Journal of Plant Protection and Pathology

Journal homepage: www.jppp.mans.edu.eg
Available online at: www. jppp.journals.ekb.eg

Susceptibility of some Broad Bean Plant Varieties to the Infestation by Certain Piercing Sucking Insects, Egypt

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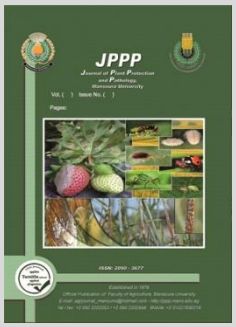

ABSTRACT

These experiments were carried out at Abo-Hammad district, Sharkia Governorate, during two growing seasons of broad bean plants (2016 / 2017 and 2017/ 2018). Some varieties of broad bean plants (Sakha 1, Giza 3 and Giza 843) to infestation with some aphid, leafhopper and whitefly insects and the effect of some chemical contents (protein, carbohydrate and pH values) to varieties of broad bean plants on the infestation of certain investigated insects. The obtained results cleared that *Aphis craccivora* (Koch) and *Myzus persicae* (Sulzer) had two peaks on broad bean plants. One peak occurred for both *Empoasca decipiens* (Paoli) and *Empoasca decedens* (Paoli) during the two seasons. The whitefly (immature and adult stages), *Bemesia tabaci* (Genn) was the most abundant species showing two peaks . The effect of each of maximum, minimum temperature and relative humidity on the numbers of certain piercing sucking insects, it is obvious that the effect was clear. The obtained results showed that broad bean varieties could be arranged descendingly according to the number of pests as follows: Giza 843, Giza 3 and Sakha 1. Chemical analysis results showed an increase in protein and carbohydrate contents led to increase the mean number of some pests infesting these varieties, while increased of pH values led to decrease the mean number of pests and rate of infestation.

Keywords: Broad bean, varieties, seasonal fluctuations, homopterous insects**.**

INTRODUCTION

Aphids, leafhoppers and whitefly are considered serious insect pests infesting broad bean plants. The plants are infested by the aforementioned pests which affect the yield as results of their direct feeding on plants. Several investigators recorded the role of homopterous insect species in transmitting the pathogens of plants diseases El Gindy, (2002) and Al-Habshy, Aml (2018). The faunae of these insects on most field and graminaceous and leguminous crops were studied in Egypt Helal *et al.*, (1996 and 1997); Al- Moaalem *et al.*, (2005); Youssef (2006) and Malik *et al.*, (2010). The most significant damage was caused by large populations of *A. craccivora* that fed on terminals and young leaf and stem tissue Nuessly *et al.*, (2004). Ebadah *et al.*, (2006) the susceptibility of some faba bean varieties to infestation with *A. craccivora* Abd-Elsamed and Al-Habshy, Aml (2013) reported considerable data on the aphids, leafhoppers and whitefly infesting broad bean plants. Elissa *et al.*, (2014) mentioned that biology of the potato leafhopper, *E. fabae* including its distribution, development, migration, agricultural host plants, and mechanics of injury to host plants Damage to alfalfa Selem, Gamila *et al.*, (2016) showed two peaks of *A. craccivora* *B. tabaci* and, *E. decipiens* on kidney bean plants. Regarding to the effect of mean temperature and atmospheric relative humidity. Abd-Elsamed *et al.*, (2018) mentioned that susceptibility of different solanaceous plant varieties to the infestation by certain piercing sucking pests. The present study aimed to investigate the seasonal fluctuation of aphid, leafhopper and whitefly insects on broad bean plants and the relation ship between these pests and climatic factors. Therefore, it was necessary to perform the present work for studying the susceptibility of different varieties to certain piercing sucking pests infesting some broad bean plants and the relationship between some chemical contents of broad bean varieties and number of aphid, leafhopper and whitefly insects.

