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PREVALENCE OF SOME ZOONOTIC PARASITES IN DOG FAECAL DEPOSITS IN ISMAILIA CITY

(With One Table and One Fig)

By

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(Received at 27/7/1995)

أنتشار بعض الطفيليات المشتركة فى براز الكلاب فى مدينة الاسماعيلية

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تم تجميع عدد ٦٨٥ عينة براز كلاب من الطرق والاماكن العامة بمدينة الاسماعيلية وذلك لفحصها ومعرفة مدى اصابة وأنتشار بويضات وحويصلات بعض الديدان والطفيليات الأولية المشتركة ومن الفحص الميكروسكوبى والتشخيص وجد أن ٥٠٠ عينة (٧٣٪) تحتوى على بويضات وحويصلات بعض الديدان والطفيليات الاولية ومن هذه العينات الموجبة وجد أن ٤٩٪ تحتوى على طفيل واحد و ٣٤ر٤٪ تحتوى على نوعين من الطفيليات و ١٤٪ تحتوى على ثلاثة أنواع من الطفيليات و ٢ر٦٪ تحتوى على أربعة أنواع من الطفيليات وكانت نسبة الاصابة ببويضات الديدان الاسطوانية :١ر٣٢٪ توكساسكارس ليونينا ، ٥ر٢٥٪ توكسوكارا كاتس و ١ر٣٪ ديدان خطافية ونسبه الاصابة ببويضات الديدان الشريطية: ٥ر١٧٪ دايبليديم كانينم ، ٢ر١٠٪ تينيا سبيشز ، ١٥ر٪ سبيرومترا بينما كانت نسبه الاصابة ببويضات الديدان المفلطحة هيتروفيس ٥ر٨٪. وان نسبه الاصابة بحويصلات الطفيليات الاولية ٨ر١٢٪ أيزوسيوارا سبيشز ، ٣ر٢٪ ساركوسين ٨ر٣٪ كريبتوسبوريديم ٣ر٨٪ جياردیا. وأتضح من هذه الدراسة أنتشار أهم مسببات الامراض الطفيلية المشتركة فى البيئة مما يوكد أهمية وضع أجراءات لمكافحة الكلاب الضالة وابعادها عن الاماكن العامة.

SUMMARY

Out of 685 dog faecal deposits collected from the road sides and public places from Ismailia city,500 (73%) harboured parasite ova, oocysts and/or cysts. From the 500 infested samples; 49%, 34.4%, 14% and 2.6% showed one type, two types, three types and four types of parasite ova, oocysts or cysts respectively. The helminth infestation rates were; 32.1% of *Toxascaris leonina*, 25.5% of *Toxocara canis*; 17.5% of *Dipylidium caninum*, 10.2% of *Taenia sp.*, 0.15% of *spirometra sp.*; 8.5% Heterophyes heterophyes and 1.3% Hookworm. The percentages of protozoan infestations were; 12.8 of *Isospora spp.*, 2.3 of *sarcocystis sp.*; 3.8 of *Cryptospordium sp.* and 8.3 of *Giardia sp.* This work indicates the prevalence of important causes of parasitic zoonoses in Egypt environment, and emphasizes the importance of the application of dog control measures and excluding dogs from public places.

Keywords: *Prevalence, some, zoonotic parasites, dog, faecal deposits, Ismailia city*

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INTRODUCTION

Among domesticated animals, carnivores particularly dogs had a time honoured situation in the general public health due to their intimate contact with man sharing him in most probabilities, home, food and water. However, little information available on their parasites especially in the faeces and soil links of the epidemiological chain, through which many of the parasites find their way to other hosts including man. Parasites of stray dogs were previously estimated in different locabties including in Giza *(FAHMY and SELIM, 1959)* Assuit *(MONIB, 1980)*, Zagazig city *(El-Azzazy and Ahmed, 1985)* and Ismailia city *(EL-GWADY and FAYEK, 1991)*. *Toxocara canis* as the cause of visceral larval migrans in persons *(BEAVER, 1969) is* widespreaded in the environment because virtually every dog is prenatally infected with such parasite *(SCOTHORN, et al. 1965)*.

