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SUPPLEMANTARY DATA

A new Echimyidae (Rodentia, Hystricomorpha) from the late Miocene of southern South America

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APPENDIX S1. Description of characters used in the phylogenetic analysis. Nomenclature of craniomandibular traits follows Hill (1935), Lavocat (1971, 1976), Woods & Howland (1979), Moore (1981), Wahlert (1984), Novacek (1993), Verzi (2001), Olivares and Verzi (2014), Verzi et al. (2014). Dental nomenclature follows Marivaux et al. (2004), Antoine et al. (2012), and homologies of crests are after Verzi et al. (2016). References of publications that include at least partial descriptions of the listed characters are indicated. Ten new characters are listed at the end.

Character 1. Premaxillary septum separating incisive foramina (Verzi, 2001): with posterior ends of premaxillae joined medially, forming a pointed or rounded projection which may join an anterior apophysis of the maxilla (0); with posterior ends of premaxillae divergent, each one forming a small lateral apophysis (1).

Character 2. Lateral walls of incisive foramina (or of the corresponding cavity in case of partially obliterated foramina) (Verzi, 2008): with concave margins (0); with protruding medial walls of premaxillae producing anteriorly convergent margins (1); margins very narrow or not developed posterior to premaxillary-maxillary suture (2).

Character 3. Premaxillary-maxillary suture at medial margin of incisive foramen (Verzi, 2008; Verzi et al., 2010): level with the portion of the suture located lateral to the foramen (0); displaced anteriorly (1); displaced posteriorly (2).

Character 4. Medial margins of maxillary fossae (Olivares et al., 2012): separated (0); approximating each other or fused along the midline and generally forming a crest (1).

Character 5. External margins of incisive foramina posterior to premaxillary-maxillary suture: separated (0); very close or fused to each other (1).

Character 6. Anterior portion of premaxilla anterior to incisive alveolus in lateral view (Carvalho and Salles, 2004; Olivares et al., 2012): low to very low (0); high, forms the ventrolateral side of a tube that is dorsally completed by the nasal (1).

Character 7. Alveolar margins of M1-M2: level with palatal bridge, or ventral and forming acute alveolar margins (0); dorsal to the palatal bridge, forming wide to moderately convex, sometimes swollen, margins (1).

Character 8. Protuberance on maxilla ventral to bottom of alveolar sheath of I1: absent (0); present and located at the level of the external alveolar margin of DP4 (1); present and located at the level of the external alveolar margin between DP4 and M1 (2).

Character 9. Lateral flange of canal for infraorbital nerve in zygomatic root (Verzi ,2008; Verzi et al., 2010): with dorsal margin free or slightly in contact with bottom of alveolar sheath of upper incisor (0); with dorsal margin joined to bottom of alveolar sheath of upper incisor (1).

Character 10. Lacrimal foramen: opens into the orbital portion of the lacrimal (0); opens into the maxilla (1).

Character 11. Portion of maxilla surrounding foramen into lacrimal canal: with a suture posterior to the foramen (0); continuous around foramen (1).

Character 12. Foramen into nasolacrimal canal: open on side of the base of rostrum or anterior portion of orbital region, visible in lateral view (0); open on medial side of maxillary lamina posterior to incisor alveolar sheath, on the margin of sphenopalatine fissure, and oriented posteriorly toward this fissure, not visible in lateral view (1); as an unossified area between the maxillary lamina posterior to the incisor alveolar sheath and the margin of the sphenopalatine fissure (2).

Character 13. Foramen into nasolacrimal canal: opens into maxilla only (0); surrounded posteriorly by lacrimal (1).

Character 14. Orientation of the proximal portion of nasolacrimal canal (Glanz and Anderson, 1990): anteroventrally to ventrally oriented (0); more anteriorly oriented (thus, more dorsal respect to the sphenopalatine fissure) (1).

Character 15. Posterior margin of dorsal part of nasolacrimal canal (Olivares et al., 2012): present and variously developed (0); absent (1).

Character 16. Dorsal part of nasolacrimal canal: formed only by lacrimal (0); formed by lacrimal and maxilla (and in some cases also by frontal) (1).

Character 17. Dorsal and anterodorsal portions of alveolar sheath of M1 (Verzi, 2008): not hidden inside sphenopalatine fissure (0); hidden inside sphenopalatine fissure (1).

Character 18. Sphenopalatine fissure: well developed (0); reduced (not owing to height of molar alveoli) (1).

Character 19. Anterior portion of sphenopalatine fissure (Olivares et al., 2012): located ventral or anteroventral to lacrimal foramen (0); located posteroventral to lacrimal foramen (1).

Character 20. Dorsal projection of jugal in antorbital zygomatic bar: absent (0); present (1).

Character 21. Maxilla in anterior portion of zygomatic arch: with an extension located dorsal to the jugal at the base of the antorbital zygomatic bar (0); extension dorsal to jugal reduced or absent (1).

Character 22. Anterior end of jugal fossa (Olivares et al., 2012): acute (0); wide, rounded to subquadrangular (1).

Character 23. Inferior jugal process (Emmons, 2005; Olivares et al., 2012): level with or slightly anterior to paraorbital process (or to the suture between squamosal and jugal) (0); behind level of paraorbital process (1).

Character 24. Relationship between zygoma and orbital region: dorsal margin of zygoma concave, not restricting orbital region (0); dorsal margin of zygoma very slightly concave or straight, restricting orbital region (1).

Character 25. Contact among maxilla, lateral palatine plate and alisphenoid in basitemporal region (Verzi, 2001): located posterior to the M3 alveolus (0); lateral to the M3 alveolus (1).

Character 26. Posterior portion of maxilla in basitemporal region (Verzi, 2001): without apophysis (0); with an apophysis lateral to M3 alveolus, oriented posterodorsally (1); with an apophysis posterior to M3 alveolus, oriented laterally (2).

Character 27. External auditory meatus (Verzi, 2008; Verzi et al., 2010): short, moderately protruding with respect to auditory bulla and epitympanic recess (0); markedly protruding, with its anterodorsal and anterior wall moderately to very concave (1).

Character 28. Alisphenoid (Verzi 2008; Olivares et al., 2012): without contact with maxilla or only contacting via a posterior maxillary apophysis (0); with its anterior margin joined to the maxilla (1).

Character 29. Anterior margin of alisphenoid: oriented posterodorsally (0); oriented dorsally or anterodorsally (1).

Character 30. Posterior margin of maxilla in alveolar region (in ventral view): anterior to the anterior margin of alisphenoid-glenoid fossa (0); level with or slightly posterior to anterior margin of alisphenoid (1).

Character 31. Masticatory and buccinator foramina: present (0); absent (1).

Character 32. Pterygoid fossa in ventral view (between alisphenoid bridge and anterior margin of lateral palatine plate): subcircular, with anteroposterior and transverse diameters subequal (0); suboval, with anteroposterior diameter greater than transverse one (1).

Character 33. Lateral margin of pterygoid fossa: oriented posterodorsally and not forming a flange extending posteriorly (0); forming a flange level with the medial margin and extending posteriorly toward the bulla (1).

Character 34. Ventral margin of posterior process of squamosal (Olivares et al., 2012): not laterally deflected (0); laterally deflected, thus forming a shelf (1).

Character 35. Posterior process of squamosal (Verzi, 2001): straight, with posterior portion wide (0); with posterior portion narrow due to development of the epitympanic recess (petrosal bulla) (1).

Character 36. Tip of lateral process of supraoccipital: located ventral to posteroventral tip of posterior process of squamosal (0); close to or level with posteroventral tip of posterior process of squamosal (1).

Character 37. Lateral process of supraoccipital (Woods, 1984:434; Olivares et al., 2012): short, located dorsal to mastoid process (0); long, ventrally extended overlapping the mastoid process or below the level of the latter (1).

Character 38. Tip of paroccipital process (Woods, 1984:427; Verzi, 2001, 2008): extending to a level ventral to auditory bulla (0); terminating dorsal to the level of the ventral portion of auditory bulla (1).

Character 39. End of paroccipital process in posterior view: free or joined to auditory bulla, not strongly expanded on to the latter (0); forming a scale-like structure adhering on to bulla, strongly expanded dorsally and ventrally (1).

Character 40. Orientation of distal portion of paroccipital process: on a plane parallel or subparallel to occipital plane (0); rotated so that its external margin becomes posterolateral or posterior (1).

Character 41. Paroccipital process: ventral or ventrolaterally oriented (0); laterally oriented (1).

Character 42. Root of paroccipital process (Verzi, 2001): facing posteriorly and aligned with the plane of the occiput, or more medially oriented owing to the development of the mastoid bulla (0); inflected at level of dorsal portion of occipital condyle and perpendicular to plane of occiput (1).

Character 43. Posterior portion of mastoid bulla: level with or anterior to root of paroccipital process (0); located posterior to level of root of paroccipital process (1); posterior to level of paroccipital process owing to hypertrophy of auditory bulla (2).

Character 44. Origin of masseteric crest of mandible (Verzi, 2008; Verzi et al., 2010): from notch for tendon of medial masseter muscle, oriented in the same direction as ventral border of notch for tendon of medial masseter muscle or nearly so (0); ventrally deflected and posterior with respect to notch for tendon of medial masseter muscle (1); ventrally deflected from notch for tendon of medial masseter muscle (2).

Character 45. Postcondyloid process in posterior view (Olivares et al., 2012): deflected ventrolaterally (0); vertical (1).

Character 46. Notch for tendon of medial masseter muscle (Olivares et al., 2012): developed as a semicircular step anterior to origin of the masseteric crest (0); incorporated into origin of the masseteric crest, as an inconspicuous groove or rough area (1).

Character 47. Lateral crest of mandible: oblique (0); subvertical (1).

