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A new species of capuchin monkey, genus *Cebus* Erxleben (Cebidae, Primates): found at the very brink of extinction in the Pernambuco Endemism Centre

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Abstract

We report the discovery of a new species of *Cebus* (Primates, Cebidae), here designated *Cebus queirozi* **sp. nov.** Mendes Pontes and Malta, found in a single population, composed of a single group of 18 individuals, in the Atlantic coast of the Pernambuco Endemism Centre, the sector of the Atlantic forest of Brazil located above the São Francisco river, one of the most important hotspots of the earth. The new species was not located in any of 23 other sites surveyed in the region, which suggests that they are critically endangered and, therefore, the holotype was not sacrificed, but photographed and subsequently released back to his group. A paratype was also photographed and used for the description. They live close to a highly-populated area, are isolated in a matrix of sugar cane plantations, and use an area of only about 200 ha, formed by highly-disturbed patches of tropical rainforest, and a swamp, formed by stands of *Montrichardia linina* (Aracaeae). The specific name acknowledges the landowner's family for having protected the area and the species for more than 30 years.

Key words: Cebidae, *Cebus queirozi* **sp. nov.** Mendes Pontes & Malta, 2006, North-eastern Atlantic Forest of Brazil, Pernambuco Endemism Centre

Introduction

Cebus apella Linnaeus, the brown capuchin monkey, was the only species of capuchin monkey referred to the tropical rainforests of the Atlantic coast of the Pernambuco Endemism Centre (Emmons & Feer, 1997; Eisenberg & Redford, 1999), a region which encompasses the States of Pernambuco, Paraíba, Alagoas and Rio Grande do Norte (*sensu*

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Prance, 1982, 1987, Silva and Casteletti, 2003), the most-threatened sector of the Atlantic forest of Brazil, located in the north of the São Francisco river, and considered one of the most important "hotspots" of the earth (Myers *et al.* 2000).

Groves (2001), reviewed in a vastly comprehensive article by Rylands *et al.* (2005), nevertheless, refers to *Cebus libidinosus libidinosus* Spix, the bearded capuchin monkey, as occurring in the region along the left bank of the São Francisco river, possibly confined to the dry xerophytic thorn-scrub vegetation typical of that region away from the coast, and also to *Cebus xanthosternos* Wied, the yellow-breasted, buff-headed capuchin, as occurring in the south of the Pernambuco Endemism Centre, in the State of Bahia, and possibly Espirito Santo and Rio de Janeiro.

Here we report a new form of untufted capuchin, totally distinct from the other species, especially from those whose distribution was closest to the Pernambuco Endemism Centre, mainly by presenting a snow-white cap on the fore-head, and body hair that is a uniformly golden-yellow mantle.

Results

A new species of capuchin monkey from the Pernambuco Endemism Centre, North-eastern Atlantic forest of Brazil: A single group of a new form of untufted cappucin monkey was discovered during regular field surveys within a privately owned sugar mill, the Usina Salgado, municipality of Ipojuca, State of Penambuco, Brazil. This species (as well as any other capuchin) has been extirpated from 23 other areas surveyed in the same region, and only one single group was encountered, comprising only 18 individuals, using an area calculated so far to be about 200 ha (including three small forest patches, and a swamp) totally isolated by a matrix of sugar-cane plantations. The blond capuchin, or as recognised locally, the *macaco-prego-galego* or the *macaco-prego-louro,* here designated as *Cebus queirozi* **sp. nov.** Mendes Pontes and Malta, is being regularly followed in their small range. Due to extreme rarity and susceptibility no individual was sacrificed, the description being based on the analysis of a live holotype that was subsequently released, and on the resulting photographic documentation, as well as on the photograph of a paratype. This procedure follows the example of Jones *et al.* (2005) and Polaszek *et al.* (2005), which was based on Article 73.1.4 of the International Code of Zoological Nomeclature (International Commission on Zoological Nomeclature, 1999), which allows the description of new taxa without the need for dead type specimens. Herein we omit the coordinates to safeguard the species.

