

Short Communication

Panstrongylus rufotuberculatus (Champion, 1899) (Hemiptera, Reduviidae, Triatominae) in Rondônia, Brazil: A novel report

Dayse da Silva Rocha^[1], Alda Lobato^[2] and Cleber Galvão^[1]

[1]. Fundação Oswaldo Cruz, Instituto Oswaldo Cruz,
Laboratório Nacional e Internacional de Referência em Taxonomia de Triatomíneos, Rio de Janeiro, RJ, Brasil.

[2]. Laboratório Central de Saúde Pública, LACEN, Porto Velho, RO, Brasil.

Abstract

Introduction: This short communication presents a novel report on the occurrence of *Panstrongylus rufotuberculatus* in the Brazilian state of Rondônia. **Methods:** Two specimens were collected inside dwellings and identified using dichotomous keys. **Results:** The present study showed the extensive geographic distribution of *P. rufotuberculatus* and the increased number of species in the state of Rondônia. **Conclusions:** This new record of *P. rufotuberculatus* is important for understanding the epidemiology of Chagas disease because this species is found naturally infected with *Trypanosoma cruzi*. Studies on the ecology, biology, and vector–host–parasite interactions of this species are essential for surveillance programs.

Keywords: Chagas disease. New records. Vectors. Surveillance programs.

Blood-sucking insects of the subfamily Triatominae (Hemiptera: Reduviidae) include 153 extant and three fossil species assigned to five tribes and 18 genera, all the extant species being considered potential vectors of *Trypanosoma cruzi* (Chagas, 1909), the etiologic agent of Chagas disease^{1,2}. Among the five tribes, Triatomini is the most diverse, with more than 70% of the species of the subfamily. The genus *Triatoma* is the most speciose within the tribe (82 species), followed by *Panstrongylus* (15 species). The tribe has the widest geographical distribution among Triatominae, reaching an extensive range of ecotopes³.

Panstrongylus rufotuberculatus (Champion, 1899) is a wild species widely distributed in South America; its occurrence has been reported in the Brazilian states of Acre; Amazonas; Mato Grosso; Pará; and the neighboring countries of Argentina, Bolivia, Colombia, Costa Rica, Ecuador, French Guayana, Peru, Suriname, and Venezuela. In Central and North America, it has been found only in Panama and Mexico (Figure 1A)^{3,4}.

Despite being reported a long time ago, the literature on *P. rufotuberculatus* is scarce, and it remains among the least known triatomines. The first report of natural infection caused by *T. cruzi* was published in Venezuela in 1940, and since then, its natural infection has been reported in Argentina, Bolivia, Costa Rica, Colombia, Ecuador, and Peru^{6,9,10}. In Argentina, specimens of *P. rufotuberculatus* were found in dwellings and attributed to the probable “attraction” to the lights⁵. Incipient domiciliation has also been reported in Bolivia and Ecuador^{7,8}. However, authors have already reported intradomiciliary colonies of *P. rufotuberculatus* in Peru, where several nymphs and adults were collected inside the dwellings^{9,10}. In Colombia, *P. rufotuberculatus* is considered a species with a high epidemiological risk for the transmission of *T. cruzi*, constituting the second most common triatomine caught inside dwellings¹¹.

In August 2018, a male specimen of triatomine was found inside a dwelling by the resident in the municipality of Rio Crespo (latitude 09° 42' 18" S and longitude 62° 53' 59" W), Rondônia state, Brazil (Figure 1B). This insect, *Panstrongylus rufotuberculatus*, was identified by the third author (CG) based on their external morphological characteristics through photographic records. For the identification of the genus *Panstrongylus*, the main criterion is the position of the antennae, inserted close to the eyes. The diagnosis

Corresponding author: Dr. Cleber Galvão.

