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SEASONAL OCCURRENCE OF CERTAIN PESTS AND NATURAL ENEMIES ASSOCIATED WITH BROAD BEAN, WHEAT AND SOYBEAN AT ASSIUT GOVERNORATE

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ABSTRACT

Weekly counts of certain pests and natural enemies inhabiting broad bean, wheat and soybean were carried out at Abnoub district, Assiut Governorate during ٢٠١٠ and ٢٠١١ seasons to study some ecological aspects.

Results indicated that the highest dominance and abundance were recorded with the pests namely; aphid species, *Thrips tabaci* Lind, *Empoasca* spp.; *Bemisia tabaci* (Genn.) and *Tetranychus urticae* Koch as well as the natural enemies namely; parasitoid species, *Scymnus interruptus* Mars. and *Orius* spp. on broad bean, wheat and soybean. Population activity of pests and natural enemies inhabiting these crops were studied.

Regarding the relation between some weather factors and the population density of these pests, In general, the results indicated that the correlation coefficient between the pests and weather factors differed according to the pest and crop.

INTRODUCTION

Broad bean (*Vicia fabae* L.), wheat (*Triticum aestivum* L.) and soybean (*Glycine max* L.) are considered among the most important crops in Egypt. These crops are subjected to injurious attacks by different insect pests, which reduce both quality and yield.

The interactions between insects and their natural enemies are essential ecological processes that contribute to regulation of insect population (Dent, ١٩٩٥).

However, environment conditions at any location influence the seasonal phenology of insect numbers, the number of generations and the level of insect abundance (Dent, ١٩٩٥), in addition of geographic range and abundance of various groups of predators (Kogan and Herzog, ١٩٨٠).

Therefore, the present work was conducted to study the dominance and abundance as well as the population fluctuation of the pests were mentioned before and natural enemies on broad bean, wheat and soybean in relation to some prevailing climatic factors during two successive growing seasons.

MATERIALS AND METHODS

Counting of the main pests and natural enemies associated with broad bean, wheat and soybean plantations was carried out at Abnoub district, Assiut Governorate during ٢٠١٠ and ٢٠١١ seasons. An area of about ١/٤ feddan per crop was divided into plots of equal size (approximately ٢٥٠ m^2). This area is located at ١٠ Km from Assiut city and was not subjected to any chemical control applications. Broad bean and wheat were sown during the second week of November, while soybean was sown in the first week of June in both seasons.

Twenty five double net strokes were practiced at weekly intervals by crossing the two diagonals of the experimental area with ٤ replicates for each crop. Specimens were kept in paper bags and transferred to the laboratory. Catched insalts were killed by chloroform and were spread on a sheet of white paper for examination and counting.

The meteorological data (maximum and minimum temperature and relative humidity) were recorded during each inspection date. Records were obtained from the meteorological station located at Assiut University, ١٠ Km away from the study site.

Dominance (D) and abundance (A) degrees for the pests and natural enemies were determined according to Facylate (١٩٧١).

$$D = \frac{t}{T} \times ١٠٠$$ where,

t = Total number of each species during the collecting period.
T = Total number for all species collected during the collecting period.

$$A = \frac{n}{N} \times ١٠٠$$ where,

n = Total number of samples in each species appeared.
N = Total number of samples taken all over the season.

The relationship between the population density of some pests and certain prevailing climatic factors (maximum, minimum temperature and relative humidity) was statistically studied by using simple correlation analysis.

RESULTS AND DISCUSSION

١. Population activity of pests and natural enemies inhabiting broad bean, wheat and soybean plants:

The population density of certain pests namely, aphid species; cotton thrips, *Thrips tabaci* Lind.; leaf hopper, *Empoasca* spp.; plant bug, *Compylomma impicta* (Wanger); leaf-miner, *Liriomyza congesta* (Beck); cotton whitefly, *Bemisia tabaci* (Genn.); plant bug, *Creontiads pallidus* Ramb. and two spotted spider mite, *Tetranychus urticae* Koch as well as natural enemies namely, the ladybird beetle, *Coccinella septumpunctata* L.; flower bug, *Orius* spp.; scymnus lady beetle, *Scymnus interruptus* Mars.; common green lacewing, *Chrysoperla cornea* Steph.; true spiders; predator bug, *Nabis* spp.; hover flies, *Syrphus corollae* F. and parasitoid species associated with broad bean, wheat and soybean plants during ٢٠١٠ and ٢٠١١ seasons at Abnoub district are illustrated graphically in Figures (١, ٢ and ٣).

١.a. Broad bean:

The obtained results illustrated in Fig. (١) clearly revealed that the initial infestation of these pests beginning from the first week of January. After the first appearance of pests, their population fluctuated and recorded several different peaks. Aphid species and *L. congesta* showed their peaks of (٣١٩.٤ and ٣١٦.٧; ٣٥.٣ and ١٩.٧ individuals / ٢٥ double strokes) during the third week of February for the first and second seasons, respectively. In accordance with these results, (Mohamed and Salman, ٢٠٠١) revealed that *Aphis craccivora* Koch increase from December till February, then decreased gradually until disappeared. Also, (Aly and Makadey, ١٩٩٠) showed three distinct larval peaks of *L. congesta* in the leaflets of broad bean plants. The peaks took place in the last ten days of January, February and March. *Empoasca* spp. revealed one peak in the first week of March (٦٤.٣) during the first season and two peaks in the first and fourth week of March (٧٩.٣ and ٨٠.٠) during the second season. In agreement with (Abou-Elhagag and Salman ٢٠٠١) who determined the peak of *Empoasca* spp. during March. *B. tabaci* recorded its peak of (١٧.٧ individuals / ٢٥ double strokes) that occurred on the ٣٠th of January in the first season earlier than that occurred in the second season on the ١٤th of February (١٧.٣ individuals / ٢٥ double strokes), while the opposite was true for *T. tabaci* that indicated its peak of (٩٠.٣) during the ٣rd of April in the ١st season later than that happened in the ٢nd season (٨٠.٧) on the ٧th of March. *C. impicta* showed its peak (٢٧.٣) during the third week of March in the ٢nd season later than that occurred during the ٢nd week of March (٢٥.٣) in the ١st season.

