SHORT COMMUNICATION

First record of the brown-throated sloth (*Bradypus variegatus* Schinz, 1825) in the Cerrado of Minas Gerais, Brazil

PEDRO B. GARCIA^{A,1}, FLÁVIO H. G. RODRIGUES^A AND ADRIANO G. CHIARELLO^B

^A Biology Department, Universidade Federal de Minas Gerais, Antônio Carlos 6627, 31270901, Belo Horizonte, Brazil

^B Biology Department, Universidade de São Paulo, Bandeirantes 3900, 14040901, Ribeirão Preto, Brazil

¹ Corresponding author. E-mail: pedrog4rci4@gmail.com

Abstract Little information is available on the occurrence of sloths in the Cerrado biome in Brazil. Here, we present the first record of *Bradypus variegatus* in the Cerrado *sensu stricto*, for the state of Minas Gerais, and possibly for the entire biome. We recorded an adult female at Rio Preto State Park, resting on a mangaba tree (*Hancornia speciosa*) at an altitude of 1,093 m. The presence of a gallery forest 200 m away suggests that the animal could have come from this and was in the process of dispersal. The sloth populations that may exist in this biome should represent unique ecological, genetic, and morphological adaptations that are worthy of study.

Keywords: Bradypodidae, Cerrado, ecotone, sloth, three-toed sloth

Registro da preguiça-de-garganta-marrom (*Bradypus variegatus* Schinz, 1825) no Cerrado de Minas Gerais

Resumo As informações sobre a ocorrência de preguiças no Cerrado brasileiro são escassas. Apresentamos o primeiro registro de *Bradypus variegatus* em Cerrado *sensu stricto*, para o estado de Minas Gerais e possivelmente para todo o bioma. Nós registramos uma fêmea adulta no Parque Estadual do Rio Preto, repousando sobre uma árvore de mangaba (*Hancornia speciosa*) a 1.093 m de altitude. A presença de uma mata de galeria a cerca de 200 m sugere que o animal poderia ter saído desta e estar em processo de dispersão. As populações de preguiças que podem existir neste bioma devem representar adaptações ecológicas bem como genéticas e/ou morfológicas únicas e meritórias de estudo.

Palavras-chave: Bradypodidae, Cerrado, ecótono, preguiça, preguiça-de-três-dedos

The family Bradypodidae contains four species of one single genus: *Bradypus pygmaeus*, *B. tridactylus*, *B. torquatus*, and *B. variegatus*. Only *B. pygmaeus* does not occur in Brazil (Anderson & Handley, 2001). The pale-throated sloth *B. tridactylus* occurs in Brazil only in the Amazon (Moraes-Barros *et al.*, 2010, 2011) and the maned three-toed sloth *B. torquatus* is endemic to the Atlantic Forest (Hirsch & Chiarello, 2012).

The brown-throated sloth *B. variegatus* has a wide distribution, occurring from Honduras to southern regions of Brazil, except in the states of Santa Catarina and Rio Grande do Sul (Moraes-Barros *et al.*,

2010, 2011); it has recently become extinct in Paraná state (Mikich & Bernils, 2004) and in Argentina (Aguiar, 2004). Although there is some mention of the occurrence of this species in all Brazilian biomes (Fonseca *et al.*, 1996), a more detailed examination of the original source information suggests a different view.

For instance, censuses conducted in the Pantanal flatland do not indicate that this species has a natural occurrence in this biome (Schaller, 1983; Alho *et al.*, 1987). A roadkill census conducted in the Cerrado-Pantanal corridor (Fischer *et al.*, 2003) includes *B.*

variegatus in the list; however, the specific coordinates for this record are not available. In the Cerrado, the situation is similar. In a review on the geographic distribution of *Bradypus* spp., Anderson & Handley (2001) showed that *B. variegatus* does not occur in the Cerrado, contrary to the information presented in the distribution maps by Emmons & Feer (1997) and Eisenberg & Redford (1999). Likewise, *B. variegatus* appears in a compilation of mammalian species that occur in the Brazilian Cerrado (Marinho-Filho *et al.*, 2002). However, in the latest review of mammals occurring in Brazil, *B. variegatus* is mentioned as being restricted to the Atlantic Forest and Amazon (Paglia *et al.*, 2012). A review of the conservation status of *B. variegatus* in Brazil (Xavier *et al.*, 2015) shows that records are available only for the north region of the Cerrado biome (lacking any specific location), which is the region where there are Cerrado-Amazon boundaries. However, an analysis by Moraes-Barros *et al.* (2010) showed that the most densely forested regions of the Cerrado should be considered places where the species may occur.

In a study using ecological niche modeling with the maximum entropy method (MaxEnt), the

predictive models generated showed that *B. variegatus* may occur throughout the entire Neotropical region, although areas with a high probability of occurrence were located in the Amazon and Atlantic forest biomes (Phillips *et al.*, 2006). All of the six records of *B. variegatus* in the state of Minas Gerais, compiled by Moraes Barros *et al.* (2010), were in cities located in the Atlantic Forest biome, with the possible exception of a record for Passos, where both Cerrado and Atlantic forests may occur.

