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# Serologic survey for antibodies to *Rickettsia* among domestic and wild animal populations in Brazil

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## INTRODUCTION

During the last 20 years, Brazilian spotted fever (BSF) has been the most common rickettsiosis and had the highest case–fatality ratio of any rickettsiosis in Brazil [1]. In Minas Gerais, many cases were described in the 1930s and 1940s, but no reports of BSF cases appeared in the medical literature during the decades of the 1950s, 1960s and 1970s. In the 1980s an epidemic form appeared in rural and peri-urban areas, predominantly in the valleys of Jequitinhonha, Mucuri and Rio Doce [2].

One of the objectives of this study was to understand the status of the BSF vectors and hosts in an area of low endemicity. The city of Santa Cruz do Escalvado, located in the Piranga Valley, Minas Gerais, Brazil (Table. 1), which is considered to be an old focus for BSF, was chosen. The first cases in this area occurred in 1985, with few cases after this date [3].

## MATERIALS AND METHODS

The capture of wild animals and the serological survey were carried out in Santa Cruz do Escalvado every 3 months during the period from May 2005 to March 2006 in partnership with professionals of the National Foundation of Health (FUNASA).

During the visits, traps to catch rodents (a total of 100 traps/collection) and opossums (a total of 20 traps/collection) were placed in nearby dwellings, including garages, sheds, stockpiles of food, plantations of corn, bamboo thickets, waste deposits and near the homes.



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Those samples were evaluated by indirect immunofluorescence reaction (IFA) using antigen obtained in São Paulo University for spotted fever group (SFG) rickettsiae (*Rickettsia rickettsii, R. parkeri, R. felis* and *R. amblyommii)* and *Rickettsia bellii.* Serum samples were tested at a dilution of 1:64 using the CDC protocol [4].

We captured wild vertebrates including rodents *Rattus rattus* (33), *Nectomys squamipes* (35) and *Oryzomys subfalus* (12) and opossums *Didelphis aurita* (14). From the 184 animals captured, we collected blood samples from 166 animals, as well as from 37 horses and 53 dogs.

The rodents were caught around their common habitats. The species *R. rattus* was captured mainly in bunkers and warehouses. The species *N. squamipes* and *O. subflavus* were captured mainly in cultivated fields and woods. The 14 *D. aurita* opossums were captured in areas close to houses and also in thickets of bamboo.

## RESULTS

The data showed 81.25% seroreactivity to SFG rickettsiae among 32 sera of *R. rattus* examined. The rest of the captured rodents did not have antibodies.

There was also a relatively prevalent serologic reactivity to SFG rickettsiae among 14 opossums captured, with 14.3% having antibodies to *R. rickettsii* and 14.3% to *R. parkeri.* The equines showed 5.4% seroreactivity to *R. bellii* and 2.7% to SFG rickettsiae, while canines showed 2%) prevalence of antibodies to *R. rickettsii* and 2% to *R. parkeri.*

## CONCLUSIONS

This study demonstrated the presence of a high percentage of seroreactivity to rickettsiosis in synanthropic animals' sera. This observation confirms the opinion that we must pay attention to the possibility of occurrence of new human cases in this area, caused by the mechanisms of natural focus invasion by man or by the dispersion of potential reservoirs and vectors of the rickettsiosis into new areas. The low percentage of seroreactivity in sentinel animals such as dogs and horses confirms that the studied area is an area of low endemicity for rickettsiosis. The next step for this study will be the confirmation of the results found by serology using molecular biological methods in the same tested animals.

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## Table 1

Percentage of seroreactivity to rickettsiae by IFA at a titre of 1:64 in animals collected in Santa Cruz do Escalvado, Minas Gerais, Brazil

| Serum | N[1] | IFA[2] | Total (%) |
|---|---|---|---|
| Dogs | 53 | 2 | 3.8% |
| Equines | 37 | 3 | 8.1% |
| Opossums | 14 | 4 | 28.6% |
| Rodents | | | |
| *N. squamipes* | 33 | 0 | 0% |
| *O. subflavus* | 2 | 0 | 0% |
| *R. rattus* | 32 | 26 | 81.3% |

[1]Total number of samples of sera collected and tested.

[2]Number of samples reactive by IFA at the titre of 1:64.