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CONFIRMED PRESENCE OF *PITHECIA AEQUATORIALIS* HERSHKOVITZ, 1987 IN ECUADOR

Diego G. Tirira

Escuela de Ciencias Biológicas e Ingeniería, Universidad Yachay Tech, San Miguel de Urcuquí, Imbabura, Ecuador; E-mail: <dtirira@yachaytech.edu.ec>; Fundación Mamíferos y Conservación, Urb. Hacienda Capelo 165, Capelo, Rumiñahui, Ecuador; and Research Associate to Instituto Nacional de Biodiversidad (INABIO), Quito, Ecuador

Abstract

Herein I confirm the presence of *Pithecia aequatorialis* in the Ecuadorian Amazon. The discovery of seven records, five corresponding to specimens deposited in museums and two from photographs taken in the field in the last decade, confirmed its presence in the province of Pastaza, between the Curaray River (right bank), to the north, and Bobonaza (left bank, middle course) and Conambo rivers (left bank, middle and lower course), to the south, in an altitudinal range of 180 to 405 m. These records extend the previously known distribution for the species in the Peruvian Amazon by more than 200 km to the west. I suggest carrying out further field studies to confirm the southern and western limits of the distribution of this primate.

Key words: distribution, Ecuador, geographical extent, natural barriers, Pastaza, Pitheciidae

Resumen

Confirmando la presencia de *Pithecia aequatorialis* en la Amazonía ecuatoriana. El hallazgo de siete registros, cinco corresponden a especímenes depositados en museos y dos provienen de fotografías tomadas en el campo en la última década, confirman su presencia en la provincia de Pastaza, entre los ríos Curaray (margen derecha), al norte, y Bobonaza (margen izquierda, curso medio) y Conambo (margen izquierda, curso medio y bajo), al sur, en un rango altitudinal de 180 a 405 m. Estos registros amplían la distribución previamente conocida para la especie en la Amazonía peruana en más de 200 km hacia el oeste. Sugiero realizar nuevos estudios de campo para confirmar los límites sur y oeste de la distribución de este primate.

Palabras clave: barreras naturales, distribución, Ecuador, extensión geográfica, Pastaza, Pitheciidae

Introduction

The geographic distribution limits of the species of the genus *Pithecia* are poorly known (Ferrari et al., 2013), especially after the latest taxonomic arrangement increased the number of species and changed the distribution limits that were previously described for many of them (Marsh, 2014).

In 1987, Hershkovitz included two specimens from “La Coca” and “Rio Coca”, Ecuador, in his description of *Pithecia aequatorialis* (Equatorial Saki), which had previously been referred to as *P. monachus* (Cabrera, 1900, 1917). These specimens are deposited at the American Museum of Natural History (AMNH 98468) (Hershkovitz, 1987) in New York, and Museo Nacional de Ciencias Naturales (MNCN 2051) (Tirira, 2021b), in Madrid. Since then, saki monkeys recorded south of the Napo River, mainly in the Yasuní National Park and

surrounding areas, have been treated as *P. aequatorialis* (e.g. Di Fiore et al., 2007; Tirira, 2007; De la Torre et al., 2011).

The most recent taxonomic revision of the genus *Pithecia* mentions that “all of the *P. aequatorialis* specimens referenced by Hershkovitz (1987) in Ecuador are *P. napensis*, except for AMNH 98468 from Bassler, which Hershkovitz incorrectly assigned to the Río Coca, a northern tributary of the Río Napo in Ecuador. The original label says northern Peru and with further investigation this proved correct” (Marsh, 2014: 64).

The other specimen mentioned by Hershkovitz (1987) (MNCN 2051) (Figure 1) also was confirmed as *Pithecia aequatorialis*, and probably was collected in Tarapotó (Nuevo Curaray), at the confluence of the Curaray and Napo rivers, in Peruvian territory (Tirira, 2021a), together with other primates obtained during the “Expedición

al Pacífico”, led by the Spanish naturalist Marcos Jiménez de la Espada (Cabrera, 1900, 1917).

At this stage, *Pithecia aequatorialis* was considered an endemic species to Peru, occurring “south of the Río Napo and south (left side) of the Río Curaray to the Río Tigre in the west (right bank)” (Marsh, 2014), and excluded from the Ecuadorian fauna. However, a photograph of a specimen of *P. aequatorialis* (identified by L. K. Marsh) kept in captivity by indigenous Waoranis in Enkerido, a village between the Ácaro and Tarangaro rivers, south of the Curaray River, Pastaza Province (Tirira, 2017), about 100 km in a straight line from the Peruvian border, raised the possibility that this species could be present in Ecuador.

