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Parasitological Survey of Rodent in Cultivated and Reclaimed Land at Assiut, Egypt

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ABSTRACT

The Ectoparasites arthropod of rodent infesting animals and human have gained much attention in Assiut. Rodent species in both old land and new reclaimed land was infested with various species from arthropods such as mites and ticks (Acari) and lice, fleas (Insecta), from this studied found that three specie of mites *Amerosieus* sp., *Hypoaspis koseii*, *Cheyletus zaheri* and one specie of hard tick was *Amblyomma* sp., infested rodent species which captured from the study areas. The study of ectoparasite from insecta show that three species of fleas were *Xenopsylla cheopis*, *Leptopsylla segnis* and *Pulex irritans* and one of lice was *Polyplax spinulosa* infested the captured rodent species. In this studied found that 6 species (1 sucking lice, 2 fleas, 1 tick and 2 mites) of Ectoparasites arthropod infesting rodent species and different location. The Faculty of Agriculture farm ranked the first in high recorded number of Ectoparasites arthropod of rodent species while the Arab El- Awamer form low recorded number of Ectoparasites arthropod of rodent species.

Key words: Ectoparasites arthropod, rodent species, survey

INTRODUCTION

The main economic importance of arthropod Ectoparasites of rodents in the farm is as vectors of pathogens to domestic animals (Singleton *et al.*, 2003; Paramasvaran *et al.*, 2009), plague and others. Ectoparasites recovered from rodents are classified into four main groups, insects (lice and fleas), Acari (mites and ticks).

Domestic rodents are closely associated with man and his and can main play both direct or indirect roles in vectors of pathogens of human (Zahedi *et al.*, 1996) The main role of domestic rodents in the transmission of diseases of public health importance in urban and semi-urban environment. They are reservoir hosts for a number of parasites, plague and other pathogens. Although rodent live in gardens and rubbish dumps, they are rarely far from houses of the rats trapped in the city during the study exist in abundance the Ectoparasites arthropod. The public should be cautious of these potentially dangerous creatures and efforts must be made to eliminate them. The main aim of the study was to elucidate the Ectoparasites fauna of urban house rodents and to compare that fauna to those of rodents caught from the surrounding urban and semi-urban areas in Assiut. The emphasis of the study was on flea infestation of urban rats and their role in transmission of diseases of public health importance.

MATERIALS AND METHODS

The present work was carried out during January 2012 to December 2012 in three different agro ecosystems in Assiut Governorate these areas were described as follows:

Cultivated area: The cultivated area used was the experimental farm of the Faculty of Agriculture, Assiut University. It is a rather mosaic agro ecosystem (old land) that has been planted with vegetables, field crops and orchards.

Reclaimed areas: Three areas with different reclamation periods were selected to carry out this study.

Experimental station of the Faculty of Agriculture, El-Ghorieb, Assiut University: It is located at the Eastern desert (25 km North East of Assiut city) and fringe of the alluvial agriculture land in the Eastern side of the River Nile. It has been planted from along period about (50 years) with isolated patches of vegetables, wheat, Egyptian clover, alfalfa and certain orchards.

Experimental station of the agriculture research center (ARC) in Arab El-Awamer, Assiut governorate: It is represented as a reclaimed area from about 20 years and it is located at the Eastern desert (20 km South East of Assiut city). It has been planted with vegetables, field crops and fruit trees.

Newly reclaimed area: It is located at the Eastern desert (25 km South East of Assiut city). It has been planted for short period less than 10 years with vegetables, field crops, orchards.

