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AMPLIAÇÃO DA DISTRIBUIÇÃO E PRIMEIRO REGISTRO DE LEUCISMO NO QUELÔNIO AMAZÔNICO *MESOCLEMMYS RANICEPS* (GRAY, 1856) (TESTUDINES: CHELIDAE)

DISTRIBUTION EXTENSION AND FIRST RECORD OF LEUCISM IN THE AMAZONIAN FRESHWATER TURTLE *MESOCLEMMYS RANICEPS* (GRAY, 1856) (TESTUDINES: CHELIDAE)

EXTENSIÓN DE LA DISTRIBUCIÓN Y PRIMER REGISTRO DE LEUCISMO EN LA TORTUGA DE AGUA DULCE AMAZÓNICA *MESOCLEMMYS RANICEPS* (GRAY, 1856) (TESTUDINES: CHELIDAE)

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Resumo

As ocorrências de mutações cromáticas em vertebrados exibem uma baixa frequência, apesar de incidirem em diversas espécies. No contexto dessas mutações, o leucismo, muitas vezes é confundido com albinismo e refere-se a perda parcial ou total de melanina, resultantes de mutações

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genéticas que apresentam consideráveis variações nos mecanismos de herança e nos genes associados. Em setembro de 2021, por volta das 7h da manhã, registramos uma fêmea adulta de *Mesoclemmys raniceps*, em exposição à luz solar direta, em um aterro de uma represa em área rural de Juara-MT-BRA. Este registro, além de representar a primeira constatação de leucismo para a espécie, ampliamos a distribuição geográfica da mesma em 236 km a oeste e a 118 k ao sul do ponto mais próximo conhecido para a espécie, até então.

PALAVRAS-CHAVE: Ampliação de distribuição, *Mesoclemmys raniceps*, leucismo.

Abstract

Chromatic mutations in vertebrates have a low frequency of occurrence, despite affecting a large number of species. Furthermore, leucism is confused with albinism, while leucism is defined as the partial or total loss of melanin, the result of genetic mutations with great variations in inheritance mechanisms and associated genes. In September 2021, at around 7 am, we recorded an adult female *Mesoclemmys raniceps*, sunbathing on a dam embankment in a rural area of Juara-MT. In addition to being the first record of leucism for the species, this record increases the species' distribution by 100km south of the nearest record.

KEYWORDS: Distribution enlargement, *Mesoclemmys raniceps*, leucism.

Resumen

Las mutaciones cromáticas en vertebrados presentan una baja frecuencia de ocurrencia, a pesar de afectar a un gran número de especies. Además, el leucismo se confunde con el albinismo, mientras que el leucismo se define como la pérdida parcial o total de melanina, resultado de mutaciones genéticas con grandes variaciones en los mecanismos de herencia y genes asociados. En septiembre de 2021, alrededor de las 7:00 a. m., registramos una hembra adulta de *Mesoclemmys raniceps* tomando el sol en el terraplén de una presa en una zona rural de Juara-MT. Además de ser el primer registro de leucismo para la especie, este registro amplía su distribución 100 km al sur del registro más cercano.

PALABRAS-CLAVE: Ampliación de la distribución, *Mesoclemmys raniceps*, leucismo.

1. Introduction

Chromatic mutations in vertebrates exhibit a low frequency of occurrence, despite impacting a broad spectrum of species (Bried et al., 2005). Furthermore, leucism is often misconstrued with albinism; however, leucism is precisely defined as the partial or complete loss of melanin, stemming from genetic mutations that display considerable variations in inheritance mechanisms and associated genes

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(Buckley, 1982). Leucism is a genetic abnormality attributed to mutant alleles (Bensch et al., 2000). These records are scarce and make it difficult to identify patterns, causes and effects (Ribeiro & Gogliath, 2012). In a population aspect, color mutations can interfere negatively, especially during the reproductive season, when there is a choice of sexual partners and become more susceptible to predation (Mulvihill & Leppold, 2005).

Leucism has been described in a wide range of animal groups, including birds, mammals, reptiles, fish, and amphibians. Birds represent the group with the highest number of records due to their abundance, wide distribution, and ease of observation in the field (Van Grouw, 2006). Cases in mammals are also relatively common, such as in mustelids, rodents, and cervids, frequently reported in wild environments in Brazil (Abreu et al., 2013). In reptiles, records are more frequent, particularly in snakes (Fernandes et al., 2020; Deshmukh et. al., 2020). Reports in South American freshwater turtles, particularly within the Chelidae family, are extremely rare, but when documented, they provide valuable information on the occurrence of this condition in long-lived species with cryptic behavior, highlighting the importance of these records for understanding the ecological and evolutionary implications of color anomalies. Sosa-Cornejo (2022) documented that leucism is the most prevalent congenital malformation in eggs and hatchlings of Lepidochelys olivacea in northwestern Mexico, with approximately 0.54% of the eggs analyzed presenting embryos or neonates with hypopigmentation. Another case involves adult leucistic females of Chelonia mydas successfully nesting in Tortuguero, Costa Rica, demonstrating that leucistic individuals can maintain normal reproductive functions (Restrepo & Valverde, 2019). These cases contrast with the absence of reliable records for Mesoclemmys, suggesting that the mutation is extremely rare in this genus or that underreporting and publication difficulties exist.

