

## CASE REPORT

### FIRST REPORT OF RABIES IN VAMPIRE BATS (*Desmodus rotundus*) IN AN URBAN AREA, UBATUBA, SÃO PAULO STATE, BRAZIL

Claudia FERRAZ(1), Samira Maria ACHKAR(2) & Ivanete KOTAIT(2)

---

#### SUMMARY

The purpose of this report is to record the first case of a hematophagous bat (*Desmodus rotundus*) infected with rabies virus in an urban area in Brazil. To the authors' knowledge, this is the first such case in Latin America. After discovering a bat in his garden at 10 o'clock in the morning, a resident of Ubatuba municipality asked the Zoonosis Control Center team to visit his home. The animal was caught alive on the same day and sent to the Pasteur Institute laboratory, where it was identified as a *Desmodus rotundus* specimen. Standard tests for rabies diagnosis were carried out (direct immunofluorescence and viral isolation), and the results were positive. The presence of different species of (primarily insectivorous) bats in urban areas represents a serious public health problem. This case, however, is indicative of a much greater risk because the species in question has hematophagous habits, what means this animals has a low energy reserves and, therefore, its need to feed daily.

**KEYWORDS:** Hematophagous bat; Rabies; Urban area; São Paulo.

---

#### INTRODUCTION

The main transmitter of human rabies in Latin America until 2003 was the dog. Since 2004, the distribution and transmission of rabies on the continent has undergone significant changes<sup>1</sup>, primarily as a result of human interference with the environment, changes in farming methods and the introduction of new economic activities. In consequence, the hematophagous bat, which was always considered as a species that transmits rabies to herbivores and is responsible for major direct and indirect economic losses, has also become the main public-health problem in tropical and subtropical regions of the Americas, particularly the Amazon region. In 2004 and 2005, 98 deaths due to rabies transmission by hematophagous bats were recorded in the Americas, most of them (64), specially in the states of Pará and Maranhão<sup>7</sup>.

Since 1998, rabies in non-hematophagous bats has become an emerging problem, specially in the Southeast of Brazil. São Paulo has been the most active state in terms of epidemiologic surveillance, with tens of cases notified in 36 species of bat (São Paulo State Rabies Control Program, Pasteur Institute, 2006) already identified in the national network of rabies diagnostic laboratories as infected with the rabies virus.

These cases generally occur in urban centers, and a number of

towns in the state of São Paulo already carry out epidemiologic investigations and have adopted measures for focus-control and colony handling and/or monitoring<sup>6</sup>.

#### CASE REPORT

This report describes the first isolation (to the authors' knowledge) of the rabies virus in a common vampire bat - *Desmodus rotundus* - found in an urban center.

In May 2006, following a request from a resident of Ubatuba municipality, staff from the Zoonosis Control Center collected a bat at 10 o'clock in the morning from the resident's backyard, located in the central area of the town. The bat was alive and dragging itself along; when provoked its behavior was aggressive.

The specimen was euthanized and kept frozen until June, when it was sent to the Diagnostics Department in the Pasteur Institute to be tested for rabies virus using the conventional techniques for diagnosing rabies recommended by the World Health Organization, namely, direct immunofluorescence<sup>3</sup> and viral isolation<sup>5</sup>. The results of both tests were positive for rabies, and the specimen was identified as *Desmodus rotundus*.

Ubatuba municipality is situated on the northern coast of the state

---

(1) Ubatuba Zoonosis Control Center, São Paulo, Brazil.

(2) Pasteur Institute, Department of Health, São Paulo, Brazil.

**Correspondence to:** Dra. Ivanete Kotait, Avenida Paulista 393, 01311-000 São Paulo, SP, Brasil. E-mail: [ikotait@pasteur.saude.sp.gov.br](mailto:ikotait@pasteur.saude.sp.gov.br)

of São Paulo, in an Atlantic forest area. Its coordinates are: latitude 23° 26' 15" S and longitude 45° 03' 45" W.

There have been no recorded cases of animal rabies in Ubatuba municipality in the last five years. However, five cases of bovine rabies have been reported in the last six months in Caraguatatuba (three cases) and Natividade da Serra (two cases), both of which share borders with Ubatuba.

Based on the results obtained at the Pasteur Institute, a team composed of staff from Agricultural Defense Department proceeded to map out the rabies focus. The team visited 17 properties; animals that had suffered recent attacks from bats (i.e., during the previous night) were identified in six of these. Records of six-monthly anti-rabies vaccinations were available in all the properties at the time of the visits, and specific measures were taken to control the hematophagous bat population.

