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A NEW POPULATION OF RED UAKARIS (*CACAJAO CALVUS* SSP.) IN THE MOUNTAINS OF NORTH-EASTERN PERU

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Abstract

Here we report on the discovery of a new population of red uakaris in the mountains of northern San Martín, north-eastern Peru. This population is isolated from the other known uakari populations in the eastern lowlands, which raises questions concerning their taxonomic status and biogeographical history. This follows a recent range extension of this taxon west of the Ucayali River. Previously, the Peruvian red uakari (*Cacajao calvus ucayalii*) was only known in Peru from the lowlands between the Amazon, Ucayali and Yavarí Rivers.

Keywords : *Cacajao*, red uakari, Peru, range extension

Resumen

Reportamos aquí el descubrimiento de una nueva población de uakaris calvos en las montañas del norte de San Martín, nororiente del Perú. Esta población se encuentra aislada de las otras poblaciones conocidas de uakaris en las tierras bajas del oriente, lo cual genera preguntas relacionadas con su estatus taxonómico e historia biogeográfica. Esto se da después de una reciente extensión del rango de este taxon al occidente del Río Ucayali. Previamente, el uakari calvo peruano (*Cacajao calvus ucayalii*) era conocido en Perú solamente de las tierras bajas entre los ríos Amazonas, Ucayali y Yavarí.

Palabras clave : *Cacajao*, uakari calvo, Perú, extensión de rango

Introduction

The distributions of many primate species in Peru and other South American countries are still not well known. New taxa and populations are still detected (Aquino *et al.*, 2008; Boubli *et al.*, 2010; Bóveda-Penalba *et al.*, 2009; Röhe *et al.*, 2009; Defler *et al.*, 2010; Vermeer *et al.*, 2011), and much more research is still needed to understand the distribution and taxonomy of Peruvian primates. According to Hershkovitz (1987), *Cacajao calvus ucayalii* is the subspecies of red uakari occurring in Peru. Its distribution was generally thought to range from the east bank of the Ucayali River eastwards to the Yavarí River and from the Amazonas River in the north to the Urubamba River in the south (Aquino and Encarnación, 1994). Recently, Bowler *et al.* (2009) reported on the presence of the species on the west bank of the Ucayali River, in the Pacaya-Samiria National Reserve (see Fig. 3), demonstrating that major rivers are not absolute geographical barriers for uakari dispersal. However, the extent of this population is unclear and is assumed to be small (Bowler *et al.*, 2009). Peruvian red uakaris are often thought to be flooded-forest specialists

(Kinzey, 1997), but recent work by Heymann and Aquino (2010) showed that most records of this subspecies come from *terra firme* forest. The related black-headed uakaris (*Cacajao hosomi*) are also reported to inhabit a wide variety of forest types (Boubli, 1999).

To date, *Cacajao calvus ucayalii* has been recorded only at low altitudes, the highest being 600-700 m a.s.l. (Heymann and Aquino, 2010). During the surveys in 2007 and 2008 on the distribution of the endemic and critically endangered San Martín titi monkey (*Callicebus oenanthe*) by the Proyecto Mono Tocón (Bóveda-Penalba *et al.*, 2009; Vermeer *et al.*, 2011), we received information from local inhabitants on the presence of red uakaris in the mountains of the northern San Martín Department, Peru. As red uakaris were only known to live in the eastern lowlands (Hershkovitz, 1987), we considered this information as unreliable. However, reports of sightings increased and we decided to investigate the situation. In 2009, we encountered an American anthropologist who not only informed us that he had seen uakaris in northern San Martín, but also provided us with pictures of a dead specimen killed

during a hunting party expedition that he had witnessed (Shane Green, personal communication to Jan Vermeer) (Fig. 1 and 2). Additionally, we obtained pictures of Awajun people, the indigenous community of northern San Martin, with head-dresses made from red uakari skins.



Figures 1 and 2. Male red uakari killed during a hunting party in the Cordillera Cahuapanas (photo courtesy of Shane Green).

With this information, we organised field trips in 2009 and 2010 to collect scientific evidence for the presence of red uakaris in the mountains of northern San Martin.

