

SURVEY AND SEASONAL ABUNDANCE OF LEAFHOPPERS INFESTING SOME SOLANACEOUS AND CRUCIFEROUS CROPS.

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ABSTRACT

A survey and seasonal abundance of leafhopper species on certain solanaceous and cruciferous vegetable plants in Sharkia, Egypt were studied by using sweeping net and sticky board traps throughout 2002/2003 and 2003/2004 seasons. The obtained results showed that the dominant leafhopper species on pepper plants were Empoasca decipiens (Paoli), E. decedens (Paoli), Cicadulina chinai (Ghauri) and Circulifer tenellus (Baker). On eggplant E. decipiens, E. decedens, C. chinai and E. lybica (De Barg). On cabbage and cauliflower plants, E. decipiens, E. decedens and Balclutha hortensis (Lindb.) were found. The seasonal abundance of the dominant leafhopper species can be summarized as follows: The population density of E. decipiens were recorded two peaks at the 3rd week of July and the 3rd week of September, respectively on pepper and eggplant, while on cabbage and cauliflower plants two peaks were noticed at 4th week of October and at the end of January, respectively. On the other hand, E. decedens had one peak occurred at the 2nd week of August on eggplant plants and at the 2nd week of November on cabbage and cauliflower plants, while on pepper plant tow peaks were showed at the 3rd week of July and at the 3rd week of September. Population of B. hortensis recorded one peak with high population density at the 2nd week of October on cabbage and cauliflower plants. Population density of C. chinai recorded only one peak on pepper plants at the 3rd week of September. On the other hand, population of E. lybica on eggplant showed two peaks at the 3rd week of July and at the 3rd week of September.

Keywords: Solanaceous, Cruciferous Plants, Seasonal abundance, leafhopper.

INTRODUCTION

Leafhoppers are serious insect pests infesting solanaceous and cruciferous plants. Several investigators recorded the role of some leafhopper species in transmitting the pathogens of plant diseases (Hegab, *et al.* 1989 a, b & 2005). The faun of these insects in different plantation either with vegetables or fruit trees were studied in Egypt (Helal, *et al.*, 1996 & El-Gindy, 2002) . The aim of the present work is to survey the leafhoppers on certain solanaceous plants (pepper and eggplant) and

cruciferous plants (cabbage and cauliflower) as well as to clear the seasonal abundance of the dominant species during 2002/2003 and 2003/2004 seasons in Minia El-Kamh, district, Sharkia Governorate.

MATERIALS AND METHODS

An area about $\frac{1}{2}$ feddan divided into two equal plots particularized for winter plantation (cabbage & cauliflower plants) and summer plantation (pepper and eggplants). All the experimental plots received the normal agricultural practices. Sampling with weekly intervals started 4 weeks from sowing date.

Sampling started when the age of the Pepper, Eggplant, Cabbage and Cauliflower plants reached about 4 weeks and continued at weekly intervals throughout, summer and winter plantation at Minia El-Kamh, district, Sharkia Governorate in 2002/2003, 2003/2004 seasons. The following two procedures of sampling were used: (1) sweeping net, of 30 cm diameter and 75 cm deep and each sample consisted of 200 single strokes taken from both diagonal directions of the field. (2) The yellow sticky board traps 20×20 cm were hanged on wood rods in the field. The height of the wood rods varied according to the height of the plants throughout the period of samples. The collected leafhopper specimens, sorted into species. Recorded of meteorological station at Zagazig city to represent the condition prevailing in the field during the period of investigation.

RESULTS AND DISCUSSION

1- Survey of leafhopper species infesting certain solanaceous and cruciferous plants:

Survey of leafhopper species infesting certain solanaceous and cruciferous plants (pepper, eggplant, cabbage & cauliflower) are shown in Table (1).

The data presented in Table (1) show the incidence of the leafhopper species belonging to family Cicadellidae on pepper, eggplant, cabbage & cauliflower plants in Minia El-Kamh, district, Sharkia Governorate. These species are as follows:

i) On pepper plants (*Capsicum annum* L.):

Four leafhopper species were collected and arranged descendingly according to their abundance on pepper plants as follows *Empoasca decipiens* (Paoli), *E. decedens* (Paoli), *Cicadulina chinai* (Ghauri) and *Circulifer tenellus* (Baker) during 2002/2003 and 2003/2004 respectively. *Empoasca decipiens* (Paoli) was the most abundant leafhopper species on pepper plants during the two investigation seasons.

ii) On eggplant (*Solanum melongena* L.):

Data obtained revealed that the following leafhopper species were found on eggplant plants: *E. lybica* (de Berg), *E. decipiens* (Paoli), *E. decedens* (Paoli) and *C. chinai* (Ghauri) in the two successive seasons 2002/2003 and 2003/2004 respectively.

Empoasca lybica (de Berg) was the most abundant leafhoppers species on eggplant plants during the summer plantations of 2002 and 2003 seasons.

These results agree with the findings of El-Blook (1976), Hegab *et al.* (1989 a & b) and Hamdi and Emam (1994).

iii) On cabbage plants (*Brassica oleracea* var. *capitata* L.):

The data presented in Table (1) show the total number of the three leafhoppers species collected by the two different techniques. Leafhopper species were collected and arranged descendingly according to their abundance: *Balclutha hortensis* (Lindb), *E. decipiens* and *E. decedens*.

iv) On cauliflower plants (*Brassica oleracea* var. *botrytis* L.):

Cauliflower plants were attacked by the following leafhopper species: *B. hortensis*, *E. decipiens* and *E. decedens*. *B. hortensis* was the most abundant species on cabbage and cauliflower plants during 2002/2003 and 2003/2004 seasons. Concerning the efficiency of the two aforementioned methods of surveying, it appears that the use of sweeping nets was the most efficient. The total numbers of all species collected by each of the two methods were 22289 & 20605 and 12670 & 10622 individuals, respectively in the two investigation seasons.

