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THE ROLE OF RODENTS AS A RESERVOIR OF ZOONOTIC INTESTINAL PARASITES AT SOHAG GOVERNORATE, EGYPT.

(With the 3 Tables & 6 Fig)

By

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دراسه عن القوارض كعامل وسيط لنقل الأمراض التى تنتقل للانسان من خلال الجهاز الهضمى فى محافظة سوهـــاج

فوزى عبد السلام ، أحمد جلال
مخيمر على

قام الباحثون بجمع مائه وستون فأرا من محطة بحوث جزيرة شندويل بمحافظة سوهاج وذلك من الأنواع المختلفه مثل راتس راتس فروجيفوريس ، راتس راتس الكسندريس ، موس مسكيولس وأرفيكانثس نيلوتيكس بواقع أربعون فأرا لكل نوع.

قام الباحثون بفحص هذه الأنواع للديدان التى تنتقل للإنسان وقد وجد أن سيفاسيا أو بفيلاتا، هيمينوليبس نانا، هيمينوليبس دايمنييوتا ، ترايكو سيفلس ميوريس ، ايميريا ، الكربتوسبوريديم ، رايليتينيا - قد وجدت بنسبه ٦٣ ر ١٥ ٪ ، ٧٥ ر ١٣ ٪ ، ٢٥ ر ١١ ٪ ، ٦٣ ر ١٠ ٪ ، ١٣ ر ٨ ٪ ، ٢٥ ر ٦ ٪ ، ١٣ ر ٣ ٪ على التوالى .

كما قام الباحثون بدراسة الأهميه الصحيه لكل طفيل بالنسبه للإنسان والحيوان.

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SUMMARY

A total of one hundred and sixty rodents of different species including *Rattus rattus frugivorius*, *Rattus rattus alexandrinus*, *Mus musculus* and *Arvicanthus niloticus* were traped from different localities at research station of Gaziert shandaweel in Sohag Governorate and examined for the presence of zoonotic intestinal parasites. *Syphacia obvelata*, *Hymenolepis nana*, *H. diminuta* *trichocephalus muris* ; *Eimeria* sp ; *Cryptosporidium* sp and *Raillietinia* sp. were detected at a rate of 15.63% ; 13.75% ; 11.25% ; 10.63% ; 8.13% ; 6.25% and 3.13% respectively. The public and animal health importance of each parasite was discussed.

INTRODUCTION

Rodents have always been very unwelcome companions of man. However, they live very near to him, steal his food, damage his house and things in it, and attack his domestic animals. Sometimes, they even attack man himself. On the other hand, people do not understand the real danger rodents cause to man and animals.

Since the very early days, rats and mice have been always of special interest to public health workers. Owing to their lkong association with man, they are endemic animals in Egypt since ancient times, and they are still important and as dangerous as they were at that time, whether from agriculture or health point of view.

Economically, they cause enoromous losses in food and agricultural products as well as industrial plants. Excluding the role of rodents in the different economic losses they produce, they are responsible for transmitting bacterial, viral, rickettsial and parasitic diseases. The world wide distribution and public health importance of parasitic diseases infesting rodents have attracted the attention of several investigators as *CHANDLER* and *READ*, 1961; *RIFAAT* et. al, *1969; LEE and LEE, 1966; ARAFA, 1968; SCHAFIAA* et al., *1981; TOSSON* et al ., *1981; EL-MASRY* et. al, *1985; MORSY* et al., *1982 and 1986; FAHMY* et al., *1983; SHOUKRY* et al., *1987; EL-SOKKARY and HEIKHEL, 1986; EL-RIDI* et.al., *1987; MOHAMED* et.al., *1987 and SAMAHA and OTIFY, 1991.*

The aim of the present work is to study the role of rodents as a reservoir of zoonotic intestinal parasites at Sohag Governorate, Egypt.

MATERIAL AND METHODS

A total of 160 rodents were captured alive from various places of research station of Gaziert Shandaweel. The captured rodents were anaesthetized with ether and identified according to the key given by Osborn and Helmy (1980). Each rodent was dissected and its small intestine extracted and split opend in saline in a wide petri-dish and thoroughly examined for a dult worms. Faecal smears were examined for protozoa both by the direct smear method and the zinc sulphate concentration technique, while others were dried in air and fixed with methanol then stained by modified Ziehl-Neelson technique *(HENRIKSON and POHLEINZ, 1981)* for *Cryptosporidium* oocysts.

RESULTS

Are presented in Tables 1-3 and Fig. 1-6

DISCUSSION

The present investigation revealed many zoonotic intestinal parasites in rodents. These were *Eimeria sp; Cryptosporidium sp; Syphacia obvelata; Trichocephalus muris; Hymenolepis diminuta ; H. nana and Raillietina sp.*

Eimeria sp.

