



LESSER HAIRY ARMADILLO

Chaetophractus vellerosus (Gray, 1875)



FIGURE 1 - (FPMAM53PH) Adult, Loma Plata, Departamento Boquerón Paraguay (Sjeff Ollers October 2009).

TAXONOMY: Class Mammalia; Subclass Theria; Infraclass Eutheria; Order Cingulata; Family Dasypodidae; Subfamily Euphractinae (Myers et al 2006, Möller-Krull et al 2007). Three species are recognised in this genus, two are present in Paraguay. *Chaetophractus* is taken from the Greek meaning "hairy shell", the specific name *vellerosus* is from the Latin and also means "hairy". The genus *Chaetophractus* was defined by Fitzinger in 1871. There are two recognised subspecies; that present in Paraguay being *C.v.vellerosus*.

The earliest fossil record of this species is from Punta Hermengo, Provincia Buenos Aires, Argentina dated at 0.9-0.78 million years ago in the early to mid-Pleistocene (Soibelzon et al 2006).

Formerly placed in the Chaetophractinae, Möller-Krull et al (2007) provided DNA evidence that demonstrated their position within the Euphractinae. Synonyms adapted from Gardner (2007):

Cryptophractus brevirostris Fitzinger 1860:385. Nomen nudum.

Dasyopus vellerosus Gray 1865:376. Type locality "Santa Cruz de la Sierra", Santa Cruz, Bolivia.

Dasyphractus brevirostris Fitzinger 1871:264. Type locality "Chili" Chile.

[*Dasyopus* (*Choetophractus*)] *vellerosus* Trouessart 1898:1146. Name combination.

Dasyopus boliviensis Grandidier & Neveu-Lemaire 1908:5. Type locality "Environs d'Uyuni (Bolivie), à 3660 mètres d'altitude", Potosi, Bolivia. Preoccupied by *Tatusia boliviensis* Gray 1873 (= *Dasyopus novemcinctus* Linnaeus 1758).

Dasyopus villerosus Grandidier & Neveu-Lemaire 1908:6. Incorrect spelling.

Chaetophractus vellerosus vellerosus Yepes 1928:500. First use of current name.

E[uphractus]. vellerosus Krumbiegel 1940:56. Name combination.

Euphractus villosus desertorum Krumbiegel 1940:61. Type locality "San Carlo", Chaco, Argentina.

ENGLISH COMMON NAMES: Lesser Hairy Armadillo, Small Hairy Armadillo (Redford & Eisenberg 1992), Small Screaming Armadillo (Redford & Eisenberg 1992), Screaming Hairy Armadillo (Neris et al 2002), Weeping Armadillo (Abba & Cassini 2010), Crying Armadillo (Wetzel 1985).

SPANISH COMMON NAMES: Pichi peludo (Neris et al 2002), Quirquincho chico (Redford & Eisenberg 1992, Díaz & Barquez 2002), Piche Llorón (Redford & Eisenberg 1992), Tatú Llorón (Cuéllar & Noss 2003).

GUARANÍ COMMON NAMES: Tatu poju'í (Neris et al 2002), Taturavuku (Cuéllar & Noss 2003), Tatundovivi (Cuéllar & Noss 2003), Tatukirisi (Cuéllar & Noss 2003). "Poju" refers to the needle-like claws of the forefeet, the addition of "i" meaning small. In other words "little Tatu poju", or small version of Six-banded Armadillo, the species commonly known as Tatu poju in Paraguay.

DESCRIPTION: A medium-small armadillo with conspicuously long, tan-coloured hairs and a notably rounded carapace. Possesses 7 or 8 movable bands between the scapular and pelvic shields, and at least 2 neck bands. There are no holes in the posterior part of the pelvic shield. The head shield is large, notably downcurved in profile on the forehead and reaches almost to the base of the snout - it has a width to length ratio of 0.9 to 0.95 (Myers and Wetzel 1979). It is composed of small disorganised scutes and has a straight posterior border. The head shield is curved over the eye and the scutes are smooth. Head and carapace greyish with pinkish or yellowish edging to scutes, most obvious on the movable bands of the neck and mid-region. Ears are long, projecting well above the head and are greyish in colour, scaled on the outer surface with a pinkish tinge to the basal part of the inner ear. Pushed backwards the ears extend beyond the second row of scapular scutes. Sides of head and ventral skin pale flesh with long tufts of hair on cheeks, legs and throat, the hairs of the ventral surface are longest, tinged greyish on the flanks and paler in the mid-ventral area. Nose pinkish. Legs short but robust, with flattened claws on all toes. There are four claws on the forefeet, the second of which is the longest.

