



An Assessment of Bovine Ticks of Veterinary Importance in Gujba Local Government Area, Yobe State Nigeria

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Abstract – A study was conducted in five different locations in Gujba Local Government Area of Yobe State, Nigeria between the months of April-June 2013 to assess the prevalence of Ticks of veterinary importance. The study area included Katarko, Goniri, Gujba, College of Agriculture farm and BuniYadi. A total of 561 heads of cattle comprising of 289 Females, 272 Males, 248 White Fulani Breeds and 313 Bororo were involved. The study revealed the existence of five different genera of ticks viz *Amblyomma*, *Hyalomma*, *Boophilus*, *Ornithodus* and *Rhipicephalus* with prevalence rates of 39.63%, 10%, 6.39%, 6.62% and 1.25% respectively. Beside, some significant findings were also discovered by the study. These included a considerably higher prevalence rate and site of collection (location) as well as cattle sex, an association between prevalence rate and cattle age, breed and months of collection.

Keywords – Bovine, Gujba, Red Bororo, Ticks, White Fulani.

I. INTRODUCTION

Nigeria's livestock population was recently estimated at 34.5 million goats, 22.1 million sheep and 13.9 million cattle populations [1]. Of the 13.9 million heads of cattle, about 11.5 million were kept in pastoral systems, while the remaining 2.4 million were kept in villages [1]. A larger proportion of these animals are largely concentrated in the northern than the southern region of the country. Specifically, about 90% of cattle populations are concentrated in the northern region. Despite the concentration of cattle population in the Northern region of Nigeria, cattle production and productivity has been hampered by low or poor husbandry practices, inadequate feed supply and disease constraints particularly ectoparasitic infestations, thereby limiting the protein supply in Nigerian diets [2]. Among the ectoparasitic infestations, ticks remain one of the most economically important parasites of cattle in tropical and subtropical countries [3]. Ticks rank second to insects as vectors of transmissible diseases in man and animals [4]. Reference [5] and [6] estimated that more than 80% of the world cattle population is infested by ticks, which are known to transmit viral, bacterial and protozoan pathogens causing Tick Borne Diseases (TBD) such as hemorrhagic fever, cowdriosis, ehrlichiosis, anaplasmosis, theileriosis and babesiosis. Ticks suck blood of their hosts resulting into

severe anemia, loss of production, weakness and immunosuppression [7] as well as damages hides and skin leading to significant financial losses to livestock farmers [8]. Production losses due to ticks and tick-borne diseases (TBD) around the globe were put at US\$ 13.9 to US\$ 18.7 billion annually [9]. Four genera of ticks notably *Amblyomma*, *Boophilus*, *Hyalomma* and *Rhipicephalus* species infect livestock in Nigeria while mild infestations with *Haemaphysalis* species and *Ornithodus* have been documented [10]. However, there is dearth of information on the prevalence of ticks affecting cattle production in Gujba LGA of Yobe State, Northern Nigeria, despite the fact that it is endowed with favorable weather condition suitable for the proliferation of cattle. Therefore, this necessitates the need for this study on the prevalence of ticks among cattle breeds in Gujba LGA of Yobe State, Nigeria.

II. MATERIALS AND METHODS

Study area

The study was conducted in Gujba Local Government Area (LGA) of Yobe state. Gujba, located in the southern part of the state represent Sudan savanna agro-ecological zone, laying between latitude 11° 15' N longitudes 9° 15' E and 10° 15' E. The climate regime is characterized by single long dry season followed by a shorter wet season. Mean annual rainfall ranges from 800 to 1000 mm. Mean annual temperature is 36 °C increasing toward the Sahel zone to about 38 °C. Humidity is low throughout the dry season. Potential evapotranspiration exceed rainfall except for few months [11].

Study design

A cross sectional study was conducted to identify the tick species, population dynamics of tick species and their predilection site on local cattle from five (5) different locations which include Katarko, Goniri, Gujba, College of Agriculture Farm and BuniYadi. The animals were selected purposively (based on the existence of at least one tick on their body) since the aim was determination of prevalence of different tick species and their predictors. The age of animals was grouped as young (between 1 and 3 years) and adult (> 3 years) according to the classification method used by [12].

