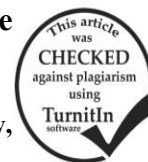


Influence of the Different Wheat Varieties on the Population Density of the Main Aphid Species in Kafr El-Sheikh Region.

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ABSTRACT

The experiments were carried out in the experimental Farm of Sakha Agricultural Research Station, Kafr El – Sheikh Government during two successive seasons, 2013/14 and 2014/15. Four wheat cultivars namely, Giza168, Sakha94, Masr2 and Gemmiza11 were obtained from Agriculture Research Station. To study the effect of, the different wheat varieties on the population density and average number of the main aphid species. The obtained results showed that, the highest average number of the bird cherry – oat aphid, *Rhopalosiphum padi* Linnaeus, was recorded on Gemmiza11 variety during the two successive seasons, and represented by 183.6 ± 69.8 and 139.4 ± 54 indiv. respectively. The results indicated that, the highest average number of the green cereal – bug aphid, *Schizaphis graminum Rondani*, and was recorded on Gemmiza11 variety during the two successive seasons, and represented by 109.2 ± 38.9 and 108.3 ± 34.1 indiv respectively. Whereas, the highest average number of the English grain aphid, *Sitobion avenae* Fabricius. was recorded on Gemmiza11 variety during the two successive seasons, and represented by 147.4 ± 39.2 and 113.1 ± 41.7 indiv respectively. Statistical analysis revealed significant differences among wheat varieties during the two seasons of study.

Keywords: Aphids, Varieties, Wheat.

INTRODUCTION

The bread wheat (*Triticum aestivum* L.) is the main crop occupies the largest area of cultivation in Egypt. Anwar *et al.* (2009). Wheat is a nutritious, useful, cost-effective crop and a source of the basic dietary product - breads which is consumed by more than 70 % of the Egyptian population. Wheat is a major cereal crop of Egypt that helps in increasing of GDP to the country's economy. It is a staple food (Anonymous, 2008). Wheat aphid is a serious pest infesting a wide range of plant hosts (60 species) including wheat, barley, corn and sorghum (Bowling *et al.*, 1998). Aphids secrete honey dew which facilitates growth with the largest area under cultivation, of sooty mold (Zia *et al.*, 2010). As a sucking pest, aphids significantly affect various vegetables, fruits and field product-breads which are consumed by more than 70 % of crops (Aheer *et al.*, 2008). Aphids are too much harmful and one aphid individual can cause 2.20 % loss in grain yield whereas 30-40% losses can occur at 15 aphids per plant. (Jarosik *et al.*, 2003). The rates of growth and migration are influenced by host plant species and their varieties. From the essential components of pest management programs are host plant preferences of the insect pest and its developmental rate as well as different varieties of the host plants (Akhter, *et al.* 2007; Khan, *et al.* 2011; Zhou, *et al.* 2011; and Lloyd, 2014).

The present study aims to throw the light on the influence of various wheat varieties on the density of the main aphid species to serve as a basis for the use of this information's in integrate pest management programs.

MATERIALS AND METHODS

The experiments were conducted in the experimental farm of Sakha Agricultural Research

Station, Kafr El – Sheikh Government during two successive seasons, 2013/14 and 2014/15. Four wheat cultivars namely, Giza168, Sakha94, Masr2 and Gemmiza11 were obtained from Agriculture Research Station. Seeds for each variety were sown in the third planting date (Beginning of December) for the two successive seasons. These experiments were conducted in area of about 1200 m². the area was divided into 16 replicates (each replicates was about 75 m²). Seeds of each variety were sown in four replicates and were arranged in Completely Randomized Design Normal agricultural practices were applied accept using any pesticides treatments. Samples initiated after three weeks from planting date and continued until the harvest time of the crop.

To evaluate the effect of different wheat varieties on the population density of the main insect pests, samples of 20 plants of each variety were selected weekly at random from each replicate. The collected samples at weekly intervals were kept in plastic bags and transferred to the laboratory for identification and counting.

RESULTS AND DISCUSSION

The bird cherry – oat aphid, *Rhopalosiphum padi* Linnaeus.

Data represented in Fig. (1) Showed that the total numbers and their ratios of *R. padi* during the two successive seasons 2013/14 and 2014/15. Gemmiza11 variety attracted the highest numbers and ratio of *R. padi* during the two successive seasons and represented by 2938(34%) and 2231 indiv.(38%) respectively. While, Giza 168 variety attracted the lowest number and ratio of *R. padi* during the two successive seasons and represented by 1716 (20%) and 1019 indiv.(17%) respectively.

