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Pattern of Ticks and Lice Infestation on Small Ruminants in Sokoto, Sokoto State

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Target Audience: Veterinarians, Animal Scientists, Animal Health workers

Abstract

Sheep and goats are major sources of meat, skin and farm yard manure for more than 60% of indigenous population in Sokoto State, Nigeria. In addition, they are important for the high social economic value, as insurance against crop failure, and usage for cultural festivities and religious sacrifices. Among the factors which hamper the productivity of these small ruminants is ecto parasitism. This study was therefore carried out to investigate the pattern of tick and lice infestations on small ruminants presented at the state Zonal Veterinary Clinic, Sokoto between March and August, 2015. Of the total 104 small ruminants presented for treatment consisting of 73 sheep and 31 goats investigated, the prevalence of tick and lice infestations in this study was observed to be 23.1% and 3.8% for sheep and goats, respectively. Thus, confirming the presence of these parasites in Sokoto. In sheep, Amblyomma variegatum (14.4%), Boophilus decoloratus (6.7%) and Linognathus ovilus (1.9%) were found, while Amblyomma variegatum (3.9%) was the only tick species found in goats. The pattern of ticks and lice infestations on small ruminants based on age distribution showed that infestation was highest among the sheep above 3 years of age. It is also higher among the female animals than in males. The infestation was highest among Yankasa breed than other breeds encountered in the study, while infestation in goats was found only among Sokoto Red. A strategic control of these ectoparasites with appropriate acaricides during the period of high burden of ticks and lice based on epidemiology is recommended

Keywords: Lice infestations, Pattern, Small Ruminants, Sokoto, Ticks

Description of problem

Small ruminants (sheep and goats) occupy a very important position in livestock production by the rural populace in Nigeria (1). The high fertility, short generation interval and adaptation even in harsh environments favoured their production. Sheep and goats are considered as an investment and insurance to provide income for the

purchase of food during seasons of crop failure. Furthermore, wool and manure are also important by-products of small ruminant productions. Sheep and goats are major sources of meat, skin and farm yard manure for more than 60% of indigenous population (2) in Sokoto State, Nigeria. Sheep and goat production is therefore considered very important for attainment in self-sufficiency in food production and increase in rural income and foreign currency earning of the nation (3). Added to these is their usage for cultural festivities and religious sacrifices which in turn result in high social economic value for the livestock keepers. The productivity of these small ruminants is, however, hampered by several factors amongst which is ecto-parasitism (2), the major ones being ticks, mites, lice, fleas and flies.

Ectoparasitic infestation can have a significant effect on sheep and goat productivity by downgrading the wool and hide quality, reducing reproductive potential and thereby reducing meat production. Untreated ectoparasitic infestations can be fatal as it may lead to irritation, complicated with weight loss, and in severe cases death whilst some like ticks can carry vector-borne ruminant diseases as well as human infections.

In ruminants, ticks like *Rhipicephalus evertsi*, *Amblyomma variegatum* and *Boophilus decoloratus* are known to be capable of transmitting both protozoan and rickettsial diseases from animals to animals and from animals to man while lice infestations have been shown to decrease the average daily gain of live weight of the infected animals (4). The transmission of ticks and lice in ruminants is by direct contact between animals within herds and rearing animals in infested environment respectively, therefore, the pattern of tick and lice infestations on small ruminants presented at the state Zonal Veterinary Clinic, Sokoto was investigated in this study.

Materials and Methods

Study area

The survey was conducted at Aliyu Jodi Zonal Veterinary Clinic located in Sokoto South Local Government area, Sokoto State. Sheep and goats presented at the Clinic were used for the study and examined for the presence of ticks and lice between March and August, 2015. Sokoto is one of the major livestock producing areas in the country and lies within the Sudan savannah vegetation belt, the rainy season starts in June and ends in September, the mean annual rainfall ranges between 500mm and 1300mm with average humidity of below 40% in most times of the year (5) and located between latitude 12^{o}-14^{o}N and longitude 4^{o}-6^{o}E.

