# PREDATION ATTEMPT BY MARMOSETS (*CALLITHRIX* SPP.) ON A PICAZURO PIGEON'S NEST (*PATAGIOENAS PICAZURO*) IN AN URBAN ENVIRONMENT

*Isabela Viotto Conti*

## Abstract

The introduction of exotic species is one of the greatest threats to biodiversity, with hybridization a major consequence. The species *Callithrix jacchus*, introduced to the Atlantic Forest, has established populations in urban areas and has been hybridizing with *C. penicillata*. Its generalist diet includes nest predation on birds, a potential threat to native bird populations. However, much of the data comes from more preserved areas, leaving a gap in our understanding of the impact of these primates on urban bird populations. Here, I describe an attempted predation of eggs in a picazuro pigeon (*Patagioenas picazuro*) nest by two *Callithrix* sp. individuals observed in a residential urban area in Campinas, São Paulo, Brazil. During the incident, the animals seemed unbothered by traffic or pedestrians, but were alert to the call of a raptor. While the significant impact of introduced predators on bird populations is well-studied, data on this behavior in invasive primates remains scarce. Further research is needed to better understand the ecological relationships in anthropogenic environments and their impacts on urban biodiversity.

**Keywords:** Callitrichidae, urban primates, invasive primates

## Resumo

A introdução de espécies exóticas é uma das maiores ameaças a biodiversidade, sendo a hibridização uma de suas maiores consequências. A espécie *Callithrix jacchus*, introduzida na mata atlântica, estabeleceu populações em áreas urbanas, e vem hibridizando-se com *C. penicillata*, produzindo híbridos com diferentes características. Sua dieta generalista inclui a predação de ninhos de aves, e estudos apontam que esse hábito pode representar uma ameaça a populações de aves nativas. Porém, grande parte desses dados são provenientes de áreas mais conservadas, havendo uma lacuna de informações sobre o impacto desses primatas em populações de aves urbanas. Aqui descrevo a tentativa de predação de ovos em um ninho de uma pomba-asa-branca (*Patagioenas picazuro*) por dois indivíduos de *Callithrix* sp., observada em uma área urbana residencial em Campinas, são Paulo, brasil. Durante o ocorrido, os animais aparentemente não se incomodaram com o trânsito ou pedestres, mas ficaram em estado de alerta com a vocalização de uma ave de rapina. Enquanto o grande impacto de predadores introduzidos em populações de aves é bem estudado, faltam dados sobre esse comportamento em primatas invasores. São necessárias mais pesquisas para compreender melhor as relações ecológicas em ambientes antrópicos e seus impactos na biodiversidade urbana.

**Palavras chaves:** Callitrichidae, primatas urbanos, primatas invasores

Invasions by non-native species are one of the greatest threats to biodiversity, making it urgent to understand the consequences of introduced animals in new environments, including disease introduction, hybridization, and predation of native species (Gurevitch and Padilla, 2004). The natural distribution of the black-tufted marmoset (*Callithrix penicillata*) is within the Cerrado biome, but it also has been introduced into other areas by the illegal wildlife trade, and can hybridize with other marmoset species, such as the common marmoset (*C. jacchus*) from the Caatinga biome (Braz et al., 2019). The two species are differentiated mostly by their auricular tuft format and colors. While the *C. penicillata* morphotype has blackish pre-auricular tufts, *C. jacchus* has white circum-auricular tufts (Rylands et al., 2009). Their hybrids have diverse traits, like white auricular tufts, similar in color but not in tuft format to those of *C. jacchus* (Cezar et al., 2017). These species and their hybrids have well-established populations in many disturbed areas of the Atlantic Forest including in urban areas (Goulart et al., 2010), where they are successful due to their generalist habits which allow for great adaptive plasticity (Ferrari et al., 2013).

These marmosets' diet includes mostly fruits and insects in the rainy season, but in the dry season, the diet is complemented with tree exudates, small vertebrates, and bird's eggs (Miranda and Faria, 2001). Due to their predatory behavior, marmosets are believed to be a threat to native bird populations (e.g. Lyra-Neves et al., 2007; Galetti et al., 2009; Alexandrino et al., 2012). Most of these studies on bird predation by marmosets were conducted in natural areas, not urban areas, with a relative lack of information about the impacts of invasive primates on urban bird populations.