Regarding to the natural enemies activity on broad bean plants in both ٢٠١٠ and ٢٠١١, it is obvious that the population density of parasitoid species was higher than the other natural enemies. In both of seasons, *C. undecimpunctata* and *C. carnea* showed their peaks during February while *Orius* spp., *S. interruptus* and true spiders recorded their peaks in March. But in case of *Nabis* spp., *S. corollae* and parasitoid species, their peaks were recorded during different dates throughout the two seasons. From the above-mentioned results, it is clear that the population of aphid species, *C. undecimpunctata* and *C. carnea* recorded their peaks during February, in harmony with (Ali and Rizk, ١٩٨٠) who

mentioned that the population of predator was correlated with the aphid population.

From the data presented in Table ١, it is obvious that, the mean number of population density of all pests and natural enemies, with the exception of jassids, associated with broad bean was much higher in the first season than in the second one.

Table ١:Mean number of certain pests and natural enemies associated with broad bean, wheat and soybean at Abnoub district, Assiut Governorate, during ٢٠١٠ and ٢٠١١ seasons.

Life style	Species	Broad bean		Wheat		Soybean	
		٢٠١٠	٢٠١١	٢٠١٠	٢٠١١	٢٠١٠	٢٠١١
Pests	*Empoasca* spp.	٢٥.٧٣	٢٩.٨٢	٢.٨٧	٣.٢٦	٢.٦٩	١.٤١
	Aphids	٨٣.٣٣	٥٣.٧١	١٤.٠٠	٥٨.٦٩	٠.٠٠	٠.٠
	C. impicta	٩.٢٢	٨.٩١	٠.٠٠	٠.٠٠	١.٤١	١.٠٠
	T. tabaci	٣١.٦٠	٢٤.٢٢	١٠.٠٨	٩.٠٥	٩.٤١	٦.٢٨
	B. tabaci	٧.٤٧	٥.٣٣	٠.٠٠	٠.٠٠	٥.٥١	٥.٧٧
	L. congesta	١٠.١٨	٨.٤٧	٠.٠٠	٠.٠٠	٠.٠٠	٠.٠٠
	C. pallidus	٠.٣١	٠.٠٤	٠.٠٠	٠.٠٠	٠.٠٨	٠.٦٢
	T. urticae	٠.٠٠	٠.٠٠	٠.٠٠	٠.٠٠	٨.٢٨	٤.٧٩
Total		١٦٧.٨٤	١٣٠.٥	٢٦.٩٥	٧١.٠٠	٢٧.٣٠	١٩.٨٧
Mean		١٤٩.١٧		٤٨.٩٨		٢٣.٥٩	
Natural enemies	*C. undecimpunctata*	٢.٥٣	٢.٢٠	٢.٤١	٢.٠٣	١.٠٨	٠.٣١
	Orius spp.	٣.٧١	٢.٥٣	٢.٤٩	٢.٥٩	٢.٩٠	٢.٠٨
	S. interruptus	٢.٨٤	٢.٢٧	٣.٤٦	٣.١٣	٣.٦٧	٢.٢٦
	carnea .C	٠.٦٠	٠.٣١	٠.٩٠	٢.١٣	٠.٦٢	٠.٢٣
	True spider	١.٠٩	٠.٨٩	٢.٢٨	٠.٨٢	٢.٠٣	١.٧٤
	Nabis spp.	٠.٢٢	٠.٠٩	٠.٠٠	٠.٠٠	٠.٠	٠.٠
	S. corollae	٠.٥٦	٠.٢٤	٠.٠٠	٠.٠٠	٠.٠	٠.٠
	Parasitoid species	٣١.٤٠	١٨.٤٠	٩.٨٧	٢٤.٤٦	٠.٠	٠.٠
Total		٤٢.٩٥	٢٦.٩٣	٢١.٤١	٣٥.١٦	١٠.٣٠	٦.٦٢
Mean		٣٤.٩٤		٢٨.٢٩		٨.٤٦	

١.b. Wheat:

Data illustrated in Fig. (٢) show weekly changes in the population density of certain pests and natural enemies existing on wheat during the two seasons (٢٠١٠ and ٢٠١١). Aphid species appeared during the ١st week of January in small numbers in both growing seasons. Thereafter the population increased gradually to reach peaks of ٥٣.٣ and ٣٢٤.٠ individuals of aphid that occurred on the ٢nd and ٤th weeks of February.

