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Survay of Ectoparasits and Endoparasites of Rodents, in Sohag Governorate, Egypt

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Abstract

The current study was designed to identify harmful external and internal parasites infesting, *rattus rattu frugivorus and Rattus rattus alexandrines*. The two species of rodents that, are, *Rattus rattus frugivorus* and *Rattus rattus alexandrines* were infested with various species of ecto parasits and endo parasites. These ectoparasites included fleas, mites, and lice. *Polyplax spinulosa* was the species of lice, *Pluexirritans* was the species of fleas, and *Ornithonyssus bacoti* was the species of mites. That species of rodents were infested with two species of endo parasites which were one species of nematoda (*Streptopharagus sp.*) and one species of cestoda (*Hymeno lepis diminuta*) which captured from studied area.

Keywards: mites, lice, fleas, *Rattus rattus frugivorus* and *Rattus rattus alexandrines*

INTRODUCTION

Since rodents frequently serve as reservoirs and intermediary hosts for certain helminthic and protozoan diseases, research on the parasitic ecology of rodents has been extensive (Smyth 1981). Diseases carried by rodents pose a serious threat in Sohag. The Rattus rattus frogivorius and Rattus rattus alexandrines are common rodent species in Sohage governorate. Rodents' function as helminth and ectoparasite reservoirs has been the focus of earlier studies on rodent-borne parasites in Sohage County. The protozoan parasites of the white and grey beiled rats have received very little attention, with the exception of a few outdated studies. Hexacanth embryos were discovered in fecal smears, adult cestodes in the small intestine, and nematode eggs and adults in the intestine, but Abdel Ghaffar (1985) did not find any intracellular or intercellular parasites or coccidian parasites in thin blood films or impression smears taken from the liver, spleen, body muscle, tongue, and brain. Sharief (1995) investigated Leishmania donovani's reservoir hosts in Gadaref State. Donkeys, cows, lambs, goats, dogs, camels, and wild rats were among the domestic animals he screened for potential reservoir hosts. The most current study on helminth parasites was published in 2006. Fagir (2006) described two genera (Raillietina sp. I, Raillietina sp. ID. one unidentified Hymenolepididae, one nematode species (Monanema nilotica), one genus (Streptopharagus sp.), and a pair of the cestodes (Hymenolepis nana and Hymenolepis diminuta). Tawil (1988) identified four genera of B. Pterygodermatites (family: Rictulariidae), C. Streptopharagus (family: Spirocercidae) from Rattus rattus, and A. Aspiculuris (family: Heteroxynematidae) from Mus musculus are nematodes found in other rodent species. Here, we identify the main ectoparasites of the white and grey bengaled rats as well as the presence of important endoparasites of internal organs. The effects of such parasites on this species' organs and their broader importance of zoonotic species for public health in Sohag will be examined in relation to this narrative.

MATERIALS AND METHODS

1. MATERIALS

We used chemical substans such as ethyl alcohol 70%, chloroform, Leitz Dialux 20 microscope to see slides and 15 wire-box traps.

2. METHOD

The current study was conducted in Jazirat Shandawil farm and Haradia village during Januray, 2021 till January ,2023. They are located about 10km East of the Governorate of Sohag. These regions have been farmed for around 20 years, with sporadic vegetable patches, wheat, alfalfa, Egyptian clover, and some orchards. It consists of about 5 Fadden, includes the fields, houses of shelters for animals and food for animals storages. Twice every 15 days, at 6 p.m. and 7 a.m., 15 baited wire-box traps, dispersed, and collected. The traps were left for three to four days after being set in the early morning or before dark. The animals that were caught were taken out of the traps and gathered. Each animal's mass and sex were noted at the time of collecting. The animals were killed using ether or chloroform. to conduct an endoparasite survey. The intestinal and stomach endoparasites were isolated. Under a dissecting microscope, these endoparasites were inspected in regular saline. To check for nematode and cestode worms, the intestines were opened longitudinally. After allowing the helminth parasites to spread out for a while, their density was determined by counting them, and location was noted. The specimens were first inspected under a microscope while still alive for morphological studies, and then, in order to determine their diagnostic qualities, the fixed stained specimens were identified under a microscope. Nematode fication was influenced by Soulsby (1978). Each rodent was given anesthesia within a jar with a pad of cotton wet with chloroform before being brushed with a rather harsh brush on a deep white plate in order to capture ectoparasites. Following collection, the ectoparasites were tagged with the relevant information and kept in polypropylene tubes filled with 70% of ethyl alcohol. From the entire fauna, the ectoparasites were categorized as ticks, mites, fleas, and lice. To capture

ectoparasites, each rodent was sedated in a jar using a cotton pad moistened with chloroform, and then brushed on a deep white plate using a relatively rough brush. Following collection, the ectoparasites were tagged with the relevant information and stored in polypropylene tubes filled with 70% of ethyl alcohol. Out of the entire fauna, the parasites were categorized as ticks, mites, fleas, and lice. It was meticulously measured how many ectoparasites (fleas, lice, and mites) there were overall. The fixed specimens were then identified under a microscope in order to ascertain their diagnostic properties. Using a Leitz Dialux 20 microscope to see slides (Leitz Wetzlar, Germany), photos were taken with a Wild MPS 11 camera. The microscope had magnifications of $4\times$ and $10\times$ for ectoparasites and $10\times$, $25\times$, and $50\times$ for parasites (helminths). The c2-test was used to assess the significance of the variation in infection prevalence rates. Smith (1973), for the taxonomy of fleas and lice, Noble and Noble (1971) provided the basis. The classification of ticks and mites was based on Younis et al. (1995), Chandler and Read (1961), Burgess (1981).

