

Identification Of Ticks Species On Cattle In Ungwan Rimi, Kaduna North Local Government Area, Kaduna State.

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Abstract

The aim of this study was to identify the tick species prevalent on cattle from Ungwan Rimi, Kaduna North L.G.A., Kaduna State. Oral interview and questionnaire were used to get information on age of cattle, effects of tick infestation on cattle. Percentage was used to determine the prevalence of ticks on cattle and chi-square was used to determine the association of tick infestation with age and sex of cattle. Ticks were picked with tweezers from the body of the cattle and preserved in 10% formalin and taken to Zoology laboratory of department of Biological Sciences of Kaduna State University for identification. Out of 152 cattle examined, (57.24%) were infested with ticks. Eight species of ticks were identified with *R. microplus* having the highest prevalence (52.95%) while *R. decoloratus* had the least (2.17%). In terms of tick infestation in relation to sex, (49.28%) of the males were infested while (63.86%) of the females were infested. The infestation in respect to age showed that (73.81%) of the young cattle were infested while (50.91%) of the adults were infested. The prevalence of ticks in relation to predilection site showed that the head had the highest number of ticks (42.5%), while the body had the least (6.10%) About the effects of tick infestation on cattle, most of the respondents (70.5%) said that damage of hides and skins of cattle was the common effect of tick infestation. In conclusion, the prevalence of tick infestation is high in this study; so awareness creation is recommended.

Keywords: Ticks species, cattle, Health implications, Control measures, Ungwan Rimi

INTRODUCTION

Ticks are important parasite of large wild and domestic animals and are also significant as carriers of serious diseases. Ticks belong to two main families, Ixodidae and Argasidae. The third family is Nuttalliellidae to which only one species belongs [8]. Ticks are widely distributed around the world especially in warm, humid climate. They live on the external surfaces like skin, feathers, or fur of their hosts, deriving nutrients and transmitting many infectious diseases to mammals including man, birds, and some reptiles and amphibians, significantly impacting their host health and well-being [9]. Tick infestations also affect the quality of cattle hides, leading to economic losses in the leather industry [3]. A conservative estimate of USD 45,269.35 loss annually was made via rejection and downgrading hides and skin destroyed by ticks in Ethiopia [6,7,11]. Cattle are particularly important, contributing to meat, milk, and hides production, as well as serving as a cultural symbol and economic asset in many communities. However, the health and productivity of cattle in Nigeria are often compromised by ticks' infestations, which are exacerbated by factors such as climate, poor management practices, and limited access to veterinary care [12].

MATERIALS AND METHODS

Study area

The study was conducted in Unguwan Rimi, Kaduna North Local Government Area of Kaduna State, Nigeria located on latitude 10° 31' 44" N and longitude 7° 27' 40" E. It covers an area of 44,408.3 Square Kilometers. The area is characterized by a tropical climate with distinct wet and dry seasons. The wet season typically starts from April to October, with the dry season spanning from October to March [4].

Study design and study animal

A cross-sectional study was conducted to investigate the prevalence of tick species on cattle in the study area and one hundred and fifty-two (152) cattle were used as sample size. Fifty structured questionnaires were administered to collect information on the medical importance and control of ticks.

Identification of Ticks

Ticks were examined, identified and classified into species using the identification key described by [15] and [17].

Sample Collection

After wearing a pair of hand gloves, ticks were carefully handpicked from different region of the body of cattle of varying age and sexes. The ticks collected from each animal were placed in a sample container containing 10% formalin diluted with 100ml of distilled water and labeled indicating the Date of Collection, Predilection site of tick, Age, and Sex of the cattle. The samples were transferred to Zoological Laboratory of Kaduna State University, Kaduna State for identification.

Data Analysis

Descriptive statistics was used to determine the prevalence of ticks on cattle and Chi square was used to determine the association of tick infestation with age and sex of cattle.

RESULTS

Out of 152 cattle examined, 87(57.24%) were infested with ticks. (Table 1)

Eight species of ticks were identified namely:

Amblyomma variegatum, *Rhipicephalus microplus*, *Dermacentor albipictus*, *Hyalomma marginatum*, *Haemaphysalis longicornis*, *Boophilus annulatus*, *Ixodes scapularis*, and *Rhipicephalus decoloratus*.

Rhipicephalus microplus had the highest prevalence with a total number of 538(52.95%) ticks, followed by *Dermacentor albipictus* with a total number of 248(24.41%) ticks, followed by *Amblyomma variegatum* with a total number of 70(6.89%) ticks, followed by *Hyalomma marginatum* with a total number of 55(5.41%) ticks, followed by *Ixodes scapularis* with a total number of 30(2.95%) ticks, followed by *Boophilus annulatus*, with a total number of 27(2.66%) ticks, followed by *Haemaphysalis longicornis* with a total number of 26(2.56%) ticks, *Rhipicephalus decoloratus* had the least prevalence with a total number of 22(2.17%) ticks (Table 1).

