

Study on Major Parasitic Problems of Rural Cattle in and Around Ambo, Western Oromia, Ethiopia

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SUMMARY

The study was conducted in and around Ambo, West Shoa zone of Oromia regional state, from November 2007 to April 2008 with the aim of determining the prevalence of major parasitic problems and identification of those parasites parasitizing rural cattle of the area. Fecal examination was performed using qualitative techniques (Flotation and sedimentation) on 352 cattle and simultaneously skin scrapings and blood smears were prepared for examination of suspected cases of ecto parasites and haemoparasites respectively. Accordingly, 49 % over all prevalence of endo parasites was registered. The endoparasites identified were *Fasciola hepatica* (23%), *Toxocara vetulorum* (9.66%), *Paraphistomum cervi* (9.38%), *Strongyle* spp (4.83%), *Monezia benedeni* (0.85%). 0.57% prevalence of *Babesia bovis* was also recorded. The over all prevalence of ectoparasites was found to be 24%. The common ectoparasites identified were *Linognathus* (1.14%), *Psoroptes bovis* (1.4%), *Sarcoptes scabiei* (0.57%), *Amblyomma variegatum* (5.40%), *Hyalomma truncatum* (1.14%) and *Boophilus decoloratus* (3.4%). Statistically, significant variation ($P < 0.001$) was observed in the prevalence of *Toxocara vetulorum* among the age groups of the study animals. These findings suggest the importance of parasitic problems in rural cattle of Ambo and its surrounding which require serious attention by concerned bodies to minimize and control the effects of those parasites on the general health status, productivity and reproductive potential of cattle.

Key Words: Ambo, cattle, parasites, Prevalence

INTRODUCTION

The growing demand for meat and milk in developing world, changing functions of livestock and changing consumers

perspectives are the major driving forces in the global livestock sector during the next two decades (World Bank, 2001)). The movement of people from rural areas to urban centers will increase the demand for food of animal origin. By the year 2020 the global population is projected to consume about 120 million tons of meat and 220 million tons of milk above the current consumption (World Bank, 2001, Ibrahim and Olaloku, 2000). Ethiopia has the largest livestock inventories in Africa, including more than 38 million cattle, 30 million small ruminants, more than one million camels and 4.5 million Equines and 40 million chickens with livestock ownership currently contributing to the lively hood of an estimated 80 percent of the rural population (CSA, 2004).

A number of parasitic, bacterial, fungal and viral diseases and nutritional deficiencies that are prevalent in Ethiopia affect the productivity of cattle (Etsehiwot, 2004). Parasitic diseases of production animals are distributed in the world. In the developed world the greatest component of the impact is probably related to the cost incurred to control these diseases. In developing world, the greatest impacts of these diseases are productivity losses (Eysker and Ploger, 2000). The effect of parasitism can be categorized in to two groups; sub clinical (asymptomatic) and clinical parasitism. The sub clinical effects include losses in animal productivity such as milk production and reduced weight gain. Whereas visible diseases symptoms like diarrhea, skin damage, anemia and associated edema are clinical effects (Eysker and Ploger, 2000).

There is no adequate information regarding

the prevalence and economic significance of GIT parasites (helminthes and protozoa) and ectoparasites in cattle in the country. The economic assessment of impact of parasites on the performance of livestock is based on the prevalence of such diseases (Grabber, 1975). The effects of internal parasites on cattle vary with the severity of infection as well as age and stress level of animals. In general calves are immunologically incompetent and special sensitivity to handling their first exposure to pasture (Tizard, 1996, Nesru, 1998).

The studies conducted in different parts of the country have revealed the prevalent nature of ectoparasitism (Endale, 2006) and GIT parasitism (Etsehiwot, 2004, Ademe, 1985, Zerfu, 1991)) in bovine species. Ticks are the most important ectoparasites of livestock in tropical and subtropical areas, and are responsible for sever economic losses both through the direct effects of blood sucking or indirectly as vectors of livestock diseases. This study is therefore, initiated to identify and determine the prevalence of parasites affecting cattle.

MATERIALS AND METHODS

The study was conducted in and around Ambo which is located at about 105km West of Addis Ababa. The study area is situated at latitude of 8°47' to 9°20' N and longitude of 37° 32' to 38°03' E. The altitude of the area is 1900 to 2275 meters above sea level and receives an annual rainfall of 800 to 1000mm with mean temperature of 19.5 °C.

The study area constitutes, 23% high land, 60% mid altitude and 17% low land. The agricultural scenario is dominated by mixed crop livestock farming system in which crop production system dominates. There are about 211,606 cattle, 48,951 sheep, 32,154 goats, 16,928 horses, 18,569 donkeys, 684 mules, and 138,156 poultry and 15, 145 bee colonies (CSA, 2004).

