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Assessment of damage caused by house sparrow, *Passer domesticus niloticus* on wheat and sorghum crops at Sohag governorate, Egypt

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Abstract

This study was carried out under field conditions in Akhmim and Gehyena districts at Sohag governorate, Egypt during 2019/2020 to estimate the damage caused by house sparrow, *Passer domesticus niloticus* (L.) individuals on wheat (*Triticum aestivum*) and sorghum (*Sorghum vulgare*). The damage caused by wild birds on wheat and sorghum fields nearby (buildings, field crops and trees). The highest damage in wheat was recorded in fields nearby trees, followed by fields nearby buildings, while the lowest damage was recorded in fields nearby field crops. On the other hand, observed that the highest damage was recorded in the first 10 meters then decreased gradually towards the middle of the field.

Keywords: *Passer domesticus niloticus*, *Triticum aestivum*, *Sorghum vulgare*, damage, buildings, field crops, trees.

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1. Introduction

Birds dominated the air and managed to invade a lot of different environments, whether land or water due to their unique anatomical and morphological structure. These make the existence of flocks in the movement of permanent and continuous environment, to others and from country to country. For example, House sparrow, *Passer domesticus niloticus* (L.), Hooded crow, *Corvus corone sardonis* (L.) and Palm dove, *Streptopelia senegalensis egyptica* (L.) were the resident birds in Egypt during all seasons of the year. Metwally *et al.* (2009), Omar (2010), Abbasy *et al.* (2012), El-Danasory *et al.* (2018) and Hassan (2018) recorded that the wild bird species, cause serious damage to many field crops during the ripening stages under the different conditions of some governorates. Also, many bird species have become closely associated with man and his own activities and to some extent, dependent on him. It was simplest from this association may merely consist of using man – made structures for perching or even nesting. At the other extreme, his crops may be utilized as food. In addition, birds may be incriminated in transmitting the causative agents of plant diseases such as virus, bacteria and fungi. Bird damage to cereal crops represents economic losses reached to 5 - 10% of the production (Bruggers and Rulle, 1981). The house sparrow, *Passer domesticus* enjoys a world-wide distribution and affects a variety of habitat types under a wide range of climatic conditions. Now, the house sparrow is

thought to be one of the important vertebrate pests for cereal crops, human habitations, and wildlife in Egypt. Damage caused by house sparrow birds is one of the problems facing many farmers in Egypt. However, the amount of crop lost, and the economic damage sustained is largely unquantified. As the house sparrow has great predilection for maturing seeds, it inflicts great damage on the maturing crops of wheat. Infestations damage to wheat and sorghum crop represents a serious problem as the losses reach up to 6.60 and 13.74% of the yield (Omar, 2019). The present work was done in the fields of Akhmim and Gehyena districts at Sohag governorate, Egypt in order to study the assessment of birds' damage on wheat and sorghum crops during 2019/2020 season, with three locations, nearby (buildings, field crops and trees) and the effect of the distance study from beginning the field experiment.

2. Materials and methods

2.1 Study area

The present work was conducted at Sohag governorate, which occupies the Upper Egypt, about 495 km South of Cairo. Sohag governorate bordered by Assiut in the North, in the South by Qena, in the East by Red Sea governorate, and in the West by New Valley governorate. Akhmim district was located in the East of the Nile River. While Gehyena district was located in the West of the Nile River (Figure 1).

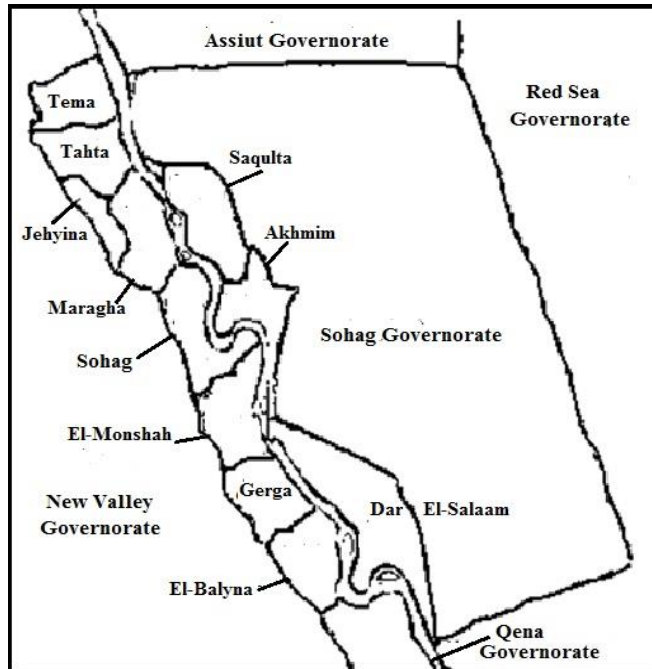


Figure (1): A map Showing the study area (Akhmim and Gehyena districts) at Sohag governorate, Egypt.