SKELETAL CHARACTERISTICS: Vizcaino et al (1999) give the following ulnar dimensions (n=1): Ulnar Length 42.7mm; Olecranon Length 16.5mm. The trend towards fossoriality is correlated with relative development of the olecranon process, and the ratio of the ulnar length to olecranon length is the Index of Fossorial Ability. An IFE above 0.70 is considered indicative of a highly fossorial species and one below 0.55 of a cursorial species. This species has an IFE of 0.63.

DENTAL CHARACTERISTICS: Armadillos lack true teeth, but possess a series of "molariform" teeth that do not follow the standard mammal dental formula. 9/9 = 36. First molariform located in the premaxillary as in *Euphractus*.

GENETIC CHARACTERISTICS: 2n=60. Redi et al (2005) give the genome size as 4.46pg (+/-0.21) or 4362 Mbp.

TRACKS AND SIGNS: No information.

EXTERNAL MEASUREMENTS: A medium-small armadillo with a rounded carapace. **TL:** male 37.6cm (32.8-40cm), female 36.8cm (26.5-41.9cm); **HB:** unsexed (21-25.3cm); **TA:** male 11.4cm (8.4-13.1cm), female 11.2cm (7.7-13.8cm), unsexed (10-12.8cm); **FT:** male 4.9cm (4-5.3cm), female 4.8cm (3.1-5.6cm), unsexed (4.4-5.1cm); **EA:** male 2.8cm (2.2-3.1cm), female 2.7cm (2.2-3.1 cm), unsexed (2.5-3.3cm); **WT:** male 860g (543-1,329g), female 814g (257-1,126g); May be up to 10% heavier during winter due to a 1-2cm thick layer of subcutaneous fat. (Parera 2002, Eisenberg & Redford 1999, Ceresoli et al 2003, Neris et al 2002, Redford & Eisenberg 1992).

SIMILAR SPECIES: Unlikely to be confused in Paraguay, this is much the smallest of the Hairy Armadillos. It can be further distinguished by its proportionately longer ears than other "Peludos" and the fact that it lacks holes in the pelvic shield. Note the smooth scutes of the cephalic shield and the pale-coloured hair on the body.

DISTRIBUTION: Distributed in arid areas from western Bolivia through the Paraguayan Chaco to central Argentina and west-central Chile. The nominate subspecies *C.v.vellerosus* occupies the northern part of the range, with *C.v.pannosus* (O.Thomas 1902) replacing it in central Argentina south to Provincia Mendoza. Typically it occurs in areas with low rainfall of between 200 and 600mm per year, though the species is also present in Provincia Buenos Aires where the rainfall is c1000mm.

In Paraguay it is most numerous in the Central Chaco, being less frequently encountered or absent from the more northerly areas of the Chaco and less common in the Humid Chaco. The species is also present in cerrado areas of the northern Orient in Departamentos Concepción and Amambay.

Abba & Vizcaíno (2008) list 1 specimen from Paraguay in the Museo Argentino de Ciencia Naturales "Bernadino Rivadavia" (MACN47.378 carapace and skull, Capitán Meza, Alto Paraná 1938). This locality is probably in error, being well outside the species current range in an area that was traditionally covered with Atlantic Forest habitat.

HABITAT: Typical of dry, xeric areas with a loose and often sandy soil. They are absent from areas with rocky soil which impedes burrow construction.

In the Chaco they are found in matorral and chaco scrub, as well as agricultural areas and even human settlements. In the northern Orient they are found in dry campo sucio cerrado and grassland. Merritt (2008) notes an increased presence of this species in agricultural areas where soil is worked and crops are planted. Typically this soil is loose and composed of sandy loam and the armadillos may select this soil type.

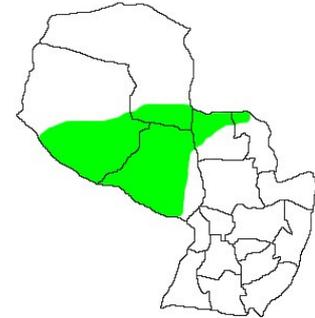
Abba et al (2007) found that the species burrows were found mainly in primary native woodland with calcaneous soils in the Buenos Aires area of Argentina, but that they tended to forage in adjacent, more open habitats.

