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EFFICIENCY OF *Coccinella undecimpunctata* L.And *Chrysoperla carnea* (STEPHENS) As BIOLOGICAL CONTROL AGAINST *Myzus persicae* (SULZER) INFESTING TOMATO PLANTS.

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ABSTRACT

The obtained relsults showed that, the reduction percentages of *Myzus persicae* population by releasing the two predators *Coccinella. undecimpunctata* and *Chrysoperla carnea* (Stephens)on tomato plants during the two successive seasons,2010 and 2011 , Obtained data confirmed that predators releasing caused reduction percentages on *M. persicae* population compared with control during two successive seasons The suppression of *M. persicae* population by three treatments of predators released (*C. undecimpunctata* and *C. carnea*), *C. carnea* and *C. undecimpunctata* on tomato plants were (86.0; 82.8; 80.2 and 84.5; 73.0; 77.6%) on 5^{th} days after releasing with three treated for the first season, 2010 and second season 2011, respectively. Then after two weeks from predators released, the reduction percentage reach its maximum (91.2, 86.0 and 89.7 %) and (91.3, 79.7% and 86.5%) for three treated during the two seasons respectively. Generally in all cases the number of aphid insects had been destroyed did not differ between three different treatments, were not significant.

INTRODUCTION

The predaceous insects form a large diverse group. Over 16 orders of insects contain predaceous members, in approximately 200 families including the spiders and mites, there are probably in excess of 200,000 species of arthropod predators (Obrycki and Kring, 1998). Many crops contain a rich assemblage of predators, and it is common to find 300-500 species of predators in a given crop.

There are some pests which cause a greet damage of the vegetables production in the greenhouses such as whitefly, *Bemisia tabaci* (Genn.) (Hemiptera:Aleyrodidae), cabbage aphid, *Brevicoryne brassicae* (L.), cotton Aphid *Aphis gossypii*, (Hemiptera: Aphididae), these pests controlled by predators such as ladybirds , Aphid lion and parasites such as parasitic wasps (Zhang, 2003 ; Zhang *et al.*, 2005 and Guri *et al.*, 2011). The aim of this study to evaluated the efficiency of the two insect predators *Coccinella undecimpunctata* and *C.carnea* against aphid species.*M. persicae* on tomato plants.

MATERIAL AND METHEDOS

To evaluate the efficiency of 2nd instar larvae of *Chrysoperla carnea* (three larvae /plant) and adult of *C. undecimpunctata* (three adults/ plant) as biological control agents of *Myzus persicae* on tomato plants under green house of 300 m^2. The area was divided into 12 replicates (5x 5 m^2) as treated by the two predators *Chrysoperla carnea* and *C. undecimpunctata* (three replicates);For each one and three replicates as control. Treatment was represented by three replicates were applied. A plastic sheet was fixed between each replicate. Randomized samples of 10 leaves /replicate were taken just before the predator release as pre-count and then samples picked up weekly intervals as post-counts. The samples were put in paper bags, directly transferred to laboratory. Immature and adults of *M. persica* were counted with aid of a stereomicroscope, after 5, 7 and 14 days.

Mass rearing of *Coccinella undecimpunctata* (L.)

When the population of *A. gossypii*, increased and reached to suitable density individuals (approximately 100 individuals/ plant) on tomato plants, these plants were inoculated with *C. undecimpunctata*. The stock culture of ladybird was obtained from infested plants and transferred to laboratory. Only 10 adults ♂+ 10 adults ♀ of ladybird (to prevent larval cannibalism) were transferred to rearing cages (30 cm diameter X 25 cm high) and kept in wooden cages (100X135X135 cm) with nylon gauze sides. To maintain the predator culture, a suitable number of the prey daily offered to the predator.

