

Prevalence and Associated Risk Factors of Ectoparasite in Ruminants in and Around Shashemene Town

¹Derara Dejene, ²Yacob Hailu, ²Getechew Terefe and ²Gemechu Berhanu

¹Kombolcha agricultural TVET College, Animal Health Department, Ethiopia

²Addis Ababa University, College of Veterinary Medicine and Agriculture, Bishoftu, Ethiopia

³College of Agriculture and Veterinary Medicine, Dambi Dollo University, Ethiopia

Abstract: A cross sectional study was conducted from November 2013 to April 2014 with the aim of studying the prevalence of ectoparasites of economic importance in ruminants in and around Shashemene town. A total of 412 (224 cattle, 102 sheep and 86 goats) were included in this study. Out of these animals 228 (55.3%) animals were infested by one or more species of ectoparasites. Of a total of examined animals; 120 (53.6%) of cattle, 65 (63.7%) of sheep and 43 (50.0%) of goats were positive for various species of ectoparasites. The major ectoparasites recorded in the present study were, ticks with prevalence of 36.6% in cattle, 15.7% in sheep and 10.5% in goats; lice 21.4% in cattle, 35.3% in sheep and 30.2% in goats, mange mite 8.0% in cattle, 8.8% in sheep and 15.1% in goats; fleas 3.1% in cattle, 12.7% in sheep and 8.1% in goats and sheep ked 24.5% in sheep. This study has revealed that lice were the predominant ectoparasites followed by mange mite and fleas in goats; ticks were the predominant followed by lice and mite in cattle and lice were the predominant followed by sheep ked and fleas in sheep. The genus *Rhipicephalus* (formerly *Boophilus*) was the most prevalent ticks in cattle, *Damalina* was the most prevalent lice in the sheep but lower in the cattle and *Sarcoptes* was the most prevalent mange mite in the goats and *Demodex* was predominant mite species in the cattle. Ticks and sheep ked were found show significant ($P < 0.05$) association with species of animals while fleas showed significant difference with both species of animals and sex. The present study has shown that ectoparasites are among important causes of skin damage which is likely to cause significant economic loss. To reduce this loss management practices should be practiced to control infestations of valuable animals.

Key words: Ectoparasites • Ethiopia • Prevalence • Ruminants • Shashemene

INTRODUCTION

Ethiopia's economy is based mainly on agriculture, including crop and livestock production, which contributes 45% of the national Gross Domestic Product (GDP), more than 80% of employment opportunities and over 90% of the foreign exchange earnings of the country. The livestock sub-sector contributes an estimated 12% to total GDP and over 45% to agricultural GDP [1]. On average, the pastoral livestock population accounts for an estimated 40% of the total livestock population of the country [2]. IGAD estimated in that pastoralist livestock makes up 30% of the nation's cattle, 70% of the goats and sheep and all camels in the country [3]. However, the Ethiopian economy, particularly agricultural

development, is extremely vulnerable to external shocks like climate change, global price fluctuations of exports and imports and other external factors [1].

Ethiopia is believed to have the largest livestock population in Africa. The total cattle population for the country is estimated to be about 53.99 million [4], 25 million sheep and 23 million goats), as a result of this, leather has been at the core of Ethiopia's economy since many centuries [1]. Livestock fulfill several functions in the Ethiopian economy by providing food, traction power, cash income, fuel and organic fertilizer. Livestock is also an important provider of export commodities such as live animals, meat, hides and skins and over the past few years, livestock and its products has been Ethiopia's second most important source of export, after coffee [5].

However, poor health and productivity of animal due to disease has considerably become the major stumbling block to the potential of livestock industry [6].

Nowadays parasitism represents a major obstacle to development and utilization of animal resource. In Ethiopia ectoparasites in ruminants cause serious economic loss to small holder farmers, the tanning industry and the country as a whole through mortality of animals, decreased skin of skin and hide [7]. Tanneries reported that 35% of sheep skin and 56% of goats' skin are rejected due to external parasites and out of the reject groups of the processed skin, about 80 to 90% defects were believed to be due to external parasites. The estimated economic loss due to drop in quality of sheep and goat skin is around USD 25.8 million per year [8].

