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SHORT COMMUNICATION

First records of the southern naked-tailed armadillo *Cabassous unicinctus* (Cingulata: Dasypodidae) in Paraguay

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Abstract The first specimens of southern naked-tailed armadillo *Cabassous unicinctus squamicaudis* from Paraguay are documented, extending the known distribution of the species approximately 270 km south-southwestward in the cerrado eco-region. This is the 12th species of armadillo documented as present in Paraguay. Paraguay is the only country with three representatives of the genus *Cabassous* occurring within its borders.

Keywords: *Cabassous tatouay, Cabassous unicinctus squamicaudis,* Paraguay, southern naked-tailed armadillo

Primeros registros de *Cabassous unicinctus* (Cingulata: Dasypodidae) en Paraguay

Resumen En este estudio se reportan los primeros ejemplares paraguayos del cabasú de orejas largas *Cabassous unicinctus squamicaudis,* extendiendo la distribución de la especie aproximadamente 270 km al sur-suroeste en la eco-región del cerrado. Es la 12º especie de armadillo documentada para el Paraguay. Paraguay se convierte en el único país cuyo territorio abarca la distribución de tres especies del género *Cabassous*.

Palabras clave: *Cabassous tatouay, Cabassous unicinctus squamicaudis,* cabasú de orejas largas, Paraguay

The southern naked-tailed armadillo *Cabassous unicinctus* (Linnaeus, 1758) is a widespread and often common species distributed east of the Andes in Venezuela, the Guianas, Brazil and the lowlands of eastern Colombia, Ecuador, Peru, and Bolivia. In Brazil it has been recorded as far south as Lagoa Santa, Minas Gerais and Maracajú, Mato Grosso do Sul (Wetzel *et al*., 2007).

The known distribution of the species has been estimated to cover some 9,660,000 km^2 and there are no major conservation threats to the species (Abba & Superina, 2010). Machado *et al.* (1998) state that the most southerly populations may be at risk from a combination of hunting pressure and habitat loss, but Tomas *et al*. (2009) noted that the species may be more common in the Pantanal region than previously thought, and that the lack of records appeared to be "solely a result of a complete lack of adequate inventories in the region". Similarly, northeastern Paraguay, from where the new records reported here originate, has also been largely overlooked by researchers.

Cabassous armadillos are poorly represented in collections and rarely observed as a result of their highly fossorial habits. Little is known of their biology, but they tend to be strongly myrmecophagous (Redford, 1985). The genus is characterized by an incomplete armor of scutes on the tail; a rounded, blunt snout; a flexible, ovoid, dome-shaped carapace with numerous, narrow transverse bands (11 to 14); and greatly enlarged, scimitar-shaped foreclaws (Wetzel, 1980).

Wetzel (1980) recognized two subspecies of *C. unicinctus*, with the smaller *C. u. squamicaudis* (Lund, 1845) referring to Brazilian, Peruvian, and Bolivian populations south of the Amazon. This subspecies was separated from the nominate by virtue of its smaller body and cranium, wider teeth, proportionately shorter rostrum, greater number of scutes on the cephalic shield, and the inferior ratio of tail to head-body length (ca. 30% in *C. u. squamicaudis* compared with ca. 50% in *C. u. unicinctus*).

Two allopatric species of *Cabassous* have previously been documented as occurring in Paraguay. The distinctive, small-eared Chacoan naked-tailed armadillo *C. chacoensis* (Wetzel, 1980) is a Chaco endemic species known only from west of the Paraguay River (Smith, 2008a). The much larger and longer-eared greater naked-tailed armadillo *C. tatouay* (Desmarest, 1804) is widespread in the Oriental region of Paraguay, though it is nowhere common (Smith, 2008b). *Cabassous unicinctus*, not previously recorded from Paraguay, is intermediate in size between *C. chacoensis* and *C. tatouay*, has ears of intermediate length, and occurs sympatrically with *Cabassous tatouay* in some parts of its Brazilian range (Ubaid *et al*., 2010). Although field identification of the two species is difficult, Wetzel (1980) documented a series of scute counts and external measurements that reliably distinguish between these species (**Table 1**).