Mass rearing of *Chrysoperla carnea* (Stephens)

Five pairs of the green lacewings ***C. carnea*** adults were confined in the glass chimney (6cm x8cm) was placed in the Petri dish (9.0 cm.). Another small petri dish (5.0 cm. dia.) was placed in the bigger Petri dish for holding cotton soaked in distilled water to maintain moisture. The upper open end of glass chimney was covered with black muslin cloth and was tightened with rubber band. The diet (sugar: yeast extract: honey: distilled water: casein 3g: 2.5gm: 2.5gm: 10 ml : 2.0gm) provided with intervals of 24 hours. Eggs laid by female green lacewing on the walls of chimney and muslin cloth were harvested. After hatching the newly hatched larvae were fed on frozen eggs of *Sitotroga cerellela*. The process continued until the formation of cocoons. The cocoons formed were removed gently with camel hair brush to other empty glass chimneys to observe and record the emergence of adults.

Statistical analysis:

The reduction percentages of infestation by compounds and by predators were calculated according to the equation of
Henderson and Tilton (1955). (ANOVA) of the obtained data were performed by using SAS program (SAS Institute, 1988)

RESULTS AND DISCUSSION

Data represented in (Table 1 and Fig. 1) indicated that interaction of *C. undecimpunctata* and *C.. carnea* caused insignificant suppressed of *M. persicae* population on tomato plants during two seasons 2010 and 2011. Data showed that the suppression of *M. persicae* by releasing (*C. undecimpunctata* and *C. carnea*), (*C. carnea*) and (*C. undecimpunctata*) on tomato plants during two successive seasons. The results revealed that aphid population before released were (126, 120, 114 and 129, 123, 134 individuals/plant) while it recorded on control (89, 101, 96 and104, 88, 112 individuals /plant) for the three treatments during two season respectively. Obtained data confirmed that predators releasing caused reduction percentages on *M. persicae* population compared with control during two successive seasons. During first season, *M. persicae* population achieved (8, 6 and 4 individuals /plant) after *C. undecimpunctata* and *C. carnea* released on 5^{th}; 7^{th} and 14^{th} days. While aphid population recorded (12, 9 and 7 individuals /plant) after releasing of *C. undecimpunctata* on 5^{th}; 7^{th} and 14^{th} days, and releasing *C. carnea* reduced the aphid population to reach (15, 11 and 5 individuals /plant) on 5^{th}; 7^{th} and 14^{th} days after predator releasing. In addition, the reduction of *M. persicae* population continuing to second season compared with control which recorded (12, 9 and 5 individuals /plant) after releasing C. *undecimpunctata* and *C. carnea* on 5^{th}; 7^{th} and 14^{th} days respectively. Whereas after releasing *C. carnea* the aphid insects population achieved (16, 13, 9 individuals /plant) on 5^{th}, 7^{th} and 14^{th} days respectively. Also, in case of releasing C. *undecimpunctata* the aphid insects population achieved (19, 10, 8 individuals /plant) on 5^{th}; 7^{th} and 14^{th} days respectively.

The suppression percentages of *M. persicae* individuals were (86.0, 82.8, 80.2 and 84.5, 73.0, 77.6%) on 5^{th} days after releasing with three treatments for the first and second seasons respectively. Then after 7 days of predators releasing the suppression percentage of *M. persicae* individuals were (89.1, 86.5, 82.6 and 86.8, 77.5, 86.0%) with three treatments for the first and second seasons respectively. At the end of the experiment, after two weeks of predators released, the reduction percentages reach its maximum (91.2, 86.0 and 89.7 %) and (91.3, 79.7% and 86.5%) for the three treatments during two seasons 2010 and 2011 respectively. Generally in all cases, the numbers of consumption aphids had been eaten did not differ between three different treatments. These results agree with Zibai and Hatami (2001) who investigated the efficiency of the ladybirds *Hippodamia variegata* (Goeze) and /or *C. carnea* (Stephens) as biological control agents of the cotton aphid *A. gossypii*. The predator: prey ratios of 1:30 and 1:90 significantly reduced the population of *A. gossypii*. At 1:30 and 1:90 there was no difference in efficiency between the uses of the predators alone or in combination. Also, Wiethoff *et al.* (2002) tested two antagonist combinations, the parasitoid *Aphidius colemani* (Viereck) with the predator species *C. carnea* (Stephens) against *Myzus persicae* (Sulz.) on sweet pepper plants. They reported cleared that, compared to the release of the parasitoid alone the aphid mortality was increased slightly than combined release of parasitoid

