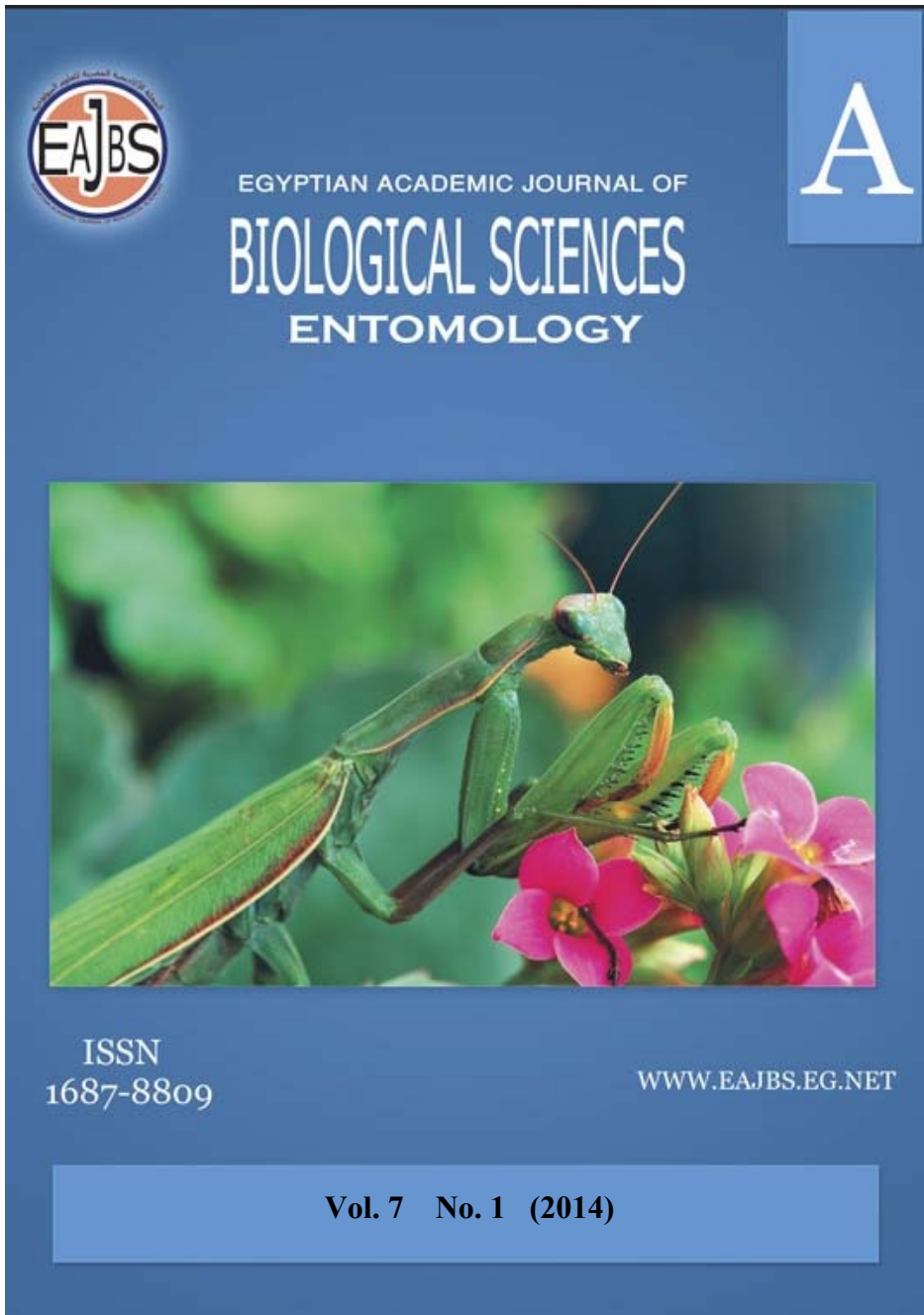


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Susceptibility of some tomato varieties to some pests and predators

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ABSTRACT

This study aimed to study the susceptibility of some tomato plant varieties to some pests and predators population during two successive seasons Nili 2011 and 2012. The obtained results revealed significant differences between the populations mean of *Bemisia. Tabaci* (Genn.) immature stages on Meram and the two other cultivars, while there were no significant differences in population between Rawan and supper-gekal varieties. Also a significant difference between the populations' mean of *Myzus persicae* (Sulzer) on Tomato variety supper-gekal and the two others. The means number of *Coccinella undecimpunctata* and *Scymnus syriacus* were significant between Tomato cultivar supper-gekal and Rawan, while there were no significant differences in population between Rawan, and Meram varieties. In addition, the results revealed that, there are insignificant between the populations of *Orius albidipennis* on the three tested varieties. The differences between the population mean of *Euseius scutalis* Athias-Henriot appeared no significant on the three tested tomato varieties. The data indicated significant differences between the population of *Tetranychus urticae* Koch and *Tetranychus cucurbitacearum* (Sayed).on Meram and the two other varieties.

