



First record of melanism in the critically endangered Pampa cat (*Leopardus munoai*), an endemic species of the Pampa grasslands

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Abstract: We report the first record of a melanistic individual of the critically endangered Pampa cat (*Leopardus munoai*), from July 8th, 2021, at 10:45 am (coordinates 30.096288° S; 54.941139° W) in the area of the Brazilian army, known as Campo de Instrução Barão de São Borja (CIBSB), popularly known as Saicã.

Keywords: Melanism, Uruguayan Pampas cat, Pampa.

Primeiro registro de melanismo no criticamente ameaçado gato-pampeano (*Leopardus munoai*), uma espécie endêmica das áreas abertas do Pampa

Resumo: Este trabalho reporta o primeiro registro de melanismo do criticamente ameaçado de extinção gato-pampeano (*Leopardus munoai*), realizado em 8 de julho de 2021, às 10:45 da manhã. O registro foi obtido nas coordenadas 30.096288° S; 54.941139° W na área do exército brasileiro Campo de Instrução Barão de São Borja (CIBSB), popularmente conhecida como Saicã.

Palavras-chave: Melanismo, gato-palheiro-pampeano, Pampa.

Introduction

Polymorphic phenotypes are common in wild cats, with records of albinism, leucism and melanism in several species of felids from Africa, South America and Asia (Eizirik et al. 2003, Warrick 2010, McBride & Giordano 2010, Schneider et al. 2012, Silva 2017, Cho et al. 2013, Xu et al. 2013, Cronemberger et al. 2018). Melanism can be defined as the darkening of the background coloration of the integument (fur), which is genetically controlled. So far, all felid polymorphic mutations have been associated with either the ASIP

(agouti signaling protein) or MC1R genes (Eizirik et al. 2003). There are some iconic cases of melanism such as in leopards (*Panthera pardus*) and jaguars (*Panthera onca*), which are called 'black panthers' (Eizirik et al. 2003, Schneider et al. 2012, Silva 2017, Silva et al. 2017). In Neotropical America, melanism is also frequently observed in small cats (Oliveira 1994, Eizirik et al. 2003, Oliveira & Cassaro 2005, Silva et al. 2016, Aximoff et al. 2021). In some cases, as in the jaguar, it is dominant, whereas in leopards it is recessive (Eizirik et al. 2003, Caro 2005). In this short communication, we report the first record of melanism in the Pampa cat (*Leopardus munoai*), an endemic

species of the Pampa biome, and a small felid from the “*Leopardus colocola* complex”, that has recently been recognized as a full species by Nascimento et al. (2020).

The Pampa cat or grassland Pampas cat, also known as Uruguayan or Muñoa’s Pampas cat, is a small felid that measures between 70 and 96 centimeters in length, and weighs an average of 3.5 kg; however, its basic ecological needs are virtually unknown. Its distribution to the north of its range would be restricted by the forest massif of the Atlantic Forest, to the south and southwest by the Prata and Paraná Rivers, respectively, and to the east by the Atlantic Ocean (Nascimento et al. 2020). Thus, the species’ range is restricted to the extreme south of Brazil (Pampa biome), Uruguay and a small strip of the Corrientes fields in the extreme northeast of Argentina. The part of the Pampa biome that spreads into the Brazilian territory measures approximately 178,000 km², which corresponds to 2.07% of the country as a whole, and is restricted to the state of Rio Grande do Sul. By making up 63% of the territory of the state, it is the dominant landscape (IBGE 2004, Overbeck et al. 2007). As a species, *L. munoai* is of high conservation concern (see Tirelli et al. 2021) and is going to be classified as Critically Endangered CR by the Brazilian authorities; however, this status has not been made official yet, and it is currently still classified under *Leopardus colocola* (as *L.c. munoai*) as Vulnerable (Queirolo et al. 2013, ICMBio unpubl. data). In this paper our intent is to report a new color morph identified for the Pampa cat (*Leopardus munoai*).

Materials and Methods

Camera trapping is being conducted in a public area belonging to the Brazilian army, known as Campo de Instrução Barão de São Borja (CIBSB), or popularly known as Saicã (Fig. 1), which covers 51,000 hectares, and is located between the municipalities of Rosario do Sul and Cacequi, in the state of Rio Grande do Sul, southernmost Brazil. The area comprises mostly native fields, with forest formations along water courses, adjacent to agriculture. In 2021, we deployed 6–9 camera traps spaced at ca. 500 m (400–600 m) from each other that focused on native fields that have been free from agriculture for at least 40 years. We followed well established camera-trapping protocols (as those described by de Oliveira et al. 2018, 2020).

