

RESEARCH NOTE

**The Occurrence of
Rhodnius prolixus Stal, 1859,
Naturally Infected by
Trypanosoma cruzi in the
State of Rio de Janeiro,
Brazil (Hemiptera,
Reduviidae, Triatominae)**

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Rhodnius prolixus, one of the most important vector of Chagas' disease in Venezuela, was basically considered in this country as related to the domiciliar transmission cycle (O Cova-Garcia et al. 1959 *Publ Div Malarial* 11: 209-253). In the sylvatic environment it was observed that this species was mainly adapted to palm tree crowns and nests of *Mycteria americana*. *R. prolixus* is a very eclectic species feeding on marsupials, rats, birds and reptilians. Moreover, it is agreed that the adaptation of *R. prolixus* to human dwellings was a consequence of human colonization of the natural foci of *Trypanosoma cruzi* (F Pifano 1973 *Arch Venezol Med Trop Parasitol Med* 5: 3-29).

During a search for triatomids performed in an Atlantic rain forest area in Teresópolis, State of Rio de Janeiro, we collected a total of 23 specimens (2 adults and 21 nymphs) of *R. prolixus* from which 13 were infected by *T. cruzi*. Eleven nymphs were found in the axils of Pteridophyta leaves; 2 adults and 4 nymphs in leafages, probably opossum nests and 6 nymphs were collected on the trunk of palm-tree. Several eggs could be found in the axils of 1 Pteridophyta (Fig. 1).

The studied area, Granja Florestal, Teresópolis, can be characterized as a secondary rain forest with poor human dwellings on the forests borders. The local population live basically on small agriculture and hunting. Weekly searches were performed between September and March (1994-95) and included palm-trees, bracts of pteridophyta, bird and mammal nests, leafages and bromeliaceae.

The collected insects were maintained in glass flasks, fed through a membrane (ES Garcia et al. 1975 *Rev Brasil Biol* 35: 207-210) and the nymphs were allowed to moult. Seven isolates of *T. cruzi* were obtained through inoculation of swiss mice with the feces of the infected bugs. Axenic medium derived metacyclic forms (10^5) from each isolate and were intraperitoneally inoculated in five swiss outbred mice weighing 18-20g. No mortality occurred and only rare flagellates during a 2-3 day period could be observed in the fresh blood preparations examined every other day, during two months. Furthermore, the experimental infection by the isolates was stable as confirmed by the positive hemocultures made three months after the inoculation.

Five of the isolates were amplified for schizodeme analysis and the digestion was performed by EcoRI according to C Morel et al. (1980 *Proc Natl Acad Sci USA* 77: 6810-6814). No differences the profiles of the fragments were observed, suggesting that the infected specimens were involved in the same transmission cycle of the parasite (Fig. 2).

Biometrical analysis - A total of 13 specimens, 7 males and 6 females were analyzed. The morphometry was based on the characteristics of the head and of the pronotum. The males external genitalia were treated in 10% KOH, phenol, creosote and mounted in Canada balsam. All examined material, as well as the external male genitalia, were consigned to the Herman Lent Collection, Instituto Oswaldo Cruz, under the following numbers: 2852, 2853, 2869 and 2879.

The total length of 4 females and 3 males was slightly smaller than the standard established for this species by H Lent and P Wygodzinsky (1979 *Bull Am Mus Nat Hist* 163: 127-519).

The male external genitalia presented the dorsal phalloteca plate and the median process of the pygophore similar to that described by H Lent and J Juberg (1969 *Rev Brasil Biol* 29: 487-560) (Fig. 3). Moreover, all specimens displayed rounded, not very prominent anterolateral angles of the pronotum, the dark stripes of the lobe of pronotum fully separated and the urosternites dark brown. Those characteristics are typical of *R. prolixus*.

The homogeneity of 13 specimens (5 females and 8 males) was observed through the mor-

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Fig. 1: eggs of *Rhodnius prolixus* in Pteridophyta.

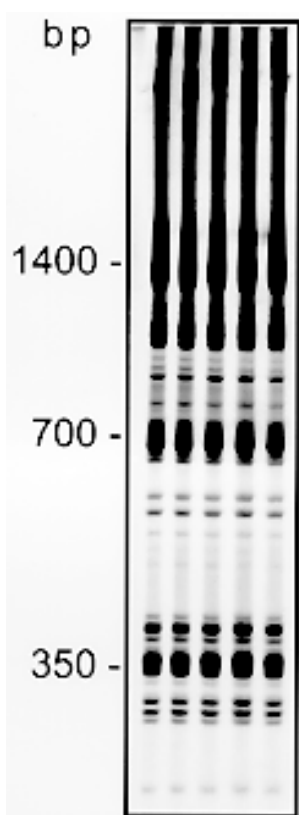


Fig. 2: schizodeme analysis with the Eco RI restriction enzyme, of *Trypanosoma cruzi* isolates from *Rhodnius prolixus*.

phometrical analysis of the following parameters: length of the head, anteocular region, length of the eye, postocular region, synthlipsis and length and width of the pronotum (Table).