INTRODUCTION

In Egypt tomato (*Lycopersicon esculentum* L.) as infested with different pests which cause considerable damage in both quantity and quality of the fruits. Some of the species are known to be of great economic importance as *Bemisia tabaci* (Genn.), *Myzus persicae* (Sulzer), *Tetranychus urticae* Koch and *Tetranychus cucurbitacearum* (Sayed). Nomikou *et al.* (2004) and Fargalla, (2005). They cause many indirect damages by transmitting several microorganisms such as viral and fungal pathogens. Phytoseiid mites are of economic importance as natural enemies of various phytophagous mites on many crops. Considered main insect pests infesting Tomato, cause serious damage to the plant, and yield (Abd-El-wahab *et al* (1996); Prabhakar and Roy (2010) and Saethre *et al.* (2011).

MATERIALS AND METHODS

This experiment was carried out in an area of about 400 m² that was cultivated with three Tomato cultivars ('Meram, supper-gekal and Rawan). Seedlings were sowing on Aug. 30th for 2011 and 2012 for nili plantation at Giza Governorate. The

whole area divided into 9 replicates (of about 42 m²). Plantings of each cultivar were sown in three replicates. Normal Agricultural practices followed except for keeping, the whole area free from any pesticides treatment. Sampling started after 15 days from planting, prolonged to the harvesting time, 10 leaves from each replicate and continued weekly until the end of season. The leaves picked handly, put in paper bags and transferred for examining in the laboratory under a stereomicroscope to determine the number of pests and predators.

Statistical analysis:

The statistical analysis (ANOVA and Simple correlation) of the obtained data were performed by using SAS program (SAS Institute, 1988) which run under WIN. Also the difference between means was conducted by using Duncan's multiple range tests in this program.

RESULT AND DISCUSSIONS

1-Whitefly, *Bemisia tabaci*:

Data in Table (1) and Fig. (1) show that the different infestation for the population mean number of immature stages and adults of *B. tabaci* were significantly higher on Rawan cultivars as harbored the highest mean number (173 individuals/ leaf), being significantly differ from Meram variety which showed moderate infestation (160.5 individuals/ leaf).

Table 1: Susceptibility of some tomato varieties to *Bemisia tabaci* (Genn.) infestation during nili seasons at Giza Governorate:

Sampling date	1 st Season: 2011			2 nd Season: 2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no. of Imm.+ adult /leaf	Mean no. of Imm. +adult /leaf	Mean no. of Imm. +adult /leaf	Mean no. of mm.+adult /leaf	Mean no. of Imm. +adult / leaf	Mean no. of Imm. +adult / leaf
Sep 2 nd week	32.5	45.9	55	12	20.3	34
Sep 3 rd week	64	196.5	178	11.5	14.5	26.2
Sep 4 th week	311.5	522	401	15.5	43	32.6
Oct 1 st week	244.6	298	312.5	18	19	26.2
Oct 2 nd week	115	129.9	119.5	12.5	29.5	35.7
Oct 3 rd week	58	89	81.3	29	34.5	41.4
Oct 4 th week	48.9	78.5	65.3	25.5	29.9	37.1
Nov 1 st week	39.5	41.3	42.5	32	31	41.5
Nov 2 nd week	194	155.9	189.9	43.5	23	33.4
Total	1108	1557	1445	199.5	244.7	308.1
Mean	123.1	173	160.5	22.2	27.2	34.2

L.S.D.=7.60

L.S.D.=4.30

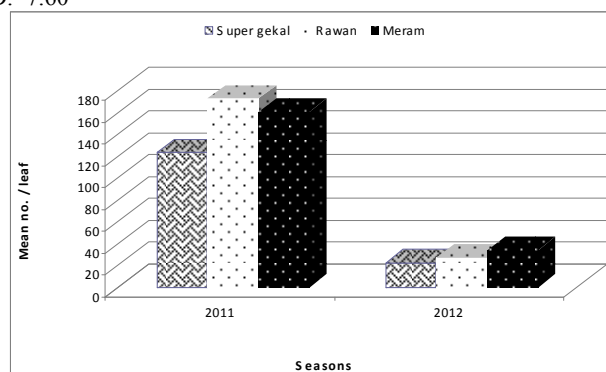


Fig. 1: Susceptibility of some Tomato varieties to *Bemisia tabaci* (Genn.) infestation during nili seasons at Giza Governorate.

