

SURVEY OF PESTS AND THEIR ASSOCIATED NATURAL ENEMIES ON SIX CANTALOUPE *CUCUMIS MELO* L. VARIETIES IN QAHA REGION, QUALYOBIA GOVERNORATE, EGYPT

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Abstract

Sampling of six cantaloupe varieties namely Ideal, E81- 065, Mirella, Vicar, E81- 013 and Magenta was conducted in summer plantation during two successive growing seasons (2006 and 2007) to determine the pests and their associated natural enemies on cantaloupe in Qaha region of Qalyobia Governorate. Two sampling techniques were conducted, water traps filled with water and detergent (pit- fall traps) and direct field observations followed by laboratory examination. Two arthropod classes were recorded during the present study (Insecta and Arachnida). At the present survey, there is a complete systematic arrangement of orders, suborders, superfamilies and families. Frequency of different species, developmental stages, sites and periods of occurrence were recorded. Insecta was represented by thirty seven species belonging to twenty one families of six insect orders, Hemiptera, Lepidoptera, Orthoptera, Thysanoptera, Neuroptera and Dermaptera.

Twenty Hemipterous species were recorded belonging to 10 families (Aleyrodidae, Aphididae, Cicadellidae, Margarodidae, Lygaeidae, Reduviidae, Pentatomidae, Pyrrhocoridae, Cydnidae and Anthocoridae). Our observations indicated that *Bemisia tabaci* Genn. was the most abundant and major pest infesting cantaloupe. High populations were recorded for *Goniagnatus guttinerius* Kbm. (Fam. Cicadellidae), *Remaudiereana annulipes* Bar. and *Henestaris laticeps* Jak. (Fam. Lygaeidae). Moderate populations from *Nezara viridula* L. (Fam. Pentatomidae) and *Myzus persicae* (Sulzer) (Fam. Aphididae) were also observed. On the other hand, other Hemipterous species were found at low levels. All of these species considered as pests except two predator species (*Coranus aegyptius* F., Reduviidae and *Orius albidipennis* (Reuter), Anthocoridae).

Lepidoptera represented by 7 insect pests belonging to four families (Pieridae, Noctuidae, Nymphalidae and Lycaenidae). Order Orthoptera in the present survey represented by 5 insect pests belonging to three families (Gryllotalpidae, Gryllidae and Acrididae).

Thysanopterans was represented by a serious and destructive pest, *Thrips tabaci* Lind. and *Scolothrips sexmaculatus* Hinds. which considered as predator, and these two species belonging to family Thripidae.

Neuroptera was represented by two species, *Cueta variegata* Klug. and *Chrysoperla carnea* Steph. and both of them belonging to predatory families (Myrmeleonidae and Chrysopidae).

In the present study, there is only one predatory species *Labidura riparia* Pall. (Dermaptera: Labiduridae).

Arachnida was represented by eighteen species belonging to fourteen families of two orders (Acarina and Araneida). All of the recorded Acarine species are pests except *Phytoseiulus persimilis* (Fam. Phytoseiidae) which considered as predator. These species belonging to five families (Tetranychidae, Tarsonemidae, Tydeidae, Acaridae and Phytoseiidae). The most abundant species of these Acarine was *Tetranychus urticae* Koch. (Fam. Tetranychidae) and all of the other species were found in low levels. On the other hand, *Tydeus sp* (Fam. Tydeidae) and *Tyrophagus putrescentiae* (Schrank) (Fam. Acaridae) were found in a moderate levels.

Our observations clearly indicated that there are 12 species of true spiders (Araneida) belonging to 9 families and the most abundant species was *Thanatus albini* Audouins (Fam. Philodromidae). From these findings one can say that true spiders can play an important and vital role as biological control agents against pests recorded in this study.

INTRODUCTION

In Egypt, cantaloupe, *Cucumis melo* L. (Cucurbitaceae) is considered one of the most important tasty nutrition vegetable, which add lots of vitamin A and C to human diet. Cantaloupe, consumed also locally for its high quality of nutrients. In 1963 Watt and Merrill found that each of 100 gm cantaloupe contains considerable amount of water, protein, fats, carbohydrates, fiber, ash, calcium, phosphorous, iron, sodium, potassium, plus different groups of vitamin B such as [Thiamin (vit. B₁), Riboflavin (vit. B₂) and Niacin (vit. B₃)] and Ascorbic acid. It is well known that this crop contains different other vitamins, fatty acids, oils and it can be extracted to obtain an enzyme which may have clinical benefits. It is promising cucurbitaceous vegetable crops grown in the open field as well as in greenhouses. Recently, to accommodate exportation requirements and also to increase cultivated area of this crop, it is necessary to cultivate some of promising new varieties.