MATERIALS AND METHODS

These experiments were carried out at Abo-Hammad district, Sharkia Governorate, during two growing seasons of broad bean plants (2016 / 2017 and 2017/ 2018). An area of about one faddan was divided into three replicates. Two sampling techniques for colleting of each group of the tested insect pests infesting broad bean plants were conducted and started when the age of broad bean plants reached about 21 – 28 days and continued at biweekly intervals throughout the growing season of broad bean until the 4th week of April. The following two procedures of sampling were used: plant samples; samples of 25 leaves were taken randomly. The leaves were placed in paper bags and transferred to the laboratory. The numbers of individuals of aphids and whitefly immatures were separately counted using a hand lens, while those of whitefly adult stage were determined by direct count on plants. A simple apparatus was used for this purpose, which was consisted of a wooden desk, a white card board paper divided into 4 cm apart columns put in the bottom, on which a glass plate was placed and the upper surface of the glass plate was allowed to be wet with fine

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DOI: 10.21608/jppp.2019.59763

droplets of water to reduce the movement of counted aphids Abd Alla (1984); Hegab *et al.*, (1987). The plants were carefully shaken on the plate and the aphid insects were counted using a small brush in each column. Sweeping net (35 cm diameter and 60 cm deep) was used and each sample consisted of 100 double strokes taken from both diagonal directions of the field. For clearing the effect of certain weather factors such as temperature and atmospheric relative humidity on the population density of the studied insect pests, the daily means of the two factors were provided by the Meteorological Central Laboratory for Agricultural Climate, Agricultural Research Center during the whole period of the two broad bean growing seasons (2016 / 2017 and 2017/ 2018)

Determination of some chemical contents

To determine total protein, carbohydrate contents and pH values, leaf samples were taken at random from each variety when there were peaks of pests and oven dried at 60°C until the constant weight. The dried leaves broad bean were finally ground and digested with a mixture of perchloric acid and nitric acid (2:1).

Determination of protein content

Total nitrogen in broad bean plants were estimated according to Bremner and Mulvaney (1982). The crude protein content was obtained by multiplying the nitrogen content by the factor 6.25.

Determination of carbohydrate content

The total carbohydrate content in broad bean plants were determined calorimetrically using the anthrone reagent and the color intensity was measured at 240 mμ following the method described by Dubois *et al.*, (1956).

Determination of pH value

PH value was estimated in the plant sap using pH meters.

Chemical analysis of the used broad bean varieties were carried out in central laboratory, Faculty of Agriculture, Banha University to determine the total protein, carbohydrate contents and pH value.

Statistical Analysis

The chemical constituents of broad bean varieties on the population density of the aforementioned homopterous insects were statistically analyzed Costat (2005) to calculate the simple correlation coefficient. The means were compared according to Duncan's multiple range test Snedecor and Cochran (1981).

RESULTS AND DISCUSSION

Insects population density as influenced by two sampling techniques on broad bean plants at Abo-Hammad district during the two successive growing seasons of 2016 / 2017 and 2017/ 2018.

1) Seasonal population fluctuations of the more dominant insect species

a) Aphid insects, *Aphis craccivora* Koch and *Myzus persicae* (Sulzer).

The data illustrated in Fig (1,2) showed that the seasonal population fluctuations of *A. craccivora* infesting broad bean plants during two successive seasons. The initial incidence of the two aphid species occurred in relatively few numbers (4 – 14 aphids/25 leaves) at the beginning of the first week of December during both seasons. Two population peaks were recorded for *A. craccivora* and *M. persicae* during 2016 / 2017 and 2017/ 2018 growing seasons on broad bean plants. The first one occurred in the 2nd week of January with the total numbers of 415 and 554 insects / 25 leaves for *A. craccivora* for the two experimented seasons, respectively. While, the first peak of *M. persicae* was found in the 3rd week of January with the total numbers of 199 and 256 insects/25 leaves for the two seasons, successively. The second peak of *A. craccivora* was found in the 1st and 2nd week of March with the total numbers of 185 and 247 insects/25 leaves for the two seasons, respectively. While The second peak of *M. persicae* was recorded in the 2nd and 1st week of March showing the total numbers of 117 and 153 insects /sample for the two seasons, consecutively.

