A Study On The Distribution Of Hard Tick (Ixodidae) On Cattle In And Around Chiro, Oromia Region, Ethiopia

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Abstract: The study was conducted for a period of six months (November 2016 to April 2017) in Chiro (Eastern Ethiopia) with the aim to determine the distribution rate of adult hard tick (Ixodidae) on cattle using a cross sectional study. The adult hard ticks were collected from cattle which are under extensive management system found in different localities of the area. During the study period, a total of 3908 adult hard tick were collected in two agro ecological zone (mid- and low-land). In this study, three genera of tick (Amblyomma, Boophilus and Rhipicephalus) with the relative infestation rate of 73.31%, 19.11% and 7.58% were found. Five tick species namely *Amblyomma cohaerance, Amblyomma variagatem Amblyomma gemma*, *Bophilus decoloratus* and *Rhipicephalus. evertsi evertsi* with respective prevalence of 32.39%, 29.29%, 11.61%, 19.11% and 7.57%. The number of male ticks collected was exceeding those of the female in all species of tick identified. Out of a total 384 animals examined 370 (96.4%) were found to be infested or they were found harboring at least one tick. The burden of tick on cattle had a significant difference in regarding sex and agro ecology. The distribution of hard tick in the study area showed insignificant difference in age, body condition and pre treated with acaricide. The role of determinant factors and little attention paid by livestock owners for treating of their animals against tick are suggested to result in abundance of tick. Acaricide application through spraying and dipping should be strategically applied to control ticks. Study on the tick born disease, involvement of wild life species as well as related facts are recommended as they may provide a valuable basis for design and launching of all control programs in the country.
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Introduction

Ticks are obligate blood feeding ectoparasites of vertebrates particularly mammals and birds (Alello, 1998). Ticks are arachnids in the subclass of Acarina and are closely related to mites. Ticks are widely distributed throughout the world particularly in tropical and sub-tropical countries and cause a tremendous economic loss in livestock production (FAO, 1984). Of the 889 species of ticks in three major families namely the Ixodidae, Argasidae and Nuttalliellidae, relatively few are important to man and domestic animals. The family, Ixodidae is relatively large and comprises thirteen genera of which *Amblyomma*, *Boophilus*, *Dermacenter*, *Hayalomma*, *Haemophisalis*, *Ixodes* and R*hipicephalus* contain species of veterinary and medical importance (Jongejan and Uilenberg, 1994). In Ethiopia, 47 different species of ticks are reported in livestock (Bayu, 2005).

Ethiopia is one of the few countries in the world with high livestock potential. The livestock population of the countries comprises about 57.8 million of cattle, 28.9 million of sheep, 29.7 million of goat, 10 million of equines, 1.2 million camels, 60 million poultry and immense bee and fisheries. This population ranked Ethiopia, first from Africa and ninth from the world in livestock population. However production efficiency of cattle is low in Ethiopia despite their large population. Also; their productivity is low due to various constraints such as diseases, poor nutrition, poor management practices and low productive performance of the indigenous breeds (CSA, 2016). Unfortunately, the contribution of this high natural resource to human nutrition and export earning is disproportionally low. Agriculture is the main stay or livelihood for 85-90% of people of Ethiopia, and is characterized to a large extent by mixed farming system (Mekonnen *et al.,* 2001).

Cattle play a significant role in the socioeconomic life of the people of Ethiopia and livestock industry represent the second largest income contributing to the GDP of the country which accounts for nearly 15% of the total GDP and about 40% of the agricultural GDP. Export of livestock and livestock byproducts also have appreciable contribution to the foreign exchange earning of the country amounting to about 15% and 70% of all export earning, and hide and skin are important components. Besides, animals provide draft power for cultivating the agricultural holding of almost all peasants (Sendros and Tesfaye,

1998). In Ethiopia, an annual estimated loss of 1 million US dollar is attributed to the down grade of hide and skin due to tick infestation. If the losses from reduced productivity, death and cost of tick control are all included the estimated total loss is much greater than this (Yilma *et al*., 1995).