e-mail: clebergalvao@gmail.com

 <https://orcid.org/0000-0003-4027-9205>

Received 9 March 2021

Accepted 15 June 2021

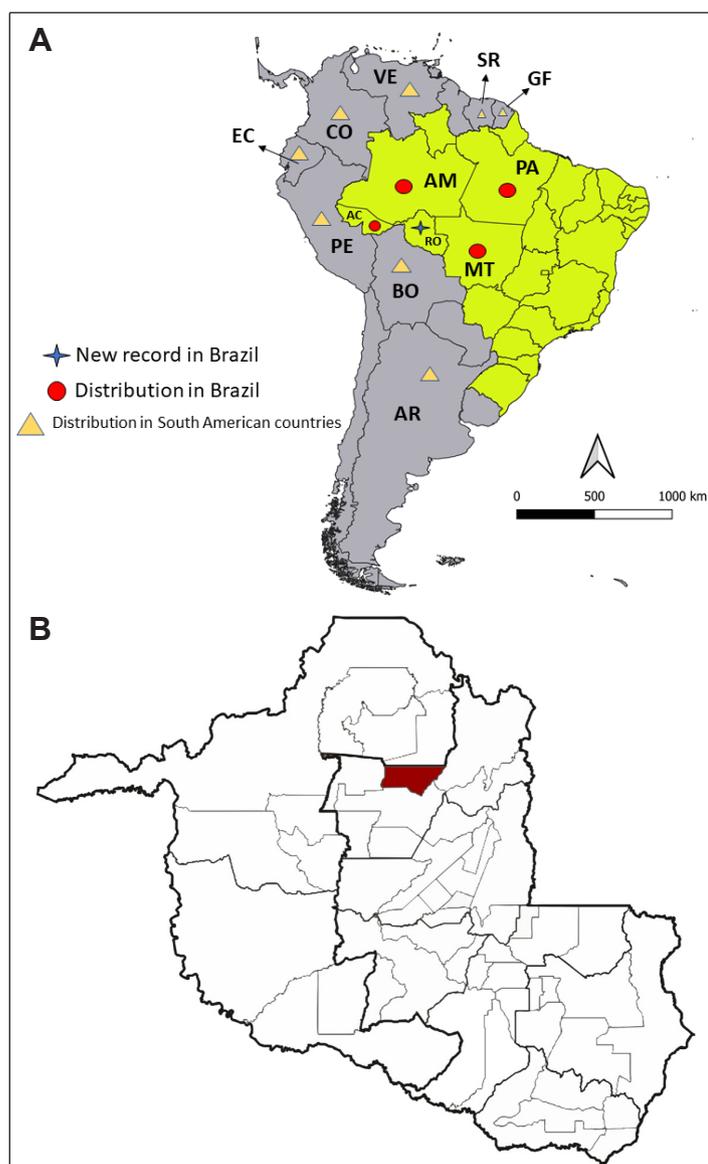


FIGURE 1: (A) Map of South America showing the previous, and the new record of *Panstrongylus rufotuberculatus* (Champion, 1899) by Brazilian states and South American countries. (B) Location of Rio Crespo, RO, Brazil, where two specimens of *Panstrongylus rufotuberculatus* (Champion, 1899) were collected.

of the species is based mainly on jugae blunt, tubercles of the fore lobe of pronotum invariably red, overall color of hemelytra pale green³ (Figure 2 and Figure 3). Two years later (October 2020), another male specimen was caught in the same municipality in a dwelling 10 km away from the first dwelling. Both specimens were caught inside dwellings by the residents and handed over to the endemic agents who referred them to Laboratório Central de Saúde Pública (LACEN-RO). The second specimen (Figure 2) was sent to the Laboratório Nacional e Internacional de Referência em Taxonomia de Triatomíneos, Oswaldo Cruz Institute, Fiocruz, Rio de Janeiro, where it was identified as *P. rufotuberculatus*, through the dichotomic keys³. The voucher specimen was deposited at the Herman Lent Collection of Triatominae Collection of the Oswaldo Cruz Institute (CTIOC) (number HL 3458). Natural infection caused by *T. cruzi* in the insects was analyzed by abdominal compression,



FIGURE 2: Dorsal view of a male *Panstrongylus rufotuberculatus* (Champion, 1899), with a total length of 24 mm. The tubercles of the fore lobe of pronotum are invariably red, an important diagnostic character.

and the contents were evaluated by direct microscopic examination; both specimens were negative.

