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THE NEAR EXTINCTION OF A POPULATION OF NORTHERN MURIQUIS (Brachyteles hypoxanthus) IN MINAS GERAIS, BRAZIL

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Introduction

The muriqui (Brachyteles) is the largest Neotropical primate and the largest mammal endemic to Brazil (Fonseca et al., 1994). It is restricted to the southeastern Atlantic Forest where forest destruction is widespread and human activities inimical to wildlife are intense. Its populations are threatened by habitat destruction and fragmentation and, despite prohibitions, there is still hunting in this region of Brazil (Mittermeier et al., 1982, 1987, 1989; Mittermeier and Konstant, 1990; Auricchio, 1997; Cosenza and Melo, 1998).

Adult male and female muriquises can weigh up to 12–15 kg (Aguirre, 1971). Their original range extended from the southern part of the state of Bahia to southern São Paulo (25°S), including the states of Espírito Santo, Minas Gerais, and Rio de Janeiro (Aguirre, 1971; Strier, 1992; Strier and Fonseca, 1996-1997). Muriquises also occur in northern Paraná (Martuscelli et al., 1994). Aguirre (1971), who conducted the most complete survey of the muriqui’s distribution, considered their preferred habitat to be primary and secondary forests between 600–1,800 m above sea level.

Despite the well-documented growth of the muriqui population at the Estação Biológica de Caratinga in the Feliciano Miguel Abdala Private Natural Heritage Reserve (RPPN-FMA) (see Strier et al., 2002) and recent discoveries of some new populations (see Melo et al., 2002; Chiarello et al., 2005), the northern muriqui, B. hypoxanthus, is classified as Critically Endangered on the IUCN Red List of Threatened Species (IUCN, 2004). All known populations are small and occur in isolated forest fragments. One of the smallest inhabits the 42-ha forest at Fazenda Esmeralda (FE), in Rio Casca, Minas Gerais.

In his visit to the Fazenda Esmeralda in 1964, Aguirre (1971) estimated 7–8 individuals surviving there. Subsequent studies of this population over a 20-year period, from 1983 to 2003, recorded an increase to a maximum of 18 individuals, followed by a subsequent and steady decline (Fig. 1). As of June 2003, there were only three muriquises remaining, two adult males and an adult female, all three of them old. This population is not considered to be viable over the long term. We report here on a survey of primates in the forest fragments in and surrounding the Fazenda Esmeralda.

Study Site and Methods

Study site

Fazenda Esmeralda (FE) is about 30 km north of the town of Rio Casca, Minas Gerais, at 20°04’16”S, 42°44’22”W (Fig. 2; Location number 1). The forest is seasonal semideciduous and surrounded by farmland and pasture. The climate is tropical humid according to the classification of Köppen (Gilhaus, 1986, cited in Stallings and Robinson, 1991). The peak rainy months are from November to February, and...
the peak dry months are from June to August. Data from the Rio Doce State Park (about 35 km from the study area) indicate average annual rainfall in the 1960s and 1970s to be 1,480 mm, with an average annual temperature of 22°C (CETEC, 1981). Altitudes in the forests at FE range from 240–480 m. The forests in the area have a long history of disturbance, through cycles of coffee, corn and, more recently, sugarcane plantations, besides the harvesting of wood in the 1960s and 1970s for the production of charcoal. The small forest fragments are today surrounded by pasture dominated by “capim-colonião” (Panicum maximum) and agricultural crops. Local farmers reported that the muriquis were heavily hunted during the 1960s and 1970s, when there were some 800 people living on the Fazenda Esmeralda working for a mining company in the region.

The forest is in various stages of succession, and there are abundant vines and lianas. Some species typical of tall primary forest, such as “bicuíba” (Virola gardneri [A. DC.] Ward), “garapa” (Apuleia leiocarpa MacBride), “jequitibá-roxa” (Cariniana legalis [Mart.] Kunze), and “peroba” (Apidosperma sp.) remain. There are few epiphytes due to the successive cycles of selective logging. The terrain is steep with slopes of 40–65°.

