Natural Occurrence of Sucking Insect Pests of Common Bean Varieties, *Phaseolus Vulgaris* L. under The Field Conditions at EL-Beheira Governorate

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DOI: 10.21608/JALEXU.2022.115396.1039

Article Information

Received:January 9th 2022

Revised: January 14th 2022

Accepted: January 16th 2022

Published March 31th 2022

ABSTRACT: These studies were carried out at El Delengat district, EL-Beheira Governorate, Egypt, in the summer and winter seasons (summer and winter plantation) of common bean plants during two successive years of 2018 and 2019. Six sucking insect pests were recorded on common bean varieties for each season. The cotton thrips, *Thrips tabaci* observed significant variation between the two plantations in each year and recorded the highest number 45.87 in summer 2019 but the lowest number was 32.25 in winter of 2018. The cotton whitefly, *Bemisia tabaci* recorded the highest numbers compared with the all pests, and increased density till recorded 161.07 individual in summer 2019. All pests recorded with the highest numbers on Npraska variety and the population increased till recorded the highest average number of 197.47 for *Bemisia tabaci***.** On the fact of Krnak variety, *Lyriomyza* spp was recorded with a few numbers but the number increased in all pests recorded the highest number in *Bemisia tabaci.* On the other hand, *E. dispiens* preferred Npraska variety and activation its population in summer plantation while the lowest numbers were recorded on Giza3 variety in summer plantation. *Aphis gossypii* recorded with high number in summer plantation of all varieties accepted Krnok variety. *Tetranychus urticae* preferred that the Npraska variety then giza6 than Krnok and giza3.

***Keywords*:** Common bean, *Phaseolus vulgaris* L., sucking insect pests, cotton aphids, whiteflies, red spider mite.

INTRODUCTION

Common bean (*Phaseolus vulgaris* L.) is an annual leguminous plant that belongs to the family Leguminoaceae, with pinnately compound trifoliate large leaves. Common bean has high protein content and is a good source of energy and provides folic acid, dietary fiber and complex carbohydrates Filella, and Penuelas, (1994). Common beans (*P. vulgaris* L.) contribute up to 57% of recommended dietary protein and 23% of energy to the nutrition of African people (Shellie and Hosfield, 1991). In African fields, numerous insect pests attack all parts of common bean during all stages of growth, from seedling to stored product (Abate, 1984; Abate, 1993; Singh and Emden, 1979).

In Egypt Common bean usually receives different insect pests that cause considerable damage in both quantity and quality of pods, viz, aphids, leaf miner, leafhoppers, thirps and red spider mite which causes serious damage to plant and subsequently yield (Schuster and Everett, 1983; Parrella *et al*., 1985; Abd El-Gawwad, 2008 and Saleh, 2011, askar, *et. al*, 2013, Amaar *et al*., 2014). The red spider mite (Acari: Tetranychidae), *Tetrunychus cinnabarinus*, is widely distributed in Africa. Although yield-loss data are not available, this pest is considered a major pest of common bean (Giga, 1989). Of the aphids (Homoptera: Aphididae), the black bean aphid, *Aphis fabae*, is the principal aphid pest directly damaging beans in Africa (Remaudiere *et. al*., 1985). Yield loss due to aphid is estimated to 37%, (Munyasa, 2013). It is widely distributed in bean-producing regions. Although it is considered a minor pest in many countries (Bate, 1988; Giga, 1989), it has recently achieved major pest status in some countries. For example, it is the most important bean pest in Sudan, where its damage causes yield losses of 14-86%, depending on the season (Salifu, 1986). The onion thrips, *Thrips tabaci* Lindeman (Thysanoptera: Thripidae), is the most damaging Thysanoptera species, insect is an extremely polyphagous species and a serious pest of a wide range of economically important crops including soybean in many parts of the world (Duchovskiene, 2006; Trdan *et al*., 2007, Amin, *et. al*., 2010). This study aimed to evaluate the seasonal abundance and the population fluctuation of certain pests infesting green bean (*Phaseolus vulgaris*)., number of pests on the plant, the combined effects of principle climatic and plant varietiy factors on the pest density under the field conditions.

