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Some Observations on *Callicebus oenanthe* in the Upper Río Mayo Valley, Peru

Melissa M. Mark

Introduction

Callicebus oenanthe was first described by Thomas (1924) from a specimen collected by one Lathan Rutter from Moyobamba on the Río Mayo at 2700 feet (823 m). Housed at the British Museum (Natural History), the holotype is the skin and skull of an adult male, Accession No. 1924.7.11.1 (Napier, 1976). Cabrera (1958) recognized the form as a subspecies of *Callicebus moloch*, and Hill (1960) as a subspecies of *Callicebus gigot* (Spix, 1823). Referring to it as the Isabelline titi, Hill noted that it was known only from the type locality and from "Yurac Yacu [= Yuracyacu], about 20 miles W. N. W. of that [the type] locality, where a female was collected by R. W. Hendee." That specimen was collected in 1926 at an altitude of 2500 feet, and is also in the British Museum (Natural History) (Napier, 1976). Hershkovitz (1963) classified it as a local variety of *Callicebus moloch discolor*. In his later revisions, however, Hershkovitz (1988, 1990) recognized it as a distinct species, characterized by a frontal blaze along the forehead (usually present), buffy or whitish hairs bordering the face, and orange fur on the inner surface of the limbs, chest and belly. It is known only from the upper Río Mayo valley in the northern section of the Department of San Martín, Peru (Hershkovitz, 1990). Besides the localities mentioned, Hershkovitz (1990) also listed a specimen from the Río Seco, 06°09'S, 77°15'W, San Martín, Peru (915 m) in the American Museum of Natural History, New York. Aquino and Encarnación (1994) provided very little information, mentioning only that it was the smallest of the Peruvian titi monkeys, occurring in cloud forest above 800 m, and sympatric with the yellow-tailed woolly monkey (*Oreonax flavicauda*) and the Andean night monkey (*Aotus miconax*). Van Roosmalen *et al.* (2002) agreed with Hershkovitz (1990) in recognizing *C. oenanthe* as a valid species.

Here I report on my findings regarding this species during a brief visit to five sites in the upper Río Mayo valley in the

Department of San Martín, Peru, in June and July 2003 (see Fig. 1).

Results

Site A: Pabloyacu

Pabloyacu is a 640-ha reserve of the Universidad de San Martín, Moyobamba (06°03'51.3"S, 76°56'31.4"W, altitude 951-1200 m asl). It is surrounded by pasture and remnant forest patches that slope down to the Río Mayo at approximately 800 m. Before it was purchased by the University in 1993, the area was heavily used by hunters, as well as for timber, firewood and the cultivation of shade-grown coffee. These activities have ceased and a full-time guard is now employed there. I surveyed this area from 30 May to 8 June 2003, and again from 11-14 July 2003. My assistant surveyed this area from 30 May to 13 June 2003. Early morning calls of *Callicebus oenanthe* were heard from surrounding forest patches, including a forest along a river which was contiguous with the reserve.

Callicebus oenanthe was not seen in the reserve, but was heard calling there twice. Titis were, however, seen on two occasions in the adjacent forest by the river. Much of this river-edge forest was burned for pasture after my first visit; I returned two weeks later and saw no sign of the group. Titis were heard calling every morning in the surrounding valley and foothills. The rarity of *C. oenanthe* in the reserve may have been due to it being near the upper altitudinal limit for the species. The only calls recorded in Pabloyacu were below 1000 m, and local people consistently indicated that *C. oenanthe* was to be found in forests near the lower-altitude pastureland below the reserve. One person claimed he had shot a titi monkey in the reserve prior to its purchase by the University.

Site B: Tarangue

The second site was Tarangue, a 45-ha forest on the banks of the Río Mayo, about 10 miles upriver from the city of Moyobamba (05°58'43.7"S, 76°59'27.5"W, altitude 800-840 m asl). The land is owned by IKAMA Peru, a conservation organization that plans to use the area – a mixture of recovering pastureland and secondary forest – to create a reserve for rescued woolly monkeys, *Lagothrix lagothricha*. It is surrounded by pasture and remnant forest patches of ≤ 100 ha, part of which was purchased in 1998 and part in 2001. Currently there is some plant collection for cultivation, construction and maintenance of minor structures and gardens, and some hunting. I surveyed this area from 9-19 June 2003.