The present report demonstrates that nine species of triatomines were found in the state of Rondônia: *Eratyrus mucronatus* Stål, 1859, *Panstrongylus geniculatus* (Latreille, 1811), *P. lignarius* (Walker, 1873), *P. megistus* (Burmeister, 1835), *P. rufotuberculatus* (Champion, 1899), *Rhodnius milesi* Carcavallo, Rocha, Galvão, and Jurberg, 2001, *R. montenegrensis* Rosa et al., 2012, *R. pictipes* Stål, 1872, and *R. robustus* Larrousse, 1927^{3,12,13,14,15}. The data of the geographical distribution of *P. rufotuberculatus* to Rondônia state are consistent with those in the prediction map for the potential distribution of this species in Brazil presented by Galvão³, but these findings in North Brazil are limited to a few specimens³. Knowledge of the biology of this species is scarce, and in natural environments, this species has been found to feed on bats, armadillos, domestic animals, and humans, but its habits are usually wild^{3,4,7}.

The increase in the number of reports of *P. rufotuberculatus* domiciliation may be related to changes in the wild environment, causing displacement to domestic environments as an alternative in the search for food. This finding emphasizes the need for careful entomological and epidemiological surveillance of this and other triatomine species in the Amazon region.

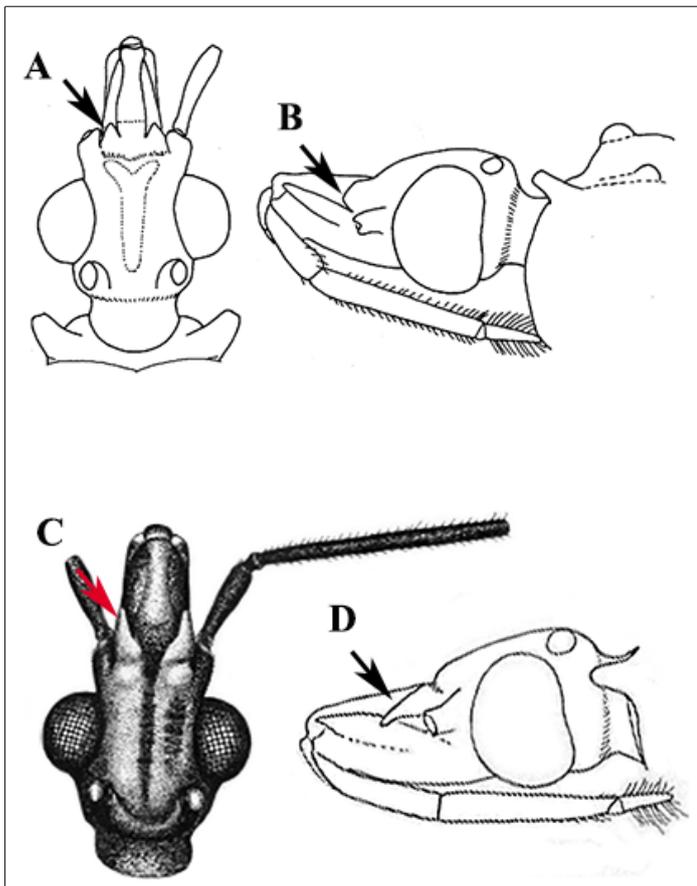


FIGURE 3: (A, B) Arrows indicate the jugae blunt, another important diagnostic characteristic of *Panstrongylus rufotuberculatus* (Champion, 1899). (B, C) Jugae sharpened, *Panstrongylus* spp.

ACKNOWLEDGMENTS

We would like to thank entomology technicians from the sanitary surveillance: Oséias Gomes da Silva and Dionisio Henrique Félix of the municipality of Rio Crespo and LACEN-RO for their support in field activities.