In Ethiopia external parasites damage livestock hide and skins, sheep skins by cockle an irritation caused by sheep ked (*Melophagus ovinus*) and sheep louse (*Bovicola ovis*), goat skins by tick, sarcoptic mange caused by mites (*Sarcoptic scabies*), some are damaged during slaughter while relatively few are spoiled during preservation [9]. Tick damage is caused by blood sucking parasite-ticks. They usually adhere to the inner part of the hides such as the dewlap and inner parts of legs. The defect has the shape of tiny holes or unhealed scars. These holes can be seen on the grain surface of the finished leather resembling tiny spots and hollows. While developing and growing into the adult organism, the male move about rapidly causing the host animal to rub and scratch. Secondary infection leads to fare more extensive damage. Badly tick infested animals have poor health and provide hide with lack of substance. The damage to leather caused by tick is so deeply seated that even with grain correction, the scars will persist. The small hole and the more or less healed scars mark the smoothness of the grain and detract from the appearance of the finished leather [10].

Louse infestation arises from attack by a wide range of louse species on cattle, sheep and goats. These pests include both biting and sucking type such as Linognathus, Solenoptes, Haematopinus species (sucking lice) and Damalina (biting lice). The lesion caused by louse infestations are often almost circular and small size and the extent of damage to the eventual leather depends on the presence or absence of secondary infection [9].

In general, as a result of their activity ectoparasites may have a variety of direct and indirect effects on their hosts. Ectoparasites commonly ticks, mite, lice, flea and sheep ked affect the host species by the inflammation and the infection they infliction on the skin [11] and by their

effect on the physiology of the animals as well as through transmission of different diseases [7]. Infestations by ectoparasites significantly affect the quality of hide there by affecting the economy of Ethiopian farmer as well as international market [12]. Although ectoparasites affect the health and productivity of ruminants and the economy of the country [7], currently there is a paucity of information regarding to ectoparasites of ruminants in and around Shashemene town. The present study was carried out to determine the prevalence ectoparasites of economic importance in ruminants and to assess host-related risk factors in the study area.

MATERIALS AND METHODS

Study Area: The study was conducted from November 2013 to April 2014 at Shashemene Veterinary clinic and in four selected peasant associations (Kebeles) namely; Awasho, Alelu, Faji sole and Burka gudina in and around Shashemene town. Faji sole is from peri-urban areas while the rest three Kebeles are from Shashemene town. This four Kebeles are purposely selected from the study district taking into consideration uses of ruminants in the area, accessibility, relative animal population in the district and relative lack of studied information. Shashemene is one of the districts found in Oromia regional state in West Arsi zone located 250 km south east of Addis Ababa at 9°N latitude and 40°E longitude. The altitude of the area ranges from 1500 to 2500 meter above sea level (a.s.l.). The rain fall pattern in study area is bimodal in distribution and falls in range of 900 -1000 mm per annual. There are long and short rainy seasons extending from June to September and from February to March, respectively. The dry season extends from October to February. The minimum, maximum and average air temperature of the area is 16°C, 27.5°C and 21.75°C, respectively. The mean relative humidity ranges from 35 to 68 percent. It is divided into two agro-ecological zones namely; highland (80%) and lowland (20%) [13].

Study Animals: The study animals were cattle, sheep and goats of both sexes and different age groups (young and adult) in and around Shashemene town.