Three groups and one lone titi were seen there. Two of the groups had juveniles, but neither had infants. Morning calls indicated at least one additional group on the property of Tarangue, and two or three other groups on neighboring properties. Individuals were recorded in both seasonally inundated and *terra firma* forest. Titis were heard

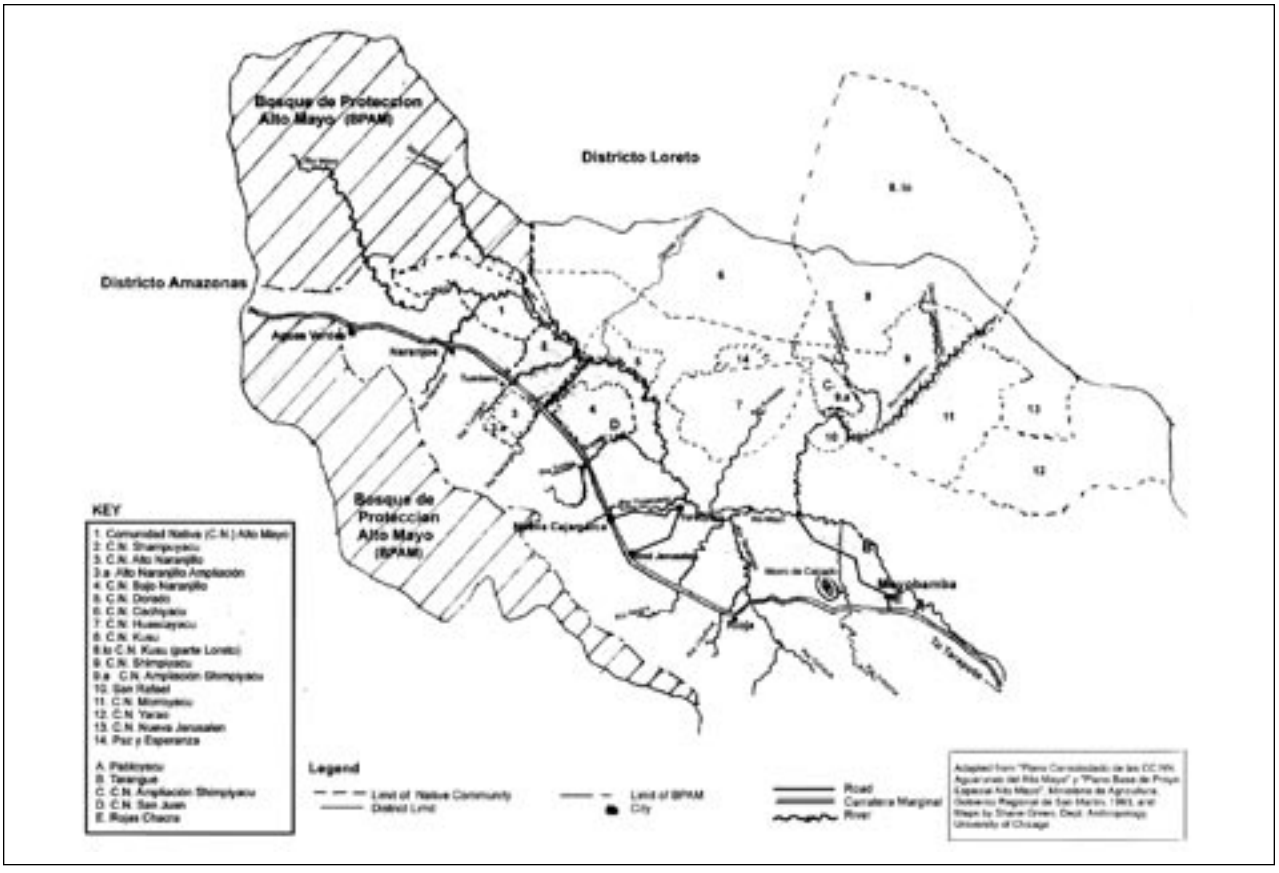

Figure 1. Location of census sites in the Alto Mayo region in the Department of San Martín, Peru.

calling throughout the surrounding valley, and another three groups were seen on a footpath just outside of the property, two in an isolated forest patch of about 7 ha. The forests are being cut down at a relentless rate – one area where titis were recorded was destroyed only two weeks later.

