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Bovine Tick Infestation in and Around Goba Town, South Eastern Ethiopia

Megarsa Seyoum and Tigist Abate

Goba District Livestock Development and Fishery Resource Office, Bale Goba, Ethiopia

Abstract: Ticks are obligate, blood feeding ecto-parasites that cause severe damage to the hides and skins of domestic cattle due to this reduce the foreign exchange of the country; and also transmit tick borne diseases The current study on bovine tick infestation in and around Goba was conducted to generate a baseline data on the identification of major cattle tick species which are common in and around Goba district. A total of 1676 ticks were collected from the half-body of 133 cattle from September, 2018 to February, 2019 in the study area. The prevalence of ticks' infestation in the area was 34.6%. Two genera of ticks were identified during the study period. These are *Ambylomma* and *Rhipicephalus*. Each of this genera has a prevalence of 24.2% (19.9-28.5), 24.2 (19.9-28.5) and 12.0% (8.7-15.2) respectively. Seven species of ticks were identified; *Ambylomma vareigatum, Aambylomma lipedum, Rhipicephalus* (*Boophilus*) *decoloratus, Rhipicephalus* (*Boophilus*) *annulatus, Rhipicephalus evertsi, Rhipicephalus praetextatus* and *Rhipicephalus turanicus*. Therefore, effective tick control programs should be formulated and implemented at national or regional level.

Key words: Hail-Body Region · Tick Burden · Acaricides · Goba

INTRODUCTION

More than 60 species of ticks infesting both domestic and wild animals have been recorded in Ethiopia [1]. Among this about 37 species and sub-species are very wide spread and important parasites of livestock Dangliesh *et al.* [2]. In Ethiopia, ticks and tick born disease cause considerable losses to livestock economy, ranking third among the prevalent parasitic diseases, after trypanosomosis and endoparasitism [3]. Apart from the direct effect of ticks infestation on the animals production and productivity, ticks are inevitably efficient vectors of many pathogens like protozoa, viruses, bacteria and rickettsia to man and domestic animals [4].

Ticks are obligate parasites of most type of terrestrial vertebrate virtually where ever these animals are found. They are more closely related spiders than to insects. The 850 described species are exclusive blood sucking in all feeding stages [5]. Two families, the Ixodidae and Argasidae are commonly knownticks in Ethiopia. The most important is the Ixodidae, often called the hard ticks, because of the presence of a rigid chitinousscutum which covers the entire dorsal surface of adult male and in larvae and nymph it extends for only a smalls area which permits the abdomen to swell after feeding. The other family is Argasidae or soft ticks, so called because they lack scutum.Ixodids are important vectors of protozoal, bacterial, viral and rickettsial disease [6]. Ticks have a great economic importance according to Morel [1]. The effects of ticks are broadly classified as illness, toxicosis and tick paralysis [7]. Ixodids have of great veterinary significance in ruminants. The number of hosts to which they attach during their parasitic life cycle varies from one to three and based on this they are classified as one-host ticks where the parasitic development from larvae to adult takes place on the one host, two-host ticks where larvae and nymphs occur on one host and adults on another and the three-host ticks where each stage of development takes place on different hosts [6]. Ticks act as vectors of disease or caused death from anaemia;cause paralysis. Heavy tick infestationcauses loss of production. Life cycle vary widely both in the number of hosts required and the host specificity. Animals are infested by larval and nymphal stages on the ground [8]. The local reaction to ticks is variable depending on the properties of the tick and on host factors. Primary tick bite lesions are papules and wheals, which may develop to crusts, erosion and ulcers and lead to focal alopecia [9]. The distribution of ticks in a temperate climate with frequent non seasonal rain fall

Corresponding Author: Megersa Seyoum, Goba District Livestock Development and Fishery Resource Office, Bale Goba, Ethiopia. Tel: +251926101964.

closely linked with the availability of micro-environment with high relative such as occurs in the mat which forms under the surface of rough grazing. Before entering tick free, protected or eradication areas stock from a tick infected area must be inspected and treated under the supervision of stock inspector [10].

The control of Ixodid ticks is largely based on the use of chemical acaricides applied either by total immersion in a dipping bath or on the form of spray, shower, or spot on. In tropics treatment is mainly directed towards cattle [6]. The main reason for tick control are to protect hosts from irritation and production losses, formation of lesions that can become secondarily affected, damage to hides and udders, toxicosis, paralysis and of greatest importance, infection with a wide variety of disease causing agents. Control also prevents the spread of tick species and the diseases they transmit to unaffected areas, regions or continents [5]. Therefore, the objective of this research was:

- To identifies the major tick species infesting bovine in the study area.
- To estimate the prevalence of tick species infesting bovine.

