Details for fossil data hand-cleaning based on authors’ expertise.

—

Lucas Buffan1,2, Fabien L. Condamine2, François Pujos3,4, Narla S. Stutz 2,5, Pierre-Olivier Antoine2 and Laurent Marivaux2

—

1Département de Biologie, École Normale Supérieure de Lyon, Université Claude Bernard Lyon 1, 69342 Lyon Cedex 07, France.

2CNRS, UMR 5554 Institut des Sciences de l’Évolution de Montpellier, Place Eugène Bataillon, 34095 Montpellier, France.

3Consejo Nacional de Investigaciones Científicas y T ́ecnicas (CONICET), Argentina

4Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (IANIGLA), CCT-CONICET-Mendoza, Av. Ruiz Leal s/n, ParqueGral, San Martín 5500, Mendoza, Argentina

5Programa de P ́os-Graduaç ̃ ao em Geociˆencias, Universidade Federal do Rio Grande do Sul (PPGGEO UFRGS), Avenida Bento Gonçalves, 9500, 91501-970, Porto Alegre, Brazil

—

**Corresponding author:** Lucas.L.Buffan@gmail.com

# Artiodactyla

*Palaeolama sp.* (coll. nb. 213138, [1]), *Lama castelnaudi* (coll. nb. 213136, [1]) and *Palaeolama weddeli* (coll. nb. 213136, [1]) age ranges were set to Early Pleistocene, according to [2].  
All *Bos taurus* and *Ovis* occurrences were removed, as representatives were introduced by humans.  
*Antifer crassus* (coll. nb. 53926, [3]) time range was set to Pleistocene according to [4]. *Platygonus narinoensis* (coll. nb. 133585, [5]) was renamed *Platygonus cf. marplatensis* according to [6].  
All occurrences of *Cervus gouazoubira* were renamed *Mazama gouazoubira*.

# Astrapotheria

*Grypolophodon imperfectus* (coll. nb. 176290, [7]) was removed as nomen dubium.  
*Parastrapotherium holmbergi* (coll. nb. 176290, [8]) formation was set to Sarmiento, stage to Deseadan-Colehuehuappian, and age range to 20-29 Ma.  
*Xenastrapotherium sp.* (coll. nb. 55602, [9]) and *Xenastrapotherium amazonense* (coll. nb. 55602, [10]) were reassigned to Laventan stage (11.8-13.8 Ma) according [11].  
*Notorhinus denticulatus* (coll. nb. 176290, [8]) removed as nomen dubium. *Astrapotherium* (coll. nb. 50074, [12]) re-assigned to Santacrucian.

# Carnivora

Removed *Felis domesticus* (coll. nb. 190846, [13]) as introduced by humans.  
Added one occurrence of *Cyonasua sp.* from the Maimará formation, Maimará locality, Jujuy, Argentina [14].

# Cetacea

# Cingulata

Cleaning was made based on the expertise of F. Pujos, and details of the procedure are available in the ./data\_2023/cleaning\_Xenarthra/Xenarthra\_FP\_2.0.xlsx table, sheet *Cingulata*. Rows highlighted in red (n=261) have been further removed for the rest of the study. Taxon names, ages, localities and formations were updated in red when needed.  
Added one occurrence of *Eosclerocalyptus* (6.4-6.6 Ma), *Doellotatus chapadmalensis* (5.9-6 Ma) and *Macrochorobates scalabrinii* (6.4-6.6 Ma) from the Maimará formation, Maimará locality, Jujuy, Argentina [14].

# Chiroptera

# Didelphimorphia

Added one occurrence of the extant genus *Chacodelphys* [15].  
All occurrences assigned to the *Micoureus* genus were re-assigned to the *Marmosa* genus, the former being a sub-genus of the latter [16].  
Based on [17], we added a new occurrence of Marmosa in the TAR-31 locality of Shapaja, Peru, Middle-Late Miocene (11.67-15.63 Ma).  
*Paradidelphys sp.* (coll. nb. 157795, [18]) was synonymised with *Thylophorops* [19].  
Added one occurrence of *Thylamys cf. colombianus* from the TAR-31 locality of Shapaja, Peru [16].  
Added one occurrence of *Sparassocynus maimarai* from the Maimará formation, Maimará locality, Jujuy, Argentina [14].

