

## SHORT COMMUNICATION

# Record of the silky anteater (*Cyclopes didactylus*; Xenarthra: Cyclopedidae) in the Atlantic Forest of Rio Grande do Norte state, northeastern Brazil

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**Abstract** Information on the distribution of the silky anteater (*Cyclopes didactylus*) is scarce, especially in the Atlantic Forest of northeastern Brazil, where the species is considered Data Deficient (DD) by the IUCN. We present the first georeferenced record of *C. didactylus* for the Atlantic Forest of Rio Grande do Norte, northeastern Brazil. A resident found the animal in 2008 near a Private Reserve of Natural Heritage in the municipality of Baía Formosa, in the surroundings of the largest Atlantic Forest fragment of the state. Our record represents the northernmost known location of the Atlantic Forest for *C. didactylus*. Given the likely importance of the registration site for the conservation of this species, future research should investigate the current state of the population and distribution of *C. didactylus* in the region to support conservation actions that guarantee its persistence in a landscape under intense anthropogenic pressure.

**Keywords:** anteater, distribution area, mammal, Pernambuco Endemism Center, Pilosa

### Registro do tamanduá (*Cyclopes didactylus*; Xenarthra: Cyclopedidae) na Floresta Atlântica do Rio Grande do Norte, nordeste do Brasil

**Resumo** Informações sobre a distribuição do tamanduá (*Cyclopes didactylus*) são escassas, especialmente na Floresta Atlântica do nordeste do Brasil, onde a espécie é considerada Deficiente de Dados (DD) pela IUCN. Apresentamos aqui o primeiro registro georreferenciado de *C. didactylus* para a Floresta Atlântica do Rio Grande do Norte, nordeste do Brasil. O animal foi encontrado em 2008 por um morador nas imediações do maior fragmento de Floresta Atlântica do estado, onde existe uma Reserva Particular do Patrimônio Natural no município de Baía Formosa. Nosso registro representa a localização conhecida mais ao norte da Floresta Atlântica para *C. didactylus*. Considerando a provável importância do local do registro para a conservação desta espécie, futuras pesquisas devem investigar o estado atual da população e a distribuição de *C. didactylus* na região para subsidiar ações de conservação que garantam sua persistência em uma paisagem sob intensa pressão antrópica.