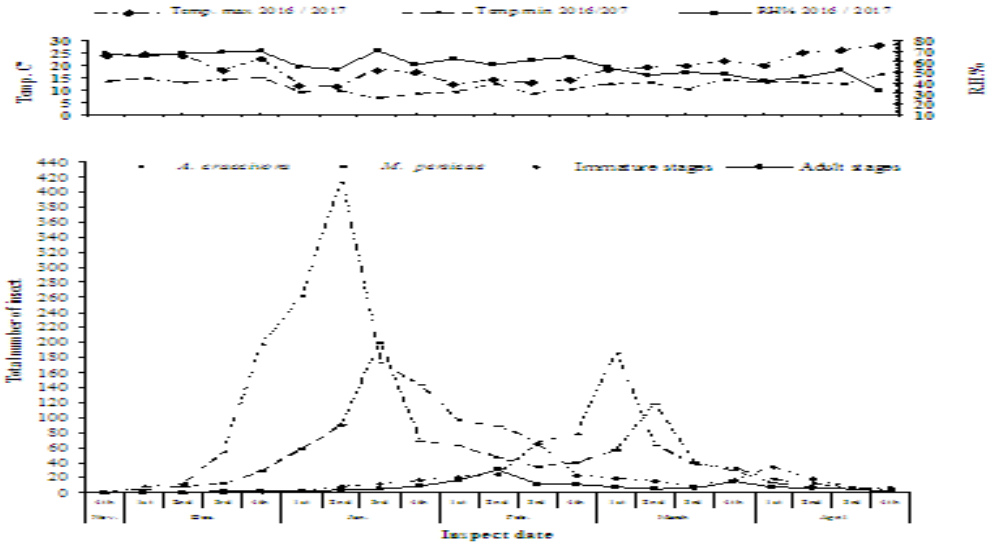

Fig. 1. Population density of aphids, whitefly infesting broad bean plants collected by using plant sample at Abo - Hammad, Sharkia Governorate during 2016/2017 season.

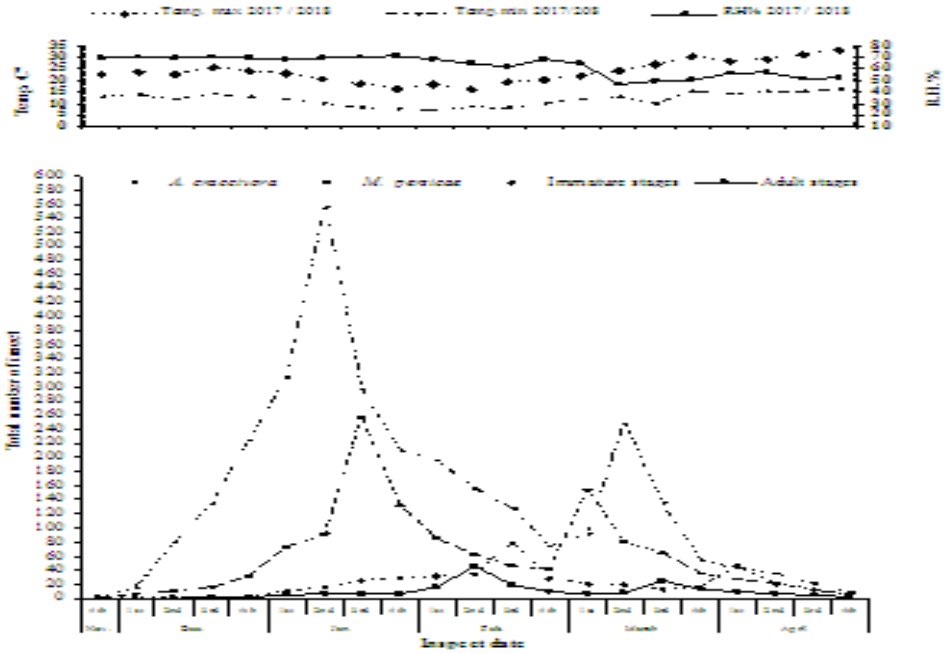

Fig. 2. Population density of aphids, whitefly infesting broad bean plants collected by using plant sample at Abo - Hammad, Sharkia Governorate during 2017/2018 season.

Results recorded here concerning the population density of *A. craccivora* and *M. persicae* on broad bean plants generally reveal that these species have two population peaks.

These results are in agreement with the findings of Saleh (1972); El-Gindy, (2002); Belliure *et al.*, (2009) and Abd-Elsamed and Al-Habshy, Aml (2013) mentioned that *A. craccivora* and *M. persicae* had two peaks on broad bean and leguminous plants.

b) Whitefly, *Bemesia tabaci* (Genn.).

Whitefly, *B. tabaci* were the most abundant species on broad bean plants during 2016 / 2017 and 2017/ 2018 seasons. As regards immature, Fig (1,2) obviously showed that the first peak was recorded in the 3rd week of February with the total numbers of 65 and 78 immatures/25 leaves; while the second peak was detected in the 1st week of April recorded the total numbers of 35 and 46 immatures/sample for the two seasons, successively. The obtained data clearly show that the population density of *B. tabaci* adults and immatures have two peaks on broad bean plants. As clearly shown in Fig (1-2) ,two population peaks were recorded for adult stage. The first peak occurred in the 2nd week of February of both 2016 / 2017 and 2017/ 2018 seasons exhibiting the total numbers of 31 and 46 adults/ 25 leaves whereas, the second peak was recorded in the 4th and 3rd week of March with the total numbers of 15 and 25 insects/ 25 leaves for the two seasons, respectively.

