beges mais ou menos evidentes; (2) a coloração laranja, marrom ou marrom-alaranjada da cauda; (3) a região cervical branca, bege ou bege-esbranquiçada; (4) o corpo bege estriado de castanho ferrugíneo, bege e ocre, bege com estrias castanhas, cinzas e pretas e bege-brancacentas. Por outro lado, a coloração negra das mãos e pés foi observada em todos os indivíduos. Portanto, consideramos a coloração da pelagem pouco confiável como caráter taxonômico, embora ela tenha sido utilizada juntamente com a morfometria do crânio e a dentição na descrição dessa espécie por Kobayashi e Langguth (1999). Além disso, a coloração da pelagem foi utilizada para distinguir *C. coimbrai* e *C. barbarabrownae*, apesar da variação no padrão de coloração dentro de uma população poder ser maior que aquela observada entre essas duas espécies do grupo *personatus*. A carência de espécimes depositados em coleções científicas compromete a resolução deste desafio taxonômico.

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## OCCASIONAL FIELD OBSERVATIONS OF THE PREDATION ON MICE, DOVE AND ANTS BY BLACK-TUFTED-EAR MARMOSETS (*CALLITHRIX PENICILLATA*)

*Ita de O. Silva*
*Adriano B. B. Alvarenga*
*Vanner Boere*

The black-tufted-ear marmoset (*Callithrix penicillata*) mainly feeds on plant exudates which can comprise up to 70% of the diet (Miranda and Faria, 2001). Other items included in the diet are insects, nectar and flowers, in different proportions. Stevenson and Rylands (1988) classify marmosets from the *Jacchus*-group as exudativore-insectivores. It is known that marmosets opportunistically feed on protein sources i.e. prey, and that their small size allows for a quite diverse diet (Rylands and Faria, 1993). Insects are the most important source of protein, but other protein-rich food currently described for this species are ants, spiders, lizards, snails, frogs, eggs and bird hatchlings (Stevenson and Rylands, 1988; Passamani and

Rylands, 2000). In this article, we report two new food sources, that may be included in the diet of wild marmosets, albeit probably very rarely: mouse and dove. We also report the ingestion of ants, confirming an animal food item in the diet of black-tufted-marmosets mentioned in the literature. Observations on predation by marmosets were made opportunistically when researchers observed the social behavior of two marmosets groups at two different study sites. Both sites, the Estação Ciência São Jose (ECSJ) and the Jardim Botânico de Brasília (JBB), include many vegetation types of the Cerrado biome. The observations were in the *cerradão*, a typical forest with medium to high semi-deciduous trees and xeromorphic vegetation (Ratter *et al.*, 1997).

*Predation on a dove (Columbina talpacoti)*
The dove predation was observed in the ECSJ, a field station of the Catholic University of Goiás (16º 44' 06" S, 49º 2' 48" W; Goiânia, Brazil), close to the suburb of the city, on 15 March 2001. Around 08:00, a group of black-tufted-ear marmoset moved toward the area around the field laboratory, staying at approximately 3 m height in small trees (*Grevillea robusta*). Suddenly, the marmoset group became very agitated. We succeeded in recording with a digital camera the moment when an adult male, located approximately 2 m above ground, captured a dove (*C. talpacoti*), immediately biting it into the head and starting to eat it (Figure 1). We did not observe the prey being shared with any other group member. The marmoset showed piloerection during the voracious consumption of the dove.

*Predation on a mouse (Mus musculus)*
The predation on a mouse happened in an area near the entrance of JBB (15° 55' 58" S, 47° 51' 02" W; Brasilia, DF, Brazil). On 20 November 2006, at 08:30 h, we saw the reproductive female of the group capturing a mouse while foraging in the forest understory, approximately 1.5 m above ground, and immediately biting of the head of the mouse (Figure 2). Although other group members, particularly infants, approached the female with characteristic submissive vocalizations, the female did not share the prey, dropping part of the carcass (mostly skin) on the ground.

