

## Relationship between the Population Density of Phytophagous and Predaceous Mites Associated with Three Mango Varieties at Assiut and Sohag Governorates



Mahmoud, A.S.<sup>1</sup>; M.A.A. Abou-Shosha<sup>1</sup>; N.A. Mahmoud<sup>1</sup> and A.A. Abd-Allah<sup>2</sup>

<sup>1</sup>Department of Agricultural Zoology and Nematology, Faculty of Agriculture, Al-Azhar University, Assiut branch

<sup>2</sup>Department of Agricultural Zoology and Nematology Faculty of Agriculture, Al-Azhar University, Cairo

Email: [Abuealhamd43@gmail.com](mailto:Abuealhamd43@gmail.com)

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### Abstract

The population densities of phytophagous and predaceous mites inhabiting leaves and green buds of three mango (*Mangifera indica* L.) varieties (Baladi, Hind and Taimour) were studied from April 2013 to March 2015. The experiments were carried out at four places at Assiut and Sohag governorates to determine the relationship between phytophagous mites and predaceous mites. Phytophagous mites *Oligonychus mangiferus* (Tetranychidae) and *Cisaberoptus kenyae* (Eriophyidae) inhabiting leaves of Baladi varieties were found with high density at Assiut and Sohag governorates, and they had two peaks during the year, the highest one was recorded in December month with mean numbers 894.00 individuals/25leaves in first year and 1004.25 individuals/25leaves in second year at Assiut governorate. During the same month, the peak recorded mean numbers was 513.75 individuals/25leaves at the first year, and 533.50 individuals/25leaves for the second year at Sohag governorate. Also phytophagous mites inhabiting leaves of the two varieties (Hind and Taimour) had two peaks, the first one recorded in July and the second recorded in January. While the peak of July month was the highest one it recorded average number 568.50 & 657.00 individual/25leaves in first and second years respectively for Hindi variety at Sohag, and 282.75 and 287.50 individual/25leaves in the two years respectively for Hindi variety at Assiut. The highest peak of Taimour variety was in July month with mean 577.50 and 670.75 individual at Sohag, while was in Jun at Assiut with mean 297.00 and 312 individual/25leaves during the first and second years, respectively. Predaceous mites (*Amblyseius cucumeris* and *Typhlodromus mangiferus*) associated with leaves of mango varieties during the two year were found with few number on leaves of mango varieties, and had a one peak in the year. The highest peak was recorded during June month with average numbers 69.25 individual in the first year (2013/2014) and 74.00 individuals/25leaves in the second year (2014/2015) on leaves of Hindi variety at Assiut governorate. Phytophagous mites *Aceria mangiferae* and *Metaculus mangiferae* (Eriophyidae) inhabiting terminal and lateral buds of three mango varieties were found with high numbers in the buds. Phytophagous mites inhabiting buds often had three peaks at the year, in May, August and November months. The highest peak was recorded on buds of Taimour variety with mean numbers 731.50 and 786.75 individuals/5 terminal buds and 458.75 and 384.00 individuals/5 lateral buds at May month in the first and second years respectively, at Sohag governorate. Predaceous mites *Amblyseius cucumeris*

and *Typhlodromus magnifiers* (Phytoseiidae) associated with Buds of mango varieties were found with slightly numbers during warm months, but didn't recorded any number during December and January months. Predaceous mites inhabiting buds had one annual peak during July month. The highest peak was recorded on buds of Taimour variety with average 7.25 and 8.00 individual/5 terminal buds, and 7.00 and 7.50 individuals/5 lateral buds in the first and second years respectively, at Assiut governorate. Statistically, there was non-significant positive correlation between the population density of phytophagous mites and numbers of predatory mites during the two years, except some cases were significant positive correlation during the two years with *Oligonychus mangiferus* mite.

**Keywords:** *Phytoseiidae*, *Tetranychidae*, *Eriophyidae*, *Population density*, *phytophagous mites*.

## Introduction

Mango fruits are a widely grown fruit trees throughout the tropical and subtropical regions, Al-Azzazy, (2012). Mango fruits are one of the most important fruit in Egypt for local market or in exporting to the external markets. Phytophagous mites *Oligonychus mangiferus* and *Cisaberoptus kenyae* inhabiting leaves and phytophagous mites *Aceria mangiferae* and *Metaculus mangiferae* inhabiting buds are important pests of mango. Devi *et al.*, (2017) studied the seasonal incidence of mango bud mite and found the mango bud mite was very low in both October, 2013 (3.7 and 4.3) and 2014 (2.4 and 1.8). The highest density of *O. mangiferus* was 7.9 mites/leaf on the second sampling date October 2008, Domingos *et al.*, (2014). The population fluctuation of phytophagous mites *O. mangiferae* (Tetranychidae) on leaves and *M. mangiferae* (Eriophyidae) on buds of mango, had two annual peaks of seasonal abundance in May and November on different mango varieties in Giza Governorate, Abd-Allah (2008). The population density of phytophagous mite *O. mangiferae* on mango was reached to its highest population during early July in the two study sea-

sons, whereas the predaceous mites *Typhlodromus mangiferous*, *Agistemus exertus*, *Amblyseius swiriskii* and *Pronematus ubiquitous* were found as predaceous mites, Fathy (2007). The mango pest (*Aulacaspis tubercularis*) had 3 peaks in the year, 2011. The first was recorded at May, the second was recorded at August while the third at November, Salem (2015). Ata *et al.*, (2016) surveyed mite species inhabiting leaves and debris of two varieties of citrus (navel orange and mandarin) in Fayoum governorate, and data revealed the occurrence of 44 mite species, according to their feeding habits and systematic position. Joyce *et al.*, (2020) surveyed five phytoseiid species on rosehip (*Rosa canina* L.) (Rosaceae) in Ankara, Turkey. So, present work was shed initiated to light on the influence of population densities of predaceous mites *Amblyseius cucumeris* and *Typhlodromus mangiferus* inhabiting mango trees on population densities of phytophagous mites *O. mangiferus* and *C. kenyae* infesting leaves and *A. mangiferae* and *M. mangiferae* infesting buds of mango trees.

## Materials and Methods

### 1-Population density of mites:

The population density of mites inhabiting mango (*Mangifera indica* L.) varieties (Baladi, Hind and Taimour) were recorded from April 2013 to March 2015. The experiments were carried out at four places at Assiut and Sohag governorates. Farm of Faculty of Agriculture Al-Azhar University, Assiut branch; local Farm at Sahel Selim, Assiut; and local farm at Al-Maragha, Sohag and the last Farm of Shandaweel Agricultural Research Station, Sohag. Samples of 25 leaves, 5 lateral and 5 terminal buds of every variety replicated four times were collected weekly. The samples were examined in the laboratory as soon after collection by the aid of a stereomicroscope. Mite numbers on buds, upper and lower leaf surfaces were recorded.

