



Fruit Consumption by the Endemic Brumback Night Monkey (*Aotus brumbacki*, Primates, Aotidae) in forest fragments of Colombian Llanos

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Resumen

Aotus brumbacki es un primate nocturno endémico de los Llanos de Colombia. Este es el primer reporte de especies consumidas por *A. brumbacki* en fragmentos de bosque de dos áreas en los municipios de San Martín y Cumaral. Las observaciones fueron realizadas durante un estudio sobre vocalizaciones y otro estudio de densidades y búsqueda de dormitorios. Las familias consumidas por *A. brumbacki* en zonas fragmentadas que también son consumidas en zonas continuas son Anacardiaceae, Arecaceae, Burseraceae, Melastomataceae, Moraceae y Myrtaceae, con algunas especies en común: *Socratea exorrhiza*, *Crepidospermum rhoifolium* y *Pseudolmedia laevis*. Cinco especies de plantas de uso humano fueron consumidas por *A. brumbacki*, este consumo puede estar relacionado con su uso en cultivos y cerca de casas, donde el primate es observado a menudo por la gente. Esta lista puede ser usada en planes de restauración y para conectar fragmentos de bosque donde la especie aún persiste.

Palabras clave: dieta, Mico de noche llanero, Fragmentos de bosque.

Abstract

Aotus brumbacki is a nocturnal primate endemic to the Llanos of Colombia. This is the first report of species consumed by *A. brumbacki* in forest fragments in the municipalities of San Martín and Cumaral. The observations were made during a study on vocalizations and another study of density and search of nest sites. The families consumed by *A. brumbacki* in fragmented zones that are also consumed in continuous zones are Anacardiaceae, Arecaceae, Burseraceae, Melastomataceae, Moraceae and Myrtaceae, with some species in common: *Socratea exorrhiza*, *Crepidospermum rhoifolium* and *Pseudolmedia laevis*. Five species of plants for human use were consumed by *A. brumbacki*, this consumption may be related to its use in crops and near houses, where the primate is often observed by people. This list can be used in restoration plans and to connect forest fragments where the species still persists.

Key words: diet, Forests fragments.

Brumback night monkeys, *Aotus brumbacki*, is an endemic nocturnal monkey of Colombian llanos (Defler 2010). Its distribution limits are poorly known but seem to be restricted from eastern portion of Boyacá and Cundinamarca departments eastward into forest areas of

Arauca, Casanare and Meta departments (Carretero et al. 2020, Defler 2010, Shanee et al. 2023). Probably it is also distributed in the lowlands of Orinoco basin, with an unknown full altitudinal range that seems to go up to 1.000 m.a.s.l in the eastern slopes of Eastern Andes (Shanee et al. 2023). *Aotus brumbacki* can be found in small gallery fragments, *Mauritia* palm swamps fragments and lowland rainforest fragments, as well as continuous forest (Carretero-Pinzón & Defler 2019). Habitat available to this small primate is being rapidly reduced by productive activities (e.g., palm oil plantations, cattle ranching, and petrol exploitation), especially in Meta, Casanare, and Arauca departments of Colombia. Therefore, this species has been classified as vulnerable by the IUCN (Carretero-Pinzón et al. 2020, Henao-Díaz et al. 2020). Regarding the natural history of *A. brumbacki*, only one study of diet has been done, reporting 25 plant species in a continuous forest (Solano 1995). In this note we report a list of species consumed by *Aotus brumbacki* in forest fragments at Colombian Llanos. Studies about diet of species from genus *Aotus* are scarce, however species of this genus are considered primarily frugivorous (Fernandez-Duque & Van Der Heide 2013, Shanee et al. 2013, Lozano-Frias 2021, Chaves dos Santos et al. 2021, Montilla et al. 2023), complementing their diet with arthropods, leaves and flowers. Families consumed by species of genus *Aotus* are different depending on the species. For example, for *A. griseimembra*, Moraceae and Urticaceae were the most important families consumed (Montilla et al. 2021), while for *A. brumbacki*, Moraceae was the family with most species consumed (Solano 1995).

Observations were done at different forest fragments in San Martín (LM 3°44'52.47"N 73°46'04.58"W; SR 3°3'30"N 73°35'40" W, LP 3°34'51.93"N 73°27'02.56"W, WGS84, Figure 1a) and Cumaral (4°14'52.2"N 73°28'15.12"W, and 4° 16'44.88" N 73°30'34.08"W, WGS84, Figura 1b) towns, Meta department, Colombian Llanos. Observations were collected during census surveys (2012 and 2016), data collection focused on species vocalizations (Vargas-Gómez 2011), and nest searching (2021 – 2023) at different seasons. No groups were followed, except for the group in which vocalizations were studied (LM area in San Martín town in 2011). All data was collected ad libitum and plant identifications were made mostly in the field by Carretero-Pinzón. Fragments were surrounded by pastures and in some areas were connected by living fences, especially in SR area, San Martín (Figure 1a). Observations were made on fragments of *Mauritia* palm swamps, gallery forest and lowland rainforest (range 1 – 1080 ha).

