



PREDATORY BEHAVIOR OF A RUFIOUS-CAPPED MOTMOT (*BARYPHTHENGUS RUFICAPILLUS*) ON A MAMMAL (*MONODELPHIS* SP.)

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Abstract · While motmots (Momotidae) are known to feed on mammals, this information comes mainly from the analysis of stomach contents. On 2 November 2018, our camera trap, located in the Projeto Dacnis area in São Francisco Xavier, a district of the municipality of São José dos Campos, State of São Paulo, Brazil, recorded a Rufous-capped Motmot (*Baryphthengus ruficapillus*) on a perch with a small opossum (*Monodelphis* sp.) in its bill. Since the bird repeatedly hit the mammal's head against the perch, we assumed it was a predation event. This is the first video record of a *B. ruficapillus* preying on a mammal, as well as the first record of a motmot preying on a marsupial. Videos recorded by camera traps are a valuable source of natural history data, as they provide records not only about dietary items, but also about the associated predatory behavior.

Resumo · Comportamento predatório de Juruva (*Baryphthengus ruficapillus*) contra um mamífero (*Monodelphis* sp.)

Embora os momotídeos (Fam. Momotidae) sejam conhecidos por se alimentarem de mamíferos, esta informação provém principalmente da análise de conteúdo estomacal. Em 2 de novembro de 2018, nossa armadilha fotográfica, localizada na área do Projeto Dacnis em São Francisco Xavier, um distrito do município de São José dos Campos, no Estado de São Paulo, registrou uma Juruva (*Baryphthengus ruficapillus*) empoleirada, com uma pequena cuíca (*Monodelphis* sp.) no bico. Assumimos que este foi um evento de predação, uma vez que o pássaro bateu a cabeça do mamífero contra o poleiro, repetidas vezes. Este é o primeiro registro em vídeo de um *B. ruficapillus* atacando um mamífero, assim como o primeiro registro de um momotídeo predando um marsupial. Vídeos gravados por armadilhas fotográficas são uma fonte valiosa de dados de história natural, pois fornecem registros não apenas sobre itens de dieta, mas também sobre o comportamento predatório.

Key words: Camera trap · Feeding behavior · Marsupial · Momotidae · Predation

The Rufous-capped Motmot (*Baryphthengus ruficapillus*) is a member of the Momotidae family (order Coraciiformes) and is an endemic species of the Atlantic Forest biome. This species occurs in lowland and semideciduous forests up to 1200 m a.s.l. from eastern Brazil, south to eastern Paraguay, to the extreme northeast of Argentina (Schulenberg 2018).

Motmots are omnivores and studies show that they mostly feed upon arthropods and fruit (Remsen et al. 1993), although vertebrates, such as small mammals, lizards, frogs, snakes, fish, and other birds, are occasionally part of their diets (Schubart et al. 1965, Orejuela 1980, Hilty & Brown 1986, Remsen et al. 1993, Master 1999, García-C & Zahawi 2006). Although records of mammalian prey are infrequent in literature, there are some published occurrences, including rodents and some unidentified small mammals consumed by *B. ruficapillus* (Schubart et al. 1965, Wilman et al. 2014, Snow & Kirwan 2019). Additionally, Greeney et al. (2005) found bones and fur from unidentified mammals inside Andean Motmot's (*Momotus aequatorialis*) abandoned nest; although it is likely that these were prey remains from the motmot, it was not possible to determine whether the remains were in the nest before the bird occupied it.

Other reports describe the hunting techniques of motmots preying on mammals. Delgado-V & Brooks (2003) reported the first motmot capture of a mouse when a *Momotus aequatorialis* pecked a Colombian Grass Mouse (*Akodon affinis*) that had just escaped from a Sherman trap. Although the bird disappeared from sight with the mouse in its bill and prey consumption was not confirmed, they pointed out that the motmot was very accurate in its hunt, suggesting that small rodents may not just be incidental preys. Chacón-Madrugal & Barrantes (2004) published the first record of an Amazonian Motmot (*Momotus momota*) consuming a long-tongued bat (family Phyllostomidae, subfamily Glossophaginae). The bat was eaten alive and the motmot did not hit the prey against the perch as motmots usually do; however, the bird did shake the bat up and down vigorously, probably to immobilize the prey. Reid & Sánchez-Gutiérrez (2010) observed a *Momotus momota* with an Alfaro's Rice Rat (*Handleyomys alfaroi*) in its bill. The bird hit the rodent against the ground several times. Neither the hunting nor the consumption of the animal were seen, but the fact that there are no records of motmots scavenging, along with the typical be-