Twenty-four species within the Chelidae family have been documented in Brazil (Cunha et al., 2022; Guedes et al., 2023). Among Amazonian turtles, the genus Mesoclemmys is the least studied (Ferrara et al., 2017; Cunha et al., 2021). *Mesoclemmys raniceps* is distributed across Brazil, Bolivia, Peru, Ecuador,

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Colombia and Venezuela (Balensiefer et al., 2012; Brito et al., 2012, Rhodin et al., 2021). Although widely distributed in Brazil, the species is considered rare within its range and difficult to detect. Its extent of occurrence in the country has been estimated at 3,434,777 km² (Area of Occupancy – AOO), representing approximately 66% of its global distribution (Rhodin et al., 2025).

2. Methodology

In September 2021, at around 7 am, we recorded a adult female of *Mesoclemmys raniceps* (Gray, 1856) (Figure 1b; 1c), sunbathing on a dam embankment in a rural area of Juara municipality, state of Mato Grosso, Brazil.

3. Results and discussion

Mesoclemmys raniceps allowed the approach, and in this way it was possible to capture it for biometrics, being essential for identification, since the individual presented a chromatic mutation caused by leucism, in fact the animal was all white with blue eyes (Figure 1a). The taxonomic identification of the species followed a systematic identification key specialized in the group, according to Garbin and Cunha (2023). The specimen it was 320 mm straight carapace length (SCL), 256 mm straight carapace width (SCW), 286 mm straight plastron length (SPL), 137 mm straight plastron width (SPW), 90 mm head length and 72 mm head width. After biometric procedures, the animal was released in the same place where it was registered. In addition to being the first record of leucism for the species, this record increases the species' distribution by 118 km south, 236 km west and 945 km east (further away) of the nearest record (Figure 2).

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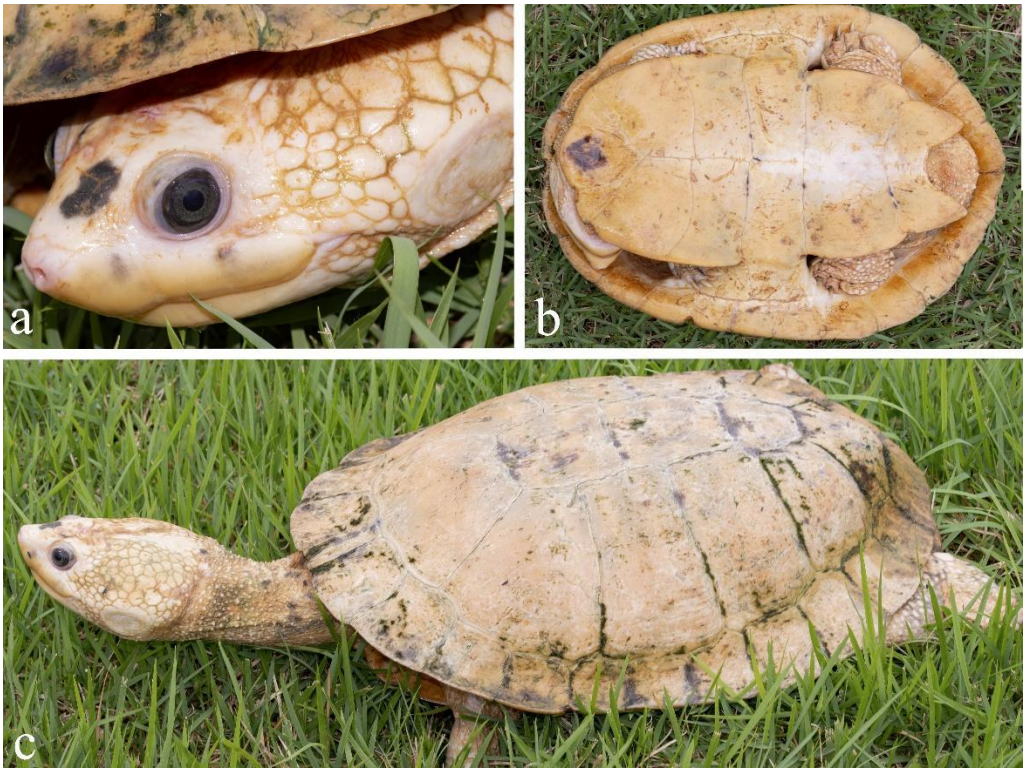


Figura 1 – A. Lateral view of head of the adult female of *Mesoclemmys raniceps* leucistic abnormality recorded in the Amazon basin in Juara municipality, Mato Grosso state, Brazil. B. Ventral view of *M. raniceps*. C. Dorsal view of *M. raniceps*. Photos: Murillo Couto.