Sample Collection: The survey of ticks, lice, fleas, sheep ked and mites was conducted on ruminants of both sexes and different age groups. Collection of ectoparasites was conducted after proper restraining of the animals. The adult parasites were manually collected from the body surface by hand. Hair coat was parted and examined for ectoparasites on five regions of the body surface namely;

head, neck, thoracic, abdominal and tail region, both on the right and left sides of these areas and the collected parasites were preserved in properly labeled plastic containers containing 70% ethanol. The collection bottles were labeled with serial numbers while other data was written on specified register format prepared for this particular purpose (date, address, sex, age and species). Sample was then transported to veterinary laboratory for further identification of the parasites. Identification of the collected ectoparasites was carried out at veterinary laboratory by the aid of stereo- and compound microscope using identification keys set by Wall and Shearer [14], which includes the morphological appearance of the parasites. The ticks were identified by checking presence or absence of festoms, eye, ventral shield, bont-legged and mouth parts and the lice was mainly identified by appreciation of its mouth part. Skin scrapings from suspected cases of mange lesion was collected and preserved in 10% formalin. Mites were made to be released from scabs and crusts after addition of 10% KOH on the specimens according to the procedure described by Soulsby [15]. Then the parasites were identified based on their morphology including its mouth part, structures of legs and general shape.

Study Design: The study was conducted using cross-sectional study design to determine the prevalence of ruminants' ectoparasites. The sample was collected from clinic and farms of extensive production system. Detailed examination of animals that was presented every Monday to Shashemene veterinary clinic was made and from farms was randomly collected from ten household of four kebele (Alelu, Awasho, Burka Gudina and Sole Faji) in and around Shashemene town. From each household the ectoparasites were randomly collected from different species of animals and different sex and age group (young under one year of age and adult above one year of age for both sheep and goats [16, 17] and age categorization of cattle was done as young and adult according to Pace and Wakeman [18]. Thus, young age group were less than four years while adult above four years. This age estimation was based on eruption of one or more incisor teeth.

Since no studies have been done on the ectoparasites of ruminants in and around Shashemene town in particular, 50% was taken as approximate expected prevalence. So, the sample size was calculated according to Thrusfield [19] sample size calculation, ninety five percent confidence levels, 5% precision and 50% expected prevalence used for the computation. Though, the required sample size was computed to be 384, a total of

412 (165 from veterinary clinic and 247 from farms of extensive production system) of ruminants of different species, age and sex group were examined to increase the precision of investigation.

$$N = \frac{1.96^2 p(1-p)}{d^2}$$

where,

N = required sample size

P = expected prevalence,

D = precision

Data Analysis: The collected data was first entered and managed into Microsoft Excel worksheet and analyzed by a statistical software namely, SPSS version 20. Prevalence was determined by the formula described by Thrusfield [19] as the rate of number of infested animals and total number of animals in population. Associations between explanatory variables (species of animals, age and sex) and prevalence were done by chi-square test and $P < 0.05$ were set to indicate significance.

RESULTS

The overall prevalence of ectoparasites was 56.4% and 54.7% in Veterinary clinic and farm respectively. Of these tick infested animals were 27.3% in veterinary clinic and 25.1% from animals sampled on farm. Similarly, lice infested animals constitute 31.5% of the animals sampled at Veterinary Clinic and 25.9% of animals sampled on farm, mite infested 5.5% in veterinary clinic and 12.6% from farm and flea and sheep ked 6.7%, 7.3% and 6.5%, 5.3% from animals sampled from veterinary clinic and farm (peasant association or kebeles) respectively. Statistical analysis has shown no statistically significant difference exists between prevalence of ectoparasites and study site ($P > 0.05$) (Table 1). However, there was relatively high prevalence of ectoparasites in animals sampled from veterinary clinic than in animals sampled from peasant associations.

A total of 412 animals (224 cattle, 102 sheep and 86 goats) were examined for the presence of ectoparasites. Of these 228 (55.3%) animals (120 cattle, 65 sheep and 43 goats) were found to have one or more types of ectoparasites. Overall 36.6%, 24.1%, 8.0% and 3.1% of examined cattle were infested with tick, lice, mite and fleas, respectively (Table 2). The overall prevalence of tick, lice, mite, fleas and ked in sheep were 15.7%, 35.3%, 8.8%, 12.7% and 24.5% respectively (Table 3). In goats lice (30.2%) was the most prevalent followed by mite (15.1%), tick (10.5%) and fleas (8.1%) (Table 4).