MATERIALS AND METHODS

Study Area: The study was conducted in and around Goba town, which was located in Bale zone of Oromia regional states. The town is located towards the South-Eastern part of Ethiopia at a distance of about 444 km from Addis Ababa. The approximate geographical location of the area is between 7° 00" north and 39° 38" east. The altitude ranges from 2400 to 4377masl and the minimum and maximum temperature of 4°C and 20°C respectively. The mean annual rainfall of the area ranges from 900 mm to 1400 mm. The estimated animal population of the area is 147, 795 cattle, 95, 853 sheep, 16, 608 goats, 29994 donkeys, 27, 098 horses, 4208 mules and 94, 033 poultry from data collected in 2019. According to the statically data of 2007 the total human population of Goba Woreda was 409, 954 (203, 923 males and 206, 031 females) [11]. The area receives a bimodal rain fall with an average annual rain fall of 1255 mm, in which heavy rain fall (long rain fall) is registered from August to November were as the low rain fall (short rain fall) season occurs during the month of March to June. The types of farming practice in the area is mixed type both crop-production and livestock rearing is commonly practiced.

Study Animals: The study animals include indigenous breeds were selected by systematic random sampling technique from the extensively managed cattle in the respective areas G/Michael, (1993). Then the sample size was calculating using the formula given by Thrusfield [12]. The study considers 95% level of significance.

Study Design: The study was used to a cross sectional study design to determine the distribution and prevalence of tick species and tick burden in the study area between age, sex and boy condition group [13]. The total number of ticks on the half- body of animals were assessed by counting all developmental stages of any tick species.

Study Methodology: A total of 384 animals were selected at systematic random from the respected study area and thoroughly examined for the presence of tick species and identified by direct macroscopic examination [14-16]. All of the collected ticks will be taken to the laboratory for further identification of their species and counted to know their burden on the half-body of the animals [17].

Data Analysis: Data collected from each study animal were recorded on specially designed form and preliminary analysis was done. The data was entered into Microsoft excel and summarized by using tables. The prevalence of ticks and associated risk factors were determined. The data are analyzed by using P-value statistical tests. A P-value less than 0.05 at 95% confidence interval is considered significance.

RESULTS

A total of 1676 ticks were collected from the half-body of 133 cattle from September, 2018 to February, 2019 in and around Goba town. The prevalence of ticks' infestation in the area was 34.6%. Three Genera of ticks were identified during the study period. These are *Ambylomma* and *Rhipicephalus*. Each of this genera has a prevalence of 24.2%(19.9-28.5), 24.2(19.9-28.5) and 12.0% (8.7-15.2) respectively. Seven species of ticks were identified during study period. These include *Ambylomma vareigatum, Ambylomma lipedum, Rhipicephalus* (*Boophilus*) *decoloratus, Rhipicephalus* (*Boophilus*) *annulatus, Rhipicephalus evertsi, Rhipicephalus praetextatus* and *Rhipicephalus turanicus*.

Table 1: Genera of ticks identified from the study cattle (n=384)

Genus	No. positive	Prevalence (95% CI)
Ambylomma	93	24.2% (19.9-28.5)
Rhipicephalus	46	12.0% (8.7-15.2)
Total	133	34.6% (29.9-39.4)

Table 2: Tick infestation prevalence by factors considered in the study

Variable	No. examined positive	Prevalence (95% CI)	P value
Age	0.929		
<4 years	100	35	35.0% (25.6-44.4)
≥ 4 years	284	98	34.5% (29.0-40.1)
Sex	0.849		
Male	170	58	34.1% (26.9-41.3)
Female	214	75	35.0% (28.6-41.5)
Breed	0.000		
Local	370	122	33.0% (28.1-37.8)
Exotic	14	11	78.6% (56.2-100)
Body condition	0.000		
Fat	33	1	3.0% (0.0-9.0)
Good	144	14	9.7% (4.9-14.6)
Medium	170	88	51.8% (44.2-59.3)
Poor	37	30	81.1% (68.2-93.9)

The species of tick infestation prevalence association with the considered risk factors showed in Table 2.

