

CHAPTER ONE

INTRODUCTION

Captive animals, kept in kuku Zoo, need to be subjected to investigation of external as well as internal parasitic infestation. The Jackal is one of the captive animals kept in the Zoo. In the Sudan research on the parasites of canines are quite meager (**Soulsby, 1982**) It should be a routine procedure to identify helminthes infestation of Zoo animals for the sake of animal health [**Soulsby, 1982**]. The results of testing animals for internal parasites would help in improving their health by treatment (**Soulsby,1982**). The present study is an attempt to recover ova of internal parasites of the Black backed Jackal *Canis mesomelas* from their feces by direct smear and floatation tests (**Soulsby,1982**).

The objectives of the study are:

1. To isolate and identify the parasites from the shape of the aggs using reference catalogues.
2. to determine the efficiency of each method used.
3. to determine which parasite had the highest level of infection.

Key words:

Black backed jackal ,parasiti ova ,intensity of parasitism, kuku Zoo.

CHAPTER TWO

LITERATURE REVIEW

The black backed jackal *C. mesomelas* is fox-like canid [Walton and Joly,2003] . with a slender body, long legs and large ears. It weighs 6-13kg, stands 38-48cm.at the Shoulder and measures 67.3-81.2cm in body length [Krofel, 2007].The taxonomic Classification of black backed jackal is as described by [Skinner 2005] .

Kingdom: Animalia

Phylum: chordate

Class: Mammalia

Order: Carnivora

Family: Canidae

Genus: Canis

Specis: C.mesomelas

Repopulation of endangered species and conservation of wild life animals in wild life parks and zoological gardens are management strategies [Ajibade et al.,2010].

Parasites can affect animals by reducing the population size , especially under nutritional Stress. They can also evict host behaviors to combat the parasites . Parasitic diseases form a major challenge to wild animals in captivity (Adedakun et al ,2002,Emikape et al ., 2002. Singl et al ., 2006 ., Emikape et al., 2007) .

In the natural habitat animals might have a natural resistance to parasites or live mutually with them (**Borkovkova,2005**) . It was reported by **Singa et al (2006) and Goossensa et al.,(2005)**. That change in environment and living conditions from free ranging to captivity influences the animals ecology and might increase susceptibility to parasitic infections .

Some workers mentioned that many animals in captive situation are exotic to the geographical locations of parks and zoo gardens where they are kept .(**Mondgil and Singla,2014**), reported that keeping a number of animal species. In close proximity , which would normally come in contact with such pathogens ,provides an opportunity for the transmission of diseases. Severe parasitoses can lead to blood loss , tissue damage , spontaneous abortion , congenital malformation and death (**Adedorun et al ., 2002 ., Emikpe et al ., 2002 .,2007., despommier,2003**).

Moving animals from one enclosure to another ,without proper parasite treatment ,is also a means of parasite transmission . Additional risks of parasite infections are brought by mixing different species of animals (**Goossensa et al .,2005**) .Zoological gardens staff members have also been reported to play an important role in the transmission of parasites among animals in zoo through their shoes ,clothes , hands ,foot or with working tools (**Adeturji ,2014**) . **Otegbade and morenikeji ,2014**).Some of the parasites are zoonotic and pose a serious threat to human health (**kashid et al .,2003**). Carnivorous animals act as definitive hosts for many intestinal parasites , some of which are responsible for several zoonotic diseases such as ancylostomosis , echinococcosi ,gnathostomosis and toxocarosis (**Schantz and Kramer ,1995., Eslami and Husseini 1998**). **Overgaauw (1997)**, further these zoonotic parasites. Inadequate information on diseases and

parasites of zoo animals is a major limiting factor in the management of zoological gardens . Investigation into prevalence geographical distribution, systematic and biology of parasites of zoo animals are important for planning and control of parasitoses . Hence the need for a regular program of gastrointestinal parasite surveillance and measures of control based on correct diagnosis, effective treatment and proper prophylaxis to ensure sound health of Zoo animals (**Abjbade etal, 2010., Moudgil etal., 2014**) .