and predator. Lambert *et al.* (2005) indicated that biological control of whitefly on tomato plants in greenhouse using *Encarsia formosa* (Gahan) only was not effective in winter season. The addition of *Eretmocerus eremicus* (Rose and Zolnerowich) and *Dicyphus Hesperus* (Knight) had the positive effect in several cropping systems, *D. Hesperus* was the effective predator of all stages of whitefly. Also, Ghabeish *et al.* (2010) evaluated the prey preference of the omnivorous bug *Dicyphus tamaninii* (Wagner) (Heteroptera: Miridae) among 5 different prey species, and its interaction between three different natural enemies *Amblyseius cucumeris* (Oudemans) *Phytoseiulus persimilis* (Athias-Henriot) and *Aphidius colemani* (Viereck) commonly used in greenhouses. The results demonstrated that *A. cucumeris*, *P. persimilis*, and *A. colemani* individuals were attacked by *D. tamaninii* in absent of unparasitized *A. gossypii*.

Table (1): Interaction between *Coccinella undecimpunctata* (L.) and *Chrysoperla carnea* (Stephens) against *Myzus persicae* (Sulzer) infesting tomato plants .

Treatment	No. of *M . persicae* / plant before release		No. of *Myzus persicae* / plant after release (%)					
			5th day		7th day		14th day	
1- First year	No.		No.	%	No.	%	No.	%-
Chrysoperla carnea + Coccinell undecimpunctata	126		8	86	6	89.1	4	91.2
Control	89		80	-	77	-	65	-
Chrysoperla carnea	120		12	82.8	9	86.5	7	86
Control	101		84	-	80	-	60	-
Coccinella undecimpunctata	114		15	80.2	11	82.6	5	89.7
Control	96		91	-	76	-	58	-
2. Second year								
Chrysoperla carnea + Coccinell undecimpunctata	129	-	12	84.5	9	86.8	5	91.3
Control	104	-	93	-	82	-	69	-
Chrysoperla carnea	123	-	16	73	13	77.5	9	79.7
Control	88	-	83	-	81	-	62	-
Coccinella undecimpunctata	134	-	19	77.6	10	86	8	86.5
Control	112	-	102	-	86	-	71	-

