



Capture of *Triatoma arthurneivai* (Hemiptera: Reduviidae) using a new luminous trap in Southeast Brazil

Captura de *Triatoma arthurneivai* (Hemiptera: Reduviidae) por nova armadilha luminosa no sudeste do Brasil

João Victor Leite Dias^{1,2}, Bethânia Alves de Avelar¹, Hildebrando Cirqueira Júnior¹, Liléia Diotaiuti² and Herton Helder Rocha Pires¹

RESUMO

Introdução: As capturas de triatomíneos em meio silvestre são laboriosas e demoradas. Algumas armadilhas podem auxiliar nessa tarefa. Relata-se novo modelo de armadilha e captura de exemplar de espécie de triatomíneo raramente encontrada. **Métodos:** Duas armadilhas luminosas foram instaladas em Diamantina, Estado de Minas Gerais e acompanhadas, semanalmente, durante um ano. **Resultados:** Uma fêmea de *Triatoma arthurneivai* foi capturada além de outros triatomíneos. **Conclusões:** Um novo modelo de armadilha poderá ser empregado na captura de triatomíneos principalmente em áreas de baixa densidade. Presume-se que o centro de endemismo de *Triatoma arthurneivai* seja a Cordilheira do Espinhaço.

Palavras-chaves: Armadilha. *Triatoma arthurneivai*. Ambiente silvestre.

ABSTRACT

Introduction: Triatomine bug captures in the wild are laborious and time-consuming. Some traps may assist in this task. We report a new trap design and the capture of a specimen of a triatomine rarely found. **Methods:** Two luminous traps were installed in the city of Diamantina, State of Minas Gerais, and surveyed weekly for a year. **Results:** A *Triatoma arthurneivai* female and other triatomine bugs were caught. **Conclusions:** A new trap design may be used in triatomine bugs field captures, mainly in low density areas. We assume the center of endemism of *Triatoma arthurneivai* is the Espinhaço Mountain range.

Keywords: Trap. *Triatoma arthurneivai*. Wild environment.

Research and methodologies used in triatomine capture in the wild environment are generally extremely laborious and minimally efficient, thus most reports of these insects occurs when they invade the artificial environments and are notified by the residents. Thus, current knowledge regarding the ecological aspects of triatomines in the wild environment is fragmented and insufficient.

For a lot of species, direct capture in their probable natural ecotopes does not offer good results, mainly due to low population density and environmental complexity^{1,2}. The use of traps has been an alternative method for triatomine capture, contributing to

knowledge of species distribution and their population dynamics³. Among the trap designs commonly used in field research are those that use illumination sources or live-baits as an insect attractant^{4,6}.

Despite showing positive results, these trap models have limited application and present several difficulties in their use, either due to the necessity for daily handling or the constant presence of an observer. Therefore, the development of traps that improve monitorization of triatomine populations in their natural environment, with reduced work detachment for the investigators, is the subject of this study.

The present work introduces an alternative model of luminous trap and reports the capture of *Triatoma arthurneivai* Lent & Martins, 1940, a species rarely found.

Two luminous trap units were installed in an area of *Campus* II of the Federal University of Jequitinhonha and Mucuri Valleys, Diamantina county, State of Minas Gerais, southeast Brazil, in order to evaluate the seasonal dispersion of triatomines by flight in this area. The trap consisted of a photovoltaic cell with a rechargeable nickel and cadmium battery, with energy supplied by sunlight (**Figure 1**). Daily, during twilight, a photo sensor determined the lighting of a lamp that remained lit overnight. Inside the trap, acrylic fins were fitted in order to contain the arrival of insects during flight, such that they fell in a container in which they were imprisoned. Weekly, an observer checked the traps for triatomine presence and also tested the lamp.

After two months permanence of the traps in the field, a female of *Triatoma arthurneivai* was captured (**Figure 2**). During the period that the traps were in the field, one year, specimens from two another species were also captured: two females of *Panstrongylus geniculatus* (Latreille, 1811) and one female of *Triatoma vitticeps* (Stål, 1859), (18°11'54" S 43°34'01" W, 1,331m). Direct searches were also performed in the possible ecotopes surrounding the capture locations (stones, barks, nests and animals burrows), as well as the installation of 60 traps with mice as the attractive⁵, though no other specimens were found.

Triatoma arthurneivai was described by Lent and Martins⁷, from a specimen captured in a stone pile in the Alto do Palácio farm, Serra do Cipó region, Jaboticatubas county (currently Santana do Riacho), State of Minas Gerais. In the same year, these authors collected a further 17 nymphs in the same location. Later, the species was found by Pellegrino⁸ in homes in Santa Rita de Caldas, also in the State of Minas Gerais. Besides captures in this state, other were made in the State of São Paulo, in the cities of Sorocaba⁹ and Votorantim¹⁰,

1. Laboratório de Doenças Parasitárias, Departamento de Farmácia, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG. 2. Laboratório de Triatomíneos e Epidemiologia da Doença de Chagas, Centro de Pesquisa René Rachou, Fundação Oswaldo Cruz, Belo Horizonte, MG.