Methods

We reviewed the literature on the distribution and taxonomy of *Cacajao* in Peru, and conducted interviews with local habitants of northern San Martin. Most of the interviewees were farmers whose plantations were in or near the forest and who regularly went hunting. Therefore, their knowledge of local wildlife was good. For the interviews, we used a series of pictures of 15 primate species that occur in Peru. The interviewed person had to name all primates that he recognized and was asked if he had ever seen them in his area. After the interview, we together judged the reliability of the information supplied. We double-checked positive reports on the presence of uakaris with other inhabitants, to determine where field surveys could lead to observations of red uakaris. Based on the information obtained, we selected three study localities on the southern slope of the central mountain range (la Cordillera Cahuapanas) for field studies (Localities 1, 3 and 4 - Fig. 3) and two sites north of the mountain range; one near the border of the Amazonas and Loreto Departments (Locality 6 - Fig. 3) and one in the Datem del Marañón Province, Loreto Department (Locality 7 - Fig. 3). On the way to survey sites, we interviewed local inhabitants to gather additional data on the presence of uakaris in the area (Localities 2 and 5 - Fig. 3).

The localities in the Cordillera Cahuapanas were several days walking distance from existing roads and well-prepared expeditions with guides and mules were necessary to reach the study sites. The other study sites could easily be reached by car and foot. Once we arrived at the chosen site, we erected a field camp and used the following days to survey the area surrounding the camp to determine if uakaris were present. We used the so-called "travel reconnaissance walks" as our survey method (Walsh and White, 1999), using pre-existing paths that were normally used by hunters or local people collecting forest products. Encounters with uakaris and other primate species were documented. When possible, the animals were photographed and filmed, and the GPS coordinates were noted.

Study areas

Cordillera Cahuapanas

The Cordillera Cahuapanas is a mountain range situated on the northern side of the Alto Mayo Valley. It is the border between the San Martin and Loreto Departments, and separates the Alto Mayo Valley from the Amazon lowland. For several species, like the endemic San Martin titi monkey (*Callicebus oenanthe*), it acts as geographical barrier to their distribution (Bóveda-Penalba *et al.* 2009). A detailed description of the geology and vegetation of the Central Cordillera Cahuapanas is provided by Treidel (2004). All forest

types above 1000 m a.s.l. were regarded as Montane Forests in field classification. According to their topographic position, Treidel (2004) divided the Montane Forest into *Montane Crest Forests*, *Montane Slope Forests* and *Montane Swale Forests*. The *Montane Slope Forest* was the most prevalent and widespread vegetation type in the Central Cordillera Cahuapanas, covering the slopes of the investigated area between 1500 and 1800 m a.s.l. With some exceptions, the tree height doesn't exceed 23 m, while the mean canopy height is only 15 m. The trees of the *Montane Swale Forests* are considerably higher, with a mean canopy height of approximately 23 m and some trees reaching heights of 36 m. *Montane Swale Forests* occur in depressions at different elevations in the Central Cordillera Cahuapanas and were recorded between 1000 m and 1570 m a.s.l. Dominant tree species do hardly vary from those of the Crest and Slope Forests. The most frequent palm tree is *Huacra pona* (*Socratea exorrhiza*), constituting between 20 and 30 % of all woody individuals in some zones. Rubiaceae, Lauraceae and Melastomataceae were the species-rich families in the Cordillera Cahuapanas between 1000 and 1840 m a.s.l., followed by Arecaceae, Clusiaceae, Euphorbiaceae and Sapotaceae. According to Treidel (2004), the flora of the montane forests of the Cordillera Cahuapanas contains

typical elements of the lower as well as of the higher elevations, with a tendency towards the higher elevations.

Datem del Marañón

Between the Cordillera Cahuapanas, the Marañón and Huallaga Rivers, there is a vast area of lowland forest, part of the Datem del Marañón and Alto Amazonas Provinces, Loreto Department (Fig. 3). This area is approximately 16,000 km² and its altitude varies from 130-300 m a.s.l.. Considering that bald uakaris are usually known only from lowland forest, we assumed that they could live in that area and could have dispersed from the lowlands into the Cordillera Cahuapanas. As no biological information was available from that region, we decided to visit the small river town of Saramiriza (locality 7 - Fig. 3) to collect additional information. On our way to Saramiriza, we also conducted interviews at Santa María de Nieva (locality 6 - Fig. 3), which is near the border of the Amazonas and Loreto Departments.

