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STUDIES ON THE GUT PARASITES OF SMALL RUMINANTS REARED IN SOME SELECTED FARMS IN IDO LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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ABSTRACT

This study investigated the prevalence of gut parasites of small ruminants in four farms (2 sheep farms; A and B and 2 goat farms; C and D) in Ido Local Government Area of Oyo state, Nigeria over a period of 4 months (March, 2014 - June, 2014). Faecal samples were obtained from 76 apparently healthy animals (33 sheep and 43 goats) using standard field and laboratory techniques. 64 animals representing a prevalence of 84.21% were infested with gut parasites. The prevalence rates according to the farms were 18.42%, 21.05%, 23.68% and 21.05% for farms A, B, C and D respectively. Five genera of gut parasites were encountered in the study area with *Strongyle* spp having the highest prevalence of 39.47%. *Eimeria* spp, *Paramphistomum* spp, *Stongyloides* spp *and Trichuris* spp had prevalence rates of 19.74%, 13.16%, 10.53% and 1.32% respectively. Sex prevalence in male and female sheep were 22.37% and 17.11% respectively, while in goats they were 25.0% and 19.74% for males and females respectively. These were statistically significant ($P<0.05$). Age prevalence was highest in sheep aged 2-3 years (23.68%) and least in sheep above 3 years old (2.63%). However, goats above 3 years had the highest prevalence (21.05%) while goats less than 2 years old had the least prevalence (3.95%). The breed prevalence of infestation in sheep showed 26.32%, 9.21% and 3.94% for OUDA, Yankasa and WAD respectively, while breed prevalence in goats showed 38.16%, 2.63% and 3.94% for Red Sokoto, WAD and OUDA respectively. There was no significant difference however ($P>0.05$) in age and breed prevalence of infestation in both sheep and goat in this study. Gut parasite infestations seem to be a problem in small ruminants since egg per gram (EPG) counts was found to range from 0 - 700. This study has shown that more and prompt attention is needed in the control of gut parasitic infestations in the study area. Small ruminant farmers are encouraged to control gut parasite infestations in their sheep and goats by anthelmintic treatment.

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1. INTRODUCTION

Small ruminants are very important in human nutrition and in both urban and rural economies and have the potential of serving as tools for poverty reduction in Nigeria. They play a vital role in rural economies through provision of meat, milk, household income, manure and skin. Sheep and goat contribute a large proportion of readily available meat in the diet of pastoralists [1]. They have been estimated to provide up to 30% of meat and 15% of milk [2]. Although small ruminants represent great resources for the nations, the

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productivity per animal is low. Medium and large scale farmers interested in commercial small ruminant farming in Nigeria is managed either in intensive or semi intensive conditions. This system of rearing inherently incurs different diseases which in turn reduces profitability of farming by treatment costs, reducing productivity and by mortality [3]. Parasitic diseases, coupled with inadequate management hamper the productive husbandry of these animals [4]. Gastrointestinal parasite infestations are worldwide problems for both small and large scale farmers but their impact is greater in sub -Saharan Africa due to the availability of a wide range of agro-ecological factors suitable for diversified host and parasite species [4]. Gastrointestinal parasites are known to be widespread in Nigeria [3] and limit ruminant production in many parts of the country [5]. The direct losses caused by these parasites are typified by hyper-acuteness and death, pre-mature slaughter, rejection of some parts at meat inspection while indirect losses include the reduction in productive potential such as decreased growth rate, weight loss, diarrhoea, anorexia, and sometimes anaemia. These constitute a major impediment to efficient and profitable livestock production [6]. Considering these situations, the study was undertaken to investigate the prevalence of gastro-intestinal parasitism in small ruminants in Ido Local Government Area, Oyo state, Nigeria. It is hoped that the study would be useful for scientists, extension service providers and veterinary practitioners for designing appropriate control measures for such parasites of sheep and goats.

2. MATERIALS AND METHODS

2.1. The Study Area

The study was carried out at four selected farms in Iddo Local Government Area of Oyo State which is located at 3^{o} $4^{/}$ $0^{//}$ E and 7^{o} $35^{/}$ $0^{//}$ N. The study was carried out between March and June, 2014. Sheep and goats from four farms designated A, B, C and D were sampled in the named study area.

