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Prevalenceof Major Skin Problems and Its Associated Risk Factors in Sheep and Goats at Veterinary Teaching Hospital of Faculty of Veterinary Medicine, East Shoa, Bishoftu, Ethiopia

Kora Asefa, Zelalem Abera and Hirpa Bobaso

College of Medical and Health Sciences, School of Veterinary Medicine,
Wollega University, P.O. Box: 395, Nekemte, Ethiopia

Abstract: A cross sectional study was conducted at Veterinary Teaching Hospital of Faculty of Veterinary Medicine Bishoftu, from November, 2015 to April, 2016. It was aimed to determine the prevalence of major skin diseases and its associated risk factors in sheep and goats. A total of 384 small ruminants; sheep (n=252) and goats (n=132) were included in the study. The overall prevalence of skin diseases in sheep and goats were 21.4% and 17.4%, respectively. The prevalence of major skin diseases was 57.4%, 31.5%, 5.6% and 5.6% for ectoparasites, viral, bacterial and mixed infection in sheep, respectively. While 47.8% and 52.2% were prevalence of ectoparasites and viral diseases in goats, respectively. The result shows that prevalence of ectoparasites (57.4%) and (52.2%) was the most prevalent diseases in sheep and goats, respectively and followed by viral diseases. Major ectoparasites identified were: tick (24.07% and 13.04%), lice (11.1%), mange mite (3.7% and 13%) and fleas (5. 6 and 21.7%) and the other skin diseases identified were: pox virus disease (11.1% and 30.4%), contagious ecthyma/orf (20.4% and 21.7%) and dermatophilosis (5.6%) in sheep and goats, respectively. Higher prevalence of skin diseases was recorded in sheep (21.4%) than in goats (17.4%) and showed significant difference in prevalence of major skin diseases between species of animals ($P<0.05$, OR=1.35, CI=1.7-2.3). The prevalence of disease was also observed in sex and was relatively higher in male (22.3%) as compared to female (18.6%) with statistically significant difference ($P<0.05$, OR=1.5, CI=1.91-2.64) between sex groups. It was higher in young (23.2%) than in adults (18.9%) and prevalence of the diseases was higher in poor body conditioned (34%) as compared with medium and good ones. There was statistically significant difference in prevalence of major skin diseases among body condition of animals ($P<0.05$, OR=1.5, CI=1.91-2.64). However, the prevalence of skin diseases of sheep and goats was moderate in this study area, further investigation of incidence of skin diseases should be warranted in order to design cost effective control measures.

Key words: Bishoftu · Ethiopia · Goats · Prevalence · Sheep · Skin Diseases

INTRODUCTION

Domestic sheep (*Ovisaries*) and goats (*Capra hiricus*) are the first ruminants to be domesticated between 10, 000 and 6, 000 BC in Southwestern Asia (Iran and Iraq). Ethiopia has long been recognized as a gateway of genetic material from Asia to Africa and its diverse ecology served to further diversify and develop the genotypes it received [1]. The estimated 25.5 million of sheep and 24.06 million of goats in Ethiopia provide contribution to the national economy [2] is one of the largest and most diverse in Africa [3-5]. Sheep and goats have short generation cycles (Short lambing/kidding interval) and high reproductive rates which lead to high production efficiency. They serve as a living bank for many farmers, closely linked to the social and cultural life of resource poor farmers [6] and provide security in bad crop years [7].

The cumulative effects of overcrowding, poor nutrition and diseases can result in serious production losses [8]. Infestation by mange mites and ticks, as well as dermatophilosis poses a considerable economic loss to the skin and hides export due to various defects [9]. In Ethiopia, livestock is the second major source of

Corresponding Author: Zelalem Abera, Department of Veterinary Clinical Science, School of Veterinary Medicine, Wollega University, P.O. Box: 395, Nekemte, Ethiopia.

foreign currency through export of live animals, meat, skins and hides[10, 11]. Skin from goats and sheep are important economic products contributing for the largest share to the total and agricultural export commodities [12] followed by live animals [13]. However, this rank has been relegated to 5th level because of rejection and down grading on hides and skin defects due to infestation by external parasites [14]. But also due to pre-and post-slaughter skin management problems [15].

