators, the area of each treatment divided into three replicates (145m<sup>2</sup> for each) and surrounded by 21.7m<sup>2</sup> as a border. Each of the six treatments mentioned was randomly replicated three times for experiment and other three, for control (replicate = 40m<sup>2</sup>), each replicate separated from other by 5m<sup>2</sup> (EL-Sebaey *et al.*, 2004 & EL-Sebaey and Abd El -wahab 2007). The tomato plants ( Kasl Rock variety) were transferred after 45 days of planting to experimental replicates. The following treatments were evaluated at separate replicates (EL-Sebaey & Abd EL-Whab 2003).

Control (A, B, C, D, E, F): Tomato plants infested with *B. tabaci* (3 replicates), respectively.

Experiments (A, B, C, D, E, F) tomato plants infested with *B. tabaci* and suppressed by one stage of the predator *C. africana* /plant, (3plots), respectively.

On the other hand, the previous mentioned design was done at Bani-Swif in the field of tomato (3180m<sup>2</sup>).

The infestation levels of *B. tabaci*. before and through the experimental period were estimated according to the procedure adopted by EL-Sebaey & Abd EL-Wahab. 2003 and EL-Sebaey *et al.*, 2004.

The different stages of predator, *C. africana* were released manually between the rows (1 predator/plant). After release the plants checked and counts of alive *B. tabaci* were recorded weekly as reported by EL-Sebaey & Abd EL-Wahab 2003 and EL-Sebaey *et al.*, 2004.

A comparison between the yield in the experimental and control plots was determined as reported by EL-Sebaey & Abd EL-Wahab 2004 and EL-Sebaey *et al.*, 2004.

The statistical equation of Henderson & Tilton (1955) was applied to calculate the reduction by different stages of predator in the population of *B. tabaci*.

## RESULTS AND DISCUSSION

In different treatments, of the assassin bug, *Coranus africana* EL-Sebaey were significantly suppressed the population of white fly *Bemisa tabaci* (Genn.) in tomato plants at Qalubia and Bani-Swif Governorates during the two years of release (2007-2008).

At Qalubia, in the different treatments of reduviid predator, *C. africana* were significantly ( $P>0.05$ ) suppressed of *B. tabaci* population of release (2007-2008). Considering the first year the suppression percentage of *B. tabaci* (adult and immature stages) when released first instar of the predator was (63.4% and 81.5% respectively) in the first week and increased to reach (89.1% and 93.7%) in the fourth week. However, these values were (47.6% and 83.4%) in the first week and (89.9% and 93.7%) in the fourth week in the second year (Fig 1&2 and Table 1&2). The reduction percentage increased in other treatments to reach the highest percentage when released adult stage of predator (85.3% & 88.5%) and (92.4% & 100%) in first and second week respectively in first year and 90.2% 91.5%) and (94.8% & 97.01%) in first and second week respectively in for the second year.

The release of *C. africana* adult and immature stage reduced the damage caused by *B. tabaci* in the total yield and it was highly significant reduced ( $P>0.001$ ), (Tables 1,3). In the presence of the predator stages respectively, the total yield was increased (from 13.73 to 20.13, 21.52, 25.01, 29.85, 31.74 and 39.01 Ton/feddan during the first year, opposed (from 14.31 to 22.12, 23.21, 27.26, 32.77, 35.42 and 40.19 Ton/feddan during the second year. The percentages (%) yield increase over control in the presence of the predator stages were 46.6; 57.1; 82.1; 117.4;131.2&184.1% and 54.57;62.19;90.49;129.0;147.5&180.85% during the two years(2007-2008) (Tables 3 & 4).

416 EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR *CORANS AFRICANA* EL-SEBAEY  
(HEMIPTERA: HETEROPTERA) ON THE POPULATION OF *BEMISIA TABACI* GENN IN  
TOMATO FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES

Table 1.

Fig 1.

Table 2.

Fig 2.

Table 3. & 4.

