Plant Archives Vol. 20, Supplement 1, 2020 pp. 2013-2016 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

PREVALENCE OF INTESTINAL PROTOZOA IN DEER IN MIDDLE OF IRAQ

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Abstract

To study the prevalence of intestinal protozoa of deer, 50 fecal samples were collected from Baghdad and was it district, forty samples were found to be infected with intestinal protozoa and overall prevalence infection rate was 50% of *Cryptospordium* sp., (30%) *Eimeria* sp. and (30%) *Entamoeba sp*. cumulatively, a total of 23 combinations of coinfections with other intestinal parasite (protozoa + Helminth) between detected infections were reported among these parasites (*Eimeria* sp. + *Rabditae) (Eimeria sp.* + *Toxocara* sp.) (*Cryptospordium* + *Rabditae)* and *(Entamoeba* sp. + *Toxocara* sp). This study is a survey documentation on multiple intestinal protozoa of deer in middle of Iraq.

Key words : Deer, wild animals*, Eimeria* sp., *Entamoeba* sp., *Cryptospordium* sp., *Toxocara* sp.

Introduction

Deer is the world-wide economic value of ruminant wildlife. Monitoring of diseases in wild animals has recently become a element necessary to prevent nature and humans. The presence of parasites in an animal resulting in decreased condition, decreased body weight gains and reproductive disorders, in particular in young humans, Furthermore, parasites affect animal products (meat and skin) quality and ultimately death (Fox, 2000). However, overpopulation could result to coccidiosis outbreaks in young wild animals with high mortality rates. There has been an increase in the population of roe deers in Galicia over the last two years (Acevedo *et al.,* 2005). Because livestock are taken into consideration to be the main reservoirs of *Cryptosporidium* oocysts, accurate information on the prevalence and species of *Cryptosporidium* is critical to assessing the risk to global health from the zoonotic transmission of *Cryptosporidium* via drinkable water. Reports on Cryptosporidium prevalence, however, and in particular *C. parvum* in livestock and wildlife are highly variable (De Waele *et al.,*2012 and Smith *et al.,* 2014) And although it has been reported that wildlife contributes to the loading of cryptosporidium in surface waters (Chalmers *et al.,* 2010). In most of the world's zoological gardens, different types of parasites were recorded in captive and wild animals, such as *Entamoeba sp*. (Opra *et al.,* 2010). Parasitic disease outbreaks in a limited space among farmed deer and intensive management practices mean that they are more severely infested with parasites than wild deer. (Vengust, 2003).

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Materials and Methods

The study included 50 deer animals of different sex and age. Fecal samples were collected from some area middle of Iraq, samples collected from with no diarrheal animals and it put in clean sterile containers. Gender, age, location and date of collection were reported on the tube and sample examination, all fecal samples were focused by flotation techniques (Urquhart *et al.,* 2000) and shethera solution (Chermette and Boufassa, 1988). Staining procedures methods were employed in this study modified ziehl – Neelsen staining technique as described by (Garcia *et al.,* 1983), and examine under 40x and 100x as well as using ocular micrometer to detect the size of infected phases of protozoa.

Results and Discussion

During this study, a total of 50 fecal sample in deer

were examined, of which 40(**80**%) were found to be infected with one or more species of intestinal protozoa.

A total of three species of intestinal protozoa parasites (cyst/oocyst) were identified, namely, *Cryptospordium* sp. (50%), *Eimeria* sp, (30%), *Entamoeba* sp (30%). (Table 1 and Table 2). (Fig. 1, 2 and 3).

Table 1: Total infection with of intestinal protozoa in deer.

Animal	No.of Samples examined	No.of positive	Percentage (%)
Deer	50	40	80

Table 2: Prevalence of intestinal protozoa species in deer.

Intestinal protozoa	No.of Samples examined	No.of positive	Percentage (%)
Cryptospordium sp	50	25	50
Eimeria sp	50	15	30
Entamoeba sp	50	15	30

Table 3: Prevalence of mixed infection intestinal protozoa with other parasite in deer.

Mix infection	No.of Samples examined	No. of case	Percentage (%)
Eimeria sp+Rabditae larva	50	10	20
Eimeria sp+Toxocara sp	50	5	10
Cryptospordium + Rabditae larva	50	5	10
Entamoeba sp+Toxocara sp	50	3	6
Total	50	23	46

Results indicated mixed infection intestinal protozoa with helminth in deer. In this study the prevalence *(Eimeria sp+Rabdita*e) infection rate (20%) was found higher than infection with (*Entamoeba sp+Toxocara s*p) were (6%). (Table 3) (Fig. 4 and 5)