Tick sampling and sample collection

The entire body surfaces of the host were inspected for ticks. After full restraining of the animal, all visible adult tick species were removed by hands or using special forceps holding the basis capitulum so as not to lose the mouth parts of the ticks. Collection of ticks were done on brisket, backside, ventral (abdomen), under tail and anovulval areas. Ticks from each animal and from the site were collected and placed in separate universal bottles containing 10%, ethyl alcohol that had been pre-libeled. Required information like date of collection, age of animal, sex of animal, site of collection were recorded. Tick species identification was done using a stereomicroscope at parasitology laboratory of the department of veterinary Microbiology and parasitology, University of Maiduguri and College of agriculture Laboratory.

Tick identification

Identification procedure required both field work and laboratory investigation of collected sample. Tick species

were identified by the shape and length of the capitulum, the color of the body, the color of the legs, position and presence or absence of punctuations on the body, shape of the eyes and the length of the mouth parts according to [13].

III. RESULTS

The characteristics of the cattle used for the study are given in table 1. Out of the total of 561 heads of cattle examined, the highest number (208) was observed at the college farm, followed by BuniYadi town (105), Katarko town (86) and Gujba town (80). Similarly, out of the total 561, 289 (51.51%) were females while 272 (48.48%) were males. There were 404 (72.01%) adults and 157 (27.99%) young. The animal belonged to two (2) breeds namely, White Fulani with 248 (44.21%) heads and Red Bororo with 313 (55.79%) heads.

Table I: Characteristics of the cattle used for the study

Location	No of Cattle	Female	Male	Adults	Young	WF	RB
Katarko	86	50	36	66	20	49	37
Goniri	82	48	34	51	31	16	66
College Farm	208	101	107	146	62	102	106
BuniYadi	105	52	53	89	16	46	59
Gujba	80	38	42	52	28	35	45
Total	561	289	272	404	157	248	313

Source: field work (2013) WF = White Fulani RB = Red Bororo

The outcomes of the results show a higher prevalence rate of bovine ticks in almost all the locations. Five genera of ticks were identified viz, amblyomma, hyalomma, boophilus, ornithodoros and rhipicephalus with percentage

rate of 39.63%, 46.10%, 6.62% and 1.25% respectively. The genus hyalomma was found to be the most prevalent in all the locations (46.10%), while rhipicephalus was the least (1.25%) and identified in only two locations.

Table II: Prevalence of Ticks Genera in the Study Area

No. of Ticks	Frequency / Percentage						
	Ticks Genera	Katarko	Goniri	College Farm	Y/Buni	Gujba	Total
Amblyomma		511(14.16%)	465(12.88)	1522(14.18)	686(19.01)	424(11.75)	3608
Hyalomma		451(10.75)	636(15.15)	1832(43.665)	833(19.85)	455(10.60)	4197
Boophilus		60(10.13)	96(16.49)	241(41.41)	106(18.21)	79(13.57)	582
Ornithodoros		34(5.64)	77(12.77)	120(19.90)	314(52.07)	58(9.62)	603
rhipicephalus		0(0)	18(15.79)	0(0)	96(84.21)	0(0)	114
TOTAL		1056(11.60)	1292(14.19)	3715(40.81)	2035(22.35)	1006(11.05)	9104

Source: field work (2013)

The prevalence rate based on cattle sex did not reveal any much difference, with percentage rate of 50.88% for the females and 49.12% for the males, whereas as considerable difference was obtained in the prevalence rate of cattle ticks based on age. Despite the fact that the number of adult cattle nearly tripled that of young ones, the prevalence rate recorded among the young cattle (36.90%) was comparatively higher in relation to that of the adult ones (63.10%).

