






## New records of buffy-tufted-ear marmoset *Callithrix aurita* (É. Geoffroy, 1812), in a protected area of Teresópolis, Brazilian Atlantic Forest, Brazil

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### Resumen

*Callithrix aurita*, un primate endémico de la Mata Atlántica, es una especie amenazada debido a la pérdida de hábitat, la deforestación, la competencia interespecífica y la hibridación. En 2018, entró en la lista de las 25 especies de primates más amenazadas del mundo. Por lo tanto, el registro en nuevos sitios de presencia puede ayudar en su conservación. Presentamos once nuevos registros para la especie en el Parque Natural Municipal de Montanhas de Teresópolis (PNMNT), obtenidos a través de transectos y uso de playback dentro y en áreas aledañas del PNMNT entre marzo de 2020 y enero de 2021. Los nuevos registros provienen de sitios de bosque secundario con altitudes entre 711 y 1000m y refuerzan la importancia del Parque para la conservación de este primate. La presencia de esta especie puede ayudar a la planificación y manejo de esta área protegida, indicando áreas de preservación y la importancia de su entorno.

**Palabras clave:** especies amenazadas, Primates, áreas protegidas, titíes.

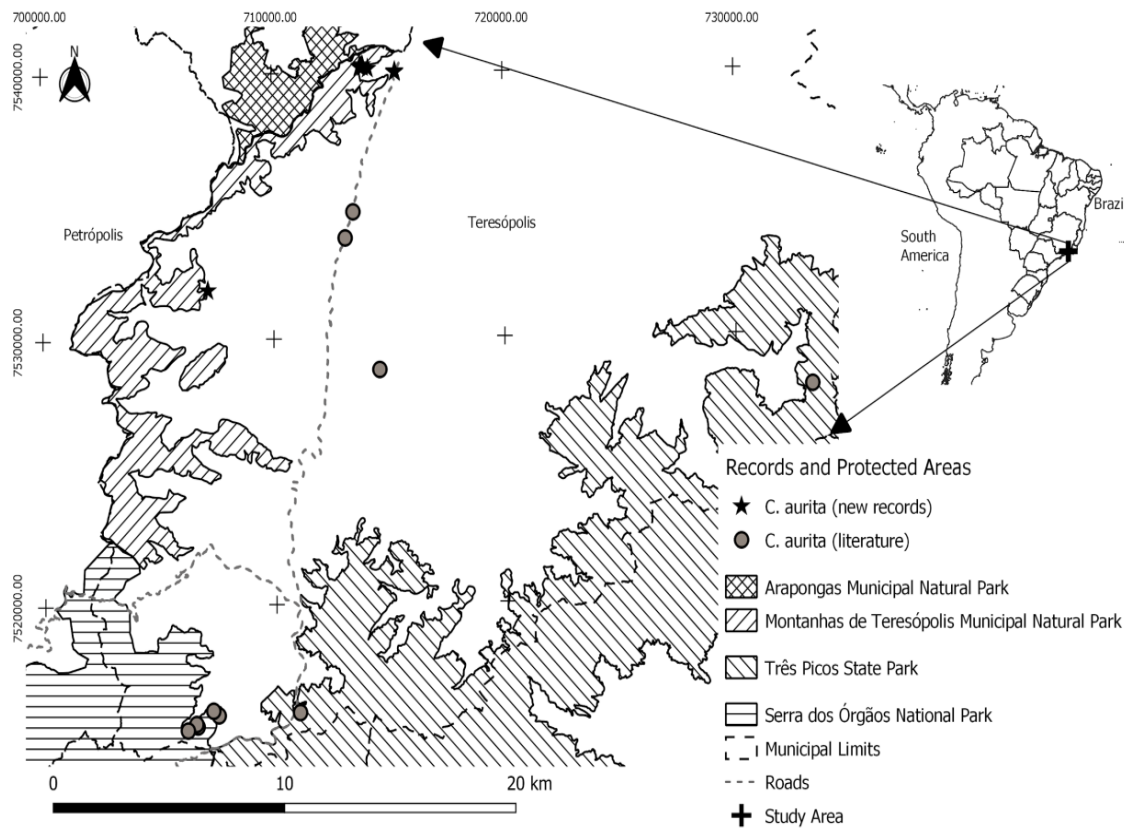
### Abstract

*Callithrix aurita*, an Atlantic Forest endemic primate, is a threatened species due to habitat loss, deforestation, interspecific competition and hybridization. In 2018, it entered the list of the world's 25-most threatened primate species. Therefore, recording new occurrence sites could help in their conservation. We present eleven new records for the species in the Montanhas de Teresópolis Municipal Natural Park (PNMNT), obtained through observation transects and playback inside and around the PNMNT between March 2020 and January 2021. The new records come from secondary forest sites with altitudes between 711 and 1000m and they reinforce the importance of the Park for the conservation of this primate. The presence of this species can help the planning and management of this protected area, indicating areas for preservation and the importance of its surroundings.