Holotype

Registered by A. R. Mendes Pontes and A. Malta on the 5th February 2006 (Plates 1 to 4); after weighting and measuring the specimen, which was recovered from an unknown

local hunter, it was released back to his group safely. We therefore, did not take invasive measures other than the ones mentioned. The Usina Salgado population is designated the source population for physical specimens in support of the holotype.

Age Sex / Class:	Adult Male
Weight:	2.920 kg
Head-body:	40 cm
Tail:	41 cm
Foot:	12 cm
Ear:	2.9 cm

Additional to the standard measures we also took:

Tibia:	15.3 cm
Femur:	12 cm
Manus:	8.4 cm
Antibrachium:	11.6 cm
Brachium:	12.5 cm

Paratype

Sub-adult individual (Plate 5). Sex not known. Picture taken in the *Montrichardia linina* swamp, Usina Salgado, State of Pernambuco.

Type locality

Lowland tropical rainforest and *Montrichardia linina* swamps of the Usina Salgado, Municipality of Ipojuca, State of Pernambuco, Brazil. The only known population to date.

Diagnosis

Body hair comprises a uniformly golden-yellow mantle, including hind and forelimbs. Hands and feet are black. Rectangular snow-white cap in the front half of the head (as in the paratype, but faded in the holotype), going down to just above the ears. Tail uniformly golden, darker than the rest of the body in the dorsal part.

Geographic distribution

Possibly restricted to this single group, at Usina Salgado, a population at the very brink of extinction, confirmed by a 5-year survey of 23 areas, including the largest and best preserved Coimbra forest (3.600 ha) not far from the site. Further surveys along the Atlantic coast of the Pernambuco Endemism Centre (possibly the former distributional range of the species), at the north-eastern sector of the Atlantic forest of Brazil, are critically needed to locate other viable populations to guarantee the future of the new critically-endangered species.

PLATE 1. The blond capuchin, *Cebus queirozi* **sp. nov.** (Mendes Pontes and Malta, 2006) from the Pernambuco Endemism Center, the Atlantic forest of North-eastern Brazil the holotype—dorsal (a) and ventral (b) view.

Habitat

The blond capuchin is now restricted to three very small forest patches, one measuring 13.4 ha, another 19.6 ha, and a third only 6 ha, which totals 39 ha of highly-modified and disturbed secondary forest, defined as lowland tropical rainforest. They are connected by a 161-ha swamp formed by stands of *Montrichardia linina* (Araceae) of up to 5 metres high,

which are used as corridors between the forest patches and also, and most importantly, as refuge against intruders, an entire home range of about 200 ha. They are highly threatened by selective cutting, intentional fires, presence of domestic animals, hunting, and even tourists from a nearby resort, despite constant, and now intensified, patrolling of the area by the landowners, who also committed themselves to reforest a considerable area surrounding their home range.

PLATE 2. The blond capuchin showing (a) the face and the faded white cap, and (b) a lateral view of whole body.

Description

General Aspect: A primarily golden monkey, with light brown eyes, and a snow-white cap. (1) Dorsally: uniformly golden (including shoulders), with the lower parts (at the

PLATE 3. The blond capuchin showing (a) head and shoulders, and (b) lateral view of the face and neck, with a furless, accentuated pendulous throat flap.

PLATE 4. The blond capuchin showing the much lighter fur that covers (a) hand, and (b) feet, and their black and furless palms.

PLATE 5. The first picture ever taken of the blond capuchin, *Cebus queirozi* **sp. nov.** in their natural environment, a *Montrichardia linina* swamp in the Pernambuco Endemism Center, the paratype.

