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(Short communication)

Comparison of the prevalence of trypanosomal infection in indigenous cattle in the Guinea and Derived Savannah Vegetational Zones of South-Western Nigeria.

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Abstract

Two hundred and two blood samples from White Fulani breed of cattle, comprising 130 from the Guinea Savannah and 72 from the derived Savannah vegetational zones of South-Western Nigeria were examined for presence of trypanosomes. These animals were reared under the nomadic system of management such that they were constantly exposed to tsetse bite both during the day and night. The results of this analysis showed that the prevalence of trypanosomal infection in the Derived Savannah and Guinea Savannah vegetational zones were 45.8 % and 27.5 % respectively. Though the incidence of trypanosomal infection is less in the Guinea Savannah vegetational zone relative to the Derived Savannah, livestock production during the dry season is severely limited due to inadequate pasture at this time of the year.

Keywords: Guinea Savannah Derived Savannah, Trypanosomal infection, Comparison.

Introduction

Trypanosoma, a haemoprotozoan is responsible for the disease known as trypanosomosis in animals (Ristic and McInytre, 1981; Ukoli, 1990). The parasite vector is mostly genus Glossina. Other modes of transmission include contamination (stercorarian trypanosomes), triatome bugs (*T. cruzi*), mechanical means (Stomoxys and Tabanus) and venerally (*T. equiperdum*) (Levine, 1973; Burger and Thompson, 1981; Cox, 1982).

Infestations by pathogenic trypanosomes cause diseases which vary in severity depending on the virulence of the organisms and susceptibility of the host (Losos and Ikede, 1970). The severity also depends on the nutritional state of the animals, especially during the dry season when feed is inadequate in quality and quantity (Losos and Ikede, 1970). Animals infected during the dry season may overcome the infection during the rainy season when feed is more abundant. Symptoms do not appear until the following dry season, but during the intervening period they will serve as reservoirs for infecting other animals (Stephen, 1970; Losos and Ikede, 1970, C.A.B., 1988).

It is a disease of economic importance because it renders approximately 10 million square

kilometers of prime African land unsuitable for cattle production and also preclude animal husbandry in the areas best suited for this activity. Losses due to the disease have been estimated by the World Bank to be approximately US$50 billion (Jawara, 1990). The importance of trypanosomosis of man and animals in Africa has been summarized by Kersaw (1970) in the statement " the World Health Organization in determining the 10 major health problems facing mankind places trypanosomosis of man and his domestic animals high on the list along with malaria, cancer and heart diseases" (Losos and Ikede, 1970; Robins, 1974).

The study aimed at determining the prevalence of trypanosomal infection in White Fulani cattle in the Derived Savannah and Guinea Savannah Vegetational zones of South -Western Nigeria using the techniques of enzyme-linked immunosorbent assay (ELISA) and dark ground (DG) buffy coat parasitological examination.

Materials and Methods

Study Area

The study was conducted in Orire and Iresa Adu (Derived Savannah) located in Surulere Local Government of Oyo State and Olokiti, Alagba and Ilorin (Guinea Savannah) located in Kwara State.

The Animals

Two hundred and two blood samples from White Fulani breed of cattle, comprising 130 from the Guinea Savannah and 72 from the derived Savannah Vegetational zones of South-Western Nigeria were examined for presence of trypanosomes. These animals were reared under the nomadic system of management such that they were constantly exposed to tsetse bite both during the day and night. In all, 6 herds were screened i.e. 3 herds from each vegetational zone. There was an average of 33 animals per herd and the herds were selected because of the co-operation received from the herdsmen in these zones. In return, the animals received veterinary attention. The sampling took place between November 1993 and April 1994.