Ectoparasites are the major causes of skin diseases that hamper small ruminant production in many areas of Ethiopia. Studies conducted in different parts of the country in the past three decades have revealed that the occurrence and spread of skin diseases have been shown to correlate with feed scarcity host, poor husbandry, climatic factors and inadequate veterinary services including absence of national control strategies [16-18].

The contribution of small ruminants to food consumption, rural income and export income are below the expected potential because small ruminant population in Ethiopia is constrained by the compound effect of diseases, poor feeding and poor managements [19]. The profitability of sheep and goat is often affected due to occurrence of diseases [20]. Among these infectious diseases affecting sheep, sheep pox is considered to be economically the most important in the tanning sector due to its slow and permanent scar formation [21].

Heavy economic losses in sheep pox outbreaks are due to mortality, abortions and loss of market value of the affected animals [22]. Ectoparasites such as mange mites, lice, keds and ticks are widely distributed in all agroecological zones in Ethiopia, causing serious economic loss in small holder farms [23].Nevertheless, large number of sheep and goats are slaughtered per annum; quality skins production remains very low due the effect of ectoparasites. Studies conducted in Ethiopia have indicated the extent of skin disease and identified ectoparasites as being the major obstacles of the small ruminant's production. Lice, keds, mange and tick are the major cause of skin disease in Ethiopia [24]. In Ethiopian tanneries, 35% of sheep and 56% of goat skins have been downgraded and rejected due to defects caused by external parasites [25, 26].

The study at Modjo export tannery, Ethiopia, revealed that ectoparasites play key role in the rejection of skin [24]. All ectoparasites cause intense irritation to the skin. Infested animals scratch, rub and bite the affected areas and this end up with skin damage [10]. Ectoparasites are the most important vectors of protozoan, bacterial, viral and rickettsial diseases [27, 28]. Even though, Ethiopia endowed with large number of small ruminant's population, little attempts have been made in the past to study on the health aspect of these animals. Lack of well-established data on the predisposing factors and prevalence of major skin diseases in domestic small ruminants in the study area have initiated this study.Therefore, the objectives of this study were to estimate the prevalence of major skin diseases of domesticated small ruminants in the study area in relation to different risk factors and to identify major skin diseases of domesticated small ruminants in the study area.

MATERIALS AND METHODS

Study Area and Period: The study was conducted at Veterinary Teaching Hospital Stationary Open-Air Clinic at the Faculty of Veterinary Medicine, Bishoftu, Ethiopia from November, 2015 to April, 2016. The study site is located at a distance of 45 KM to the East of Addis Ababa). The area has elevation of 1780 m, latitude of 09° 01?.232?? and longitude of 038°48?.177??. The mean minimum and maximum temperatures in the area ranged from 14 °C to 27 °C with an average annual rain fall of 1151.6 mm [29]. In the town, there are 160, 697 cattle, 22, 181 sheep, 37, 510 goat, 5660 horse, 38, 726 donkey, 268 mule and 191, 380 poultry [30].

Study Population: Sheep and goats of all sexes and ages were used in the study. The study animals were all breeds, kept under extensive management system. The age of the animals was estimated using the dentation formulae described by Desta [31]. Animals were divided into two groups according to their age, namely young (Less than or equal to 1 year old) and adult animals (Above 1 year old). The body condition score was determined according toGatenby [32] and were grouped as poor, medium and good.

Size Determination: The sample size for this study was determined by using the formula described by Thrusfield [33].

$$n = \frac{1.96^2 P_{exp}(1 - P_{exp})}{d^2}$$

whereas n is numbers of individuals to be sampled, P is the expected prevalence and d^2 is desired absolute precision (0.05). Since there was no previously obtained data on the prevalence of skin diseases in domesticated small ruminant in the study area. Therefore, an overall

mean expected prevalence of 50% should be used with desired absolute precision of 5%. Accordingly, 384 heads of sheep and goat were included in the study.