Faecal sample collection and laboratory analysis

A total of 76 apparently healthy animals of both sexes, aged 6 months and above were randomly selected for the study, out of which 33 were sheep (17 males and 16 females) and 43 were goats (28 males and 15 females). The sheep comprised 3 breeds (OUDA, Yankassa and WAD) and goats comprised 3 breeds also (Red Sokoto, WAD and OUDA). Faecal samples were aseptically collected from the rectum of each animal. The faeces from each animal were put into sample bottle which was then labelled and put in an ice pack. All samples were taken to the Veterinary Parasitology Laboratory of the Faculty of Veterinary Medicine, University of Ibadan for analysis. Gut parasites were identified using the procedures of floatation and sedimentation while McMaster method was used for ova/oocysts count as prescribed by [7]. These preparations were viewed under the microscope using the X40 objective lens. A minimum of 50 fields were searched per slide in each of the procedures adopted. Ova/oocysts were identified based on structural and morphometric criteria according to [8].

2.2. Statistical analysis

Descriptive and inferential statistics were employed in analysing the data in the study. The prevalence rates among breeds, age and sex of the animals were expressed as percentage of the total number of animals sampled. Chi square test was used to evaluate relationship between the prevalence of infestation and the breed and sex of the animals studied. A P-value of $P<0.05$ was considered significant. Inferential statistics was done using SPSS version 17.

3. RESULTS AND DISCUSSIONS

Out of 76 animals examined, 64 were infested with gut parasites with an overall prevalence of 84.20%. Out of 33 sheep examined 30 were infested showing a prevalence rate of 39.47% while out of 43 goats examined 34 were infested with a prevalence rate of 44.73%. The prevalence rates according to the farms were 18.42%, 21.05%, 23.68% and 21.05% for A, B, C and D respectively (Table 1).

Five genera of gut parasites were identified, namely; *Strongyle* spp, *Strongyloides* spp, *Eimeria* spp, *Paramphistomium* spp and *Trichuris* spp, showing prevalence rates of 39.47%, 10.53%, 19.74%, 13.16% and 1.32% respectively. *Strongyle* spp accounted for 10.53%, 9.21%, 13.16% and 6.58% prevalence in farms A, B, C and D respectively. *Strongyloides* spp had prevalences of 3.95%, 5.26%, 0.00% and 1.32% respectively in farms A, B, C and D. The prevalence of *Eimeria* spp were 3.95%, 2.63%, 5.26% and 7.90% in farms A, B, C and D respectively. *Paramphistomium* spp showed prevalence of 0.00%, 3.95%, 3.95% and 5.26% respectively in farms A, B, C and D. *Trichuris* spp was isolated in only farm C with a prevalence rate of 1.32% (Table 2).

All the 17 male sheep examined were infested, with a prevalence rate of 22.37%. Out of 16 female sheep examined, 13 were infested with a prevalence rate of 17.11%. All the 15 female goat examined were infested, with a prevalence rate of 19.74%, while 19 male goats out of 28 examined were infested showing a prevalence rate of 25.00% (Table 3). This result showed that there was a significant difference (X^2 =10.59, df= 1, P<0.05) in the prevalence of infestation between sexes in the study area. 10 sheep less than 2 years old were examined of which all were infested with a prevalence rate of 13.16%. Out of 21 sheep between the ages of 2 to 3 years, 18 were infested with a prevalence rate of 23.68%. 2 sheep above 3 years of age were examined and both were infested with a prevalence rate of 2.63%. All 3 goats less than 2 years of age examined were infested with a prevalence rate of 3.95%. Out of 21 goats between the ages of 2 to 3 years, 15 were infested with a prevalence rate of 19.74%. 19 goats above 3 years of age were examined, out of which 16 were infested with a prevalence rate of 21.05% (Table 3). There was no significant difference (X^2 = 3.474, df = 2, P>0.05) between gut parasite infestation and age in the study area.

