

Identification of Intestinal Helminths from Faecal Material of Sheep (*Ovis Aries*) Slaughtered at Hadejia Abbatoir, Jigawa State

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Abstract

A total of 100 faecal samples of sheep (*Ovis aries*) consisting of 56 male and 44 female were examined. These samples were processed and screened by direct and sedimentation methods for the detection of parasite (Their ova, larval or adult form). Ova of parasites were identified through their morphological features using the standard keys. The gastrointestinal parasite encountered were *Ascaris lumbricoides* (47%), *Fasciola hepatica* (0.5%), *Strongyloides stercoralis* (2%), *Trichuris trichiura* (7%), *Enterebius vermicularis* (15%), *Paragonimus sepecies* (27.5%), and *Ancylostoma dueodenale* (1%). Sex wise number of intestinal parasites was higher in male (54%), than female (46%) ($P < 0.05$). In conclusion, the data obtained in this study suggest that the sex were important factors which influence the prevalence of gastrointestinal parasites.

Keywords: Abbatoir, Faecal material, Helminthes, Identification, Intestinal.

Introduction

Helminthiasis is a chief cause of monetary losses in ruminant's worldwide (Ferre *et al.*, 1995). Intestinal helminthes are considered as one of the utmost significant and underrated problems, which hinder sheep productivity (Perry and Randolph, 1999). In a survey, Perry *et al.* (2002) found that amongst gastrointestinal helminthes, nematode had great impact on survival and productivity of sheep in developing countries. While liver flukes, particularly, *Fasciola* species was the major threat for sheep and goat production (Hansen and Perry 1994; Urquhart *et al.*, 1996). Also, tiny liver flukes such as *Dicrocoelium* species and rumen flukes, *Paramphistomum* species were comparatively less important for sheep because only few sporadic losses had been caused by them (Urquhart *et al.*, 1996). Bansal *et al.* (2015) studied seasonal prevalence of gastrointestinal helminthes of sheep and goat in India and reported that Strongyle-type worms were the ascendant parasite amongst all three seasons with a high prevalence rate in rainy season (88.9%). They found highest prevalence of *Strongyloides* species (16.70 %) in rainy season whereas the prevalence of rumen fluke and liver fluke was highest during summer, and were 35.9% and 8.1 %, respectively. However, in Bangladesh, according to Sangma *et al.* (2012) and Mazid *et al.* (2006), about 81.1 to 94.7% helminthiasis occurred respectively in sheep under both rural and farm conditions.

Parasitism in sheep and goat is a substantial problem plaguing farmers across the nation. As gastrointestinal parasite infection is the most important limiting factor of sheep

productivity; parasitism has a highly detrimental effect on the sheep industry (Jones, 2001). Parasitic gastro-enteritis continues to pose a serious health threat and limitation to the productivity of small ruminants due to associated morbidity, mortality and cost of treatment and control measures on a clinical and sub-clinical level (Martinez- Gonzalez, *et al.*, 1998; Nwosu, *et al.*, 2007).

Losses due to intestinal parasitism can be categorized as direct or indirect. Direct losses are due to acute illness and death, forced premature slaughter and rejection of parts of the carcass at meat inspection in abattoirs. Acute parasitic conditions can be recognized and affected animals are generally treated by the farmer and thus direct losses can be avoided. In contrast, sub-clinical levels of parasitism cause indirect and more subtle losses and do not induce obvious clinical signs (Barger *et al.*, 1994).

Gastrointestinal parasitism is one of the most common infections in livestock. Clinical signs and sequel are dependent on the parasite fauna present and the intensity of infection. In sheep, these can range from subclinical weight loss to lethal pathologies such as anaemia, diarrhoea and severe protein loss (Pugh and Baird, 2012). In addition, parasitism can have indirect consequences on metabolism such as mobilisation of proteins for an immune-response, reduced feed intake due to anorexia or increased susceptibility to other pathogens (Coop and Kyriazakis, 1999; Moreau *et al.*, 2010). Since the 1960s the use of anthelmintics has become an important strategy to control nematode infections in livestock and increase their production performance (Kaplan, 2004). For example, Sanchez *et al.*, 2014 reported the results of a meta-analysis which concluded that dairy cattle gained an estimated increase in milk production of 0.35 kg/day following treatment against gastrointestinal nematodes.