The most economically important genera of tick-borne prokaryotic and eukaryotic haemoparasite infecting cattle in communal area are the rickettsial diseases like anaplasmosis ehrlichiosis, cowdrosis and the protozoal diseases babesiosis and theileriosis (Bell-sakyi *et al.,* 2004). Anaplasmosis, heart water, and babesiosis are the most important constraints to the livestock health and productivity (Coetterel *et al*., 2004). These diseases cause high morbidity and mortality, decrease milk and meat production, loss of draft power, and loss of financial resource through the institution of control measures (Makala *et al.,* 2003). Different study have showed that tick free herds can perform 25% better than those infected. The free herd have faster weight gain, shorter calving interval, reach puberty earlier and have high milk yield (Pegram *et al*., 1992)

Ixodidae tick can adopt different strategies to suck their host and these strategies may vary widely from species to species and from region to region. Some ticks live in open environment and crawl on to the vegetation to wait their host to bypass and this behavior of waiting on vegetation is known as questing (Wall and Sheare, 1997). Within the Ixodidae, seven genera of tick are economically important, Amblyomma, Boophilus, Rhipicephalus, Hayalomma, Ixodes, Dermacenter and Haemophisalis (Kaiser, 2000).

The families of ticks that parasitize livestock are categorized in to two, Argasidae (soft tick) and Ixodidae (hard tick). Although both share certain basic properties, Argasidae and Ixodidae differ in structure, behavior, physiology, ecology, feeding and reproductive pattern (Alello, 1998). Most ticks are active during warm period of the year and undergo hibernation and become dormant during the cold period; they hide with in fissure in the ground, under rock or in crack and building. (Allelo, 1998).

Ticks are chelicerated, bearing four pairs of walking legs, palps and mouth parts in the form of chericerae, adults ranging from 0.5 over 20 mm long. They have external signs of body segmentations and are divided in to two body components, gnathosoma or captulum (mouth part or a fusion of head and thorax) and the idiosoma (the abdomen) (Hendrix, 1998). All ticks at each stage of life cycle parasitizes animals crawling on their host and attaching to skin with their mouth part which consists of hypostoms and palps penetrating the epidermis while hypostoms penetrate to dermis with the help of chelicerae (Walkers and Olwage, 2003).

There are four stages in the life cycle of hard ticks; these are egg, larvae, nymph and adult. After engorged by blood, the female drop off from its vertebrate host and seek sheltered locality in which to lay a single large batch of eggs after which she dies while males usually remain longer. Depending up on the climatic condition, eggs hatch in two weeks to several months giving rise to hexapod larvae. The larvae climb on to a host and suck blood for several days and molt to octopod nymphs. The nymphs then feed on the host and molt to adult male and female ticks. The process of molting can take place either on the ground or on the host depending on the pattern of life cycle of the species (Jongejan and Uilenberg, 1994).

The impact of ticks on livestock production can be divided in to two; these are effect of tick burden as ectoparasite and the effect of disease transmission by serving as a vector. As ectoparasites, ticks are responsible for blood loss, irritation that results in tick worry and interruption of the grazing habits of cattle, damage and loss of udder. Damages to the hide are also caused by the attachment and feeding activity of ticks which provide portal of entry for secondary bacterial infections and for larvae that induce myiasis and tick paralysis due to the toxin they secret in to the blood. The secreted toxin may even disseminate to the respiratory organ and cause death of the animals (Sere, 1999).

These impacts caused by ticks initiated the development of control strategies. These tick control strategies can be basically divided in to two; these are off-host control and on-host control strategies (Kaufman et al., 2006).

Off-host control strategy includes spelling and the use of anti tick plants. Pasture spelling involves keeping livestock off the area to allow starvation and death of all ticks. This method best performed by treating pastures in rotation. The effectiveness of pasture spelling depends on whether alternative hosts, either domestic or wild animals are available to the ticks. Traditional burning of pasture and transhumance are also related with such control However, under condition of extensive production such as those in most of Tropical African countries this approach is of litter practical relevance. The use of tick repellant grasses is another possible means of control of tick population in the field (Malonza et al., 1992).

On-host control involves the application of chemicals (acaricides) and herbal preparations on the host. Acaricides are usually applied by spraying race or hand spraying. Spraying races required extensive initial installation and qualified maintenance service and hence have very limited application to large part

of Africa. Hand spraying and dressing involve a large physical labor input nevertheless they are frequently the only feasible method available for small holders where scattered settlement structure inhibits the use of communal facilities. Dipping is the most frequently selected method of application for communal tick control facilities. The frequency of acaricide application varies widely ranging from three days to several months according to the type of tick to be controlled. Seasonal dynamics of the tick population, efficacy of acaricides used and the type of control strategy pursued affect the effectiveness of the control system (Decastro and Newson, 1993).

