

SHORT COMMUNICATION

Peridomiciliary colonies of *Triatoma vitticeps* (Stal, 1859) (Hemiptera, Reduviidae, Triatominae) infected with *Trypanosoma cruzi* in rural areas of the state of Espírito Santo, Brazil

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In Brazil, the colonization of human dwellings by triatomines occurs in areas with native vegetation of the caatinga or cerrado types. In areas of Atlantic forest such as in the Brazilian state of Espírito Santo, there are no species adapted to live in human habitations. The few autochthonous cases of Chagas disease encountered in Espírito Santo have been attributed to adult specimens of *Triatoma vitticeps* that invade houses from forest remnants. In recent years, the entomology unit of the Espírito Santo State Health Secretariat has recorded nymphs infected with flagellates similar to *Trypanosoma cruzi* in rural localities. Entomological surveys were carried out in the residences and outbuildings in which the insects were found, and serological examinations for Chagas disease performed on the inhabitants. Four colonies were found, all associated with nests of opossums (*Didelphis aurita*), 111 specimens of *T. vitticeps*, and 159 eggs being collected. All the triatomines presented flagellates in their frass. Mice inoculated with the faeces presented trypomastigotes in the circulating blood and groups of amastigotes in the cardiac muscle fibres. Serological tests performed on the inhabitants were negative for *T. cruzi*. Even with the intense devastation of the forest in Espírito Santo, there are no indications of change in the sylvatic habits of *T. vitticeps*. Colonies of this insect associated with opossum nests would indicate an expansion of the sylvatic environment into the peridomicile.

Key words: *Triatoma vitticeps* - peridomiciliary colonies - *Trypanosoma cruzi* - Espírito Santo - Brazil

At least five of the 125 species of triatomines recorded in the Americas have acquired the capacity to colonize human dwellings (Galvão et al. 2003). In Brazil, the distribution of triatomines associated with houses coincides with human colonization of areas with natural vegetation of the *cerrado* or *caatinga* types. Atlantic forest areas generally do not present foci of domiciliation (Forattini 1980, Coura 2003).

During the 20th century, forests in the Brazilian state of Espírito Santo were devastated for the exploitation of timber and planting of diverse agricultural crops, leaving only 8.15% of the territory with natural vegetation coverage. The impact of these actions culminated in the extinction of many species and adaptation of others to the new conditions imposed by man (Ipema 2004).

None of the seven triatomine species recorded in Espírito Santo has acquired the capacity of domiciliation (Galvão et al. 2003, Santos et al. 2004). The adult specimens of *Triatoma vitticeps* (Stal, 1859) that are frequently captured in the domiciliary environment in rural areas are attracted by lights or are seeking bloodmeals (Sessa & Carias 1986, Dias et al. 1989).

Serological surveys have demonstrated a low prevalence of Chagas disease in Espírito Santo, the few autochthonous cases of human transmission being attributed to *T. vitticeps* (Barros et al. 1975, Sessa et al. 2002), which is also incriminated as a vector of the parasite in the state of Rio de Janeiro (Lorosa et al. 2003).

The objective of the present study was to investigate the significance of the finding of *T. vitticeps* nymphs infected with *T. cruzi* in an anthropic environment of the state of Espírito Santo, Brazil.

In routine entomological vigilance studies carried out in 2002-2004, the entomology unit of the State Health Secretariat recorded *T. vitticeps* nymphs with flagellates similar to *T. cruzi* in the municipalities of Venda Nova do Imigrante (20°24',14"S; 41°08',48"W) and Castelo (20°32',56"S; 41°02',11"W) (Figure), located at about 800 m above sea level in the mountainous region of Espírito Santo.

