

AHC -20

Abundance of Ectoparasites on Ruminant Animals in Langtang South Local Government Area of Plateau State

J.A. Yohana¹, I.Z. Abu¹ and S.E. Alu²

¹Department of Zoology, Faculty of Sciences, University of Jos, P.M.B.2084, Jos, Nigeria.

²Department of Animal Science, Faculty of Agriculture, Nasarawa State University, Keffi, P.M.B.135, Shabu-Lafia campus, Nasarawa State, Nigeria.

Corresponding author: J.A. Yohana; E-mail: jaelyohanna@yahoo.com; Tel +2348023740652

Abstract

This study was conducted between November 2015 to February 2016 using cattle sheep and goats in different flocks to investigate the abundance of ectoparasites in Langtang South Local Government Area of Plateau State in Nigeria. A total sample size of 100 animals was randomly selected and subjected to clinical examinations of ectoparasites. All species, sex and age group of local origin were included in the study having adults to be above one year and young to be less than one year. The population constituted indigenous cattle sheep and goats kept in small flocks and managed under the traditional extensive farming system. Clinical examinations of the ectoparasites of each study animal were performed by physical examinations of skin, inspection and palpation of skin across all parts of the animal for the presence of ectoparasites and gross lesions while identification was based on their morphological structures. The results show that the parasites were found mostly concentrated (13.8%) around the anus than most other parts due to the available soft tissues around the anus of cattle. Of the high concentration around the anus, *Hyalomma* were abundantly (25) identified than the *Amblyomma* (3) with the males having the highest abundance (16) than the females (12) and were also found to be concentrated around the scrotum (9.4%) but not as much as those of the anus. The result of *Amblyomma* and *Hyalomma* abundance on sheep shows that the females were higher (45) than the males (9). However, it was observed to be more on the body (21.4%) followed by anus (14.3%) and body and feed (12.5%) than other parts. The abundance of *Amblyomma* (45) was more than that of *Hyalomma* (11) with females being higher (45) than the males (9) in goats. Conclusively, all the animals examined were infested with ticks while sheep and goats showed low infestation rates compared with the collection made from the cattle. Strategic treatment of ruminants with insecticides should be practiced in the study area to minimize the impacts of ectoparasites on the health of the animals.

Keywords: Ectoparasites, abundance, ruminant animals, *Amblyomma* and *Hyalomma*

Introduction

Arthropods constitute the largest animal phylum and yet a relatively small number of species are directly or indirectly related to public health (Fritzsche, 2003). The relative importance of medical and public health entomology seems to be increasing with a worldwide resurgence of certain arthropods e.g. bed bugs, mosquitoes and ticks (Goddard *et al.*, 2012; Hamer *et al.*, 2010; Lambrecht *et al.*, 2010).

Ticks are among the most medically important groups of arthropods; they are vectors of several very important diseases and may be implicated in tick paralysis (Estrada-Pena and Jongejans, 1999). Many of the diseases transmitted are limited to a certain genus or species of ticks. As such, it is important for the clinical diagnostic laboratory to identify ticks to at least the genus level and preferably to species level in many clinical settings.

Tick infestation is the major problem for animal health that causes substantial economic losses, particularly in tropical and subtropical countries where approximately 80% of the world's cattle population is raised (Jabbar *et al.*, 2015). Tick infestations not only cause direct damage due to the tick bite and blood loss, but ticks can also transmit a wide range of pathogens including zoonotic pathogens, which can produce a serious public health threat (Cooney and Flays, 1972).

The objective of this study is therefore, to investigate the abundance of ectoparasites on ruminant animals in Langtang South Local Government Area of Plateau State in Nigeria.

Materials and Methods

The study was conducted in Magama village of Langtang South L.G.A of Plateau State, Nigeria. Magama is known for its farming activities mostly mixed farming in which farmers cultivates crops and rear animals as well as fishing activities which is an annual festival done in Magama dam popularly known as River Magama. The area has an average temperature range of about 25 - 30 and 40 - 50°C degrees during rainy and dry seasons, respectively with a lowland area with no mountains and rocks. Grassland and broad leaf forest naturally cover the non-cultivated lands and ruminant animals are the most abundant animal species reared by most farmers in the area.

A cross-sectional study of randomly sampled ruminant holdings was conducted from November 2015 to February 2016 in Magama village, Sabon-Gida District of Langtang South L.G.C. in Plateau State. The study population constituted indigenous cattle sheep and goats kept in small flocks and managed under the traditional extensive farming system.

