Prevalence of Gastro-intestinal Parasites in Small Ruminants slaughtered at a Selected Slaughter Slab in Ado Ekiti, Southwest Nigeria

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Abstract

This study was carried out to determine the prevalence of gastrointestinal parasites in small ruminants (sheep and goats) slaughtered at Atikankan slaughter slab, Ado Ekiti. Faecal samples collected directly from the rectum of 108 slaughtered animals (sheep and goat) were sampled between May and July, 2015. Faecal floatation and sedimentation techniques were employed on faecal samples. The results reveal that 69(63.9%) animals were found to be parasitized by gastrointestinal parasites. Four genera of GIT parasites were identified, *Strongylessp*, *Strongyloidespapillosus*, Monieziasp, Coccidia sp. with prevalence of 37%, 30%, 19%, and 5.5%, respectively. Strongyles species had the highest prevalence among the GIT parasites while *Moniezia species* had the lowest. In GIT infections the females were the most parasitized. Statistical analyses (P > 0.05) indicated a relationship between sex and infection of animals. The study revealed the existence of GIT parasites in small ruminants' slaughtered Atikankan slab in Ado Ekiti, southwestern part of Nigeria.

Keywords: Gastrointestinal parasites, Ado Ekiti, Prevalence, ruminant

Introduction

Small ruminants form an important economic and ecological niche in agricultural systems of rural communities across developing countries. This is because small ruminants make a very valuable contribution to household income, especially to the poor in the rural arears (Oluwatayo and Oluwatayo, 2012). The growing demand to meet the protein need of the populace has placed small ruminants in vantage position as an alternative to beef. Sheep and goats contribute in no small measure to meat production in Nigeria (Adewuyi and Adu, 1983)Small ruminants especially goats is an essential component of traditional ceremonies like marriages, naming ceremonies in traditional African societies. The ability of small ruminants to convert the indigestible cellulose to animal protein added to the advantage of being able to raise them within a small space has also encourage their husbandry (Saiful Islam and Taimur, 2008). It has been estimated that goats and sheep provide up to 30% of the meat and 15% of the milk supplies in sub-Saharan Africa (Bikila*et al.,* 2013).In recent times, the benefits derived from small ruminants were notably below expectation owning to low productivity(Jatau*et al.,* 2011).One important culprit of this low productivity is gastrointestinal parasitic infections,which has constituted a major drawback to the production of small ruminants in the tropics and especially in Africa through reduction of weight gain, reduced nutrient utilization, lower meat, milk and wool production, involuntary culling and cost of treatment and mortality (Kumsa and Wosseene, 2006).Estimated losses as a result of intestinal helminthoses of sheep and goat in Nigeria were put at 60million dollars annually (Akerejola*et al.,* 1979).In Nigeria, Small ruminants are often reared extensively; this gives rise to scavenging thereby predisposing such animal to parasitic infections (Adediran*et al.,* 2014). Prevalence of gastrointestinal parasitic infestation in small ruminants may be influenced by several host factors such as age, sex, body weight, plain of nutrition, immune status and breed of animal *(Bhat et al.,* 2012),as well as environmental factors of temperature, rainfall, humidity andhusbandrypractices.In order to improve small ruminant production, epidemiology of parasitic infection needs to be fully understood to enable appropriate control measure to be instituted. However, several studies have been

conducted, to determine the prevalence of gastrointestinal parasites in small ruminants in Nigeria but little is known of the prevalence in the study area. This study therefore aims at determining the prevalence, species of gastrointestinal parasites, in slaughtered small ruminants in Ado Ekiti, Ekiti State, Nigeria.

Materials and Methods

Study Area

The study was conducted in Ado Ekiti. Ado Ekiti, is the capital of Ekiti State located on Latitude 07°14'North of the equator and Longitude 05°25' East of the Greenwich Meridian. It comprises 64 communities with a population of 308,621, according to 2006 population census (www.ekitistate.gov.ng/2015). It enjoys two seasons in the year, the raining season (April - October) and the dry season (November - March).It is bounded on the North and West by Ifelodun/Irepodun Local Government and East and South by Gbonyin, Ikere and Ekiti South West Local Government. Its longest North-South extent is 16km and the longest East- West stretch is about 20km (www.ekitistate.gov.ng/2015).

Study Site

The study was conducted at Atikankan Slaughter Slab in Ado Ekiti. The slaughter slab is located down the Erekesan Market, along Ogbon Ado Street, in Ado Ekiti. Atikankan Slaughter Slab is the only small ruminant abattoir in Ado Ekiti. The butchers here are made up predominantly of the Hausa origin of Nigeria followed by few butchers of the Yoruba ethnic group. Animals slaughtered from which samples were taken were West African Dwarf (WAD) goats and sheep and the Red Sokoto goats and are majorly from the northern part of the country with fewer numbers from neighboring towns and villages from Ekiti. Slaughter commences from 7.30 am every day. Prior to commencement of the study, an awareness visit was made to seek the cooperation of the butchers. During the study, the slab was visited twice a week between the hours of 7:00AM and 9:00AM each day.