MATERIALS AND METHODS

The present study was carried out at El Delengat district, El-Beheira Governorate, Egypt, in summer and winter seasons (plantations) of

common bean plants replicated in two successive years of 2018 and 2019. A general survey was conducted in the common bean plants at El Delengat district during the two growing seasons of 2018 and 2019 (summer and winter plantation). Investigations were made on leaves, stems and pods for insects and mites. Insects' samples were identified in the field and the laboratory using a hand lens and a microscope. The insects and mites were recorded as main and minor pests according to their severity.

1- Population fluctuation of the major pests infesting common bean plants:

Field study was carried out at a private farm at El Delengat district, El-Beheira Governorate, Egypt during two successive seasons, of 2018 and 2019. The experimental area was one feddan cultivated with four different cultivars in mid-February and mid- September for both seasons. All recommended agricultural practices were followed during the growing season without insecticide applications. Sampling procedures were started two weeks ago after sowing and continued at weekly intervals until the harvest time. The plants were visually examined in the field with counting the insect pests. Samples collection started after about two weeks from planting and continued until the harvesting time. At weekly intervals, ten leaves from each replicate were picked out and each put in a paper bag early in the morning from three different heights of the plant. Bags were transferred to the laboratory for examination on the same day using a stereomicroscope. The insect stages were the nymphs of *Bemisia tabaci*, nymphs and adults of *Empoasca dispiens*, *Aphis gossypii* and *Thrips tabaci* larvae of *Lyriomyza* spp, and all stages of the red mites, *Tetranychus urticae* were counted and recorded.

2- Susceptibility of common bean varieties to infestation with the sucking insect pests:

An area of about 3200 m2 (divided into 16 blocks of about 200 m2 /block) was cultivated with the four common bean varieties (Nebraska, Karnak, Giza 6 and Giza 3). Each block was separated from the other by borders (uncultivated two rows). The seeds were obtained from the Ministry of Agriculture, Egypt, and transplanted in the mid-February as a summer plantation and mid-September as a winter plantation. Four replicates of each variety were transplanted and evaluated in complete randomized design. All regular recommended agricultural practices were followed without any pesticide treatments during the whole period of the experiment. Sampling started 15 days post-planting dates, whereas 10 leaves from each replicate were collected at weekly interval up to the end of the season. The leaves were picked manually, placed in paper bags, and transferred to the laboratory for examination using a stereomicroscope to determine the number of adults, nymphs, larvae tunnels leaf and the number of immature stages/leaf of the tested plants.

Data Analysis.

Data were analyzed using (SAS Institute, 1988) to test standard error between treatments ($p < .005$) and estimate LSD among treatments.

RESULTS AND DISCUSSION

1. Population density of the sucking pests attacked common bean varieties during summer and winter plantation in season 2018.

The cotton thrips, *Thrips tabaci:*

Common bean varieties were received different numbers of insect and mite pests during the study period. As shown in table (1) *T. tabaci* (nymphs and adults) are recorded in all varieties with highest population on Npraska variety but in a few numbers for Giza3 and giza6. In summer plantation in season 2018 and 2019 common bean varieties attacked by *T. tabaci* with high numbers than winter plantation. The average number of *T. tabaci* was ranged between 20 – 60 individuals / 10 leaves. In addition, average number of insects increased on common bean in winter and summer plantation 2019 than the population in year 2018. described that dry weather with abstemiously high temperature can be the increasing factor for thrips population while wet season with moderately high relative humidity affect the thrips population. Duchovskiene (2006) evaluate two leek varieties against onion thrips, *T. tabaci* infestation. Also, he reported that, onion thrips infested both the varieties but 100% infestation was found in the next following year. He observed the population of thrips throughout the season with peak in the month of July and reaches 3.4 thrips per plant at the end of growing season.