Study Design: A cross sectional study was conducted in animals presented at Veterinary Teaching Hospital Stationary Open-Air Clinic at the Faculty of Veterinary Medicine, Bishoftu, Ethiopia. Animals coming to the veterinary clinic for various purposes were selected by using simple random method is used for sampling and examined for the presence of various skin diseases. Age, sex, species and body condition were considered as risk factors for the occurrence of major skin diseases in domestic small ruminants.

Study Methodology

Clinical Examination: The study animals were properly recode during sampling and then each animal were also carefully inspect for the skin pathogens and the related risk factors such as sex, age, body condition and species were recorded before sampling. The samples were taken to Addis Ababa University veterinary laboratory for identification. Clinical skin disease investigations were conducted by examination of skin of each animal through visual inspection and palpation.

Dermatophytosis was clinically considered based observation of infected hairs becoming brittle, dry, lusterless and ring shaped lesion develop which becomes alopecia and also dermatophilosis was clinically considered when lesions form papules; serous exudates causing matting of hairs to form a tufted appearance scab formation which was sever and generalized. Viral infections like pox diseases were diagnosed based on their occurrence in a flock and observable clinical pictures such as wide spread skin lesions on and around the muzzle, ears, scrotum and udder [34]. The diagnosis of contagious ecthyma and photosensitization was based on their clinical manifestations and gross pathological lesions [35- 37].

Sample Collection: Ectoparasites encountered either on the skin surface or attached to the hair were sampled or collected in 70% alcohol. Depending upon the clinical presentation of skin diseases, samples such as, skin-scrapings and externally visible parasites were collected and subjected to a proper laboratory investigation. The sampled animals were clinically inspected for presence of mange mite. From animal showing signs of scales, crusts, alopecia itching, a skin scraping was taken. Scrape the edge of the affected area until blood oozed. Multiple sites were scrapped to increase the likelihood of ectoparasite detection. A few drops of 10% KOH solution were added to the sample, a cover slip applied and cleansing of debris allowed proceeding for 15-30 minutes before microscopic examination [38-40].

The neck, shoulder, belly, ribs, back, flank and rump areas of both sides of the body were examined for presence of lice and fleas by parting the hair. From clinically positive animals, specimens were collected, preserved in 10% formalin or 70% alcohol and later identified /confirmed in the laboratory. From clinically infected animals specimens were collected, preserved and dispatched to laboratory for confirmation [41]. To ensure that the mouth parts are not left behind, ticks were gently removed from the attachment site [40]. All collected samples will be examined/ confirmed in the laboratory as per the procedure recommended by Wall and Shearer [40] and Urquhart *et al*. [41].

Data Analysis: The data was entered into Microsoft Excel spread sheet and data analysis were carried out using SPSS version 20 statistical analysis system. The Chi-square (X^2) and Odds Ratio (OR) was calculated to assess the strength of association of different risk factors with the prevalence of major skin diseases. A statistically significant association between variables was said to exist if the calculated P-value was <0.05 and the 95% confidence interval (CI) for OR doesn't include 1.

RESULTS

The Overall Prevalence of Major Skin Disease in Sheep and Goats: The study comprises species, sex, age and body condition of animals as major variables those play a role for the existence of major skin diseases. From a total of 384 domesticated small ruminants (252 sheep and 132 goats) examined at Veterinary Teaching Hospital of Faculty of Veterinary Medicine in Bishoftu, overall of 20.01% individual animals were found to be positive for different major skin diseases (Table 1).

Prevalence of major skin diseases according to the species of animals were 54 (21.4%) and 23 (17.4%) sheep and goats, respectively. There was statistically significant difference in prevalence of major skin diseases between species of animals (P<0.05, OR=1.35, CI=1.7-2.3). This result shows Ovine species were more likely to be affected by these major skin diseases more than one times as compared to that of Caprine species.