## 2-Statistical analysis of data:

Correlation between the average of the population density of Phytophagous and Predaceous mites, also significance calculated regression was tested according to Steel and Torric, (1960).

## Results and Desiccation

### 1- Population density of phytophagous mites (*Oligonychus mangiferus* and *Cisaberoptus kenyae*) and predaceous mites (*Amblyseius cucumeris* and *Typhlodromus mangiferus*) associated with leaves of mango varieties during two years (2013/2014 – 2014/2015):

#### 1.1- Mites inhabiting leaves of mango variety Ballade at Sohag and Assiut governorate:

Tables (1 and 2) Shows that, the phytophagous mites had two peaks during the two successive years on leaves of mango variety Baladi at Sohag governorate, the first peak was in August with average 544.25 and

555.00 individuals/25 leaves during the two years respectively. While the second peak was recorded in December with mean numbers 513.75 and 533.50 individuals during the two years respectively. Also, two peaks were recorded for phytophagous mites at Assiut governorate, the first one was in August with mean numbers 616.25 individuals in the first year, and 770.00 individuals/25 leaves in the second year, and the second peak was found in December with an average 894.00 and 1004.25 individuals/25 leaves during the two years respectively. However the predaceous mites *A. cucumeris* and *T. mangiferus* have one annual peaks of seasonal abundance, in Sohag was recorded in July with number 39.75 & 42.75 individuals/25 leaves during the two successive years respectively. In Assiut the peak was in August with mean numbers 29.25 & 29.00 individuals/25 leaves in the first and second year, respectively. The lowest numbers of phytophagous mites at Sohag were recorded in February with average 347.75 & 373.00 individuals followed by January with mean 377.00 and 387.75 individuals/25 leaves during the two successive years, respectively. The predaceous mites recorded zero number during January month at Sohag, while at Assiut recorded zero number during January and February during the two successive years. Also, data in Tables (1 and 2), show a highly significant positive effect on population density of *Oligonychus mangiferus* affected by the predaceous mite as, values (0.929\*\*, 0.888\*\*) and (0.941\*\*, 0.844\*\*) were detected in the first and second years, in Sohag and Assiut respectively.

**Table 1. Monthly mean numbers of phytophagous and predaceous mites associated with mango variety Baladi on leaves during two years at Sohag Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. ken- yae</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. ken- yae</i>	Total No. of phyto. mites	Total No. of pred. mites
April	62.25	416.00	478.25	14.50	72.00	434.75	506.75	16.50
May	84.00	376.50	460.50	18.50	86.50	388.00	474.50	21.75
June	102.50	309.00	411.50	22.75	112.00	335.25	447.25	26.50
July	164.00	247.00	412.00	39.75	174.25	332.75	407.00	42.75
Aug.	158.00	386.25	544.25	28.75	163.00	392.00	555.00	30.50
Sep.	83.00	272.00	355.00	22.25	93.00	278.00	371.00	24.50
Oct.	40.00	261.25	301.25	13.50	46.00	248.00	294.00	15.50
Nov.	36.00	376.25	412.25	5.50	38.00	388.00	426.00	5.00
Dec.	15.50	498.25	513.75	1.25	14.75	518.75	533.50	1.25
Jan.	12.00	365.00	377.00	0.00	13.25	374.50	387.75	0.00
Feb.	35.75	312.00	347.75	1.75	37.00	336.00	373.00	3.00
Mar.	92.50	332.50	425.00	10.25	98.75	350.00	448.75	13.00
(r)	0.929**	-0.482	0.172		0.941**	-0.532	0.099	

**Table 2. Monthly mean numbers of phytophagous and predaceous mites associated with mango variety Baladi on leaves during two years at Assiut Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. ken- yae</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. ken- yae</i>	Total No. of phyto. mites	Total No. of pred. mites
April	68.25	435.50	503.75	6.25	77.50	588.25	665.75	4.25
May	62.00	232.25	294.25	8.25	71.50	378.00	449.50	5.25
June	108.75	227.50	336.25	15.25	96.00	292.00	388.00	9.00
July	174.25	363.00	436.25	22.25	166.75	384.50	551.25	17.75
Aug.	150.00	466.25	616.25	29.25	142.00	628.00	770.00	29.00
Sep.	95.50	287.25	383.25	15.00	97.00	405.00	502.00	13.25
Oct.	73.00	426.25	499.25	5.50	82.50	564.75	647.25	8.00
Nov.	42.75	525.75	568.50	2.75	63.00	677.00	740.00	2.50
Dec.	21.00	873.00	894.00	0.75	32.00	972.25	1004.25	0.75
Jan.	15.50	470.50	486.00	0.00	16.75	610.00	626.75	0.00
Feb.	56.00	293.50	349.50	0.00	55.25	352.00	407.25	0.00
Mar.	103.50	362.25	465.75	4.50	97.75	495.00	592.75	3.50
(r)	0.888**	-0.352	-0.126		0.844**	-0.176	0.014	

(\*\*) Correlation is significant at the 0.01 level.

Densities of phytoseiid mites population and that of the phytophagous mites (a mixed population of *O. mangiferus* and *C. kenya*e individuals) during the two successive years (Table 1 and 2), had no significant effect (0.172, -0.126) and (0.099, 0.014)

during the two successive years respectively. There was no significant correlation between the population density of phytophagous mite and numbers of predaceous mites during the two years.