# Litopterna

*Archaeohyracotherium mediale* (*Didolodontidae*, coll. nb. 176164, [7]) was synonymised with *Asmithwoodwardia subtrigona* (*Protolipternidae*) by Gelfo (2006)[20].  
*Argyrolambda conidens* was synonymised with *Didolodus multicuspis* [20].  
*Didolodus sp.* (coll. nb. 199563, [21]) was removed as associated to “unidentified *Didolontidae*” in the paper. *Enneoconus parvidens* (coll. nb. 176164, [22]) was synonymised with *Ernestokokenia nitida* by Gelfo (2006)[20].

# Microbiotheria

*Clenia brevis* was excluded from the *Clenia* genus by Goin and Abello (2013) [23]. Hence, we rename the genus *aff\_Clenia*.

# Notoungulata

All occurrences referred to as *Bryanpattersonia nesodontoides* were synonimised with *Archaeotypotherium propithecus* according to [24].  
All occurrences referred to as *Bryanpattersonia sulcidens* were renamed *Protarchaeohyrax gracilis* according to [24].

#No order *Wirunodon chanku* (coll. nb. 149523, [25]) age range was set to Early Oligocene (28.7-33.9 Ma). The three occurrences of the *Rumiodon* genus were attributed to Early Oligocene (28.7-33.9 Ma) All occurrences of the *Protodidelphis* genus were attributed to Late Palaeocene-Early Eocene (47.8-59.2 Ma), just like all occurrences from the *Carolopaulacoutoia* and *Didelphopsis* genera.

# Paucituberculata

*Actestodon* genus was synonimised with *Actestis* [26]. Added one occurrence *aff. Palaeothentes* from the TAR-31 locality of Shapaja, Peru [16]. *Propalaeothentes* was synonimised with *Palaeothentes* [26]. Added *Palaeopanorthus primus* from the Colhuehuappuian of Chubut, Argentina [26].

# Perissodactyla

*Equus sp.* (coll. nb. 142016, [27]) was set to *Equus (Amerhippus)*. Together with *Equus sp.* (coll. nb. 71275, [28]; coll. nb. 70673, [29]; coll. nb. 92814, [30]), *Equus (Amerhippus)* (coll. nb. 70673, [31]) and *Hippidion sp.* (coll. nb. 70673, [31]), their upper time boundary were set to 0.99 Ma, according to MacFadden (2013) [32].  
*Equus sp.* (coll. nb. 142158 and 142160, [33]) were both set to *Equus (Amerhippus)*.  
*Equus asinus* (coll. nb. 190844, [13]) was removed as introduced by humans.  
*Equus caballus* (coll. nb. 63337, [34]) was set *Equus (Amerhippus) neogeus* by Alberdi and Prado (1992) [35].  
*Equus caballus* (coll. nb. 70704, [31]) time range was set to Holocene.  
*Equus caballus* (coll. nb. 142016, [27]) was set to *Equus (Amerhippus) insulatus*.  
*Equus caballus* (coll. nb. 73842, [36]) time range was set to Pleistocene by [37].  
*Equus santaeelenae* (coll. nb. 144922, 145506, [38]) time ranges were adjusted to Late Pleistocene.  
*Hippidium (Plagiohippus)* (coll. nb. 71304, [39]) name was set to *Hippidion* [35].  
*Hypohippidium humahuaquense* (coll. nb. 210722, [40]) was synonymised with *Hippidion devillei* by [35] *Hippidion sp.* (coll. nb. 73842, [36]; coll. nb. 199157, [41]; coll. nb. 53926, [3], 2 occurrences) time ranges were adjusted to Pleistocene.  
*Tapirus (Tapilarum)* (coll. nb. 53928, [3]) name was shortened to *Tapirus*, and age set to Early Pleistocene.  
*Tapirus oliverasi* (coll. nb. 146534, [42]) species name was removed as doubtful [43], occurrence therefore renamed *Tapirus*. *Tapirus tarijensis* (coll. nb. 70673, [31]) lower age boundary was set to 1.06 Ma.

