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Annual Occurrence and Population Dynamics, of Cotton Aphids, *Aphis gossypii* Glover on Specific Host Plants at Sharkia Governorate, Egypt

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**ABSTRACT**

This study was conducted at Zagazig region, Sharkia Governorate during the period extended from the end of November, 2013 till early December, 2015 to determine host plants list of Cotton Aphid, *Aphis gossypii* Glover, occurrence on hosts, in addition to figure its annual population dynamic on the important economic and weeds/wild plant hosts to employ these information in preparing effective integrated aphids management program. The obtained results revealed that the cotton aphid colonized wide range of 37 economic host plant species and 23 weeds/wild plant species follow 22 plant families. The highest occurrence ratio of 38.9 %, was recorded on the family Malvaceae plants while, the lowest one of 0.069 % recorded on the family liliaceae (garlic plants). The mean numbers of *A. gossypii* were varied as host plant variation where the highest occurrence ratio of 16.81 % was recorded on cotton plants; *Gossypium barbadenc* L. followed by okra plants, *Hibiscus esculentus* L. presented 11.456 %; while the lowest ratio of 0.043 % was recorded on aellen-wild beet, *Beta vulgaris* Perennis. In regarded to the weed/wild plants the highest harboring ratio of 5.023% was recorded on purslane, *Portulaca oleracea* while the lower ratio of 0.079 % was recorded on yellow weed sorrel, *Oxalis corniculata* plants.

The cotton plants, *G. barbadenc* found harbored *A. gossypii* with longest periods extended from early April till early October during growing season of 2014 and from early- may till mid-October 2015, with the highest peak of 320 individuals / leaf recorded at 15th August, 2014; followed by the peak of 270 individuals / leaf recorded at 30th July, 2015 on lantana plants.

In regarded to the general annual population dynamic, there were two critical activity periods, where the aphids recorded on limited number of plant hosts and with low numbers, the 1st period extended from 6th Feb., till 5th Apr., 2014 with 16 hosts only and the population density ranged 1 individual/leaf on scarlet pimpernel, *Anagallis avensis* to 47 individual/leaf on little mallow, *Malva parriflora* . The 2nd activity period from 2nd Jan., till 20th Feb., 2015 with 14 host only and the population density ranged from 1 individual/leaf on shepherd purse, *Capsella bursa-pastoris* to 66 individual/leaf on little mallow, *M. parriflora*. That means the obvious hosts play important role in the annual dispersal and dynamic of *A. gossypii* between its main and alternative hosts throughout the activity periods.

INTRODUCTION

Cotton aphids, *Aphis gossypii* Glover (Homoptera: Aphididae) considered as the most worldwide serious aphid species causes yield loss, directly by sucking cell contents of infested plants parts and indirectly by exert huge amounts of honeydew that eventually promotes development of black sooty mold, which reduces the...
photosynthetic efficiency and plant vigor and growth (Jazzar and Hammad, 2003). In Egypt, economic threshold of cotton aphids, *A. gossypii* was varied as insect stages, socio economic judgment and insects environment suitability where it was 4-10 insects/leaf, (Ibrahim, 2001). The cotton aphids infested wide range of cultivated economic crops including crops (Cereals, Pulses and Oilseeds), vegetables, fruits, ornamental plants and weeds/wild plants, wild plants are present as alternative hosts for aphids from which they disperse to economic crops plants, in any case the host range varied as location of investigation (Sánchez et al., 2002; Azize et al., 2008; Blackman & Eastop, 2000). In Egypt, most aphids studies were carried out on cultivated economic hosts and inspect the wild plants as accidentally infested hosts (Willcocks, 1922; Hall, 1926; Habib and El Kady 1961; Attia, 1967; Shalaby, 1974; Harakly 1975).

The effective integrated pest management program always needs more and more of recent information about the pest's biology, ecology and host range (economic and alternative plant hosts) to employ these information in forecasting program and took the decision of *A. gossypii* control measures at suitable time.

The present work aimed to determine the *A. gossypii* host rang, occurrence ratio and occurrences periods on each host, in addition to figure its annual population dynamic on the important economic and weeds/wild host plants at Zagazig region to employ these information in preparing effective integrated aphids management program.