This report describes a predation attempt on a picazuro pigeon (*Patagioenas picazuro*) nest by two marmosets. The event occurred in the surroundings of the campus of the State University of Campinas (UNICAMP), located in Campinas city, São Paulo state, Brazil (Figure 1). The University's neighborhood is a residential area, with small patches of Atlantic Forest and wooded parks. The city is located in a transition zone of Cerrado and Atlantic Forest, where the black-tufted marmoset (*Callithrix penicillata*) could naturally occur (Rylands et al., 2009). Verçosa and Setz (2020), who studied the local populations' diet, suggest that there are groups containing the local species, plus non-native common marmosets and their hybrid descendants (Figure 2). Their diet is composed mostly of gum. Due to their charisma, the marmosets are fed by


**Figure 1.** Location of the predation attempt by *Callithrix* spp. on the Picazuro pigeon nest. The circle in the inset map indicates the location of Campinas City in São Paulo state.

**Figure 2.** Two marmosets from a group on the UNICAMP campus. The individual on the left has a *Callithrix penicillata* morphotype, while the one on the right has a *C. jacchus* morphotype. Photo: Isabela Viotto Conti.

locals with fruit; bananas form a great percentage of their diet, especially in the dry season.

On June 24, 2022, at 11 a.m., a marmoset pair, one adult female (with a *Callithrix penicillata* morphotype) and one adult male (with pre-auricular, but white and gray tufts, probably a hybrid morphotype), came to the corner of a street near to UNICAMP (-22.821240°, -47.073592°), walking along electricity cables. They climbed onto a flamboyant tree (*Delonix regia*), an exotic species, and approached a picazuro pigeon (*P. picazuro*) nest on a branch at 3 m height. These birds are native and common in cities. Both marmosets tried to reach the egg underneath the female pigeon's body, while the bird agitated its wings, trying to get them to go away. These loud movements did not scare the primates, who continued to try to get the egg, removing the twigs in the bottom of the nest. The marmosets only stopped trying to get the egg when a yellow-headed caracara (*Milvago chimachima*) vocalized nearby, and the alarmed marmoset female climbed away to a nearby branch. Although there are no records of this species of caracara preying on marmosets, as a bird of prey it probably was recognized as a potential predator. After a few seconds, the marmosets restarted the quest.

After another two minutes, the female marmoset stopped and moved to another branch in the same tree, while the male persisted in attempting to remove the egg. Another pigeon, possibly the nestmate, flew to the tree while vocalizing, but this did not disturb the primates. After a brief period, the male marmoset destroyed the nest through pulling out twigs, leading to the egg falling and breaking on the ground. The marmoset pair ended their pursuit of the egg and approached the human observers, then climbed into another tree, continuing on along the trees of a nearby backyard. The female pigeon stayed in the ruined nest, but the next day she was gone.

During the 10 minutes of the event, the marmosets apparently were not bothered by the traffic noises, such as cars, motorcycles, and pedestrians, demonstrating their adaptation to the urban environment. However, they immediately showed a reaction to a call of a bird of prey.

While Zaluar and Vale (2021) claim that invasive marmosets do not have an impact on the bird population, Zaluar et al. (2022) argue that they do have a negative impact by causing a decrease in bird acoustic diversity in areas with marmoset occurrence. Although feral cats (*Felis catus*) are reported to be one of the biggest threats to urban bird populations (Marra and Santella, 2016), little is known about invasive marmosets' impact on birds. On the other hand, with the deficit of other frugivorous species in urban areas, marmosets may also have a positive effect on urban ecology through acting as seed dispersers (Silva et al., 2017).

The present report demonstrates the importance of understanding a well-adapted invasive predatory primate's effect on local bird populations. Invasive species are a global problem that causes environmental degradation and can cost hundreds of billions of dollars in the eradication process and in monitoring for new diseases (Warziniack et al., 2021). It is crucial to understand invasive species' effects on biodiversity in any kind of environment, including in urban areas.

## Acknowledgments

I thank Professor Eleonore Zulnara Freire Setz and my colleague Federico Hernan Garrido de Leon for their review of the manuscript.

**Isabela Viotto Conti**, Programa de Pós-graduação em Ecologia, Departamento de Biologia Animal, Instituto de Biologia, Universidade Estadual de Campinas (UNICAMP), Campinas, São Paulo, Brazil. E-mail: <i199174@dac.unicamp.br >.

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