Despite predictions that the geographic distribution of *C. unicinctus* may extend to include the campos cerrados region of northeastern Paraguay, to date there have been no specimens reported. In this paper we provide the first records of *C. unicinctus* in Paraguay, from Departamento Amambay and Departamento San Pedro. The latter record extends the known range of the species approximately 270 km south-southwestward from previous records in Mato Grosso do Sul (Wetzel *et al*., 2007).

A decomposed specimen of a small *Cabassous* was found by personnel of Para La Tierra (henceforth PLT – an NGO promoting research and conservation in Paraguay) on 6 January 2011 in an area of cerrado within the Reserva Natural Laguna Blanca (henceforth RNLB), Departamento San Pedro

Table 1. Scute counts and external measurements provided by Wetzel (1980) for distinguishing between specimens of *Cabassous tatouay* and *C. unicinctus squamicaudis*, and scute counts and measurements for specimens reported herein. For the three specimens of *C. unicinctus* reported herein, measurements taken independently by two of the authors (PS, RDO) are reported respectively. For CZPLT-M 001, the actual number of scutes present is indicated in parentheses, and the count numbers are estimates. Head and body length (total length minus tail length) and ear length were taken from the specimen tags for MNHNP 919 and TK 61367.

	From Wetzel (1980)		Paraguayan specimens reported herein			
			C. unicinctus			*C. tatouay*
	C. tatouay	*C. unicinctus*	CZPLT-M 001	CZPLT-M 002	MNHNP 919	TK 61367
Movable bands	12.8±0.6	12±0.4	12 - 12	12 – 13	12 – 12	13
Head scutes	48.3±3.7	54±5.5	NA	53 – 54	56 – 55	45
Scutes on 3rd movable band	31±1.7	28±1.3	28 – 26 (23)	27 – 27	24 – 24	32
Scutes on 4th movable band	30.8±1.6	27.4±1.3	27 – 27 (23)	27 – 27	23 – 23	31
Scutes on 1st scapular band	21.8±5.5	20.1±1.9	20 – 19	20 – 19	19 – 20	19
Scutes on last scapular band	29±1.5	26.3±1.7	27 – 28	27 – 27	25 – 24	29
Scutes on 1st pelvic band	29.1±1.4	24.4±1.6	23 – 23 (18)	23 – 23	20 – 22	30
Scutes on last pelvic band	8±1.3	6.6±1	7 – 6 (4)	6 – 6	NA	8
Head and body length (cm)	>36	<35	NA	32.1	34.7	48.2
Ear length (mm)	>40	<30	NA	29	32	54

(23°47′44″S, 56°17′22″W). The specimen lacked a head and showed some damage to the carapace, but retained both hind limbs and one forelimb (**Fig. 1**). Fused epiphyses of the long bones indicated that the individual was an adult. All flesh had decomposed from the specimen, but the carapace was complete apart from some two small areas of damage which resulted in some missing scutes. Scute counts, scute shape, and external measurements confirmed that this specimen was referable to *C. unicinctus* (**Table 1**). The specimen is catalogued in the PLT registered collection with the specimen number CZPLT-M 001.

An adult male *C. unicinctus* (**Fig. 2**) was collected alive on 13 April 2011 at Estancia Las Mañanitas, Departamento San Pedro (23°41′28″S, 56°13′00″W; ca. 30 km E, 20 km N of Santa Rosa del Aguaray). The locality is ca. 13.7 km NE of the first, also in cerrado biome (**Figs. 3 and 4**). This individual was collected, prepared as a skin and skull specimen, and cataloged as CZPLT-M 002

A review of *Cabassous* specimens deposited in the Museo Nacional de Historia Natural del Paraguay (MNHNP) revealed an additional specimen of *C. unicinctus* from Paraguay. MNHNP 919 (skin and skull, skull not found or examined by us) was collected 12 July 1988 at Parque Nacional Cerro Corá (approx. 1.5 km east of administration office), Departamento Amambay (coordinates not given, estimated by us as 22°39′03″S, 56°00′46″W). Although catalogued as *C. tatouay*, measurements and scute counts (**Table 1**) identify the specimen as *C. unicinctus*.