Rodents were collected alive from various ecological areas and classified into species. All rodents were trapped alive using specially mode wire traps measuring 29×22×50 cm (Paramasvaran *et al.*, 2009). The distribution frequency of each species (%) was estimated. For the collection of ectoparasites, rodents were individually anaesthetized in ajar containing a cotton pad moistened with chloroform, then brushed in a deep white plate using relatively hard brush. Ectoparasites were collected and preserved in glass tubes containing 70% ethyl alcohol, labeled with necessary informations. The rodent ectoparasites were fleas, lice, mites and tick. From the whole fauna. Mites were selected and separately isolated in small vials using a camel's hair brush and then counted using stereoscopic binocular microscope. Clearing and preparation of mites were done using lactic acid. Two types of slide preparations were done (i.e., Temporary and Permanent preparations). The two types were used for mites examination of identification. Identification of mites were done using different keys constructed by Hughes (1976), Krantz (1978), Evans (1982) and Zaher (1986a, b).

RESULTS AND DISCUSSION

Study of rodent ectoparasites were aimed to explain the role of these parasites for transmitting the various disease to the wild animals such as rodent and other animals. On the other side the disease which transmits from the wild animals to the domestic animals, production animals and poultry especially to the humans.

The parasitic species of mites and ticks (Acari), Lice and Fleas (insect: Anopura and Siphonaptera) were found on species of rodents encountered during the course of the present work. The ectoparasites were collected from the three rodent species (i.e., *R.r.frugivorus*, *R.r.alexandrinus* and *A. niloticus*) in the cultivated and semi-arid areas during the course of the present study.

Data in Table 1 revealed that rodent species in both old land and new reclaimed land was infested with various species from arthropods such as mites and ticks (Acari) and lice, fleas (Insecta), from this table found that three specie of mites *Hypoaspis koseii*, *Cheyletus zaheri* and one specie of hard tick was *Amblyomma* sp., infested rodent species which captured from the study areas. The study of Ectoparasites from insecta show that three species of fleas were *Xenopsylla cheopis*, *Leptopsylla segnis* and one of lice was *polyplax spinulosa* infested the captured rodent species. Ali *et al.* (1974), Abdel-Gawad (1979), Ali (1985), Salman *et al.* (1986), Bakr *et al.* (1995, 1996) and Embarak (1997).

Data in Table 2 studied that survey of ectoparasites infesting rodents in the different location, results show that in faculty farm found that lice (*Polyplax spinulosa*), fleas (*Xenopsylla cheopis*) and tick (*Amblyosieus* sp.,) while in El-Ghorieb farm collected that lice (*Polyplax spinulosa*), fleas (*Leptopsylla segnis*, *Xenopsylla cheopis*) and mites (*Cheyletus zaher* and *Hypoaspis* sp.).

In Arab El-Awamer found only lice (*Polyplax spinulosa*) while in semi-newly reclaimed area collected that lice (*Polyplax spinulosa*), fleas (*Leptopsylla segnis*) and mites (*Cheyletus zaheri*).

Data in Table 3 studied that survey of ectoparasites infestation of three rodent in faculty, El-Ghorieb farm, Arab El-Awamer and semi newly reclaimed area. The results show that *A. niloticus* found that *Cheyletus* sp., in faculty farm and semi reclaimed area while not found in two other areas. Also found that *Polyplax spinulosa* only from Arab El-Awamer, *Hypoaspis* sp., collected that of *R.r. frugivorus* in faculty farm.

Data in Table 2, 3, from Jan.-Dec. 2012, 6 species of ectoparasites arthropods (1 sucking lice, 2 Fleas, 1 Tick, 2 mites) were recorded from rodents belonging to 3 species (*A. niloticus*, *R.r.frugivorus*, *R.r.alexandrinus*) at Assiut area. Durden *et al.* (2000) reported 19 species of ectoparasites arthropods were recovered from species rodents.