# Pilosa

Cleaning was made based on the expertise of F. Pujos, and details of the procedure are available in the ./data\_2023/cleaning\_Xenarthra/Xenarthra\_FP\_2.0.xlsx table, sheet *Pilosa*. Rows highlighted in red (n=180) have been further removed for the rest of the study. Taxon names, ages, localities and formations were updated in red when needed.  
Added one occurrence of *Proscelidodon* (Upper Miocene-Lower Pliocene) and one *cf. Pleurolestodon* (5.8-5.9 Ma) from the Maimará formation, Maimará locality, Jujuy, Argentina [14].

# Polydolopimorphia

*Chulpasia sp.* (coll. nb. 132938, [44]) was removed as only one record of *Chulpasia* (species *mattaueri*) has been found in Peru.  
*Groeberia minoprioi* (coll. nb. 92669, [45]) age range was set to Late Eocene-Early Oligocene (27.82-37.71 Ma).  
*Marmosopsis sp.* (coll. nb. 133039, [46]) age range was set to Late Palaeocene-Early Eocene (47.8-59.2 Ma).  
*Patagonia peregrina* (coll. nb. 27311, [23]) age range was set to Chattian (23.03-27.82 Ma). All occurrences of *Polydolops clavulus* were renamed *Archaeodolops clavulus*, according to [47]. Added one occurence of *Archaeodolops clavulus*, according to the same paper.  
All occurrences of *Proargyrolagus bolivianus* were attributed to the Salla formation, Bolivia. Hence, their age boundaries were restricted to 24.5-26 Ma.  
*Amphidolops serrula* (coll. nb. 13779, [48]) was re-assigned to Late Palaeocene (oldest recorded Polydolopid).  
*Polydolops sp.* (coll. nb. 14208, [49]) was removed as age boundaries (Early Miocene) were way outside known boundaries for records of this genus (Middle Eocene).  
Added occurrence from a newly described genus of the Peridolopidae family from the TAR-74 locality of San Martín, named *Peridolopidae\_gen\_A* [21].

# Primates

Ages of Deseadian Soriacebines *Branisella* and *Canaanimico* were restricted to the 24.5-26 Ma interval according to [50].

# Proboscidea

*Mastotherium hyodon* (coll. nb. 142016, [27] and 145181, [51]) genus named was set to *Cuvieronius*.  
*Stegomastodon sp.* (coll. nb. 211646, [52]) was synonymised with *Notiomastodon platensis*.  
All mentions of *Mammut* were removed. *Notiomastodon platensis* (coll. nb. 144515, [53]), formerly described as *Amahuacatherium peruvianum* was removed as its age was questioned in [54].

# Rodentia

## Added Occurrences

*Ricardomys longidens*, Laventan age, San Martín department, Peru [55].  
*Microscleromys sp.* (two occurrences), *Microscleromys cribriphilus*, *Microscleromys paradoxalis*, *Microsteiromys jacobsi*, *Nuyuyomys chinqaska*, *Scleromys*, Laventan age, San Martín department, Peru [55].  
*Balsayacuy sp.*, Rupelian age (restricted to the 27.82-31.1 Ma interval), Departamento de Ucayali, Santa Rosa locality, Peru [56]. Described as an occurrence of *Balsayacuy huallagaensis*, but species attribution doubtful. Hence, restricted to genus level. From the same paper (same locality and same age), we also add one occurrence of *Shapajamys minor*, one of *Ucayalimys amahuacensis* and one of *Vucetichimys pterilophodonica*.  
*Erethizon sp.*, Vorohuean (Marplatan) age, Uquía formation, Quebrada de Humahuaca locality, Jujuy state, Argentina [57].  
*Eoincamys valverdei* and *Tarapotomys subandinus*, Early Oligocene of resp. TAR-72 and TAR-22, San Martín, Peru [58].  
*?Palaeocavia* (5.8-5.9 Ma), *Pithanotomys? solisae* (5.8-5.9 Ma), *Pithanotomys sp.* (5.8-5.9 Ma) *Palaeocavia sp.* (5.9-6.0 Ma) and *Palaeocavia humahuaquense* (6.4-6.6 Ma) from the Maimará formation, Maimará locality, Jujuy, Argentina [14].