CHAPTER THREE

MATERIAL AND METHODS

The research was carried out in KuKu Zoological garden , College of Animal Production Science and Technology ,Sudan University of Science and Technology . KuKu Zoo has an area of about 10 acre . In the Zoo different animal species are kept under Captive conditions and most of the animals are kept in cages . There are als some domestic animal species such as camels ,horses sheep and goats .The dimensions of the cage in which four black backed jackals are kept ,were **6x3x3m**. The cage was constructed of iron poles and wire net .The floor of the cage was made of mixture of gravel, sand and cement . As mall portion of the cage was left for food container, and drinking water was provide in a cement basin. Inside the cage there were two adult male and two adult female black backed jackals.

Fresh faecal samples were collected in duplicates as follows:

5 specimens on 18-5-2016

6 specimens on 22-5 -2016

4 specimens on 25-5-2016

8 specimens on 29-5-2016

4 specimens on 15-7-2016

4 specimens on 20-7-2016

Two methods were applied for parasitic egg recovery:-

_ Direct smear on glass slides , covered with slide covers and mounted for detection,on Microscope stage 10x (**Soulsby,1982**).

_ floatation method by preparing a concentrated saline solution in a test tube to the brim , stirred with glass rod and placing the glass slide on top of the tube for trapping the floating parasite eggs on slide surface . Identification to the species level was according to (**Soulsby,1982**). Descriptive procedure was adopted in representing results as frequency and percent of total infestation .

CHAPTER FOUR

RESULTS

The black backed jackal in Kuku was proved to be infected with six internal parasites Sp. [Tables 1,2,]. The highest prevalence was for Toxoscaris 25% and 40% of the total eggs recovered for direct smear and floatation method respectively, and consist Toxoplasma and Giardia in direct smear only Toxoscaris constituted the highest infestation rate of the total for both methods as 35.5%. Generally the prevalence rate could be arranged in descending **order** : Toxoscaris, Coccidia , Echinococcus, Taenia ,Trichuns , Giardia ,Toxoplasma and Ascaris as being the least table

Table1: Helminth parasitic ova recovered in direct smear method:

Method	Sp.	Frequency	%
Direct smear	Toxoscaris	4	25
	Echinococcus	6	37.3
	Coccidia	2	12.5
	Gardia	1	6.25
	Toxoplasma	1	6.25
	Trichris	1	6.25
	Teania	1	6.25
Total		16	100

Table 2 : Helminth parasitic ova recovered in floatation method

Method	Sp.	Frequency	%
Floatation	Toxoscaris	7	46.66
	Coccidia	5	33.33
	Giardia	0	0
	Toxoplasma	0	0
	Teania	1	6.66
	Trichuris	1	6.66
	Ascaris	1	6.66
Total		15	100%

Table 3 :

Total number of ova recovered as % for the two methods:

Sp.	Frequency	%
Toxoscaris	11	35.33
Echinococcus	6	19.79
Coccidia	7	22.58
Giardia	1	3.22
Toxoplasma	1	3.22
Teaenia	2	6.45
Trichris	2	6.45
Scaris	1	3.22
Total	31	10%

CHAPTER FIVE

D ISCUSSION

The present study constituted a preliminary surveillance for prevalence of intestinal parasites in the jackal *Canis mesomelas* of Kuku Zoo. The highest prevalence rate was observed for *Toxoscaris* sp. (35.33 % of the total recovery). Adeniyi et al., (2015), have reported the prevalence of *Toxoscaris* sp. at a lower level (17%) in carnivores of a west Nigerian Zoo. The infection with tapeworms (in the present study), showed a higher prevalence rate. This might be due to the fact that he tested three carnivore species which was expected to reveal a different result from that of testing only one species. The infestation with protozoan species were 45.16% of the total recovered parasitic ova which exceeded the prevalence rate of *Toxoscaris* sp. infection, but comparison here wouldn't be feasible, because you couldn't compare a single worm with 6 worms. The results of the present study agreed with results reported by other workers, of the opinion that parasitic diseases are common to zoo carnivores in countries of warm tropical climate due to the factors that favor the development of parasites such as high temperature, and humidity. Direct smear and floatation methods revealed the recovery of similar species of helminth parasitic ova. These methods were complimentary, therefore the use of both methods was to confirm the results.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

It has been shown that the black backed jackal was infected by some internal parasitism. The prevalence of helminthic infection in the jackal was in the order of *Toxocaris* sp. with the highest level (**38.67%**); followed by *Coccidia* (**28.58%**); *Echinococcus* (**19.35%**); and *Taenia* (**6.45%**). *Giardia*, *Toxoplasma*, *Trichuris* and *Ascaris* showed the lowest level of prevalence (**3.22%**) for each.