height of the rump) slightly darker. (2) Ventrally: uniformly golden, with the lower parts darker (in the groin), with the fur growing from a mid-ventral line along the chest and belly towards the sides. (3) Forelimbs: uniformly golden, with the inner parts darker and with less fur. (4) Hind limbs: uniformly golden, with the inner parts darker and with less fur. (5) Hands and feet: black, furless in the palm only. The fur that covers hands and feet are much lighter than the rest. (6) Tail: carried parallel to the plane of the back when travelling, with the distal half coiled. (7) Face and forehead: pinkish, with some dark patches, sparsely covered with golden short fur (longer in the forehead just below the cap, and around the mouth). (8) Cheeks: masseter muscle well developed giving the impression of swollen cheeks. Skin flabby, with folds hanging (possibly due to age of the holotype, an old male). In the outer part of the cheeks a vertical line of fur grows upwards to meet the white cap, just above the ears. (9) Neck: furless in this individual exclusively, with accentuated pendulous, darkly-pigmented skin, a throat flap. (10) Ears: black, covered by long golden fur. (11) Head: front half is formed by the white cap, and the back half is golden, but darker than the rest of the body. (12) Cap: snow-white in the front half of the head, divided in the middle. Fur growing backwards, and not erect (not tufted).

Etymology

The specific name acknowledges the Queiroz family of landowners for having protected this region known to keep a population of *blond* monkeys for more than 30 years, for having taken the initiative to invite the authors to look for this species in the area in order to start a scientifically-based conservation programme, and for having spontaneously decided to start a reforestation project to enlarge the forest area available.

Discussion

The characteristics of the blond capuchin, *Cebus queirozi* **sp. nov.** here presented, which are basically a uniformly golden-yellow mantle, and a snow-white cap, differ significantly from those listed by Torres de Assunção (1988) *apud* Rylands *et al.* (2005) for animals from North-eastern Brazil, which are: (1) ventral hairs yellowish brown, (2) flanks occasionally greyish brown, (3) cap occasionally brown, and (4) a diffuse dorsal stripe. Additionally, they also differ from the other species for being much smaller, head-body measure of the adult alpha male being only 40 cm.

The blond capuchin also differs significantly from *Cebus apella*, as it is described in Emmons and Feer (1997) and Eisenberg and Redford (1999) for North-eastern Brazil, due to the latter possessing (1) a crown covered with a black or dark-brown cap that extends down cheeks as a distinct dark bar in front of ears, (2) hairs of cap that form short tufts above ears, (3) tail that is black or brown, and (4) hind limbs brown and darker than the body.

It differs significantly from the different specimens of the *Cebus apella* group deposited at the National Museum of Rio de Janeiro, Brazil (specimen No. 24314, from Fonte Boa, AM, Brazil), and at the Museum of the University of São Paulo — MZUSP (specimen No. 2743, 2883, from Mintiba, Amazonas, Brazil; No. 3848, 3851, 3849, from Bahia, Brazil; No. 6325, from rio Aricá, Mato Grosso, Brazil; No. 4262, from Cuiabá, Mato Grosso, Brazil; No. 6321, no locality; No. 6967, 6972, 7040, from rio das Mortes, Mato Grosso, Brazil; No. 3362, from Corumbá, Mato Grosso, Brazil; No. 3771, from Coxim, Mato Grosso do Sul, Brazil; No. 5133, from rio Arapiuns, Pará, Brazil).

It also differs significantly from the other species deposited at the National Museum of Rio de Janeiro, Brazil, and Museum of the University of São Paulo — MZUSP, especially from the two species that have a distribution that is nearest to this one (Figure 1), which are:

Cebus libidinosus libidinosus, that occurs along the left bank of the São Francisco river, and presents (1) a black or dark brown crown, (2) dark brown tail, and (3) distal parts of hind and forelimbs dark brown (National Museum of Rio de Janeiro — specimens No. 23321, 23320, 23309, 23311, 23316, 23310, 23315, 23313, 23314, 23312, 23317, 23318, 23319, all from Serrita municipality, State of Pernambuco, Brazil; No. 4838, from Anápolis, Goiás, Brazil; No. 23254, from Goiás, Brazil; No. 23243, 23242, 23235, all

from Itajuí, Bahia, Brazil; No. 23237, from Cariranha, Bahia, Brazil; MZUSP — specimens No. 2365, 2364, both from Rio Araguaia, Goiás, Brazil; No. 10642, from Goiania, Goiás, Brazil). The well-preserved and described museum material allowed us to compare the standard measures of *C. libidinosus* (Head-body: Mean 76 cm ± 4.5; Tail: Mean 42.7 cm ± 1.8; Foot: Mean 12 cm ± 0.6, and Ear: Mean 2.4 cm ± 0.4, n=14), with those of *Cebus queirozi* **sp. nov.**, which suggests that although length of tail, foot, and ear do not differ significantly, the latter is probably much smaller.