## Corrections

*Cachiyacuy contamanensis* (coll. nb. 149523, [59]) was renamed *Cachiyacuy sp.* as taxonomic assignation under debate. Two *Cachiyacuy contamanensis* occurrences from the same collection, same paper, were renamed *cf. Cachiyacuy contamanensis*, for the same reason.  
*Kichkasteiromys raimondii*: age range set to 34-35 Ma.  
Time boundaries of *Cachiyacuy cf. contamanensis* and *Cachiyacuy contamanensis* (coll. nbs. 207061 and 207062, [60]) were set to Priabonian (33.9-37.2 Ma). Same for *Cachiyacuy cf. kummeli*, *Eoespina* and *cf. Eoespina* (coll. nb. 207062, 207062 and 207065, [60]) Remaning occurrences of the genus *Cachiyacuy* (four in total) were set to Late Eocene (33.9-41.2 Ma).  
*Canaanimys maquiensis* (coll. nb. 149523, [59]) was renamed *Canaanimys sp.* as taxonomic assignation under debate.

Time boundaries of four *Cachiyacuy kummeli* occurrences (coll. nb. 144474, [61]; 176136, [62], 207067 and 207062 [60]) were set to Bartonian-Priabonian (33.9-41.2 Ma). Same for *Eobranisamys sp.* (coll. nb. 176151, [62]) and for all occurrences from the 144474 collection, including one *Chachapoyamys cf. kathetos* [55], one *Eoespina sp.* [61], one *Canaanimys maquiensis* [61] and one *Eobranisamys javierpardoi* [62].  
Ages of all occurrences from the collection 149523 were restricted to Rupelian. These included two *cf. Cachiyacuy kummeli* occurrences [59], one *Canaanimys sp.* [59], one *Eobranisamys riverai*, one *Eobranisamys romeropittmanae*, one *Eoespina woodi*, one *Eoincamys ameghinoi*, one *Eoincamys pascuali*, one *Eopicure kraglievichi*, one *Eosachacui lavocati*, one *Eosallamys paulacoutoi*, one *Eosallamys simpsoni* [63], one *Pozomys sp.*, two *Pozomys ucayalensis* [59], one *Eodelphomys almeidacomposi*, one *Eopululo wigmorei* [63].  
Ages of two *Sallamys pascuali* occurrences (coll. nb. 95688, [64]; 133539, [65]), three *Branisamys luribayensis* (coll. nb. 95688 [64]; 95688 [66]; 133539 [65]) were sharpened to the 25-26 Ma interval.  
Ages of one *Pozomys ucayalensis* (coll. nb. 176129, [62]) were set to Bartonian-Priabonian (33.9-41.2 Ma). Ages of two *Eoespina sp.* occurrences (coll. nb. 176140, [62]) was restricted to Late Eocene.  
Ages of one *Eoespina* and one *cf. Eoespina* occurrence (coll. nb. 207062 and 207065, [60]) were set to Rupelian.  
*Eoincamys pascuali* (coll. nb. 207064, [60]) was renamed *Eonincamys sp.*. Age range of all Late Oligocene occurrences from the Salla formation, La Paz, Bolivia, was set to 24.5-26 Ma. *Eopululo wigmorei* (coll. nb. 225588, [21]) species name was set to *Eopululo sp.* according to [55].  
Names of all *Eumysops chapalmalensis* occurrences were set to *Eumysops chapadmalensis*.

## Removed occurrences

*Cachiyacuy kummeli* (coll. nb. 207067, [60]), renamed *C. cf. kummeli* (doublon) according to [55].  
*Canaanimys sp.* (coll. nb. 176136, [67]), taxonomic revision [55].  
*Canaanimys maquiensis* (two occurrences, coll. nb. 207066 and 207067, [60]), taxonomic revision [55].  
*Chachapoyamys kathetos* (coll. nb. 207067, [55]), re-assigned to *C. cf. kathetos* (doublon) [55].  
Four Brazilian occurrences of the genera *Eobranisamys* (two) and *Eoincamys* (two) with absurd ages (coll. nb. 57989, [68]; coll. nb. 217834, [69]).  
*Tarapotomys sp.* (2 occurrences) (coll. nb. 199560, [58]; coll. nb. 199563, [21]), respectively re-described as *aff. Tarapotomys sp.* and *Tarapotomys subandinus* in [55].  
*Incamys bolivianus* (coll. nb. 95688, [64]), doulon.  
*Asteromys bolivianus* (coll. nb. 133591, [70]), doublon.  
All *Rattus rattus* occurrences, as introduced by humans.