In the present study, the infection rate among the examined rodents was 8.13% (Table, 1), a result which differ than that recorded by *EL-RIDI* et.al., *(1987)* who recorded a percentage of 14%. *Eimeria* sp was detected in all species of rodents except *Mus musculus.* The highest incidence of infection was found in *Arvicanthus niloticus* (15%), and the lowest was in *Rattus rattus alexandrinus* (7.5%), Table (1), Fig (2). These results differ from those of *HEGAZI* et.al., *(981)* who recorded infection a mong *Mus musculus.*

Cryptosporidium sp.

The infection rate among the examined rodents reached 6.25% (Table, 1), a percentage which is higher than that reported by *SAMAHA* and *OTIFY (1991)* who estimated an attack rate of 5.7% in Behiera and Alexandria Governorates. *Gryptosporidium* oocysts were obtained in the stained faecal smears in all species of rodents except *Mus musculus.* These data are coincide with that obtained by *SAMAHA and OTIFY (1991)* who also failed to detect it in any of the *Mus musculus* and *Arvicanthus niloticus* examined. The highest incidence was recorded in *Rattus rattus frugivorus* (12.5%) and the loweat was in *Arvicanthus niloticus* (2.5%), Table (1), Fig (1). However, the specificty of the mammalian species of *Cryptosporidium* is unknown *(GRANT* et. al., *1980).* The possibility of cross infestation between rodents and man with *Cryptosporidium* need

further investigations.

Syphacia obvelata

Syphacia obvelata as an oxyurid nematode of cosmopolitan distribution among rats and mice, is considered a zoonotic disease of rare occurrance *(RILEY, 1919)*. Human infection probably results from accidental contamination of human food or drink with the droppings of infected murine hosts which is likely to occur in localities with poor sanitation when highly infested with rodents.

In the present work, the infection rate among the examined rodents was 15.63% (Table 1), a finding which is more or less higher than that recorded by *ARAFA (1968)* in the coastal zone and *FAHMY* et. al., *(1983)* in Assiut Governorate who estimated an incidence percentage of 3.0 % & 4.2 % respectively. These variations might be attributed to rodent species, behaviour and environmental conditions.

The recovery rate of *Syphacia obvelata* in *Mus musculus* (27.5 %), Table (1), fig (2&3)., agree with that obtained by *MOHAMED* et.al., *(1987)* who also recorded a highest incidence of infection among *Mus musculus* (27.3 %).

Trichocephalus Muris

The infection rate of *Trichocephalus muris* among the examined rodents was 10.63 % (Table 1), apercentage which is higher than that recorded by *EL-RIDI* et.al., *(1987)* in Sharkiyia Governorate (7.0 %). The parasite was detected in all species of rodents with the highest incidence of infection in *Arvicanthus niloticus* (15 %), and the lowest in *Rattus rattus frugivorus* (5 %), Table (1), fig (1&4). These results differ with those obtained by *EL-RIDI* et. al., *(1987)* who recovered the highest incidence of the parasite in *Arvicanthus niloticus* (12.5 %), and the lowest incidence in *Mus Musculus* (9.1 %).

Hymenolepis diminuta

The infection rate among the examined rodents was 11.5% (Table,1), a percentage which is greatly lower than that recovered by *EL-RIDI* et.al ., *(1987)* in Sharkiyia Governorate (29 %). However, the parasite was detected in all species of rodents except *Mus musculus*. The highest incidence of infection was noticed in *Arvicanthus niloticus* (20%), and the lowest in *R. rattus alexandrinus* (I0 %), Table (I), Fig (I&2).

Regarding *H. diminuta* infection in humans, in Egypt *CHANDLER* and *READ (1961)*, and *ARAFA (1968)* recorded human infection rate of 2 % and 7.8 % respectively.

Hymenolepis nana.

Hymenolepis nana (13.75 %) was detected in all species of rondents (Table, 1 and Fig 3 & 4), with the highest incidence of infection in *Mus musculus* (27.5 %), and the lowest in *A.*

niloticus (2.5 %). These results were more or less in agreement with that recorded by *WISSA (1967)*; *ARAFA (1968)*; *MONIB (1980)*; *EL-AZZAZY (1981)* and *EL-RIDI* et. al.,*(1987)*.