An educational campaign targeting municipality residents and highlighting the ecological relevance of bats and the public-health risks, as well as the importance of having domestic animals vaccinated, was run on local radio and television.

Although the presence of hematophagous bats feeding on domestic animals and humans has been reported in other urban centers (for example, Olinda<sup>2</sup>, São Paulo, Belo Horizonte, Rio de Janeiro and Salvador)<sup>8</sup>, this is the first report, to the authors' knowledge, of the identification and isolation of the rabies virus in a hematophagous bat - *Desmodus rotundus* - from an urban center.

Epidemiologic surveillance and rabies diagnosis, particularly in cats and dogs, have enabled the São Paulo State Rabies Control Program to record countless cases of isolation of the rabies virus in pets. Antigenic and/or genetic typing of this virus has led to the identification of hematophagous and non-hematophagous bat variants<sup>4</sup>.

It is worth stressing the importance of the epidemiologic surveillance of rabies in bats, species identification and continued joint work by the Departments of Health, Agriculture and the Environment.

## RESUMO

### Primeiro relato de raiva em morcego hematófago (*Desmodus rotundus*) em área urbana, Ubatuba, São Paulo, Brasil

Este relato tem por objetivo fazer o primeiro registro de morcego hematófago (*Desmodus rotundus*) infectado com o vírus da raiva,

encontrado em área urbana de um município do Brasil e, até onde os autores têm conhecimento, na América Latina. Um munícipe de Ubatuba, São Paulo, solicitou a visita da equipe do Centro de Controle de Zoonoses em sua residência, após ter encontrado um morcego em seu quintal, às 10:00 horas da manhã. No mesmo dia o animal foi recolhido, ainda vivo, para ser encaminhado ao Laboratório do Instituto Pasteur. No Laboratório foi feita a identificação do espécime, *Desmodus rotundus*, e realizadas as provas clássicas para diagnóstico da raiva (Imunofluorescência Direta e Isolamento Viral), que resultaram positivas. A identificação de diferentes espécies de morcegos em áreas urbanas, predominantemente espécies insetívoras, representa um sério problema para a saúde pública. Este caso, no entanto, por tratar-se de espécie com hábitos hematofágicos, indica um risco ainda maior, tendo em vista a baixa reserva energética destes animais e a necessidade que têm de se alimentarem diariamente.

## REFERENCES

1. BELOTTO, A.; LEANES, L.F.; SCHNEIDER, M.C.; TAMAYO, H. & CORREA, E. - Overview of rabies in the Americas. *Virus Res.*, **111**: 5-12, 2005.
2. DANTAS TORRES, F.; VALENÇA, C. & ANDRADE FILHO, G.V. - First record of *Desmodus rotundus* in urban area from the city of Olinda, Pernambuco, Northeastern Brazil: a case report. *Rev. Inst. Med. trop. S. Paulo*, **47**: 107-108, 2005.
3. DEAN, D.J.; ABELSETH, M.K. & ATANASIU, P. - Fluorescent antibody test. In: MESLIN, F.-X.; KAPLAN, M.M. & KOPROWSKI, H. *Laboratory techniques in rabies*. 4. ed. Geneva, World Health Organization, 1996. p. 88-95.
4. FAVORETTO, S.R.; CARRIERI, M.L.; CUNHA, E.S.M. *et al.* - Antigenic typing of Brazilian rabies virus samples isolated from animals and humans, 1989-2000. *Rev. Inst. Med. trop. S. Paulo*, **44**: 91-95, 2002.
5. KOPROWSKI, H. - The mouse inoculation test. In: MESLIN, F.-X.; KAPLAN, M.M. & KOPROWSKI, H. *Laboratory techniques in rabies*. 4. ed. Geneva, World Health Organization, 1996. p. 80-87.
6. KOTAIT, I.; AGUIAR, E.A.C.; CARRIERI, M.L. & HARMANI, N.M.S. - **Manejo de quirópteros em áreas urbanas**. São Paulo, Instituto Pasteur, 2003. (Manual Técnico nº 7).
7. MINISTÉRIO DA SAÚDE. Programa Nacional de Profilaxia da Raiva - **Casos de raiva humana notificados e percentual de casos transmitidos segundo a espécie animal**. Brasília, Ministério da Saúde, 2005.
8. UIEDA, W.; CEZÁRI, A. & ESBERARD, C.E.L. - The common vampire bat in urban areas of large cities from Brazil. In: INTERNATIONAL BAT RESEARCH CONFERENCE, 11., Pirenópolis, Goiás, 1998. *Abstracts*. p. 9.

Received: 8 December 2006

Accepted: 14 June 2007