The prevalence of tick infestation on cattle in relation to sex of cattle showed that Female cattle had higher prevalence (63.86%) than the Male cattle (49.28%). The difference in prevalence of ticks between the male and female cattle was significant (χ^2 , $p < 0.05$). (Table 2)

And in terms of age-related tick prevalence, the results showed that the young cattle had more prevalence (73.31%) than the adult cattle (50.91%). The difference in prevalence between the young and adult cattle was significant (χ^2 , $p < 0.05$). (Table 2)

The result revealed that the head region has the highest number of ticks 432 with mean occurrence of 2.84, followed by the Tail 218 with mean occurrence of 1.43, followed by the front/ventral side 201 with mean occurrence of 1.32, followed by the Legs 103 with mean occurrence of 0.68, then the back 62 with mean occurrence of 0.41. (Table 3)

Table 1: Overall prevalence of ticks on cattle from Ungwan Rimi and the species identified

Number Examined	Number infested (%)	Species of ticks identified	Number of ticks collected (%)	Mean occurrence
152	87 (52.24)	<i>Amblyomma variegatum</i>	70(6.89)	0.46
		<i>Boophilus annulatus</i>	27(2.66)	0.18
		<i>Dermacentor albipictus</i>	248(24.41)	1.63
		<i>Haemaphysalis longicornis</i>	26(2.56)	0.17
		<i>Hyalomma marginatum</i>	55(5.41)	0.36
		<i>Ixodes scapularis</i>	30(2.95)	0.20
		<i>Rhipicephalus decoloratus</i>	22(2.17)	0.14
		<i>Rhipicephalus microplus</i>	538(52.95)	3.54
Total			1016(100)	6.68

Table 2: Prevalence of tick Infestation on cattle from Ungwan Rimi in relation to sex and age of the cattle

Sex	Number examined	Number infested (%)
Male	69	34 (49.28)
Female	83	53(63.86)
Age (Years)		
Young (1-2 years)	42	31(73.81)
Adult (3 years and above)	110	56(50.91)

Table 3: Prevalence of Tick Infestation in Relation to Predilection Sites

Predilection sites	Number examined = 152	Number infested = 87	Number ticks collected (%)	Mean occurrence
Tail			218(21.46)	1.43
Leg			103(10.14)	0.68
Ventral side			201(19.78)	1.32
Dorsal side			62(6.10)	0.41
Head region			432(42.52)	2.84
Total	152	87	1016(100)	6.68

RESPONSE TO QUESTIONNAIRE

Most of the respondents (70.5%) were of the opinion that the effect of tick infestation on cattle is damage of hides and skin, 20.5% of the respondents indicated transmission of disease, 9.1% of the respondents indicated reduced milk production. (Table 4)

Table 4: Effects of tick infestation on cattle

Effects	Number of respondents (%)
Transmission of diseases	9(20.5)
Damage of hides and skin	31(70.5)
Reduced milk production	4(9.0)

DISCUSSION

Ticks and tick-borne diseases have potential veterinary importance especially on cattle [18]. The overall prevalence of tick infestation on cattle in the study area is high and it showed similarities with findings of previous studies on tick prevalence conducted in India 58.6% [5] and in Nigeria 63.4% [10]. These similarities may be due to similar conditions, climate, rearing system and management.

Eight species of ticks were identified from the study area, with *R. microplus* having the highest prevalence. The high prevalence of *R. microplus* on cattle agrees with findings of previous study on the prevalence

and identification of ticks on cattle in Uganda [14]. This may be due to the availability of suitable habitat, climate and host for tick growth.

According to this study, the prevalence of tick infestation was higher in female than in male. The findings of the study showed similarity in a study conducted in Bangladesh [18] where females had 49.31% and males had 19.92%. This may be due to long period spent on pregnancy and lactation by the female cattle which reduces their immunity.

In relation to age, the young cattle had more prevalence than the adult cattle. The difference in prevalence between the young and adult cattle was significant. This result showed similarities with as previous studies conducted in Uttar Pradesh, India [2] and in Western Nigeria [1]. This may be due to the fact that young cattle have a lower level of acquired immunity against ticks compared to the adults. This result also showed dissimilarities with a previous study in Bangladesh [18] and in Ghana [16] where adult cattle had more prevalence of ticks than the young cattle.

The findings of this study detected the head region as the highest tick infestation site. In a previous study, it was reported that most of the ticks usually attach themselves to the head of cattle [13]. This may be due to the fact that the head region consisting of the ear, nose, face, and mouth has large surface area for attachment of tick.

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