On the other hand, the lowest mean number was recorded 123.1 individuals/ leaf on Tomato supper-gekal variety during 2011.

The results recorded mean numbers were 22.2, 27.2 and 34.2 individuals/ leaf for Tomato supper-gekal variety, Rawan and Meram varieties during second season, respectively.

The relative population mean of immature stages and adults of *B. tabaci* infesting tomato leaves was also affected, significantly with tomato cultivars during the two seasons.

2-Aphids, *Myzise prsicae*:

Data in Table (2) and Fig. (2) showed the variation of the mean numbers of aphid, *M. persicae* between the three tested varieties. The lowest mean number was recorded 34.50 individuals/ leaf for Tomato supper-gekal cultivar, while the Rawan and Meram were recorder the highest 39.70 and 42.90 individuals/ leaf during first season, respectively. The highest mean number of *M. persicae* was 22.6 individuals/ leaf on Meram variety, while the lowest mean number of infestation on Tomato supper-gekal variety and Rawan were 20.5 and 19.0 individuals/ leaf, during second season respectively.

Table 2: Susceptibility of some tomato varieties to *Myzise prsicae* (Sulzer.) infestation during nili seasons at Giza Governorate

Sampling date	1 st Season:2010/2011			2 nd Season:2011/2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no.of adults / leaf	Mean no.of adults / leaf	Mean no.of adults / leaf	Meanno.of adults / leaf	Mean no.of adults / leaf	Mean no.of adults / leaf
Sep 2 nd week	19.2	35.5	25.3	14.8	36.2	12.1
Sep.3 rd week	62.4	75.1	54.7	5.1	18.4	16.2
Sep 4 th week	65.4	62.5	91.2	19.5	41.2	15.2
Oct 1 st week	93.9	52.4	75.1	26.0	21.5	30.1
Oct 2 nd week	15.3	72.1	31.3	24.8	16.7	32.5
Oct 3 rd week	52.5	34.5	45.2	33.1	20.8	45.2
Oct 4 th week	47.1	37.2	49.5	24.2	14.5	31.4
Nov 1 st week	10.5	15.1	32.0	24.9	13.2	15.6
Nov.2 nd week	68.4	42.1	71.2	16.6	9.4	18.2
Total	311	358	386.5	185	171.3	203.5
Mean	34.5	39.7	42.9	20.5	19	22.6

LSD= 8.3

LSD=2.4

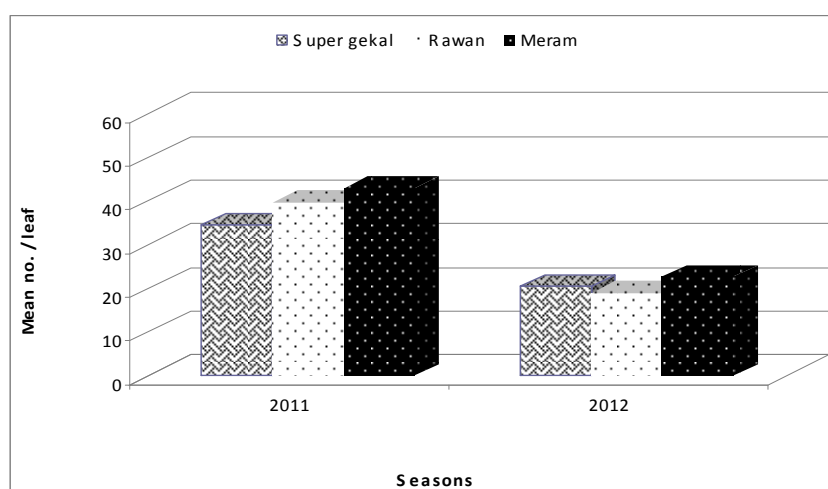


Fig. 2: Susceptibility of some tomato varieties to aphids, *Myzise prsicae* (Sulzer.) infestation during nili seasons at Giza Governorate

3- *Coccinella undecimpunctata* and *Scymnus syriacus*:

The population mean number of *C. undecimpunctata* and *S. syriacus* throughout first season were 4.8, 3.4 and 4.5 individuals/ leaf supper-gekal variety, Rawan and Meram varieties, respectively.(Table 3 and Fig. 3).