According to the report published in 2007 by Economic Affairs Sector, Egyptian Ministry of Agriculture, the cultivated area of cantaloupe reached in summer and winter plantations about 64068 and 12574 feddan, respectively, in the open field producing about 674146 and 151341 tons, respectively and about 15750m² in nili plantation in greenhouses producing about 270 tons in different Governorates. This vegetable crop is subjected to be attacked by many harmful phytophagous arthropod species from seedling period up to harvesting. These pests causes large amount of damage and significant losses

in cantaloupe yield not only in Egypt but also in many other countries of the world. According to literatures, one can say that the natural enemies notably predator species associated with these pests play an important role as biological control agents.

According to recent Integrated Pest Management strategies which depend mainly on the natural enemies besides the other effective and safe control methods, aiming to avoid extensive use of pesticide which have serious effects on the ecosystem, pest resistance and disturbance of natural balance. The current findings were mostly built up in order to survey and spot light mainly on the developmental stage, frequency, sites and period of occurrence of different insect pests, Arachnids and their associated natural enemies occurring on different six cantaloupe varieties during summer plantation in two successive seasons (2006 and 2007) at Qaha region, Qalyobia Province to provide us by information about biological control agents which considered as main factor in Integrated Pest Management (I.P.M.).

MATERIALS AND METHODS

Present investigation was carried out for two successive growing seasons on summer plantation of 2006 and 2007 at Plant Protection Research Institute Station at Qaha region, Qalyobia Governorate to survey different arthropod pests and associated natural enemies on cantaloupe plants. During the two studied seasons, an area of about 2100m² was cultivated with six cantaloupe varieties namely Ideal, E81-065, Mirella, Vicar, E81-013 and Magenta. Each variety was cultivated in 350m² with three replicates (of about 116.67 m² each). Seeds were sown on April 13th, 16th for 2006 and 2007, respectively, at a distance of 30cm between hills. Replicates were arranged in a randomized complete block design. Regular agricultural treatments for cultivation of cantaloupe were received and no chemical control was applied from sowing seeds till the end of growing season on August. The survey was carried out by using two sampling technique methods:

- 1- Water traps filled with water and detergent (pit-fall traps), distributed between plants in considerable distance during only 2006 season.
- 2- Direct field observation followed by laboratory examination which were carried out during two investigated seasons.

Sampling technique

Pit-fall traps, 10 cm diameter and 14 cm depth (filled with water and detergent) were installed at 14cm below soil surface after 32 days from sowing date (they were located one trap per replicate). Each trap was replaced by a new one every 5 days throughout the first season of study. The trap catches were transferred to the laboratory where pests and natural enemies were obtained by using a sieve

plate to isolate the different species in the same day. In the second sampling technique method sampling started about two weeks from cultivation date and continued 15 weeks during the two seasons. One hundred and eighty leaf samples were randomly picked out from cantaloupe plants. A primary examination was made by naked eyes, in the field, then samples were kept separately in polyethylene bags and transferred to the laboratory. All of the collected species from both sampling techniques were isolated and counted either by naked eyes (in case of large insect species) or by aid of stereomicroscope. Some of these species can be identified immediately, but others were difficult to be known, so they were assorted into orders then into species and preserved in vials containing 70% ethanol alcohol to be identified.

The population of the most abundant and major pests infesting cantaloupe were estimated by counting the total numbers per two square inches on the underside of leaf with *Bemisia tabaci* (Genn.) [egg and nymphal stages] and *Tetranychus urticae* (Koch.) [egg and motile stages], however, the total individuals [nymphs+ adults] of *Thrips tabaci* (Lind.) were determined by counting the total number per the whole underside leaf, the same counting was adopted for *Myzus persicae* (Sulzer) [nymphs + adults] and adults of *Aphis gossypii* (Glover). The other different pests and predators recorded on leaves of cantaloupe varieties were estimated by counting the total number on both leaf sides.

A label including all necessary information concerning locality, date of collection and name of the host plant (cantaloupe) was stuck on a vial of each unknown specimen, also the abundance and the developmental stage of species were considered. Identification of insect species which belong to order Hemiptera was carried out in Survey and Taxonomy Research Department while, identification of true spiders (Araneids) were conducted in Cotton and Field Crop Mite Research Department. Some Acarine species were identified in Vegetable Mite Research Department at Plant Protection Research Institute. The other insect species belonging to orders Lepidoptera, Orthoptera, Thysanoptera, Neuroptera and Dermaptera were identified by the authors.