Table 1. Population density of *Thrips tabaci.* on common bean varieties during season 2018 and 2019 as summer and winter plantation

Seasons	Giza3	Giza6	Npraska	Krnak
Summer (2018)	43.54 a	32.42 b	57.98 a	45.35 b
Winter (2018)	26.79 c	23.88 c	45.73 c	32.60 d
Summer (2019)	33.21 b	42.79 a	57.35 a	50.13 a
Winter (2019)	21.96 d	30.44 b	53.96 b	40.00 c
LSD 5%	**4.66**	**3.92**	**2.82**	**3.76**

The potato leafhopper, *Empoasca dispiens*

Seasonal average of *E. dispiens* insect density was counted and recorded on four varieties of common bean in years 2018 and 2019 (table2). In summer plantation common bean varieties attack by high number of insects compared with winter plantation. *E. dispiens* density not increased above 60 individual insect/ leaf and not decreased than three insects on one leaf spatial in winter plantation. On the other hand, *E. dispiens* preferred Npraska variety and activation its population in summer plantation while the lowest numbers were recorded on Giza3 variety in summer plantation. The winter plantation of all varieties recorded a fewer numbers (8 insects/10 leaves) under field conditions. The common bean, *P. vulgaris* (L.) can be affected on *E. dispiens* insect density so our data was nearly agreement with Naseri *et al.* (2009) how determined the population density and spatial distribution pattern of *Empoasca decipiens* Paoli were in Tehran area, Iran, during 2004-2005 on four species of common bean *Phaseolus vulgaris* (L.) *var.* Talash, lima bean *P. lunatus* (L.) Savi ex Hassk. var. Sadaf, rice bean *P. calcaratus* Roxb. var. Goli and cowpea *Vigna sinensis* (L.) var. Parastoo. The highest and lower mean population densities of *E. decipiens* per leaf were observed on Parastoo cowpea (18.85 in 2004 and 29.94 in 2005) and Talash common bean (1.08 in 2004 and 0.37 in 2005), respectively in summer plantation.

Table. 2. Population density of *Empoasca dispiens.* On common bean varieties during season 2018 and 2019 as summer and winter plantation

Season	Giza 3	Giza 6	Npraska	Krnok
Summer 2018	27.04 b	21.06 b	39.02 b	31.33 b
Winter 2018	6.41 c	3.24 c	4.34 c	2.93 c
summer 2019	30.69 a	39.13 a	55.35 a	40.51 a
Winter 2019	2.91 c	3.61 c	6.98 c	2.35 c
LSD 5%	3.53	4.27	6.23	4.90

The cotton whitefly, *Bemisia tabaci*

As shown in table (3), *Bemisia tabaci* attacked the common bean varieties during the season 2018 and 2019 in summer and winter plantation, forever Npraska varity received the highest numbers while Giza3 attacked by the lowest number of insects. Data also reflected that *B. tabaci* was activated more in winter compared with the other insects. On summer plantation *B. tabaci* numbers ranged between 120- 260 individuals / 10 leaves during the study period. Jha and Varkkey (2018) reviewing a paper to assess the effect of different environmental factor on the population of whitefly *B. tabaci* and found that different environmental factors affect insect population in different extent even variation was found in same calamitic factors in different location or different time and its distribution.

Table. 3. Population density of *Bemisia tabaci.* On common bean varieties during season 2018 and 2019 as summer and winter plantation

Season	Giza 3	Giza 6	Npraska	Krnok
Summer 2018	84.03 b	90.83 c	169.67 c	129.24 c
Winter 2018	57.49 d	114.96 b	162.44 c	123.31 d
summer 2019	113.42 a	131.97 a	244.35 a	154.56 b
Winter 2019	74.91 c	117.77 b	213.42 b	159.50 a
LSD 5%	5.85	4.27	9.63	4.51

The cotton aphid, *Aphis gossypii.*

The data in table (4), showes that, *A. gossypii* was more active on Krnak variety than all common bean varieties and increased its density till recorded 23 and 24 insects/ 10 leaves in summer and winter 2018 respectably. The density decreased on Giza3 recorded the lowest number in winter 2019. On the other hand in 2018, *A. gossypii* recorded with high number in summer plantation of all varieties accepted Krnok variety.