Table 1: Prevalence of skin disease in sheep and goats based on different Variables

Variables	Nº of examined	Nº of positive	Prevalence (%)	P-value	OR	95% C.I.	
						Lower	Upper
Sex							
Female	236	44	18.6	0.012	1.5	1.91	2.64
Male	148	33	22.3	-	-	-	-
Age				-	-	-	-
Young	99	23	23.2	0.311	0.74	0.42	1.32
Adult	285	54	18.9	-	-	-	-
Species							
Ovine	252	54	21.4	0.034	1.35	1.66	2.25
Caprine	132	23	17.4	-	-	-	-
Body condition							
Poor	106	36	34	0.000	1.21	1.12	3.42
Medium	101	22	21.8	0.016	0.44	2.22	3.85
Good	177	19	10.7	-	-	-	-
Ground total	384	77	20.05				

Table 2: Prevalence of major skin disease in sheep and goats by species

Major skin Problems	Sheep (n=252)		Goat (n=132)		Ground total (%)
	Nº of infected	Prevalence (%)	Nº of infected	Prevalence (%)	
Ectoparasites	31	57.4	11	47.8	42 (54.5)
Tick	13	24.07	3	13.04	16 (20.8)
Mange	2	3.7	3	13.04	5 (6.5)
Lice	6	11.1	-	.	6 (8.8)
Fleas	3	5.55	5	21.73	8 (10.4)
Ticks and Fleas	3	5.55	-	-	3 (4)
Ticks and Lice	3	5.55	-	-	3 (4)
Ticks and Mange	1	1.85	-	-	1 (1.3)
Viral	17	31.5	12	52.2	29(37.66)
Pox virus disease	6	11.11	7	30.43	13(16.88)
Contagious ecthyma	11	20.37	5	21.73	16(20.77)
Bacterial	3	5.6	-		3 (4)
Dermatophilosis	3	5.6	-	-	-
Mixed	3	5.6	-		3 (4)
Fleas, ticks and viral	3	5.6	-	-	-
Total	54	21.43	23	17.42	77(20.05)

$X^2 = 3.6$ $p<0.05$

Sex-wise prevalence of skin diseases was relatively higher in male (22.3%) as compared to the female (18.6%) with statistically significant difference (P<0.05, OR=1.5, CI=1.91-2.64) between sex groups. The prevalence in young was 23.2% and 18.9% in adults and prevalence in body condition of animals was also seen and higher in poor body conditioned (34%) as compared with medium and good ones. There was statistically significant difference in prevalence of major skin diseases among body condition of animals (P<0.05, OR=1.5, CI=1.91-2.64) (Table 1).

The different ectoparasites identified were ticks *Ambylomma* (37%), *Hyalomma* (4.1%), *Boophilus* (33.33%) and *Rhipicephalus* (25%) in sheep and only *Ambylomma* (100%) in goats; flea like *Ctenocephalescanis* (33.33%) and *Ctenocephalesfelis* (66.66%) in sheep and fleas like *Ctenocephalescanis* (16.66%) and *Ctenocephalesfelis* (83.33%) in goats; lice like *Damalina* (22.22%) and *Linognathus* (77.77%) in sheep; *Demodex* (40%) and *Psoroptes* (60%) mites in sheep and Demodex (100%) in goats and The other skin diseases encountered were pox virus disease (11.11%) in sheep and (30.43%) in goats; contagious ecthyma/orf (20.37%) in sheep and (21.73%) in goats; dermatophilosis (5.6%) in sheep. However, there was no statistically significant difference of skin disease was observed between age of animals (P >0.05).