Table 1: Prevalence of ectoparasites in ruminants in veterinary clinic and different peasant associations (extensive farming system) of in and around Shashemene town

Ectoparasites	Sites		χ^2	P-value
	Vet. Clinic (n=165)	Farm (n=247)		
Tick	45 (27.3%)	62 (25.1%)	0.16	0.690
Lice	52 (31.5%)	64 (25.9%)	2.9	0.234
Mite	9 (5.5%)	31 (12.6%)	3.1	0.581
Flea	11 (6.7%)	16 (6.5%)	1.6	0.447
Sheep ked	12 (7.3%)	13 (5.3%)	0.7	0.394
Overall	93 (56.4%)	135 (54.7%)	0.21	0.643
Total Ground	228 (55.3%)			

Key: n = number of animals examined, χ^2 = Pearson Chi-Square

Table 2: Prevalence of ectoparasites in the cattle depending on the sex and age group

Animal species	Age/sex group	No. (%) of animals positive for			
		Tick	Lice	Mite	Fleas
Cattle (n=224)	M (n=74)	31 (41.9%)	21 (28.4%)	5 (6.8%)	1 (1.4%)
	F (n=150)	51 (34.0%)	33 (22.0%)	13 (8.7%)	6 (4.0%)
	Y (n=62)	17 (27.4%)	21 (33.9%)	4 (6.5%)	3 (4.8%)
	A (n=162)	65 (40.1%)	33 (20.4%)	14 (8.6%)	4 (2.5%)
Overall	n=224	82 (36.6%)	54 (24.1%)	18 (8.0%)	7 (3.1%)

Key: n = number of animals examined, M = male, F = female, A = adult, Y = young

Table 3: Prevalence of ectoparasites in the sheep depending on the sex and age group

Animal species	Age/sex group	No. (%) of animals positive for				
		Tick	Lice	Mite	Fleas	Sheep ked
Sheep (n=102)	M (n=34)	7 (20.6%)	13 (38.2%)	2 (5.9%)	3 (8.8%)	5 (14.7%)
	F (n=58)	9 (13.2%)	23 (33.8%)	7 (10.3%)	10 (14.7%)	20 (29.4%)
	Y (n=31)	6 (19.4%)	7 (22.6%)	1 (3.2%)	4 (12.9%)	6 (19.4%)
	A (n=71)	10 (14.1%)	29 (40.8%)	8 (11.3%)	9 (12.7%)	19 (26.8%)
Overall	N=102	16 (15.7%)	36 (35.3%)	9 (8.8%)	13 (12.7%)	25 (24.5%)

Key: n = number of animals examined, M=male, F=female, A=adult, Y=young

Table 4: Prevalence of ectoparasites in the goats depending on the sex and age group

Animal species	Age/sex group	No. (%) of animals positive for			
		Tick	Lice	Mite	Fleas
Goat (n=86)	M (n=25)	4 (16.0%)	10 (40.0%)	2 (8.0%)	0 (0.0%)
	F (n=61)	5 (8.2%)	16 (26.2%)	11 (18.0%)	7 (11.5%)
	Y (n=23)	1 (4.3%)	8 (34.8%)	2 (8.7%)	3 (13.0%)
	A (n=63)	8 (12.7%)	18 (28.6%)	11 (17.5%)	4 (6.3%)
Overall	n=86	9 (10.5%)	26 (30.2%)	13 (15.1%)	7 (8.1%)

Key: n = number of animals examined, M = male, F = female, A = adult, Y = young

The genera of tick identified on ruminants during this study were *Ambyloma*, *Boophilus* and *Rhipicephallus* with prevalence of 7.6%, 21.5% and 7.6%; 7.8%, 5.9% and 2.0% and 7.0%, 3.5% and 0.0% in cattle, sheep and goats, respectively and also the genera of lice identified were *Linognathus*, *Damalina* and *Haematopinus* with prevalence of 16.1%, 0.4% and 7.6%; 5.9%, 29.4% and 0.0% and 20.9%, 9.3% and 0.0% in cattle, sheep and goats, respectively (Table 5). *Boophilus*, *Rhipicephallus*,

Linognathus and *Demodex* were the most prevalent in cattle, *Sarcoptic scabies* was higher prevalent in goats while *Damalina* and sheep ked were most abundant in sheep.