420 EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR *CORANS AFRICANA* EL-SEBAEY  
(HEMIPTERA: HETEROPTERA) ON THE POPULATION OF *BEMISIA TABACI* GENN IN  
TOMATO FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES



At Bani-Swif, the suppression percentage of *B. tabaci*, (adult and immature stages where released first instar was 77.4% and 68.2%) in first week and reach to (93.06 % and 87.5%) in fourth week, during the first year (Fig 3 & Table 5). On the other hand, these values were (76.2% and 54.6%) in the first week and reach to (91.6% and 88.4%) in fourth week during the second year (Fig. 4 & Table 6). The reduction percentage increased in other treatment to reach the highest percentage when released the adult stage,(95.3% & 84.6%) and (97.4% 92.7%) during first and second week respectively in the first year. These reduction were (94.4% 81.8%) and 99.2% & 91.2%) respectively in the second year. The pest was completely eradication from third week in two years.

The release of *C. africana* treatments reduced the damage in the total yield and it was highly significant reduced ( $P > 0.001$ ), (Table 3 & 4). The total yield was increased in the six treatments (from 22.6 to 25.1, 25.8, 27.0, 29.0, 29.9 and 31.1 ton/feddan respectively) during the first year opposed (from 22.6 to 25.7, 25.9, 26.7, 28.6, 30.1 and 31.4 ton/feddan respectively) during the second year. The percentages (%) yield increase over control in the presence of the predator stages were 46.6; 57.1; 82.1; 117.4; 131.2 & 184.1% and 58.72; 64.71; 84.59; 105.7; 135.8 & 174.9% during the two years (2007-2008) (Tables 7 & 8).

El-Sebaey & Abd EL-Wahab (2003) reported that *C. africana* suppressed *B. tabaci*, *A. gossypii* and *Spodoptera littoralis* in tomato fields at Fayoum with increasing the obtained yield. The reduction rates of *B. tabaci* infestation levels differed according to the numbers of predator, also the parameters of yield (EL-Sebaey *et al.*, 2004).

On the other hand (EL-Sebaey *et al.*, (2002 b) mentioned that *C. africana* reduced the level of infestation of *Bemisia tabaci* in cucumber green house with increasing of early and total yield. Also the reduction rates of *Aphis gossypii* Glov. infestation according to the release of adult predator in each level in cucumber and squash fields with increasing the total yield at Fayoum governorate (EL-Sebaey & Abd EL-Wahab 2007).

422 EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR *CORANS AFRICANA* EL-SEBAEY  
(HEMIPTERA: HETEROPTERA) ON THE POPULATION OF *BEMISIA TABACI* GENN IN  
TOMATO FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES

Table 5.

Fig. 3.

424 EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR *CORANS AFRICANA* EL-SEBAEY  
(HEMIPTERA: HETEROPTERA) ON THE POPULATION OF *BEMISIA TABACI* GENN IN  
TOMATO FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES

Table 6.

Fig. 4.

426 EFFECT OF DIFFERENT STAGES OF REDUVIID PREDATOR *CORANS AFRICANA* EL-SEBAEY  
(HEMIPTERA: HETEROPTERA) ON THE POPULATION OF *BEMISIA TABACI* GENN IN  
TOMATO FIELD AT QALUBIA AND BANI-SWIF GOVERNORATES

Table 7. & 8.