The mean number of *C. undecimpunctata* and *S. syriacus* on different tomato varieties during second season gave highest population number on Tomato supper-gekal variety (7.1 individuals/ leaf), while the lowest population was recorded on Rawan variety with mean 4.20 individuals/ leaf. The mean number on Meram variety was 5.8 individuals/ leaf.

Statistical analysis of the difference between means number of *C. undecimpunctata* and *S. syriacus* were significant between Tomato supper-gekal and Rawan, while there were no significant differences in population between Rawan and Meram varieties.

Table 3: Susceptibility of some tomato varieties to *C. undecimpunctata* and *S. syriacus* during nili seasons at Giza Governorate.

Sampling date	1 st Season:2010/201			2 nd Season:2011/2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Meanno.of Imm+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf
Sep 2 nd week	0	0	0.2	3.2	0	0
Sep.3 rd week	2.4	0	3	5.9	3.2	0
Sep 4 th week	3.1	0.2	2.3	6.6	7.4	0
Oct 1 st week	2.4	1	5.3	7.3	4.5	0.8
Oct 2 nd week	2.5	5.1	3.4	11.9	2.9	2.3
Oct 3 rd week	9.5	4.7	7.7	7.7	8.2	2.5
Oct 4 th week	15.5	10.8	9.6	10	3.3	4.1
Nov 1 st week	20.2	8.2	6.4	7	4.7	8.4
Nov.2 nd week	3.4	1	2.6	4.5	3.8	11
Total	43.5	31	40.5	64.1	38	29.1
Mean	4.8	3.4	4.5	7.1	4.2	5.8

LSD=3.1

LSD=2.8

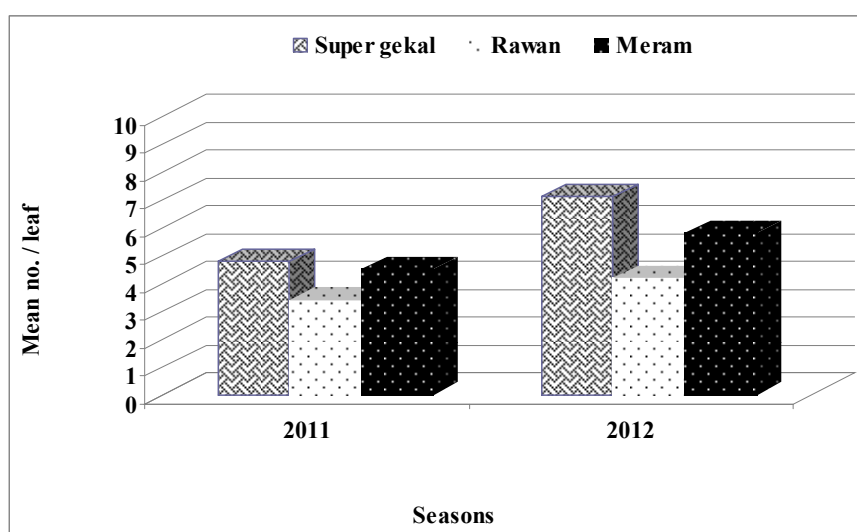


Fig. 3: Susceptibility of some tomato varieties to *C. undecimpunctata* and *S. syriacus* during nili seasons at Giza Governorate.

4- *Orius albidipennis*:

Data in Table (4) and Fig. (4) the mean number of *O. albidipennis* during first season was recorded 5.0 individuals/ leaf on Tomato supper-gekal variety, while the mean number of this predator on varieties Rawan and Meram were 3.1 and 5.9 individuals/ leaf. On the other hand, the mean number of *O. albidipennis* during season 2012 was recorded 2.2 individuals/ leaf on Tomato supper-gekal variety, while the mean number were 1.6 and 1.2 individuals/ leaf on Rawan and Meram varieties, respectively.

Statistical analysis revealed that, there are no significant between the populations of *O. albidipennis* on the three tested varieties.

