



## THE FIRST REPORT OF *MELIPONA (MICHMELIA) RUFIVENTRIS* LEPELETIER, 1836 IN THE MUNICIPALITY OF SACRAMENTO, MINAS GERAIS, BRAZIL

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**Abstract:** A survey of the apifauna was performed in a conservation area formed by phytophysiognomies of a Cerrado Biome located in Sacramento, Minas Gerais. The sampling of bees was carried out through collecting individuals during their flower visits, using aromatic baits, and actively searching for nests. Seventeen bee species were registered, among them, a nest of *Melipona rufiventris*. Considering that this species had never been registered in the municipality of Sacramento (Minas Gerais, Brazil) and that it is also a species endemic to the Cerrado and in danger of extinction, dependent on protected remnants, and that suffers from several anthropic actions, this note has relevance and contributes to the biogeographic knowledge of the species.

26 **Keywords:** endemic species, Savannah, stingless bee.

### O PRIMEIRO REGISTRO DE *MELIPONA (MICHMELIA) RUFIVENTRIS* LEPELETIER, 1836 NO MUNICÍPIO DE SACRAMENTO, MINAS GERAIS, BRASIL

**Resumo:** Foi realizado um levantamento da apifauna em uma unidade de conservação formada por fitofisionomias do bioma Cerrado localizada no município de Sacramento, Minas Gerais. A amostragem das abelhas foi realizada por meio da coleta de indivíduos durante as visitas às flores, com uso de iscas aromáticas e busca ativa de ninhos. Dezesete espécies de abelhas foram registradas, entre elas, um ninho de *Melipona rufiventris*. Considerando que esta espécie nunca havia sido registrada no município de Sacramento (Minas Gerais, Brasil), é uma espécie endêmica do Cerrado, está em risco de extinção, é dependente de remanescentes protegidos e que sofre com várias ações antrópicas, esta nota tem relevância e contribui para o conhecimento biogeográfico da espécie.

**Palavras-chave:** espécie endêmica, Cerrado, abelha sem ferrão.

The genus *Melipona* sp. Illiger, 1806 is composed of four subgenera, among which *Michmelia* Moure, 1975 stands out due to the greater number of species (36) (Camargo & Pedro, 2013). Within this taxon are nine species with wide distribution throughout Brazil, forming the *rufiventris* group (Camargo & Pedro, 2013). There are two species of this group in the state

of Minas Gerais, Brazil *Melipona (Michmelia) rufiventris* Lepeletier, 1836 and *Melipona (Michmelia) mondury* Smith, 1863 (Camargo & Pedro, 2013). However, the occurrence of these species coincides with different environmental limits; *M. rufiventris* in the typical Cerrado vegetation and *M. mondury* in the areas of Atlantic Forest (Melo, 2003).

*Melipona rufiventris* is popularly known as

“uruçu” or “uruçu amarelo” and considered endemic to the Cerrado biome (ICMBio, 2018). Its distribution covers the states of Bahia, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Piauí, São Paulo, and Tocantins (Camargo & Pedro, 2013). The diversity of forests presents in the Cerrado, consisting of gallery forest, riparian forest, “cerradão”, and seasonal semi-deciduous and deciduous forests (Ribeiro & Walter, 1998) can provide different nesting substrates for *M. rufiventris* (Siqueira et al., 2007). This stingless bee species builds nests in pre-existing cavities in arboreal sized plant species (Siqueira et al., 2007).

The aim of this study was to record the unprecedented occurrence of *M. rufiventris* in the municipality of Sacramento, in the state of Minas Gerais, Brazil.

The study was carried out in a conservation area belonging to the Minas Agro Mercantil Ltda company (19°57'29"S / 47°23'07"W), whose vegetation is formed by cerrado rupestre, “cerradão” and gallery forest. The climate in the region is Aw, according to the Koppen classification, presenting a tropical savanna climate, with dry winter and rainy summer, and the average temperature of the coldest month exceeds 18°C (Kottek et al., 2006).

The apifauna survey was carried out in

June 2020, using three methods: collecting individuals during their flower visits, using aromatic baits, and actively searching for meliponid nests through surveys of thick tree trunks and searches for the external movement of workers. The active captures and searches for nests were carried out through walks along the trails that cut through the vegetation fragments, from 7 am to 2 pm, the time of greatest bee activity in the field. Capture was performed with the aid of entomological nets and the bees were collected from the flowers for later identification (Azevedo et al., 2008). The aromatic baits were intended to capture individuals from the Euglossini tribe, as the males are attracted to collect these aromas for later use in courting behavior and territorial demarcation (Roubik & Hanson, 2004).