Statistical analysis has shown that statistically significant difference exists between prevalence of ticks, fleas and sheep ked and species of study animals and between fleas and sex ($P < 0.05$), while no statistically significant difference exists between prevalence of lice

Table 5: Genera of ectoparasites identified in different species of animals

Species of ectoparasites	Species of animals			Overall
	Cattle (n=224)	Sheep (n=102)	Goats (n=86)	
<i>Ambyloma</i>	17 (7.6%)	8 (7.8%)	6 (7.0%)	31 (13.6%)
<i>Rhipicephalus</i> (formerly <i>Boophilus</i>)	48 (21.5%)	6 (5.9%)	3 (3.5%)	57 (25.0%)
<i>Rhipicephallus</i>	17 (7.6%)	2 (2.0%)	0 (0.0%)	19 (8.0%)
<i>Linognathus</i> species	36 (16.1%)	6 (5.9%)	18 (20.9%)	60 (26.3%)
<i>Damalina</i> species	1 (0.4%)	30 (29.4%)	8 (9.3%)	39 (17.1%)
<i>Haematopinus</i> species	17 (7.6%)	0 (0.0%)	0 (0.0%)	17 (7.5%)
<i>Sarcoptic scabies</i>	6 (2.7%)	7 (6.9%)	13 (15.1%)	26 (11.4%)
<i>Demodex</i>	12 (5.4%)	2 (2.0%)	0 (0.0%)	14 (6.1%)
<i>Ctenophalides</i> species	7 (3.1%)	13 (12.7%)	7 (8.1%)	27 (11.8)
Sheep ked	0 (0.0%)	25 (24.5%)	0 (0.0%)	25 (11.0%)
Overall	120 (53.6%)	65 (63.7%)	43 (50.0%)	228 (55.3%)

Table 6: Statistical analysis of ectoparasites related to species of animals, sex and age group

Ectoparasites		Tick	Lice	Mite	Fleas	Sheep ked	Overall
Species of animals	C (n=224)	82 (36.6%)	54 (24.1%)	18 (8.0%)	7 (3.1%)	0 (0.0%)	120 (53.6%)
	S (n=102)	16 (15.7%)	36 (35.3%)	9 (8.8%)	13 (12.7%)	25 (24.5%)	65 (63.7%)
	G (n=86)	9 (10.5%)	26 (30.2%)	13 (15.1%)	7 (8.1%)	0 (0.0%)	43 (50.0%)
	χ^2 (p-value)	29.5 (0.000)	4.6 (0.102)	3.7 (0.159)	11.0 (0.004)	80.6 (0.000)	2.9 (0.236)
Sex	M (n=133)	42 (31.6%)	44 (33.1%)	9 (6.8%)	4 (3.0%)	5 (3.8%)	79 (59.4%)
	F (n=279)	65(23.3%)	72 (25.8%)	31 (11.1%)	23 (8.3%)	20 (7.2%)	149 (53.4%)
	χ^2 (p-value)	3.2(0.073)	2.4 (0.125)	1.9 (0.164)	4.0 (0.045)	1.9 (0.173)	1.3 (0.523)
Age	Y (n=116)	24(20.7%)	36 (31.0%)	7 (6.0%)	10 (8.6%)	6 (5.2%)	65 (56.0%)
	A (n=296)	83(28.0%)	80 (27.0%)	33 (11.1%)	17 (5.7%)	19 (6.4%)	165 (55.7%)
	χ^2 (p-value)	2.3(0.126)	0.7 (0.416)	2.5 (0.115)	1.1 (0.288)	0.2 (0.628)	0.7 (0.792)