Acaricid application is still the main method of tick control in Ethiopia, Arsenic and chlorinated hydrocarbon have been banned because of the threat to human health and the emergency of acaricide resistance against important species of tick (Descastero and Newson,1993). Currently, organophosphates are the most widely used chemicals although evidence of resistance is emerging. Amides and pyrethroids have recently been introduced while plants that have acaricide property are widely used for tick control in rural areas (Mekonnen, 1998).

In Ethiopia, hard ticks are found in all agro ecological zones of the country (Pegram et al., 1981). Different tick species are widely distributed in Ethiopia and a number of researches reported the distribution and abundance of tick species in different part of the country. *Amblyomma* tick is one of the most abundant tick genera in Ethiopia and has been reported in many parts of the country. *Rhipicephalus* is also reported to be predominant genera and *Boophilus* and *Hayalomma* also have a significant role (Gebre et al., 2001). Although tick and tick-borne diseases such as babesiosis, cowdrosis and anaplasmosis are reported in Ethiopia, east coast fever caused by *Theilaria parva* and its vector *Rhipicephalus appendiculatus* has not yet been reported (Solomon *et al.,* 2003). Because diseases like east coast fever and its vector *Rhipicephalus appendiculatus* are found in the neighboring country Kenya, there will be a risk of introduction to Ethiopia and this necessitate the execution of cross sectional surveys in different parts of the country. Even though a number of researches were conducted on the infestation of hard tick in eastern Ethiopia the economic loss due to tick infestation and tick born disease was still aggravated so this study will add some information to solve the above mentioned problems.

Therefore, the major objectives of this study are:

- To identified the major tick species in and around Chiro.
- To assess the distribution of the identified species of tick in the area.

Materials And Methods

Study Area

Description of the Study Area

West harerghe zone is located to the eastern part of Ethiopia and Oromia 317km far from Addis Ababa. West harerghe is bordered on the south by the Shebelle River which separates it from Bale, on the southwest by Arsi, on the northwest by the Afar Region, on the north by the Somali Region and on the east by East Hararghe (CSA, 2007). The study area is located between 7^0 52' 15''- 9^0 28' 43'' N latitude and 40^0 03' 33''– 40^0 34'' 13'' E longitude with an altitude of 1200-3600m above sea level. It is also characterized by three agro-climatic zones, namely highland (Dega), midland (WeinaDega) and lowland (Kola). Kola takes more percentage 49.51%, Dega covers 12.49%, WeinaDega 38%. There are two rainy seasons: *ganna* (June-September) and *belgi/badhesa* (February-April). The mean annual rain fall of the area is from 650-1500 mm and average temperature 20.5-24 ˚c (West Hararge Zonal Agriculture and Natiural Resourse Office, 2016).

Study Animal and Sample Size

The survey was conducted on a total of 384 cattle. These cattle were selected and sampled by using systematic random sampling techniques. The ticks were collected from different body regions of the cattle such as head, ear, brisket, dewlap, scrotum, teat, and tail. The different age groups of the cattle (calf, young and adult) were involved in the study and the age of the animal was determined based on teeth eruption.

The sample size was calculated according to Thrushfield (2007), taking the expected prevalence to be 50% with (95% CI) and 5% desired absolute precision (d = 0.05). Accordingly, the total sample size calculated were 384 animals using the following formula.

$n = 1.96^2 (Pexp) (1-Pexp)/ d^2$

Where n = required sample size; Pexp = expected prevalence and d = absolute precision

Study Design

For this study, a cross sectional study was conducted and determinant factors that affects tick infestation (sex, age, body condition, agro ecology and treatment with acaricides), favorable predilection sites and the relative tick burden on the animal were assessed in the study area.

Tick Collection, Count and Identification

During sampling, animals were either restrained, casted or laid down or restrained with rope and half body collection on alternative body side of the cattle was made. All visible attached adult ticks of all cattle were collected from seven body regions (ear, head, dewlap, brisket, udder, tail and scrotum). Ticks were removed gently and carefully in a horizontal pull to

the body surface by hand. The collected adult ticks were kept for identification in pre-labeled bottle containing 70% ethanol until identification was made at Chiro Regional Laboratory according to Hoogstrael (1956) and Matthyias and colbo (1987). Petri dish and stereomicroscope were used for identification procedure described using Taxonomy of African Tick Identification Manual (Onen *et al.,* 2006).

Data Analysis

Descriptive data analysis was employed in summarizing the data regarding tick isolation, count and identification in cattle of different sex, body condition, altitude, and age as well as pre treated or not treated with acaricide of the animals. Chi-squire test was employed in comparing the distribution of hard ticks on cattle with respect to sex, body condition, altitude, age and pre treated or not treated with acaricide to determine the associations of risk factors and occurrence of the different tick genera and species on the animals. A statistically significant association between variables was said to exist if the calculated $p < 0.05$ at 95% confidence level (Thrusfeild, 2007).