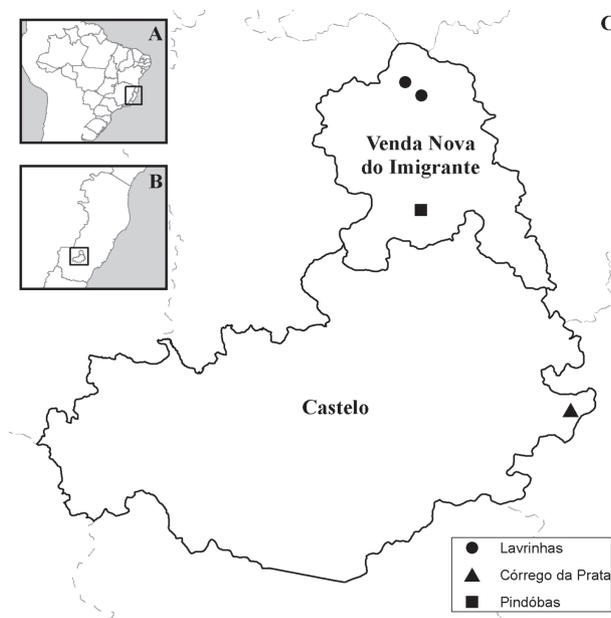
Based on these findings, entomological surveys were carried out in these localities, looking for indicators of domiciliation of this triatomine. An active search for the insects was carried out in residences and outbuildings, domestic animal shelters and timber piles in the peridomicile.

The excreta of the triatomines collected were examined using optical microscopy and those that contained flagellates were inoculated into the peritoneal cavities of mice. Blood samples from these animals were examined

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Map of the state of Espírito Santo. A: Brazil; B: state of Espírito Santo; C: municipalities where we found the colonies of *Triatoma vitticeps*.

from the second week onwards and histological sections of cardiac muscle were obtained from animals with circulating trypomastigotes.

Samples of blood were collected from 18 inhabitants of five residences investigated, for serological detection of *T. cruzi* infection using the ELISA, indirect immunofluorescence, and haemagglutination methods.

One hundred and eleven specimens of *T. vitticeps*, consisting of adults and nymphs of several stages as well as 159 eggs were obtained from investigations of the surroundings of five residences (Table). All the *T. vitticeps* colonies were associated with nests of opossums (*Didelphis aurita*).

A colony encountered in Córrego Prata, in the municipality of Castelo, Espírito Santo, was associated with an opossum nest located under the timber pile of an inhabited dwelling. In the remaining localities the colonies were associated with nests located in spacious outbuildings used to store tools and in woodpiles.

All the triatomines collected presented flagellates in their faeces. Inoculations of faecal samples from 13

triatomines in the peritoneal cavities of mice produced acute parasitaemia, with numerous trypomastigotes in the blood and groups of amastigotes in the cardiac muscle fibres. Serological tests for Chagas disease were negative in all the inhabitants examined.

The triatomine *T. vitticeps* is considered to be a poor vector of *T. cruzi*, because of its sylvatic habits and probably also because it does not defecate during or immediately after a bloodmeal (Gonçalves et al. 1988). The rare human cases of Chagas disease in Espírito Santo would be consequences of the occasional incursion in the domiciliary environment by wild triatomines. Nymphs are rarely found and are generally not infected. These nymphs are probably descended from wild females, which not tend to colonize human dwellings (Sessa & Carias 1986). However, intense destruction of the forest could induce changes in the habits of *T. vitticeps*, as already observed in other species.

In the state of Rio de Janeiro, Lorosa et al. (2004) reported domiciliated *T. vitticeps* infected with *T. cruzi*. However these authors did not investigate the possible co-existence of the triatomines with wild animals.

Based on the results of the present study, there do not appear to be indices of change in the behaviour of this species. Opossum nests with which the triatomine colonies are associated represent an expansion of the sylvatic environment into the peridomestic. Nevertheless, given the frequency with which opossums approach rural residences, entomological vigilance is necessary to ensure that infected *T. vitticeps* colonies do not become established in the peridomestic areas of houses.

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TABLE
Developmental stage compositions of *Triatoma vitticeps* colonies found in rural areas of the state of Espírito Santo, Brazil - 2002-2004

Municipality (locality)	Eggs	Nymphs (stages)					Adult	Total
		1st	2nd	3rd	4th	5th		
Venda Nova do Imigrante (Pindobas)	146	-	7	6	17	2	14	46
Venda Nova do Imigrante (Lavrinhas)	-	1	3	10	8	7	2	31
Castelo (Córrego Prata)	-	-	1	2	1	2	3	9
Venda Nova do Imigrante (Lavrinhas)	13	3	12	13	9	5	3	45
Total	159	4	23	31	35	16	22	111

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