AUTHORS' CONTRIBUTION

AL: conducted the fieldwork and microscopic analysis of infection with *Trypanosoma cruzi*; DSR: written the original draft; CG: studied the specimens and reviewed whole text. All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FINANCIAL SUPPORT

This study was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

ORCID

Dayse da Silva Rocha: 0000-0001-5633-9001

Alda Lobato: 0000-0001-9105-6322

Cleber Galvão: 0000-0003-4027-9205

REFERENCES

1. Alevi KCC, Oliveira J, Garcia ACC, Cristal DC, Delgado LMG, Bittinelli IF, et al. *Triatoma rosai* sp. nov. (Hemiptera, Triatominae): A new species of Argentinian Chagas disease vector described based on Integrative Taxonomy. *Insects*. 2020; 11(12):830.
2. Zhao Y, Galvão C, Cai W. *Rhodnius micki*, a new species of Triatominae (Hemiptera, Reduviidae) from Bolivia. *Zookeys*. 2021;1012:71-93.
3. Galvão C. Vetores da doença de Chagas no Brasil. Curitiba: Sociedade Brasileira de Zoologia; 2014. 289p.
4. Hiwat H. Triatominae species of Suriname (Heteroptera: Reduviidae) and their role as vectors of Chagas disease. *Mem Inst Oswaldo Cruz*. 2014;109(4):1-7.
5. Salomon OD, Ripoll CM, Rivetti E, Carcavallo RU. Presence of *Panstrongylus rufotuberculatus* (Champion, 1899) (Hemiptera: Reduviidae: Triatominae) in Argentina. *Mem Inst Oswaldo Cruz*. 1999; 94(3):285-8.
6. Oliveira AS de, Ribeiro MAL, Castro GVS, Brilhante NA, Camargo LMA, Meneguetti DUO. Confirmation of the occurrence of *Panstrongylus rufotuberculatus* (Champion, 1899) in the state of Acre, western Amazon. *Rev Soc Bras Med Trop*. 2019;52: e20180388.
7. Noireau F, Bosseno MF, Vargas F, Brenière SF. Tendência aparente à domesticidade observada em *Panstrongylus rufotuberculatus* Champion, 1899 (Hemiptera: Reduviidae) na Bolívia. *Res Rev Parasitol*. 1994;54:263-4.
8. Fernández JC, Zambrano JC, Fernández TR. Reporte de triatomines (Hemiptera: Reduviidae: Triatominae), vectores de la enfermedad de Chagas, em la zona de nuevo Zapotal, Cantón Ventanas, Provincia de Los Ríos, Ecuador. *Rev Pat Trop*. 2008; 37(4):355-62.
9. Marín E, Santillán R, Cuba C, Jurberg J, Galvão C. Hallazgo de *Panstrongylus rufotuberculatus* (Champion, 1899) (Hemiptera, Reduviidae, Triatominae) en ambiente domiciliario en la Región Piura, Perú. *Cad. Saúde Pública*. 2007;23(9):2235-8.
10. Torres DBV, Cabrera R. Geographical distribution and intra-domiciliary capture of sylvatic triatomines in the Convención Province, Cusco, Peru. *Rev Inst Med Trop São Paulo*. 2010;52(3):157-60.
11. Wolff M, Castillo D. Domiciliation Trend of *Panstrongylus rufotuberculatus* in Colombia. *Mem Inst Oswaldo Cruz*. 2002;97(3):297-300.
12. Massaro DC, Rezende DS, Camargo LMA. Study of the triatomine fauna and occurrence of Chagas disease in Monte Negro, Rondônia, Brazil. *Rev Bras Epidemiol*. 2008;11(2):228-40.
13. Terassini FA, Stefanello C, Camargo LMA, Meneguetti DUO. First report of *Panstrongylus lignarius*, Walker, 1873 (Hemiptera, Reduviidae, Triatominae), in the State of Rondônia, Brazil. *Rev Soc Bras Med Trop*. 2017;50(4):547-9.
14. Castro MALR, Castro GVS, Souza JL, Souza CR, Ramos LJ, Oliveira J, et al. First report of *Panstrongylus megistus* (Hemiptera, Reduviidae, Triatominae) in the State of Acre and Rondônia, Amazon, Brazil. *Acta Trop*. 2018;182:158-60.
15. Galvão C, Justi S. An overview on the ecology of Triatominae (Hemiptera: Reduviidae). *Acta Trop*. 2015;151:116-25.