Site C: Comunidad Nativa Ampliación Shimpiyacu
The Ampliación Shimpiyacu is an Aguaruna community area of 4,996 ha (05°50'32.3"S, 77°05'48.6"W, altitude 820-910 m asl). Hunting, by both Aguarunas and recent immigrants, is commonplace, and there is also selective wood extraction. The Río Sukiyacu and its tributaries traverse the area, and here the forests are also being destroyed; I heard chainsaws on a daily basis. I surveyed this area from 26 June to 8 July, 2003. Community members told me that while *C. oenanthe* was not usually targeted by hunters, prey was so scarce that hunters often came home with whatever animal they encountered, including titis. There were very few mammals in the area. Three groups of *C. oenanthe* were seen, one with an infant. In contrast to sites A and B, calls were rarely heard.

Site D: Comunidad Nativa San Juan
I visited another Aguaruna community at the Comunidad Nativa San Juan, part of the Comunidad Nativa Bajo Naranjillo (05°49'7.3"S, 77°17'24.3"W, altitude 811-844 m asl). Local residents initially reported that titis were present, and one was apparently shot on the morning of my arrival. Over the next two days, however, I encountered no sign of them. The majority of the land near the community has been converted into rice fields, and the hunting pressure is heavy.

Site E: Rojas Chacra
In order to evaluate population densities near larger human settlements, I explored two small forest remnants on 9-10 July 2003. These remnants were located less than three miles from the city of Moyobamba (06°00'S, 76°58'W): one of 2 ha at 804 m asl, and another of 4 ha at 807 m asl. The 2-ha fragment had at least six individuals at the time of the survey.

Color Variations
All individuals seen at Pabloyacu most closely resembled the drawing by S. Nash in Van Roosmalen *et al.* (2002, p. 9), with a whitish frontal blaze and orange chest, belly, and inner arms. However, coat color appeared to be light brown agouti, rather than dark brown agouti. All *C. oenanthe* seen at Tarangue had a lighter coat color than was indicated in Van Roosmalen *et al.* (2002). Coat color was a buff agouti, with a whitish frontal blaze. The chest, belly and inner arms were uniformly orange, but lighter in color and contrasting less with the back coloration than those at Pabloyacu. My field assistant also reported one individual at Site B, Tarangue, of the same general appearance, but with a black transverse blaze and light brown agouti crown and sideburns, with no white facial hairs. All individuals seen at Ampliación Shimpiyacu were markedly darker than is indicated in the description of Hershkovitz (1990) and the illustration in Van Roosmalen *et al.* (2002). At Shimpiyacu, *C. oenanthe* had a very dark brown agouti coat color, with a white frontal blaze that contrasted markedly with the dark brown agouti color of the crown and sideburns. The white blaze was also wider than individuals from other sites. In addition, the chest, belly, and underarms were a red-orange.

Interviews
I conducted interviews with residents of the native communities of Bajo Naranjillo, San Juan (Extension of Bajo Naranjillo), Alto Mayo, Shampuyacu, and the mestizo communities of Yuracyacu, Tumbaro, and Paz y Esperanza (Fig. 1). The interviewees were shown a drawing and a photograph of *Callicebus oenanthe*, and were played a recording of the long calls of *C. brunneus*. In addition to attesting to the presence or absence of *C. oenanthe* in their own communities, many people indicated where they knew these monkeys to be present. The results are shown in Table 1. Negative replies were obtained for the Comunidad Nativa Bajo Naranjillo (one interviewee), the Comunidad Nativa Alto Mayo (three interviewees) and Paz y Esperanza (one interviewee). See Figure 1 for community locations in the Department of San Martín.

Hunting and Pets
Titis are not actively sought by hunters, but they are more likely to enter the pot when other game becomes scarce. Aguaruna hunters do not raise domestic animals and depend entirely on game for their protein. *C. oenanthe* are popular in the local pet trade, and I encountered infants and juveniles in the market in Moyobamba. There are also many captive primates, including *C. oenanthe* and *Aotus miconax*, in various "tourist centers" of the upper Mayo valley.

