

## Communications

## Prevalence of trypanosomosis in sheep and goats in a region of Northern Nigeria

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DANIEL (A.D.), JOSHUA (R.A.), KALEJAIYE (J.O.), DADA (A.J.). Prévalence de la trypanosomose chez le mouton et la chèvre dans une région du Nord-Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1994, 47 (3): 295-297

La prévalence de la trypanosomose a fait l'objet d'une étude menée d'avril à juin 1991 sur des moutons et des chèvres dans les régions administratives d'Alkaleri et de Gombe (Etat de Bauchi, Nord-Nigeria). Six cent quinze animaux (258 moutons et 357 chèvres) ont été examinés au plan de l'infection trypanosomienne. Dans cet effectif, 19 moutons (7,4 p. 100) et 18 chèvres (5,0 p. 100) se sont révélés positifs, soit 37 animaux infectés parmi lesquels 22 par *Trypanosoma vivax*, 9 par *T. congolense* et 6 par *T. brucei*. Pour connaître la méthode la mieux adaptée au contrôle de la maladie chez les petits ruminants dans les conditions habituelles de leur élevage au Nigeria, les auteurs ont recherché la sensibilité de 4 méthodes couramment utilisées pour son diagnostic parasitologique. Les méthodes de concentration-centrifugation pour l'étude de l'hématocrite et la technique de l'interface leucocytaire ou "buffy coat" se sont révélées plus précises que les méthodes standard, à savoir sang frais entre lame et lamelle, et frottis mince. Étant donné la prévalence de la maladie, les moutons et les chèvres doivent être soignés aussi bien que les bovins dans la région.

Mots clés : Caprin - Ovin - Trypanosomose - *Trypanosoma brucei* - *Trypanosoma congolense* - *Trypanosoma vivax* - Prévalence - Diagnostic - Nigeria.

## Introduction

In Nigeria, there is abundant information on cattle trypanosomosis. The disease with regard to other domestic animals is probably similar but is less well documented (4, 5, 10). STEPHEN (11), in a review of clinical manifestation of trypanosomosis of livestock, indicated that goats are seldom infected with salivarian trypanosomes. Studies by LEACH (7) however, asserted that heavy losses occur among infected sheep and goats when they are exposed to savannah species of *Glossina*. JOSHUA and IGE (4) also found a 5 % incidence rate in slaughter goats in Jos, Plateau State. This raises the possibility that the disease in sheep and goats might be underestimated (4, 5), although the level is still unknown.

Knowledge of the status of the disease in small ruminants is imperative, especially in the areas under study because of their proximity to Yankari Game Reserve where no tsetse control programme is carried out.

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This paper presents findings on the prevalence of natural trypanosomosis in sheep and goats, obtained from the comprehensive field survey of the areas under study.

## Materials and methods

## Study area

The study area covers 9 villages in the Southern Fringe of the Sahel ecological zone, in both Alkaleri and Gombe local Government areas of Bauchi State during the months of April-June 1991. These villages were chosen according to the number of districts to ensure wider coverage. The mean annual rainfall was about 300 mm. The locality supported abundant game species grazing as freely as the domestic stock because of the nearness of Yankari Game Reserve.

## Sheep and goats

Animals involved in this study are kept peridomestically, but are allowed to graze extensively during the day time. The breeds predominant in this area were sahelian goats and Uda sheep (table I). A total of 615 animals were randomly screened: 258 sheep and 357 goats. Approximately 5 ml of blood were collected from the jugular vein of each animal into Bijou bottles containing EDTA as anti-coagulant.

Diagnosis of infection was made by the standard trypanosome detection methods (STDM): wet and thin films (9, 12), and the microhaematocrit centrifugation technique (HCT) and buffy coat method (BCM) (9, 12). The difference between the two techniques is that the standard trypanosome detection methods can diagnose infections in which parasitaemia averages 500 parasites per ml while the concentration methods can diagnose samples containing 10 or more trypanosomes per µl.

