**File S1**

**Appendix S1 Nomenclature authorities for all species names mentioned in this paper.** (\*): species used for analyses in this paper.

O. Didelphimorphia

 *Caluromys lanatus* (Olfers, 1818) \*

 *Caluromys philander* (L., 1758) \*

*Caluromys trinitatis* (Thomas, 1894) \*

 *Chironectes minimus* (Zimmermann, 1780) \*

 *Didelphis imperfecta* Mondolfi and Pérez-Hernández, 1984 \*

 *Didelphis marsupialis* L., 1758 \*

 *Didelphis pernigra* J. A. Allen, 1900 \*

 *Gracilinanus agilis* (Burmeister, 1854)

 *Gracilinanus dryas* (Thomas, 1898) \*

 *Gracilinanus emiliae* (Thomas, 1909)

 *Gracilinanus marica* (Thomas, 1898) \*

 *Lutreolina crassicaudata* (Desmarest, 1804) \*

*Marmosa demerarae* (Thomas, 1905) \*

 *Marmosa lepida* (Thomas, 1888) \*

 *Marmosa murina* (L., 1758) \*

 *Marmosa robinsoni* Bangs, 1898 \*

 *Marmosa tyleriana* Tate, 1931\*

 *Marmosa waterhousei* (Tomes, 1860) \*

 *Marmosa xerophila* Handley and Gordon, 1979 \*

 *Marmosops cracens* (Handley and Gordon, 1979) \*

 *Marmosops fuscatus* (Thomas, 1896) \*

 *Marmosops impavidus* (Tschudi, 1845) \*

 *Marmosops neblina* Gardner, 1990 \*

 *Marmosops pakaraimae* Voss, Lim, Díaz-Nieto and Jansa (2013)\*

 *Marmosops pinheiroi* (Pine, 1981) \*

 *Metachirus nudicaudatus* (É. Geoffroy, 1803) \*

 *Monodelphis adusta* (Thomas, 1897) \*

 *Monodelphis brevicaudata* (Erxleben, 1777) \*

 *Monodelphis palliolata* (Osgood, 1914) \*

 *Monodelphis reigi* Lew and Pérez-Hernández, 2004 \*

*Monodelphis* species A (see Pine and Handley, 2007) \*

 *Philander andersoni* (Osgood, 1913) \*

 *Philander deltae* Lew, Pérez-Hernández and Ventura, 2006 \*

 *Philander mondolfii* Lew, Pérez-Hernández and Ventura, 2006 \*

O. Paucituberculata Ameghino, 1894

 *Caenolestes fuliginosus* (Tomes, 1863) \*

**Appendix S2 Sources of information on the distribution of the marsupial species in Venezuela.**

Anderson RP, Gutiérrez EE, Ochoa J, García FJ, Aguilera M (2012) Faunal nestedness and species-area relationship for small non-volant mammals in “sky island” of northern Venezuela. Stud. Neotrop Fauna Environ 47: 157-170.

Bisbal FJ (1998) Mamíferos de la Península de Paria, estado Sucre, Venezuela y sus relaciones biogeográficas. Interciencia 23: 171-181.

Bisbal FJ, Naveda Rodríguez A (2010) Mamíferos de la cuenca del río Guárico, estados Aragua, Carabobo y Guárico, Venezuela. Mem Fund La Salle Cien Nat 172: 69-89.

Brown BE (2004) Atlas of New World marsupials. Fieldiana Zool 102: 1-308.

Gardner AL (2007) Mammals of South America, Volume 1. The University of Chicago Press, Chicago and London. 669 pp.

Gardner AL, Creighton K (2007) Genus *Marmosops*. In: Gardner AL, editor. Mammals of South America. Chicago and London: The University Chicago Press. pp 61-74.

Guerrero R, Hoogesteijn R, Soriano P (1989) Lista preliminar de los mamíferos del Cerro Marahuaca. T. F. Amazonas, Venezuela. Acta Terramaris 1: 71-77.

Gutiérrez EE, Soriano P, Rossi RV, Murillo JJ, Ochoa J, Aguilera M (2011) Occurrence of *Marmosa waterhousei* in the Venezuelan Andes, with comments on its biogeographic significance. Mammalia 75: 381-386.

Lew D, Pérez-Hernández R (2003) Una nueva especie del género *Monodelphis* (Didelphimorphia:Didelphidae) de la Sierra de Lema, Venezuela. Mem Fund La Salle Cien Nat159-160: 7-25.

Lew D, Pérez-Hernández R, Ventura J (2006) Two new species of *Philander* (Didelphimorphia, Didelphidae) from northern South America. J Mammal 87: 224-237.

Linares OJ (1997) New locality records of mouse opossums from Venezuela (Marsupialia: Didelphidae). Mammalia 61: 255-259.