According to the latest taxonomic review, males and females of *Pithecia aequatorialis* are distinct from their closest geographic relative, *P. napensis*; according to Marsh (2014), the diagnostic features (Figure 1) are that in males, *P. aequatorialis* shows “the retention of a dense, fully white arch around the face and a very

bright, extensive orange ruff on the chest in addition to the grizzled general body pelage” (p. 63). In *P. napensis*, “the white of the face is only as eyespots above the eyes and as a ‘headband’ between the ears over the crown” (p. 63). While *napensis* has varying degrees of orange ruff, it is not quite as extensive as that of *P. aequatorialis*. In females, *P. aequatorialis* are “far more white in the ring about the face and much greyer overall” than *P. napensis* (Marsh, 2014: 63).

Here, I report several records that confirm the presence of *Pithecia aequatorialis* in the Ecuadorian Amazon; based in these records I present a map of its hypothetical distribution in the country.

Methods

Possible new records for *Pithecia aequatorialis* in Ecuador were sought via visits to museums and scientific collections in Ecuador and other countries, in addition to review of photographs of saki monkeys found in the literature and databases, and consultation with colleagues

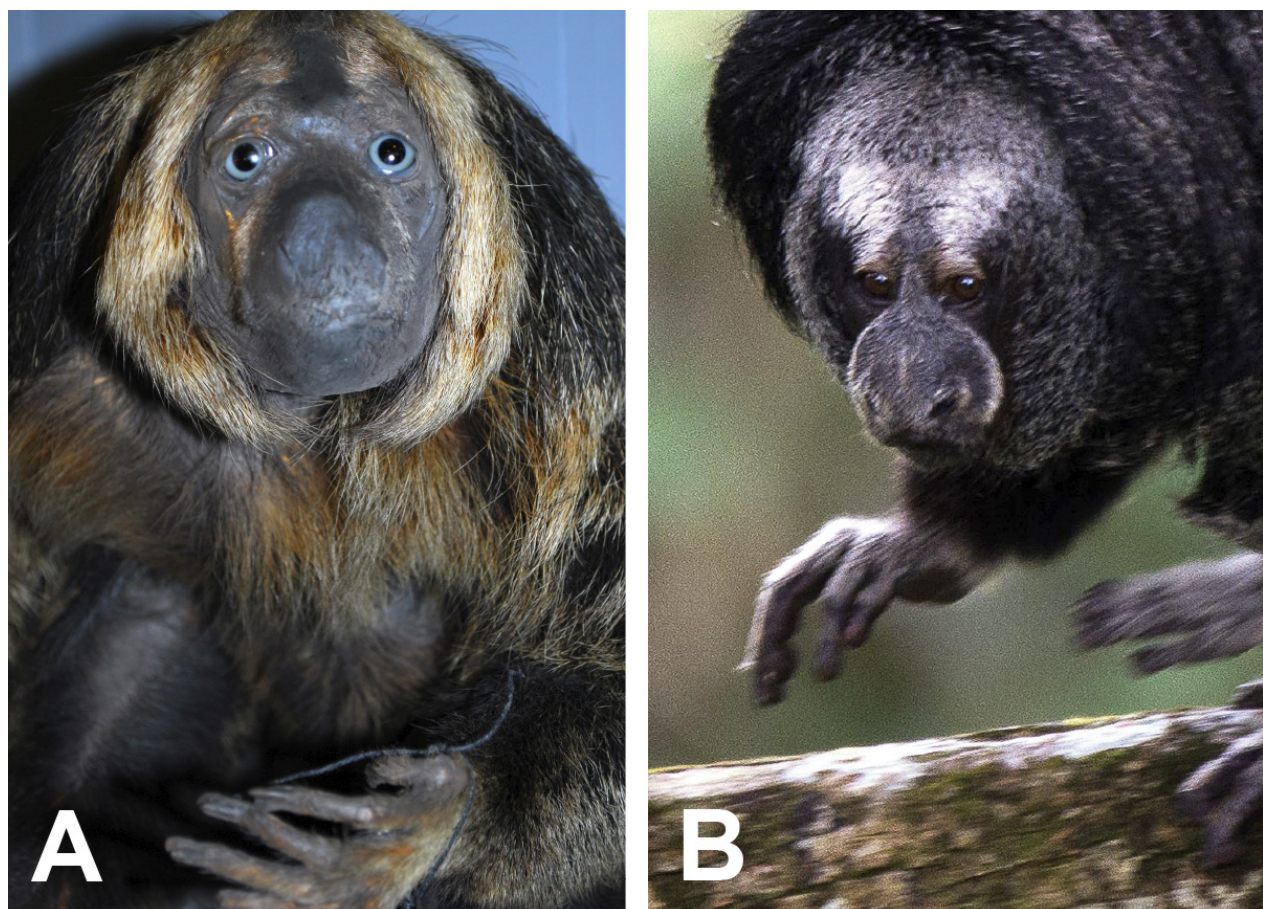


Figure 1. Males of (A) *Pithecia aequatorialis* (Equatorial Saki), probably from Curaray, Peru (MNCN 2051); and (B) *P. napensis* (Napo Saki), in Yasuni National Park, Ecuador. Photos by D. G. Tirira (A) and R. Jarrin (B).

and institutions known to have worked in Ecuadorian Amazonia, specifically in Pastaza and Orellana provinces.

All records obtained were reviewed to confirm their identification; the diagnostic criteria were: fully white arch around the face and a very bright, extensive orange ruff on the chest in addition to the grizzled general body pelage, mainly in males (according to Marsh, 2014); in addition, other available information was reviewed, such as geographic location and year of capture or sighting.

When direct confirmation was not possible (due to specimens or photographs not being available), records were included as suspected *Pithecia aequatorialis* if they were within the hypothetical range of the species. This criterion was followed due to the fact that the distribution of the two species (*P. aequatorialis* and *P. napensis*) is clearly separated by the Curaray (to the north) and Tigre (to the south) rivers. Therefore, at least in these areas, it is not possible for the species to come together and all records on either side of the rivers were attributed to the respective species.

MAY	Museo Abya-Yala, Quito, Ecuador.
MCNM	Museo de Ciencias Naturales, Colegio Nacional Maldonado, Riobamba, Ecuador.
MEPN	Museo de Historia Natural, Escuela Politécnica Nacional, Quito, Ecuador.
MMG	Museo Municipal de Guayaquil, Guayaquil, Ecuador.
QCAZ	Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito, Ecuador.

New records