### 1.2- Mites inhabiting leaves of mango variety Hindi at Sohag and Assiut governorate:

Tables (3 and 4) clearly demonstrated that, the predaceous mites *A. cucumeris* and *T. mangiferus* have one annual peak of seasonal abundance on leaves of Hindi mango variety. It was recorded in August at Sohag with mean numbers 29.50 individuals in the first year and 36.00 individuals/25 leaves in the second year,. In Assiut the peak of predaceous mites was recorded in June with mean numbers 69.25 and 74.00 individual during the two successive years (2013/2014 and 2014/2015). Statistical analysis of the data obtained from tables (3 and 4), illustrated that, the relationship between the populations of phytoseiid mites and *O. mangiferus* was highly significant positively in Sohag, but it's not significant positively in Assiut, its effected (0.938\*\* and 0.564) and (0.953\*\* and 0.539) in the first and the second years in Sohag and Assiut respectively. However, the relationship between the

population of phytoseiid mite and the eriophyid mite *Cisaberoptus kenya* had negative effect during two years. As shown by correlation values, Correlation coefficient values were (-0.717\*\*, -0.355) and (-0.263, -0.356) in the first and the second year in Sohag and Assiut Governorates respectively. Then the relationship between density of phytoseiid mites population and that of the phytophagous mites (a mixed population of (*O. mangiferus* and *C. kenya* individuals) during the two successive years had no significant effect (0.124 and 0.066 and 0.309 and -0.012) during the two successive years in Sohag and Assiut governorates, respectively. Numbers of phytophagous mites started in rise from April to reached the first peak at July with average 568.50 and 657.00 individuals/25 leaves in first and second years respectively at Sohag. The second peak was found at January with mean numbers 542.50 individuals in the first year and 625.00 individuals/25 leaves in the second year at the same governorate.

**Table 3. Monthly mean numbers of phytophagous and predaceous mites associated with mango Hindi variety on leaves during two years at Sohag Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. kenya</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. kenya</i>	Total No. of phyto. mites	Total No. of pred. mites
April	91.75	388.00	479.75	11.00	110.75	394.75	505.50	13.00
May	78.50	272.50	351.00	12.75	99.00	288.00	387.00	13.75
June	114.00	280.00	394.00	20.75	122.00	365.25	487.25	21.00
July	175.00	393.50	568.50	26.75	205.00	452.00	657.00	34.50
Aug.	140.00	256.75	396.75	29.50	182.00	382.00	564.00	36.00
Sep.	82.25	238.00	320.25	19.75	94.25	258.25	352.50	22.75
Oct.	74.00	269.00	343.00	10.75	87.75	298.00	385.75	13.75
Nov.	50.75	290.00	340.75	5.50	36.75	336.00	372.75	4.75
Dec.	32.00	348.25	380.25	2.25	21.50	478.00	499.50	1.75
Jan.	6.25	536.25	542.50	0.50	4.50	620.50	625.00	0.50
Feb.	18.75	347.50	366.25	4.00	12.25	386.00	398.25	4.00
Mar.	56.00	255.00	311.00	10.00	48.25	270.00	318.25	12.50
(r)	0.938**	-0.717**	0.124		0.953**	-0.263	0.309	



**Table 4. Monthly mean numbers of phytophagous and predaceous mites associated with mango Hindi variety on leaves during two years at Assiut Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. ken-yae</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. ken-yae</i>	Total No. of phyto. mites	Total No. of pred. mites
April	71.25	152.00	223.25	8.00	68.25	161.50	229.75	11.75
May	57.50	68.00	125.50	21.00	55.25	72.00	127.25	22.50
June	74.00	90.50	164.50	69.25	69.75	94.00	163.75	74.00
July	117.00	96.25	213.25	65.75	107.50	102.25	209.75	67.25
Aug.	134.25	148.50	282.75	23.50	126.75	160.75	287.50	27.75
Sep.	98.50	31.00	129.50	23.50	96.50	32.00	128.50	23.75
Oct.	46.25	61.25	107.50	18.25	61.25	70.50	131.75	19.00
Nov.	28.00	88.00	116.00	0.50	34.25	96.00	130.25	1.50
Dec.	20.75	132.75	153.50	1.00	27.50	140.50	168.00	0.50
Jan.	10.50	228.00	238.50	2.75	12.25	232.50	244.75	3.00
Feb.	23.50	164.00	187.50	5.00	32.50	176.25	208.75	6.00
Mar.	90.75	103.75	194.50	6.25	94.25	115.00	209.25	9.00
(r)	0.564	-0.355	0.066		0.539	-0.356	-0.012	

(\*\*) Correlation is significant at the 0.01 level.

The lowest number of phytophagous mites at Sohag was recorded at March in the two years with average 311.00 and 318.25 individuals in first and second years respectively. Phytophagous mites were approaches the same trend at Assiut governorate, that population of phytophagous mites had two peaks during the first and second years (2013/2014 and 2015/2015). The first peak was the highest one in August, with counts of 282.75 and 287.50 individuals /25 leaves in the two years, respectively. The second peak was recorded during January month with average numbers 238.50 and 244.75 individuals/25 leaves in the first and second years respectively at Assiut. On the other hand, lowest population in the first year was recorded at October with mean 107.50 individuals, while in the second year was in May with average numbers 127.25 individuals/25leaves at the same governorate.

### 1.3- Mites inhabiting leaves of mango variety Taimour at Sohag and Assiut governorate:

Tables (5 and 6) explains that, the predaceous mites (*A. cucumeris* and *T. mangiferus*) inhabiting mango variety Taimour had one annual peak of seasonal abundance, which was recorded in August during the two successive years with mean numbers 40.00 and 42.25 individuals/25 leaves at Sohag during the first and second years, respectively. At Assiut governorate the peak of predaceous mites was the highest one with mean numbers 54.00 and 60.75 individuals during the first and second years respectively. The lowest number of predaceous mites was recorded in January during the two years at the two governorates (1.00 & 0.25 individual at Sohag and 0.00 & 0.00 individual at Assiut). A highly significant positive correlation existed between the predaceous mites populations and the

mango red mite *O. mangiferus* in the first year (0.798\*\*, 0.712\*\*), and the second year, (0.792\*\*, 0.724\*\*). Such findings showed that, the predaceous mites positively effective on *O. mangiferus* mite. Concerning, statistical data obtained that, it was found the phytoseiid mites population were non-significant effect (-0.059, -0.654\* and -0.211, -0.661\*) on the population density of the leaf coat mango mite *C. kenyae* in the first and second year, respectively. Also, the relationship between the phytoseiid mite population density and the popu-

lation density of total phytophagous mites (*O. mangiferus* and *C. kenyae*) were non-significant effect (0.369 and -0.044 and 0.312, and -0.077) during the two successive years. Phytophagous mites infesting mango variety Taimour were appear with highly numbers at Sohag and had two peaks during the two successive years. The first one recorded in July month with mean 577.50 and 670.75 individuals/25 leaves at Sohag during the first and second years respectively.