Raillietina sp

The infection rate of *Raillietina* sp 3.13 % recovered among the examined rodents (Table,1) is more or less coincide with the data given by *EL-RIDI* et.al.,*(1987)* in sharkiyia Governorate (3.0%). The parasite was detected in all species of rodents except *Mus musculus* and it was reported with equal incidence of infection among *Rattus frugivorus* and *R. rattus alexandrinus* (5 %),Table (I),Fig (1&2). These results differ with data given by *EL-RIDI* et .al., *(1987)*, who recorded the highest incidence of infection in *Mus musculus* (27.2 %).

In general, the highest infection rate was recorded in cestodes (28.13%), and the lowest in protozoa (14.38%), Table (2), Fig (5), These results differ with that recorded by *RIFAAT* et.al.,*(1971)*, who recorded the infection rates of 22.2 % and 17.6 % for both cestodes and nematodes respectively.

Regarding the mixed infection, the highest incidence was recorded in *A. niloticus* (65 %0) and the lowest in *R. Rattus frugivorus* (55 %0) Table (3), Fig (5).

From the previous data, it may safely conclude that the presence of rodents constitute a complex economic and public health problems. So,rat proofing measures in human and animal buildings and the maintenance of sanitary measures together with the mechanical, chemical and biological destruction of rodents are essential.

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Tabel (1) : Incidence of Infection with Zoonotic Intestinal parasites in Rodents at Sohag Governorate .

Parasites	Differnt Species of domestic rats												Total		
	R . r . f			*R . r . a*			*Mus musculous*			*Arvicanthus niloticus*					
	E.No	+Ve No.	%	E.No	+Ve. No.	%	E.No	+Ve. No.	%	E.No	+Ve. No.	%	E.No	+Ve .No.	%
Eimeria Sp	40	4	10	40	3	7.5	40	0.0	0.0	40	6	15	160	13	8.13
Cryptosporidium	40	5	12.5	40	4	10	40	0.0	0.0	40	1	2.5	160	10	6.25
Syphacia obvelata	40	5	12.5	40	3	7.5	40	11	27.5	40	6	15	160	25	15.63
Trichocephalus muris	40	2	5	40	5	12.5	40	4	10	40	6	15	160	17	10.63
Hymenolepis diminuta	40	6	15	40	4	10	40	0.0	0.0	40	8	20	160	18	11.25
Hymenolepis nana	40	4	10	40	6	15	40	11	27.5	40	1	2.5	160	22	13.75
Raillietina Sp	40	2	5	40	2	5	40	0.0	0.0	40	1	2.5	160	5	3.13

R.r.f. : *Rattus rattus frugivorus* .
R.r.a. : *Rattus ruttes alexandrinus* .
E . No : Examined number .
+Ve . No : Positive number .
% : Percentage of infection .

Table (2) : Incidence of infection with protozoa Nematodes and Cestodes among Rodents at Sohag Governorate .

Parasites	Exmined number	Positive number	Percentage of Infection
Protozoa	160	23	14.38%
Nematodes	160	42	26.25%
Cestodes	160	45	28.13%

Table (3) : Prevalence of zoonotic intestinal Parasites in Rodents at Sohag G .

Rats	E.No	+Ve.No	T.%	Single infection		Mixed Infection	
				+Ve.No	%	+Ve.No	%
Rattus rattus frugivorus	40	28	70	6	15	22	55
Rattus rattus alexandrinus	40	27	67.5	4	10	23	57.5
Mus musculous	40	26	65	2	5	24	60
Arvicanthus niloticus	40	29	72.5	3	7.5	26	65

E.No: Examined number .
+ Ve.No: Positive number .
% : Precentag of infection .

