ACTA PALAEONTOLOGICA POLONICA

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SUPPLEMENTARY ONLINE MATERIAL FOR

Systematic review of *Neocavia* from the Neogene of Argentina: Phylogenetic and evolutionary implications

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Supplementary Online Material

SOM. 1. Morphological Character List and GenBank accession numbers.
Morphological characters with an asterisk (*) are considered "ordered"

Mandibular characters

1. Mental foramen: absent (0); present (1).

2. ***Location of the mental foramen on the anterior region of the dentary: dorsal on the diastema (0); close to the dorsal margin of the dentary and opening dorsolaterally (1); at the dorsoventral midpoint of the lateral surface of the dentary and opening laterally (2); close to the ventral margin of the dentary and opening laterally (3).

3. Dorsoventral position of the mandibular foramen respect to the retromolar fossa: dorsal respect to the retromolar fossa (0); ventral respect to the retromolar fossa (1).

4. *Antero-posterior position of the mandibular foramen respect to the retromolar fossa, when the mandibular foramen is ventral to the retromolar fossa: posterior to the retromolar fossa (0); at the same level to the retromolar fossa (1); anterior to the retromolar fossa (below m3) (2).

5. Posteroventral projection of the posterior end of the mandibular symphysis (“chin”), in lateral view: absent (0); present (1).

6. Development of posteroventral projection of the posterior end of the mandibular symphysis (“chin”), in lateral view: well developed, forming an elongate peg exposed in lateral view (0); moderately developed, only a low bulge projects ventrally and is marginally exposed in lateral view (1).

7. Labial edge of the condyle that is the insertion point of *m. masseter posterior*, in posterior view: projecting laterally with respect to wall of the dentary, forming small knob (0); lacking a distinct knob, continuous with lateral wall of the dentary (1).

8. Medial edge of the condyle that is the insertion point of *m. pterygoideus externus*, in posterior view: projecting medially forming a shelf that overhangs the medial surface of the dentary (0); poorly developed projecting medially forming a small knob with respect to medial wall of the dentary (1).

9. Shape of the post-condylar process, in lateral view: squared-off, forming approximately a 90° angle (0); rounded (1).

10. Length of the post-condylar process: equal or longer than the anteroposterior length of the condyle (0); shorter than anteroposterior length of the condyle (1).

11. Height of the coronoid process compared to the position of the condyle: located at the same dorsoventral level as the condyle (0); located more ventrally than the condyle (1).

12. *Anterior margin of the coronoid process: convex (0); straight (1); concave (2).

13. Dorsal end of the coronoid process: pointed and posterodorsally projected (0); pointed and dorsally projected (1); blunt (2).

14. *Dorsoventral position of the mandibular notch: located above the occlusal surface of the dental series (0); located at the same height as the occlusal surface of the dental series (1); located ventral to the occlusal surface of the dental series (2).

15. Shape of the mandibular notch: concave (0); almost straight (1).

16. *Dorsoventral position of the anterior most point of the lunar notch: low, located ventral to the dorsoventral midpoint of the dentary (between the ventral edge of the dentary and the condyle) (0); located at the approximate dorsoventral midpoint of the dentary (1); high, located above the dorsoventral midpoint of the dentary (2).

17. Posterior extension of the angular process: level with the post-condylar process (0); ending anterior to the post-condylar process (1); ending posterior to the post-condylar process (2).

18. *Pterygoid shelf: developed (0); reduced (1); absent (2).

19. Mylohioid shelf: absent (0); present (1).

20. *Posterior extension of the root of the lower incisors: extending up to the level of m3 (0); extending up to the level of the posterior lobe of m2 (1); extending up to the level of the anterior lobe of m2 (2); extending up to the level of the posterior lobe of m1 (3); extending up to the level of the anterior lobe of m1 (4).

21. *Location of the notch for the insertion of the tendon of the *m. masseter medialis pars infraorbitalis* with respect to the toothrow: between p4 and m1 (0); below m1 (1); between m1 and m2 (2).

22. Ridge of the notch for the insertion of the tendon of the *m. masseter medialis pars infraorbitalis*: absent (0); present (1).