### MATERIALS AND METHODS

This study was conducted at Zagazig region, Sharkia Gov. on the all plants or trees (about 200 species of plants and trees) found in the study area during two years extended from the end of November 2013 till early December 2015. The area from Kafer Abd El Aziz to Bany Amer villages were chosen for screening the host range of Cotton Aphid, *Aphis gossypii* Golver, ratio and occurrence periods on hosts, in addition to figure its annual population dynamic on the important economic and weeds/wild host plants.

Weekly randomized samples of ten seedlings in three replicates (at early plants growth period) or ten leaves (of mature plants) or ten shoots of the small plants or ten twigs of trees of inspected plant species. The all plants or trees found in the study area (cultivated economic plants and weeds found interfere this cultivation in addition to the weeds/wild plants found out fields (at road & irrigation canal's banks) were inspected actually in fields early in the morning using hand lens (10X) or took in paper bags to laboratory to examined using binocular stereomicroscope. Aphid's numbers were counted on different inspected plant species and recorded.

The obtained data were subjected to arithmetic curing, population figures illustration (using Excel software computer program) and the obtained results were illustrated in Table (1 a, b) and Figs (1-5) to define host rang, determine ratio and periods of occurrence on host plants, in added to illustrate annual population dynamic of *A. gossypii* on the important hosts. The wild/weeds plants were identified as description made by Boulos and El-Hadidi (1967).

### RESULTS AND DISCUSSION

**Host Range of Cotton Aphid (CA),* Aphis gossypii* Golver:**

Data in Table (1) revealed that *Aphis gossypii* colonized wide range of 37
economic plant species and 23 weeds/wild plant species follow 22 plants families could be arranged in descending order in accordance to occurrence ratios (%) as follows: Family Malvaceae harbored 38.9, Cucurbitaceae 12.01, Compositae 7.141, Verbenaceae 6.458, Solanaceae 5.036, Pertulacaceae 5.023, Chenopodiaceae 4.46, Cruciferae 3.071, Euphorbiaceae 2.764 Meriaceae 1.939, Lamiaceae 1.908, Leguminaceae 1.775, Polygonaceae 1.249, Liliaceae 0.069, Spermacetiaceae 0.719, Tiliaceae 0.713, Convolvulaceae 0.649, Graminaceae 0.553, Rosaceae 0.496, Apiaceae 0.469, Lamiaceae 0.079 %.

Table (1b): Host plants and relative abundance percentages of the cotton aphids, Aphis gossypii Glover at Zagazig region during the period extended from end-Nov. 2013 till early-Dec. 2015.

Occurrence ratios of the cotton Aphid, A. gossypii on economic crops hosts:
The mean numbers of A. gossypii infested economic plants were varied as host plans species, recorded highest occurrence rate of 16.81 % (of total numbers found infested all hosts during the whole study period) on G. barbadenc, followed by Hibiscus esculenta L. presented 11.458 %; Lantana sabrifota (6.458%) ; H. sabdorifia (4.144%); Luffa aegyptiaca, (3.261%) and Citrullus vulgaris (2.774%). The lowest abundance of 0.043% was recorded on Beta vulgaris Perennis. The following host plants had colonized percent ranged between 2.195 to 0.069% can be arrange in descending order as, H.cannabnus, Althaea rosa, H.irisnum. Cucumis melo var. cantalupensis, C.sativus, C. melo. Var. flexosus, Lycopersicum esculentum, Solanum melongena, S. nigrum, Capsicum frutescens, Spinacia oleracea, Beta vulgaris Perennis, Allium sativum, Rosa sp, Helianthus annus L., Trifolium alexandarimin, Vicia faba, Sesbanium indicum, Sesbania aculeate, Lantana sabrifota, Salix sub cerrata, Psidium guava, Mentha spicata, Ripeus communis, Corchorus olitorius, Zea mays, Ipomoea batatus, Morus alba.

