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ABSTRACT

Members of the Pampas Cat species group are small felids specialized for life in open habitats. Their taxonomic history is complex, and they were divided into five species recently. In the case of one of the species, the Uruguayan Colocolo, there is a recent controversy between authors who either argue that its valid name is *Leopardus munoai* (Ximénez, 1961), or that it is *L. fasciatus* (Larrañaga, 1923). A revision and reinterpretation of the original sources for these names, namely Azara (1801, 1802), Desmarest (1816), and Larrañaga (1923) confirms the correct name of the Uruguayan Colocolo to be *L. munoai*. The neotype of *L. fasciatus* is invalid because: 1) as a nominal species, *L. fasciatus* is not a senior synonym of *L. munoai*, as it was assumed by those who designated the neotype, but instead it is a junior synonym of the Southern Pampas Cat, *L. pajeros* (Desmarest, 1816); and 2) the designation of the neotype involved errors typified as causes of invalidity in Article 75 of the International Code of Zoological Nomenclature.

Key words: Argentina, Brazil, Félix de Azara, Pajero Cat, pampas, taxonomy, Uruguay, zoological nomenclature.

RESUMEN

Los miembros del grupo de especies Gato de las Pampas son pequeños félidos especializados para la vida en ambientes abiertos. Su historia taxonómica es compleja y recientemente fueron divididos en cinco especies. En el caso de una de las especies, el Colocolo Uruguayo, hay una controversia reciente entre autores que sostienen que su nombre válido es *Leopardus munoai* (Ximénez, 1961), o que es *L. fasciatus* (Larrañaga, 1923). Una revisión y reinterpretación de las fuentes originales de estos nombres, a saber, Azara (1801, 1802), Desmarest (1816) y Larrañaga (1923), confirma que el nombre correcto del Colocolo Uruguayo es *L. munoai*. El neotipo de *L. fasciatus* es inválido porque: 1) como especie nominal, *L. fasciatus* no es un sinónimo más antiguo de *L. munoai*, como supusieron quienes designaron el neotipo, sino un sinónimo más reciente del Gato de las Pampas del Sur, *L. pajeros* (Desmarest, 1816); y 2) la designación del neotipo involucró errores tipificados como causales de no validez en el Artículo 75 del Código Internacional de Nomenclatura Zoológica.

Palabras clave: Argentina, Brasil, Félix de Azara, Gato Pajero, nomenclatura zoológica, pampas, taxonomía, Uruguay.

INTRODUCTION

Within the genus *Leopardus* Gray, 1842 (Mammalia, Carnivora, Felidae), the members of the Pampas Cat species group are the most specialized for life in open habitats (García-Perea 1994, Nascimento *et al.* 2021). Before the mid 1990's, they were deemed to represent a single species (Kitchener *et al.* 2017). They were divided into three species by García-Perea (1994), and into five by Nascimento *et al.* (2021). Based on the latter authors, the current classification of the species group divides them into: 1) the Central Chilean Colocolo, *Leopardus colocola* (Molina, 1782), endemic to Chile; 2) the Southern Pampas Cat, or Southern Colocolo, *L. pajeros* (Desmarest, 1816), occurring in Argentina (the northern limit is the Catamarca Province), and southern Chile; 3) the Uruguayan Colocolo, *L. munoai* (Ximénez, 1961), occurring in Uruguay, Argentina (Corrientes Province), and Brazil (Rio Grande do Sul); 4) the Pantanal Cat, *L. braccatus* (Cope, 1889), occurring in northern Argentina (Formosa Province), Paraguay, Bolivia (Beni Department), and Brazil (Mato Grosso and Piauí States); and 5) the Northern Colocolo, *L. garleppi* (Matschie, 1912), occurring in northern Argentina (Catamarca and Córdoba Provinces), northern Chile (Tarapacá Region), Bolivia, Peru, Ecuador, and southwestern Colombia (Nascimento *et al.* 2021, Astorquiza *et al.* 2023, Distel *et al.* 2023, ASM 2024, Cabrera-Ojeda & Meléndez 2024). The species group is divided into two clades that diverged 0.54 Myr ago: one of them includes *L. colocola*, *L. pajeros* and *L. garleppi*; the other includes *L. munoai* and *L. braccatus* (Nascimento *et al.* 2021).

