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A Study of *Schistosoma* Parasite in Sheep in Jalingo, Taraba State, Nigeria.

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ABSTRACT

Sampled sheep populations in Jalingo, Taraba state, Nigeria were surveyed for Schistosoma parasite by examining their faecal samples. A total of two hundred and fifty (250) faecal samples were collected from sheep of both sexes and different ages in different locations in Jalingo environs and transported to Parasitology laboratory, Department of Animal Health, College of Agriculture, Science and Technology, Jalingo for analysis. Microscopic examination of the faecal samples revealed that forty five (45/250) of the samples were positive for Schistosoma spp giving an overall prevalence of 18% in the study. Results also revealed that ewes had a prevalence rate of 25/125(20%) which is higher than that of the rams 20/125 (16%). Adult sheep had a prevalence rate of 40/125 (32%) which is higher than that of young sheep which is 5/125(4%). In the study, Aunguwan gadi had the highest prevalence rate of 29/82(35.3%) when compared to Jekada fari 14/83(16.9%) and Sabon gari 2/85 (2.4%) respectively. From the recorded prevalence, Schistosoma parasite infection is moderately prevalent in the study area. Frequent extension services should be undertaken to educate farmers on the impacts of schistosoma infection on the productivity of sheep. To better understand the parasite's epidemiology and to develop effective preventive and management strategies, more research work on the prevalence of this parasite is been advocated. Implementation of appropriate control measures for the eradication of intermediate host should is also be encouraged.

Keywords: Schistosoma, trematodes, parasites, prevalence, intermediate host, metacercaria, Jalingo, Taraba, Aunguwan gadi

INTRODUCTION

Sheep in Nigeria is used mainly for meat production (Misra, 1980). Parasites can cause major production losses to sheep production if they are not diagnosed and managed properly (Alberta, 2005). Parasites are organisms that obtain their food from other living creatures. Usually, parasites are smaller than their food source and this distinguishes them from predators such as tigers, which also eat other living things (Doyle, 2003). Worms affecting sheep can be divided into three (3) categories: nematodes, or round worms, cestodes or tape worms, and trematodes or flukes (Alberta, 2005). The parasites belonging to the class trematoda are commonly known as the flukes, those living in the blood are therefore called "blood flukes", those associated with the liver and gall bladder is called liver fluke (Gunn, 2009). The schistosome parasites are elongate unisexual and dimorphic trematodes which inhabit the blood vessels of their host. The female is slender and usually longer than the male, and the female is carried in the gutter like groove, the gynaecophoric canal of the male (Soulsby, 1982). Schistosomes are dioecious (unisexual) worms which are an exception among trematodes and have an indirect life cycle, while water snails belonging to the genera *Bulinus and planorbis* acts as an intermediate host (Brown, 1980). Control measures are based on interrupting the epidemiological cycle by removing of adult parasites by chemotherapy, elimination of the intermediate hosts by molluscides, habitat modification and preventing access of definitive hosts to natural water course such as creating a barrier to prevent animals from gaining access to water contaminated by the snail vectors are very effective (Farida and Shombe, 2012). Parasitism is of supreme importance in many agro-ecological zones and still a serious threat to the livestock economy worldwide. Sheep and goats are known to suffer from various endo-parasites of which helminthes infection are of great importance (Taylor, 2007). Diseases are of importance, thus limiting factors to productivity worldwide (Ajani *et al*., 2015). *Schistosoma* causes major economic impact like production losses due to schistosomiasis resulting from mortality, delayed growth, partial liver condemnation, and poor future reproduction performance, increased susceptibility to other parasitic or bacterial diseases (Pitchford and Visser, 1998). Information on the prevalence of *schistosoma* parasite in the study area is quite limited. Therefore, this study was undertaken to determine the prevalence of *Schistosoma* parasite in sheep in Jalingo along with associated risk factors related to the parasite.

MATERIALS AND METHOD

This study was conducted in Jalingo local government area. Jalingo is one of the sixteen (16) local government areas in Taraba state. It is located along longitude 11.3N and latitude 8.95E. Jalingo is bounded by Lau local government area in the north, Yorro local government area at the south - East and Ardo-kola local government area at the southwest. Jalingo local government has annual rainfall of 1,260mm with annual temperature of 29.7°c in the rainy season while 35-45°c in dry season. The vegetation of Jalingo falls within the New Guinea ecological zone characterized by short grass interspersed with conditions which are mostly of economically value (NPC, 2006).

This was a cross sectional study. A total of two hundred and fifty (250) faecal samples of sheep were collected within Jalingo in selected farms in different locations where sheep were being raised and the laboratory experiment was conducted at the Parasitology Laboratory, Department of Animal Health Technology, College of Agriculture Science and Technology Jalingo to detect *Schistosoma* eggs using sedimentation method. Properly restrained sheep were prepared for faecal sample collection. Faeces were scooped out of the rectum after a polythene bag was worn over the hand that was then introduced into the rectum. Each recovered faecal sample taken was immediately dispensed into a universal bottle for preservation in 10% formalin. Samples taken were labelled appropriately and transported to the Parasitology Laboratory, Department of Animal Health Technology, College of Agriculture Science and Technology Jalingo for analysis in an ice packed container. The parasites eggs were examined using methods described by Hansen and Perry (1994).

DATA ANALYSIS

Data collected were subjected to statistical analysis and represented in tables. Simple percentages were used to calculate the number of positive against negative.

