

## New data on the ecology and geographic distribution of *Saguinus inustus* Schwarz, 1951 (Primates, Callitrichidae)

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(With 1 figure)

### Abstract

*Saguinus inustus* (Schwarz, 1951) is one of the neotropical primates least studied. The distribution of the species ranges from the north of the Solimões River, between the Negro and Japurá Rivers in Brazil, and Guayabero-Guaviare Rivers in Colombia. Nevertheless, due to the low number of specimens collected from the lower Japurá and lower Negro Rivers areas, the geographic distribution is so far poorly delineated. In this study, field data was composed of sightings and the collection of specimens during a survey of mammal diversity in the Amaná Sustainable Development Reserve (ASDR). For this survey, two 40-day expeditions were carried out in 2004. The first one occurred during the flooded season in June and July, and the second was during the peak of the dry season in October. Direct sightings were made through hiking along transects, navigation along water channels with a 30-hp speedboat, and gliding along flooded trails in the forest. New records of *S. inustus* were made in 11 different localities in ASDR. The study has confirmed the presence of the species in the Amanã area, carrying out the first records of the species in flooded forest habitats.

**Keywords:** *Saguinus inustus*, flooded forests, Amazônia, Amanã reserve.

### Novos dados sobre a ecologia e distribuição geográfica de *Saguinus inustus* Schwarz, 1951 (Primates, Callitrichidae)

### Resumo

*Saguinus inustus* (Schwarz, 1951) é um dos primatas neotropicais menos estudados. No Brasil, a espécie ocorre ao norte do Rio Amazonas entre os Rios Negro e Japurá (Caquetá), e Guayabero-Guaviare na Colômbia. No entanto, devido ao pequeno número de espécimes coletados entre o baixo Japurá e o baixo Negro a distribuição geográfica é mal delineada. No presente estudo, os dados de campo são compostos por observações e coletas realizadas durante o levantamento da diversidade de mamíferos da Reserva de Desenvolvimento Sustentável Amanã (RDSA). Para este levantamento, duas expedições de 40 dias foram realizadas em 2004. A primeira ocorreu durante a estação da cheia em junho e julho, e a segunda durante o pico da estação seca em outubro. Observações diretas foram feitas através de deslocamentos a pé em transecções, de lancha 30 hp ao longo de cursos d'água, e de canoas durante a cheia na área de várzea. Novos registros de *S. inustus* foram realizados em 11 diferentes localidades na RDSA. Este estudo confirmou a presença da espécie em Amanã, realizando os primeiros registros da espécie em florestas alagadas.

**Palavras-chave:** *Saguinus inustus*, primatas, Amazônia, Amanã.

### 1. Introduction

*Saguinus inustus* (Schwarz, 1951) is one of the least studied Neotropical primates. According to the literature, the species has been found in only 16 sites (Hershkovitz, 1977; Hernández-Camacho and Defler, 1993; Barnett et al., 2002; Defler, 1983, 2004; Iwanaga, 2004; Palácios et al., 2004; Souza, et al. 2004) and only 16 individuals have been deposited in scientific collections. The distribution of the species ranges from the north of the Solimões Rivers, between the Negro and Japurá Rivers

in Brazil, and Guayabero-Guaviare Rivers in Colombia (Hershkovitz, 1977; Hernández-Camacho and Defler, 1993; Defler, 2004; Souza et al., 2004). Nevertheless, due to the low number of specimens collected from the lower Japurá and lower Negro Rivers areas, the geographic distribution is so far poorly delineated.

In 1980, Rylands (unpubl., reported in Barnett et al., 2002) carried out the first record of the species in the Amanã Sustainable Development Reserve (ASDR) area,

sighting a group of *S. inustus* along the north margin of Amanã lake. Iwanaga (2004) confirmed through local reports the presence of the species in two localities of the Jaú National Park: the “Janela Monteiro” site and the “Janela Floresta”, both along the Jaú River.

