



# SOUTHERN YELLOW-EARED BAT

*Vampyressa pusilla* (J.A. Wagner, 1843)



**FIGURE 1** - Adult (©Marco Mello [www.casadosmorcegos.org](http://www.casadosmorcegos.org)).

**TAXONOMY:** Class Mammalia; Subclass Theria; Infraclass Metatheria; Order Chiroptera; Suborder Microchiroptera; Superfamily Noctilionoidea; Family Phyllostomidae, Subfamily Stenodermatinae, Tribe Ectophyllini (López-Gonzalez 2005). There are three species in this genus, one of which occurs in Paraguay (Gardner 2007). The generic name *Vampyressa* means “little vampire” in erroneous reference to supposed blood-sucking habits (Palmer 1904). The species name *pusilla* is Latin meaning “small” (Lewis & Wilson 1987). There is no fossil record for the species (Lewis & Wilson 1987).

Goodwin (1963) attempted to clarify the identity of five bats collected by Natterer in the early 1800s and identified as *Phyllostomus pusillum*. Two of these were from “Sapitiva” with the other three from Ipanema (Lim et al 2003). Peters (1866) redescribed the holotype of *V.pusilla* as Wagner’s (1843) description was brief, and a more detailed description provided by Wagner (1850) was accompanied by an illustration of a different specimen from Ipanema and lacked cranial and dental characters. Goodwin (1963) considered the illustration provided in Peters (1866) to belong to a different species which he described as *V.nattereri*, but Peterson (1968) stated that *V.nattereri* was in fact an adult *V.pusilla* and that arrangement has been followed by most authors since.

Despite having only a subadult specimen of *V.pusilla* available to him, Goodwin (1963) considered both *V.venilla* and *V.thyone* as subspecies of *V.pusilla*, noting that the differences that Thomas (1909) noted between those taxa are not greater than those between subspecies of *V.pusilla*. Peterson (1968) considered *V.venilla* a synonym of *V.thyone*, but not being able to examine the any Atlantic Forest specimens of *V.pusilla*, he followed Goodwin (1963) in considering *V.thyone* a subspecies of *V.pusilla*. Myers (1983) noticed that Paraguayan specimens of *V.pusilla* were larger than Central American *V.p.thyone*. Lim et al (2003) raised *V.p.thyone* to species level based on morphological, mensural, chromosomal and mitochondrial differences with *V.p.pusilla*. Porter & Baker (2004) found that Brazilian specimens were strongly divergent in cytochrome-*b* from populations of *V.p.thyone* of the rest of South America and supported their specific status. The species is thus now considered monotypic (Gardner 2007).

Synonyms adapted from Gardner (2007) and López-González (2005):

*Phyllostoma pusillum* J.A. Wagner 1843:366. Type locality "Sapitiva" (=Sepetiba), Rio de Janeiro, Brazil.

*Chiroderma pusillum* W.Peters 1866:395. Name combination.

*Stenoderma (Chiroderma) pusillum* Pelzeln 1883:34. Name combination.

*V[ampyrops]. pusillus* O.Thomas 1889:170. Name combination.

*V[ampyrops (Vampyressa)]. pusillus* O.Thomas 1900:270. Name combination.

*Vampyressa pusilla* Miller 1907:156. Name combination.

*Vampyressa pusilla pusilla* Goodwin 1963:8. Name combination.

*Vampyressa nattereri* Goodwin 1963:16. Type locality "probably Ipanema, district of São Paulo, Brazil".

*V[ampyressa]. natteri* Peterson 1968: 7. Incorrect spelling.

*Vampyressa pusilla* Reis & Muller 1995: 33. Incorrect spelling.

**ENGLISH COMMON NAMES:** Southern Yellow-eared Bat (Gardner 2007), Little Yellow-eared Bat (Wilson & Cole 2000), Southern Little Yellow-eared Bat (IUCN).