An additional *Cabassous* specimen from near Cerro Corá (22°38′37″S, 56°00′58″W, ca. 0.6 km NW of the previous Cerro Corá locality) is also deposited in the MNHNP. The specimen was collected on 26 March 1996, carries field number TK 61367, is preserved in fluid, and is not yet catalogued. This individual is, however, clearly referable to *C. tatouay* (**Table 1**), thus extending Ubaid *et al.*'s (2010) report (from São Paulo state, Brazil) of sympatric distributions of these two congeners into the Paraguayan cerrado / Atlantic Forest transitional mosaic.

With southern populations of *C. unicinctus* perhaps threatened in Brazil (Machado *et al.*, 1998), the discovery of this species in Paraguay assumes both national and international significance. Though the species may be more widespread in Paraguay than is currently known, given the scarcity of records and the increasing conversion of land to agriculture in the Oriental region of Paraguay, it may be safest to assume that the species is of national conservation concern.

This addition to the national mammal list means that 12 species of armadillo are now documented as occurring in Paraguay, second only to Argentina with 15 and more than Brazil with 10 (Abba & Superina 2010). Paraguay is furthermore the only country in which three species of *Cabassous* are documented as occurring within its national borders. We follow Wetzel *et al.* (2007) in considering the reported presence of *C. chacoensis* in Brazil, based on a single specimen from a zoological garden, as probably in error.

Figure 1. *Cabassous unicinctus*, CZPLT-M 001 (Photo Karina Atkinson).

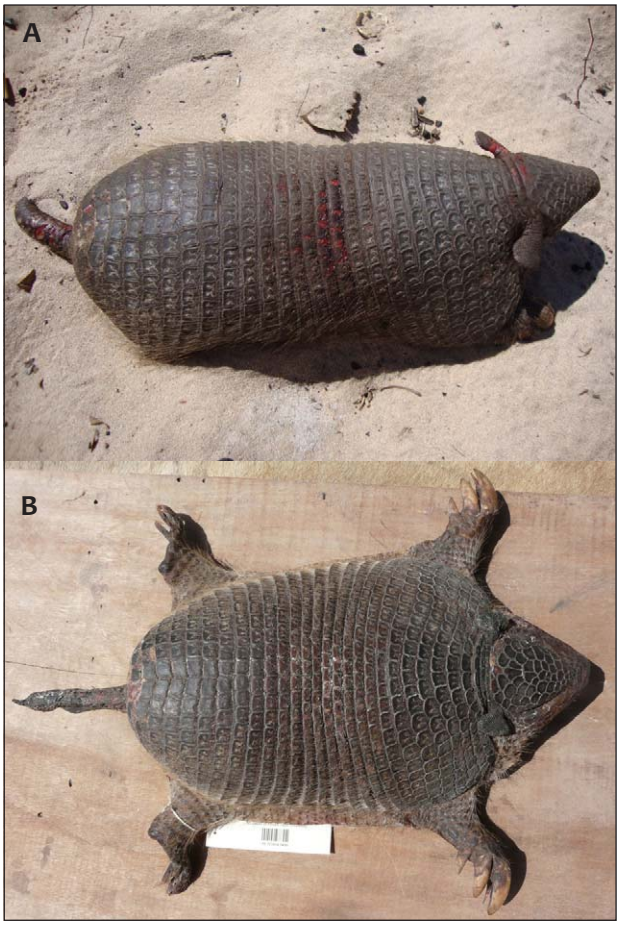

Figure 2. *Cabassous unicinctus*, CZPLT-M 002. A. photo of live animal (Photo Helen Pheasey); B. photo of prepared specimen showing distinguishing characteristics (Photo Karina Atkinson).