These results agree with the findings of El-Gindy (2002); Hashem (2005) and Abd-Elsamed and Al-Habshy,Aml (2013) mentioned that whitefly has two peaks on broad bean and leguminous plants in winter plantations.

c) Leafhopper insects, *Empoasca decipiens* (Paoli) and *Empoasca decedens* (Paoli).

The total number of the leafhoppers, *E. decipiens* and *E. decedens* individuals per sample (100 duble strokes) on broad bean plants during 2016/2017 and 2017/2018 seasons were shown in Fig (3-4). *E. decipiens* started to appear in the first week of December excepting the second species started to appear in the second week of December during the two seasons. Only one peak was recorded for *E. decipiens* and *E. decedens* for the two seasons on broad bean plants. The peak occurred in the 2nd week of March with a total numbers of 49, 65 and 32, 40 insects / sample for *E. decipiens* and *E. decedens* during the two seasons, respectively. In general the population density of leafhopper species on broad bean plants clearly show that both of *E. decipiens* and *E. decedens* had one peak during the period of study. These results partially agree with the findings of El-Gindy (2002); Galetto *et al.*, (2011); Mahmoud *et al.*, (2011) and Abd-Elsamed and Al-Habshy,Aml (2013) who mentioned that *E. decipiens and E.decedens* had one peak on broad bean and winter vegetable plants.

2) Effect of maximum, minimum temperature and relative humidity on insects.

a) ***A. craccivora***

The data presented in Table (1) clearly revealed that the numbers of *A. craccivora* high negatively significantly and negatively significantly correlated with the maximum of temperature, (r_1 = - 0.6218**, -0.5234*) in 2016 / 2017 and 2017/ 2018 seasons, respectively. The number of *A. craccivora* was negatively significant with minimum temperature (r_2 = -0.4540* and -0.4919 *) in the two seasons, respectively. There were insignificant correlation coefficients between the numbers of *A. craccivora* and relative humidity (r_3 = 0.2076, 0.3579) in the two seasons, respectively.

b) *M. persicae*

The obtained results in Table (1) cleared that the correlation coefficients between *M. persicae* and

maximum temperature were negatively significant (r_1 = -0.4508 * and - 0.5569*) in the two seasons, respectively. The number of *M. persicae* was negatively high significant and negatively insignificant with minimum temperature (r_2 =-0.6397 ** and -0.6020) in the two seasons, respectively. While, correlation coefficients respecting relative humidity proved to be statistically positively insignificant (r_3 =0.2333 and 0.2789) in the two abovementioned seasons, successively.

c) *E. decipiens*

In 2016/2017 season, the correlation coefficient between *E. decipiens* and maximum temperature were negatively insignificant (r_1 = -0.3747 and -0.2907) in the two seasons, respectively. The number *E. decipiens* was negatively insignificant with minimum temperature (r_2 = -0. 2413 and -0.3056) in the two seasons, respectively. While, the correlation of relative humidity was negatively insignificant (r_3= -0.1018 and -0.3429) in both seasons respectively Table (1).

d) *E. decedens*

The correlation coefficients between *E. decedens* and maximum temperature showed that negatively insignificant (r_1 = -0.3129 and- 0.2834) in the two seasons, respectively. The number *E. decedens* was negatively insignificant with minimum temperature (r_2 = -0.1774 and -0.3127) in the two seasons, respectively. But relative humidity showed that negatively insignificant (r_3 = -0.1458 and - 0.3444) for the two seasons, respectively.