Hydatidosis is considered as a major endemic zoonotic disease in various middle eastern countries in both humans and animals *(MATOSSIAN, et al. 1977)*.

Cryptosporidia are coccidian parasites found in a variety of mammals, birds and reptiles *(ANDERSON, 1982)*. It has been recently recognized in the dog *(WILSON et al. 1983)*. Although human cases from an urban environment suggest that rodents, pets or other human beings might be the source of infection, such sources have not been confirmed *(LASSER, et al. 1979)*.

Giardia infection is the third most common infection found in dogs, and the prevalence of infection has been found estimated between 1% to 25% or more when single faecal samples have been obtained *(KENNEDY, 1989)*. Giardiasis has become an important cause of small intestinal disease in man *(SMITH, 1985)* and some domestic animals including dogs *(SIMMONS and PASSON, 1981)*.

Whereas health education and sanitary improvements have reduced the frequency of promiscuous defecation by human beings thus lowering the level of soil contamination with eggs of human adapted helminths, dogs have hardly been affected by such sanctions and continue to deposit feces at will. Hence, opportunities for transmission of canine enteric pathogens to man are common. In view of the importance of the dog parasites both as a human health hazard and a cause of economic loss, the present study was undertaken to elucidate the prevalence of dog parasites in their faecal deposits in Ismailia city.

MATERIAL and METHODS

A sum of 685 dog faecal deposits were collected from road sides and public places in Ismailia city during the period from July, 1994 to March, 1995. The faecal samples were collected in

plastic containers and transported to the laboratory, at the faculty of Vet. Med., Suez Canal University, where they were examined by using the direct smear and concentration techniques for the recovery of parasitic ova, oocysts and cysts. The two most commonly used concentration techniques are sedimentation and flotation.

In sedimentation technique, a formalin-ethyl acetate mixture was added to the faecal suspension to clear out the faecal debris and fix the parasitic forms that may be present *(FALER, 1984)*. Sheather's sugar flotation technique was performed as described by *GARZA (1983)*, and for further identification of protozoa infestation, permanent-stained smears were prepared from the levitation suspension (meniscus) by using schaudinn's solutions fixative and Hidenhin iron Alum Hematoxylin stain *(LEVINE, 1985)*.

Parasitic ova, oocysts and/or cysts were identified with the help of the various morphological descriptions of the species reported in literatures and text books as *SOULSBY (1982) and JAY and MARION (1992)*.

RESULTS

The prevalence of parasites in dog faecal deposits is summarized in table (1). Of the 685 dog faecal droppings, 500 (73%) harbored parasite ova, oocysts and/or cysts. From the 500 infected samples; 245 (49%), 172 (34.4%), 70 (14%) and 13 (2.6%) showed one type, two types, three types and four types of parasite ova, oocysts or cysts respectively.

The most abundant parasite species, as shown in Fig (1); were *Taxascaris leonina* (32.1%), *Toxocara canis* (25.5%), and *Dipylidium caninum* (17.5%) followed by *Isospora spp.* (12.8%) which were identified as Isospora canis (3.4%) oocysts measured 32 x 42 um and *Isospora ohioensis* or other related species (9.5%) had the same size (21x25 um) as *Isospora neorivolta* or *Isospora burrows*, could not be reliably distinguished from one another. The intermediate prevalence of parasite species of the examined dog feacal droppings, were *Taenia spp.* (10.2%); *Heterophyes heterophyes* (8.5%) and *Giardia sp.* (8.3%). In decreasing order, *Spirometra sp.* (0.15%) and Hookworm (1.3%) were the least prevalent followed by *Sarcocystis sp.* (2.3%) and *Cryptosporidium sp.* (3.8%).

