



Bayero Journal of Pure and Applied Sciences, 12(1): 151 - 154

Received: February, 2019

Accepted: June, 2019

ISSN 2006 – 6996

A SURVEY OF TICK INFESTATION ON CATTLE IN SELECTED AREAS OF BAUCHI NORTH SENATORIAL ZONE, BAUCHI STATE, NIGERIA

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ABSTRACT

Tick-borne diseases are spread throughout the world but are most numerous and exerting greatest impact in the tropical and subtropical regions. The survey of tick infestation on cattle was carried out in Bauchi North Senatorial Zone, Bauchi State, Nigeria to ascertain the impact of ticks on their host. Ticks specimens were collected by detaching them from their host using a forceps. The results showed that 1719 ticks were recovered from the randomly selected 200 cattle examined. The species found were 900 (53%) Amblyomma species, 637 (37%) Boophilus species, 159 (9%) Hyalomma species and 23 (1%) Rhipicephalus species. The infestation of ticks was higher in Giade 554 (32%) followed by Itasgadau 523 (30%), Jama'are 336 (20%) and Katagum 306 (18%). It was also higher in Female cattle 982 (57%) than the male 737 (43%) cattle and in White Fulani followed by Sokoto Gudali and Red Bororo with 1193 (69%), 386 (23%) and 140 (8%) respectively. From the result of this study tick infestation was high and this has serious economic implication as it reduce the productivity of the farmers and also has the potential infliction causes of diseases to both cattle and human. Therefore, appropriate control measures should be instituted by the authorities to minimize these losses in production as well as educating the farmers on the effect of tick infestation on their cattle and cattle consumers in study area.

Keywords: Tick, Cattle, Infestation, Bauchi

INTRODUCTION

Ectoparasites, particularly ticks, are important parasites because of their voracious blood-feeding activity and as vectors for various agents of diseases in both man and livestock (Cumming, 1998). In Nigeria parasites constitute a major constrain to livestock production (Fabiya, 1984). Certain factors have been observed to affect the distribution of ectoparasites to their host. Among some are the season (James-Rugu and Iwuala, 2002) and mode of livestock rearing or system (James-Rugu and Iwuala, 1995). Tick-borne diseases were again ranked high in terms of their impact on the livelihood of resource poor farming communities in developing countries (Perry *et al.* 2002). This is particularly relevant in parts of sub-Saharan Africa, Asia and Latin America, where the demand for livestock products is increasing rapidly (Delgado, 1999). Eight hundred and ninety six (896) tick species were recognized worldwide (Guglielmone *et al.*, 2010)

Ticks of domestic animals directly cause poor health and loss of production to their hosts by many parasitic mechanisms. Ticks also transmit numerous kinds of viruses, bacteria, and protozoa between domestic animals (Walter, 2017). Most of the investigations on prevalence of tick species in Africa (Nigeria) are more than a decade old (Perry, *et al.*, 2002) whereas periodical monitoring of tick infestation is an essential component for formulating effective control measures. The impact of ticks and tick borne diseases on the individual and national economics warrants application of appropriate tick control strategies on priority basis (Basil, 2005). Therefore the present study was conducted to determine the tick infestation on cattle in the Bauchi North senatorial zone in relation to sex, breed, and location for proper control measures.

MATERIAL AND METHODS

Study Area

The study was conducted in Bauchi North Senatorial Zone, Nigeria. Seven Local Governments make up the zone out of the twenty Local Governments of the state which includes Katagum, Shira, Jama'are, Itas/ Gadau, Zaki, Gamawa and Giade. The zone occupies a total land of 9717km representing about 20.2% of the state's total land area. The vegetation of the zone is Sudan savannah ecosystem. The major climate elements that influence the climate of the study area and affecting the farming system are temperature and precipitation (rainfall), the annual temperature ranged between 22-33°C from April to May (Bashir *et al.*, 2001). The mean annual rainfall ranged between 615.6-985mm with peak between July- Augusts.

Sample Collection

Random sampling techniques were used to select 200 cattle from four selected Local Governments of this Senatorial zone and 50 cattle in each selected Local Government. Ticks specimens were collected by detaching them from their host using a forceps. All parts of the body of cattle were carefully examined. The ticks collected were stored in container containing 70% alcohol for later identification in the laboratory. The containers were labeled based on the location, breed and sex of the sample collected. The samples collected were then transported to the Laboratory for identification

using method described by Wall and Shearer (1997).