# Sparassodonta

Cleaning was highly based on Tarquini et al. 2022 [71]. In addition, we removed our single *Argyrolestes peralestinus* occurrence (coll. nb. 176285, [72]) as nomen nubidum [73]

# Xenungulata

# References

1. Rusconi C. 1949 El puelchense de buenos aires y su fauna (plioceno medio) segunda parte.

2. Pascual R, Ortega Hinojosa EJ, Gondar D, Tonni E, *et al.* 1965 Las edades del cenozoico mamalı́fero de la argentina, con especial atención a aquellas del territorio bonaerense. In *Anales de la comisión de investigaciones cientı́ficas de la provincia de buenos aires*, pp. 165–193.

3. Rusconi C. 1934 Tercera noticia sobre los vertebrados fósiles de las arenas puelchenses de villa ballester. In *Anales de la sociedad cientı́fica argentina*, pp. 19–37.

4. Croitor R. 2022 Paleobiogeography of crown deer. *Earth* **3**, 1138–1160.

5. Stirton R *et al.* 1947 A rodent and a peccary from the cenozoic of colombia. *Compilación de estudios geológicos oficiales en Colombia* **7**, 317–324.

6. Gasparini GM, Moreno-Mancilla OF, Cómbita JL. 2021 Selenogonus narinoensis stirton, 1947 (tayassuidae, cetartiodactyla, mammalia): Taxonomic status and paleobiogeographic implications. *Fossil Record* **24**, 65–75.

7. Simpson GG. 1967 The beginning of the age of mammals in south america. Part 2, systematics: Notoungulata, concluded (typotheria, hegetotheria, toxodonta, notoungulata incertae sedis), astrapotheria, trigonostylopoidea, pyrotheria, xenungulata, mammalia incertae sedis. Bulletin of the AMNH; v. 137.

8. Roth S. 1904 Noticias preliminares sobre nuevos mamı́feros fósiles del cretáceo superior y terciario inferior de la patagonia. *Revista del Museo de la Plata* **11**, 135–158.

9. Frailey CD. 1986 Late miocene and holocene mammals, exclusive of the notoungulata, of the rio acre region, western amazonia.

10. Ribeiro AM. 2013 Mamı́feros fósiles y biocronologı́a en el suroeste de la amazonia, brasil. *Publicación Electrónica de la Asociación Paleontológica Argentina* **14**.

11. Goillot C, Antoine P-O, Tejada J, Pujos F, Gismondi RS. 2011 Middle miocene uruguaytheriinae (mammalia, astrapotheria) from peruvian amazonia and a review of the astrapotheriid fossil record in northern south america. *Geodiversitas* **33**, 331–345.

12. Tournouër A. 1903 *Note sur la géologie et la paléontologie de la patagonie*.

13. Steadman DW. 1986 Holocene vertebrate fossils from isla floreana, galápagos.

14. Candela AM *et al.* 2023 The late miocene mammals from the humahuaca basin (northwestern argentina) provide new evidence on the initial stages of the great american biotic interchange. *Papers in Palaeontology* **9**, e1527.

15. Teta P, Pardiñas UF, D’Elı́a G. 2006 Rediscovery of chacodelphys: A south american marsupial genus previously known from a single specimen. *Mammalian Biology* **71**, 309–314.

16. Stutz NS *et al.* 2022 Late middle miocene metatheria (mammalia: Didelphimorphia and paucituberculata) from juan guerra, san martı́n department, peruvian amazonia. *Journal of South American Earth Sciences* **118**, 103902.