**SPANISH COMMON NAMES:** Murciélaguito de orejas amarillas (Barquez et al 1993).

**GUARANÍ COMMON NAMES:** No known names.

**DESCRIPTION:** A very small, striped Stenodermatid. Nose leaf uniformly yellowish-brown and conspicuously long and spear-shaped. Dorsally pale brownish, with tricoloured hairs featuring a slightly paler medial band and no longitudinal white vertebral line. In Paraguayan specimens the tip of the dorsal hairs are reddish-brown, the bases brown and the central portion creamy-white. A pair of moderately conspicuous white facial stripes is present on the head, those above the eye extending back to between the ears, those below the eye extending to the base of the ear. The fur between the bands may appear slightly darker (especially in the area around the eye), sometimes giving a vaguely masked appearance. Ventral hairs unicoloured light brown to buffy. Ears fairly large and rounded, obtusely pointed at the tip. They are blackish in colour with bright yellowish borders and tragus, and typically a yellowish colouration to the area around the ear canal. Urotagium very narrow with the posterior edge almost naked except for the central portion where it is lightly furred. Calcar very short. (Barquez et al 1999, López-González 2005).

**CRANIAL CHARACTERISTICS:** Skull elongate with rostrum less than length of the braincase and broader in the area of the canines. Sagittal crest greatly reduced and virtually disappears at mid-point between the orbits. (Barquez et al 1999). Ramus of mandible relatively deep, the ascending branch elevated to an angle of almost 90°. (Goodwin 1963).

No noticeable sexual dimorphism in measurements (Lim et al 2003). Compared directly with *V.thyone* the skull is larger and more robust, with more developed postorbital processes leading to a broader appearance to the rostrum. In the nasal region the anterior medial palatal extension is thicker with a central and two lateral foraminas anteriorly. Palatal openings are not constricted posterolaterally.

Myers et al (1983) give the following means for to males from Paraguay: *Greatest Length of Skull* 19.6mm; *Condylbasal Length* 17.7mm; *Zygomatic Width* 11.7mm; *Interorbital Constriction* 5mm; *Mastoid Width* 9.8mm; *Width M2 to M2* 8.4mm.

López-González (2005) provides the following range measurements for 2 specimens from PN Ybycuí, Paraguay: *Greatest Length of Skull* 19.8mm; *Condylbasal Length* 17.9-18.1mm; *Mastoid Width* 9.7-9.9mm; *Zygomatic Width* 11.6-12.1mm; *Interorbital Constriction* 5-5.3mm; *Width Across Upper Canines* 4.7-4.8mm; *Width Across Upper Molars* 8.4mm.

Pedro et al (1997) give the following measurements for 2 males and 1 female from southern Sao Paulo State, Brazil: *Greatest Length of Skull* male 20.5-20.8mm, female 20.8mm; *Zygomatic Width* male 11.8-12mm, female 11.7mm; *Postorbital Constriction* male 5.1-5.2mm, female 5mm; *Width of Braincase* male 8.8-9mm, female 8.8mm; *Width Across Upper Canines* male 5.1-5.2mm, female 5mm; *Length of Mandible* male 12.4-12.6mm, female 12.5mm.

Lim et al (2003) give the following measurements for 10 specimens from São Paulo State, Brazil (n=10): *Greatest Skull Length* 20mm (+/- 0.4mm); *Zygomatic Width* 11.7mm (+/- 0.2mm); *Mastoid Width* 9.8mm (+/- 0.1mm); *Interorbital Constriction* 5mm (+/- 0.1mm); *Width Across Upper Molars* 8.4mm (+/- 0.3mm).

Longo et al (2007) give the following range measurements for "two to five specimens captured in the Pantanal and neighbouring uplands": *Greatest Skull Length* 20.1-22mm; *Zygomatic Width* 11.2-11.3mm; *Mastoid Width* 9.3-9-7mm; *Interorbital Constriction* 5.1-5.7mm; *Width Across Upper Molars* 8.3-9mm.

Barquez et al (1999) give the following measurements for the single Argentinean specimen: *Greatest Length of Skull* 20.2mm; *Condylbasal Length* 18.9mm; *Zygomatic Width* 12.1mm; *Palatal Length* 9.1mm; *Mastoid Width* 9.3mm; *Width of Braincase* 9.1mm; *Interorbital Constriction* 5.5mm; *Width Across Upper Canines* 5.2mm; *Length of Mandible* 13.2mm; *Width Across Upper Canines* 5.2mm; *Width Across Upper Molars* 8.5mm.

