

## Confused identities: the case of the *chauve-souris septième* or *chauve-souris brun-blanchâtre* of Azara (1801)

## Identidades confundidas: el caso del *chauve-souris septième* o *chauve-souris brun-blanchâtre* de Azara (1801)

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Félix de Azara described several species of bats in his seminal work on mammals of Paraguay in 1801. One of these bats, the *chauve-souris septième* or *chauve-souris brun-blanchâtre*, was used by É. Geoffroy St-Hilaire (1806) to describe his *Vesp[ertilio]. villosissimus*, a name currently applied to the southern hoary bat, *Lasiurus (Aeorestes) villosissimus*. The latter, in addition, is the type species of the genus *Aeorestes* Fitzinger 1870. In this contribution, through a reevaluation of the description provided by Azara (1801), we demonstrate that the *chauve-souris septième* or *chauve-souris brun-blanchâtre* is clearly referable to the subgenus *Dasypterus* W. Peters, 1870. Strict application of the rule of priority in this case would cause considerable and undesirable nomenclatural upheaval, including the synonymy of *Nycticejus Ega* Gervais, 1856 with *Vesp[ertilio]. villosissimus* É. Geoffroy St-Hilaire, 1806 and the need of a new genus (or subgenus)-level name for hoary bats. We thus recommend preservation of current usage by declaring a neotype for *Vesp[ertilio]. villosissimus* É. Geoffroy St-Hilaire, 1806 and proposing a new type species for *Aeorestes* Fitzinger, 1870.

**Key words:** *Aeorestes*; *Dasypterus*; Hoary Bats; Lasiurine bats; *Lasiurus*.

Félix de Azara describió varias especies de murciélagos en su trabajo seminal sobre los mamíferos del Paraguay en 1801. Uno de estos murciélagos, el *chauve-souris septième* o *chauve-souris brun-blanchâtre* fue utilizado por É. Geoffroy St-Hilaire (1806) para describir *Vesp[ertilio]. villosissimus*, un nombre que se aplica actualmente al murciélago escarchado gris del sur, *Lasiurus (Aeorestes) villosissimus*. Esta última, además, es la especie tipo de *Aeorestes* Fitzinger 1870. En esta contribución, a través de una reevaluación de la descripción proporcionada por Azara (1801), demostramos que el *chauve-souris septième* o *chauve-souris brun-blanchâtre* es claramente referible al subgénero *Dasypterus* W. Peters, 1870. La aplicación estricta de la regla de prioridad en este caso causaría una alteración nomenclatural considerable e indeseable, incluida la necesidad de sinonimizar *Nycticejus Ega* Gervais, 1856 bajo *Vesp[ertilio]. villosissimus* É. Geoffroy St-Hilaire, 1806 y la necesidad de un nuevo nombre genérico o subgenérico para los murciélagos escarchados grises. Por lo tanto, recomendamos la preservación del uso actual a través de la designación de un neotipo para *Vesp[ertilio]. villosissimus* É. Geoffroy St-Hilaire, 1806 y proponiendo una nueva especie tipo para el taxón *Aeorestes* Fitzinger, 1870.

**Palabras clave:** *Aeorestes*; *Dasypterus*; Lasiurinae; *Lasiurus*; murciélagos canosos.

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Félix de Azara (1742–1821) was a Spanish military engineer and pioneer in natural history studies in southern South America (Contreras 2010). Charged with delimiting of the borders of the Spanish and Portuguese crowns on the continent, he was sent to Buenos Aires and Asunción (at this time within the limits of the Virreinato del Río de La Plata), in representation of the Spanish king. When his Portuguese equivalent failed to show, he focused his attention on documenting the fauna, culture and geography of his new home, a broad area that he defined as “Paraguay and La Plata”, that includes modern day eastern Argentina, Paraguay, extreme southern Brazil and Uruguay. A detailed chronology of his life, movements and work was provided by Mones and Klappenbach (1997) and Contreras (2010).