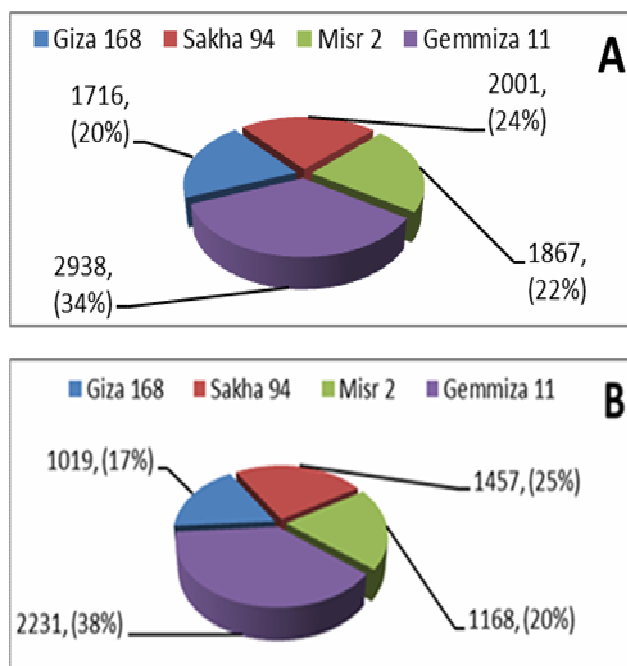


Fig 1. Total number and their ratios of *R. padi* on various wheat varieties during the two successive seasons 2013/14 (A) and 2014/15 (B) at Kafr El- Sheikh Governorate.

Data presented in Table (1) showed the average numbers of *R. padi* on wheat varieties during two seasons. In the first season, the highest average number of *R. padi* was recorded on Gemmiza11 variety with an average of 183.6 ± 69.8 and 139.4 ± 54.0 indiv. respectively. While, the lowest average number of aphid was recorded on Giza 168 variety with an average of 107.3 ± 43.9 and 63.7 ± 20.0 indiv. respectively.

Table 1. Influence of varieties on the average numbers of *R. padi* on wheat plants during 2013/14 and 2014/15 seasons.

Variety	2013/14 season	2014/15 Season	Av.± SE
Giza168	$107.3 \pm 43.9c$	$63.7 \pm 20.1c$	84.5 ± 31.2
Sakha94	$125.1 \pm 37.6b$	$91.1 \pm 31.9b$	101.5 ± 35.3
Misr2	$116.7 \pm 42.6c$	$73.0 \pm 24.0c$	91.2 ± 31.5
Gemmiza11	$183.6 \pm 69.8a$	$139.4 \pm 54.1a$	136.3 ± 38.5
LSD_{at 5%}	5.4	3.6	

In a column, means followed by the same letter are not significantly different at the 5% level

As a conclusion, in Fig (1) and Table (1), the highest average number of *R. padi* was recorded on Gemmiza11 variety during the two successive seasons, and represented by 183.6 ± 69.8 and 139.4 ± 54 indiv., respectively. Statistical analysis revealed significant differences among wheat varieties during the two seasons.

The green cereal – bug aphid, *Schizaphis graminum* Rondani. :

Data represented in Fig. (2) Showed that the total numbers and their ratios of *S. graminum* during the two successive seasons 2013/14 and 2014/15. Gemmiza11 variety attracted the highest numbers and ratio of *S. graminum* during the two successive seasons and represented by 1747 (29%) and 1733 indiv. (35%) respectively. While, Misr2 variety attracted the lowest number and ratio of *S. graminum* during the first

season and represented by 1150 indiv. (19%) Meanwhile, in the second season. Giz168 variety attracted the lowest number and ratio of *S. graminum* and represented by 806 (17%).

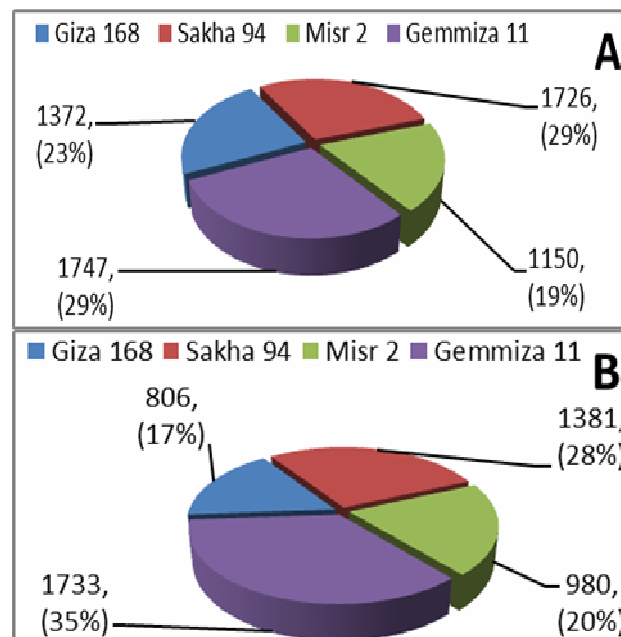


Fig 2. Total number and their ratios of *S. graminum* on various wheat varieties during the two successive seasons 2013/14 (A) and 2014/15 (B) at Kafr El- Sheikh Governorate.