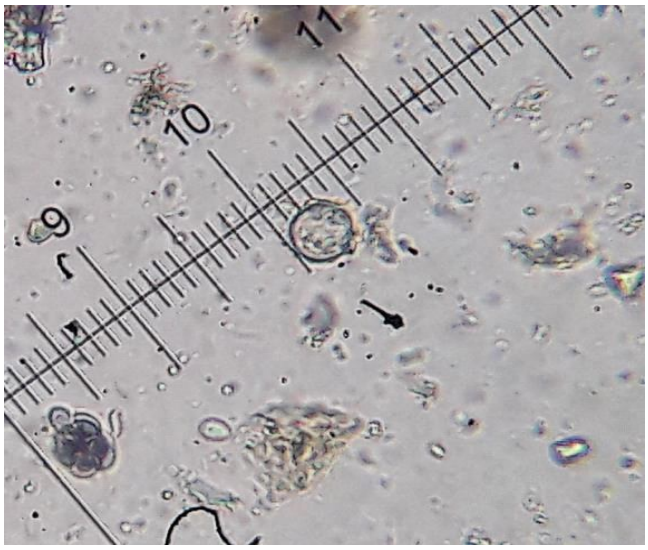

Fig. 1: *Cryptospordium* oocyst sp.

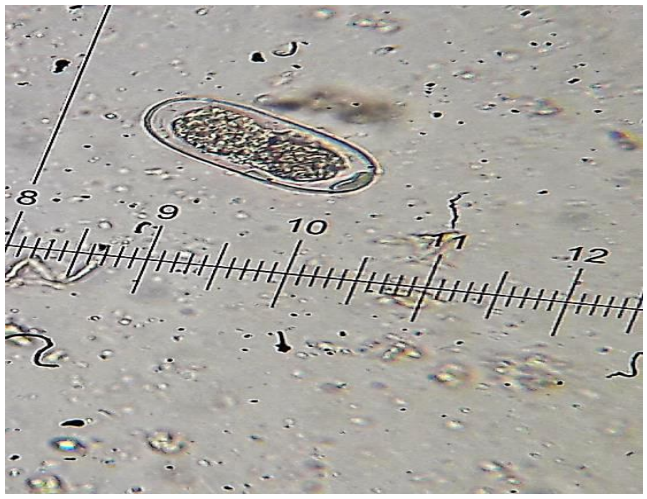

Fig. 2: *Eimeria* sp.

50 fecal samples in deer were examined in the current study, of which 40 (80 %) were found to be infected, these findings support earlier reports (Pacon, 1994; Santin *et al.,* 2004 and Pilarczyk *et al.,* 2005).

This study is in agreement with Tan *et al.,* (2017) who recorded gastrointestinal (GI) infections with parasites (22.9%) in deer and Barmon *et al.,* (2014) who recorded prevalence of gastrointestinal parasites of deer was (69.29%).

Based on the current study, the high prevalence of gastrointestinal parasites indicates

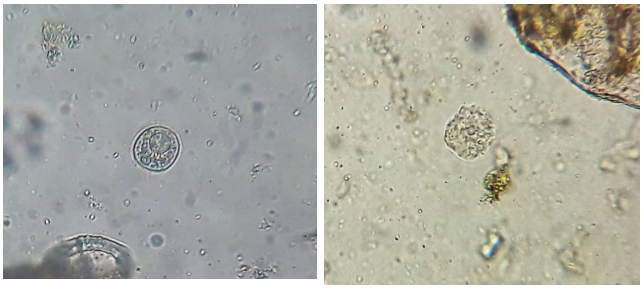

Fig. 3: Left and right *Entamoeba* trophozoite sp.

that it may have some detrimental effects on the health of these captive deers. It means that the gastrointestinal infection had an undetermined number of deers without showing any physiological outward signs of infection. It is very important in zoonotic terms because these animals can serve as reservoir of hosts for gastro intestinal parasites that are pathogenic to man (Nayak, 2016).

Similarly, Kanungo *et al.,* (2010) reported that the majority of deer noted a higher rate of mixed infection. Khatun *et al.,* (2014) reported 35.6% positive for helminth infection and 24% positive for protozoan infections, which is much lower than the current study, while Khasid *et al.,* (2003) reported 96.13% positive for

Fig. 4: Toxocara egg sp.

Fig. 5: *Rabditae* larva.

wild animal parasites and 100% helminthic infection was observed in spotted deer.

This was more or less similar to the Parasani *et al.,* (2001) report, which revealed that in the zoo of Rajkot Municipal Corporation, 50 % animals were positive for helminth infections and 18.8 % for protozoa. Lim *et al.,* (2008) reported 34.5 % positive for helminths and 21.8 percent %for protozoa, which is much lower than the current study for helminth infections but higher for protozoan infections.

Either as a single or mixed infection recorded at a higher rate in captive deer during this investigation shows that, effective control measures to reduce their environmental contamination are highly necessary. Frequent removal of dung and treatment of infected animals are very important gastrointestinal parasite control strategies. In addition, the practice of husbandry, the routine monitoring of parasites and the use of selective anthelmintics may be crucial for the control of parasitic gastrointestinal infections (Nayak, 2016).

Our study gives an overview of deer parasites in the middle of Iraq, but much more studies on livestock in the area and wild herbivores are needed to evaluate the dynamics of parasite transmission. Therefore, further research can also be carried out to maintain the ecological balance and to evaluate the financial losses due to parasitic deer illnesses (Barmon *et al.,* 2014).

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