RESULTS AND DISCUSSION

Data in Table (1) indicate that there are 37 insect species belonging to six insect orders under investigation, however, all of these species are pests except 6 species considered as predators. Arachnids represented by two orders (Acarina and Araneida), the first one comprises only 6 species belonging to 5 families, one of these species considered as predator, and the second order represented by 12 species belonging to 9 families, however, all of these species are predators.

Table 1. Insect pests, natural enemies and Arachnids associated with six cantaloupe *C. melo* L. varieties at Qaha region, Qualyobia Governorate during two successive seasons 2006 and 2007

Class	Order	Super family	Family	Species	Pests	Predators
I- Insecta	Hemiptera	-	10	20	18	2
	Lepidoptera	-	4	7	7	-
	Orthoptera	-	3	5	5	-
	Thysanoptera	-	1	2	1	1
	Neuroptera	-	2	2	-	2
	Dermaptera	-	1	1	-	1
Total			21	37	31	6
II-Arachnida	Acarina	5	5	6	5	1
	Araneida	-	9	12	-	12
Total		5	14	18	5	13

The following is full account on the survey studies dealing with the above mentioned classes:

I- Class: Insecta

1- Order: Hemiptera

This order comprises two suborders (Homoptera and Heteroptera). Suborder Homoptera comprises a vast assemblage of forms ranging in size from the often microscopic Coccidae to the large tropical lantern bugs (Fulgoridae) and the cicads which may be as long as 5 cm with a wing expand of 10 cm. As shown in Table (2), all of homopterous species practically are polyphagous and mostly injurious to agriculture.

Suborder Homoptera is divided in the present survey into four families: Aleyrodidae, Aphididae, Cicadellidae and Margarodidae. All species which belong to

these families were observed on cantaloupe leaves ranging from few individuals to high populations except for Aleyrodids (whiteflies) which occurred as the most abundant species from April – August (the whole period of the studied seasons). *B. tabaci* Genn., the most widely distributed species in the greenhouses, it being a general feeder and has now become through commerce a cosmopolitan species. In the present survey, it is represented by eggs and nymphs. Aphididae represented here by two species, *M. persicae* (Sulzer) which observed on leaves of cantaloupe during April- August in moderate population as nymphs and adults, and *A. gossypii* (Glover) was observed in few individuals as adults during May and July. The third homopterous family is Cicadellidae which was represented by three species considered as pests, two of them observed as few individuals (*Opsius bipunctatus* F. and *Empoasca lybica de-Berg*), and the third one observed on cantaloupe leaves in high population during period extended from July – August was *Goniagnatus guttuinerius* Kbm.

Family Margarodidae is a comparatively small one but is widely distributed in all parts of the world. The most important genus is *Icerya*. In the present study nymphs of *Icerya purchasi* Maskell were observed in few numbers on the cantaloupe leaves during June.

Suborder Heteroptera as shown in Table (2) was represented by six families. All species belonging to these families considered as pests except two species *Coranus aegyptius* F. (Fam. Reduviidae) and *Orius albidipennis* Reuter (Fam. Anthocoridae) which are predators.

It is clear from our observations that *Henestaris laticeps* Jak. and *Remaudiereana annulipes* Bar. (Fam. Lygaeidae) were observed in high populations infesting cantaloupe plants during May- August.

2- Order: Lepidoptera

This order is divided into two suborders, one of them, Ditrysia which represented in the present study by four families (Pieridae, Noctuidae, Nymphalidae and Lycaenidae). All species belonging to these families are pests infested cantaloupe leaves and found as few individuals inhabited cantaloupe varieties during May- July. The recorded species were *Pieris rapae* L., *P. brassica* L., *Spodoptera littoralis* (Boisd.), *Agrotis ipsilon* Rott., *Autographa chalyces* L., *Vanessa cardui* L. and *Cosmlyce baeticus* L. (Table. 3).

3- Order: Orthoptera

This order divided into two suborders (Ensifera and Coelifera). Ensifera was represented by two families Gryllotalpidae and Gryllidae (Table. 4). *Gryllotalpa gryllotalpa* L., found in soil during August, is among the most astonishing members of the order. These insects are often responsible for considerable injury to cultivated

crops. *Gryllus bimaculatus* and *G. domesticus* were found as adults in soil during June- July.