DISCUSSION

The distribution and abundance of the most common tick species infest cattle in Ethiopia vary greatly from one area to another. In this study *Ambylomma* and *Rhipicephalus* were found to be maina bundant tick genera in Goba region (24.2%) which is less than in Ambo that reported by Tessema and Gashaw [18] which was 48.2%. It was also less than that of reported by Gebremichael [19] in North Omo, Birhane [20] in Hawassa and Assefa [21] in Asella. *Rhipicephalus decoloratus* was the most abundant species in Goba district (34%). It was also reported as the first abundant species in and around Asosa by Fantahun and Mohammed [22] which has a prevalence of 45%. But it is higher than that of reported by Tiki and Addis [23] at Holeta that 18.13%. *Rhipicephalus decoloratus* can transmit *Babesiabegimina* and *Anaplasmamarginale* to cattle and severe tick infestation can lead to tick worry, anorexia and anemia Mekonnen *et al.* [24] *Ambylomma variegatum* is the most widely distributed cattle tick in Ethiopia [1, 25]. *Ambylomma variegatum* also causes the greatest damage to hides and skins because of its long mouth part which renders the commodity valueless on world market if the infestation is high Solomon *et al.* [26]. It was the second abundant species in Goba district (29.7%) which is higher than results (18.1%) reported by Tadesse *et al.* [27] at Mizan Teferi and it is less than results reported by Husen, [28] in Western Shoa Zone at Bako District which has a prevalence of 54.3%. *Amblyommalipedum* was the third abundant (11.6%) species in Goba district and *Rhipecephalus praetextatus* was the fourth (11%) *Rhipecephalus evertsi* was fifth abundant species (10.2%). Similar results was reported from Mizen Teferi by Tadesse *et al.* [27] which has a prevalence of 12.3%. This tick species was also reported to be prevalent in Hawassa by Birhane [20] and Asella by Assefa [21]. The effect of age and sex on the burden of ticks was statistically insignificant (P>0.05). But age was significant as reported by Fantahun and Mohammed [22] from Asosa which have been higher ticks infestations in older animals observed. The effect of breed and body condition score on burden of ticks were statistically significant (P<0.05). Similar results on body condition was reported from Asella by Tessema and Gashaw [18]. Several authors have reported high infestations of tick result poor body condition due to consumption of high amount of blood and fluid by those ticks [29]. But different results was reported from Holeta by Tiki and Addis [23] that determines high prevalence of infestation in local breeds (44.97%) and (15.83%) in cross breed. This difference was may be due to variation of habit of using acaricide of population of the area, management system, diseasedistribution and breed difference.

CONCLUSION AND RECOMMENDATIONS

The present study showed the presence of infestations of ixodid bovine tick species in and around Goba town. The important and abundant tick species investigated in this research were *Ambylomma variegatum, Ambyommalepidum, Rhipicephalus praetextatus, Rhipicephalus evertsievertsi* and *Boopholus decoloratus*. This ticks species cause considerable losses to the livestock economy and act as efficient vector of many pathogens to man and animals and decrease the production obtained the invested livestock population. This was because of the attentions given to the infestation were not sufficient and lack of available information on tick species and the debris behind tick infestation which aggravates the infestation of the livestock population in the area by ticks. Based on the above conclusion the following recommendation forwarded.

- High attention should be given to control ticks infestations.
- Combinations of available method of tick control are necessary to guarantee complete control of ticks and tick-borne diseases.
- Whenever necessary, when the load of ticks found to be higher the application of acaricides is often necessary to protect ticks and the diseases they transmit.
- Animal health extension work through educating animals owners about the impact of ticks on the animal health and productions.