Conclusions

Although small populations of *Callicebus oenanthe* remain in forest fragments near human habitations and agricultural fields, as well as in more remote areas such as the forests in native communities, the extremely rapid rate of deforestation that I witnessed makes it unlikely that they are healthy or sustainable. Many of the forest fragments have been isolated within the last five years, and abnormally high population density after recent isolation usually results in a population crash and local extinction (Laurance and Bierregaard, 1997). In the space of six weeks, I personally witnessed at least three incidents in which *C. oenanthe* territory was destroyed. In addition, the majority of forest fragments that I observed were separated by at least 20 m of open pastureland or agricultural fields.

The majority of the records of the presence of titis (sightings and calls) were made within 20 m of rivers and streams. Other sightings were in inundated or seasonally inundated forest, possibly indicating a particular affinity to gallery forests and swamp areas. I observed a preference for swamp and gallery forest in both highly disturbed and relatively intact forests. However, June/July is the beginning of the

Table 1. Localities for *Callicebus oenanthe* based on interviews. C.N. = Comunidad Nativa.

Location	Present	Interviewee	Occupation
1. C. N. San Juan	Yes	Eduardo Gomez Allui	Apo (chief) of community
	Yes	Edward Gomez Antuash	Son of E. Gomez
2. Tumbaro	Yes	Jorge Dias	Wood extraction/farmer >5 years
3. C. N. Cachiyacu	Yes	Adolfo Juep	Chief of CNBN/Bilingual Aguaruna teacher
4. C. N. Huascayacu	Yes	Adolfo Juep	Chief of CNBN/Bilingual Aguaruna teacher
	Yes	Ricardo Yagkitai Wajcui	Member C. N. Alto Mayo/Park Guard BPAM
	Yes	Fermin Yagikai Entsakua	Subchief C. N. Alto Mayo
	Yes	Nikolo Huataugasi Flores	Secretary C. N. Alto Mayo
	Yes	Elderly resident	C. N. Shampuyacu
5. C. N. Bajo Naranjillo	No	Adolfo Juep and wife	Chief of CNBN/Bilingual Aguaruna teacher
6. C. N. Alto Mayo	No	Fermin Yagikai Entsakua	Subchief C. N. Alto Mayo
	No	Nikolo Huataugasi Flores	Secretary C. N. Alto Mayo
	No	Ricardo Yagkitai Wajcui	Member C. N. Alto Mayo/Park Guard BPAM
7. C. N. Dorado	Yes	Ricardo Yagkitai Wajcui	Member C. N. Alto Mayo/Park Guard BPAM
	Yes	Fermin Yagikai Entsakua	Subchief C. N. Alto Mayo
	Yes	Nikolo Huataugasi Flores	Secretary C. N. Alto Mayo
8. C. N. Morroyacu	Yes	Ricardo Yagkitai Wajcui	Member C. N. Alto Mayo/Park Guard BPAM
	Yes	Fermin Yagikai Entsakua	Subchief C. N. Alto Mayo
	Yes	Nikolo Huataugasi Flores	Secretary C. N. Alto Mayo
	Yes	Eduardo Gomez Allui	Apo (chief) of C. N. San Juan
9. Yuracyacu	Yes	Elderly resident	C. N. Shampuyacu
	Yes	Ricardo Yagkitai Wajcui	Member C. N. Alto Mayo/Park Guard BPAM
	Yes	Fermin Yagikai Entsakua	Subchief C. N. Alto Mayo
	Yes	Nikolo Huataugasi Flores	Secretary C. N. Alto Mayo
	Yes	Manueal Cabrera Moncado	Resident >5 years
10. Paz y Esperanza	No	Wagner Corbaja	President of community of Paz y Esperanza

dry season, and it is possible that reliance upon these areas increases at this time.