Suborder Coelifera represented here by only one family (Acrididae) which contains two insect pests infesting leaves of cantaloupe varieties. Author's observations indicated that the Acrids adults recorded at periods extended from May up to July.

4- Order: Thysanoptera

The members of this order form a homogenous group readily distinguished from other insects by their characteristic small size, shape, and structures including especially the peculiar fringed wings which appear only in certain other very small insects. This order is divided into two suborders (Terrebrantia and Turbulifera). As shown in Table (4) it is clear that there was only one Terrebrantian family (Thripidae), and this family represented by two species *T. tabaci* Lind. and *Scolothrips sexmaculatus* Hinds. Thrips injure plants by destroying the cells of the living leaves, buds, flowers, and fruit tissues, by causing sterility, and also by disseminating bacterial, viruses and fungus diseases.

T. tabaci considered one of the most abundant species in the present survey as nymphs and adults during April- August. On the other hand, *S. sexmaculatus* is a predator recorded on cantaloupe leaves during May- July in a few numbers.

5- Order: Neuroptera

Data in Table (5) indicated that there are two families belonging to this order (Myrmeleonidae and Chrysopidae). Myrmeleonidae is the dominant family of the order and has no less than 40 genera and about 650 species. The most common Egyptian genus is *Cueta*, which represented here by larvae and adults of *C. variegata* Klug. (ant lion) on leaves of cantaloupe varieties as few individuals during May- August, and this species considered as predator. The Chrysopidae comprise a large family of some 25 genera and 420 species. The dominant predacious genus in Egypt, *Chrysoperla*, is a cosmopolitan one and is very well known wherever it occurs. *Chrysoperla carnea* Steph. is one of the largest species observed as eggs, larvae and adults on cantaloupe leaves during May- July, however, it is also predator on some pests infesting cantaloupe plants. All of Neuropterans recorded in the present study play an important role as biological control agents.

6- Order: Dermaptera

As shown in Table (5) this order represented by one family (Labiduridae). This family contains the largest earwig, *Labidura riparia* Pall. which considered as predator observed on the cantaloupe leaves during July.

II- Class: Arachnida

Arachnids are arthropods with fully chitinized exoskeleton. During the current study, this class was represented by two orders (Acarina and Araneida).

1- Order: Acarina

This order represented by five families (Tetranychidae, Tarsonemidae, Tydeidae, Acaridae and Phytoseiidae). The first family is represented in the present study by two species, 1st one (the most abundant) is *T. urticae* Koch. which was found as eggs and motile stages during April – August. The 2nd one is *Eutetranychus orientalis* (Klean) which was found as motile stages during August. Family Tarsonemidae was represented only by one species, *Tarsonemus sp* as motile stages on leaves in few individuals during period of April- August. *Tydeus sp* belonging to family Tydeidae was found as motile stages infested cantaloupe leaves in moderate population during June- August. The fourth family (Acaridae) was represented by one species, *Tyrophagus putrescentiae* (Schrank) observed as motile stages in moderate population during August (Table.6). On the other hand, family Phytoseiidae was represented only by the Acarine predator, *Phytoseiillus persimilis* which observed as motile stages on plant leaves in few individuals during period extended from April to August (Table. 7).

2- Order: Araneida

It is quite clear from our observations presented in Table (7) that this order represented by nine families, however, all recorded species are considered as predators affecting the infestation rates of pests infesting the different varieties of cantaloupe plants.

All of the true spiders were observed on the plant leaves except one species recorded on flowers, *Misumena vatia* (Fam. Thimosidae) during July. The observed true spider families in our survey were (Araneidae, Philodromidae, Lycosidae, Uloboridae, Salticidae, Dictynidae, Linyphiidae, Theridiidae and Thimosidae). The most abundant predator was *Thanatus albini* (Audouins) which observed as immature stages and adults during August. From results obtained in Table (7), one can say that these predator may be found as adults or immature stages (spider ling) according to the Araneid species.

According to sampling for insect pests of cantaloupe, Edelson (1986) compared between two sampling methods (visual observations, a combined suction and visual technique).

