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Short communication

Seasonal Variation in Trypanosomosis Rates in Small Ruminants at the Kaduna Abattoir, Nigeria

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ABSTRACT

Seasonal variation in trypanosome parasitological infection rates in small ruminants was studied at the Kaduna Central abattoir, North Central Nigeria. Blood samples were obtained at slaughter from 320 goats and 209 sheep during the dry and rainy seasons and examined using the Haematocrit Centrifugation Technique, Buffy coat method and Giemsa stained blood smears. The packed cell volume of the animals were also obtained. The over all trypanosome infection rate in all small ruminants was 2.10%. Infection rates in sheep and goats were 2.39% and 1.88% respectively. The infection rates were higher in rainy season than the dry season while *Trypanosoma vivax* was the dominant infecting trypanosome in all the ruminants followed by *T.congolense* and *T.brucei*. Infection rates observed here were relatively high and confirmed the resurgence of animal trypanosomosis in the country and its threat to sustainable livestock production.

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Key Words: Trypanosomosis, infection-rates, season, Kaduna, Nigeria.

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INTRODUCTION

Last decade witnessed upsurge in the menace of African trypanosomosis in man and animals (Barreth *et. al*; 2003; Abenga *et. al*; 2005). In Nigeria, animal trypanosomosis still constitutes a major obstacle to food security in spite of previous attempts towards chemotherapeutic and tsetse control (Onyiah, 1997; Abenga *et. al*; 2004). Like other parts of Sub-Saharan Africa, the disease is most devastating in terms of poverty and lost of agricultural production (Hursey, 2000). These losses include; reduction in herd sizes as a result of livestock deaths and drop in calving rate, reduced market value of animals as a result of loss in condition, drop in milk production, reduced work efficiency of draft animals and prevention of mixed farming (Swallow 2000).

Lack of adequate information on the true prevalence status of the disease has prevented proper planning for control in several endemic countries including Nigeria. Similarly, natural trypanosomosis in small ruminants has not been adequately investigated, as emphasis is placed more on diseases in cattle. This has resulted to the exclusion of small ruminants from control campaign by governments and has enhanced their carrier status in the spread of trypanosomosis to man and animals. Trypanosomes of major threat to ruminants include *Trypanosoma vivax*, *T.congolense* and *T.brucei*.

The aim of this work was to determine the influence of season on trypanosome infection rates in small ruminants using animals brought for slaughter at the Kaduna central abattoir as a case study and to assess their carrier status and

economic importance.

MATERIALS AND METHODS

The sheep and goats sampled in this survey were mostly brought in from Kaduna State and few from neighboring Northern States of Kano, Sokoto, Zamfara and Borno States. A total of 320 goats and 209 sheep were screened covering the period of March to April in the dry season and August to September 2004 in the rainy season. Five milliliters of jugular blood was collected randomly at the point of slaughter in bottles containing one milligram powder ethylene diamine tetra acetic acid (EDTA) per millimeter of blood. The blood samples were kept cool by placing them in cold boxes containing ice packs after collection. Parasitological examination was done in the Laboratory using the haematocrit centrifugation technique, HCT (Woo, 1971), buffy coat method (BCM) (Murry *et. al*; 1977) and Giemsa stained thin films made after BCM examination.

The packed cell volume (PCV) of each animal was also determined while trypanosome species were identified based on their motility using the BCM and morphological features from Giemsa stained films. The physical condition of the animals was also examined.

RESULTS

The overall trypanosome infection rate in small ruminants brought to the Kaduna Central Abattoir for dry and rainy season are summarized on table 1.

Table 1. Trypanosome infection rates in small ruminants at slaughter in Kaduna, North Central, Nigeria.

Small Ruminant	Season	No Examined	No. Positive	% Infection	T.vivax	T.congolense	T.brucei	Overall Infection Rate %
Goats	Dry	211	2	0.90	1	0	1	1.88
	Rainy	109	4	3.67	2	1	1	
Sheep	Dry	82	0	0.00	0	0	0	2.39
	Rainy	127	5	3.94	2	2	1	
Total		529	11	8.51	5	3	3	2.10

The over all infection rate in the small ruminants was 2.1%, however infection rate in the rainy season (3.81%) was higher compared to infection rate in the dry season (0.68%).

In goats, out of 320 animals sampled, 6 were parasitologically positive for trypanosomes giving infection rate of 1.88%. The infection rate of 3.67% was observed in the rainy season while that of the dry season was 0.90%. In sheep, out of the 309 animals sampled, 5 were positive for trypanosomes giving infection rate of 2.39%. The infection rates for rainy and dry season was 3.94% and 0.0% respectively.

The infection due to *Trypanosoma vivax* (45.45%) was highest followed by *T.congolense* (27.27%) and *T. brucei* (27.27%), while infection rate in females (2.27) was higher than that of males (1.69%). Over all packed cell volume of parasitologically positive animals was lower compared to that of negative animals.

Table

2-Sex distribution of trypanosome infection rates in small ruminants at the Kaduna Abattoir, North Central Nigeria

Small ruminant	Sex	No. Examined	No. Infected	% Infected
Goats	Male	118	2	1.69
	Female	202	4	1.98
Sheep	Male	59	1	1.69
	Female	150	4	2.67

DISCUSSION

The overall infection rate of 2.10% in small ruminants at slaughter in Kaduna, North Central Nigeria was significantly higher than the national trypanosomiasis prevalence rate in ruminants obtained by the EEC-Trypanosomiasis control project between 1989 and 1991 (Onyiah, 1997). Although Kalejaiye *et. al.*; (1995) reported similar infection rates in goats at slaughter in Ibadan, South West Nigeria, these rates indicate a general resurgence in the menace of trypanosomiasis in Nigeria with negative economic impact on meat quality of animals at slaughter (Abenga *et. al.*; 2002). These increases may be attributed to the

problems of drug resistant trypanosome strains, increased vector activities and insufficient policies for control of the disease in small ruminants. Higher infection rates observed in sheep (through not statistically significant) may have arisen from the husbandry practice in this part of Nigeria where sheep unlike goats are usually taken out for grazing together with cattle on trans-humance and are more exposed to tsetse bites and other vectors (Agu and Amadi 2001).

The higher infection rates arising from *T. vivax* confirms the dominance of *T. vivax* as the most economically important trypanosome affecting livestock in Nigeria given the complementary roles played by other haematophagous flies (Onyiah, 1997; Desquesnes and Dia, 2004) beside tsetse in mechanical transmission of this parasite.

The ability of *T.vivax* to be transmitted mechanically by other vectors other than *Glossina* has been identified as a factor responsible for spread of the parasite to many parts of Central and South America and Asia (Davila and Silva, 2001), and maintenance of trypanosome infection transmission in the presence of tsetse control. The higher infection rate during rainy season may be attributed to increase in both tsetse and other biting flies population during this part of the year making such vectors to also encroach on settlement areas.

This study suggests that trypanosomiasis in small ruminants is still prevalent in Nigeria and constitute a threat to meat supply to the nation. Higher infection rates are likely to have been the case if molecular techniques were used given the superiority of such techniques over the parasitological diagnostic methods in detection of trypanosomes in animals. Seasonal control of trypanosomes in sheep and goats is therefore essential in limiting the current losses arising from the disease in small ruminants and their roles as reservoir hosts for both human and animal trypanosomiasis. Further more mechanical spread of *T.vivax* beyond Africa suggest a need for global and collaborative initiatives against this trypanosome as it poses as an important threat to livestock production.

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