The two volume “Essais sur l’histoire naturelle des Quadrupèdes de la Province du Paraguay” (Azara 1801) was perhaps the first serious attempt to describe the mammal fauna of the Southern Cone of the continent. Much to the chagrin of the author, the French version (translated by L. E. Moreau-Saint-Méry) was an incomplete draft that he had sent to Europe for opinion, only to find out later that it had in fact been published. This prompted comments in the prologue of the Spanish version of the text “Apuntamientos para la historia natural de los cuadrúpedos del Paragüay y Río de la Plata” (Azara 1802) to the effect that this Spanish version should be considered the finished item, as it contained corrections to the errors and additional species not figured in Azara (1801). Nonethe-

less, many of the scientific names coined by European academics (including É. Geoffroy St-Hilaire, Desmarest, Oken and Olfers among others), that were derived from Azara's text (as Azara did not employ Linnean binomials), were based on this French version, even though the specimens described (the types) did not always correspond to those in the Spanish version (although not in this case).

Though Azara's descriptions are well written for the time, a lack of biological training, coupled with a global underestimation of the extent of zoological variation in the 19<sup>th</sup> century, meant that not all of the animals in his descriptions have been identified conclusively, or correctly. Reviews of his texts on the didelphids (e. g., [Voss et al. 2009](#)) and rodents ([Tate 1932](#); [Contreras and Teta 2003](#); [Pardiñas et al. 2007](#)) have been published, but the descriptions of the bats have been largely assumed to be correct (given that many original scientific names were based upon them). However, the description of the *chauve-souris septième* or *chauve-souris brun-blanchâtre* ([Azara 1801](#); Tome 2: 284), currently regarded as referring to the Southern Hoary Bat, and the basis of *Lasiurus villosissimus*, originally described as *Vesp[ertilio]. villosissimus* É. Geoffroy St-Hilaire, 1806, clearly does not refer to a hoary bat. A re-evaluation of the identity of this bat takes on renewed significance, given the recognition that this form, formerly considered a subspecies of *Lasiurus cinereus* ([Palisot de Beauvois 1796](#)) by [Sanborn and Crespo \(1957\)](#), is in fact a different species ([Baird et al. 2015](#)). In addition, *Vesp[ertilio]. villosissimus* is the type species of the genus level name *Aeorestes* Fitzinger, 1870 by original designation.

Disagreement as to the identity of *Vesp[ertilio]. villosissimus* is not new (see [Allen 1901, 1905](#); [Thomas 1901, 1902, 1910](#)). Though [Allen \(1901\)](#) originally considered the name to refer to *Vespertilio bonariensis* Lesson and Garnot, 1827 (at this time, the name applied in part to the South American "red bats"), he later associated it with *Dasypterus* W. Peters, 1870 ([Allen 1905](#)). On the other hand, [Thomas \(1901, 1902, 1910\)](#) consistently maintained that the bat described by [Azara \(1801\)](#) corresponded to *L. cinereus* (at this time, the name used for the South American "hoary bats"). Allen (1905) provided a convincing argument to link Azara's *chauve-souris septième* or *chauve-souris brun-blanchâtre* with *Dasypterus*, but [Thomas \(1910\)](#) did not accept the suggestion, although he did concede it was "a little more plausible". [Allen \(1905:190–191\)](#) reasoned: "(1) That it [i.e., *Vesp[ertilio]. villosissimus*] was of about the size of *L. borealis*, having a wing span of about 317 mm. (2) That it had a rather long, pointed ear, much larger and differently shaped than the ear of *Lasiurus sensu lato*. (3) That the naked edges of the interfemoral membrane, do not exist in the *L. borealis* group, and are only slightly seen in the *L. cinereus* group. (4) That the extreme softness, great length, and the color of the pelage, does not agree in any respect with that of *L. borealis*, nor very well with that of *L. cinereus*, but does agree in length and softness with the *Dasypterus ega* group." Subsequent authors (e. g., [Cabrera](#)

[1958](#); [Sanborn and Crespo 1957](#); [Gardner and Handley 2007](#)) did not discuss this issue again, tacitly accepting the opinion of [Thomas \(1910\)](#).

In this note, we discuss the identity of *Vesp[ertilio]. villosissimus*, through a re-evaluation of the original texts of [Azara \(1801, 1802\)](#) and application of our current knowledge of the genus *Lasiurus*. In addition, we include some notes on the type locality and the nomenclatural implications of possible name changes.

