

Low probability of transmission of *Trypanosoma cruzi* to humans by domiciliary *Triatoma sordida* in Bolivia

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Abstract

The role of *Triatoma sordida* in the domestic transmission of *Trypanosoma cruzi* was assessed in 7 rural lo

horse, anti-pig, anti-cat, anti-dog, anti-human, anti-chicken, anti-murid rodents, and anti-*Didelphis*. Blood meals of human origin were confirmed by the presence of continuous precipitation bands between the gut contents and human serum placed in an adjacent well.

Serological survey

In March 1995, 5 of the villages were selected for a serological survey: Recreo, Guapomocito, Cotoca, Cochabambita and Cerrito. Capillary blood samples were taken from 418 residents who gave voluntary consent (319 schoolchildren 5–15 years old and 99 adults) from unselected houses and 62 people belonging to 14 families living in dwellings infested by *Tri. sordida*; at least one *Tryp. cruzi* positive specimen of *Tri. sordida* infected with *Tryp. cruzi* was detected in each house. Movement or residence of participants outside the area was noted. Sera derived from the blood samples were stored at -20°C until tested simultaneously for anti-*Tryp. cruzi* immunoglobulin G (IgG) antibodies using indirect immunofluorescence (IF) and enzyme-linked immunosorbent assay (ELISA) as described by BRENIERE *et al.* (1984). A sample was considered positive when both serological tests gave positive results.

Studies on animals

Dogs and cats were examined in 3 villages (Cochabambita, Guapomocito and Cotoca) in February 1996. All the animals living in 31 households were recorded (name, sex and age) but only those ≥ 3 months were examined. Xenodiagnosis was performed using 14 third-instar nymphs of *Tri. infestans* divided between 2 boxes. After 30 and 60 d, the faeces of these bugs were examined for the presence of flagellates. Blood samples were obtained by venipuncture from household dogs and sera were stored at -20°C . They were tested for anti-*Tryp. cruzi* IgG antibodies using ELISA. Sera from 6

pared with only 68.6% after the initial search. Although no bug was found in the remaining 37 houses, in 24.3% of them indirect evidence of infestation, such as faecal streaks, dead eggs or exuviae, was found.

The crowding index was very low (3.1 bugs per infested house): 85.7% of houses had one to 5 bugs, while less than 3% had more than 10 bugs.

Sixty-one bugs were collected from outhouses in San Juan Bautista and Cotoca in February 1995. All were identified as *Tri. sordida* by their morphology and enzyme electrophoresis; 59% were nymphs.

Prevalence of *Tryp. cruzi* in *Tri. sordida*

Faecal samples from 220 domiciliary *Tri. sordida* originating from the 7 localities were examined microscopically for the presence of flagellates; 165 samples were also examined by PCR. Trypanosomes were identified by at least one method in 47 (21.4%) of the samples (Table 2). The percentage of infected triatomines varied greatly according to the locality (from zero in 2 villages to over 32% in 3 others). The infection rate did not differ significantly between adults and nymphs (28.0% and 17.4%, respectively; $P > 0.05$). Thirty-three of the 165 faecal samples analysed simultaneously for the presence of parasites by microscopy and PCR (Table 3) were found to contain trypanosomes by microscopy, compared with 32 by PCR. The 2 techniques agreed on 93.3% of the faecal examinations. The overall infection rate of triatomines collected from outhouses was 4.9%.

Blood meals

Seventy-eight *Tri. sordida* (67 from houses and 11 from outhouses) had their blood meals examined. Forty-eight meals (61.5%) could be identified: 41 (85.4%) were single feeds on human, chicken or dog blood and the remainder had fed on 2 hosts (human/chicken, human/dog or dog/chicken). Among the *Tri. sordida*

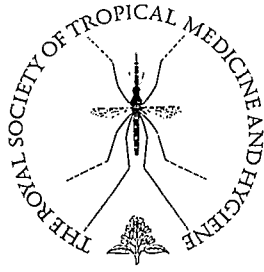
Table 2. *Trypanosoma cruzi* infection rates in domiciliary *Triatoma sordida* in Velasco Province, Santa Cruz Department, Bolivia^a

Locality	No. of nymphs		No. of adults		Total no. examined	No. with <i>T. cruzi</i>
	Examined	With <i>T. cruzi</i>	Examined	With <i>T. cruzi</i>		
Recreo	23	0	4	0	27	0
San Juan Bautista	4	0	2	0	6	0

seropositive persons had lived in other known endemic areas with domiciliary *Tri. infestans*. The prevalence of human infection with *Tryp. cruzi* in our area of domestic *Tri. sordida* is lower than that reported in the Paraguayan Chaco, where *Tri. sordida* was identified as the vector of *Tryp. cruzi* and the human seropositivity rate was

attributed to the transmission of *Trypanosoma cruzi* to man. In: *New Approaches in American Trypanosomiasis Research*, Scientific Publication no. 318, Pan-American Health Organization, Washington, pp. 307-316.

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