17. Marivaux L *et al.* 2020 New record of neosaimiri (cebidae, platyrrhini) from the late middle miocene of peruvian amazonia. *Journal of human evolution* **146**, 102835.

18. Reguero MA, Candela AM. 2011 Late cenozoic mammals from the northwest of argentina. *Cenozoic geology of the Central Andes of Argentina* **458**, 411–426.

19. Goin FJ, Pardiñas UFJ. 1996 Revisión de las especies del género hyperdidelphys ameghino, 1904 (mammalia, marsupialia, didelphidae). *Estudios geológicos* **52**.

20. Gelfo JN. 2006 Los didolodontidae (mammalia: Ungulatomorpha) del terciario sudamericano. Sistemática, origen y evolución. *Mastozoologı́a Neotropical* **13**, 275–277.

21. Antoine P-O *et al.* 2021 Biotic community and landscape changes around the eocene–oligocene transition at shapaja, peruvian amazonia: Regional or global drivers? *Global and Planetary Change* **202**, 103512.

22. Simpson G. 1948 The beginning of the age of mammals in south america. Part i introduction. Edentata, condrylarthra, liptoterna, and notioprotogonia. *Bulletin of the American Museum of Natural History* **91**, 1–232.

23. Goin FJ, Abello MA. 2013 Los metatheria sudamericanos de comienzos del neógeno (mioceno temprano, edad mamı́fero colhuehuapense): Microbiotheria y polydolopimorphia. *Ameghiniana* **50**, 51–78.

24. Croft DA, Mariano joint author Depto. Cientı́fico de Paleontologı́a de Vertebrados Bond (Museo de La Plata A La Plata, John J. 2003 Large archaeohyracids (typotheria, notoungulata) from central chile and patagonia: Including a revision of archaeotypotherium.

25. Goin FJ, Candela AM. 2004 New paleogene marsupials from the amazon basin of eastern peru. *The Paleogene Mammalian Fauna of Santa Rosa, Amazonian Peru. Natural History Museum of Los Angeles County, Science Series* **40**, 15–60.

26. Abello MA. 2007 Sistemática y bioestratigrafı́a de los paucituberculata (mammalia: Marsupialia) del cenozoico de américa del sur. PhD thesis, Universidad Nacional de La Plata.

27. Boule M, Thevenin A. 1920 Mammifères fossiles de tarija. Imprimerie nationale, mission scientifique g. De créqui-monfort et f.

28. Rolim J. 1974 Calcário secundário com restos fósseis de mamı́feros pleistocênicos em pernambuco. *Anais Academia Brasileira de Ciências* **46**, 417–422.

29. Oliveira A, Becker-Kerber B, Cordeiro LM, Borghezan R, Avilla LS, Pacheco M, Santos CMD. 2017 Quaternary mammals from central brazil (serra da bodoquena, mato grosso do sul) and comments on paleobiogeography and paleoenvironments. *Revista Brasileira de Paleontologia* **20**, 31–44.

30. Salles LO. 2006 *Quarternary mammals from serra da bodoquena, mato grosso do sul, brazil*. Oficina Gráfica da Univ. do Brasil.

31. Marshall LG, Sempere T, *et al.* 1991 The eocene to pleistocene vertebrates of bolivia and their stratigraphic context: A review. *Fósiles y facies de Bolivia* **1**, 631–652.

32. MacFadden BJ. 2013 Dispersal of pleistocene equus (family equidae) into south america and calibration of GABI 3 based on evidence from tarija, bolivia. *PloS one* **8**, e59277.

33. Coltorti M *et al.* 2007 Last glacial mammals in south america: A new scenario from the tarija basin (bolivia). *Naturwissenschaften* **94**, 288–299.

34. Deschamps CM. 2005 Late cenozoic mammal bio-chronostratigraphy in southwestern buenos aires province, argentina. *Ameghiniana* **42**, 733–750.

35. Alberdi MT, Prado JL. 1992 El registro de hippidion owen, 1869 y equus (amerhippus) hoffstetter, 1950 (mammalia, perissodactyla) en américa del sur. *Ameghiniana* **29**, 265–284.

36. Oliver-Schneider C. 1935 Mamı́feros fósiles de chile (adiciones y correcciones a la lista preliminar). *Revista Chilena de Historia Natural* **39**, 297–304.