Evaluation of three sampling methods for estimating adults sweet potato whitefly [yellow sticky trap, visual (leafturn) and modified vacuum (Handvac)] were compared over a 2- year period to determine sampling reliability for estimating adult

population levels of *B. tabaci* on cantaloupe *C. melo* (Palumbo *et al.*, 1995). Survey in Japan during 1989 and 1990 was carried out by Matsui and Nakashima (1992) revealed that *B. tabaci* considered one of the most destructive pests of melon, cucumber and squash in greenhouses. Field survey was conducted to determine crops infested with *Thrips palmi* by Kajita *et al.*, 1996. These crops included cucumber, squash, watermelon, and many other vegetable crops. Similar studies were carried out by Geraud *et al.*, 1998 who recorded in their survey during 1989- 94 different arthropods associated with melon in north western Venezuela. In 2002 Boll *et al.* found that melon crops affected by a range of pests, especially *A. gossypii*.

Natural enemies of *B. tabaci* were recorded by Oliveria *et al.*, 2003 in field and vegetable crops including melon. Yellow sticky traps were used to monitor two piercing – sucking insects, whiteflies, *Bemisia spp.* and *Thrips spp.* on cucurbit plants during May and June 2001 in Saudi Arabia (Al- Ajaln, 2005). *Bemisia tabaci* destroyed melon crops and seriously damaged other vegetables, ornamental and row crops (Chu *et al.*, 2007). The authors developed a whitefly trap (named the CC trap) that could be left in the field for extended times periods, however, these traps were used to monitor populations of *B. tabaci* adults during year- round samplings from 1996 to 2002 to study the variations in the weekly traps catches of the insect.

CONCLUSION

It is quite clear from the obtained results and observations in the present study that *B. tabaci* Genn., *T. tabaci* Lind. and *T. urticae* Koch. were the most dominant and injurious pests attacking all of the six cantaloupe varieties. On the other hand, *C. carnea* Steph., *O.albidipennis* (Reuter) and different species of true spiders (Araneids) were the active predators, so they have many pest preys on cantaloupe such as *B. tabaci*, *T. tabaci*, aphids, phytophagous mites, eggs, immature stages and adults of different insect pests.

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I- Class: Insecta

Table 2. Survey on Hemipterous pests and natural enemies associated with six cantaloupe (*C. melo* L.) varieties at Qaha region, Qualyobia Governorate during two successive growing seasons 2006 and 2007

Taxonomic category	Scientific name	Insect stage	Site of occurrence	Frequency	Relationship	Period of occurrence
Suborder:						
A- Homoptera						
Family:						
1- Aleyrodidae	<i>Bemisia tabaci</i> (Genn.)	Eggs and nymphs	Leaves	⊙ + + +	Pest	April- August
2- Aphididae	<i>Myzus persicae</i> (Sulzer)	Nymphs and adults	Leaves	** + +	Pest	April- August
	<i>Aphis gossypii</i> (Glover)	Adults	Leaves	* +	Pest	May, July
3- Cicadellidae	<i>Opsius bipunctatus</i> F.	Adults	Leaves	+	Pest	July
	<i>Empoasca lybica de-Berg</i>	Nymphs	Leaves	+	Pest	May- July
	<i>Goniagnatus guttinerius</i> Kbm.	Nymphs and adults	Leaves	*** + + +	Pest	July - August
4- Margarodidae	<i>Icerya purchasi</i> Maskell	Nymphs	Leaves	+	Pest	June
B-Heteroptera						
Family:						
1- Lygaeidae	<i>Remaudiereaana annulipes</i> Bar.	Nymphs and adults	Leaves	+ + +	Pest	June- August
	<i>Henestaris laticeps</i> Jak.	Nymphs and adults	Leaves	+ + +	Pest	May- August
	<i>Nysius sp</i>	Nymphs	Leaves	+	Pest	July- August
	<i>Oxycarenus hyalinipennis</i> Costa	Adults	Leaves	+	Pest	July
2- Reduviidae	<i>Coranus aegyptius</i> (F.)	Nymphs and adults	Leaves	+	Predator	July- August
3- Pentatomidae	<i>Nezara viridula</i> L.	Eggs and adults	Leaves	+ +	Pest	May- August
	<i>Nezara millierei</i> M. R.	Nymphs and adults	Leaves	+	Pest	July- August
	<i>Eusarcoris ventralis</i> (Her. and Sch.)	Nymphs and adults	Leaves	+	Pest	July - August
	<i>Eusarcoris sp</i>	Adults	Leaves	+	Pest	August
	<i>Eurydema ornatum</i> (L.)	Adults	Leaves	+ +	Pest	June
4- Pyrrhocoridae	<i>Scantius aegyptius</i> (L.)	Nymphs and adults	Leaves	+	Pest	July- August
5- Cydnidae	<i>Geotomus elongatus</i> (Her. and Sch.)	Nymphs and adults	Leaves	+	Pest	July- August
6- Anthorcoridae	<i>Orius albidipennis</i> (Reuter)	Nymphs and adults	Leaves	+ +	Predator	April- August

* Few individuals were recorded in the present survey.