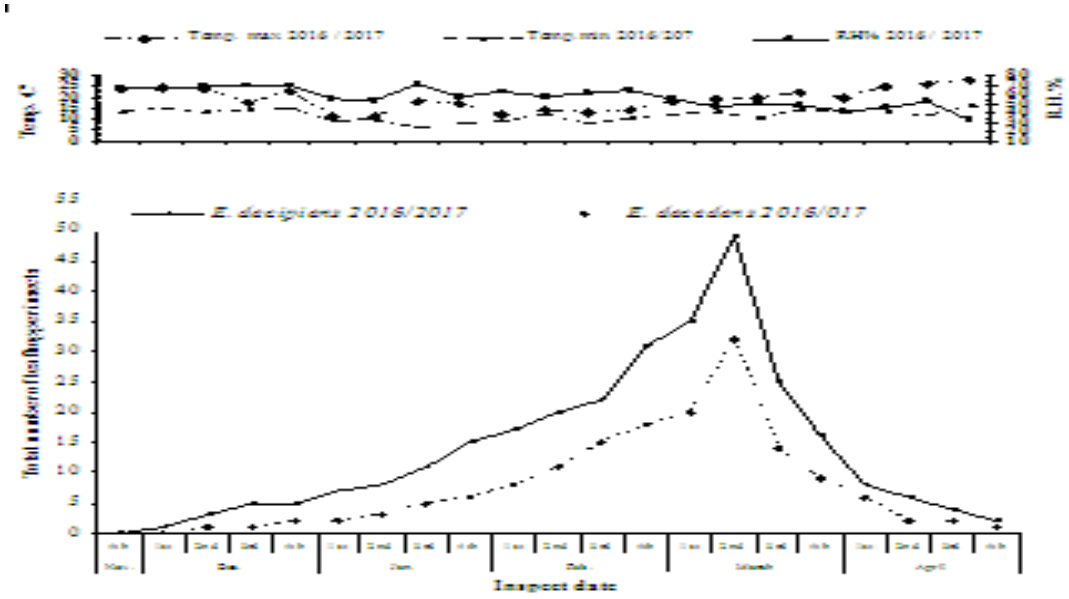

Fig. 3. Population density of leafhopper, E. decipiens and E. decedens infesting broad bean plants collected by using plant sample at Abo - Hammad, Sharkia Governorate during 2016/2017 season.

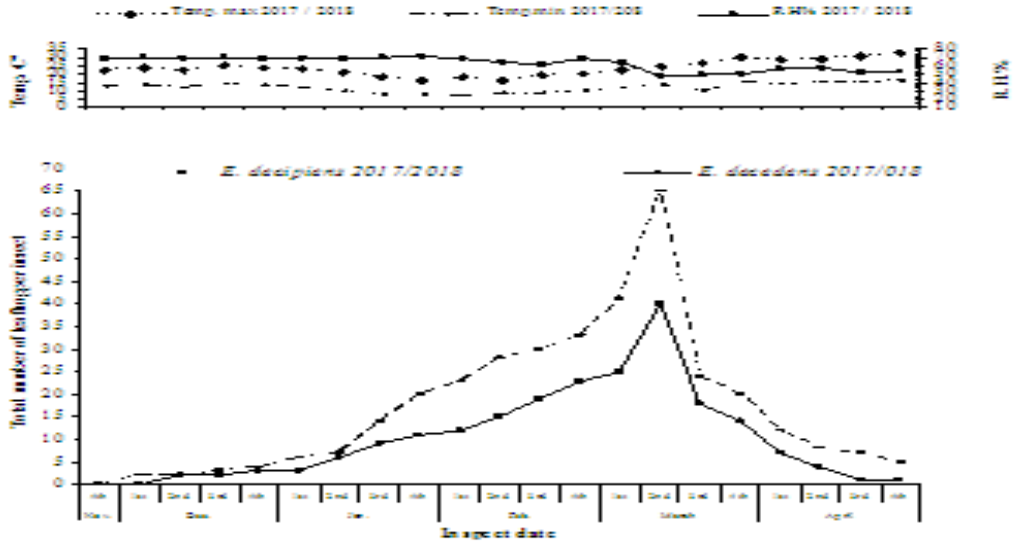

Fig. 4. Population density of leafhopper, *E. decipiens* and *E. decedens* infesting broad bean plants collected by using plant sample at Abo - Hammad, Sharkia Governorate during 2017/2018 season.

Table 1. Simple correlation (r), partial regression (b) and explained variance (E.V.) for the numbers of some homopterous insects infesting broad bean plants under weekly maximum, minimum temperature and relative humidity during 2016/2017 and 2017/2018 seasons.