Souza et al. (2004) collected a male adult killed by local residents of the Boa Esperança community, located at Amanã lake (02° 28' 12" S and 64° 44' 27" W), and deposited it at Mamirauá Institute's collection (IDSMasto-001). Souza et al. (2004) also observed groups of the species in *terra-firme* forest, close to the community area. Souza et al.'s observations were made at the opposite margin of that of the recordings carried out by Rylands (Barnett et al., 2002).

All sightings of *S. inustus* described in literature were made in *terra-firme* forest (Defler, 1983; Hernández-Camacho and Defler, 1983; Barnett et al., 2002; Iwanaga, 2004; Souza et al., 2004). The aim of this study is to update the information on the geographic distribution and use of habitat by *S. inustus*, reporting new occurrences and sightings in habitats different from those recorded in literature.

## 2. Methods

Secondary data was obtained through literature review (Hershkovitz, 1977; Hernández-Camacho and Defler, 1991; Barnett et al., 2002; Defler, 1983; 2004; Iwanaga, 2004; Palácios et al., 2004; Souza et al., 2004) and records of Brazilian scientific collections (IDSM and MPEG). Field data was composed by sightings and collection of specimens during a survey of mammal diversity in the ASDR (IBAMA n°. 086/2004 – CGFAU/LIC). For this survey, two 40-day expeditions were carried out in 2004. The first one occurred during the flooded season in June and July, and the second was during the peak of the dry season in October. Direct sightings were made through hiking along transects, navigation along water channels with a 30-hp speedboat, and gliding along flooded trails in the forest.

Two monitoring trails were opened: the Ubim trail located on the left margin of Ubim creek at the left bank of Amanã lake (02° 30' 37" S and 64° 36' 40" W), and the Bacaba trail on the right margin of Amanã lake (2° 30' 37" S and 64° 36' 40" W). Using line transect sampling methods (Emmons, 1984; Buckland et al., 1993) observations were made about group size and habitat use. Stomach and bowel contents of specimens collected were deposited in the Mamirauá Institute scientific collection, whereas furs, skulls and skeletons were deposited in the MPEG. Two individuals were later donated to IDSM. Tissues for DNA extraction were deposited in the Universidade Federal do Pará, Molecular Biology Laboratory.

## 3. Results and Discussion

New records of *S. inustus* were made in 11 different localities in ASDR (Figure 1, Table 1). Two sites were lo-