Table. 4. Population density of *Aphis gossypii.* On common bean varieties during season 2018 and 2019 as summer and winter plantations

Season	Giza 3	Giza 6	Npraska	Krnok
Summer 2018	10.62 a	19.47 a	14.12 a	22.77 a
Winter 2018	6.58 b	10.67 b	6.98 c	23.56 a
summer 2019	7.06 b	10.69 b	11.54 b	15.74 b
Winter 2019	4.28 c	6.35 c	6.67 c	6.10 c
LSD 5%	**0.66**	**1.38**	**0.91**	**2.02**

Lyriomyza leafminers

Numbers of larvae of *Lyriomyza* spp, was recorded in average numbers on common bean varieties, no significant variation were observed between the different varieties (as shown in table (5). Npraska variety, reflected the performance of *Lyriomyza* spp naturally occurred and recorded the highs number mor than 16 insect/10 leaves in summer 2019 but in summer 2018 *Lyriomyza* spp density decreased recording less than 11 individuals/10 leaves on Giza6 variety. On fact of year 2018 and 2019, *Lyriomyza* spp recorded active in the summer than in the winter.

Table 5. Population density of *Lyriomyza* spp. On common bean varieties during season 2018 and 2019 in both summer and winter plantation

Season	Giza 3	Giza 6	Npraska	Krnok
Summer 2018	5.61 c	6.90 c	9.59 c	7.56 c
Winter 2018	4.90 c	6.03 d	8.44 d	6.64 d
summer 2019	11.34 a	10.41 a	16.15 a	13.97 a
Winter 2019	9.14 b	8.47 b	13.25 b	9.07 b
LSD 5%	0.76	0.48	0.88	0.82

The red mite, *Tetranychus urticae*:

The means of *T. urticae* were presented in common bean varieties and recorded with high number (table 6). The data reflected that, *T. urticae* preferred that the Npraska variety then giza6 than Krnok and giza3. The average natural occurrence was active in summer 2018 than all seasons and recorded the highest density on Npraska. The lowest occurrence of *T. urticae* recorded in winter at all time of study period. Abd EI-Gawwad (2004) showed that the population density of *T. urticae* was the main Tetranychidae mite infesting common bean leaves.

Table 6. Population density of *Tetranychus urticae* On common bean varieties during season 2018 and 2019 as summer and winter plantation

Season	Giza 3	Giza 6	Npraska	Krnok
Summer 2018	23.38 a	36.59 a	52.62 a	34.44 a
Winter 2018	8.72 c	17.98 c	33.95 c	25.88 c
summer 2019	18.14 b	28.59 b	42.62 b	31.44 b
Winter 2019	4.72 d	9.98 d	17.95 d	9.88 d
LSD 5%	2.13	2.92	3.67	2.74

2.Susceptibility of common bean varieties caused by sucking insect pest's density and distribution.

Common bean, *Phaseolus vulgaris* varieties received several pests as shown in Table (7). The date collected and calculated in average number of all pests on each of plant varieties to estimated the effect on pest density. Giza3 variety was received the lowest number of *A. gossypii and Lyriomyza spp. T. tabaci*, recorded with the highest number of 31.38 / 10 leaves on giza3 variety. Meanwhile in case of Giza6 variety, the population of all pests was increased gradually than the population of pests on giza3. *B. tabaci* was recorded with highest average number of 113.38 individual / 10 leaves but *Lyriomyza spp* recorded the lowest average number of 7.95 on giza6. All pests recorded with the highest numbers on Npraska the population increased till recorded the highest average number of 197.47 for *B. tabaci*. On the fact of Krnak variety, *Lyriomyza spp* was recorded with a few numbers but the number increased in all pests recorded the highest number in *B. tabaci.* Sedaratian, *et al.* (2010) studied Population density and distribution of *Thrips tabaci* Lindeman on seven soybean varieties (Williams, Tellar, Sahar, Dpx, L17, Sari and Zane) and one genotype (Ks3494) in Tehran region, during 2007. They also recorded that, the highest population density of the thrips per leaf was recorded on varieties, Dpx and on Ks3494 (0.81±0.05 and 0.80±0.05, respectively). But the lowest population density was observed on L17 and Tellar (0.62±0.04 and 0.64±0.03, respectively).

