

LISTS OF SPECIES

Mammals, Serra da Concórdia, state of Rio de Janeiro, Brazil.

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Abstract: The Atlantic Forest in the state of Rio de Janeiro is extremely fragmented and reduced in its original extension. Although there are a great number of studies related to the biome, few lists are available for this region. The present study seeks to get information on the mammals of a remnant forest in Serra da Concórdia, an area from which no information is currently available. The rapid mammal's survey was accomplished by use of pitfalls, live traps, transects, mist nets, and camera traps. We recorded 37 terrestrial species that represent 22.3 % of Rio de Janeiro state mammal species. Among the recorded species, six are endemic of the Atlantic Forest, one is endemic of the state, and eight are in the state list of threatened or presumably threatened species. The area presents great mammal richness and an increasing effort will probably reveal the presence of additional species.

Introduction

The Brazilian Atlantic Forest is one of the 34 recognized hotspots in the planet (Mittermeier et al. 2005). In the state of Rio de Janeiro it was intensively suppressed and now is fragmented due to human exploration over the last five centuries; from its original covering, only 16 % has remained (Rocha et al. 2003). The vertebrate fauna of the state is extremely rich, with 1,131 recorded species, of which, 185 are mammals (Bergallo et al. 2000; Rocha et al. 2004). Concerning this group, three species are endemic, 23 % are threatened, and 18 % are presumably threatened in the state (Bergallo et al. 2000; Rocha et al. 2003).

Knowledge of fauna and flora distribution and abundance has a great importance as a decision tool for the biodiversity conservation. In this context, the Serra da Concórdia is also relevant since, in 1994, it has been considered as a portion of the Biosphere Reserve of the Atlantic Forest (Legislation UNESCO 10/10/1992). Serra da Concórdia is a remnant of semideciduous forest and there is few information available about this phytogeographic region in the state of Rio de Janeiro (Ururahy et al. 1983). The goal of this study is to get information about mammal species that occur in the referred region.

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Materials and methods

Study Site

The present study was carried out in Santo Antônio da Aliança farm, an area partially included in the *Santuário da Vida Silvestre da Serra da Concórdia* (22°22'18" S, 43°47'23" W), a private reserve in Barra do Pirai and Valença municipalities, state of Rio de Janeiro (Figure 1). The farm encompasses an area of 295 ha, 220 of which comprises the reserve. The altitude varies from 600 m to 925 m above sea level. The

vegetation is classified as semideciduous forest in different succession stages. The farm is located in a massif named Serra da Concórdia, that also includes encircles the recently created State Park of Serra da Concórdia. The *Santuário da Vida Silvestre da Serra da Concórdia* is surrounded mainly by pasture fields and fragments of secondary forest (Figure 2), also comprising other fragment where silviculture practices are developed.