The Río Mayo valley is under severe threat from deforestation, mainly for agriculture. Like many areas of the eastern Andes, the Alto Mayo has experienced a large wave of immigrants over the last three decades (Young and León, 1997) and in the last 20 years, the region has lost nearly 40% of its forest cover, nearly all of it in the low-altitude river basins (Rengifo, 1994). Deforestation has increased since the recent completion of a major two-lane paved highway connecting Tarapoto to Aguas Verdes (Fig. 1), La Carretera Marginal. From 1989-1992, rice cultivation in San Martín increased by 48%, from 109,729 ha to 163,147 ha in cultivation (Rengifo, 1994). I was unable to find any data for the last 15 years, but during the 1980s, prior to the completion of the Carretera Marginal, the rate of deforestation was approximately 40,000 ha per year, in a district with a total area of 5,135,085 ha. Rice is most often cultivated in lowland areas near major rivers, which is also the preferred habitat of *C. oenanthe.*

Rowe and Martinez (2003) visited the Río Mayo valley looking for *Callicebus oenanthe* in October 2002. They surveyed a number of areas, but had little luck in finding them. They heard titis on the north bank of the Río Mayo at the confluence with the Río Huallaga, but were unable to determine which species they were. They also visited the Bosque de Protección de Alto Mayo, which extends from the town of Rioja north along the border between the Departments of San Martín and Amazonas. They were unable to find any evidence that titi monkeys occurred there, and indicated that it may be due to the high elevation (1080 m asl). They found the same situation at the Reserva del Morro de Calzada at 1074 m asl. They photographed a pair of *C. oenanthe* which were trapped near Rioja (see Fig. 1). Rowe and Martinez (2003) also pointed to the Carretera Marginal as a source of immigrants and increased forest destruction, and indicated a bleak situation regarding the forests in the upper Río Mayo valley, finding that most had been cleared between 750 and 950 m asl for rice cultivation over the last 20-30 years.

Although little attention is being given to forest conservation in this region, there is potential for establishing protected areas for *C. oenanthe*. The large community of Aguaruna Indians is well-organized, and undoubtedly has an important role to play in the conservation of this species. The Department of San Martín has 13 municipal protected areas, but most are poorly demarcated and routinely invaded by immigrants. Each native community has been granted large tracts of forest, and although the Aguaruna rent their land to immigrant farmers for the cultivation of rice, papayas, and coffee, they control over 100,000 ha – much of it

forested. *C. oenanthe* is still at risk in these areas, since its preferred habitat is also sought after by rice-farmer tenants. Perhaps of note is that *C. oenanthe* near the banks of the Río Mayo differs in color from populations of *C. oenanthe* in the Aguaruna territory to the northeast. If conservation efforts intend to protect both color morphs, then action will need to be taken outside of native lands as well.

Conservation efforts should also be made to protect small populations in isolated fragments, encouraging landowners to preserve them on their land while management plans can be drawn up and put into action. The first step in this process should be an intensive survey of all potential *C. oenanthe* habitat in both the lower and upper regions of the Alto Mayo valley, with particular attention paid to determine the distributions of the different color morphs.

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Group, Range, and Population Size of *Alouatta pigra* at Monkey River, Belize

Mary S. M. Pavelka

Introduction

A number of studies of the Belizean black howling monkey, *Alouatta pigra*, have been published over the past 10 years, not only contributing to the growing information base for this species, but also suggesting greater variability in behavior and ecology within the genus than had been previously recognized (Brockett and Clark, 2000; Brockett *et al.*, 1999a, 1999b, 2000a, 2000b; Clark and Brockett, 1999; González-Kirchner, 1998; Horwich *et al.*, 2001a, 2001b; Ostro *et al.*, 1998, 2000, 2001; Silver *et al.*, 1998; Treves *et al.*, 2001). While howlers in general are considered to be the most folivorous of the New World monkeys, the earliest reports of *A. pigra* described it as frugivorous (Coelho *et al.*, 1976; Schlichte, 1978). It has become clear, however, that while Central American black howlers can survive for long periods on just leaves (Horwich and Lyon, 1990), fruit and other reproductive plant parts are consumed whenever available (Silver *et al.*, 1998, 2000; Ostro *et al.*, 1999). Silver *et al.* (1998) reported that fruit consumption comprises 48% of the monthly feeding time, and they described *A. pigra* as being as frugivorous as possible and as folivorous as necessary.

Directly relevant to this paper are the significantly smaller group sizes reported for *A. pigra* (2-10 individuals per