Ectoparasite Prevalence in Small Ruminant Livestock of Ginir District in Bale Zone, Oromia Regional State, Ethiopia

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Abstract

Ethiopia with its greatest variation in climate and topography possesses one of the largest small ruminant populations in the world, which is kept extensively mostly by small holder farmers and adjacent to crop production.

This study was conducted to determine the seasonal prevalence and type of Shoats ectoparasites in Ginir district of Bale zone. Clinical examination and laboratory analysis were made on 233 sheep and 567 goats. Out of the 800 sampled animals, 449 (56.2%) were infested with one or more ectoparasite. The prevalent ectoparasites observed were lice, Mange, ticks and kid species.

In our attempt, two cases Tick and Lice species were most prevalent on shoats in the area. In conclusion, the prevalence of ectoparasites in the present study was high in wet than dry season which was 90.05 and 20.2% respectively and this could affect the wellbeing and productivity of small ruminants. Therefore, to reduce ectoparasites prevalence and impact on the productivity and health status, planning of integrated control measures with sustainable veterinary services aiming at creating awareness about the importance and control of ectoparasites for livestock owners is required.

Abbreviations: N, North; E, East; Spp, Species; Pa’s, Peasant association.

Keywords: Ectoparasite, Seasonal Prevalence, Small Ruminants.
1. Introduction

Ethiopia with its greatest variation in climate and topography possesses one of the largest small ruminant livestock populations in the world, which is kept extensively mostly by small-holder farmers and adjacent to crop production [1, 2]. Small ruminants represent an important segment of the Ethiopian livestock system. They are an important source of income for the agricultural communities and are one of the country’s major sources of foreign currency through skin and meat export and are among important sources of animal protein, providing 35% of meat and 14% of milk consumption. The national small ruminant livestock population is estimated to be 63 million animals, which are raised in different agro-ecological regions of the country [2]. However, the contribution from this huge livestock population to food production and export income is far below the potential. This would be due to the compound effects of several factors, including that of ectoparasite infestation [1, 3].

Infestation by ectoparasites could lead to considerable economic losses to farmers due to loss of productivity, mortality, and skin diseases. Ectoparasites including lice, sheep ked, ticks, fleas, and mange mites are reported to cause a wide range of health problems such as mechanical tissue damage, irritation, inflammation, hypersensitivity, abscesses, weight loss, lameness, anemia, and in severe cases death of infested animals with the consequent socioeconomic implications [4, 7]. In addition, ectoparasite infestations could induce great economic losses due to reduction of wool quality, meat and milk yield, and losses as a result of culling and related with cost of treatment and prevention of the problem. They are also responsible for great preslaughter skin defects, resulting in downgrading and rejection of small ruminant skins [8, 10]. According to tanneries reports, skin defects due to ectoparasite effects cause 35% of sheep and 56% of goat-skin rejections in Ethiopia [11]. Moreover, ectoparasites are known to have zoonotic importance and be capable of transmitting several types of pathogens from animals to animals and from animals to humans due to their blood sucking habit [7, 10]. All these established facts imply that ectoparasites cause serious economic losses to the farmer, the tanning industries, and the country as a whole [8, 10].

Therefore, information on prevalence, distribution, and potential risk factors of ectoparasitism of small ruminants is significant because this knowledge could be used to make informed decisions about control strategies.

Materials and Methods

Study Area

The present study was conducted on ectoparasites of small ruminants in Giner District, in December and April 2016 (7°08′N 40°49′E). The area is located 400 kms southeast of Asela with an average altitude of 4676 ft above sea level. It experiences a bimodal temporal pattern of rain-fall with a long rainy season extending from July to September and a short rainy season from February to April.
Study Animals

The study was carried out on indigenous goats and sheep that were managed under extensive production system.

Study design

A cross-sectional type of study was used to investigate ectoparasites of goats and sheep and a simple random sampling method was used. The study was conducted during the dry season (December) and the wet season (April) and the sample size for the current study was determined as per the method described by [9]. Clinical inspection of each sampled animal was performed visually and by multiple fleece partings, followed by physical examination of skin, inspection, and palpation of the skin across all parts of the animal for the presence of parasites and gross lesions indicating the clinical form of infestation by ectoparasites.

Ectoparasite Collection and Identification

After proper restraining, representative specimens were collected from infested and diseased animals. Ectoparasites (sheep ked, ticks, lice, and fleas) either encountered on the skin surface or attached to the hair were collected manually from sites of attachment. A coat brushing technique was applied to collect lice from host skin. The collected samples were placed in labeled universal bottles containing 70% ethanol and taken to our Laboratory Centre located in Asela town.