RESULTS

Table I. Shows the overall prevalence of *Schistosoma* parasite in sheep in Jalingo. Out of 250 samples collected from sheep in the study area and examined microscopically for the presence or absence of *Schistosoma* parasites, 45 (18%) were positive.

Table II. Shows the prevalence of *Schistosoma* parasite in sheep in Jalingo in relation to sex. 250 samples were obtained in the study area comprising of 125 samples from male and 125 from females. In rams, 20/125 (16%) samples were found to be positive and 25/125 (20%) samples were found to be positive from the ewes. Therefore, ewes have a higher prevalence when compared to the rams.

Table III. Shows the prevalence of *Schistosoma* parasite in sheep in Jalingo in relation to age. 250 samples were obtained in the study area comprising of 125 samples from adults and 125 from the young. In the samples collected from adults, 40/125 (32%) were found to be positive and 5/125 (4%) was found to be positive from the young. Adult animals therefore have a higher prevalence when compared to the young.

Table IV. Shows the prevalence of *Schistosoma* parasite in Jalingo based on location. 250 samples were obtained in the study area comprising of 85 samples from Sabon gari; 82 from Auguwan Gadi and 83 samples from Jekada fari. Results showed that 2/85 (2.40%), 29/82 (35.3%) and 14/83 (16.9%) samples were positive from Sabon gari, Anguwan Gadi and Jekada fari areas respectively. This shows that Auguwan Gadi have the highest prevalence when compared to Sabon gari and Jekada fari areas.

Table I showing the overall prevalence of *Schistosoma* parasite in sheep in Jalingo

No. of samples collected	No. of positive	Prevalence
250	45	18%

Table II showing the prevalence of *Schistosoma* parasite in sheep in Jalingo based on sex.

Sex	No. Of samples collected	No. Of positive	Prevalence
Male	125	20	16%
Female	125	25	20%
Total	**250**	**45**	**18%**

Table III showing the prevalence of *Schistosoma* parasite in sheep in Jalingo based on age

Age	No. Of samples collected	No. Of positive	Prevalence
Adult	125	40	32%
Young	125	5	4%
Total	**250**	**45**	**18%**

Table IV showing the prevalence of *Schistosoma* parasite in sheep in Jalingo based on location

Location	No. of samples collected	No. of positive	Prevalence
Sabon gari	85	2	2.4%
Aunguwan gadi	82	29	35.3%
Jekada fari	83	14	16.9%
Total	**250**	**45**	**18%**

DISCUSSION

The present study was conducted to determine the prevalence of *Schistosoma* parasites in ovine in Jalingo, Taraba state, Nigeria. The overall prevalence of *Schistosoma* parasite in the present study was found to be 18% (45/250). The present finding is higher than the recorded prevalence of 11.37% by Zangana and Aziz (2012) in Northern Iraq, 9.4% by Fentanew and Derso (2017) in Mecha district, North western Ethiopia, 5.5% by Lo and Lemma (1973) in Ethiopia, 1.7% by Ravindra *et al*., (2008), 1.7% by Ferede *et al*., (2013) and 1.5% by Moritu *et al*., (2014) respectively. However, the prevalence of the present study is lower than previous study where a prevalence of 20% was reported by Islam *et al*., (2011) in Bangladesh. The difference in prevalence between the present study and other studies might be due to difference in sample size, climatic condition (early dry season in Jalingo) during sampling period and the locations covered. Availability of stagnant water body and water for irrigation practice in Anguwan gadi area of Jalingo which favours the development and multiplication of snail intermediate host and animal management practices are key factors in relation to the recorded prevalence.

The present study recorded the prevalence in rams to be (16%) and ewes (20%) which shows that ewes had high prevalence than the rams. This recorded prevalence in relation to sex in this study is in disagreement with a study by Yirsaw and Zewdu (2016) in North western Ethiopia who recorded (9.1) in females and 16.7% in males. The difference may be due to the sample size used in this present study. The reason for higher prevalence of *Schistosoma* infection in the females in this study can be assumed to be due to genetics and difference in susceptibility due to effects of hormone. Stress from pregnancy and lactation are parameters that can suppress immune status of females and thereby increase prevalence of Schistosoma in females in relation to their male counterparts.

From the study, prevalence was higher in adults (32%) than the young (4%). This result however is not consistent with the study from Taylor *et al*., (2007) which recorded a higher prevalence in the young with less or no immunity to resist new infection as the prevalent reason; thus indicating that as the age of the animal increases, the prevalence decreases. The reason for this high prevalence in adults in this study may not be farfetched as adult animals have longer exposure to the intermediate host than young animals and consequently have high worm burden.

Based on prevalence in relation to location, Aunguwan Gadi has the highest prevalence of (35.3%) when compared to Jekada fari (16.9%) and Sabon gari (2.4%). This high prevalence in Aunguwan gadi may be due to the presence of stagnant water which supports the multiplication and development of snail intermediate host in the area. Sheep in the area are grazed along open gullies where there is a lot of stagnant water that support snail growth. Okpala (2004) had remarked that where fresh water snail vector is present, the transmission of *Schistosoma* takes place rapidly especially where there is contact between the host and snail infested water and this was the case with Aunguwan Gadi; the area with most *Schistosoma* prevalent samples in the current study.

CONCLUSION

The outcome of (18%) prevalence rate in this finding strongly suggests *Schistosoma* parasite is endemic in the study area. Further studies are needed to gather a rich data base on the parasite which will be useful in formulating cost effective and workable *Schistosoma* control measures in the area.

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CONFLICT OF INTEREST

There was no conflict of interest among the authors of this work.

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