International Journal of Advanced Research in Biological Sciences
ISSN: 2348-8069
www.ijarbs.com
(A Peer Reviewed, Referred, Indexed and Open Access Journal)
DOI: 10.22192/ijarbs Coden: IJARQG (USA) Volume 13, Issue 5-2026

Research Article

DOI: http://dx.doi.org/10.22192/ijarbs.2026.13.05.008

Prevalence and identification of major Ixodid tick parasites of cattle in South Mecha District, North Gojjam, and Ethiopia

Bekalu Koyachew Birhan[1] and Gizachew Fentahun Desta[2]
[1] Livestock and Fisher Resource Development Office, Mahal Genet, Ethiopia
[2] Department of Biotechnology, Ingibara University, Ethiopia

Abstract

A cross-sectional study was conducted from September 2024 to May 2025 in South Mecha District with the objective of investigating Ixodid tick genera and prevalence with their associating risk factors such as sex, age, body condition scores, and geography. Adult ticks were collected from 384 local indigenous cattle breed. Out of the total of 384 cattle examined, 344(89.6%) were found to be infested by one or more genera of Ixodid tick parasites. A total of 1365 adult ticks, which belongs to four genera of ticks were collected and identified using stereomicroscopy. In this study Rhipicephalus (Boophilus), Hyalomma, Amblyomma, and Boophilus were identified as 41.2%, 25.1%, 18.2%and 15.5% respectively. More numbers of Rhipicephalus was collected. The prevalence of Ixodid tick parasite across the sex of animal found significantly different at ($P < 0.05$) in male 231 (60.2%) and female 153 (39.8%) animals with x^2 =9.83 and p-value =0.001 value. According to their geographical variation animals were found apparently different with highest prevalent in kebeleLehulumSelam114 (33.1%) followed by Birhan Chora 105 (30.5%) and lower record were found in Lehulum Birhan 62 (18.0%) and Zemene Birhan 63(18.3%).The prevalence also found apparently different in young, adult and old animals were found to be 64 (18.6%), 204 (59.3%), 76 (22.1%) respectively. Based on their body condition score of animals, poor 92 (26.7%) medium 233 (67.7%) and good body condition 4 (5.5%), In this study breed, body condition score, management and age did not indicate and found statistical significant association with the infestation rate with x^2 =8.201 and p-value =0.017 value at ($P < 0.05$) . This study indicates that the area is highly infested by Ixodid tick genera and cause economic loss to the farmers and severe damage to hide and skin industry by reducing the foreign exchange of the country. So it requires special attention should give to the control and prevention of Ixodid tick in the area.

Keywords: Cattle, South Mecha, Ixodid tick, Prevalence, Associated Factors

1. Introduction

Ethiopia has diverse topography with wide range of agro-ecological zones that are suitable to host a very huge animal population (Mekasha *et al*., 2014). The country has the largest livestock population in Africa with the estimated domestic animal more than 60.4 million cattle, 31.3 million sheep and 32.7 million goats, 56.06 million chickens, 2.01 million Horses, 8.85 million donkeys, 0.46 million mules, 1.42 million camels and 6.52 million hives (CSA, 2018).

Livestock and livestock products play a significant role in Ethiopia's socio-economic growth as a source of security and additional cash income. Among livestock, cattle play a significant role in supplying meat, milk and source of power for the farming activities (Abebaw and Tamiru, 2010).In the livestock industry, skins and hides play a significant role in producing revenue through exports globally (Tamiru and Abebaw, 2010).

But the contribution of this large livestock resource to the country's national income is excessively diminutive due to a variety of factors. One of the main causes preventing Ethiopia from fully utilizing the potential of cattle is the prevalence of disease and parasites (Kumsa et al., 2012). One of the most common problems is external and internal parasitism in extensive and intense production systems (Regasa *et al*., 2015). Ectoparasites, in particular, tick can cause weight loss, loss of condition, reduction in milk production, (Yasine *et al*., 2015). In Ethiopia, ticks are the most common external parasites among cattle and cause a substantial economic impact by decreasing hide and skin quality, reducing milk production (Mideksa *et al*., 2017). They have a significant negative impact on the economics of Ethiopian farmers as well as global markets, both directly and indirectly (Walker *et al*., 2014) and Minwyelet *et al*., 2021).