Result

From the total 384 cattle examined from November, 2016 to April, 2017, a total of 3,908 adult hard ticks were collected and these animals were found to be infected with different genera of ticks. Three genera of ticks with a relative infestation rate of 73.31% for *Amblyomma,* 19.11% of *Boophilus* and 7.58% of *Rhipicephalus* have been founded. Five tick species were identified from the 384 cattle sampled and three species were from *Amblyomma* (*Amblyomma cohaerance*, *A. variegatum* and *A. gemma*). One species was from *Boophilus* (*Boophilus decoloratus*) and the other species was from *Rhipicephalus* (*Rhipicephalus evertsi evertsi*) in this study from 384 cattle examined, 370 cattle were infested with at least by one species of tick and the overall prevalence of hard tick on cattle in the area was 96.4%.

Table 1: The distribution of different tick genera in the study area

No.	Location (PA)	Number of animals examined	Number of *Amblyomma* (%)	Number of *Boophilus* (%)	Number of *Rhipicephalus* (%)	Total (%)
1	Ijafara	57	458 (15.98)	258 (38.15)	134 (45.27)	850 (21.75)
2	Tayfe	52	213 (7.93)	71 (9.50)	-	284 (7.26)
3	Qilisoo	54	805 (28.09)	-	-	805 (20.59)
4	Kella	55	261 (9.10)	35 (4.68)	-	296 (7.57)
5	Shola	56	265 (9.24)	40 (5.35)	-	305 (7.80).
6	Najabas	60	653 (22.79)	275 (36.81)	162 (54.73)	1090 (27.89)
7	Wadeyti	50	210 (7.32)	68 (9.10)	-	278 (7.11)
Total		384	2865 (100)	747 (100)	296 (100)	3908 (100)

PA: Peasant Association

Table 2: Tick species distribution with their relative infestation rate in the area

No.	Location (PA)	Number of Animal examined	*Amblyoma cohaerance*			*Amblyoma variagatum*			*Amblyoma gemma*			*Boophilus decoloratus*			*Repicephalus evertsi evertsi*		
			M	F	Total (%)	M	F	Total (%)	M	F	Total (%)	M	F	Total (%)	M	F	Total (%)
1	Ijafara	57	94	40	134 (10.58)	145	60	205 (17.90)	94	25	119 (26.21)	180	78	258 (34.83)	96	38	134 (45.27)
2	Tayfe	52	76	27	103 (8.13)	68	22	90 (7.86)	16	4	20 (4.40)	57	14	71 (9.50)	-	-	-
3	Qilisoo	54	266	135	401 (31.67)	200	84	284 (24.80)	100	20	120 (26.43)	-	-	-	-	-	-
4	Kella	55	90	35	125 (9.67)	71	30	101 (8.80)	22	13	35 (7.70)	28	7	35 (4.68)	-	-	-
5	Shola	56	101	26	127 (10.03)	66	42	108 (9.43)	24	6	30 (6.60)	32	8	40 (5.35)	-	-	-
6	Najabas	60	220	46	266 (21.01)	210	64	274 (24.93)	90	23	113 (24.89)	210	65	275 (36.81)	108	54	162 (54.53)
7	Wadeyti	50	66	44	110 (7.97)	65	18	83 (7.25)	15	2	17 (3.74)	50	18	68 (9.10)	-	-	-
Total		**384**	**913**	**353**	**1266 (100)**	**825**	**320**	**1145 (100)**	**361**	**93**	**454 (100)**	**557**	**190**	**747 (100)**	**204**	**92**	**296 (100)**

Table 3a: Distribution of tick species in different body region of cattles

A. cohaerance (%)	*A.variegatum (%)*	*A.gemma (%)*	**B.decoloratus** (%)	**Rh.evertsi (%)**	Attachment site
Scrotum/udder	764(60.35)	520(45.41)	254(55.94)	26(3.48)	-
Brisket	252(20)	325(28.38)	170(37.44)	347(46.45)	78(26.35)
Dewlap	225(26.2)	300(26.2)	30(6.60)	344(46.05)	-
Tail	25(1.97)	-	-	26(3.48)	-97(32.77)
Head	-	-	-	4(0.54)	74(25)
Ear	-	-	-	-	47(15.87)

Tick species collected from different body part

The distribution of ticks in relation to body parts of the animal was indicated that the most preferable site of attachment of ticks is udder and scrotum and (40%), brisket (30%), dewlap (23%), tail (3.8%), head (2.%) and ear (1.2%).