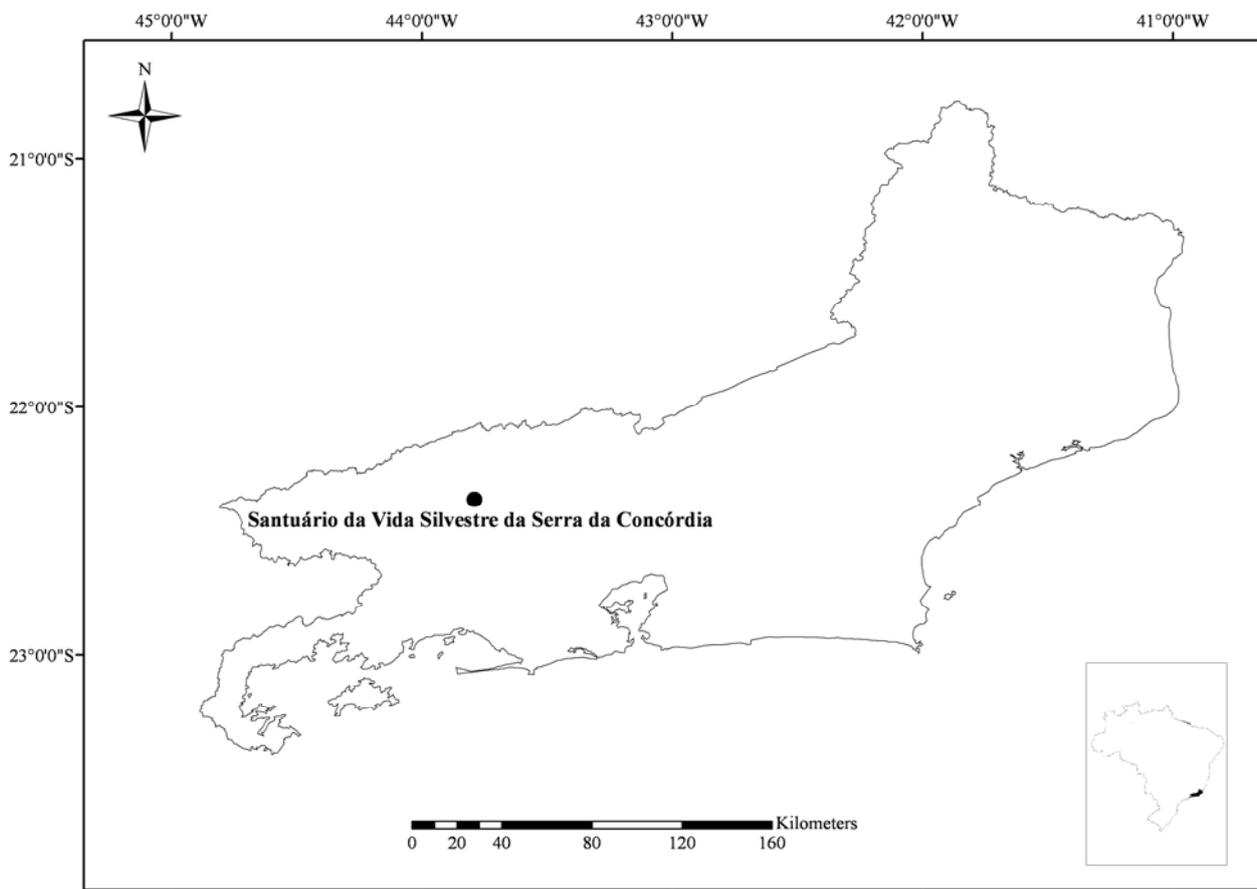


Figure 1. Map showing the location of Serra da Concórdia massif.

Data collection

The rapid mammal's survey field occurred from 1st to 8th April (all mammals). We collected the small mammals using 126 live traps (90 on the ground and 36 in trees) of Sherman and Tomahawk types, in three different trails. In each trail, we set 30

traps on the ground, 40 m apart from each other. On the fourth day, we moved the ground traps 20 m forward. The traps set on trees (12 in each trail) were 100 m apart from each other and were kept in the same place during all the survey. Baits used

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were banana, bread moistened with sunflower oil, a mixture of banana, peanut butter, maize flour, and sardine oil. Only one kind of bait was used in each trap. Traps were opened during six consecutive nights, totalizing an effort of 756 traps by night. The rodents and marsupials were

also surveyed in pitfall traps, using 30 buckets of 30 liters divided in three different systems, each one consisting of 10 buckets, 5 m apart from the next one and connected with a drift fence, totalizing an effort of 180 buckets/night.



Figure 2. Serra da Concórdia landscape. Photo by H. G. Bergallo.

Bats were captured in mist nets opened before the sunset and closed after a period of six or twelve hours, totalizing an effort of 5220 m/h-nets. Nets were opened in trails, close to fructifying trees (mainly banana and fig trees) and refuges or on water bodies. Captured mammals were identified, marked, sexed, measured, weighed and released at the same point of capture. Two individuals of each species were prepared as vouchers (IBAMA

license # 89/05-RJ). Specimens were identified to the species level using morphological characters or karyological data (for some rodent species). Specific names followed Wilson and Reeder (2005). Voucher specimens are deposited in the mammal collection of the *Museu Nacional*, UFRJ, and in the bat collection of the *Laboratório de Diversidade de Morcegos*, UFRRJ, both in Rio de Janeiro.