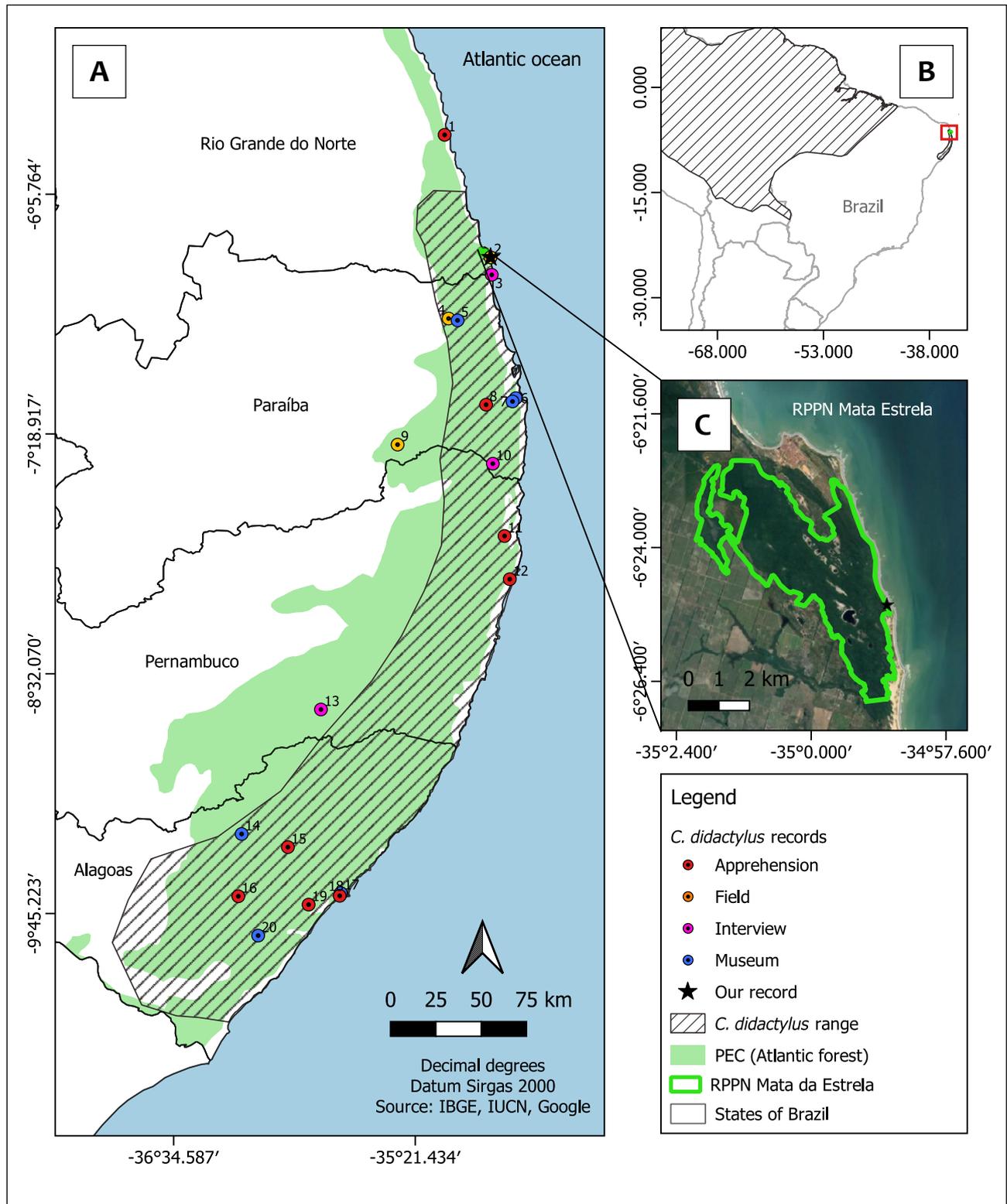
**Palavras-chave:** área de distribuição, Centro de Endemismo Pernambuco, Mamífero, Pilosa, tamanduá

The silky anteater (*Cyclopes* sp.) is one of the smallest and least known taxa of the superorder Xenarthra (Miranda & Superina, 2010), and the smallest species of the order Pilosa, weighing

approximately 300 g (Feijó & Langguth, 2013). The species of the genus are nocturnal and exclusively arboreal (Miranda & Superina, 2010; Hayssen *et al.*, 2012). In association with its cryptic coloration

these characteristics make field detection difficult and contribute to the lack of knowledge about this taxon (Feijó & Langguth, 2013; Miranda *et al.*, 2015). The largest database on the abundance and

occurrence of neotropical xenarthrans shows that *Cyclopes* sp. has the smallest number of records among the studied taxa ( $n = 240$ , Santos *et al.*, 2019). *Cyclopes* sp. feeds mainly on ants, but it may also



**FIGURE 1.** A. Location of Pernambuco Endemism Center in northeastern Brazil; B. *Cyclopes didactylus* records in the Pernambuco Endemism Center obtained through different survey methods, including primary and secondary data, and highlighting the new record presented here; C. location of Mata Estrela Private Reserve (RPPN) in Rio Grande do Norte state, near the place where the animal was found being kept by a fisherman. Literature records with geographic coordinates: 1, 8, 11, 12, 15, 16, 18, 19: Miranda & Superina (2010); 9, 10: Santos *et al.* (2019); 5, 6, 7, 14, 17, 20: Feijó & Langguth (2013); 4: Gonçalves *et al.* (2018); 3: Campos *et al.* (2018); 13: Silva & Mendes Pontes (2008).

