

**SHORT REPORT**

---

**SINANTHROPIZATION OF TRIATOMINES  
(HEMIPTERA: REDUVIIDAE) IN THE ITUMBIARA  
MUNICIPALITY, GOIÁS, BRAZIL**

---

*Fernanda Alves de Camargo*<sup>1</sup>, *Camila Aline Romano*<sup>2</sup>, *Carmeci Natalina Elias*<sup>2</sup>, *Heloisa Helena Garcia da Silva*<sup>2</sup> and *Ionizete Garcia da Silva*<sup>2</sup>

**ABSTRACT**

This notification presents the occurrence of triatomines captured in the synanthropic environment in the urban area of the municipality of Itumbiara, Goiás. The colonies were found inside homes and on beds, walls, ceilings and counters. They were also found outside the houses on fences, in hen houses, pigeon nests and pigpens. In descending order, the infestation by triatomine species was: *Triatoma sordida* (99.7%), *Rhodnius neglectus* (0.2%) and *Panstrongylus diasi* (0.1%). Only the species *T. sordida* was infected by *Trypanosoma cruzi*, with an index of 5.5%.

**KEY WORDS:** Chagas disease; triatomines; vectors; American trypanosomiasis.

Chagas disease is of great epidemiological importance both in Brazil and in the Americas. It is estimated that in recent years approximately seven million people have been infected by *Trypanosoma cruzi*, and around 25 million are at risk of infection by exposure to vectors (WHO, 2017; Cavallo et al., 2016). The vector transmission of this disease is closely related to human-triatomine contact, due to the anthropological, social, economic and cultural characteristics of the inhabitants of the Americas. In addition to transmission by triatomines, *T. cruzi* can also be transmitted orally, through the ingestion of contaminated food, through blood transfusion, and congenitally (Brasil, 2015; Silveira & Martins, 2015).

---

1. Municipal Health Office, Superintendency of Endemic Diseases, Itumbiara, GO, Brazil.

2. Laboratório de Biologia, Fisiologia de Insetos/Bioatividade de Plantas, Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, GO, Brazil.

Corresponding author: Ionizete Garcia da Silva, Instituto de Patologia Tropical e Saúde Pública, Rua 235 s/n. Setor Universitário, CEP 74605-050. Goiânia, Goiás, Brazil. E-mail: profionizete@yahoo.com.br

Received for publication: 10/10/2017. Accepted: 26/10/2017.

*Triatoma infestans* was the main vector of Chagas disease in the state of Goiás and is an allochthonous species there. Subsequent to its control, through intense chemical intervention, it was thought that the eradication of the disease would be possible. At the same time, however, it was also expected that other autochthonous species would eventually substitute *T. infestans* in human domiciles. Therefore, studies were carried out in order to evaluate epidemiological as well as entomological indicators that could show the frequency and the risk of transmission by other species of triatomines. Former publications by Rassi et al. (2003) indicated a relationship between the reduction of acute cases of Chagas disease and the control of *T. infestans*. Moreover, Oliveira & Silva (2007) presented entomological indicators that evidenced sinanthropization of autochthonous species, such as *Triatoma sordida* and *Rhodnius neglectus*, which replaced the controlled species, with high infestation rates in the domestic environment.

This study confirms the mechanism of sinanthropization of *T. sordida* through colonies established in urban areas of Itumbiara, Goiás. The Cerrado biome, currently found in the states of Goiás, Mato Grosso, Mato Grosso do Sul, Tocantins, Piauí, Pernambuco, Bahia, São Paulo and some localities in Santa Catarina and Rio Grande do Sul, is the epicenter for this species (Carcavallo et al., 1997a; Galvão & Gurgel-Gonçalves, 2015).

*T. sordida* infestations are usually peridomiciliary, but intradomiciliary colonies are commonly found at sites previously colonized by *T. infestans*. This fact is an obstacle to vector control effectiveness (Acosta et al., 2017). The peridomicile triatomines are usually detected colonizing environments occupied by domestic animals (Carcavallo et al., 1997b; Silveira & Martins, 2015). Among 148 species of triatomines described so far, 65 are found in Brazil (Silveira & Martins, 2015). Fifteen of these are epidemiologically important because they colonize the anthropic environment and present *T. cruzi* infection. In studies carried out in Goiás by Oliveira & Silva (2007), the following species were identified in the anthropic environment: *P. diasi*, *P. geniculatus*, *P. megistus*, *R. neglectus*, *T. costalimai*, *T. infestans*, *T. pseudomaculata*, *T. sordida* and *T. williami*. In a comparison between infestation rates and synanthropic density among the species, *T. sordida* was dominant with an index of 86%, which was significantly higher than all the other species together. A similar predominance occurred with *T. cruzi* infection rate (80.2%) in relation to the other species.

In Itumbiara (18 ° 25 '12 "S 49 ° 13' 04" W), southern region of the state of Goiás, inspections performed by agents from the Superintendency of Endemic Diseases have captured many specimens of triatomines, especially *T. sordida*. The specimens were found in domiciles and in the peridomiciles in different neighborhoods. Captured triatomines were identified, underwent parasitological examination, and were sent to the Laboratory of Insect Biology and Physiology at the Institute of Tropical Pathology and Public Health (IPTSP / UFG) for taxonomic confirmation.

