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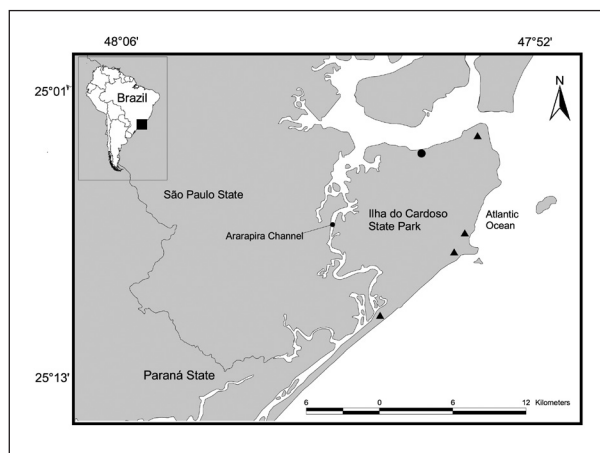
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## WAS THERE EVER A MURIQUI (*Brachyteles*) POPULATION IN THE ILHA DO CARDOSO STATE PARK IN SOUTHEASTERN BRAZIL?

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### Introduction

The muriqui, or woolly-spider monkey, (*Brachyteles*) is the largest of the New World primates (Nishimura *et al.*, 1988), and a flagship for the conservation of the Atlantic Forest in Brazil. They are endemic to the Brazilian Atlantic Forest (Aguirre, 1971; Nishimura *et al.*, 1988), which itself is threatened due to deforestation, with now only 8% remaining, scattered among innumerable fragments of different sizes. Of the 91,930 km<sup>2</sup> left, only 36% (33,084 km<sup>2</sup>)



**Figure 1.** Study area and location of the four villages (black triangles) and an isolated family (black circle) interviewed in the Ilha do Cardoso State Park, in São Paulo, southeastern Brazil.

is protected under federal law, despite the fact that it is a conservation hotspot due to its species richness and many endemic species (MMA and SBF, 2000; Myers *et al.*, 2000). Two species of muriqui are recognized: the southern (*Brachyteles arachnoides*) and the northern (*B. hypoxanthus*). Both are threatened from habitat loss and hunting—the southern muriqui is classified as Endangered and the northern muriqui as Critically Endangered (Nishimura *et al.*, 1988; Mendes *et al.*, 2008; Talebi, 2008). Research on primates in the Atlantic Forest has been ongoing since the late 1970s, and was stimulated mainly by Aguirre's (1971) pioneering monograph that generated interest in and concern for muriquis (Strier *et al.*, 2005). By 1971, the muriqui (only one species was recognized at the time) was believed to have occurred in forests extending south from the Rio Paraguaçu in Bahia to the Rio Ribeira valley in northern Paraná (Aguirre, 1971). Melo and Dias (2005) reviewed the numerous surveys and discoveries of further populations since the report by Aguirre (1971). This included the first report of a population in the Ilha do Cardoso State Park by Martuscelli *et al.* (1994). Martuscelli *et al.* (1994) reported that muriquis were seen twice in the northern part of the island (four adults in April 1989, two individuals in January 1991) during a four year study (1989–1992), but that they had since been extirpated (at least two monkeys were known to have been killed by local people). The occurrence of the muriqui on the island has never been independently confirmed. Here we report our findings concerning the presence of the muriqui in the Ilha do Cardoso State Park and discuss whether there ever was in fact a muriqui population there.

### Methods

#### Study Area

The Ilha do Cardoso State Park (151 km<sup>2</sup>) is on the southern coast of the state of São Paulo, in southeastern Brazil (25°10'015"S, 48°00'05"W; Sampaio *et al.*, 2005; Fig. 1). The island is part of the Iguape-Cananéia-Paraguá

estuarine-lagoon complex, a group of coastal-marine preserves and one of the largest preserved areas of the Atlantic Forest of the states of São Paulo and Paraná (Tabarelli *et al.*, 2005). The Ilha do Cardoso is separated from the mainland by the Arapira Channel which, in some places, is only 30 m wide (Fig. 1). The altitude ranges from sea level to 800 m (Pfeifer, 1981–1982), with the highest elevations in the center of the island (Barros *et al.*, 1991). There is no dry season, but rainfall is highest from December to March, with maxima of 1673–3014 mm yr<sup>-1</sup> (Funari *et al.*, 1987). Most of the island (74%) is tropical lowland rainforest, including the slopes and coastal plains, along with sandy soil shrub (*restinga*), sand dunes and mangroves in the remaining areas (Melo and Montovani, 1994). People of European descent occupied the island prior to it being declared a protected area in 1962, and fishing and small-scale agriculture were the most important local activities (Almeida, 1946). Today, there are still some people there, but they occupy only the margins of the southern, eastern, and northern coastal plains, with fishing and tourism being their chief livelihoods. In 1992, Amerindians of the Guarani Mbya ethnic group settled in the northwestern part of the island.