Table 7. Average seasonal number of common bean pests attacked different varieties of Common bean, *P. vulgaris*.

common bean varieties	*Thrips tabaci*	*Bemisia tabaci*	*Aphis gossypii*	*Empoasca dispiens*	*Lyriomyza spp*	*Tetranychus urticae*
Giza3	31.38^{c}	82.46^{d}	7.14^{d}	16.76^{c}	7.75^{c}	13.74^{c}
Giza6	32.38^{c}	113.88^{c}	11.80^{b}	16.76^{c}	7.95^{c}	23.29^{b}
Npraska	53.76^{a}	197.47^{a}	9.83^{c}	26.42^{a}	11.86^{a}	36.78^{a}
Krnak	42.02^{b}	141.65^{b}	17.04^{a}	19.28^{b}	9.31^{b}	25.41^{b}
LSD 5%	4.21	19.81	0.78	1.86	0.77	3.86

Means followed by the same letter(s) within the same column are nonsignificantly different ($P \leq 0.05$)

3.Effect of plantation dates on density of the sucking pests and its distribution.

During the season of 2018 and 2019, data collected in the summer and winter season as shown in table (8). Six species sucking insect pests recorded on common bean varieties at all time of the season. Data in Table (8), showed that, numbers of *T. tabaci* were significantly variation between the two plantation in each year and recorded the highest number 45.87 in summer 2019 but the lowest number was 32.25 in winter 2018. *Bemisia tabaci* recorded with the highest number compared with all pests to record 161.07 individual in summer 2019. The cotton aphid, *A. gossypii* recorded the lowest numbers in summer and winter season of 2018 and 2019 (Table 2). In addition, *E. dispiens* recorded the lowest number in winter plantation of season 2019 but in summer 2019 it recorded the highest numbers with 41.42 individual insects. In the fact of *Lyriomyza spp*, the pest recorded with highest numbers (12.97) during the 2019. On the other way of insect, the red mites, *Tetranychus urticae* was recorded at all time with significant deferent average numbers between 10.63 and 36.76 individual mite. In the general *Bemisia tabaci*, recorded with the highest average number of 161.07 in summer 2019 but *E. dispiens* recorded with the lowest number of 3.69 in winter 2019. Data in table (8) reflected that, all pests recorded with high number in the summer compared with winter plantation. The present research the observations of Nayak *et al.* (2004) who reported that the minimum temperature was positively correlated with *B. tabaci* and so in agreement with those obtained by Younes *et al.* (2001) who detected significant negative correlation between the tested weather factors. Jesus *et al.* (2009) noted a negative and non-significant linear correlation between average temperatures of whitefly number.

Mastoi, *et al.* (2013) carried out studies on varietal resistance of okra against whitefly (*B. tabaci*) and fruit borer (*Earias* spp) at Entomology department, on seeds of six varieties namely, Sabzpari, Super green, Noori-786, Sharmeeli, Pusa sawani, and Ambak which sown on April 19, 2004 in a randomized complete block design (RCBD) with four replications. They also recorded the observations on pest infestation started in the second week of May, 2004 and continued till harvest of the crop. Observations were recorded at weekly intervals from five plants selected at random per treatment. The results revealed that the population of whitefly varied significantly ($P < 0.05$) on different dates and varieties. Okra variety Sabzpari harbored the minimum pest (3.17 insects/leaf) population, while Noori-786 harbored the maximum (4.46 insects/leaf) population. El-Saidy *et al.* (2012)

reported that common bean cultivar Hama was more susceptible than Polista cultivar. The authors found significant differences between the two kidney bean cultivars for *B. tabaci* the susceptibility of the two cultivars to these insect infestations was also varied during the two studied seasons. Therefore, plant breeders must be study characters of this cultivar in more details and transferred the desirable one's into the other new produced cowpea cultivars. Amal *et. al*, (2018) The number of white flies infested the three cultivars was statistically significant during 2013 and 2014 summer and winter cropping seasons. In summer 2013 cropping season, the cultivars Copy and Polesta were the most susceptible varieties while, the cultivar Manga was less susceptible one. In winter 2013 cropping season, the cultivars Copy and Manga were more susceptible to whitefly infestation than Polesta cultivar.