Identifying the types of ticks present in the area is essential in order to gather information that can be used to create more efficient programs for preventing and eradicating ticks. Therefore identifying the types of ticks commonly found at a particular site and their preferred hosts is essential for implementing an effective intervention strategy. However, there is no documented data on the prevalence, species of ticks, risk factors associated with ticks infesting cattle and public awareness in the current study area. Therefore, the objectives of the current study were to estimate the prevalence and identifying Ixodid tick genera infestation and associated risk factors in South Mecha District.

2. Materials and Methods

2.1. Description of Study Area

The study was conducted in South Mecha District, North Gojjam Zone, Amhara Regional State, Ethiopia. The District is located approximately 565 km Northwest of Addis Ababa and about 72 km Southwest of Bahir Dar, the regional capital. South Mecha District covers a total land area of about 45,297.5 hectares. Geographically, the district lies between 11°6'30"N and 11°17'30"N latitude and 37°4'00"E and 37°15'00"E longitude. Administratively, South Mecha is one of the ten districts in North Gojjam Zone and was officially established in 2010 following its separation from North Mecha District. The district comprises 14 kebeles, two of which were formed through administrative restructuring after the separation. South Mecha District is bordered by North Mecha District to the north and west, Sekela District to the south, and North Mecha and Yilmana Densa districts to the east (South Mecha District Agriculture Office, 2025).

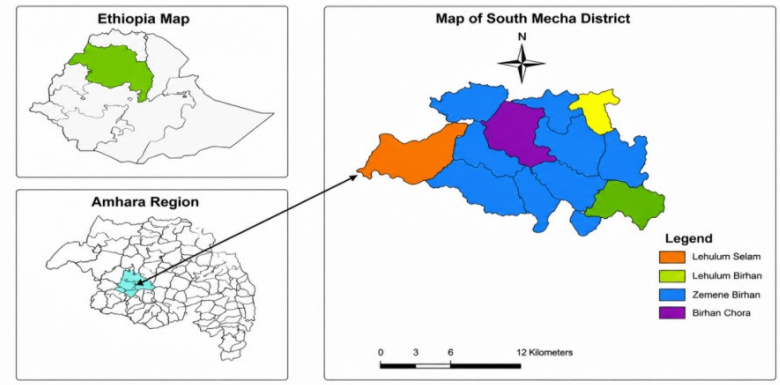

Figure 1: Study Area Map

2.2 Study Population

The study population comprised local indigenous cattle with different ages, sexes, and body condition categories from different kebeles of South Mecha District.

2.3 Study design

A cross-sectional study From September 2024 to May 2025 was carried out using a simple random sampling method to determine the prevalence and types of Ixodid ticks genera in the study area.

2.4 Sample size determination

The total number of animals required for the present study was calculated using Thrusfield's (2018) formula with a 50% expected prevalence, a 95% confidence interval and an absolute precision of 5%, because there was no previous study report in the study area.

Accordingly: $N = \frac{1.962\ P(1-P)}{D^2}$

Where: N is the total sample size; P is the expected prevalence; and D^2 is the absolute precision

.

Therefore, depending on this calculation; the total sample size was 384 selected by using the random sampling technique from selected kebeles randomly.

2.5 Tick Collection and Identification

Animals were recorded as positive with ticks and negative without ticks and data were collected from each site after the animals were physically restrained and placed in separate universal bottles pre-filled with 70% alcohol. The necessary information such as collection date, sex, age, body condition and kebele was recorded alongside with sample. After collection, the preserved ticks were transported to Bahirdar regional Parasitology Laboratory, for genus identification for stereo-microscope. The identification of tick genera was based on characteristics such as the shape and length of the mouthparts (capitulum), the colour of the body and legs, the placement of punctuations on the body, the shape of the eyes and the length of the mouthparts (Walker et al., 2014).

