

## Investigation of Ecto-endo Parasites in Some Animals in Al-Mahaweel Reserve / Babylon.

Zaman tukey Abaul abbas<sup>1</sup>

<sup>1</sup> General Directorate of Education at Babylon, Ministry of Education

[tisckwgskw@gmail.com](mailto:tisckwgskw@gmail.com)

Sadiya Aziz Anah<sup>2</sup>

<sup>2</sup> College of Education, University of AL-Qadisiyah University, AL- Diwaniyah, Iraq.

[sadiya.anah@qu.edu.iq](mailto:sadiya.anah@qu.edu.iq)

### Abstract

The current study aimed to investigate parasites in some animals located in Al-Mahaweel reserve located north of Babel Governorate in central Iraq during the winter season. In the study, 261 fecal samples were collected from six species of animals, including *Dama dama*, *Gazelle subgutturosa*, *Gazelle gazelle*, and *Macaca* sp. and two types of birds are ostrich, *Struthio camelus*, and peacock, *Pavo cristatus* to investigate Parasitic infections. *Entamoeba* recorded the highest infection rate of 81%, followed by *Cryptosporidium* spp. with an infection rate of 42%, *Isospora* sp. 40%, and the lower rate of infection with the *Balantidium* sp. of 28.57%, *Ascaris* sp. of 22.85%, *Toxocara canis* 20%, and one ectoparasite, *Hyalomma Marginatum* on ostriches with a rate of 16%. This study showed that parasitic infections are widespread in captive animals in the winter season, and they are among the dangerous causes for the health of these animals. Where it is necessary to conduct more studies to examine the mechanism of transmission of parasites among protected animals.

Keywords: Reserves, Captive animals, internal parasites, Ticks

### Introduction

A reserve or a sanctuary is an area of land with specific dimensions that aims to preserve wildlife and all plant and animal species in their families and includes endangered species that are kept inside cages. Parasitic diseases are generally considered a concern for the health of the animals of these reserves as a result of the high environmental pollution (1), these animals are usually at risk of parasitic infection due to the constant environmental stress as a result of the presence of the animal in captivity. These

animals represent a reservoir for many parasites Examination of fecal samples taken from these animals showed the presence of different types of parasites that have a significant nwgative impact on the live of these animal(2) Therefore, as a result of the lack of information about parasites that infect captive animals in Iraqi reserves, this study was conducted to diagnose some zoonotic parasites and their spread in Al- Mahaweel Reserve, north of Babylon.

## Material and Methods

The current study included the examination of 261 stool samples collected from six species of animals, including *Dama dama*, *Gazelle subgutturosa*, *Gazelle gazelle*, and *Macaca* sp. Two types of birds are the ostrich, *Struthio camelus*, and the peacock, *Pavo cristatus*. The collected samples were placed in clean, numbered plastic boxes and kept in a refrigerated box, then transferred to the postgraduate laboratory in the Department of Life Sciences, University of Al-Qadisiyah for the purpose of examination. The samples were examined by different laboratory methods, where the intestinal parasites were examined in the feces of animals by (3) method, and the direct smear was used to search for Trophozoite or eggs from the samples directly, and the modified Ziehl- Nielsen stain was used to diagnose the *Cryptosporidium* spp. and the Lugols iodine stain to diagnose the rest of the parasites. All glass slides were examined under a light microscope at (40X) or (100X) magnification. Diagnosis of intestinal parasitic is based on dependence on (4)(5)

As for the external parasites, the ticks were collected from the neck area and the top of the eyelid for animals under study. Samples were placed in 70% alcohol and some drops of glycerin. Samples were examined using dissecting microscope and diagnosis of species based on categories described in classifying keys (6).

## Statistical Analysis

Chi-square test was used to determine the significant differences at the probability level ( $P \leq 0.05$ ).

## Results and Discussion

The results of the current study showed that the animals in the Al Mahaweel Reserve were found infected with six types of internal parasites and one type of external parasite (Table 1). *E. histolytica* parasite recorded the highest rate of infection in *Macaca* sp. and *Gazelle subgutturosa*, which amounted to 81.81% and 20%, respectively, While isolates of *Cryptosporidium* spp. of *G.gazella* and *Pavo cristatus* by 42% and 18.5%, respectively

*Cryptosporidium* spp. *Isospora* sp. was recorded in the smears prepared from the feces of *Struthio camelus*, with a percentage of 40%. *Balantidium* recorded an infection rate of 28.57%, while eggs of *Ascaris* sp. In smears prepared from the feces of *Dama dama*, at a rate of 22.85%, the lowest percentage

of *Toxocara canis* was recorded, which was isolated from the feces of *G.gazella*, at a rate of 20%. Statistical analysis results showed the presence of moral differences in the infection rates at the probability level of  $P \leq 0.05$ . As for external parasites, *Hyalomma marginatum* was isolated from ostriches neck area and the upper eyelid at a percentage of 16% (Table1 and Fig.1).