The oldest binomial, *Felis pajeros*, applied to the Southern Pampas Cat (Desmarest 1816) was based on the earlier morphological description under the vernacular names 'Chat pampa' (Azara 1801: 179–184) and 'Gato pajero' (Number XVIII; Azara 1802: 160–167). In the last decades, the species has been referred to as *Lynchailurus pajeros* (García-Perea 1994) and as *Leopardus colocola pajeros* (Kitchener *et al.* 2017); though it is currently known as *Leopardus pajeros* (for a detailed synonymy, see Nascimento *et al.* 2021). Desmarest's (1816) description was as follows: 'Twenty-third Species.— The PAJEROS of d'Azara; *Felis pajeros*, Nob., is also an animal from Paraguay (not yet figured), the size of the wild cat, whose hair is long, soft and gray-brown above, with reddish transverse bands under the throat and belly, and dark rings on the legs. The Pampa cat,

by the same author, does not seem to differ from it'¹. Because no holotype was ever designated for the species, and because a name-bearing type was deemed necessary to define the nominal taxon objectively, Nascimento *et al.* (2021) selected a neotype for *L. pajeros*.

The Uruguayan Colocolo, *Leopardus munoai*, originally deemed identical to the 'Gato pajero' (Azara 1801, 1802), was described as *Felis colocola munoai*. Its subspecific name was emended to *F. c. munoai* by Ximénez (1970). It was transferred to the genus *Leopardus* by Wozencraft (2005), and elevated to species by Nascimento *et al.* (2021).

RECOGNITION AND NEOTYPIFICATION OF
LEOPARDUS FASCIATUS

Dámaso Antonio Larrañaga (Montevideo, 1771–1848) was contemporaneous with Félix de Azara (Barbuñales, 1742–1821) and Anselme Gaëtan Desmarest (Paris, 1784–1838). Some of his most important writings (Larrañaga 1922, 1923, 1924) were first published by the Instituto Histórico y Geográfico del Uruguay (IHGU). Larrañaga summarily described hundreds of new species of plants and animals. In 1818, Larrañaga (1922: 85) was aware of Desmarest's description of *Felis pajeros*, to which he referred to as '*Felis Pajeros (fasciatus)* Dicc.' [Dicc. = Dictionnaire, a misspelling of Dictionnaire]. Nevertheless, also based on Azara's (1802) Number XVIII cat, he devised his own binomial, which through the agency of the IHGU was promulgated as *Felis fasciatus* Larrañaga, 1923. Ximénez *et al.* (1972) deemed *F. fasciatus* a junior synonym of *F. colocola pajeros*. However, the Uruguayan form was referred to as *Felis colocola fasciatus* by Klappenbach (1997), as *Lynchailurus braccatus fasciatus* by González (2001), and as *Leopardus braccatus fasciatus* by González & Martínez-Lanfranco (2010). Nascimento *et al.* (2021) treated *Felis fasciatus* as a junior synonym of *Leopardus pajeros*, while noting that González & Martínez-Lanfranco (2010) used *fasciatus* in place of *munoai* without justification and ignoring the discussion of Ximénez *et al.* (1970).

Based on their interpretation of Azara's (1801, 1802) and Larrañaga's (1923) writings (the relevant passages are quoted below), Martínez-Lanfranco & González (2022) doubled down on their argument that the correct name for the Uruguayan Colocolo is *Leopardus fasciatus* instead of *L. munoai*. They even designated a neotype for *L. fas-*

1 'Vingt-troisième Espèce.— Le PAJEROS de d'Azara; *Felis pajeros*, Nob., est aussi un animal du Paraguay (non encore figuré), de la taille du chat sauvage, dont le poil est long, doux et gris-brun en dessus, avec des bandes transverses roussâtres sous la gorge et le ventre, et des anneaux obscurs sur les pattes. Le chat Pampa, du même auteur, ne paroît pas en différer' (Desmarest 1816).

ciatus, with a type locality near the Río Negro of Uruguay, ~100 km to the northeast of that of *L. munoai*. Following Martínez-Lanfranco & González (2022), the latest version of the Mammal Diversity Database of the American Society of Mammalogists (ASM 2024) accepts *L. fasciatus* as the valid name of the Uruguayan Colocolo.

Azara (1801: 179) stated that: ‘I do not know, and I have not heard that it lives in Paraguay. It is found in the Pampas, south of Buenos Aires, in the grasslands between the 55th and 36th degrees of latitude’². Azara (1802: 160) expanded these remarks as follows: ‘NÚM. XVIII. ON THE PAJERO. They call it Pajero cat because it lives in the fields, hiding in the grasslands without entering the forests and bushes, where the previous ones live. I do not know, nor have I heard that it exists in Paraguay; and it could be, because having a sufficient population and fewer fields, they might have been able to exterminate it. I caught four in the Pampas of Buenos Aires between the 35 and 36 degrees, and another three where the Black [donde al Negro]’³ [bold mine]. Azara (1802: 161) also stated that the species was found ‘on both sides of the La Plata River with identity of shapes, colors and habits’⁴, hence he clearly was collectively referring to populations at present classified (Nascimento *et al.* 2021) as *Leopardus pajeros* (Argentina) and *L. munoai* (Uruguay).

