Detection of Cryptosporidium spp. in Animals' Zoo of Basra City

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Abstract. The detection of Cryptosporidium Spp. from faecal samples collected from several animals at the Basra Zoo is part of this research. The total infected percentage reach to (52.9%, 28.6%, 16.7%, 12.5%, 6.7%, 0.0%, 0.0%, 0.0%, 0.0%) in bears, cat, lions, pigs, camels, banshee, horse, tigers, and hyena respectively. The results showed that the total infected percentage was (13%). The average oocyst size was found to be within the typical range of Cryptosporidium Spp oocyst sizes. The average oocyst size was found to be within the range of Cryptosporidium spp. oocyst sizes.

Keywords: Cryptosporidium, Zoo, Basra.

1 Introduction

Parasitic illnesses in caged animals are one of the most common causes of severe diarrhoea and even death [4]. Many researchers have been tracking various parasites in captive and wild animals at zoological gardens across the world, and many zoos, conservation parks, and wildlife rehabilitation centres have expressed worry about the current state and level of contamination of their animal collections. A zoo is predisposed to the spread of infections due to the concentration of numerous animal species in a small space, as well as the stress induced by imprisonment and contact with humans [3].

Cryptosporidiosis is a zoonotic and anthropologic disease caused by protozoan parasites of the genus Cryptosporidium. It has a worldwide distribution and is one of the four leading pathogens causing diarrheal disorders in children, according to most surveys [8]. The goal of this study was to identify certain zoonotic protozoa and determine their prevalence in various hosts.

2 Materials and Methods

2.1 Collection of Water Samples

This study has been performed from September until November 2013. Nine types of these animals Zoo of Basra city (bears, lions, camels, pigs, banshee, horse, tigers, hyena, and cats) all

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the sample were put in polyethylene containers water which delivered to the laboratory parasitological to detect of oocyst of *Cryptosporidium* spp.

2.2 Oocyst Detection

To detect Cryptosporidium oocysts, the faecal samples were concentrated using the formalin method [6], a drop was taken from each deposit using a Pasture pipette and smeared on a glass slide, then the smears were fixed transiently over a flame and stained for 5 minutes with a strong carbol fuchsin solution. The slide was heated until steam formed, but not to the point of boiling, and an extra stain was applied if the slide became dry. The smear was stained, then washed under running tap water for 1-2 minutes before being decolorized in 5% sulphuric acid for 30 seconds. The smears were rinsed in tap water for 1-2 minutes before being counterstained for 1 minute with 3 percent methylene blue stain. Finally, the smears were rinsed in tap water, air-dried, and inspected microscopically for Cryptosporidium oocysts under oil immersion (100). The following formula was used to compute the percentage of contaminated samples:

$$\text{Infected Percent} = \frac{\text{Infected samples}}{\text{Total samples}} \text{ x } 100 \qquad (1)$$

2.3 Statistical Analysis

After data cleaning, the data was transferred to a Microsoft Excel Spreadsheet for statistical analysis, and then into the SPSS (Statistical Package for the Social Sciences version 15.) package software application. For all variables, descriptive statistics (%) were performed, as well as analytical statistics to determine the relationships between the variables. Chi-square statistical tests were used to determine the relationship between variables.

3 Results

Air-dried slides were examined under light microscopy at 100 X magnifications, oocyst of *Cryptosporidium* were found as pink coloured round and spherical body as shown in Figure 1.

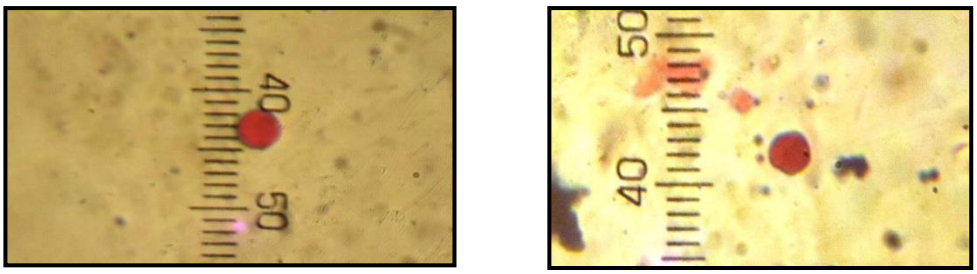

Fig 1: Cryptosporidium oocyst staining with a modified Zeihl Neelsen 100 X**.**

90 inspected animals with 15 (13%) were disease-ridden with Cryptosporidium spp. nine types of these animals Zoo (bears, lions, camels, pigs, banshee, horse, tiger, hyena, and cat) were delivered to the laboratory parasitological to detect oocyst of Cryptosporidium spp. As represented in Table 1.

Table 1: The percentage of animals infected with Cryptosporidium Basrah Zoo is a zoo in Basrah, Iraq.

	Examined animals	Infected animals	Percentage of infected one
bears	**17**	**9**	**52.9%**
lions	**12**	**2**	**16.7%**
camels	**15**	**1**	**6.7%**
pigs	**8**	**1**	**12.5%**
banshee	**11**	**0**	**0.0%**
horse	**6**	**0**	**0.0%**
tiger	**7**	**0**	**0.0%**
hyena	**7**	**0**	**0.0%**
cat	**7**	**2**	**28.6%**
Total	**90**	**15**	**13%**

Discussion

Table 1 shows the overall prevalence of Cryptosporidium Spp. in animals at Basra Zoo (1). 90 (13%) of the (9) tested animals were contaminated with Cryptosporidium oocyst. Six types of these animals are bears, lions, camels, pigs, and cat; each had infected with oocyst of the parasite, while banshee, horse, tiger, hyena none. This is result is quite agree with [7] which recorded (21.9%) in confined animals in Al- Zawra Zoo in Baghdad city, but disagreement with [7] who identified oocysts of *Cryptosporidium* spp. in deer at caged animals of one park in Baghdad (100%), and with [1] who recorded Percentage (58.7%) in the north zoo of Iraq cities and worldwide prevalence of parasite which was 19.5% [5] at a zoo in southern Brazil. The variations between these findings and those of other research are related to the diagnostic technique utilised or the fact that parasite prevalence varies from year to year and from one region to another within the same country [2].

4 Recommendation

1. The use of a routine microscopically diagnostic procedure is advised, and technical medical personnel must be trained to diagnose Cryptosporidium and other parasites in caged animals in Iraq.

2. More research into the detection of Cryptosporidium in captive animals' workers.

3. To account for all sociocultural influences, a more complete epidemiological investigation is necessary.

4. Introduce parasite species diagnosis using molecular techniques, genotyping, and subtyping in captive animals.

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