REFERENCES

1. Morel, P., 1980. Study on Ethiopian tick (acaricidae, ixodida). Republic of France, Ministries of foreign affaairs France Vet. Mission, Addis, E.J.E.M.T. and pp: 7-32.
2. Dalgliesh, R.J., W.K. Jorgensen and A.J. Devos, 1990. Australian frozen vaccines for the control of Babesiosis and Anaplasmosis in cattle. A Review Tropical Animal Health and Production, 22: 44-52. DOI: 10. 1007/BF02243499.
3. Zeleke, M. and T. Bekele, 2004. Species of ticks on camels and their seasonal dynamics in Eastern Ethiopia. Tropical Animal Health and Production, 36: 225-231.
4. Radostits, M.O., C. Gaye, D.C. Blood and K.W. Hinchkliff, 2000. Veterinary Medicine. A text book of disease of cattle, sheep, pigs, goats and horses. Sounders, London, pp: 1040-1405.
5. Khan, M., 2005. The Merck veterinary manual, ninth edition, Merial, pp: 749-764.
6. Urquhart, G.M., G. Armour, G.L. Duncan, A.M. Dunn and F.W. Jennings, 1996. Veterinary parasitology, secndedition. Blackwell's Science, pp: 188.
7. Brossard, M., 1998. The use of vaccine and genetically resistant animals in tick control in genetic resistant to animals disease Rev. Sce. Retch off. Int. Epit, 17(1): 188-199.
8. Radostits, O.M., CC. Gay, K.W. Hinchkliff and D.C. Peter, 2007. A text book of the disease of cattle, horses, sheep, pigs and goats, tenth edition, Sounders' Elsevier, pp: 1599.
9. Jubb, K.V.F., P.C. Kennedy and N. Palmar, 1993. Pathology of domestic animals, fourth edition, volume 1, Elsevier, pp: 691.
10. Vincet, B., 2005. Farming meat goats. Breeding, Production and Marketing, pp: 288-289.
11. Gobaworeda Agricultural and natural resource Office, (2019).
12. Thrusfield, M., 2018. Veterinary Epidemiology, UK, Black Well Science, 4th edn, pp: 178-197.
13. Meinon, M., 1989. Body condition scoring as of cattle in Ethiopia. Ministry of agriculture and rural development, Ethiopia.
14. Hogstraal, H., 1978. Biology of tick. In tick born disease and their and the vectors. J.K.H Wild. Pro. Int Conf. Edinburgh, pp: 1314.
15. James, R.N. and S. Jiday, 2004. A survey of ecto parasites of some livestock from some areas of born and Yobo States Nig. Vet. J., 25: 48-55.
16. Nwosu, C.O., M.S. Adamu, P.A. Shingu and M.I. Ahmed, 2003. Parasites of cattle in Borno state. Nigeria. Nig. J. Applied Biol., 4: 65-70.
17. Centers for disease control and prevention CDC, 2011. How ticks grow, survive and spread disease.
18. Tessema, T. and A. Gashaw, 2008. Prevalence of ticks on local and breed cattle in and around Asellatown, south eastern, Ethiopia.
19. Gebremichael, T., 1993. Tick and tick born diseases of cattle in nrth Omo Administrative Zone-DVM thesis, Faculty of Veterinary Medicine, Addis Ababa University, DebreZeit, Ethiopia.

20. Birhane, M., 2004. Distribution of livestock tick species in Hawassaarea.DVM thesis.
21. Assefa, B., 2004. A survey of ticks and tick-born blood protozoa in cattle at Asella, Arsi Zone. DVM thesis, FVM, AAU, Debra-Zeit, Ethiopia.
22. Fantahun, B. and A. Mohammed, 2010. Survey on the distribution of tick species in and around Asosa town western Ethiopia FVM, AAU, Debra-Zeit, Ethiopia.
23. Tiki, B. and M. Addis, 2011. Distribution of Ixodid ticks on cattle around Holetatown, Ethiopia.
24. Mekonnen, S., I. Hussein and B. Bedane, 2001. The distribution of the Ixodid ticks in central Ethiopia. Onderstepoort journal of veterinary Research, 68(4): 243-251.
25. Pegram, G., H. Hogsraal and H.Y. Wassef, 1981. Ticks (acari Ixodidea) of Ethiopia. Distribution, ecology and host relationship of species infecting livestock. Bulletin of Entomology Research, 71: 339-359. 89
26. Solomon, G., M. Silashi, M. Nigiust, C. Thomas, T. Getachew, M. Abebe, B. Genet, S. Demeke and Z. Ejigu, 2007. Distribution and seasonal variation of ticks on cattle at Ghibe Tolly in central Ethiopia. Ethiopian Veterinary Journal, 11(1): 121-139.
27. Tadesse, F., G. Abdadfaji, S. Girma, B. Kumsa and T. Gibat, 2011. Identification of tick species and their preferred site on cattle's body in and around Mizan Teferi, Southwestern, Ethiopia.
28. Husen, U., 2009. Survey of cattle tick species and tick burden in and around Bako town DVM thesis, College of Agriculture and Veterinary Medicine, Jimma University, Jimma, Ethiopia.
29. Sutherest, R.W., 1987. Tick ecology: The importance of population dynamics indeveloping national tick control and eradication programs, In: The eradication of ticks proceeding of the export consultation on the eradications of ticks with special reference to Latin America, Mexico, 22-26 June 1987, pp: 196-210.