Address to: Dr. Herton Helder Rocha Pires. Lab. Doenças Parasitárias/Deptº Farmácia/UFVJM. Rod. MGT-367 Km-583 5000, Alto da Jacuba, 39100-000 Diamantina, MG, Brasil.

Phone: 55 38 3532-6047

e-mail: hhrpires@yahoo.com.br

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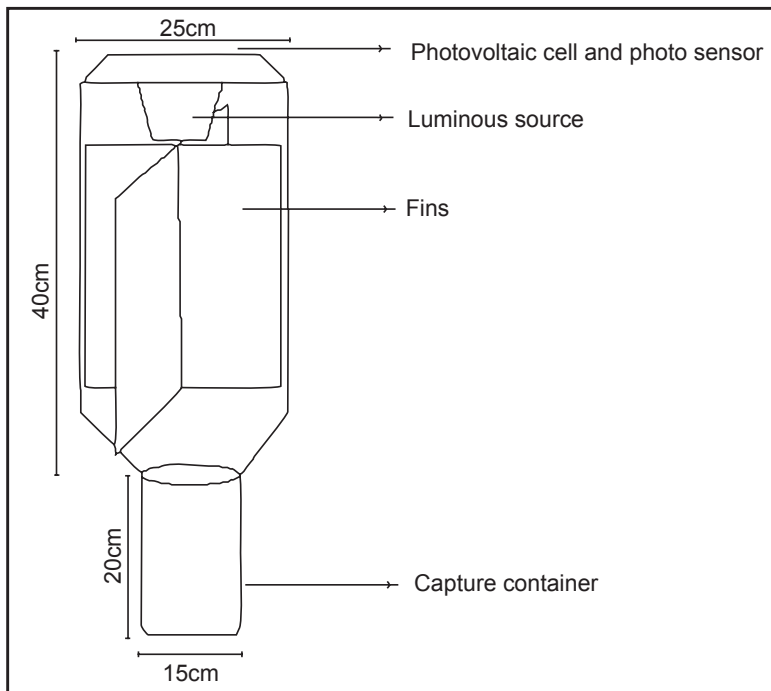


FIGURE 1 - Luminous trap design.

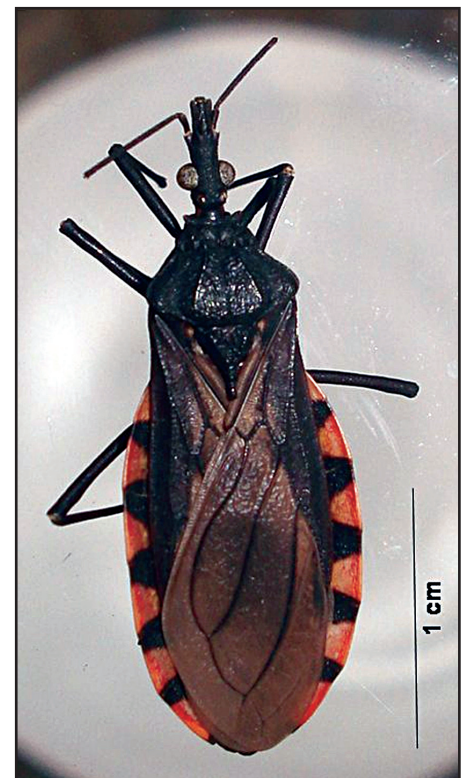


FIGURE 2 - Female of *Triatoma arthurneivai* caught in luminous trap.

where 248 specimens were captured, and in the State of Paraná, Guairá county¹¹. However, recent studies of morphometry have showed that the insects captured outside the Serra do Cipó region are specimens of *Triatoma wygodzinskyi* Lent, 1951, considering outstanding differences among the populations studied^{2,12,13}.

The City of Diamantina and the capture location of the species (Santana do Riacho at Serra do Cipó) are located in the Espinhaço Range at about 1,370m altitude, show similar characteristics of vegetation and relief and are about 130km from each other

(Figure 3A). In the rocky grasslands, the predominant phytophysognomy is that of the *Cerrado* biome, which usually occurs at altitudes above 900m, and the occurrence of herbaceous species of the families Graminae, Gypraceae, Eriocaulaceae and Xyridaceae is characteristic. The eventual occurrence of some small trees and bushes is also observed¹⁴. The rocky composition