**Methods**

We carried out four surveys to census the primates and assess the muriqui population at FE: 1) 29 March to 4 April 2003; 2) 26 April to 1 May 2003; 3) 26 May to 31 May 2003; and 4) 14 June to 19 June 2003. Each expedition involved about 58 hours of fieldwork for a total of 234 hours. We re-opened trails that were used by previous researchers and cut new ones. Morning censuses were begun at 0700 h and lasted approximately four hours. Afternoon censuses were conducted from 1400–1800 h, such that we were able to cover the entire area of forest accessible by the trail system, including all areas used by muriquis, in one day. We used binoculars and also playback recordings (portable Diskman, a CD with vocalizations of *B. hypoxanthus*, *Cebus nigrith*, *Callicebus nigrifrons* and *Callithrix aurita*, and a Mini-twin MT 10 Fender amplifier) to increase the likelihood of finding the primates. Whenever possible, we took photographs with a Sony Mavica FD75 digital camera.

We recorded all sightings of primates, all vocalizations heard, and information obtained from interviews with local inhabitants. Other forest fragments reported to have supported muriquis in the past were also surveyed to determine whether they might still be present.

**Results and Discussion**

The forest fragment at FE continues to suffer strong anthropogenic pressures. In the past, the main problem was selective logging for charcoal production. Logging has, without doubt, considerably reduced the floristic species diversity.
The remaining secondary forest has enormous numbers of vines and patches of bamboo, with a canopy now reduced to an average height of 6.8 m (Lemos de Sá and Strier, 1992). During the first expedition, we heard dogs barking in the forest. Local residents told us that these dogs have been harassing the primates at FE for years.

**Muriquis**

We were in contact with the muriquis for an average of seven hours in each of the expeditions. On the first expedition only three trails were passable, and we had difficulty walking in the forest and locating the muriquis, partly due to the steep terrain and dense vegetation typical of secondary growth. Only on 30 March 2003 did we see an adult male about 12 m from the observer, 10 m from the trail, and 9 m from the ground. At 1800 h on the same day, we heard a second muriqui calling from the other side of the forest in the area called “Porção da água” (there is a small stream there). On 2 April 2003 we saw another individual in the “Porção da água.” This part of the forest is the only area that has not been logged, as was evident from the well-developed understory and the presence of various large trees including “jequitibá” (*Cariniana legalis*), “pau d’alho” (*Gallesia integrifolia*), and “angico” (*Anadenanthera* sp.). Local residents mentioned seeing a solitary muriqui in a neighboring forest fragment (separated by an open field) on 31 March 2003.

For the second expedition, we cut nine new trails and were consequently able to observe three adult muriquis (a female and two males) on four consecutive and complete days. We frequently found the muriquis in a part of the forest with a high density of “leiteira” trees (*Margaritaria nobilis*, Euphorbiaceae) that were in fruit. They fed in these trees throughout the day as well as in other trees, including “angelim-amargoso” (*Andira* sp.), “angico” (*Anadenanthera* sp.), and “vinhático” (*Platymenia folioloa*). They fed especially on the mature leaves of “angelim-amargoso,” and on lianas and vines, including a species of Bignoniaceae.

We cut four new trails for the third expedition, and were able to reach formerly inaccessible parts of the forest, making us even more successful in contacting and observing the muriquis. We were able to reconfirm the composition of the group: just the three muriquis seen during the second expedition. *Ad libitum* data (Setz, 1991) indicated that the muriquis spent 60% of the total observation time resting, 23% traveling, and 17% feeding (Fig. 3). The time spent feeding could have been low because of the low availability of food.

Local people informed us that muriquis had been heard calling in another forest fragment in the past year (about 140 m from the study area; not shown in Fig. 2). In 2002, R. Ribeiro (pers. comm.) also saw an adult male muriqui crossing a pasture in the direction of this same forest. During the final, fourth expedition, we visited four other forest fragments near our study area but were unable to confirm the presence of muriquis in any (Table 1; Fig. 2).