23. *Development of the ridge of the notch for the insertion of the tendon of the *m. masseter medialis pars infraorbitalis*: poorly developed (0); developed, without forming a shelf around the notch (1); well developed, forming a shelf around the notch (2).

24. *Notch for the insertion of the tendon of the *m. masseter medialis pars infraorbitalis*: connected to the masseteric crest (0); isolated, located between the massteric crest and the horizontal crest (1); connected to the horizontal crest (2).

25. *Development of the masseteric crest: well developed, forming a shelf that projects laterally with respect to the lateral surface of the dentary (0); forming a well-developed ridge that fails to project with respect to the lateral surface of the dentary (1); poorly developed as a thin and low ridge (2); forming a scar (3).

26. Dorsoventral length of the masseteric scar: high (0); low (1).

27. *Anterior origin of the masseteric crest with respect to the toothrow: below m1 (0); between m1 and m2 (1); below m2 (2); between m2 and m3 (3); below m3 or posteriorly to m3 (4).

28. Shape of the lateral crest (*sensu* Woods, 1972): straight, projecting anteroventrally from the base of the coronoid process (0); curved, deflecting anteroventrally from the base of the coronoid process (1).

29. Horizontal crest: absent (0); present (1).

30. *Development of the horizontal crest: present as a low and broad ridge (0); present as a conspicuous crest, forming a laterally projected shelf but lacking a dorsal fossa (1); well developed, forming a laterally projected shelf and bearing a fossa on its dorsal surface (2).

31. *Posterior extension of the horizontal crest, in lateral view: extending up to the anterior margin of the mandibular condyle (0); approximately ending at the anteroposterior midpoint of the mandibular condyle (1); extending up to the posterior margin of the mandibular condyle (2).

32. Depth of the fossa located dorsal to the horizontal crest with respect to the dorsoventral depth of the notch for the insertion of the tendon of the *m. masseter medialis pars infraorbitalis* when the nMpi is joined to the horizontal crest: notch and fossa different in depth (0); notch and fossa equal in depth (1).

33. Alveolar protuberance of the m1 (ventral outgrowth of the base of some molariform alveoli that projects ventrally from the ventral surface of the dentary): absent (0); present (1).

34. Development of alveolar protuberance of m1: present as a small but distinct convexity on the ventral margin of the dentary (0); present as well-developed bulge on the ventral margin of the dentary (1).

35. Antero-posterior length of the lower diastema respect to the molariform series: equal or shorter than molariform series (0); longer than the molariform series (1).

36. Dorsal margin of the lower distema: oblique (0); subplane (1).

Cranial characters

37. Articulation of nasals with respect to premaxilla: nasals articulate with premaxilla throughout their length (0); anterior half of nasals do not articulate with premaxilla (1).

38. Interorbital width (relationship between the narrower width of the frontals in the orbit and the largest width of the braincase posterior to the zygomatic squamosal process): longer, > 50% (0); shorter, <50% (1).

39. Posterior portion of the frontals: plane (0); convex (1).

40. *Anterior portion of the parietals: plane (0); slightly convex (1); strongly convex (2).

41. Interparietal in adult specimens: present (0); absent (1).

42. *Proportion of supraoccipital in dorsal view, respect to the antero-posterior length measured from the fronto-parietal suture up to posterior margin of supraoccipital: up to 9% (0); between 9.1% and 20% (1); more than 20% (2).

43. Area between temporal fossae: plane interposed (fossae do not merge on the middle line) (0); sagittal crest (1).

44. Development of the temporal fossae: shallow (0); intermedia (1); deep (2)

45. Antero-posterior length of the upper diastema respect to molariform series: equal or longer then the molariform series (0); shorter than molariform series (1).

46. Ridge through which the maxillary artery and the infraorbital nerve (Cherem and Ferigolo, 2012): absent (0); present (1).

47. Development of the ridge through which the maxillary artery and the infraorbital nerve: reduced (0); developed (1); very developed (2).

48. Dorsal process of the zygomatic squamosal process: absent (0); present (1).

49. Position of the boundary between the mastoid and paraoccipital processes: at the same level or above the external auditory meatus (0); beneath the external auditory meatus (1).