I visited 13 museums and scientific collections that have specimens of *Pithecia* collected in Ecuador and deposited in Colombia, Spain, Sweden, United States, and Ecuador; of them, I found specimens identified as *Pithecia aequatorialis* in the following:

In addition, the following databases and photographic archives were reviewed: Bioweb (Brito et al., 2021), iNaturalist (2023), and WCS-Ecuador unpublished records.

Distribution map

The hypothetical distribution of *Pithecia aequatorialis* in Ecuador was mapped based on confirmed records. Limits of the polygon were defined according to Marsh (2014): south side of the Curaray River (in the north) and north side of the Tigre River (in the south) (Marsh and Heymann, 2018). The current distribution was obtained by overlapping the hypothetical distribution map with information on anthropogenic intervention, determined using remnant vegetation cover, extracted from the land use map of Ecuador (MAE, 2018).

Results

Seven records were obtained that confirm the presence of *Pithecia aequatorialis* in Ecuador (Table 1, Figure 2): four with recorded localities and three without associated provenience data (the only available information was “Ecuador”). Most of them are historical records (from 1950 to 2000). Additionally, 11 records of saki monkeys were obtained that, due to their distribution area, are suspected to correspond to *P. aequatorialis* (Table 1). All records with confirmed localities come from the Pastaza Province, between 180 and 405 m altitude.

Discussion

The evidence confirms that *Pithecia aequatorialis* inhabits Ecuador, more than 200 km west of the nearest record from the Peruvian Amazon documented by Marsh (2014). Although the information available is still scarce, the discovery of several historical records deposited in museums, in addition to photographs taken by colleagues in the field, allow confirmation of its presence in the country, with the following proposed hypothetical distribution (Figure 3):

In Ecuador, *Pithecia aequatorialis* inhabits the province of Pastaza, between the Curaray River (right bank), to the north, and Bobonaza (left bank, middle course) and Conambo rivers (left bank, middle and lower course), to the south. Other rivers within its distribution with confirmed records were Manderoyacu, Pintoyacu, and Alto Corrientes (locations of minor rivers are indicated in Table 1 and Figure 3).

These new records maintain the limits suggested by Marsh (2014), with the variation that the Conambo River, one of the two main tributaries of the Tigre River (that begins right on the border with Peru), acts as a southern limit; *Pithecia aequatorialis* is present only on the left bank of this river, within its middle and lower courses; while, towards the upper course, its distribution reaches a small section of the Bobonaza River. According to this information, this species inhabits Ecuador and Peru within the interfluvial system made up of the Curaray-Napo rivers, to the north; and Bobonaza-Conambo-Tigre-Marañón, to the south.