Table 3b: The different species of tick in relation to risk factors

Risk factors	Tick species					
	Amblyoma cohaerance	*Amblyoma variagatum*	*Amblyoma gemma*	*Boophilus decoloratus*	*Repicephalus evertsi evertsi*	Mixed infestation
Sex	Possitive (%)	Possitive (%)	Possitive (%)	Possitive (%)	Possitive (%)	Possitive (%)
Female 220	54 (24.45)	30 (13.63)	20 (9.09)	29 (13.18)	5 (2.27)	82 (37.27)
Male 164	46 (28.04)	29 (15.85)	16 (9.75)	18 (10.97)	1 (0.69)	20 (12.19)
P.value 0.003						
X^2 36.310						
Age						
Calf 53		3 (5.66)				
Young 116	16 (30.18)	18 (15.51)	4 (7.54)	8 (15.09)	1 (1.89)	31 (58.49)
Adults 225	30 (25.86)	38 (16.88)	10 (8.62)	20 (17.24)	17 (14.65)	21 (18.10)
P value 0.006	54 (24)		22 (9.77)	19 (8.44)	0	102 (45.33)
X^2 54.416						
Body Condition						
Poor 52	11 (21.15)	12 (23.07)	3 (5.77)	6 (11.53)	1 (1.92)	19 (36.53)
Medium 306	78 (25.49)	43 (14.05)	28 (9.15)	39 (12.74)	5 (1.63)	113 (36.92)
Good 26	11 (42.30)	4 (15.38)	5 (19.23)	2 (7.69)	0	4 (15.38)
P.value 0.818						
X^2 24.699						
Agro ecology						
Mid land 267						
Low land 117	79 (29.58)	42 (15.73)	25 (9.36)	37 (13.85)	0	84 (31.46)
P.value 0.000	21 (17.94)	15 (12.82)	11 (9.40)	10 (8.54)	6 (5.13)	54 (46.15)
X^2 91.463						
Treatment						
Treated 151						
Not treated 233	36 (23.84)	25 (16.55)	12 (7.94)	19 (12.58)	3 (1.98)	56 (37.08)
P. value 0.298	64 (27.46)	34 (14.59)	24 (10.30)	28 (12.02)	3 (1.29)	144 (61.8)
X^2 17.348						

Considering factors like age, sex, body condition of animal, pre treated or not treated with acaricide and agro ecology of the study area as shown in Table 3, showed P<0.005 for agro ecology and sex.

Discussion

During the study period, three genera of tick namely *Amblyomma*, *Boophilus* and *Rhipicephalus* with a relative infestation rate of 73.31%, 19.11% and 5.75%, respectively. This implies that the over all tick burdens in the region during the study period was high, and this might be because of the study conducted during peak tick season and little attention paid by the owner to their cattle. During the survey five species of tick were identified, *Amblyoma cohaerance* (32.39%), *A. variegatum* (29.29%), *A. gemma* (11.61%), *Boophilus decoloratus* (19.11%) and *Rhipicephalus evertsi evertsi* (7.57%).

Amblyoma cohaerance was found to be the most abundant tick species in the area and this is supported by the work of Yitbark (2004) indicating this species to be the most abundant tick infesting cattle in south western Ethiopia. *Amblyoma cohaerance*t has also been reported to be prevalent in many other parts of the country such as Rift Valley (Pegram, 1981) and in high land area of Harar and Diredawa district (Manuer and Tilahune, 1991). The result was some what less than the previous report with tick prevalence rate 50.15% (Seid, 2004). This may be due to the improvement of management system and the habit of the owner treating their animal may be increased. This tick species found in very high number in the study area was probably due to geographical location. The result of this study disagree with the finding of (Allekaw, 2000) at Metekel Ranch in Ethiopia showing the prevalence of 5.7% and this could be due to the geographical difference i.e. tick prefer wetter high land and sub high land receiving >800 mm rainfall annually (Pegram *et al,*.1981). The result of this study showed a significant difference (P<0.05) of the tick load in the agro ecology and sex of the animal this is because the distribution. Coherence is generally between at altitude of about 1200-3600m of above sea level with annual rainfall of about 650-1500 mm p.a.