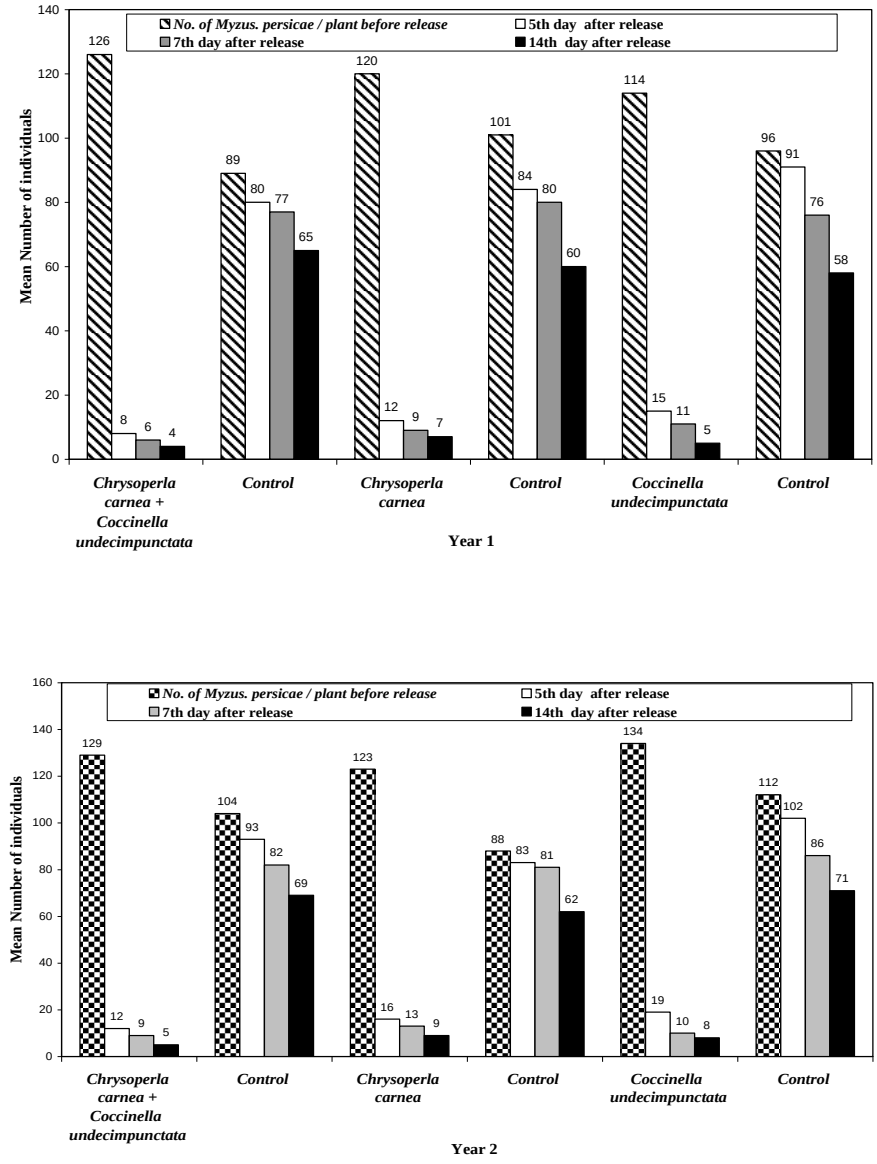

Fig. (1): Interaction between *Coccinella undecimpunctata* (Reiche) and *Chrysoperla carnea* (Stephens) against *Myzus persicae* (Sulzer) infesting tomato plants *Lycopersicon esculentum* L. during two successive seasons.

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كفأة أبو العيد ذو الإحدى عشر نقطة و أسد المن كعنصر من عناصر لمكافحه البيولوجية لمكافحة Myzsus persica (sulzer) الذي يصيب نباتات الطماطم

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****معهد بحوث وقاية النبات –الدقى**

أوضحت الدراسة أن الفرق فى نسبة الخفض خلال موسمي الدراسة عند مكافحة حشره *Myzsus persica* بواسطة إطلاق المفترسين أبو العيد ذو الإحدى عشر نقطة و أسد المن على كانت غير معنوية. و حيث وصلت نسبة الخفض بعد خمسة أيام من الاطلاق لحشرة المن فى الثلاثة معاملات من المفترس أسد المن + ابو العيدالاحدى عشرة نقطة و المفترس أسد المن والمفترس ابو العيدالاحدى عشرة نقطة منفردين كل على حدة على نبات الطماطم (٨٦.٠و٨٢.٨و٨٠.٢%) و (٨٤.٢و ٧٣.٠ و٧٧.٦ %)خلال الموسمين ٢٠١٠&٢٠١١ بينما كانت نسبة الخفض بعد أسبوعين فى المعاملات من أطلاق المفترسات ضد حشرة *Myzsus persica*. (٩١.٢و ٨٦.٢ و٨٩.٧ & ٩١.٣ و٧٩.٧ و ٨٦.٥) فى السنة الاولى والثانية على التوالى .

قام بتحكيم البحث

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