Character 48. Anterior margin of base of coronoid apophysis: close to the alveolar edge of molars (0); more lateral and ventral with respect to alveolar edge of molars, extending anteriorly as a more or less marked rim distinct from the lateral crest (1).

Character 49. Lower incisor (Olivares et al., 2012): long, bottom alveolar sheath at level of posterior or posterolateral portion of m3 or more posterior (0); short, bottom alveolar sheath at level of m2 or m3 but not reaching posterior portion of m3 (1); extremely short, bottom of alveolar sheath at level of Dp4 (2).

Character 50. Anteroloph on DP4: reaching the labial side of the tooth, with labial end level with end of protoloph or nearly so (0); markedly shorter, labial end not reaching level of end of protoloph (1).

Character 51. Mesolophule on DP4 (Patterson in Patterson and Wood, 1982; Verzi et al., 2014): transversely oriented, independent or partially fused to posteroloph (or posteroloph + metaloph) (0); represented by a posteriorly oriented short crest or spur contacting the posteroloph (or posteroloph + metaloph) (1); spur reduced or absent (2).

Character 52. Protoloph on M1–2 (Carvalho and Salles, 2004; Olivares et al., 2012): present as a complete loph, independent or fused to anteroloph (0); reduced to its labial portion, forming a tubercle isolated or fused to the anteroloph (1).

Character 53. Mesolophule on M1 (Verzi et al., 2014): reaching the labial side of the tooth, with its labial end reaching the labial end of the posteroloph + metaloph (0); shorter and posterolabially oriented (1).

Character 54. Mesolophule on M1 (Verzi et al., 2014): with its labial end reaching the labial edge of the molar, free or contacting the anterior part of the metacone area (0); with its labial end joined to the medial wall of metacone area (1).

Character 55. Mesolophule on M1–2 (see Lavocat's interpretation in Wood, 1974:fig. 1; Verzi et al., 2014): originated from the hypocone area (0); lingually connected to posteroloph + metaloph (1).

Character 56. Posterior lophs of adult M1: mesolophule not fused to posteroloph + metaloph; separated by the metaflexus or metafossette (0); fused, forming a simplified lobe without fossettes even when paraflexus/fossette and mesoflexus/fossette are present (1).

Character 57. Posteroloph + metaloph on non-senile M1–3: widely connected to the hypocone area (0); connection to the hypocone area narrow or absent (1).

Character 58. Flexi of M1-2: persistent or forming fossettes nearly synchronically (the metaflexus may close somewhat earlier) (0); para- and metaflexus closing markedly earlier than mesoflexus, parafossette generally smaller and more short-lived than the metafossette (1).

Character 59. Metaflexus on non-senile M1–M2: curved and of variable length, but never occupying the entire occlusal surface (0); transverse and strongly penetrating, crossing the entire occlusal surface or nearly so (1).

Character 60. Dp4: with lophid/s anterior to hypolophid subparallel, free, or united at the lingual end by the flexids closing, but not forming a lobe (0); with lophid/s anterior to hypolophid forming a rounded lobe (1); with lophids anterior to hypolophid joined to form a subrhombic lobe or a rounded lobe with a pointed projection on the labial side of the protoconid area (2); with lophids anterior to hypolophid joined to form a subovoidal to semicircular lobe (3); with lophids anterior to hypolophid represented by a single, composite, curved crest, which joins the hypolophid when worn forming a lobe of variable morphology (4); with lophids anterior to hypolophid forming a v-shaped lobe (5).

Character 61. Dp4: with persistent flexids/fossetids (0); with only hypo- and mesoflexid (1); with hypostriid and mesostriid (2); without flexids (3).

Character 62. Anterior side of m1-2 (metalophulid I – protoconid area): straight or convex especially at level of the protoconid (0); with a convexity at level of the bottom of the anteroflexid (or antero- + mesoflexid) and a concavity at level of the protoconid area, the latter with a pointed lateral extension (1).

Character 63. Metalophulid II of m1–2: originating from the protoconid area (0); originating from the metalophulid I (1).

Character 64. Lophids posterior to metalophulid I: metalophulid II and mesolophid present as complete crests (0); root of metalophulid II joined to or even submerged into middle portion of metalophulid I, mesolophid present as a complete crest or joined to the previous composite crest forming two (see Carvalho and Salles 2004) to one crest/s (1); metalophulid II present as a complete crest, or interrupted in its middle and represented by a proximal spur and a distal portion, mesolophid absent or rarely present during early ontogeny (2); metalophulid II as a reduced, short crest joined to or integrated into the distal portion of metalophulid I so that the lingual end of the first crest is usually expanded, mesolophid as a reduced crest or a spur that does not join the relictual metalophulid II or corresponding distal thickening of the first crest (3); metalophulid II as a reduced, short crest joined to or integrated into the distal portion of metalophulid I so that the lingual end of the first crest is usually expanded, mesolophid forming a complete or interrupted crest whose distal end joins the metalophulid II or the corresponding distal thickening of the first crest (4).

Character 65. Anterior lophids of m1-2: not forming a lobe (0); forming a lobe due to early fusion (relative to posterior lophids) of the lophids anterior to hypolophid (1); forming a lobe by early fusion of the hypolophid with the anterior complex lophid (2).

Character 66. Enamelled margins of hypolophid: both essentially straight or moderately concave anteriorly, extreme of lophid subrounded or truncated (0); more markedly concave, especially the posterior one, extreme of lophid pointed (1).

Character 67. Posterolophid of adult m1-2: not isolated (0); forming an isolated lamina (1).

Character 68. Protoconid area, hypolophid and ectolophid: not aligned (0); aligned and posterolingually oriented (1).

Character 69. Flexids (or the corresponding fossettids) of lower molars (Verzi et al., 2010): present (0); only hypo- and mesoflexid/fossettid (or their corresponding striids) are present (1); absent or vestigial (2).

Character 70. Orientation of lingual extreme of posterior flexid (metaflexid) of adult lower molars: lingual or posterolingual (0); markedly posterior (1).

Character 71. Hypo- and mesoflexid of m1-m2, if figure-eight shaped: present (0); closed and leaving evident striids in non-senile adults (1).

Character 72. m3 (Verzi, 2008; Verzi et al., 2010): not reduced or moderately reduced (especially its posterior lobe) (0); extremely reduced, subelliptic to subcircular in cross section, with its implantation posterolateral or posterior and dorsal to i1 (1).

Character 73. Occlusal morphology of m1–m2, if subrhombic to crescent-shaped (Verzi, 2008; Verzi et al., 2010): without anterior protrusion limiting the lingual concavity (0); crescent shaped, with an anterior protrusion limiting the lingual concavity (1).

Character 74. Occlusal portion of molars: moderate to small relative to skull or mandible size (0); proportionally very large (1).

Character 75. Basal portion of molar crown (lacking flexids) (Verzi et al., 2011): short, with at least the hypoflexid extending almost to the base of the crown (0); high (1).

Character 76. Ventral width of rostrum, anterior to the incisive foramina (Olivares and Verzi, 2015): similar to that at level of incisive foramina (0); markedly narrower (1).

Character 77. Antorbital zygomatic bar (Olivares and Verzi, 2015): narrow and with the anterior margin at the level of DP4-M1 (0); markedly wider and with the anterior margin at the level of M1-M2 (1).

Character 78. Anterior boundary of the orbit (Olivares and Verzi, 2015): at the level of DP4-M1 (0); at the level of M2 (1).

Character 79. Mastoid bulla (Olivares and Verzi, 2015): wide (0); narrow (1).

Character 80. Mandibular condyle (Olivares and Verzi, 2015): (0) markedly dorsal to the molars; (1) near at the occlusal level of molars or below it.

Character 81. Occlusal surface of upper incisors (Olivares and Verzi, 2015): not extended along the whole exposed crown (0); long, extended along the whole exposed portion of crown (1).

Character 82. Lateral process of supraoccipital (Olivares and Verzi, 2015): straight (0); anteriorly deflected in its origin (1).

Character 83. Morphology of anterior margin of labial end of metaflexid of adult m1-m2: straight, labially or anterolabially oriented, and close to lingual end of hypoflexid (0); curved, posterolabially oriented and widely separated from posterior margin of hypoflexid (1).

Character 84. Labial fossettes of upper molars and lingual fossettids in lower molars: formed early in ontogeny (elongated and persistent) (0); formed sequentially as wear progresses (1).

Character 85. Morphology of hypoflexid of trilophodont m1-m2 (in occlusal view): not exceeding midline of molar (0); exceeding midline of molar (1).

Character 86. Location of lingual end of hypoflexid of trilophodont m1-m2 (in occlusal view): slightly anterior to labial end of metaflexid (0); facing labial end of metaflexid (1); facing posterolabial margin of mesoflexid (2).

Character 87. Trilophodont molars: with wide lophids, narrow flexids (0); with very narrow lophids, wide flexids (1).

Character 88. Morphology of the posterior lophs in M1 vs M2: with the same pattern of loph reduction (0); with different pattern of loph reduction (M1 with marked reduction of last lophs, mesolophule + metaloph + posteroloph and M2 with mesolophule as an independent crest, connected or not to the hypocone area) (1).

Character 89. Supraorbital ridges (Neves and Pessôa, 2011; Pessôa et al., 2015): absent or poorly developed (0); conspicuous, extending almost in parallel along anterior half of frontals and diverging toward squamosal-parietal or fronto-squamosal sutures (1); conspicuous, extending in parallel along frontals and squamosal-parietal suture (2).

Character 90. Lateral margin of incisive foramina, anterior to premaxilla-maxillary suture (Olivares and Verzi, 2015): without contact with interpremaxillary foramen (0); very close to and lateral to interpremaxillary foramen (1).

Character 91. Diastema in front of dp4: below alveolar margin, describing a curve or forming a ledge (0); level with alveolar margin, without ledge, slightly curved or straight (1).