37. Canto J, Yáñez J, Rovira J. 2010 Estado actual del conocimiento de los mamı́feros fósiles de chile. *Estudios Geológicos* **66**, 255–284.

38. Pujos F, Salas R. 2004 A new species of megatherium (mammalia: Xenarthra: Megatheriidae) from the pleistocene of sacaco and tres ventanas, peru. *Palaeontology* **47**, 579–604.

39. Reig OA. 1957 Un mustélido del género galictis del eocuartario de la provincia de buenos aires. *Ameghiniana* **1**, 33–47.

40. Alvarez EF de. 1957 Hypohippidium humahuaquense nov. sp. *Ameghiniana* **1**, 85–95.

41. Cione AL, Tonni EP. 1996 Reassesment of the pliocene-pleistocene continental time scale of southern south america. Correlation of the type chapadmalalan with bolivian sections. *Journal of South American Earth Sciences* **9**, 221–236.

42. Ubilla M. 1983 Sobre la presencia de tapires fosiles en el uruguay (mammalia, perissodactyla, tapiridae). *Revista de la Facultad de Humanidades y Ciencias* **1**, 85–104.

43. Holanda EC, Rincón AD. 2012 Tapirs from the pleistocene of venezuela. *Acta Palaeontologica Polonica* **57**.

44. Sigé B, Sempere T, Butler RF, Marshall LG, Crochet J-Y. 2004 Age and stratigraphic reassessment of the fossil-bearing laguna umayo red mudstone unit, SE peru, from regional stratigraphy, fossil record, and paleomagnetism. *Geobios* **37**, 771–794.

45. Simpson GG, Minoprio JL, Patterson B. 1962 *The mammalian fauna of the divisadero largo formation, mendoza, argentina*. Museum of Comparative Zoology at Harvard College.

46. Tejedor MF *et al.* 2009 New early eocene mammalian fauna from western patagonia, argentina. *American Museum Novitates* **2009**, 1–43.

47. Chornogubsky L. 2021 Interrelationships of polydolopidae (mammalia: Marsupialia) from south america and antarctica. *Zoological Journal of the Linnean Society* **192**, 1195–1236.

48. Ameghino F. 1902 *Notices préliminaires sur des mammifères nouveaux des terrains crétacés de patagonie*. Impr. Coni Fréres.

49. Marshall LG. 1982 Systematics of the extinct south american marsupial family polydolopidae.

50. Marivaux L, Adnet S, Altamirano-Sierra AJ, Boivin M, Pujos F, Ramdarshan A, Salas-Gismondi R, Tejada-Lara JV, Antoine P-O. 2016 Neotropics provide insights into the emergence of new world monkeys: New dental evidence from the late oligocene of peruvian amazonia. *Journal of Human Evolution* **97**, 159–175.

51. Schneider CO. 1927 Contribucion a la paleontologfa chilena. El mastodonte de carahue (dibelodon andium, CUV.). *Revista Chilena de Historia Natural* **31**, 272–276.

52. Ubilla M, Perea D, Rinderknecht A, Corona A. 2009 Pleistocene mammals from uruguay: Biostratigraphic, biogeographic and environmental connotations. *Quaternário do Rio Grande do Sul*, 217–230.

53. Campbell KE, Frailey CD, Romero Pittman L. 2000 The late miocene gomphothere amahuacatherium peruvium (proboscidea: Gomphotheriidae) from amazonian peru: Implications for the great american faunal interchange-[boletı́n d 23].

54. Negri FR, Bocquentin-Villanueva J, Ferigolo J, Antoine P-O. 2009 A review of tertiary mammal faunas and birds from western amazonia. *Amazonia: Landscape and Species Evolution: A look into the past*, 243–258.

55. Boivin M *et al.* 2021 Late middle miocene caviomorph rodents from tarapoto, peruvian amazonia. *PLoS One* **16**, e0258455.

56. Arnal M, Pérez ME, Tejada Medina LM, Campbell Jr KE. 2022 The high taxonomic diversity of the palaeogene hystricognath rodents (caviomorpha) from santa rosa (peru, south america) framed within a new geochronological context. *Historical Biology* **34**, 2350–2373.

