

Molecular detection of *Trypanosoma cruzi* and *Trypanosoma evansi* infection in dogs of Paraguay.



Maria Fátima Rodríguez Valinotti¹, Keisuke Suganuma^{2,3}, Lungowe Muyanganf⁴, Ishmael Kojo Assang⁵, Takahisa Shirakawa⁶, Kenji Hikosaka⁷, Yukari Koyama⁷, Antonio Rodriguez¹, Rosmary Rodriguez Valinotti¹, and Tomás J. Acosta⁶.

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¹ Centro de Diagnóstico Veterinario, CEDIVEP SRL, San Lorenzo, Paraguay.

² Research Center for Global Agromedicine, Obihiro University of Agriculture and Veterinary Medicine, Inada, Obihiro, Hokkaido, Japan.

³ National Research Center for Protozoan Diseases, Obihiro University of Agriculture and Veterinary Medicine, Inada, Obihiro, Hokkaido, Japan.

⁴ Chipata Regional Lab, Chipata, Zambia.

⁵ Amrahia Dairy farm, Accara-North, Ghana.

⁶ Field Center of Animal Science and Agriculture, Obihiro University of Agriculture and Veterinary Medicine, Inada, Obihiro, Hokkaido, Japan.

⁷ Graduate School of Medicine, Chiba University, Chiba, Japan.

Introduction Canine trypanosomosis is a vector borne disease caused by protozoa of the genus *Trypanosoma* (Kinetoplastida: Trypanosomatidae). Chagas disease is a widespread infection in Paraguay is an endemic zoonosis caused by *Trypanosoma cruzi* detected in different mammalian reservoirs including dogs. Surra is an animal trypanosomosis caused by *T. evansi*, which is known to infect a large diversity of mammalian hosts. The aim of this study was to determine the presence of *T. cruzi* and *T. evansi* by a cross-sectional molecular epidemiological survey for canine trypanosomosis.

Association between prevalence of kinetoplast parasites in dog in Paraguay (*T. evansi*, *T. cruzi*) and explanatory values in the study were statistically analyzed by Multivariable logistic regression.

Results: The prevalence of *T. evansi* and *T. cruzi* using TBR1/2, S35/36 was 14.63% (36/246) and 20.33% (50/246) respectively (Table 1). In addition, the prevalence of mixed infection with *T. evansi* and *T. cruzi*, detected using both TBR1/2 and S35/36 was 4.47% (11/246). Positives samples for *T. evansi* and *T. cruzi* were detected in six of eight departments of the country (Fig. 1). All of them are distributed in the eastern region. In Asunción city, the main city of the country were detected the highest percentage of positive samples 12.78% (17/133) and 17.29% (23/133) for *T. evansi* and *T. cruzi*, respectively. There was not association of kinetoplast parasite infection among department, sex, and age by the statistical analysis and none of significant difference of blood parameters among infection status were observed.



Fig.1 Geographical distribution of *T. cruzi* and *T. evansi*.

Table 1. Results of the detection *T. cruzi* and *T. evansi* by PCR

ID	Department	Population density (person/km ²)	N	Positive n (%)	
				<i>T. evansi</i>	<i>T. cruzi</i>
4	Asuncion	4431.7	133	17 (12.78)	23 (17.29)
6	Caaguazu	41.7	2	0 (0)	1 (50)
8	Canindeyu	12.2	2	0 (0)	0 (0)
9	Central	811	85	14 (16.47)	20 (23.53)
10	Concepcion	10.5	1	0 (0)	0 (0)
11	Cordillera	55.3	4	1 (25)	1 (25)
12	Guaira	51	1	0 (0)	1 (100)
14	Misiones	12.1	1	1 (100)	0 (0)
16	Paraguari	27.5	1	0 (0)	0 (0)
ND			16	3 (18.75)	4 (25)
			246	36 (14.63)	50 (20.33)

Materials and Methods: Two hundred forty-six samples of canine whole blood were collected from different animal hospitals that sent their samples to a veterinary private laboratory (CEDIVEP). There was from 8 departments that constitute Paraguay and 218/246 of the samples were from the Central department, data of sex and age were obtained. Thirty μ L of blood samples were preserved using FTA card DNA extraction was performed following the manufacture's protocols. The PCR reactions were performed using S35/S36 primers and TBR primers, for *T. cruzi* and *T. evansi*, respectively. Risk factor analysis by X2 test or Fisher's exact test, were performed to investigate the association of kinetoplast parasite infection among department, sex, and age.

Conclusion: Canine trypanosomosis is prevalent in dogs from Paraguay. *T. cruzi* have a higher prevalence than *T. evansi*. Further studies will be necessary to understand the dynamics of the host, vectors, and environment, regarding the urbanized geographical situation of the dogs, including the zoonotic potential as reservoirs of these pathogens.