Table 8. Average number of common bean pests in summer and winter seasons of the two successive years 2018 and 2019.

Season	*Thrips tabaci*	*Bemisia tabaci*	*Aphis gossypii*	*Empoasca dispiens*	*Lyriomyza spp*	*Tetranychus urticae*
Summer 2018	44.82^{a}	118.45^{c}	16.74^{a}	29.61^{b}	7.41^{c}	36.76^{a}
Winter 2018	32.25^{c}	114.55^{c}	11.95^{b}	4.23^{b}	6.50^{c}	21.63^{c}
Summer 2019	45.87^{a}	161.07^{a}	11.26^{b}	41.42^{a}	12.97^{a}	30.20^{b}
Winter 2019	36.59^{b}	141.40^{b}	5.85^{c}	3.96^{c}	9.98^{b}	10.63^{d}
LSD 5%	2.19	7.22	1.49	6.26	0.97	3.77

Means followed by the same letter(s) within the same column are nonsignificantly different ($P \leq 0.05$)

According to Gamila, *et al.* (2016) how studied survey in 2014 and 2015 summer successive seasons, studied the population fluctuations of the red spider mite *Tetranychus urticae* Koch, cow pea aphid *Aphis craccivora* Koch, American serpentine leaf miner *Liriomyza trifolii* (Burgess), cotton whitefly *Bemesia tabaci* (Genn.), potato leafhopper *Empoasca decipiens* (Paoli), cotton thrips *Thrips tabaci* L. and cotton aphid *Aphis gossypii* Glover infesting kidney bean plants at Abo Hammad district, Sharkia governorate, Egypt. The aforementioned pests were collected by two different methods from kidney bean plantation using plant samples and sweeping net. The obtained results showed that the plant samples proved to be the best method to investigate mite, aphids, leaf miner (larvae), whitefly and thrips pests, while sweeping net proved to be the best technique to investigate the potato leafhoppers. The seasonal abundance of *T. urticae* and *L. trifolii* showed three peaks of population density, while the results of *A. craccivora, B. tabaci, E. decipiens* on kidney bean plants showed two peaks of population density during two seasons. Amal *et. Al*., (2018) found that, in 2013 and 2014 cropping seasons, the population densities of *B. tabaci* gradually increased from the 3rd week of March until the 4th week of April. For, the population density increased and reached a peak from the 1st week of May, and then the population density decreased gradually from the 4th week of May until the 3rd week of June in 2013 and 1st of June in 2014. Densities of this pest typically increased as the growing season progressed and reached a peak in November and started to decrease from 1st of December until the end of them. On the other hand, *B. tabaci* density showed nonsignificant negative association with relative humidity in 2014 summer season and 2013 winter seasons and significant negative association in 2014 winter season with correlation coefficients of 0.18, 0.73 and 0.32 respectively. Darwish, in 2019 studied the susceptibility of certain potato cultivars to infestation with the sucking insect pests in El-Beheira Governorate, Egypt. Five potato cultivars were evaluated through two successive seasons (summer plantations) in field experiments. In agreement with the current study he found that none of the tested potato cultivars was immune or highly resistant to the tested insect pests.

REFERENCES

Abate T. 1984. Further notes on insect pests of grain legumes in Ethiopia. Comm. Ethiop. Entomol. Newsl. 3(2):4- 5

Abate T. 1993. Control of other pests and diseases. In Dryland Farming in Africa, ed. JRJ Rowland, 9188-204. London: Macmillan

Abd El-Gawwad, S. A.Y. 2008. Study of integrated pest management on some pests of common bean plant. Ph.D. Thesis, Zoology Department, Faculty of Science for Girls, Al-Azhar Univ., 409 pp.

Abd El-Gawwad, S.A.Y. 2004. Biological, ecological and biocontrol studies on some mites. Ms. Thesis Fac. of Sci. AL-Azhar, Univ. 197 pp.

Amaar, Mona I., S. A. EL-Refai, Rania S.A.