The occurrence of *R. prolixus* in Brazil is controversial and many misleading identifications have been made due to the difficulty to distinguish among this and related species like *R. nasutus* and *R. neglectus* in which the occurrence is much more frequent. It is actually accepted that *R. prolixus* occurs basically in the states of Amazonas and Pará but there are also reports on the occurrence of this species in the states of Piauí, Goiás, Amazonas, Minas Gerais, Maranhão, Rio de Janeiro and São Paulo (H Lent & AV Martins 1940 *Rev Entomol* 11: 887-886, O Tavares 1971 *Rev Soc Bras Med Trop* v. 5, JC Filho 1979 *Rev Bras Malar D trop* XXXI: 579-585, DNC Bento et al. 1992 *Rev Soc Bras Med Trop* 25: 51-58). *R. prolixus* have been found colonizing both sylvatic and artificial environments. In the forests this species has been mainly associated with birds although it can also be found in other sylvatic ecotopes such as burrows of armadillos. The presence of *R. prolixus* in human dwellings were reported in the states of Goiás, Minas Gerais and Pernambuco by AC Silveira et al. (1984 *Rev Brasil Malariol D Trop* 36: 15-312). It is important to emphasize that these were scattered reports and no more studies about *R. prolixus* in those areas have been published.

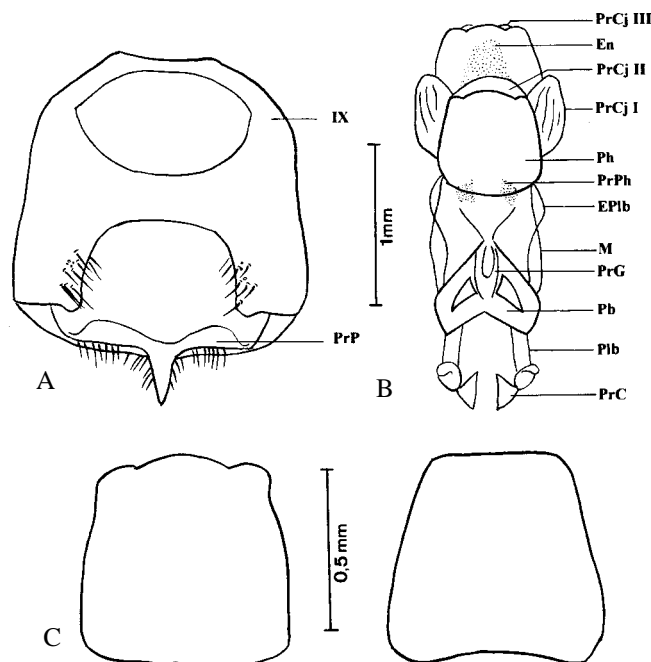


Fig. 3 - A: pygophore (IX) and median process of the pygophore; B: phallus, ventral view. Conjunctive process I, II and III, endosoma (En), dorsal phalloteca plate (Ph), struts (PrPh), pedicel (Eplb), membrane (M), median bridge (PrG), basal plate (BP), bridge basal plate (Plb); C: dorsal phalloteca plate.

TABLE

Morphometrical analysis (in mm) of 13 adult specimens of *Rhodnius prolixus*, collected in Teresópolis, State of Rio de Janeiro, Brazil

No. of specimes	Total length	Length of the head	Anteocular region	Postocular region	Synthlipsis	Length of pronotum	Width of pronotum
2852 ♂	18.5	3.8	2.4	0.6	0.6	2.5	3.8
2853 ♂	19.5	3.9	2.4	0.6	0.6	2.9	3.9
2869 ♂	16.5	3.5	2.3	0.5	0.4	2.3	3.3
2870 ♂	17.0	3.6	2.3	0.6	0.5	2.4	3.3
2871 ♂	18.0	3.9	2.5	0.6	0.6	2.8	3.8
2872 ♂	18.0	3.9	2.4	0.7	0.5	2.6	3.6
2873 ♂	17.0	3.8	2.2	0.6	0.5	2.5	3.6
2874 ♀	18.0	3.6	2.3	0.6	0.5	2.3	3.3
2875 ♀	20.0	4.1	2.6	0.6	0.6	2.6	3.9
2876 ♀	19.0	4.1	2.5	0.6	0.6	2.9	4.0
2877 ♀	18.5	3.8	2.4	0.6	0.6	2.7	3.8
2878 ♂	18.0	3.8	2.4	0.6	-	2.6	3.6
2879 ♀	18.5	3.8	2.4	0.7	0.6	2.6	3.8

R. prolixus found in Teresópolis seemed very well adapted to that environment since adults, nymphs and even eggs could be found. It is known that triatomines specially *Rhodnius* are well adapted to different palm trees (L Diotaiuti et al. 1984 *Rev Brasil Malariol D Trop* 36: 11-14, 1984 *Mem Inst Oswaldo Cruz* 79: 293-301, Bento et al. *loc.cit.*), but this is the first report on *Rhodnius* colonizing Pteridophyta. The inhabitants of the border of the forest did not recognize the bugs and no Chagas'

disease records have been found, suggesting that only a sylvatic transmission cycle is taking place in this area and that *R. prolixus* is directly associated with the maintenance of the parasite among wild animals. The species was probably introduced in the area through migrants and we do not know if *R. prolixus* is spread through all the county or is just initiating the colonization. In any case, further studies are necessary in order to follow up the colonization of *R. prolixus* in Teresópolis.