Table (1):Total number of leafhopper species collected by different techniques from certain solanaceous and cruciferous plants in Minia El-Kamh district, Sharkia Governorate collected during 2002/2003 and 2003/2004 seasons.

Leafhopper species	Host plants	Total number of leafhoppers/sample			
		2002 / 2003		2003 / 2004	
		S.N.	Y.S.B.T.	S.N.	Y.S.B.T.
<i>Empoasca decipiens</i>	Pepper	1864	1089	1541	890
	Eggplant	2766	1449	2451	1390
	Cabbage	933	486	1126	594
	Cauliflower	847	530	1074	614
<i>Empoasca decedens</i>	Pepper	1226	726	1051	597
	Eggplant	2310	1376	2132	1295
	Cabbage	588	256	594	288
	Cauliflower	479	145	531	161
<i>Balclutha hortensis</i>	Cabbage	1135	543	1267	680
	Cauliflower	1059	631	1513	729
<i>Cicadulina chinai</i>	Pepper	1044	545	976	402
	Eggplant	1893	895	1659	697
<i>Empoasca lybica</i>	Eggplant	5162	3504	3892	1904
<i>Circulifer tenellus</i>	Pepper	983	495	798	381
Total		22289	12670	20605	10622

S.N. = Sweeping net

Y.S.B.T. = Yellow sticky board traps

These results agreed with the findings by Hegab *et al.* (1989 a, b), El-Gendy (2002) and disagreed with Hemeida (1981) who maintained that, only *E. decipiens* infested solanaceous vegetable plants at Giza region.

2- Seasonal abundance of the dominant leafhopper species infesting some solanaceous and cruciferous plants:

The following discussion on the population density of the dominant leafhopper species are based on the records of the sweeping nets technique. In all cases the other technique (yellow sticky board traps) showed trends similar to those of the sweeping net.

i) On pepper plants:

a) *Empoasca decipiens* (Paoli):

Empoasca decipiens was the most abundant leafhopper species on pepper plants during 2002 and 2003 seasons.

Data presented in Figs. (1&2) show that the first observation of leafhoppers occurred at the end of May. The initial number of *E. decipiens* adult was noticed on the 4th week of May at 26.77°C, 26.48°C with a mean of 54.50% and 49.00% R.H for both seasons, respectively. According to the population density of *E. decipiens* individuals on pepper plants two peaks which occurred during the two seasons of investigation. The first one was recorded at the 3rd week of July with a mean number of 82 and 54 adults/200 strokes in 2002 and 2003 seasons, respectively at 29.91°C, 28.48°C with 62.29% and 61.28% R.H for the aforementioned seasons. While the second peak was obtained at the 3rd week of September with a mean numbers of 33 and 30 adults/sample at mean temperatures of 27.03°C, 27.41°C with 54.86% and 58.57% R.H for the two successive seasons, respectively.

b) *Empoasca decedens* (Paoli):

The total number of *E. decedens* individuals collected from pepper plants during 2002 and 2003 seasons are illustrated graphically in **Figs. (1&2)**. The initial infestation by *E. decedens* were recorded at the 4th week of May.

According to the population density of *E. decedens* adult recorded two peaks on pepper plant, during the two seasons of 2002/2003, 2003/2004. The first one was observed at the 3rd week of July with a mean numbers of 36 and 32 adult/sample at mean temperature of 29.91°C, 28.48°C with 62.29% and 61.28% R.H for the two experimental seasons. The second peak was obtained in the 3rd week of September with a total numbers of 27 and 19 adults/ sample at mean temperature of 27.03°C, 27.41°C with 54.86% and 58.57% R.H for two seasons respectively.

Then the numbers of leafhopper decreased until reached the minimal numbers at the 2nd week of October with a total numbers of 4 and 3 adults/sample at mean temperature of 25.55°C and 24.74°C and 61.71% and 62.14% R.H during the two successive seasons.

