

## **Prevalence of Gastrointestinal Parasites of Hunting Dogs in Maiduguri, Borno state, Nigeria**

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**Abstract:** This study was geared towards investigating the prevalence of gastrointestinal parasites of hunting dogs in Maiduguri, Borno state, Nigeria. A total of 250 fecal samples were collected per rectum. The parasites were determined using formol ether and floatation concentration methods. An overall prevalence of 38% for gastrointestinal infection was recorded. The prevalence was higher in young 39(48.1%) than adults 56(33.1%). The prevalence in relation to sex shows that males had a higher prevalence 42(40.8%) than the females 56(33.1%). The prevalence of infection according to sex and age was statistically not significant ( $p < 0.05$ ). This study provides evidence that gastrointestinal parasitic infection are prevalent in hunting dogs in the study area with some of the infections being zoonotic a public health risk to man.

**Keywords:** Borno state, Gastrointestinal, Hunting dogs, Nigeria, Prevalence.

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### **I. Introduction**

Dogs are the most successful canids adapted to human habitation worldwide [1]. Recent genetic fossil and DNA evidence shows that dogs were early as 100,000 years ago [2]. The intelligence of these animals has been explain by man, and this has made dogs useful to man for various activities, which includes hunting, retrieving, herding, rescue operations, tracking and guidance [3]. Dogs are also considered as loyal friends and compatriots to man [4]. Despite the substantial benefits derived from keeping dog. Dogs also act as reservoir for a large number of parasitic zoonoses such as toxocariosis and ancylostomosis especially in developing countries and communities that are socio-economically disadvantaged [5].

The common council signs and symptoms of gastrointestinal parasite infection in dogs include nausea, vomiting, fever, weightloss, anaemia, dull hair coat and sudden death [6]. With increasing number of security and hunting dogs in Maiduguri there is more contact between dogs and people and exposing humans to zoonotic parasites. The transmission of these parasites could be by direct contact with dog and indirectly with the dog excretions and secretions [7]. Despite the extensive work carried on intestinal parasites of dogs in various parts of the country especially in Maiduguri, there is paucity of information on the prevalence of gastrointestinal parasites in hunting dogs in Maiduguri, Borno state, Nigeria. Thus this study was undertaken in the study area.

### **II. Materials And Methods**

#### **Study Area**

This study was carried out in Maiduguri, the capital and largest urban city of Borno state, in the north eastern part of Nigeria. It is cosmopolitan in nature, situated at an elevation of 354 meters above sea level, located between latitudes 11° and 14°N and longitudes 10° and 14°E, within the conventional Sahel zone and has a total land mass of 50,778 square kilometers [8]. It has a population density 1,738 people per square kilometers, and a total population of 521,492[9]. It is bordered by the Republic of Niger to the north, Cameroon republic to the east and to the northeast by Chad Republic, within the country its neighbouring states are Adamawa to the south, Yobe to the west and Gombe to the southwest. The temperature ranges from 35-40° C for the most parts of the year with 2 distinct seasons, a rainy season with a mean annual rainfall of 647mm from July to October and a prolonged dry season for the rest of the year [10]. The state derives great economic activity from its rich livestock and fishery production [9].

#### **Sample Size Estimation.**

The sample size was determined using formular of thrustfield [11]. Using a previous prevalence of 13.8% [12] and the calculated sample size was 183 samples for more precision 250 fecal samples were collected from hunting dogs.

### **Sample Collection**

Faecal samples were collected from the rectum of dogs using protective disposable gloves at various locations within Maiduguri between May to July 2016. The samples were put into universal bottles carefully labelled indicating sex and age which were transported in an ice pack to the Veterinary Microbiology and Parasitology laboratory of the faculty of veterinary medicine, university of Maiduguri for processing. Prior to faecal collection, animals were identified, restraint and the perineum thoroughly prepared by cleaning with water to prevent contamination. Simple random sampling technique was employed.

### **Sample Processing and Faecal Examination**

Faecal samples were processed and screened using two methods, the formol ether concentration and the sodium chloride flotation technique [13], [14].

### **Microscope Examination**

Identification of parasite eggs was done in accordance to keys of Soulsby [13].

### **Statistical Analysis**

All data generated during sample collection and laboratory examination of samples were recorded. Prevalence was calculated as  $p = d/n(\%)$ , where  $p$  = prevalence,  $d$  = number infected and  $n$  = number examined [11]. Chi-square was used to compare the prevalence of intestinal parasites between young and adults as well as male and female using Graphpad Instat [15].

## **III. Results**

The prevalence of intestinal parasites of hunting dogs according to sex in Maiduguri, Borno state, Nigeria is presented in table 1. Out of the total 250 faecal samples examined, 95(38%) were positive, however out of the 250 faecal samples 103 were males while 147 were females. A higher prevalence rate was recorded in males 42(40.8%) compared to females 53(36.1%). There was no statistical variation in the prevalence rate between sexes ( $p > 0.05$ ).

