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Prevalence of Gastro Intestinal Nematodes of Camel Slaughtered at Akaki Abattoir, Addis Ababa, Ethiopia

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Abstract: A cross sectional study was conducted from November 2013 to April 2014 in Akaki Abattoir, Addis Ababa, Ethiopia to determine the prevalence of Gastrointestinal Nematodes based on Coprological examination and to assess the effect of risk factors for Gastrointestinal Nematodes in Camels. Coprological examination was conducted using flotation technique revealed out of total 384 faecal samples examined 213 were positive for Gastrointestinal Nematode with over all prevalence 55.5%. The most common Nematodes encountered were *Strongyle eggs* (48.7%) followed by *Trichuris* species (3.9%) and mixed infections (2.9%). Statistical analysis of host factors such as sex, age and origin with the prevalence of Gastrointestinal Nematode infection indicated no significant association ($P>0.05$), where as there were a significant variation ($P<0.05$) of Gastrointestinal Nematodes infections between different body condition of camels. The present study showed that the Gastrointestinal Nematodes are an important health problem that affecting the well being and productivity of the camels. More emphasis should be given to integrated approaches of control of Gastrointestinal nematodes of camel.

Key words: Gastro Intestinal Nematodes · Camels · Prevalence · Addis Ababa · Ethiopia

INTRODUCTION

Ethiopia is a country with huge livestock population in Africa. The livestock resource contributes about 30-35% of agricultural gross domestic product and more than 85% of farm cash income and also it provides draught power for cultivation, the house hold meat and milk and its major source of cash and store of wealth for the rural population [1]. The Camels (camels dromedaries), one humped camel, is an important livestock species uniquely adapted to hot arid environment [2]. Camels are a sub set of huge livestock resources in Ethiopia which the population estimated to be over one million, the arid and semi arid areas of the country that constitute more than 60% of the total area and home of millions pastoral and agro pastoral communities [3]. The Easter and Southern part of the country namely, Afar, Somalia and Borena are the major areas were camel husbandry is widely practiced. In this area, the livelihood of pastoral communities is certainly ensured by dromedaries [4] and Camel is the most efficient domesticated animal used for transport, milk and meat and has great ability to perform in hostile environment [5].

Numerous of parasites infected camels, many of them are responsible for enteric infection [6]. Helminthic infections of camelids Gastrointestinal (GI) tract are classified into two groups: common and occasional. A number of helminthes are camelids specific, but some are also common to other hosts, especially domestic ruminants and wild animals [7]. Among the

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Nematodes, some appear to be practically specific to the dromedary. Camel specific nematodes are included; *Haemonchus longisipes, Nematodirus Mauritanicus, Nematodirus dromedarii* but most of camel Nematodes are also common to Sheep and Goats, like *Trichostrongylus prololurus, Tichostronglus vitrinus, Ostertagia mongolica, Nematodirus spathiger, Oesophagostomum venulosum* [8].

There are a variety of lesser Nematodes that plague Camels; among these are Tapeworms and the parasite *camelostrongylu*s, named after the camels themselves. They also inhabit the camel's intestines and can cause diarrhea. These cysts occur in the liver and lungs, grow slowly and if left unchecked can cause pressure on the organs that gradually increases causing injury from the inside [9].

Gastrointestinal parasites, may assume much more significant role in camel husbandry because Parasites not only reduce the productivity and performance of camels but also predispose to other Infectious diseases. Knowledge on camel husbandry management and parasitic diseases control is still very unreliable and insufficient [10]. The same in Ethiopia, researches that have been conducted on camel GIT nematodes prevalence are very limited.

Therefore the main objectives of the present study were to determine the prevalence of gastrointestinal nematodes of camel slaughtered in Akaki abattoir, Addis Ababa and to identify the risk factors for camel GI Nematode infection.

MATERIALS AND METODS

Study Area: The study was conducted at Addis Ababa, Akaki Abattoir. Addis Ababa is located at 9.03° North latitude and 38.8° East longitudes with an average altitude of 2400 m above sea level. Addis Ababa covers about 54,000 hector of land with an average population of more than 3 million. It has an average temperature during winter 6°C minimum and 23 °C maximum and during summer 10°C minimum and 24°C maximum with an annual temperature of 15.9°C. It also receives an annual rain fall of 1089 mm or 91 mm per month with 60.1% annual relative humidity which ranges from 49% in February to 82% in July [11]. Although the camel meat is not popular in Addis Ababa, the Somali community and some other Muslim communities who live in the city are the main consumer of the camel meat from this abattoir. As a result the Akaki abattoir usually slaughters an average of 8-10 camels per day.