Character 92. Placement of inferior zygomatic root in relation to palatal bridge (Carvalho and Salles, 2004; Candela and Rasia, 2012): at same level (0); inferior zygomatic root more dorsally placed (palatal bridge projected ventrally) (1).

APPENDIX S2. Combined character matrix. Multistate characters 49 and 51 were treated as ordered (additive). The morphological matrix (92 characters and 73 taxa) used for the morphological phylogenetic analysis is the numeric block, without last 6 genera.

nstates 32;
xread
4232 79

&[numeric]

Dasyprocta	0	?	0	?	1	0	0	0	0	?	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	?	0	0	0
	0	0	0	0	0	0	0	0	0	?	?	0	0
	?	0	0	0	0	?	?	0	0	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0
	0	0	?	?	?	0	0	0	0	0			
Clyomys	0	0	0	0	0	0	0	0	1	0	1	1	0
	0	0	0	0	0	0	0	0	1	1	1	1	0	0
	0	0	0	0	1	0	0	0	0	0	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	4	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	0
	0	1	1	1	0	0	0	0	0	0				
Euryzygomatomys	0	0	0	0	0	0	0	0	0	1	0	1	1	
	0	0	0	0	0	0	0	0	0	1	1	1	1	0
	0	0	0	0	0	1	0	0	0	0	0	1	0	0
	1	0	0	0	0	0	0	0	0	0	0	0	1	0
	0	0	0	0	0	0	4	0	0	?	?	0	0	0
	0	0	0	?	0	?	0	0	0	0	0	0	0	0
	0	0	1	1	1	0	0	0	0	0	0			
Carterodon	0	0	0	0	0	0	0	0	0	?	1	1	?	
	0	0	0	0	0	0	0	0	1	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	0	0	0	0	0	4	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	0
	0	1	1	1	0	0	0	0	0	0				
Theridomysops	0	?	?	?	0	?	?	0	0	?	?	?		
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	0	?	0	0	0	0	0	1	0	
	0	0	0	0	0	0	4	0	0	?	?	0	0	0
	0	0	0	?	0	?	0	0	0	?	0	?	?	?
	?	0	1	1	1	0	0	?	?	0	0			
Dicolpomys	0	?	0	?	0	0	?	0	1	?	?	?	?	
	?	0	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	0	?	0	0	0	0	0	0	1	?	?

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0 1 ? ? ? 0 ? 0 0 0
Trinomys 0 0 0 0 0 0 1 0 0 0 1 1 0
0 0 1 [01] 0 1 1 0 0 0 0 0 0 0
0 0 0 0 0 1 0 1 0 0 1 0 0 1
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Egracilis 0 0 0 0 0 0 0 0 0 ? 1 1 0
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Echapalmalensis 0 0 0 0 0 0 0 0 0 ? 1 1
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Emarplatensis 0 0 0 0 0 0 0 0 0 ? 1 1 0
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0 1 0 0 0 0 0 1 0 0
Pampamys 0 ? 0 ? 0 0 0 0 0 ? ? ? ?
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	?	?	?	0	?	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	[01]	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	?	0	?	0	0	?
	0	1	0	0	0	0	0	0	0	0				
Thrichomys	0	0	0	0	0	0	0	0	0	0	1	1	0	
	0	0	0	1	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	1	[01]	0	0	0	1	0	0	1
	0	0	0	0	0	1	0	0	0	0	2	0	0	0
	[01]	1	0	0	0	0	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	0	1	0	0	0	1	1	0	0	0				
Tlaurentius	0	0	0	0	0	0	0	0	0	0	1	1	0	
	0	0	0	1	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	1	1	0	0	0	1	0	0	1
	0	0	0	0	0	1	0	0	0	0	2	0	0	0
	[01]	1	0	0	0	0	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	0	1	0	0	0	1	1	0	0	0				
Ullumys	0	?	?	?	0	?	?	0	0	?	1	?	?	
	?	0	0	1	0	0	0	?	?	?	?	?	0	0
	?	0	0	0	?	?	?	?	?	?	?	?	?	?
	?	?	?	0	?	1	0	0	0	0	2	0	0	0
	[01]	1	0	0	0	1	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	?	1	?	1	?	?
	0	1	0	0	1	1	0	?	1	0				
Eintermedius	0	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	0	?	?	0	0	0	?	?	?	?	?
	?	?	?	?	?	?	?	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	?	?	?	?	?	?	?
	0	1	0	0	1	?	?	?	1	?				
Hoplomys	0	0	0	0	0	0	1	0	0	?	1	1	0	
	0	0	1	1	?	1	0	0	0	0	0	0	0	
	0	0	0	0	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	0	0	?	?	?	0	1	0	0	0				
Proechimys	0	0	0	0	0	0	1	0	0	0	1	1	0	
	0	0	1	1	?	1	0	0	0	0	0	0	0	
	0	0	0	0	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	1	[01]	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	0	0	[?0]	[?0]	[?0]	0	1	0	0	0				
Paramyocastor		0	?	0	0	1	0	?	?	0	?	?	?	
	?	?	?	?	?	?	?	?	?	?	?	?	?	?

?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	0	?	?	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	?	1	0	0	0
0	0	0	?	0	?	0	0	0	?	?	?	0	0
?	0	1	?	?	?	0	?	?	0	1			
Myocastor	0	0	0	0	1	0	0	0	0	?	1	1	0
0	0	0	0	0	0	0	0	0	0	1	0	0	0
0	1	0	0	0	?	0	1	0	0	1	0	0	1
0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	0	1	0	0	0	0	0	1	1	0	0	0	0
0	0	?	0	?	0	0	0	0	0	1	0	0	1
0	1	?	?	?	0	0	0	0	1				
Mesomys	0	0	0	0	0	0	0	0	0	0	1	1	0
0	0	0	0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	0	1	0	1	0	0	1	0	0	1
0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1	0	0	0	0
0	0	?	0	?	0	0	0	0	0	0	0	0	1
0	0	?	?	?	0	2	0	0	0				
Lonchothrix	0	0	0	0	0	0	0	0	0	?	1	1	0
0	0	0	0	0	1	1	0	0	0	0	0	0	0
0	1	0	0	0	1	0	1	0	0	1	0	0	1
0	0	0	1	1	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1	0	0	0	0
0	0	?	0	?	0	0	0	0	0	0	0	0	1
0	0	?	?	?	0	2	0	0	0				
Isothrix	0	0	0	0	0	0	0	1	0	0	1	1	0
0	0	0	0	0	1	[01]	0	0	0	0	0	0	0
0	0	1	0	0	1	0	1	0	0	?	0	0	1
0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	?	?	0	0	0	0
0	0	?	0	?	0	0	0	0	0	0	0	0	1
0	1	0	1	0	0	0	0	0	0				
Maruchito	0	?	0	?	0	0	?	1	0	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	1	?	?	?
?	?	?	0	?	0	0	0	1	0	0	0	0	0
0	0	0	0	1	0	0	0	?	?	0	0	0	0
0	0	?	0	?	0	0	0	?	?	?	?	?	?
1	1	0	2	0	0	?	0	0	0				
Makalata	0	0	0	0	0	0	0	1	0	?	1	1	0
0	0	0	0	?	1	1	0	0	0	0	0	0	0
0	0	1	1	0	1	0	1	0	0	1	0	0	1
0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	0	1	0	1	0	0	0	?	?	0	0	0	0
0	0	?	0	?	0	0	0	0	0	0	0	0	1
1	1	0	2	0	0	0	0	0	0				

Toromys	0	0	0	0	0	0	0	1	0	?	1	1	0
	0	0	0	0	1	1	0	0	0	1	0	0	0
	0	0	1	1	0	1	0	1	0	0	1	0	0	1
	0	?	0	0	1	0	1	0	1	0	0	0	0	0
	0	0	1	0	1	0	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	1	1	0	2	0	0	0	0	0	0				
Phyllomys	0	0	0	0	0	0	0	0	1	0	0	1	1	0
	0	0	0	0	?	1	1	0	0	0	1	0	0	0
	0	0	1	0	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	0	0	1	0	0	0	0	0
	0	0	1	0	1	0	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	1	1	0	2	0	0	0	0	0	0				
Echimys	0	0	0	0	0	0	0	0	1	0	0	1	1	0
	0	0	0	0	?	1	1	0	0	0	1	0	0	0
	0	0	1	0	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	0	0	1	0	0	0	0	0
	0	0	1	0	1	0	0	0	?	?	0	0	0	0
	0	0	?	0	?	0	0	0	0	0	0	0	0	1
	1	1	0	2	0	0	0	0	0	0				
Kannabateomys		0	0	2	2	1	1	0	1	0	?	1	1	
	0	0	0	0	0	?	1	1	0	0	0	1	0	0
	0	0	1	1	1	0	1	0	1	0	0	1	0	0
	1	0	0	0	0	1	0	1	0	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	?	?	0	0	0
	1	0	0	?	0	?	1	0	0	0	0	0	0	0
	1	0	1	0	0	0	0	0	0	0	1			
Dactylomys	0	0	2	0	1	1	0	1	0	?	1	1	0	
	0	0	0	0	?	1	1	0	0	0	1	0	0	0
	0	1	1	1	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	1	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	?	?	0	0	1	1
	0	0	?	0	?	1	0	0	0	0	0	0	0	1
	0	1	0	0	0	0	0	0	0	1				
Olallamys	0	0	2	?	1	1	0	1	0	?	1	?	?	
	0	0	0	?	?	1	1	0	0	0	1	0	?	?
	0	?	?	1	0	1	0	1	0	0	1	0	0	1
	0	0	0	0	1	0	0	0	1	0	0	0	0	0
	0	0	0	0	0	0	0	0	?	?	0	0	1	1
	0	0	?	0	?	1	0	0	0	0	0	0	0	1
	0	1	0	0	0	0	0	0	0	1				
Adelphomys	0	?	?	?	0	0	?	1	0	?	?	?	?	
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	0	?	0	1	0	0	0	?	0	?	?
	0	0	0	0	0	3	0	0	?	?	0	0	0	1