*Predation on ants (Labidus sp.)*
The predation of the ants happened along a forest border of the JBB. On 23 August 2006, beginning at 11:15 we observed the marmosets descending to the forest understory above and ground close to a swarm of army ants, identified as *Labidus* (Ecitoninae, Formicidae) by Dr. C. R. F Brandão (Zoology Museum, São Paulo University). The marmosets caught and quickly ingested ants and did not seem to be intimidated by the ants' bites. This continued for approximately 3.5 hours. During this period, the whole group (15 animals) accompanied the swarm front, but among them, only two male adults and two juveniles fed on the ants.

*Callithrix penicillata* is widely distributed throughout the Cerrado (Stevenson and Rylands, 1988), one of the world's hot spots for biodiversity conservation (Myers et al., 2000). This species, like *C. jacchus*, is found in urbanized areas and has been successfully introduced in several regions (Cunha *et al*, 2006; Mendes Pontes and Soares, 2005; Miranda and Faria, 2001; Stevenson and Rylands, 1988; Vilela and Faria, 2004). It is presumed to have a flexible and opportunistic diet. Most data available on the diet of the marmosets and tamarins is focused on fruits and exudates, making it necessary to better describe and comprehend the role of prey in the behavioral ecology of Callitrichidae (Nickle & Heymann, 1996; Heymann *et al.*,



**Figure 1.** Adult male of *Callithrix penicillata* eating a dove (*Columbina talpacoti*) at the Estação Ciência São Jose.



**Figure 2.** Adult female of *Callithrix penicillata* biting the head of a *Mus musculus* individual previously captured in the forest understory at the Jardim Botânico de Brasília.

2000). The predation of bird nests, mostly for obtaining eggs and hatchlings is well described (Marini and Melo, 1998; Mendes Pontes and Soares, 2005), but according to Stevenson and Rylands (1988), marmosets rarely feed on birds and hatchlings when in their natural habitat. The relevant literature has few reports on the predation of adult birds (Cunha *et al.*, 2006), and the predation of this species of dove in particular has not been previously described. The bird preyed upon is commonly found in urban areas in Brazil (Sick, 1997). The contact from this bird with marmoset groups is presumably common in cities and their surrounding areas. The common mouse is an invasive species of the Brazilian fauna and is closely connected to human activity. The mouse predation reported here occurred in an area with pronounced human influence, and proximity to garbage cans. Newborn mice are used to complement the diet of marmosets kept in captivity (Coimbra-Filho, *et al*, 1981). However, this is the first description of an adult mouse predation by a marmoset in a wild environment.

Our observations on predation of the ant genus *Labidus* by black-tufted-ear marmoset are in line with recent observations of Melo Jr and Zara (2007) in the Cerrados and Atlantic Forest. Rylands and collaborators (1989) and Melo Jr and Zara (2007) have already described marmosets as predators of ants and insects that are displaced by the raiding ant swarms. Mendes Pontes and Soares (2005) also mention the presence of ants in the marmoset's diet. Although there is a relatively high abundance of this ant species in the woods of the JBB, predation is not commonly observed. While foraging to attain the dove and the mouse was notably an individual behavior, the ants and insects flushed by the ants were eaten while the whole group foraged, as described previously by Passamani and Rylands (2000). The predation on the mouse and the dove, although interesting from the point of view of flexibility in feeding habits, also adds a potential epidemiological link between the several diseases that are present in the region (i.e. zoonotic hemorrhagic fevers, Figueiredo, 2006) and the managing of wild marmosets in preservation areas with strong human influence. Doves and particularly mice are important agents for the dissemination of several pathogens (Pereira *et al*, 2001; Sick, 1997) that infect both human and non-human primates.