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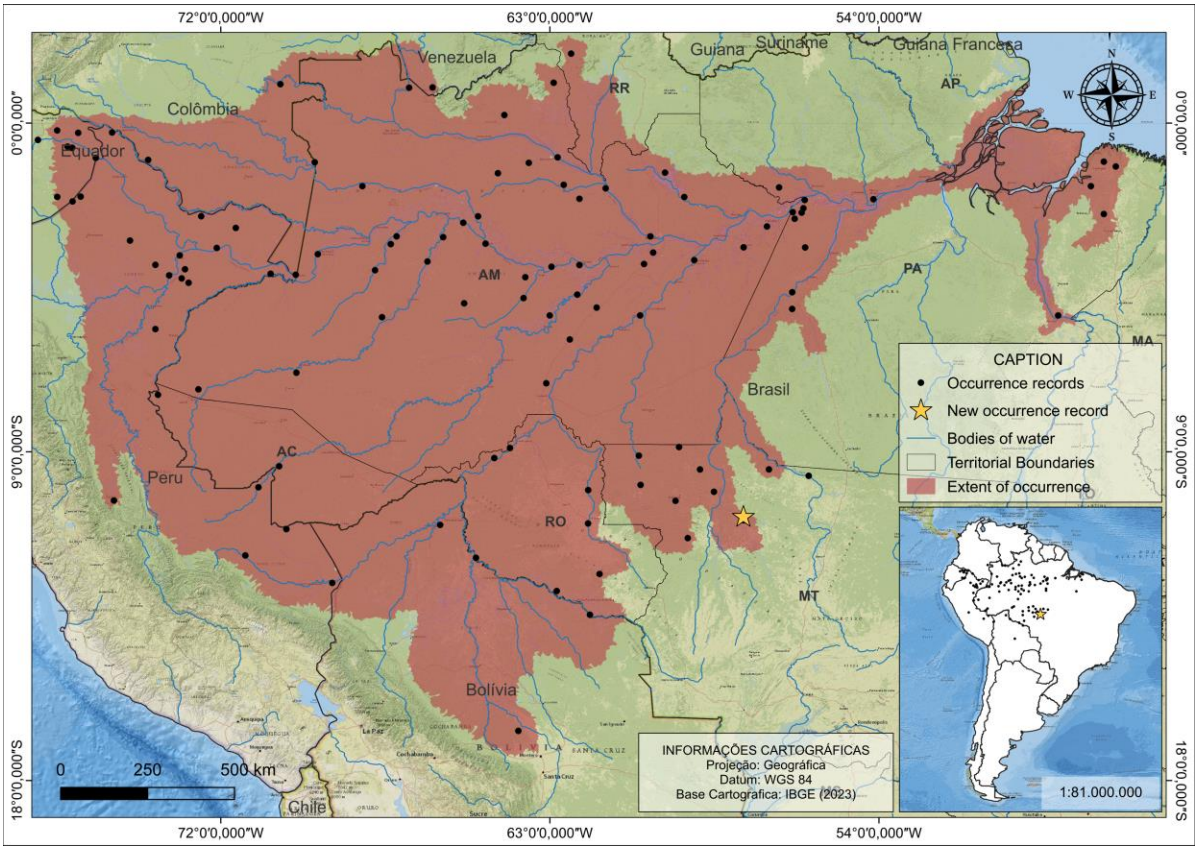


Figure 2 – Distribution of *Mesoclemmys raniceps* in the Amazon basin. Black dots are species records obtained through scientific literatures. Yellow star is the new record of expansion of the species.

Endemic to the Amazon rainforest, *M. raniceps*, in Brazil they are found in the states of Acre, Amazonas, Mato Grosso, Rondônia, Roraima e Pará (Rhodin et al., 2025).

Species of the genus *Mesoclemmys* are notoriously difficult to identify due to the high morphological similarity among congeners and the challenges associated with recording and capturing individuals (Cunha et al., 2019). *Mesoclemmys raniceps*, in particular, has been recorded in remote forested areas, often several kilometers inland, where trapping is necessary to document its presence. Such fieldwork poses significant logistical and financial challenges, as capture success is

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uncertain and few researchers undertake these demanding expeditions (Brito et al., 2019).

Because of these difficulties in sampling and the inaccessibility of the habitats where the species occurs, studies aimed at clarifying the distribution range of *M. raniceps* are urgently needed, especially given the ongoing anthropogenic alterations to Amazonian ecosystems (Fearnside, 2005; Phillips et al., 2008; Brito et al., 2019). Moreover, persistent taxonomic uncertainties continue to complicate the correct identification of species within *Mesoclemmys*. As noted by Cunha (2024), *M. raniceps* exhibits striking variation in coloration depending on sun exposure, further hindering accurate diagnosis.

In this context, the present study provides important contributions to the natural history of *Mesoclemmys raniceps*, addressing both ontogenetic variation and population-level pattern of distribution.

4. Conclusion

This work brings the first record of leucism in *M. raniceps*, in addition to expanding the species' distribution by 118 km south, 236 km west and 945 km east (further away) of the nearest record. With the forest modifications and fragmentations that occur intensely in the Amazon, records of expansion of areas of occurrence are exceptional in order to assess the level of threat to the species and propose mitigating measures for the conservation of the species.

5. Funding

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