**Key words:** endangered species, primates, protected areas, marmosets.

The Brazilian Atlantic Forest is home to endemic primates, such as the buffy-tufted-ear marmoset, *Callithrix aurita* (É. Geoffroy Saint-Hilaire, 1812) (Rylands et al., 1996), which occurs in the states of Rio de Janeiro, Minas Gerais and São Paulo, occupying high-altitude forests and, in some cases, lowlands regions (Brandão and Develey, 1998). In 2018, it was included in the list of the 25 most threatened primate species in the world (Carvalho et al., 2019), and it has also been classified as endangered (EN) by the IUCN Red List (Melo et al., 2020) and by the Official Brazilian List of Endangered Species of Fauna (Melo et al., 2018;). The species suffers the impacts of habitat loss, interspecific competition, hybridization and diseases from allochthonous congeners: *Callithrix jacchus* (Linnaeus, 1758) and *Callithrix penicillata* (É. Geoffroy Saint-Hilaire, 1812) (Carvalho et al., 2018; Melo et al., 2020).

This note presents new records of *C. aurita* in a protected area in the municipality of Teresópolis, located in the mountainous region of the state of Rio de Janeiro (Fig. 1). This region is part of Serra do Mar mountain range, with the highest potential of conservation and ecotourism of all Brazilian Atlantic Forest (Viveiros de Castro et al., 2021). Teresópolis' remaining Atlantic Forest is preserved by three protected areas (PA): Montanhas de Teresópolis Municipal Natural Park (PNMNT), Três Picos State Park (PETP) and the Serra dos Órgãos National Park (PARNASO).



Data Source: CUNHA, 2004; PEREIRA et al., 2008; ANA, 2010; INEA, 2018; CULOT et al., 2019. Projection System: UTM Spindle: 23S Datum: Sirgas2000  
Organized by: Philippe Ribeiro e Silva, Vítor Cunha, Jorge Luiz Nascimento, Carlos Eduardo de Viveiros Grelle. Jan. 2021.

**FIGURE 1.** Distribution records of *Callithrix aurita* in Teresópolis, RJ, Brazil.

The study area (PNMNT) is the largest municipal PA for the Atlantic Forest biome, protecting 4.397 hectares (SOS Mata Atlântica, 2017). Studies on *C. aurita* have been taken only in PARNASO and PETP, indicating the presence of the species and its allochthonous

congeners (Pereira et al., 2008; Detogne et al., 2017; Culot et al., 2019; Cronemberger et al., 2019).

Between March 2020 and January 2021, we performed linear transects in the middle of the forest and occasional sampling on nearby roads using playback of the species' vocalization for attracting and making visual contact with it. We recorded the presence of *C. aurita* 11 times (Table 1), inside and close to the limits of the PNMMT (Fig. 1). All records were obtained in secondary forests between 711 and 1000 m a.s.l., occasionally with bamboos and near roads. We only report records where visual contact was possible to identify the species.

**TABLE 1.** Records for *Callithrix aurita* in Teresópolis, RJ. PNMMT= Montanhas de Teresópolis Municipal Natural Park; PARNASO= Serra dos Órgãos National Park; BR 116= Santos Dumont Highway; V= Visualization; P= Playback; NI = No information; \*\* records by playback of genus *Callithrix*, and without identification of species.

