Prevalence of rabies in bats and risk factors associate. Retrospective study of twenty-six years in São Paulo City, Brazil

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INTRODUCTION

Bats are one of the most important reservoirs of rabies virus (RABV) in the world. In Brazil, cases of rabies involving bats have been identified, mostly with cats as the intermediate animal in the rabies cycle.

METHOD

✓Diagnosis: direct immunofluorescent, mouse inoculation or viral isolation in cell culture;

RESULTS

✓From 1997 to 2023, 10,348 bats were submitted for rabies diagnosis

✓ Insectivorous bats represented 60.8%.

✓110 bats were rabies positive (0.97%):

➢97 were insectivorous bats (five species represented 82.7%)

Myotis nigricans (23), *Eptesicus furinalis* (18), *Tadarida brasiliensis* (17), *Histiotus velatus* (12) *and Nyctinomops macrotis* (10).

➢And among 13 phytophagous bats, 10 were *Artibeus lituratus*

Habit food	Total Number	rabies	sex		age	
		positive	females	males	adult	young
Insectivorous	6294	97	57	40	83	14
Nectarivorous	2618	1	0	1	1	0
Frugivorous	1195	12	5	7	11	1
Hematofagous	240	0	0	0	0	0
Onivorous	1	0	0	0	0	0
Total	10,348	110	62	48	95	15

Habit food	Total Number	rabies	sex		age		Circunstances of capture		
		positive	females	males	adult	young	fallen on the ground	get into houses	roosting in buildings
Insectivorous	6294	97	57	40	83	14	55	32	10

There was a significant association between rabies and bats collected in atypical situations (p=0,0001; α=0.05).

Among insectivorous bats, 71.7% were captured in atypical situation defined as “fallen on the ground, unable to fly or entry into houses”

The chance of rabies positive bats captured in atypical situation was 3.4 (Odds Ratio) higher than those eaptured in their shelters.

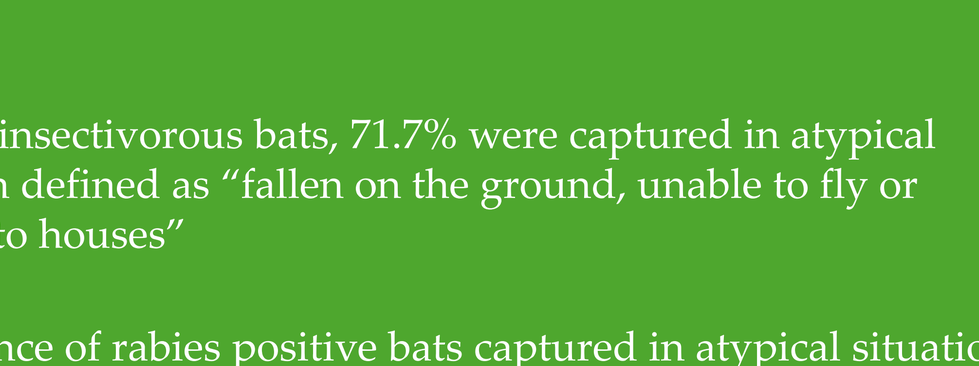
✓ Most of the rabies positive insectivorous bats (63.8%) were found during the rainy season (October to March).

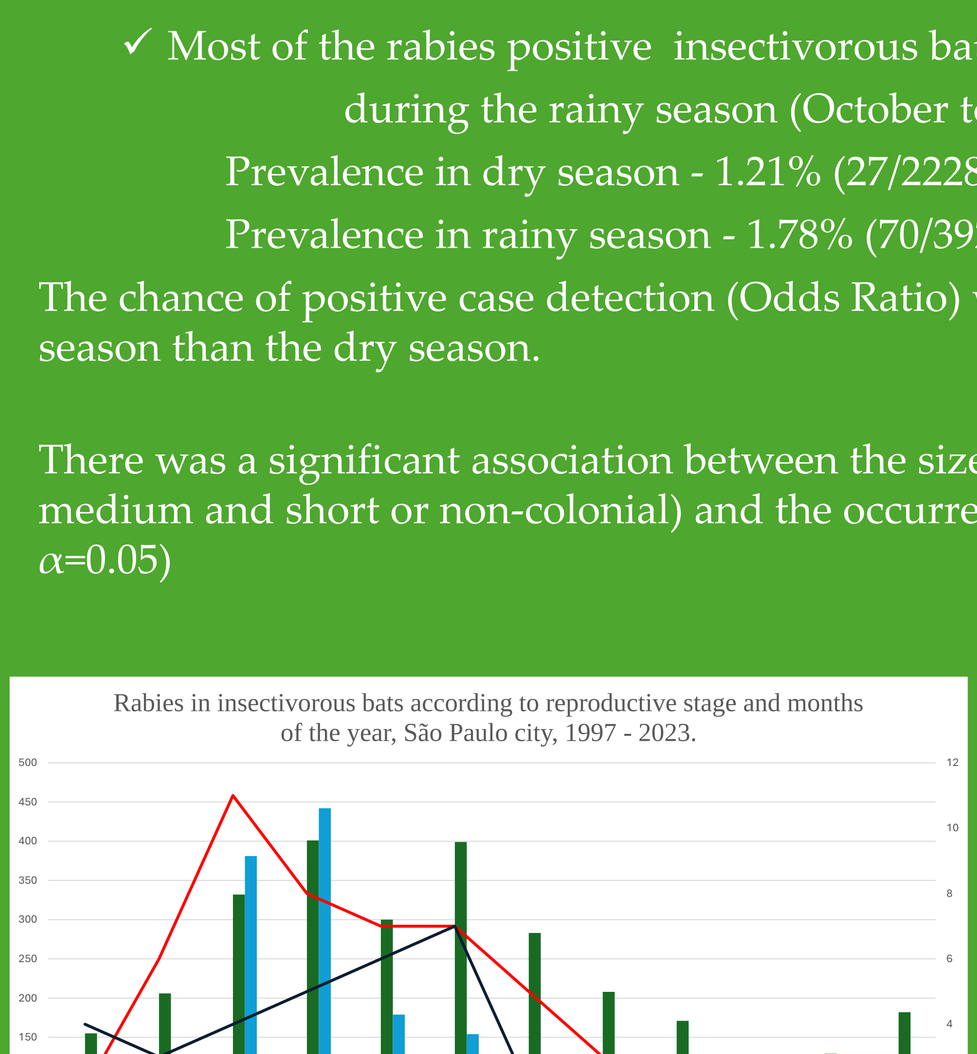
Prevalence in dry season - 1.21% (27/2228);

Prevalence in rainy season - 1.78% (70/3921);

The chance of positive case detection (Odds Ratio) was 1.5 higher in rainy season than the dry season.

There was a significant association between the size of the colony (big or medium and short or non-colonial) and the occurrence of rabies (p=0.0008; α=0.05)





The increase in the number of RABV-positive insectivorous bats during the warmer and rainy periods occurred in parallel with the reproductive period of these species:

✓ higher occurrence of rabies in females
✓ increase in the number of pups and lactating bats in December and January
✓ higher number of positive males in March.

DISCUSSION

The increase in the number of RABV-positive insectivorous bats during the warmer and rainy periods occurred in parallel with the reproductive period of these species and can be related to the stress involving the pregnancy, lactation, maternal care, and hierarchical disputes among males. This period also corresponds to an increase of complaints from citizens about bats.

These observations can be used as a reference for services responsible for orientation and managing of bats in urban cities. The displacement of insectivorous bats must be intensified during the dry season, avoiding the reproductive period, the spread of the rabies virus in the colony, and impacts in the survival of the pups.

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