

Nota Científica
(Short Communication)

**PRIODONTES MAXIMUS (CINGULATA, DASYPODIDAE)
IN THE RESERVA PARTICULAR DO PATRIMÔNIO
NATURAL VALE ENCANTADO, TRIÂNGULO MINEIRO,
SOUTHEASTERN BRAZIL**

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RESUMEN. Se reporta la presencia del armadillo gigante, *Priodontes maximus*, en la Reserva Particular del Patrimonio Natural Vale Encantado (RPPN-VE, Uberaba, Minas Gerais, Brasil) con base en análisis de cuevas y en un registro visual. Fueron mapeadas 27 cuevas en la región nordeste de la RPPN-VE con un ancho medio de 43.54 cm y una altura media de 32.00 cm. Asimismo, se discute la importancia de las Reservas Naturales en la región del Triângulo Mineiro.

The giant armadillo, *Priodontes maximus* (Dasypodidae), is the largest living armadillo, with an average length of 90.00 cm and a mass of about 30.00-40.00 kg. The species has a wide occurrence in Brazil and are patchily distributed from Colombia, northern Venezuela and Guianas (French Guiana, Guyana and Suriname) to Paraguay and northern Argentina (Wetzel 1982, Silveira *et al.* 2009, Abba & Superina 2010). Giant armadillos inhabit the tropical forests of Amazonia, open savannas of the Cerrado and the Gran Chaco, the low lands of the Pantanal, and the Atlantic forest (Cabrera & Yepes 1940, Silveira *et al.* 2009, Abba & Superina 2010, Srbek-Araujo *et al.* 2009, Porfirio *et al.* 2012). Due to its solitary behavior, nocturnal lifestyle, fossorial habits, and low population density (Nowak 1999), this species is rarely observed in nature; therefore, some studies are based on indirect evidence, such as burrows (Carter 1983). In many areas its current status and ecological behavior is still poorly known. The giant armadillo is evaluated as a rare species, particularly in eastern and south-eastern regions of Brazil, and the accelerated expansion of agricultural lands

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is affecting its home habitat (Silva 1984, Nowak 1999, Anacleto & Marinho-Filho 2001). Recent studies on the ecological status of the giant armadillo in some areas are sparse or absent (Silveira *et al.* 2009). The most significant studies were done in Pantanal (Schaller 1983, Alho *et al.* 1987, Coutinho *et al.* 1997, Trolle 2003, Trolle & Kéry, 2005, Porfirio *et al.* 2012) and are limited to protected areas (Carter 1983, Carter & Encarnação 1983, Silveira *et al.* 2009, Srbek-Araujo *et al.* 2009).

We report the presence of *Priodontes maximus* in the *Reserva Particular do Patrimônio Natural Vale Encantado* (RPPN-VE), a private reserve created in 2004 in Triângulo Mineiro region, southeastern Brazil. The RPPN-VE is located about 29 km north of the Uberaba City (Minas Gerais State; Fig. 1). It consists of a preserved patch of Cerrado surrounded by intensely agricultural areas. The reserve includes 38.40 ha of natural areas, with an average altitude of 900 m above sea level. The Cerrado vegetation is fairly heterogeneous including gallery forests associated with water bodies, and savanna-like landscapes with dense grassland, dense clumped shrubs and small trees to closed woodland, with a canopy height of about 12-15 meters (Ratter *et al.* 1997). This region is in a tropical zone, with a dry season (April to September) and