Sheep are more attractive to smallholder farmers due to their ability to multiply and grow faster than cattle at a relative low cost. They provide source of income, have two parities per year, easy to handle, require small grazing area and little feeds, provide manure, require little initial capital investment, used in social functions, attain maturity age in short time, provide meat and have no traditional or religious restrictions compared to pigs (Moshi, 1994; Mtenga *et al.*, 2003; Morris, 2009). Despite their advantages, sheep production is constrained by prevalence of diseases, poor nutrition, poor marketing infrastructures and low genetic potentials.

The parasites infect the livestock which lead to serious illness that sentences the animal to reduce meat and milk production and finally lead to their death. These problems prone the conduct of this research to identify those parasites present in the animals.

Statement of Research Problem

The issues of parasites among our livestock take a very long time going through the communities, but the people take their minds out of it without knowing the consequences that follow because of their carelessness, then the issue brings the very tragic problem to

that communities. Due to this, the issue of identify different parasites infecting our livestock come from in order to solve the problem.

Objecives of the Study

1. To identify the species of intestinal helminthes infecting sheep slaughtered at Hadejia abbatoir.
2. To determine the abundance of the parasites.

Material and Methods

Study Area

Hadejia Local Government Area of Hadejia Emirate is located in the north eastern corner of Jigawa State. It lays between 9°37' E and 10° 35' E Longitude and 13°02' N Latitude. The climate of the area is wet and dry type, rainfall spread between June and September with mean Annul rainfall of 315mm. The soil of the study area is sandy in nature except in Fadama area that has clay soil (Wikipedia, 2000). River Hadejia provides water for irrigation and fish production. Most of people in the area are farmers that grow both rain fed and irrigated crops and some are animal herders. Hadejia is a town with many traders and business men and thus a large number of animals were slaughtered daily. According to Abubakar *et al.* (2016), data from the Abattoir is useful for the identification of problems and may be used to reveal the prevalence, identification, seasonal variation and economic importance of the parasites that infect the slaughtered animals.

Study Population

A total of 100 sheep were examined for the presence of parasites. The animals are both adult of both sexes. In this study a specified number of animals were used and all of them are indigenous.

Sample Collection

The study was carried out between May and June, in Hadejia Abattoir. The slaughter house was visited for two months, once in every week. This was done between 6.00 am to 10.00 am (normal period when animals are slaughtered in the area). Faecal samples were collected directly from the small intestines of one hundred (100) ruminants (56 Ram and 44 Ewe). These animals were randomly selected from the general abbatoir Hadejia. Samples were brought to the laboratory, Department of Biological Sciences, Sule Lamido University Kafin Hausa for identification of ova/eggs/larvae and adults of different intestinal helminthes.

Preparation and Laboratory Analyses of Samples

Faecal samples were collected directly from the animals' small intestine, to avoid contamination with Free-living soil nematode, and stored in the sample container. While

storing the faeces, its condition, colour, presence of blood, mucus and presence of parasites segments were noted.

Examination and Identification of Parasites

After collection, the samples were immediately examined by direct smear method and sedimentation method to detect ova or larva of helminthes. During the work, in every sample the numbers of times the individual parasites appear in the single sheep were recorded according to (Soulsby, 1982).

Direct Smear Method

A thin smear was prepared by spreading a small amount of faeces on a grease free clean slide and few drops of normal saline was added then examined under microscope with low power objectives of 10X as described by (Soulsby, 1982).

Sedimentation Method

In this method, small portion of faeces were mixed with 10-25 ml of water in test tube and centrifuged for 5 minutes. The supernatant was carefully discarded without disturbing the sediment. Finally, smear was made with a small amount of the sediment on a grease free glass slide and was examined using 10X eye-piece and 10X objective. Some samples were considered negative after examination of three slides with no eggs or larvae or adult's segment and were identified on the basis of morphological characteristics described by (Soulsby, 1982).

Results

A Monthly Distribution of the Parasites

A total of 100 sheep intestinal samples were collected at Hadejia general abattoir, Jigawa state for the period of two month between (May – June, 2019). In the total number of the sheep intestinal samples collected, 56 (56%) were ram and 44 (44%) were ewe. Among the parasite identified in the total number of the intestinal samples collected, *Ascaris lumricoides* was found with highest number of (48%), followed by *Enterobius vermicularis* with number of (15%) and then followed closely by *Paragonimus spp* eggs with number of (27.5%) (Table: 4.1). *Fasciola hepatica* was the least parasite found through the entire sampling period with lowest number of (0.5%), then followed closely by *Ancylostoma duodenale* with number of (1.2%) (Table: 4.1). The remaining parasite identified were *Taenia saginata*, *Trichuris trichura* and *Strongyloides stercoralis* with value of (9.4%), (7.7%) and (2.3%) respectively (Table: 4.1).