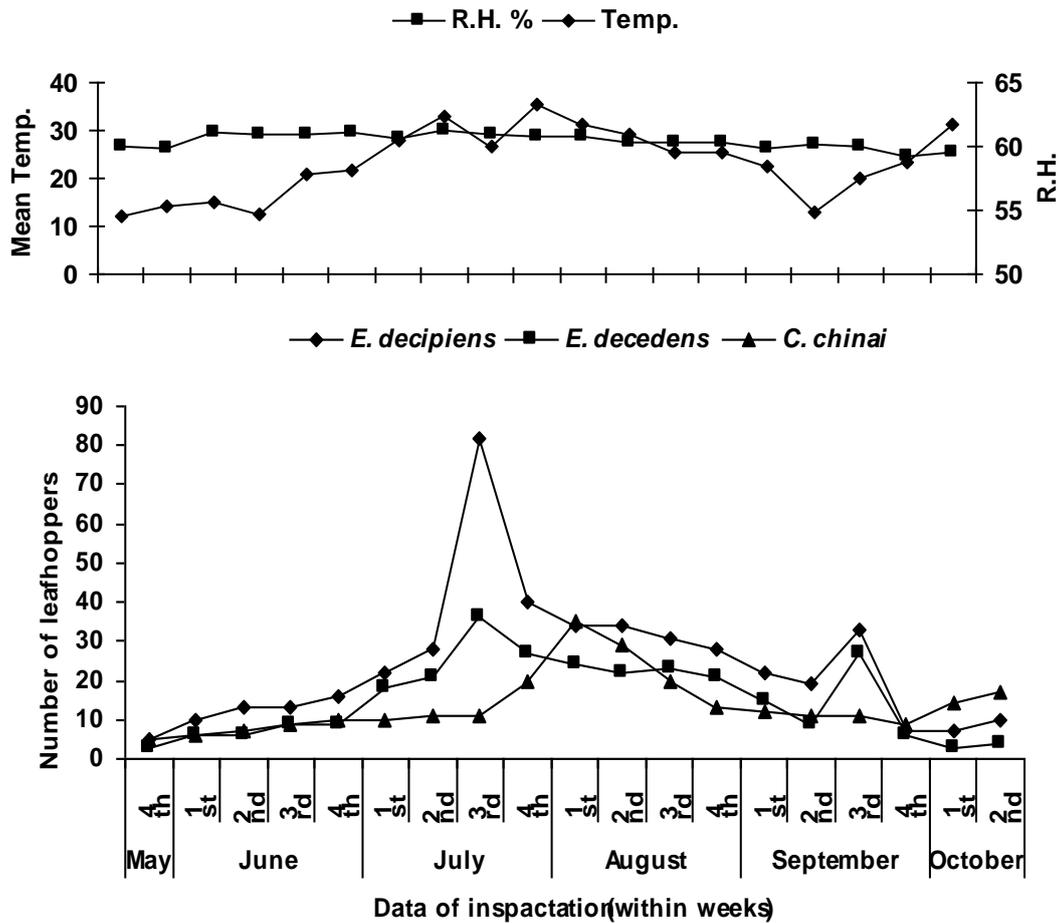


Fig. (1): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *C. chinai* infesting pepper plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2002/2003.

c) Cicaduline chinai (Ghuri):

The first appearance of *C. chinai* individuals was pointed out at the end of May for both 2002 and 2003 seasons, at 26.77°C, 26.48°C with 54.50%, 49.00% R.H for the two seasons, respectively as shown in Figures (1&2).

The initial numbers per a sample (200 strokes) were 5 and 3 individuals in the two seasons, respectively. According to the abundance of *C. chinai* (Ghuri) individuals on pepper plants, there are only one peak recorded at the 1st of August with a total number of 35 and 37 adult/sample for 2002 and 2003 seasons, respectively at 28.90°C, 28.03°C with 63.29%, 61.29% R.H for the two seasons, respectively.

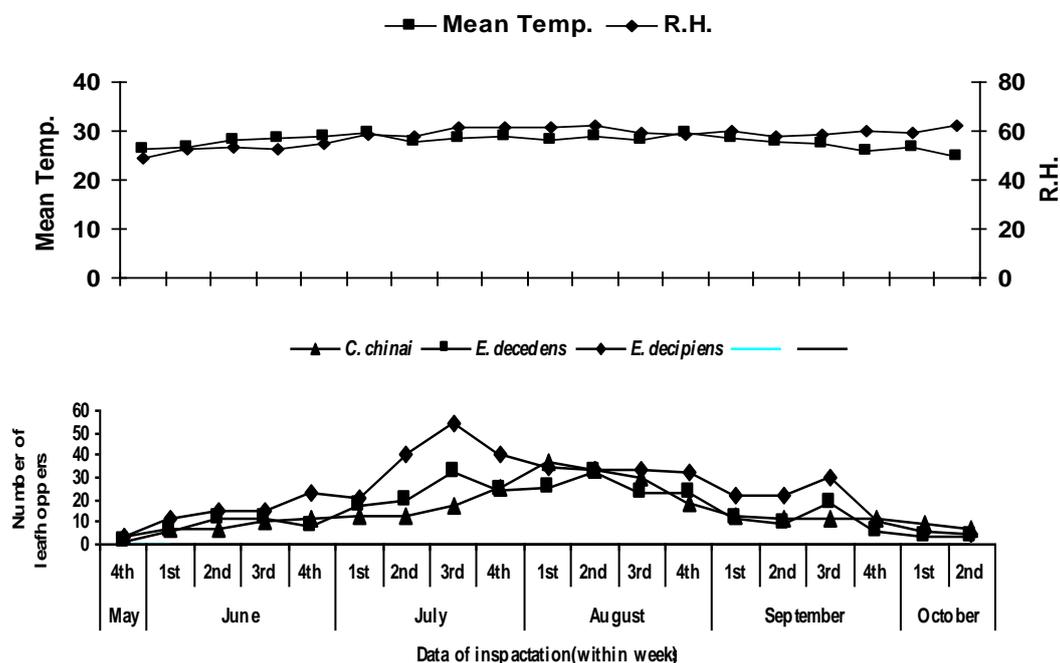


Fig. (2): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *C. chinai* infesting pepper plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2003/2004 season.

ii) Eggplant plants:

a) *Empoasca decipiens* (Paoli)

The total number of leafhoppers infesting eggplant plants during the period from the 4th week of May to the 2nd week of October are illustrated graphically in Figures(3 &4). According to population fluctuation of *E. decedens* adult on eggplants plants during summer plantation, two peaks were obtained. The first one was recorded at the 3rd week of July with a total number of 69 and 45 adult/sample in 2002 and 2003 seasons, respectively at 29.91°C, 28.48°C and 62.29%, 61.28% R.H for the two seasons, respectively. The second peak was noticed at the 3rd week of September with mean numbers of 78 and 60 adults/sample at mean temperatures of 27.03 °C, 27.41°C with 54.86 % and 58.57% R.H for the two seasons, respectively.

b) *Empoasca decedens* (Paoli).