Table III: Prevalence based on cattle sex

No. of Ticks	Frequency / Percentage		
	Ticks Genera	Female	Male
Amblyomma		1915(53.08)	1693(46.92)
Hyalomma		2005(47.77)	1292(52.23)
Boophilus		272(46.74)	310(53.26)
Ornithodoros		396(65.67)	207(34.33)
Rhipicephalus		44(33.60)	70(61.40)
TOTAL		4632(50.88)	4472(49.12)

Source: field work (2013)

Table IV: Prevalence based on cattle age

No. of Ticks	Frequency / Percentage	
	Adults	Young's
Amblyomma	2238(62.02)	1370(37.97)
Hyalomma	2409(57.40)	1788(42.60)
Boophilus	469(80.58)	113(19.42)
Ornithodoros	575(85.41)	88(14.59)
Rhipicephalus	114(100)	0(0)
TOTAL	5745(63.10)	3359(36.90)

Source: field work (2013)

Similarly, an association between breed of cattle and prevalence rate of cattle ticks was also established by this study. The rate was found to be 72.29% among the red bororo breeds and 25.71% among the white Fulani breeds. Meanwhile, the outcome of the study has as well identified sort of descending prevalence rate of cattle ticks over the three months of collection. It was found to be higher in April and continued to decline through May and June. The percentage rate for these months was 42.04, 38.52 and 19.44% for April, May and June respectively.

Table V: Prevalence based on cattle breed

No. of Ticks	Frequency / Percentage	
	White Fulani	Red Bororo
Amblyomma	1006(27.88)	2602(72.12)
Hyalomma	1022(24.35)	3175(75.65)
Boophilus	204(35.05)	378(64.95)
Ornithodoros	104(18.08)	494(81.92)
Rhipicephalus	0(0)	114(100)
TOTAL	2336 (25.71)	6763 (72.79)

Source: field work (2013)

Table VI: Prevalence based on month of collection

No. of Ticks	Frequency / Percentage		
	April	May	June
Amblyomma	1532(42.46)	109(46.4.6)	984(27.27)
Hyalomma	1670(37.79)	1950(30.27)	577(21.13)
Boophilus	196(33.68)	263(45.19)	123(21.13)
Ornithodoros	331(54.89)	189(30.85)	86(14.26)
Rhipicephalus	98(85.96)	16(14.03)	0(0)
TOTAL	3827(42.04)	3507(38.52)	1770(19.44)

Source: field work (2013)

IV. DISCUSSIONS

Bulk of the cattle used in this study were selected from the college farm because it is a watering points where many cattle from the surrounding villages converge to drink comparatively, higher population of ticks is been reported during the wet season while the dry season is known to have low ticks population. Reference [10] reported that cattle tick distribution is largely determined by climatic factors such as rainfall and vegetation. The relatively high concentrations of bovine ticks in this study area at the period of data collection (April-June) which happens to be dry season is an issue of concern. Besides, the prevalence rate recorded as well as the genera of ticks

revealed is in consent with the report of National Council of Agriculture [11].

The absence of association between cattle sex and the prevalence rate of cattle ticks noticed, also agrees with many reports by other researchers. However, the study has revealed an association between cattle age and prevalence rate of cattle ticks. Reference [15] reported that large and older animals develop some degree of immunity over time against tick infestations. It was also noticed that cattle with poor body conditions harbored most of the ticks. Reference [16] reported a relationship between parasitism and animal's body conditions. Furthermore, an association was also revealed by this study between cattle breed and tick infestation. It was discovered that, red Bororo breeds were more susceptible to infestation by ticks than the white Fulani breeds. Though some researchers have reported between and within breed differences in the susceptibility of ruminants to parasitic infections, the result and findings of this study in that respect is open for further investigations. For instance, [17] reported that there is a possible existence of genetic resistance to strong lid nematodes among domesticated livestock and that the dwarf short- horned breeds of cattle found predominating Southern Nigeria are relatively tolerant to some endemic diseases like trypanosomiasis and streptothricosis

The study also established that as the months got drier so also the pasture, and a decline in the intensity of bovine tick infestation; a finding that agrees with the report of [17]. The endemic nature of bovine tick infestation in this area discovered by this study could as well as attributed to the fact that, the nomads who mostly own these cattle neglect simple therapeutic and prophylactic measures against ticks infestations and embark on primitive traditional methods of combating the menace, a measure that does not have any significant importance in the modern world of medicine. This indicates that the nomads in this sub-region do employ etho-veterinary medicine, [18].

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