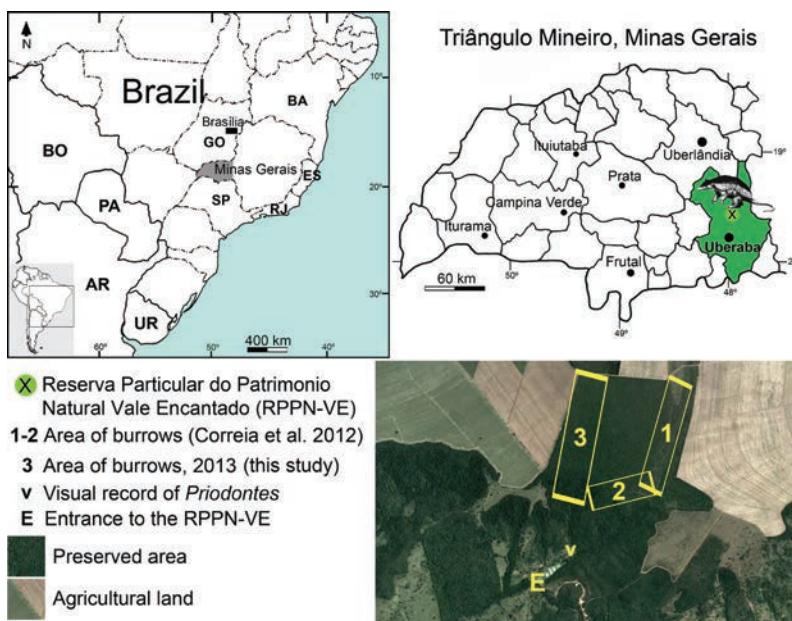


Figure 1. Location map of the Triângulo Mineiro region in southeastern Brazil and of the *Reserva Particular do Patrimônio Natural Vale Encantado* (RPPN-VE) at Uberaba Municipality, State of Minas Gerais. The studied areas are showed in the satellite image modified from Google Earth (2013). Abbreviations: AR, Argentina; BA, Bahia; BO, Bolivia; ES, Espírito Santo; GO, Goiás; PA, Paraguay; RJ, Rio de Janeiro; SP, São Paulo; UR, Uruguay.

a warm, rainy season (October to March) (Aw of Köppen system). The RPPN-VE is monitored and protected by its owner, Sr. José Noel Prata, and by staff of the *Associação de Preservação e Pesquisa Ambiental Vale Encantado* (APPA-VE), which are developing several projects since 2008, including scientific research and both ecological and educational programs.

During the first half of 2013, 27 burrows were mapped in the northeastern portion of the RPPN-VE (see Fig. 1). The vegetation at the northeastern portion of the reserve includes grassland with a dense cover of shrubs and small trees (Fig. 2A). The average width of the burrows is 43.54 cm and the average height is 32.00 cm (see Table 1). In some burrows (*i.e.*, old burrows; see below), it is clearly noted that the height measurement is underestimated due to the filled in at the entrance by soil and leafs, and shows a high coefficient of variation (Table 1).



Figure 2. A) Area where the burrows were found at the *Reserva Particular do Patrimônio Natural Vale Encantado* (RPPN-VE), Uberaba Municipality, Minas Gerais State, southeastern Brazil. B) New burrow with tail marks at the removed soil (arrows). C) Old burrow.

Table 1. Basic descriptive statistic for burrows of *Priodontes maximus* recorded at *Reserva Particular do Patrimônio Natural Vale Encantado (RPPN-VE)*, Uberaba, Minas Gerais State, Brazil) during 2013 field work. Linear measurements are in cm; SD is standard deviation; CV is coefficient of variation.

	n	Mean	SD	Minimum	Maximum	CV
Burrow width	27	43.50	6.84	33.00	64.00	15.70
Burrow height	27	32.40	6.51	21.00	42.00	20.10
Very old burrows	14 (52%)					
Old burrows	10 (37%)					
New burrows	3 (11%)					