DISCUSSION

Egypt has a large population of dogs that move freely within cities, coming into contact with other urban, suburban and rural animals of the their own and different species. Therefore we intended to throw a light on the parasite infestations in dog faecal dropping in the Egypt environment.

In the present study, the overall prevalence of parasites in the dog faecal dropping was higher than that reported, in Jordan (61.6%) by *ABO-SHEHADA and ZIYADEH (1991)*. However they found a higher prevalence of infestations by *Taenia spp.* (44.1%), *Dipylidium caninum* (19.8%), *Sarcocystis sp.* (8%) and

Hookworm (5%) than that reported in the present survey.

The only work surveying parasites in dogs in Ismailia city was conducted on a limited sample of stray dogs by *EL-GWADY and FAYEK (1991)* who found that *Dipylidium caninum* (60%) and *Toxascaris leonina* (30%) were the most abundant followed by *Toxocara canis* (10%). In this survey, *Toxascaris leonina* and *Toxocora canis* were the most prevalent followed by *Dipylidium caninum*. The percentage of *Toxascaris leonina* was nearly similar to that reported by *El-GWADY and FAGEK (1991)*. SIAM, *et al. (1994)* reported that *Toxacaris leonina* was the most common and prevalent nematode encountered during faecal examination from carnivora in Zoo gardens. In the present work, percentage of *Toxocara canis* infestation was nearly similar to that reported by *BORG and WOODRUFF (1973)* in Britan (24%). The efficiency of *Toxocara canis* life cycle in dogs can be attributed to transplacental migration of larvae from infected bitches to fetuses *(SOULSBY, 1969)*. By the time a pup is 4 weeks old, a female worm can shed 200,000 eggs daily into feces. It is not surprising to find that a third of faecal samples from public places are contaminated with canine nematode eggs *(DUBIN, et al. 1975)*.

Low prevalence of Hookworm infestation in this study, could be attributed to the sandy nature of the ground and desication which are lethal for the eggs and larvae of this nematode *(EL-GWADY and FAYEK, 1991)*.

In the present survey the prevalence of Taeniid eggs infestation, which may include those of *Echinococcus granulosus*, could be attributed to the transhumant sheep-raising, because of the close association of dogs and sheep. This system of sheep raising is practiced throughout Egypt. The practices of sheepmen involving dogs are important since dogs are both potential sources of infection and transports of the parasite from one area to another *(CERLLIN, et al.1982) Spirometra sp.* was not common in dog faecal droppings and only one specimen contained this cestode eggs. This was similar to that reported by *JACKSON and ARANDEL (1971)*. On the other hand, the presence of trematode, *Heterophyes heterophyes* could be attributed to the wide area of fresh water and brackish water in and on the border of the investigated area which enhance the growth of fresh water snails and fishes, the intermediate hosts of these worms *(PEDRO and BORIS, 1989)*.

Our results indicate that dogs are a source of numerous parasitic helminths particularly ascarids, Taeniids and Heterophiid worms. They therefore represent a source of potential danger to man *(FARMER, et al. 1978)*.

Concerning the protozoan parasites, in this study; the prevalence of Isospora organisms (12.8%) was higher than that obtained by *EL-SHABRAWY and IMAM (1979)* in Egypt (4.7%). This survey revealed a low prevalence rate of *Sarcocystis sp.* in dog faecal deposits. This result was lower than that reported in Britain (57%) by *FARMER, et al.*

(1978) and in south Australia (11.5%) by *FORD and BEVERIDGE (1980).*

Cryptosporidium infection has been reported but not definitely incriminated as the etiologic agent of disease in dogs *(WILSON, et al. 1983),* and serologic evidence of exposure has been demonstrated in dogs *(TZIPORI and CAMPBELL, 1981).* Although cryptosporidial infection is very common in calves during the first three weeks of life *(ANDERSON and BULGIN, 1981 and ABOU-EISHA, 1994)* and dogs living in close proximity to animal farms frequently relish calf feces. There was low prevalence of *Cryptosporidium sp.* oocysts of dog faecal deposits in the investigated area.

