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PITHECIA MITTERMEIERI (MARSH, 2014) GEOGRAPHIC DISTRIBUTION: NEW RECORDS EXTEND THE RANGE EAST OF THE JURUENA RIVER

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Introduction

The range of Mittermeier's saki monkey (*Pithecia mittermeieri*) (Primates: Platirrhini) was originally proposed to extend throughout the region east of the Madeira River up to the Juruena River as well as along the entire Guaporé River (Marsh, 2014). It had been suggested by Miranda-Ribeiro (1914), Hershkovitz (1987) and Sampaio et al. (2012) that the taxon that corresponds to the modern *P. mittermeieri* also exists east of the Juruena River. However, this distribution was not followed by Marsh (2014), who instead restricted its distribution to the region west of this river. The name *Pithecia mittermeieri* is deployed here, despite questions about the validity of the *Pithecia* taxonomy of Marsh (2014) raised by Serrano-Vilavicencio et al. (2019). Genetic studies are needed to resolve the relationship between *P. mittermeieri* and *P. irrorata.*

Recently, new populations of *Pithecia mittermeieri* have been recorded in the Upper Paraguai River Basin (De Lazari et al., 2014; Gusmão and Santos-Filho, 2015; Orsini et al., 2017). Some of these records (24 and 26, Fig. 1) not only extend the range of *P. mittermeieri* 300 km south-eastward, but they are also the easternmost points for the genus as a whole in Mato Grosso state, Brazil. They also represent new population records in the ecotonal region between the Amazon, Pantanal, and Cerrado. Such new sites suggested that *P. mittermeieri* species distribution was greater than that formerly recognized, and here we report additional records that extend the species' geographical distribution still farther eastward.

Methods and observations

Our survey was conducted at Fazenda Camargo Correa in the municipality of Diamantino, state of Mato Grosso, in a 307,880 ha block of continuous terra firma forest. Cerradão enclaves (RadamBrasil, 1978) are also present. The area is located on the Chapada dos Parecis (Fig. 1, point 28). The climate of the region is AW with 1,900mm mean annual rainfall, and 23°C mean annual temperature (Alvares et al., 2014).

Primate surveys were conducted using line-transect methodology adapted from Peres (1999), where three trails were

traversed every morning (from 5h to 12h) from October 5th to October 15th, 2018, with a total of 106 km of sampling effort. All vegetation strata were scanned to locate and identify members of the regional primate fauna. During the survey period, two *Pithecia mittermeieri* sightings were obtained (Fig. 2) while groups of the animals were moving along tree branches. Seven adults and subadult individuals were observed during the first sighting, and five individuals, including one juvenile and four adults and subadults in the second. Subsequently, locality records available in Sampaio et al. (2012), Marsh (2014), Gusmão and Santos-Filho (2015) and Orsini et al. (2017) were compiled along with those from the current study in order to produce a map with all known records for the species (Fig. 1). The corresponding updated species occurrence records are provided in Table 1.

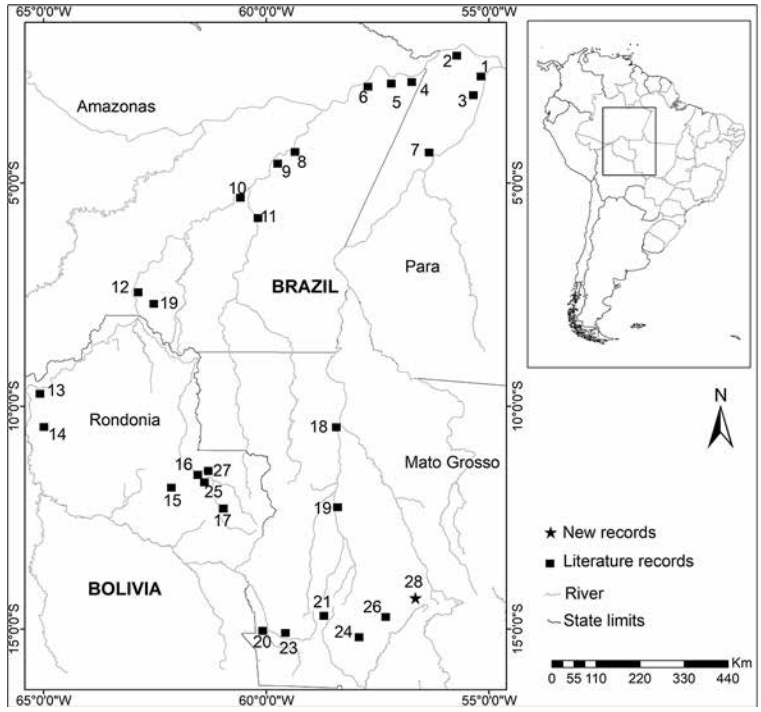

Figure 1. Distribution map of *Pithecia mittermeieri*, with squares indicating the locations available in the literature, and the star the new locality from this study. Numbers correspond to locations listed in Table 1.

Figure 2. Adult male *Pithecia mittermeieri* photographed in Fazenda Camargo Correa, Diamantino municipality, Mato Grosso state, Brazil. Photo: O. D. S.

Table 1. Records of *Pithecia mittermeieri* obtained from the literature and from field data in Brazil.