It is noted from the results of the study that the infection rate of captive animals in Al-Mahaweel Reserve amounted to 37.5%. This is less than the percentage recorded in some studies from around the world. This may be attributed to several reasons, including. this study was conducted in the winter season when the infection rate decreases, the different environmental conditions, the number of animals examined, and the geographical location .

**Table(1): Infection rate and severity of parasite species isolated from some captive animals .**

Species of animals	Species of parasites								
	Number of animal	Number of animal infected	<i>Cryptosporidium</i> spp.	<i>Entamoeba</i> spp.	<i>Isospora</i> sp.	<i>Balantidium</i> sp.	<i>Ascaris</i> sp.	<i>Toxocara canis</i>	<i>Hyalomma Marginatum</i>
			N%	N%	N%	N%	N%	N%	N%
<i>Dama dama</i>	35	15	0	0	0	10(28.57)	8(22.85)	0	0
<i>Gazella gazelle</i>	50	20	12(42)	0	0	0	0	10(20)	0
<i>G.subgutturosa</i>	45	9	0	9(20)	0	0	0	0	0
<i>Macaca</i> sp.	11	9	0	9(81.81)	0	0	0	0	0
<i>Struthiocamelus</i>	50	25	0	0	20(40)	0	0	0	8(16)
<i>Pavo cristatus</i>	70	20	20(18.5)	0	0	0	0	0	0

