

## ROLE OF DOMESTIC CATS *FELIS CATUS* AS RESERVOIR HOSTS OF INTERNAL PARASITES AND PROTOZOA IN BAGHDAD

Afkar M. Hadi\* and Azhar A. Faraj\*\*

\* Natural History Research Center and Museum, University of Baghdad/Iraq

\*\*Veterinary Medicine Collage, University of Baghdad, Baghdad, Iraq

### ABSTRACT

Examining of 80 feces samples showed that 31 samples of the house and stray cats harbored either single or mixed infection with eight species of parasites and protozoa with a total infection rate 38.75 %.The results on parasite classes are: *Toxocara cati* (5%), *Ancylostoma tubaeforme* (3.75%), *Capillaria felis*(3.75%), *Isospora* sp.(10%), *Cryptosporidium parvum*(3.75%), *Cryptosporidium muris* (6.25%), *Toxoplasma gondi* (3.75%), *Giardia* sp.(2.5%) infection from feces of cats that showed single, double and triple infections. Our findings revealed the risk for public health, thus preventive measures should be implemented.

**Keywords:** stray cat; Intestinal parasites, Helminth, Protozoa, *Cryptosporidium*; *Giardia*; *Capillaria*.

### INTRODUCTION

Cats are domestic animals frequently infected by intestinal parasites. Moreover, several feline intestinal parasites are zoonotic and are considered important to public health. Although dogs and cats are often considered family members by their owners, it is important to emphasize that they may be vectors of intestinal parasites. All intestinal protozoan parasites have an oral-fecal transmission cycle and a major component for the spread of these parasites is the shedding of oocysts or cysts into the environment (Claerebout *et al.*, 2009). Cats in Iraq enjoy close association as pets or as stray cats(Nihad *et al.* 1989), therefore those animals provide a potential reservoir as well as definitive hosts of helminth parasites especially in rural areas, they are reservoir for many zoonotic infections such as hookworms and Ascariasis (Calvete *et al.* 1998; Fisher,2003). The transmission of zoonotic agents could be through indirect contact with animal secretions and excretion, infected water and food, and through direct contact with the animal (Bugg *et al.*, 1999). Surveys of gastrointestinal helminthes of cats in different countries indicated that cats can harbor a wide range of nematodes and cestodes (Abo- Mahdi *et al.*2008; Palmer *et al.*2008) and the predominate species found were *Toxocara cati*, *Ancylostoma tubaeforms*, *Diplopylidium nolleri*, *Taenae taeniaeformis* (Changizi *et al* 2007). The aim of this study is identification of gastrointestinal parasites and protozoa in cats.

### MATERIALS AND METHODS

A total of 80 feces samples from house and stray cats to investigate gastrointestinal parasites and protozoa were collected in Baghdad from March to October 2013, (10 samples/month).

Fecal samples were concentrated by the formalin - ether sedimentation method. Fecal smears of the sediment were made and stained by the modified Zeal - Nelson technique. The complete surface of the smear was examined for *Cryptosporidium* oocysts. Smear of the feces

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were prepared and stained with trichrome stains to detect cysts or trophozoites of *Giardia* and *Entamoeba*. Also, fecal samples were examined using flotation technique in saturated sodium chloride solution. Measurements and color Photographs of eggs, cysts and oocysts were taken using Ocular micrometer calibration. Diagnosis followed: (Al-Joobori 2002; Thienpont *et al* 1986; Edward & Marietta 1959; WHO, 2004).

## RESULTS

Examining of the studied samples showed that 31 samples feces of the house and stray cats harbored either single or mixed infection with eight species of parasites and protozoa with a total infection rate 38.75 %. The results on parasite identifications are shown in table1.

The results on the mode of infection showed that only eight samples acquire single infections with either egg of helminthes or protozoan parasite and comprised 10% of the total sample and (25.8% of the infected). The double infection with protozoa and helminthes, appear in 4 samples and comprised 5% (12.9% of the infected). The triple infection appeared in 5 samples and comprised 6.25% (16.1% of the infected), table2.

Table 1: Prevalence of individual parasites in 80 samples of feces of cats.

Parasites	No. of infected samples	% from total samples	% from infected samples
<i>Toxocara cati</i>	4	5	12.9
<i>Ancylostoma tubaeforme</i>	3	3.75	9.6
<i>Capillaria felis</i>	3	3.75	9.6
<i>Isoospora</i> sp.	8	10	25.8
<i>Cryptosporidium parvum</i>	3	3.75	9.6
<i>Cryptosporidium muris</i>	5	6.25	16.1
<i>Toxoplasma gondii</i>	3	3.75	9.6
<i>Giardia</i> sp.	2	2.5	6.45
Total	31	38.75	

Table2:Prevalence of single and mixed infection of parasites in 80 feces samples of cats.