The total numbers of *E. decedens* leafhopper collected from eggplant plants during 2002 and 2003 seasons are illustrated graphically in Figures (3&4). The initial occurrence of *E. decedens* on eggplant plants were 9 and 3 adult /sample at the 4th week of May in 2002 and 2003 seasons, respectively with a mean temperature of 26.77°C, 26.48°C and 54.50%, 49.00% R.H for both seasons, respectively. Population density of *E. decedens* tended to increase until reached its first peak at the 2nd week of August with a total number of 57 and 69 adult/sample in 2002 and 2003 seasons, respectively at 28.69°C, 28.84°C with 61.71%, 61.86% R.H for the two seasons,

respectively. After this peak *E. decedens* numbers tended to decline until reached its minimal number in 2nd week of October with a total numbers 20 and 7 *E. decedens*/sample in 2002 and 2003 seasons, respectively when the mean temperature were 25.55°C and 24.74°C and R.H were 61.71% and 62.14% for both seasons, respectively.

c) *Cicadulina chinai* (Ghauri).

The adults *C. chinai* started to appear in both seasons from about the 3rd and 2nd week of June for 2002 and 2003 seasons, respectively at 29.10°C, 28.05°C with 54.71%, 53.57% R.H for the two seasons respectively. The initial numbers/sample (200 strokes) were 15 and 6 individuals in the two seasons, respectively. According to the abundance of *C. chinai* individuals on eggplant plants, only one peak was recorded at the 3rd of September with a total number of 67 and 45 adult/ sample for at 27.03°C, 27.41°C with 54.86%, 58.57% R.H, 2002 and 2003 seasons respectively. The number of *C. chinai* tended to decline until reached its minimal at the 2nd week of October with a total number of 10 and 15 adult/sample at a mean temperature of 25.55°C, 24.74°C with 61.71%, 62.14% R.H for two seasons, respectively.

d) *Empoasca Lybica* (de Berg.).

The first collections of *E. lybica* adults were noticed at the 4th week of May (15 and 8 adult/sample) at 26.77°C, 26.48°C with a mean of 54.50% and 49.00% R.H for both seasons respectively.

According to the abundance of *E. lybica* adults on eggplant plants appeared two peaks during the two seasons of investigation. The first one was recorded at the 3rd week of July with a mean number of 108 and 84 adults/sample in 2002 and 2003 seasons, respectively at 29.91°C 28.48°C with 62.29% and 61.28% R.H for two successive seasons. The second peak was obtained at the 3rd week of September with mean numbers of 100 and 90 adults/sample at mean temperature of 27.03°C, 27.41°C with 54.86% and 58.57% R.H for the two seasons, respectively. Regarding the weekly counts of *E. lybica* on eggplant plants, it clear that this species was more abundant during 2002 than 2003 seasons. These results agree with those obtained by El-Kady *et al.* (1973), Herakly (1974), Metwally (1976), Hegab *et al.* (1989a,b), Hamdi (1992) and Hamdi and Emam (1994).

iii) On cabbage plants.

a) *Empoasca decipiens* (Paoli):

The data obtained in Figures (5&6) indicated two peaks representing high population densities for *E. decipiens*. The first one occurred on the 4th week of October with a total numbers of 51 and 63 adults/sample in 2002/2003 and 2003/2004 seasons, respectively at a mean temperature of 22.92°C, 26.95°C with 60.40%, 59.60% R.H in the two investigation seasons, respectively. The second peak was noticed in the end week of January with total numbers of 11 and 21 adults/sample in the two seasons

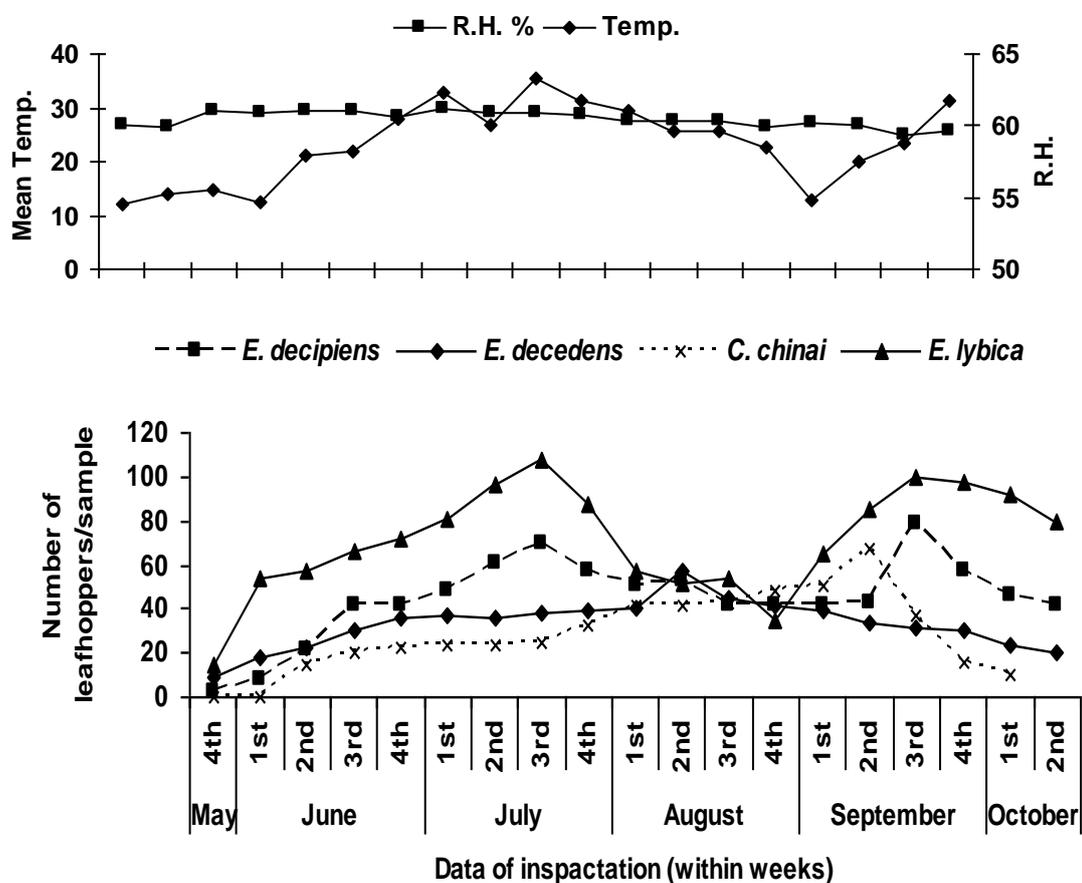


Fig. (3): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens*, *C. chinai* and *E. lybica* infesting Eggplant plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2002 / 2003 season.

respectively at a mean temperature of 14.71°C, 14.84°C with 56.40%, 61.10% R.H for the two seasons, respectively.