Table 1. Confirmed and suspected records of *Pithecia aequatorialis* for Ecuador.

No.	Year	Location	Coordinates, altitude	Source	Condition
1	1950	Pastaza, Montalvo, Bobonaza River	02°01'48"S, 76°58'12"W, 300 m	MEPN 7920 (dry skin on collection)	Confirmed
2	1951	Pastaza, Alto Corrientes, Corrientes River	01°48'00"S, 77°07'00"W, 405 m	QCAZ 768 (skull on collection)	Suspected
3*	1963	Pastaza, Conambo River	02°08'04"S, 76°05'58"W, 200 m	MMG MAM-3 (dry skin on exhibition)	Confirmed
4*	< 1980	Ecuador (unspecified location)	Unknown	MCNM no number (dry skin on exhibition)	Confirmed
5*	< 1980	Ecuador (unspecified location)	Unknown	MEPN 9163 (dry skin on collection)	Confirmed
6	1989	Pastaza, pozo Danta, 35 km N of Montalvo	01°48'09"S, 76°47'04"W, 360 m	Albuja (1990) (unpublished report)	Suspected
7	1996	Pastaza, Lorocachi, S Curaray River	01°36'46"S, 75°59'30"W, 200 m	Freire (1997) (thesis)	Suspected
8	1996	Pastaza, Zucylán, S Curaray River	01°35'10"S, 75°40'59"W, 190 m	Freire (1997) (thesis)	Suspected
9	1996	Pastaza, Río Tigre, confluence of Pintoyaku and Conambo rivers	02°07'15"S, 76°02'51"W, 180 m	Freire (1997) (thesis)	Suspected
10*	< 2000	Ecuador (unspecified location)	Unknown	MAY no number (dry skin on exhibition)	Confirmed
11*	2006	Pastaza, Enkerido, Manderoyacu River	01°22'55"S, 77°06'17"W, 280 m	Tirira (2017) (P. Trujillo-picture)	Confirmed
12	2007	Pastaza, Yana Yacu, Pintoyacu River	01°58'32"S, 76°07'12"W, 200 m	Vacacela (2007) (published record)	Suspected
13	2013	Pastaza, Conambo River	01°52'20"S, 76°52'42"W, 240 m	WCS database (J. Palacios-observation)	Suspected
14*	2013	Pastaza, Wiririma, Pintoyaku River	01°56'24"S, 76°12'36"W, 214 m	WCS database (J. Palacios-picture)	Confirmed
15	2013	Pastaza, Imatiña, Conambo River	02°00'22"S, 76°28'12"W, 200 m	WCS database (J. Palacios-observation)	Suspected
16	2014	Pastaza, Mazaramu, Zápara territory	01°46'12"S, 77°05'24"W, 399 m	WCS database (J. Palacios-observation)	Suspected
17	2014	Pastaza, Pindu Yaku, Pintoyaku River	01°43'48"S, 76°36'36"W, 207 m	WCS database (J. Palacios-observation)	Suspected
18	2019	Pastaza, Toñampari, S Curaray River	01°13'26"S, 77°22'59"W, 310 m	Tirira (2022) (Cahuiya Omaca-comment from local villager)	Suspected

The asterisk (*) corresponds to records with photographs in Figure 2.

This is the first distribution map proposed for the species in Ecuador since the taxonomic revision of Marsh (2014). However, the western limit has not been defined, an area that seems to have an overlap with the distribution of *Pithecia napensis*; therefore, it is likely that both species occur sympatrically in this area, a possibility that has been noted may occur with some species of the genus *Pithecia* (Marsh, 2014; Lehtonen, 2017). It will be necessary to carry out surveys in this area to confirm this possible sympatry.

The hypothetical distribution of *Pithecia aequatorialis* in Ecuador reaches an estimated surface area of 10,284 km², but excluding deforested areas the remaining forest is 9,403 km² according to the land use map of MAE (2018), a reduction of less than 9%. Most of the deforested area is along its western limit.