Rashwan and M. F. A. H. Hegab, 2014. Populaton dinamics and control of certain pests infesting green bean (*Phaseolus vulgaris*) at Qalubiya governorate, Egypt. Egypt. J. Agric. Res., 92 (3), 2014.

Amal I. Safe 1 , EL-Saied A. Naiem1 , Horia. A. Abdel-Whab2 and Kamal M. El-Gendy 2018. Population Dynamics of the Whitefly, *Bemisia Tabaci* (Gennadius) (Homoptera: Aleyrodidae) on Common Bean, *Phaseolus vulgaris* in Relation to Cultivar, Temperature and Humidity ALEXANDRIA SCIENCE EXCHANGE JOURNAL, VOL. 39, No.2. APRIL- JUNE 2018 298

Amin Sedaratian-Jahromi, Yaghoub Fathipour, Ali Asghar Talebi, Samira Farahani, 2010. Population Density and Spatial Distribution Pattern of Thrips tabaci (Thysanoptera: Thripidae) on Different Soybean Varieties. Journal of Agricultural Science and Technology 12:275-288

Askar, S. I.; M. A. M. El-Aw and Kh. A. A. Draz (2013): Population density of the mealy plum aphid, Hyalopterus pruni (Geoffroy), (Homiptera: Aphididae) and its natural enemies on the weed, Arundo donax, L. at El-Beheira Governorate: J. Agric. & Env. Sci. Dam. Univ., Egypt Vol.12 (2) 93-105.

Bate T. 1988. Insect and Mite Pests of Horticultural and Miscellaneous Plants in Ethiopia. IAR Handbook, No. 1. Addis Ababa, Ethiopia: Inst. Agric. Res. (Ethiopia). 115 pp.

Darwish A. A. E. 2019. Variation in the susceptibility of some potato (Solanum tuberosum L.) cultivars to infestation with certaion piercing sucking insect pests. J. Plant Prot. and Path., Mansoura Univ., Vol.9 (12): 849 – 853, 2018

Duchovskiene, L. 2006. The Abundance and Population Dynamics of Onion Thrips (*Thrips tabaci* Lind.) in Leek under Field Conditions. Agro. Res., 4: 163-166.

El-Saidy E.M.A., Aziza M. M. Abou-Zaid and Amna, M.H. Maklad 2012. Evaluation of the Susceptibility of two Kidney Bean Cultivars to the Infestation of the Two- Spotted Spider Mite and Some Sap-Sucking Insects a Their Relations with Some Abiotic Factors. J. of App. Sci. Res., 8(11): 5543-554

Gamila Sh. Selem1 ; Heba A. Ismail 2 and Abd-Elsamad, A. A.2, 2016. Population fluctuations of the main pests infesting kidney beans and its relation with some weather factors. Annals of Agric. Sci., Moshtohor ISSN 1110-0419 Vol. 54(4) (2016), 969–976

Giga DP. 1989. Constraints to bean production in Zimbabwe. In Proc. Meet. Pan-Afr. Work. Group Bean Entomol., lst, Aug. 69. CIAT Afr. Workshop Ser. No. 11, pp. 21-25. Cali, Colombia: CIAT

Kumar Jha, J., & Varkkey, B. (2018). Are You a Cistern or a Channel? Exploring Factors Triggering Knowledge-Hiding Behavior at the Workplace: Evidence from the Indian R&D Professionals. Journal of Knowledge Management, 22, 824-849. https://doi.org/10.1108/JKM-02-2017-0048

Abdul Hafeez Mastoi 2013. varietal resistance of okra against whitefly and fruit borer. Scholarly Journal of Agricultural Science Vol. 3(3), pp. 78-82, March, 2013

Nayak, S.K., R. Ujagir, and R.C. Chhibber.2004. Effect of abiotic factors on the insect population build up on Black gram, Vigna mungo L. crop. Shashpa 11(1): 31-36.

Parrella, M.P.; Jones,V.P. ; Youngman, R.R. and Lebeck, L.M. 1985. Effect of leaf mining and leaf stippling of *Liriomyza* spp. on photosynthetic rates of chrysanthemum. Ann. Entomol. Soci. America, 78: 90-93.

