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## DISTRIBUTION AND CONSERVATION OF THE BUFFY TUFTED-EAR MARMOSET, *CALLITHRIX AURITA*, IN LOWLAND COASTAL ATLANTIC FOREST, SOUTH-EAST BRAZIL

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### Introduction

The buffy tufted-ear marmoset, *Callithrix aurita*, is endemic to southeastern Brazil. The species occurs in the Atlantic Forest region, one of the most threatened ecosystems in the world (Mittermeier, 1988; Fonseca, 1985), its distribution ranging from the northernmost part of the state of Rio de Janeiro, east and northeast of São Paulo state to the southeast of Minas Gerais (Hershkovitz, 1977; Vivo, 1991). *C. aurita* is the most southerly species of the genus (Muskin, 1984a). It is listed as "Endangered" by IUCN and by the Official List of Threatened Species in Brazil of the Brazilian Institute for the Environment (Ibama).

*C. aurita* is of the least known of the Atlantic forest callitrichids. Brief field studies have been carried out by Torres de Assumpção (1983), in São Paulo, and Muskin (1984a, 1984b) and Bueno (1989) in southern Minas Gerais. Corrêa (1995) and Coutinho (1996) carried out the first of the more detailed field studies in the Serra do Mar State Park, São Paulo, and Martins (1998) re-

cently completed a study of the feeding ecology of a group of *C. aurita* in Muskin's (1984a, 1984b) and Bueno's (1989) study site in southern Minas Gerais. Here we report on some preliminary results from a long-term study on the species being carried out by LDB in the Serra da Bocaina, on the border of the states of São Paulo and Rio de Janeiro, particularly regarding the question of the altitudinal range of the species and its conservation status.

### Altitudinal distribution in coastal Atlantic forest

The altitudinal distribution of the species is controversial. Olmos and Martuscelli (1995) record that it occurs only at altitudes ranging from 600 to about 1200 m in São Paulo, and Rylands (1994) considered the species restricted to montane forest from 500-800 m. However, there are museum specimens collected in the foothills of the Serra do Mar, south of Rio de Janeiro: in 1941, Pedra Branca, municipality of Paratí, and 1942, Mambucaba, municipality of Angra dos Reis (Table 1). These two past records are the only evidence to date for the species' occurrence in lowland forest (Coimbra-Filho, 1991; Vivo, 1991). From observations made in 1952, Coimbra-Filho (1991) suggested that the buffy tufted-ear marmoset may occur in other lowland areas within the state of Rio de Janeiro, although he considered the species as probably regionally extinct there. All the recent records of the species along the coastal Atlantic forest are restricted to montane forest (Table 1).

Another species which is ecologically similar to *C. aurita*, and even suspected to be a subspecies of *aurita*, is the buffy-headed marmoset, *C. flaviceps* (see Coimbra-Filho, 1991, Coimbra-Filho *et al.* 1993). The buffy-headed marmoset is also largely restricted to montane forest, and occurs mainly at altitudes over 500 m in the states of Minas Gerais and Espírito Santo (Mendes, 1993). Both of these marmosets face harsh seasonal extremes of temperature and rainfall (Ferrari *et al.* 1996). It is interesting to note that in tropical semideciduous forest in the interior, the buffy tufted-ear and buffy-headed marmosets also occur at lower elevations (Stallings and Robinson, 1991; Ferrari

**Table 1.** Museum localities and field observations of the buffy tufted-ear marmoset *Callithrix aurita* along the coastal Atlantic forest, southeastern Brazil.

Locality	State	Coordinates	Altitude (m)	Source
Serra de Macaé	RJ	22° 10' S - 42° 00' W	500	MNRJ
Teresópolis	RJ	22° 27' S - 42° 59' W	902	MNRJ
Petrópolis	RJ	22° 30' S - 43° 11' W	810	MNRJ
Mambucaba (Angra dos Reis)	RJ	23° 01' S - 44° 31' W	100	MNRJ
Pedra Branca (Paratí)	RJ	23° 14' S - 44° 44' W	80	MNRJ
Bananal Ecological Station	SP	22° 48' S - 44° 22' W	1200	L.D. Brandão (pers. obs.)
Bocaina National Park	SP	22° 40' S - 44° 24' W	1200	L.D. Brandão (pers. obs.)
Taquara (Serra da Bocaina)	SP	22° 43' S - 44° 24' W	1300	MZUSP
Fazenda Posse (S. J. Barreiro- Serra do Mar)	SP	22° 44' S - 44° 37' W	1200	MZUSP
Núcleo Cunha (Serra do Mar State Park)	SP	23° 14' S - 45° 03' W	1000	Corrêa (1985)
Alto da Serra (Serra do Mar)	SP	23° 47' S - 46° 19' W	1375	Hershkovitz, 1977
Fazenda Lagoa (S.L.Paraitinga - Serra do Mar)	SP	23° 15' S - 45° 20' W	800	Olmos & Martuscelli, 1995

State: RJ - Rio de Janeiro, SP- São Paulo. Sources: MNRJ - National Museum, Rio de Janeiro. MZUSP - Zoology Museum, Universidade de São Paulo.

