



SEVEN-BANDED ARMADILLO

Dasybus septemcinctus (Linnaeus, 1758)

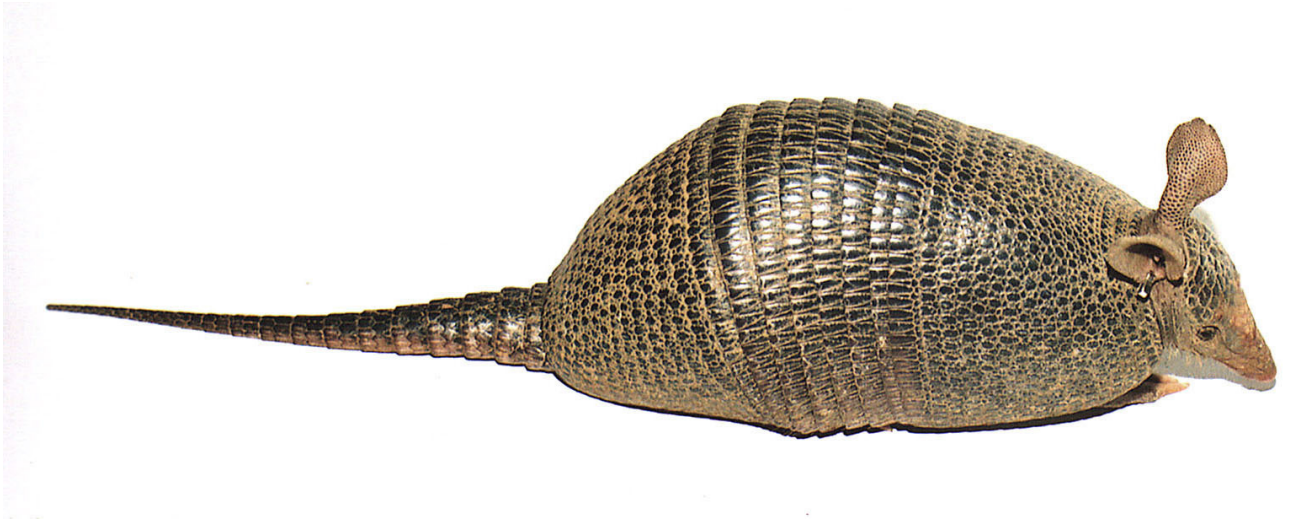


FIGURE 1- Adult, Brazil (© Mauricio Bonasso Sampaio).

TAXONOMY: Class Mammalia; Subclass Theria; Infraclass Eutheria; Order Cingulata; Family Dasypodidae; Subfamily Dasypodinae (Myers et al 2006, Möller-Krull et al 2007). Seven species are recognised in this genus, three are present in Paraguay. The origin of the generic name *Dasybus* is from the Greek for "hairy or rough-footed" (Palmer 1904); *septemcinctus* means "seven bands", in reference to the movable bands across the back. Prior to Hamlett's (1939) clarification of the species identity, this species had been constantly confused with *Dasybus hybridus* and *Dasybus novemcinctus* in the published literature. Synonyms adapted from Hamlett (1939) and Gardner (2007):

[*Dasybus*] *septemcinctus* Linnaeus 1758:51. Type locality "in Indiis" corrected to "Brasilia" by Erxleben (1777) and restricted to Pernambuco, Brazil by Cabrera (1958).

Tatusia (*Muletia*) *propalatum* Rhoads 1894:111. Type locality "Bahía" Brazil.

Tatusia megalolepis Cope 1889:134. Type locality "Chapada" Matto Grosso, Brazil.

[*Tatusia* (*Tatusia*)] *megalolepis* Trouessart 1898:1140. Name combination.

[*Tatusia* (*Muletia*)] *propalatum* Trouessart 1898:1140. Name combination.

Tatu septemcincta O.Thomas 1900:548. Name combination.

Tatu megalolepis O.Thomas 1904:243. Name combination.

[*Tatus* (*Tatus*)] *megalolepis* Trouessart 1905:814. Name combination.

[*Tatus* (*Muletia*)] *propalatum* Trouessart 1905:814. Name combination.

Dasybus megalolepe Yepes 1928:468. Name combination and incorrect spelling.

Dasybus propalatus Yepes 1928:468. Name combination.

Dasybus [(*Dasybus*)] *septemcinctus* Wetzel & Mondolfi 1979. Name combination.

Dasybus septencinctus Passamani et al 2000:208. Incorrect spelling.

Dasybus semptemcinctus Nava et al 2007:260. Incorrect spelling.