**Table 5. Monthly mean numbers of phytophagous and predaceous mites associated with mango variety Taimour on leaves during two years at Sohag Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. kenyae</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. kenyae</i>	Total No. of phyto. mites	Total No. of pred. mites
April	98.25	430.25	528.50	8.25	102.00	441.75	543.75	10.25
May	77.00	298.00	375.00	11.25	84.50	301.50	386.00	15.75
June	101.75	322.25	424.00	17.75	178.00	352.00	530.00	21.75
July	206.50	371.00	577.50	28.25	284.75	386.00	670.75	30.50
Aug.	152.00	418.50	570.50	40.00	172.00	457.00	629.00	42.25
Sep.	80.50	290.00	370.50	27.75	95.00	278.00	373.00	27.00
Oct.	40.00	237.00	277.00	15.00	61.25	244.00	305.25	16.50
Nov.	28.50	202.75	231.25	8.75	42.00	228.25	270.25	7.25
Dec.	22.00	363.00	385.00	3.25	28.00	395.00	423.00	4.75
Jan.	18.00	512.25	530.25	1.00	22.25	590.50	612.75	0.25
Feb.	20.25	382.00	402.25	3.00	27.00	479.00	506.00	3.50
Mar.	54.00	294.00	348.00	6.75	61.50	396.00	457.50	8.25
(r)	0.798**	-0.059	0.369		0.792**	-0.211	0.312	

**Table 6. Monthly mean numbers of phytophagous and predaceous mites associated with leaves of mango variety Taimour during two years at Assiut Governorate**

Months	Mean no. of moving stages / 25 leaves							
	2013 / 2014				2014 / 2015			
	<i>O. mangiferus</i>	<i>C. kenyae</i>	Total No. of phyto. mites	Total No. of pred. mites	<i>O. mangiferus</i>	<i>C. kenyae</i>	Total No. of phyto. mites	Total No. of pred. mites
April	51.75	143.00	194.75	7.75	57.00	152.00	209.00	9.75
May	94.00	161.00	255.00	15.25	98.75	173.00	271.75	18.75
June	102.00	195.00	297.00	26.75	110.00	202.00	312.00	28.75
July	140.25	147.00	287.25	51.25	152.00	156.00	308.00	56.25
Aug.	95.00	134.00	229.00	54.00	102.00	138.00	240.00	60.75
Sep.	48.00	145.00	193.00	31.50	56.00	150.00	206.00	34.00
Oct.	22.00	149.00	171.00	23.25	27.50	155.00	182.50	27.50
Nov.	24.00	178.00	202.00	7.75	30.00	183.00	213.00	9.00
Dec.	20.50	191.00	211.50	0.00	24.25	196.00	220.25	0.00
Jan.	19.00	290.00	309.00	0.00	20.00	308.00	328.00	0.00
Feb.	33.25	239.00	272.25	1.00	35.00	272.00	307.00	2.50
Mar.	78.00	217.00	295.00	6.50	84.00	224.00	308.00	7.00
(r)	0.712**	-0.654*	-0.044		0.724**	-0.661*	-0.077	

(\*\*) Correlation is significant at the 0.01 level.

(\*) Correlation is significant at the 0.05 level.

The second one recorded in January month with mean 530.25 and 612.75 individuals/25 leaves at Sohag during the first and second years respectively. Low numbers and low peaks for Phytophagous mites inhabiting leaves of mango variety taimour were recorded at Assiut governorate. The first peak was recorded in June month with average numbers 297.00 and 312 individuals/25 leaves at Assiut during the first and second years respectively, the second one was found in January month with mean 309.00 and 328.00 individuals during the first and second years respectively. Generally, the population density of phytoseiid mites were non-significant effect on population density of total phytophagous mites (*O. mangiferus* and *C. kenyae*), during the two successive years. But it high significant positive correlation was found between the phytoseiid mites and the tetranychid mite *O. mangiferus*. So, this results agree with those obtained by Al-Azzazy

(2005), Reis *et al.* (2008), Abdel-Maksoud (2006), Fathy (2007) and Abd-Allah (2008).

**2- The relationship between the population densities of phytophagous mites (*Aceria mangiferae* and *Metaculus mangiferae*) and predaceous mites (*Amblyseius cucumeris* and *Typhlodromus mangiferus*) associated with Buds mango varieties during two successive years (2013/2014 - 2014/2015):**

**2.1-Mites inhabiting buds of mango variety Baladi at Assiut and Sohag governorates.**

Data in Tables (7 and 8) cleared that, the population of predaceous mites (*A. cucumeris* and *T. mangiferus*) inhabiting buds of mango variety Baladi have one annual peaks of seasonal abundance in June with mean numbers 4.00 and 5.00 individuals/5 terminal buds and 4.00, 4.50 individuals/5 lateral buds at Sohag during the first and second years respectively.



**Table 7. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango Baladi variety during two years at Sohag Governorate**

Months	Mean no. of phytophagous mites / 5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
April	422.00	2.00	452.25	2.75	371.75	2.25	396.00	2.50
May	614.50	3.25	658.00	3.75	580.25	3.00	612.50	3.50
June	452.00	4.00	482.25	5.00	498.00	4.00	532.25	4.50
July	390.25	3.25	504.00	4.00	426.75	2.00	470.75	3.25
Aug.	560.75	2.25	618.75	2.75	320.25	1.50	398.00	1.75
Sep.	346.00	1.25	372.00	1.25	105.00	0.75	216.50	0.75
Oct.	208.25	0.00	240.75	0.00	52.00	0.00	40.25	0.00
Nov.	300.00	0.00	348.00	0.00	238.00	0.00	280.75	0.00
Dec.	452.75	0.00	480.75	0.00	378.75	0.00	409.00	0.00
Jan.	271.00	0.00	372.50	0.00	295.25	0.00	311.25	0.00
Feb.	232.50	0.50	302.00	1.25	176.25	0.75	232.50	1.50
Mar.	418.50	2.75	345.00	2.75	258.50	2.25	270.00	2.50
(r)	0.611 *		0.614 *		0.709 **		0.701 *	

**Table 8. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango Baladi variety during two years at Assiut Governorate**

Months	Mean no. of phytophagous mites / 5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
April	110.50	2.50	106.75	3.25	54.00	2.00	62.50	2.50
May	480.00	3.00	512.00	3.75	326.25	2.50	334.75	3.00
June	320.25	6.25	436.00	7.50	266.75	5.25	284.00	6.75
July	180.00	5.00	252.00	6.75	224.00	4.50	196.00	5.50
Aug.	392.75	4.25	365.25	5.75	238.50	3.00	224.75	4.50
Sep.	200.50	3.00	196.00	4.00	110.00	1.75	106.00	3.00
Oct.	457.00	2.25	422.50	2.75	266.25	0.75	259.50	1.75
Nov.	380.00	1.00	366.25	1.50	198.75	0.50	186.00	0.75
Dec.	260.00	0.00	275.00	0.75	132.75	0.00	140.00	0.50
Jan.	200.00	0.00	206.00	0.00	102.00	0.00	115.00	0.00
Feb.	180.50	1.50	192.00	2.25	90.00	0.75	96.00	1.50
Mar.	140.50	2.50	154.00	2.75	69.25	2.00	73.25	2.50
(r)	0.307		0.121		0.307		0.121	

(\*\*) Correlation is significant at the 0.01 level.