Insects	Simple correlation						Partial regression						Explained variance %	
	2016/2017			2017/2018			2016/2017			2017/2018				
	r_1	r_2	r_3	r_1	r_2	r_3	b_1	b_2	b_3	b_1	b_2	b_3	2016/17	2017/18
A. craccivora	-0.6218**	-0.4540*	0.2076	-0.5234*	-0.4919*	0.3579	-0.0301	-0.0115	0.0202	-0.0185	-0.0107	0.0225	21.15	26.28
M. persicae	-0.4508*	-0.6397**	0.2333	-0.5569*	-0.6020**	0.2789	-0.0486	-0.0359	0.0506	-0.0444	-0.0283	0.0379	41.10	36.60
E. decipiens	-0.3747	-0.2413	-0.1018	-0.2907	-0.3056	-0.3429	-o.1507	-0.0505	-0.0824	-0.0875	-0.0542	-0.1756	9.21	74.52
E. decedens	-0.3129	-0.1774	-0.1458	-0.2834	-0.3127	-0.3444	-0.1927	-0.0569	-0.1806	-0.1348	-0.0877	0.2786	7.54	71.29
B. tabaci(immature)	-0.3854	-0.3757	-0.1325	-0.3868	-0.5073	-0.0483	-0.1301	-0.0661	-0.0900	-0.1015	-0.0784	-0.0216	20.83	38.32
B. tabaci (adult)	-0.4379	-0.2274	-0.0332	-0.3626	-0.4782	-0.1831	-0.3128	-0.0846	-0.0478	-0.1677	-0.1301	-0.1437	6.33	51.12

r_1 and b_1 = Coefficients of simple correlation and partial regression between maxm temperature and the numbers of insects, respectively.
r_2 and b_2 = Coefficients of simple correlation and partial regression between minimum temperature and the numbers of insects, respectively.
r_3 and b_3 = Coefficients of simple correlation and partial regression between mean relative humidity and the numbers of insects, respectively.

e) Whitefly, *B. tabaci*

The obtained results in Table (1) cleared that the correlation coefficients between (*B. tabaci* immature and adults) and (maximum, minimum) temperature and relative humidity obtained that negatively insignificant in thetwo seasons

Combined effects of meteorological factors on the numbers of aphid and leafhopper insects.

The effect of (maximum and minimum) temperatures and mean relative humidity on aphid and leafhopper insects numbers were estimated by calculating the partial regression analysis. E.V. % values Table (1) demonstrate that the population of aphid, leafhopper and whitefly insects in the two seasons more sensitive to changes in the considered weather factors (maximum and minimum) temperatures and mean relative humidity showed the highest values of *E. decipiens* 74.52 % for the second season. On the other hand, the least combined effects were detected of *E. decipiens* showing the least values of 9.21% for the first season

Similar results were obtained by Parh, 1986, Hegab *et al.,* 1987 and Raupach *et al.,* 2002 which greatly correspond with the present results.

3) Susceptibility of different varieties on Population Density by certain piercing sucking pests infesting broad bean

a) *A. craccivora*

As shown in Table (2) the differences between mean numbers of aphid infested broad bean plant varieties during the two seasons were obviously differed. The most susceptible variety was Giza 843 (97.35 and 150 insects/ plant sample) in the two seasons of the present study, respectively, while the least susceptible variety was Sakha 1that recorded mean numbers of 75.64 and 112.17 insects/plant sample for *A. craccivora* in 2016/2017 and 2017/2018 seasons, successively.

b) *M. persicae*

Data given in Table (2) showed that significant differences between the mean numbers of aphid on broad bean varieties during the two seasons. The most susceptible variety was Giza 843 (45.70 and 61.95 insects /plant sample) in both seasons, respectively, while the least susceptible variety was Sakha 1 recording 37.85 and 48.21 insects/ plant sample for *M. persicae* in both seasons, consecutively.

Table 2.Susceptibility of board bean varieties to the infestation with aphid, leafhopper and whitefly insects along with yield during 2016/2017 and 2017/2018 seasons at Abo-Hammad district in Sharkia Governorate.