**DENTAL CHARACTERISTICS:** I2/2 C 1/1 P2/2 M2/2 = 28. Upper incisors well separated with I1 twice the size of I2. Cutting edges of I1 not bifid. Canine normal with cingulum well-developed posteriorly and almost contacting the anterior surface of P1. P1 half the size of P2 and with single cusp. P2 separated from P1 and M2, and with two cusps - a clear, high paracone and a lower mesostyle. Labial cusps of upper molars elevated to form cutting edge, lingual cusps extend labially forming a platform. Lower incisors subequal, bifid and fill space between canines. The p1 is smaller than p2 and both with single cusp. m1 with well-developed protoconid and hypoconid. m2 with paraconid and entoconid more developed than they are on labial cusps. (Barquez et al 1999). Posterior cusp of the last upper premolar is more developed in *V.pusilla* than *V.thyone* and the upper molars are broader (Lim et al 2003).

Lim et al (2003) give the following measurements for 10 specimens from São Paulo State, Brazil (n=10): *Upper Tooth Row* 6.9mm (+/- 0.2mm); *Lower Tooth Row* 6.6mm (+/- 0.2mm). Longo et al (2007) give the following range measurements for "two to five specimens captured in the Pantanal and neighbouring uplands": *Upper Tooth Row* 6.9-7.5mm; *Lower Tooth Row* 6.8-7.1mm.

Myers et al (1983) give the following means for two males from Paraguay: *Upper Tooth Row* 6.4mm. López-González (2005) provides the following range measurements for 2 specimens from PN Ybycuí, Paraguay: *Upper Tooth Row* 6.3-6.4mm; *Lower Tooth Row* 6.6-6.7mm. Barquez et al (1999) give the following measurements for the single Argentinean specimen: *Upper Tooth Row* 6.5mm; *Lower Tooth Row* 7.4mm.

**GENETIC CHARACTERISTICS** 2n=20. FN=36. (Myers et al. 1983).

**EXTERNAL MEASUREMENTS:** This is the smallest of the Paraguayan Stenodermatids (López-González 2005).

López-González (2005) provides the following range measurements for 2 specimens from PN Ybycuí, Paraguay: **TL:** 53-54mm; **FA:** 29.7-33.8mm; **FT:** 9mm; **EA:** 14-15mm; *Length of Third Digit* 31.9mm; **WT:** 11-12g.

Myers et al (1983) give a mean **FA** of two males from Paraguay of 32.4mm.

Pedro et al (1997) give the following measurements for 2 males and 1 female from southern São Paulo State, Brazil: **FA** male 34-34.1mm, female 33.6mm; *Tibia* male 13.2-13.6mm, female 13.5mm; *Third Metacarpal* male 32.7-34.2mm, female 34.6mm; *Fourth Metacarpal* male 32.5mm, female 33.7mm; *Fifth Metacarpal* male 33.7-34.2mm, female 32.7mm. Lim et al (2003) gave a **FA** range of 33-36mm for 10 specimens from São Paulo State, Brazil. Longo et al (2007) a **FA** range of 35-40mm and **WT** of 15-18g for "two to five specimens captured in the Pantanal and neighbouring uplands".

Barquez et al (1999) give the following measurements for the single Argentinean specimen (n=1): **TL** 55mm; **FT** 17mm; **FA** 34.5mm; **EA** 9mm; **WT** 15g.

**SIMILAR SPECIES:** Several species of Stenodermatinae have bold pale head stripes and they are the only subfamily of Phyllostomid that possess them. This is much the smallest of these striped species and the only species with forearm <40mm. Its small size immediately distinguishes it from the much larger

(almost twice the size) *Artibeus* and the head stripes tend to be boldest in the largest species in that genus, *Artibeus lituratus*.

The remaining two Stenodematids with bold head stripes may also show yellowish edges to the ears but both are readily distinguished by the longitudinal white vertebral line. In *Platyrrhinus lineatus* the line reaches to the crown. In *Chiroderma doriae* it reaches to the interscapular area.