It is worth to mention that a low peak of population density was observed at the 1st week of March, 2003/2004 with a total number 15 adults/sample at a mean temperatures of 20.43°C with 66.14%R.H. This differences may be due to the variations of environmental conditions prevailing during execution of these experiments.

b) *Empoasca decedens* (Paoli).

Figures (5&6), showed that the first samples were collected in the 1st week of October and the initial occurrence of leafhopper in cabbage plant were 3 and 6 adult/sample in 2002/2003 and 2003/2004 seasons, with a mean temperature of 24.79°C, 26.53°C with 58.71%, 59.57% R.H for both seasons, respectively.

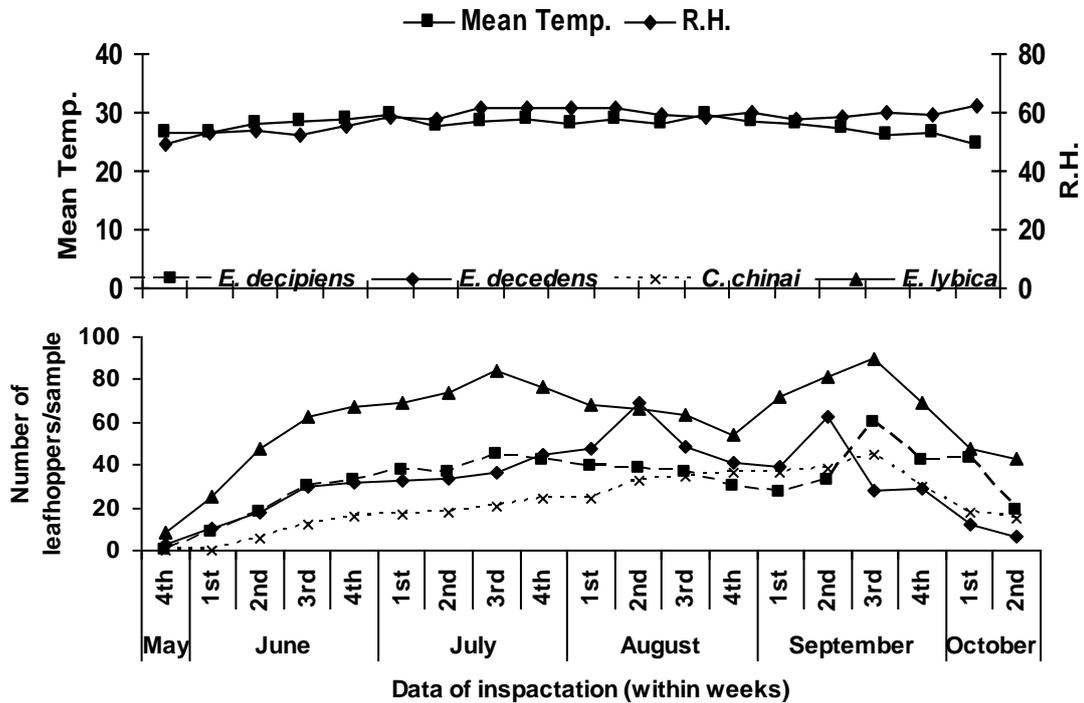


Fig. (4): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens*, *C. chinai* and *E. lybica* infesting Eggplant plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2003/2004 season.

Figures (5&6) indicate that the mean number of leafhoppers on cabbage plants tended to increase until reached its first peak at the 2nd week of November showing total numbers of 22 and 24 adult/sample at 12.55°C and 22.27°C with 56.57% and 65.00% R.H for the two seasons respectively. After this peak, the population of leafhoppers on cabbage plants tended to decline until the absolutely disappearance in the 1st week of March with at mean temperatures 18.01°C, 20.43°C with 57.85% and 66.14% R.H in 2002/2003 and 2003/2004 seasons, respectively.

The data obtained show that the population density of *E. decedens* had only one peak on cabbage plants.

c) *Balclutha hortensis* (Lindb).

The total number of *B. hortensis* individuals infesting cabbage plants are illustrated graphically in Figures (5&6). Both figures illustrated the total number of *B. hortensis* which firstly collected from cabbage plants during two seasons were 18 and 11 individuals/200 strokes at 1st week of October at a mean temperature at 24.79, 26.53°C with 58.71%, 59.57% R.H for two seasons, respectively.

One peak was recorded for *B. hortensis* on cabbage plants at the 2nd week of October with a total numbers of 46 and 66 adult/sample at a mean temperature at

25.55°C, 24.74°C with 61.71%, 62.14% R.H for the two seasons, respectively. Then, the number of *B. hortensis* tended to decline until the hiding at the 1st week of March with a total number of zero and zero individuals/200 strokes at a mean temperature of 18.01°C, 20.43°C with 57.85%, 66.14% for the two seasons, respectively.