The identification of trypanosome species was carried out according to the specification of HOARE (3) and WOO (12), using morphological differentiation of parasites on Giemsa-stained thick and thin films. Subsequently, 200

TABLE I Prevalence of trypanosome infection in the two local government areas

	Number of sheep sampled (number positive)		Number of goats sampled (number positive)		Total number sampled (number positive)
	Male	Female	Male	Female	
Alkaleri	43 (4)	80 (6)	42 (3)	147 (8)	312 (21)
Gombe	32 (3)	103 (6)	33 (1)	135 (6)	303 (16)
Total	258 (7.4 %)		357 (5.0%)		615 (6.0%)

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films were viewed with a X100 oil immersion objective. The wet film was examined by phase contrast microscopy.

The HCT and BCM were performed using capillary tubes sealed and spun for 5 min in a microhaematocrit centrifuge. Capillaries were placed on a clean microscope slide (up to 12 at a time). The buffy coat zone was covered with a few drops of diluent beneath a coverslip and examined under the microscope using X10 eyepieces in combination with a X25 objective. Packed cell volume (PCV) was used to estimate anaemia using a haematocrit centrifuge and reader (12).

## Results

Details of the species detected are shown in tables I and II. Seven and four male sheep and goats respectively were positive for various trypanosomes, while 12 and 14 female sheep and goats were similarly positive. A total of 19 sheep and 18 goats were positive for trypanosomes giving a total of 37 and a rate of 6%. Table III shows the sensitivity of the four detection methods, with the buffy coat being the most sensitive. The mean PCV of the positive and negative sheep was  $23.3 \pm 1.05$  and  $27.5 \pm 0.46$ , respectively. In the positive and negative goats it was  $22.6 \pm 1.44$  and  $24.2 \pm 0.48$ , respectively.

## Discussion

The findings of this survey show that *T. vivax*, *T. congolense* and *T. brucei* infections occur in domestic sheep and goats. The overall rate of 6% positive cases in both sheep and goats suggests that trypanosomosis may be relatively less common in small ruminants than in cattle. This finding adds more credence to the observation in ESURUOSO, HOARE and STEPHEN (2, 3, 11) that cattle are preferred feeding hosts for tsetse flies in areas where both small ruminants and cattle co-exist.

The fact that the prevalence observed in the two local government areas was only 6% does not mean that small ruminant trypanosomosis should not be taken seriously. The really figure is certainly higher, as normal microscopic examination of blood films often fails to reveal the presence of trypanosomes in blood samples. Positive cases detected by different methods showed that the concentration methods: buffy coat method and haematocrit centrifugation technique are more sensitive than the standard trypanosome detection methods: wet films and thin films (table III).

This study shows that *T. vivax* was the predominant trypanosome species observed, which agrees with other authors, findings in West Africa (2, 6, 8). The reason may be mechanical transmission or the shorter development cycle in the anterior station of the tsetse-fly. The low PCV observed in infected animals indicates that trypanosomosis is accompanied by anaemia (1).

## Conclusion

Trypanosomosis in sheep and goats is more common and severe than had previously been appreciated. Sheep and goats must be included in chemotherapeutic or chemoprophylactic programmes in the region, so that they do not become a reservoir of infection for the bovine species considered to be economically important.

TABLE II Distribution of species of trypanosomes in sheep and goats in the two local government areas

	Number sampled	Number positive	<i>T. vivax</i>	<i>T. congolense</i>	<i>T. brucei</i>
Sheep					
Male	75	7	4	3	—
Female	183	12	8	2	2
Total	258	19	12	5	2
Goats					
Male	75	4	1	2	1
Female	282	14	9	2	3
Total	357	18	10	4	4
Grand total	615	37 (6.0%)	22 (59.5%)	9 (24.3%)	6 (16.2%)

TABLE III Trypanosome infections detected by different methods of diagnosis in the two local government areas

Methods of	Number of samples examined	Number of samples positive (% sensitivity*)	Percent of total samples positive
Wet blood examination	615	21 (56.8)	3.4
Giemsa-stained thin blood film	615	24 (64.9)	3.9
Buffy-coat method (BCM)	615	34 (91.9)	5.5
Haematocrit-centrifugation technique (HCT)	615	30 (81.1)	4.9

\* % sensitivity based on total number of positives detected.