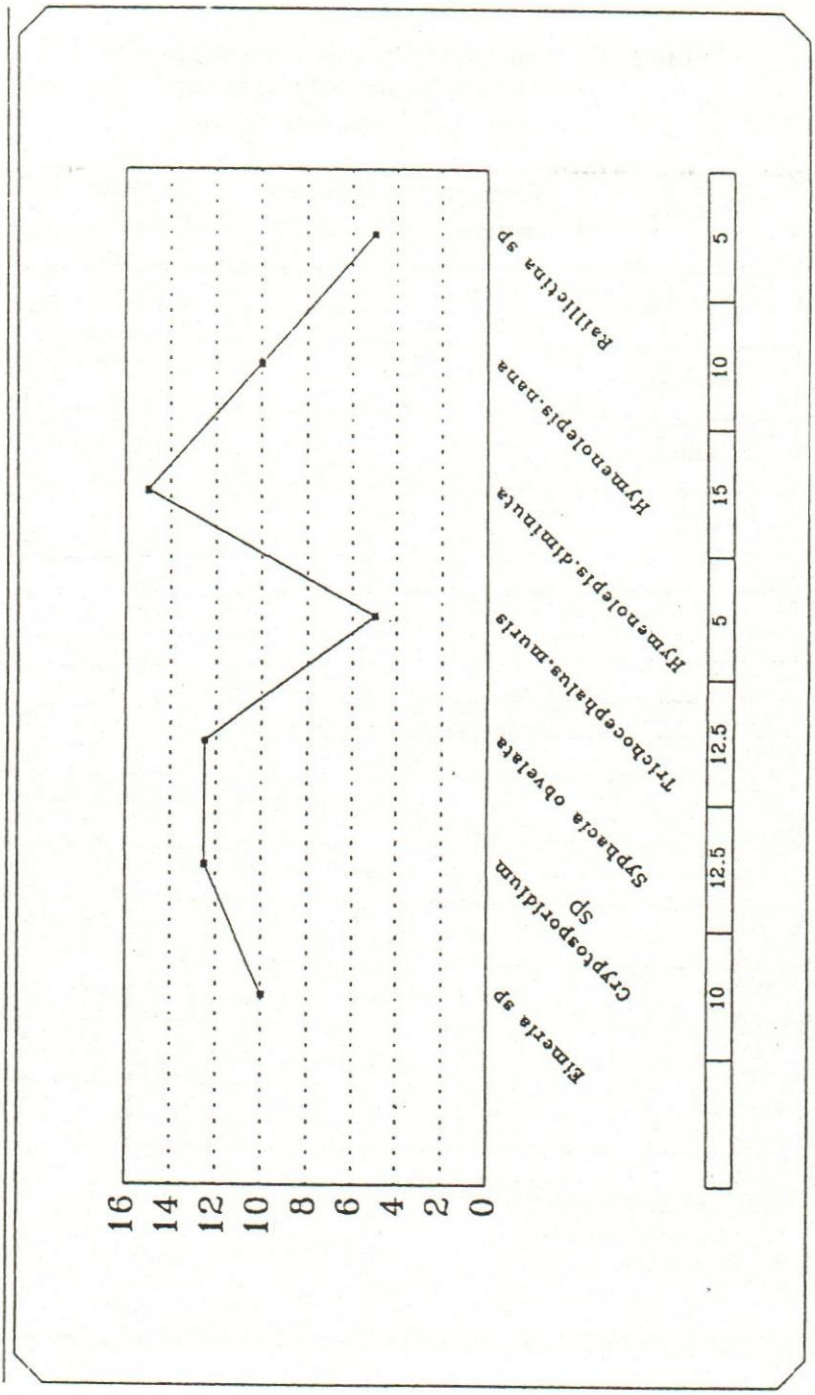
INCIDENCE OF INFECTION WITH ZOONOTIC INTESTINAL PARASITES OF
R.rattus frugivorus AT SOHAG GOVERNORATE.
16
14
12
10
8
6
4
2
0
Balantidium sp
Hymenolepis nana
Hymenolepis diminuta
Trichocephalus muris
Syphacia obvelata
Cryptosporidium
Sp
Eimeria sp
10
12.5
12.5
5
15
10
5

Fig.(1)

INCIDENCE OF INFECTION WITH ZOONATIC INTESTINAL PARASITES OF R.rattus alexandrinus AT SOHAG GOVERNORATE.