From 2014 to June 2017, 1,090 triatomines were captured in the synanthropic environment: Two specimens of *R. neglectus*, one specimen of *Panstrongylus diasi* and 1,087 specimens of *T. sordida*. The occurrence of these triatomines in Itumbiara is hereby shown by their frequencies in each neighborhood: Jardim Leonora (12.6%), Jardim Morumbi (30.6%), in the city center (2.4%) and Setor Paranaíba (54.5%). Some residences had annexes such as hen houses and pigpens. Downtown, the main colonization focus was in the building where the old Municipal Market was located. In this location, 26 triatomines were captured in a single sample; six adults and 20 nymphs.

In the inspections of the house annexes, triatomines were found in hen houses, pigpens and wood piles. In the intradomicile area they were detected on beds and in a crib. Captured triatomines were examined to determine the infection rate by *T. cruzi*. Only *T. sordida* from the peridomicile proved to be infected (5.1%).

In the other neighborhoods, *T. sordida* colonies were associated with pigeon nests. Since birds are resistant to *T. cruzi* infection, there must be a mammal sharing these environments and acting as an infecting source for the triatomines, otherwise the infection rate would not be positive. Pigeon nests serve as refuges for *T. sordida*, hindering the effect of insecticides and consequently influencing control measures. In addition, climatic and environmental variations may alter the residual effect of the insecticides in the peridomicile area.

After the elimination of *T. infestans* from the state of Goiás, the studies conducted by Oliveira & Silva (2007) on the entomological indicators of the infestation and density of triatomines in domiciles recommended the maintenance of entomological surveillance in the municipalities. This surveillance is important to detect changes in the behavior of the epidemiologically prominent species (*T. sordida* and *R. neglectus*) and to prevent the occupation of the environments previously occupied by the eliminated species.

It seems that the advice of Oliveira & Silva (2007) has gone unnoticed or been neglected. The data of this work corroborate their recommendation but also show the re-occupation of the niches that were once occupied by *T. infestans* in the anthropic environment. We hope that this short report is seen as a warning regarding triatomine re-infestation and consequently the possible return of vector-transmitted Chagas disease.

## REFERENCES

1. Acosta N, López E, Lewis MD, Llewellyn MS, Gómez A, Román F, Miles M, Yeo M. Hosts and vectors of *Trypanosoma cruzi* discrete typing units in the Chagas disease endemic region of the Paraguayan Chaco. *Parasitology* 144: 884-898, 2017.
2. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Doença de Chagas aguda no Brasil: série histórica de 2000 a 2013. *Bol Epidemiológico* 46: 1-9, 2015.

3. Cavallo MJ, Amelotti I, Gorla DE. Invasion of rural houses by wild triatominae in the arid Chaco. *J Vector Ecol* 41: 97-102, 2016.
4. Carcavallo RU, Curto de Casas, SI, Sherlock IA, Galíndez Girón I, Jurberg J, Galvão CA, Segura M, Noireau F. Geographical distribution and alti-latitudinal dispersion of triatominae. In: Carcavallo RU, Girón IG, Jurberg J, Lent H. *Atlas dos vetores da doença de Chagas nas Américas*. Vol. III. Fiocruz: Rio de Janeiro. 1997a. p747-792.
5. Carcavallo RU, Rodrigues DSF, Salvatella R, Curto de Casas SI, Sherlock IA, Galvão C, Rocha DS, Galíndez Girón I, Otero Arocha MA, Martínez A, Rosa JA, Canala DM, Farr TH, Barata JMS. Habitats and related fauna. In: Carcavallo RU, Girón IG, Jurberg J, Lent H. *Atlas dos vetores da doença de Chagas nas Américas*. Vol. II. Fiocruz: Rio de Janeiro. 1997b. p 561-600.
6. Galvão C, Gurgel-Gonçalves R. Vetores conhecidos no Brasil. In: Galvão (org.) *Vetores da doença de Chagas no Brasil*. Curitiba: Sociedade Brasileira de Zoologia, 2015. p 88-170.
7. Oliveira AWS, Silva IG. Distribuição geográfica e indicadores entomológicos de triatomíneos sinatrópicos capturados no Estado de Goiás. *Rev Soc Bras Med Trop* 40: 204-208, 2007.
8. Rassi A, Luquetti AO, Ornelas JF, Ervilha JF, Rassi GG, Rassi Junior A, Azeredo BVM, Dias JCP. Impacto do controle químico extensivo de *Triatoma infestans* sobre a incidência de casos agudos e a prevalência de doença de Chagas. O exemplo de Montalvânia, Minas Gerais. *Rev Soc Bras Med Trop* 36: 719-727, 2003.
9. Silveira AC, Martins E. Histórico do controle da transmissão vetorial e situação epidemiológica atual. In: Galvão (org.) *Vetores da doença de Chagas no Brasil*. Curitiba: Sociedade Brasileira de Zoologia, 2015. p 10-25.
10. WHO, World health Organization. *Chagas disease (American trypanosomiasis)*. Fact sheet. Available at: <<http://www.who.int/mediacentre/factsheets/fs340/en/>>. Accessed at: August 30<sup>th</sup>, 2017.