Occurrence ratios of the cotton aphid:
The weed/wild plants were varied as A. gossypii hosts suitability where the highest abundant percentage of 5.023% was noticed on Pertulaca oleracea followed by 4.456 % on Malva parrifera and 2.165 % on Anagallis arvensis. The relatively lowest abundance ratio of 0.079 % was recorded on Oxalis corniculata plants. The following host plants had colonized percentages ranged 1.732-0.096 % can be arrange in descending order as, capsella bursa, Coronopus squamatus Asch, Eruc sativum, Sisymbrium Irio, Brassica rapa, B. kaber, Cucurbita pepa, Citrullus
volgaris, Rumex deutatus, Chenopodium murale, Amaranthus ascendens Lois, Xanthium strumarium, Conyza egyptiaca, C.discorides, Sonchus deraceus, Sichorium endivia, Melilotus indica, Medicago polymorpha, Anagallis arvensis, Euphorbia pilufifera, Rumx dentantus, Hedra colchica, Convelvulus arvensis, Anmi majus, Oxalis corniculata,

Population dynamics and occurrence periods A. gossypii on Economic crops and weeds/wild plants:

Economic crops hosts:

The seasonal and annual population dynamic of A. gossypii will be discussed only on main cultivated economic crops hosts that colonized by 11.458 % to 2.105 % of total numbers of aphids on all investigated hosts at study location as follows:

Field crops:

**Cotton, Gossypium barbadenc L.**

The data illustrated in Fig. (1) cleared that the cotton plants, G. barbadenc was harboured relatively highest numbers of A. gossypii with longest occurrence periods extended from plants emergence till harvest during growing season of 2014; the insect population was oscillated and fluctuated drawing two peaks, the 1st one regarded at 22nd May with mean numbers of 250 individuals / leaf and the 2nd recorded at 15th August with mean numbers of 320 individuals/leaf). In the same trend, during the 2nd cotton growing season of 2015 the infestation period was extended from early- may till mid-October illustrated tow peaks; the 1st one noticed at 18th June with mean number of 231 individuals / leaf and the 2nd at 10th of September recorded 221 individuals/leaf).

**Sunflower, Helianthus annus L.**

The sunflower, H. annus plants was inspected as wild plants found neighbor cultivated fields, along canals and in waste area. The sunflower plants found harboured A. gossypii in five occurrence periods, the 1st extended from 2nd Jan. till 13th Feb. 2014 with one population peak of 24 individuals/ leaf recorded at 23rd Jan.,

The 2nd and short period from 21st Mar. to 3rd May. 2014 with one peak of 13 individuals/ leaf was recorded at 11th Apr., and then the population reduced to restart again at the third occurrence period from 27th Jun. to 27 Sep. 2014 recorded one peak also at 24th Jul. with 37 individuals /leaf. The 4th occurrence period of A. gossypii on the wild H.annus plants was extended from 28th Nov.2014 to 17th Jan 2015 with only one peak noticed at 26th Dec, 2014 with 23individuals/leaf. The last occurrence period was started from 10th Apr. to 22nd May 2015 with only one peak at 1st May with 25individuals/leaf.

**Vegetable crop:**

**Okra plants, Hibiscus esculentus L.**

The data illustrated in Fig. (1) clear that the okra plants, H. esculentus recorded 2nd order of A. gossypii occurrence ratios and periods after cotton plants. The okra plants found colonized by A. gossypii at inspection start time at 28th November 2013 with mean number of 62 individuals / leaf then the population decreased to very low mean number of 4 individuals / leaf and disappeared at 2nd January 2014.

During the growing season of 2014, A. gossypii colonized okra plants in two occurrence periods the 1st, from 11th April till 20th September 2014 with moderate population oscillation, fluctuation and drawing two definite peaks, the 1st regarded at 31st May (73 individuals / leaf) and the 2nd one at 1st August (60 individuals/leaf); while the 2nd occurrence period was extended from 7th November till 26th December reordering one peak of 22 individuals / leaf at 28th November. In the other hand, during the 2nd okra growing season of 2015 the aphid recorded relatively high
numbers throughout relatively long infestation period extended from 18th April till 3rd December, illustrated three defined peaks; the 1st one at 28th May with 66 individuals / leaf; the 2nd at 26th June, recorded 260 individuals / leaf and the 3rd one at 24th September with 139 individuals / leaf.

Fig. 1: Population dynamics of cotton aphids on main specific plant hosts at Zagazig region during the period extended from 28, Nov.2013 till 3, Dec. 2015.