ENGLISH COMMON NAMES: Seven-banded Armadillo (Cimari 1996, Wilson & Cole 2000), Seven-banded Long-nosed Armadillo (Cimari 1996), Brazilian Lesser Long-nosed Armadillo (Redford & Eisenberg 1992), Lesser Long-nosed Armadillo (Esquivel 2001), Yellow Armadillo (Gardner 2007).

SPANISH COMMON NAMES: Mulita común (Redford & Eisenberg 1992), Mulita chica (Abba & Superina 2010). The Spanish name "Mulita" or "little mule" stems from the long, donkey-like ears present in members of this genus. Despite the name this is not the commonest of the "Mulitas" in Paraguay and is not particularly common anywhere in its range.

GUARANÍ COMMON NAMES: Tatu'í **MPA** (Villalba & Yanosky 2000), Chachu **Ac** (Villalba & Yanosky 2000), Tatu kuju **Ac** (Esquivel 2001). The Guaraní name Tatu'í is the most frequently utilised in Paraguay for this species, the Spanish names rarely being heard in everyday speech. Tatu'í means "little armadillo" in reference to the smaller size of this species when compared to *Dasybus novemcinctus*, commonly referred to as Tatu hu.

DESCRIPTION: "Long-nosed" Armadillos have a broad, depressed body, an obtusely-pointed rostrum, long, pointed ears and short legs. The carapace consists of two immobile plates, the scapular and pelvic shields separated by 6 or 7 movable bands connected to each other by a fold of hairless skin. The carapace is mostly blackish, hairless and with the scales of the anterior edge of the movable bands not notably different in colour from the rest of the dorsum. Lateral scutes have dark blackish-pink centres only slightly discernible from the rest of the carapace, but never as obviously pale as in Nine-banded. Scutes on the movable bands are triangular in shape, but those on the main plates are rounded. The number of scutes present on the fourth movable band varies from 44 to 52, with a mean of 48.4 (Hamlett 1939). The head is thin and triangular with a sloping forehead and long, mobile ears with rounded tips that are not separated by armour at the base. Head plate is dark and blackish, the scutes being heavy and closely attached to the skull. The tail is intermediate length (80-100% body length), broad at the base and narrowing towards the tip. There are four toes on the forefeet (characteristic of the Subfamily Dasypodinae), the middle two much the longest, and five on the hindfeet. The underside is naked and blackish-pink with only a light covering of coarse greyish hair sprouting from regularly-spaced papillae.

SKELETAL CHARACTERISTICS: Steeply descending frontal bone and an almost horizontal rostrum with a triangular tip in lateral profile.

DENTAL CHARACTERISTICS: Armadillos lack true teeth. "Long-nosed" armadillos have single-rooted, peg-like teeth that lack enamel. Dental formula 6/8=28.

GENETIC CHARACTERISTICS: 2n=64, FN=80. Redi et al (2005) gives the genome size as 5.17pg (+/-0.25) or 5056 Mbp.

TRACKS AND SIGNS: *Dasybus* prints can be distinguished from those of other armadillos by their long, pointed toes with four toes on the forefoot and five on the hindfoot. However they generally leave the impression of only the two central toes on the forefeet (though sometimes the outer toe is also visible) and three central toes on the hindfeet. Given a full print, the hindfoot has a pointed heel with three long, somewhat pointed central toes and two, much shorter, outer toes set well back towards the heel. The forefoot has the inner toe much reduced and it rarely leaves an impression. **FP:** 3 x 1.8cm **HP:** 4.5 x 3.4cm. **PA:** 18cm. (Villalba & Yanosky 2000). Prints of *D.novemcinctus* are approximately 50% larger than those of this species.

EXTERNAL MEASUREMENTS: The smallest of the "long-nosed armadillos" in Paraguay. **TL:** 40.08cm (36.5-47.5cm); **HB:** 26.05cm (24-30.5cm); **TA:** 14.75cm (12.5-17cm); **FT:** 6cm (4.5-7.2cm); **EA:** 3.09cm (3-3.8cm); **WT:** 1.63kg (1.45-1.8kg). (Emmons 1999, Redford & Eisenberg 1992) Hamlett (1939) gives the following measurements of preserved specimens for this species *Head* 6.5cm (5.2-7.3cm); *Body:* 17.8cm (14.7-20.3cm); **TA:** 15.3cm (14.6-20cm); **EA:** 2.67cm (2-3.5cm). Da Silva (2006) gives the following **WT** measurements for specimens near Brasilia, Brazil: males 900g (+/-200, n=8) females 1000g (+/-300, n=5). The differences are not significant.