The result obtained by either direct smear or floatation methods were the same.

6.2 RECOMMENDATIONS

There are other carnivorous animal species in Kuku Zoo which might be infected with helminthes parasites. It is therefore we recommended that:

1-surveillance for internal parasites, using the same methods, of helminthes ova recovery for the lion, hyenas to form a complete picture of parasitic infestation in The Carnivores

2-Such faecal examination should be done routinely to make sure of parasitic picture in the carnivores of Kuku Zoo.

3-The results, which should include the parasite of other captive animal species in the Zoo should be reported the veterinary supervisor for treatment

.4- Animal attendants should be advised to follow the hygienic procedures.

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PlateNO(1):TrichrisSp.

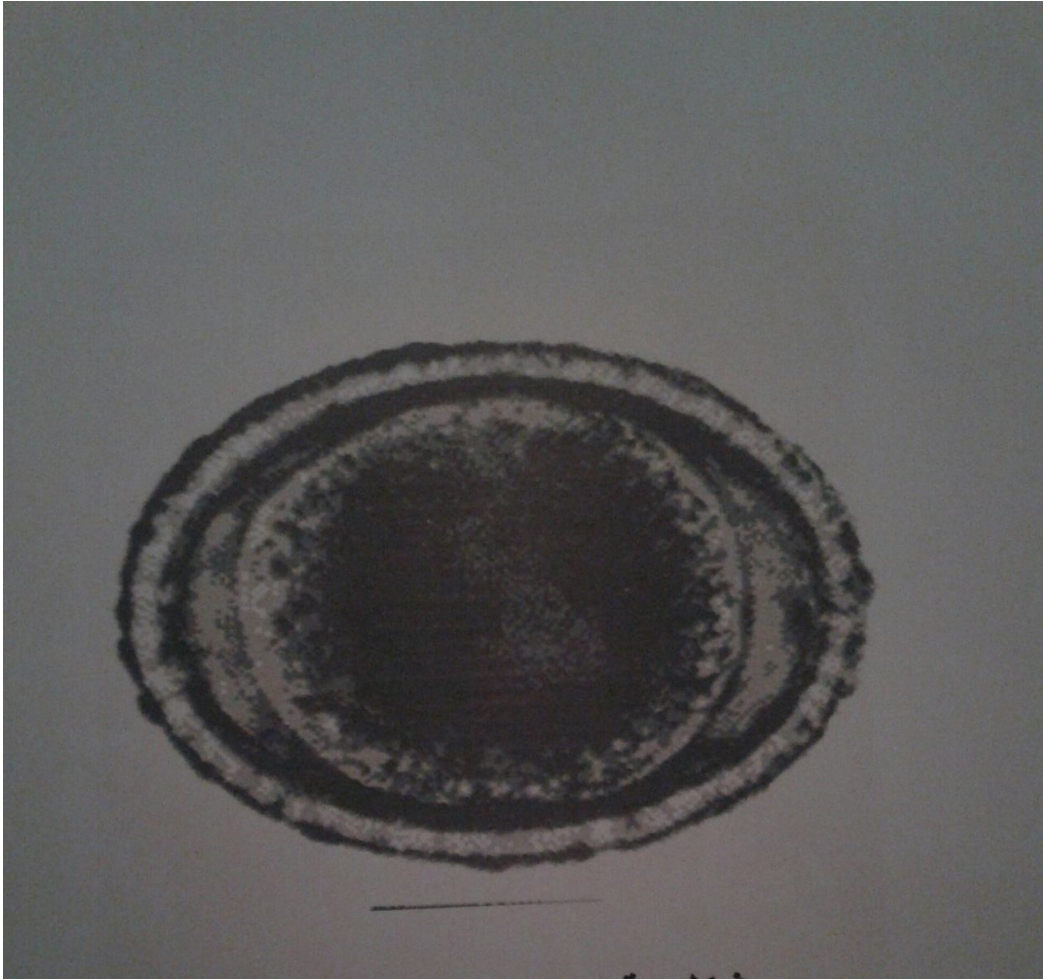


Plate No(2)Toxoscaris Sp.



Plate No (3): Echinococcus Sp.



Plate No(4): **Taenia Spp.**



Plate No (5) Giardia Spp.