The study included both male and female local breed cattle categorized into 3 age groups: from birth to six months, more than six months to one year and above one year of age. Faecal samples were collected directly

from the rectum or top layers of fresh faeces and kept in plastic containers and labeled. After collection, samples were transported in ice box to Parasitology laboratory for investigation. Those samples, which were not examined within 24 hours, were stored in a refrigerator at 4°C. During collection of samples, approximate or exact age of cattle, housing condition, sex and recent deworming history were recorded. Fecal samples were processed and examined by flotation and sedimentation techniques as described by (Urquhart *et al.*, 1996) and parasitic eggs were identified using ova identification keys provided by (Soulsby, 1986).

Blood samples were collected from the ear vein and thin smears were prepared and stained with Giemsa stain and examined under the microscope using oil immersion.

While collecting feces, the skins of cattle were inspected for the presence of ectoparasites or skin lesions. Any visible ectoparasite was collected and skin scrapings were made when suspected mange lesions were encountered. Ticks were removed carefully and gently in horizontal pull to the body surface by hand and then preserved in properly labeled plastic containers containing 70% ethanol. The ectoparasites encountered were identified based on the procedures described by (Soulsby, 1986). Post mortem examination was conducted at Ambo slaughter house using visual inspection, palpation and systemic incision of organs to look for any adult parasites.

Data analysis

Pearson chi-square (χ^2) test using Inter coded STATA (Version 7.0) soft ware was used to analyze the data. A statistically significant association between the variables and the infections was considered to exist if the calculated P-value is less than 0.05 at 95% confidence interval.

RESULTS

A total of 352 cattle were examined for helminthes, protozoa and external parasites. The over all prevalence of endoparasites was found to be 49.48%.

Among the major parasites identified in cattle, *Fasciola hepatica* (23.30%) were the dominant helminthes followed by *Toxocara vitulorum* (19.66%), *Paraphistomum cervi* (9.38%), *Strongyle* (4.83%), *Monezia benedeni* (0.85%) (Figure1). *Babesia bovis* (0.57%) was the only haemoparasite encountered during the study.

Significance difference ($P > 0.05$) was not observed in the prevalence of endo parasites between the different age groups of cattle except *T. vitulorum* (Table I).

There was no significant difference ($P > 0.05$) observed in the prevalence of endoparasites between the sexes of animals (Table I).

Out of 99 cattle examined by post mortem

investigation, 11(11.11%), 15(15.15%), 22(22.2%) were found to harbor *Fasciola hepatica*, *Paraphistomum cervi* and Hydatid cyst respectively (Table II).

The over all prevalence of ectoparasites was found to be 28.06%. The predominant ectoparasites identified in the study area were: *Linognathus vituli* (11.08%), *Amblyomma variegatum* (5.40%), *Boophilus decoloratus* (3.41%), *Hyalomma truncatum* (1.14%) and *Haematopinus eurysternus* (1.14%), *Psoroptes bovis* (1.14) and *Sarcoptes scabiei* (0.57%) (Figure1). No significant difference ($p > 0.05$) was observed in the prevalence of ectoparasites between sexes and among the age groups (Table III).

Table I: Prevalence of endoparasites by age and sex group

Age groups of animal	No examined	No. & % of infected animals with endo parasites				
		T.vetulorum P = 0.000*	Fasciola hepatica P= 0.631	Paraphistomum cervi P= 0.898	Monezia bendeni	Mixed
< 6 month	16	6(37.50%)	3(18.75%)	1(6.25%)	-	
>6 -12 month	34	6(17.65%)	6(17.65%)	3(8.82%)	-	
>12moths	302	22(7.28%)	73(24.17%)	29(9.60%)	3(0.99%)	6(1.70%)
Sex group						
Male	181	10(5.52%)	39(21.55%)	16(8.84%)	3(1.66%)	-
Female	171	7(4.09%)	43(25.15%)	17(9.94%)	-	-
Total	352	34(9.66%)	82(23.30%)	33(9.38%)	3(0.85%)	6(1.46%)

* Significant difference between age group but no significant difference between sexes

Table II: Prevalence of endo parasites observed during postmortem examination of adult cattle

No. examined	No. and % of infected animals		
	Fasciola hepatica	Paraphistomum cervi	Hydatid cyst
10	2(20.00%)	1(10.00%)	3(30.00%)
89	9(10.11%)	14(15.73%)	19(21.35%)
99	11(11.11%)	15(15.15%)	22(22.22%)

