



## SOME GASTRO-INTESTINAL PROTOZOA OF ZONOTIC IMPORTANCE OBSERVED IN CAPTIVE ANIMALS OF AL- ZAWRAA ZOO IN BAGHDAD

<sup>1</sup>Amanee Mohammad Radhy, <sup>1</sup>Jenan Mahmood Khalaf & <sup>2</sup>Azhar Ali Faraj

<sup>1</sup>Dep. Internal and Prevental Veterinary Medicine/ College of Veterinary Medicine/ University of Baghdad/Iraq

<sup>2</sup>Dep. Parasitology/ College of Veterinary Medicine/ University of Baghdad/Iraq

### ABSTRACT

The study aimed to investigate the exits of gastro-intestinal protozoa in feces of the animals of AL-Zawraa zoo in Baghdad. One hundred and sixty fecal samples were collected from 90 males and 70 females' of 19 species of captive animals and birds aged between <1 to >1 year during November 2012 to May 2013. The results of the present study revealed that protozoal infection occurs almost in all species of captive wild animals and birds which indicates that animals kept in zoological gardens are at risk of infection by various GI protozoa. According to our information the results of the present study represent the first study in Iraq which was detected the *Entamoeba coli* in bear (100%), dog (100%), monkey (86%) and kangaroo (100%), as well as the sporocyst of *Sarcocysts spp.* was identified in fecal sample of tiger (50%), lion (50%) and dog (100%). Whereas the oocysts of *Giardia spp.* were detected in feces of jackal (100%), camel (100%), goat (100%), ostrich (40%) and peacock (40%), also oocysts of *Cryptosporidium spp.* were identified only in deer (100%). The age of the animals and birds under this study have no significant effect on the prevalence of protozoa infection among captive animals, except the sex of animals, female showed highly percentage of infection with protozoa as compared with males. In view of our results, we can concluded that protozoa infection is highly prevalent among animals of AL-Zawraa zoo which considers very serious source to the health of these animals and their kids also it has direct and indirect effect on life of visitors and workers of the Zoo, so more studies should be carrying out to determine the risk and mechanism of cross – transmission of parasite of public health as well as the importance of applying the hygienic practices and well adjusting anti protozoa programs for both the zoo worker and the animals .

**KEYWORDS:** gastro-intestinal protozoa, captive animals, AL- Zawraa zoo, Baghdad.

### INTRODUCTION

Parasitic diseases of captive animals constitute one of the major problems causing serious diarrhea and even mortality (Cordon *et al.*, 2008) in most. Many researchers have been record different types of parasites in captive and wild animals at zoological gardens of the world, like *Entamoeba sp.* (Opra *et al.*, 2010), *Sarcocysts spp.* (youn, 2009), *Giardia* (Castro–Hermida *et al.*, 2011) and *Cryptosporidium* (Abu–Samra *et al.*, 2011 ). Hasso *et al.*, (1997) conducted a study in Iraq to investigate the intestinal bacteria and parasites identified from animals of Baghdad zoo, According to their results, three species of parasite eggs (*Ascaridia*, *Toxocara* , *Haemonchus*) as well as oocyste of *Eimeria* have been identified. Whereas Radhy and Hassan (2012) identified *Cryptosporidium spp.* And *Eimeria spp.* in different species of animals of AL-Zawraa zoo. As a result of inadequate information on diseases and parasite of zoo animals in Iraq, this study was conducted to diagnose some zoonotic protozoa and its prevalence in different types of hosts.

### MATERIALS & METHODS

The study included 160 animal of 90 male and 70 female aged between young (less than year) and more than year during the period of November 2012 to May 2013.

**Samples collection:** Fecal samples were collected from none diarrheic animals in clean, sterile containers.

**Samples examination:** All fecal samples were concentrated by brine flotation methods (Urquhart *et al.*, 2000) and shethera's solution (chermette and Boufassa, 1988).

**Staining procedures:** two different staining methods were employed in this study modified ziehl – Neelsen and Eosin staining technique as described by (Garcia *et al.*, 1983), as well as using ocular micrometer to detect the size of infected phases of protozoa.