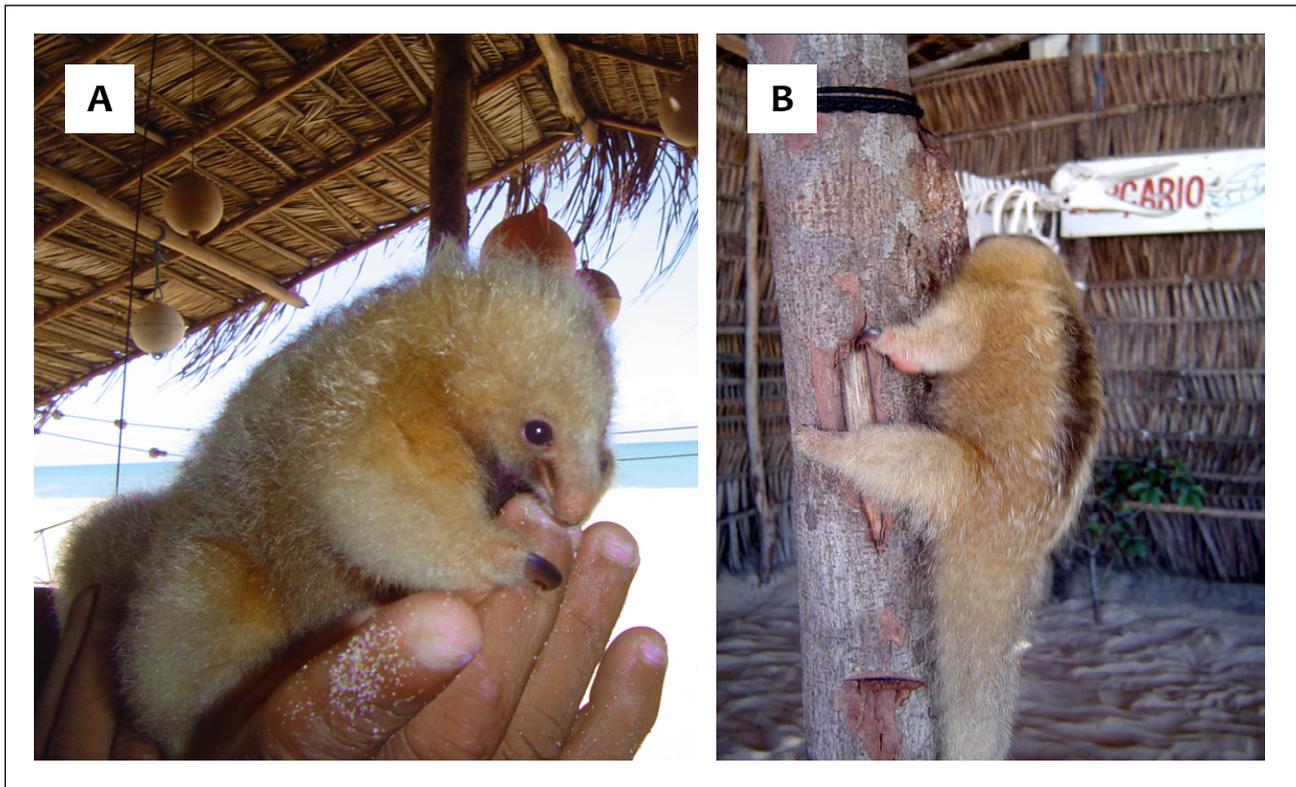
**TABLE 1.** Location of the *Cyclopes didactylus* records in the Pernambuco Endemism Center of the Brazilian Atlantic Forest, including primary and secondary data, and highlighting the new record presented here at Mata Estrela Private Reserve in Rio Grande do Norte state. The numbers correspond to the records in **FIGURE 1**. Literature records that did not report geographic coordinates are not included, such as the records reported by Miranda *et al.* (2018) for the following locations: Rio São Francisco (Alagoas), Jaboatão dos Guararapes and Timbaúba (Pernambuco).