0 1 ? 0 ? ? 0 0 ? ? ? ? ? ?
0 1 0 0 0 0 ? ? 0 ?
Stichomys 0 0 0 0 0 0 0 1 0 ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? 0 ? 0 1 [01] 1 0 0 0 ? ?
0 0 [01] 0 0 3 0 0 ? ? 0 0 0 1
0 1 ? 0 ? ? 0 0 ? 0 ? ? 0 ?
0 1 0 0 0 0 ? 0 0 0
Paradelphomys 0 ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? 0 ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? 0 ? ? 0 0 1
1 0 1 ? ? ? 0 0 0 ? ? ? ? ?
? 0 1 0 0 0 ? ? ? 0 ?
Eodelphomys 0 ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? ? ? ?
? ? ? ? ? ? ? ? ? ? ? 0 0 1
0 1 ? ? ? ? 0 0 ? ? ? ? ? ?
0 1 0 0 0 ? ? ? ? ?
Octodon 0 1 0 0 0 0 0 0 0 0 0 0
[01] 0 0 0 0 1 0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0 0 0 0 0 1 0
0 0 0 0 1 0 0 0 0 0 ? ? ? ?
? ? ? ? 1 ? ? 1 ? ? ? ? ? ?
? 1 ? 0 0 ? 0 0 0 0 0 ? 0 0
? ? ? ? ? ? 0 0 0 0 0
Spalacopus 0 1 0 0 0 0 0 0 ? ? 0 ? ?
0 0 0 0 0 ? 0 0 0 0 1 0 1 1
0 1 0 0 0 0 0 0 0 0 0 1 0 0
1 0 0 1 0 0 0 0 0 ? ? ? ? ?
? ? ? ? ? ? 1 ? ? ? ? ? ? ?
1 ? 0 0 ? 0 0 0 0 0 ? 0 0 ?
? ? ? ? ? 0 0 0 0 1
Aconaemys 0 1 0 0 0 0 0 0 0 1 0 1 0
0 0 0 0 1 ? 0 1 0 0 [01] 0 1 1
0 1 0 0 0 0 0 0 0 0 0 1 0 0
1 0 0 1 0 0 0 0 0 ? ? ? ? ?
0 ? 0 1 ? ? 1 ? ? ? 1 ? ? ?
1 ? 0 0 ? 0 0 0 0 0 ? 0 0 ?
? ? ? ? ? 0 0 0 0 0
Pithanotomys 0 1 0 0 0 0 0 0 0 1 ? 0 ?
? 0 0 0 1 0 0 1 0 0 ? 0 1 ?
0 ? 0 0 0 ? 0 0 1 0 0 1 0 0
1 0 0 1 0 0 0 0 0 ? ? ? ? ?

?	?	?	?	?	?	1	?	?	?	?	?	?	?
1	?	0	0	?	0	0	0	0	1	?	0	0	?
?	?	?	?	?	0	0	0	0	0				
Tympanoctomys		0	1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1	0	0	0	1
2	0	0	0	0	0	0	0	0	1	1	0	1	0
0	0	1	2	1	0	0	0	0	0	?	?	?	?
?	?	?	?	?	?	?	1	?	?	?	?	?	?
?	1	?	0	1	?	0	0	0	0	0	?	0	0
?	?	?	?	?	?	0	0	0	0	1			
Octomys		0	1	0	0	0	0	0	0	0	0	0	0
?	0	0	0	0	0	0	0	0	0	0	0	1	2
0	0	0	0	0	0	0	0	1	1	0	1	0	0
0	1	0	1	0	0	0	0	0	?	?	?	?	?
?	?	?	?	?	?	1	?	?	?	?	?	?	?
1	?	0	0	?	0	0	0	0	0	?	0	0	?
?	?	?	?	?	0	0	0	0	0				
Octodontomys	0		1	0	0	0	0	0	0	0	0	0	0
?	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1	0	0
0	0	0	1	0	0	0	0	0	?	?	?	?	?
0	?	0	1	?	?	3	?	?	?	1	?	?	?
1	?	1	1	?	0	1	0	0	0	?	0	0	?
?	?	?	?	?	0	0	0	0	0				
Abalosia	0	?	0	?	0	0	0	0	0	0	?	?	?
?	0	?	?	0	0	0	0	1	0	?	0	1	2
?	0	0	0	?	?	0	?	?	?	?	?	?	?
0	1	0	1	?	0	0	0	0	?	?	?	?	?
?	?	?	?	?	?	1	?	?	?	?	?	?	?
1	?	0	0	?	0	0	0	0	0	?	0	?	?
?	?	?	?	?	0	0	?	0	0				
Actenomys	0	0	1	1	0	0	0	0	0	1	[01]	?	1
0	0	0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	0
0	0	1	1	0	0	0	0	0	?	?	?	?	?
?	?	?	?	?	?	3	?	?	?	?	?	?	?
2	?	?	0	1	0	1	0	0	0	?	0	0	?
?	?	?	?	?	0	0	0	0	1				
Ctenomys	0	0	0	1	0	0	0	0	[02]	?	[01]	0	
[12]	0	0	0	0	0	?	0	0	0	0	0	0	0
0	1	0	?	0	0	0	0	0	0	0	0	1	1
0	0	0	1	1	0	0	0	0	0	?	?	?	?
?	?	?	?	?	?	?	3	?	?	?	?	?	?
?	2	?	?	1	0	0	1	0	0	0	?	0	0
?	?	?	?	?	?	0	0	0	0	0			
Xenodontomys		0	0	1	1	0	0	0	0	0	1	?	?
?	?	0	0	?	1	0	0	0	0	?	?	?	0
0	?	?	?	?	?	?	0	?	0	0	0	?	?

?	?	0	?	1	?	0	0	0	0	?	?	?	?
?	?	?	?	?	?	?	3	?	?	?	?	?	?
?	2	?	?	0	1	0	1	0	?	?	?	?	?
?	?	?	?	?	?	0	0	0	0	0			
Eucelophorus		0	0	0	0	0	0	0	0	2	1	?	?
1	?	0	0	?	0	?	0	0	0	0	0	0	1
?	1	0	0	0	0	0	0	0	0	0	0	1	1
0	1	0	1	1	0	0	0	[01]	0	?	?	?	?
?	?	?	?	?	?	?	3	?	?	?	?	?	?
?	2	?	?	0	0	0	1	0	0	0	?	0	0
?	?	?	?	?	?	0	0	0	0	0			
P_innominatus		0	?	0	?	0	0	0	?	0	?	?	?
?	?	?	?	?	?	?	?	0	0	0	?	0	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	1	?	0	0	0	0	?	?	?	?
?	?	?	?	?	?	?	3	?	?	?	?	?	?
?	1	?	1	0	?	0	1	0	?	?	?	?	?
?	?	1	?	?	?	0	?	?	0	?			
Praectenomys	0	0	0	?	0	0	?	0	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	1	?	0	0	0	0	?	?	?	?	?
?	?	?	?	?	?	3	?	?	?	?	?	?	?
2	?	?	1	0	0	1	0	0	0	?	0	?	?
?	?	?	?	?	0	?	0	0	?				
Sallamys	0	?	0	?	0	0	?	0	0	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	1	?	?	0	0	0	0	0	0	0	0
1	1	0	0	0	1	0	0	1	3	0	0	0	0
0	0	?	0	?	0	0	0	?	?	?	?	?	?
0	1	0	1	0	1	?	0	0	0				
Willidewu	0	?	0	0	0	0	0	0	0	?	?	?	?
?	?	?	?	?	0	?	?	?	?	?	?	0	0
?	0	?	0	?	?	?	?	?	?	?	?	?	?
?	?	?	1	?	0	0	0	0	?	?	0	0	0
1	1	0	0	0	0	0	0	1	3	0	0	0	0
0	0	?	0	?	0	0	0	?	?	?	?	?	?
0	1	0	1	0	1	?	0	0	0				
Acaremys	0	0	[01]	?	0	0	0	0	0	0	?	?	?
?	?	?	?	?	?	?	0	0	0	0	0	?	?
0	?	?	0	?	?	?	0	?	?	0	1	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	
[01]	0	0	0	1	0	1	0	0	1	4	1	0	0
0	0	0	0	0	?	0	0	0	?	?	?	?	?
?	0	1	0	0	0	0	?	0	0	0			
Chasichimys	0	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?