Key: n=number of animals examined, C=cattle, S=sheep, G=goat, M=male, F=female, A=adult, Y=young, χ^2 =Person Chi-Square

and mange mite and sex, age and species of study animals; tick and sheep ked and sex and age of study animals ($P>0.05$) (Table 6). However, there was relatively high prevalence of lice infestation in sheep than in cattle and goats and high prevalence of mange mite in goats than in cattle and sheep and over all prevalence of ectoparasites were high in sheep than in cattle and goats and high in male and young animals (Table 5).

DISCUSSION

The result of the present study showed a wide range of single and multiple ectoparasites infestation by an overall prevalence of 55.3% in the study area. This study has shown that ectoparasites are causing problems in ruminant production in the study area. The overall prevalence in the clinic and farm was 56.4% and 54.7%, respectively. There was no difference in prevalence between the veterinary clinic and farms, this showed that the societies have not the awareness of effect of ectoparasites on the live animals and hide and skins and do not treat the animals infested by ectoparasites properly. The most common ectoparasites were ticks, mange mite, lice, fleas and sheep ked. One or more of

these ectoparasites were recorded in 120 (53.6%) of cattle, 65 (63.7%) of sheep and 43 (50.0%) of goats. Lower prevalence 43.9% in sheep and 10.2% in goats was reported from Ambo [20]. The overall prevalence of cattle skin parasites (53.6%) was markedly higher than the prevalence reported from Bench Manji zone (27.3%) by Onu and Shiferaw [21]. This could be attributed to management and differences in the epidemiology of sampling sites. Lice were found to be the most prevalent ectoparasites followed by mite in goats and in sheep followed by sheep ked while ticks were most prevalent ectoparasites followed by lice in cattle. The present study in general revealed that ectoparasites are the most important causes of skin infection and damage. Since skin and hides is important export commodity for Ethiopia ectoparasites are among serious causes of economic losses through down grading of hides and skins [9].

The prevalence of ticks due to one or more genera of ticks was 36.6% in cattle, 15.7% in sheep but 10.5% in goats. This result is comparable to the prevalence of 19% in sheep and lower in goats (35.7%) from Kombolcha [22]. But this result showed prevalence that is higher than the tick the prevalence of 16% reported in cattle [21] from Bench Manji zone. In contrast higher prevalence in sheep

and goat was observed in Tigray [23] and in cattle (44.98%), in sheep (26.64%) and in goats (67.24%) from Adama [24]. This difference could be probably due to strategic control program being taken at the study area to minimize prevalence of ectoparasites in ruminants.

Three genera of ticks (*Amblyoma*, *Boophilus* and *Rhiphicephallus*) were identified in this study. Of this tick affecting cattle, sheep and goats in the study area, *Boophilus* was found to be the most prevalent. The prevalence of ticks infestation in cattle was *Amblyoma* species (7.6%), *Boophilus* species (21.5%) and *Rhiphicephallus* (7.6%), in sheep *Amblyoma* species (7.8%), *Boophilus* species (5.9%) and *Rhiphicephallus* (2.0%) whereas in goats *Amblyoma* species (7.0%) and *Boophilus* species (3.5%). Previously some investigators found higher prevalence for ticks in cattle specially that of *Amblyoma* (28.33%) in Kombolcha [25]; 50.5% *Amblyoma*, 29.49% *Rhiphicephallus* from Holeta [26]; 60.1% *Amblyoma*, 22% *Rhiphicephallus* and lower report of *Boophilus* (15.4%) from Asella in cattle [27] and 35.28% of *Amblyoma*, 46.79% of *Rhiphicephallus* and lower report of *Boophilus* (13.05%) in cattle from Borana [28]. Comparable results have been published from Bench Manji zone in cattle for prevalence of *Amblyoma* (8.0%) and *Boophilus* (11.7%) [21]. In contrast lower prevalence of *Amblyoma* (0.9%) was observed in Bahir Dar in goats [29]. The difference could be due to difference in agro-ecology management practices.