Amblyoma variagatum was the second most abundant tick species in the study area with prevalence rate 29.29%. This is incomparable with results of the tick survey conducted in western Shewa and Bako

district by Husen (2009) with prevalence of 54.3%. Studies conducted by Surafel (1996) in Tigray and Daniel (1994) in south Wollo indicated similar results. The present study result of *A.variegatum* was also disagree with the survey conducted in Holeta and Adda with the prevalence of (45.49%) thes might be due to the fact that tick is very abundant in Western centeral parts of Ethiopia (Pegramet al., 1981). The prevalence of *A.variegatum* was significantly associated (P<0.05) with agro ecology and sex of the animals.

Boophilus decoloratus was found to the third abundant tick species in the study area with the prevalence rate of 19.11%. *Boophilis decoloratus* is often collected in Ethiopia and do not seem to be abundant. This tick species is abundant in wetter high land and sub high land receiving more than 800 mm rainfall annually. The results of this study disagree with finding of Allekaw (2000) at Metekel Ranch, showing a prevalence of 5.7%. Tamiru (2008) at and Teshome (1995) reported the highest count, 80%. This may be due to geographical and altitudinal factors which is 1500-1600 m.a.s.i. at Metekel Ranch. According to Hoogstram (1956), *B. decoloratus* was present at all altitude from sea level to High Mountain which occurs in humid area (Morel, 1980). The prevalence of *B. decoloratus* was significantly different (P<0.005) in case of agro ecology. In the present study, *Boophilus decoloratus* was common from the middle of November the end of December which is a period immediately after rainy season in the area; and decrease after the months of rainy season. How ever, this contradicts with the report of Shiferaw (2005) in Wolyta area that reported highest frequency observed during dry season.

Amblyoma gemma with a prevalence rate of (11.61%) is the fourth abundant tick species in this study. The prevalence of this study disagrees with study conducted in Jimma, south Ethiopia (Yitbark, 2004) that report low prevalence of this tick which may be due to difference in geographical location and weather condition. *Amblyoma gemma* in the present study showed statically significant association (p<0.05) with agro ecology and sex of animals.

Rhipicephalus eversi evertsi was the least abundant tick species collected representing a prevalence rate of 7.57% of the total tick collected. This tick species was reported to be prevalent by other authors such as Behailu, (2004) and Tamiru, (2008). Morel (1980) mentioned that the native distribution *of R. eversi evertsi* in Ethiopia seems to be connected with middle highland, dry savannas and steppes in association with zebra and ruminant. This tick shows no apparent preference for any particular altitude, rainfall or season (Pegram *et al.,* 1981). This finding contradicts the report of Solomon *et al* (2003) in Ghibe who recorded highest count. Prevalence of *R. evertsi evertsi* in the present study has association and statically significant (P<0.05) with sex of animals and agro ecology

In this study, the most infested region of the animal were udder and scrotum followed by dewlap and brisket The predilection sites mentioned in this study were similar to those reported by Okello-Onen (1999). Several factors such as density (Kettle, 1995), time and season (Seyoum, 2005), inaccessibility for grooming (Chandler and Read, 1994) have also been reported to determine the attachment sites. This is important in order to know which body part of the animal requires more attention during spraying.

The male to female sex ratio in all the five species of ticks identified showed that male to be greater than female. This is might be due to the fact that fully engorged female ticks drop off to the ground to lay eggs while males tend to remain permanently attached to the host up to several months (Solomon and Kassa, 2001). This study also showed that the infestations were higher in those cattle of poor body condition than good body condition. This result was comparable with previous reports at Bako district by Husen (2009). The effect of age on the burden of tick is also statistically significant (P<0.05) and the result is comparable with recent studies at Asela (Tamiru, 2008) and Bako district (Husen, 2009).

Conculussion And Recommendations

The most important tick species found during the study were *A. cohaerance*, *A. variagatum*, *A. gemma*, *B. decoloratus* and *R. evertsi evertsi*. Of this species, *A. cohaerance, A. cohaerance B. decoloratus* are the most abundantly distributed tick species. The Prevalence of the different tick species in relation to risk factors such as age, sex and body condition of the animal, pre treatment or no treatment with acaricide and agro ecology of the study area have showed a statistical association for agro ecology of the study area and sex of the animal. Furthermore, the current study showed that the most infested region of the animal were udder and scrotum followed by dewlap and brisket. This helps to know which body part of the animal requires more attention during the application of acaricide.

Based on the above conclusion the following recommendation are forwarded

- Further epidemiological studies should be conducted on tick in different season and in different species of the animals.
- Country wide effective tick control strategies should be designed.
- Efforts should be made to introduce community based tick control strategies.