The bees were killed with ethyl acetate and deposited in the Entomological Collection of the Biodiversity Museum of the Federal University of Uberlândia.

Sixty-two bees belonging to 17 species were registered (Tab. 1). Among the records, a nest of *Melipona rufiventris* (19°57'40"S / 47°22'57"W) was located on the phytophysiology of “cerradão”, in the trunk of a live tree, from which three workers were collected for identification (Fig. 1).

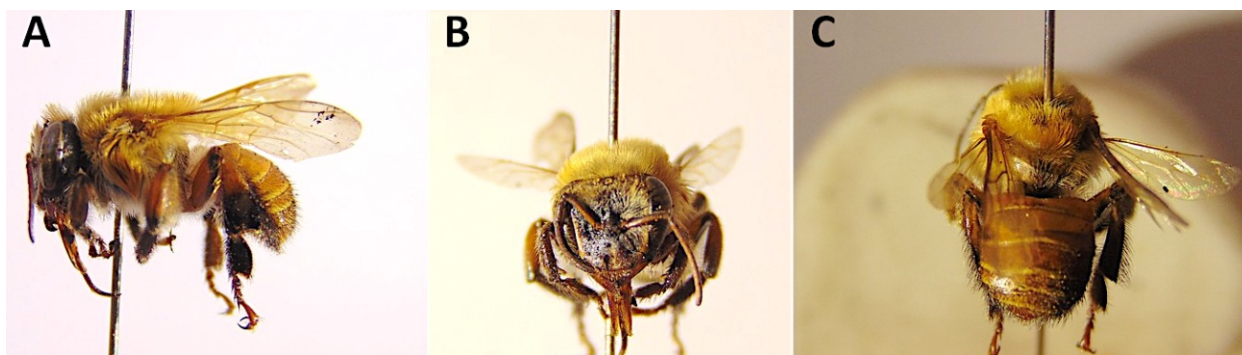
**Tab. 1.** Species of bees collected in a conservation area belonging to the Minas Agro Mercantil Ltda Company in the municipality of Sacramento, Minas Gerais, Brazil. Collection methodologies: FV = flower visits; AB = aromatic baits; EN = entomological nets.

Species	Abundance	Collection methodologies
<b>Apinae</b>		
<i>Apis mellifera</i> Linnaeus, 1758	10	FV
<i>Bombus (Fervidobombus) morio</i> (Swederus, 1787)	2	FV
<i>Euglossa (Euglossa) fimbriata</i> Moure, 1968	1	AB
<i>Euglossa (Euglossa) melanotricha</i> Moure, 1967	2	AB
<i>Euglossa (Euglossa) securigera</i> Dressler, 1982	1	AB
<i>Eulaema (Apeulaema) nigrita</i> Lepeletier, 1841	3	AB
<i>Melipona (Melikerrtia) quinquefasciata</i> Lepeletier, 1836	1	FV
<i>Melipona (Michmella) rufiventris</i> Lepeletier, 1836	3*	EN
<i>Tetragona clavipes</i> (Fabricius, 1804)	3	FV
<i>Trigona</i> sp. 1 Jurine, 1807	10	FV
<i>Trigona spinipes</i> (Fabricius, 1793)	20	FV
<i>Xylocopa (Neoxylocopa) frontalis</i> Olivier, 1789	1	FV
<i>Xylocopa (Neoxylocopa) griseescens</i> Lepeletier, 1841	1	FV

... continuação Tab. 1.

Halictinae		
<i>Augochlorini</i> sp. 1 Beebe, 1925	1	FV
<i>Augochlorini</i> sp. 2 Beebe, 1925	1	FV
<i>Augochloropsis</i> sp. 1 Cockerell, 1897	1	FV
<i>Augochloropsis</i> sp. 2 Cockerell, 1897	1	FV
Total	62	
Richness	17	

\*The three workers were collected when left the same nest.



**Fig. 1.** Worker bee of the species *Melipona (Michmelia) rufiventris* Lepeletier, 1836 collected in the municipality of Sacramento, Minas Gerais, Brazil. Views from (A) lateral, (B) frontal and (C) upper.

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In Minas Gerais there are records of *M. rufiventris* in 29 cities distributed in the regions of Triângulo Mineiro and Alto Paranaíba, North, Northwest, South, Midwest, Jequitinhonha, and Central (Gonçalves, 2017). The municipality of Sacramento borders on eight other municipalities in Minas Gerais, of which only four have records of this species (Nova Ponte, Perdizes, Araxá and Uberaba) (Fig. 2).