### RESULTS & DISCUSSION

The overall prevalence of gastro-intestinal protozoa of animals at AL-Zawraa Zoo is shown in table (1). Out of 160 examined animals, 101 (63%) were infected with GIT protozoa. Seven types of these animals; bear, dog, Jackal, Camel, Deer, Goat and kangaroo, each had a 100% GIT protozoa infection, while hyena, Dalij, Lama, Fox, Wolf, Zepra and pony none. The most highly prevalence between diagnostic protozoa in this study were *Entamoeba coli* and *Giardia spp.* then *Sarcocysts spp.* and *Cryptosporidium spp.*

*Entamoeba coli* were identified in bear (100%), dog (100%), monkey (86%) and kangaroo (100%).

The prevalence of *Entamoeba coli* infection in dogs was (100%), that result was different from those reported in dogs of Ibadan (Adetinmi and Osayomi, 2010), who reported that prevalence of *Entamoeba histolytica* was 58.2 %. *Entamoeba coli* were also reported in 30 (86%) of

monkeys of present study, these values were similar to those recorded by Dawet *et al.* (2013) in Nigeria.

**TABLE 1:** Percentage of Infection with Protozoa In Animals of AL-Zawraa Zoo.

Type of animal	No. of exanimate animals	No. of Infected animals	%	Diagnosis
Bear	14	14	100	<i>Entamoeba coli</i>
Tiger	10	5	50	<i>Sarcocysts spp.</i>
Lion	24	12	50	<i>Sarcocysts spp.</i>
Dog	5	5	100	<i>Sarcocystsspp + Entamoeba coli</i>
Jackal	4	4	100	<i>Giardia spp</i>
Hyena	4	0	0	
Dalij	4	0	0	
Camel	4	4	100	<i>Giardia spp.</i>
Deer	16	16	100	<i>Cryptosporidium spp.</i>
Goat	5	5	100	<i>Giardia spp.</i>
Monkey	35	30	86	<i>Entamoeba coli</i>
Kangaroo	2	2	100	<i>Entamoeba coli</i>
Lama	2	0	0	
Fox	6	0	0	
Wolf	7	0	0	
Zeptra	6	0	0	
Pony	2	0	0	
Ostrich	5	2	40	<i>Giardia spp.</i>
Peacock	5	2	40	<i>Giardia spp.</i>

Concerning *Giardia* results revealed that the prevalence was: jackal (100%), camel (100%), goat (100%), ostrich (40%) and peacock (40%). The prevalence of *Giardia* in camels was (100%), this result was disagree with Beck *et al.*(2011) who confirm the absence of *Giardia* in captive camels in zoo of Croatia. On the other hand the prevalence in goats was higher than 33% which was recorded by Castro-Hermida *et al.* (2007) in goats of Spain. In one recent study (Papini *et al.*, 2012) *Giardia* has been detected in Pet and Zoo birds in Italy (parrols % 25, macaw 50%) while it was absent in Ostrich and peacock. *Sarcocysts spp.* was observed in feces of tiger (50%), lion (50%) and dog (100%). The prevalence of lion in our study was similar to 45% which was recorded by Bjork *et al.* (2000) in Tanzania. Also the results which reported in dog was similar with those reported by Berentsen *et al.* (2012 ) who recorded (92 %) prevalence rate in African wild dogs in Zambia .

The cysts of *Cryptosporidium* was found only in feces of deers (100%), this result was higher than result found by Skerrett and Holland, (2001) in Ireland. In the present study, parasitization by different types of protozoa was higher in both (young and adults animals), these results are agreed with results of previous study (Adejinmi and Osayomi, 2010). The effect of sex on the prevalence of protozoa in captive animals and birds is presented in table (2). Of the 90 male and 70 female the percentage of infection by different types of protozoa was 57 % in male and 71% in female. The result showed that female showed highly percentage of infection with protozoa and the reasons may be related with decrease in immunity due to stress – pregnancy – lactation which play role in increasing their sensitivity to infection (Swai *et al.*, 2011). Through using of ocular micrometer we can detect the size of infected phases of protozoa which presented in feces of different animals table (3).