These results agree with those of Abou-Elhagag and Abdel-Hafez (١٩٩٨) and Legrand *et al.* (٢٠٠٤) they stated that the aphid populations increased in February and March. The same trend was achieved with thrips, the population started in small numbers in both growing season. Then the population increased gradually to attain peaks of ٢٠.٣ and ٢٥.٠ individuals of thrips that occurred on the ١st week of February, then the population decreased gradually until the ٣٠th of March during the two seasons. Individuals of jassids were occurred throughout the two seasons in relatively low numbers.

In respect of natural enemies associated with wheat plants in both seasons, the data revealed that the parasitoid species were occurred in relatively high number allover two seasons comparing with the other natural enemies recording the maximum number (٤١.٠ and ٦٩.٣ individuals) in the ٣rd week of February and ١st week of March during the ١st and ٢nd seasons. Concerning ladybird beetle, flower bug, scymnus lady beetle, common green lacewing and true spiders, data indicated low numbers and the peaks of these natural enemies were showed in different times during the two seasons.

It is clear from the data obtained in (Table ١) that population density of the two pests, jassids and aphid species as well as the three natural enemies, common green lacewing, flower bug and parasitoid species were higher in the ٢nd season than the ١st one, while the opposite was true for other pests and natural enemies.

The aforementioned results indicate that *C. undecimpunctata* was slightly high on broad bean than wheat may be result from the population of aphid species on broad bean was higher than on wheat. In concurrence with this result (Ali and Rizk, ١٩٨٠) mentioned that *C. undecimpunctata* was greater on wheat than in clover and broad bean probably due to the population density of prey, particularly aphid, which was higher on wheat.

١.c. Soybean:

Data in Fig. (٣) indicate that the three pests namely *T. tabaci*, *B. tabaci* and *T. urticae* as well as the three natural enemies namely *Orius* spp., *S. interruptus* and true spiders recorded higher population densities than the three pests *Empoasca* spp., *C. impicta* and *C. pallidus*

as well as the other two natural enemies *C. undecimpunctata* and *C. cornea* in both seasons. *T. urticae* recorded one peak of (٢٦.٣ and ١٧.٣) on the ٢١st and ٢٢nd of August during the ١st and ٢nd seasons, respectively while *T. tabaci* showed its peak during ٢٨th and ١٥th of August in the ١st and ٢nd seasons, respectively. Moreover, the peak of *B. tabaci* indicated during the ١st week of August and ٤th week of July during the ١st and ٢nd seasons, respectively. These results confirm those obtained by El-Doksh (٢٠٠٦) who indicated that, the population of *T. urticae* attained its peak during the last week of August and the population of *B. tabaci* reached its peak throughout July to early September.

As for natural enemies *S. interruptus* and true spiders recorded their peaks (١١.٠; ٦.٠ and ١٣.٣; ٤.٠) on the ٢١st and ٢٩th of August, whereas *Orius* spp. showed its peak (١٢.٠ and ١٥.٧) on the ٤th of September and ٢٩th of August during the ١st and ٢nd seasons, respectively. Generally, the results of the two seasons indicated both population of prey and predators are coincident, the increasing and decreasing of prey populations corresponding with the increment and decrement of predator populations. These results were agreement with that obtained by Shaalan *et al.* (٢٠٠٧).

From the data given in (Table ١) it is clear that the mean number of the population density of all pests and natural enemies with the exception of *B. tabaci* and *C. pallidus* was lower in the second season than in the first season.

In view of the abovementioned results (Table ١) it could be concluded that the two grand season means of pests and natural enemies collected from broad bean (١٤٩.١٧ and ٣٤.٩٤ individuals / ٢٥ double strokes) were higher than that collected from wheat (٤٨.٩٨ and ٢٨.٢٩) while the grand lower means of pests and natural enemies were (٢٣.٥٩ and ٨.٤٦) collected from soybean.

٢. Dominance and abundance degrees of certain pests and natural enemies species:

Dominance and abundance degrees of some pests and natural enemies species inhabiting the three studied crops (broad bean, wheat

and soybean) during ٢٠١٠ and ٢٠١١ seasons are summarized in (Table ٢).

In case of broad bean, the highest dominant and abundant were achieved with the three pests, aphid species, *T. tabaci* and *Empoasca* spp. and one natural enemy, parasitoid species during the two seasons, but their ranked diverted during the two seasons. As shown (Table٢) aphid species recorded the highest dominant and abundant (٣٩.٥ and ١٠٠.٠; ٣٤.١ and ١٠٠.٠) during the first and second seasons, respectively and followed by *T. tabaci*, parasitoid species and *Empoasca* spp. (١٥.٠ and ١٠٠.٠; ١٤.٩ and ١٠٠; ١٢.٢ and ١٠٠.٠) during the first season, while the value of dominance and abundance for *Empoasca* spp., *T. tabaci* and parasitoid species (١٨.٩ and ١٠٠.٠; ١٥.٤ and ٩٣.٣; ١١.٧ and ١٠٠.٠) during the second season, respectively. Leaf-miner, *L. congesta* indicated low dominance and high abundance (٤.٨ and ١٠٠.٠; ٥.٤ and ١٠٠.٠) during the first and second seasons, respectively.

The dominance and abundance degrees for wheat in (Table ٢) indicated that, aphid species recorded the highest dominant and abundant (٢٩.٠ and ١٠٠.٠; ٥٥.٣ and ١٠٠.٠) during the first and second seasons, respectively and followed by *T. tabaci* and parasitoid species (٢٠.٨ and ١٠٠.٠; ٢٠.٤ and ١٠٠) during the first season while followed by parasitoid species and *T. tabaci* (٢٣.٠ and ١٠٠.٠; ٨.٥ and ١٠٠.٠) during the second season, respectively.

