RESEARCH NOTE

Outbreak of Trypanosomiasis Due to *Trypanosoma vivax* (Ziemann, 1905) in Bovines of the Pantanal, Brazil

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Location of trypanosomiasis outbreaks due to *Trypanosoma vivax* in the Poconé subregion of the Pantanal of Brazil. R1 to R9: Ranch 1 to Ranch 9.

In this paper we report the first recorded occurrence of *Trypanosoma vivax* in the Pantanal, Brazil. The Pantanal is a seasonal floodplain of about 140,000 km^2, located in the centre of South America, between 16° and 21° S and 55° and 58° W (Fig.). It is divided into ten subregions differing in terms of water courses, soil types and historical occupation (EMBRAPA/CENARGEN 1987 Documentos, 82, Brasília, DF, Brasil, 339 pp.). Extensive cattle ranches varying from 10,000 to 200,000 ha occupy most of this wetland. The Pantanal is one of the most important livestock regions of Brazil. Trypanosomosis is one of the world's most important diseases of livestock and man, and makes it practically impossible to raise livestock in many parts of the tropics which would otherwise be ideal. *T. vivax* infects a wide range of wild and domestic ungulates, is transmissible both cyclically by tsetse flies and mechanically by other blood suckling flies, and is recognized as an important cause of cattle losses in many areas (BA Allsopp & SD Newton 1985 *Int J Parasitol 15*: 265-270). In the acute form of infection the animal has a high temperature, lethargy, weakness, anemia and slight loss of condition and dies within five weeks. Abortion may occur, but foetal blood and amniotic fluid have not been found to be infected. Weight loss may be substantial in a relatively short time. It has been observed that pure zebu cattle develop high parasitemia and disease

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terminating in death (GJ Losos & BO Ikede 1972 *Rev Pathol Dis Dom and Lab An Caused by T. congolense, T. vivax, T. brucei, T. rhodesiense and T. gambiense,* S Karger Basel 71pp). *T. vivax* is found throughout the tsetse belt in Africa, and has spread to others parts of Africa, Central America and South America, the West Indies and Mauritius. *T.vivax* was reported in the New World for the first time in French Guyana (M Leger & M Vierne 1919 *Bul Soc Pathol Exotique 12*: 258-266) and later in others parts of South America, Central America, and some Caribbean islands (RD Meléndez et al. 1995 *Trypnews* 2: 4). In Brazil, *T. vivax* was reported for the first time in water buffalo (*Bubalis bubalis*) from the vicinity of the city of Belém, State of Pará (JJ Shaw & R Lainson 1972 *Ann Trop Med Parasitol 66*: 25-32).

In the beginning of 1995, outbreaks of ophtalmitis, abortion, dysentery, and death occurred in ranches located in the Poconé subregion of the Pantanal Information that a drug (dimenazene diaceturate) was being used, with success, to cure sick animals of one ranch let us to investigate the possibility that trypanosome infection was responsible. The sick bovines were bled from their jugular vein using a vacuum system, and blood samples were obtained from ranches R1 till R9 (Fig.). The sampled animals, all zebu purebred and crossbred (*Bos taurus taurus* x *Bos taurus indicus*), were from 1 to 9 years old (mean 7 years old). Diagnosis was made using the microhemat-ocrit centrifuge test (MHCT), and blood from each sample and the concentrated parasites in the buffy coat of micro hematocrit tubes were used to prepare thin smears. The trypanosomes were identified as *T. vivax* on morphological and biometrical data (Table). The clinical signs observed were fever, lethargy, loss of apppetite, weakness, lacrimation, dysyntery, abortion and loss of condition. Some animals had substantial loss of weight in a relatively short time. Other animals had a more chronic form of disease for four or six months, with emaciation and severe cachexia. Ten of 29 (34.48%) observed bovines were infected by *T. vivax*.

Morphologic studies mentioned in CA Hoare (1972 *The Trypanosomes of Mammals*. A Zoological Monograph, Blackwell Scientific Publication, Oxford, 749pp.) state that the range of lengths of *T. vivax* were from 18µm to 31µm (including free flagellum 3-6µm long), with means from 21µm to 25.4µm, while over 90% of the measurements were between 20µm to 26µm. The dimensions of *T.vivax* firstly reported in Brazil were 22.77µm (ranging from 19.2µm to 25.0µm). We found shorter forms of *T. vivax* in the Pantanal. H Fairbairn (1953 *Ann trop Med Parasit 47*: 394-405) showed that short forms were characteristic of the strains causing acute disease in cattle of West Africa, while long forms are associated chiefly with strains causing chronic infection in East Africa.

In Kenya a temporal association has been noted between the rainy season when biting flies, particularly Tabanidae, are abundant, and an increased prevalence of *T. vivax* infections in cattle (PR Gardiner 1989 *Adv Parasitol 28*: 229-317). In the Pantanal, our studies showed that the season tabanid occurs in the first half of the rainy season, from September/October to December/January although these insects still remain in high numbers until the end of the rainy season. This period thus represents the period of major risk of trypanosome transmission by tabanids, especially by species of high vector potential such as *Tabanus importunus* (ATM Barros, unpublished data, 1994). The recorded outbreak occurred during a prolonged rainy season (September 1994 to May 1995) which in the Pantanal, coincides with the tabanid season. In Africa *T. vivax* also infects various species of antilope for which the parasite is non-pathogenic. In the Pantanal the fauna of ungulates is very rich and coexists with domestic animals and these animals could serve as important reservoir of infection.

The occurrence of *T. vivax* clearly represent an important bovine disease in the Pantanal. More studies will be necessary however to determine the epizootiology of *T. vivax* in this region and the impact of the disease in its economy.

TABLE

Measurements of *Trypanosoma vivax* of bovines from Pantanal, Brazil, means ± SE (µm) (n=100)

	P-K	K-N	P-N	N-A	F	L	PK/KN	PN/NA
Minimum	0	4.05	4.86	2.43	2.43	11.34	0	0
Maximum	3.24	8.10	8.91	7.29	9.72	21.87	0.6	0.6
Mean	1.02	6.10	7.18	5.40	6.15	18.73	0.19	1.50
SE	1.16	1.29	1.18	1.63	2.38	3.80	0.23	0.72

P-K: distance from posterior end to kinetoplast. K-N: from kinetoplast to middle of nucleus. P-N: from posterior end to middle of nucleus. N-A: from nucleus to anterior extremity. F: free flagellum length. L: total length, including free flagelum.