The extremely similar *Vampyressa thyone* occurs in northern Bolivia (Pando, Beni, northern La Paz, northern Cochabamba and northern Sta Cruz Departments - Aguirre 2007) and is unlikely to occur in Paraguay. However due to the extreme similarity between these species and the poorly understood distribution of both, the differences are summarised here. It differs in cranial and dental characters (see relevant sections) and is consistently smaller in all measurements (eg FA 30-34mm in *thyone* and 33-36mm in *pusilla*) with no overlap (eg Greatest Length of Skull, Zygomatic Width, Maxillary Tooth Row Length) or only very slight overlap. Externally it typically shows a yellow outer edge to the nose leaf (uniformly brown in *pusilla*) and is less furry on the arms and legs. The dorsal fur is shorter and hairs do not extend notably beyond the interfemoral membrane, the fur being longer and more lax in *pusilla* and extending noticeably beyond the interfemoral membrane. The edging on the ears is paler in *V.pusilla* and more yellow in *V.thyone*. (Lim et al 2003)

**DISTRIBUTION:** This species is endemic to the Atlantic Forest region of southern Brazil and eastern Paraguay. Literature citations of this species in northern South America and Central America refer to the now split *Vampyressa thyone* Thomas 1909. They noted that the two species are allopatric and separated in range by the Chaco and Pantanal (Lim et al 2003). However Longo et al (2007) confirmed that the species is in fact present in part of the Brazilian Pantanal and substantially closed the distribution gap to around 400km.

In Brazil the species has been recorded in all the southern States; Mato Grosso do Sul (Longo et al (2007), Paraná (Miretzki 2003), Santa Catarina (Cimardi 1996), São Paulo (Zortéa & Alves de Brito (2000); as well as more northerly records from Bahía, Alagoas and Distrito Federal (dos Reis et al 2007).

There is only one specimen from Argentina from the junction of Ruta 21 and Arroyo Oveja Negra, 2km west of Parque Provincial Moconá, Provincia Misiones (Barquez et al 1999).

In Paraguay the species is known only from two localities, PN Ybycuí, Departamento Paraguari and the now disappeared Yaguarete Forest, Departamento San Pedro. López-González (2005) lists the following Paraguayan specimens: PN Ybycuí, Paraguari: UMMZ 133730-31 (2 skins with skulls), MNHNP 0194-96 (3 skins). Yaguarete Forest 1km N, 4km W of headquarters, San Pedro: TK56607.

**HABITAT:** Paraguayan specimens were collected in well-conserved, semi-deciduous Atlantic Forest (López-González 2005). Myers et al (1983) collected six specimens in PN Ybycuí, Departamento Paraguari in mist nets at the edge of a small clearing. Barquez et al (1999) note that the Argentinian specimen was captured over a stream in rainforest.

However the species also appears able to tolerate semi-humid areas in cerrado areas (Bordignon 2006) and even gallery forest and forested cordilleras in Pantanal (Longo et al 2007)

**ALIMENTATION:** There is little data referring specifically to this species but it may be considered frugivorous (Gardner 1977).

**Foraging Behaviour and Diet** Zortéa & Alves de Brito (2000) found pellets with *Ficus* sp. seeds in them associated with feeding tents close to food sources in Espirito Santo, Brazil, and *Ficus* seeds were also found in faeces of a male from São Paulo State (Pedro et al 1997).

**REPRODUCTIVE BIOLOGY:** Only limited data is available on this species.

**Seasonality** Myers et al (1983) note that a female captured in June in PN Ybycuí, Departamento Paraguari was pregnant.

*Argentina* Barquez et al (1999) state that the only specimen taken in Argentina was a male with testes 3x4mm during December.



Brazil Zortéa & Alves de Brito (2000) captured a heavily pregnant female and lactating female carrying a non-volant juvenile in 13 February 1998 at Santa Lúcia Biological Station, Espírito Santo. Pedro et al (1997) report a pregnant female (embryo CRL 23.5mm) from southern Sao Paulo State on 10 October 1996. Longo et al (2007) note a pregnant female taken in Mato Grosso do Sul on 27 January 2006 that was subsequently released, and Bordignon (2006) a lactating female from northeastern Mato Grosso do Sul during November 2004.