2.6. Data analysis

The collected data were entered and stored in a Microsoft Excel spreadsheet (Ms-2010). Then the data stored in excel were exported to the SPSS Version 25 software program. Descriptive statistics such as percentages were applied to compute some of the data. The chi-square test was used to study the relationship between each risk factor and the outcome. For all statistical analyses at 95% confidence interval and an absolute precision of 5%, a statistical significance level of $p < 0.05$ was considered.

3. Results

3.1. Tick Infestation in Cattle and Potential Risk Factors

Out of the 384 cattle examined, 344 (89.6%) were infested with one or more tick species. The study was conducted on different kebeles of agro-ecological area. Accordingly, the highest prevalence of tick was observed in Lehulum Selam 114 (33.1%), while the least prevalence of tick was observed in LehulumBirhan62 (18.0%) (Table1). Tick infestation rates were found to be influenced by the age of the cattle. As a result, adult cattle 204 (59.3%) had a higher tick prevalence than old cattle 76 (22.1%) and young cattle 64 (18.6%). The body condition related to tick infestation was assessed in the current study, and medium body animals had a higher prevalence of 233 (67.7%) followed by poor body animals 92 (26.7%) while the least was recorded in good body condition 4 (5.5%). There was a statistically significant ($p < 0.05$) relationship between tick prevalence and animal body condition (Table1). The study also conducted across the sex wise comparison and found that higher prevalence was recorded in animals 207 (60.2%) than females 105(30.5%).These findings also found significant relationship ($p < 0.05$) with tick infestation and those males animals are more affected by ticks than female animals (Table1).

Table 1: Potential risk factors for Ixodid ticks infestation status of cattle in the case of South Mecha District

Risk factors		No. animal examined	No. positive animals	χ2	P-Value
Kebeles	LehulumSelam	128	114 (33.1%)		
	LehulumBirhan	69	62 (18.0%)		
	ZemeneBirhan	67	63(18.3%)		
	BirhanChora	120	105(30.5%)	2.020	0. 568
Sex	Male	231	207 (60.2%)		
	Female	153	137 (39.8%)	9.83	0.001
Age	Young	68	64 (18.6%)		
	Adult	231	204 (59.3%)		
	Old	85	76 (22.1%)	1.901	0.387
Body condition	Poor	110	92 (26.7%)		
	Medium	251	233 (67.7%)		
	Good	23	4 (5.5%)	8.201	0.017

3.2. Ioxid Tick Genera Identification and Their Burden

Overall, 1365 count of Ioxdid ticks genera were recorded which belongingto the generaof Amblyomma, Hyalomma and Rhipicephalus, and Rhipicephalus (Boophilus), were identified. Morphological identification of the collected ticks showed that Rhipicephalus (Boophilus) 562 (41.2%) was the most abundant and predominant tick species on cattle in South Mecha district, followed by Hyalomma 341 (25.1%), Ambylomma 250 (18.2%) and Rhipicephalus 212 (15.5%) (Table2).

Table 2: Overall count of Ioxid tick genera in the study area of South Mecha district

Genus	No. counted tick	Proportion(%)
Ambylomma	250	18.2%
Hyalomma	341	25.1%
Rhipicephalus (Boophilus)	562	41.2%
Rhipicephalus	212	15.5%
Total	1365	100%

3.3. Body Distribution of Ioxid Tick Genera

Ticks were collected from different body regions of the animal and high proportions of ticks were collected from dewlap 498 (36.5%) followed by udder 335 (24.5%) and scrotum 336 (24.6%), belly and back 84 (6.2%), sternum 76 (5.5%) and head and ear36 (2.6%). In this study, a high proportion of Rhipicephalus (Boophilus) genera was collected from scrotum/udder dewlap 477(84.8%) and the least was collected from head and ear13 (2.2%). Similarly other genera of Ioxdid tick also found predominantly in dewlap, scrotum and udder while lower genera counted in head and ear and belly and back of animal body parts (Table 3).