Study Population: The study was conducted on 384 apparently healthy slaughtered one humped camels (Camelus dromedaries) brought from various camel raring pastoral areas of the country namely, Borena, Methara and Kereyu.

Study Design: A cross sectional study was conducted from November 2013 to April 2014 in Akaki abattoir, Addis Ababa to determine the prevalence rate and risk factor of the Gastro Intestinal Nematodes of camel. Samples were collected randomly and each examined animals were registered in prepared data collecting format.

Sample Size and Sampling Technique: To determine the sample size, an expected prevalence of 50% was taken into consideration since there is no research work on GI Nematode parasites of camel in the area. The desired sample size for the study was calculated using the formula given by Thrusfield [12] with 95% confidence interval and 5% absolute precision. Therefore, by substituting the values of the variables in the formula the sample size was determined to be 384.

Data Collected and Method of Collection: Faecal sample were collected and data of sex, age, body condition and origin of the animal were collected using sampling format. Faecal sample were collected from the rectum of the animal using a plastic glove and then taken to Addis Ababa University, Veterinary parasitological laboratory with in sampling bottle under ice box. During sampling date, origin, sex and animal code were labeled. Samples were preserved using 10% formalin or inside +4 °C refrigerator for examination.

Coprological Examination: Investigation was carried out through laboratory examination of collected samples. The collected faecal samples were tested by using faecal flotation techniques. Every sample was examined.

Data Analysis: Data of the coprological examination were entered in a Microsoft excel spread sheet and summarized. Then analyses were done by using SPSS version 17 software of the computer programmed for the statistical analysis. The chi-square test ($x^{2)}$ was used

to asses and association of the frequency of GI Nematode parasites with different risk factors. Prevalence was calculated by dividing the number of positive animals by the total animals examined then multiplied by 100.

RESULT

Out of the total of 384 fecal samples collected and examined, 213 were positive for Gastrointestinal Nematodes with the overall prevalence of (55.5%). The prevalence of GI Nematode in different origin is shown (Table 1) and the higher prevalence was shown in those camel originated from Borena (60.4%) and lowest prevalence shown in camels originated from Kereyu (50.8%). However, the differences were not statistically significant (P> 0.05).

In this study, assessment was made to see the effect of sex on disease prevalence. The prevalence of Gastrointestinal Nematode in relation to sex, 64.7% in male and 55.04 in female were observed (Table 2). However, there was no statistical significant difference between the prevalence of female and male camel (P>0.05).

The prevalence of gastrointestinal nematode in different body condition scores of the study animals was also presented in (Table 3) and statistically significant (p<0,05). The study showed that highest prevalence of the parasites was in poor body conditioned camels (68.75%) followed by moderate (53.8%) and in good (26.8%) body conditioned camel.

Study was also conducted to see the influence of age on the prevalence of GI nematode with respect to age and raveled that there was no statistically significant

Table 1: Prevalence of GI Nematode based on origin

Origin	No of animals examined	No of positive animals	Prevalence (%)	Chi-square	P-value
Borena	212	128	60.4	4.964	0.096
Methara	107	52	48.6		
Kereyu	65	33	50.8		
Total	384	213	55.5		

Table 2: Prevalence of GI Nematode based on sex

Sex	N° of animals examined	N° of positive animals	Prevalence (%)	Chi-square	P-value
Male	17	11	64.7		
Female	367	202	55.04	0.614	0.433
Total	384	213	55.5		

Table 3: Nematode based on body condition score

Body Condition Score	N° of examined animas	N° of positive animals	Prevalence (%)	Chi-square	P-value
Poor	144	99	68.75		
Medium	184	99	53.8		
Good	56	15	26.8	29.142	0.000
Total	384	213	55.5		

Table 4: Prevalence of GI Nematode based on age

Age	N° of animals examined	N° of positive animals	Prevalence (%)	Chi-square	P-value
5-10	42	29	69.05		
>10	342	184	53.8	3.520	0.061
Total	384	213	55.5		

Table 5: Prevalence of GI Nematode

Parasite	No of parasite Identified	Prevalence (%)	Chi-square	P-value
Strongyle eggs	87	48.7		
Trichuris spp	15	3.9		
Mixed	11	2.9	3.840	0.000
Total	213	55.5		

association (p>0.05) between those age gropes. Between the age of groups 69.05% in 5-10 years old and 53.8% in greater than 10 years old was observed in this study.