ALIMENTATION: The majority of the daily activity is attributed to foraging and there has been some seasonal variation in diet noted by researchers. Greeger (1980a) working in the Monte Desert of NW Argentina stated that insects dominate the diet in the summer (46% by volume) and plant matter predominates in winter (50.7% by volume) when insect matter drops to 25.7%. A significant vertebrate content in the diet was also detected, typically lizards, birds, anurans and mice such as *Ehygomodontia* and *Phyllotis* (27.7% by volume in summer, 13.9% by volume in winter). Scorpions were found in 31% of stomachs analysed in summer and 47% of winter stomach, and though spiders were equally common they appeared to be absent from the diet.

Stomach analysis in the Bolivian Chaco revealed vegetable material to predominate in the diet (56%) typically fruits of Algarrobo *Prosopis chilensis*, Mistol *Ziziphus mistol*, Yvyra hû *Sideroxylon obtusifolium* supplemented with beetles, ants and termites (40%) (Cuéllar & Noss 2003).

In Buenos Aires Province, Argentina a 14 month study found that 63.6% of stomach contents consisted of animal material, with just 18% plant material. Insects predominated in the diet during spring and winter, but plant material predominated during autumn. (Soibelzon et al 2007). Soibelzon et al (2007) noted that they were not able to confirm whether vertebrates in stomachs were captured alive or consumed as carrion, but hypothesised that amphibians and reptiles present in stomachs were likely captured underground, when rendered immobile by thermal factors and that the armadillos probably made use of prey items that were most abundant and easy to capture during any given season.

Abba & Cassini (2010) also working in Provincia Buenos Aires found vertebrate remains in 30% of 119 fecal samples. Coleoptera made up over a quarter of the material in the diet, with leaves, fruit,



Formicidae, Blattaria and mammals also contributing significant amounts. The food niche breadth was 0.47 on the Levin Index.

A considerable amount of sand is often ingested when foraging and has accounted for up to 50% of the content of some examined stomachs (Gregeor 1980a). Over the course of 5 nights an individual in Catamarca was recorded to probe for food 222 times and dug 19 burrows, frequently retracing the paths of previous evenings and revisiting the same burrows (Gregeor 1980b). This species is able to pass long periods without drinking (Eisenberg & Redford 1999) and derives the majority of its water from its food thanks to an extremely efficient renal system. Captive specimens maintained on a dehydrated meat diet were able to remain in water balance where Nine-banded Armadillos were not. (Gregeor 1975).

REPRODUCTIVE BIOLOGY: In the Bolivian Chaco the presence of lactating females suggest that the species breeds from November to January (Cuéllar & Noss 2003).

GENERAL BEHAVIOUR: Though occasionally active by day this species is principally nocturnal with peaks of activity from 8pm to 3am (Cuéllar & Noss 2003). Abba et al (2009) captured this species mainly at dusk. Abba & Cassini (2010) found no significant difference in the capture rate of animals outside of their burrows between the colder seasons and the warmer seasons, concluding that the species is active year round.

Home Range Minimum home range for one individual has been estimated at 3.4ha. (Redford & Eisenberg 1992), however there appears to be a difference in home range according to habitat-type, being around 4ha in humid areas but considerably larger in more arid environments (Edentate Specialist Group 2004). On one night an individual in Catamarca, Argentina was recorded to move between 650 and 1400m whilst foraging (Gregeor 1980b).

Refuges Burrows typically have numerous entrances, often located at the base of shrubs or under some kind of vegetation cover. Abba et al (2007) found this species to be specialised in its burrow locations in Provincia Buenos Aires, Argentina, preferring to locate the burrows in tala woodland.

The entrance ranges from 80-150mm in diameter. Mean burrow slope is 28° (Gregeor 1974). Individual animals have several burrows within the home range and burrow systems may be several metres long. They do not necessarily use the same burrow on consecutive nights and generally enter and leave any given by burrow by different holes (Gregeor 1980b). When present the animal usually seals the entrance with plant material. No nest is built in the burrow.

Defensive Behaviour Typically runs from danger, being capable of high-speeds and adopting a zigzagging path to confuse the pursuer. Heads rapidly for its burrow. Captured individuals have been documented to emit a high-pitched scream. *Parasites* Navone (1990) recorded the nematode *Aspidodera fasciata* (Aspidoderidae) and the cestode *Matherotaenia diminuta* (Anoplocephalidae) in this species in the Argentinean Chaco.

Mortality In northeastern Buenos Aires Province, Abba et al (2009) found this species to be considerably less abundant in areas where dogs were present than in areas where they were absent.