Table 4: Susceptibility of some tomato varieties to *Orius albidipennis* during nili seasons at Giza Governorate:

Sampling date	1 st Season:2010/2011			2 nd Season:2011/2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Meanno.of Imm+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf
Sep 2 nd week	0.5	0	0	0	0	0
Sep.3 rd week	1.3	0	1.6	0.5	0	0
Sep 4 th week	3.2	0	6.4	1	0.2	0.3
Oct 1 st week	2.6	1	5.2	2	1.5	0.5
Oct 2 nd week	4.4	1.6	5.8	2.5	2.2	1
Oct 3 rd week	7.1	6.1	8.2	3	3	1.7
Oct 4 th week	9.6	4.2	10.5	4.5	3.6	3.5
Nov 1 st week	11.5	10.8	8.2	5	2	1.9
Nov.2 nd week	5.1	4	7.1	2.1	2	1.8
Total	45.3	27.7	53	20.6	14.5	10.7
Mean	5	3.1	5.9	2.2	1.6	1.2

LSD=1.9

LSD=0.99

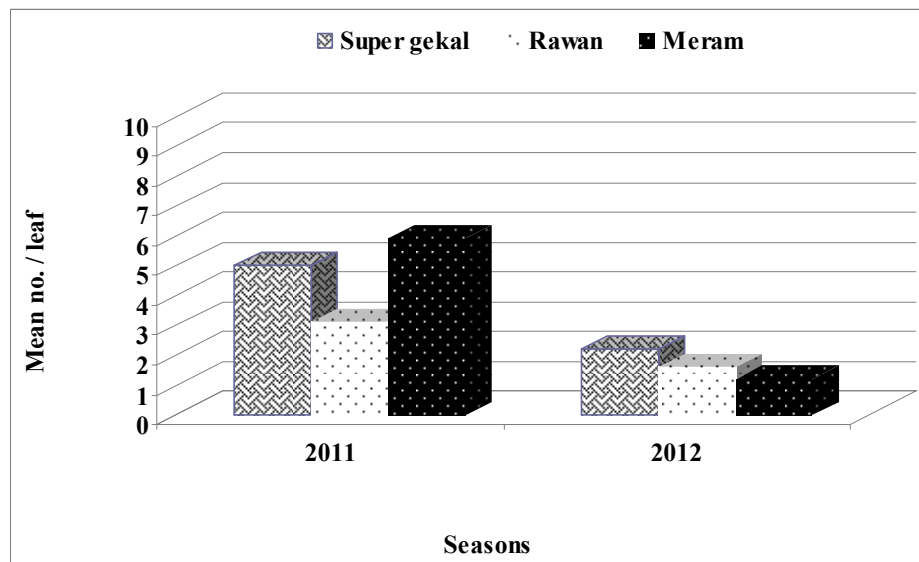


Fig. 4: Susceptibility of some tomato varieties to *Orius albidipennis* during nili seasons at Giza Governorate

5- *Euseius scutalis*:

Data represented in Table (5) and Fig. (5) showed the differences in *E. scutalis* population between three tested tomato cultivars for the first season which recorded

the mean number of *E. scutalis* 3.2, 1.8 and 1.7 individuals/ leaf on Tomato supper-gekal, Rawan and Meram cultivars, respectively.

In the second season, the mean number of *E. scutalis* was 2.1, 1.6 and 1.8 individuals/ leaf on Tomato supper-gekal, Rawan and Meram varieties, respectively.

Statistical analysis of the differences between the population mean of *E. scutalis* appeared no significant on the three tested tomato cultivars.

Table 5: Susceptibility of some tomato varieties to *Euseius scutalis* Athias-Henriot. during nili seasons at Giza Governorate.

Sampling date	1 st Season:2010/2011			2 nd Season:2011/2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no. of nymph+ adult / leaf	Mean no. of nymph+ adult / leaf	Mean no. of nymph+ adult / leaf	Mean no. of nymph+ adult / leaf	Mean no. of nymph+ adult / leaf	Mean no. of nymph+ adult / leaf
Sep 2 nd week	0	0	0	0	0	0
Sep.3 rd week	1	0	0	0	0	0
Sep 4 th week	2	1	0	1.5	1	1.1
Oct 1 st week	4.3	2.8	2.1	2.4	0.5	2.5
Oct 2 nd week	4.9	3.6	0.8	3.7	2.4	0.5
Oct 3 rd week	8.2	4.5	3.5	3.4	1.5	3.9
Oct 4 th week	1.4	1.1	3.8	2.5	3.4	4.1
Nov 1 st week	2.5	2.6	2.5	2	2.5	2.3
Nov.2 nd week	4.1	0.6	1.4	3.2	3.4	1.5
Total	28.4	16.2	14.1	18.7	14.7	15.9
Mean	3.2	1.8	1.7	2.1	1.6	1.8