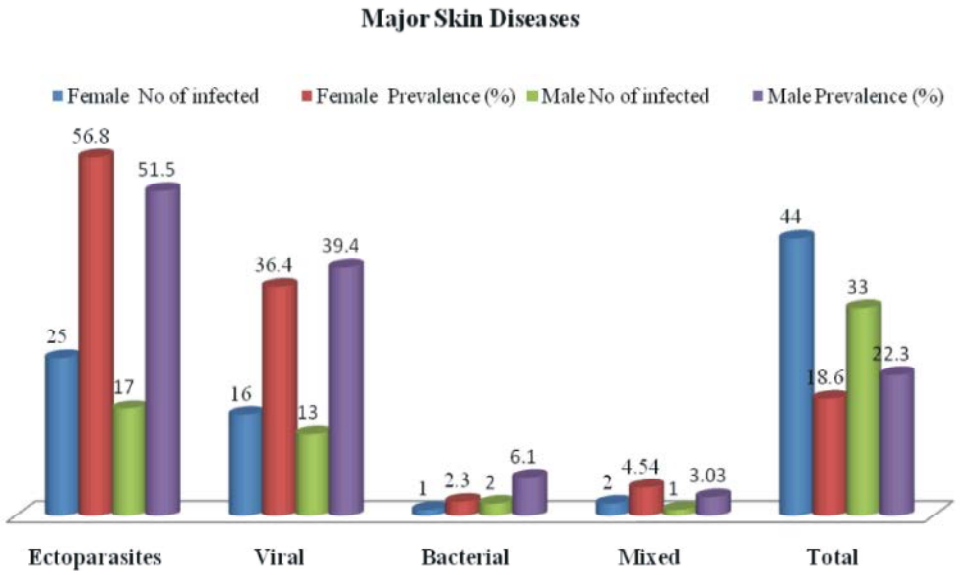

Fig. 1: Prevalence of major skin disease in sheep and goat based on sex

The predilection site of skin disease was tick in hairless area such as ear, axial, groin and tail part, mange mite neck and head areas, dermatophilosis on the back, orf in face region, sheep and goat pox in whole body parts of small ruminants. For flea's infestation attachment site was side of the body and lower abdomen for sheep and goat. The common sites of lice infestation on sheep were the skin of shoulder, neck side and back parts.

Prevalence of Major Skin Diseases Based on Animal Species: Prevalence of major skin diseases was observed and out of the total of 252 sheep and 132 goats examined; 21.43% sheep were found infected by one or more major skin diseases and 17.42% goats were found infected by only one major skin disease. The prevalence of these skin diseases was 57.4%, 31.5%, 5.6% and 5.6% for ectoparasites, viral, bacterial and mixed infection in sheep, respectively. While 47.8 % and 52.2% were prevalence of ectoparasites and viral diseases in goats, respectively. The result shows that ectoparasites (57.4%) and (52.2%) were the most prevalent diseases in sheep and goats, respectively and followed by viral diseases (Table 2).

The Overall Prevalence of Major Skin Disease in Sheep and Goats Based on Sex: Also prevalence of major skin diseases was observed and out of the total of 236 female and 148 male examined; 18.6% and 22.3% were found infected by one or more major skin diseases, respectively. The prevalence of these skin diseases was 56.8%, 36.4%, 2.3% and 4.5% for ectoparasites, viral, bacterial and mixed infection in female, respectively. While 51.5%, 39.4%, 6.1% and 3.0% for ectoparasites, viral, bacterial and mixed infection in male, respectively (Figure 1). The result revealed that ectoparasites (56.7%) and (51.5%) were the most prevalent diseases in sheep and goats, respectively. It is followed by viral diseases (Figure 1).

Prevalence of Major Skin Disease in Sheep and Goats Based on Age: Out of the total of 99 young and 285 adults examined, 23.2% young and 18.9% adult were found infected by one or more major skin diseases. The prevalence of these skin diseases was 52.2% and 47.8% for ectoparasites and viral infection in young, respectively. While 55.6%, 33.3%, 5.6% and 5.6% for ectoparasites, viral, bacterial and mixed infection in adult, respectively. The result shows that ectoparasites and viral diseases were the most prevalent diseases in age of animals in the study area (Table 3).

The Prevalence of Major Skin Disease on Sheep and Goat by Body Condition: Prevalence of major skin diseases was observed and out of the total of 106 poor, 101 medium and 177 good examined; 34% poor, 21.8% and 10.7% good were found infected by one or more major skin diseases. The prevalence of these skin diseases were 72.2%, 19.4%, 5.6% and 2.8% for ectoparasites, viral, bacterial and mixed infection in poor, respectively. Where as in medium body condition 59.1%, 31.81%, 4.5% and 4.5% for ectoparasites, viral, bacterial and mixed infection, respectively. While 15.8%, 78.9% and 5.3% for