Screening Procedure

Blood samples were collected by jugular venipuncture into heparinised capillary tubes. The samples were kept on ice and examined for trypanosome parasites about 3 hours after collection by the dark ground (DG) buffy coat parasitological examination as described by Paris *et al* (1982). This involved making a blood smear in the form of a wet film with concentration by centrifugation in a haematocrit capillary. The clear zone in the capillary (buffy coat) was then carefully mounted on a clean slide and examined. Slides which showed the presence of the parasites were stained with Giemsa stain. Trypanosoma species identification was based on the speed and type of movement as well as morphology of the stained organism.

Trypanosoma antigen detection in sera samples was done using antigen ELISA technique (Nantulya, 1989). This principle is the qualitative detection of the presence or absence of species specific trypanosomal antigen in the sera of field-sampled cattle.

Results

Parasitological examination as well as Enzyme linked immunosorbent assay (ELISA) analysis of the blood sampled indicated the presence of mixed trypanosomal infection comprising of *Trypanosoma brucei, T. vivax* and *T. congolense* in herds screened in the two vegetational zones. The results of this analysis showed that the prevalence of trypanosomal infection in the Derived Savannah and Guinea Savannah vegetational zones were 45.8 % and 27.5 % respectively. The antigen-ELISA technique

Table 1: Prevalence of trypanosome species among 202 white Fulani cattle as detected by DG and ELISA techniques in the 2 vegetational zones.

Species	Guinea Savannah		Derived Savannah	
	No + ve	% + ve	No + ve	% + ve
Trypanosoma congolense	20	15.4%	13	18.1%
T. vivax	11	8.5%	16	22.2%
T. brucei	15	11.5%	17	23.6%
T. congolense + T. brucei	8	6.2%	5	6.9%
T. congolense + T. vivax	0	0%	1	1.4%
T. brucei + T. vivax	2	1.5%	3	4.2%
T. congolense + T. brucei + T. vivax	1	0.8%	2	2.8%

showed that a larger proportion of the herds were infected with trypanosomiasis (46.2% of total number of cattle) whereas the buffy coat only detected a lower of 27.7% in the stock.

Table 1 shows the prevalence of the different species of trypanosomes in the zones. *T. brucei* had the highest prevalence rate of 23.6% and this occurred in the Derived Savannah. *T. vivax* and *T. congolense* showed prevalence rate of 22.2 % and 18.1 % respectively in the Derived Savannah. However, in the Guinea Savannah, *T. congolense* was the most prevalent (15.4 %) trypanosome compared with other species in this zone. About 7% of animals sampled from the Derived Savannah zone were infected with both *T. congolense* and *T. brucei* while 6.2 % of those from the Guinea Savannah were infected with both species. Both *T. brucei* and *T. vivax* were found in 4.2% of samples from the Derived Savannah while 1.5 % was recorded for Guinea Savannah. In the case of samples positive for the 3 species, 2.8 % was recorded for Derived Savannah while only 0.8 % was recorded for Guinea Savannah.

Discussion

From this survey, the Derived Savannah with prevalence rate of 45.8 % will pose a greater challenge for livestock production compared with Guinea Savannah with a prevalence of 27.5 %. This observation agrees with Jawara (1990) where it was stated that trypanosomosis is a major problem in the more humid regions of West and of Central Africa. The result of this survey tends to suggest that the more arid zones are less infected with trypanosomes compared to the humid zones. However, the poor quality of the pasture in the arid zones particularly during the dry season cannot sustain livestock production. The aftermath of the scenario above is what led to the traditional system of management known as nomadism. In this regards, the Fulani herdsmen move their herds during the dry season southward i.e. to the humid zones with high quality pasture. These zones however are more infested with tsetse, the vector of the trypanosome species (Ukoli, 1990).

While the concept of nomadism cannot be ignored, the practice could however be improved upon. For instance it has been suggested that grazing reserves should be provided for the nomadic herdsmen because energy lost in the course of transhumance on the part of the herdsmen and their animals could be conserved and livestock production could then experience a boost.

It is also possible that if trypanocides are promptly used the incidence of trypanosomosis could be drastically reduced in the Derived Savannah zone. This way livestock production could also be enhanced in this part of the country.

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