SHORT COMMUNICATION

A noteworthy elevational record of the Southern naked-tailed armadillo *Cabassous unicinctus* in Colombia, with comments on the species distribution in the country

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Abstract We present a new altitudinal record of the Southern naked-tailed armadillo *Cabassous unicinctus* in Colombia based on video and photographic records obtained with camera traps inside a forest located at 1,200 m asl, close to Churumbelos Natural National Park, in the Andean foothills of the Amazon Basin of Colombia. Furthermore, we reviewed records of the species available in the literature and museums. We found that the species was previously known from less than 10 localities between 0 and 600 m asl. Our review of the records for this species in Colombia shows that our finding constitutes the highest elevation and the westernmost known record for this armadillo in the country.

Keywords: Amazon, Andean foothills, *Cabassous centralis*, camera-trap, Cauca, Cingulata

Un registro altitudinal notable del armadillo coiletrapo amazónico *Cabassous unicinctus* en Colombia, con comentarios sobre la distribución de la especie en el país

Resumen Presentamos un nuevo registro altitudinal del armadillo coiletrapo *Cabassous unicinctus* en Colombia a partir de registros de vídeo y fotográficos obtenidos con cámaras trampa al interior de una selva Andina a 1.200 msnm, área aledaña al Parque Nacional Natural Churumbelos, zona del piedemonte andino-amazónico de Colombia. Además, revisamos los registros de la especie en Colombia disponibles en literatura y museos. Encontramos que la especie era conocida previamente de menos de 10 localidades entre los 0 y 600 msnm. Nuestra revisión de los registros de esta especie en Colombia indica que este hallazgo constituye el de mayor elevación y el más occidental conocido para este armadillo en el país.

Palabras clave: Amazonas, *Cabassous centralis*, Cauca, Cingulata, Piedemonte Andino, trampa cámara

The Southern naked-tailed armadillo *Cabassous unicinctus* (Linnaeus, 1758) is distributed east of the Andes in Colombia, Venezuela, Ecuador, and Peru (*C. u. unicinctus*), as well as in Bolivia, the Guianas, Brazil, and northeastern Paraguay (*C. u. squamicaudis*; Anderson, 1997; Wetzell *et al.*, 2008; Smith *et al.*, 2011). This species inhabits different types of

habitats, including forest and grasslands (Emmons & Feer, 1990).

Cabassous unicinctus is characterized by its highly fossorial habits (Smith *et al.*, 2011). The abundance of food and, perhaps, coexistence with similar species can influence the activity patterns of the species (Meritt, 1985; Bonato *et al.*, 2008). For example,

C. unicinctus is reported to be nocturnal throughout its range (Emmons & Feer, 1990; Hayssen, 2014), but diurnal in the Brazilian Cerrado, frequently appearing during daytime in months of reduced arthropod biomass (Bonato *et al.*, 2008).

In Colombia, *C. unicinctus* is known from less than ten localities, ranging from sea level to 600 m asl (Solari *et al.*, 2013). Information on its distribution is contradictory, with some authors considering the species distributed only in the Orinoco and Amazon regions (eastern Colombia; see Cuervo Díaz *et al.*, 1986; Wetzel *et al.*, 2008; Hayssen, 2014), whereas others include the Sierra Nevada de Santa Marta (SNSM), Perijá massif, and the Caribbean region (Alberico *et al.*, 2000; Solari *et al.*, 2013). However, the distribution of *C. unicinctus* is defined as cis-Andean in recent accounts, with no overlap with the trans-Andean *C. centralis* (Hayssen, 2014).

Here, we present a new record of *C. unicinctus* from Colombia (FIG. 1). We also consolidate the information on the distribution of *C. unicinctus* in Colombia by reviewing specimens and records in the literature (FIG. 2; TABLE 1).