57. Reguero M, Candela A, Alonso R. 2007 Biochronology and biostratigraphy of the uquı́a formation (pliocene–early pleistocene, NW argentina) and its significance in the great american biotic interchange. *Journal of South American Earth Sciences* **23**, 1–16.

58. Boivin M, Marivaux L, Pujos F, Salas-Gismondi R, Tejada-Lara J, Varas-Malca RM, Antoine P-O. 2018 Early oligocene caviomorph rodents from shapaja, peruvian amazonia. *Palaeontographica A* **311**, 87–156.

59. Arnal M, Kramarz AG, Vucetich MG, Frailey CD, Campbell Jr KE. 2020 New palaeogene caviomorphs (rodentia, hystricognathi) from santa rosa, peru: Systematics, biochronology, biogeography and early evolutionary trends. *Papers in Palaeontology* **6**, 193–216.

60. Assemat A *et al.* 2019 Restes inédits de rongeurs caviomorphes du paléogène de la région de juanjui (amazonie péruvienne): Systématique, implications macro-évolutives et biostratigraphiques. *Geodiversitas* **41**, 699–730.

61. Antoine P-O *et al.* 2012 Middle eocene rodents from peruvian amazonia reveal the pattern and timing of caviomorph origins and biogeography. *Proceedings of the Royal Society B: Biological Sciences* **279**, 1319–1326.

62. Boivin M, Marivaux L, Candela AM, Orliac MJ, Pujos F, Salas-Gismondi R, Tejada-Lara JV, Antoine P-O. 2017 Late oligocene caviomorph rodents from contamana, peruvian amazonia. *Papers in Palaeontology* **3**, 69–109.

63. Frailey CD, Campbell KE. 2004 Paleogene rodents from amazonian peru: The santa rosa local fauna. *The Paleogene Mammalian Fauna of Santa Rosa, Amazonian Peru* **40**, 71–130.

64. Lavocat R. 1976 RONGEURS CAVIOMORPHES DE l’OLIGOCENE DE BOLIVIE. II. RONGEURS DU BASSIN DESEADIEN DE SALLA-LURIBAY.(COLLECTION HOFFSTETTER).

65. Patterson B, Wood AE. 1982 *Rodents from the deseadan oligocene of bolivia and the relationships of the caviomorpha*. Museum of Comparative Zoology, Harvard University.

66. Hartenberger J. 1975 Nouvelles découvertes de rongeurs dans le déseadien (oligocène inférieur) de salla luribay (bolivie).

67. Antoine P-O *et al.* 2016 A 60-million-year cenozoic history of western amazonian ecosystems in contamana, eastern peru. *Gondwana Research* **31**, 30–59.

68. Kerber L. 2017 Imigrantes em um continente perdido: O registro fossilı́fero de roedores caviomorpha (mammalia: Rodentia: Ctenohystrica) do cenozoico do brasil. *Terrae Didática* **13**, 185–211.

69. Lacerda M, Romano PS, Bandeira KL, SOUZA LG. 2021 Georeferencing fossiliferous localities from solimões and acre basins (brazil)-what we know so far about solimões formation and future perspectives. *Anais da Academia Brasileira de Ciências* **93**.

70. Pérez ME, Arnal M, Boivin M, Vucetich MG, Candela A, Busker F, Quispe BM. 2019 New caviomorph rodents from the late oligocene of salla, bolivia: Taxonomic, chronological, and biogeographic implications for the deseadan faunas of south america. *Journal of Systematic Palaeontology* **17**, 821–847.

71. Tarquini SD, Ladevèze S, Prevosti FJ. 2022 The multicausal twilight of south american native mammalian predators (metatheria, sparassodonta). *Scientific Reports* **12**, 1224.

72. Marshall LG. 1978 *Evolution of the borhyaenidae, extinct south american predaceous marsupials*. Univ of California Press.

73. Prevosti FJ, Forasiepi AM. 2018 *Evolution of south american mammalian predators during the cenozoic: Paleobiogeographic and paleoenvironmental contingencies*. Springer.