(\*) Correlation is significant at the 0.05 level.

Also, at Assiut governorate the peak of predaceous mites was recorded at June but with mean numbers 6.25, 7.50 individuals/5 terminal buds and 5.25 and 6.75 individuals/5 lateral buds in the first and second

years, respectively. The months of Oct., Nov., Dec. and January recorded zero number for predaceous mites at Sohag, while in Assiut only in January month was recorded zero number for predaceous mites.

Tables (7 and 8) showed that, a highly significant positive effect existed on population density of eriophyid mites affected by the predaceous mite as, values (0.614\*, 0.611\*) and (0.701\*, 0.709\*\*) were detected in the first and second year, on terminal and lateral buds in Sohag, respectively. Also, the phytoseiid mites population had negative effect on the population of eriophyid mites during two years. Whereas, correlation coefficient values (0.121, 0.307) and (0.450, 0.447) clearly showed that, no significant effect between population density of eriophyid mites and its predator mites in the first and second years, in Assiut respectively. The population of phytophagous mites (*A. mangiferae* and *M. mangiferae*) inhabiting terminal buds of mango variety Baladi at Sohag, had three peaks during the two years (2013/2014 and 2014/2015), the first peak was the highest one, it recorded during May month mean numbers 614.50 & 658.00 individuals /5 terminal buds, and the second peak was recorded during August month (560.75 & 618.75 individuals/ 5 terminal buds), the third peak was the lowest, and occurred during December month (452.75 & 480.75 individuals/5 terminal buds) in the first and the second years respectively, at Sohag governorate. While, that population of phytophagous mites inhabiting lateral buds, had two peaks during the two years at the same governorate. The first peak occurred during May month with average 580.25 individuals for first year and 612.50 individuals/5 lateral buds in second year. The second peak was recorded at Dec. month with mean 378.75 in-

dividuals in the first year and 409.00 individuals/5 lateral buds in second year at Sohag governorate. On the other hand, the population density of phytophagous mites inhabiting terminal and lateral buds had three peaks during the two years at Assiut governorate. The first peak observed during May with average 480.00 and 512 individuals/5 terminal buds in the first and second year, respectively. The second peak was recorded during August month with mean 392.75 individuals in the first year and 365.25 individuals for the second year. The last peak was recorded in October with mean 475.00 individuals in first year and 422.50 individuals/5 terminal buds in the second year. Also three peaks for phytophagous mites inhabiting lateral buds were recorded in the same months. The first one recorded in May month with average 326.25 and 334.75 individuals/5 lateral buds in the first and second year, respectively. The second peak was recorded during August month with mean 238.50 individuals in the first year and 224.75 individuals for the second year. The third peak was recorded in October with mean 266.25 individuals in first year and 259..50 individuals/5 lateral buds in the second year at Assiut governorate. Eriophyid mites recorded moderate numbers during the other months.

## **2.2-Mites inhabiting buds of mango variety Hindi at Assiut and Sohag governorates.**

Tables (9 and 10) showed that, The predaceous mites (*A. cucumeris* and *T. mangiferus*) inhabiting terminal buds of mango variety Hindi didn't recorded any number during November, December and January months

and starting to rise from February to reach a one annual peaks of seasonal abundance in July with mean numbers 5.75 and 6.25 individuals/5 buds during the two years at Sohag. Also, mites inhabiting terminal buds at Assiut had one peak in the same month (July) with mean numbers 5.00 and 5.50 individuals/5 buds during the two years, respectively. Predaceous mites (*A. cucumeris* and *T. mangiferus*) inhabiting lateral buds gradually increased after January month to reach a peak in July with average numbers 4.75 and 5.50 individuals/5 buds at Sohag, it was 4.25 and 5.00 individuals/5 buds at Assiut during the first and second years, respectively. Tables (9 and 10) showed that, no significant effect existed on population density of eriophyid mites affected by the predaceous

mite as, values (0.498 and 0.558) and (0.001 and 0.234) were detected in the first and second year, on terminal and lateral buds in Sohag, respectively. Whereas, Correlation coefficient values (0.425, 0.304) and (0.492, 0.456) clearly showed that, no significant between population density of eriophyid mites and its predator mites in the first and second year respectively, at Assiut. Numbers of phytophagous mites (*A. mangiferae* and *M. mangiferae*) inhabiting terminal buds of mango variety Hindi at Sohag, gradually increased from March reaching the first peak in May with average 508.75 and 590.25 individuals/ 5 buds, and the second peak was in November with average 413.50 and 443.50 individuals during the first and second years respectively.

**Table 9. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango variety Hindi during two years at Sohag Governorate**

Months	Mean no. of phytophagous mites / 5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
<b>April</b>	340.25	2.00	401.00	2.50	138.00	2.50	192.00	2.75
<b>May</b>	508.75	3.00	590.25	3.75	412.50	3.00	436.25	3.50
<b>June</b>	454.25	5.00	506.75	4.75	207.75	3.50	233.00	4.00
<b>July</b>	418.25	5.75	460.50	6.25	111.25	4.75	165.00	5.50
<b>Aug.</b>	386.00	3.25	429.00	4.50	102.50	2.50	100.25	3.50
<b>Sep.</b>	210.75	2.00	280.50	2.50	124.25	1.25	122.75	1.75
<b>Oct.</b>	192.50	0.50	200.00	1.00	205.00	0.00	168.25	1.00
<b>Nov.</b>	413.50	0.00	443.50	0.25	319.75	0.00	340.00	0.50
<b>Dec.</b>	360.75	0.00	331.75	0.00	174.50	0.00	134.25	0.00
<b>Jan.</b>	251.75	0.00	279.75	0.00	26.50	0.00	86.75	0.00
<b>Feb.</b>	177.00	1.25	196.50	1.25	6.75	1.50	14.00	1.25
<b>Mar.</b>	203.75	2.00	218.50	2.75	28.00	2.50	52.50	2.00
<b>(r)</b>	0.558		0.498		0.234		0.001	