#### Data collection

During 2002–2007, we made an extensive study of the occurrence of medium to large mammals on the island. We used a combination of census techniques, including direct sighting, camera trapping and transect surveys (Wilson *et al.*, 1996; Thompson *et al.*, 1998; Pardini *et al.*, 2004; Tomas and Miranda, 2004). Besides primates, we found evidence of 18 medium to large mammal species. For primates, we used direct sightings during walks along transects (NRC, 1981; Chiarello and Melo, 2001). We also interviewed local people about their hunting practices and their knowledge of the fauna of the island. This part of the study was carried out under the auspices of the Cananéia Institute for Research (Instituto de Pesquisas Cananéia) that has been involved in ethnoecological studies there for more than 10 years (Oliveira, 2006; Oliveira *et al.*, 2008; Hanazaki *et al.*, 2009; Bahia and Bondioli, 2010). We conducted interviews, following Viertler (2002) in 2007, asking people about their hunting traditions, their knowledge of the local flora and fauna on the island as well as the Ilha Comprida and Ilha de Cananéia and the nearby mainland. Questions concentrated on the last five years, but also included memories of older experiences when they were offered. This was part of a study to establish the historical presence of mammals on the islands (Cheida *et al.*, unpubl. data) through information gathered from active and retired hunters who were well acquainted with the islands and nearby mainland. We interviewed 39 people between the ages of 17 and 81, most of whom had lived for more than 30 years on the island or nearby. Photographs were shown during the interviews to help identify species, including the miquiqui and three other primates known to occur in the region (Lorini and Persson, 1994; Passos *et al.*,

2007): the southern miquiqui (*Brachyteles arachnoides*), the black capuchin (*Cebus nigritus*), the brown howler monkey (*Alouatta clamitans*), and the black-faced lion tamarin (*Leontopithecus caissara*).

#### Results

A total of 224 km were walked along trails in all vegetation formations on the island during 2002–2005 (Barros *et al.*, 1991; Nakano-Oliveira, 2006). In 2005 and 2006, we intensified census efforts and included an additional 175 km of rainforest (92 km in the lowlands, 83 km in the uplands). Walking speed was consistently 0.5–1.0 km h<sup>-1</sup> (Buckland *et al.*, 1993). There were five trails totaling 8,050 m (Ingberman *et al.*, 2009). Previous studies were concentrated on the northern part of the island where miquiquis were originally reported (Martuscelli *et al.*, 1994), where we sighted just one primate, the brown howler monkey (*Alouatta clamitans* Cabrera, 1940).

Of the 39 interviewees, 28 hunt or hunted on the island; 19 of them lived in one of the four villages on the island (Pereirinha, Marujá, Cambriú, Foles) or elsewhere on the island (Fig. 1), and another nine lived on nearby islands. It was clear that these 28 hunters were very familiar with the local fauna and they easily and correctly identified mammals from the photos. Of the primates, only the brown howler monkey was identified as occurring on Ilha do Cardoso. The black capuchin and the black-faced lion tamarin were both recognized as occurring on the nearby islands and mainland. Not one interviewee recognized the miquiqui or suggested that it was found anywhere in the region.

#### Discussion

Earlier studies also failed to find the miquiqui on the island, and stated that the only primate there was the brown howler (Almeida, 1946; São Bernardo, 2004). In addition to the howler, all other mammals weighing more than 3 kg (as in Almeida, 1946) are still found on the island (this study), the only exception being the jaguar (*Panthera onca*) (Cheida *et al.*, unpubl. data; Fusco-Costa *et al.*, unpubl. data; Nakano-Oliveira, 2006; Ingberman *et al.*, 2009; Fusco-Costa *et al.*, 2010). Besides the jaguar, therefore, the assemblage of medium to large mammals is as it has been for over 60 years.

Since the channel that separates the Ilha do Cardoso from the mainland is often very narrow, it is possible that miquiquis could cross it and remain on the island temporarily, such as from 1989 to 1991, as reported by Martuscelli *et al.* (1994), but without being seen by the local people. However, aside from Martuscelli *et al.* (1994), there is no evidence of the miquiqui in additional studies along the northern coast of state of Paraná (Andriguetto-Filho *et al.*, 1998) nor in other coastal regions near the Ilha do Cardoso State Park (this study). The nearest documented record of the miquiqui is about 35 km away in a more mountainous area

(farther inland near the headwaters of the rios Serra Negra, Pardo and Jacupiranga [Aguirre, 1971]) that is more typical of where they are found elsewhere in their range today. Also, emigration in this genus does not occur in groups but rather by females who leave their natal group when they mature (Strier, 1991), so it is very unlikely that a whole group would go to the island.

Evidence for the occurrence of mureiqui on the Ilha do Cardoso is tenuous at best; Martuscelli *et al.* (1994) providing the only record, with no additional support for a population or its extinction, in over 60 years of historical records. Because that report did not provide additional information, such as methods, exact dates and locations, we suggest that the mureiqui was never resident on Ilha do Cardoso and, therefore, this single and unsupported record should not be used in determining its distribution. Conservation efforts for the endangered *Brachyteles arachnoides* will be better directed by understanding its true habitat requirements and geographic distribution.

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## EXTENSIÓN DE RANGO DE DISTRIBUCIÓN DEL MONO LUCACHI *Callicebus Aureipalatii* (PITHECIIDAE) PARA EL DEPARTAMENTO DE LA PAZ, BOLIVIA

Omar Martínez

### Introducción

Los monos tití (*Callicebus* spp.) pertenecen al grupo de primates de tamaño pequeño, cuyo rango de masa corporal varía desde 0.8 a 1.4 kg (Smith y Jungers, 1997), poseen cola no prensil y son primariamente frugívoros (Hershkovitz, 1990). La familia Pitheciidae agrupa alrededor de