1. Choice infestation test:

Several types of ectoparasites, including lice, mites, and fleas, plagued the white-bellied, greybellied, and Rattus r. frugivorus and Rattus r. alexandrines rats. These rodents were infested with various species of endoparasites such as nematode and cestodes. which were captured from the studied areas. Generally, the results of our studied areas able to provide data on the external parasites so that we can prevention and control of animal diseases in the region. (Shayan & Rafinejad, 2006; Telmadarraiy et al., 2007; AboElmaged & Desoky, 2013) These findings were accepted. The goal of the study of rodent ectoparasites was to clarify how these parasites spread different diseases to rodents and other wild animals. The deasese, on the other hand, spreads from wild animals to domestic animals, poultry, and production animals, including humans. The parasite species of lice, mites, fleas (insects Anoplura and Siphonoptera), and ticks (Acari) were found on rodent species during the current investigation. Ectoparasites were isolated from two rat species (R. r. frugivorus and R. r. alexandrines) in semi-arid and cultivated environments for the current study.

RESULTS AND DISCUSSION

Acari		Insects	
Mites	Ticks	Lice	Fleas
Dermanyssida		Anoplura	Siphonoptera
Ornithonyssus bacoti		Polyplax spinulosa	Pullexirritans

Table (1): of Ectoparasites species infested on R. r. frugivorus and R. r. alexandrines

Rodent species that were taken from the research sites.One species of lice, *Polyplax spinulosa* fig.(1), and one species of flea, *Pulexirritans* fig.(3), affected the rodent species that were collected, according to an analysis of ectoparasites from insects, Baker et al. (1995 and 1996), Soliman et al. (1986), and Embark (1997). The table data revealed that rat species were infested by a variety of arthropoda species, including mites, lice, and fleas (Insecta). One species of mite was identified as *Ornithonyssus*

bacoti fig. (2). One species of cestode, *Hyminolipes* diminuta fig.(4,5,6), was discovered, and the first third of the small intestine was its preferred location. The availability of food may help to explain this. In cases of severe infection, cestodes were found throughout the intestine, suggesting that competition compelled some of them to settle in less desirable areas. The high infection incidence (65%) in rats collected from Khartoum, which is most likely home to more intermediate hosts per

unit area, may be explained by the theory that insects produce cysticercoids, even though the most of these worms have an unknown life cycle. According to Abu Madi et al. (2001), insects may consume the same foods as rats or come into contact with their waste.



Figure(1):Lice species (*Polyplax spinulosa*) infested of *R. r. f. and R. r. a.*.



Figure(2):Mites species (*Ornithonyssus bacoti*) infested of *R. r. f.* and *R. r. a*.



Figure (3): Fleas species (*Pullexirritans*) infested of *R. r. f.* and *R. r. a*.



Figure (4): Mature segment of (*Hyminolipes diminuta*) infestsd of *R. r. f.* and *R. r. a.*



Figure (5): Gravid segment of (*Hyminolipes diminuta*) infestsd of *R. r. f.* and *R. r. a.*



Figure (6): Eggs of (*Hyminolipes diminuta*) infestsd of *R. r. f.* and *R. r. a.*

This survey revealed a minimal total nematode infection rate. The stomach of *R. r. f.* and *R. r. a.* were used to isolate *Streptopharagus sp.* fig.(7,8,9), *Acomys cahirinus, Gerbillus sp, Meriones libycus*, and *Rattus sp* in Egypt (Myers 1954) as well as *R. norvegicus, R. rattus, Gerbillus gerbillus* and *A. niloticus*, (Mohamed et al. 1993) have also yielded species in this genus.



Figure (7): Nematde species (*Streptopharagus* sp) infested of *R. r. f.* and *R. r. a.*



Figure (8): Anterior region of *Streptopharagus* sp infested of *R. r. f.* and *R. r. a.*



Figure (9): Posterior region of *Streptopharagus* sp infested of *R. r. f.* and *R. r. a.*

CONCLUSION

The two species of rodents that are, *Rattus rattus frugivorus* and *Rattus rattus alexandrines* were infested with various species of ecto parasits and endo parasites. These ectoparasites included fleas, mites, and lice. *Polyplax spinulosa* was the species of lice, *Pluexirritans* was the species of fleas, and *Ornithonyssus bacoti* was the species of mites. That species of rodents were infested with two species of endo parasites which were one species of nematoda (*Streptopharagus sp.*) and one species of cestoda (*Hymeno lepis diminuta*) which captured from studied areas.

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