Data in (Table ٢) show that the three pest species, *T. tabaci*, *B. tabaci* and *T. urticae* adding to couple of natural enemies, *S. interruptus* and *Orius* spp. associated with soybean were indicated high dominance and abundance with differences in their ranked during the two seasons. *T. tabaci* reached the highest dominance and abundance during the two seasons followed by *T. urticae*, *B. tabaci*, *S. interruptus* and *orius* spp. (٢٥.٠ and ١٠٠.٠; ٢٢.٠ and ٩٢.٣; ١٤.٦ and ٩٢.٣; ٩.٧ and ٨٤.٦; ٧.٧ and ٩٢.٣ successively) during the first season and followed by *B. tabaci*, *T. urticae*, *S. interruptus* and *orius* spp. (٢٣.٧ and ١٠٠.٠; ٢١.٨ and ٦١.٥; ١٨.١ and ٦٩.٢; ٨.٥ and ٨٤.٦; ٧.٨ and ٥٣.٨ respectively) during the second season.

Seasonal occurrence of certain pests with broad bean, wheat and soybean

Table ٢: Dominance and abundance degrees of certain pests and natural enemies on broad bean, wheat and soybean at Abnoub district, Assiut Governorate, during ٢٠١٠ and ٢٠١١ seasons.

Yield	Season	Dominance and Abundance degrees	Mean No. pests and natural enemies / ٢٥ single strokes																
			Empoasca spp.	Aphids	*C. impicta*	*T. tabaci*	*B. tabaci*	*L. congesta*	*C. pallidus*	*T. urticae*	C. undecimpunctata	*Orius* spp.	*S. interruptus*	*C. carnea*	True spider	*Nabis* spp.	*S. corollae*	Parasitoid species
Broad bean	٢٠١٠	D.	١٢.٢	٣٩.٥	٤.٤	١٥.٠	٣.٥	٤.٨	٠.١	-	١.٢	١.٨	١.٣	٠.٣	٠.٥	٠.١	٠.٣	١٤.٩
		A.	١٠٠.٠	١٠٠.٠	١٠٠.٠	١٠٠.٠	٨٦.٧	١٠٠.٠	٧٣.٣	-	٨٦.٧	٩٣.٣	٨٦.٧	٦٦.٧	٧٣.٣	٤٠.٠	٦٠.٠	١٠٠.٠
	٢٠١١	D.	١٨.٩	٣٤.١	٥.٧	١٥.٤	٣.٤	٥.٤	٠.٠	-	١.٤	١.٦	١.٤	٠.٢	٠.٦	٠.١	٠.٢	١١.٧
		A.	١٠٠.٠	١٠٠.٠	١٠٠.٠	٩٣.٣	٧٣.٣	١٠٠.٠	١٣.٣	-	٨٦.٧	٩٣.٣	٧٣.٣	٤٦.٧	٥٣.٣	٦.٧	٢٦.٧	١٠٠.٠
Wheat	٢٠١٠	D.	٥.٩	٢٩.٠	-	٢٠.٨	-	-	-	-	٥.٠	٥.١	٧.٢	١.٩	٤.٧	-	-	٢٠.٤
		A.	٧٦.٩	١٠٠.٠	-	١٠٠.٠	-	-	-	-	٩٢.٣	٨٤.٦	٩٢.٣	٥٣.٨	٧٦.٩	-	-	١٠٠.٠
	٢٠١١	D.	٣.١	٥٥.٣	-	٨.٥	-	-	-	-	١.٩	٢.٤	٢.٩	٢.٠	٠.٨	-	-	٢٣.٠
		A.	٧٦.٩	١٠٠.٠	-	١٠٠.٠	-	-	-	-	٩٢.٣	٩٢.٣	٨٤.٦	٦١.٥	٦٩.٢	-	-	١٠٠.٠
Soybean	٢٠١٠	D.	٧.١	-	٣.٧	٢٥.٠	١٤.٦	-	٠.٢	٢٢.٠	٢.٩	٧.٧	٩.٧	١.٦	٥.٤	-	-	-
		A.	١٠٠.٠	-	٩٢.٣	١٠٠.٠	٩٢.٣	-	٢٣.١	٩٢.٣	٧٦.٩	٩٢.٣	٨٤.٦	٦٩.٢	١٠٠.٠	-	-	-
	٢٠١١	D.	٥.٣	-	٣.٨	٢٣.٧	٢١.٨	-	٢.٣	١٨.١	١.٢	٧.٨	٨.٥	٠.٩	٦.٦	-	-	-
		A.	١٠٠.٠	-	٧٦.٩	١٠٠.٠	٦١.٥	-	٩٢.٣	٦٩.٢	٥٣.٨	٥٣.٨	٨٤.٦	٤٦.٢	١٠٠.٠	-	-	-

Although the low dominance degrees of *C. impicta*, *B. tabaci*, *L. congest*, *C. pallidus* and *Empoasca* spp. show that these pests species could not be considered as economic pests of broad bean, wheat and soybean, whoever their high abundance degrees indicate that these pests are established in the studied area and they may cause further problems if the conditions allow. On the other hand, high values of dominance and abundance degrees of parasitoid species comparing to the other natural enemies revealed that these parasitoids are well established in the studied area and they may contribute significantly to the biocontrol of the associated pests. Moreover, despite of the low dominance degrees of *C. undecimpunctata*, *orius* spp., *S. interruptus*, *C. carnea*, true spider, *Nabis* spp. and *S. corollae* show that these predators could not be played a role in regulating the pest populations, their high abundance degrees indicate that these predators are established in the studied area and they could be of economic importance if the environmental conditions changed in their favour. These finding in congruity with those documented by Ali *et al.* (١٩٩١) and Ali and Abdel-Rahman (٢٠٠٠).