Remaudiere G, Amonyin G, Autrique A. 1985. Les plants hotes des pucerons africains. In Contribution a I'Ecologie des Aphides Africains. Plant Production and Protection Papers. ed. G Remaudiere, A Autrique, 64: 103-9. Rome: FA0

Saleh, F. M. 2011. Effect of certain agricultural practices and biological control on soygreen bean pests. Ph.D. Thesis, Economic Entomol. Department, Faculty of Agric., Mansoura Univ., 219 pp.

Salifu AB. 1986. Studies on aspects of the biology of flower thrips, *Megalurothrips sjostedti* (Trybon), with particular reference to resistance in its host cowpea, Vigna Unguiculata (L.) Walp. PhD thesis. Wye College, U

SAS Institute, 1988. SAS/STAT User`s Guide, Ver. 6.03. SAS Institute Inc., Cary, North Carolina.

Schuster, D.J., and Everett, P.H. 1983. Response of *Liriomyza trifolii* (Diptera: Agromyzidae) to insecticides on tomato. Con. Entomol., 76: 1170-1174.

Sedaratian A., Fathipour Y.*, Talebi A.A., Farahani S.Population Density And Spatial Distribution Pattern Of Thrips Tabaci (Thysanoptera: Thripidae) On Different Soybean VarietiesJOURNAL OF AGRICULTURAL SCIENCE AND TECHNOLOGY (JAST) JULY 2010 , Volume 12 , Number 3;
Page(s) 275 To 288.

Singh SR, and Emden HF. 1979. Insect pests of grain legumes. Annu. Rev. Entomol. 24255-78

Trdan, S., Valic, N. and Znidarcic, D. 2007. Field Efficacy of Deltamethrin in Reducing Damage Caused by *Thrips tabaci* Lindeman (Thysanoptera: Thripidae) on Early White Cabbage. J. Pest Sci., 80: 217-223.

Younes, A. A., S. M. Soliman and S. E. Saadoon. 2001. Ecological studies on some sucking insects and mite associated with certain soygreen bean cultivars. J. Agric. Sci. Mansoura Univ., 26: 4551-4558.

الملخص العربي

التواجد الطبيعي للآفات الحشرية الماصة للعصارة لأصناف الفاصوليا الشائع ، *Phaseolus vulgaris* L. تحت الظروف الحقلية بمحافظة البحيرة

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أجريت هذه الدراسات بمنطقة الدلنجات بمحافظة البحيرة بمصر في موسمي الصيف والشتاء (العروة الصيفيه والشتوية) لنبات الفاصوليا الشائع خلال عامين متتاليين من 2018 و 2019. تم تسجيل ستة آفات حشرية ماصة على اصناف الفاصوليا لكل موسم. لاحظ تربيس القطن *Thrips tabaci* تباينًا معنويًا بين العروتين من حيث التعداد في كل عام وسجل أعلى تعداد 45.87 في صيف 2019 ولكن أقل تعداد كان 32.25 في شتاء 2018. سجلت الذبابة البيضاء للقطن ، *Bemisia tabaci* أعلى التعداد مقارنة بجميع. الآفات التة سجلت ، وازدادت كثافتها حتى سجلت 161.07 فردًا في صيف 2019. سجلت جميع الآفات أعلى أعداد على صنف نبراسكا وزاد عدد السكان حتى سجلت أعلى متوسط رقم 197.47 *Bemisia tabaci*. على الجانب الاخر صنف Krnak ، تم تسجيل *Lyriomyza* spp بأعداد قليلة ولكن االتعداد الاعلى في جميع الآفات سجل في *Bemisia tabaci*. من ناحية أخرى ، فضلت حشرة *E. dispiens* صنف النبراسكا وارتفع تعدادها في العروة الصيفية بينما سجلت أقل تعداد على صنف جيزة 3 في العروة الصيفية. سجلت *Aphis gossypii* مع عدد كبير في العروة الصيفية لجميع الأصناف ماعدا الصنف Krnok. فضل العنكبوت الاحمر *Tetranychus urticae* الاصناف التالية صنف Npraska ثم giza 6 على Krnok و giza3 على الترتيب.