Figure 1. (A) Still image of a video captured from a camera trap at Projeto Dacnis area, located in São Francisco Xavier, Municipality of São José dos Campos, State of São Paulo, Brazil, on 2 November 2018, depicting a Rufous-capped Motmot (*B. ruficapillus*) perched on a fallen tree branch with a small opossum (*Monodelphis* sp.) in beak (white circle). (B) Cropped image from the same video showing detail of *B. ruficapillus* with the prey in the bill.

havior of hitting live prey against a hard surface, suggests that this motmot had captured the rat alive. Despite these observations, the importance of mammals in the diet of motmots remains ill-understood, thus highlighting the importance of reporting new events of motmots preying on other vertebrates.

Here, we present the first video record of the predatory behavior shown by *B. ruficapillus* on a mammal, which is also the first record of a marsupial as a potential prey of Motmotidae. The video was recorded by a camera trap in an area owned by Projeto Dacnis, a private non-governmental organization (NGO) dedicated to biodiversity conservation practice through scientific research and environmental education. The property is in São Francisco Xavier, a subdistrict of the Municipality of São José dos Campos in the state of São Paulo, in southeastern Brazil. São Francisco Xavier is in an Atlantic Forest fragmented landscape, composed of primary and secondary forests ranging from 630 to 2023 m a.s.l. It is also permeated by farming areas and known as the Mantiqueira Mountains.

At the Projeto Dacnis property, camera traps are used on a daily basis to identify and collect data on the animals that inhabit this forest edge area. At 17:10 h (UTC -3) on 2 November 2018, one of our camera traps (Bushnell® Trophy® Cam Essential HD E3, located at 22°53'43.98"S, 45°56'8.64"W, 832 m a.s.l.) recorded a 15-second video of a *B. ruficapillus* individual with a small opossum (*Monodelphis* sp.) in its bill (video available at [https://](https://youtu.be/vbpK1tv1VL8)

youtu.be/vbpK1tv1VL8). Figure 1A shows the image recorded by the camera trap, and Figure 1B shows the zoomed-in detail of the picture from which the identification of the marsupial was possible. The motmot was perched on a fallen tree branch about 20 cm above the ground. Initially, the motmot hit the head of the *Monodelphis* against the perch once, then managed to turn the mammal's head in the direction of its mouth, remaining in this position for a few seconds. Finally, the motmot turned the mammal upside down again, hitting its head against the perch three more consecutive times before the camera stopped recording. The motmot never released the prey or used anything but its bill to hold it.

The camera is motion-activated, with a 5-second delay to start recording, so it was not possible to see the motmot hunting the marsupial. Since there are no records of motmots feeding on prey they did not kill (García & Zahavi 2006), we believe that the Rufous-capped Motmot captured its prey alive. We examined the area on a daily basis and there was no evidence of a dead marsupial at the camera site neither before or after the event. It was not possible to verify if the prey was hunted by the motmot in the same location as the recording, but our previous observations (unpublished data) show that one or more small species of *Monodelphis* sp. inhabit the trails of the Projeto Dacnis area, though the population density is unknown.

Since we were unable to see the Rufous-capped Motmot swallowing the marsupial, we preferred using the term

'predatory behavior' instead of 'predation', given that the motmot performed the typical moves previously documented by other authors (García-C & Zahawi 2006, Reid & Sánchez-Gutiérrez 2010) on how motmots deal with live prey before consuming it. During our observations, *B. ruficapillus* seemed to aim specifically for the striking of the marsupial's head against the perch. In the video recorded by Reid & Sánchez-Gutiérrez (2010), it is possible to see a *Momotus momota* doing something similar, turning its prey upside down before hitting it against the ground. It suggests that this behavior is used to kill the prey or to immobilize it by rendering it unconscious. Unlike true raptors, motmots have short unprotected legs and they must rely on their beaks for capturing and killing large prey (Smith 1975).

Our observation suggests that despite their limitations, camera traps are very useful tools that allow researchers to collect animal behavior and ecology data without the observer's disturbance. As this technology is becoming more affordable, this type of data is increasing, allowing ornithologists and naturalists glimpses of rarely observed behaviors (Rocha et al. 2017, Granados et al. 2019).

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