?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	1	?	0	0	0	0	?	?	?	?	?
?	?	?	?	?	1	2	0	?	?	0	0	0	0
[02]	0	?	0	?	0	1	0	?	?	?	?	?	?
0	1	0	1	0	0	?	?	0	0				
Chasicomys	0	?	0	?	0	0	?	0	0	0	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	1	?	0	0	0	0	?	?	0	?	?
0	1	0	0	?	1	2	0	?	?	0	0	0	0
0	0	?	0	?	0	0	0	?	?	?	?	?	?
?	1	0	1	0	0	?	0	0	?				
Protadelphomys		0	0	0	0	0	0	0	0	0	?	?	0
1	?	0	?	?	1	0	0	?	?	?	?	?	?
?	?	0	?	?	?	?	?	?	?	?	0	?	?
0	0	?	1	1	?	0	0	0	0	?	?	0	0
0	1	1	0	0	0	0	0	0	1	3	0	0	1
0	0	0	?	0	?	0	0	0	?	0	?	0	0
?	0	1	0	1	0	1	?	0	0	0			
Protabrocoma	0	?	0	?	0	0	?	0	0	?	?	?	?
?	1	?	?	0	0	?	?	?	?	?	?	?	?
?	?	?	?	?	?	?	?	?	?	?	?	?	?
?	?	?	0	?	0	?	1	2	?	?	?	?	?
?	?	0	?	?	?	0	?	?	?	0	1	0	0
0	0	?	0	?	0	0	0	?	?	?	0	?	?
0	1	0	2	0	0	?	0	0	?				
A_bennettii	0	0	0	0	1	0	0	0	0	0	0	?	0
1	1	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	1	0	1	1	0	1	0	0
0	0	2	1	0	0	0	1	2	?	?	?	?	?
?	?	?	?	?	?	?	0	?	?	?	?	1	0	0
0	0	?	0	?	0	0	0	0	0	?	0	0	?
0	1	0	2	0	0	0	0	0	0				
A_cinerea	0	0	0	0	1	0	0	0	0	0	0	?	0
1	1	0	0	0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	1	0	1	1	0	1	0	0
0	0	2	1	0	0	0	1	2	?	?	?	?	?
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0	0	?	0	?	0	0	0	0	0	?	0	0	?
0	1	0	2	0	0	0	0	0	0				
Cuscomys	0	0	0	?	1	0	0	0	0	?	0	?	0
1	1	0	0	?	0	0	0	1	0	0	0	0	0
0	0	1	0	0	0	1	0	0	1	0	1	0	0
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0	0	?	0	?	0	0	0	0	0	?	0	0	?
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Spaniomys	0	?	0	0	0	0	?	0	0	?	0	?	0
	1	1	0	0	0	0	0	?	?	?	?	?	?	?
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	?	?	?	0	?	0	0	1	1	0	0	0	0	0
	0	0	0	0	0	0	0	[01]	0	2	0	1	0	0
	0	0	?	0	?	0	0	0	?	0	?	?	0	?
	0	1	?	?	0	0	0	0	0	0				
Dudumus	0	?	?	?	0	0	?	?	0	0	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	2	0	0	0	[01]	0	0	1	0	0	1
	0	0	0	0	0	2	0	0	0	2	0	0	0	0
	0	0	?	0	?	0	0	0	?	?	?	?	?	?
	0	1	?	?	?	0	?	?	0	?				
Prospaniomys	0	0	0	0	0	0	0	0	0	0	0	?	?	?
	?	1	0	0	0	0	1	0	0	0	0	0	0	?
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	[01]	0	0	0	0	0	2	0	1	0	2	0	0	0
	0	0	0	?	0	?	0	0	0	0	0	?	0	0
	?	0	1	?	?	?	0	?	?	0	0			
Caviocricetus	0	?	?	?	0	0	?	0	0	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	2	?	1	0	1	0	1	1	0	1	1
	0	0	0	0	0	5	0	0	0	2	0	0	0	0
	0	0	0	0	?	0	0	0	?	?	?	?	?	?
	0	1	?	?	?	0	?	?	0	?				
Neophanomys	0	?	?	?	0	0	?	0	0	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	1	?	0	0	0	0	1	2	0	?	?
	?	0	0	?	?	1	0	0	?	?	?	0	0	0
	0	0	0	0	?	0	0	0	?	?	?	?	?	?
	0	1	0	0	0	?	?	?	0	?				
A_minutissimus	0	?	?	?	0	0	?	0	0	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	1	?	0	0	0	0	1	2	0	1
	1	0	0	0	0	0	1	0	0	?	?	0	0	0
	0	0	0	0	0	?	0	0	0	?	?	?	?	?
	?	0	1	0	0	0	0	?	?	0	?			
Xylechimys	0	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	?	?	?	?	?	?	?	?	?	?	?
	?	?	?	0	?	0	1	1	1	?	?	?	?	?
	?	?	?	?	?	?	?	0	?	?	1	0	0	1

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Deseadomys 0 ? ? ? ? ? ? ? ? ? ? ? ?
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Platypittamys 0 ? ? ? ? ? ? 0 ? ? ? ? ?
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Protacaremys 0 ? ? ? 0 0 ? 0 0 ? ? ? ?
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Plesiacarechimys 0 ? ? ? ? ? ? ? ? ? ? ? ?
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1 0 0 0 0 0 1 0 0 1 4 0 0 0
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Galileomys 0 ? ? ? ? ? ? ? ? ? ? ? ?
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0 0 0 0 0 ? ? 0 1 4 1 0 0 0
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Pipanacoctomys ? ? ? ? ? ? ? ? ? ? ? ? ?
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Cavia ? ? ? ? ? ? ? ? ? ? ? ? ? ?
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Chinchilla ? ? ? ? ? ? ? ? ? ? ? ? ? ?
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Erethizon ? ? ? ? ? ? ? ? ? ? ? ? ? ?
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Cuniculus ? ? ? ? ? ? ? ? ? ? ? ? ? ?
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Hydrochoerus ? ? ? ? ? ? ? ? ? ? ? ? ? ?
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&[dna]
Hydrochoerus
GACTACCTAAATGGCCCCTTCACGGTGGTGGTCAAGGAGTCATGTGATGGGATGGGGGACGT
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GAAAAACTTGTCAGGGAAGTGGAAGGCCTTGAGGCTTCTGGCTCAGTCTACATTTGCACTCT
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CGCTGAGAACCTGGAACGCTACGAGGTCTGGCGTTCCAACCCGTACCACGAGTCAGTGGAAG
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TTGGACAAGCATCTCAGAAAGAAGATGAAC??
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Erethizon

GACTACCTGAATGGCCCCTTCACGGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGGGATGT
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GGGAGGTGTATAAAAATCCCAATGCCTCCAAAGAGGAAAGGAAAAGATGGCAGGCCACCTT
GGACAAGCATCTCCGAAAGAAGATGAAC??
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A_bennettii

GACTACCTCAGTGGCCCCTTCACGGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGGG
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ACCTTGGACAAGCATCTCCG??
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Octodontomys

GACTACCTCAATGGCCCCTTCACGGTGGTGGTCAAGGAATCTTGTGATGGGATGGGGGATGT
GAGTGAGAAGCACGGGAGCGGGCCGGCAGTTCCTGAAAAGGCAGTTCGTTTTTCATTCACCA

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TTTCACAAAAC

Ctenomys

?????CCTCAATGGCCCCTTCACGGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGGGATGTGA
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GGGGAGGTGTATAAAAACCCCAATGCTTCCAAAGAGGAAAGGAAAAGATGGCAGGCCACCT
TGGACAAGCATCTCAGAAAGAAGA??
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Echimys

GACTACCTCAACGGTCCCTTCACGGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGAGATGT
GAGTGAGAAACACGGGAGCGGGCCTGCCGTTCCTGAAAAGGCAGTTCGTTTTTCATTCACCG
TCATGAGAATTACCATTGCGCACAACTCCCAGAACGTGAAGGTGTTTGAGGAAGCCAAGCCT
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CCTGACTGCCATCCTCAGCCCGCTCATCGCTGAGAGGGAAGCCATGAAGAGCAGTGAGCTCC
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GAGAGGCATGAAGCTCTCAGGGAGCTGATGGACCTTTACCTGAAGATGAAGCCTGTGTGGCG
GTCCACATGCCCAGCTCAGGAGTGTGCAGACTCCCTCTGCCAATACAGCTTCAATTCCCAGC
GTTTCGCCGAGCTTCTCTCTACCAAGTTCAAGTACAGATACGAAGGCAAAATCACCAATTAC
TTCACCAAAAC

Isothrix

GACTACCTCAATGGCCCCTTCACCGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGAGATGT
GAGTGAGAAACACGGGAGCGGGCCTGCCGTTCCTGAAAAGGCAGTTCGTTTTTCATTCACCG
TCATGAGAATTACCATAGCGCACAACTCCCAGAACGTGAAGGTGTTTGAGGAAGCCAAGCCT
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AGAGGCATGAAGCTCTCAGGGAGCTGATGGACCTTTACCTGAAGATGAAGCCCGTGTGGCGG
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CACAAAAC

Hoplomys

GACTACCTCAGTGGCCCCTTCACGGTGGTTGTCAAGGAGTCTTGTGATGGGATGGGAGATGT
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CTGGACAAGCATCT??
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Dactylomys

GACTACCTCAACGGCCCCTTCATGGTGGTGGTCAAGGAGTCTTGTGATGGGATGGGGGATGT
CAGTGAGAAACATGGCAGCGGGCCTGCCGTTCCTGAAAAGGCAGTTCGATTTTCATTCACCG
TCATGAGAATTACCATAGCGCACAACTCCCAGAACGTGAAGGTGTTTGAGGAAGCCAAGCCT
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TTCAACAAAAC

Makalata

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GCTACGGGATCGAGTGAAAGGGGTCTCGGCCAAACCTTTCATCGAGACGGTCCCTTCCATAG
ACGCGCTGCACTGTGACATCGGCAATGCGGCCGAATTCTACAAG??????????????????????????
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Mesomys

????ACCTGAATGGCCCCTTCACGGTGGTGGTGAAGGAGTCTTGCGATGGGATGGGAGATGTG
AGTGAGAAACACGGGAGCGGGCCTGCCGTTCCTGAAAAGGCTGTTCGTTTTTCGTTCACTGT
CATGAAGATTACTATAGCGCACGGCTCACAGAACCTGAGAGTGTTTGAGGAAGCCAAGCCTA
ACTCGGAACTGTGTTGCAAGCCCCTGGGCCTTATGCTGGCCGATGAGTCCGACCACGAGACC
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Phyllomys

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Proechimys

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Thrichomys

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Toromys

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Myocastor

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Cavia

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Dasyprocta

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Hydrochoerus

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Cuniculus

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Chinchilla

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Erethizon

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A_bennettii

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Aconaemys

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Octodon

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Octodontomys

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Octomys

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Pipanacoctomys

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Spalacopus

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Tympanoctomys

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Ctenomys

??CTCTTGGGTTGAATTTATTGAGCTAGATATTGATGA
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Clyomys

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Euryzygomatomys

??TTTATTGAGCTAGATATTGATGACCCT
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???