Larrañaga (1923: 345) described *L. fasciatus* as follows: ‘Sp. 5. F(elis). fasciatus—tail elongate immaculate, woolly, body above dilutely brown, below white with cinnamon-banded feet. Sp. n. HABITAT more common than the previous one, does not enter forests: length 34½, tail 11¾. Azara Number XVIII Pajero’⁵. Larrañaga (2023) made no other mention or comment about *L. fasciatus* other than listing the name in the indexes of the book, and in two tables (inserted between pages 340 and 341) entitled ‘Classification of the mammals of the La Plata River, particularly its Eastern Bank according to the system of Cuvier, with their characters adapted to the country’⁶ and ‘Classification of the mammals of this country according to the system of Cuvier’⁷.

MISINTERPRETATION OF AZARA (1801, 1802) AND LARRAÑAGA (1923)

Martínez-Lanfranco & González (2022) did two things. First, they argued *Leopardus fasciatus* (Larrañaga, 1923), and not *L. munoai* (Ximénez, 1961), to be the oldest name available for the Uruguayan Colocolo. In support of this claim, they stated that Larrañaga (1923) ‘clearly distinguished’ between Uruguayan and Argentinian specimens (Premise 1), and that he ‘was explicit’ in that his description of *F. fasciatus* was based solely on Uruguayan specimens (Premise 2). Second, ‘to anchor Larrañaga’s *fasciatus* to Uruguayan pampas cats’, they designated a neotype for this taxon; to justify this action, they inferred that, because Azara (1802) mentioned the Pajero cat to inhabit both sides of the La Plata River, his ‘donde al Negro’ [‘where the Black’] was intended to mean that this felid occurs in the vicinity of the Río Negro of Uruguay (Premise 3); accordingly, for the neotype, they chose a type locality just to the south of this river. Unfortunately, Martínez-Lanfranco & González (2022) went beyond the meaning and scope of the statements (transcribed in full in the preceding section) of Azara (1801, 1802) and Larrañaga (1923) on the Pajero cat, as the examination that follows of what I am referring to as their premises reveal.

Premise 1) Larrañaga (1923) ‘clearly distinguished’ between Uruguayan and Argentinian specimens.—It is hard to see how by means of a description containing only 14 words⁵, and without a diagnosis or comparisons, two closely related, variable and similar felids could be ‘clearly distinguished’; and there is no reason to assume that the use of such words⁵ indicates that Larrañaga knew and intended to say that the two felids represent different species or subspecies. Martínez-Lanfranco & González (2022) claimed that ‘in the context of Larrañaga’s diagnosis of the new species, *fasciatus* refers to the specimens as having cinnamon-colored banded feet. Azara (1802:162), in contrast, mentioned that the “Pajero” had lightly cinnamon-colored

2 ‘JE ne sache point, et je n’ai pas ouï dire qu’il habite le Paraguay. On le rencontre dans les Pampas, au Sud de Buenos-Ayres, lieu où, entre les pajonals du 55.º et du 36.º degré de latitude’ (Azara 1801).

3 ‘NÚM. XVIII. DEL PAJERO. Le llaman Gato pajero, porque habita los campos, escondiéndose en los pajonales sin entrar en los bosques y matorrales, donde habitan los precedentes. No sé, ni he oído que exista en el Paragüay; y podrá ser, porque teniendo bastante poblacion y ménos campos, le habrán podido exterminar. Yo pillé quatro en las Pampas de Buenos Ayres entre los 35 y 36 grados, y otros tres donde al Negro’ (Azara 1802).

4 ‘en ambas bandas del Rio de la Plata con identidad de formas, colores y costumbres’ (Azara 1802).

5 ‘Sp. 5.º. F. fasciatus—cauda elongata immaculata, lanosa, corpore supra dilute fusco, infra albido cum pedibus cinnamomo-fasciato. Sp. n. HABITAT communior precedenti, nemora non ingreditur: longitudine 34½, cauda 11¾. Azara N.º XVIII Pajero’ (Larrañaga 1923).

6 ‘Clasificación de los mamíferos del Río de la Plata, particularmente de su Banda Oriental según el sistema de Cuvier, con sus caracteres acomodados al país’ (Larrañaga 1923).

7 ‘Clasificación de los mamíferos de este país según el sistema de Cuvier’ (Larrañaga 1923).

limbs without bands. However, this contraposition is not supported by the authors' words: Larrañaga (1923) wrote '*with cinnamon-banded feet*'⁸; whereas Azara (1802: 162) wrote '*The forelimbs and hindlimbs are whitish on the inside, and cinnamon-white on the outside; but they also have dark transverse stripes or rings across them that are dark and very evident*'⁸.