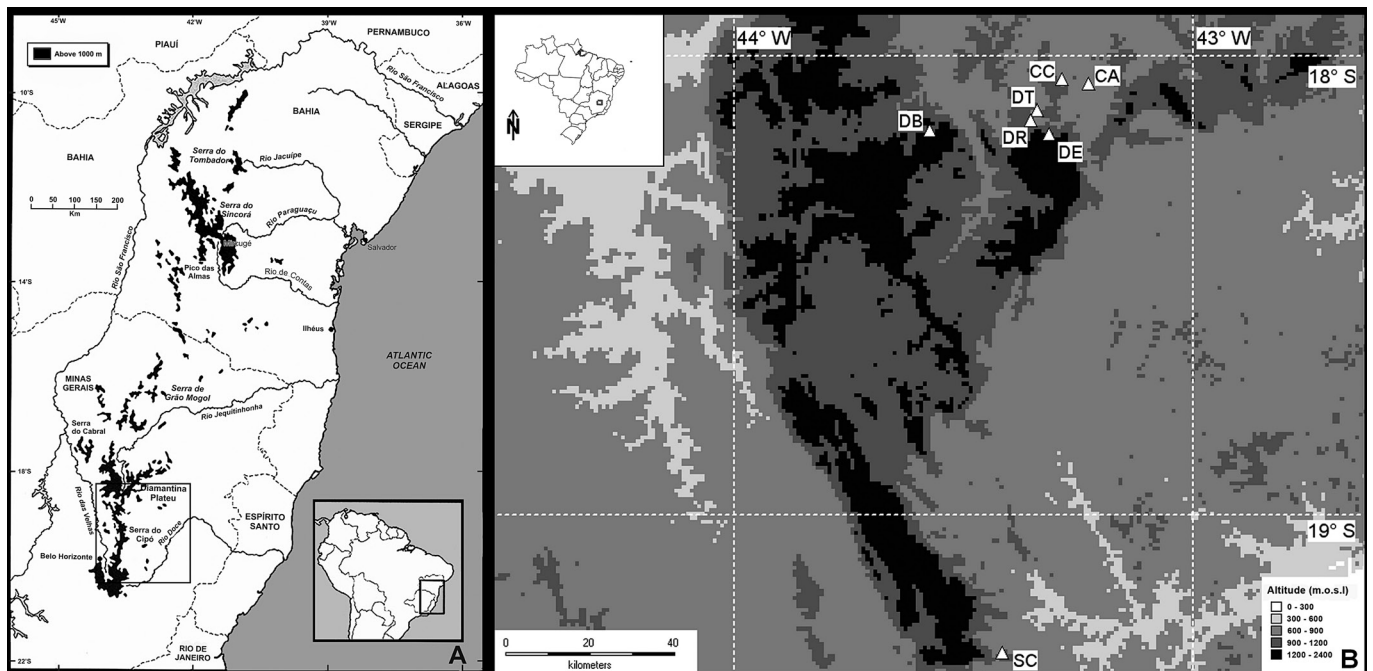


FIGURE 3 - A: Espinhaço Range Region, Brazil, showing land above 1,000m in the Espinhaço Range, in the States of Minas Gerais and Bahia. B: Capture sites of *Triatoma arthurneivai* in State of Minas Gerais and altitude in meters over sea level (m.o.s.l.).

DB: Batatal locality, Diamantina, DE: Extração locality, Diamantina, DR: Rio Grande locality, Diamantina, DT: Trap location, Diamantina, CC: Casas Populares locality, Couto de Magalhães de Minas, CA: Amendoim locality, Couto de Magalhães de Minas, SC: Alto do Palácio farm, Santana do Riacho. Rectangle refers to Figure 3B area (from <http://botanysi.edu/projects/cpd/sa/map56.htm>);

of the area is characterized by sedimentary origin (sandstones) that metamorphosed into metarenites or quartzite. They are usually tenacious and present layers, with or without cross stratifications, and numerous fractures. About 90 to 99% are composed of quartz and sometimes also contains mica¹⁵. In this area, lizards and rodents were identified that are probably associated with *T. arthurneivai*.

Capture data for triatomines at the Regional Healthcare Administration of Diamantina (Gerência Regional de Saúde de Diamantina), subsequent to the trapping, records the presence of six more specimens of *T. arthurneivai* found in homes in Diamantina (Batatal, Extração, and Rio Grande localities, and one insect from an unreported location) and Couto de Magalhães de Minas counties (Casas Populares, and Amendoim localities), State of Minas Gerais, suggesting that the place of origin and endemism of this specie is in the Espinhaço Range, as previously proposed^{12,13} (Figure 3B).

Finally, we present the prototype of a luminous trap that is easy to operate, which does not require the continuous presence of an observer, and has long-term application in fieldwork. However, additional studies should be performed in order to further evaluate its functionality, in environments showing the presence of other triatomine species and different population densities, in order to clarify the capturing efficiency of the prototype trap as an instrument of detection of wild populations.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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