Species identification was confirmed based on the concave head profile shown by both *L. munoai* and its sister species from the Cerrado, *Leopardus braccatus*. This is a diagnostic feature for identification of both species during camera-trapping (T.G. de Oliveira, pers. obs., F.D. Mazim pers. obs.). The ears are more pointed than the spotted species of *Leopardus*, which would also set it apart from a melanistic Geoffroy’s cat, aside the bulkier body of the latter (T.G. de Oliveira, pers. obs., F.D. Mazim pers. obs.). Body shape and proportions are also used to distinguish them among the species (Oliveira & Cassaro 2005). Additionally, the researchers (TGO, FDM) have a vast experience with camera-trapping of small Neotropical felids (>5,000 records identified),

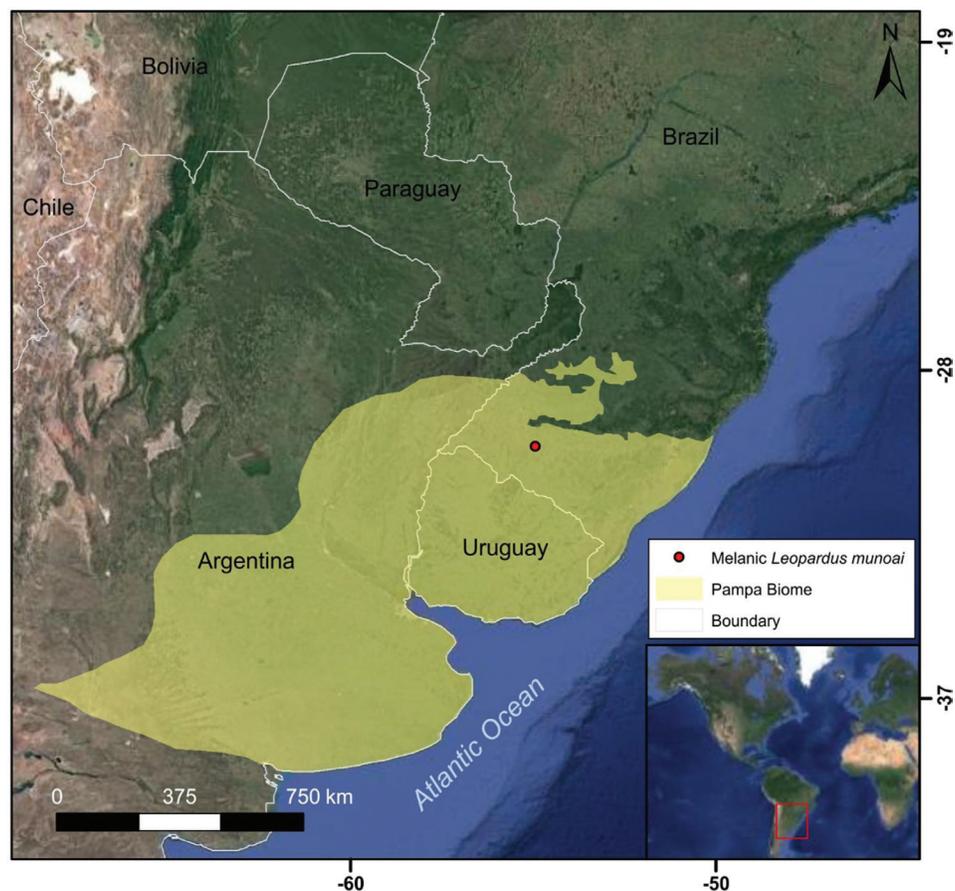


Figure 1. Location where the melanistic male specimen was recorded.



Figure 2. Melanistic male Pampa cat (*Leopardus munoai*) caught by camera-trap in the Pampa grasslands of Saicã (southernmost Brazil).

live-trapping (>200 individuals caught) as well as experience with several specimens of all Brazilian small cats in captivity.

Results and Discussion

After an effort of 1,080 trap-nights, a melanistic male Muñoa's Pampas cat was photo-trapped on July 8th, 2021, at 10:45 am (coordinates 30.096288° S; 54.941139° W) on the edge of a swamp, locally known as Laguna, which, in the 1970s, was intensively used to irrigate rice fields; a practice that no longer occurs within the limits of the CIBSB (Fig. 2). Another individual, with a plain, standard coat had been recorded earlier in the same area (May 27th 2021).

This is the first report of a melanistic *L. munoai* individual. However, melanism in the Pampas cat species complex (i.e., *Leopardus colocola* complex) has been recorded, mostly in the Pampas cats (*Leopardus braccatus*) found in the savannas of northern and central-western Brazil (Aximoff et al. 2021, T. de Oliveira pers. com.). In some sites, such as Mirador State Park in the savannas of Maranhão state, melanistic individuals can comprise up to > 90% of all records (T. de Oliveira pers. com.). However, we still cannot confirm whether melanism is a common event for *L. munoai*; but, based on records of road-killed individuals (N = 28, F. Mazim pers. obs.), it does not seem to be so. There is still a lot to be learned about this endemic felid of the Pampas.

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Fábio Dias Mazim: data collection; analysis and interpretation; manuscript preparation and revision.

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Simone Stefanello: data collection; manuscript preparation and revision.

Paulo Kuester: data collection; manuscript preparation and revision.

Daniel Alves Spiazzi: data collection; manuscript preparation and revision.

Darwin Dias Fagundes: data collection; manuscript preparation and revision.

João Fabio Soares: data collection; manuscript preparation and revision.

Tadeu Gomes de Oliveira: analysis and interpretation; manuscript preparation and revision.

Conflicts of Interest

The authors declare no conflict of interest.

Data Availability

All data are available in the paper.

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