No.	Source	Method	Municipality	State	Latitude	Longitude
1	Miranda & Superina, 2010	Apprehension	Natal	Rio Grande do Norte	5°47'39.0"S	35°12'33.34"W
2	This work	Field	Baia Formosa	Rio Grande do Norte	6°25'2.03"S	34°58'39.19"W
3	Campos <i>et al.</i> , 2018	Interview	Mataraca	Paraíba	6°30'21.5"S	34°58'17.40"W
4	Goncalves <i>et al.</i> , 2018	Field	Mamanguape	Paraíba	6°43'41.8"S	35°11'21.51"W
5	Feijó & Langguth, 2013	Museum	Mamanguape	Paraíba	6°44'15.8"S	35°8'38.63"W
6	Feijó & Langguth, 2013	Museum	João Pessoa	Paraíba	7°7'59.99"S	34°51'0.00"W
7	Feijó & Langguth, 2013	Museum	João Pessoa	Paraíba	7°9'0.00"S	34°52'0.01"W
8	Miranda & Superina, 2010	Apprehension	Santa Rita	Paraíba	7°10'0.00"S	35°0'0.00"W
9	Santos <i>et al.</i> , 2019	Field	Salgado de São Félix	Paraíba	7°22'10.5"S	35°26'47.59"W
10	Santos <i>et al.</i> , 2019	Interview	Caapora	Paraíba	7°27'59.8"S	34°57'57.81"W
11	Miranda & Superina, 2010	Apprehension	Igarassu	Pernambuco	7°50'4.14"S	34°54'25.24"W
12	Miranda & Superina, 2010	Apprehension	Recife	Pernambuco	8°3'14.78"S	34°52'49.92"W
13	Silva & Mendes Pontes, 2008	Interview	Jaqueira	Pernambuco	8°43'0.00"S	35°50'0.00"W
14	Feijó & Langguth, 2013	Museum	Viçosa	Alagoas	9°21'0.00"S	36°13'59.99"W
15	Miranda & Superina, 2010	Apprehension	Atalaia	Alagoas	9°25'0.00"S	36°0'0.00"W
16	Miranda & Superina, 2010	Apprehension	Anadia	Alagoas	9°40'0.00"S	36°15'0.00"W
17	Feijó & Langguth, 2013	Museum	Maceió	Alagoas	9°39'0.00"S	35°43'59.99"W
18	Miranda & Superina, 2010	Apprehension	Maceió	Alagoas	9°39'51.7"S	35°44'18.56"W
19	Miranda & Superina, 2010	Apprehension	Marechal Deodoro	Alagoas	9°42'32.4"S	35°53'43.79"W
20	Feijó & Langguth, 2013	Museum	Manimbu	Alagoas	9°52'0.00"S	36°9'0.00"W

include beetles in its diet (Miranda *et al.*, 2009; Hayssen *et al.*, 2012; Miranda *et al.*, 2015). Usually solitary, males and females only join during the breeding season, and the male may help take care of the offspring (Hayssen *et al.*, 2012; Miranda *et al.*, 2015).

Until recently, *Cyclopes didactylus* (Linnaeus, 1758) was the only recognized species of the genus, comprising seven subspecies (Miranda *et al.*, 2015) that occurred in tropical forests from Central and South America to southern Mexico (Miranda *et al.*, 2014). However, more recently, robust morphological, morphometric, and molecular analyses

performed by Miranda *et al.* (2018) suggested the existence of at least seven valid species of the genus. *Cyclopes didactylus* now comprises disjunct populations in South America, one of them in the north of the Amazon forest, covering Venezuela, the Guyanas, and part of Brazil, reaching the Brazilian state of Piauí (Miranda *et al.*, 2018). The other population of the species occurs in the Atlantic Forest of northeastern Brazil, including the states of Rio Grande do Norte, Paraíba, Pernambuco, and Alagoas (Miranda *et al.*, 2018), one of the most biodiverse and threatened regions of the Atlantic Forest, known as Pernambuco Endemism Center (PEC) (Ribeiro *et al.*,



**FIGURE 2.** Specimen of *Cyclopes didactylus* found opportunistically in the municipality of Baía Formosa, Rio Grande do Norte, in 2008, while it was being held captive by a local fisherman. The characteristic dorsal stripes of the species can be observed in **B**. Photographs by Luiz Yoshihiro Garcia de Lima Hagi.

2009). Morphologically, *C. didactylus* is the only *Cyclopes* species with clearly marked dorsal and ventral stripes (Miranda *et al.*, 2018).

The recognition of the new species reinforces the need to improve knowledge about the ecology and distribution of the genus, especially to support conservation initiatives. While in its assessment prior to the taxonomic split *C. didactylus* was listed as Least Concern (LC) by the IUCN Red List of Threatened Species (Miranda *et al.*, 2014) and by the latest Brazilian Red List, the disjunct population of northeastern Brazil was classified as Data Deficient (DD) (Miranda *et al.*, 2015).