Linares OJ (1998) Mamíferos de Venezuela. Caracas: Sociedad Conservacionista Audubon de Venezuela. 691 pp.

Linares OJ, Rivas B (2003) Mamíferos del sistema deltaico (Delta del Orinoco- Golfo de Paria), Venezuela. Mem. Fund. La Salle Cien Nat 159-160: 27-104.

López-Fuster MJ, Pérez-Hernández R, Ventura J, Salazar M (2000) Effect of environment on skull-size variation in *Mamosa robinsoni* in Venezuela. J Mammal81: 829-837.

López-Fuster MJ, Salazar M, Pérez-Hernández R, Ventura J (2002) Craniometrics of the orange mouse opossum *Marmosa xerophila* (Didelphimorphia: Didelphidae) in Venezuela. Acta theriol47: 201-209.

Mondolfi E (1997) Lista provisional anotada de los mamíferos de la Cuenca del Río Caura, Venezuela. In: Huber O, Rosales J, editors. Caracas: Ecología de la Cuenca del Río Caura, Venezuela 2. Scientia Guaianae 7. pp. 11-63.

Mustrangi MA, Patton JL (1997) Phylogeography and systematic of the slender mouse opossum *Marmosops* (Marsupialia, Didelphidae). Univ Calif publ zool130: 1-86.

Ochoa J (2000) Efectos de la extracción de maderas sobre la diversidad de mamíferos pequeños en bosques de tierras bajas de la guayana venezolana. Biotropica 32: 146-164.

Ochoa J, García JF, Caura S, Sánchez J (2009) (“2008”) Mamíferos de la cuenca del río Caura, Venezuela: listado taxonómico y distribución conocida. Mem Fund La Salle Cien Nat170: 5-80.

Ojasti J, Guerrero R, Hernández O (1992) Mamíferos de la Expedición de Tapirapecó, estado Amazonas, Venezuela. Acta Biol Venez14: 27-40.

Ramoni-Perazzi P, Bianchi G, Molina M(1994) Hallazgo de la comadreja colicorta *Monodelphis adusta* (Thomas, 1897) en la cuenca del Lago de Maracaibo, Venezuela. Acta Cien Ven 45: 325-326.

Sánchez, J, Lew D (2012) Lista actualizada y comentada de los mamíferos de Venezuela. Mem Fund La Salle Cien Nat 173-174: 173-238.

Soriano PJ (1987) On the presence of the short-tailed oposum *Monodelphis adusta* (Thomas) in Venezuela. Mammalia 51: 321-324.

Ventura J, Lew D, Pérez-Hernández R, López-Fuster MJ (2005) Skull size and shape relationships between Venezuelan *Monodelphis* taxa (Didelphimorphia: Didelphidae), including the recently described species *M. reigi* Lew & Pérez-Hernández 2004. Trop Zool 18: 227-235.

Ventura J, Pérez-Hernández R, López-Fuster MJ (1998) A morphometric assessment of the systematics of *Monodelphis brevicaudata* (Didelphimorphia: Didelphidae) in Venezuela. J Mammal 79: 104-117.

Ventura J, Salazar M, Pérez-Hernández R, López-Fuster MJ (2002) Morphometrics of the genus *Didelphis* (Didelphimorphia: Didelphidae) in Venezuela*.* J Mammal83: 1087-1096.

Voss RS, Jansa SA (2003) Phylogenetic studies on didelphid marsupials II. Nonmolecular data and new IRBP sequences: Separate and combined analyses of didelphine relationships with denser taxon sampling. Bull Am Mus Nat Hist 276: 1-82.

Voss RS, Jansa SA (2009) Phylogenetic relationships and classification of didelphid marsupials, and extant radiation of New World Metatherian mammals. Bull Am Mus Nat Hist 322: 1-177.

Voss RS, Lim BK, Díaz-Nieto JF, Jansa S (2013) A new species of *Marmosops* (Marsupialia: Didelphidae) from the Pakaraima highlands of Guyana, with remarks on the origin of the endemic Pantepui mammals fauna. Am Mus Novitates 3778: 1-27.

Voss RS, Lunde DP, Simmons NB (2001) Mammals of Paracou, French Guiana: A Neotropical lowland rainforest. Part 2: nonvolant species. Bull Am Mus Nat Hist 263: 1-236.