Breed prevalence showed that 20 out of 22 OUDA sheep examined were infested with a prevalence rate of 26.32%, while all 7 Yankasa sheep examined were infested with a prevalence rate of 9.21% and 3 out of 4 WAD sheep examined were infested with a prevalence rate of 3.94% (Table 4). There was no significant relationship (X^2 = 1.957, df =2, P>0.05) between gut parasite and breeds of sheep in the study area. Out of 37 Red Sokoto goat examined, 29 were infested with a prevalence rate of 38.16%, while 2 out of 3 WAD goats examined were infested with a prevalence rate of 2.63% and all 3 OUDA goats examined were infested with a prevalence rate of 3.94% (Table 5). There was no significant difference (X^2 = 1.0842, df =2, P>0.05) between gut parasite and breeds of goat in the study area. The average ova/oocyst per gram of faeces of the isolated parasites in the study area were $7x10^2$, $5x10^2$, $3x10^2$, $1x10^2$ and $1x10^2$ for *Strongyle* spp., *Paramphistomium* spp., *Eimeria* spp., *Strongyloides* spp. and *Trichuris* spp. respectively (Table 6).

Table 1 Prevalence of gut parasites in the study area

		SHEEP		**GOATS**		**TOTAL**	
Farms	Total No. of Animals	Number Examined (%)	Number Positive (%)	Number Examined (%)	Number Positive (%)	Number Examined (%)	Number Positive (%)
A	23	15(65.23)	14(18.42)	-	-	15	14(18.42)
B	42	18(42.86)	16(21.05)	-	-	18	16(21.05)
C	55	-	-	23(41.82)	18(23.68)	23	18(23.68)
D	37	-	-	20(50.05)	16(21.05)	20	16(21.05)
Total	157	33(50.77)	30(39.47)	43(46.74)	34(44.73)	76	64(84.20)

Table 2 Genera prevalence of gut parasites in the study area

	SHEEP		**GOAT**		**TOTAL**
	A	**B**	**C**	**D**	
Genera(ova/cyst)	Number Positive (%)	Number Positive (%)	Number Positive (%)	Number Positive (%)	Number Positive (%)
Strongyle spp.	8(10.53)	7(9.21)	10(13.16)	5(6.58)	30(39.47)
Strongyloides spp.	3(3.95)	4(5.26)	0.(0.00)	1(1.32)	8(10.53)
Eimeria spp.	3(3.95)	2(2.63)	4(5.26)	6(7.90)	15(19.74)
Paramphistomium spp.	0(0.00)	3(3.95)	3(3.95)	4(5.26)	10(13.16)
Trichuris spp	0(0.00)	0(0.00)	1(1.32)	0(0.00)	1(1.32)
Total	14(18.42)	16(21.05)	18(23.68)	16(21.05)	64(84.21)

Table 3 Sex and age distribution of gut parasites of sheep in the study area

	SHEEP					
		FEMALE (EWE)		**MALE (RAM)**		
Age (Years)	Total No. of sheep examined (%)	Number Examined (%)	Number Positive (%)	Number Examined (%)	Number Positive (%)	Total Number Positive(%)
<2	10 (13.16)	6 (7.89)	6 (7.89)	4 (5.26)	4 (5.26)	10 (13.16)
2 – 3	21 (27.63)	8 (10.53)	5 (6.58)	13 (17.11)	13 (17.11)	18 (23.68)
>3	2 (2.63)	2 (2.63)	2 (2.63)	0	0	2(2.63)
Total	33 (43.42)	16(21.05)	13(17.11)	17 (22.37)	17 (22.37)	30 (39.47)

Table 3 Cont'd: Sex and age distribution of gut parasites of goats in the study area

	GOAT					
		FEMALE (EWE)		**MALE (RAM)**		
Age (Years)	Total No. of sheep examined (%)	Number Examined (%)	Number Positive (%)	Number Examined (%)	Number Positive (%)	Total Number Positive(%)
<2	3 (3.95)	3 (3.95)	3 (3.95)	0	0	3. (3.95)
2 – 3	21 (27.63)	10 (13.16)	10(13.16)	11 (14.47)	5 (6.58)	15 (19.74)
>3	19 (25.0)	2 (2.63)	2 (2.63)	17 (22.37)	14(18.42)	16 (21.05)
Total	43 (56.58)	15 (19.74)	15 (19.74)	28 (36.84)	19 (25.0)	34 (44.74)