٣. The relation between some weather factors (temperature and relative humidity) and the population of certain pests associated with broad bean, wheat and soybean:

٣.a. Broad bean:

Data in (Table ٣) indicated negative and insignificant correlation between all pests and humidity during the two seasons except aphid species in the second season was negative and significant, where (r =-٠.٥٣٥), but for *B. tabaci* in the first and second seasons the correlation was positive only (r=٠.١٨١ and ٠.١٩٥ respectively). In ٢٠١٠ season, positive correlation was observed for all pests with maximum and minimum temperatures except with *B. tabaci* was negative correlation and *C. pallidus* indicated negative correlation with maximum temperature, while in ٢٠١١ season maximum and minimum temperatures showed negative correlation with all pests except that for *C. impicta* and *T. tabaci* showed positive correlation with maximum temperature (r=-٠.١٩٦ and ٠.٣٤٩ consecutively). The correlation coefficient was significant for maximum temperature with *T. tabaci* (r=٠.٦١١) during the ١st season and *B. tabaci* (r=-٠.٦٣٨ and -٠.٥٢٨)

during the ١st and ٢nd season, as well as highly significant with *C. pallidus* (r=-٠.٦٤٨) during the ٢nd season. Whereas, minimum temperature showed significant correlation with *Empoasca* spp. (r=٠.٥٣٦ and -٠.٥٣٦ during the ١st and ٢nd seasons, *C. impicta*, *T tabaci* and *B. tabaci* (r=٠.٥٦٦, ٠.٥٩٣ and -٠.٦٠٧) during the ١st season, adding to *C. pallidus* (r=-٠.٦٢٧) during the ٢nd season.

٣.b. Wheat:

Data in (Table ٣) revealed that the correlation coefficient values were negative for humidity with aphid species and *T. tabaci* (r=-٠.٥١٩ and -٠.٣٧٨; -٠.٤٦٦ and -٠.٠٤٣), while positive correlation with *Empoasca* spp. (r=٠.٤٦٥ and ٠.٦٢٢) during the ١st and ٢nd seasons respectively. Negative correlation for *Empoasca* spp. and *T. tabaci* as well as positive correlation for aphid species was recorded with maximum temperature during the ١st and ٢nd seasons. The minimum temperature showed positive correlation with aphid species during the two seasons, in addition to negative correlation with *Empoasca* spp. and *T. tabaci* in the ١st season and positive correlation in the second one. The simple correlation coefficient for all cases was insignificant except for aphid species and *Empoasca* spp. with humidity were significant (r=-٠.٥١٩ and ٠.٦٢٢) during the ١st and ٢nd seasons, respectively.

٤.b. Soybean:

Data presented in (Table ٣) indicated that, negative correlation between humidity and *T. tabaci*, while positive correlation with *B. tabaci* and *C. pallidus* during the two seasons. However, the humidity recorded positive correlation with *Empoasca* spp. and *C. impicta* during the ١st season and negative correlation in the ٢nd season. The maximum and minimum temperatures showed positive correlation with *C. impicta*, *T. tabaci*, *B. tabaci* and *C. pallidus* during the two seasons, while the correlation with *Empoasca* spp. was positive in the ١st season and negative in the ٢nd season. Regarding to *T. urticae*, the correlation coefficient was negative with humidity and positive with maximum temperature during the two seasons, while the minimum temperature revealed positive correlation in the ١st season and negative correlation in the ٢nd season.

Table ٣: The correlation coefficient between some weather factors (temperature and relative humidity) and the population of certain pests associated with broad bean, wheat and soybean.