50. Dorso-ventral position of the external auditory meatus respect to the occlusal surface of the dental series (lateral view): at the same level (0); below the occlusal surface of the dental series (1).

51. Posterior border of the upper diastema: oblique (0); vertical (1).

52. *Posterior border of the upper diastema respect to the antero-posterior length of maxilla (measured from the premaxillary-maxillary suture to the posterior border of maxilla at level of the posterior projection of M3): up to 10% (0); between 10.1% and 13% (1); between 13.1% and 16% (2); between 16.1% and 20% (3); more than 20% (4).

53. Length of incisive foramina (relationship between the antero-posterior length of the incisive foramina and the antero-posterior length of the diastema –from the posterior margin of the alveolus incisive to the most anterior margin of the alveolus p4–): long, >50% (0); short, <50% (1).

54. Maximum width of the posterior margin of the incisive foramina respect to the maximum width of maxilla at same level: narrow (< 50%) (0): wide (≥ 50%) (1).

55. Palatal surface: plane (0); only anterior portion concave (1); concave (2); uneven (3)

56. *Location of the apex of the mesopterygoid fossa with molar series, when the M3 has one or two lobes: level with the M2 (0); between M2 and M3 (1); level with the M3 (2).

57. *Location of the apex of the mesopterygoid fossa with molar series, when the M3 has three or more lobes: level with the anterior portion of the M3 (0); level at the middle point of the M3 (1); level with the posterior portion of the M3 (2).

58. Shape of the apex of mesopterygoid fossa: acuminate (0); curved (1); blunt (2).

59. Margins of the mesopterygoid fossa: convergent (0); subparallel (1).

60. *Maximum length of bullae (antero-medial/postero-lateral) respect to antero-posterior length from the premaxillary-maxillary suture up to anterior border of magnum foramen: up to 20% (0); between 20.1%-25 % (1); between 25.1%- 34% (2); more than 34% (3).

61. *Maximum width of the anterior half of the basioccipital respect to width of the basicranium at the same level: up to 20% (0); between 20.1% and 30% (1); between 30.1% and 40% (2); more than 40% (3).

Postcranial characters

62. Length of ulna bone with respect to length of skull: ulna less or same than skull (0); ulna greater than skull (1).

63. Length of shin bone with respect to length of skull: shin bone less than skull (0); shinbone greater than skull (1).

64. Length of radius with respect to length of humerus: radius less than humerus (0); radius greater than humerus (1).

Dental characters

65. *Degree of hypsodonty: slightly hypsodont, having the root and the anteroposterior length of the occlusal surface longer than the height of the crown (0); mesodont, having the root and the anteroposterior length of the occlusal surface approximately equal to the height of the crown (1); protohypsodont, having the root and the anteroposterior length of the occlusal surface less than half the height of the crown (2); euhypsodont, lacking roots (3).

66. Cement in late ontogenetic stages: absent (0); present (1).

67. Cement in young-adult ontogenetic stages: absent (0); present (1).

68. Cement in juvenile ontogenetic stages: absent (0); present (1).

69. Fossettes/ids in late ontogenetic stages: present (0); absent (1).

70. Fossettes/ids in young-adult ontogenetic stages: present (0); absent (1).

71. Fossettes/ids in juvenile ontogenetic stages: present (0); absent (1).

72. Mesofossettid in young-adult stages: present (0); absent (1).

73. Distribution of enamel in molars: covering the entire crown (0); interrupted at the base of the lingual wall (1); interrupted at the base and the corner of the lingual wall (2); interrupted at the base and in two strips (3); interrupted along the entire labial wall of the upper molars (lingual of the lower molars) except for the flexus/ids opposite to the hyopflexus/id (4); interrupted along the entire lingual wall and anterolingual and posterolingual walls (5).

74. Position of upper incisors: orthodont (0); inclined (1).

75. Enamel of upper and lower incisors: uncolored (0); with color (1).

76. Constriction of the apex in each lobe of the m1-m2: absent (0); present (1).

77. Longitudinal furrow opposite to hypoflexus/id: absent (0); present (1).

78. Transverse dentine crest on the occlusal surface, located at the middle of each molar lobe: absent (0); present (1).

79. Replacement of deciduous premolar: unreplaced (0); with replacement (1).

80. Type of replacement: postnatal replacement (0); prenatal replacement (1).

81. Lobes in p4: incipient (0); well-developed (1).

82. *Anterior projection on the pr.I. of p4: absent (0); incipient (1); developed (2); like an incipient lobe (3); pr.s.a. (4).