The overall prevalence of lice infestation was 24.1% in cattle, 35.3% in sheep and 30.2% in goats. The overall prevalence is lower than that Desalegn [22] who have reported prevalence of 56.5% in sheep and 55.2% in goats from Kombolcha and 57.0% and 47.1% in sheep and goats respectively in Gondar [30]. But this result is higher than the prevalence recorded in Tigray 1.3% and 6.1% in sheep and goats respectively [23]; in Bahir Dar 3.8% and 9.7% in sheep and goats respectively [29] and in cattle (10.4%) from Bench Manji [21]. Lice infestation was observed to affect most animals in the flocks of sheep and herds of cattle and goats. This showed that close contact between animals is important in the transmission of the parasites.

Three species of lice (*Linognathus* species, *Damalina* species and *Haematopinus* species) were identified from cattle, sheep and goats. The prevalence of lice infestation was *Linognathus* species 16.1% in cattle, 5.9% in sheep and 20.9% in goats; *Damalina* species 0.4% in cattle, 29.4% in sheep and 9.3% in goats; *Haematopinus* species 7.6% in cattle. Comparable results; *Linognathus* species 9.09% in cattle; 33.69% of *Damalina* species in sheep and 21.6% of *Linognathus* species in the

goats from Gondar [30] and *Damalina* species 22.28% in sheep were reported from Kombolcha [25]. Lower prevalence of *Linognathus* in cattle (4.7%) was reported from Benji Manji [21]. *Linognathus* and *Damalina* species cause defects that appear on the grain side of semi-processed skin after pickling, which is not detected when the skin is examined in its raw or in live animals [31].

The overall prevalence of mange mite in this study was 8.0% in cattle, 8.8% in sheep and 15.1% in goats. This is comparable with previous reports of Tewodros *et al.* [30] who found 6.59% in sheep from Gondar and 13.16% in sheep and 18.29% in goats from Guto-Gidda [32]. Two genera of mange mite (*Sarcoptes* and *Demodex*) were identified in this study. Of the mange mites affecting ruminants in the study area, *Sarcoptes* was found to be most prevalent in goats (15.1%). This is in support of previous report made by Abebayehu *et al.* [25] who found *Sarcoptes* (30.3%) to be the most prevalent species in Kombolcha. Demodecosis was found with prevalence of 5.4% in cattle and 2.0% in sheep. This result is comparable with the prevalence of 9.58% in cattle and 6.58% in sheep from Kombolcha [25].

The overall prevalence of flea infestation was 3.1% in cattle, 12.7% in sheep and 8.1% in goats. This is comparable to the report from Kombolcha [25] in cattle. Fleas are generally not considered to be important ectoparasites of livestock; however, this may not be true particularly when livestock live in close association with farm cats and dogs [33].

The present study also revealed that out of 102 sheep examined, sheep ked (*Melophagus ovinus*) had shown 24.5% prevalence. This is comparable with report of Abebayehu *et al.* [25], 32.57% from Kombolcha and 20.1% from Gondar [30] and higher than the report of Rahmeto *et al.* [23], 6.7% from Tigray. The lower prevalence (1.8%) reported from Bahir Dar by Tesfaye *et al.* [29].

CONCLUSION

Present study showed that ectoparasites are infesting significant proportions of ruminants in the study area. It was shown that ticks, mange mite, lice, fleas and sheep ked were the major ruminant's pests. Cattle were highly infested with tick than sheep and goats while sheep ked was found infested only sheep and lice were similarly infested all the studied animals. All age groups and both sex of livestock were found infested with various type of ectoparasites. Ectoparasites especially lice, ticks and mange mites remain to cause skin damage

in the area. Based on the findings of the current study, Good veterinary services and management practices put in the place to control infestations of these valuable animals and awareness should be created among the farmers and animal health assistances to indicate the extent of the problem should be recommended.

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