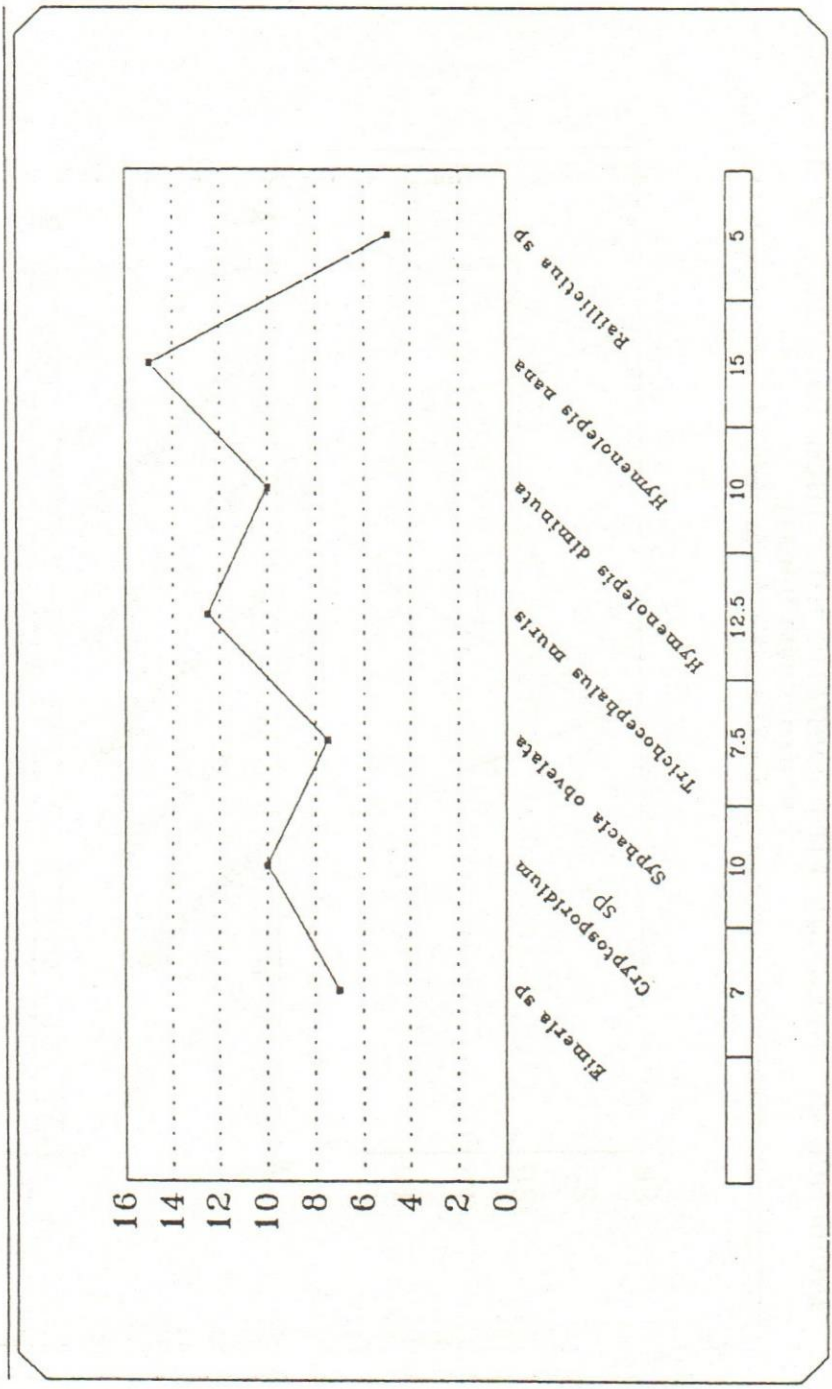

Fig.(2)

INCIDENCE OF INFECTION WITH ZOONATIC INTESTINAL PARASITES IN RODENTS AT SOHAG GOVERNORATE.