The study was conducted using cattle sheep and goats in different flocks. A total sample size of 100 animals was randomly selected and subjected to clinical examinations of ectoparasites. All species, sex and age group of local origin were included in the study having adults to be above one year and young to be less than one year. Poor body condition scores were given for those which were extremely thin and those having smoothed and less prominent spinouts and transverse process in which fingers can be pushed and had the moderate depth of loin (part of the body on both sides of the spine between the lowest ribs and the hips) muscle. The good bodies conditions score were given to those which the spinouts only stick up very slightly and those having smooth, rounded and well covered transverse processes and full loin muscles.

Clinical examinations of the ectoparasites of each study animal were performed by physical examinations of skin, inspection and palpation (examination of body's part by touch, especially for medical purpose) of skin across all parts of the animal for the presence of ectoparasites and gross lesions indicating the clinical form of infestation by ectoparasites. These parasites were identified based on their morphological structures as described by Wall and Shearer (1997).

Ectoparasites including ticks were manually collected from their sites of attachment on the animals' bodies. Ticks were removed from the skin of the hosts with their mouth parts intact using forceps for identification by rubbing Vaseline at the site of the attachment which leads to the detachment of the parasites. After the collection, the parasites were placed in universal labeled bottle containing 70% ethanol which serves as a preservative. Samples collected were properly labeled with all relevant and required information and were taken to the Parasitology laboratory of the University of Jos for identification using stereomicroscope (dissecting microscope) according to their key morphological structures as described by Wall and Shearer (1997).

Results and Discussion

The result of *Amblyomma* and *Hyalomma* abundance on cattle in Magama village in Langtang South L.G.A of Plateau State is presented on Table 1. These parasites were found mostly concentrated (13.8%) around the anus than most other parts due to the available soft tissues around the anus. Of the high concentration around the anus, *Hyalomma* were abundantly (25) identified than the *Amblyomma* (3) with the males having the highest abundance (16) than the females (12). They were also found to be concentrated around the scrotum (9.4%) but not as much as those of the anus.

Table 2 summarizes the result of *Amblyomma* and *Hyalomma* abundance on sheep in Magama village in Langtang South L.G.A of Plateau State. The result shows that the females are higher (45) than the males (9). They were observed to be more on the body (21.4%) followed by anus (14.3%) and body and feed (12.5%) than other parts where they were collected such as feet, body and ear, feet and ear, neck, ear, feet and neck. The abundance of *Amblyomma* (45) was more than that of *Hyalomma* (11) with females being higher (45) than the males (9).

Table 1: Ticks abundance on cattle in Magama village in Langtang South L.G.A of Plateau State

S/N	Part of collection	Total no Collected (%)	Genera identified		Sex	
			<i>Amblyomma</i>	<i>Hyalomma</i>	M	F
1	Anus	28 (13.8)	3	25	16	12
2	Scrotum	19 (9.4)	10	9	6	13
3	Tail	5 (2.5)	4	1	1	4
4	Tail and ear	7 (3.4)	3	4	2	5
5	Eye and Udder	18 (8.9)	3	15	8	7
6	Udder and feet	17 (8.4)	7	7	4	10
7	Anus and tail	10 (4.9)	5	5	2	8
8	Feet and body	10 (4.9)	3	7	4	6
9	Tail and eye	5 (2.5)	3	2	1	4
10	Ear and scrotum	5 (2.5)	3	2	2	3
11	Scrotum and tail	4 (1.9)	0	4	3	1
12	Neck and udder	3 (1.5)	0	3	2	1
13	Udder	9 (4.4)	9	0	2	7
14	Neck	3 (1.5)	0	3	1	1
15	Tail and neck	4 (1.9)	2	2	0	3
16	Feet	10 (4.9)	10	0	0	10
17	Body	10 (4.9)	13	0	0	13
18	Eye	5 (2.5)	5	0	0	5
19	Anus and scrotum	3 (1.5)	3	0	0	3
20	Ear	6 (2.10)	6	0	0	6
21	Tail and body	3 (1.5)	3	0	0	3
22	Feet and scrotum	6 (2.10)	5	1	1	5
23	Anus and feet	3 (1.5)	2	1	0	3
24	Anus and ear	5 (2.5)	5	0	0	5
25	Body and scrotum	5 (2.5)	0	5	0	5
Total		203 (98.4)	107	96	57	143

Table 2: Ticks abundance on sheep in Magana Langtang South L.G.C.