Pests	Simple correlation coefficient (r)																	
	Broad bean						Wheat						Soybean					
	٢٠١٠			٢٠١١			٢٠١٠			٢٠١١			٢٠١٠			٢٠١١		
	Weather factors																	
	Max. temp.	Min. temp.	R. H.	Max. temp.	Min. temp.	R. H.	Max. temp.	Min. temp.	R. H.	Max. temp.	Min. temp.	R. H.	Max. temp.	Min. temp.	R. H.	Max. temp.	Min. temp.	R. H.
Empoasca spp.	٠.٣٧٨	٠.٥٣٦*	-٠.١٦٦	-٠.١٣٣	-٠.٥٣٦*	-٠.٤٨٩	-٠.١٧٥	-٠.٣٦٣	٠.٤٦٥	-٠.١٠٣	٠.٠٤٢	٠.٦٢٢**	٠.٣٦٢	٠.٣٦٠	٠.٦٣٤*	-٠.١٧٠	-٠.١٨٧	-٠.٢٢٥
Aphids	٠.٠٥٩	٠.١٣٤	-٠.٢٧٠	-٠.٢٣٥	-٠.٤٠٨	-٠.٥٣٥*	٠.٠٦٥	٠.٠١١	-٠.٥١٩*	٠.٠٣٩	٠.٠٧٦	-٠.٣٧٨	-	-	-	-	-	-
L. impicti	٠.٤١٥	٠.٥٦٦*	-٠.٠٤٥	٠.١٩٦	-٠.٣٤٩	-٠.٢١١	-	-	-	-	-	-	٠.٨١٤**	٠.٧٧٩**	٠.٤١٦	٠.٥٠١**	٠.٣٦٦	-٠.٠٧٠
T. tabaci	٠.٦١١*	٠.٥٩٣*	-٠.٣٦٩	٠.٣٤٩	-٠.١٧٠	-٠.٤٥٧	-٠.٤٢٢	-٠.٤٤٥	-٠.٤٦٦	-٠.١٢٣	٠.٠١٩	-٠.٠٤٣	٠.٦٤١*	٠.٤٨٢	-٠.٠٥٢	٠.٢٧٣	٠.١٠٣	-٠.٢٨٠
B. tabaci	-٠.٦٣٨*	-٠.٦٠٧*	٠.١٨١	-٠.٥٢٨*	-٠.١٦١	٠.١٩٥	-	-	-	-	-	-	٠.٧١٠**	٠.٨٥١**	٠.٥٩٧*	٠.٤٦٧*	٠.٥٢٧**	٠.١٦٠
L. congesta	٠.٠٢٠	٠.٠٩٥	-٠.١٩٣	-٠.٣٠٨	-٠.٢٧٧	-٠.٢٥٩	-	-	-	-	-	-	-	-	-	-	-	-
C. pallidus	-٠.١٢٥	٠.١٥	-٠.٣١٧	-٠.٦٤٨**	-٠.٦٢٧*	-٠.٢٣٦	-	-	-	-	-	-	٠.٣٥٨	٠.٠٩٦	٠.٠٩٤	٠.٥٢٤**	٠.٤٩٤*	٠.٤٥٥*
T. urticae	-	-	-	-	-	-	-	-	-	-	-	-	٠.٤٩٦	٠.٢٤٩	-٠.٢٢١	٠.١٦٦	-٠.٠٢٤	-٠.٣٠٣

** Significant at ١ % level of probability.
* Significant at ٥ % level of probability.

The highly significant correlation coefficient were recorded for *C. impicta* and *B. tabaci* during the ١st season with maximum and minimum temperatures (r=٠.٨١٤ and ٠.٧٧٩; ٠.٧١٠ and ٠.٨٥١ respectively) as well as *C. impicta* and *C. pallidus* with maximum temperature (r= ٠.٥٠١ and ٠.٥٢٤) and *B. tabaci* with minimum temperature (r= ٠.٥٢٧) during the ٢nd season. Moreover, the significant correlation coefficients were achieved with maximum temperature for *T. tabaci* (r=٠.٦٤١) and humidity for *Empoasca* spp. and *B. tabaci* (r=٠.٦٣٤ and ٠.٥٩٧ respectively) during the ١st season, adding to maximum temperature for *B. tabaci* (r=٠.٤٦٧) as well as minimum temperature and humidity for *C. pallidus* (r=٠.٤٩٤ and ٠.٤٥٥) in the ٢nd season.

These findings are in harmony with those obtained by Younes *et al.* (٢٠٠١) who reported that moving stages of *T. urticae* had significant positively correlated with temperature, while it was negatively correlated with relative humidity. El-Doksh (٢٠٠٦) indicated that aphid species, *E. lypica* and *T. urticae* attained negative correlation while *B. tabaci* had positive relation with humidity as well as maximum and minimum temperatures.