## REFERENCES

1. Afifi, A. I., K. T. Awadalla, M. F. S. Tawfik and I. I. A. El-Sebaey. 1994. A survey of Egyptian reduviids. Egypt J. Biol. Pest. Cont.
2. El-Sebaey, I. I. A. 1996. Description and biological studies on different developmental stages of *Vachiria natolica* stal (Hemiptera-Heteroptera-Reduviidae). Egypt. J. Biol. Pest. Cont. 6 (2): 177-184.
3. El-Sebaey, I. I. A. 1997. Biological and morphological studies on *Coranus aegyptius* (F.) (Hemiptera: Reduviidae). Egypt. J. Agric. Res. 76(3): 933-945.
4. El- Sebaey, I. I. A. 2001a. Biology and predation rates of certain adult Reduviids (Heteroptera: Reduviidae). Egypt J. Biol. Pest Cont., 11 (1): 15-23.
5. El- Sebaey, I. I. A. 2001b). Biology and predation rates of the, assassin bug, *Coranus africana* El-Sebaey (Heteroptera: Reduviidae) on the cotton pests, *Spodoptera littoralis* (Bosid.) and *Agrotis ypsilon* Rott. Bull. Fac. Agric., Cairo. Univ., 52: 655-668.
6. El- Sebaey, I. I. A. 2002. *Coranus africana* sp. Nov., A new harpactorin (Reduviidae: Hemiptera) from Egypt. Egypt. J. Agric Res., 80 (1) : 211-217.
7. El- Sebaey, I. I. A. and M. H. El-Bishry. 2001. Biological aspects and predation of *Coranus africana* El-Sebaey on the Laboratory preys *Anagasta kuehniella* and *Corcyra cephalonica*. Egypt. Jou. Bio. Pest. Cont., 11(2): 57-62.
8. El- Sebaey, I. I. A. and M. M. El-Shazly. 2002. Effect of containers size on the development and Mass rearing of the predatory bug, *Coranus africana* (Hemiptera: Reduviidae). Proc. of the 2<sup>nd</sup> conf. of Ent., March 27, 2002, pp, 133-145.
9. El- Sebaey, I. I. A, M. M. El-Shazly and H. A. Abd El-Wahab. 2002a. Seasonal changes in the population density of *Coranus africana* El-Sebaey in Egypt as indicated by life table parameters. Egypt. J. Agric. Res., 80 (2): 631-645.
10. El- Sebaey, I. I. A, H. A. Abd El-Wahab and S. A. Ibrahim. 2002b. Suppression of white fly *Bemisia tabaci* (Genn.) with Augmentative release of assassin bug, *Coranus africana* El-Sebaey (Het; Reduviidae) in cucumber green house. j. Unio. Arab Biol. Cairo; Voll. 17 (A): 197-205.
11. El- Sebaey, I. I. A and H. A. Abd. El- Wahab. 2003. Suppression of *Bemisia tabaci* (Genn), *Aphis gossypii* Glov. and *Spodoptera littoralis* (Bosid) by *coranus africana* El-Sebaey (Het.: Reduviidae) in tomato field. Bull. Fac. Agric. Cairo Univ., 54 (1) 141-150.

12. El- Sebaey, I. I. A and H. A. Abd El-Wahab. 2007. Evaluation the role of the assassin bug, *Coranus africana* El-Sebaey (Heteroptera: Reduviidae) in the suppression of different infestation levels of *Aphis gossypii* Glov. in Cucumber and squash fields. Egypt. J. Agric. Res., 85 (2): 489-496.
13. El- Sebaey, I. I. A, H. A. Abd El-Wahab and S. A. Ibrahim. 2004. Evaluation of the role of the predatory bug *Coranus africana* El-Sebaey (Heteroptera: Reduviidae) in the suppression of different infestation levels of the white fly *Bemisia tabaci* in tomato field. Al- Azhar J. Agric. Res. 39:31-44.
14. Henderson C. F. and E. W. Tilton. 1955. Test with acaricides against the brown wheat mite. J. Econ. Entomol., 48: 157-161.



## تأثير الأطوار المختلفة للمفترس *Coranus africana* El-Sebaey

(فصيلة البق السفاح -رتبة نصفية الأجنحة ) فى خفض تعداد الذبابة البيضاء

*Bemisia tabaci* Genn. بحقول الطماطم فى محافظتى القليوبية وبنى سويف

ايمان السباعى ، حورية عبد الوهاب

معهد بحوث - وقاية النبات - مركز البحوث الزراعية - الدقى - جيزة

تم اكنار الأطوار المختلفة للمفترس *Africana Coranus* وإطلاقها لمكافحة الذبابة البيضاء

*B. tabaci* فى حقول الطماطم بمحافظة القليوبية ( الدلتا ) مقارنة بمحافظة بنى سويف (وجه قبلى )

وأوضحت النتائج أن نسبة انخفاض الاصابة تختلف تبعا لعمر المفترس فى كل معاملة حيث حقق

أسرع معدل خفض فى الاسبوع الثانى من اطلاق الأطوار الكاملة للمفترس ( 94.1% & 100% )

للأطوار الكاملة وغير الكاملة للذبابة البيضاء على التوالي فى العام الأول بينما كانت فى العام الثانى

( 94.8% & 97.01% ) للأطوار الكاملة وغير الكاملة للذبابة البيضاء على التوالي بمحافظة القليوبية

، بينما كان معدل الخفض فى محافظة بنى سويف ( 92.7% & 97.4% ) للأطوار الكاملة وغير

الكاملة على التوالي فى العام الأول بينما كانت ( 91.2% & 99.2% ) على التوالي فى كل عام بكل

من محافظة القليوبية وبنى سويف.