83. Orientation of the pr.I. of p4 when it has two well-developed lobes but without anterior projection: transverse (0); oblique (1).

84. h.p.i. (h.1i.) on p4: absent (0); present (1).

85. *Depth of h.p.i on the occlusal surface of p4: shallow (0); up to 25% (1); up to 50% (2); up to 75% (3); more than 75% (3).

86. h.2i. (h.s.i.p.) on p4: absent (0); present (1).

87. Location of h.2i. on p4: pr.I. (0); pr.II. (1).

88. Depth of h.2i on the occlusal surface of p4: shallow (0); deep (1).

89. h.3i. (h.s.i.a.) or h.s.i. on p4: absent (0); present (1).

90. Location of h.3i. on p4: central (0); anterior (1).

91. Depth of h.3i on the occlusal surface of p4: shallow (0); deep (1).

92. Depth of h.2i. respect to h.3i. on p4: h2.i deeper h.3i (0); equally deep (1); h2.i shallower h.3i (2).

93. Orientation of h.2i. and h.3i. in pr.I. of p4: parallel (0); convergent (1).

94. h.5i. in pr.s.a. of p4: absent (0); present (1).

95. *Depth of h.5i. in pr.s.a. of p4: shallow, up to 25% (0); deep, up to 50% (1); very deep, more than 50% (2).

96. Depth of h.p.i. with respect to h.5i. of p4: h.p.i. deeper h.5i. (0); h.p.i. equally deep h.5i. (1).

97. c3 in pr.I. of p4: absent (0); present (1).

98. *Development of c.3 in pr.I of p4 when the h.2.i. is located in pr.I: short (0); normal (1); long (2).

99. h.s.e. on p4: absent (0); present (1).

100. Orientation of h.s.e. in p4: transverse (0); oblique (1).

101. Depth of h.s.e. with respect to h.f.e. on p4: h.s.e. equally deep h.f.e. (0); h.s.e. deeper h.f.e. (1); h.f.e. deeper h.s.e. (2).

102. Developments of lobes in M1/m1-M2/m2: incipient lobes (0); developed lobes (1).

103. Shape of the anterior lobe of m1-m2: triangular (0); heart-shaped (1); lanceolate (leaf-shaped) (2); laminar (3).

104. Shape of the posterior lobe of m1-m2: triangular (0); heart-shaped (1); complex heart-shaped (2).

105. h.s.i. in m1-m2: absent (0); present (1).

106. *Depth of h.s.i. in m1-m2: shallow (0); less than 50% (1); approximately half of the prisms (50%) (2); more than 50% of the prism but not splitting (3).

107. h.t.i. in m1-m2: absent (0); present (1).

108. *Depth of h.t.i. in m1: up to 50% of the prism (0); crossing the prism but not splitting (1); crossing and dividing the prism (2).

109. *Depth of h.t.i. in m2: up to 50% of the prism (0); crossing the prism but not splitting (1); crossing and dividing the prism (2).

110. Depth of h.s.i. respect to h.t.i. in m1: equally deep (0); h.s.i. shallower than h.t.i. (1).

111. h.p.i. in m1-m2: absent (0); present (1).

112. Depth of h.s.i. respect to h.p.i. m1: equally deep (0); h.s.i. shallower than h.p.i. (1).

113. *Depth of h.p.i. in m1-m2: shallow (0); up to 25% (1); up to 50% (2); reaching the labial end (3); dividing the prism (4).

114. h.s.e. in m1-m2: absent (0); present (0).

115. Depth of h.s.e. in m1-m2: shallow, not surpassing the labial end of the h.p.i. (0); up to 50% of the width of the tooth (1).

116. *Transverse extension of the hypoflexus/id: transversely shorter than half of the width of the crown (0); extending from the margin up to the transverse midpoint of the crown (1); extending beyond the transverse midpoint of the crown (2); crossing completely the tooth (3).

