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### A MURIQUI (*BRACHYTELES HYPOXANTHUS*) WITH A BROKEN LEG AT THE ESTAÇÃO BIOLÓGICA DE CARATINGA, MINAS GERAIS, BRAZIL

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The northern miqui (*Brachyteles hypoxanthus*) is Critically Endangered (Hilton-Taylor, 2002) and one of the world's 25 most endangered primates (Konstant *et al.*, 2002). The total known population is currently estimated at between 700 and 1000 animals. The behavior, ecology, demography and reproduction of one group of northern miquis, the Matão group, has been studied since 1982 at the Estação Biológica de Caratinga in the Feliciano Miguel Abdalla Private Natural Heritage Reserve (RPPN) in Minas Gerais, Brazil. Here we report our observations on the behavior and recovery of a three-year-old female with a broken leg.

Miquis travel by suspensory locomotion, propelling themselves by their arms, with or without the assistance of their tail (Nishimura *et al.*, 1988; Iurck, in prep.). Suspensory locomotion optimizes time and energy costs for primates such as miquis that travel widely between dispersed food sources (Cant *et al.*, 2001; Youlatos, 2002). Members of the Matão study group travel an average of 1,206 m a day, with recent maximum daily travel distances of 2,835 m (Dias and Strier, 2002). The large size of the northern miqui makes it especially vulnerable to injury from falls when traveling rapidly, and/or when branches break (Strier, 1999).

We observed the behavior of a three-year-old female in the Matão study group during February–July 2002, when she was suffering from a fracture in her right lower leg. We first noticed it on 20 February 2003; there was a visible lesion, and her leg was bent into an unnatural position. She was seen in this state a few hours after an encounter with a neighboring group, the Jaó group, in an area where the home ranges are known to overlap (Dias and Strier, 2002). The encounter included vocal and visual displays, but we saw no evidence that the female had been attacked or had fallen. The fracture appeared to be of the tibia, which is found toward the anterior of the lower leg and ordinarily

supports the weight of the femur above it (Gardner and Osburn, 1971). In addition, there was evidence of swelling and deformity consistent with trauma around the tibia, but not the fibula (Apley and Solomon, 1989).

The female was seen on the periphery of the group five days later (25 February 2003), together with an adult female and her dependent infant. The injured female spent at least four hours in a tree, where she was observed feeding and resting until we had to leave her to accompany the rest of the group. She did not use her injured leg, which was extended stiffly, swollen on the lower portion, and with a visible lesion on the fur (Fig. 1). She frequently licked and manipulated the area around the wound.

On 28 February 2003, she was observed traveling with the rest of the group, but without using her injured leg. On 6 March 2003, she was seen playing with two infants, and from 12–19 March 2003, she was also seen near other juveniles and adult females, including her own mother and her younger sibling. Her injured leg remained stiff and she was not observed to use it on any of these occasions.

It was on 23 March 2003 that we first saw her using the injured leg, resting it lightly on some branches while she was moving. On 30 March 2003 she was again seen using her injured leg while traveling with other group members. From 4–26 April 2003, we had few opportunities to observe the female, as the Matão group was subdivided into smaller parties at the this time, and it was difficult to locate every individual each day. However, it appeared that the female's



**Figure 1.** Young female (JO) feeding with lower right leg bone fracture on 25 February 2003. Photo by Carla B. Possamai.

leg had healed, despite the persistence of some swelling and a mark on her fur where the injury had occurred. Her movements appeared to have returned to normal, and she seemed to have fully recovered. She was routinely observed until 15 September 2003, after which date she suddenly disappeared. She is presumed to have died, because she was much younger than is typical for natal females when they disperse (Printes and Strier, 1999; Strier and Ziegler, 2000) and she was not seen in any of the other marmoset groups in the forest (Strier *et al.*, 2002).

We are unaware of any other reports describing recovery from bone fractures in wild marmosets, although healed fractures have been reported in other species of wild primates, including moustached tamarins (*Saguinus mystax*; Herrera and Heymann, 2004), mantled howler monkeys (*Alouatta palliata*; Estrada *et al.*, 2001), black spider monkeys (*Ateles paniscus*; Karesh *et al.*, 1998), Japanese macaques (*Macaca fuscata*; Nakai, 2003), mountain gorillas (*Gorilla gorilla beringei*; Lovell, 1990), and lowland gorillas (*G. g. gorilla*), bonobos (*Pan paniscus*) and chimpanzees (*P. troglodytes troglodytes* and *P. t. schweinfurthii*; Jurmain, 1997). Although fractures of the tibia are described in some of the apes (for example, Jurmain, 1997), in most primates they appear to be uncommon compared to fractures of other bones.

In humans, recovery from bone fractures involves the formation of bone callous, which gradually replaces the damaged bone tissue. Inferior limb bones may take 12–24 weeks to heal (Apley and Solomon, 1989). Our observations of this female suggest that in young marmosets, the recovery and healing process may be much more rapid, occurring within six to seven weeks. The marmoset's suspensory mode of locomotion, which relies much more on the arms than the legs, may have contributed to her rapid recovery.

Despite her fully recovered appearance, however, it is possible that her injury was directly or indirectly responsible for her disappearance and presumed death. Her injury may have become infected, but there were no external signs. It is also possible that she was still weak or slow, making her more vulnerable to predators, the only cause of death identified to date for younger marmosets at this site (Printes *et al.*, 1996).

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## A SURVEY OF BLACK HOWLER (*ALOUATTA PIGRA*) AND SPIDER (*ATELES GEOFFROYI*) MONKEYS ALONG THE RÍO LACANTÚN, CHIAPAS, MEXICO

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### Introduction

One of the major problems in making adequate conservation assessments of primate populations is a lack of data on their location and demographic features—an issue exacerbated by rapid changes in species distribution as a result of forest destruction and fragmentation. Rapid assessment surveys can update such information and set the stage for further studies of population, ecology and conservation. In southern Mexico, large expanses of the native habitat of *Alouatta palliata*, *A. pigra* and *Ateles geoffroyi*—the three northernmost species of Neotropical primates—have been converted to pasture, and the primates have become extinct in many localities (Estrada and Coates-Estrada, 1996; Estrada and Mandujano, 2003). In other areas, populations of the three species exist in fragmented landscapes under precarious ecological and demographic conditions (Estrada *et al.*, 1999, 2002b). Finally, some populations exist in the protected forests of ecological reserves, national parks and biosphere reserves (Estrada *et al.*, 2002a, 2004). However, such information is still scanty for many regions of southern Mexico. In this paper we report data resulting from a first-time survey of populations of *A. pigra* and *A. geoffroyi* along a 40-km section of the Río Lacantún, Chiapas, one of the remotest regions of southern Mexico.