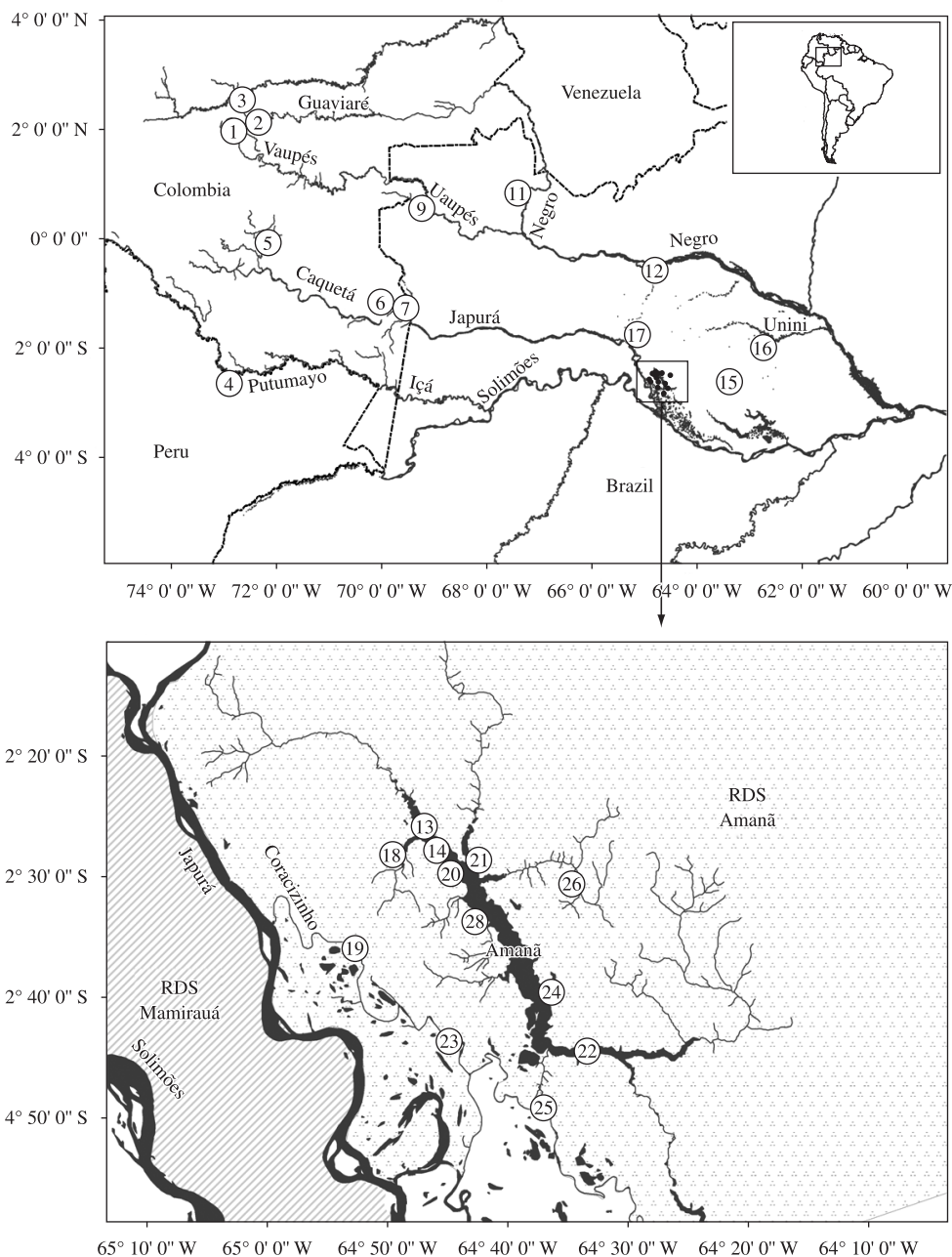
cated on the vicinities of Amanã lake, at the Juá Grande/Jaquirana creek (2° 28' 11" S and 64° 49' 33" W) and Urucurana, Boa Esperança community (02° 29' 07" S and 64° 44' 53" W), characterising *terra firme* and *igapó* habitats. Two other collection sites were located at the Coraci sector, one near Nova Canaã community, on the margins of Coracizinho River (02° 35' 27.4" S, and 64° 53' 10.6" W and 02° 35' 42.4" S and 64° 52' 56.7" W), and the other on São Bento channel (02° 37' 36.0" S and 64° 51' 57.7" W), characterising *várzea* habitats.

Collections were made along Juá Grande creek, in *terra firme* and *igapó* habitats, near Boa Esperança community. Three observations were made in flooded areas in ASDR, two in *várzea* forests on the margin of Coracizinho Rivers, and another one on Bacaba trail, in *igapó* forest. Three observations were made in *terra firme* forest, in monitoring trails (one group was observed in Ubim trail, and two other groups were observed in Bacaba trail). Other records came from observations on trails located near Boa Esperança community (02° 44' 43" S and 64° 33' 26" W), Bom Jesus do Baré community (02° 28' 37" S and 64° 42' 30" W), Belo Monte community (02° 44' 33" S and 64° 33' 26" W), São José do Urini community (02° 43' 47" S and 64° 44' 53" W), Boa Vista do Calafate community (02° 39' 35" S and 64° 36' 23" W) and Nova Jerusalém community (02° 49' 12" S and 64° 37' 07" W).

Not much difference was observed between male and female sizes collected in ASDR (Table 2). Females were 4.5% taller and 2.5% heavier than males. Only two males were collected and their weight and length did not differ from those collected by Souza et al. (2004) (TL 670 g, n = 1).

Four groups were sighted on monitoring trails, three in *terra firme* forest and one in *igapó* forest, on the right margin of Amanã lake (Table 3). These groups were composed of two, three, and four individuals (2.75 average, n = 4, sd = 0.96). Due to the small number of sightings on monitoring trails, it was not possible to estimate abundance of the species in the area. Nevertheless, it seems that groups sighted at Amanã were smaller from those sighted in the Caquetá Rivers region, in Colombia. In that area, Palácios et al. (2004) sighted groups that varied from three to eleven individuals (06 average, n = 5, sd = 2.7), and Defler (2004) reported the existence of groups with three, seven and eight individuals.

