

POPULATION DENSITY AND SEASONAL DISTRIBUTION OF RODENT SPECIES AT SHEEP FARMING IN EI-KAWTHER REGION, SOHAG GOVERNORATE, EGYPT

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ABSTRACT

The present work aimed to give an idea about the incidence and distribution of rodents species in sheep farms at Sohag University during December, 2012 till November, 2013. Results revealed the presence of three species of rats included the Lesser garbia, *Gerbillus* sp., (1.08%); the Nile grass rat, *Arvicanthis niloticus* (4.44%), and the white bellied rat, *Rattus rattus frugivorus* (94.27%). On the other hand, the highest populations of rodent species were recorded in spring (34.41%) and summer (29.03%) followed by autumn (20.79%) and winter (15.77%), respectively.

Keywords: dominant species, Lesser garbia, the Nile grass rat, the white bellied rat

INTRODUCTION

Rats and mice are possibly the most damaging rodents based on economic losses and health-related issues. They are constantly associated with unsanitary habitats, such as sewers and pit latrines and thrive in overcrowded apartments. It has been reported that nearly 4 million rats are born every day and 10 rats for every human alive (Health and Medical News, 2003). High abundance is expected to lead to more contact between humans and rats resulting more than ever to debilitating rat borne zoonoses with the increased density of human population (Davis *et al.*, 2005).

In Egypt, the changes of the environment by reclamation the desert and increase the cover plant in this area have been a great effect to the distribution of rodent species on abundance in the studied area (El-Sherbiny, 1987; Desoky, 2007 and Abdel-Gawad (2010). Our study aims to identify the rodent species and its seasonal changes to be used in the development of a future plan in effective strategy for implementation of rodent management programs in cultivated and newly reclaimed agro ecosystems in Egypt.

MATERIALS AND METHODS

The present work was carried out in the experimental station of the Faculty of Agriculture, El-Kawther region, Sohag University during December, 2012 till November, 2013. It is located in newly reclaimed area at the Eastern desert area as arid region (15km. East of Sohag Governorate). This area has been planted from along period about (30 years) with isolated patches of vegetables, wheat, Egyptian clover, alfalfa and certain orchards.

Fifteen wire-box traps were distributed twice every 15 days at 6pm and collected at 7am. The captured rodents were classified and recorded. The

percentage of every species was estimated as a percent from total rodents captured during the year dominant percentage (D %).

Dominant percentage = Number of rodent species/ Total rodents captured*100

RESULTS AND DISCUSSION

The results show in the experimental station of the Faculty of Agriculture, El-Kawther region, Sohag University Data in table (1) indicated the presence of three rodent species of rats included the Lesser garbia, *Gerbillus* sp. was recorded (1.08%) from newly reclaimed area; while the Nile grass rat, *Arvicanthis niloticus* recorded (4.44%). This may be attributed to the availability of food in neighbored field crops and vegetables plantations also, but the white bellied rat, *R. r. frugivorus* was the dominant specie recorded (94.27 %). This may be due to the presence of attributed to the availability of food and shelter as will as preferring trees for nesting. This may be due to the inter-specific competition between this species and other species.

Generally, *R.r.frugivorus* was the most dominant species in the sheep Farm during study period, beside the several factors e.g., intra-specific competition, fecundity increasing and in habitat the ecosystems in which poultry buildings established in the Faculty farm the presence of palm trees in the preparation of farm animal production, or poultry farm nearby, this provides shelter and increase in feed stores.

This finding is in agreement with Abo Elmaged (1998), who recorded five species of rodents *Mus musculus*, *A. niloticus*, *Rattus norvegicus*, *Rattus rattus alexandrinus* and *R. r. frugivorus*, in the animal farm of the Faculty of Agric. Assiut University. Also, Desoky(2011) found that rodents trapped from animal-farm, Assiut University during the period from 2007 to 2010 years. were: the white bellied rat, *R. r. frugivorus* (Linnaeus) represented by 52.86%, the grey-bellied rat, *R. r. alexandrinus* (Linnaeus), represented by 28.74% and the Nile grass rat, represented by *A.niloticus* (Desmarest), (18.40%).

Data in table (2) showed the average seasonal abundance of rodent species captured. *A. niloticus* was observed in winter 2.15% from the population studied followed by summer 1.79% and autumn 0.72%. The absence population was recorded during spring. This may be due to that some of *A. niloticus* have to enter the farm sheep in the absence of food and shelter in the fields, either in the case of the provision of food and shelter, especially in periods of pre-harvest and harvest that do not pertain to farm sheep and for this reason are no spring. El-Deeb *et al.*, (1992) in Fayoum, Minia and Sharkia governorates of Egypt, noticed that of *A.niloticus* (Desm.) had two peaks after the harvesting periods of winter (wheat and barley) and Summer (maize and rice) crops.

Table (1): List of rodent species collected from sheep Farm, El-Kawther region, Sohag University, during December 2012 till November 2013.

