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The prevalence of bovine trypanosomes in parts of Benue state, north-central Nigeria

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Tsetse-borne African animal trypanosomiasis remains a serious threat to livestock production in sub-Saharan Africa. The disease limits the full potential of agricultural development in 36 endemic countries of Africa[1,2]. In Nigeria, livestock production is limited by trypanosomiasis as tsetse flies infest about 75% of the nation's land mass[3] subjecting the animal population at great risk of the disease. In the absence of vaccine against the disease, case detection, treatment and vector control remain strategic control options. Previous reports on trypanosomiasis showed that Benue state was a known human African trypanosomiasis (HAT)/sleeping sickness endemic focus[4,5]. In addition, trypanosomes of veterinary importance had also been recorded[6]. A recent survey on HAT in Benue state showed that the areas surveyed were no longer endemic for sleeping sickness[7]. Our purpose was to investigate the prevalence of trypanosomes in cattle and also update information on the status of animal trypanosomiasis in the state, prior to the implementation of the Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC)-Nigeria initiative. Specifically, we investigated the prevalence of trypanosomes in cattle drawn from three Local Government Areas of Benue state, north-central Nigeria.

The study was carried out in February 2008, in three Local Government Areas (LGAs) of Benue state, namely, Oju, Guma and Gwer West. In Oju, Oju Grazing Reserve (OGR); Wanune-Tyullen, Guma LGA and Livestock Investigation and Breeding Centre, Raa'v Gwer West LGA were the areas studied. The OGR is located at 6° 50' N lattitude and longitude 8° 25' E; Wanune-Tyullen: latitude 7° 30' N and longitude 8° 5' E; and and Raa'v: latitude 7° 30' E and longitude 8° 11' N. The OGR is partially developed and heavily encroached, dilapidated infrastructures, collapse of earth dams and access roads were manifest at the time of our survey. All these and in particular, scarcity of water, as reported by the pastoralists occasioned migration of cattle to neighbouring Cross Rivers State where water supply did not pose much problem. Tyullen was undeveloped. The main cattle breed in the two areas is White Fulani (Zebu-trypanosusceptible). The Raa'v cattle ranch owned by Benue State Government with initial mandate to breed trypano-tolerant cattle, Muturu and N'Dama had suffered setbacks and was only recently reactivated in October 2007. Some cattle were brought in a week prior to the survey (Omminyi Agaba 2008—Personal communication).

Cattle were kept under traditional management and grazing under communal land pastures at OGR and Tyullen. At Raa'v cattle ranch, intensive animal husbandry was practiced. Trypanocides are provided monthly while other veterinary drugs, haematinins, and mineral salt licks are given fortnightly. Supplementary feed, besides grazing in restricted areas was routinely provided and pour-on (Cypermil) applied on animals to ward off flies and ticks from biting them.

The Benue State Ministry of Agriculture gave ethical clearance. Informed consent was obtained from the participants and in particular the pastoralists before cattle sampling. Six pastoralists at OGR who were still around during the period of survey consented to the study and 50–70% of their cattle sampled randomly. At Tyullen, all the cattle brought at screening centers were sampled while at Raa'v, the cattle were sampled at random. A total of 395 cattle were studied. The cattle screened were as follows: OGR (166); Tyullen (144) and Raa'v (85). All the cattle were bled from the jugular vein and their blood samples were collected into specimen labeled bottles containing anticoagulant. Blood samples were individually screened for trypanosome parasites using parasitological methods of Buffy coat[8] and Giemsa thin blood smears. Packed-cell volume (PCV) was also estimated by the

microhaematocrit technique[9]. All cattle found infected were treated with diminazene aceturate, 7.5 mg/kg body weight, given intramuscularly. Also cattle with haematocrit value (PCV) below 24% were similarly treated. Data were analyzed using descriptive statistics[10].

The parasitological prevalence of trypanosomes is shown in the Table 1. Trypanosome infections were recorded in 15 of the 395 cattle screened with an overall prevalence of 3.8%. The prevalence in each of the study area was as follows: OGR 6%; Tyullen 3.5% and 0% at Raa'v cattle ranch. The trypanosome parasites seen were *Trypanosoma vivax* (14) and *T. congolense* (1). A total of five microfilariae and one theileria were recorded. The mean PCV values showed a decline which was more in trypanosome-positive (23.40 ± 3.63%) compared with 26.55 ± 5.72% for trypanosome-negative cattle. Among the trypanosome-negative cattle, some had low PCV values without trypanosomes seen in their blood. For example, 33 from Tyullen had PCV values in the range of 16–23%; 27 from OGR had PCV values ranging from 13–23% while nine at Raa'v had values in the range of 20–23% and these were the ones recently procured. The parasitology method used is limited in sensitivity.

The results indicate that cattle trypanosomiasis is an important disease in the study areas with the exception of the Livestock Investigation and Breeding Centre, Raa'v. The intensive management of cattle practiced at Raa'v is good for improved production programme unlike traditional animal husbandry which exposes animals to risks of acquiring more infections, thereby constraining production. The 3.8% overall prevalence compared well with the approximated 4% prevalence for Nigeria obtained from the country wide animal trypanosomiasis survey within the European Economic Community (EEC). However, this overall prevalence was much higher than 1.8% prevalence overall obtained for cattle in an area of Benue state[6] confirming that animal trypanosomiasis is very much present in the state. Further, recent reports of trypanosomiasis problems in livestock production in different parts of Nigeria have been presented[11, 12] with emphasis on instituting effective and sustained control measures against the disease. The very high infection by *T. vivax* agrees with findings reported in parts of northern Nigeria[11,12] and elsewhere[13]. The mean PCV values were reduced in trypanosome-positive cattle. This may be as a result of the effect of the parasites on blood cells. Trypanosomiasis main symptom is anaemia which manifests by drop in PCV value[14].

Table 1. Prevalence of bovine trypanosomes in the areas of Benue state surveyed (February 2008)

Locations	No. of cattle screened	No. (+) ve	Prevalence (%)
Oju LGA			
Oju Grazing Reserve	166	10	6
Guma LGA			
Wanune/Tyullen	144	5	3.5
Gwer West LGA			
Raa'v	85	0	0
Total	395	15	Overall 3.8

This study concludes that animal trypanosomiasis is still a problem in Benue state. The results have provided information that will update data and useful to the PATTEC-Nigeria initiative to fight trypanosomiasis problem towards sustainable agriculture. Effective control of animal trypanosomiasis will not only impact positively on the well being of the inhabitants of this region but also on Nigerians as a whole since 'Benue state is known as the food basket' of the nation.

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