** Moderate population // // // // //

*** High population // // // // //

⊙ Most abundant species // // // // //

Table 3. Survey on Lepidopterous insects attacking six varieties of cantaloupe (*C. melo* L.) at Qaha region, Qalyobia Governorate during two successive seasons 2006 and 2007

Taxonomic category	Scientific name	Insect stage	Site of occurrence	Frequency	Relationship	Period of occurrence
Suborder:						
Ditrysia						
Family:						
1- Pieridae	<i>Pieris rapae</i> L.	Adults	Leaves	* +	Pest	June- July
	<i>Pieris brassica</i> L.	Adults	Leaves	+	Pest	July
	<i>Spodoptera littoralis</i> (Boisd.)	Larvae	Leaves	+	Pest	June- July
2- Noctuidae	<i>Agrotis ipsilon</i> Rott.	Eggs	Leaves	+	Pest	May- June
	<i>Autographa chalyces</i> L.	Larvae	Leaves	+	Pest	May- June
3- Nymphalidae	<i>Vanessa cardui</i> L.	Adults	Leaves	+	Pest	July
4- Lycaenidae	<i>Cosmlyce baeticus</i> L.	Adults	Leaves	+	Pest	July

* Few individuals were recorded in the present survey.

Table 4. Incidence of Orthopterous and Thysanopterous insects occurring on six varieties of cantaloupe (*C. melo* L.) at Qaha region, Qalyobia Governorate during two successive growing seasons 2006 and 2007

Taxonomic category	Scientific name	Insect stage	Site of occurrence	Frequency	Relationship	Period of occurrence
1- Order:						
Orthoptera						
Suborder:						
A- Ensifera						
Family:						
1- Gryllotalpidae	<i>Gryllotalpa gryllotalpa</i> L.	Adults	Soil	*+	Pest	August
	<i>Gryllus bimaculatus</i>	Adults	Soil	**+ +	Pest	June- July
2- Gryllidae	<i>Gryllus domesticus</i> (L.)	Adults	Soil	+	Pest	July
B- Coellifera						
Family:	<i>Acrotylus insubricus</i> (Scop.)	Adults	Leaves	***+ + +	Pest	May - July
Acrididae	<i>Anacridium aegyptium</i> L.	Adults	Leaves	+ +	Pest	June-July
2- Order:						
Thysanoptera						
Suborder:						
Terrbrantia						
Family:						
Thripidae	<i>Thrips tabaci</i> Lind.	Nymphs and adults	Leaves buds and flowers	⊕+ + +	Pest	April- August
	<i>Scolothrips sexmaculatus</i> Hinds.	Adults	Leaves	+	Predator	May- July

* Few individuals were recorded in the present survey.

** Moderate population // // // // //.

*** High population // // // // //.

⊕ Most abundant species // // // // //.

Table 5. Survey on Neuropterous and Dermapterous insects associated with six varieties of cantaloupe (*C. melo* L.) at Qaha region, Qalyobia Governorate during two successive seasons 2006 and 2007

Taxonomic category	Scientific name	Insect stage	Site of occurrence	Frequency	Relationship	Period of occurrence
1- Order: Neuroptera Family:						
1- Myrmeleonidae	<i>Cueta variegata</i> Klug.	Larvae and adults	Leaves	*+	Predator	May- August
2- Chrysopidae	<i>Chrysoperla carnea</i> Steph.	Eggs, larvae and adults	Leaves	+	Predator	May- July
2- Order: Dermaptera Family:						
Labiduridae	<i>Labidura riparia</i> Pall.	Adults	Leaves	+	Predator	July

* Few individuals were recorded in the present survey.