LSD= 2.8

LSD=1.9

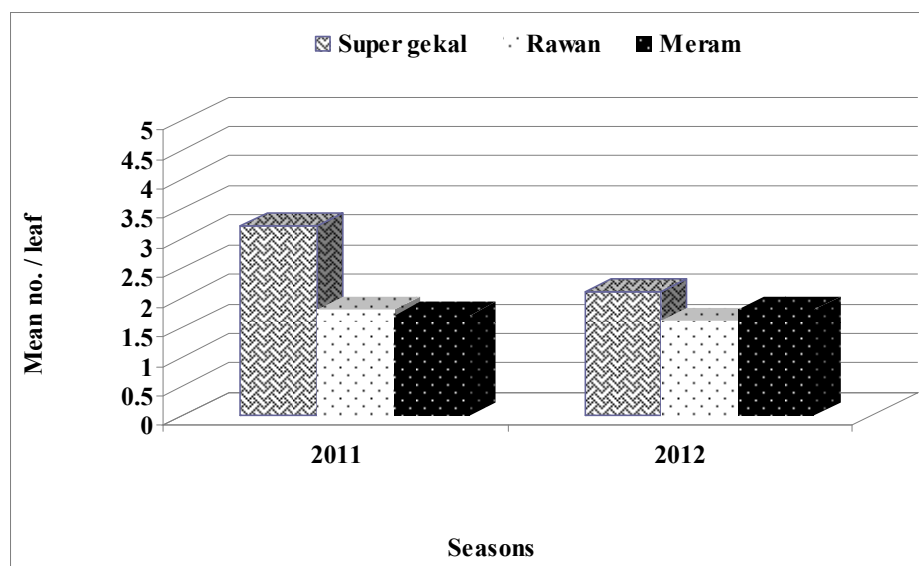


Fig. 5: Susceptibility of some tomato varieties to *Euseius scutalis* Athias-Henriot during nili seasons at Giza Governorate.

6- *Tetranychus urticae* and *Tetranychus cucurbitacearum*:

Data in Table (6) and Fig. (6) indicated the infestation level by *T. urticae* and *T. cucurbitacearum* (adults and immature stages) to three tomato varieties throughout 2011 season. The highest mean number of the movable stages was recorded on Rawan cultivar (130.80 individuals/ leaf), while the lowest one (34.0) was recorded

on Tomato supper-gekal variety. The moderate infestation (81.50 individuals/ leaf) recorded on Meram variety.

Statistical analysis of the obtained data indicated significant differences between the population on Meram and the two other varieties. On the other hand, there were no significant differences in the pest population between Tomato supper-gekal variety and Rawan variety. The mean number of *T. urticae* and *T. cucurbitacearum* (adults and immature stages) were 156.5, 168.7 and 173.1 individuals/ leaf on Tomato supper-gekal, Rawan and Meram varieties, during the second season, respectively.

Table 6: Susceptibility of some tomato varieties to *Tetranychus* spp during nili seasons at Giza Governorate.

Sampling date	1 st Season:2010/2011			2 nd Season:2011/2012		
	Super gekal	Rawan	Meram	Super gekal	Rawan	Meram
	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf	Meanno.of Imm+adults / leaf	Mean no.of Imm.+adults / leaf	Mean no.of Imm.+adults / leaf
Sep 2 nd week	0	0	0	2.2	16.6	21.4
Sep.3 rd week	0	0	3.6	20.5	19.4	33.2
Sep 4 th week	5.8	10.6	5.5	31	21.7	26.8
Oct 1 st week	9.6	25.5	25.4	41.4	57.7	39
Oct 2 nd week	11	30.7	61.2	77	99.8	43.2
Oct 3 rd week	15.3	59	76.4	94.73	91.4	92.8
Oct 4 th week	20.6	187.4	80.1	340.4	487.9	423.7
Nov 1 st week	145.1	478.4	97.2	479.7	348.2	401
Nov.2 nd week	98	385.2	383.7	321.2	375.4	475.7
Total	305.4	1176.8	733.1	1408.1	1518.1	1556.8
Mean	34	130.8	81.5	156.5	168.7	173.1