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# Observation of Black-Capped Capuchins (*Cebus apella*) Feeding on an Owl Monkey (*Aotus brumbacki*) in the Colombian Llanos

Xyomara Carretero-Pinzón
Thomas R. Defler
Stephen F. Ferrari

Black-capped capuchins (*Cebus apella*) are known to feed on a wide variety of vertebrate prey, including lizards, frogs, birds, bats, marsupials, rodents, and squirrels (Izawa, 1978, 1990; Terborgh, 1983; Galetti, 1990; Rímoli, 2001; Resende *et al.*, 2003; Defler, 2004), although to date, there is only one report involving another primate, an infant titi, *Callicebus moloch* (Sampaio & Ferrari, 2005). Here we describe the behavior of a group of black-capped capuchins feeding on an adult female owl monkey (*Aotus brumbacki*) in a fragment of gallery forest in the Colombian Llanos. This appeared to be the scavenging of a carcass, rather than a predation event, but the observation nevertheless emphasizes the potential of the capuchins for the exploitation of prey this size.

The event was recorded during the long-term monitoring (September 2005 to January 2007) of a group of 43 squirrel monkeys, *Saimiri sciureus albigena* (Carretero-Pinzón, 2008) on the Arrayanes Farm (3°3'30"N, 73°35'40"W) near San Martín in the Colombian Llanos, department of Meta (Fig. 1). The group occupied a matrix of small fragments of gallery forest of up to 21 ha, including those on the neighboring Santa Rosa Farm, that are interconnected by fences. We collected quantitative behavioral data in scan samples (one minute scans at five minute intervals), and whenever an association was formed with the local group of *Cebus apella* [during 28.3% of monitoring time (1,113 hours of total observation time)]. We also collected data on the members of this group (1 adult male, 1 adult female, 2 juveniles, and 1 infant) using the same sampling schedule. During the event reported here we abandoned this schedule and the capuchins were monitored continuously for the first half hour and then at five-minute inter-

vals, until the carcass was abandoned.

On the morning of January the 12th, 2006, when the squirrel monkeys and capuchins were foraging together in a mixed troop at approximately 08:35, the adult male *C. apella* apparently found a dead female owl monkey (*Aotus brumbacki*) in a tree hole. The assumption that the capuchin found the owl monkey rather than captured it alive is based on the lack of visible or audible evidence of hunting activity or prey capture. On finding the carcass, the adult male became visibly excited, and emitted feeding vocalizations, that were answered in kind by the four other group members, who then approached to a distance of 3-5 m from the tree-hole, from where they observed the male. The male pulled the owl monkey's legs out of the hole and began biting, tearing and eating the flesh of one of the legs. The male was the only individual to feed on the carcass during the first eight minutes, but then he moved to a neighboring tree to rest and looked on as the other group members moved in to feed. The adult female and the infant fed on the second leg; then one of the juveniles pulled the carcass out of the hole as far as its neck, bit off the right radius and hand, and ran to the neighboring tree to consume these parts. The four individuals each spent some 8-10 minutes feeding on different parts of the carcass. Tolerance and sharing appears to be typical of vertebrate predation in the capuchins (e.g. Perry and Rose, 1994; Resende *et al.*, 2003), at least where relatively large-bodied prey is concerned (Izawa, 1978). After approximately 20 minutes, the adult male returned to feed on the carcass in close proximity with the infant, while vocalizing aggressively towards the female, who responded submissively and moved to a neighboring tree. The infant eventually joined the female to be groomed, and one juvenile rested nearby while the other foraged for arthropods. All five group members ingested parts of the owl monkey's limbs, tail or dorsal musculature, but, while one of the juveniles probed the abdomen with its hand, none of the capuchins appeared to feed on the intestines or internal organs. Curiously, Resende *et al.* (2003) recorded the opposite pattern in the predation of a rat by *C. apella*, where the soft parts were consumed and the musculature ignored. In the pres-



**Figure 1.** Location of the study area, showing the main fragments of gallery forest on the Arrayanes (16 ha) and Santa Rosa (21 ha) farms in the Colombian Llanos.