II- Class: Arachnida

Table 6. Survey on Arachnid pests recorded during two successive growing seasons (2006 and 2007) on six cantaloupe varieties (*C. melo* L.) at Qaha region, Qalyobia Governorate

Taxonomic category	Scientific name	Acarine stage	Site of occurrence	Frequency	Period of occurrence
Order: Acarina Suborder: A- Prostigmata 1- Superfamily: Tetranychoidae Family: Tetranychidae	<i>Tetranychus urticae</i> Koch.	Eggs and motile stages	Leaves	⊙ + + +	April- August
	<i>Eutetranychus orientalis</i> (Klean)	Motile stages	Leaves	* +	August
2- Superfamily: Tarsonemoidea Family: Tarsonemidae	<i>Tarsonemus sp</i>	Motile stages	Leaves	+	April – August
3- Superfamily: Tydeioidea Family: Tydeidae	<i>Tydeus sp</i>	Motile stages	Leaves	** + +	June- August
B- Acaridida (Astigmata) Superfamily: Acaroidea Family: Acaridae	<i>Tyrophagus putrescentiae</i> (Schrank)	Motile stages	Leaves	++	August

* Few individuals were recorded in the present survey.

** Moderate population // // // // //.

⊙ Most abundant species // // // // //.

Table 7. Survey of Arachnid predators recorded on six varieties of cantaloupe (*C. melo* L.) at Qaha region, Qalyobia Governorate during two successive seasons 2006 and 2007

Taxonomic category	Scientific name	Arachnid stage	Site of occurrence	Frequency	Period of occurrence
Order:					
Araneida					
Family:					
1- Araneidae	<i>Argiope trifasciata</i>	Adults	Leaves	* +	July
2-Philodromidae	<i>Philodromus rufus</i>	Adults	Leaves	+	June
	<i>Philodromus sp</i>	Adults	Leaves	+	July- August
	<i>Thanatus albini</i> (Audouins)	Adults	Leaves	*** + + +	August
	// //	Immature stages	Leaves	+	August
3- Lycosidae	<i>Lycorma ferox</i>	Adults	Soil	+	May and August
	// //	Immature stages	Soil	+	May - August
4- Uloboridae	<i>Uloborus waickenaerius</i>	Adults	Soil	+	June
	// //	Immature stages	Soil	+	July- August
5-Salticidae	<i>Neotha oculata</i>	Adults	Leaves	+	June and August
	// //	Immature stages	Leaves	+	June - August
	<i>Zygoballus bettimi</i>	Adults	Leaves	+	August
	// //	Immature stages	Leaves	+	June- August
6-Dictynidae	<i>Dictyna valucipes</i>	Immature stages	Leaves	+	August
7- Linyphiidae	<i>Helophora sp</i>	Immature stages	Soil	+	July
8-Theridiidae	<i>Steatoda albomaculatus</i>	Immature stages	Leaves	+	May and July
9- Thimosidae	<i>Misumena vatia</i>	Adults	Flowers	+	July
Order:					
Acarina					
Superfamily:					
Phytoseioidea					
Family: Phytoseiidae	<i>Phytoseiulus persimilis</i>	Motile stages	Leaves	+	April - August

* Few individuals were recorded in the present survey.

*** High population // // // // //

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حصر للآفات والأعداء الحيوية المصاحبة لها على ستة أصناف
من الكنتالوب *Cucumis melo* L. في منطقة
قها بمحافظة القليوبية - مصر

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تم عمل حصر للآفات والأعداء الحيوية المصاحبة لها ضمن دراسة بيئية على ستة أصناف
كنتالوب (Ideal, E81- 065, Mirella, Vicar, E81- 013, Magenta) في العروة الصيفية خلال
موسمين متعاقبين (٢٠٠٦ و ٢٠٠٧) في منطقة قها بمحافظة القليوبية. تم استخدام طريقتين من طرق
أخذ العينات، وهما: المصائد المائية التي تحتوي على ماء وdetergent (مصائد السقوط الأرضية)
وطريقة العد المباشر في الحقل والتي يعقبها الفحص المعمل. أوضحت الدراسة وجود طائفتين من
مفصليات الأرجل (طائفة الحشرات وطائفة العنكبوتيات). وقد تم أيضاً من خلال الدراسة الحالية
عمل ترتيب تسمي كامل للأصناف يتضمن الرتب، تحت الرتب، فوق الفصائل، الفصائل. كما تم
تسجيل تعداد الأنواع المختلفة والمرحلة العمرية التي وجدت عليها ومكان وفترة تواجد النوع. لوحظ
تواجد ٣٧ نوع تابعة لطائفة الحشرات في هذه الدراسة وهذه الأنواع تنتمي إلى إحدى وعشرين
فصيلة والتي تنتمي بدورها إلى ست رتب حشرية وهم نصفية الأجنحة، حرشفية الأجنحة، مستقيمة
الأجنحة، هدية الأجنحة، شبكية الأجنحة، جلدية الأجنحة.