Table 1: Ectoparasites species infested three rodent species in faculty and El-Ghohieb farm during 2012

Acari		Insects	
Mites	Ticks	Lice	Fleas
Laelapidae	Ixodidae	Anoplura	Siphonoptera
<i>Hypoaspis koseii</i>	<i>Amblyomma</i> sp.	<i>Polyplax spinulosa</i>	<i>Xenopsyllae cheopis</i>
Cheyletidae			<i>Leptopsylla segnis</i>
<i>Cheyletus zaheri</i>			

Table 2: Survey of ectoparasites of rodents in different areas during 2012

Fac. agric. farm	El-Ghorieb farm	Arab El-Awamer	Semi-newly reclaimed
Lice	Lice	Lice	Lice
<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>
Fleas	Fleas		Fleas
<i>Xenopsyllae cheopis</i>	<i>Xenopsyllae cheopis</i>		<i>Leptopsylla segnis</i>
	<i>Leptopsylla segnis</i>		
	<i>Pullex irritans</i>		
Tick	Mites		Mites
<i>Amerosieus</i> sp.	Ameroseiidae		Cheyletidae
	<i>Amerosieus</i> sp.		<i>Cheyletus zaheri</i>
	Laelapidae		
	<i>Hypoaspis koseii</i>		
	Cheyletidae		
	<i>Cheyletus zaheri</i>		

Table 3: Survey of ectoparasites to rodent species in study areas during 2012

Species	Fac. agric. farm	El-Ghorieb farm	Arab El-Awamer	Semi-newly reclaimed
<i>A. niloticus</i>	Lice	Lice	Lice	Lice
	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>
	Fleas	Fleas		Fleas
	<i>Xenopsyllae cheopis</i>	<i>Xenopsyllae cheopis</i>		<i>Leptopsylla segnis</i>
	Mites			Mites
	Cheyletidae <i>Cheyletus zaheri</i>			<i>Cheyletus zaheri</i>
<i>R. r. frugivorus</i>	Lice	Lice	-	-
	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>		
	Fleas	Fleas		
	<i>Xenopsyllae cheopis</i>	<i>Xenopsyllae cheopis</i>		
	<i>Leptopsylla segnis</i>	<i>Leptopsylla segnis</i>		
	Mites	Mites		
<i>R. r. alexandrinus</i>	Cheyletidae <i>Cheyletus zaheri</i>	Laelapidae <i>Hypoaspis</i> sp.		
	Lice	Fleas	Lice	Lice
	<i>Polyplax spinulosa</i>	<i>Xenopsyllae cheopis</i>	<i>Polyplax spinulosa</i>	<i>Polyplax spinulosa</i>
	Fleas	Mites		Fleas
	<i>Xenopsyllae cheopis</i>	Cheyletidae		<i>Leptopsylla segnis</i>
	<i>Leptopsylla segnis</i>	<i>Cheyletus</i> sp.		
	Mites			
	Cheyletidae <i>Cheyletus zaheri</i>			
	Tick			
	Ixodidae			
	<i>Amblyomma</i> sp.			

While not found in El-Ghorieb farm. This species was not recorded in Arab El-Awamer and semi-reclaimed area. While in *R.r.alexandrinus* collected that *Polyplax spinulosa* and *Amblyseius* sp., from El-Ghorieb farm but not found in faculty farm. Also found that *Polyplax spinulosain* only from Arab El-Awamer.

The relation study of inter specific between the rodent species and their ectoparasites show that not specific relation between the rodent species and ectoparasites species. The relation study between the population density of rodent species and the density of ectoparasites species show that the fluctuation of the density of rodent ectoparasite took the same trend of the fluctuation of the rodent species in the study areas, This data was agreement with Abdel-Gawad (1979), El-Deeb *et al.* (1999), El-Kady *et al.* (1995, 1998), Bochkov *et al.* (2000) and Durden *et al.* (2000).

Some ectoparasites arthropods found in this investigation have already been reported and high prevalence was recorded from species rodents, this data was agreement with He *et al.* (1997), Wei *et al.* (2010) and Madinah *et al.*(2011).

CONCLUSION

Parasitological survey of rodent species in cultivated and new reclaimed land was infested with various species from arthropod such as one specie sucking lice, three species fleas, one specie tick and three species mites of different location. The arthropod Ectoparasites were collected from domestic rodent species (*R.r.frugivorus*, *R.r.alexandrinus* and *A. niloticus*) in urban and semi-urban environment in Assiut areas.

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