Based on the foregoing, we conclude that, although there are a few and geographically inaccurate mentions, there are no records containing specific or detailed locations that confirm the occurrence of *B. variegatus* in the Cerrado biome. Here we present, to the best of our knowledge, the first record of *B. variegatus* in Cerrado vegetation *sensu stricto* (FIG. 1) for the state of Minas Gerais, and possibly for the entire biome.

The animal was sighted by a member of this research team (PG) at 18°07'20.8"S, 43°18'54.18"W, next to an inner trail of the Rio Preto State Park (RPSP), Minas Gerais state, on 25 June 2015, at

FIGURE 1. The brown-throated sloth, *Bradypus variegatus* (Schinz, 1825), recorded in the Cerrado of Rio Preto State Park, Minas Gerais, Brazil.

approximately 16:00 hr. The trail originates at the Rio Preto's riverside, along the eastern boundary of the RPSP, and continues to the top of a mountain where there is a small hut called Toca da Raposa where some maintenance tools are kept. The animal was sighted approximately 2.4 km from the riparian forest of the Rio Preto river (18°07'20"S, 43°20'54"W) at an altitude of 1,093 m (FIG. 2).

No dorsal speculum (an orange patch of fur surrounded by black hair) was observed, suggesting that this individual was a female (Eisenberg & Redford, 1999). Although the animal was not weighed, its size and body proportions were indicative of an adult. The animal was resting on a mangaba tree, *Hancornia speciosa* (Apocynaceae), approximately 2 m high. The predominant vegetal covering in the area is Cerrado ralo, which is the shortest and least dense formation of the Cerrado *sensu stricto* (Ribeiro & Walter, 2008). Open vegetation occurs less than 200 m away on the southern side of the mountain, and the northern side is dominated by the Cerrado *sensu stricto*. Also present nearby are two gallery forests. One of these is located approximately 200 m away from the sighted animal on the northern side of the mountain. This forest follows an

intermittent river that was dry during the study period. The other forest is at similar distance from the animal, however, it is located on the southern side of the mountain, following the Embira creek. Thus, the animal was found at high altitude, in open vegetation with some small trees, and next to two semi-deciduous forests that are associated with the Atlantic Forest. Considering that the brown-throated sloth is arboreal and herbivorous, we infer that the individual could have been dispersing between two riparian Atlantic forests.

According to a mammal census conducted in the RPSP in 2006, there is no record of any sloths occurring in this area (Oliveira *et al.*, 2013). Although this census was based mostly on footprints found along roads and transects, the lack of records for *Bradypus* spp. by the authors and the absence of sloths listed in the management plan of the park suggests that sloths are locally rare.

The RPSP is a Protected Area with 10,755 ha located in the central region of the Espinhaço Range. During the cold season of 2015 the minimum temperature registered by a local weather station was 6 °C in August, and the maximum during the warm

FIGURE 2. Location of the *Bradypus variegatus* specimen recorded in Rio Preto State Park, Minas Gerais, Brazil. The black circles represent the nearest municipal centers (Source: Instituto Brasileiro de Geografia e Estatística, Ministério do Meio Ambiente).

season was 40 °C, in October. In the RPSP, grassland and savanna formations of the Cerrado prevail. However, areas with seasonal semi-deciduous forests also occur (IEF, 2004). Furthermore, at altitudes higher than 1,000 m there are *capões*, which are natural forest patches surrounded by a grassland matrix (Meguro *et al.*, 1996). The *capões* of the Espinhaço Range have a high floristic similarity with the semi-deciduous forests associated with the Atlantic Forest of southeastern Brazil (Coelho, 2014). Such vegetal formations and the occurrence of the primate *Callithrix geoffroyi* (Humboldt, 1812) in the RPSP (Mesquita & Passamani, 2009; Oliveira *et al.*, 2013), a typical species of the Atlantic Forest, indicate that the region is an ecotone zone between this biome and the Cerrado.

According to the RPSP management plan (IEF, 2004), the species *Ficus enormis* (Moraceae) can be found in this area. It belongs to one of the most representative families found in the diet of *Bradypus* species. The species *Cecropia pachystachya* (Urticaceae) also occurs in the area and is, along with other embaúbas (*Cecropia* spp.), among the most important species consumed by sloths (Chiarello, 2008).

The existence of habitat patches that could be used by *B. variegatus* increases the possibility of its natural occurrence in the region. Furthermore, there is no evidence that the present record was an animal released by humans, although this possibility exists. The distance from any urban centers, the closest being 10 km away (Felício dos Santos municipality), also indicates that an accidental or intentional release is unlikely.

Our record represents, to our knowledge, the first record of *B. variegatus* occurrence in the Cerrado *sensu stricto*. The review of available information clearly indicates that there is a lack of information on the occurrence of sloths in the Cerrado biome. Moraes-Barros *et al.* (2014) pointed out that new studies are necessary in Brazil in order to properly establish the geographic distribution of *B. variegatus*, not only in this biome but also in the Pantanal and Caatinga. Considering the size of the Cerrado, the second largest biome in Brazil, and its wide variety of vegetation formations, the sloth populations that may exist in this biome should represent unique ecological adaptations (diet, habitat use, etc.) as well as genetic and/or morphological adaptations worthy of study. These populations are also important for studies on genetic variability and population viability, among many others aspects, which remain barely explored.

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