Collection of Faecal Sample

Faecal Samples were collected from the rectum of each slaughtered animal by the use of disposable hand gloves and placed in a clean polythene bag. The samples were properly labeled and transported immediately to the laboratory on ice pack for examination of parasite eggs using floatation and sedimentation method.

Processing of Faecal Sample:

(i) Floatation Method

Saturated sodium chloride solution was used with a specific gravity of 1.20. Three grams of feacal materials were weighed into a container and 30mls of saturated sodium chloride added. The feaces and floatation fluid was thoroughly mixed with a spatula. The suspension was then poured through a tea strainer into a test tube supported by a stand and the test tube was gently topped up with suspension that left a convex meniscus at the top. A cover slip was then carefully placed at the top and the test tube allowed tostand for 20 minutes. The cover slip was again carefully lifted and placed on a clean slide. The slide was examined under the microscope at X10 and

Table 1: Prevalence of gastrointestinal parasi slaughtered sheep and goats

X40 magnification (Urquhart, 1997).

(ii) Sedimentation

Three grams of feaces was weighed into a container and 50mls of tap water added and thoroughly mixed with a spatula. The suspension was filtered using a tea strainer into another container. The filtered material was then poured into a test tube and allowed to sediment for about 30 minutes and the supernatants were removed. The sediment was re-suspended in 5mls of water and allowed to stand for another 5minutes while the supernatant was discarded. A drop of methylene blue was added to the sediment in a stand. The dyes stained the feacal particles deep blue with trematodes eggs which was left unstained. Sediments were examined under the light microscope at X10 and X40 magnification for presence of trematodes ova (Urquhart, 1997).

Identification of parasite

Parasites were identified according to

morphological characteristics of the shape, colour and size of eggs using the Thienpoint Key (Thienpoint*et al.,* 1979).

Data Analysis

Data obtained were analyzed using simple percentages and Chi (x) square was used to determine the relationship between infection and sex of animals (P > 0.05) using SAS statistical package (SAS, 1988)

Result

Out of the total of 108 faecal samples collected, 96(63.9%) were positive for gastrointestinal parasites. The WAD sheep had the highest prevalence 19(86.4%) followed by Red Sokoto Goat 11(64.7%) and WAD goat is the least 39(56.5%) as indicated in Table 1. Out of the 96(63.9%) positive small ruminants for gastrointestinal infection, the females had a prevalence of 65(65.0%) while male had a prevalence of 4(50.0%) (Table 2). The gastrointestinal parasites observed in this study were *Strongyles*p, *Strongyloidespapillosus, Moniezia* sp., and coccidian oocyst. *Strongyles*p has the highest prevalence 40(37.0%), followed by *Strongylodespapillosus* 33(30.6%), Coccidia oocyst 21(19.4%) and *Moniezia* sp. 6 (5.6%) is the least

Table 1: Prevalence of gastrointestinal parasites in relation to breed of slaughtered sheep and goats

Breed	No. Examined	No. Positive (%)
Red Sokoto Goat	17	11(64.7)
WAD Goat	69	39(56.5)
WAD Sheep	22	19(86.4)
Total	108	69(63.9)

WAD = West African Dwarf

Table 2: Prevalence of gastrointestinal parasites in relation to sex of slaughtered sheep and goats

Sex	No. Examined	No. Positive (%)
Male	8	4(50.0)
Female	100	65(65.0)
Total	108	69(63.9%)

Table3: Distribution of gastrointestinal parasite in slaughtered Sheep and Goat

Parasite	No. Examined	No. Positive (%)
Strongylesp	108	40(37.0)
S.papilosus	108	33(30.6)
Coccidiasp	108	21(19.4)
Monieziasp	108	6(5.6)

Discussion

The 63.9% prevalence level for gastrointestinal parasite recorded in the study is in agreement with previous studies (Nwigw*eet al.,* 2013, Adejimi*et* al., 2015) both recorded a prevalence level of 69.0% and 73.5%, respectively. From the investigation, *Strongyloidespapillosus, Strongylesp, Moniezas*p and *coccidia* sp. were the gastrointestinal parasites observed in the study. This agreed with the report of Gadahi*et al.* (2009) and Nwigw*eet al.* (2013) who noted that the most pathogenic helminths andprotozoan parasites in the intestinal tract of small ruminants are *Strongyle* sp., *Strongyloidespapillosus, Moniezas*p.and*Coccidia* sp. The high incidence of infection recorded in this study may be attributed to season. April to June is the peak of the raining season in the study area, which provides favourable agro-climatic conditions like heavy rainfall, thick vegetation, high humidity and high temperature which support the development of the pre-parasitic stages of the parasites in the host environment as well as the abundance of the intermediate hosts (Kucha *et al.,* 2011)The high prevalence of coccidian parasite in the animals might be as a result of untidy environment in which the animals are kept and overcrowding which present a conducive atmosphere for multiplication of this

parasite. The low prevalence of gastrointestinal parasite in WAD goat, compared with Red Sokoto goats and WAD sheep, could be as result of breed resistance to parasitic infections. WAD goats has beenfound to be endowed with the capacity to resist trypanosome infection and nematode infection more effectively than any known breed of goat (Cheijina and Behnke, 2012) The high prevalence of gastrointestinal parasitic infections in the female agreed with the result of (Dagnachew*et al*., 2011; Nwigwe*etal.,* 2013 and Adediran*et al.,* 2014). Females have been found to be more susceptible to parasitic infection than the male, due to exposure to stress under different conditions like pregnancy and lactation (Soulsby, 1982).