In this work, we present a record of *C. didactylus* obtained in 2008 in the vicinity of a private protected area in the Atlantic Forest ecoregion of Rio Grande do Norte, at the northern limit of the biome in northeastern Brazil.

The record presented here was opportunistically obtained in May 2008 by one of the authors (Luiz Yoshihiro Garcia de Lima Hagi; LYGLH) approximately 50 m away from the Mata Estrela Private Reserve of Natural Heritage (Mata Estrela Private Reserve) (06°25'02"S, 34°58'37"W; **FIG. 1**), the largest remnant of Atlantic Forest in Rio Grande do Norte. The reserve encompasses approximately 2,040 ha, of which 1,888 ha are semideciduous forest, 82 ha dunes and restinga vegetation, and 70 ha lakes; its limits reach the coastline (Olmos, 2003). LYGLH

met a fisherman with a silky anteater (**FIG. 2**). The fisherman, who lives on the beachfront, claimed to have found the specimen in the forest around the site (**FIG. 3**). LYGLH instructed him to return the silky anteater to the forest, but we could not confirm its fate.

Our record represents the northernmost occurrence location for the species in the northeastern Atlantic Forest. Only one documented record existed for Rio Grande do Norte, but the exact origin of that animal, which had been seized by the Instituto Brasileiro do Meio Ambiente e Recursos



**FIGURE 3.** Atlantic Forest vegetation of the Mata Estrela Private Reserve in Baía Formosa, Rio Grande do Norte, where a local resident probably captured the specimen of *Cyclopes didactylus* presented in our study. Photo: Paulo Fernandes.

Renováveis (IBAMA) (Miranda & Superina, 2010), was unknown. Our record is 40 km from the closest record of the species with documented location, a museum specimen collected at Mamanguape in Paraíba (Feijó & Langguth, 2013; Santos *et al.*, 2019; **FIG. 1, TABLE 1**). Reports obtained from interviews point to the presence of the species in Mataraca, Paraíba, a municipality bordering Baía Formosa (Campos *et al.*, 2018), 10 km from Mata Estrela Private Reserve (**FIG. 1, TABLE 1**).

The record presented here confirms the occurrence of the species in the surroundings of the private reserve (where it probably came from) in the Atlantic Forest domain on the south coast of Rio Grande do Norte. This record reinforces the relevance of the few protected areas of the PEC for the biome's biodiversity maintenance. Recent work has shown that private reserves have great relevance for PEC fauna conservation, especially in a context of high degradation and low coverage of protected areas (Carvalho *et al.*, 2021). However, these areas are generally isolated and inserted in very fragmented landscapes (Carvalho *et al.*, 2021), as is the case of Mata Estrela Private Reserve. The latter is surrounded by sugarcane monoculture and despite legal protection, it suffers from illegal hunting, extraction of firewood, and invasion of domestic animals (Costa-Neto, 2018), probably due to insufficient management and inspection. Therefore, the *C. didactylus* population as well as other iconic and forest-dependent species that occur in the region, such as the blonde capuchin monkey (*Sapajus flavius*) and the red-handed howler (*Alouatta belzebul*; Fialho *et al.*, 2014), are likely to be at risk of local extinction.

Knowledge about the PEC mammals is still dramatically scarce and needs to advance to support conservation and management actions in an intensely fragmented landscape (Carvalho *et al.*, 2021). Although our record is more than 10 years old and may generate some uncertainty about the current occurrence of the species in the area, the relative protection provided by the presence of a private reserve, as well as more recent interview data of a close region in Paraíba (Campos *et al.*, 2018), suggest that the species should persist in the region, as advocated by Garbino *et al.* (2018). New surveys, however, are needed to confirm its current presence and define its population status and distribution in other fragments of the region. Conservation actions are urgently needed to guarantee the persistence of *C. didactylus* in the northern limit of the Atlantic Forest. These actions include the establishment of protected areas and ecological corridors, the fight against hunting and illegal deforestation, and educational actions that publicize the local fauna and sensitize the region's residents and the owners of large sugarcane plantations that contain forest fragments.

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