117. Hypoflexus/id (HFI, and hfe) forms a fossete/id with the ontogeny: yes (0); no (1).

118. Shape of the hypoflexus/id in occlusal view: very narrow and short (0); V-shaped (1); narrow and very long (2); funnel shaped (3); canal shaped (4); V-shaped with blunt end (5).

119. *Length of p4-m1 with respect to the length of the m2-m3 (Wood and Patterson, 1959): p4-m1 shorter than m2-m3 (0); p4-m1 approximately equal to m2-m3 (1); p4-m1 longer than m2-m3 (2).

120. Relative size of lower molars: m1<m2>m3 (0); m1<m2<m3 (1); m1=m2<m3 (2); m1=m2=m3 (3).

121. m3, when p4 has three lobes: simple (only h.p.i and h.s.i) (0); complex (h.p.i, h.s.i., and accessory flexids) (1).

122. Transversal extension of the external fissure in complex m3: up to 75% (0); more than 75% (1).

123. Orientation of left and right molar series: parallel to each other (0); anteriorly convergent (1).

124. Number of lobes in P4: one (0); two (1).

125. Shape of the anterior lobe of M1-M2: heart-shaped (0); laminar (1); lanceolate (leaf-shaped) (2).

126. Shape of the posterior lobe of M1-M2: triangular (0); heart-shaped (1).

127. Labial projection of the anterior lobe of M1-M2: absent (0); present (1).

128. Shape of the labial projection of the anterior lobe of M1-M2: tip shaped (0); rounded shaped (1).

129. H.P.E. in M1-M2: absent (0); present (1).

130. H.S.E. in M1-M2: absent (0); present (0).

131. Depth of the H.P.E. respect to H.S.E.: equally deep (0); H.P.E. deeper than H.S.E. (1); H.S.E. deeper than H.P.E. (2).

132. Relative size of the upper molars: P4<M1<M2 (0); P4>M1<M2 (1); P4>M1=M2 (2); P4>M1>M2 (3).

133. *Number of lobes in M3: one (0); two (1); three (2); four (3); five - six (4); seven - ten (5); more than 10 (6).

134. Shape of lobes in M3 when it has three or more lobes, in which the first lobes is/are heart-shaped: heart shaped (0); lanceolate shape (1); laminar (2).

135. Pattern of the shape of lobes in M3 when it has three or more lobes: more than the first lobe are heart-shaped or lanceolate-shape (0); only the first lobe is heart-shaped or lanceolate-shape and the others are laminar (1).

136. Posterior projection of the posterior lobe in M3, when the pattern is not laminar: absent (0); present (1).

137. *Development of the posterior projection of the posterior lobe in M3 with two lobes: incipient (0); antero-posteriorly short (1); antero-posteriorly long (2); incipient lobe shaped (3).

138. *Development of the posterior projection of the posterior lobe in M3 with three or more lobes, when the pattern is not laminar: incipient (0); like a small lobe (1); like a rounded lobe (2).

139. External fissures in laminar prisms of M3: ephemeral or absent (0); present (1).

140. *First five laminar prisms in M3 when have more than 10 laminar prisms: ephemeral or absent (0); shallow (1); deep (2).

GenBank accesion numbers.

Family	Species	TTH	GHR	Cytochrome b	12S
Caviidae	*Cavia aperea*	AF433883.1	AF433930.1	GU136759.1	AF433908.1
	Dolichotis patagonum	AF433893.1	AF433939.1	AY382787.1	AF433917.1
	Dolichotis salinicola	AF433895.1	AF433941.1	GU136723.1	AF433919.1
	Galea musteloides	AF433885.1	AF433932.1	GU067527.1	AF433910.1
	Galea spixii	AF433888.1	AF433935.1	GU067492.1	AF433913.1
	Hydrochoerus hydrochaeris	AF433902.1	AF433948.1	GU136721.	U12454.1
	Kerodon rupestris	AF433891.1	AF433938.1	GU136722.1	AF433916.1
	Microcavia australis	AF433889.1	AF433937.1	AF491750.1	AF433915.1
Cuniculidae	*Cuniculus paca*	AF433880.1	AF433928.1	AY206570.1	AF520693.1
Dasyproctidae	*Dasyprocta*	AF433897.1	AF433942.1	AF437783.1	AF433921.1
Echimyidae	*Proechimys*	FJ865463.1	AF332039.1	U35414.1	U12447.1

SOM 2. Combined matrix.