Results in general concerning the population density of leafhopper species on cabbage plants show clearly that *Empoasca. decedens* and *Balclutha hortensis* has only one peak at the 2nd week of November and the 2nd week of October for the two leafhopper species respectively. But *E. decipiens* had two peaks the first was at the 4th week of October and the second was at 4th week of January during cabbage growing seasons.

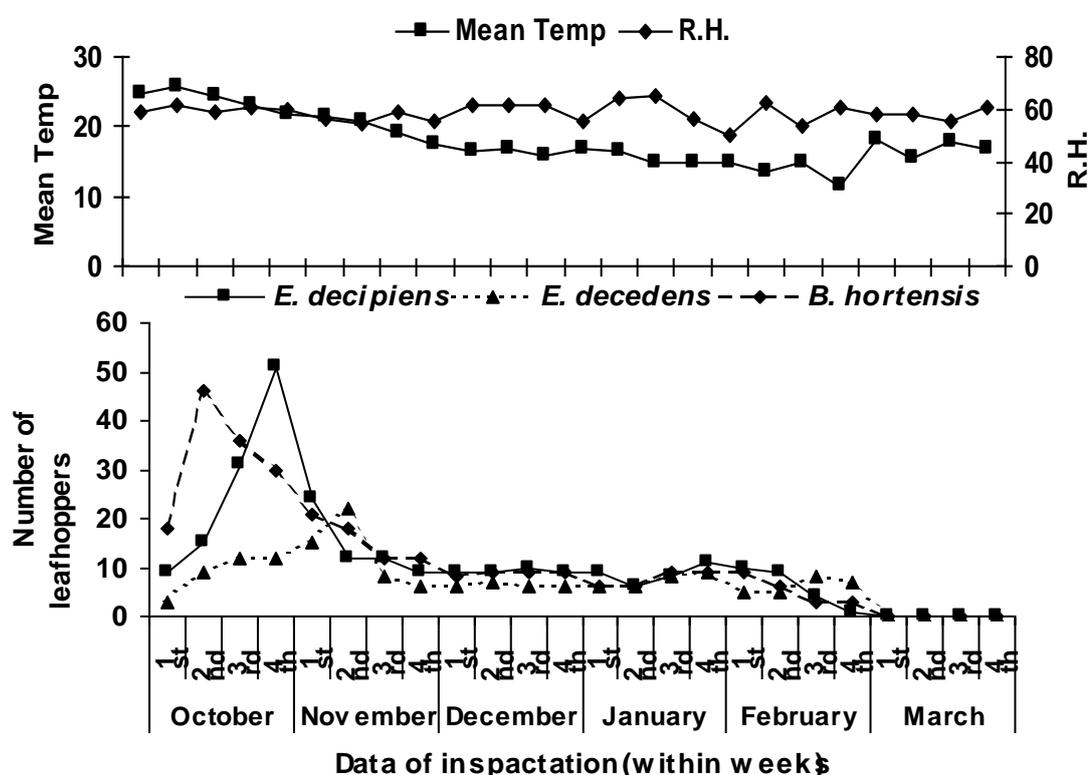


Fig. (5): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *B. hortensis* infesting cabbage plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2002/2003 season.

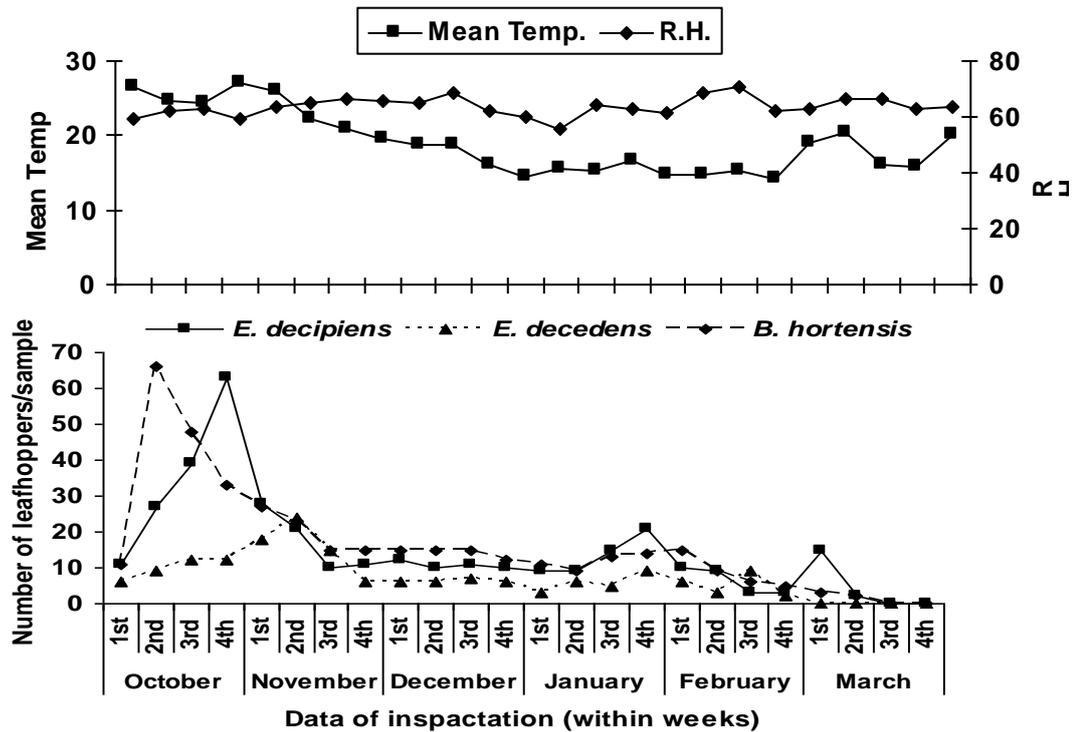


Fig. (6): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *B. hortensis* infesting cabbage plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2003/2004 season.

iv) Cauliflower plants

a) *Empoasca decipiens* (Paoli).