Infection	No. of samples	% from total samples(80)	% from infected samples(31)
The single infection	8	10	25.8
The double infection	4	5	12.9
The triple infection	5	6.25	16.1

## DISCUSSION

The results obtained indicated that the percentage of infection with gastrointestinal parasites and protozoa is high (38.75 %). The reason may be some factors such as geographical location, status of animal ownership, sampling protocols, demographic factors, anthelmintic usage, and diagnostic techniques are responsible for the wide range of endoparasite prevalence (Mundim *et al.*, 2007).

This study revealed *Toxocara cati*, *Ancylostoma tubaeforme* and *Capillaria* sp. that similar to Al – Obaidi (2012) in Mosul Province. The finding of *Toxocara* eggs and larvae indicated their importance for public health especially children who play there in soil, that similar

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findings have been reported previously from Iraq (Woodruff 1980), Jordan (Abo-Shehada 1989) and Iran (Motazedian 2006). *Isospora* sp. with relatively high prevalence (10%). This is higher than the prevalence previously found in Nova Scotia 6.4% (Malloy 1978) and less than from Iran 15.17% (Bahrami 2011) these may be due to the differences in temperatures and socio-economic environment between these regions. Two species of *Cryptosporidium* appeared in current study and their rates 3.75% for *C. parvum* and 6.25% for *C. muris*, these results are similar to Bahrami (2011).

Cyst of *Giardia* appeared in two samples 2.5% at this study which is less than Bahrami (2011) who reported 25% at female, 14.28% at male and this may be due to the smaller size of samples.

*Toxoplasma* oocyst shed in cat (the definitive host) feces sporulate in the soil under warm, humid conditions and could contaminate water and food, especially fruits and vegetables. About 20% to 90% of the world's adult population in different regions are reported to have had contact with the parasite *Toxoplasma* (Galván-Ramírez *et al.*, 1998).

The first record of Toxoplasmosis in Iraq was by Machattie (1938) from the spleen of wild dogs in Baghdad, after that the diagnosis of the disease by serological tests were applied at slaughtered sheep and goats at Al-Dura and Al-Shualla in Baghdad that appeared with high infection rate 84.5% as examined by Complement Fixation Test (CFT) and Indirect Haemagglutination Test (IHAT) (Rasheed, 1984). In another study, sheep and goat also recorded 43.3%; positive cases with IHAT 38.7% and positive cases with IFAT 33.14% (Mehdi, 1988). The infection rate of Toxoplasmosis in aborted women in Baghdad 34.7% by Enzyme linked immunosorbent assay (ELISA), Immunofluorescence technique (IFAT) (Al-Dejaly, 1988).

The overall prevalence of single and mixed infection of parasites in current study related to local conditions that can have a great effect on the prevalence of parasites in a cat population. If the cats are hunters and spend a good deal of time outdoors, they will develop parasite infections different from those of the indoor cat; furthermore in Iraq most cats are outdoor (house or stray).

At our results the eight species of gastrointestinal worms and protozoa from feces of house and stray cats with infection rate 38.75% was risk. For this reason, preventive measures should be implemented. These could include health education of the public, good personal hygiene practices, control of stray cats and their exclusion from public places and children's playgrounds by fencing and should be apply all treatment and vaccine orders for houses cats.

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دور القطط كمضائف خازنة لبعض الطفيليات والاولي المعوية في بغداد

أفكار مسلم هادي\* و ازهار علي فرج\*\*  
\*مركز بحوث ومتحف التاريخ الطبيعى، جامعة بغداد، باب المعظم، بغداد، العراق  
\*\*كلية الطب البيطري، جامعة بغداد، ابو غريب، بغداد، العراق

الخلاصة

صممت هذه الدراسة لبحث دور القطط الاليفة والسائبة في نقل بعض انواع الطفيليات والاولي المعوية في بغداد/ العراق لما له من تاثير على الصحة العامة. تم فحص 80 عينة براز اظهرت 31 عينة منها احتوائها على ثمانية انواع من الطفيليات والاولي المعوية بنسبة اصابة كلية 38.75% وكانت كمايلي:

*Toxocara cati*(5%), *Ancylostoma tubeforme*(3.75%), *Capillaria felis*(3.75%),  
*Isospora* sp.(10%), *Cryptosporidium parvum*(3.75%), *Cryptosporidium muris*(6.25%), *Toxoplasma gondi*(3.75%), *Giardia* sp.(2.5%).