Table 2 shows the prevalence of intestinal parasites in hunting dogs according to age in Maiduguri, Borno state, Nigeria. Out of the 250 faecal samples examined, 81 were young while 169 were adults. A higher prevalence was recorded in young 39(48.1%) as to adults 56(33.1%). There was no statistical variation in the prevalence rate between sexes ( $p > 0.05$ ).

Table 3 shows the prevalence of various intestinal parasites of hunting dogs in Maiduguri, Borno state. Out the 95 positive samples, *Ancylostoma* spp, *Toxocara* spp, *Diphylidium* spp, *Isospora* spp and *Taenia* spp were detected recording prevalence rate of 52(54.8%), 14(14.7%), 12(12.6%), 10(10.5%) and 7(7.3%) respectively with *Ancylostoma* recording the highest prevalence rate.

## **IV. Discussion**

This study revealed an overall prevalence of 38%, which is lower compared to the report of Umoh and Asake, [16] who reported a prevalence of 83% for Zaria area, so also are Olufemi and Babode [17] and Mahmud et al. [18] who reported prevalence of 86.9% and 72.5% in Calabar and Sokoto state, Nigeria. However it is closely related to the report of Kamani et al. [19] who reported a prevalence of 37% in Vom, Nigeria.

The intestinal parasites identified in the study include *Ancylostoma* spp, *Toxocara* spp, *Diphylidium* spp., *Isospora* spp., and *Taenia* spp. The most frequently observed intestinal parasites in the study was *Ancylostoma* spp 52 (54.8%) followed by *Toxocara* spp, *Diphylidium* spp, *Isospora* spp and *Taenia* spp with 14 (14.7), 12 (12.6) 10 (10.5%) and 7 (7.3%) respectively. The most commonly encountered parasites in this study was *Ancylostoma* spp (54.8%), which is in agreement with other research findings in Nigeria [20], [21], and [5] and other parts of the world [22], [23] and [24]. Difference in frequency of gastrointestinal helminth infection between countries is possible due to differences in climatic factors required for the biology of the parasites, veterinary facilities and public awareness to take care of dogs. [25], [26].

A higher prevalence rate was observed in males (40.8%) compared to females (36.1%) in the study, this could be attributed to the fact that male dogs tend to travel long distances to search for females partners during breeding season. So also was higher prevalence in puppies (48.1%) than adults (33.1%). The high prevalence observed for puppies was in accordance with the findings by other workers. [27], [28], [7] and [29]. This could be due to the fact that most adults are carriers shedding infective eggs after acquiring immunity from previous exposure. There is also possibility of transplacental or transcolostral transmission of helminthes (Soulsby, 1982). Most helminthes diagnosed in this study (*Ancylostoma* spp, *Toxocara* spp and *Diphylidium* spp) are potential zoonoses with severe consequences in man especially children [30].

## V. Conclusion

The intestinal parasites detected in the study include; *Ancylostoma* spp, *Toxocara* spp, *Diphylidium* spp., *Isospora* spp., and *Taenia* spp with *Ancylostoma* spp having the highest prevalence rate. Infection rate was higher in males than females so also was it higher in young than adult dogs.

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**Table 1:** Prevalence of Gastrointestinal Parasites of Hunting Dogs according to Sex in Maiduguri, Borno State, Nigeria.

Sex	No Examined	% Number of Positive
Male	103	42 (40.8) <sup>a</sup>
Female	147	53 (36.1) <sup>a</sup>
Total	250	95 (38.0)

Numbers with same superscript in 3<sup>rd</sup> column did not differ significantly (P>0.05): chi-square.

**Table 2:** Prevalence of Gastrointestinal Parasites of Hunting Dogs according to Age in Maiduguri, Borno State, Nigeria.

Age	No Examined	No of Positive (%)
Young (< 1 year)	81	39 (48.1) <sup>a</sup>
Adult (> 1 year)	169	56 (33.1) <sup>a</sup>
Total	250	95 (38.0)

Numbers with same superscript in 3<sup>rd</sup> column did not differ significantly (P>0.05): chi-square.

**Table 3:** Prevalence of Various Gastrointestinal Parasites of Hunting Dogs in Maiduguri, Borno State, Nigeria.

Parasites	No. Positive(%)
<i>Ancylostoma</i> spp.	52 (54.8)
<i>Toxocara</i> spp.	14 (14.7)
<i>Diphylidium</i> spp.	12 (12.6)
<i>Isospora</i> spp.	10 (10.5)
<i>Taenia</i> spp.	7 (7.3)
Total	95 (100)