The result of this study also identified the GI nematodes present in camel shown in Table 5. From the total of 384 camel examined 55.5% were found positive for GI Nematode.Of the GI Nematode,the prevalence of *strongyle, trichuris* and mixed parasitism both (*strongyle* and *trichuris*) was 48.7%,3.9% and 2.9% respectively.

DISCUSSION

The study was conducted from November 2013 to April 2014 in Addis Ababa, Akaki abattoir to determine the prevalence and risk factors of Gastro intestinal Nematodes in camels. During the study period a total of 384 fecal samples were collected for coprological examinations and analyzed in laboratory. During this study, the overall prevalence of 55.5% (213) camel was positive for eggs of Gastrontestinal Nematode. This finding has lower prevalence rate as compared to by Borji *et al*. [10] in Iran,75.1%, Bekele [13] in Ethiopia, 75%,Ukashatu *et al*. [14] in Nigeria, 77.8% and higher than Elawad *et al.* [15]in Saudi Arabia and Anwar and Kiahn [16] in Pakistan. In general this study reveals a relatively low prevalence rate than the previous works. The difference in sampling period; awareness of the people about the parasites and improvement of veterinary service may play a role for this variation.

Origin of the animals was compared and there was no statistically significant difference between them (P>0.05). However, the highest prevalence was observed in Borena (60.4%) followed by Methara (48.6%) and the lowest in Kereyu (50.8%). The reason might be associated with the time of sampling period.

The result of this study also showed that there was no statistically significant difference in the prevalence of GI Nematode in relation to sex (P>0.05).Even though the number of males slaughtered were lower than females, but male (64.7%) camels were found to be harboring by the parasite more than the female (55.04%) camels. But this result is not in agreement with Bekele [13], study on Gastrointestinal Helminths of dromedary (*Camelus dromedarius*) in semi-arid lands of Eastern Ethiopia, reported significantly higher prevalence in female (77.6%) than male (64.8%) camels and Swai *et al.* [17], study on intestinal parasitic infection of camel in Tanzania, reported 68.1% in female and 46.9% in male. Generally the prevalence of parasites is higher in Female camels than male counterparts. This may be due to the physiological peculiarities of the female camels, which usually constitute stress factors thus reducing their immunity to infections [18].

The prevalence of Gastrointestinal Nematode infection was higher in poor body conditioned animals (68.75%) than medium (53.8) and good (26.8%) and the difference was statistically significant (p<0.05). This is in agreement with Swai *et al*. [17] higher prevalence in poor body conditioned (83.3%) followed by medium body conditioned (62.7%) and good body conditioned (61.2%) camels. Generally poorly nourished animals appear to be less competent in getting rid of infection although it is unusual for well feed animals to succumb the disease in right environmental conditions [19].

In the current study the overall prevalence was higher in camels between 5-10 years old than camels greater than 10 years old. There was no statistically significant difference between the different age groups of camels (P>0.05) with a prevalence rate of 69.05% and 53.8% in 5-10 and greater than10 years old respectively. Swai *et al.* [17] also reported higher prevalence in 6-10 years old (70%) and then camels greater than10 years old (60.5%).

Among the different Gastrointestinal Nematodes, the most prevalent Nematodes were *strongyle* (48.7 %.).But this is not in agreement with Ukashatu *et al.* [14] and Bamayi *et al.* [20] reported 87.3% and 92.4%, respectively. The present study also showed that, trichuris (3.9%) was prevalent next to *Strongyle,* but Ukashatu *et al.* [14] and Mohamed *et al*. [21] reported 4.3% and 6.67% respectively. Mixed parasitism (2.9%) also encountered in the present study but it is not in agreement with Swai *et al*. [17] recorded (35.5%). But the high prevalence of helminthes reported in this study was due to the fact that the study was carried out during the rainy season.

CONCLUSION

The result of the present study showed that Gastro intestinal Nematodes were prevalent (55.5%) in dromedary camels of Akaki abattoir, Addis Ababa. From this result Gastro Intestinal Nematodes are an important health problem in the study area by affecting the well being and productivity of camels. Infestation rate of Gastrointestinal Nematode in poor body conditioned camel was significantly higher and the predominant parasites in the study area were *strongyle* followed by *trichuris* and mixed parasitic infestation.

Recommendations: Based on the above conclusion the following recommendations are forwarded. Awareness creation on the camels owner should be given to prevent nematode infections, strategic dewarming should be implemented to reduce the exposure and the study indicated presence of gastro intestinal parasites at different level of prevalence: however, it didn't indicate the effect of these parasites on their health and production therefore; further studies should be conducted to determine the pathological importance and impact of parasitic infections.

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Conflicts of Interest: All the authors would like to declare that they do not have any conflicts of interest.

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