Table 1 shows the list of plant species used by *Aotus brumbacki* groups in San Martín and Cumaral forest fragments, as well as plants consumed by *A. brumbacki* in a continuous area reported by Solano (1995). For all plant species, only fruits were consumed by *A. brumbacki*, except by *Gliricidia sepium* from which they consumed flowers. Families consumed by *A. brumbacki* in fragmented areas that are also consumed in continuous areas are Anacardiaceae, Arecaceae, Burseraceae, Melastomataceae, Moraceae and Myrtaceae, with some common species such as: *Socratea exorrhiza*, *Crepidospermum rhoifolium* and *Pseudolmedia laevis*. Five species of human use were consumed by *A. brumbacki*, this consumption can be related to its use in crops and close to farmhouses, where this species of nocturnal primate is more often seen by local people.

This note reports 16 new species consumed by *Aotus brumbacki* (Table 1), increasing plant species list to 41 species. Five new families of plant species are reported in this note (Chrysobalanaceae, Lauraceae, Marcgraviaceae, Malpighiaceae and Sapotaceae) compared to those observed by Solano (1995). Moraceae is the most reported family of plants consumed by *Aotus brumbacki* in both studies combined.

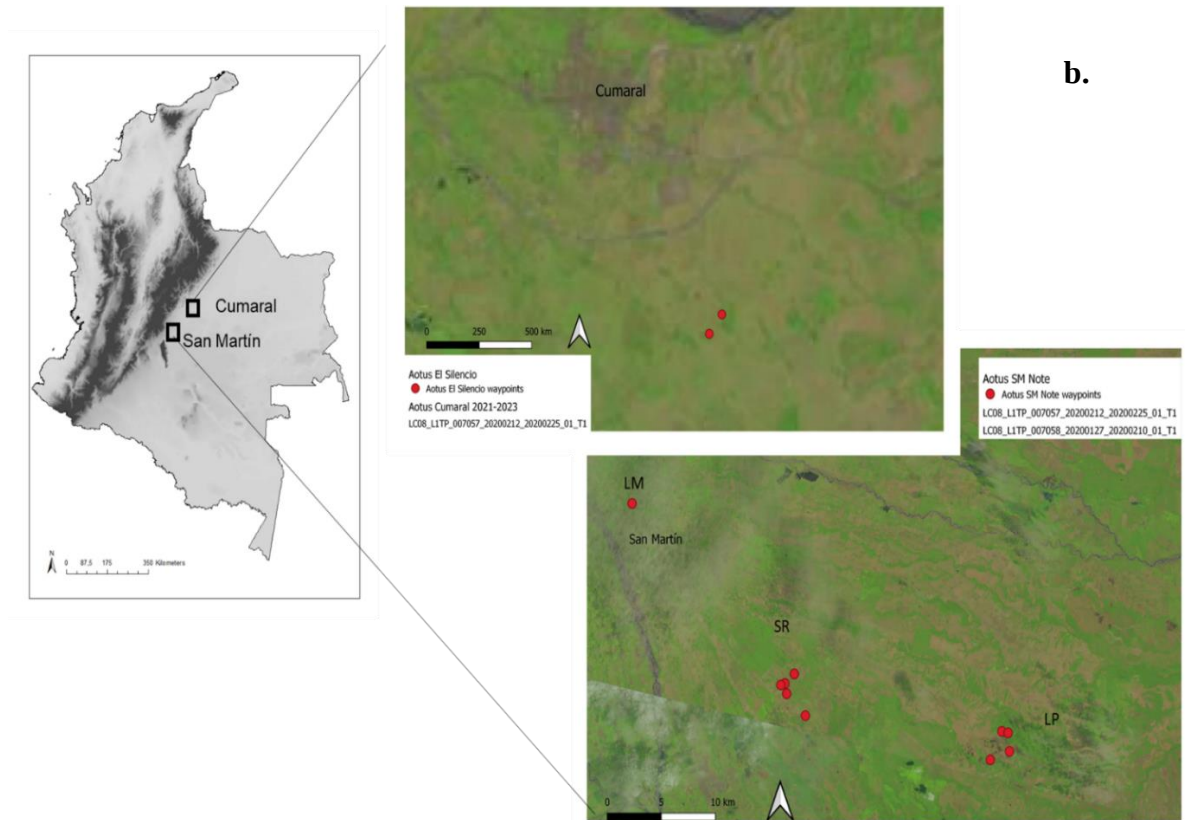


Figure 1. Location of fragments in: a) San Martín (LM 3°44'52.47"N 73°46'04.58"W; SR 3°3'30"N 73°35'40"W, LP 3°34'51.93"N 73°27'02.56"W, WGS84) and b) Cumaral (4°14'52.2"N 73°28'15.12"W, WGS84 and 4° 16'44.88" N 73°30'34.08"W, WGS84) towns with observation of *Aotus brumbacki* consuming fruits. Red point shows fragments where observations were made.