*Notes on the identity of the Azara's chauve-souris septième or chauve-souris brun-blanchâtre.*

[Azara \(1801, 1802\)](#) described his *chauve-souris septième* or *chauve-souris brun-blanchâtre* as a species with extremely soft hair, an overall whitish-brown coloration and moderately long, pointed ears (Appendix 1–3). [Azara \(1801, 1802\)](#) also remarked that the uropatagium was hairy, except at its border, and of the same color as the body pelage (Appendix 1–3). The description of the furred uropatagium confirms that, within the context of the Paraguayan fauna, this bat is a species of *Lasiurus* Gray, 1831 *sensu lato*. The genus *Lasiurus* includes 3 subgenera (sometimes treated as genera), for which the names *Lasiurus* (broadly referred to as the red bats), *Dasypterus* (yellow bats), and *Aeorestes* (hoary bats) are used. Three species, representing the three recognized subgenera, are documented for Paraguay ([De La Sancha et al. 2017](#)): *Lasiurus (Lasiurus) blossevillii* (Lesson, 1826), *L. (Aeorestes) villosissimus* (É. Geoffroy St-Hilaire, 1806) and *L. (Dasypterus) ega* (Gervais, 1856) ([López-González 2005](#)). However, while both *L. blossevillii* and *L. villosissimus* have their uropatagia covered by hairs almost to the border, *L. ega* has it furred only in the proximal half.

Though the description of this bat is brief, there are no grounds for associating a bat described as having "whitish-brown" pelage with the clade of hoary bats, which are distinctively-colored with frosted dark grey-and-white body fur and an obvious yellowish "balaclava," or the red bats, which are characterized by a reddish coloration frosted with white (e. g., [Shump and Shump 1982a, 1982b](#); [Kurta and Lehr 1995](#); [Díaz et al. 2011](#)). In turn, *L. ega* has a yellowish-olivaceous to brownish coloration (cf. [López-González 2005](#)), more in accordance with the description made by [Azara \(1801, 1802\)](#). Finally, *L. ega* has more pointed and moderately long ears, contrasting with the shorter and more rounded pinna of the other two species (cf. [Barquez et al. 1999](#)). That [Azara \(1801, 1802\)](#) is indeed describing an individual of the species currently referred as *L. ega* is supported circumstantially by the fact that the morphometrics are consistent (though not diagnostic) with the measurements of *L. ega* (Table 1) and the fact that this species is a much more common bat than *L. villosissimus* in Paraguay ([López-González 2005](#)).

*Notes on type locality.*

[Azara \(1801, 1802\)](#) does not provide a type locality for the *chauve-souris septième*, *chauve-souris brun-blanchâtre*

**Table 1.** External measurements (mean  $\pm$  standard deviation, and range) for *Vesp[ertilio]. villosissimus* and the 3 species currently included within *Lasiurus* found in Paraguay (cf. López-González 2005). Measurements for *V. villosissimus* were converted into mm using the French inch ("pie de Paris" o "pie de Rey") and line (1 inch = 27.07 mm, 1 line = 2.23 mm).

	<i>Lasiurus blossevillii</i>	<i>Lasiurus ega</i>	<i>Vesp[ertilio]. villosissimus</i>	<i>Lasiurus villosissimus</i>
Total length	Male: 103.4 $\pm$ 8.70 (89.0–110.0; <i>n</i> = 7) Female: 107.2 $\pm$ 5.27 (97.0–119.0; <i>n</i> = 16)	Male: 119.7 $\pm$ 4.80 (107.0–127.0; <i>n</i> = 35) Female: 56.5 $\pm$ 3.72 (117.0–139.0; <i>n</i> = 31)	117.28	Male: 130.3 $\pm$ 1.53 (129.0–132.0; <i>n</i> = 3) Female: 131.6 $\pm$ 4.50 (127.1–136.0; <i>n</i> = 2)
Tail length	Male: 46.1 $\pm$ 7.22 (33.0–55.0; <i>n</i> = 7) Female: 48.6 $\pm$ 3.35 (45.0–56.0; <i>n</i> = 16)	Male: 53.5 $\pm$ 4.28 (45.0–61.0; <i>n</i> = 35) Female: 56.5 $\pm$ 3.72 (48.0–63.0; <i>n</i> = 31)	51.88	Male: 55.3 $\pm$ 6.81 (50.0–63.0; <i>n</i> = 3) Female: 56.3 $\pm$ 3.21 (54.0–60.0; <i>n</i> = 3)
Wingspan	~350–450	335–355	311.31	~430
Ear length	Male: 12.0 $\pm$ 1.53 (10.0–14.0; <i>n</i> = 7) Female: 12.3 $\pm$ 1.35 (9.0–14.0; <i>n</i> = 16)	Male: 17.5 $\pm$ 4.55 (13.0–21.0; <i>n</i> = 35) Female: 16.5 $\pm$ 1.63 (13.0–21.0; <i>n</i> = 31)	15.79	Male: 15.7 $\pm$ 0.58 (15.0–16.0; <i>n</i> = 3) Female: 16.0 $\pm$ 1.00 (15.0–17.0; <i>n</i> = 3)