2.2 Assessment of harmful birds damage on wheat and sorghum crops

This study was carried out under the field conditions in Akhmim and Gehyena districts at Sohag governorate, Egypt. The work it has been conducted at three different habitats representing different environmental and ecological areas. These habitats were nearby each of (buildings, field crops and trees). The field trails started from March 2019 to October 2020 seasons for Assessment of birds' damage on wheat and sorghum crops. For wheat and sorghum crops the damage assessment was conducted in areas Akhmim and Gehyena districts at Sohag governorate during 2019/2020

season, with three locations, nearby (buildings, field crops and trees) and the effect of the distance study from beginning the field experiment. The different distances from the border were (10, 20, 30 and 40 m) for wheat and sorghum crops. 12 feddans cultivated with wheat and sorghum crops were randomly chosen in the mentioned location above. Sampling was done according to the methods adopted by Poche *et al.* (1982). A wooden square meter frame was used for twenty-five times in random at different portions of selected fields. The samples were taken weekly starting from the appearance of ears till the harvest. The percentage damage of ears was scored in different categories according to De-

Haven (1974):

$$\text{Percentage of birds damage} = \frac{\text{Number of damaged ears}}{\text{Total investigated ears}} \times 100$$

2.3 Statistical analysis

Data obtained were statistically analyzed using a randomized complete block design. Means were compared according to Duncan's Multiple Range test, at 0.05 level of probability.

3. Results and Discussion

3.1 Assessment of harmful birds damage on wheat and sorghum

The work herein was carried out to estimate the damage caused by harmful birds in wheat and sorghum. The damage caused by birds on wheat and sorghum fields nearby (buildings, field crops and trees) and the different distances from the border (10, 20, 30 and 40 m) in planted areas in Akhmim and Gehyena districts at Sohag governorate, Egypt during 2019/2020 season.

3.1.1 In Akhmim district

Data in Table (1) show the damage caused by house sparrow *Passer domesticus niloticus* individuals on wheat and sorghum fields nearby (buildings, field crops and trees) and the different distances from the field border at Akhmim district during 2019/2020 season. It has been observed that the highest damage was recorded in fields nearby trees (12.05

and 9.90%) of wheat and sorghum crops, followed by fields nearby buildings (7.90 and 7.75%). While the lowest damage was in fields nearby field crops (5.15 and 5.55 %). On the other hand, the results revealed that the highest percentage of damage caused by sparrow birds was in 10 meters (14.67 and 15.07 %), for wheat and sorghum, respectively. And the birds damage of wheat and sorghum crops was decreased gradually towards the middle of the field, till to 40 meters from the side of the distance were (12.47, 4.47 and 1.87 %) and (9.33, 5.27 and 1.27 %), for 20, 30 and 40 meters), respectively. Omar and El-Danasory (2014) mentioned that the highest damage of wheat occurred at the nearby cultivations of buildings and animal husbandry (25.87 and 19.20%). On the other hand, the lowest damage was observed in the nearby cultivations of orchards (9.33%).

3.1.2 In Gehyena district

Data in Table (2) show the damage caused by house sparrow birds on wheat and sorghum fields nearby (buildings, field crops and trees) and the different distances from the field border. The highest damage caused by sparrow birds was recorded in fields nearby trees (13.95 and 10.85 %) for wheat and sorghum crops, respectively. Followed by fields nearby buildings (8.15 and 8.60%). But the lowest birds damage was in the wheat and sorghum field nearby field crops (5.10 and 4.80%). On the other hand, observed that the highest damage was recorded in

the first 10 meters then decreased gradually towards the middle of the field.

Table (1): Average percentage of birds damage on wheat and sorghum crops at Akhmim district during 2019/2020.

Distance	House sparrow damage on wheat				House sparrow damage on sorghum			
	Location			Mean	Location			Mean
	Buildings	Field crops	Trees		Buildings	Field crops	Trees	
10 m	15.40	11.20	17.40	14.67a	15.80	13.40	16.00	15.07a
20 m	12.40	9.40	15.60	12.47a	8.00	6.80	13.20	9.33b
30 m	2.80	0.00	10.60	4.47b	5.40	2.00	8.40	5.27bc
40 m	1.00	0.00	4.60	1.87b	1.80	0.00	2.00	1.27c
Mean	7.90b	5.15bc	12.05a	8.37	7.75ab	5.55b	9.90a	7.73

Means with each examined weeks for treatments followed by the same letter are not significant differences at the 0.05 level probability.

The statistical analysis of data shows that, there are significant differences between the distances, for wheat and sorghum crops. The average percentage of the house sparrow damage in distances were 15.27, 12.93, 4.67 and 3.40% and 15.87,

10.13, 5.07 and 1.27%, respectively. Mosallm (2017) reported that the highest total percentage of damage caused by House sparrow and Palm dove individuals on sorghum fields nearby trees, following by buildings.