**Table S1 Matrix of significant similarities for the physiographical regions in Venezuela (for abbreviations see Fig. 1).** +, Values significantly higher than expected at random, P < 0.05; -, values significantly lower than expected at random, P < 0.05; 0, values not different from those expected at random.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | D7 | B4 | B5 | C2 | B2 | D6 | D2 | B1 | D1 | B3 | C1 | D3 | D4 | D5 |
| A2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| D7 |  | + | 0 | + | 0 | - | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| B4 |  |  | + | + | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 |
| B5 |  |  |  | + | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 |
| C2 |  |  |  |  | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 |
| B2 |  |  |  |  |  | 0 | 0 | + | 0 | + | 0 | 0 | 0 | 0 |
| D6 |  |  |  |  |  |  | - | 0 | 0 | 0 | + | 0 | 0 | 0 |
| D2 |  |  |  |  |  |  |  | 0 | + | 0 | 0 | 0 | + | + |
| B1 |  |  |  |  |  |  |  |  | + | + | 0 | 0 | 0 | 0 |
| D1 |  |  |  |  |  |  |  |  |  | + | 0 | + | + | + |
| B3 |  |  |  |  |  |  |  |  |  |  | 0 | 0 | + | + |
| C1 |  |  |  |  |  |  |  |  |  |  |  | + | + | + |
| D3 |  |  |  |  |  |  |  |  |  |  |  |  | + | + |
| D4 |  |  |  |  |  |  |  |  |  |  |  |  |  | + |

**Table S2 Matrix of significant similarities for the marsupial species from Venezuela.** +, Values significantly higher than expected at random, P < 0.05; -, values significantly lower than expected at random, P < 0.05; 0, values not different from those expected at random.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *M. cracens* | *M.* species A | *P. deltae* | *P. andersoni* | *M. lepida* | *M. pinheiroi* | *M. reigi* | *M. pakaraimae* | *M. tyleriana* | *M. neblina* | *L. crassicaudata* | *D. imperfecta* | *C. philander* | *M. brevicaudata* | *M. adusta* | *M. impavidus* | *M. waterhousei* | *D. dryyas* | *C. fuliginosus* | *D. pernigra* | *C. lanatus* | *M. nudicaudatus* | *P. mondolfii* | *C. minimus* | *M. demerarae* | *D. marsupialis* | *M. murina* | *C. trinitatis* | *G. marica* | *M. fuscatus* | *M. robinsoni* | *M. palliolata* |
| *M. xerophila* | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| *M. cracens* |  | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | 0 | 0 | 0 |
| *M.* species A |  |  | - | - | - | - | - | - | - | - | 0 | - | - | - | - | - | - | - | - | - | - | 0 | 0 | - | - | - | - | 0 | - | - | 0 | - |
| *P. deltae* |  |  |  | - | - | - | - | - | - | - | 0 | - | - | - | - | - | - | - | - | - | - | 0 | - | 0 | 0 | - | 0 | 0 | - | - | 0 | 0 |
| *P. andersoni* |  |  |  |  | + | 0 | - | - | - | - | - | 0 | + | + | - | - | - | - | - | - | 0 | 0 | - | 0 | 0 | 0 | 0 | - | - | - | - | - |
| *M. lepida* |  |  |  |  |  | + | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - | - | - | 0 | - | 0 | 0 | - | 0 | - | - | - | - | - |
| *M. pinheiroi* |  |  |  |  |  |  | + | + | + | + | 0 | 0 | + | + | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| *M. reigi* |  |  |  |  |  |  |  | + | + | + | 0 | 0 | 0 | 0 | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | - | 0 | - | - | - | - | - |
| *M. pakaraimae* |  |  |  |  |  |  |  |  | + | + | 0 | 0 | 0 | 0 | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | - | 0 | - | - | - | - | - |
| *M. tyleriana* |  |  |  |  |  |  |  |  |  | + | 0 | 0 | 0 | 0 | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | - | 0 | - | - | - | - | - |
| *M. neblina* |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | 0 | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | - | 0 | - | - | - | - | - |
| *L. crassicaudata* |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| *D. imperfecta* |  |  |  |  |  |  |  |  |  |  |  |  | + | + | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| *C. philander* |  |  |  |  |  |  |  |  |  |  |  |  |  | + | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| *M. brevicaudata* |  |  |  |  |  |  |  |  |  |  |  |  |  |  | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| *M. adusta* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + | + | + | + | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. impavidus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + | + | + | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. waterhousei* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + | + | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *G. dryas* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. fuliginosus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *D. pernigra* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. lanatus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. nudicaudatus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 0 | 0 | + | + | 0 | 0 | 0 | 0 | 0 |
| *P. mondolfii* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. minimus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 0 | + | 0 | 0 | 0 | 0 | 0 |
| *M. demerarae* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + | 0 | 0 | 0 | 0 | 0 |
| *D. marsupialis* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 0 | 0 | 0 | 0 | 0 |
| *M. murina* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | 0 | 0 | 0 |
| *C. trinitatis* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0 | + | 0 |
| *G. marica* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 0 | + |
| *M. fuscatus* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | + |
|  *M. robinsoni* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + |