Coporological Prevalence Of Gastrointestinal Parasites Of Shoats In Hulet Ejjue Enesie And Bibugne Districts Of East Gojjam Zone, Northwest Ethiopia

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Abstract: A cross-sectional study was conducted from November, 2017 to March, 2018. A total of 384 fecal samples were randomly collected directly from the rectum of individual animal. 196 from sheep and 188 from goats to determine the prevalence of various endoparasites in Hulet Ejjue Enesie and Bibugne districts of East Gojjam Zone, Northwest Ethiopia. Parasitological investigation was performed using sedimentation technique. Data were analyzed using Stata version12.0 software programs. Accordingly, an overall prevalence 44% was found positive for endoparasites. The prevalence of gastrointestinal parasites tended to be higher in sheep 60.7% than in goats 26.5%. endoparasites identified in sheep included *Haemoncus* (52%), *Coccidia* (44.3%), *Trichuris* (34.6%), *Nematodirus* (22.9%), paramphistomum 18.3% and *Fasciola* (60.7%) while only *Haemoncus* (26.5%), *Trichuris* (11.7%), *Coccidia 19.6%* and *Fasciola* (4.2%) were recorded from the fecal samples of goat. A statistically significant difference ($P < 0.05$) was found in prevalence between species.

Key words: *Endoparasites, Hulet Ejjue Enesie, Bibugne, Prevalence, Sheep, Goats*

1. Introduction

There is great variation in the prevalence and the geographic distribution of helminth infection in animals in the country, due to temperature, rainfall and the type of soil determine the occurrence of a given parasite species. Helminthosis, especially parasitic gastro-enteritis, constitutes to pose a serious health threat and a limitation to the productivity of small ruminants due to the associated morbidity, mortality, cost of treatment and control measures (Nwosu *et al*., 2007). Nematode parasites of small ruminants result in low productivity due to stunted growth, poor weight gain and poor feed utilization (Pedreira *et al*., 2006). The prevalence of gastrointestinal helminths is related to the agro-climatic conditions like quantity and quality of pasture, temperature, humidity and grazing behavior of the host (Pal and Qayyum, 1993). *Haemonchus contortus,* found in the abomasum of sheep and goats, causes blood loss resulting in decrease in erythrocytes, lymphocytes, hemoglobin, packed cell volume, body weight and wool growth (Hayat *et al*., 1996). A decrease in profitability up to 15% and weight loss up to 50% due to gastrointestinal parasites have been reported by Hussain (1985). Changes in season, prevalence and relative burden are the key factors to control the parasitic diseases effectively (Malczewski *et al*., 1996). However, in most areas of Hulet ejjue enesie and Bibugne no study has been conducted regarding the prevalence of different gastrointestinal parasites in small ruminants.

Therefore, the current study was aimed to investigate the prevalence of various endoparasites of sheep and goats in Hulet ejjue enesie and Bibugne districts.

2. Materials And Methods

2.1. Study areas

The study was conducted from November 2017 to March 2018 in Hulet Ejjue Enessie and Bibugne districts of East Gojjam Zone, northwest Ethiopia as indicated in (Figure 1). The areas were selected purposively by considering the importance of endoparasites in small ruminants. The district has highland, midland, and lowland agro-ecologies. Hulet Ejjue Enessie is located in the East latitude and longitude of 11°15'(11.25°) north 37°45'(37.75°) east. With an elevation vary from 1200 to 3500m.a.s.l. The rainfall distribution varies from year to year and across seasons. Accordingly the annual rainfall distribution varies between 1150mm to1189mm. The long rain season extends from June to September followed by a dry season October to February. The shorter rainy season lasts from March to May. The daily temperature varies from 8^0c to 30^0c with the average temperature of 22^0c. Bibugne is located in the East latitude and longitude of 11°00'0.00"N 37°34'59.99"E with an average elevation of 2,216.m.a.s.l. The daily temperature varies from 7^0c to 25^0c. Small ruminant populations are estimated at 116124 sheep, 43727 goats and 55989 sheep, 21567 goats in Hulet Ejjue