Figures (7 & 8) indicated that the numbers of *E. decipiens* on cauliflower plants tended to increase until reached its first peak at the end of October with a total numbers of 43 and 47 adults/200 strokes in the two seasons respectively at a mean temperature of 22.92°C, 26.95°C with 60.40%, 59.60% R.H for the two seasons of investigation respectively. The second peak was recorded at the last week of January with total numbers of 19 and 15 adults/sample in 2002/2003 and 2003/2004 seasons respectively at a mean temperature of 14.71°C, 14.84°C with 56.40%, 61.10% R.H for the two seasons respectively.

It is worth to mentioned that third peak with a low population density was observed only at the 1st week of March in 2003/2004 season with a total numbers of 12 adults/sample at a mean temperatures of 20.43°C with 66.14% R.H.

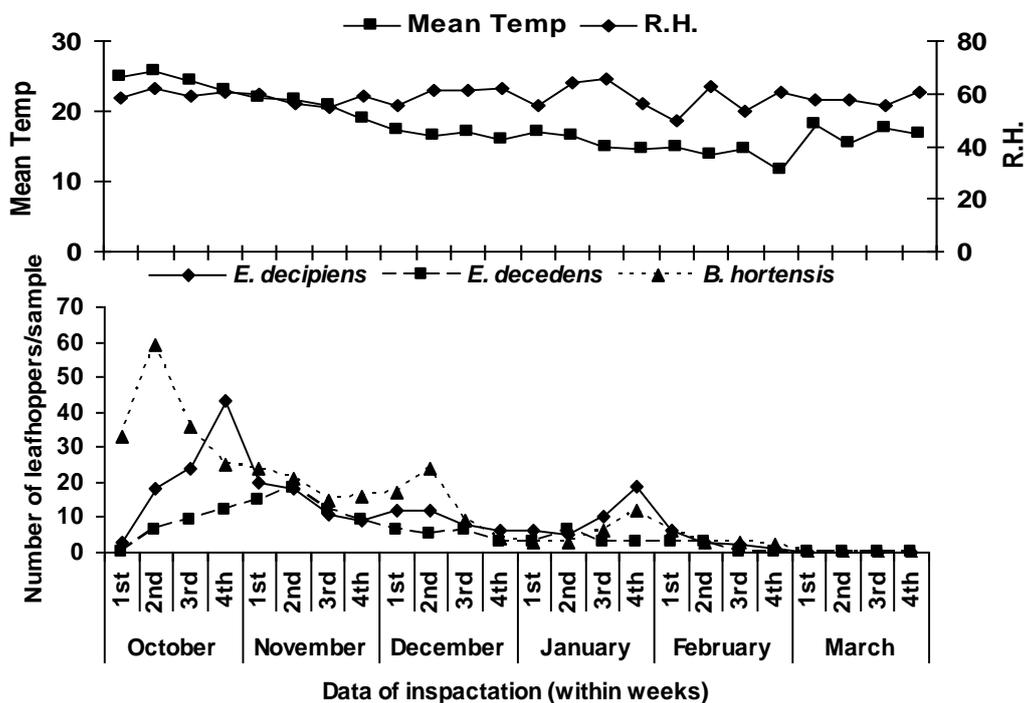


Fig. (7): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *B. hortensis* infesting cauliflower plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2002/2003 season.

b) *Empoasca decedens* (Paoli):

Data in Figs. (7&8) showed that only one peak of *E. decedens* appeared during 2002/2003 and 2003/2004 seasons on cauliflower plants. The peak recorded at the mid November with a total numbers of 18 and 22 adult/sample at 21.55°C and 22.27°C with 56.57% and 56.00% R.H for two seasons respectively.

c) *Balclutha hortensis* (Lindb):

In Figs. (7&8) indicated that the first collection of *B. hortensis* individuals was counted at the 1st week of October (33 and 12 adult/sample) for the two seasons, respectively at 24.79°C, 29.53°C with 58.71%, 59.57% R.H. According to the abundance of *B. hortensis* individuals on cauliflower plants, three peaks were recorded, the first one occurred at the mid of October with a total number of 59 and 66 adult/sample 2002/2003 and 2003/2004 seasons, respectively at 25.55°C, 24.74°C with 61.71%, 62.14% R.H for the two seasons, respectively.