Table 3: Distribution Ixodid Ticks on Body Part of Cattle in South Mecha District

Body region	Ambylomma (counted)	Rhipicephalus (Boophilus) (counted)	Rhipicephalus (counted)	Hyalomma (counted)	Total
Udder	67	154	52	62	335 (24.5%)
Dewlap	97	201	76	124	498 (36.5%)
Scrotum	62	122	42	110	336 (24.6%)
Head and ear	5	13	14	4	36 (2.6%)
Belly and back	12	42	11	19	84 (6.2%)
Sternum	7	30	17	22	76 (5.5%)
Total	250	562	212	341	1365 (100%)

4. Discussion

In this study, very high prevalence of ticks (89.6%) was recorded. This study indicated that tick is the most significant ecto-parasite of cattle in South Mecha district, Amhara regional state, in northern Ethiopia, according to the current study. The prevalence of the present finding is in line with higher prevalence report obtained from different part of the country. Accordingly, 95% of prevalence was also reported by Minwyelet *et al*. (2021) in the southern part of Ethiopia, 81.25% by Alemu *et al*., 2014, in northwest Ethiopia, (97.8%) by Nateneal *et al*., 20125,in Bedele district, Oromiyia regional state, Western Ethiopia, 82% by Getachew *et al*., 2014Northwest Ethiopia, and 91.50% by Shichibi, 2017 in Saylem, Gesha and Masha districts of Southern Ethiopia.

On other hand, our study is higher than the finding reported by Tiki and Addis, 2011 with a prevalence of 25.64% in Holetatown, Ethipoia, the report of Kassa and Yalew, 2012, with a prevalence of 33.21% in Haramaya district and the prevalence report of 38% by Shane *et al*., 2017, in Tiyo District, Arsi Zone, Oromia Region. This may due to variation in agroecology, sample size, methodology of the study, deworming practices of the community within their respective study area and season of the study was conducted.

The prevalence of tick infestation found vary across the age, sex, body and agro-ecology of associated risk factors compared in the current study. Among associated risk factors sex and body was found significantly variation ($p<0.05$). The animals with medium and poor body conditions had significantly higher tick infestations than good body animals. The finding is in line with that of Wolde and Mohamed, 2014, who reported that cattle with poor body conditions were significantly more infested than cattle with good body conditions. This study also agrees Nateneal *et al*., 20125, and Hordofa *et al*., 2021, who reported cattle with poor body condition were significant ($P<0.05$).

The study also found significant different across the sex of animal with higher prevalence recorded in males (60.3%) compared with females (39.8%).This finding agrees with the finding of Chumburo and Bayou, 2021, who reported prevalence rate of tick infestation was found to be higher in male cattle (42.2%) than females (34.7%) and Hordofa *et al*., 2021, who reported the prevalence of tick infestation was higher in male cattle (100%) than females (46.3%) in and around Honkola Wabe District. On the other hand, this finding was disagree the previous findings of Shichibi, 2017, who reported higher prevalence in female (89.77%) and Nateneal *et al*., 2015, who indicated the higher tick prevalence in female (52.9%) than male (41%). The difference of this finding may attribute different management system, sample distribution and males were mostly working animal which was a predisposing factor for ecto-parasite than females.

A total of 1365 adult ticks were collected from different body parts of infested animals in the study sites. From the total of tick collected genera In the current study, Rhipicephalus (Boophilus) 562 (41.2%) was one of the highly distributed tick's genera in the study area. This is in accordance with the report of Bossen and Mohamed (2012) in and around Asossa town, western Ethiopia, where Rhipicephalus (Boophilus) was found to be the most abundant tick genera (70.3%). But this finding is disagree with the previous study of Wolde and Mohamed, 2014 (34.9%) in Arbegona District, Southern Ethiopia and Hordofa *et al*., 2021 (43.46%) in Humbo district, SNNPR of Ethiopia, indicated Amblyomma as the leading tick genera. This may be due to the different agro-becology contribute the variation for thick genera counted.

Regarding the predilection site of the tick genera, the most preferred site were udder, dewlap, scrotum, head and ear Belly and back. The results showed that various tick genera have relatively different predilection sites and agree with the work of D. Hordofa *et al*., 2021, in and around Honkola Wabe District. With regard to distribution pattern of ticks, most tick genera were counted more preferable in site of dewlap, udder and scrotum body regions of animals and the study was agree with the report of Nateneal *et al*., 2015, who recorded more on dewlap regions of animals.