**GENERAL BEHAVIOUR:** This is a little known and rarely recorded species throughout its range. Most of the published literature on this species in fact refers to *V. thuyone*.

**Roosts** This is a tent-making bat that modifies large leaves into suitable roost sites. According to the definitions of tent structures by Kunz et al (1994) this species constructs an apical tent.

Zortéa & Alves de Brito (2000) described roost sites in Espírito Santo, Brazil. They found tents associated principally with *Heliconia* (Heliconiaceae) leaves (*H. sparthocircinantha* and *H. richardiana*) and a maximum of 5 tents were found on a single plant. *Heliconia* sp with leaves that are not sufficiently broad to form an apical tent are not utilised. The leaves had been cut in the lateral veins and interconnecting tissue either side of the midrib, causing the leaf to partially collapse. Veins were severed basally but not all the way to the distal portion, and the midrib was severed distally so that the terminal end of the leaf collapsed downward forming an apical tent with three sides. Partial cuts were also present on some leaves that did not result in collapse. Mean dimensions of 20 tents in *Heliconia* were: roost height 158.6cm (+/-9.3); leaf length 111.7cm (+/-5); central breadth of the leaf 37.7cm (+/-1.1); basal breadth of the leaf 24.1cm (+/-1); petiole length 64.1cm (+/-5.8); tent aperture 23.1cm (+/-0.9); modified length near central vein 83.9cm (+/-4.8); distance from base to collapse 66.9cm (+/-3.9). They found a single male roosting in another tent, two (at least one female) in another tent and two unsexed individuals in a third tent. The bats were in close contact, huddled close to the collapse point on the midrib.

Single unoccupied roosts were found associated with *Piper* sp. and *Philodendron ornatum*. The *Piper* tent had the follow dimensions: roost height 220cm; leaf length 50cm; central breadth of the leaf 31cm; basal breadth of the leaf 27cm; petiole length 13cm; tent aperture 13cm. The leaf had not collapsed along the midrib. The *Philodendron ornatum* had cut veins near the base of the leaf and several cuts along the midrib as an attempt to create leaf collapse. It had following dimensions: roost height 180cm; leaf length 36cm; central breadth of the leaf 36cm; petiole length 48cm; tent aperture 19cm.

The shape of tents in *Simira* aff. *eliezariana* (Rubiaceae) are similar to those observed in *Heliconia* allowing for the difference in leaf morphology. Modified leaves had cuts in the secondary veins and interstitial tissues along the midrib. The leaves had 20 (+/-25) secondary veins of which a mean of 16 were cut at the basal portion, not reaching the tip. The tip was again collapsed to form a three-sided tent. Mean dimensions of 6 tents in *Simira* were: roost height 365cm (+/-0.3); leaf length 70.7cm (+/-1.3); central breadth of the leaf 41.7cm (+/-1.8); distance from base to collapse 45.8cm (+/-4).

**VOCALISATIONS:** No information.

**HUMAN IMPACT:** None in Paraguay where the species is known only from a handful of specimens from undisturbed humid forest.

**CONSERVATION STATUS:** Globally considered to be Data Deficient by the IUCN, see <http://www.iucnredlist.org/apps/redlist/details/22841/0> for the latest assessment of the species. This is a rarely-recorded bat endemic to the depleted Atlantic Forest region and apparently with specialised and population limiting ecological requirements. No population estimates are available.

The Paraguayan specimens were collected in protected areas in semideciduous, Atlantic Forest in a relatively good state of conservation, suggesting that the species may be sensitive to habitat fragmentation and degradation López-González (2005). SEAM (2006) considers the species vulnerable in Paraguay and one of the two collection sites has since been completely deforested. Though it potentially occurs throughout the Atlantic Forest region of eastern Paraguay it apparently does so at low density.

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**FIGURE 2** - Adult (© Merlin D. Tuttle, Bat Conservation International, [www.batcon.org](http://www.batcon.org)).



**FIGURES 3-9** - Skull (©Philip Myers/Animal Diversity Web <http://animaldiversity.ummz.umich.edu>).