During the implementation of the TEAM monitoring protocol (<http://www.teamnetwork.org/>) of the Biocuenas project led by Conservación Internacional Colombia, we installed 60 trap cameras

between 2016 and 2017 in the Amazonian Andean foothills of Colombia as an initiative to identify Objects of Conservation Value. One record was of a Southern naked-tailed armadillo. The new record is based on three photographs and a short video of one individual in a sub-Andean forest located on the Andean slopes of the Amazon basin, in San Juan de Villalobos village, municipality of Santa Rosa, Department of Cauca, Caquetá River Basin, southwestern Colombia (1°25'16.55"N, 76°25'39.32"W; 1,200 m asl). The record was obtained on 8 December 2016 at 03:45 h using a Bushnell Camera trap. The individual was identified as belonging to the genus *Cabassous* based on the shape of the carapace and the short tail without notable scales (FIG. 1; <https://www.youtube.com/watch?v=vM2Id1zDr0w>). Although specific diagnostic characters could not be verified from the photographs, the animal was identified as *C. unicinctus* because the locality of the record is on the eastern slopes of the Eastern Cordillera of Colombia. This is quite far (>500 km) from the trans-Andean distribution of the other species of the genus (*C. centralis*) registered in the country. In the video, the armadillo performs two digging attempts, with the second one occurring as the individual was leaving the area. This behavior has been reported as a body rotation while the armadillo digs, forming a round burrow (Carter & Encarnaço, 1983). No

FIGURE 1. Photographic record of *Cabassous unicinctus* from San Juan de Villalobos, Department of Cauca, southwestern Colombia.

additional information could be obtained from the video and photographs. The only other xenarthrans detected with the same camera trap arrays at San Juan de Villalobos were the nine-banded armadillo *Dasypus novemcinctus* and the southern tamandua *Tamandua tetradactyla*.

Our literature search revealed that there are two additional camera trap records of *C. unicinctus* in Colombia (TABLE 1). The first one is from Alto Fragua, Indi-Wasi Natural National Park, but no additional information was provided. The second record was obtained at La Resaca Natural Municipal Park on 25 December 2016 at 03:00 h, using a camera trap installed in front of a *C. unicinctus* burrow located in an open area with some plants of *Bellucia pentamera*. Additional camera trapping efforts focused on armadillos have been carried out in Casanare and Meta departments, but they failed to detect *C. unicinctus* (Trujillo & Superina, 2013; Aya-Cuero *et al.*, 2017).

Apart from the records from Alto Fragua and La Resaca, we only found eight records in the literature and museum specimens (TABLE 1), plus two considered dubious (FIG. 2). Of these, only one (department of Meta, Villavicencio; Wetzel *et al.*, 2008) is supported by voucher specimens. In addition, specimens with unknown location have been maintained in captivity at finca El Turpial (Cortés Duarte *et al.*, 2015), and Bioparque Los Ocarros (Trujillo & Superina, 2013). Additional museum records come from Villavicencio, in Ocoa, and the department of Meta, Puerto Lleras, Casibare (TABLE 1). Specimens from Villavicencio at Museo de La Salle (MLS) constitute the oldest records from Colombia and were collected between 1930 and 1932 (TABLE 1).

Records from the department of Putumayo, La Paya Natural National Park, and Guainía, Puinawai National Natural Reserve, are based on interviews but no additional information was provided (TABLE 1). We obtained two additional localities in the department of Guaviare, at La Lindosa and El Retorno, based on interviews performed by one of us (JPL) in 2016. We considered the interview-based records as belonging to *C. unicinctus* because the localities are located in the Amazon region of Colombia (~250 km east of the Eastern Cordillera), where *C. centralis* has never been recorded.

Records from the department of Cesar, Perijá (Corredor-Carrillo & Muñoz-Saba 2007; Muñoz-Saba, 2009) are controversial and contradictory due to the lack of supporting information, such as voucher specimens or photographic evidence, that would allow definitive assignment to either *C. centralis* or *C. unicinctus*. Furthermore, these records are from localities west of the Andes of Colombia, where *C. unicinctus* has not been registered previously (see Cuervo Díaz *et al.*, 1986; Eisenberg, 1989; Wetzel *et al.*, 2008; Hayssen, 2014).