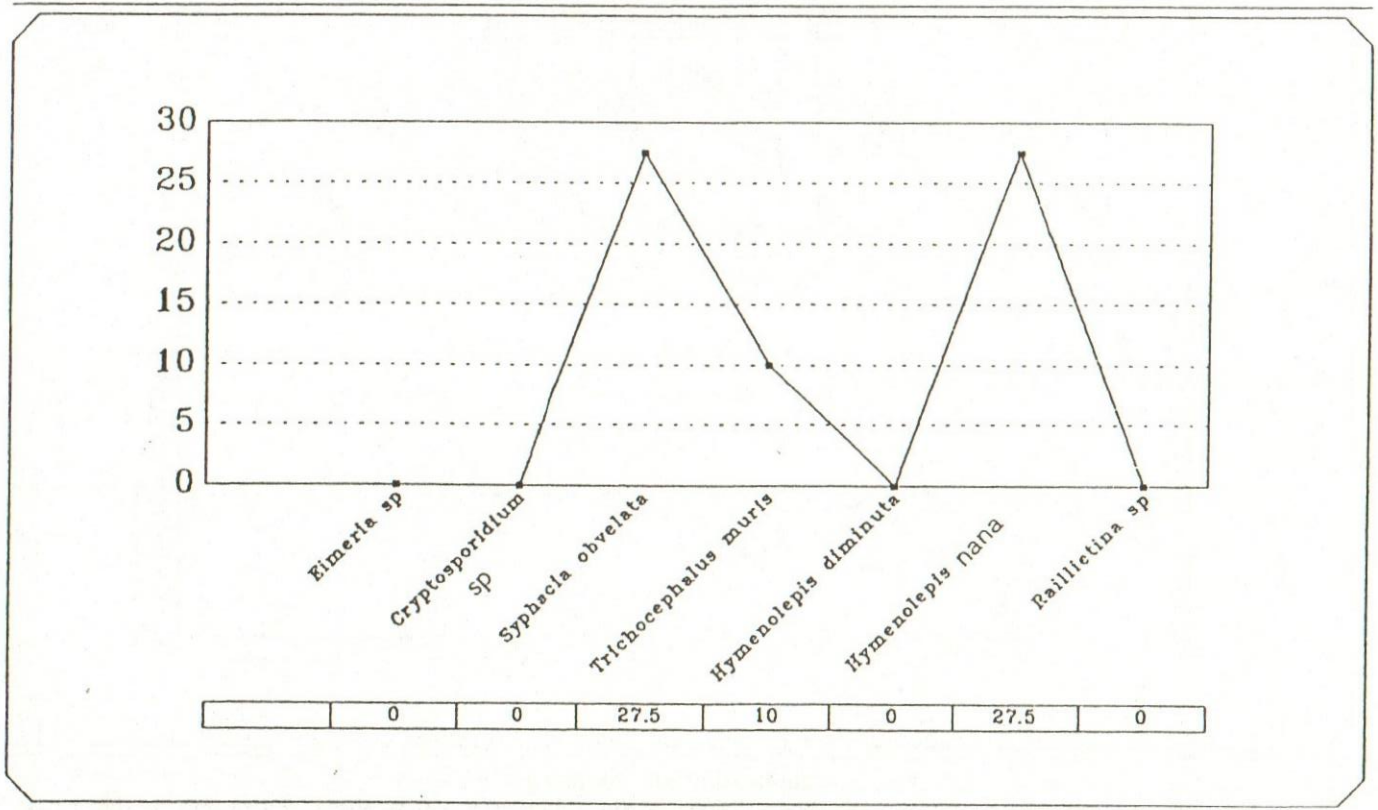

Fig.(3)

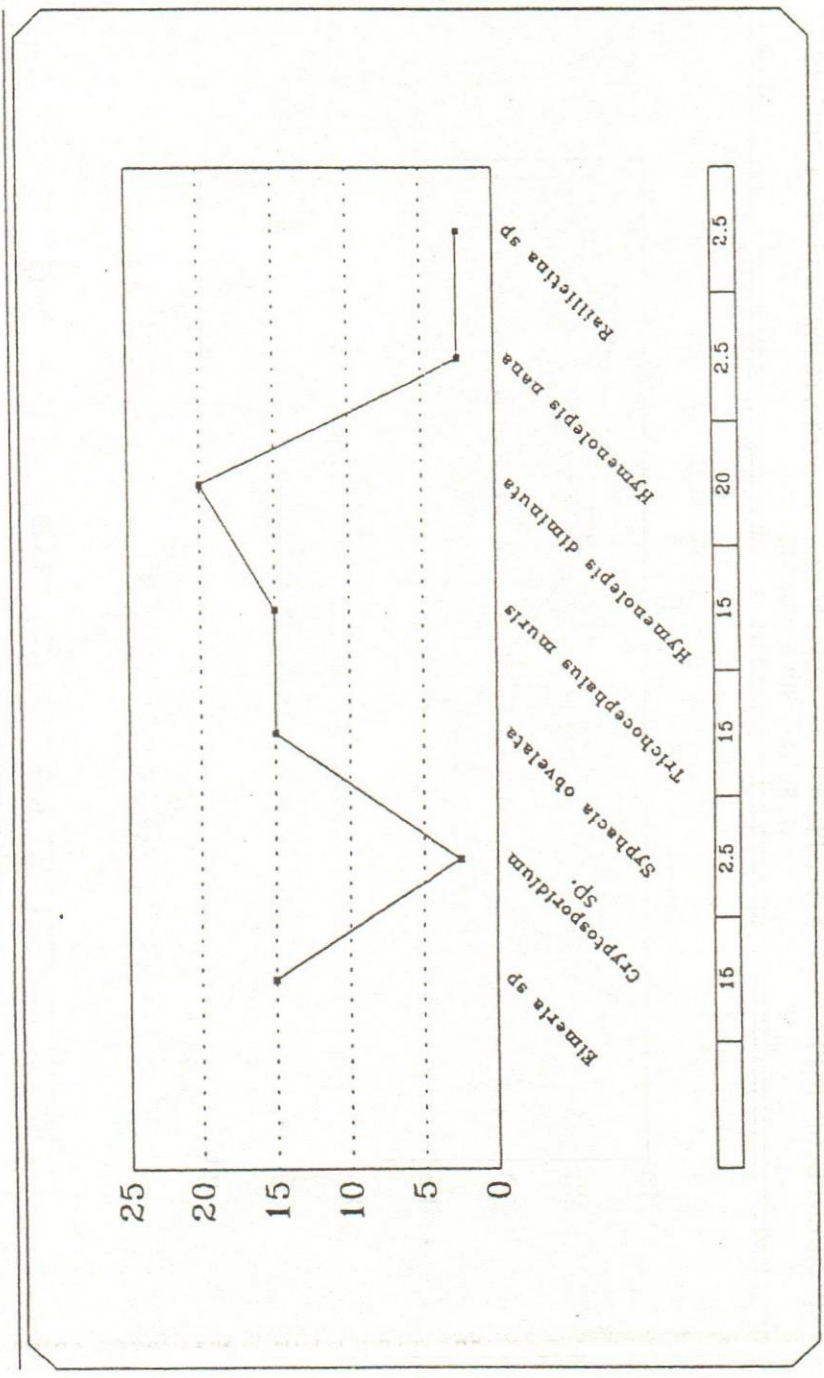
INCIDENCE OF INFECTION WITH ZOONATIC INTESTINAL PARASITES Of A.niloticus
AT SOHAG GOVERNORATE.
25
20
15
10
5
0
Eimeria sp
Cryptosporidium Sp.
Syphacia obvelata
Trichocephalus muris
Hymenolepis diminuta
Hymenolepis nana
Raillietina sp
15
2.5
15
15
20
2.5
2.5