Sample collection

A total of 73 sheep and 31 goats were observed for tick and lice infestations. The estimated age, sex, breed and chief complaint of each of the animals were recorded. Animals infested with ticks and lice were noted, and the parasites on each of the animals were collected into sample bottles containing 70% alcohol with 5% glycerol, labelled and transported to the Veterinary Parasitology and Entomology Laboratory, Usmanu Danfodiyo University, Sokoto for identification. Care was taken to minimize discomfort

and pain to the animals during the process of sample collection.

Laboratory identification of ticks and lice

Collected ticks and lice samples were sorted and identified at the Veterinary Parasitology and Entomology Laboratory, Faculty of Veterinary Medicine, Usmanu Danfodiyo University, Sokoto using a tick identification keys (6) and lice guide (7).

Results and Discussion

Of the 104 small ruminant examined, 28 were infested with either ticks or lice or both, giving an overall prevalence of 26.9%. The highest prevalence of 23.1% was recorded for sheep, while goats were 3.8%. For tick infestations, sheep recorded the highest prevalence of 21.2% while it was 3.8% for goats. Lice infestations were only recorded in the sheep with prevalence of 1.9%.

The pattern of age distribution of ticks and lice on examined sheep and goats is presented in Table 1. Forty sheep examined were less than one year old out of which 11 (27.5%) were infested with ticks and lice. 33.3% of the examined sheep which were between 1½ and 2 years of age were infested with ticks and lice. 42.9% of the examined sheep which were between 2½ and 3 years of age were infested with ticks and lice. 60% of the examined sheep which were above 3 years of age were infested with ticks and lice. Sixteen goats examined were less than one year old out of which one (6.3%) was infested with ticks. None of the examined goats which were between 1½ and 3 years of age were infested with ticks. 42.9% of the examined goats which were above 3 years of age were infested with ticks.

Table 1: Pattern of ticks and lice infestations on sheep and goats of different age groups

Age (years)	Sheep		Goat	
	No examined	No infested (%)	No examined	No infested (%)
<1	40	11 (27.5)	16	1 (6.3)
1½ - 2	21	7 (33.3)	3	0 (0.0)
2½-3	7	3 (42.9)	5	0 (0.0)
>3	5	3 (60.0)	7	3 (42.9)

Based on sex of all the animals examined, 12(11.5%) out of 52 male and 16 (15.4%) out of 52 female were infested with either ticks or lice or both (Table 2). Of the 41 male sheep examined 10.6% were infested with either ticks or lice or both while 12.5% of the 32 female sheep examined were infested with either ticks or lice or both. Of the 11 male goats examined, 0.9% was infested with ticks. Also 2.9% of the 3 female sheep examined were infested with ticks.

Table 2: Prevalence of ticks and lice infestations on sheep and goats of different sexes

	No. Male examined	No. Male infested (%)	No. Female examined	No. Female infested (%)
Sheep	41	11 (10.6)	32	13 (12.5)
Goats	11	1 (0.9)	20	3 (2.9)
Total	**52**	**12 (11.5)**	**52**	**16 (15.4)**

The pattern of ticks and lice infestations on examined sheep and goat based on breed distribution is presented in Table 3. Thirty-eight Ouda sheep were examined out of which 23.7% were infested with ticks and lice. 35.3% of the 17 Balami sheep examined were infested with ticks and lice. 66.7% of the 3 Yankasa sheep examined were infested with ticks and lice. Twenty-three Sokoto Red goats were examined out of which 17.4% were infested with ticks. None of the WAD goats and Kano Brown goats was infested with ticks or louse.

Table 3: Pattern of ticks and lice infestations on sheep and goats of different breeds

Sheep			Goat		
Breed	**No examined**	**No infested (%)**	**Breed**	**No examined**	**No infested (%)**
Ouda	38	9 (23.7)	Sokoto Red	23	4 (17.4)
Balami	17	6 (35.3)	WAD	3	0 (0.0)
Yankassa	3	2 (66.7)	Kano Brown	1	0 (0.0)
Crosses	15	7 (46.7)			

The species of ticks and lice obtained from sheep and goats at Sokoto Zonal Veterinary Clinic is presented in Table 4. *Amblyomma variegatum* is the most numerous ectoparasite found in this study as it accounted for 20.5% and 12.9% of the examined sheep and goats, respectively. *Linognathus ovilus* is the only louse species found on sheep alone in this study and it accounted for 2.7% of the examined sheep.