Echimys

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Isothrix

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Phyllomys

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Proechimys

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Thrichomys

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???

Trinomys

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Toromys

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CGGAACAGGCTCCAAGCTCTGAAATGGCCCTCCCAGATTATACCTCTG??????????????????
??

Myocastor

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Hoplomys

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&[dna]

Cavia

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Dasyprocta

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??

Chinchilla

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Hydrochoerus

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??

Cuniculus

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Erethizon

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Aconaemys

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Octodon

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Octodontomys

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Octomys

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Pipanacoctomys

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Spalacopus

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Tympanoctomys

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Ctenomys

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Clyomys

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Euryzygomatomys

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Echimys

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Isothrix

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Hoplomys

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Kannabateomys

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Dactylomys

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ACC??
?????????

Lonchothrix

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Makalata

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Mesomys

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Phyllomys

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Proechimys

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Thrichomys

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Trinomys

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Myocastor
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Cuniculus

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Chinchilla

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Erethizon

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Octodontomys

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Ctenomys

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Clyomys

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C

Echimys

ACCACCCCATACCTGGAAGATGCCCCGGAGCTGCCCCTGCATGACCTCTACTGCAGCAAGCT
GCTGGATCTGGTCTTCCTGCTGGACGGCTCCTCCAGGCTCTCGGAGGCCGATTTCGAGGTGCT
GAAGGCCTTCGTGGTGAGCGTCATGGAGCGCCTGCACATCTCCCAGAAGCGGATCCGGGTGG
CGGTGGTCGAGTACCACGACGGCTCCCATGCC??????TACCTCGAGCTCAAGGCCCGGAAGCG
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TCAGCGAGGTCCTCAAGTACACGCTGTTCCAGATCTTCAGCAAAATTGAGCGCCCCGAGGCC
TCCCGCATCGTGCTGCTCCTGACTGCTAGCTCAGAGCCCAGGCGGATGGCCCAGAATTTGCTC
CGCAGTGTCCAGGGCCTGAAAAAGAAAAAGGTCATCCTGATGCCAGTGGGCATCGGGCCGC
ATGTCAACCGCCAGCAGATCCGACTCATTGAGAAGCAGGCCCCGGAAAACAAGGCCTTCATG
CTCAGCGGTGTGAATGAGCTGGAGGAGAGGAGGGACGAGATCGTCAACTACCTCTGTGACC
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TGTCCTGGAGGGCTCTGACAAAGTGGGAGAAGCCAACTTCAACAGGAGCAAGGAGTTCGTG
GCAGAGGTGATCCAGCGCATGGCCGTGGGCCAGGACGGCGTCCACGTCACGGTGCTGCAGT
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CC

Isothrix

??????????????????????GCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCTGCTGGATC
TGGTCTTCCTGCTGGATGGCTCCTCCAGGCTCTCAGAGGCGGATTTTGAGGTGCTGAAGGCCT
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Hoplomys

??TTCTACTGCACCAAGCTGCTGGATCTGGTCTTCC
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AGCTTCTCCGCCAGCCAGGGCGACCGGGAGCAGGTGCCAAACTTAGTTTACATGGTCACAGG
AAATCCTGCCTCTGATGAGATTAGACGGTTGCCTGGAGACACTGAGGTGGTGCCCATTGGAG
TGGGCCCTGATGCCAACATGCAGGAACTGCAGAGGGTCAGCTGGCCT

Kannabateomys

??????????????????ACGCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCTGCTGGAT
CTGGTCTTCCTGCTGGATGGCTCCTCCAGGCTCTCGGAGGCGGATTTCGAGGTGCTGAAGGCC
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ACATGGTGGCCGTGGAGTATACCTTCCGTGAGGCCCAGTCCAAGGGAGATGTGCTACAGCAT
GTGCGAGAGATCCAGTTCCGGGGTGGCAACCAGACCAACACCGGGCTGGCCTTGCAGTACTT
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Dactylomys

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CCCGCATCGTGCTGCTCCTGACTGCCAGCTCAGAGCCCAAGAAGATGGCCCGGAATTTGTTC
CGCAACATCCAGGGCCTGAAGAAGAAAAAGGTCATCCTGATGCCAGTGGGCATCGGGCCGC
ATGCCAACCTCCAGCAGATCCGACTCATTGAGAAGCAGGCCCCCGAAAACAAGGCCTTCATG
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CGGAGGTGATCCAG??
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Makalata

ACCACCCCGTCCCTGGAAGACGCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCT
GCTGGATCTGGTCTTCCTGTTGGATGGCTCCTCCAGGCTCTCGGAGGCTGATTTCGAGGTGCT
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CAGCATGTGCGAGAGATCAAGTTCCGGGGTGGCAACCAGACGAACACCGGGCTGGCCTTGC
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GGTGGTGCCCATCGGAGTGGGCCCTCATGCCAACATGCAGGAACTGCAGAGGGTCAGCTGGC
CC

Mesomys

ACCACCCCATACCTGGAAGACGCCCCGGAGCTGCCCCTGCATGACTCCTACTGCAGCAAGCT
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TCGTACATGGTGGCCGTGGAGTATACCTTCCGTGAGGCCCAGTCCAAGGGGGATGTGCTGCA
GCATGTGCGAGAGATCCAATTCCGGGGTGGCAACCAGACCAACACCGGGCTGGCCTTGCAGT
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TACATGGTCACAGGAAATCCTGCCTCTGATGAGATTAGACGGTTGCCTGGAGACATCGAGGT
GGTGCCCATTGGAGTGGGCCCTGGTGCCAACATGCAGGAACTGCAGAGGGTCAGCTGGCGC

Olallamys

ACCACCCCATACCTGGAAGACGCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCT
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Phyllomys

ACCACCCCATACCTGGAAGATGCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCT
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CTGTGGTCGAGTACCATGACGGCTCCCATGCC??????TACCTCGAGCTCAAGGCCCGGAAGCG
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Proechimys

??????????????????????MCCCAGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCTGCTGGATC
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CAGAGAGTTTGTCCCCAGAACCCAAGAGAAAGTCTATGGTTCTGGATGTGGTGTTTGTCCTG
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CATTGGAGTGGGGCCTGATGCCAACATGCAGGAACTGCAGAGGGTCAGCTGGCC?

Thrichomys

??????????????????????GCCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCTGCTGGATC
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TGAGCACAGCTTCTCCGCCAGCCAGGGTGACCGGGAGCAGGCGCCAAACCTGGTTTACATGG
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Trinomys

??????????????????ACGTCCCAGAGCYGCCCCTGCATGACTTCTACTGCAGCAAGCTGCTGGAT
CTGGTCTTCCTGCTGGATGGCTCCTCCAGGCTCTCGGAGGCGGATTTCGAGGTGCTGAAGGCC
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CATTGGAGTGGGCCCTGGTGCCAACATGCAGGAACTGCAGAAGGTCAGCTGGC??

Toromys

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AGGCTCTCAGAGAGTTTGTCCCCAGAACCCAAGAGAAAGTCCATGGTTCTGGATGTGGTATT
CGTCCTGGAGGGCTCTGACAAAGTAGGAGAGG??
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Myocastor

ACCACCCCATACCTGGAAGACACCCCGGAGCTGCCCCTGCATGACTTCTACTGCAGCAAGCT
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CAGCACGTGCGAGAGATCCAATTCCGGGGTGGCAACCAGACCAACACTGGGCTGGCCTTGCA
GTACTTGTCTGAGCACAGCTTCTCTGCCAGCCAGGGTGACCGGGAGCAGGCGCCAAACCTGG
TTTACAYGGTCACAGGAAATCCTGCCTCTGATGAGATTAGACGGTTGCCTGGAGACATCGAG
GTGGTGCCCATTGGAGTGGGCCCTGATGCCAGCATGCAGGAACTGCAGAGGGTCAGCTGGCC
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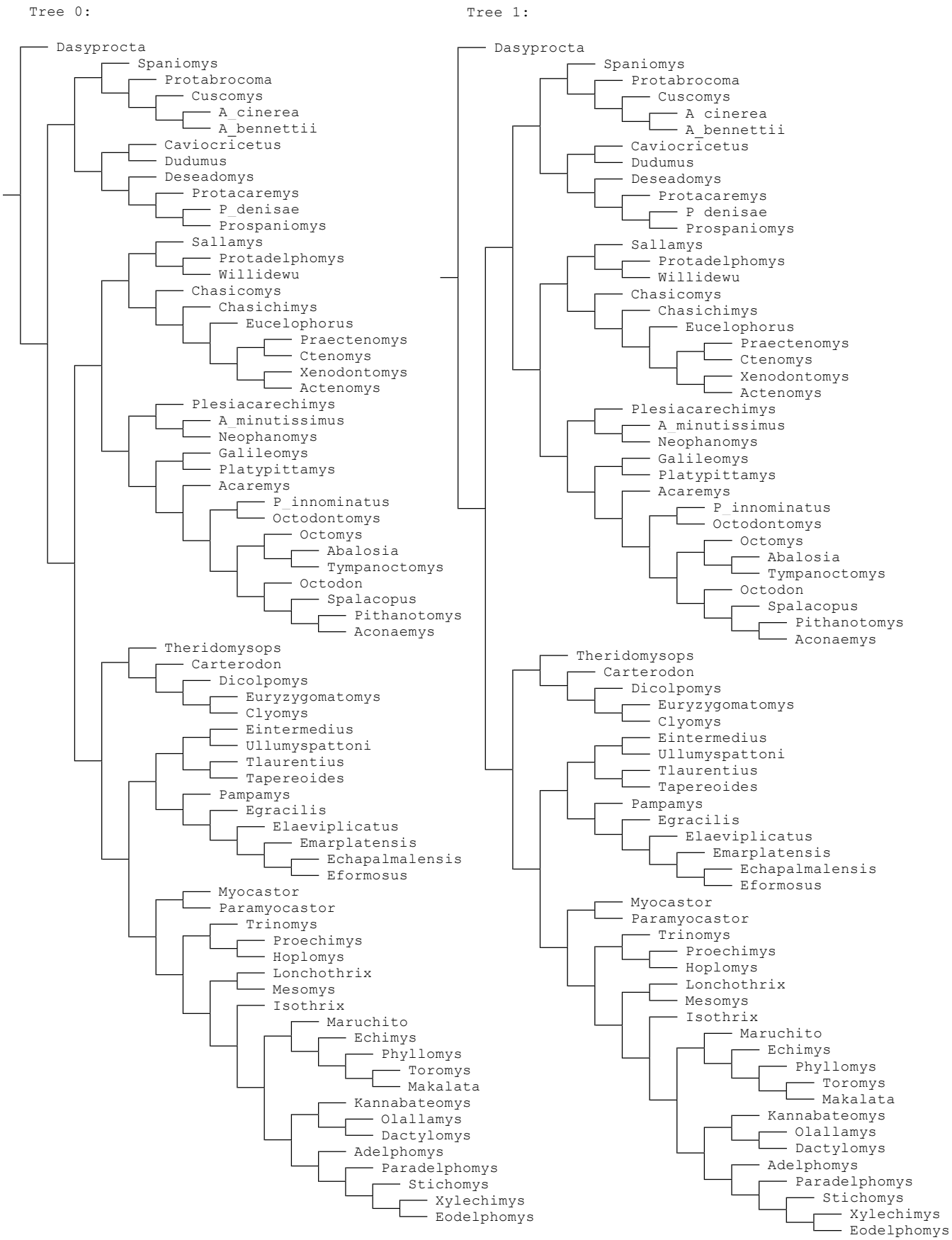
TABLE S1. GenBank accession numbers. References are indicated in brackets and are listed at the end.