Fig.(4)

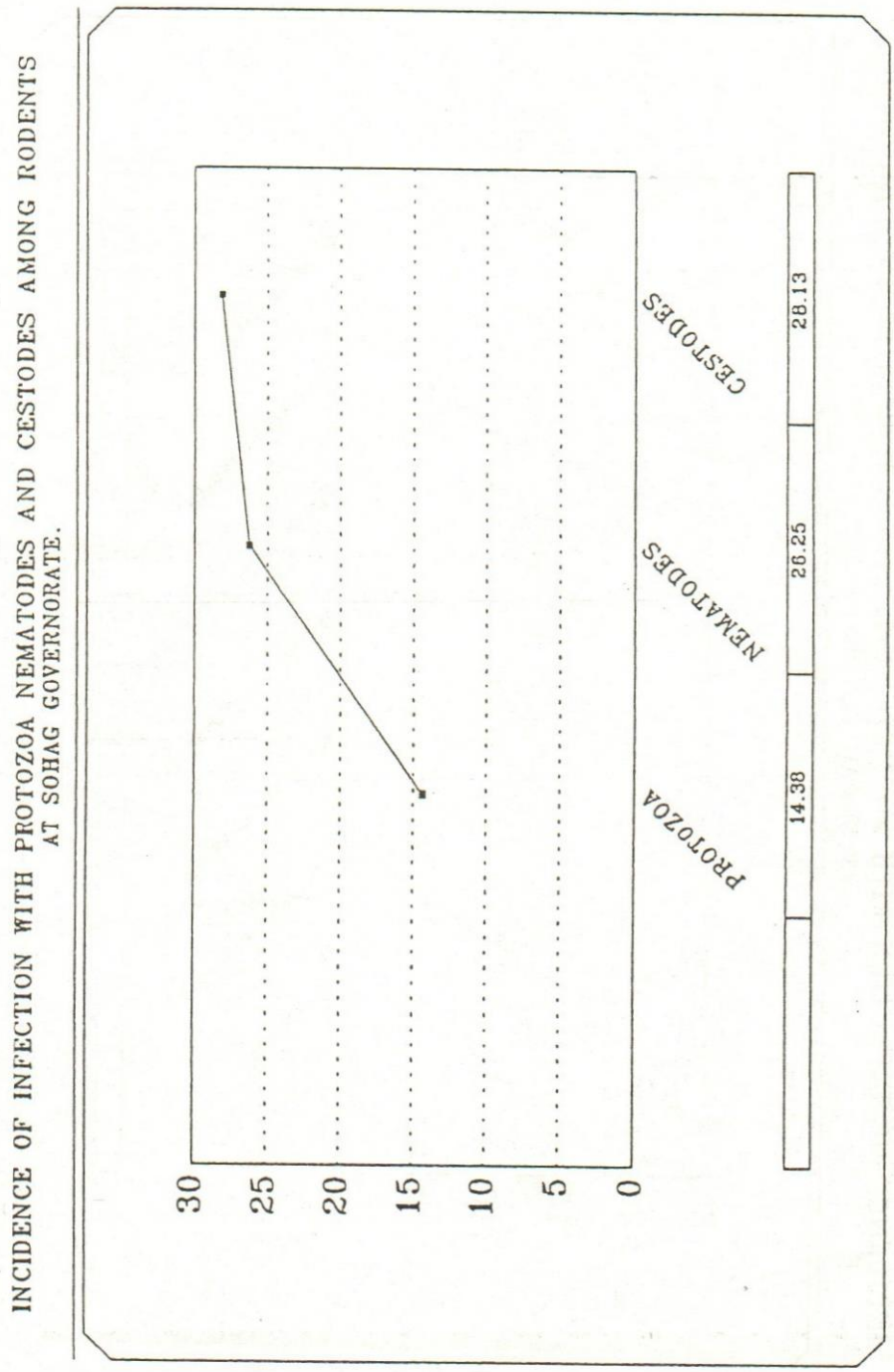
INCIDENCE OF INFECTION WITH PROTOZOA NEMATODES AND CESTODES AMONG RODENTS
AT SOHAG GOVERNORATE.
30
25
20
15
10
5
0
PROTOZOA
NEMATODES
CESTODES
14.38
26.25
28.13