**Table 10. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango Hindi variety during two years at Assiut Governorate**

Months	Mean no. of phytophagous mites / 5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
April	68.75	1.00	96.50	1.50	10.00	0.75	28.25	1.50
May	152.00	1.75	194.00	2.25	58.25	1.75	95.75	2.25
June	138.25	3.50	181.00	4.00	192.00	2.75	251.00	3.25
July	242.00	5.00	278.00	5.50	284.00	4.25	385.25	5.00
Aug.	328.50	4.00	360.50	3.25	196.00	2.75	208.00	2.75
Sep.	176.00	2.50	282.00	2.50	100.75	1.50	146.50	1.25
Oct.	90.50	1.75	103.00	1.75	20.00	0.75	42.00	0.50
Nov.	174.00	0.50	185.00	0.50	98.50	0.50	118.00	0.25
Dec.	285.00	0.00	342.00	0.00	214.00	0.00	288.75	0.00
Jan.	98.00	0.00	178.00	0.00	190.75	0.00	239.00	0.00
Feb.	57.25	0.75	85.00	0.50	102.00	0.25	142.50	0.50
Mar.	26.00	1.50	44.00	1.50	34.25	1.00	62.00	1.50
(r)	0.304		0.425		0.456		0.492	

Also phytophagous mites inhabiting lateral buds had two peaks during the two years; the first one was recorded in May with mean 412.50 and 436.25 individuals and the second one recorded in November with average 319.75 and 340.00 individuals/5 lateral buds during the first and second years respectively, at Sohag. On the other hand the eriophyid mites infested the terminal buds of mango variety Hindi at Assiut governorate had three peaks during the two years but with few numbers, the first one was recorded in May with mean 152.00 and 194.00 individuals and the second one recorded in August with average 328.50 and 360.50 individuals and the third one was in December with average numbers 285.00 and 342.00 individuals/5 terminal buds during the first and second years respectively. While eriophyid mites infested the lateral buds had only two peaks at the same governorate (Assiut); the first one was observed in July with mean 284.00 and

385.25 individuals and the second one recorded in December with average 214.00 and 288.75 individuals/5lateral buds during the first and second years respectively. The minimum recorded numbers for eriophyid mites infested the terminal buds at Assiut were in March with mean 26.00 and 44.00 individuals and at Sohag were in February with mean 177.00 and 196.50 individuals/5terminal buds during the first and second years respectively. Minimum recorded numbers for lateral buds were in February at Sohag with average 6.75&14.00 individuals. However at Assiut were in April with mean 10.00 and 28.25 individuals/5lateral buds during the first and second years, respectively.

### 2.3- Mites inhabiting buds of mango variety Taimour at Assiut and Sohag governorates.

Tables (11 & 12) illustrated that, The predaceous mites (*A. cucumeris* and *T. mangiferus*) inhabiting buds of Taimour, started in increasing gradu-

ally from February to reach a peak in August with average 4.75 and 5.25 individuals/5 terminal buds at Sohag, while the mites inhabiting lateral buds reach a peak at July with mean 3.75 and 4.2525 individuals/5 buds during the first and second years respectively. The population density of predaceous mites decreased gradually to reach zero number from November to February

for terminal and lateral buds at Sohag governorate. The predaceous mites inhabiting buds at Assiut governorate also had one annual peaks of seasonal abundance at July with mean 7.25 and 8.00 individuals/5 buds in case terminal buds and 7.00 and 7.50 individuals/5 buds in case lateral bud in the two successive years respectively.

**Table 11. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango Taimour variety during two years at Sohag Governorate**

Months	Mean no. of phytophagous mites / 5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
April	475.75	2.00	426.50	2.25	309.00	2.00	312.00	2.25
May	741.50	2.75	786.75	3.00	458.75	2.75	484.00	3.25
June	634.00	3.50	668.00	4.00	294.25	3.25	356.50	3.75
July	522.00	4.50	590.00	5.00	201.50	3.75	232.50	4.25
Aug.	390.00	4.75	362.25	5.25	184.25	3.50	176.25	3.75
Sep.	150.75	2.00	178.00	2.75	90.75	1.75	99.00	1.50
Oct.	271.50	1.00	284.25	0.75	162.00	1.00	180.50	1.25
Nov.	442.00	0.00	492.50	0.00	306.50	0.00	362.50	0.00
Dec.	318.25	0.00	322.75	0.00	198.50	0.00	256.00	0.00
Jan.	246.00	0.00	186.00	0.00	102.00	0.00	170.00	0.00
Feb.	185.50	0.75	192.00	0.75	98.75	0.25	100.25	0.75
Mar.	332.25	2.00	348.75	2.00	121.25	1.25	154.00	1.75
(r)	0.484		0.512		0.282		0.357	

**Table 12. Monthly mean numbers of phytophagous and predaceous mites associated with buds of mango Taimour variety during two years at Assiut Governorate**

Months	Mean no. of phytophagous mites/5 Buds							
	Lateral buds				Terminal buds			
	2014 / 2015		2013 / 2014		2014 / 2015		2013 / 2014	
	Phyto. Mites	Pred. mites	Phyto. mites	Pred. mites	Phyto. Mites	Pred. mites	Phyto. Mites	Pred. mites
April	498.75	2.50	514.75	3.25	196.00	2.75	226.00	3.00
May	596.00	3.50	610.00	4.00	385.75	3.75	412.00	3.75
June	385.00	5.50	400.00	6.25	280.00	4.75	306.50	5.25
July	298.25	7.25	317.00	8.00	125.00	7.00	168.75	7.50
Aug.	410.25	4.75	473.00	5.75	320.75	3.75	395.75	4.25
Sep.	201.00	2.75	218.00	3.50	130.00	2.00	160.25	2.75
Oct.	362.50	0.75	325.25	2.25	134.00	0.75	121.00	1.75
Nov.	524.00	0.00	536.50	0.00	260.25	0.00	284.50	0.00
Dec.	456.75	0.00	447.75	0.00	173.50	0.00	176.50	0.00
Jan.	317.00	0.00	308.25	0.00	124.00	0.00	151.00	0.00
Feb.	224.00	1.75	238.50	2.25	162.50	1.50	146.00	2.50
Mar.	286.00	2.75	314.00	3.50	137.00	2.50	153.75	3.00
(r)	- 0.129		- 0.054		0.072		0.099	



Tables (11 and 12) explained that, no significant effect existed on population density of eriophyid mites affected by the predaceous mites as, values (0.512, 0.484) and (0.357, 0.282) were obtained in the first and second year, on terminal and lateral buds in Sohag, respectively. Also, the phytoseiid mites populations had no significant effect on the population of Eriophyid mites during two years whereas, Correlation coefficient values (-0.129, -0.054) and (0.072, 0.099) clearly showed that, no significant effect between population density of eriophyid mites and its predator mites in the first and second year, at Assiut respectively.