Family / Species	12S rRNA	GHR	vWF	RAG1
Caviidae				
Cavia aperea	AF433908 (14)	AF433930 (14)		
Dasyproctidae				
Dasyprocta leporina	AY093660 (1)	FJ855207 (15)	U31607 (13)	
Hydrochoeridae				
Hydrochoerus	U12454 (19)		AJ251137 (7)	
Cuniculidae				
Cuniculus paca	AF520693 (5)		AJ251136 (7)	
Chinchillidae				
Chinchilla lanigera	AF520696 (5)	AF520660 (5)	AJ238385 (6)	
Erethizontidae				
Erethizon dorsatum	AF520694 (5)	AF520658 (5)	AJ251135 (7)	AY011887 (11)
Abrocomidae				
Abrocoma bennettii		FJ855213 (15)	JN415073 (10)	JN414949 (10)
Octodontinae				
Aconaemys sagei	AF520672 (5)	AF520645 (5)		
Octodon degus	AM407930 (17)	AF520647 (5)		
Octodontomys gliroides	AF520685 (5)	AF520649 (5)	JF938711 (18)	KF590663 (16)
Octomys mimax	AF520687 (5)	AF520665 (5)		AF520665 (5)
Pipanacoctomys aureus	AY249753 (4)	AY249752 (4)		
Spalacopus cyanus	AF520689 (5)	AF520653 (5)		
Tympanoctomys barrerae	AF520692 (5)	AF520655 (5)		
Ctenomyinae				
Ctenomys boliviensis	U12446 (19)	FN855214(15)	JN415078 (10)	JN414961 (10)
Echimyidae				
Clyomys laticeps	AF422851 (8)	JX515326 (2)	AJ849306 (3)	
Euryzygomatomys spinosus		AF422854 (8)	JX515327 (2)	JF297706 (9)
Echimys chrysurus	AF422877 (8)	FJ855215 (20)	AJ251141 (7)	EU313303 (12)
Isothrix bistriata	AF422873 (8)	FJ855216 (15)	AJ849308 (3)	EU313311 (12)
Hoplomys	AF520668 (5)		JN415080 (10)	JN414965 (10)
Kannabateomys amblyonyx		AF422850 (8)		AJ849310 (3)
Dactylomys dactylinus	AF422874 (8)		KF590667 (16)	EU313300 (12)
Lonchothrix emiliae	AF422857 (8)			
Makalata didelphoides	AF422878 (8)		JF297707 (9)	EU313314 (12)
Mesomys hispidus	AF422860 (8)		AJ849305 (3)	EU313322 (12)
Olallamys			KF590673 (16)	
Phyllomys blainvillii	AF422876 (8)	JX515331 (2)	JF297735 (9)	JX515323 (2)
Proechimys simonsi	AF422864 (8)	JX515324 (2)	AJ849320 (3)	EU313333 (12)
Thrichomys apereoides	AF422855 (8)	JX515325 (2)	AJ849315 (3)	EU313334 (12)
Toromys grandis		KF590694(16)	KF590676 (16)	EU313336 (12)
Trinomys yonenagae	AF422865 (8)		AJ849318 (3)	
Myocastor coypus	AF520669 (5)	AF520662 (5)	AJ251140 (7)	AY011892 (11)

FIGURE S1. Six most parsimonious trees, 198 steps long (CI = 0.571; RI = 0.854).