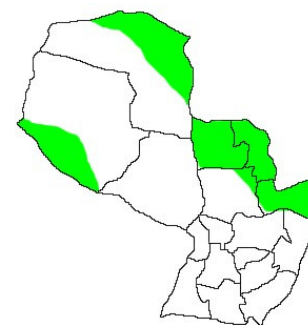
SIMILAR SPECIES: This is the smallest of the "long-nosed armadillos" in Paraguay and can be immediately separated from the much larger and more widespread *Dasybus novemcinctus* by the number of bands - 6 or 7 as opposed to eight or nine (usually 8) in that species (Hamlett 1939). Though of similar proportions *D.novemcinctus* is typically 50% larger in all measurements. Note also that the tail length of *D.novemcinctus* is equal to or greater than the body length, and that this species is often noticeably proportionately shorter-tailed, the tail being 80-100% body length. It can be further distinguished by the blackish colouration extending to the movable bands, which lack yellowish-white triangular scales on the posterior edge. This species has similarly-proportioned long ears (40-50% of head length) but given the

difference in size between the animals the measurements are considerably smaller in this species. Proportionately this species is larger headed with a broader snout (Hamlett 1939). *D.novemcinctus* has 7 to 9 teeth in the upper jaw, typically 8, compared to 6 in this species. Using the fourth movable band as a standard, Hamlett (1939) noted that this species has a mean of 48.4 scutes (range 44-52) whereas *D.novemcinctus* has a mean of 60 scutes.

The existence of a third species of *Dasypus* in Paraguay has recently been called into question, and though traditionally they have been assigned to the taxa *hybridus*, their specific identity is by no means clear. *D.hybridus* is distinguished from this species principally by its measurements. It has proportionately shorter ears (25-30% of head length) and noticeably shorter tail (67-70% body length). It is intermediate in size between this species and *D.novemcinctus* (though much closer to *septemcinctus*) and shares the 6 or 7 movable bands across the dorsum and the 6 teeth in the upper jaw. It has a mean of 54 scutes along the fourth movable band (Hamlett 1939).

DISTRIBUTION: Wide-ranging from the eastern Amazon of Brazil south to northern Rio Grande do Sul, and west through eastern Bolivia and to northern Argentina. In Bolivia it is rare and known only from Departamentos Beni, Santa Cruz and eastern Tarija (Anderson 1997).

In Paraguay the species is possibly widespread but its exact range is unclear as a result of confusion with other species of *Dasypus* and a paucity of museum specimens. Though there are less than a handful of records in the country, it may be assumed to be present in the cerrado belt of Departamentos Concepción and Amambay, south at least to Departamento Canindeyú (where there is specimen documentation) and, given its presence in north-eastern Provincia Corrientes in Argentina it may also be present in suitable habitat in the south of the country where suitable habitat exists - though many of the grasslands in this area are wet or seasonally-flooded, not dry (P.Smith pers.obs). It has not been confirmed to occur in Misiones Province in northern Argentina, though it is may be found in open habitats in the south of that Province (Chebez 2001) and the previous extent of the Atlantic Forest may have acted as barrier to the distribution of this species both in Paraguay and northern Argentina. In the Chaco it is absent from the driest areas but possibly present in southern Departamento Boquerón and also potentially in the Mato Grosense region of Departamento Alto Paraguay.



Abba & Vizcaíno (2008) list 1 specimen from Paraguay in the Museo Argentino de Ciencia Naturales "Bernadino Rivadavia (MACN28.226 skin and skull, Puerto Guarany 1928).

HABITAT: Little information is available on habitat preference in this species, though it apparently prefers dry as opposed to humid areas. Reportedly occurs mainly in open habitats, grasslands and pastures, including cerrado and chaco. In southeastern Brazil it has also been found in gallery forest and shrubland and is apparently able to withstand moderate levels of human disturbance (Edentate Specialist Group 2004). In São Paulo, Brazil Bonato (2002) found the species in low numbers in campo sucio cerrado, whereas Da Silva & Barros (2009) found it mainly in *sensu strictu* cerrado.

Anacleto et al (2006) used the genetic algorithm program GARP to predict the species distribution in Brazil, with results suggesting this species would occur in Amazonia, Cerrado, Caatinga and Atlantic Forest biomes in that country.

ALIMENTATION: Almost nothing is known of the specific feeding behaviour of this species but it is likely to be similar to that of the Nine-banded Armadillo. Bonato (2002) found only ants and termites in the diet in the Brazilian cerrado. In captivity it will take yoghurt and eggs (Olmos 1995).

REPRODUCTIVE BIOLOGY: Da Silva & Barros (2009) found approximately equal numbers of males and females near Brasília, with 6 males and 5 females captured. Individuals in reproductive condition were captured in November 2006 and June 2005. Juveniles were only captured after December 2005, leading to the conclusion that the period of reproduction spans the end of the dry season and the beginning of the rainy season (June to September) .