**Squash, Cucurbita pepo L.:**

The data illustrated in Fig. (2) cleared that, the cotton aphids, *A. gossypii* found infested *C. pepo* plants in four occurrence periods; the 1st was extended from 21st Mar. till 22nd May 2014 recorded one peak at 24th Apr. 2014 with 58 individuals/leaf. The 2nd period was extended from 24th Jul. to 29th Aug 2014 on *C. pepo* plants with one weak peak of 9 individuals/ leaf recorded at 15th Aug., and then the population decline to restart again in the third occurrence period from 10th Oct to 5th Dec. 2014 recorded one peak at 7th Nov. with 32 individuals /leaf. The 4th occurrence period of cotton aphids, *A. gossypii* on the *C. pepo* plants was extended from 17th Jan. to 3rd Jun 2015 with three peaks of 13, 57 and 40 individuals/ leaf recorded at 20th Feb, 18th Apr and 1st May for the three peaks, respectively.

**Snake cucumber, Cucumis melo var flexosus L.:**

The cotton aphids found infested *C. melo* plants throughout whole growth season of plants in one occurrence periods for each of the two study years Fig. (2). The 1st periods extended from 14th Jun. till 29th Aug 2014, recorded one peak at 7th Aug. with 42 individuals /leaf. The second one was extended from 24th Jul. to 15th Oct. 2015 on *C. melo* plants with two peaks of 46 and 66 individuals/ leaf recorded at 13th Aug. and 3rd Sep. for the two inspected peaks, respectively.

**Eggplant, Solanum melongena L.:**

The *A. gossypii* found infested eggplant plants in three occurrence periods Fig. (2), the 1st extended from 18th Jul. till 20th Sep 2014 recorded one peak at 22nd Aug.2014 with 50 individuals / leaf. The 2nd and short period was extended from 18th Apr. to 15th May 2015 on *S. melongena* plants with one peak of 17 individuals/ leaf recorded at 1st May, then the population decline to restart again in the third
occurrence period from 16th Jul to 24th Oct. 2015 recorded two peaks at 13th Aug and 1st Oct. with 38 and 23 individuals/leaf for the two flashed peaks, respectively.

Fig. 2: Population dynamics of cotton aphids on vegetables specific plant hosts at Zagazig region during the period extended from 28, Nov.2013 till 3, Dec. 2015

**Ornamental plant, lantana, Lantana sabrifota L.:**

The data figured in Fig. (4) chowed that the lantana, *L. sabrifota* was harbored relatively high numbers of *A. gossypii* with five activity periods. The 1st one recorded throughout January 2014 with one population peak at mid-Jan. (10 individuals / leaf). The 2nd activity period was extended from 24th Jul. till 17th Jan. 2015 with four peaks. The peaks were recorded at 3rd week of Aug., 20th Sep., 7th Nov. and 26 Dec. with 35, 25, 46 and 24 individuals / leaf for the four peaks, respectively. The third activity period was extended from 14th Feb till 7th Mar. 2014 with small oscillation with one weak peak of 9 individuals / leaf at 20th Feb. The 4th period was extended from 10th Apr. until 7th May 2015 with one peak of 15 individuals / leaf at 24th Apr. The last activity period with highest density extended from 2nd Jul. until 3rd Dec. 2015 illustrated three peaks of 270, 52 and 36 individuals/leaf recorded at 30th Jul., 3rd Sep. and 29th Oct. 2015 for the three peaks, respectively.

**Medicinal plants:**
**Roselle, Hibiscus sabdoriffa L.:**

The illustrated data in Fig. (1) cleared that the cotton aphids, *A. gossypii* was infested Roselle plants, *H. sabdoriffa* through the study years with one long term infestation period for each of year. During the 1st year of 2014, the infestation started in low numbers at 31st May recorded 2 individual/leaf, oscillated and fluctuated till the end of Roselle growth season at 19th Dec. recorded three remarked peaks at 5th Jul., 12th Sep. and 7th Nov. with 58, 71 and 39 individuals / leaf for the three peaks, respectively. During 2015 the infestation was delayed to the mid-July but in low numbers also of (2 individual/leaf), then the population increased gradually to record three distinct peaks of 69, 63 and 25 individual/leaf recorded at 20th Aug., 1st Oct. and at 26th Nov. for the three peaks, respectively.
Spearmint, *Mentha spicat* L.:

The spearmint plants *M. spicata* found harbored *A. gossypii* in four occurrence periods Fig. (2), the 1st was started from 2nd Jan. till 5th Apr. 2014 with one population peak of 34 individuals/shots recorded at 30th Jan. The 2nd period was extended from 24th Jul. to 4th Sep. 2014 on *M. spicata* plants with one peak of 23 individuals/shots recorded at 15th Aug., then the population reduced to restart again at the 3rd period from 13th Dec. 2014 to 3rd Apr. 2015 recorded two peaks at 2nd Jan. and 7th Mar. with 30 and 22 individuals/shots for the two inspected peaks respectively. The last activity period of cotton aphids on the spearmint plants was in start from 30th Jul. to 17th Sep 2015 with only one peak noticed at 20th Aug, with 20 individuals/shots.