Although there is still significant native forest cover within the proposed distribution area for *Pithecia aequatorialis* in Ecuador, with low rates of deforestation

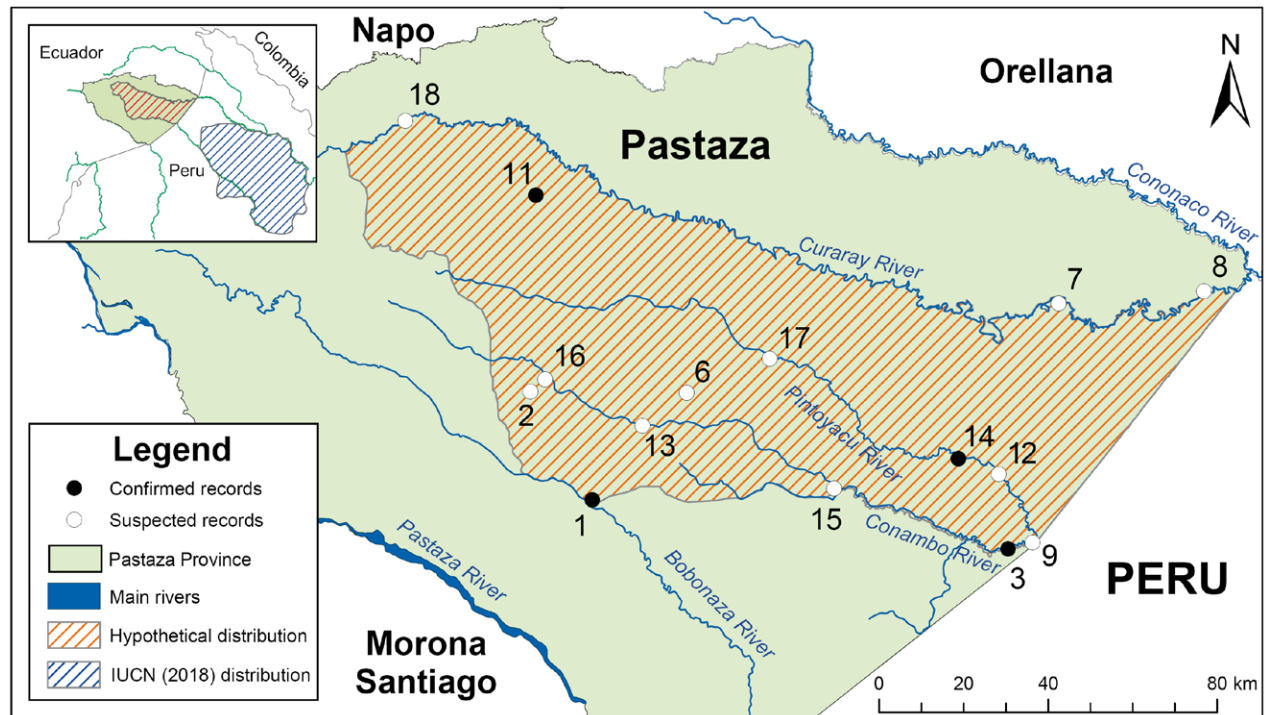


Figure 2. Confirmed records of *Pithecia aequatorialis* (Equatorial Saki) in Ecuador (all males). (A) Ecuador (no data) (MEPN 9163). (B) Pastaza, Enkerido (Waorani territory). (C) Ecuador (no data) (MCNM no number). (D) Ecuador (no data) (MAY no number). (E) Pastaza, Wiririma, Pintoyaku River (Zápara territory). (F) Pastaza, Conambo River (MMG MAM 3). Photos by D. G. Tirira (A, C, D, F); P. Trujillo (B); J. Palacios (E).

and fragmentation (Tirira, 2021b), conservation of the species is a matter of concern since there currently exist no protected areas within its range. This is due the fact that the proposed distribution area occupies different indigenous territories (EcoCiencia, 2021). These territories have a special status in Ecuador that does not allow the declaration of protected areas and the indigenous peoples are free to hunt primates and other wild mammals as a means of subsistence (Asamblea Constituyente, 2008), activity that can result in excessive and unsustainable hunting (Zapata Ríos et al., 2009).

In Ecuador, primates are one of the main protein sources for indigenous peoples (Hames and Vickers, 1982). Although current evidence indicates that species of the genus *Pithecia* are consumed infrequently compared to those of the genera *Ateles* and *Lagothrix*, among others (Tirira, 2021b), it cannot be ruled out that in future they may be hunted more often, and prior to the extirpation of the more frequently consumed species. For these reasons, *P. aequatorialis* has been assessed as Vulnerable according to last edition of the *Lista Roja de los mamíferos del Ecuador [Red List of Mammals of Ecuador]* (Tirira, 2021c).

Figure 3. Hypothetical distribution of *Pithecia aequatorialis* in Ecuador (IUCN, 2018 distribution in Marsh and Heymann, 2018). Numbers are explained in Table 1. Napo, Pastaza, Orellana, and Morona Santiago are provinces of the Ecuadorian Amazon.



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