Two out of four groups sighted were in association with double-toothed kites (*Harpagus bidentatus*). Although local people affirmed that these birds follow *S. inustus* to predate them, field sightings suggested foraging associations. This avian species is predominantly insectivorous, but may also feed from small vertebrates (Fontaine 1980; Boinski and Scott, 1988). Previous records show that insectivorous birds may benefit from association with primates, capturing prey trying to escape from predation. This behaviour helps them catch previously inaccessible prey, raising foraging efficiency and protection against other predators (Boinski and



**Figure 1.** Geographical distribution of the *Saguinus inustus* specimens. See Table 1 for information on each of the records.

Scott, 1988; Egler, 1991). This type of association has been observed in other species of *Saguinus* (Egler, 1991; Haymann, 1992) and other genus of primates (Greenlaw, 1967; Fontaine 1980; Boinski and Scott, 1988; Marsh, 2004; Hankerson, 2006).

*Saguinus inustus* is categorised as least concern in the IUCN red list (2009), but in Amanã the species is relatively abundant, often sighted around manioc gardens and in transects for biodiversity monitoring. No hunting event was recorded for the species, and local people af-

firm that *S. inustus* is not hunted for subsistence due to one of its characteristics - its low weight. The species is, nevertheless, used as a pet, and in some rare cases it is commercialised, as observed by Souza et. al. (2004).

#### 4. Conclusions

Although this study has almost doubled the number of records of *S. inustus*, much more data is needed to better understand its geographical distribution. The study has confirmed the presence of the species in the Amanã