We classified the age of the burrows into three categories: very old, old, and new. Very old burrows are partially filled in by soil and dry leaves, often with small vegetation growing; there are abundant spider webs. Old burrows usually have spider webs and the soil removed outside is already compacted. Both very old and old burrows are in disused. The new burrows have the soil removed still loose (non-compacted) and the entrance edge is well preserved. Accordingly, we identified 14 very old, 10 old, and three new burrows (Table 1). One burrow identified in May 2013 had remains of dead ants near the entrance and both tail and claw marks were visible on the removed soil (Fig. 2B). The shape of the burrow entrances is relatively unvaried. They are either totally circular (Fig. 2) or with a slightly "D" shape, with the floor slightly concave. When the entrances are located in high ant mounds the inclination is low (10-20 degrees). On flat ground the inclination reaches 40° degrees maximum. We did not recognize a pattern of orientation of the burrow entrance. In ant mounds of large size (average diameter of 5.00 m) 5 burrows were distributed along its circumference. The majority of recorded burrows at RPPN-VE are in ant mounds in dense vegetation (Fig. 2) suggesting an ecological strategy of *Priodontes* quite different from that reported in the Serra da Canastra National Park (Carter & Encarnação 1983). In the latter region, most burrows are located in flats mounds and open field. Open field at the RPPN-VE is much reduced, leaving the activities of the giant armadillo confined to other environments.

In addition to burrows, several shallow excavations (initiated, non-finished burrows) were detected but they were not counted as burrows. These excavations include 10 records in our area of study. They may represent failed excavations; however, we cannot discard the possibility that some of these actually represent very old burrows affected and damaged by environmental conditions. Due to the width of these excavations (maximum width 58.00 cm) and their mostly shallow condition we do not considered them as burrows of other armadillos occurring in the area.

The average width of the burrows found at RPPN-VE matches with that reported by Carter & Encarnação (1983) at Serra da Canastra National Park (average width of

45.00 cm) which shows statistically significant difference with the burrows of other armadillos (e.g., *Euphractus* and *Cabassous*). An initial study on the eastern portion of the RPPN-VE (Correia *et al.* 2012) reported 16 burrows (see Fig. 1) with a minimum diameter (transversal wide) of 39.00 cm and a maximum diameter of 65.00 cm (Mean=48.25 cm; n=16). Nonetheless, the sample here analyzed has a width range larger than in the sample obtained by Correia *et al.* (2012).

The only visual record of a giant armadillo in the RPPN-VE was made by the owner of the reserve, Sr. José Noel Prata in 2006. He observed a giant armadillo at night destroying the honeycombs while searching for food (Fig. 1). After this experience, the honeycombs were abandoned in order to preserve the natural condition of the RPPN-VE and the giant armadillo was not observed again.

The Triângulo Mineiro is a region particularly affected by agricultural activities, disturbing the fauna and flora as a whole (Silva & Bates, 2002). For that reason, the RPPN-VE in Uberaba represents an important area for natural preservation. The governmental incentive to develop this type of natural reserves in private proprieties is helping environmental conditions (Barreto & Mineo 2012); and this is especially important given that several biomes from Brazil (e.g., Atlantic Forest, Cerrado) are being drastically affected in term of biodiversity conservation (e.g., Ratter *et al.* 1997, Cavalcanti & Joly 2002, Zimbres *et al.* 2013). About 260 RPPNs exist in Minas Gerais and the combined area of these reserves is approximately 121,200.00 ha (Barreto & Mineo 2012). Unfortunately, the Triângulo Mineiro is the region with fewest RPPNs in Minas Gerais (Barreto & Mineo 2012). Such a low proportion and also the absence of federal Natural Reserves do not bring benefits in conservational policies or scientific research. Particularly, much work is still needed at the RPPN-VE to ensure the long-term survival of the giant armadillo as well as of other mammal species (e.g., *Myrmecophaga tridactyla*, *Chrysocyon brachyurus*), considering that this area is surrounded by agricultural lands. Despite the presence of a reduced protected area, this constitutes a relevant habitat for the giant armadillo in Uberaba. Further studies at the Triângulo Mineiro region are required considering that the main occurrences and studies of this species at west Minas Gerais State were only done at the Serra da Canastra National Park (Carter 1983, Carter & Encarnação 1983), located about 150 km of the RPPN-VE.

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