In the laboratory, the ectoparasites were identified on the basis of their morphological structure using the determination keys by [10] and [11] Further identification at the species level was conducted using a stereomicroscope using the key by [12]

Results

Dry Season

The overall ectoparasites prevalence of 20.2% was recorded for examined animals. From 133 sheep and 267 goats examined for ectoparasites, 26 (19.5%) sheep and 55 (20.6%) goats were found to be infested with one or more ectoparasites. Ticks (12.7%), lice (5.5%), and sheep ked (0.5%) were the identified ectoparasites for sheep and ticks (12.2%) and lice (1.5%) were identified for goats (Table 1).
Table 1

<table>
<thead>
<tr>
<th>No</th>
<th>District</th>
<th>Peasant Association</th>
<th>Spp</th>
<th>Lice</th>
<th>Sheep Ked</th>
<th>Fleas</th>
<th>Ticks</th>
<th>Mange</th>
<th>Total +Ve</th>
<th>Prev. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ginir</td>
<td>Gamo,Duksi</td>
<td>Sheep</td>
<td>133</td>
<td>22</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>26</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Goat</td>
<td>267</td>
<td>6</td>
<td>-</td>
<td>49</td>
<td>-</td>
<td>55</td>
<td>20.6</td>
</tr>
<tr>
<td>Total</td>
<td>Shoat</td>
<td></td>
<td>Sheep</td>
<td>400</td>
<td>26</td>
<td>2</td>
<td>-</td>
<td>51</td>
<td>81</td>
<td>20.2</td>
</tr>
</tbody>
</table>

Wet Season

The overall prevalence of ectoparasites 90.2% was recorded for examined animals during the wet season. Of 100 sheep and 300 goats examined for ectoparasites, 92 (92%) sheep and 276 (90.2%) goats were found to be infested with one or more ectoparasites. Ticks (92%) and Linognathus ovillus (0.16%) were the identified ectoparasites in sheep. Similarly, the identified ectoparasites on goats included Linognathus scaprae (2.6%), mange mites (0.66%) and ticks (88.6%). The tick species identified were Rhipicephalus evertsi, Boophilus decoloratus and Amblyomma variegatum for sheep and R. evertsi and A. variegatum for goats (Table 2).

Table 2

<table>
<thead>
<tr>
<th>No</th>
<th>District</th>
<th>Pa’s</th>
<th>Spp</th>
<th>Lice</th>
<th>Sheep Ked</th>
<th>Fleas</th>
<th>Ticks</th>
<th>Mange mites</th>
<th>Total +Ve</th>
<th>Prev. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ginir</td>
<td>Gamo</td>
<td>Sheep</td>
<td>100</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>92</td>
<td>92</td>
<td>92.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duksi</td>
<td>Goat</td>
<td>300</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>266</td>
<td>276</td>
<td>90.2</td>
</tr>
<tr>
<td>Total</td>
<td>Shoat</td>
<td></td>
<td>Sheep</td>
<td>400</td>
<td>24</td>
<td>-</td>
<td>-</td>
<td>358</td>
<td>368</td>
<td>90.2</td>
</tr>
</tbody>
</table>
Table 3: Overall prevalence (Dry + Wet season) of ectoparasites on sheep and goats in the Surveyed area

<table>
<thead>
<tr>
<th></th>
<th>Spp</th>
<th>Linognatuss p.</th>
<th>Sheep ked</th>
<th>A.variegatum</th>
<th>R.evertisi</th>
<th>B.decoloratus</th>
<th>Mange mites</th>
<th>Total +Ve</th>
<th>Prev. %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry season</strong></td>
<td>Sheep</td>
<td>22</td>
<td>16.5%</td>
<td>2</td>
<td>1.5%</td>
<td>15</td>
<td>30.6%</td>
<td>22</td>
<td>44.8%</td>
</tr>
<tr>
<td></td>
<td>Goat</td>
<td>6</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1.5%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Wet season</strong></td>
<td>Sheep</td>
<td>40</td>
<td>16%</td>
<td>62</td>
<td>62%</td>
<td>38</td>
<td>38%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Goat</td>
<td>8</td>
<td>2.6%</td>
<td>81</td>
<td>30.4%</td>
<td>100</td>
<td>37.5%</td>
<td>85</td>
<td>31.9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>80</td>
<td>54</td>
<td>2</td>
<td>158</td>
<td>162</td>
<td>97</td>
<td>2</td>
<td>449</td>
</tr>
</tbody>
</table>

Discussion

Results presented in this study revealed that the overall prevalence of ectoparasites was higher during the wet (90.2%) than the dry (20.2%) season. This finding suggests the great importance of livestock ectoparasites in the study areas. The absence of improved husbandry practices and inadequate veterinary services, favorable climatic conditions, low input of feeds, and poor awareness of livestock owners on the effects of ectoparasite might have strongly contributed to the wide occurrence of parasite infestation.

In conclusion, the present study identifies lice and ticks to be the major ectoparasites of farmed small ruminants. These ectoparasites have been identified as the major causes of sheep and goat production constraints and quality deteriorations of skin in Ethiopia. Therefore, the growing threat from ectoparasite on overall sheep and goats’ productivity and tanning industry in Ethiopia warrants urgent control intervention. Hence, to manage the effects of ectoparasite in small ruminant populations, it would be valuable to implement effective extension system and programs that could lift up community awareness on management of animals, effect of ectoparasites, and practicable strategic control measures with full cooperation of farmers and responsible bodies in the area.
References