- Detection of acaricide resistant tick species which are economically important, since limited types of acaricide were used in the area.
- Veterinary professionals mainly animal health technicians should .
- be trained on the effective and modern field diagnostic techniques of tick born disease.
- Detailed study on tick born diseases, involvement of wild life species and related factors are recommended as they may provide a valuable basis for design and launching of tick control program.

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References

1. Allekaw, S. (2000): Distribution of tick and tick-borne diseases at Metekel Ranch, *Journal of Ethiopian veterinary association* 4(1): 40-60.
2. Alello, S.E. (1998): The Merck veterinary manual, 8th ed. Merck and CO. INC, Whitehouse Station, N. J., USA, P_P 670.
3. Bayu, K. (2005): Standard veterinary laboratory diagnostic manual, Volume 3: MOA ADDIS ABEBA.
4. Behailu, A. (2004): A study of ticks and tick-borne protozoan diseases in cattle at Assela, Arsi Zone, Ethiopia, DVM Thesis, Faculty of Veterinary Medicine, Addis Ababa University, Debrezeit.
5. Bell Sakyi, L., Koney, E.B.M., Dogbey, O. and Walker, A.R. (2004): Incidence and prevalence of tick haemoparasites in domestic ruminant in Ghana, *Veterinary Parasitology*. 124 (1-2): 25-42.
6. Central Statistical Agency (CSA), 2016. Agricultural Sample Survey. Livestock, Poultry and Beehives population (private peasant holdings). Federal Democratic Republic of Ethiopia, Central Statistical Authority (CSA), Addis Ababa, Ethiopia. Available at: http://ochaonline.un.org/ethiopia.
7. Chandler, C., Read, P. (1994): Introduction to parasitology, John Weakly and Sons Inc. UK, 10: 882.
8. Coetzerel, J.A.M., Thomson, G.R. and Justin, R.C. (1994): Infectious diseases of livestock with special reference to South Africa, Oxford University press, Cape Town.
9. Daniel W (1994). Survey on tick species of cattle, camel, sheep and goat in South Wollo region, Ethiopia. DVM Thesis, Faculty of Veterinary Medicine, Addis Ababa University, Debrezeit.
10. Decastro, J.J. and Newson, R.M. (1993): A survey of tick species in western Ethiopia including pervious finding and recommendation for further tick survey in Ethiopia, AG. DP/ETH/ 83/023/ technical report, FAO.
11. FAO (1984): Tick and tick-borne diseases control practical field manual vol-1 FAO, Rome. Pp 1-300.
12. Gebre, S. Nigist, M and Kassa, B. 2001. Seasonal variation of tick on calves at Sabata in western shewa zone Ethiopian Veterinary Journal 7: 7-30.
13. Hendrix, C.M. (1998): Diagnostic veterinary parasitology, 2nd edition, Mosby. Inc.164-227.
14. Hoogstrael, H., 1956. African Ixodidae I. Ticks of the Sudan (with Special Reference to Equatorial Province and with Preliminary Reviews of the GeneraBoophilus, *Margaroups* and *Hyalomma*). US Government Department of Navy, Bureau of Medicine and Surgery, Washington, DC.
15. 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.
16. Jongejan, F. and Uilenberg, G.1994 Tick and control method: Rev.sci Tech.off, Epiz.,13:1201-1226.
17. Kaiser, M.N. 2000 Ethiopia report on tick taxonomy and biology, AG/DP/ETH/83/023 consultant repor. Ood and Agricultural Organization of United Nation, Rome, pp 92
18. Kaufman, P.E.Koahler, P.G. and Butler, J.F.,2006. External parasiteon beef cattle. Entomology and Nematology department, Florida cooperative extension service, institution of food and agricultural science, University of florida, http//edis,ifas,ufl,edu/i9.130,11/04/2007.
19. Kettle DS (1995). Medical and veterinary Entomology, CAB International, Wallingford, Oxon, UK. 2: 440-485.
20. Makala, L.H., Mangani, P., Fujisaki, K. and Nagasawa, h., 2003, the current status of major tick born disease in Zambia, veterinaryresearch, 34; 27-45.
21. Malonza, M.M., Dipeolu.O.O, Amoo, A.O. and Hassan. S.M. (1992). Laboratory and field observation on anti-tick property of the plant Gynandropsis gynandra birg, veterinary parasitology. 42:123-126.
22. Manuer K, Tilahun J (1991). A survey of Ectoparasites of cattle in Harer and Dire Dawa districts, Harangue Administrative Region of Ethiopia. Bull. Anim. Hlth. Prod., 30: 45-53.