لوحظ تواجد عشرون نوع تابعة لرتبة نصفية الأجنحة وهذه الرتب تنتمي إلى عشر فصائل
(Aleyrodidae, Aphididae, Cicadellidae, Margarodidae, Lygaeidae, Reduviidae,
Pentatomidae, Pyrrhocoridae, Cydnidae, Anthocoridae)
كما لوحظ من خلال الحصر الحالي تواجد ذبابة القطن والطماطم البيضاء (*Bemisia*
tabaci Genn.) بكثرة كافة رئيسية للكنتالوب. إضافة إلى ذلك توضح الدراسة وجود تعداد معنوي
ملحوظ للآفات (*Goniagnatus guttuinerius* Kbm. (فصيلة. Cicadellidae)، *Henestaris laticeps*
Jak. و *Remaudiereana annulipes* Bar. (فصيلة. Lygaeidae) في الوقت الذي تواجدت
فيها حشرة البقعة الخضراء *Nezara viridula* L. (فصيلة. Pentatomidae) ومن الخوخ
Myzus persicae (Sulzer) (فصيلة. Aphididae) بتعداد متوسط. وقد وجد أن تعداد بقية الأنواع التابعة
لرتبة نصفية الأجنحة كان منخفضاً. إضافة إلى ذلك فإن كل الأنواع التابعة لهذه الرتبة آفات حشرية
قيماً عدا نوعين من المفترسات: *Coranus aegyptius* F. (فصيلة. Reduviidae) والأرويس *Orius*
albidipennis (Reuter) (فصيلة. Anthocoridae).

- رتبة حرشفية الأجنحة: يتبع هذه الرتبة من خلال الدراسة الحالية سبعة أنواع حشرية تنتمي إلى أربع فصائل (Pieridae, Noctuidae, Nymphalidae, Lycaenidae).
- رتبة مستقيمة الأجنحة: أوضحت الدراسة تواجد خمسة أنواع حشرية تنتمي إلى ثلاثة فصائل (Gryllotalpidae, Gryllidae, Acrididae).
- رتبة هديبة الأجنحة: من خلال الدراسة الحالية لوحظ تواجد الآفة الحشرية الضارة تـربس القطن والبصل *Thrips tabaci* Lind. بالإضافة إلى المفترس *Scolothrips sexmaculatus* Hinds. وهذان النوعان ينتميان إلى فصيلة Thripidae.
- رتبة شبكية الأجنحة: يتبع هذه الرتبة النوعان أسد النمل *Cueta variegata* Klug. وأسد المن *Chrysoperla carnea* Steph. وهما من المفترسات الحشرية ويتبعان فصيلتي (Myrmeleonidae and Chrysopidae).
- لوحظ من الحصر وجود مفترس حشري هو *Labidura riparia* Pall. والذي يتبع فصيلة Labiduridae من رتبة جلدية الأجنحة.
- طائفة العنكبوتيات: يتبع هذه الطائفة ثمانى عشر نوعاً تنتمي إلى أربعة عشرة فصيلة تابعة لرتبتين هما القراديات والعنكبوتيات.
- كل الأنواع التابعة لرتبة القراديات أنواع من الحلم جميعها آفات فيما عدا المفترس *Phytoseiulus persimilis* والذي ينتمي إلى فصيلة Phytoseiidae. وتلك الأنواع تنتمي إلى خمس فصائل: (Tetranychidae, Tarsonemidae, Tydeidae, Acaridae, Phytoseiidae) وكان أكثر أنواع الحلم تواجداً هو الأكاروس العنكبوتي ذي البقعين *Tetranychus urticae* Koch. الذي ينتمي إلى فصيلة Tetranychidae وكل أنواع الحلم الباقية تواجدت بتعداد محدود ما عدا النوعان *Tydeus* sp الذي ينتمي إلى فصيلة Tydeidae والنوع *Tyrophagus putrescentiae* (Schrank) الذي ينتمي إلى فصيلة Acaridae قد تواجدا بتعداد متوسط.
- وقد أسفرت الدراسة عن تواجد اثني عشر نوعاً من العناكب الحقيقية تتبع تسع فصائل جميعها أنواع مفترسة وكان أكثر المفترسات تواجداً هو النوع *Thanatus albini* Audouins. (فصيلة. Philodromidae).
- مما سبق يتضح أن العناكب الحقيقية True spiders يمكنها أن تلعب دور حيوي وهام كأحد عوامل مكافحة البيولوجية للقضاء على الآفات المسجلة قيد الدراسة.