Table 4 Relationship between sex and breed of sheep in the study area

		MALE(RAM)		**FEMALE (EWE)**		
BREEDS	Total No. of sheep examined (%)	Number Examined(%)	Number Positive (%)	Number Examined (%)	Number Positive (%)	Total Number Positive %)
OUDA	22(28.95)	10(13.16)	10(13.16)	12(15.79)	10(13.16)	20(26.32)
YANK ASA	7(9.21)	6(7.90)	6(7.90)	1(1.32)	1(1.32)	7(9.21)
WAD	4(5.26)	1(1.32)	1(1.32)	3(3.95)	2(2.63)	3(3.95)
Total	33	17 (22.37)	17(22.37)	16 (21.05)	13 (17.11)	30 (39.47)

Table 5 Association between sex and breed of goats in the study area

		MALE(BUCK)		**FEMALE (DOE)**		
BREEDS	Total No of goats Examined (%)	Number Examined (%)	Number Positive (%)	Number Examined (%)	Number Positive (%)	Total Number Positive (%)
RED SOKOTO	37(48.68)	10(13.16)	10(13.16)	27(35.53)	19(25.0)	29(38.16)
WAD	3(3.95)	2(2.63)	2(2.63)	1(1.32)	0(0.00)	2(2.63)
OUDA	3(3.95)	3(3.95)	3(3.95)	0(0.00)	0(0.00)	3(3.95)
Total	43	15 (19.74)	15 (19.74)	28 (36.84)	19 (25.0)	34 (44.73)

Table 6 Parasitic load of gut parasites in the study area

Parasites Isolated	Average egg/oocyst count per gram (EPG) of faeces
Strongyle spp.	7×10^2
Strongyloides spp.	5×10^2
Eimeria spp.	3×10^2
Paramphistomium spp.	1×10^2
Trichuris spp	1×10^2

The prevalence rate of gut parasite infestation of small ruminants obtained in this study is higher than the 17.2% reported by [9] and 38.6% reported by [10] in eastern and northern Nigeria respectively as well as the 51.9% reported by [11] in Egypt. Variations in gut parasitic infestation rates in the different ecological zones have been previously reported in Jordan [12], in Irag [13], in Turkey [14] and in Egypt [15]. The climatic variations across different geographical regions and type of husbandry practices adopted are factors that can influence survival of the parasites. This may thus account for the observed variation in the prevalence rate of gut parasitism reported by different workers. *Strongyle* was the most abundant nematode genus in the study. This is probably related to its high fecundity, which means that it is likely that the larvae are ingested in higher numbers than those of other genera [16]. Species of *Strongyle* are able to tolerate a very wide range of climatic conditions [17]. The temperature and rainfall requirements of *Strongyle* and *Paramphistomum* species are similar [18] and the 3rd-stage larvae of both develop readily at temperatures ranging from 25 to 33°C8. This explains why they were both the most prevalent genera isolated in the study area. However, the prevalence of *Paramphistomes* was lower than that reported in Pakistan [19]; this may be attributed to the difference of geographical area. Prevalence of the infection also varied between the adult (>2years) and the young sheep and goats (<2years). More adults were infected than the youngs. The variance may be as a result of method of sampling and husbandry practices. However, more adult sheep and goats were examined than the youngs. While working on gastrointestinal helminthes [10] showed that there was always a close association between age and intestinal helminthes. Infestation was higher in males than in females. This is in line with the works of [20], [10] and [21]. This could be attributed to the fact that more males than females were randomly sampled and examined. However, most of the females examined were infested. Infestation could therefore be said not to be gender related among sheep and goats sampled. Although the prevalence rates of gut parasitic infestations among the four breeds of sheep and goats sampled in the study area was not statistically different, WAD were found to be least susceptible in both sheep and goats while OUDA and Red Sokoto were the most susceptible sheep and goats respectively. This agrees with the reports of [22] in WAD goats. The high prevalences of both OUDA sheep and Red Sokoto goats may be associated with difference in sample numbers.

The EPG counts of 0 – 700 reported in this study was higher than the 0-250 in cattle but lower than the 0-6000 reported in small ruminants [23]. This could be attributed to the fact that the drier the faeces the more concentrated the parasite eggs are within the faeces [16].

In general, this study showed that gut parasite infestation is still under control. This could be due to good farming practices. However, attention should be focused on dominant genera such as *Strongyle* and *Paramphistomum* that have the potential to become problematic. It is therefore important that appropriate control and management of these parasites are practiced. To increase the productivity of

sheep and goats, control of gut parasites should be based on epidemiological observations and not rely on anthelmintics only. Alternative means of control, such as pasture management and use of medicinal plants [24] merit consideration.

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