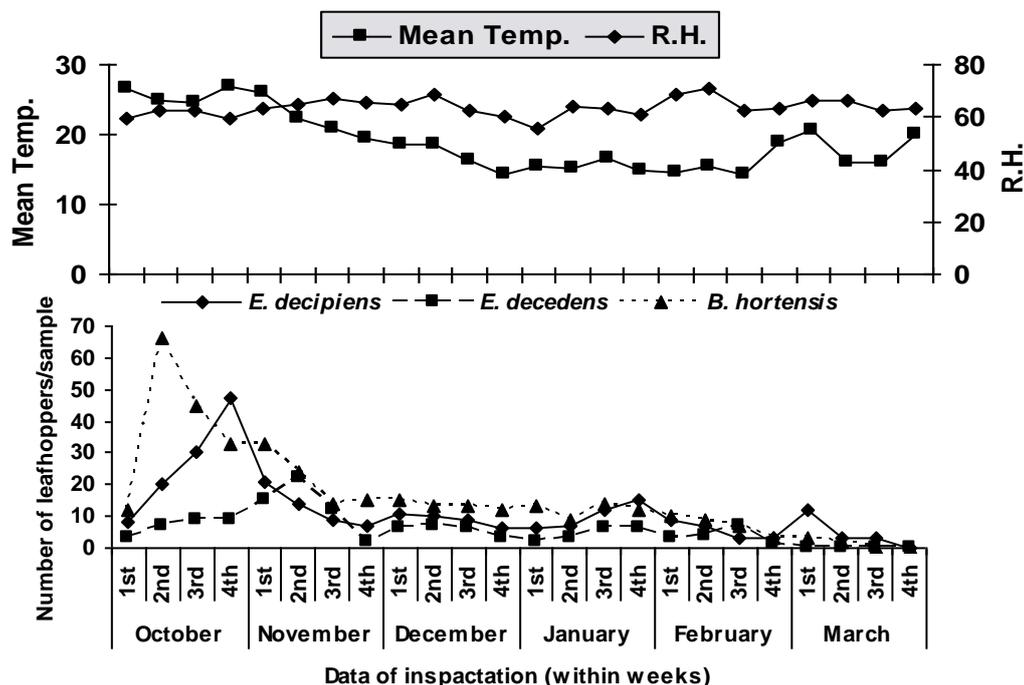


Fig. (8): Seasonal abundance of leafhoppers *E. decipiens*, *E. decedens* and *B. hortensis* on cauliflower plants collected by sweeping net at Minia El-Kamh district, Sharkia Governorate during 2003/2004 season.

The second peak was recorded at the 2nd and 1st week of December with a total number of 24 and 15 adult/sample at 16.57°C, 18.64°C with 61.43% 65.00% R.H in 2002/2003 and 2003/2004 seasons, respectively . The third peak was observed at the end of December and at 3rd week of January with a total numbers of 12 and 14 adult/sample at 14.71°C, 16.53°C with 56.40% and 63.14 % R.H in 2002/2003 and 2003/2004 seasons, respectively. After the third peak the number of *B. hortensis* decreased until the disappearance absolutely at the first and mid of March with a mean temperature of 15.37°C, 15.94°C with 57.71%, 66.29% R.H for the two seasons, respectively. Similar results were found by Hegab *et al.* (1989a,b) and Soliman (1993).

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حصر ودراسة الوفرة الموسمية لنطاطات الأوراق التي تصيب بعض نباتات العائلة الباذنجانية والصليبية

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أجريت الدراسة خلال موسمين متتاليين ٢٠٠٣/٢٠٠٢ - ٢٠٠٤/٢٠٠٣ بهدف حصر أنواع نطاطات الأوراق وكذلك دراسة الوفرة الموسمية للأنواع السائدة التي تصيب بعض نباتات العائلة الباذنجانية (الفلل - الباذنجان) في الموسم الصيفي وبعض نباتات العائلة الصليبية (الكرنب - القرنبيط) في الموسم الشتوي المنزرعة في مركز منيا القمح محافظة الشرقية - مصر وذلك باستخدام طريقتين لأخذ العينات وهي المصائد اللونية اللاصقة الصفراء ، المصيدة الشبكية.

وقد أوضحت النتائج المتحصل عليها أن أنواع النطاطات السائدة والتي تصيب نباتات الفلفل هي:

Empoasca decipiens(Paoli), *Empoasca decedens*(Paoli), and *Cicadulina china*(Ghauri)

على حين أن النوع *Circulifer tenellus* (Baker) قد وجد بكثافة عديدة قليلة. بينما أنواع نطاطات الأوراق التي تصيب نباتات الباذنجان هي: *Empoasca decipiens*(Paoli), *Empoasca decedens*(Paoli), *Cicadulina china*(Ghauri)and *Empoasca lybica* (de Berg) *decedens*(Paoli), وكان أنواع نطاطات الأوراق التي تصيب نباتات الكرنب والقرنبيط هي: *Empoasca decipiens* (Paoli), *Empoasca decedens* (Paoli)

and *Balclutha hortensis* (Lindb).

كما أوضحت نتائج دراسة الوفرة الموسمية للأنواع السائدة من نطاطات الأوراق أن كثافة المجموع لحشرة *Empoasca decipiens* (Paoli) سجلت قمتين علي نباتات الفلفل والباذنجان في الأسبوع الثالث من يوليو والأسبوع الثالث من سبتمبر، وكذلك قمتين علي نباتات الكرنب والقرنبيط في نهاية أكتوبر والأسبوع الأخير من يناير. بينما سجل كثافة المجموع لحشرة *Empoasca decedens* (Paoli) قمتين علي الفلفل في الأسبوع الثالث من يوليو والثالث من سبتمبر، كذلك سجلت قمة واحدة علي كل من نباتات الباذنجان في الأسبوع الثاني من أغسطس وعلي نباتات الكرنب والقرنبيط في الأسبوع الثاني من نوفمبر. بينما كثافة المجموع لحشرة *Balclutha hortensis* (Lindb) سجل قمة واحدة علي نباتات الكرنب في الأسبوع الثاني من أكتوبر، كما قد لوحظت ثلاثة قمم علي نباتات القرنبيط الأولى في منتصف أكتوبر ، الثانية (منتصف ديسمبر موسم ٢٠٠٣/٢٠٠٢ والأول من ديسمبر موسم ٢٠٠٤/٢٠٠٣)، بينما سجلت القمة الثالثة في (نهاية يناير موسم ٢٠٠٣/٢٠٠٢ والأسبوع الثالث من يناير موسم ٢٠٠٤/٢٠٠٣). كما أن كثافة المجموع لحشرة *Cicadulina chinai* (Ghauri) سجل قمة واحدة في الأسبوع الأول من أغسطس علي نباتات الفلفل وأيضا في الأسبوع الثالث من سبتمبر علي نباتات الباذنجان. في حين وجد أن كثافة المجموع لحشرة *Empoasca lybica* (de Berg) قد سجلت قمتين الأولى في الأسبوع الثالث من يوليو والثانية في الأسبوع الثالث من سبتمبر علي نباتات الباذنجان.