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DANIEL (A.D.), JOSHUA (R.A.), KALEJAIYE (J.O.), DADA (A.J.). Prevalence of trypanosomiasis in sheep and goats in a region of Northern Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (3): 295-297

The prevalence of trypanosomiasis was studied during April-June 1991, in sheep and goats kept peridomestically in Alkali and Gombe local Government areas of Bauchi State in Northern Nigeria. A total of 615 animals, consisting of 258 sheep and 357 goats were examined for trypanosome infection. Of this total, 19 (7.4 %) sheep and 18 (5.0 %) goats were positive giving a total infection rate of 37 (6.0 %), 22 being positive with *Trypanosoma vivax*, 9 with *T. congolense* and 6 with *T. brucei*. In order to elucidate the most appropriate tool for surveying trypanosomiasis in small ruminants under Nigerian field conditions, the sensitivity of four techniques currently in use for the parasitological diagnosis of trypanosomiasis was investigated. The concentration methods: haematocrit centrifugation and buffy coat method, were more accurate than the standard trypanosome detection methods: wet film and thin film. Due to the prevalence of the disease, sheep and goats must be treated as well as cattle in the region.

**Key words** : Goat - Sheep - Trypanosomiasis - *Trypanosoma brucei* - *Trypanosoma congolense* - *Trypanosoma vivax* - Prevalence - Diagnosis - Nigeria.

## Isolation of *Theileria parva* (SAO Hill) and *Theileria parva* (West Kilimanjaro) and their cross-immunity with *Theileria parva* (Kasoba)

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MUSISI (F.L.), JACOBSEN (P.), QUIROGA (J.C.), NJUGUNA (L.M.). Isolement de *Theileria parva* (SAO Hill) et *Theileria parva* (West Kilimanjaro) et leur immunité croisée avec *Theileria parva* (Kasoba). *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (3) : 297-300

Deux souches de *Theileria parva* ont été isolées sur du bétail-témoin pendant des essais d'immunisation sur le terrain contre la theilériose à SAO Hill et West Kilimanjaro, dans les parties Sud et Nord de la Tanzanie respectivement. Ces deux souches de parasites ont engendré une affection grave au point de vue clinique qui a nécessité un traitement antitheilérien pour 3 des 5 bovins infectés expérimentalement. Les animaux guéris de cette infection avec les deux souches de *T. parva* en cause n'ont pas présenté de signes fébriles, et un seul animal sur quatre a présenté une parasitose avec de rares schizontes pendant un jour, au cours d'un test d'infection avec *Theileria parva* (Kasoba) originaire du sud du Malawi. À l'inverse, les deux témoins ont montré des signes de fièvre avec la présence de schizontes, et l'un d'entre eux a dû subir un traitement antitheilérien pour être sauvé.

**Mots clés** : Bovin - Theilériose - *Theileria parva* - Immunité - Infection expérimentale - Tique - *Rhipicephalus appendiculatus* - Tanzanie.

## Introduction

This paper describes the results of attempts to infect experimental animals with *Theileria* parasites from East Coast fever (ECF) immunization trial sites in Tanzania, the course of their infection and the preliminary observations on cross-protection following challenge with *Theileria parva* (Kasoba) from northern Malawi.

## Materials and Methods

### Parasite isolation and challenge (table I)

#### *Theileria parva* (SAO Hill)

Laboratory-reared *Rhipicephalus appendiculatus* nymphal ticks were fed on control cattle suffering from ECF during an ECF field immunization trial in 1990 at SAO Hill

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