*et al.* 1996). The buffy-headed marmoset has a much smaller range and it appears to be more restricted to higher elevations than the buffy tufted-ear marmoset. We have found new evidence which confirms the existence of the buffy tufted-ear-marmoset in lowland coastal forest of the foothills of the Bocaina mountain range.

#### Buffy tufted-ear marmoset in lowland coastal forests

In order to confirm the occurrence of *C. aurita* in lowland coastal forests, we carried out a survey from November 1996 to February 1997 along the coast from northern São Paulo to the coast of southern Rio de Janeiro. We visited all the villages along the coast between the two states, interviewing residents who knew the forest and its animals. Color photographs of different species of marmosets were shown to these people to check if they recognized the buffy tufted-ear marmoset. We also used a tape recorder with the species' vocalization, attempting to attract wild groups which might be occurring in the forest of this region.

None of the people interviewed between Ubatuba and Parati recognized the species. Only in Mambucaba, municipality of Angra dos Reis, Rio de Janeiro, did we obtain evidence that the interviewees knew of the buffy tufted-ear marmoset. In Mambucaba, we also found an adult male in captivity, which had been taken from the forest four months previously, and later two more individuals, an adult male and a female, also being kept as pets. The person who caught these animals showed us the area where the species could be found.

From our own experience, finding wild groups of buffy tufted-ear marmosets is not easy. While we were surveying the forest around Mambucaba (elevation 165 m) where the captive marmosets had been caught, we located a group because one marmoset gave a very high-pitched rasping scream above us, while the usual repetitive mobbing vocalizations were not emitted. Alarm calls of this kind are reported for marmosets, and most often associated with aerial predators (Ferrari and Ferrari, 1990). The group at Mambucaba had already suffered the loss of three individuals, and probably, for this reason, the marmosets were very shy.

#### Threats and Conservation

The buffy tufted-ear marmoset has had most of its natural habitat destroyed. Most especially, the lowland habitats have been transformed or destroyed through human activities. Deforestation dates from the 1500s, when the first colonizers arrived on the coast of Brazil. Angra dos Reis, as a result of its geographical location, was one of the first coastal areas settled and explored. Mambucaba was an important center for trade between Indians and Europeans, and the region around Mambucaba has been settled since 1573. Trading booms from the earliest days of colonization peaked around 1830, with the expansion of coffee plantations, and the export of sugar-cane and

"aguardente", an alcoholic sugar cane distillation (Machado, 1995). Nowadays, other factors contribute to deforestation in these areas, situated on a narrow stretch of forest between the mountains and the sea; the main one being real estate acquisition and the housing industry.

Beside, habitat loss throughout the species' range, it is now also threatened by hunters, who catch them illegally for pets. Because of its natural rarity, it is not as commonly found, however, as the ubiquitous and introduced common marmosets, *C. jacchus*, frequently up for sale in markets. The introduction of *C. jacchus*, occurring naturally only in northeast Brazil, may represent a threat to the buffy tufted-ear marmoset.

The evidence we have indicates that *C. aurita* still occurs in the lowland coastal forests of Rio de Janeiro, but not in the lowland coastal forest of São Paulo. The record for Ubatuba, São Paulo, needs further investigation (Olmos and Martuscelli, 1995).

The forested area of the state of Rio de Janeiro, originally 4.294.000 ha (97% of the state) was reduced to 896.200 ha (20,24%) by 1990 (Brazil, 1994). The area where the buffy tufted-ear marmoset was found is near to the Bocaina National Park of 110.000 ha, with 60% of the Park in Rio de Janeiro and 40% in São Paulo. Although the species does occur inside the Park, the lowland forest around Mambucaba is outside this protected area.

During our surveys, we also recorded the presence of the fork tailed-pigmy tyrant, *Ceratotriccus furcatus*, a highly threatened endemic bird species restricted to the northern coast of São Paulo and the southern part of Rio de Janeiro (Collar *et al.* 1992). Another threatened species observed was the blue-bellied parrot, *Triclaria malachitacea*, highly subject to illegal trafficking.

In spite of all the difficulties in applying conservation measures, the lack of trained forest guards and the need to create a conservation awareness, efforts are now underway through a partnership between the Brazilian Institute for the Environment (Ibama) and a local non-governmental organization, "Pró-Bocaina", for action in the region. At present, an agreement between these two institutions is resulting in the elaboration of a management plan to guarantee the effective protection of the Park. Initiatives at all levels, from governmental, to scientific and local communities will strongly reinforce the effectiveness of conservation measures, vital for the survival of the increasingly threatened buffy tufted-ear marmoset in the lowland coastal forest.

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### PRELIMINARY OBSERVATIONS ON HANDEDNESS IN WILD TAMARINS (*SAGUINUS* SPP.) AND TITI MONKEYS (*CALLICEBUS CUPREUS*)



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This paper reports on preliminary observations of handedness during feeding in wild populations of black-chinned emperor tamarins (*Saguinus imperator imperator*), Weddell's saddleback tamarins (*Saguinus fuscicollis weddelli*), and red titi monkeys (*Callicebus cupreus*)