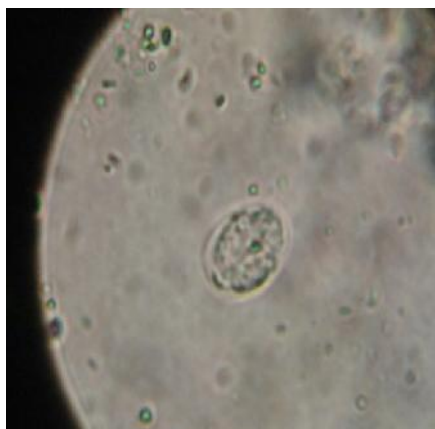
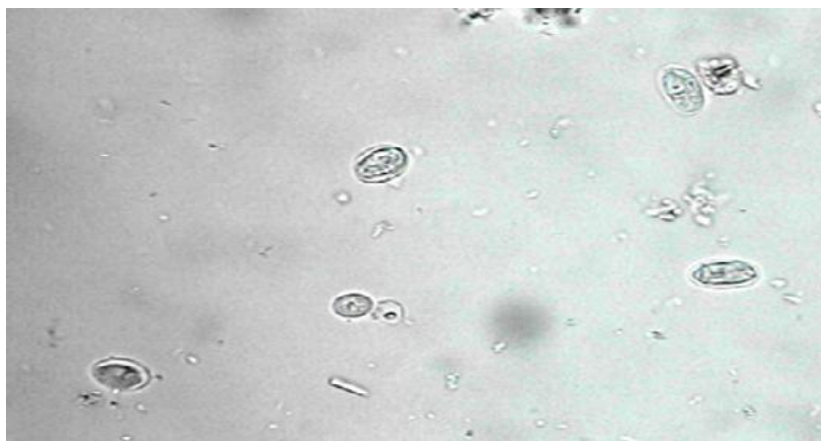
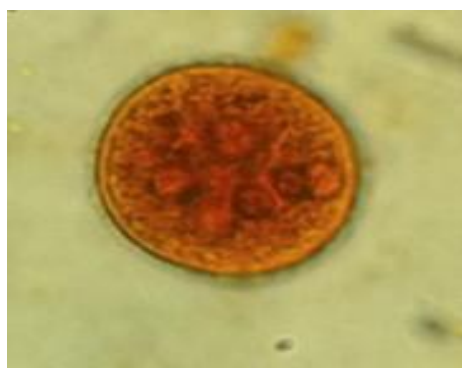
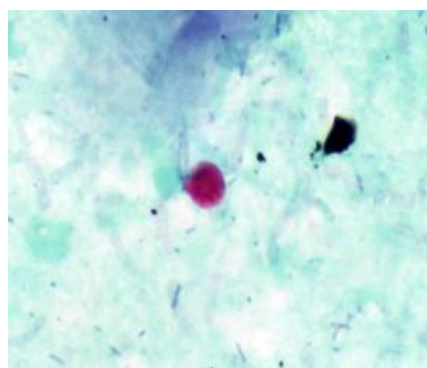
**TABLE 2:** Number of Infected male and female by protozoa in animals of AL-Zawraa zoo.

Sex of animal	No. of examined animals	No. of Infected animals	%
Male	90	51	57
Female	70	50	71
Total	160	101	63

Differences between infection proportion belonged to gender were not significant (Chi-square value 3.686 P=0.055)

**TABLE 3:** Measurement rate of infected phases of protozoa by micrometer unit.

Species	/Measuring range of eggs Micrometer
<i>Sarcocystis spp.</i>	9.5 x 14.5 shape (1)
<i>Giardia spp.</i>	6 x 10 shape (2)
<i>Entamoeba coli</i>	10 x 20 shape (3)
<i>Cryptosporidium spp.</i>	3.4 x 4 shape (4)

Shape 1: sporocyst of *Sacrocystis* (40x)Shape 2: oocyst of *Giardia* (40x)Shape 3: *Entamoeba coli* (40x).Shape 4: *Cryptosporidium spp.* (40x) of oocyst shape

**FIGURES** 1, 2, 3 and 4 illustrated the shapes of protozoa which recorded in this study in feces of captive animals and birds.

The results of our study indicates that captive animals may possibly serve as reservoirs to many type of protozoa and may be a potential source of infection to both domestic animal and human attendants on the one hand human visitors on the other, although certain adverse conditions of stress crowding, such as those which obtain in captivity, have often compromised the existing reservoir status, (John *et al.*, 1982) transporting of animals from cage to other one, zoo workers, contaminated tools, all these factors play an important role to disseminate infection between different types of animals.

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