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We recorded large mammals in transect lines crossed during the day and the night, besides observations of traces and tracks. We walked a total of 29190 m during seven days. Four camera traps were placed in the area and periodically baited with banana and sardine. The camera traps were maintained 32 days in the area.

Results and discussion

We recorded 37 mammal species, 22.3 % of the total of 166 terrestrial mammal species known to inhabit the state of Rio de Janeiro (Rocha et al. 2004). Of these, five are endemic to the Atlantic Forest: *Didelphis aurita* (Wied, 1826) (Figure 3), *Marmosops incanus* (Lund, 1840), *Philander frenatus* (Linnaeus, 1758), *Blarinomys breviceps* (Winge, 1887) (Figure 4), and *Trinomys gratosus bonafidei* (Moojen, 1948) (Costa et al. 2007; Fonseca et al. 1996; Pessôa and Reis 1992). This last species is also endemic to the state of Rio de Janeiro (Pessôa and Reis 1992) and its distribution area has been amplified in the present study. Eight species are in the list of threatened species of the state and three are in the Brazilian list (Bergallo et al. 2000; Machado et al. 2005).



Figure 3. *Didelphis aurita*. Photo by H. G. Bergallo.



Figure 4. *Blarinomys breviceps*. Photo by D. Astua.

We confirmed the presence of *Puma concolor* (Linnaeus, 1771) from a posterior member footprint found in the margin of one track. The footprint measures were 5.98 cm (total width) and 5.16 cm (total length). These results are in concordance with those proposed by Oliveira and Cassaro (2005) for this specie. *P. concolor* has a broad geographical distribution (Mazzolli 1993). This top predator may have important role in regulating its prey populations (Hairston et al. 1960, Terborgh et al. 2001).

Information supplied by the farm owner and vicinity residents attest that other species can occur in the area such as: *Tamandua tetradactyla* (Linnaeus, 1758) (Lesser anteater), *Dasypus novemcinctus* Linnaeus, 1758 (Nine-banded armadillo), *Dasypus septemcinctus* Linnaeus, 1758 (Seven-banded armadillo), *Euphractus sexcinctus* (Linnaeus, 1758) (Six-banded armadillo), *Callithrix* sp. (Marmosets), *Callicebus nigrifrons* (Spix, 1823) (Black-fronted titi), *Alouatta guariba* (Humboldt, 1812) (Brown howler monkey), *Eira barbara* (Linnaeus, 1758) (Tayra), *Leopardus pardalis* (Linnaeus, 1758) (Leopard cat), *Pecari tajacu* (Linnaeus, 1758) (Collared peccary), *Mazama* sp. (Brocket deer) and *Hydrochoerus hydrochaeris* (Linnaeus, 1766) (Capybara). The occurrence of these species in the area is probably due to their great geographical range. Including these species, the total number of the *Santuário da Vida Silvestre da Serra da Concórdia* mammals raises to 47. However we remember that the records provided by reports should be viewed with caution. The occurrence of species recorded by reports must be confirmed by subsequent surveys.

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The richness of the area and the presence of several threatened and endemic species, point out the importance of Serra da Concórdia to mammal conservation. However, new studies should be developed in the area aiming the evaluation of

populations viability and the increase of survey effort in order to register new species.

Table 1 contains the list of recorded species, the respective registration method, and threat status.

Table 1. List of captured species, respective registration form, and threat degree. Codes for type of record: Ca, registered by capture; CT, registered by camera trap; MN, registered by mist net; Si, registered by sighting; Tr, registered by tracks that indicate the presence of the species. Codes for threat degree: PT, presumably threatened; Vu/VU, Vulnerable; PEx, probably extinct, according to Bergallo et al. (2000) and Machado et al. (2005).