Tables (11 and 12) demonstrated that, the population of phytophagous mites inhabiting buds of mango variety Taimour at Sohag governorate had two peaks during the two years for terminal and lateral buds. The first was the highly one, it recorded in May month with average numbers 741.50 and 786.75 individuals for terminal buds and 458.75 and 484.00 individuals for lateral buds, and the second one was in November month with average numbers 442.00 and 492.50 individuals for terminal buds and 306.50 & 362.50 individuals/5 lateral buds during the first and second years respectively, at Sohag. On the other hand the phytophagous mites inhabiting buds of mango variety Taimour at Assiut governorate had three peaks during the two years for terminal and lateral buds. The first was in May month with average numbers 596.00 and 610.00 individuals for terminal buds and 385 and 412.00 individuals for lateral buds, and the second one was in August month with moderate density 410.25 and

473.00 individuals for terminal buds and 320.75 and 395.75 individuals for lateral buds. The third peak recorded in November with average 524.00 and 536.50 individuals for terminal buds and 260.25 & 284.50 individuals/5 lateral buds during the first and second years respectively, at Assiut. Statistically, there was non-significant positive correlation between the population density of phytophagous mites and number of predatory mites during the two years, except Baladi mango variety in Sohag governorate was significant positive correlation during the two years; in addition to terminal bud of Taimour mango variety in Assiut was non-significant negative correlation during the two years. These results were agree with those obtained by Al-Azzazy(2005), Abdelallah (2008) and Al-Azzazy (2016).

#### References

- Abd-Allah, A.A.M. (2008). Susceptibility of mango varieties for infestation with mites. Ph.D. Thesis Fac. Agric., Al-Azhar University.
- Abdel-Maksoud, M.A.(2006). Ecological and biological studies on mites associated with fruit trees in Assiut and Sohag Governorates.[PhD Thesis]. Cairo (Egypt): Al-Azhar University.
- Al-Azzazy, M.M.,(2012). Mango Rust Mite *Metaculus mangiferae* (Atiah) (Acari: Eriophyidae) as Main Factor Affecting The Leaf Mineral Content of The Mango Trees *Mangiferae indica* L. J. Plant Prot. and Path., Mansoura Univ. 3 (10): 1099 – 1104.
- Al-Azzazy, M.M., (2005). Integrated management of mites infesting mango trees [PhD Thesis]. Cairo (Egypt): Al-Azhar University.
- Al-Azzazy, M.M., (2016). Population fluctuation and control of the citrus

- rust mite, *Phyllocoptruta olievora* (Ashmead) (Arachnida: Prostigmata: Eriophyidae). Journal of Agricultural and Veterinary Sciences Qassim University, 9 (2): 175-186.
- Ata, M.M.; Sakkran T.H.F., Fawzy M.M.H. and El-Shahawy G.Z., (2016). Survey and Population Dynamic of Some Mites Associated with Citrus Trees in Fayoum Governorate. Egypt. J. Agric. Res., 94 (1): 1-16.
- Devi M.; Niranjana, R.F. and Umapathy, G. (2017). Seasonal incidence of different *Aceria* sp. correlated with weather parameters. Jour. of Entom. and Zoo. Studies; 5(3): 39-43.
- Domingos, C.A.; Melo, J.W.S.; Oliveira, J.E.M. and Manoel, G.C. Gondim J.R., (2014). Mites on grapevines in northeast Brazil: occurrence, population dynamics and within-plant distribution, Inter. Jour. of Acarol. 10 (March) DOI: 10.1080/01647954.2014.891651.
- Fathy, F.M.M. (2007). Environmental and Biological studies on some mites associated with the dominant and Widely distributed plants around Quaroun Lake area-Fayoum Governorate. [M.Sc. Thesis] Ain shams university.
- Joyce, M.R., Jaqueline M.P. Rodrigo D.D. and André J.A.P., (2020). Population Dynamics of Rubber Tree Mites. Floresta Ambiente; 27 (4):1-6.
- Salem, H.A., Mahmoud Y.A. and Ebadah I.M.A., (2015). Seasonal Abundance, Number of Generations and Associated Injuries of the White Mango Scale, *Aulacaspis tubercularis* (Mangifera) (Newstead) (Homoptera: Diaspididae) Attacking Mango Orchards. July–August 2015 RJPBCS 6(4):1379.
- Steel, R.G.D. and Torrie, J.H., (1960). Principles and procedures of statistics. McGraw-Hill Book Company, INC. New York.

## العلاقة بين الكثافة العددية للأكاروسات نباتية التغذية والأكاروسات المفترسة المصاحبة لثلاثة اصناف من أشجار المانجو في محافظتي أسيوط وسوهاج

احمد شرف محمود محمد<sup>١</sup>، محمد ابو الحمد عبدالمقصود ابوشوشه<sup>١</sup>، نشأت عبدالعزيز محمود<sup>١</sup>  
وعوض على عبدالله<sup>٢</sup>

<sup>١</sup>قسم الحيوان الزراعي والنباتود، كلية الزراعة، جامعة الأزهر فرع اسيوط  
<sup>٢</sup>قسم الحيوان الزراعي والنباتود، كلية الزراعة، جامعة الأزهر القاهرة

### الملخص

يعتبر محصول المانجو من اهم محاصيل الفاكهة في مصر سواء للاستهلاك المحلي او التصدير للأسواق الخارجية، لذا اجريت هذه الدراسة على مدار عامين لتحديد علاقة الكثافة العددية بين كلاً من الآفات الأكاروسية والمفترسات الأكاروسية. اجريت الدراسة على ثلاثة اصناف من المانجو وهي البلدي، الهندي، التيمور في اربعة مواقع في كلاً من محافظتي اسيوط وسوهاج وتبين من الدراسة ان اهم الانواع الأكاروسية المتغذية على الأوراق هي *Cisaberoptus kenyae* keifer و *Oligonychus mangiferus* Rahman and Sapr Metaculus والأنواع المتغذية على البراعم هي *Aceria mangiferae* Sayed والنوع *mangiferae* Attiah في كلاً من المحافظتين وعلى الثلاثة اصناف. بينما الأكاروسات المفترسة التي وجدت هي النوع *Typhlodromus mangiferus* Zaher and El Brollosy والنوع *Amblyseius cucumeris* (Oudemans) وتبين من الدراسة ان تذبذب اعداد الأكاروسات المتطفلة والمفترسة والعلاقة بينهما كانت كالتالي:

### أولاً: الأكاروسات نباتية والتغذية والمفترسة المصاحبة للأوراق:

وجد ان الأكاروسات التغذوية على الأوراق لها قمتين للكثافة العددية في العام على الثلاثة اصناف وفي كلا المحافظتين وقد سجلت القمة العددية الاولى على الصنف البلدي خلال شهر اغسطس والثانية خلال شهر ديسمبر في كلا العامين (٢٠١٤/٢٠١٣ - ٢٠١٥/٢٠١٤) وكلا المحافظتين، لكن الكثافة الثانية كانت الأعلى في اسيوط بمتوسط ٨٩٤,٠٠ فرد/د/ ورقة في العام الاول و١٠٠٤,٢٥ فرد/د/ ورقة في العام الثاني في محافظة اسيوط، ومن خلال التحليل الإحصائي وجد ان للمفترسات تأثير إيجابي على النوع *O. mangiferus*، بينما كان للمفترسات قمة عددية واحدة في العام على كل الأصناف وكلا المحافظتين وقد سجلت على صنف البلدي خلال شهر يولييه بمتوسط ٣٩,٢٥ فرد/د/ ورقة في العام الأول و٤٢,٧٥ فرد في العام الثاني. كانت الزيادة العددية الاولى للأكاروسات نباتية التغذية على الصنف هندي في شهر يولييه وهي الأعلى بمتوسط ٥٦٨,٥٠ فرد في العام الأول و٦٥٧,٠٠ فرد/د/ ورقة في العام الثاني والثانية في شهر يناير في سوهاج و اسيوط. بينما سجلت الزيادة الاولى في اسيوط في اغسطس والثانية في يناير كما سجلت الزيادة العددية للمفترسات في شهر اغسطس في سوهاج وخلال شهر يوليو في اسيوط خلال العامين بمتوسط ٦٩,٥٠ & ٧٤,٠٠ فرد/د/ ورقة في العامين على الترتيب. اما الصنف تيمور فقد سجلت الأكاروسات المتغذية على الأوراق الزيادة الأولى لها في شهر يوليو والثانية خلال شهر يناير في كلا المحافظتين بمتوسط ٥٧٧,٥٠ & ٦٧٠,٧٥ فرد خلال العامين على الترتيب في سوهاج، اما الاعداد في اسيوط على نفس الصنف فكانت اقل ولكن الزيادات العددية كانت في نفس الأشهر. كما سجلت المفترسات الزيادة الوحيدة لها خلال شهر اغسطس على نفس الصنف وكلا المحافظتين ولكن كانت الزيادة بأسيوط هي الأعلى بمتوسط ٥٤,٠٠ & ٦٠,٧٥ فرد/د/ ورقة في العام الأول والثاني على الترتيب، وكان للمفترسات تأثير إيجابي على الأكاروسات المتغذية على الأوراق.

**ثانياً: الأكاروسات نباتية التغذية والمفترسة المصاحبة للبراعم:**

الأكاروسات المفترسة المتواجدة على البراعم أيضاً كان لها قمة عددية واحدة وكانت ما بين شهر مايو ويونيه ويوليه بينما لم تسجل أي أعداد لها على البراعم خلال شهري ديسمبر ويناير خلال العامين وعلى كل الاصناف. اما الأكاروسات المتغذية على البراعم فتراوحت بين زيادتين الى ثلاث خلال العام. فقد سجلت أكاروسات البراعم على الصنف البلدي في سوهاج ثلاث زيادات على البراعم الطرفية، الزيادة الأولى وهي الأعلى كانت في شهر مايو بمتوسط ٦١٤,٥٠ فرد/٥ براعم في العام الأول و ٦٥٨,٠٠ فرد/٥ براعم في العام الثاني، وكانت الزيادة الثانية في شهر اغسطس والثالثة في شهر ديسمبر. بينما سجلت البراعم الجانبية زيادتين الأولى خلال شهر مايو وهي الأعلى أيضاً بمتوسط عددي ٥٨٠,٢٥ & ٦١٢,٥٠ فرد/٥ براعم جانبيه خلال العامين. بينما في اسيوط سجلت البراعم الطرفية والجانبية ثلاث زيادات الأول في مايو والثانية في اغسطس والثالثة في اكتوبر. اما المفترسات فتواجدت بأعداد قليلة على البراعم وبزيادة واحدة خلال شهر يونيه وكانت اعلى في اسيوط على الصنف البلدي بمتوسط ٦,٢٥ & ٧,٥٠ فرد على البراعم الطرفية و ٥,٢٥ & ٦,٧٥ فرد/٥ براعم على البراعم الجانبية في العام الأول والثاني على الترتيب، ولم يكن لها تأثير إيجابي على الأكاروسات المتطفلة على البراعم. اما صنف المانجو هندي فقد اصيب بأكاروسات البراعم بأعداد متوسطة وسجلت الأكاروسات المتغذية على البراعم زيادتين في العام في سوهاج وثلاث زيادات في اسيوط، سجلت الزيادة الأولى في شهر مايو وهي أيضاً الأعلى بمتوسط ٥٠٨,٢٥ & ٥٩٠,٢٥ فرد للبراعم الطرفية و ٤١٢,٢٥ & ٤٣٦,٢٥ فرد/٥ براعم، للبراعم الجانبية في العام الأول والثاني على الترتيب، اما الزيادة الثانية كانت في شهر نوفمبر. اما في اسيوط فسجلت الثلاث زيادات في أشهر مايو، أغسطس، ديسمبر على الترتيب كما سجلت الزيادة الوحيدة للمفترسات في شهر يوليه. اما الصنف تيمور فسلكت الأكاروسات نفس السلوك وهي زيادتين في سوهاج الاول في مايو والثانية في نوفمبر لكن بأعداد اعلى قليلاً، ايضاً سجلت ثلاث زيادات في محافظة اسيوط في الأشهر مايو واغسطس ونوفمبر على الترتيب. اما المفترسات على براعم الصنف تيمور فقد كانت زيادتها العددية في سوهاج خلال شهر اغسطس على البراعم الطرفية وفي شهر يونيه على البراعم الجانبية خلال العامين، اما في اسيوط فكانت الزيادة العددية لها في يونيه على كلاً من البراعم الطرفية والجانبية وفي العامين على التوالي.