Despite the cryptic behavior of *A. brumbacki* that make it difficult to study as well as its nocturnal habits, information such as that reported here is important for reforestation and regeneration projects to connect forest fragments where this species persists. More studies with detailed data on diet of *A. brumbacki* are still need it, as well as landscape scale projects in which the effect of variables at different scales is determined for better implementation of conservation and management actions of this endemic species.

Table 1. List of plant species consumed by groups of *Aotus brumbacki* in continuous and fragmented areas.

Especie	Familia	Reference
<i>Tapirira guianensis</i> *	Anacardiaceae	This study: San Martín
<i>Anacardium occidentale</i> *†	Anacardiaceae	This study: Cumaral
<i>Spondias mombin</i> *	Anacardiaceae	This study: Cumaral
<i>Euterpe oleacea</i> *	Arecaceae	This study: San Martín
<i>Mauritia flexuosa</i> *	Arecaceae	This study: San Martín
<i>Socratea exorrhiza</i>	Arecaceae	This study: San Martín, Solano 1995
<i>Jessenia bataua</i>	Arecaceae	Solano 1995
<i>Iriartea deltoidea</i>	Arecaceae	Solano 1995
<i>Bombacopsis quinata</i>	Bombacaceae	Solano 1995
<i>Quarariba cf. asterolepis</i>	Bombacaceae	Solano 1995

<i>Protium cf. llanorum</i> *	Burseraceae	This study: San Martin
<i>Crepidospermum rhoifolium</i>	Burseraceae	This study: San Martin, Solano 1995
<i>Protium cf. apiculatum</i>	Burseraceae	Solano 1995
<i>Protium sagotianum</i>	Burseraceae	Solano 1995
<i>Jacaratia digitata</i>	Caricaceae	Solano 1995
<i>Cecropia membranacea</i>	Cecropiaceae	Solano 1995
<i>Cecropia ficifolia</i>	Cecropiaceae	Solano 1995
<i>Pourouma bicolor</i>	Cecropiaceae	Solano 1995
<i>Licania sp.</i> *	Chrysobalanaceae	This study: San Martin
<i>Garcinia macrophylla</i>	Guttiferae	Solano 1995
<i>Gliricidia sepium</i>**†	Fabaceae	This study: San Martin
<i>Inga sp.</i>	Fabaceae	Solano 1995
<i>Persea americana</i>**†	Lauraceae	This study: Cumaral
<i>Norantea guianensis</i> *	Marcgraviaceae	This study: San Martin
<i>Byrsonima cf. spicata</i> *	Malpighiaceae	This study: San Martin
<i>Miconia sp.</i>	Melastomataceae	This study: San Martin
<i>Miconia elata</i> *	Melastomataceae	This study: San Martin
<i>Bellucia grossularoides</i>	Melastomataceae	This study: San Martin
<i>Bellucia pentamera</i>	Melastomataceae	Solano 1995
<i>Pseudolmedia cf. oblicua</i> *	Moraceae	This study: San Martin
<i>Ficus americana</i> *	Moraceae	This study: San Martin
<i>Pseudolmedia laevis</i>	Moraceae	This study: San Martin, Solano 1995
<i>Coussapoa orthoneura</i>	Moraceae	Solano 1995
<i>Ficus insípida</i>	Moraceae	Solano 1995
<i>Ficus sp.</i>	Moraceae	Solano 1995
<i>Perebea xanthochyma</i>	Moraceae	Solano 1995
<i>Syzygium samarangense</i>**†	Myrtaceae	This study: Cumaral
<i>Eugenia cf. Cowanii</i>	Myrtaceae	Solano 1995
<i>Guapira myrtiflora</i>	Nictaginaceae	Solano 1995
<i>Undetermined</i>	Papilionaceae	Solano 1995
<i>Passiflora nítida</i>	Passifloraceae	Solano 1995
<i>Alibertia etulis</i>	Rubiaceae	Solano 1995
<i>Pouteria sapota</i>**†	Sapotaceae	This study: Cumaral

*New plant species reported to be consumed by *Aotus brumbacki*. †Species of human use introduced and native that were consumed by *A. brumbacki*.

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