Table (2): Average percentage of birds damage on wheat and sorghum crops at Gehyena district during 2019/2020.

Distance	House sparrow damage on wheat				House sparrow damage on sorghum			
	Location			Mean	Location			Mean
	Buildings	Field crops	Trees		Buildings	Field crops	Trees	
10 m	15.60	11.00	19.20	15.27a	15.40	12.60	19.60	15.87a
20 m	13.40	9.40	16.00	12.93ab	11.60	4.80	14.00	10.13ab
30 m	2.20	0.00	11.80	4.67bc	5.60	1.80	7.80	5.07bc
40 m	1.40	0.00	8.80	3.40c	1.80	0.00	2.00	1.27c
Mean	8.15b	5.10bc	13.95a	9.07	8.60ab	4.80b	10.85a	8.08

Means with each examined weeks for treatments followed by the same letter are not significant differences at the 0.05 level probability.

While, the lowest total percentage of damage was recorded on sorghum field nearby field crops at Beni- Auday and New Assiut cities at Assiut Governorate. Reviewing the above-mentioned results, it could be concluded that bird damage varied according to type of crop, distances from the field borders, areas and environmental conditions of the studied location. In this study, house sparrow, *Passer domesticus niloticus* caused the

most serious damage at ripening stage of considered crops. The highest damage occurred in most cases, during the ripening stages of sorghum than wheat crop. This variation may be due mainly to the variation in morphology and phonology characteristics of plant and seeds. Also, It has been observed that the highest damage was recorded in the first 10 meters from the field borders. This may be related to the presence of the bird nests on the trees at the

field edges and near the nesting habitats of buildings. Data also, indicated that bird damage percent differed according to the type habitat, whereas crops nearby trees were severely damage followed by those nearby buildings and field crops. The highest damage in the wheat and sorghum fields was nearby trees and buildings may be due to the individuals of birds stay more beside and inside nests on trees and buildings to feed and her youngs. While the lowest bird damage was in fields nearby field crops because crops together and the damage spread over wide areas.

References

- Abbasy, M. R. A., Mostafa, M. A., Khattab, M. M. D., El-Danasory, M. A. M. and Attia, M. A. I. (2012), "Wild birds injurious to some field crops at Ismailia governorate under field conditions", *Journal of Plant Protection and Pathology*, Vol. 3 No. 10, pp. 1067–1077.
- Bruggers, R. L. and Rulle, P. (1981), "Economic impact of pest birds on repining cereal in Senegal", *Protection Ecology*, Vol. 3, pp. 7–16.
- De-Haven R. W. (1974), *Bird damage appraisal methods in some agriculture crops*, Proceedings of the 6th Vertebrate Pest Conference, pp. 246–248.
- El-Danasory, M. A. M., Ahmed, M. M., Omar, M. M. A. and Hassan, A. A. A. (2018), *Damage of wild birds in wheat and sorghum crops at Sohag governorate*, 1st International Scientific Conference "Agriculture and Futuristic Challenges", Faculty of Agriculture, Al-Azhar University, Nasr City, Cairo, Egypt, Vol. 1 No. 1, pp. 398–403.
- Hassan, A. A. G. (2018), *Ecological and biological studies on some wild bird species at Sohag governorate*, M.Sc. Thesis, Faculty of Agriculture, Al-Azhar University, Egypt, pp. 152.
- Metwally, A. M., Ahmed, M. A., Mahmoud, N. A. and Abdel-Aal, M. M. (2009), "Field trials to evaluate damage caused by wild birds to certain field crops under different habitats at Assiut governorate", *Journal of Agricultural Sciences*, Vol. 34 No. 2, pp. 941–950.
- Mosallm, M. A. S. (2017), *Ecological and toxicological studies on some wild bird species at Assiut governorate*, M.Sc. Thesis, Faculty of Agriculture, Al-Azhar University, Egypt, pp. 110.
- Omar, M. M. A. and El-Danasory, M. A. M. (2014), "Estimation of injury caused by House sparrow *Passer domesticus niloticus* (L.) in wheat crop at Assiut governorate", *Journal of Plant Protection and Pathology*, Vol. 5 No. 10, pp. 939–945.
- Omar, M. M. A. (2019), "Studies on some harmful and beneficial bird species in newly reclaimed areas in Sohag governorate", *Al-Azhar Journal of Agricultural Research*, Vol. 44 No. 2,

pp. 187–193.

Poche, R. M., Main, M. U. and Hoqie, M.
E. (1982), "Rodent damage and

burrowing characteristics in
Bangladesh wheat fields", *Journal of
Wildlife Management*, Vol. 46, pp.
139–147.