

Prevalence of Gastrointestinal Parasites and their Impact in Sheep in Riyom Local Government Area of Plateau State

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ABSTRACT

This study examined the prevalence of gastrointestinal (GI) parasites of small ruminants with a focus on sheep in Riyom local government area of Plateau state, Nigeria. About two hundred (200) fecal samples were randomly collected from sheep from two (2) districts in the study location which are Jal and Riyom districts. From the 200 fecal samples analyzed using simple floatation and sedimentation techniques to examine for the presence of GI parasites; 87 were from rams and 113 from ewes, 100 were obtained from Jal and 100 from Riyom districts respectively. The data were statistically analyzed using Chi-square (χ^2) and p value ≤ 0.05 was considered significant. 128 samples were positive for gastrointestinal parasitic infections in the examined sheep, with an overall prevalence of 64%. The results showed eleven (11) species of GI parasites identified in the study area namely; *Eimera spp.* 73 (40.6%), *Strongyloide* 16 (8.9%), *Oesophagostomum* 35 (19.4%), *Trichostrongylus* 25 (13.9%), *Fasciolasp* 11 (6.1%), *Bunostomum spp.* 5 (2.5%), *Haemonchus spp.* 9 (5%), *paramphistomum* 1 (0.5%), *Neosascaris* 1 (0.5%), *Dicrocoelium* 3 (1.7%), *Avitellina spp* 1 (0.5%). The level of eggs/oocyst per gram of feces between sexes group there showed no statistical significance ($p=0.478$) but a higher prevalence was found in ewes, 73 (64.6%) than the rams, 55 (63.2%). Also, adult sheep, 102 (66.7%) showed no significance ($p=0.107$) in prevalence when compared to young ones 26 (55.3%). The infection level was statistically significant ($p=0.001$) between the two (2) areas of study, Riyom district and Jal district, with values of 51.0% and 77.0% respectively. GI parasites are endemic among sheep in the study area, knowledge on these parasites and related epidemiological parameter is important for outlining fruitful control strategies against GI parasites.

Keywords: Gastrointestinal-parasite; Prevalence; Riyom

INTRODUCTION

Gastrointestinal parasites are usually classified into nematodes, trematodes and cestode which are the three major types of parasitic helminthes of economic importance in sheep production [1]. Nematodes causes the most pathologies and production loss in sheep [2]. Moreover, studies have shown that some of sheep gastrointestinal parasites are of public health importance and they were indicted in zoonotic transmission to human either by direct contact with sheep feces or indirectly through consumption of contaminated water or food [3]. Majority of farmers in Nigeria raise their livestock under extensive or semi-intensive production system as an addition to

main agriculture activities [4]. Most of these non-nomadic farmers buy their stock from the Fulani nomads who actually keep livestock as the main activity for sustenance and income generation. With this cycle both endo and ecto parasitism control becomes critical if economic benefits are to be generated from livestock production [5]. In the tropics the warm and humid climatic condition, the region provide favorable environment for development of worm eggs to infective larvae, thus apart from nutritional problems helminthosis is a limiting factors in the improvement of livestock due to production losses, increase cost of management and treatment and even mortality in severe cases [6]. While among flukes, liver flukes, particularly,

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Fasciola spp. was the major threat for sheep and goat production [7]. Also, tiny liver flukes such as *Dicrocoelium spp.* and rumen flukes (*Paramphistomum spp.*) were comparatively less important for sheep because only few sporadic losses had been caused by them [8]. Clinical and sub clinical signs of the disease, such as diarrhea, mortalities affect mainly young animals, anorexia, emaciation and poor reproductive performance and even death [9].

STUDY LOCATION

The research was conducted in Riyom local Government area in Plateau State, Nigeria. Riyom is endowed with a land area of 807 square kilometers (km²), the area is divided into two, Jal and Riyom district with a population of 134,557 at the 2006 census and located between latitude 9°38'N, longitude 8.460°E and the altitude ranges from around 1200 m-1829 m above sea level, which is predominantly Berom. The LGA has boundaries with Kaduna and Nasarawa State.

MATERIALS AND METHODS

Saturated sodium chloride salt (NaCl), distilled water, applicator stick, universal bottle, polythene bags, labeling sheet, slides, hand gloves, masking tape, saturated salt solution, beaker, cover slips, universal bottles, spatula sieve, microscope, fecal samples, refrigerator, sheep, flask or coolers, ice packs and marks.