LSD=3.4

LSD=2.8

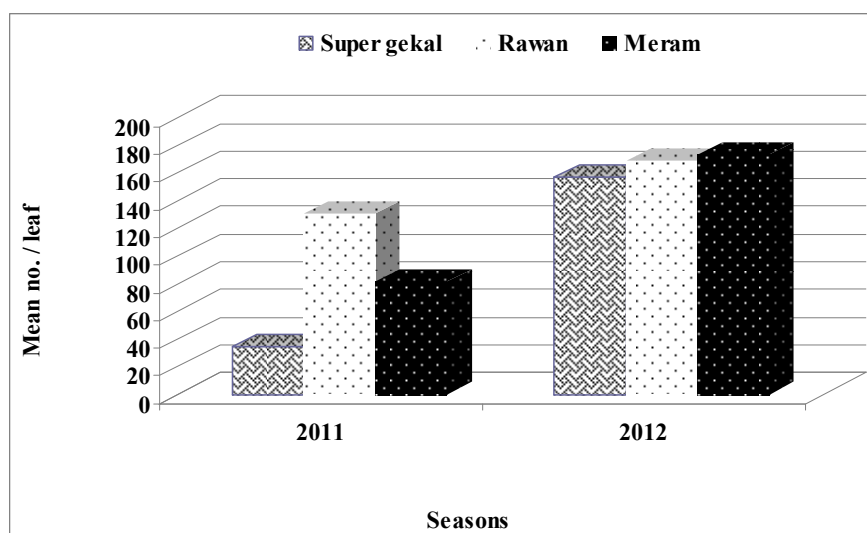


Fig. 6: Susceptibility of some tomato varieties to *Tetranychus* spp during nili seasons at Giza Governorate

In this respect, Farrag *et al.*, (1980) investigated the resistance of five bean varieties to the spider mite *Tetranychus arabicus* Attiah infestation and stated that, Seminole and Giza 3 varieties were the most resistant to infestation, while, Processor, Harvester and Contender varieties were most susceptible to spider mite infestation. The susceptibility of 24 bean cultivars to whitefly *Bemisia tabaci* (Genn.), the spider

mite *T. urticae* and rust diseases with special reference to yield and pod characteristics was studied by Faris *et al.*, (1991). Megali *et al.*, (1992) evaluate the susceptibility of 16 pea cultivar to infestation by two-spotted spider mites, leafminers and thrips in Qalubia Governorate and observed that, Danne, Norvist and Helka were the most tolerant cultivars to mite infestation than the other cultivars. In Egypt, Habashy (2000) carried out a field experiment to evaluate nine bean and twenty cowpea cultivars against two phytophagous mites *T. urticae* and *T. cucurbitacearum* at Qalyubiya Governorate. For the nine bean cultivars, she observed that the highest population of *T. urticae* occurred on Kentucky, Blue cultivar and Branco cultivar while the lowest number occurred on Monunert (Navy) cultivar. Mayadunnage *et al.* (2009) identified two species of predatory hoverflies (Diptera: Syrphidae) belong to genus *Syrphus* Fabricius in vegetable growing areas of mid country region of Sri Lanka. The one of *Syrphus* species was collected from aphid colonies on egg-plant (*Solanum melongena*), cabbage (*Brassica oleracea* var. capitata), long bean (*Vigna sesquipedalis*), pea (*Pisum sativum*) and wing bean (*Psophocarpus tetragonolobus*). The *Syrphus* species 2 was collected from aphid colonies on cabbage (*Brassica oleracea* var. capitata) and cauliflower (*Brassica oleracea* var. botrytis). One predatory brown lacewing (Neuroptera: Hemerobiidae) species belong to genus *Micromus* from aphid colonies on cabbage (*Brassica oleracea* var. capitata), and another carnivorous lepidopteran species (Lycaenidae) *Spalgis epius* from *Pseudococcus* colonies on *Solanum xanthocarpum* were also identified by the survey. Prabhakar and Roy (2010) studied the vegetable crops in different regions of North-east Bihar to record the taxonomic diversity of Aphids and their coccinellid and syrphid predators during the period seasons third, 17 species of Aphids infesting more than 40 species of vegetable plants and more than 10 species of their Coccinellid and Syrphid predators were recorded in this region. Among these predators, *Coccinella septempunctata*, *Coccinella transversalis*, *Micraspis discolor*, *Cheilomenes sexmaculata*, *Pulus pyrochilus* and *Syrphus sp.* were recorded as the common and potential predators of aphids of north-east Bihar. However, the suitability of aphids from various host plants was different for this ladybird beetle. Saethre *et al.* (2011) identified from samples collected from 29 vegetable and 22 weed species aphid species, their host plants and natural enemies across Benin. A total of 82% of the vegetable species and 12% of the weed species were infested with aphids. *Aphis gossypii* Glover infested a wide range of the vegetables and occurred on 62% of the species, while *Aphis craccivora* Koch, *Aphis spiraecola* Patch, *Lipaphis erysimi* (Kalt.), *Myzus persicae* (Sulzer) and *Toxoptera odinae* (Van de Goot) were collected from a limited number of vegetables, each with a frequency occurrence ranging from 3 to 28%. The weeds *Commelina benghalensis* L. and *Euphorbia hirta* L. were common alternative weed hosts for aphids. Common natural enemies were the predators *Cheilomenes propinqua* (Mulsant), *Cheilomenes sulphurea* (Olivier) and *Ischiodon aegyptius* (Wiedemann), the obligate entomopathogen *Neozygites* sp., and the parasitoids *Lysiphlebus testaceipes* (Cresson) and *Aphelinus ficusae* Prinsloo & Naser. *Lysiphlebus testaceipes* was usually the only primary parasitoid on aphids across the sites and its common host was *Aphis gossypii* (Glover) From parasitized mummies, five species of hyperparasitoids were collected, the most abundant being *Syrphophagus africanus* (Gahan).