5. Conclusion and Recommendations

The most important genera investigated in the study area were Rhipicephalus (Boophilus), Ambylomma, Hayloma, and Rhipicephalus with the most prevent genera of Rhipicephalus (Boophilus). The study demonstrated that tick infestation was high burden and the major challenge in reducing productivity and cause health problems of cattle in the South Mecha District with an overall prevalence of 89.6%. This study indicated that revealing Ioxid ticks ara the most important ecto-parasite of cattle in the study area. A tick has a great production and economic impact by causing, decreasing milk and meat yield and quality and decreases the quality of skin and hides in the tannery industries. Poor management systems and lack of appropriate prevention and control like regular deworming may contribute the high burden of the parasite in the area. Therefore, the author has recommended that serious attention is needed at all levels to minimize the negative Impacts on the health, production and productivity of cattle in the District. More over good management practice

like regular deworming using acaricides and create awareness among livestock owners about the veterinary importance of ticks for integrated tick control.

Data Availability

Data supporting this research article are available from the corresponding author or first author on reasonable request.

Ethical Approval Consent and ethical approval for our research work were gained from South Mecha District Agriculture Office of Animal Research Ethics and Review committee

Conflicts of Interest: The author(s) declare(s) that they have no conflicts of interest.

Authors' Contributions

BK: Contributed to sample collection, writing of the manuscript, and interpretation of data.

GF: Contributed to sample collection, writing of the manuscript, and data analysis.

Acknowledgments

The authors would like to thank South Mecha District Veterinary Parasitology Laboratory workers and South Mecha District Agriculture Office for their all-round helps during the work. All research costs were covered by author's contributions

6. References

Abebaw G, Tamiru T (2010) Prevalence of ticks on local and crossbred cattle in and around Asella town, Southeast Ethiopia. Ethiopian Veterinary Journal 14: 79-89. 2.

Alemu, G., Chanie, M., Mengesha,D., & Bogale,B.(2014).Prevalence of ixodid ticks on cattle in Northwest Ethiopia. Acta Parasitologica Globalis,5(2), 139–145.

BossenFantahun, B., & Mohamed, A. (2012). Survey on the distribution of tick species in and around Assosa town, Ethiopia. Research Journal of Veterinary Sciences, 5(2), 32–41.

Chumburo, M. and K.Bayou, "Prevalence and identification of ixodid ticks on cattle in around Hawassa town, southern Ethiopia," International Journal of Advanced Research in Biological Sciences, vol. 8, pp. 118–125, 2021.

CSA (Central Statistical Authority of Ethiopia, Agricultural office 2018.

Getachew, A. C. Mersha, M. Dessalegne, and B. Basaznew, "Prevalence of ixodid ticks on cattle in Northwest Ethiopia," Acta Parasitologica Globalis, vol. 5, pp. 139–145, 2014.

Hordofa, D. A. Hedato, Y. Haji, and A. Senbetu, "A study on prevalence, identification and status of Ixodid (hard) ticks infestation in cattle in and around Honkola Wabe District," International Journal of Veterinary Sciences Research, vol. 7, pp. 151–155, 2021.

Kassa, S. A., & Yalew, A. (2012). Identification of ixodide ticks of cattle in and around Haramaya district, Eastern Ethiopia. Scientific Journal of Crop Science, 1(1), 32–38.

Kumsa, B., Beyecha, K., and Geloye,M. (2012). Ectoparasites of sheep in three agro-ecological zones in central Oromia, Ethiopia. Onderstepoort Journal of Veterinary Research, 79, 442.

Mekasha Aklilu, Kinde Tesfaye, Alan J Duncan (2014) Trends in daily observed temperature and precipitation extremes over three Ethiopian eco-environmets. International journal of climatology.34(6):1990-1999.

Mideksa, K., Haile, G., Mekonnen, N., &Furgasa, W. (2017). Prevalence and identification of bovine ixodide tick in dandi district, West Shoa zone, Oromia Region, Ethiopia. SOJ Veterinary Sciences, 3(5), 1–8.