Data presented in Table (2) showed the average numbers of *S. graminum* on wheat varieties during 2013/14 and 2014/15 seasons. Gemmiza11 variety the highest average number of *S. graminum* was recorded on with an average of 109.2 ± 38.9 and 108.3 ± 34.1 indiv. respect. While, the lowest average number of aphid was recorded on Misr2 variety with an average of 71.9 ± 23.2 indiv. in the first season. Meanwhile, in the second season. Giza 168 with an average of 50.4 ± 14.9 indiv.

Table 2. Influence of varieties on the average numbers of *S. graminum* on wheat plants during 2013/14 and 2014/15 seasons.

Variety	2013/14 season	2014/15 season	Av.± SE
Giza168	$85.8 \pm 33.0b$	$50.4 \pm 14.9d$	68.1 ± 24.0
Sakha94	$107.9 \pm 39.7a$	$86.3 \pm 27.9b$	99.5 ± 35.9
Misr2	$71.9 \pm 23.2b$	$61.3 \pm 25.4c$	75.0 ± 25.7
Gemmiza11	$109.2 \pm 38.9a$	$108.3 \pm 34.1a$	110.8 ± 38.0
LSD_{at 5%}	4.9	2.9	

In a column, means followed by the same letter are not significantly different at the 5% level

As a conclusion, the highest average number of *S. graminum* was recorded on Gemmiza11 variety during the two successive seasons, and represented by 109.2 ± 38.9 and 108.3 ± 34.1 indiv respectively. Statistical analysis revealed significant differences among wheat varieties during the two seasons of study.

The English grain aphid, *Sitobion avenae* Fabricius.

Data represented in Fig. (3) Showed that the total numbers and their ratios of *S. avenae* during the two successive seasons. Gemmiza11 variety attracted

the highest numbers and ratio of *S. avenea* during the two successive seasons and represented by 2359(33%) and 1810individ. (34%) respectively. While, Misr2 variety attracted the lowest number and ratio of *S. avenea* during the first season and represented by 1216individ. (17%) Meanwhile, in the second season. Giza 168variety attracted the lowest number and ratio of *S. avenea* and represented by 986 (18%) respectively.

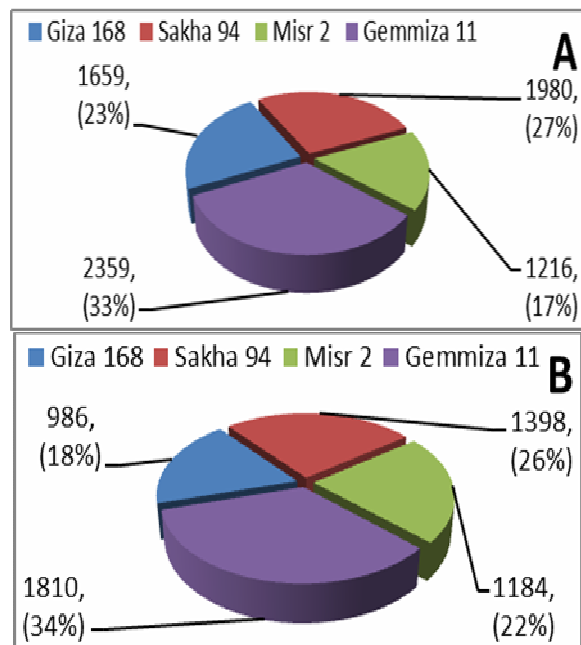


Fig 3. Total number and their ratios of *S. avenea* on various wheat varieties during the two successive seasons 2013/14 (A) and 2014/15 (B) at Kafr El- Sheikh Governorate.

Data presented in Table (3) showed the average numbers of *S. avenea* on wheat varieties during two seasons. The highest average number of *S. avenea* was recorded on Gemmizal1variety during the two successive seasons and represented by an average of 147.4 ± 39.2 and 113.1 ± 41.7individ.respectively.While; the lowest average number of aphid was recorded on Misr2variety with an average of 76.0± 29.0individ.in the first season, the lowest average number of aphid was recorded on Giza 168 variety with an average of 61.6 ± 18.4individ.respectively. in the second season.