Study design

Sampling was carried out using simple random sampling method. A total of 200 sheep were randomly selected from two districts of Riyom Local government area of Plateau State.

Sample collection and handling

A total of 200 sheep were used for the research work. About 10 g of fecal sample was collected directly from the rectum using disposable hand gloves and freshly fecal samples obtained were place in a sample container label and carried in a flask (cooler) with ice packs then taken to parasitology laboratory of the Federal College of Animal Health And Production Technology, Vom as soon as possible for analyses.

Sample processing

Fecal sample obtained were examined using saturated sodium chloride floatation and sedimentation techniques while eggs and oocytes were identified using the light microscope at X40 objective [10].

Fecal sample

The fecal samples were examined, the present of helminthes eggs using the floatation technique and sedimentation technique as described [11,12].

DATA ANALYSIS AND RESULTS

The data was analyzed using chi square (chi x²) with p values equal to or less than (p ≥ 0.05) regarded as significant and the Graph Pad prism version 4.0 window, was used to analyzed the

distribution of gastrointestinal parasites (Tables 1-3) (Figures 1 and 2).

Table 1: Prevalence of gastrointestinal parasites showing relation in sex.

Sex	Number Examined	Number Positive	Prevalence (%)	p Value
Male	87	55	63.2	0.478
Female	113	73	64.6	
Total	200	128	64	

Table 2: Prevalence of gastrointestinal parasites in sheep with relation in age.

Age	Number Examined	Number Positive	Prevalence (%)	p Value
Young	47	26	55.3	0.107
Adult	157	102	66.6	
Total	200	128	64	

Table 3: Prevalence of gastrointestinal parasites showing relation with location.

Location	Number Examined	Number Positive	Prevalence (%)	p Value
Riyom district	100	51	51	0.001
Jal district	100	77	77	
Total	200	128	64	

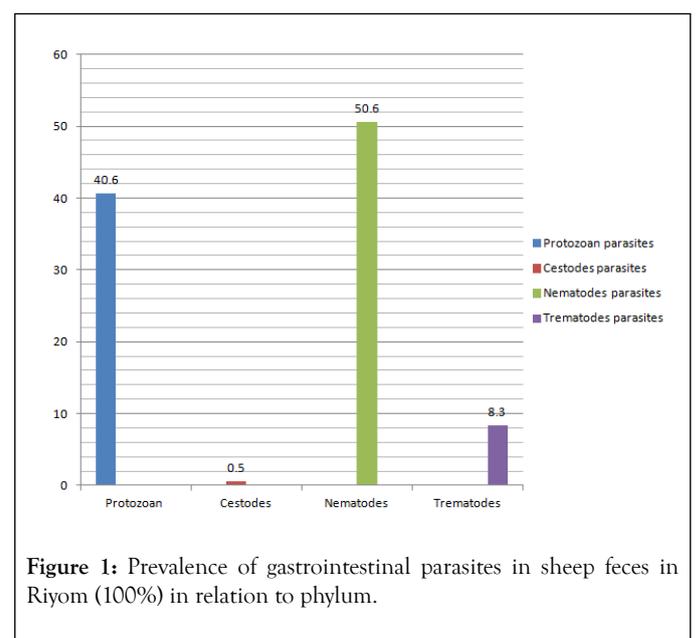
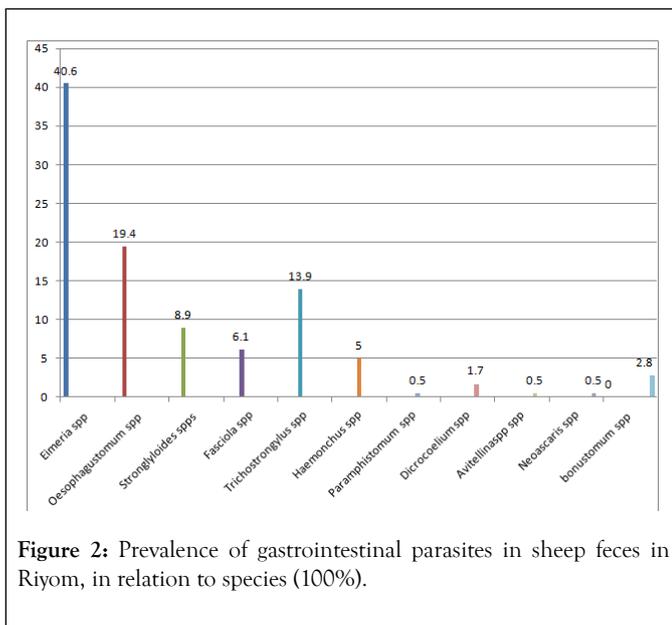


Figure 1: Prevalence of gastrointestinal parasites in sheep feces in Riyom (100%) in relation to phylum.