Taxa	Type of record	Degree of Threat	
		Rio de Janeiro	Brazil
Order Didelphimorphia			
Didelphidae			
<i>Caluromys philander</i> (Linnaeus, 1758)	Si		
<i>Didelphis aurita</i> (Wied, 1826)	Ca/CT/Si		
<i>Marmosops incanus</i> (Lund, 1840)	Ca		
<i>Metachirus nudicaudatus</i> (Desmarest, 1817)	CT		
<i>Monodelphis</i> sp.	Si		
<i>Philander frenatus</i> (Linnaeus, 1758)	CT		
Order Xenarthra			
Dasypodidae			
<i>Cabassous tatouay</i> (Desmarest, 1804)* ^I	CT	PT	
Order Chiroptera			
Noctilionidae			
<i>Noctilio leporinus</i> (Linnaeus, 1758)	Si		
Family Phyllostomidae			
<i>Anoura caudifer</i> (É. Geoffroy, 1818)	MN		
<i>Anoura geoffroyi</i> Gray, 1838	MN		
<i>Artibeus fimbriatus</i> Gray, 1838	MN		
<i>Artibeus lituratus</i> (Olfers, 1818)	MN		
<i>Carollia perspicillata</i> (Linnaeus, 1758)	MN		
<i>Chrotopterus auritus</i> (Peters, 1856)	Si		
<i>Desmodus rotundus</i> (É. Geoffroy, 1810)	MN		
<i>Diaemus youngi</i> (Jentink, 1893) ^{II}	MN	Vu	
<i>Glossophaga soricina</i> (Pallas, 1766)	MN		
<i>Platyrrhinus recifinus</i> (Thomas, 1901) ^{III}	MN	Vu	VU
<i>Pygoderma bilabiatum</i> (Wagner, 1843)	MN		
<i>Sturnira lilium</i> (É. Geoffroy, 1810)	MN		
Vespertilionidae			
<i>Myotis</i> cf. <i>riparius</i>	MN		
<i>Myotis levis</i> (I. Geoffroy, 1824)	MN		
<i>Myotis nigricans</i> (Schinz, 1821)	MN		

*, Threatened in the list of the state of Minas Gerais. I, Figure 5; II, Figure 6; III, Figure 7.

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Table 1. Continued.

Taxa	Type of record	Degree of Threat	
		Rio de Janeiro	Brazil
Order Carnivora			
Canidae			
<i>Cerdocyon thous</i> (Linnaeus, 1789)	Si		
<i>Chrysocyon brachyurus</i> (Illiger, 1815)	Tr	PT	VU
Procyonidae			
<i>Nasua nasua</i> (Linnaeus, 1766)	Si		
<i>Procyon cancrivorus</i> (G. Cuvier, 1798)	Tr		
Felidae			
<i>Puma concolor</i> (Linnaeus, 1771)	Tr	Vu	VU
Order Rodentia			
Sciuridae			
<i>Guerlinguetus aestuans</i> (Linnaeus, 1766)	Si		
Cricetidae			
<i>Akodon cursor</i> (Winge, 1887)	Ca		
<i>Blarinomys breviceps</i> (Winge, 1887)	Ca	PEX	
<i>Oligoryzomys nigripes</i> (Olfers, 1818)	Ca		
Erethizontidae			
<i>Sphiggurus insidiosus</i> (Lichtenstein, 1818)	Si	PT	
Cuniculidae			
<i>Cuniculus paca</i> (Linnaeus, 1766)	Si	Vu	
Echimyidae			
<i>Trinomys gratosius bonafidei</i> (Moojen, 1948)	Ca		
Order Lagomorpha			
Leporidae			
<i>Sylvilagus brasiliensis</i> (Linnaeus, 1758)	Si		



Figure 5. *Cabassous tatouay* captured by camera trap.

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Figure 6. *Diaemus youngi*. Photo by H. G. Bergallo.



Figure 7. *Platyrrhinus recifinus*. Photo by H. G. Bergallo.

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Acknowledgements

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Appendix 1

Voucher list: *Akodon cursor* (MN 70233); *Blarinomys breviceps* (MN 68882); *Trinomys gratus bonafidei* (MN 70154); *Oligoryzomys nigripes* (MN 70173-4 and 70227); *Anoura geoffroyi* (TAX 3957-8); *Platyrrhinus recifinus* (TAX 3949); *Myotis nigricans* (TAX 3961); *Pygoderma bilabiatum* (TAX 3962); *Sturnira lilium* (TAX 3948).