Results

We encountered individuals of *Cacajao* only at two sites within the selected localities; these were near Candamo and

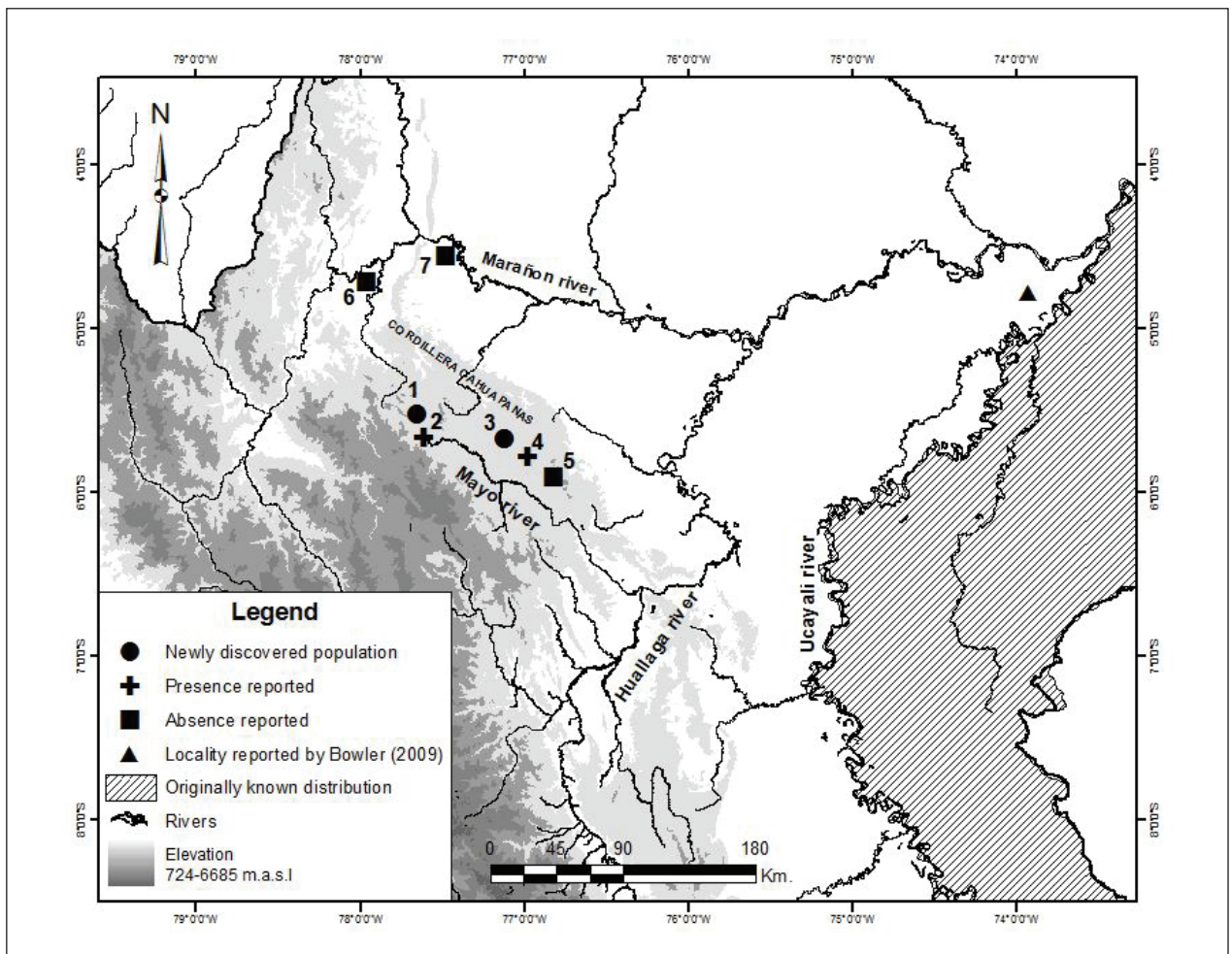


Figure 3. Study sites: Candamo (1); Aguas Verdes (2); Kusu (3); the border of the Yarau territory (4); El Alamo (5); Santa María de Nieva (6) and Saramiriza (7).