**Table 1.** Update of records of *Saguinus inustus*.

Localities	Coordinates	Habitats	References
1. Colombia, Alto Caño Itilla, upper Río Vaupés	2° N and 72° 47' W	-	Hershkovitz, 1977; Hernández-Camacho and Defler, 1983.
2. Colombia, Caño Grande, upper Río Inírida	2° 10' N and 72° 20' W	-	Hershkovitz, 1977; Hernández-Camacho and Defler, 1983.
3. Colombia, San José del Guaviare	2° 34' N and 72° 39' W	-	Hershkovitz, 1977; Hernández-Camacho and Defler, 1983.
4. Colombia, Angostura, right margin of Guayabero River, Guaviare	2° 34' 31" S and 72° 52' 57" W	Terra Firme	Hernández-Camacho and Defler, 1983.
5. Colombia, Cano Yaviya, Yará River, Caquetá	0° 00' 10" S and 72° 11' 58" W	Terra Firme	Hernández-Camacho and Defler, 1983.
6. Colombia, Mirití-Paraná River, Amazonas	01° 11' 44" S and 69° 53' 26" W	Terra Firme	Defler, 1983; Hernández-Camacho and Defler, 1983.
7. Colombia, vicinity of Comeyafú, 19,000-ha indigenous reserve on the left margin of the Río Caquetá in the state of Amazonas	1° 17' S and 69° 34' W	Terra Firme	Palácios et al., 2004.
8. Brazil, Amazonas, Provação Santa Cruz, Igarapé Turi, right bank Rio Papuri (Uaupés)	0° 38' N and 69° 22' W	-	Hershkovitz, 1977; MPEG-8789
9. Brazil, Amazonas, Mouth of Papuri River, Rio Uaupés	0° 36' N and 69° 13' W	-	Hershkovitz, 1977
10. Brazil, Amazonas, Uaupés River; opposite side of Tahuapunta;	0° 36' N and 69° 11' W	-	Hershkovitz, 1977
11. Brazil, Amazonas, Tabocal, Negro River	0° 48' N and 67° 14' W	-	Hershkovitz, 1977
12. Brazil, Amazonas, Jaúanari	0° 32' S and 64° 49' W	-	Hershkovitz, 1977
13. Brazil, Amazonas, on the north margin of Amanã lake.	-	Terra Firme	Barnett et al., 2002
14. Brazil, Amazonas, Near Boa Esperança community	02° 28' 12" S and 64° 44' 27" W	Terra Firme	Souza et al., 2004
15. Brazil, Amazonas, Janela Monteiro – Parque Nacional do Jaú	02° 36' 22" S and 63° 21' 27" W	Terra Firme	Iwanaga, 2004
16. Brazil, Amazonas, Janela Floresta – Parque Nacional do Jaú	01° 58' 24" S and 62° 43' 19" W	Terra Firme	Iwanaga, 2004
17. Brazil, Amazonas, Maraã, Maguari, on the left margin or Japurá River.	1° 50' S and 65° 12' W	-	MPEG: 21840
18. Brazil, Amazonas, Igarapé Juá Grande / Jaquirana, Amanã Reserve.	02° 28' 11" S and 64° 49' 33" W	-	This study: MPEG 36621; 36622; 36623; 36626; 36627; 36628; 36632 e 36633.
19. Brazil, Amazonas, Margins of Coracizinho River, Amanã Reserve.	02° 35' 27.4" S and 64° 53' 10.6" W; 02° 35' 42.4" S and 64° 52' 56.7" W	-	This study (sighting)
20. Brazil, Amazonas, Boa Esperança community	02° 44' 43" S and 64° 33' 26" W	-	This study (sighting)
21. Brazil, Amazonas, Bom Jesus do Baré community.	02° 28' 37" S and 64° 42' 30" W	-	This study (sighting)
22. Brazil, Amazonas, Belo Monte community.	02° 44' 33" S and 64° 33' 26" W	-	This study (sighting)
23. Brazil, Amazonas, São José do Urini community.	02° 43' 47" S and 64° 44' 53" W	-	This study (sighting)
24. Brazil, Amazonas, Boa Vista do Calafate community.	02° 39' 35" S and 64° 36' 23" W	-	This study (sighting)
25. Brazil, Amazonas, Nova Jerusalém community.	02° 49' 12" S and 64° 37' 07" W	-	This study (sighting)
26. Brazil, Amazonas, UBIM transect, on the right margin of Igarapé Ubim.	2° 30' 37" S and 64° 34' 41" W	Terra Firme	This study (sighting)
27. Brazil, Amazonas, BACABA 01 transect.	2° 33' 54" S and 64° 42' 17" W	Terra Firme	This study (sighting)
28. Brazil, Amazonas, BACABA 02 transect.	2° 33' 32" S and 64° 42' 44" W	Igapó	This study (sighting)

**Table 2.** General characteristics of specimens collected in Amanã Sustainable Development Reserve.

Specimens collected	Date	Sex	TL (mm)	CC (mm)	Weight (g)
MPEG 36621	13/6/2004	female	681	407	650
MPEG 36622	13/6/2004	female	633	381	550
MPEG 36623*	13/6/2004	female	602	374	400
MPEG 36628	14/6/2004	female	635	380	530
MPEG 36632	14/6/2004	female	625	380	440
MPEG 36633*	15/6/2004	female	656	407	560
MPEG 36626	14/6/2004	male	590	343	510
MPEG 36627	14/6/2004	male	630	370	560
Averages ♂			610.00	356.50	535.00
Averages ♀			638.67	388.17	521.67

\* Fur donated to the Mamirauá Institute collection.

**Table 3.** Groups of *S. inustus* sighted in monitoring transects.

Group #	Transect	Habitat	# of individuals
1	Ubim	Terra firme	03
2	Bacaba 01	Terra firme	04
3	Bacaba 02	Igapó	02
4	Bacaba 01	Terra firme	02

area, carrying out the first records of the species in flooded forest habitats. The expected geographic distribution of the species covers 23,464,000 ha, 61% of which are protected, either in indigenous land or protected areas (Figure 1). The assumption that it occurs along all lower Japurá-Negro interfluvium remains to be confirmed. The correct delimitation of its range is of fundamental importance for its conservation. Further studies are urgently needed to assess the status of *S. inustus*, besides long-term research on its ecology and behaviour.

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