Conclusion and Recommendation

This study has shown that small ruminants slaughtered at Ado Ekiti harboured *Strongyloidespapillosus, Strongyle* sp, *Moniezas*p and *coccidia* sp. as the major gastrointestinal parasites.

There is a need to carry out awareness education amongst the butchers and farmers on the risk associated with gastrointestinal parasite infection of small ruminants. Control measures such as biosecurity measures, strategic anthelmintic administration and zero grazing should be encouraged.

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References

Adediran, O.A., Adebiyi, A.I., Uwalaka, E. C.(2014).Distribution of Gastrointestinal Helminthoses of small Ruminants in Ibadan, South-Western Nigeria: Role of Traditional Rearing System. *Nat. Sci.* 12(9):25-29

Adejimi, O.O., Adejimi, J.O., Falohun, O.O., Adejoro O.R, Dauda, W.J (2015). Prevalence of gastrointestinal parasites of goats in Ibadan, Southwest, Nigeria. *World Journal of Agricultural Research,* 3(2): 49 – 51

Adewuyi, A.A., and Adu, I.F. (1983). Seasonal Variation of Some Level of Blood Components of some indigenous and Cross breed of Sheep. *Tropical Animal Production*, 9: 223 -230

Akerejola O. O., Schillhorn Van Veen T. W., Njoku C. O. (1979): Ovine and Caprine diseases in Nigeria: A review of economic loss. *Bul. Anim. Hlth. Prod. Afr.,* 27(1), 65-69.

Bikila, E. Yeshitla, A., Worku, T., Teka,F., and Benti, D.(2013). Epidemiology of Gastrointestinal Parasitees of Small Ruminants in Geshi District, Southwest Ethiopia. *Advance in Biological Research,* 7(5):169-174

Chiejina, S.N. and Behnke, J.M. (2011). The unique resistance and resilience of the Nigerian Dwarf goat to gastrointestinal nematode infections. Parasites and Vectors, 4(12):

Dagnachew, S., Amamute, A. and Temesgen, W. (2011). Epidemiology of gastrointestinal helminthiasis of small ruminants in selected sites of North Gondar zone, Northwest Ethiopia. Ethiop. Vet. J., 15: 57-68.

Gadahi, J. A. Arsyed, M. J. Ali, Q Javaid, S B, and Shah, S. I. (2009). Prevalence of gastrointestinal of sheep and goat in and around Rawalpindi and Islamabad. *Pakistan vet. World*, 2(2):51-53

Jatau, I.D., Abdulganiyu, A., LawalA.L., Okubanjo, O.O. and Yusuf, K.H. (2011). Gastrointestinal and haemoparasitism of sheep and goats at slaughter in Kano, Northern-Nigeria. *Sokoto Journal of veterinary Sciences,* 9(1):7-11.

Kucha, J. A., Chisti, M. Z., Zaki, M.M., Rasool, S. A.D.M., Ahmad, J. and Tak, H. (2011). Some Epidemiological Aspects of Fascioliasis among Cattle of Ladakh. *Global Veterinaria*, 7: 342 - 346

Kumsa, B and Wossene, A (2006) Abomasal nematodes of small ruminants of Ogaden region, eastern Ethiopia: Prevalence, worm burden and species composition. *Revue Méd. Vet.*, 157 (12):27 -32

Nwigwe, J. O., Njoku, O.O., Odikamnoro. O. O. and Uhio, A. C. (2013).Comparative

study of intestinal helminth and protozoa of cattle and goats in Abakaliki metropolis of Ebonyi State, Nigeria. *Advances in Applied Science Research*, 4(2):223-227.

Oluwatayo, I. B. and Oluwatayo, T. B. (2012) Small Ruminants as a Source of financial Security: A case Study of women in Rural Southwest Nigeria. IMTFI Working Paper 2012 -2

Saiful Islam, K.B.M., and Taimur, M.J.F.A. (2008). Helminthic and Protozoan internal Parasitic infection in free Ranging Small Ruminants of Bangladesh. *Slov. Vet. Res*., 45(2): 67-72

SAS User's Guide Statistics. SAS Inc. Cary, North Carolina 1998 Edition.

Soulsby, E.J.L. *Helminths, Arthropods and Protozoa of domesticated animals*. Bailliere, Tindall and Cassel, London 1982; 809

Thienpoint, D., Rochete, F., Vanparijis, O. F. (1979). *Diagnosing Helminthosis through Coprophagical examination*. Jansssen Research Foundation Beerse, Bengium.

Urquhart, G.M., Armour J., Duncan J.L. Dunn, A.M. and Jennings, F.W. (1997). Veterinary Parasitology 2nd edition Balckwell Science.