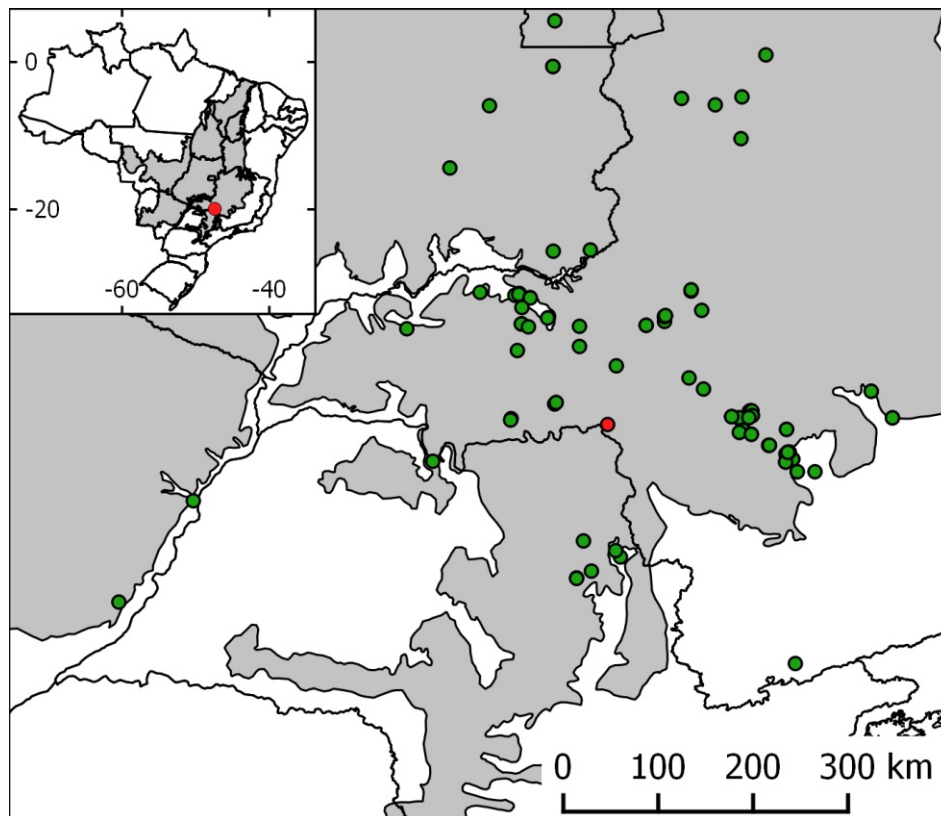
Gonçalves (2017) stipulated an occurrence model for *M. rufiventris* using climatic layers and altitude, and based on bibliographic reviews, computerized databases, visits to entomological collections, observations by other researchers, and active collections in the Midwest and Central regions of Minas Gerais. The municipality of Sacramento is located in an area considered to have a high potential for occurrence. The registration of this species in the sampled conservation area has a high degree of relevance. According to the predictive model of Gonçalves (2017), the areas with the greatest potential for the occurrence of *M. rufiventris* are the most impacted by agricultural activity, the-

refore, the preserved area sampled may be acting as an "island" in a landscape degraded by human activities.

According to the Red List of the Brazilian Fauna Threatened with Extinction (ICMBio, 2018), *M. rufiventris* is considered 'in danger of extinction', however, it is not present as an endangered species from Minas Gerais, despite having previously been listed as such (COPAM, 1995; COPAM, 2010). The list of endangered species of animals in the state of Minas Gerais, which was created in 1995, was updated only in 2010, and is outdated (COPAM, 1995; COPAM, 2010).

The main anthropic actions that threaten the occurrence and conservation of this species are fragmentation, habitat destruction, and predatory honey extraction (ICMBio, 2018; Kerr et al., 1999).

Faunal surveys are very important for understanding the diversity that exists in the Cerrado, especially considering the distribution of endemic species. *M. rufiventris* occurs in savanna areas preferable close to areas of remnants,



**Fig. 2.** Location of the new record of *Melipona* (*Michmelia*) *rufiventris* Lepeletier, 1836 (red dot) within the occurrence already known for the specie (green dots) in the Cerrado biome (gray area), Brazil.

when these are available in a landscape context (Gonçalves, 2017). This highlights the importance of preserving the original vegetation in maintaining endemic species in biome.

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