**Other primates**

While studying the muriquis at FE from 1986 to 1987, Lemos de Sá (1991) recorded the presence of single groups of titi monkeys (*Callithrix aurita*), capuchin monkeys (*Cebus nigritus*), and buffy-tufted-ear marmosets (*Callithrix aurita*) in the 42-ha forest of our study site. Our surveys confirmed that all three primates still resided there. We also saw two buffy-tufted-ear marmosets (*Callithrix aurita*), together with a group of *Callicebus nigrifrons* (titi monkeys), in a neighboring fragment separated from the study site by a road, but considered here as part of the same area.

During the last expedition (14–19 June 2003) we recorded the presence of titi monkeys, black-horned capuchins, and buffy-tufted-ear marmosets in two other fragments (Fazenda Esmeralda and Fazenda Esmeralda de Cima), and found another group of capuchin monkeys in a third forest in the Fazenda Córrego do Ouro, all near our study site (Table 1; Fig. 2).

**The fate of the three muriquis**

The situation of the muriquis at Rio Casca was discussed at the Second Meeting of the Committee for the Conservation and Management of the Muriqui (Comité Brasileiro para Conservação do Muriqui), recently created by the Instituto Brasileiro de Desenvolvimento Sustentável e dos Recursos

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**Table 1.** Census results from study site and neighboring forest fragments.

<table>
<thead>
<tr>
<th>Map</th>
<th>Local</th>
<th>Coordinates</th>
<th>Area (ha)</th>
<th>Species encountered</th>
<th>Encounter type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fazenda Esmeralda (study site)</td>
<td>20°04’16”S 42°44’22”W</td>
<td>42</td>
<td><em>Callithrix aurita</em>  <em>Cebus nigrifrons</em>  <em>Brachyteles hypoxanthus</em></td>
<td>Visual  Visual  Visual</td>
</tr>
<tr>
<td>2</td>
<td>Fazenda Esmeralda (forest fragment 01)</td>
<td>20°03’21.0”S 42°44’10.0”W</td>
<td>85</td>
<td><em>Callithrix aurita</em>  <em>Cebus nigrifrons</em>  <em>Cebus nigritus</em></td>
<td>Vocal  Vocal  Visual</td>
</tr>
<tr>
<td>3</td>
<td>Fazenda Esmeralda de Cima</td>
<td>20°07’03.0”S 42°44’11.0”W</td>
<td>177</td>
<td><em>Callithrix aurita</em>  <em>Cebus nigrifrons</em>  <em>Cebus nigritus</em></td>
<td>Reported by local  Vocal  Visual</td>
</tr>
<tr>
<td>4</td>
<td>Fazenda Córrego do Ouro</td>
<td>20°01’21.0”S 42°43’37.0”W</td>
<td>127</td>
<td><em>Cebus nigritius</em></td>
<td>Reported by local</td>
</tr>
<tr>
<td>5</td>
<td>Fazenda Esmeralda (forest fragment 02)</td>
<td>20°04’22.0”S 42°43’55.0”W</td>
<td>22</td>
<td><em>Cebus nigrifrons</em></td>
<td>Visual</td>
</tr>
</tbody>
</table>
Naturais Renováveis (IBAMA). The meeting was held from 30 June to 1 July 2003 in Belo Horizonte, Minas Gerais. Three alternatives were proposed:

- Continue to monitor the remaining individuals in this population without interfering with them;
- Capture the three muriquis, and release them in another forest with an extant muriqui population;
- Capture the three individuals and maintain them in captivity.

If captured, they would be transported to a Triage Center at the Universidade Federal de Viçosa. Following quarantine and medical examinations (including analyses of parasite loads, genetics, and reproductive status), the fate of the muriquis (reintroduction or permanence in captivity) would be determined in a special meeting of the Muriqui Committee. We estimate that to capture and transport the muriquis would cost about R$12,000. The option to capture the three muriquis and to build them a suitable enclosure would cost approximately R$14,000. The option to capture the three individuals and maintain them in captivity.

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