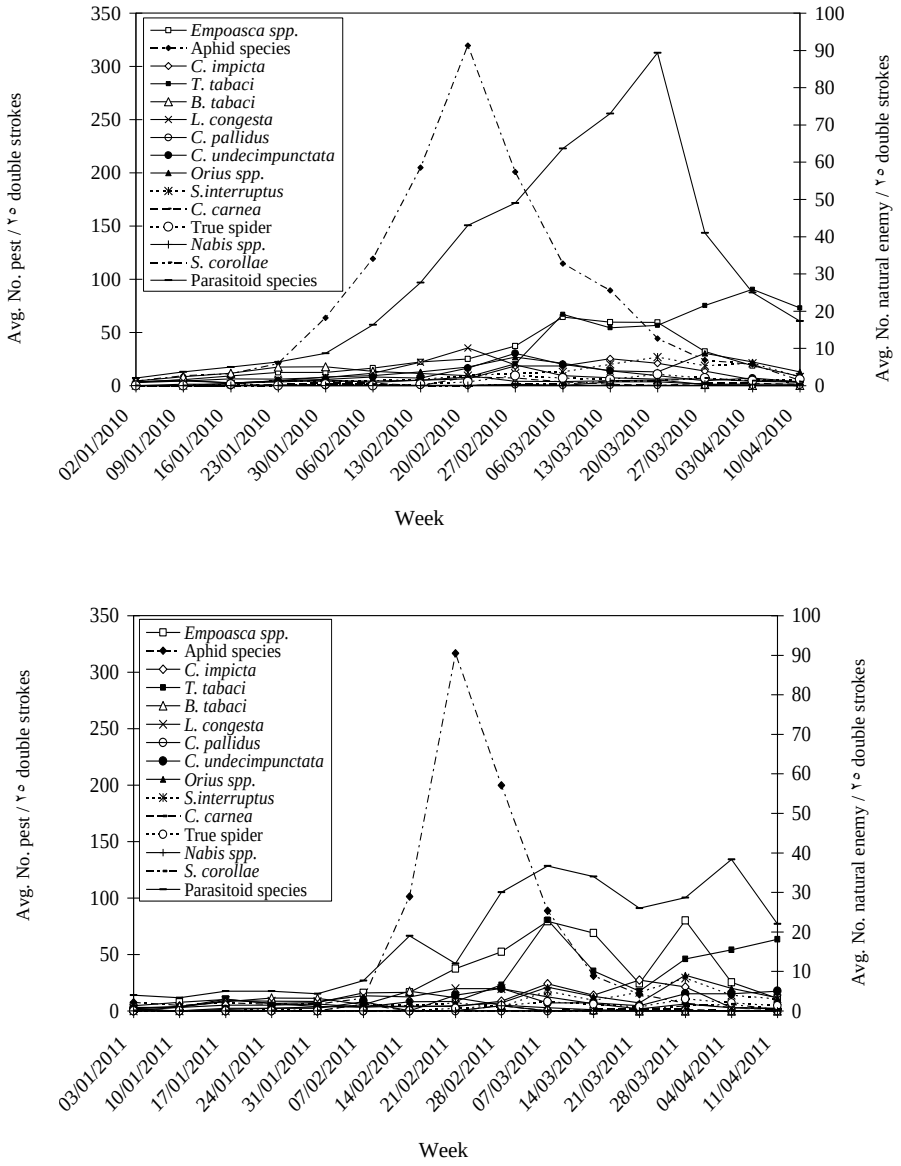

Fig. ١: Population fluctuation of some pests and natural enemies associated with broad bean at Abnoub district, Assiut Governorate, during ٢٠١٠ and ٢٠١١ seasons.

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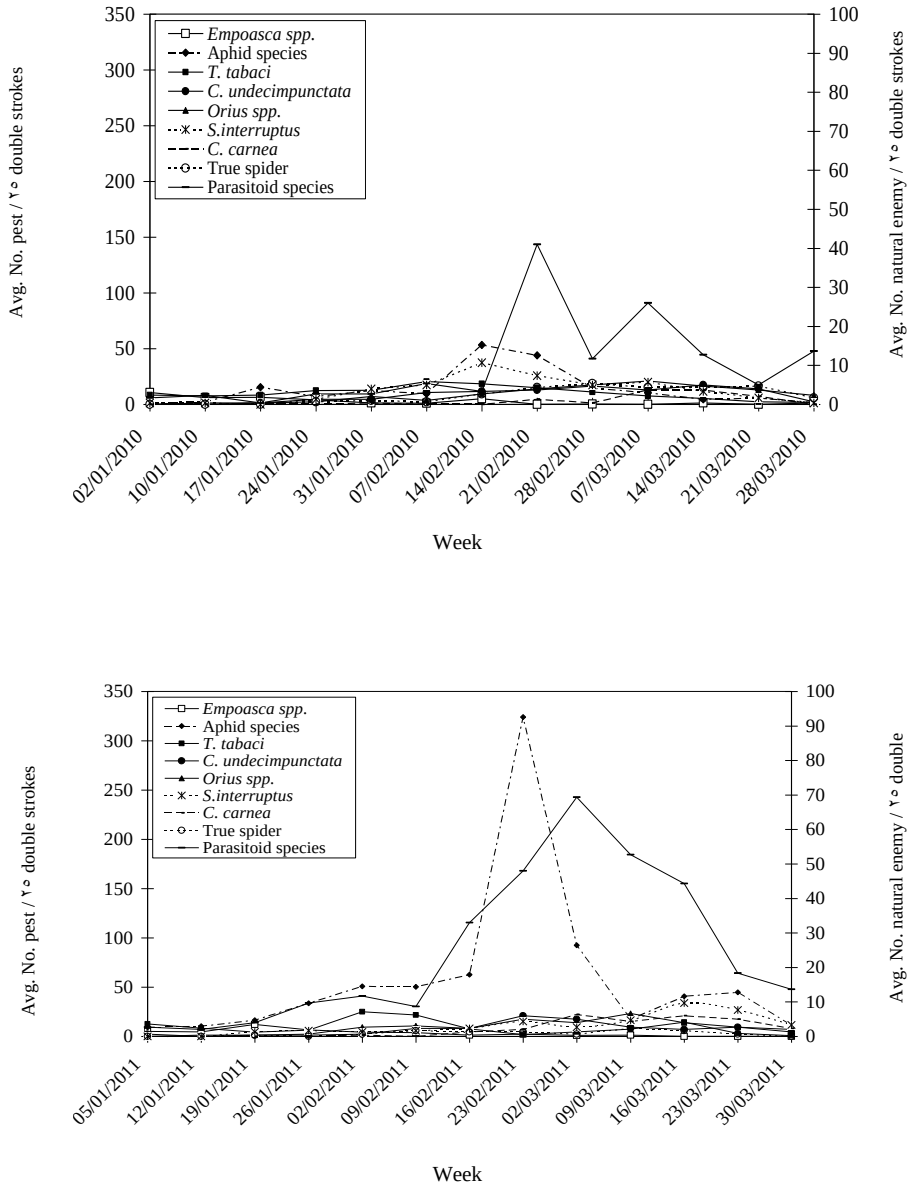

Fig. ٢: Population fluctuation of some pests and natural enemies associated with wheat at Abnoub district, Assiut Governorate, during ٢٠١٠ and ٢٠١١ seasons.