near the native community of Kusu, both in the Cordillera Cahuapanas. In September 2009 we observed, during an expedition of seven days, two uakaris near the settlement of Candamo (05°31'S 077°39'W; altitude 1,421 m a.s.l.). The specimens were observed from several hundred meters away using 10×40 binoculars and we were not able to take photographs. Inhabitants of the Candamo sector are well acquainted with the species, which they call “mono corulo”, meaning “the monkey without a tail”. A hunter even described the beautiful green eyes of a female that he had killed (at an altitude of 1,312 m a.s.l.). The species is usually not being hunted as it is too small, and the hunter regretted his deed. A second visit of 10 days to the Candamo area in April 2010 resulted in more reports from local settlers, but no observations. The presence of *Cacajao* was also reported along the path to Candamo, near Aguas Verdes (05°40'S 077°36'W; altitude 1,004 m a.s.l.).

Our 6-day expedition in July 2010 to Santa María de Nieva (04°35'S 077°52'W; altitude 208 m a.s.l.) and Saramiriza (04°33'S 077°26'W; altitude 148 m a.s.l.), on the right bank of the Marañón River and north-west of the Cordillera Cahuapanas, didn't result in any evidence that uakaris live in that area. Elders of the (native) community indicated that they had observed the species near Iquitos (which is well within their known distribution range), but never on their territory. From 18-25 of August 2010 we surveyed the area on the border of the Awajun community of Kusu (05°40'S 077°07'W; altitude 1,115 m a.s.l.). There is little human disturbance in this remote site, and already on the first day we encountered a group of 30 bald uakaris. The animals were afraid of humans, but we observed very well the group, consisting of adults, juveniles and carried infants and could take photographs and videos. No uakaris were seen during the rest of the survey.

During our last expedition from 8-17 November 2010, local settlers reported that no uakaris have ever been seen near El Alamo (05°54'S 076°50'W; altitude 1,416 m a.s.l.) or elsewhere in their territory. However, one person had observed the species on the territory of the neighbouring Awajun Yarau community. Therefore we set up our camp on the border of their territory and the Yarau community (05°54'S 076°49'W; altitude 1,021 m a.s.l.). During the eight days that we surveyed the area, no uakaris were observed. This site is some 35 kilometres east of Kusu and also south of the Cordillera Cahuapanas (Fig. 3), and was chosen to investigate the eastern extent of the population.

The living and dead animals we saw during our surveys and on the pictures mentioned before match phenotypically with *C. c. ucayalii*, although they might be slightly larger.

During the study we collected data on the distribution of 11 other primate species, of which 6 were observed (Table 1).

Table 1. Reports and observations of other primate species at three study localities on the southern slope of the central mountain range (la Cordillera Cahuapanas), and two additional ones near the border of the Amazonas and Loreto Departments and in the Datem del Marañón Province, Loreto Department, Peru.

Locality	Observations		Reports
	Species	Altitude (m a.s.l.)	Species
Candamo	<i>Ateles belzebuth</i>	1,162	-
	<i>Alouatta seniculus</i>	1,412	-
	<i>Cebus apella</i>	1,163	-
	<i>Cebus albifrons</i>	1,200	-
	<i>Saguinus fuscicollis</i>	1,370 + 1,170	-
Saramiriza	<i>Saguinus fuscicollis</i>	148	<i>Ateles belzebuth</i>
			<i>Ateles chamek</i>
			<i>Alouatta seniculus</i>
			<i>Cebus albifrons</i>
			<i>Cebus apella</i>
			<i>Callicebus discolor</i>
			<i>Pithecia sp.</i>
			<i>Aotus sp.</i>
			<i>Saimiri sciureus</i>
			<i>Callithrix pygmaea</i>
Kusu	<i>Lagothrix poeppigii</i>	1,046	
	<i>Saguinus fuscicollis</i>	1,065	
Yarau	<i>Cebus apella</i>	1,021	
	<i>Saguinus fuscicollis</i>	1,370	
El Alamo	<i>Pithecia sp.</i>	1,309	