Family species	No.	%	Common name
Fam. Cricetidae: <i>Gerbillus</i> sp. (Olivier)	3	1.08	Lesser garbia
Fam. Muridae: <i>Arvicanthis niloticus</i> (Desmarest)	13	4.66	Field rat, grass rat, Nile rat and Nile grass rat
<i>Rattus rattus frugivorus</i> (Linnaeus)	363	94.27	white bellied rat, date palm rat
Total	279	100	

Table (2) Seasonal distribution of certain rodent species at sheep farming, El Kawther region, Sohag University, during December, 2012 till November 2013.

Seasons	Rodent species							
	<i>A. niloticus</i>		<i>R.r. frugivorus</i>		<i>Gerbillus</i> sp.		Total	
	No.	%	No.	%	No.	%	No.	%
Winter	6	2.15	38	13.62	0	0	44	15.77
Spring	0	0	95	34.05	1	0.36	96	34.41
Summer	5	1.79	74	26.52	2	0.72	81	29.03
Autumn	2	0.72	56	20.07	0	0	58	20.79

In the same results, *R. r. frugivorus* was observed in spring representing 34.05% from the population studied followed by summer 26.52% and autumn 20.07%. The lowest population was recorded during spring 13.62%. This may be due to the provision of food and shelter, such as palm trees in this region and increase reproductive efficiency in the spring and summer of this type. Also the existence of competition within the members of the same species and members of other species. Abdel-Gawad (1987) recorded, three rodent species *A. niloticus* (Desm.), *R. rattus frugivorus* and *Gerbillus* spp Desm., in Wady El-Assiuty area, Assiut governorate. He noticed that, *A. niloticus* (Desm.) preferred areas planted with the field crops and some parts under cultivation beside old cultivated land while *R. r. frugivorus* was found in citrus orchards and around fanners buildings, whereas *Gerbillus* spp Desm., lived in desert and semi-desert parts where wild plants and weeds were grown.

On the other hand, results showed that *Gerbillus* sp. was observed in summer represented by 0.72% from the population followed by spring 0.36%. The absence population during winter and autumn may be due to the farm located in newly reclaimed area, intervened some desert rats to sheep farm at times, to the farm near the residence of the desert rats, and an escape from high temperature. Abdel-Galil (2005) in Assiut governorate, recorded the roof rat *Rattus rattus*, occurred abundantly followed by the Norway rat *Rattus norvegicus*, the Nile grass rat *A. niloticus* and the demsy rat *Gerbillus pyramidium*, respectively in field crop. In the houses habitat, the highest index

was recorded with the Norway rat *R. norvegicus*, while the Nile grass rat, *A. niloticus* and the demsy rat, *G. pyramidium* were completely absent.

Generally, the population dynamics showed that, high population of rodents was observed during spring with 34.41% followed by summer 29.03% and the lowest population was counted during autumn and winter with 20.79% and 15.77%.

CONCLUSION

- 1- The differences in species composition of rodents depending on locality, habitat type and preferred food.
- 2- High population density of rodents occurred in spring and summer were increased activity. However, the lowest density was during winter and autumn season.
- 3- The control of rodents depends upon the locality, neighboring and available food and can be used effectively in an Integrated Pest Management Approach (IPMA) for the regulation of the rodents population density.

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الكثافة العددية والتوزيع الموسمي لأنواع القوارض في مزرعة الاغنام بمنطقة

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الغرض من هذه الدراسة التعرف علي أنواع القوارض المختلفة و توزيعها الموسمي بمدينة الكوثر وهي منطقة حديثة الاستصلاح تقع بالصحراء الشرقية شرقي محافظة سوهاج بحوالي ١٥ كيلو متر ، و تتواجد بها مزرعة الاغنام بجامعة سوهاج وأجريت هذه الدراسة خلال شهر ديسمبر ٢٠١٢ و حتي نوفمبر ٢٠١٣ وأوضحت النتائج تواجد ثلاثة أنواع من القوارض و هي الجريلس *Arvicanthis* بنسبة ١.٠٨% و هومن الانواع الصحراوية، و جرذ الحقل النيلي *Arvicanthis niloticus* بنسبة ٤.٤٤% و جرذ النخيل نو البطن البيضاء *Rattus rattus frugivorus* بنسبة ٩٤.٢٧%.

و بدراسة التوزيع الموسمي لهذه الأنواع وجد بصفه عامة أن أعلى كثافة سجلت في فصل الربيع ٣٤.٤١% و يليه فصل الصيف ٢٩.٠٣% مقارنة بفصل الخريف ٢٠.٧٩% و الشتاء ١٥.٧٧%. ولكن بصفه خاصة اختلفت التذبذبات الموسمية لبعض الانواع لإختلاف الظروف البيئية المحيطة بكل نوع.

هذه النتائج يمكن الأستفاده بها في وضع خطة مستقبلية وإستراتيجية يمكن تطبيقها في عمل برنامج متكامل لمكافحة القوارض في الأراضي الزراعية وحديثة الإستصلاح في مصر.