Locality	Date	LAT	LONG	Type	Hybrid/Exo- tic sp. Pre- sence	Hour	Altitude	Source
PNMMT	14/01/2021	-22.230161°	-42.924686°	V/P	NO	07:40	848m	This study
PNMMT**	08/01/2021	-22.23043°	-42.924061°	P	NI	07:20	831m	This study
BR 116 (Km 57)	07/01/2021	-22.232150°	-42.910736°	V/P	YES	12:10	711m	This study
PNMMT	21/12/2020	-22.229731°	-42.924206°	V	NO	08:40	805m	This study
PNMMT	18/12/2020	-22.230185°	-42.925140°	V	NO	07:30	851m	This study
PNMMT	15/12/2020	-22.230162°	-42.924695°	V/P	NO	07:30	851m	This study
BR 116 (Km 57)	05/12/2020	-22.231996°	-42.910681°	V/P	YES	10:40	714m	This study
BR 116 (Km 57)	18/11/2020	-22.231742°	-42.910617°	V/P	NO	11:20	715m	This study
Fazenda dos Caboclos	18/09/2020	-22.306652°	-42.988965°	V	YES	09:24	~1000m	This study
PNMMT	07/04/2020	-22.230478°	-42.925437°	V	NO	10:40	860m	This study
Fazenda Lagoa Orgânicos	16/03/2020	-22.230966°	-42.921957°	V/P	NO	09:20	830m	This study
PARNASO	ago./05	-22.449550°	-42.986464°	V	YES	NI	NI	Pereira et al., 2008
PARNASO	jul./05	-22.454064°	-42.993567°	V	YES	NI	NI	Pereira et al., 2008
PARNASO	jun./05	-22.454925°	-42.993019°	V	YES	NI	NI	Pereira et al., 2008
PARNASO	08/02/2004	-22.451119°	-42.984167°	V	NO	10:20	950m	Cunha, 2004
PETP	NI	-22.337697°	-42.734777°	NI	NI	NI	1908m	Culot et al., 2019
NI	NI	-22.279714°	-42.928008°	NI	NI	NI	851m	Culot et al., 2019
NI	NI	-22.288603°	-42.931274°	NI	NI	NI	834m	Culot et al., 2019
NI	NI	-22.333333°	-42.916667°	NI	NI	NI	960m	Culot et al., 2019
PETP	NI	-22.450000°	-42.950000°	NI	NI	NI	895m	Culot et al., 2019

In March and April 2020, a group of *C. aurita* was observed (Fig. 2A) at Fazenda Lagoa Orgânicos, around and inside the PNMMT. In September 2020, at 9:24 AM, we identified one individual with *C. aurita* phenotype and at least four other individuals from *Callithrix* sp. (Fig. 2B) in a private property located close to the boundaries of the PNMMT (Fazenda dos Caboclos). In November 2020, at 11:20 AM, a solitary male of *C. aurita* responded to playback (Fig. 2D) near the road BR-116 (km 57; ~1,5km the limits of PNMMT). In December 2020, we gathered records in two different dates. A group of four individuals was recorded: one male, one female and two young ones, within the boundaries of the PNMMT, this time close to a Brazilian grape tree (*Plinia cauliflora*) and bamboo (Fig. 2C). This group was recorded again later in the month, plus two hybrid individuals that were registered next to an individual of *C. aurita* near BR 116. In January 2021, at 07:40 AM, one male and other sex-unidentified individuals of *C. aurita* were seen inside PNMMT. At 12:10 PM near BR 116, a mixed group of three marmosets was registered, one *C. aurita* male and two sex-unidentified individuals of *Callithrix* sp.





**FIGURE 2.** A) three individuals of *Callithrix aurita*, 16/03/2020; B) an individual with *Callithrix aurita* phenotype together with two hybrid individuals (*Callithrix sp.*), 18/09/2020; C) two adult individuals of *C. aurita*, 21/12/2020; D) one adult individual of *C. aurita*, 18/11/2020.

These new occurrences are located within the expected geographical range (Rylands et al., 2009; Melo et al., 2020) and altitudes (Brandão and Develey, 1998) for Teresópolis. Previously, the only primate registered in the PNMMT was the allochthonous *C. jacchus* (Pereira et al., 2019). The habitats of secondary forest and bamboo presence are the same cited in the literature (for example Norris et al., 2011). These new records inside and outside PNMMT reinforce the importance of a careful planning of the forests adjacent to the protected area, both for the establishment of a buffer zone and area expansions, including conservation actions with the surrounding human communities. In addition, we suggest developing a long-term research, management and conservation program for the identified group, according to the goals of the National Action Plan for the Conservation of Primates of the Brazilian Atlantic Forest (ICMBio, 2018). This program should include the following objectives: i) Quantify group size and home range of *C. aurita* in the PNMMT region; ii) identify how many groups of *C. aurita* occur in the region, iii) perform genetic studies to verify the genotype of the group; iii) start a continuous monitoring of group (or groups), iv) establish strategies for preventing contact of *C. aurita* with allochthonous species; v) search and identify new areas with *C. aurita* populations. The management actions needed include the definition of priority areas in which the removal of introduced primates might be necessary, since hybridization is recognized as a threat to *C. aurita* (Oliveira & Grelle 2012).

Primates are commonly flag species (Mittermeier et al., 2005), and the presence of the threatened *C. aurita* in the region potentially encourages actions aimed at forest restoration, helping to achieve goals for the 2021-2030 decade of restoration (Dudley et al.,

2020). Furthermore, Teresópolis may be another municipality using *C. aurita* as a flag species and guiding conservation actions mentioned above, following the municipalities of Petrópolis and Nova Friburgo that have established actions to preserve the species. Therefore, this region has potential to preserve many populations of this threatened marmosets.

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