Varieties	Mean of insect number / sample												Mean yield kg/plot	
	Aphids				Leafhoppers				*WhiteflyB. tabaci*					
	A. craccivora		*M. persicae*		*E. decipiens*		*E. decedens*		Immature s		Adult stages			
	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18
V1	75.64^{b}	112.17^{c}	37.85^{b}	48.21^{b}	11.52^{a}	13.25^{a}	5.35^{a}	7.91^{b}	11.63^{a}	17.32^{a}	6.10^{a}	7.25^{a}	10.25^{a}	12.65^{a}
V2	82.42^{b}	130.31^{b}	40.63^{b}	56.39^{a}	13.12^{a}	15.53^{a}	6.24^{a}	9.26^{ab}	13.15^{a}	19.46^{a}	6.89^{a}	8.54^{a}	9.10^{a}	11.18^{a}
V3	97.35^{a}	150^{a}	45.7^{a}	61.95^{a}	14.50^{a}	17.90^{a}	7.90^{a}	10.75^{a}	14.85	20.1^{a}	7.55^{a}	9.45^{a}	7.87^{a}	8.50^{a}
F.	14.02**	59.35**	11.03**	13.24**	1.41^{ns}	1.21^{ns}	2.18^{ns}	3.63^{ns}	0.89^{ns}	2.12^{ns}	0.91^{ns}	1.22^{ns}	1.41^{ns}	2.85^{ns}
L.S.D 0.05	10.26	8.49	4.15	6.57	4.34	7.33	2.93	2.58	5.88	3.46	2.63	3.46	3.46	4.32

V1 = Sakha 1 V2 = Giza 3 V3 = Giza 843

c) *E. decipiens*

As shown in Table (2) the differences between the mean numbers of *E. decipiens* infested broad bean varieties during the two seasons proved to be statistical significant. The most susceptible variety was Giza 843 (14.50 and 17.90 insects/ sweep Sakha 1indicating 11.52 and 13.25 insects/ sweep net for *E. decipiens* in both seasons, respectively.

d) *E. decedens*

As shown in Table (2) the differences between the mean numbers of leafhopper on infested broad bean varieties were greatly varied during the two seasons. The most susceptible variety was Giza 843 indicating 7.90 and 10.75 insects/ sweep net for *E. decedens* in both seasons, respectively, while the least susceptible variety was Sakha 1 (5.35 and 7.91 insects/sweep net) in the net) in both seasons, respectively, while the least susceptible variety was two seasons, successively.

e) *B. tabaci*

Data given in Table (2) indicated that the differences between mean numbers of whitefly *B. tabaci* (immatures and adults) infesting broad bean plant varieties during the two seasons. Sakha 1variety was the least susceptible host plant for immatures infestation showing 11.63 and 17.32 immatures / plant sample, while the variety Giza 843

appeared to be the most susceptible broad bean variety (14.85 and 20.10 immatures /plant sample) during the two seasons, respectively. The most susceptible variety was Giza 843 (7.55 and 9.45 adults /plant sample) in both seasons, respectively, while the least susceptible variety was Sakha 1 recording 6.10 and 7.25 adults / plant sample for adults in both seasons, consecutively.

Mean yield (kg/plot)

With respect to the influence of broad bean varieties on broad bean yield, data presented in Table (2) show that Sakha 1variety yielded the highest means of 10.25 and 12.65 kg/plot in the two seasons, respectively. While, Giza 843 variety yielded the lowest means of 7.87 and 8.50 kg/plot in the two seasons, respectively. Generally, from the obtained results, Giza 843 variety was more susceptible to aphid, whitefly and leafhopper pests infestation, whereas Sakha 1variety was the least susceptible cultivar.

The results agreed with the findings of Saleh *et al.*,1(973); Nosser (1996); El-Gindy (2002) and Hashem (2005) mentioned that varities of legumenous plants had a great effect on incidence of homopetrous insects. Ebadah *et al.,* (2006) the susceptibility of some faba bean varieties to infestation with *A. craccivora.* Hewa *et al.,* (2017) mentioned that volatile-mediated attraction of greenhouse whitefly *Trialeurodes vaporariorumto* to eggplant. Abd-Elsamed *et al.,* (2018) mentioned that susceptibility of different solanaceous plant varieties to the infestation by certain piercing sucking pests

4) Relationship between some chemical contents of broad bean varieties and population density of certain piercing sucking pests

Data given in Table (3) showed that effects of different chemical contents of broad bean varieties on the aphid, leafhopper and whitefly pests during 2016/2017 season.

Table 3. Relationship between some chemical contents of board bean varieties and mean number of aphid, leafhopper and whitefly insects during 2016/2017 season.