Table 3. Influence of varieties on the average numbers of *S.avenea* on wheat plants during 2013/14 and 2014/15 seasons.

Variety	2013/14 season	2014/15 season	Av.±SE
Giza168	103.7 ± 47.9c	61.6 ± 18.4c	83.9 ± 34.1
Sakha94	123.8 ± 43.9b	87.4 ± 29.5b	74.4 ± 27.6
Misr2	76.0 ± 29.0d	74.0 ± 21.4ab	105.7 ± 38.7
Gemmiza11	147.4 ± 39.2a	113.1 ± 41.7a	153.7 ± 56.9
LSD _{at 5%}	5.2	2.7	

In a column, means followed by the same letter are not significantly different at the 5% level

As a conclusion, the highest average number of *S. avenea* was recorded on Gemmizal1variety during

the two successive seasons, and represented by 147.4 ± 39.2 and 113.1 ± 41.7individ.respectively. Statistical analysis revealed significant differences among wheat varieties during the two seasons of study.

These results are in consistent with those of EL-Mitwally, *et al.* (2013) who showed significant differences between the five wheat varieties for *R. padi* population abundance, EL – Rawy (2013) who found that the three cultivars (Misr2, Giza 168 and Gemmeiza7) had the lowest infestation rates by the cereal aphids (37.3, 62.2 and 65.2 aphids/10 plants, respectively). Khorchid (2013) showed that the highest infestation by *S. graminum* was recorded on Sakha93 and Giza 168 varieties On the other hand, Gemmieza9 &7 varieties were lowest. Helmi *et al.* (2013) determined that Gemiza-9 has to be the most resistant cultivar, whereas Giza-168 was the most susceptible one for aphid infestations. Tabasum, *et al.* (2012) found that the wheat cultivar V- 02192 has to be considered in IPM program to minimize the infestation with aphids. They observed that aphid population was maximum on February 24, and then exhibited a decline trend until March 8. From March 8 up to March 17 a slump in aphid population was observed. The Inqalab- 91 genotype had the lowest population of aphids. Al-Habashy (2008) found that Sakha 61 variety proved to be the least susceptible host plant for insects (aphids and leafhoppers) infestation followed by Gimaza 7 variety whereas Giza 168 variety appeared to be the most susceptible wheat variety. Shahid *et al.*(2001) revealed that *S. avenae* infestation started during the 2nd week of February and reached a peak of 4.55 aphids/ leaf during the 2nd week of March on all the tested genotypes. The highest average aphid population (2.45 aphids/leaf) was on wheat cultivar, IBW-96369, while the lowest was on IBW-96351.Abou-Elhagag, *et al.* (2001). Evaluated ten wheat cultivars for their susceptibility to cereal aphids (*R.padi*, *S.graminum* and *R. maidis*) in Egypt. Sids 9, Sids 7, Sids 5 and Gemiza 1 showed the lowest population of *R.padi* and *R. maidis*, while Sids 5 Sids 7, and Sids 9 were the least preferred cultivars by *S. graminum*. Sids 9, Sids 7 and Sids 5, aside from obtaining the highest yields, were the least susceptible to infestation by all studied cereal aphids.

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تأثير أصناف القمح المختلفة على الكثافة العددية لأنواع المن الهامة في منطقة كفر الشيخ.
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أجريت التجارب الحالية في المزرعة البحثية بمحطة البحوث الزراعية بسخا محافظة كفر الشيخ حيث تم زراعة أربعة أصناف من محصول القمح الأساسية وهم جيزة 168 و سخا 94 ومصر 2 و جيزة 11 (خلال موسمي الدراسة 2014/2013 و 2015/2014). لدراسة تأثير أصناف القمح المختلفة على الكثافة العددية ومتوسط التعداد لاهم أنواع المن. أوضحت الدراسات أن أعلى متوسط لتعداد حشرة من الشوفان على صنف القمح جيمزه 11 خلال موسمي الدراسة 69.8 ± 183.6 و 54.0 ± 139.4 فرد على التوالي. سجل صنف القمح جيمزه 11 أعلى متوسط تعداد لحشرة من النجيليات خلال موسمي الدراسة بالتالي 38.9 ± 109.2 و 34.1 ± 108.3 فرد على التوالي. حشرة من النجيليات الانجليزي سجلت أعلى متوسط تعداد على صنف القمح جيمزه 11 خلال عامي الدراسة 41.7 ± 113.1 و 39.2 ± 147.4 فرد وأظهرت الاحصائيات معنويه عاليه بين أصناف القمح المختلفه خلال موسمي الدراسة .