or *murcielago blanquizco*, noting merely that he had "several identical specimens". However, Azara (in Agacino 1941) stated that his *Murcielago 5<sup>to</sup>* (= *murcielago blanquizco*) was captured in the house of Dr. Ignacio Pazos during February and that the specimen had been given to Azara. From the near identical text and the identical measurements, it is clear that this refers to the same species as the *chauve-souris septième* or *chauve-souris brun-blanchâtre*. The restriction of the type locality of *L. cinereus villosissimus* made by Cabrera (1958) to Asunción is thus accurate, based on the available data. Ignacio Pazos (born La Coruña, Spain 1760, died Cádiz, Spain 3 October 1804) was a naval officer and geographer, who formed part of an expedition to delimit the Spanish territories in South America, and worked closely with Azara during his time in Paraguay. The type specimen is now lost (Carter and Dolan 1978).

#### Nomenclatural implications.

*Vesp[ertilio]. villosissimus* É. Geoffroy St.-Hilaire, 1806 is based on the *chauve-souris septième* or *chauve-souris brun-blanchâtre* of Azara (1801). However, as demonstrated here and by Allen (1905), *Vesp[ertilio]. villosissimus* É. Geoffroy St.-Hilaire, 1806 is in fact a senior synonym of *L. ega* and has date priority over *Nycticejus Ega* Gervais, 1856, the current valid name for the Southern Yellow Bat. Strict application of the rule of priority in this case would cause considerable and undesirable nomenclatural upheaval and may be summarized as follows:

1) The date priority of *Vesp[ertilio]. villosissimus* E. Geoffroy St.-Hilaire, 1806 over *Nycticejus Ega* Gervais, 1856 means that the scientific name of the Southern Yellow Bat would become *Lasiurus (Dasypterus) villosissimus* (E. Geoffroy St.-Hilaire, 1806), with type locality in Asunción, Paraguay. Such a change would be unfortunate, since *D. ega* is the name that has been applied to the southern yellow bats for more than 150 years (see Gardner and Handley 2007).

2) The species actually known as *Lasiurus (Aeorestes) villosissimus*, the Southern Hoary Bat, would be called by the next available name; *i. e.*, *Lasiurus (Aeorestes) grayi* Tomes, 1857: 40, with type locality "Chili" (= Chile).

3) The genus-level name *Aeorestes* Fitzinger, 1870 (dated 13 October 1870), with *Aeorestes villosissimus* as type species, would become a senior synonym of *Dasypterus* W. Peters, 1870 (dated 22 December 1870, with *Lasiurus intermedius* as type species) and thus be applicable to the Yellow Bats, not the Hoary Bats.

4) No valid supraspecific names are available for the Hoary Bats and they would require a new name, either for use as a genus or subgenus.

In order to avoid all these undesirable and destabilizing nomenclatural changes, the authors of this note will formally request the International Commission on Zoological Nomenclature (ICZN) to use its plenary powers to conserve both the supraspecific and specific names for both species affected (*i. e.*, those currently referred as *L. ega* and *L. villosissimus*). We thus recommend preservation of current usage by declaring a neotype for *Vesp[ertilio]. villosissimus* É. Geoffroy St.-Hilaire, 1806 and proposing a new type species for *Aeorestes* Fitzinger, 1870.

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## Appendix 1

Transcription of the original French text of ([Azara 1801](#); Tome 2, pp. 284–285) upon which the name *Vesp[ertilio]. villosissimus* E. Geoffroy St.-Hilaire, 1806 is based.

### CHAUVE-SOURIS SEPTIÈME

ou

### CHAUVE-SOURIS BRUN-BLANCHÂTRE

J'ai possé dé divers individus de cette espèce, et ils étoient identiques entre eux.

Longeur, 4 pouces i tiers (11 centimètres 2 tiers)

Queue, 23 lignes (5 centimètres)

Envergurs, 11 pouces et demi (31 centimètres un tiers).