Females give birth to 7 to 9 genetically identical offspring (Esquivel 2001).

GENERAL BEHAVIOUR: Little known. Solitary and said to be largely nocturnal, though occasionally active at dusk and during the day. However Bonato (2002) found them active only between 6am and 2pm in the Brazilian cerrado.

Home Range Da Silva (2006) estimated the density of this species as 0.30 individuals per hectare in the cerrado near Brasilia, Brazil. The maximum home range estimated for the species was 1.6ha for a male, with another male utilising an area of 1.1ha. One female had an estimated home range of 0.8ha. Recapture rates were low and the maximum permanence for a recaptured individual in any one area was just 4 months. Encarnaçao (1987) had earlier estimated the home range of one female at Serra do Canastra, Minas Gerais, Brazil at 0.44ha.

Refuges They frequently expand burrows dug by other species. Captive juveniles construct nests at low temperatures. (Redford & Eisenberg 1992)

Defensive Behaviour Da Silva & Barros (2009) note that capture of this species by hand is difficult because of their ability to run and jump through vegetation and tendency to take refuge in the first burrow that they encounter.

Mortality Lacerda et al (2009) report attacks by domestic dogs on this species in Brasilia National Park. Rodrigues et al (2007) found remains of this species in 16.5% of Maned Wolf *Chrysocyon brachyurus* scats in Brasilia, representing an estimated 27.45% of the total biomass consumed and making it the major food item in the diet.

Parasites Nava et al (2007) listed the Ixodid tick *Amblyomma auricularum* on this species in Paraguay on a specimen from Departamento Presidente Hayes. Brum et al (2003) found 17 male and 8 female *Amblyomma fuscum* on an individual from Rio Grande do Sul, Brazil. Evans et al (2000) list *Amblyomma brasiliense* from the same state.

Vicente et al (1997) list the nematode *Ascaroterakis pulchrum* Vicente, 1965 for this species from Brazil in their catalogue.

Martinez et al (1999) note the presence of cestodes of the genus *Mathevotaenia* (Anoplocephalidae) in this species with a prevalence of 28.5% in seven specimens tested.

VOCALISATIONS: Captive animals emit quiet grunts not usually audible in the wild (Villalba & Yanosky 2000).

HUMAN IMPACT: Opportunistically hunted for food. During a study of the Xavante indigenous groups inhabiting the cerrado of Central-West Brazil this species was hunted 14 times during 33 months, but was not considered a major part of the diet of the group owing to its small size (Leeuwenberg 1997).

Paracoccidioidomycosis Paracoccidioidomycosis (PCM) is the most important and prevalent systemic mycosis in Latin America where it has been recorded principally in Brazil, Colombia and Venezuela. The etiological agent of the disease is the fungus *Paracoccidioides brasiliensis* and infection is primarily through inhalation of the spores (Restrepo et al 2001). This species is naturally affected by the fungus. Richini-Perreira et al (2008) found a roadkill individual of this species in São Paulo State, Brazil with *P. brasiliensis* amplicons in the lungs, spleen, liver, and mesenteric lymph node.

CONSERVATION STATUS: The Seven-banded Armadillo is considered Lowest Risk, least concern by the IUCN (Abba & Superina 2010), see <http://www.iucnredlist.org/search/details.php/6293/all> for the latest assessment of the species. The Centro de Datos de Conservación in Paraguay do not list the species and nor is it listed by CITES. The last conservation assessment of the species in Paraguay considered it Least Concern (Morales 2007), but Smith (in press) recommends that the species be considered data deficient at the national level on account of the severely limited information about the species range in Paraguay.

This species is little known throughout its range, despite its wide distribution. It is nowhere common in Paraguay but possibly under-recorded because of its superficial similarity to the Nine-banded Armadillo and difficulties associated with its capture. It is apparently able to withstand a moderate degree of human disturbance but precise data on the threats it faces are lacking and it seems to be a naturally low density species. Da Silva & Barros (2009) estimated an area of between 6700 and 27,800ha as necessary to maintain a viable population of this species. A reality closer to the higher figure would qualify the species as of conservation concern in Paraguay. As for other armadillos, habitat destruction, fire and hunting are the major threats to the species.

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CITATION: Smith P 2008 - FAUNA Paraguay Handbook of the Mammals of Paraguay Number 14 *Dasypus septemcinctus* - www.fauparaguay.com/dasypusseptemcinctus.html.



FIGURE 2- Adult, Brazil (©Mauricio Bonasso Sampaio).