FIGURE 2. Locality records of *Cabassous unicinctus* in Colombia. Squares: Records based on voucher specimens at Instituto de Ciencias Naturales and Museo La Salle. Orange circles: Records based on camera traps. Blue circles: Records based on interviews. Stars: Dubious records in literature.

Records of the species in northern Colombia (Caribbean region and Sierra Nevada de Santa Marta; Alberico *et al.*, 2000; Solari *et al.*, 2013) seem to be based on the observations provided by Allen (1904; as *C. lugubris*). Nevertheless, Allen (1904) noted that *Cabassous* from northern Colombia (west of the Andes) and the Caribbean region is morphologically closer to *C. centralis*, and recent reviews have included these records in the synonym of the latter (Wetzel *et al.*, 2008). To our knowledge, there are no trans-Andean *C. unicinctus* vouchers in any Colombian mammalogical collection. As a consequence, records of *C. unicinctus* from Cesar department, Perijá (Corredor-Carrillo & Muñoz-Saba, 2007; Muñoz-Saba, 2009) are considered dubious, and their validation requires additional evidence. A similar problem has been observed in the two closely related species of tamanduas (genus *Tamandua*) from Colombia (Alzate-Gaviria *et al.*, 2016), where historical records have not been properly examined and evaluated, causing confusion as to the distribution of each species.

In conclusion, the specimen described here constitutes the westernmost record in Colombia (by ~60 km) and extends the altitudinal range of the Colombian population of the species by around 600

TABLE 1. Locality records of *Cabassous unicinctus* from Colombia. CT: camera trap; IN: interview; PS: preserved specimen. ICN: Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá; MLS: Museo de La Salle, Universidad de La Salle, Bogotá. PNN: National Natural Park; PNM: Municipality Natural Park; RNN: National Natural Reserve.

Department	Locality	Coordinates	Elevation (m)	Source	Date; method
Cauquetá	Alto Fragua, Indi-Wasi (PNN)	~1°24'N, 76°01'W	Unknown	Negret <i>et al.</i> (2015)	January 2012-March 2013; CT
	La Resaca (PNM)	1°26'3.372"N, 75°53'44.231"W	579	Informe Técnico Cauquetá (2017)	25 December 2016; CT
Cauca	San Juan de Villalobos	1°25'16.55"N, 76°25'39.32"W	1,200	This study	8 December 2016; CT
Guainía	Puinawai (RNN)	~2°10'N, 69°10'W	178	Muñoz (2001)	Unknown; IN
Guaviare	La Lindosa	2°30'N, 72°53'W	200	This study	April 1999; IN
	El Retorno	2°23'N, 72°41'W	200	This study	2005; IN
Meta	Villavicencio	4°09'N, 73°37'W	500	ICN 3791	20 April 1968; PS
			Unknown	MLS 473	January 1930; PS
				MLS 309	February 1932; PS
				MLS 1661	19 July 1975; PS
	Villavicencio, Ocoa	4°06'N, 73°28'W	~500	ICN 1616	27 May 1952; PS
	Puerto Lleras, Casibare	3°15'N, 72° 59'W	210	ICN 1615	1 January 1958; PS
Putumayo	La Paya (PNN)	00°10'N, 75°05'W	220	Polanco-Ochoa <i>et al.</i> (2000)	April/May 1994; IN

m. It is also the first record of the genus from the department of Cauca (see Ramírez-Chaves & Pérez, 2010). However, in other countries, such as Ecuador, the species has been recorded in similar ecosystems and elevations (~1,500 m asl; Tirira, 2007). Likewise, Orcés & Albuja (1985) reported *C. unicinctus* from Puyo, on the eastern slopes of the Eastern Cordillera, at ~900 m asl. Thus, our finding of *C. unicinctus* at high elevation in Colombia is not surprising and may represent a common feature in the distribution of naked-tailed armadillos. For example, *C. centralis* has been found at up to 3,018 m asl (Díaz-N. & Sánchez-Giraldo, 2008). Finally, the scarcity of the records of *C. unicinctus* in Colombia highlights the need for further research on this poorly known armadillo in this country.

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