Vareities	Protein	Carbohydrate	PH	K	Ca	P	Aphids		Leafhoppers		Whitefly *B. tabaci*	
							A. craccivora	*M. persicae*	*E. decipiens*	*E. decedens*	immature	adult
Sakha 1	12.00 [a]	46.25 [b]	5.00 [a]	2.34	2.12	0.65	75.64 [b]	37.85 [b]	11.52 [a]	5.35 [a]	11.63 [a]	6.10 [b]
Giza 3	13.95 [a]	59.62 [a]	4.42 [a]	1.86	2.37	0.59	82.42 [b]	40.63 [a b]	13.12 [a]	6.24 [a]	13.15 [a]	6.89 [a b]
Giza 843	14.87 [a]	67.78 [a]	4.13 [a]	1.45	2.10	0.63	97.35 [a]	45.70 [a]	14.50 [a]	7.90 [a]	14.85 [a]	7.55 [a]
F	2.15 [ns]	17.74 [**]	1.22 [ns]				14.23 [**]	4.32 [ns]	1.11 [ns]	2.51 [ns]	1.67 [ns]	4.69 [ns]
L.S.D 0.05	3.46	9.37	1.19				10.19	6.63	4.89	2.83	4.32	1.16

Total protein, carbohydrate contents and pH value

Sakha 1 variety showed the mean numbers of *A. craccivora, M. persicae, E. decipiens, E. decedens, B. tabaci* (immatures) and *B. tabaci* (adults) of 75.64, 37.85, 11.52, 5.35, 11.63 and 6.10 pests/sample, respectively, 12.00 µ/m total protein, 46.25 % Carbohydrate contents and 5.00 pH on the other hand. Giza 843 variety the mean numbers of *A. craccivora, M. persicae, E. decipiens, E. decedens, B. tabaci* (immatures) and *B. tabaci* (adults) of 97.35, 45.70, 14.50, 7.90, 14.85 and 7.55 pests/sample, respectively with 14.87 µ/ m total protein, 67.78 % carbohydrate contents and 4.13 pH, during 2016/2017 season.

Generally, from the obtained results increasing the broad bean total protein and carbohydrate contents led to increase the mean number of insects infesting this variety. But the increased pH value, led to decrease the mean number of insects and mite on broad bean. The least susceptible to pests infestation and the highest yield (Sakha 1).

Baghour *et al.,* (2001); El – Gindy (2002); Hashem (2005) Youssef (2006); Al-Habshy *et al.,* (2011); Hegab *et al,.* (2014); Amer (2016) and Abd-Elsamed (2018) pointed out that the chemical constituents of some graminaceous, leguminous, solanaceous and broad bean plants varieties were effective on the population density of aphid, leafhopper and whitefly insects.

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قابلية بعض أصناف نباتات الفول البلدى للإصابة ببعض الحشرات الثاقبة الماصة - مصر

أمل زكريا نور الدين الحبشي ،عبد الله على عبدالصمد و سعيد عبدالفتاح محمود عامر

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أجريت هذه الدراسة في منطقة ابوحماد محافظة الشرقية لنباتات الفول البلدى خلال موسمى ٢٠١٦/ ٢٠١٧ و٢٠١٧/ ٢٠١٨ . بعض أصناف الفول البلدى (سخا ١ و جيزة ٣ وجيزة ٨٤٣) وإصابتها ببعض حشرات المن ونطاطات الأوراق والذبابة البيضاء وتاثير بعض المكونات الكيميائية (البروتين والكربوهيدرات و قيمة pH) لبعض أصناف الفول البلدى والإصابة بالحشرات. وجد أن حشرة من البقوليات *A.craccivora* ومن الخوخ الاخضر *M. persicae* لهما قمتى نشاط وجد قمة نشاط واحدة لنطاطات الأوراق *E. decipiens* و *E. decedens* خلال موسمي الدراسة. الذبابة البيضاء (الاطوار الغير كاملة والحشرات الكاملة) لها قمتى نشاط خلال موسمي الدراسة. ومن دراسة تأثير كل من درجة الحرارة العظمى والصغرى وكذلك الرطوبة النسبية على تعداد بعض الحشرات الثاقبة الماصة أوضحت النتائج أن التأثير كان واضحا. أوضحت النتائج أن جيزة ٨٤٣ أكثر أصناف الفول حساسية وأن سخا ١هو أقل الأصناف إصابة. نتائج التحليل الكيميائي اوضحت أنه كلما ازداد محتوى النبات من البروتين والكربوهيدرات أزداد مستوى الإصابة بالآفات التي تم دراستها كما وجد أن الزيادة في قيمة pH يقابلها انخفاضا في تعداد بعض الآفات.