Table 4.1: Number of parasites identified during two months of sample collection between May and June, 2019.

Parasites	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Total	%
<i>Ascaris lumbricoides</i>	53	29	44	71	25	25	17	10	16	24	314	48.3
<i>Trichuris trichura</i>	1	-	2	-	-	8	6	15	3	15	50	7.7
<i>Strongyloides stercoralis</i>	2	-	-	-	-	7	3	-	-	3	15	2.3
<i>Fasciola hepatica</i>	-	-	3	-	-	-	-	-	-	-	3	0.5
<i>Paragonimus westermani</i>	1	-	1	2	1	2	-	-	-	-	7	10.4
<i>Entrobis vermicularis</i>	-	-	45	-	21	1	9	14	7	1	98	15.1
<i>Paragonimus spp eggs</i>	12	28	22	5	11	-	5	5	6	-	94	14.5
<i>Ancylostoma duodenale</i>	-	-	-	-	-	8	-	-	-	-	8	1.2
Total	84	70	125	94	63	51	44	44	32	43	650	100

Discussion

Rams were more infected than the ewe. This study revealed *Ascaris lumbricoides*, *trichuris trichuira* and *paragonmimus spp eggs* species as the most common parasites of sheep in the study area, and this agreed with findings of Eysker and Ogunsusi (1980) which reported the same as the most incriminated gastro-intestinal parasites of domestic ruminants. The identified species of the parasites in sheeps in this study were *Ascaris lumbricoides*, *Trichuris trichuira*, *Taenia saginata*, *Faciola hepatica*, *Strongyloides strecoralis*, *Ancylostoma duedenale*, *Paragonimus westerman* and *Paragonimus spp egg*. The various species of endoparasites recovered during present investigation have been reported by various researchers in different parts of the world such as Pedeira *et al* (2006).

The results of the present study are supported by the findings Kanyari *et al.* (2009), who found females to be more resistant to infection than males. Raza *et al.* (2007) reported the same that rams were more susceptible to gastrointestinal parasites as compared to ewe. The influence of sex on the susceptibility of animals to infections could also be attributed to genetic predisposition and differential susceptibility owing to hormonal control. Testosterone is known for its immunosuppressive activity (Seli and Arici, 2002), and this has often been invoked as the major reason for the higher susceptibility of males to wide variety of infectious diseases (Robert and Kyriazakis, 2001). The results of the present study are in

agreement with that of Gualy *et al.* (2006) and Raza *et al.* (2007) reported prevalence of gastrointestinal parasite infection of sheep higher in rams than in ewes. Several authors have documented that adult and old animals develop acquired immunity (Urquhart *et al.*, 1987) against helminthes infections as they get mature due to repeated exposure (Dagnachew *et al.*, 2011) and this will help expel the parasite before it establish itself in the Gastrointestinal Tract (Dunn, 1978; Shah-Fischer and Say, 1989).

Conclusion

In conclusion, the present study identified that many numbers of intestinal helminthes infect most of our domestic animal. Among them are *Ascaris lumbricoides*, *Trichuris trichuara*, *Fasciola hepatica*, *Strongyloides streccoralis*, *Ancylostoma duodenale*, *Paragonimus species*, and *Entrobis vermicularis*. This study revealed a high incidence of Intestinal parasites of sheep in Hadejia abattoir. It was found that Ram and Ewe sheep share some species of intestinal parasites even though the incidences vary significantly. It was also noted that Ewe acquires more resistance to common intestinal parasites than Ram does. We do believe that this study will help the researchers as well as the epidemiologist to take the necessary steps regarding the control and management of intestinal parasitic diseases of small ruminants in Hadejia since there is no report on this issue. Although this study is not sufficient and further extensive study should be carried out throughout the area, this study might serve as a baseline for further studies.

Recommendations

Based on the findings of this study, the following recommendations were made:

- In the places where those animals were raised up, the herders of the animal are advised to isolate the unhealthy animal from the healthy ones because this is the first step in avoidance of the transmitting of parasites from one animal to another.
- Animal infected with certain type of disease should be taken to veterinary for treatment.

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