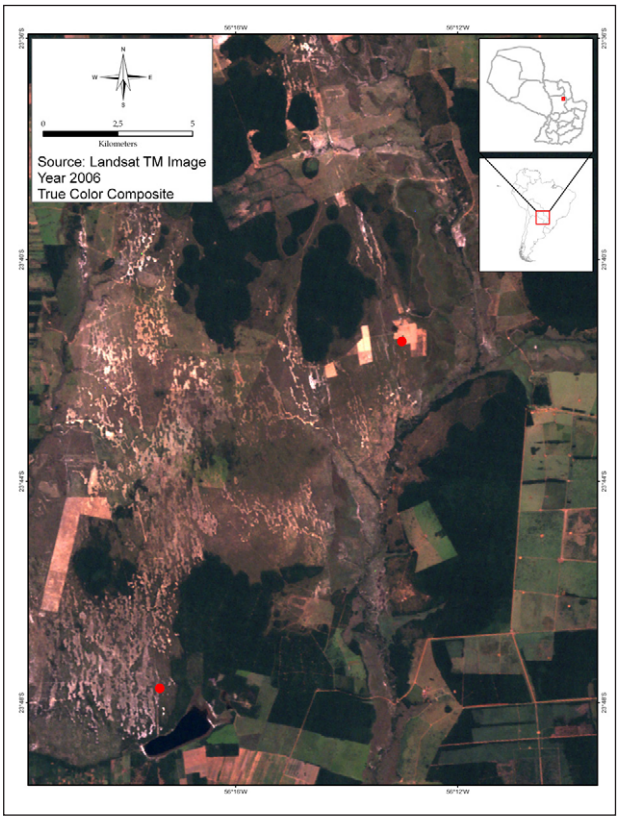

Figure 3. Satellite image showing localities (red circles, lower left and upper right) in cerrado habitat patches where two *C. unicinctus* were collected in Departamento San Pedro, Paraguay.

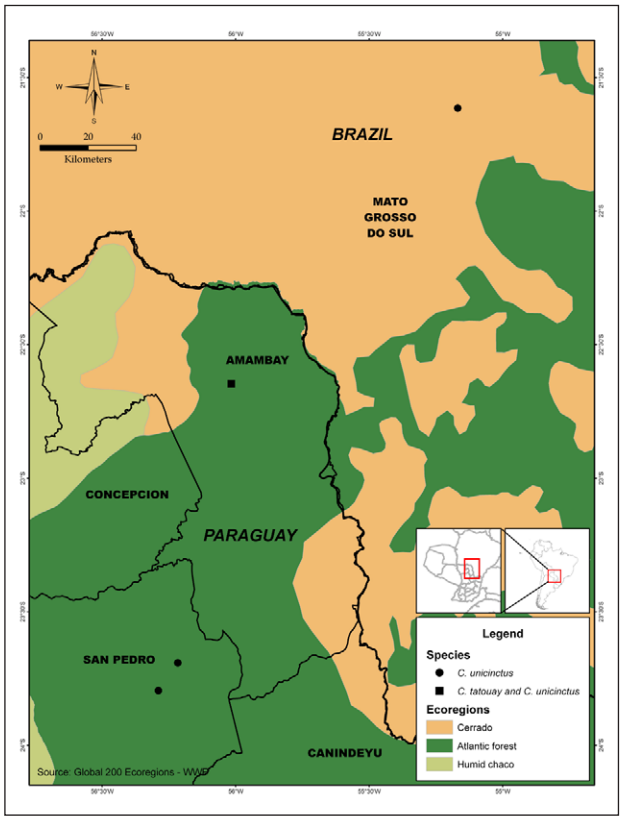

Figure 4. Map showing the collecting localities of previous nearest locality record of *Cabassous unicinctus* in Mato Grosso do Sul, Brazil (Wetzel *et al.*, 2007), three Paraguayan specimens of *C. unicinctus* reported herein, and one specimen of *C. tatouay* collected sympatrically with *C. unicinctus*. Eco-regions are shown, based on World Wildlife Fund (WWF) Global 200 Eco-regions (Dinerstein *et al.*, 2000). Although the Paraguayan localities are shown here as within the Interior Atlantic Forest, both are from isolated patches of cerrado habitat which are found "extralimitally" beyond the cerrado eco-region as shown here.

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