Le poil est extrêmement doux, plus long que d'ordinaire, et d'un brun très-blanchâtre. C'est de la même couleur qu'est la membrane de la queue ; cette dernière est velue, excepté dans sa bordure.

L'aile est couleur de mure, excepté les doigts et le voisinage du bras et du corps, que sont brun-blanchâtres. L'aile est unie au métatarse, et la membrane que va à l'extrémité de la queue nait un peu plus haut ; les vertèbres de la queue sont très-longues et minces.

L'oreille est comme celle du rat ; elle est haute de 7 lignes (1 centimètre et demi) ; elle présente presque son ouverture en avant ; elle est un peu aiguë à sa pointe, un peu inclinée vers le front, et encore vers le côté, et de son intérieur nait une pointe aiguë comme celle d'une épée.

Le museau n'est pas aigu, et il est divisé, à son extrémité pelée, par un canal, comme celui de la Chauve-Souris précédente.

La mâchoire supérieure excède un peu ; mais cet excédant, et même un peu plus d'espace encore, manque d'os, et par conséquent d'incisives, et peut se retrousser facilement ; cependant plus en dedans est une longue canine de chaque côté, jointe à laquelle et vers la partie extérieure, est une petite dent aiguë, que l'on pourroit appeller incisive, si elle n'étoit pas démesurément éloignée de son analogue de l'autre côté.

Dans la mâchoire inférieure, l'on n'aperçoit point d'incisives, mais le tact les découvre, et l'on voit, de chaque côté, une canine un peu plus grande que celle d'en haut.

## Appendix 2

Translation of the French text of [Azara \(1801\)](#) (see above, Appendix 1).

### SEVENTH BAT

or

### WHITISH-BROWN BAT

I have possessed various individuals of this species, and they were identical to each other.

Length, 4 inches and a third (11 2/3 centimetres)

Tail, 23 lines (5 centimetres)

Wingspan, 11 and a half inches (31 1/3 centimetres)

The hair is extremely soft, longer than usual, and of a very whitish brown. The membrane of the tail is of the same color; the latter is hairy, except at its border.

The wing is blackberry-colored, except for the fingers and the area around the arm and the body, which are whitish-brown. The wing is united to the metatarsus, and the membrane that goes to the end of the tail inserts a little higher; the vertebrae of the tail are very long and thin.

The ear is like that of the rat; it is 7 lines high (1 1/2 centimetres); it almost presents its opening forward; it is a little sharp at its point, a little inclined towards the forehead, and again towards the side, and from its interior arises a sharp point like that of a sword.

The muzzle is not sharp, and it is divided, at its bare end, by a canal, like that of the previous bat.

The upper jaw protrudes a little; but this excess, and even a little more, lacks bones, and consequently lacks incisors too, and thus can be easily pushed in. Internally there is a long canine on each side, and next to it externally, is a small sharp tooth, which one would call an incisor, if it were not disproportionately distant from its equivalent on the other side.

In the lower jaw, it is not possible to see any incisors, but they can be felt, and on each side, there is a canine, a little larger than that above.

### Appendix 3

Transcription of the original Spanish text of [Azara \(1802; Tome 2, pp. 303–304\)](#).

NUM. LXXVII.

DEL PARDO BLANQUIZCO.

He pillado varios idénticos. Longitud  $4 \frac{1}{3}$  pulgadas: cola  $1 \frac{11}{12}$ : braza  $11 \frac{1}{2}$ . El pelo es suavísimo, mas largo de lo regular, y pardo muy blanquizco. De este color es la membrana de la cola, que tiene pelos, ménos en la borda. El ala morada; y los dedos y la inmediacion del brazo y del cuerpo pardos blanquizcos. Dicha ala une al metatarso, naciendo poco mas arriba la membrana que va al fin de la cola. Oreja de Raton, alta 7 líneas, casi presenta delante su abertura, algo aguda en la punta, un poco inclinada para la frente y hácia el costado; y de lo interior sale una punta aguda como de espada. El hocico no agudo: la mandíbula superior excede un poco; pero este exceso y algo mas carece de hueso, y por consiguiente de incisivos, y se arremanga fácilmente: mas adentro hay en cada lado un colmillo largo, y junto á él hácia fuera un dientecillo agudo, que podría llamarse incisivo si no distase demasiado del del otro lado. No se ven incisivos abaxo, pero los encuentra el tacto; y hay un colmillo en cada lado algo menor que el de arriba.