In the present survey, The percentage of *Giardia sp.* infestation was nearly similar to that reported by *HAIBA (1956) and EL-SHABRAWY & IMAN (1979)* In Egypt (8.97%). It was lower than that obtained by *MAGDA AMIN (1992)* in Sharkia Governorate (30%).

From the zoonotic point of view, *Giardia* is not always host specific and once introduced to a human population from an animal source, that could be dogs, it may circulate creating a heterogenous parasite population. The rate of infection may vary according to the age of animals *(SYKERS and FOX, 1989),* the contact with other animal *(SISK, et al. 1984)* or man *(SWAN and THOMPSON, 1986).*

Generally our results revealed that the major parasitic infestations were detected in dog faecal deposits collected from comparatively less hygienic, over crowded areas and road sides in close proximity to the animal farms *(EL-SHABRAWY and IMAM, 1979).* The fluctuations reported in the prevalence of parasite ova, oocysts and /or cysts in dog faecal deposits may be a reflection of their resistance to environmental factors namely, temperature aridity and to a lesser extent ultraviolet irradiation *(ABO-SHEHADA and ZIYADEH, 1991).* Many of the reported dog parasites in this study, have impacts on human and animal health. Therefore, the control of pollution by dogs of soil in public places used by children would be one way to prevent such infection. Moreover, those playing on contaminated or potentially contaminated soil or sand should wash their hands after words, and particularly before consuming food. Clearly increasing attention should be given to the hygienic control of dogs to prevent them contaminating public places with infective excreta; owners should ensure that their animal are free from, infection and are not a public danger.

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Table (1): Prevalence of some parasites in dog faecal deposits collected from different localities in Ismailia city.

- No. of samples examined	685
- Species	No. (%)
- *Helminths.*	
1- *Toxascaris leonina* eggs.	220 (32.1)
2- *Toxocara canis* eggs .	175 (25.5)
3- Hookworm eggs.	9 (1.3)
4- *Taeniid* eggs.	70 (10.2)
5- *Spirometra* sp. eggs.	1 (0.15)
6-*Dipylidium Caninum* egg capsules.	120 (17.5)
7- *Heterophyes heterophes* eggs.	58 (8.5)
- *Protozoa*	
8- *Isospora* spp. oocysts.	88 (12.8)
9- *Sarcocystis* spp. oocysts.	16 (2.3)
10- *Cryptosporidium* sp. oocysts.	26 (3.8)
11- *Giardia* sp. cysts.	57 (8.3)

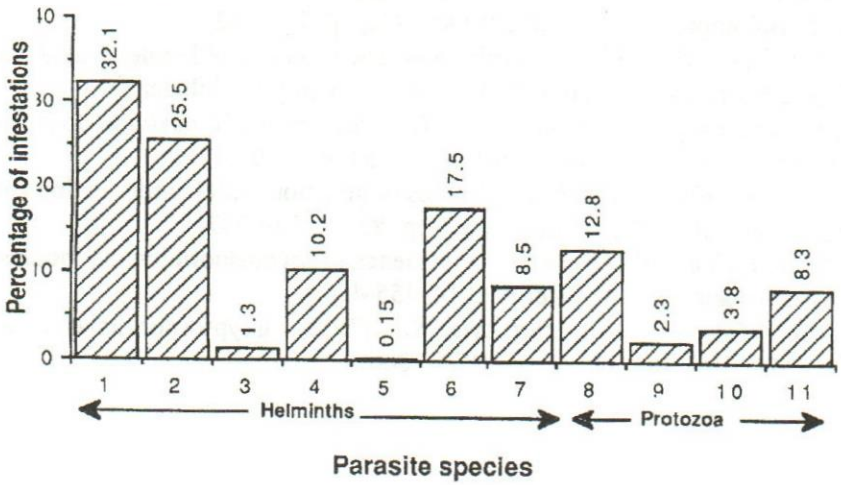

Fig (1): Percentage of parasite infestations in dog faecal deposits in Ismailia City