Area	Locality	Latitude (S)	Longitude (W)	Reference
1	Amorin, Brabo, Limoatuba (Olalla collection, by gazetteer, Paynter Jr. & Traylor Jr. 1991)	02°25'16"	055°07'30"	Marsh (2014)
2	Rio Arapiuns, Aruá (Olalla collection, by gazetteer, Paynter Jr. & Traylor Jr. 1991	02°39	055°37'59"	Marsh (2014)
3	Limoal near Boim (Olalla collection, by gazetteer, Paynter Jr. & Traylor Jr. 1991)	02°43' 05"	055°13'23"	Marsh (2014)
4	Parintins, Amazonas	02°37'12"	056°52'48"	Marsh (2014)
5	Rio Andira	02°46'12"	057°03'36"	Marsh (2014)
6	Lago Andira	02°45'	057°09'36"	Marsh (2014)
7	Itaituba, Villa Braga	04°25'00"	056°16'59"	Marsh (2014)
8	Igarapé Auara (Olalla collection, by gazetteer, Paynter Jr. & Traylor Jr.1991)	04°17'13"	059°25'48"	Marsh (2014)
9	Borba	04°24'00"	059°34'59"	Marsh (2014)
10	Rio Aripuanã	05°11'38"	060°23'35"	Marsh (2014)
11	Lago do Cipotuba	05°32'06"	060°22'23"	Marsh (2014)
12	Humaitá, Amazonas	07°25'44"	063°00'07"	Marsh (2014)
13	Destacamento do Ribeirão (Natterer 1883)	10°15'	065°16'	Marsh (2014)
14	Rio Pacáas Novos (Natterer 1829)	10°48'07"	065°07'41"	Marsh (2014)
15	Nova Brasília (PoloNoreste 1985)	10°44'24"	10°44'24"	Marsh (2014)
16	Cacoal State Park	11°09'	061°34'	Marsh (2014)
17	Chupinguaia	12°	061°	Marsh (2014)
18	Retiro do Veado Branco, Serra do Norte (Comissão Rondon)	11°19'59"	059°	Marsh (2014)
19	Km 16 on BR 230 (approx.)	07°32'17"	062°44'53"	Marsh (2014)
20	Cravari, Mato Grosso	14°49'	60° 6'	Hershkovitz (1987)
21	Tapirapuã, Rio Cipotuba, Mato Grosso	12°56'	58°40'	Hershkovitz (1987)
22	Brasnorte, Mato Grosso	12°32'	57°52'	Sampaio et al. (2012)
23	Pontes & Lacerda, Mato Grosso	15°01'	59°37'	Sampaio et al. (2012)
24	Tangara da Serra, Mato Grosso	14°35'23"	057°24'27"	Gusmão and Santos-Filho (2015)
25	RPPN Água Boa, Cacoal, Rondônia	11°29'	061°26'	Gusmão et al. (2014)
26	Lambari do Oeste, Mato Grosso	15°11'42"	057°44'43"	Orsini et al. (2017)
27	Linha 9, km 3.5, Cacoal, Rondônia	11°28'	61°21'	Cavalcante et al. (2018)
28	Fazenda Camargo Correa, Diamantino, Mato Grosso	14°16'9"	56°40'13"	Current study

Discussion

The data presented in this study reinforce the opinion voiced in Sampaio et al. (2012) that geographical distribution extensions were likely for this species in the eastern Juruena River region. Gusmão and Santos-Filho (2015) extended the range some 200 km to the east, and Orsini et al. (2017) recorded another population about 70 km to the south of the limit proposed of Gusmão and Santos-Filho (2015). The eastern-most known records available in Mato Grosso state are those given in this study, an eastern extension for the genus range as a whole in Mato Grosso, corresponding to an extension of more than 90 km within the Chapada dos Parecis. As the species had been reported only within the Amazon until now, and the current study took place in the extreme southeastern edge of the Amazon rainforest, *Pithecia mittermeieri* seems unlikely to be found beyond these limits.

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PREDATION BY A SLATE-COLORED HAWK, *LEUCOPTERNIS SCHISTACEA*, ON JUVENILE GRAELL'S BLACK MANTLED TAMARINS, *LEONTOCEBUS NIGRICOLLIS GRAELLSI*

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Introduction

Predation is considered an important factor in callitrichid ecology and evolution (Caine 1993; Pulliam 1984). However, predation events on wild groups are difficult to observe (Ferrari 2009). Here we report two predation events by the slate-colored hawk *Leucopternis schistacea* on one group of Graell's black mantled tamarins *Leontocebus nigricollis graellsi* in Amazonian Ecuador.

Study site

The predation events took place in Sacha Lodge Reserve, a private area of well-preserved forest in the northern bank of the Napo River in Amazonian Ecuador (0°28'16.55" S, 76°27'32.38" W). A group of seven Graell's black mantled tamarins, *Leontocebus nigricollis graellsi* (2 adults, 24-26 cm; 3 subadults, 22-23 cm; and 2 juveniles that were probably twins (14-15 cm)), was followed from May 30 through August 9, 2018, to collect data of their feeding behavior.

Results and Discussion

On June 23, 2018, at 11:55 (local time), the tamarins were feeding on *Parkia* sp. exudates and resting at about 25 m above ground. One of the individuals suddenly started to