Egyptian Luffa, *Luffa aegyptiaca* L.:

The illustrated data in Fig. (1) showed that, the *A. gossypii* harbored *L. aegyptiaca* plants through the two study years with four occurrence periods, the 1st one considered as extension over the previous year infestation where it extended from 28th Nov. till 20th Dec. 2013 started with relatively high number of 18 individuals/leaf and then come down. The 2nd occurrence period was extended from 22nd Aug. to 26th Dec 2014 recorded two define peaks of 47and 30 individuals/leaf recorded at 27th Sep. and 15th Nov.2014 for the two peaks, respectively; then the population decline to restart again to record the third occurrence period from 29th Jan till 19th Mar. 2015 with one weak peak of 18 individuals/leaf. The last period was inspected from 24th Jul. to 3rd Dec. 2015 recorded three peaks; the highest one of 97individuals/leaf was recorded 1st Oct. 2015.

Fruit trees; Guava, *Psidium guava* L.:

The guava, *P. guava* trees was inspected as solitary trees found in cultivated fields and along irrigation canals in the study area. The guava trees found colonized by the cotton aphids, *A. gossypii* in four occurrence periods Fig (4), the1st one was extended from 9th Jan. till 31st May 2014 with two population peak of 12 and 68 individuals/leaf recorded at 30th Jan. and 25th Apr. for the two peaks, respectively. The 2nd and shortened occurrence period was extended from 7th Aug. to 12th Sep. 2014 on guava trees with one weak peak of 13 individuals/leaf recorded at 22nd Aug., then the population reduced to restart again at the 3rd occurrence period from 7th Mar. to 3rd Jun. 2015 recorded one peak also at 1st May with 43individuals/leaf. The last period of *A. gossypii* on the *P. guava* trees was extended from 30th Jul. to 3rd Sep 2015 with only one peak noticed at 13th Aug, with relatively low number of 12 individuals/leaf.

Weeds and wild plant hosts:

The occurrence and annual dynamic of *A. gossypii* population will be discussed only on main wild/weeds hosts that colonized by 5.023% to 1.739 % of total numbers of aphids on all investigated hosts at study location as follows:

Common purslane, *Portulaca oleracea*:

The cotton aphids, *A. gossypii* found infested purslane plants in five occurrence periods Fig (3), the 1st one extended from 28th Nov. till 26th Dec 2013.on old plants and listed one peak at 5th Dec. with 18 individuals/shots this period was extension to the last occurrence period of previous year. The 2nd period was expanded from 11th Apr. to 9th May 2014 on purslane plants seedlings with one peak of 22 individuals/seedling recorded at 25th Apr., then the population decline to restart again in the 3rd period from 11th July to 5th Dec. 2014 recorded three peaks at 15th Aug., 27th Sep. and 15th Nov. with 67, 29 and 35 individuals/shots for the three peaks, respectively. The 4th period of was extensive from 18th Apr. to 15th May 2015.
with one peak of 15 individuals/ seedling at 1st May. The last period extended from 3rd Jun. to 3rd Dec. 2015 with two equal peaks in numbers of 69 individuals/shots recorded at 26th Jun and 3rd Sep., respectively. So this plant considered as one of the important plant host of cotton aphids especially during the early and late growth season of purslane plants.