This study revealed an overall prevalence of ticks and lice infestations in small ruminants to be 26.9%, with 23.1% and 3.8% in sheep and goats respectively. In sheep, *Amblyomma variegatum* (14.4%), *Boophilus decoloratus* (6.7%) and *Linognathus ovilus* (1.9%) were found, while *Amblyomma variegatum* (3.9%) was the only tick species found in goats. This finding is in agreement with previous studies which reported that the prevalence of ticks and lice infestations is higher in sheep than goats (8,9).

In a study covering 931 samples over a period of 15 years (1990 to 2005) on ectoparasites of domestic animals in Northern Nigeria, (8) found ticks in 15.68% and lice in 11.28% of the samples with *Amblyomma variegatum* as the most abundant tick and *Manecanthus stramineus* as the most abundant lice. In another survey of ectoparasites infesting livestock in three local government areas of Nasarawa State, (9) found ticks to be the most common ectoparasites found in sheep

(49.5%) and goats (39.3%) with *Amblyomma variegatum* and *Haematopinus eurytternus* as the commonest tick and louse species respectively. In a survey of ectoparasites on 492 goats in Akwa Ibom State, (10) found that *Linognathus africanus* was the commonest ectoparasite infesting goats in the area accounting for 49.3% in the survey while *Ixodes ribicundus was the commonest tick species* accounting for *27.1%*.

The ticks infestation observed in this study may be due to the climatic conditions of Sokoto which is suitable for survival of parasites and thus their infestations of animals (5). Another contributing factor may be due to farm management techniques including constructions, poor hygienic conditions of farms or where the animals are kept, lack of ectoparasitic control measures, feeding and watering systems. It has been stated that increasing worldwide movement of commodities, animals and people is also responsible for the globalization of parasites (11).

The only louse species collected from sheep in this study is *Linognathus ovilus*. This is in agreement with the report of that of Radostits (12) who stated that the most common sucking lice of small ruminants include *L. ovillus* (sucking face louse) and *L. stenopsis* (sucking blue louse). *The consequence of lice infestations in small ruminants is irritation* from louse-feeding which make animals to rub and scratch, resulting in restlessness, rough areas on the skin or loss of hair. Improper nutrition due to animal spending more time on scratch than eating result in weight loss and reduction in production, particularly milk in case of dairy animals (13*)*.

Lice of goats can be controlled by both production practices and chemical intervention. Providing a high-energy diet can be an effective louse control strategy. If possible, it is important to keep animals in uncrowded conditions and to spot-treat or quarantine any infested individuals until they have been successfully deloused. Most louse populations on animals vary seasonally, depending on the condition of the host. Animals under stress will usually support larger louse populations than normally found. Control of louse infestations is needed whenever an animal scratches and rubs to excess. Louse control is difficult with just a single insecticide application since they will not kill the louse eggs. A second application is needed 2 weeks after the initial one to allow the eggs to hatch (*13)*.

In this study, the pattern of age distribution of ticks and lice on small ruminants showed that infestation is highest in sheep above 3 years of age and higher in female than in males. The infestation is highest in Yankasa breed than other breeds studied while infestation in goats was found only in Sokoto Red goats. In conclusion, the prevalence of tick and lice infestations in this study was found to be 23.1% and 3.8% for sheep and goats respectively. *A. variegatum*, *B. decoloratus* and *L. ovilus* were the two species of ticks and louse found in the study area.

Since the control of ticks by acaricides is the most common method of tick control world-wide, strategic use of these acaricides during the period of high tick burden based on the life-cycle and epidemiology of the ticks is recommended as effective ectoparasitic

control measure as this will always be desirable to assist in improving the small ruminant production in the area.

Table 4: Species of ticks and lice on sheep and goats at Sokoto Zonal Veterinary Clinic

	Sheep	Goat
Ectoparasites	**Number (%)**	**Number (%)**
Amblyomma variegatum	15 (14.4)	4 (3.9)
Boophilus decoloratus	7 (6.7)	0 (0.0)
Linognathus ovilus	2 (21.9)	0 (0.0)

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