Premise 2) Larrañaga (1923) '*was explicit*' in that his description of *F. fasciatus* was based solely on Uruguayan specimens.—The argument of Martínez-Lanfranco & González (2022) is as follows: '*Larrañaga (1923), in turn, was explicit in that the taxa he was enumerating and describing, e. g., Felis fasciatus, were from Uruguay and not generically from the Río de la Plata (which could have also included Argentina; Larrañaga 1923:341–342)*'. At least in my copy of Larrañaga's (1923) book, there is nothing between pages 340 and 342, other than two tables^{6,7} listing mammals occurring in Uruguay, including native, introduced and domestic species. Therefore, not only it is not explicit, but it is not even implicit that any of these mammals occurs in Uruguay and not in Argentina. Most importantly, both Desmarest (1816) and Larrañaga (1923) described their species based on Azara's Number XVIII cat (said to inhabit both sides of the La Plata River) as a whole and not divided into parts, thus their binomials originally were applied to both Argentinian and Uruguayan populations.

Premise 3) Through the expression '*donde al Negro*', Azara (1802: 160) intended to mean that his '*Gato pajero*' occurs in the vicinity of the Río Negro of Uruguay.—In his works, when referring to rivers, Azara typically used the word 'Río' before the name of rivers, e.g., Río de la Plata, río Negro, río Paraguay, río Paraná, río Uruguay. In Spanish, the expression '*donde el*' (of which Azara's '*donde al*' is a rare variant, or perhaps a typographical error) followed by the name of a living being (usually a person, but also an animal or a plant) is often used to refer to a place belonging to such being, or where such being is. For these reasons, it is likely that when Azara wrote '*donde al Negro*' what he intended to say is that he saw his Pajero cat in the same place where he also saw his '*Gato Negro*' (almost certainly melanistic individuals of another species of *Leopardus*), to which he also referred as '*(d)el Negro*' ('*NÚM XV. DEL NEGRO*'; Azara 1802: 154). Based on Azara's account, he saw his '*el Negro*' in Rio Grande do Sul, 450–500 km to the east of the type locality that Martínez-Lanfranco & González's (2022) chose for their neotype.

CONCLUSIONS

Martínez-Lanfranco & González (2022) incorrectly assumed that, when describing *L. fasciatus*, Larrañaga (1923) distinguished between Uruguayan and Argentinian specimens, and that he based this taxon solely on Uruguayan specimens. In fact, like Desmarest's (1816) description of *L. pajeros*, that of *L. fasciatus* was based on Azara's (1801, 1802) account of the '*Chat pampa*' or '*Gato pajero*', which the latter author conceptualized as occurring on both sides of the La Plata River. Therefore, contrary to the claims of Martínez-Lanfranco & González (2022), and as previously concluded by Ximénez *et al.* (1972) and Nascimento *et al.* (2021), *L. fasciatus* (Larrañaga, 1923) should be considered a junior synonym of *L. pajeros* (Desmarest, 1816), and not a senior synonym of *L. munoai* (Ximénez, 1961).

Whereas synonymizing and reviving synonyms in the manner regulated by the International Code of Zoological Nomenclature (ICZN 1999) (herein Code) are commonplace in taxonomy, neotypification is not (ICZN 1999: Article 75, Yanega *et al.* 2018). This is so because the designation of a neotype can create redundancies with other type material, mismatches between the nominal taxa and the natural populations represented by the neotype, and erroneous type localities. This is exemplified by the neotype of *L. fasciatus*: it is redundant with the holotype of *L. munoai*; it stands for a nominal species occurring in Argentina and for natural populations occurring in Uruguay; and it has a type locality based on a misinterpretation of Azara's (1802) and Larrañaga's (1923) writings.

The designation of a neotype by Martínez-Lanfranco & González (2022) is invalid and problematic because *L. fasciatus* is invalid. In addition, the Code defines certain precise conditions under which a neotype shall not be designated. Those that applied to the neotype of *L. fasciatus* are: 1) '*A neotype is not to be designated as an end in itself, or as a matter of curatorial routine, and any such neotype designation is invalid*' (Article 75.2); 2) '*A neotype is validly designated when there is an exceptional need and only when that need is stated expressly and when the designation is published with the following particulars: 75.3.1. a statement that it is designated with the express purpose of clarifying the taxonomic status or the type locality of a nominal taxon; 75.3.6. evidence that the neotype came as nearly as practicable from the original type locality [Art. 76.1]*' (Article 75.3). Quite clearly, Martínez-Lanfranco & González (2022) designated a neotype for *L. fasciatus* in the absence

⁸ '*Los brazos y piernas por dentro blanquecinos, y por fuera blancos acanelados ; pero ademas tienen zunchos ó anillos al través oscuros muy reparables*' (Azara 1802).

of an exceptional need, and without proper support for their choice of a type locality.

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