S/N	Site of collection	No. collected (%)	Genera identified		Sex	
			<i>Amblyomma</i>	<i>Hyalomma</i>	M	F
1	Ear and feet	4 (7.1)	4	0	0	4
2	Body	12 (21.4)	10	2	2	10
3	Feet	5 (8.9)	5	0	0	5
4	Body and feet	7 (12.5)	7	0	1	6
5	Neck	3(5.4)	3	0	0	3
6	Ear and Body	5 (8.9)	5	0	2	4
7	Anus	8 (14.3)	2	6	2	4
8	Feet	1 (1.8)	1	0	0	1
9	Body and anus	7912.5)	4	3	2	5
10	Ear	2 (3.6)	2	0	0	2
11	Feet and neck	29 (3.6)	2	0	1	1
Total		56 (100)	45	11	9	45

The result of *Amblyomma* and *Hyalomma* abundance on goats in Magama village in Langtang South L.G.A of Plateau State shows that the parasites were not as prevalent as found on cattle and sheep (Table 3). However, the highest concentration was found around the anus (13.2%) and ear and feet (10.5%) followed by the ones was found around the body(10.5%), anus and body (10.5%) and body and feet (10.5%). *Amblyomma* were the most abundantly

(27) found that the *Hyalomma* (11) on goats having the highest number of females (23) the males (15).

Table 2: Ticks abundance on sheep in Magana Langtang South L.G.A, Plateau State

S/N	Site of collection	No collected(%)	Genera identified		Sex F
			<i>Amblyomma</i>	<i>Hyalomma</i> M	
1	Body	4 (10.5)	4	0	2
2	Feet	3 (7.9)	0	3	2
3	Body and ear	5 (13.2)	5	0	3
4	Ear	3 (7.9)	3	0	3
5	Anus and body	4 (10.5)	4	0	2
6	Feet and anus	2 (5.3)	2	0	2
7	Ear and feet	5 (13.2)	0	5	3
8	Body and feet	4 (10.5)	4	0	3
9	Anus	5 (13.2)	5	0	3
10	Anus and ear	3(7.9)	0	3	2
	Total	38 (100.1)	27	11	23

From the findings of this study, it was revealed that ticks occurred mostly on cattle than sheep and goats which contradict the previous reports (Lehman, 1993) that higher prevalence occurs in younger animals than the adults. However, the present study is in consonance with the reports of Yakhchali and Hossiene (2006). Yishaket *et al.* (2015) reported higher prevalence in adult animals than the younger ones.

Conclusion and Recommendation

All the animals examined were infested with ticks while sheep and goats showed low infestation rates compared with the collection made from the cattle. Strategic treatment of ruminants with insecticides should be practiced in the study area (Magama) to minimize the impacts of ectoparasites on the health of the animals. Awareness should be created for the local farmers about the essential aspects of controlling the parasites as well as improved management practices for ruminants should be implemented to reduce disease transmission.

References

- Cooney, J.C. and Flays. K.L.(1972). The ticks of Alabama (Ixodidae: Acarina). Auburn University Agricultural Experimental Station bulletin number 426. Auburn University. Auburn. AL.
- Estrada-Pena, A. and Jongejan, F. (1999). Ticks feeding on humans: a review of records of human-biting Ixodoidea with special reference to pathogen transmission. *Exp. Appl. Acaral.* 23:695-715.
- Fritsche, T.R. (2003). Arthropods of medical importance. P2061-2078 In Baron EJ. Pfaller MA, Jorgensen JH. Tenover MC, editors. Manual of clinical microbiology, 8th edition, volume 2 ASM Press Washington. DC.
- Goddard, J. (2012). Physician's guide to arthropods of medical importance, 6th edition. CRC Press, Boca Raton. FL.
- Hamer, S.A., Tsao, J.I. Walker, E.D. and Hickling, G.J. (2010). Invasion of the Lyme disease vector Ixodes scapularis: implications for Borrelia burgdorferi endemicity. *EcoHealth* 7:47-63.
- Lambrechts, L., Scott. T.W. and Gubler, D.J. (2010). Consequences of the expanding global distribution of *Aedes albopictus* for dengue virus transmission. *PLoS Negl. Tropical Disease* 4:e646. 10.1371.
- Jabbar, A., Abbas, T., Sandhu, Z.D., Saddiqi, H.A., Qamar, M.F. and Gasser, R.B. (2015). Tick-borne diseases of bovines in Pakistan: major scope for future research and improved control. *Parasite Vectors*, 8:283.
- Mohammed-Saleem, M.A. () Mixed farming systems in sub-Saharan Africa. International Livestock Research Institute, P O Box 5689, Addis Ababa, Ethiopia
- Wall, R. and Shearer, D. (1997). Veterinary Entomology: Arthropod Ectoparasites of Veterinary Importance. Pp 96-140