23. Matthysse, J.G and Colbo, M.H (1987). The Ixodidae tick of Uganda. Entomological society of America, College park, Maryland.
24. Mekonnen, S. (1998): Ticks, tick born disease and control strategies in Ethiopia, proceeding of the second international conference on tick pathogen at the host-vector interference global perspective August20-September 1995, Kruger National park, South Africa.
25. Mekonnen, S., Hussein, I. and Benane, B. (2001): The distribution of Ixodidae ticks (Acari: Ixodidae) in central Ethiopia *Onderstepoort journal of veterinary rerearch* 68:243-252.
26. Morel, P., 1980. Tick distribution and vegetation zones in Ethiopia. Study on Ethiopian ticks (Acaridae, Ixodida), pp: 259-266.
27. Okello-Onen, J., S. Hassan and S. Essuman 1999. Taxonomy of African ticks, an identification manual International Center for Insect Physiology and Ecology press, Nairobi, Kenya, pp: 1-124.
28. Onen, J.O., Hassan S.M. and Essuman, S., 2006. Taxonomy of African tick identification Manual. International center for Insect physiology and ecology.
29. Pegram, G. Hoogstrael. H. and Wasset. .Y. 1981. Tick (Acari, Ixodidae) of an Ethiopian distribution, ecology and host relation of species infecting livestock's. Bulleting of entomology research 71: 339-359.
30. Pegram, R.G. 1992. Biosystematics studies on the genus rhipicephalus: the R. Sanguinenus and R. simus group (Ixodidae) Food and agricultural Organization of United nation, Rome, pp 160.
31. Sendros, D. And Tesfaye, K. 1998. Factors to be considered in the formulation of livestock breed police in proceeding of the five national conference of Ethiopian society animal production Addis Abeba, ESAP. Pp (13-27).
32. Sere, C. (1999). Towards the economic assessment of veterinary input in tropical Africa international livestock center for Africa working document No.1 Addis Abeba, Ethiopia ILCA 63 pp32.
33. Seyoum Z (2005). Distribution and host parasite relationship of Ixodidae ticks in Eastern Amhara, Ethiopia. Ethi. Vet. J., 9(1): 9-17.
34. Shiferaw, D. (2005): cattle tick dynamic in different agro ecology zone of wolyta, Southern Ethiopia. Master degree. Addis Abeba University, FVM, Debre Zeit, P_P 1-137.
35. Solomon G, Nigist M, Kassa B (2003): Seasonal variation of ticks on calves at Sebata in Western Shoa Zone. Ethi. Vet. J., 7(1:2): 17-30.
36. Solomon, G. and G. Kassa, 2001. Development reproductive capacity and survival of *Amblyomma variegatum* and *Boophilus decoloratus* in relation host resistance and climatic factors under different field conditions. Vet. Prasitol, 75: 241-253.
37. Surafel, M. (1996). Survey of tick species on four domestic animals in Tigray region. DVM thesis, Faculty of Veterinary Medicine, Debrezeit, Ethiopia.
38. Tamiru T (2008). A survey of Bovine tick species in and around Assella Town. DVM thesis, Jimma University College of Agriculture and Veterinary Medicine; Jimma, Ethiopia.
39. Teshome, (1985): Cattle tick resistance against acaricide in the institution of agricultureal research at Bako. FVM, Addis Abeba University, Ethiopia, DVM thesis.
40. Thrushfield, M (2007) veterinary epidemiology 3rded. Black well science Ltd, London. pp 32.
41. Walker, J.B. and Olwage, A. (2003) the tick vector of Cowderia ruminatun (ixodidae, ixodidea genus) and their genus. Onder. J vet res., 54, 353-379.
42. Wall and shearer, D, (1997), veterinary Entomology: Anthropo Ectoparasites of veterinary importance, chairman and hall, UK. 96-140.
43. West Hararge zonal Agriculture and Natiural Resourse Office, 2016.
44. Yilma, J., Daniel, S. and Dorchies, P. (1995): Survey of ticks infesting domestic ruminants in south wollo region of Ethiopia. De Medicine. vetrinaries. 143; 3, 213-220.
45. Yitbark, G., 2004. Tick species infesting livestock in Jimma, Southern Western Ethiopia DVM thesis. FVM, AAU, Debr Zeit, Ethiopia.

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