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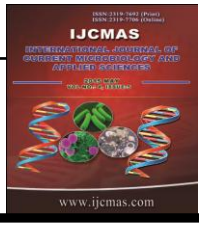

Original Research Article

Prevalence of gastrointestinal parasites in domestic cats (*Felis catus*) in Al-Diwaniya province / Iraq

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Keywords

Stray cats, house cats, Gastrointestinal parasites, Al-Diwaniya province

A B S T R A C T

This study was conducted to determine prevalence of gastrointestinal parasites in 90 fecal samples collected from stray and houses cats in Al-Diwaniya province during period from June to November 2014. 43 sample (47.77%) were infected with one or more species of parasites. The present study recorded ten genera of parasites in cats feces included four genera of protozoa cyst were: *Giardia* sp. (9.30%), *Cryptosporidium parvium* (6.97%), *Isospora* sp. (6.97%) and *Entamoeba* spp. (4.65%). Also five genera of worms eggs included three genera of nematodes eggs were: *Toxocara cati* (25.58%), *Ancylostoma* spp.(23.25%) and *Toxascaris leonina* (6.97%), two genera of cestodes eggs were: *Diphylobotherium latum* (6.97%) and *Taenia* spp. (4.65%) in addition one species of arthropods: Mite egg (4.65%). Results of this study showed 18 samples (41.86%) infected with either eggs of worms or protozoan parasites, the double infection with two species of parasites appeared in 15 samples (34.88%),while the triple infection with three species of parasites appeared in 10 samples (23.25%).

Introduction

Gastrointestinal parasites represented a major source of diseases for cats in the tropics, and have been recognized as important public health problems in several parts of the world (Buijs, 1993). Cats can act as vectors, carriers, reservoirs and definitive hosts for many intestinal parasites that infect human (Mircean *et al*., 2010). As well as being constitute serious threat to reptiles, birds and smaller mammals (Dalimi and Mobedi, 1992). These animals play an important role in transmission of parasites to human and other animals by discharge helminthes eggs, larva, cyst or oocyst in their feces therefore have significant role in contamination of public environment (Sowemimo, 2012). Also It' s buried their feces in soil that leads to the accumulation of numerous enteric parasites, in addition places that used for defecation are often shared by several cats and this may lead to contamination of cats' paws with infective eggs (Engbaek *et al*., 1984). Thus, this environment is a favorable habits for parasitic infection and protect them from desiccation (Uga and Kataoka, 1995). because of close association between cats and humans makes them responsible for the high endemicity of some zoonotic diseases

like toxocarosis, toxoplasmosis and opisthorchiidosis (Overgaauw, 1997).

There are several reported in the world recorded many species of parasites in cats including *Toxoplasma gondii*, *Cryptosporidium* spp., *Spirometra, Taenia taeniaeformis, Toxocara cati, Giardia* sp., *Sarcocystis* spp., *Echinococcus* spp., *Ancylostoma* spp., *Strongyloides* spp. *Sarcocystis* spp., *Blastocystis* spp. and *Microsporidia* spp. (Dalimi and Mobedi, 1992; Changizi *et al*., 2007).
Parsons (1987) pointed through examined feces of cats shown that ascarid nematode, *Toxocara cati* and hookworm, *Ancylostoma tubaeform* were the commonly reported intestinal helminthes parasite of cats worldwide.

The aim of this study is determine prevalence of gastrointestinal parasites in feces of stray and houses cats in Al-Diwaniya province.

Material and Methods

This study was conducted from June to November 2014 in order isolate and identify parasites from feces of stray and houses cats collected from different parts in Al-Diwaniya province.

Fecal examination

Fecal samples were collected freshly into clean polythene bags from 90 cats transported to laboratory of parasitology in Department of Biology, College of Education, Al-Qadisiya University, then examined by the formalin-ether sedimentation method and floatation technique in saturated sodium chloride solution as per the procedure outlined by (Soulsby 1982). Fecal smears were prepared and stained with modified Ziehl Neelsen staining method for presence of *Cryptosporidium* oocyst as described by (Henricksen and Pohlenz 1981). Smear of feces were prepared and stained with trichome iodine stains to detect cysts or trophozoites of protozoa (Tanyuksel and Petri, 2003).

Results and Discussion

The current study showed prevalence of parasites in feces cats collected from different parts in Al-Diwaniya province is (47.77) and these cats were infected with various parasites especially zoonotic parasites. This result is lower than percentages recorded by each of Sharif *et al*. (2009) in northern Iran and Labarthe *et al*. (2004) in Rio de Janeiro of Brazil they indicated that (90%) of feces cats in both regions were infected with parasites.

Differing percentages recorded may be due to season, geographical region (humidity and temperature), habits and behaviors of animal populations and kinds of cats (household, stray, shelter, feral) (Pomroy, 1999).

The current study recorded four genera of protozoa cyst included *Giardia* sp. (9.30%), *Cryptosporidium parvium* (6.97%), *Isospora* sp. (6.97%) and *Entamoeba* spp. (4.65%) as Table (1) and Figures (1-4). These results agreement with previous studies in the world such as (Bahrami *et al*., 2011) in Iran when recorded cyst of *Giardia* spp. (18.91%), oocyst of *Cryptosporidium parvium* (8.1%) and oocyst of *Isospora* spp. (24.32%), also agree with (Khalafalla, 2011) in Egypt when recorded infected cats with *Entamoeba* sp. (12.5).
Infecting cats with protozoa occur by ingestion food and water contaminated with cyst of protozoa and discharge them by their feces in environment thus play a major role in transmit theses parasites to human (Mamatha *et al*., 2005).