Total	261	98	37.5						

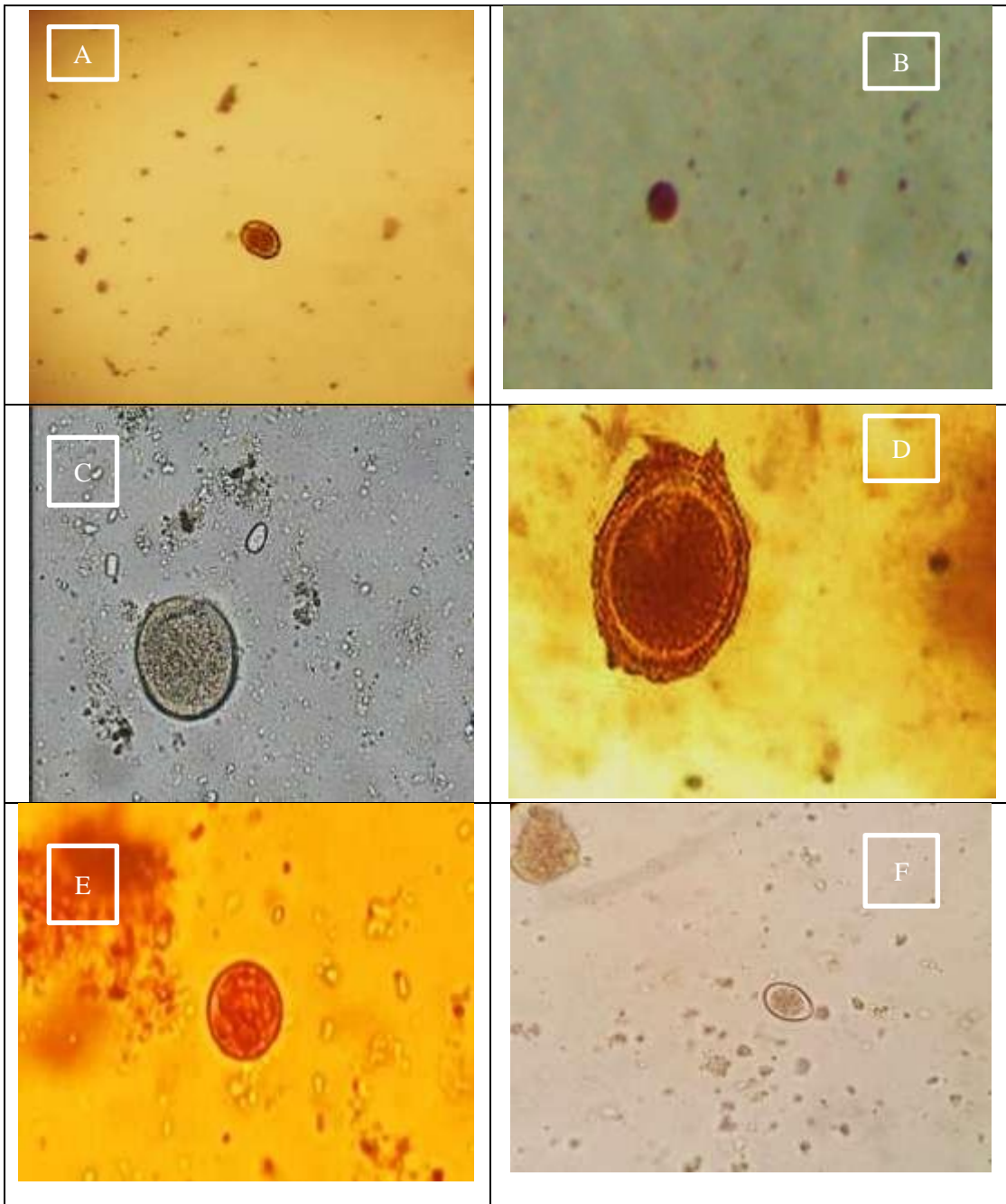




Fig.1: **A.** *Ascaris* sp., **B.** *Cryptosporidium* spp. ,**C.** *Balantidium* sp.,**D.** *Toxocara canis*,  
**E.** *Entamoeba histoiytic* , **F.***Isospora* sp.,**G&H** Dorsal and ventral veiw of ♂ *Hyalomma marginatum*

Monkeys recorded the highest infection rate, reaching 81.81%. The results of the current study were higher than a study conducted in Japan by(7), where the infection of *Macaca Fascinlaris* was recorded at a rate of 37%. And in China by(8), where it was observed that chimpanzees had an infection rate of 48%. In Nepal,(9) indicated that *rhesus monkeys* were infected with *E.histolytica* and *E.coli* at a rate of 1.8% and 31.76%. As for deer, an infection rate of 20% was recorded, which is higher than the study conducted by(10) in Anhui Province, China, where Sika deer was infected with the *Entamoeba* sp. by 14%. While *Cryptosporidium* spp. in *Gazelle gazelle* and *Pavo cristatus*, by 42% and 18.5%, respectively. The recording of this parasite in the current study is consistent with many local and international studies. Indicated(11) that the peacock in Al Saada Zoo and the Agricultural Center in Diwaniyah was infected with a mixed infection, and the infection with the *Cryptosporidium* was recorded at a rate of 33.33%. Globally(12) in Tokyo reported a 7.5% infection rate for *Yezo deer* according to a PCR test for the *Cryptosporidium* spp. In northeastern China(13) reported an infection rate of *sika deer*, reindeer and red deer infection amounted to 15%, 0.4%, and 4.6%, respectively. The reason for the difference in the percentage of the study from other percentages may be attributed to the difference in the number of samples examined, in addition to the fact that the Oocytes of this parasite are resistant to antiseptics and medicines, as it is difficult to eliminate it in polluted environments.

*Isospora* sp was recorded in ostriches with an infection rate of 40%. This percentage is higher than what was recorded by(14) in this study of ostriches imported from Europe, where it reached 15% and higher than the percentage mentioned by(15) in central Iraq, which amounted to 8%. This percentage is different due to the different number of infected animals and the method of examining samples. The lowest rate of infection with *Balantidium* sp. in *Dama dama*, with a rate of 28.57%. This percentage is lower than the 35.7% indicated by (16) in the study of *Sambar deer* in a safari zoo in Bangladesh and higher than the 1.57% was recorded by (17)

This study recorded an infestation of *Dama dama* *Ascaris* sp. with an infection rate of 85.22%, and the current study agrees with the study(18) in the infection of deer in Inshaiva puri National park in Nepal, with a rate of 19%, and differs from the results of(19) in the study of the Indian Hog deer located in Bir Moti Bagh Wildlife Sanctuary in Nepal, which recorded an infection rate of 10%. The cause of infection with *Ascaris* eggs is attributed to high humidity during winter, and the eggs are resistant to winter low temperature



The incidence of *Gazelle gazelle* with *Toxocara canis* was recorded at a rate of 20%. Recordings of this genus are consistent with many international studies that indicated that many hosts were infected with this parasite, as it was noted (20) that Hares were infected with *T. canis* in some wild animal habitats, with an infection rate of 11.76%. Deer is a non-specific host for *Toxocara canis* but an incidental host, The parasite encapsulates in host muscles and may be a source of infection in carnivorous animals, and infection with this parasite occurs as a result of the presence of some wandering dogs that are kept as pets by workers. As for ectoparasites, *Hyalomma Marginatum* was parasitized on ostriches by 16%. The registration of this species is considered as recording a new host for it in Iraq, as previous studies did not indicate that it was recorded in ostriches (21) was able to isolate ticks of *H.albiparmotum*, *H.luscitanicum* and *H.Rhipicephalus* from ostriches imported from the United States of America. (22) also indicated that ostriches were infected with Crimean Congo through ticks *Hyalomma* sp. as *Hyalomma* spp. was recorded by (23) while studying ostriches found in Africa.

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Article submitted 1 March 2023. Accepted at 29 March

Published at 30 Jun 2023.