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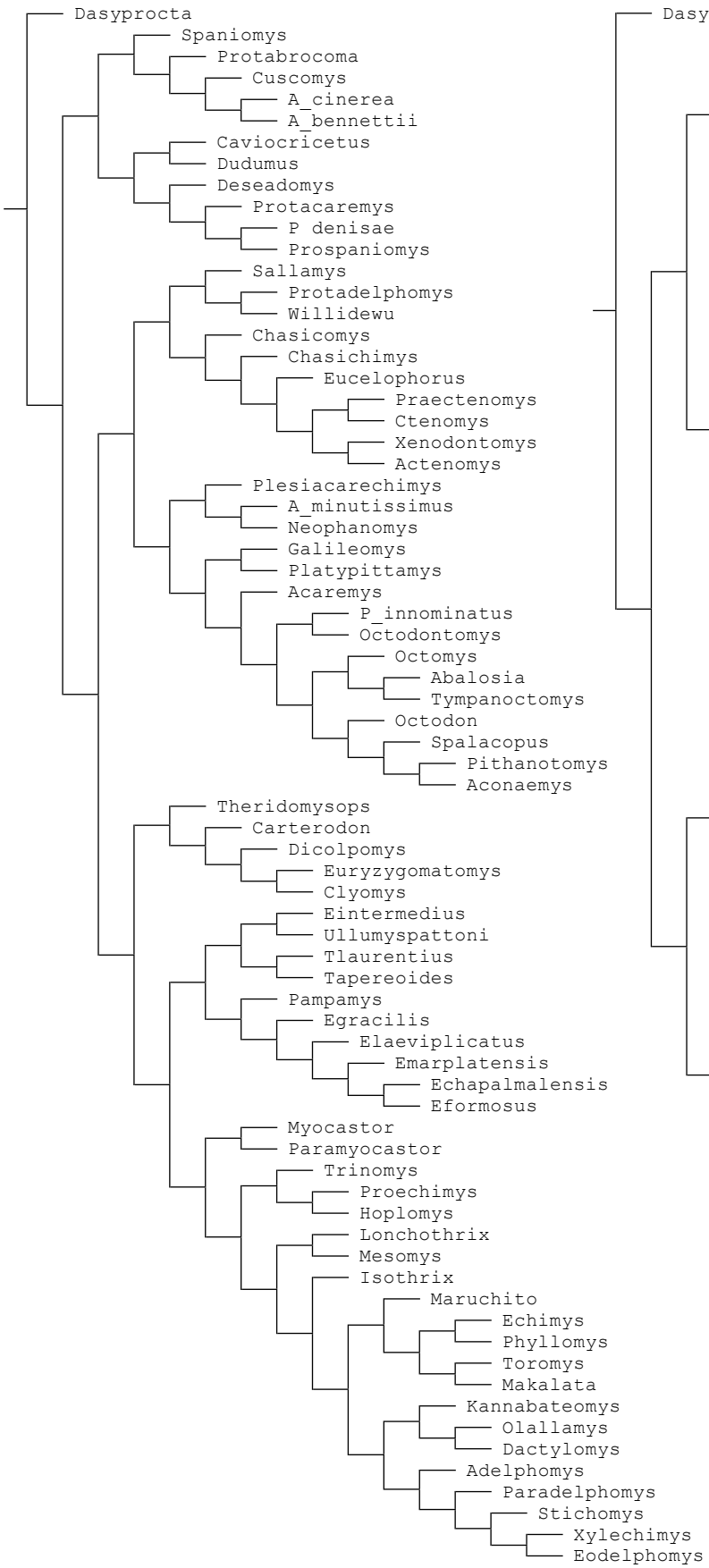
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Ctenomys
Xenodontomys
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Abalosia
Tympanoctomys
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Theridomysops
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Euryzygomatomys
Clyomys
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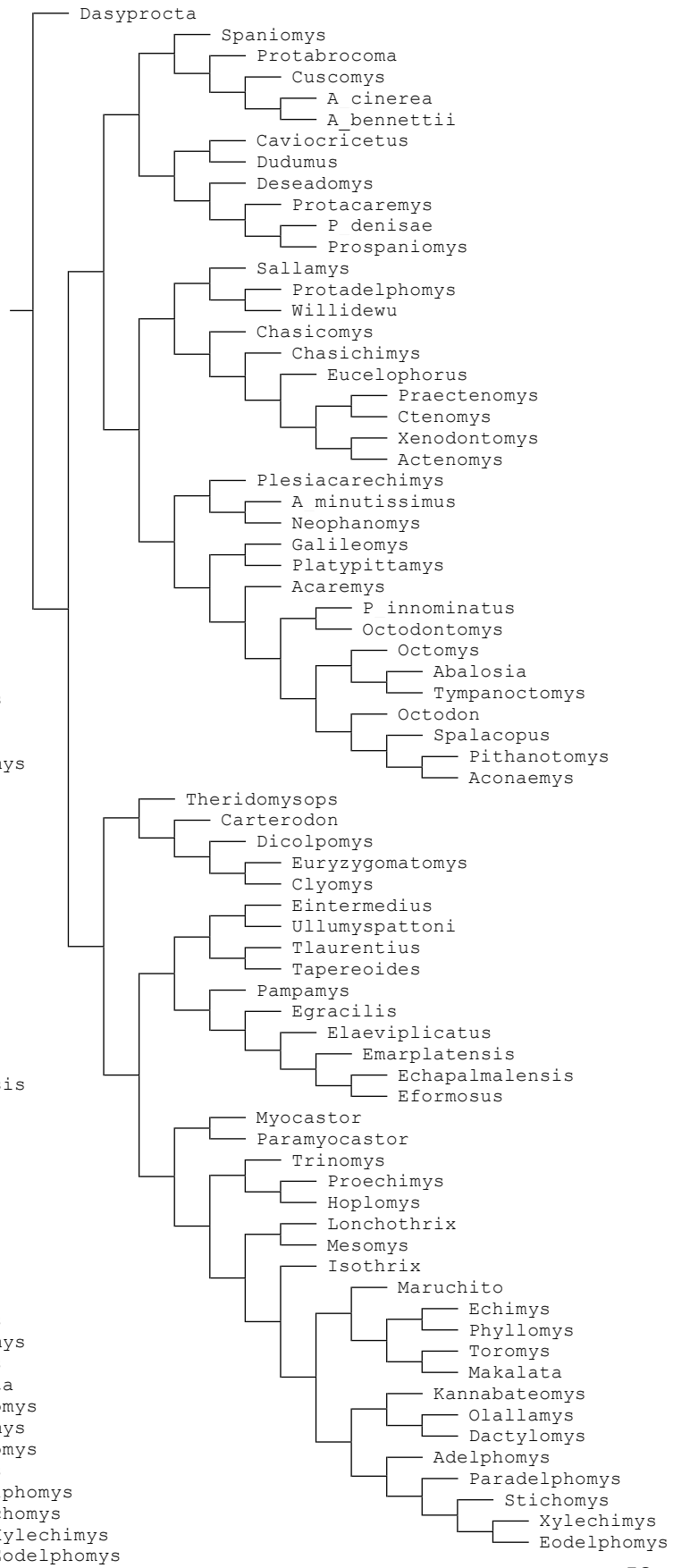
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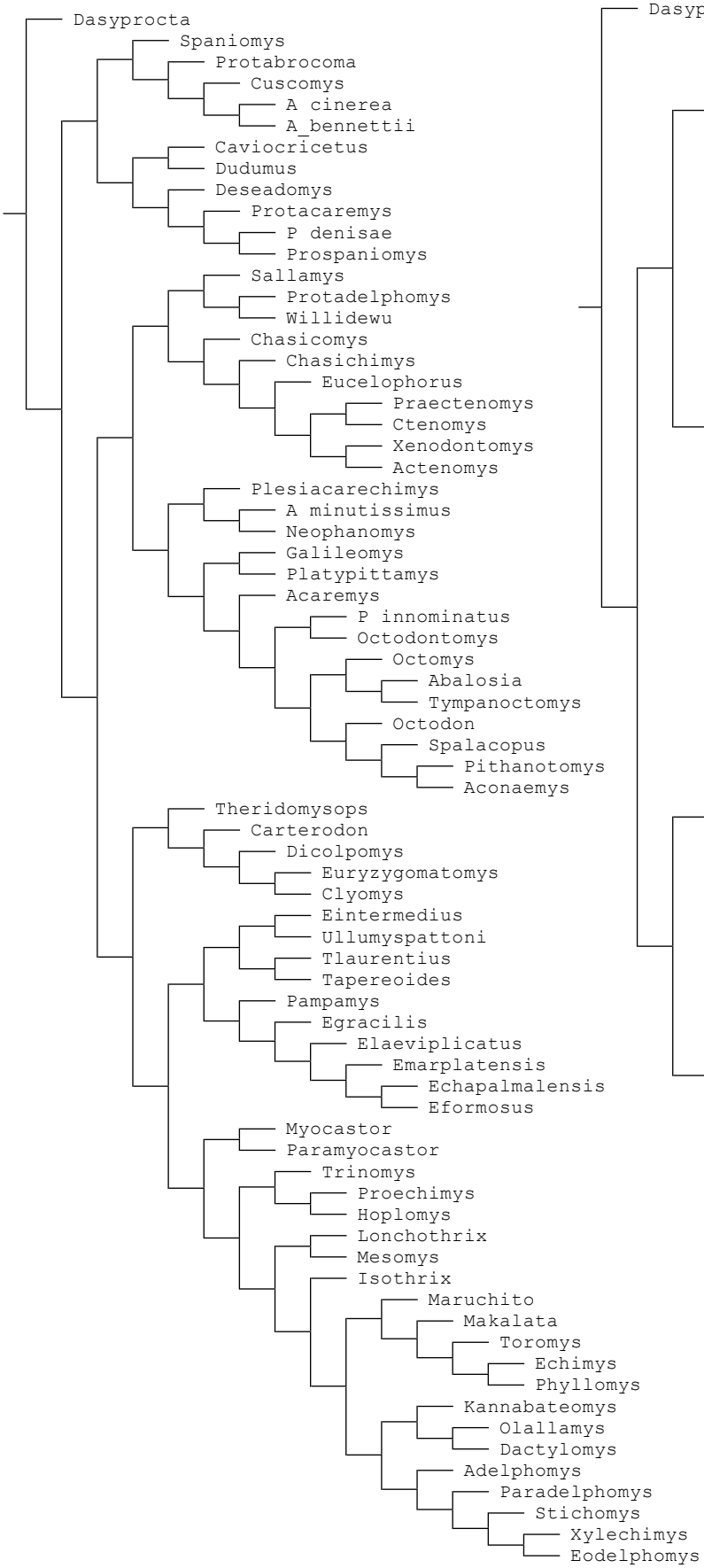
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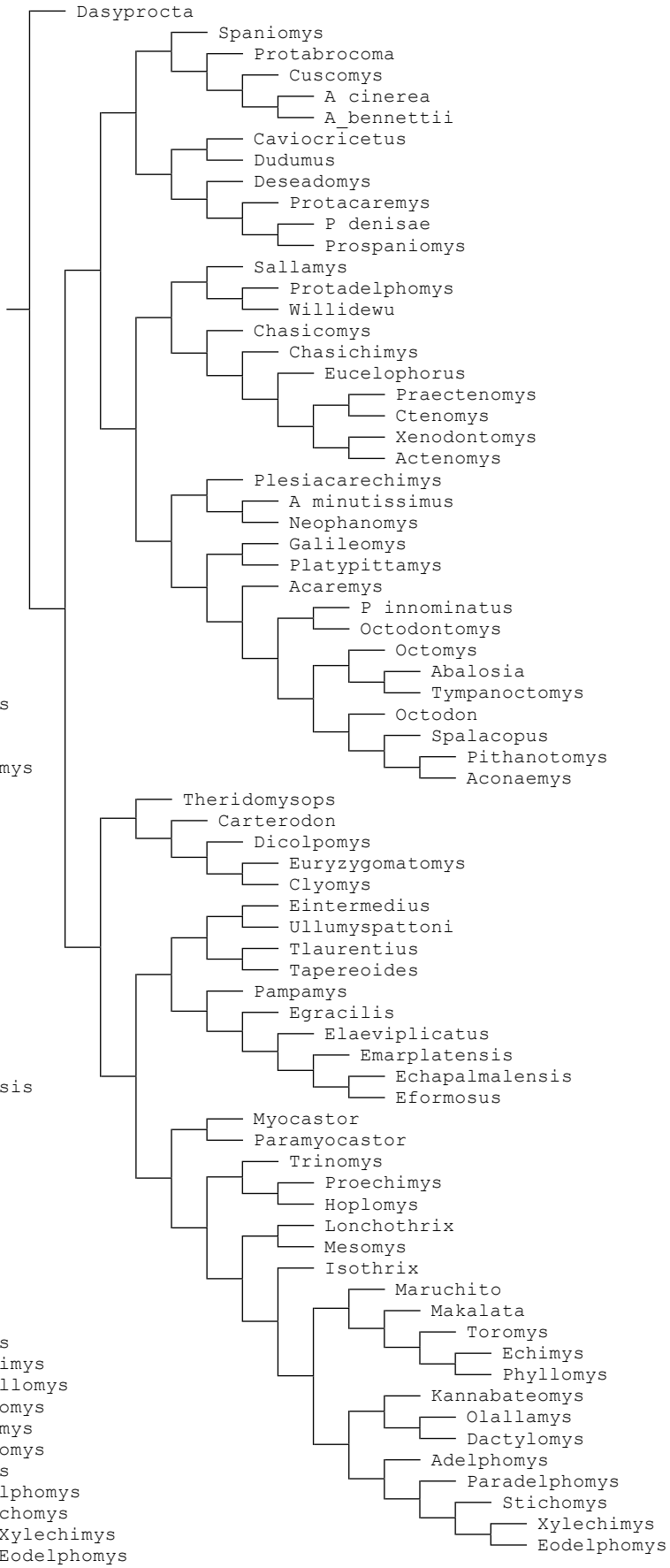
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