Statistical Analysis

The results obtained were analyzed using chi-square for any significant differences on the incidence of tick infestation in different locations, breeds and sex at $P < 0.05$ level of significance, simple percentage and frequency were used to present the results.

RESULTS AND DISCUSSION

Livestock industry in Nigeria is faced with many problems and one of such problems is parasitic diseases (Jawara, 1990). Parasitic infection is known to cause great economic losses in livestock production in Africa in general (Ajayi, 1995). In this study, four genera of ticks were encountered with *Amblyomma* species with the highest prevalence followed by *Boophilus* species, *Hyalomma* species and *Rhipicephalus* species with 900(53%), 637(37%), 159(9%) and 23(1%) respectively (table 1). This species encountered were similarly encountered by many researchers such as (Fabiya, 2007; Owolabi *et al.*, 2015; Obadiah and Shekaro 2012; Joseph, *et al.*, 2014). The *Rhipicephalus* species which is the least prevalence species in this study, this is because it is an accidental ectoparasite (tick). *Rhipicephalus* species have been reported to have preference of dog as host (Ouhelli and Pandey, 1982). And this is possible because some of the cattlerearers are using dog which usually help them for security and hunting.

Table 1: Distribution and Abundance of Ticks Species Collected during the study

Species of ticks	No. collected	Percentage
<i>Amblyommavariegatum</i>	675	39
<i>Amblyommasplendidum</i>	225	13
<i>Boophilusannulatus</i>	324	19
<i>Boophilusdecoloratus</i>	222	13
<i>Boophilusgeigy</i>	91	5
<i>Hyalommarufipes</i>	64	4
<i>Hyalommatruncatum</i>	95	6
<i>Rhipicephalus</i> species	23	1
Total	1719	100

Table 2: Sex Related Ticks Infestation on Cattle in Sample Area

Sex	Frequency	Percentage
Male (Bull)		
<i>Amblyomma</i> species	411	56
<i>Boophilus</i> species	267	36
<i>Hyalomma</i> species	49	7
<i>Rhipicephalus</i> species	10	1
Sub-total	737	43
Female (Cow)		
<i>Amblyomma</i> species	489	50
<i>Boophilus</i> species	370	38
<i>Hyalomma</i> species	110	11
<i>Rhipicephalus</i> species	13	1
Sub-total	982	57
Total	1719	100

Table 3: Ticks Infestation on Cattle in Sample Area Based on breed

Breed	No of Cattle Examined	Frequency	Percentage
White Fulani	145	1193	69
SokotoGudali	39	386	23
Red Bororo	16	140	8
Total	200	1719	100

X^2 calculated = 0.17; X^2 tabulated = 5.99, df= 2, P>0.05

Table 4: Ticks Infestation on Cattle in Sample Area Based on Location

Location	No of Cattle Examined	Frequency	Percentage
Katagum	50	306	18
Itasgadau	50	523	30
Jama'are	50	336	20
Giade	50	554	32
Total	200	1719	100

X^2 calculated = 11.84; X^2 tabulated = 7.81, df= 3, P>0.05

The study showed that, the infestation of ectoparasite by the tick is higher in female 57% than male 43% cattle (Table 2). This study is in agreement with the earlier report of Malann *et al.* (2016) but contrary to the report of Obadia *et al.* (2017) and Obadia and Shekaro (2012) who reported high infestation in male than female which may be due to different method of rearing and the rearing environment, but it is worth to note that all species examined occurred in both sexes of the cattle. The infestation rate is higher in white Fulani breed than other breed. White Fulani breed is the most abundant breed in the study area. The Red Bororo and SokotoGudali breed were not much in the area as (table 3). Also, the infestation rate was not statistically different among the species (P>0.05). Obadia and Shekaro (2012) reported that no breed were completely resistance to tick infestation.

The tick infestation based on location on the cattle was higher in Giade with 32% followed by Itas-Gadau, Jamare and katagum with 30%,

20% and 18% respectively. The infestation rate in different location was statistically significant (P<0.05). This may be due to the rearing method and dirty environment where the tick thrive are readily found and also it may attribute to more awareness in urban areas than rural.

CONCLUSION AND RECOMMENDATION

In conclusion, from the result of this study tick infestation was high and this has serious economic implication as it reduce the productivity of the farmers and also has the potential infliction causes of diseases to both cattle and humans. Therefore, appropriate control measures should be instituted by the authorities to minimize these losses in production as well as educating the farmers on the effect of tick infestation on their cattle and cattle consumers in the study area.

Conflict of interest

The authors declare no conflict of interest.

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