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ARABIC SUMMARY

حساسية بعض أصناف الطماطم لبعض الآفات و المفترسات

سامية عبد الفتاح يسن- نفين فوزي عرفات - فتينة أحمد بيومي
معهد بحوث وقاية النباتات - دبي- جيزة

أجريت التجربة في محافظة الجيزة خلال الموسمين 2010 / 2011 ، 2011 / 2012 في العروة النبلى دراسة قابلية الحساسية لبعض أصناف نبات الطماطم (صنف مرام - صنف راوان- صنف سوبر جيكال) للاصابة ببعض الآفات. و أهم المفترسات.

وأوضحت النتائج أن الأطوار الغير كامله للذبابة البيضاء *Bemisia tabaci*: خلال الموسم 2010/2011 سجل أعلى متوسط من الاصابة بالأطوار غير الكامله للذبابة البيضاء على الصنف راوان يليه الصنف مرام بينما كان الصنف سوبر جيكال أقلهم أصابه. وفي الموسم الثاني 2011 / 2012 سجل أعلى متوسط من الاصابة بالأطوار غير الكاملة للذبابة البيضاء على الصنف مرام يليه الصنف راوان بينما كان الصنف سوبر جيكال أقلهم أصابه.

سجلت نتائج الموسم الاول 2010 / 2011 أعلى متوسط بالمن على صنف مرام يليه صنف راوان بينما كان الصنف سوبر جيكال أقلهم أصابه. خلال الموسم 2011 / 2012 سجل أعلى متوسط من الاصابة بالمن على صنف مرام يليه صنف سوبر جيكال بينما كان الصنف راوان أقلهم أصابه.

أظهرت النتائج زيادة أعداد المفترسين أبو العيد ذو الإحدى عشر نقطة و أبو العيد السوري *Coccinella undecimpunctata*، *Scymnus syriacus* على الصنف سوبر جيكال خلال الموسمين 2010 / 2011 و 2011 / 2012.

كما سجلت النتائج زيادة أعداد بقعة الأوريس *Orius albidipennis* على الصنف مرام يليه الصنف سوبر جيكال، بينما كان الصنف راوان أقل تعداد خلال الموسم 2010 / 2011 . و فى الموسم الثاني أعلى تعداد على الصنف سوبر جيكال يليه الصنف راوان بينما كان الصنف مرام أقلهم تعداد.

وفى الموسم الاول سجل المفترس الاكاروسى *Euseius scutalis* أعلى تعداد على الصنف سوبر جيكال بينما كانا الصنفين راوان مرام وأقل فى التعداد وفى الموسم الثاني وجد التعداد متقارب على الثلاث أصناف بدون فرق معنوى بينهما.

العنكبوت الاحمر *T.urtica and T.cucurbitacearum* سجل خلال الموسم الأول أعلى تعداد على الصنف راوان يليه الصنف مرام بينما لوحظ أن الصنف سوبر جيكال قد سجل أقل مستوى من الاصابة الأطوار المتحركة.

سجلت النتائج فى الموسم الثاني أعلى تعداد على الصنف مرام يليه الصنف راوان بينما تعرض الصنف سوبر جيكال لاقل مستوى من الاصابة.