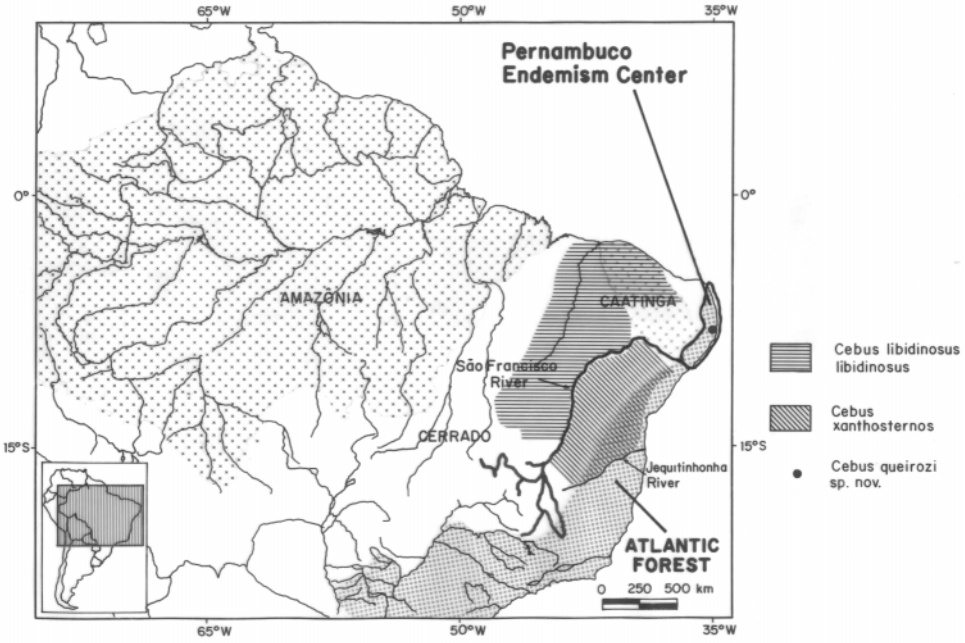

FIGURE 1. Location of the new species, *Cebus queirozi* **sp. nov.** in the Pernambuco Endemism Center, according to this study, and distribution of the other *Cebus* species referred to the adjacent area, according to Groves (2001) and Rylands *et al.* (2005).

Cebus xanthosternos, which occurs in the south of the Pernambuco Endemism Centre, in the State of Bahia, and possibly Espirito Santo and Rio de Janeiro, and presents (1) dark brown or blackish head, (2) hindlimbs, (3) forelimbs, and (4) tail, and also (5) laterally the body is darker than the rest (National Museum of Rio de Janeiro — specimens No. 23225, 23223, 23224, all from Itamarají, Bahia, Brazil; MZUSP — specimens No. 2582, 2585, both from Senhor do Bonfim, Bahia, Brazil). No standard measures were available for comparisons.

Thus, we fully recognise *Cebus queirozi* **sp. nov.** Mendes Pontes and Malta as a new species, possibly endemic to the different types of tropical rainforest of the Atlantic coast of the Pernambuco Endemism Centre, which encompasses the Brazilian States of Pernambuco, Paraíba, Alagoas and Rio Grande do Norte, and propose their inclusion in the Brazilian and in the international lists of endangered species, as critically endangered.

The discovery of this new critically-endangered (overlooked for centuries) species of capuchin within this zone of endemicity (sensu Prance, 1982, 1987, Silva and Casteletti, 2003), where 23 species of endemic birds have already been described, as well as one species of reptile, four species of butterflies, two species of gastropods, at least four species of amphibians, and at least 11 species of trees (http://www.cepan.org.br/Centro de Endemismo Pernambuco), highlights the overwhelming importance and uniqueness of this highly-threatened area for the conservation of the earth's biota. It also points to the great lack of information on its mammalian fauna, and the urgent need for surveys in order to understand their distribution and status throughout the region.

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