Minwyelet, A., Abaynew, G., Haben, F., &Mesfin, M. (2021). Study on the distribution of ixodid ticks of cattle in pastoral areas of Yabello district, Boranazone, Oromia, Ethiopia.

Parasite Epidemiology and Control,12, 2405–6731.

Minwyelet, A., Abaynew, G., Haben, F., &Mesfin, M. (2021). Study on the distribution of ixodid ticks of cattle in pastoral areas of Yabello district, Borana zone, Oromia, Ethiopia.

Nateneal, B., Tamerat, E. Fikadu, M. Yimer, and K. Jelalu, "Identification and prevalence of ixodid tick in bovine at Bedele dis trict, Oromiyia regional state, Western Ethiopia," Journal of Parasitology and Vector Biology,vol.7,pp.156–162, 2015.

Regasa, T. D., Kebede Tsegay, A., & Waktole, H. (2015).Prevalence of major ectoparasites of calves and associated risk factors in and around Bishoftu town. African Journal of Agricultural Research, 10(10), 1127– 1135.

Shane, T. T. Gunse, and F. T. Woldemariyam, "Identification of tick and tick borne hemo parasites in Tiyo District, Arsi Zone, Oromia Region," Journal of Veterinary Science and Technology, vol. 2, 2017.

Shichibi, T. H. "Bovine ixodid ticks: prevalence, distribution and associated risk factors in Saylem, Gesha and Masha dis tricts, Southern Ethiopia," Advances in Biology Research, vol. 11, pp. 265–270, 2017.

Shichibi, T. H. "Bovine ixodid ticks: prevalence, distribution and associated risk factors in Saylem, Gesha and Masha dis tricts, Southern Ethiopia," Advances in Biology Research, vol. 11, pp. 265–270, 2017.

South Mecha District Agriculture Office, 2025, (SMAO). Technical Report South Mecha District, South mecha, (2025), Ethiopia

Tamiru, T., & Abebaw, G. (2010).Prevalence of ticks on local and crossbreed cattle in and around Asella town, southeast Ethiopia. Ethiopian Veterinary Journal, 14(2), 79–89.

Thrusfield, M. (2018).Veterinary epidemiology. John Wiley & Sons.

Tiki, B. and M. Addis, "Distribution of ixodid ticks on cattle in and around Holeta town, Ethiopia," Global Veterinaria, vol. 7, pp. 527–531, 2011.

Walker, A. R., Bouattour, A., Camicas, J. L., Estrada-Peña, A., Horak, I. G., Latif, A. A., Pegram, R. G., & Preston, P. M. (2014). Ticks of domestic animals in Africa: A guide to identification of species (pp. 1–230). Bioscience Reports.

Wolde, A., and Mohamed, A. (2014). Prevalence of ixodid ticks on Bovine in Soddozuria districts, Wolaita Zone, Ethiopia. Acta Parasitologica Globalis, 5(3), 188–197.

Yalew, A., Adugna, S., Keffale, M., 2017. Identification of major Ixodid ticks on cattle in and around Haramaya town, eastern Hararghe, Ethiopia. Acta Parasitol Glob 8 (1), 09–16.

Yasine, A., Kumsa, B., Hailu, Y., &Ayana, D. (2015). Mites of sheep and goats in Oromia Zone of Amhara Region, North Eastern Ethiopia: Species, prevalence and farmers awareness. BMC Veterinary Research, 11(1), 1–6.

Zelalem, A. E. Asfaw, and F.Alemayehu, "Prevalence of bovine hard ticks in Chiro District, West Hararghe Zone, East Oro miya," Acta Parasitol Globalis, vol. 7, pp. 66–67, 2016.

Access this Article in Online

Website: www.ijarbs.com

Subject: Veterinary Sciences

Quick Response Code

DOI:10.22192/ijarbs.2026.13.05.008

How to cite this article:
Bekalu Koyachew Birhan and Gizachew Fentahun Desta. (2026). Prevalence and identification of major Ixodid tick parasites of cattle in South Mecha District, North Gojjam, and Ethiopia. Int. J. Adv. Res. Biol. Sci. 13(5): 75-82.
DOI: http://dx.doi.org/10.22192/ijarbs.2026.13.05.008