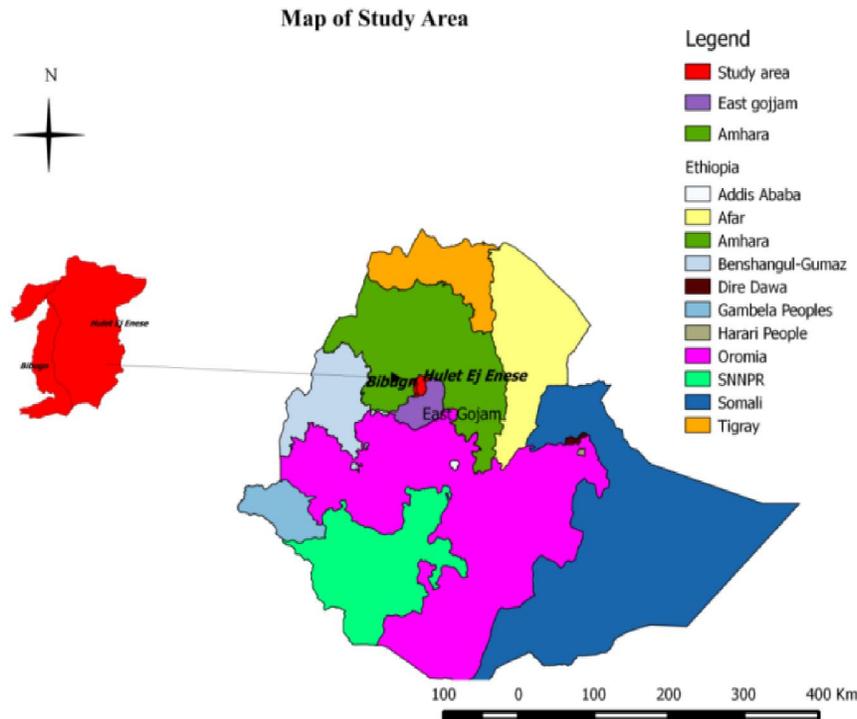Enesie and Bibugne districts respectively (EGZLDO, 2017).

Figure 1: Map of study area. Source (QGIS software version 2.8 and OCHA, 2016)

2.2 Study Animals

Indigenous sheep and goats kept under extensive management system, owned by smallholders, were used for the study.

2.3 Study Design

A cross-sectional study design was used to determine the prevalence of sheep and goats endoparasites in the study area.

2.4 Sample Size Determination

Simple random sampling method was implemented for sampling of sheep and goats. Sample size for the study was calculated using the formula given by [Thrusfield, 2005] with precision level of 5%, confidence interval of 95% and the expected prevalence of 50%, since there was no similar study done previously on the study area. Accordingly, the required sample size was 384.

$$n = 1.96^2 * Pexp(1-Pexp)/d^2$$

Where n=require sample size, Pexp=expected prevalence, CI=confidential Interval (95%), d=desired absolute precision (5%).

2.5 Sample Collection and Examination

Three hundred eighty-four faecal samples were collected from the rectum of each animal. All samples were kept in clean sampling bottles containing 10% formalin as preservative and identified appropriately. The samples were transported to the laboratory of Hulet Ejju Enesie district laboratory for coprological examination. The samples were later processed in the laboratory using the sedimentation technique. Identification of endoparasites was done using a standard microscope under ×10 objective magnification.

2.6 Data Management and Analysis

Descriptive statistics was used to analyze the sample data. Overall prevalence was calculated by dividing the number of positive animals by the total number of animals examined and times 100. Chi-square ($\div2$) test was used to asses weather there is a statistical significant difference in gastrointestinal parasite infection between species. A statistically significant association between variables was considered to exist if the calculated p-value is less than 0.05 with 95% confidence level

3. Results

Table 1. Overall Prevalence of *Haemonchus, Coccidia, Trichuris, Nematodirus, Fasciola and paramphistomum* parasites in sheep and goats.