![Population dynamics of cotton aphids on weeds specific plant hosts at Zagazig region during the period extended from 28, Nov.2013 till 3, Dec. 2015.](image)

**Little mallow, Malva parviflora:**

The cotton aphids, *A. gossypii* found infested Little mallow plants in three occurrence periods Fig. (1), the 1st one expanded from 18 Nov. 2013 tell 19 Apr. 2014 and listed three peaks recorded at 20th Dec 2013, 20th Feb. 2014 and 21st March 2014 with 32, 47, and 19 individuals/leaf for the three peaks respectively; this period was extension to the last occurrence period of 2013. The 2nd period was extended from 20th Sep. 2014 to 7th May 2015 on *M. parviflora* plants with four peaks of 63, 42, 66 and 65 individuals/leaf registered at 17th Oct., 21st Nov.2014, 17th Jan. and 7th Mar. 2015, respectively; then the population decline to restart again in new growth season to record the 3rd occurrence period from 24th Oct. 2015 to end of study period at 3rd Dec. 2015 recorded one peak at 13th Nov. with 50 individuals/leaf. So, the little mallow plants considered as one of the important hosts of cotton aphids throughout its growth season.

**Scarlet pimpernel Anagallis arvensis:**

The scarlet pimpernel, *A. arvensis* found harbored *A. gossypii* in five activity periods Fig. (3), the 1st one expanded from 12th Dec. 2013 tell 20th Feb. 2014 and listed two peaks at 26th Dec 2013 and 6th Feb.2014 with 22 and 18 individuals/shots for the two peaks, respectively; this period was extension to the last occurrence period of 2013. The 2nd period was registered from 19th Apr. to 16th May 2014 on *A. arvensis* plants with one weak peak of 9 individuals/ shots recorded at 3rd May.2014. The 3rd period extended from 24th Oct.2014 to 23rd Jan. listed one peak at 28th Nov. 2014 with 30 individuals/shots. The 4th period was presented from 7th Mar. to 7th May 2015 with two peaks of 23 and 28 individuals/ shots recorded at 27th March and 18th Apr. respectively. The last occurrence period was registered from 15th Oct. to
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the end of study period at 3\textsuperscript{rd} Dec. 2015 drown one peak of 32 individuals/ shots at 13\textsuperscript{th} Nov. 2015.

**Yellow weed sorrel, Oxalis corniculata:**

The perennial weed yellow weed sorrel, *O. corniculata* which grow in the shadow area, found harbored *A. gossypii* in four activity periods Fig. (3), the 1\textsuperscript{st} one extended from 5\textsuperscript{th} Apr. tell 6\textsuperscript{th} Jun 2014.on old plants and recorded one peak at 9\textsuperscript{th} May. with 17 individuals/shots. The 2\textsuperscript{nd} period was expanded from 27\textsuperscript{th} Sep. to 15\textsuperscript{th} Nov. 2014 with one peak of 18 individuals/ shots listed at 17\textsuperscript{th} Oct., then the population decline to restart again in the 3\textsuperscript{rd} period from 13\textsuperscript{th} Mar. to 22\textsuperscript{nd} May. 2015 listed one peak at 18\textsuperscript{th} Apr. with 37 individuals/shots. The 4\textsuperscript{th} period was expanded from 15\textsuperscript{th} Oct. to 26\textsuperscript{th} Nov 2015 with one peak at 5\textsuperscript{th} Nov. with 16 individuals/shots.

**Ploughman's spikenard. Conyza discorides L.:**

The illustrated data in Fig. (4) cleared that the ploughman spikenard, *C. discorides* found harbored cotton aphids, *A. gossypii* in three occurrence periods, the 1\textsuperscript{st} one extended from 28 Nov. 2013 tell 23 Jan. 2014, recorded one peak at 12\textsuperscript{th} Dec 2013 with 52 individuals/leaf; this period was extension to the last activity period of 2013 . The 2\textsuperscript{nd} period was expanded from 3\textsuperscript{rd} Oct. to 26\textsuperscript{th} Dec 2014 with one weak peak of 42 individuals/ leaf recorded at 31\textsuperscript{st} Oct.2014. The 3\textsuperscript{rd} period was from 29\textsuperscript{th} Oct.2014 to 3\textsuperscript{rd} Dec 2015 .recorded one peak at 19 Nov. with 34 individuals / leaf.

The *Ch. murale* plants found harbored *A. gossypii* in three activity periods Fig. (4), the 1\textsuperscript{st} one which was extension to the last activity period of 2013 recorded from 28\textsuperscript{th} Nov. 2013 till 13\textsuperscript{th} Feb. 2014 recorded two peaks at 5\textsuperscript{th} Dec 2013 And 16\textsuperscript{th} Jan 2014 with 25 and 17 individuals/leaf for the two peaks, respectively. The 2\textsuperscript{nd} period was from 27\textsuperscript{th} Sep. to 13\textsuperscript{th} Dec 2014 with one peak at 17\textsuperscript{th} Oct. with 35 individuals/ leaf. The 3\textsuperscript{rd} period extended from 1\textsuperscript{st} Oct. to 3\textsuperscript{rd} Dec 2015 .recorded two peaks at 15\textsuperscript{th} Oct. and 13\textsuperscript{th} Nov. with 22 and 24 individuals / leaf for the two peaks, respectively.