Parasites Ezquiaga et al (2008) mention an association with the flea *Polygenis platensis* (Siphonoptera) in Provincia Buenos Aires. This species is normally associated with a tuco-tuco *Ctenomys talarum*, and its presence on an armadillo host suggests interactions between the armadillo and the tuco-tuco. The flea was present on 18% of captured specimens. Guglielmo & Nava (2006) list the Ixodid ticks *Amblyomma auricularium*, *A.pseudoconcolor*, *A.pseudoparvum* and *A.tigrinum* for this species in Argentina.

Physiology Estecondo et al (2001) describe the morphology of the dorsal surface of the tongue of this species using a scanning electron microscope. Galindez et al (2006) describe the structure of the spleen. Codón & Casanave (2000) describe the morphology of the ovaries in this species.

VOCALISATIONS: It is frequently cited in the literature that this species emits loud screams of protest when handled, though in the authors experience with numerous animals in the Paraguayan Chaco, none have produced vocalisations when handled. (P.Smith, H.del Castillo pers.obs.). Of over 500 captures in the Buenos Aires area, only around 6% of animals produced screams (A.Abba in litt) and it seems that such vocalisations are extremely infrequent.

HUMAN IMPACT: The small size of this species makes it less attractive to human hunters. According to a long term study of the diet of the Isoso indigenous in group in the Bolivian Chaco this was the least

frequently hunted armadillo species (Cuéllar & Noss 2003). In the Argentine Chaco it made up 18.4% of the diet of local people and was consumed a mean of 0.06 days per year (+/-0.01) (Altrichter 2006).

In Bolivia the carapace of the species is used to make musical instruments such as *charangos* (small guitars) and drums, and other body parts are fashioned into pieces of jewellery or amulets. Prices for *charangos* were as high as US\$50-100 in Bolivia and US\$80-120 from 1996 to 1998. In Bolivia whole stuffed animals of this species and the very similar *C.nationi* are considered to bring good luck and sold for up to US\$45 during the same period.

Soibelzon (2007) concluded that their tendency to prey on potential pest species such as larvae of Scarabaeidae, Noctuidae and Curculionidae means that their presence in agricultural areas may even be beneficial to farmers.

CONSERVATION STATUS: The Lesser Hairy Armadillo is considered Low Risk, least concern by the IUCN (Abba & Superina 2010), see <http://www.iucnredlist.org/search/details.php/4369/all> for their latest assessment of the species. The species is not listed by CITES. It is found in several protected areas in the Paraguayan Chaco.

Though only confirmed to be present in Paraguay in 1979 (Myers and Wetzel 1979), this is one of the more commonly-encountered armadillo species in the Central Chaco area. Merritt (2008) notes that it was infrequently encountered during the late 1990s, but has since become more common. This species is able to withstand considerable alteration of habitat by humans and is not unduly affected (and may even have benefited from) ranching and farming practices in the areas around the Mennonite colonies (Merritt 2008). The species is frequently seen on roads in the Mennonite colonies, where it is amongst the most common armadillo species (Merritt 2008).

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CITATION: Smith P 2008 - FAUNA Paraguay Handbook of the Mammals of Paraguay Number 12 *Chaetophractus vellerosus* - www.faunaparaguay.com/chaetophractusvellerosus.html.

FIGURE 2- (FPMAM48PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.
Adult. Laguna Capitán, Departamento Presidente Hayes,
July 2006.
Photo Paul Smith.



FIGURE 3- (FPMAM49PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.
Adult lateral view. Laguna Capitán, Departamento
Presidente Hayes, September 2006.
Photo Paul Smith.



FIGURE 4 - (FPMAM50PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Adult dorsal view. Laguna Capitán, Departamento Presidente Hayes, September 2006.

Photo Paul Smith.

FIGURE 5 - (FPMAM54PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Adult. Cuenca Upper Yacaré Sur, Departamento Presidente Hayes, October 2008.

Photo Paul Smith.



FIGURE 6 - (FPMAM51PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Adult. Laguna Capitán, Departamento Presidente Hayes, July 2006.

Photo Paul Smith.



FIGURE 7- (FPMAM55PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Forefoot. Cuenca Upper Yacaré Sur, Departamento Presidente Hayes, October 2008.

Photo Paul Smith.



FIGURE 8- (FPMAM56PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Hindfoot. Cuenca Upper Yacaré Sur, Departamento Presidente Hayes, October 2008.

Photo Paul Smith.

FIGURE 9- (FPMAM57PH)

Lesser Hairy Armadillo *Chaetophractus vellerosus*.

Burrow. Laguna Capitán, Departamento Presidente Hayes, July 2006.

Photo Paul Smith.