Discussion

The discovery of this population of red uakaris is of great biogeographic and conservation interest. The population is separated from the known population in the east by more than 365 kilometres and by the wide and fast flowing Hualaga River. Although uakaris have recently shown to exist west of the Ucayali River (Bowler *et al.*, 2009), the western extent of this population is thought to be limited as the species has never been observed in the western part of the Pacaya-Samiria National Reserve (personal communication with guides living on the western border of the reserve to Jan Vermeer). The large gap between the populations is difficult to explain. The forest between both populations is continuous, and there are relatively few people living in the area. Common woolly monkeys (*Lagothrix poeppigii*), which we observed near Kusu (Locality 3 - Fig. 3), also live in the Pacaya-Samiria National Reserve (personal observations, Jan Vermeer). The same is true for saki monkeys (*Pithecia sp.*), although the taxonomy of this genus is unclear and it is possible that the species observed during this study is different from the animals in the Pacaya-Samiria National Reserve. The Brazilian subspecies of *Cacajao calvus calvus* and

Cacajao calvus rubicundus seem to have disjunct distribution ranges, although their precise distribution is still poorly understood (Veiga *et al.*, 2008). Our observations become even more interesting as they extend the recorded altitudinal range of the species. The animals in Kusu were encountered at an altitude of 1,115 m a.s.l., and we observed some individuals at an altitude of 1,421 m a.s.l. near Candamo. This is more than 700 meters higher than the former highest known altitude for Peruvian red uakaris (Heymann and Aquino, 2010). Only one other uakari species, the black *Cacajao hosomi*, is also known to be flexible in altitudes, as it has been reported from both the lowland and the montane forests at altitudes of 1,500 m in Pico da Neblina Tepui mountain (Boubli, personal communication). Black uakaris are known to migrate seasonally to other areas, following the seasonal variation in fruit availability (Boubli 1999). It is possible that San Martín's uakaris have descended in the past into the lowland forests of the Alto Mayo Valley (800–1,000 m a.s.l.), towards the Mayo River, as local inhabitants reported that the species occupied once the lowlands south of the Mayo River (personal communication of local settlers to Julio C. Tello-Alvarado). The flooded forests near the Mayo River resemble in many aspects the forests of the Amazon lowlands. The Aguajal palm (*Mauritia flexuosa*) is common and the Aguajal swamp forests are comparable to those in the Amazon lowlands where *Cacajao calvus ucayalii* is common (Börner, 2000). In eastern Peru, the fruit of *Mauritia flexuosa* is an important food resource for *Cacajao calvus ucayalii*, although probably not essential (Aquino and Encarnación, 1999; Bowler and Bodmer, 2011). However, since the completion in 1975 of the Carretera Marginal through the Alto Mayo Valley, immigration and illegal settlement has resulted in a high annual human population growth and much forest has been converted to agricultural lands. In most areas, the connection between the montane forests and the lowland forests has been disrupted. If access to the lowland forest of the Alto Mayo Valley was essential for the survival of this population, the disruption of the connection between the Cordillera Cahuapanas and the lowland forests, with its extensive Aguajal swamps, could have serious consequences for its future. On the other hand, the review of the habitat of *Cacajao calvus ucayalii* by Heymann and Aquino (2010) shows that the species is flexible, and it is possibly that these uakaris are able to adapt to a new situation.

We were not able to determine the extent of the distribution range of this population within the confines of this study, but assume it to be small. The most western observation, in the Candamo sector, is on the eastern border of the Bosque de Protección Alto Mayo, a large nature conservation area. If the species were widespread further west, it would already have been reported by guards or scientists working in the reserve. The most eastern of the new localities from where the species is reported here is the native community of Yarau, only 100 km east of the Candamo sector. It is not reported from the lowlands north of the Cordillera Cahuapanas, while most of the southern lowlands have been

deforested. Additional surveys will be needed to estimate the total distribution range of the population. More interviews with the native communities living north of the Mayo River may result in more data on the (historical) distribution range of the species, and the importance of the lowland forests near the Mayo River for this population.

Considering their distant separation from the other populations, one could expect to find genetic differences and that the mountain uakaris represent a new taxon, as was the case in the black uakaris reported by Boubli *et al.* (2008). Additional studies should provide evidence as to whether this is correct or if these animals represent a separate population of *Cacajao calvus ucayalii*. In any case, the population seems to be small and have a restricted range. Given their possible ecological discrepancy from other red uakari populations (i.e. altitudinal range) efforts to protect these "mountain red uakaris" and their habitat are urgent. Proyecto Mono Tocón intends to assist local organisations with the protection of their mountain habitat.

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