DISCUSSION

Out of 200 fecal samples of sheep examined, 128 were infested with various types of GI parasites the result of the research clearly showed a high prevalence of gastrointestinal (GI) parasites in sheep in Riyom LGA with an overall prevalence of 64%. This result is in consonance with the reports of in Jammu province who reported 67.2% sheep were infested with parasites [13]. According to reports about 58.7% and 53.3% of sheep were infested with single or multiple GI parasites, respectively [13,14]. GI parasites was prevalence in sheep with Nematodes having 50.6%, Cestodes 0.5%, Trematode 8.3%, whereas protozoa was more frequent in sheep with 40.6% (Figure 1 above).

The prevalence of gastrointestinal parasites by sex is shown in Table 1. Male sheep 55 (63.2%) and female sheep 73 (64.6%) were infested with one or more GI tract parasites. Although there was no statistically significant ($p=0.478$) and ($p>0.05$) just like authors had found before showing no significant difference ($p<0.05$) in the prevalence of GI tract parasites between sex, while found significant difference ($p<0.05$) in the prevalence of GI tract parasites between sex [14,15].

Among the different age group, there no significant difference in the overall prevalence of GI parasites. However, the prevalence of GI parasites was higher in adults with 102 (66.7%) compared to young with 26 (55.3). This result agreed with the report of who report that higher infection in adult (100%) compared to young sheep (76.1%) in Mymensingh, Bangladesh [16]. However, higher prevalence of infection in adult might be due to compromised body defence as they do not developed immunity due to repeated natural infection. Higher prevalence in the young could be attributed to under developed immune system and susceptibility to the infection [17].

Table 3 presented high prevalence of GI parasite in sheep with location. It showed significant difference ($p=0.001$) on the prevalence of GI parasite due to location, with the highest prevalence of GI parasite observed in location in JAL district

77.0% and Riyom district 55.0%. Geographical location and climate conditions of the experimental area Riyom L.G.A might be responsible for this variation [18-21].

Figure 2 above show the prevalence of infection with different GI parasites identified, namely, *Strongyloides* spp. (8.9%), *Oesophagostomum* spp. (19.4%), *Trichostrongylus* spp. (13.9%), *Haemonchus* (5%), *Bunostomum* spp. (2.8%), *Neoscaris* (0.5%), *Fasciola* spp. (6.1%), *Dicrocoelium* spp. (1.7%), *Paramphistomum* spp. (0.5%). *Avitellina* spp. eggs were the only cestodes found in 0.5% and *Eimeria* spp. was also the only protozoa parasites found in 40.6% of examined samples respectively. Higher parasitic load was detected for *Eimeria* spp., *Oesophagostomum*, *Trichostrongylus* spp. and *Strongyloides* spp. whereas low parasitic load was prevalence in *Dicrocoelium* spp., *Paramphistomum* spp., *Fasciola* spp., *Haemonchus*, *Bunostomum*, *Avitellinaspp* and *Neoscaris* [22-25].

CONCLUSION

The result of the study clearly showed that most of the sheep (small ruminants), kept in the research study area are infected with gastrointestinal parasites. The owners or farmers may not have noticed the effects because of the subclinical or chronic nature of the infection, which often do not result in mortality. However, their effects is usually manifested in production losses in the form of impairment of productive potential such as decreased growth rate in the lambs, late maturity, weight loss and increased susceptibility to other disease. Therefore, there is need for prevention and control programs against these parasites of sheep in the study area of Riyom. These when carried out will improve the production potential of these animals and the economic well-being of the farmers and country at large.

RECOMMENDATION

- More studies on gastrointestinal parasites in Riyom LGA should be carried out.
- Preventive and control measure should be considered in the research study area to reduce the problem of gastrointestinal parasites by embarking on a proper strategic deworming program and good management practices.
- Awareness and enlightenment program to educate sheep farmers should be instituted by the local government authority.

CONFLICT OF INTEREST

The authors affirm that there is no conflict of interest.

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