Variable	Categories	Number Examined	Number Positive	Prevalence %	$\chi 2$	P-value
Species	Sheep	196	119	60.7	45.3316	0.000
	Goat	188	50	26.5		
Overall		384	169	44		

Table 2. Prevalence of gastrointestinal endoparasites in sheep and goats

Parasites	Variable	Categories	Number Examined	Number Positive	Prevalence (%)	$\chi 2$	P-value
Haemonchus	Species	Sheep	196	102	52	25.9789	0.000
		Goat	188	50	26.5		
Coccidia	Species	Sheep	196	87	44.3	26.7909	0.000
		Goat	188	37	19.6		
Trichuris	Species	Sheep	196	68	34.6	28.2683	0.000
		Goat	188	22	11.7		
Nematodirus	Species	Sheep	196	45	22.9	48.8929	0.000
		Goat	188	-	-		
Fasciola	Species	Sheep	196	119	60.7	138.1892	0.000
		Goat	188	8	4.2		
Paramphistomum	Species	Sheep	196	36	18.3	38.1027	0.000
		Goat	188	-			

4. Discussion

The overall prevalence of endoparasites in both sheep and goats was found to be 44%. However, the prevalence of endoparasites tended to be higher in sheep 60.7% compared to goats 26.5%. The frequency of occurrence of different species identified in sheep and goats are shown in (Table 1). A significant difference (p < 0.05) was noted regarding the prevalence of various species of parasites in sheep and goats. The prevalence of *Haemoncus* was higher 52% in sheep compared to goats 26.5%. Similarly, Trichuris, Coccidia and Fasciola were more frequently found in the fecal samples of sheep compared to goats as shown in (Table 2). On the other hand, *Nematodirus* and paramphistomum were only detected in the fecal samples of sheep and were absent in the goats as shown in (Table 2). Various species of endoparasites recovered in the present study has also been reported earlier (Asnji and Williams, 1987; Gupta et al., 1987; Guiomaraes and Walter, 1987; Njau, 1987; Uriarte and Valderrabno, 1989; Pal and Qayyum, 1993). The higher prevalence of endoparasites in sheep than goats may be attributed to a variety of factors like ground grazing habit of sheep. In addition the variation in the prevalence of endoparasites among species might be due to the fact that sheep had indiscriminate type of grazing behavior which led to a high chance of acquiring infection whereas goats were selective grazers or browsers, because of this there chance of exposure to infective stage not as higher as that of sheep. (Riche *et al.*, 1973; Suh et al., 1980; Javed et

al., 1992). *Haemonchus, coccidia and Fasciola* is an important and common nematode parasite and requires special attention for its control. It has been suggested that *Haemonchus* can acquire resistance faster than other gastrointestinal nematodes, like *Trichostrongylus*, because of its high biotic potential (Torres-Acosta *et al.*, 2003). The results of the current study show that *Haemonchus*, *Trichuris*, *Nematodirus*, *Coccidia, paramphistomum* and *Fasciola* are prevalent in the areas of Hulet ejjue Enesie and Bibugne districts. It has been reported that *Coccidia* and other gastrointestinal nematodes as mixed or single infections are the major parasitic diseases of sheep and goats in tropical and temperate climates (Faizala and Rajapakse, 2001). Deaths due to *Eimeria* species may also occur though lowered productivity due to poor growth is usually unnoticed by farmers (Faizala *et al.*, 1999). Prevailing agro-climatic conditions like overstocking of the animals, poor grazing management, irregular deworming, grazing of young and adult animals together with poorly drained land provide ideal conditions for transmission of the endoparasites to build up clinical infection of the host. The overall higher incidence of nematodes infestation in the areas surveyed could be attributed to lower immunity of hosts as a result of malnutrition. As the livestock in that area under investigation largely depended on grazing in deteriorated range-lands. It was also observed that farms in these areas lacked fences and cattle, sheep and goats used the same pasture for grazing. In conclusion, various

gastrointestinal parasites have been found in both sheep and goats. Regular control measures should be practiced to reduce the parasitic burdens in the affected areas.

5. Conclusion and Recommendations

The result of the present study indicated that endoparasites are an important parasite in sheep and goats in the study areas. Consequently species of the animals were the major risk factors for endoparasites infection in the study areas. The high prevalence of GIT found in this study could be associated to lack of awareness about the transmission and control of endoparasites. Furthermore, the extensive management systems and the tendency of farmers to graze their animals in these areas because of feed scarcity.

Therefore based on the above conclusion the following recommendations are foreword:

▪ Awareness creations to small ruminant owners in relation to transmission, prevention and control methods of endoparasites in the study areas.

▪ Further studies should be designed about economic loss, dynamics of the disease and anthelmintics efficacy against endoparasites.

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11/17/2018