Fig.(5)

PREVALENCE OF ZOONOTIC INTESTINAL PARASITES IN RODENTS AT SOHAG GOVERNORATE.

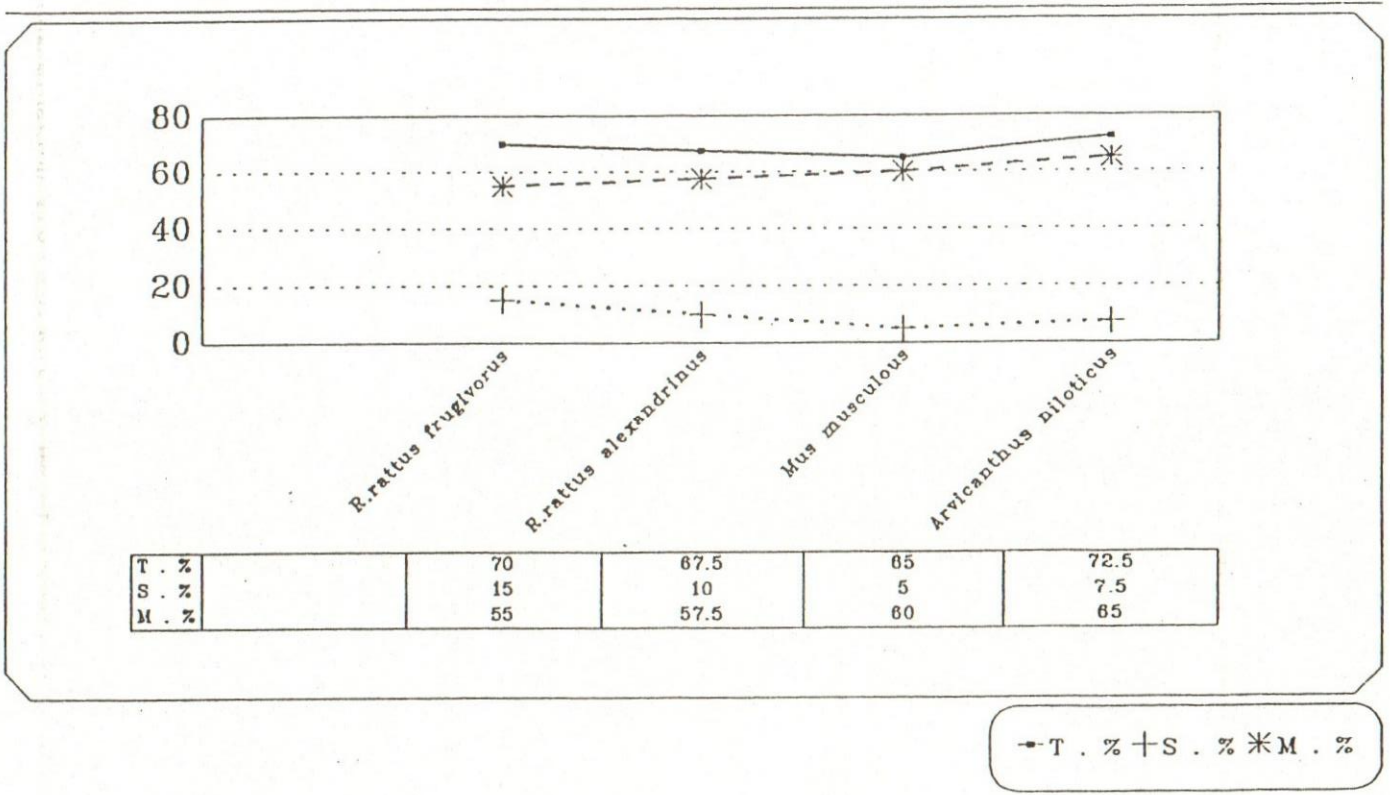

Fig.(6)