**Fig. 4:** Population dynamics of cotton aphids on wild specific plant hosts at Zagazig region during the period extended from 28, Nov.2013 till 3, Dec. 2015.
Nettle leaf or goosefoot, *Chenopodium murale*:

**Water melon, *Citrullus vulgaris***:

The water melon, *C. vulgaris* which inspected as weeds/wild plants found in/out cultivated fields, where it is not cultivated as commercial crop in the study area found infested by *A. gossypii* in four occurrence periods. The 1st one was extension to the last occurrence period of 2013 extended till 12th Dec. 2013, where 35 individuals/leaf was recorded firstly and then the population decreased. The 2nd period was extended from 24th Jul. to 20th Sep. 2014 with one peak of 40 individuals/leaf recorded at 22nd Aug, and then the population reduced to restart again at the third and short occurrence period from 24th Oct. to 28th Nov. 2014 recorded one peak at 7th Nov. with 28 individuals/leaf. The 4th occurrence period was extended from 26th Jun. to 26th Nov 2015 with three peaks noticed at 16th Jul, 17th Sep. and 13 Nov. with 36, 70 and 14 individuals/leaf for the three peaks, respectively.

**The Egyptian willow trees, *Salix subc serrata***:

The newly twigs of Egyptian willow, *S. subc serrata* trees found harbored *A. gossypii* in six occurrence periods, the 1st one which was extension to the last occurrence period of 2013 till 30 Jan 2014 started with 25 individuals/twig and then oscillated till disappeared at the end of period. The population of *A. gossypii* was oscillated in very low numbers at the tow temporary periods (3&4) from 7th to 21st Mar. 2014 and from 15th to 29th Aug. 2014 without cleared peaks. The 4th period was extended from 19th Dec. 2014 to 27th Mar. 2015 with two relatively weak peaks of 32 and 8 individuals/twig listed at 17th Jan. and 13th Mar. for the two recorded peaks, respectively. The temporary 5th occurrence period noticed from 16th Jul. to 13th Aug. 2015 then the population decline to restart again in the last occurrence period extended from 10th Sep. to 19th Nov. 2015 with one peak of 32 individuals/twig recorded at 15th Oct 2015 on *S. subc serrata* trees.

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**ARABIC SUMMARY**

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تقلبات تعداد حشرات من القطن على العوائل النباتية الأساسية والبديلة في محافظة الشرقية، مصر

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وضعت النتائج أن حشرات من القطن وجدت على مدى عوائل واسع تمثل في 37 نبات ينتمي إلى 14 نوع من النباتات البرية والخليجية وتتتبع كلاً 22 عائلة نباتية. سجلت أعلى نسبة تواجد 38.9% على نباتات العائلة الخبازية بينما كانت أقل نسبة 14.2% سجلت على نباتات العائلة الزنديقة (ثوم). اختفت نسبة تواجد حشرات من القطن تجاوز 11.1%. لاختلاف العائلات النباتية حيث سجلت أعلى نسبة تواجد 17.8% على نباتات القطن تلاها نباتات النباتات البرية 15.4% بينما سجلت أقل نسبة 10% على نباتات النباتات البرية ونجحت في قضاء 40% من نباتات النباتات البرية. وجد أن النتائج للتكاثر على نباتات القطن وجدت في مجموعات 2015 وتحديداً في منتصف أكتوبر 2015 وتحديداً في 5 أكتوبر 2014 تلاها النباتات الفصلية أثرت على نباتات الأطعمة 30 فرد/ورقة في 15 أغسطس 2012 تلاها النباتات الفصلية أثرت على نباتات الأطعمة 30 فرد/ورقة في 3 يوليو 2014 وجد نتائج محدودة الحركة السنوية لمجموع حشرات من القطن حيث سجل المن خلالها عدد

**aphis gossypii** glover infesting brinjal plants J. Bio-sci. 17: 123-127