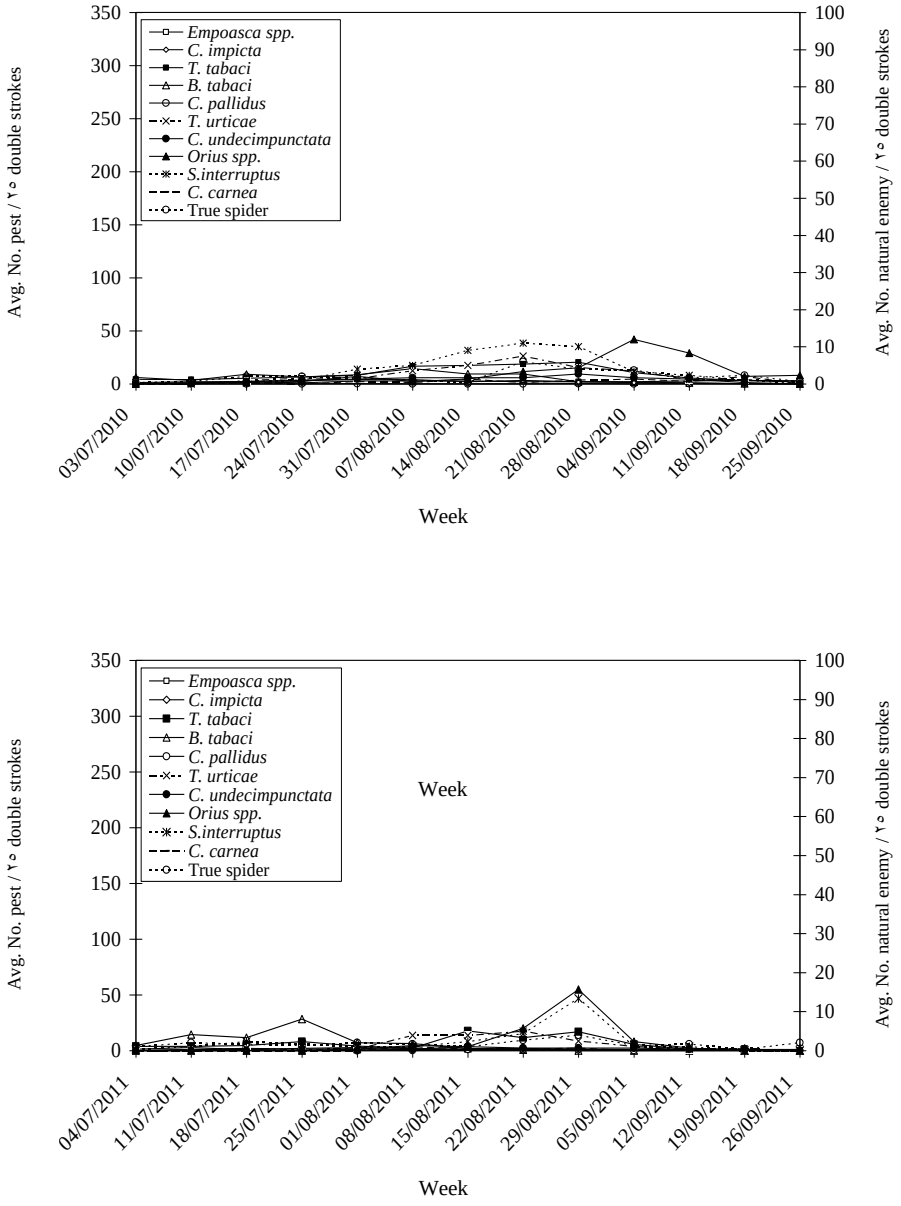

Fig. ٣: Population fluctuation of some pests and natural enemies associated with soybean at Abnoub district, Assiut Governorate, during ٢٠١٠ and ٢٠١١ seasons.

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التواجد الموسمي لبعض الآفات والأعداء الحيوية المتواجدة على الفول البلدي والقمح وفول الصويا بمحافظة أسيوط

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أجريت هذه الدراسة بهدف دراسة تعداد بعض الآفات والأعداء الحيوية المتواجدة على ثلاث محاصيل، وهي الفول البلدي والقمح وفول الصويا في مركز أبنوب – محافظة أسيوط خلال موسمين متتاليين ٢٠١٠ و ٢٠١١.

أظهرت نتائج دراسة السيادة والوفرة للأنواع المتواجدة من خلال حساب درجاتها على الثلاثة محاصيل إنه بالنسبة للآفات (المن ، التربس ، الجاسيد ، آكاروس العنكبوت ذو البقعتين) ، والأعداء الحيوية (الطفيليات ، الأسكمنس ، الأوريس) سجلوا أعلى درجة من السيادة والوفرة خلال موسمي الدراسة. أيضا تم دراسة النشاط الموسمي للآفات والاعداء الحيوية محل الدراسة والمتواجدة على الثلاث محاصيل خلال موسمي الدراسة.

كما تم دراسة العلاقة بين بعض العوامل الجوية (الحرارة والرطوبة النسبية) وتعداد بعض الآفات المتواجدة على الفول البلدي والقمح وفول الصويا. وقد اوضحت النتائج اختلاف نوع العلاقة ومعنويتها بإختلاف الآفة والمحصول محل الدراسة.