Table 3: The prevalence of major skin disease on sheep and goat by age

	Young (n=99)		Adult (n=285)		
Major Skin Problems	Nº of infected	Prevalence (%)	Nº of infected	Prevalence (%)	Ground total (%)
Ectoparasites	12	52.2	30	55.6	42 (54.5)
Tick	3	13.04	13	24.1	16 (20.8)
Mange	0		5	9.3	5 (6.5)
Lice	2	8.7	4	7.4	6 (7.8)
Fleas	5	21.7	3	5.6	8 (10.4)
Ticks and Fleas	0		3	5.6	3 (4)
Ticks and Lice	1	4.3	2	3.7	3 (4)
Ticks and Mange	1	4.3	0		1 (1.3)
Viral	11	47.8	18	33.3	29 (37.7)
Pox virus disease	5	21.7	8	14.8	13 (16.9)
Contagious ecthyma	6	26.1	10	18.5	16 (20.8)
Bacterial	0		3	5.6	3 (4)
Dermatophilosis	0		3	5.6	3(4)
Mixed	0		3	5.6	3 (4)
Fleas, ticks and viral	0		3	5.6	3 (4)
Total	23	23.2	54	18.9	77 (21.1)

X= 16.5 P>0.05

Table 4: The prevalence of major skin disease on sheep and goat by body condition

	Poor (n=106)		Medium (n=101)		Good (n=177)		
Major skin Problems	Nº of infected	(%)	Nº of infected	(%)	Nº of infected	(%)	Ground total (%)
Ectoparasites	26	72.2	13	59.1	3	15.8	42 (54.5)
Tick	7	19.4	6	27.3	3	15.8	16 (20.7)
Mange	4	11.1	1	4.5	-	-	5 (6.5)
Lice	5	13.9	1	4.5	-	-	6 (7.8)
Fleas	5	13.9	3	13.6	-	-	8 (10.4)
Ticks and Fleas	2	5.6	1	4.5	-	-	3
Ticks and Lice	2	5.6	1	4.5	-	-	3
Ticks and Mange	1	2.8	-	-	-	-	1 (1.3)
Viral	7	19.4	7	31.8	15	78.9	29 (37.7)
Pox virus disease	3	8.3	2	9.1	8	42.1	13 (16.9)
Contagious ecthyma	4	11.1	5	22.7	7	36.8	16 (20.8)
Bacterial	2	5.6	1	4.5	-	-	3 (4)
Dermatophilosis	2	5.6	1	4.5	-	-	3 (4)
Mixed	1	2.8	1	4.5	1	5.26	3 (4)
Fleas, ticks and viral	1	2.78	1	4.54	1	5.26	3 (4)
Total	36	34	22	21.8	19	10.7	77 (21.1)

$X^2 = 49.3$, $P < 0.05$

ectoparasites, viral and mixed infection in good, respectively. The result shows that there was significantly higher prevalence of major skin disease in animals with poor body condition than those with medium and good body conditions (Table 4).

DISCUSSION

The present study was conducted at Veterinary Teaching Hospital in the Faculty of Veterinary Medicine, Addis Ababa University, Bishoftu Ethiopia, from November 2015 to April 2016. This was aimed to determine the prevalence of major skin diseases in domesticated small ruminants in relation to different risk factors (Species, age, sex and body condition of animals) in the study area.

A total of 384 domesticated small ruminants (252 sheep and 132 goats) were examined and overall prevalence of major skin diseases was 20.1% with 21.43% and 17.42% prevalence in sheep and goats, respectively. The prevalence of skin diseases in the present finding is lower than the previous studies reported from Gondar

Veterinary Clinic by Teshome and Derso [42] with prevalence of 40.31% and Adama Veterinary Clinic by Yacob *et al.* [43] with prevalence of 25%. This study might be associated with difference in agro-ecology of the area and seasonal difference of the study period and also may be due to availability of veterinary service and awareness created among society in study area.

The overall ectoparasite prevalence of small ruminant in the present study area was 57.4% in sheep and 47.8% in goat which is in close accordance with report from Tigray region byMulugeta*et al*. [25] with prevalence of 55.5% in sheep and 58% in goats and from different agroecological zone of eastern Amhara bySertese and Wossene [44] with prevalence of 50.5% in sheep and 56.4% in goats. However, the present finding is greater than report from Gondar Veterinary Clinic byTeshome and Derso [42] with prevalence of 13.58% in sheep and 2.24% in goats and from Adama town by Yacob *et al.* [43] with the prevalence of 13.80% in sheep and 7.80% in goats. This difference in prevalence of ectoparasite in different study area might be associated with difference in agro-ecology of the area and seasonal difference of the study period.