Table III: Prevalence of Ectoparasites by Age and sex groups

Age Group	No examined	No & infected Animals with different ecto parasites							
		Psoroptes bovis	Sarcoptes scabiei	Linognathus vituli	Haematopinus eurysternus	Hyalomma truncatum	Amblyomma variegatum	Boophilus decoloratus	Mixed
<6months	16	-	-	-	-	-	-	-	-
>6-12months	34	-	-	34(11.26%)	1(2.94%)	-	2(5.88%)	-	-
>12months	302	4(1.32%)	2(0.66%)	34 (11.26%)	3(0.99%)	4(1.32%)	17(5.63%)	12(3.97%)	17(4.84%)
Sex group									
Female	171	1(0.58%)	-	23(13.45%)	2(1.17%)	2(1.17%)	13(7.60%)	7(4.09%)	
Male	-	3(1.66%)	-	16(8.84%)	2(1.10%)	2(1.01%)	6(3.31%)	5(2.76%)	
Total	352	4(1.14%)	2(0.57%)	39 (11.08%)	4 (1.14%)	4(1.14%)	19(5.40%)	12(3.41%)	17(4.18%)

DISCUSSION

During this study, over all prevalence of 49 % endoparasites, 24 % ectoparasites and 0.57% haemoparasite were registered. The prevalence of endoparasites recorded during this study is less than 54.38%, reported by Dejenu (1998) , in cattle in Kelala, South Wollo and 82.8%, reported by Nesru (1998) (82.8%) and 78.7% by Endale (2006) in Holeta. One of the major parasitic problems in the study area was fasciolosis, which accounted for 23.30% of the positive samples during the survey. This result is similar to the report of Amanuel (1992), who reported a prevalence of 26.22% in Chilalo-Arsi. This could be due to similar ecological condition for the distribution of the snail intermediate hosts. There was no significant difference ($P > 0.05$) observed in the prevalence of fasciolosis between the age groups and sexes.

Significant difference ($P = 0.000$) in the prevalence of *Toxocara vitolorum* among the age groups was observed in this study. Higher prevalence was recorded in animals with the age of up to 6 months(37.50 %), followed by animals with the age of more than 6 to12 months(17.65 %) and the least figure was registered in animals above 12 months (7.28%) old. This has a strong agreement with the report of Faris (2005) in Holeta. The higher prevalence of *Toxocara vitolorum* in caltte aged up to 6 months could be attributed to the fact that the most important source of infection is the milk of the dam in which larvae of the parasite are available for up to 30 days after

parturition and calves are hence exposed to the infection. The ingestion of larvated eggs by calves over six month old seldom results in potency (Urquhart *et al.*, 1996. In female animals resumption of development in late pregnancy allows further transmammmary transmission (Urquhart *et al.*, 1996). Other helminthes like strongyles (4.83 %), *Paraphistomum cervi* (9.38%), *Monesia benedeni* (0.85 %) and also the haemoparasite, *Babesia bovis* (0.57 %) were identified in this study. Other workers : (Faris, 2005, Etsehiwot, 2004, Tesfaye, 1998) have also reported similar findings on the prevalence of these parasites in different parts of the country. During this study major ectoparasites identified include *Linognathus vituli* (11.08%), *Amblyomma varigatum* (5.40%), *psoroptes bovis* (1.14%) and *Sarcoptes scabiei* (0.57%). Even though detailed studies on the distribution of ectoparasites of cattle were not conducted in the country, some workers have reported the existence of different tick species from various parts of Ethiopia (Mehari, 2004, Surafel, 1996, Dejenu,1998, Yitbarek, 2004, Mekonen *et al.*, 2000, Endale, 2006).

The present findings of sarcoptas and psoroptas have strong similarity with that of Yacob *et al.*, (2008) who reported 0.34 % and 0.68 % prevalence respectively in Adama. The current results on the prevalence of linognathus, Heamatopinus, psoroptes and sarcoptes are similar to an earlier report from eastern Shoa (Amanuel, 1992). There was no significant variation ($P > 0.05$) in the prevalence of ectoparasites

among age groups and sexes.

During mortem examination of cattle at Ambo municipal abattoir, the dominant endoparasites observed were Hydatid cyst (22.22%), *paraphistomum cervi* (15.15%) and *Fasciola hepatica* (11.11%). Similar results (21.13% and 25.7%) on the prevalence of Hydatid cyst were reported by Graber (1975) in Addis Ababa and Konso respectively.

CONCLUSION

The prevalence of different endoparasites and ectoparasites observed in rural cattle in the study area indicate that the area is conducive for the successive perpetuation of these parasites and favourable for subsequent transmission to susceptible hosts. The significance of these parasites should not be underestimated as they hamper the growth, productivity and reproductive potential of animals and inflicting skin damage resulting in economic loss of the individual farmers in particular and the nation in general.

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