Also This study appeared five genera of worm eggs included three genera of nematodes eggs were: *Toxocara cati* (25.58%), *Ancylostoma* spp. (23.25%) and *Toxascaris leonin*a (6.97%), two genera of cestodes eggs were: *Diphylobotherium latum* (6.97%) and *Taenia* spp.(4.65%) in addition one species of arthropods: Mites eggs (4.65%) as Table (1) and Figures (5-10). In the present study most prevalent species of parasites is *Toxocara cati* (25.58%) that consistent with results of Zibaei *et al*. (2007) in Iran when recorded infected cats in Shiraz with *T. cati* (42.6%). Cats buried their feces in soil that may increase the probability of spread *T. cati* eggs and these eggs have ability to resistant environmental conditions and can remain infectious for years in a favorable environment therefore children who play in this locations at risk of Toxocariasis because of geophagia and poor individual hygiene (Blaszkowska *et al*., 2013).

Ancylostoma spp. and *Toxascaris leonina* are other nematodes species found in the current study, these results lower than percentage finding by Thienpoint *et al*. (1981) in Belgium where recorded infected cat with *Ancylostoma* spp. *and T. leonina* (39.5% and 17%) respectively.

Diphyllobotherium latum (6.97%) identified in this study that similar with result of Okaeme (1986) in Nigeria, finding these eggs in this study may be due to these cats eating fish as food sources, therefore cats are acting as important indirect reservoirs of this parasite for humans.

Taenia spp. (4.65%) appeared in this study that similar to the finding by El-Shabrawy and Imam (1978) in Cairo, Egypt when recorded *Taenia* spp. (30%). Mite eggs (4.65%) isolated in this study, this agree with results of Khalafalla (2011) when isolated Mite eggs (13%) from fecal samples of cats in Nile Delta of Egypt and noted infected cats with mites may be due to the cat's habits and swallowed these eggs then discharge with their feces.

Table.1 Types of parasites isolated from cats feces.

Parasites	No. infected	percentage (%)
***Giardia* sp.**	**4**	**9.30**
Cryptosporidium parvium	**3**	**6.97**
***Isospora* sp.**	**3**	**6.97**
***Entamoeba* spp.**	**2**	**4.65**
Toxocara cati	**11**	**25.58**
***Ancylostoma* spp.**	**10**	**23.25**
Toxascaris leonina	**3**	**6.97**
Diphylobotherium latum	**3**	**6.97**
***Taenia* spp.**	**2**	**4.65**
Mite egg	**2**	**4.65**
Total	**43**	**47.77**

Table.2 Type of parasitic infection in cats feces.

Type of parasitic infection	No. of samples	Percentage (%)
The single infection	**18**	**41.86**
The double infection	**15**	**34.88**
The triple infection	**10**	**23.25**

Figure.1 *Giardia* sp. cyst (40X)

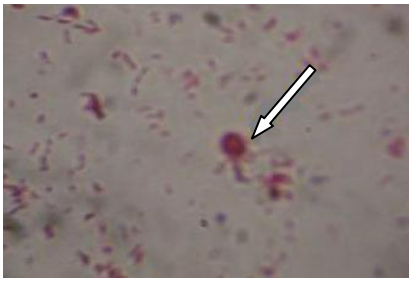

Figure.2 *Cryptosporidium parvium* (40X)

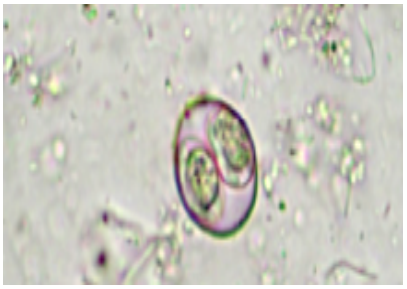

Figure.3 *Isospora* sp. (40X)

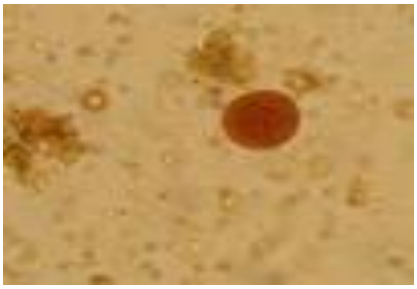

Figure.4 *Entamoeba* sp. cyst (40X)

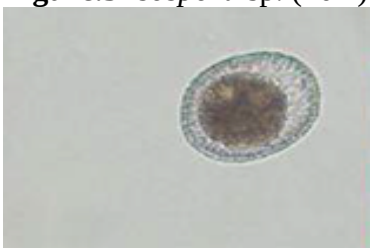

Figure.5 *Toxocara cati* egg (40X)

Figure.6 *Ancylostoma* spp. egg (40X)

Figure.7 *Toxascaris leonin*a egg (40X)

Figure.8 *Diphylobotherium latum* (40X)

Figure.9 *Taenia* sp. egg (40X)

Figure.10 Mite egg (40X)

Results of this study showed 18 samples (41.86%) infected with either eggs of worms or protozoan parasites, the double infection with two species of parasites appeared in 15 samples (34.88%) while the triple infection with three species of parasites appeared in 10 samples (23.25%) as Table (2).

These results are consistent with study of Khalafalla (2011) in Egypt when reported infected cats with single infection (42%), double infection (35%) and three or more infection (13%).

High prevalence rate of cats with a wide range of parasites in the studied area suggests that people face risk of parasitic infections through contact with infected cats and their excretion. Therefore human health education are recommended in the communities through prevention measures should implement include health education, public personal hygiene, control of stray cats and their exclusion from public places and children's playgrounds.

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