An attempt has also been made to compare prevalence of major skin disease between sex groups. And the higher prevalence was observed in male animals (22.3%) as compared to females (18.6%). The result of study shows statistically significant differences ($P<0.05$, OR=1.5) with the prevalence of skin disease between sex groups. This finding agrees with the work of Yacob *et al.* [43] who reported higher prevalence of skin disease in males than in females. This might be a result of the natural fighting behavior of male animals among themselves, which could predispose them to various skin diseases.

Species wise comparison has been made and relatively higher prevalence was observed in sheep (21.4%) as compared to goat (17.4%). The result of the study indicated statistically significant differences ($p<0.05$, OR=1.35) with prevalence of skin diseases between species groups. This difference may be due to docile behavior and long hair of sheep.

Also a higher prevalence of skin disease was recorded in animals with poor (34%) than medium (21.8%) and good body conditioned animals (10.7%). The present study shows statistically significant differences ($p<0.05$, OR=1.21) with the prevalence of skin disease among body conditions. This finding agrees with the work of Teshome and Derso [42] who reported higher prevalence of skin disease in poor than medium and good body condition. This might be due to malnutrition, other concurrent disease or poor immunological response.

However, there was no statistically significant difference of skin disease between age of animals ($P>0.05$) in the current study, relatively higher prevalence of skin disease was recorded in young (23.2%) as compared to the adult animals (18.9%). This observation agrees with the work of Mulugeta *et al.* [25] who reported higher prevalence of skin disease in young than in adult. Young animals are very susceptible to skin disease this may be due to scarcely wool cover skin and immunological immaturity.

The overall prevalence of the tick infestation (24.1% in sheep and 13.1% in goats) was observed in the present study area. This finding was lower as compared to Abunna *et al*. [45] who reported a higher prevalence of tick infestation in sheep (87.5%) and goat (89.9%) in Miesso district, Zelalem [46] of 65.5% in sheep and 33% in goats in Dire Dawa region (Eastern Ethiopia), Yacob *et al*. [18] in and around Wolaitasoddo, Southern Ethiopia with the prevalence of (68% in sheep and 19% in goats) and Abebe *et al.* [47] with prevalence of 40% and 58.8% in sheep and goats in selected districts of Tigray region, Ethiopia. This difference may be due to availability of veterinary service or study season.

However, the present study was greater than report from central Ethiopia and Adama, Oromia regional state by Haffize [48] with prevalence of 0.9% in sheep and 1.7% in goat and 4.8% in sheep and 0% in goat, respectively. Environmental variations and differences in the time of year when the study was conducted could also contribute to differences in the prevalence of tick infestation in various areas of the country as temperature and relative humidity are the major ecological determinants for the reproduction and growth of tick populations [49].

The overall prevalence of mites in sheep and in goats was found to be 3.7% and 13.04% respectively in present study. Prevalence of mange mite obtained in this study area were somewhat greater than other researches done in different parts of country, 4.27% in goats and 2.07% in sheep from Sidama zone by Teshome[17] 3.96% in goats and 2.63% in sheep from central Ethiopia by Haffize [48] 6.87 % in goats from Wolayta by Chalachew [19] 1.42% in sheep in Nekemte region by Regasa [50] and 2.91% of sheep in Adama, Oromia regional state byYacob *et al.* [43]. However, the present finding is lower than the previous studies report from Kombolcha by Numery [51] with prevalence of 33.27% in goats. This difference may be due to difference agro-ecology and study season.

Prevalence of lice in sheep was found to be 2.38% in present study and lice infestation was not encountered in goats during this study this might be due to low number of goats during study period. The present finding is by far

lower than the previous studies report from Amhara regional states by Tefera [52] with prevalence of 39.8% in sheep and 29.2% in goats, Kombolcha byNumery [51] with prevalence of 14.2% in sheep. However, this finding was in agreement with the previous reports by Haffize [48] 2% in sheep from central Ethiopia and 3.94% in sheep conducted in and around Adama town by Yacob *et al.* [43]. Such difference in prevalence may be associated to differences in agro-climate, in season during which the study was conducted and health care animals in study areas.

Lice infestation can also associate with other underlying problems such as malnutrition and chronic disease [53]. In current study, the prevalence of lice was significantly higher in poor body condition than those animals with medium body condition in sheep and goats and not occurs in good body condition. This is due to the fact that animal in poor body condition that improperly fed show poor immune response against the infestation. The same reason was suggested by Urquhart *et al*. [41]. Also, it was significantly higher in poor body conditioned than those animals with medium body conditioned and not occurred in good body conditioned animals.

Also, the prevalence of flea infestation in sheep and goats has been observed and was found to be 5.55% and 21.73%, respectively. The result showed that, goats were more affected as compared with sheep in this study. It is lower than the previous studies report from Bahir Dar Veterinary Clinic by Tesfaye *et al.* [54] with prevalence of 13.2% in sheep and higher than 11.3% in goats. Flea infestation was usually manifested and shows with animal those malnourished and less fed and also animal which harsh housing management and poor body condition as reported by Urquhart *et al.* [41].

The main skin diseases caused by virus encountered in present study were contagious ecthyma/orf and pox virus diseases. The prevalence of contagious ecthyma in present study according to species of animals was 20.37% in sheep and 21.73% in goats. The present finding is greater than report from Adama Veterinary Clinic by Yacob *et al.* [43] with prevalence of 5.3% in goat and 2.38% in sheep and by Teshome *et al.* [42] with 8.55% in goat and 8.87% in sheep. However, this finding was somewhat similar with that of Nibret *et al.* [55] 17.07% in small ruminants and the present study was lower as compared previously report by Bishawired [56] (27.91%) in small ruminants.

The study was also under taken to observe the prevalence of the pox virus diseases which was 30.43% in goat and 31.5% in sheep in present study. However, the present study was greater than report from central Ethiopia by Haffize [48] with prevalence of 1.53% in sheep and 1.62% in goat. Such difference in prevalence may be associated with season during which the study was conducted.

The prevalence of dermatophilosis observed in this study was 5.6% in sheep which is lower than the previous report, Haffize [48] 13.07% in sheep. This might be due to low level of rain fall in the study period, which could prohibit clinical streptotrichosis from coming to picture. Prolonged wetting, high humidity and various ectoparasites which reduce or permeate the natural barriers of the integument influence the development, prevalence, seasonal incidence and transmission of dermatophilosis [41].

However, the prevalence of dermatophilosis in the present study was greater as compared to the previous report from Yacob *et al*. [43] that showed 0.53% in sheep at Adama, Oromia regional state. The species susceptibility to Dermatophilosis could depend on the natural resistance of the animals and the type of management provided to them.

CONCLUSION AND RECOMMENDATION

The present study was conducted at Veterinary Teaching Hospital Stationary Open Air Clinic of Faculty of Veterinary Medicine, Bishoftu, from November 2015 to April 2016. Result of the study revealed that moderate prevalence of major skin diseases in domesticated small ruminants was observed in the study area. The major ectoparasites identified were: tick, lice, mange mite and fleas and the other skin diseases identified were: pox virus disease, contagious ecthyma/orf and dermatophilosis in the study area. Even though small ruminants are important components of the Ethiopian farming system, their contribution to food consumption, rural income and export income are below the expected potential because of small ruminant population in Ethiopia is constrained by the compound effect of diseases, poor feeding and poor managements. Ectoparasites are the major causes of skin diseases that hamper small ruminant production in many areas of Ethiopia. This result considerable economic loss particularly to the skin and hide export due to various defects.

So, some recommendations were forwarded as Education should be provided to the animal owners in the study area on the prevention and control of major skin diseases particularly, ectoparasites, Infected animals should be treated with an appropriate treatment in order to reduce spread of the problem in the study area, Better animal husbandry and management activities should be

practiced among animal owners to minimize the incidence of skin diseases and economic losses due to the diseases and Further investigation of the frequency, distribution and seasonality of incidence of skin diseases should be under taken in order to design cost effective control measures.

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