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D.patagonum 12120-101102000220221223-40121111101001111100-
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D.salinicola   12120-101102000222022122 3-401201110010011111 00-
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Microcavia_chapalmalensis
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C.aperea 11121000011102022012012231411200110001121010012110031021-
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G.spixii 111211001101111220111122314012201000011 20?1000?0100200?2-1130???31111111401101111 2-110--0-?-----0-0--1110-0???1-10-2-311??11010-01?21--11-??
K.rupestris 12120-010011210120141122314012010-000000110000?0000?1020-00210003111111150110011 14-100--0-?--0--0-100111[0 1]00---1100-2-3100-11010-11011--11-?-
Procardiomys_martinoi 12120-
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Hydrochoeropsis_dasseni
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Hydrochoeropsis?_wayuu
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Phugatherium_cataclisticum   12120-1????????22??311223?4?12110-
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H.hydrochaeris 121210111011210222040122304012[0 1]10-
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C.aperea
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M.australis
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G.musteloides
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G.spixii
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D.patagonum
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D.salinicola
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H.hydrochaeris
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K.rupestris
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Dasyprocta
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Cuniculus
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K.rupestris
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H.hydrochaeris
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C.aperea
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D.patagonum
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D.salinicola
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G.musteloides
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G.spixii
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M.australis
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Proechimys
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K.rupestris
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G.musteloides
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ccode      +  1 3 11 13 15 17 19 20 22.24 26 29 30 39 41 51 55 56
59 60 64 81 84 94 97 105 107 108 112 115 118 132 136 137 139 *;

ho 150000;
proc /;
comments 0
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SOM 3. The list of synapomorphies of the phylogenetic analysis.

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 Dolicavia_minuscula :
    All trees:
      Char. 6: 0 --> 1
      Char. 7: 0 --> 1
      Char. 12: 0 --> 1
      Char. 14: 0 --> 1
      Char. 16: 2 --> 0
      Char. 30: 0 --> 2
      Char. 40: 1 --> 0
      Char. 41: 0 --> 1
      Char. 73: 0 --> 1
      Char. 81: 2 --> 3
      Char. 112: 1 --> 0

  Microcavia_chapalmalensis :
    All trees:
      Char. 1: 2 --> 3
      Char. 10: 1 --> 0

  M.australis :
    All trees:
      No autapomorphies:

  Neocavia_lozanoi :
    All trees:
      No autapomorphies:

  Neocavia_depressidens :
    Some trees:
      Char. 19: 3 --> 4
      Char. 81: 1 --> 0

  Neocavia_sp_nov :
    All trees:
      No autapomorphies:

  Neocavia_sp :
    All trees:
      No autapomorphies:

  C._porcellus :
    All trees:
      Char. 30: 0 --> 1

  Cavia_tschudii :
    All trees:
      No autapomorphies:

  C.aperea :
```

```
  All trees:
    No autapomorphies:

Cavia_cabrerai :
  All trees:
    Char. 81: 0 --> 2

Paleocavia_impar :
  All trees:
    No autapomorphies:

Paleocavia?_mawka :
  All trees:
    Char. 18: 1 --> 0
    Char. 112: 1 --> 0

G.musteloides :
  All trees:
    Char. 20: 1 --> 0
    Char. 51: 2 --> 3
    Char. 52: 0 --> 1
    Char. 128: 0 --> 1
    Char. 242: C --> T
    Char. 251: A --> G
    Char. 261: T --> C
    Char. 373: A --> T
    Char. 449: A --> T
    Char. 475: A --> G
    Char. 500: A --> G
    Char. 505: T --> C
    Char. 537: T --> G
    Char. 543: C --> T
    Char. 610: T --> C
    Char. 626: T --> C
    Char. 647: C --> T
    Char. 736: C --> T
    Char. 801: A --> T
    Char. 812: A --> G
    Char. 840: C --> T
    Char. 847: G --> A
    Char. 909: C --> T
    Char. 919: C --> T
    Char. 920: C --> A
    Char. 1016: A --> T
    Char. 1019: T --> C
    Char. 1031: A --> C
    Char. 1039: C --> A
    Char. 1040: A --> T
    Char. 1121: A --> T
    Char. 1133: C --> T
    Char. 1145: C --> T
```

Char. 1178: C --> T
Char. 1206: C --> T
Char. 1214: A --> T
Char. 1217: C --> A
Char. 1220: C --> T
Char. 1235: C --> T
Char. 1265: C --> T
Char. 1268: C --> A
Char. 1289: C --> T
Char. 1307: T --> C
Char. 1322: C --> T
Char. 1332: C --> T
Char. 1343: T --> C
Char. 1346: A --> C
Char. 1355: C --> T
Char. 1358: A --> C
Char. 1412: T --> C
Char. 1445: T --> C
Char. 1454: A --> T
Char. 1464: G --> A
Char. 1529: T --> C
Char. 1547: C --> G
Char. 1562: T --> A
Char. 1568: T --> C
Char. 1612: A --> G
Char. 1634: C --> T
Char. 1674: C --> T
Char. 1685: C --> A
Char. 1688: C --> T
Char. 1773: A --> T
Char. 1777: T --> C
Char. 1787: C --> T
Char. 1788: A --> C
Char. 1793: G --> C
Char. 1809: C --> T
Char. 1813: C --> T
Char. 1830: C --> T
Char. 1848: T --> C
Char. 1862: T --> C
Char. 1895: A --> G
Char. 1934: C --> T
Char. 1940: C --> T
Char. 1962: C --> T
Char. 1979: T --> C
Char. 1994: C --> T
Char. 2028: T --> G
Char. 2042: C --> T
Char. 2047: C --> T
Char. 2079: T --> C
Char. 2120: A --> C
Char. 2144: C --> T

```
    Char. 2153: C --> A
    Char. 2165: C --> A
    Char. 2171: C --> T
    Char. 2179: T --> C
    Char. 2183: C --> T
    Char. 2219: A --> G
    Char. 2283: G --> A
    Char. 2290: T --> A
    Char. 2291: G --> T
    Char. 2448: A --> C
    Char. 2457: A --> G
    Char. 2639: T --> C
    Char. 2640: G --> A
    Char. 2682: T --> A
    Char. 2717: C --> T
    Char. 2952: T --> C
    Char. 3009: A --> T
    Char. 3104: A --> G
    Char. 3243: T --> G
    Char. 3290: A --> G
    Char. 3559: G --> A
    Char. 3700: T --> C

G.spixii :
  All trees:
    Char. 1: 2 --> 1
    Char. 12: 0 --> 1
    Char. 155: T --> C
    Char. 192: G --> A
    Char. 200: A --> T
    Char. 210: A --> G
    Char. 212: C --> T
    Char. 226: T --> C
    Char. 354: C --> T
    Char. 361: A --> T
    Char. 362: T --> A
    Char. 403: A --> G
    Char. 406: A --> G
    Char. 411: A --> G
    Char. 413: A --> G
    Char. 451: A --> G
    Char. 453: A --> T
    Char. 476: T --> C
    Char. 502: A --> T
    Char. 593: C --> T
    Char. 635: A --> G
    Char. 641: T --> C
    Char. 806: T --> C
    Char. 846: A --> G
    Char. 897: A --> G
    Char. 898: T --> C
```

Char. 912: T --> G
Char. 917: A --> G
Char. 918: T --> C
Char. 944: A --> G
Char. 945: G --> A
Char. 1004: T --> C
Char. 1042: C --> A
Char. 1048: T --> C
Char. 1112: A --> T
Char. 1119: T --> A
Char. 1127: A --> C
Char. 1130: C --> T
Char. 1139: T --> C
Char. 1154: C --> T
Char. 1161: C --> T
Char. 1169: C --> T
Char. 1185: G --> T
Char. 1205: T --> A
Char. 1226: C --> G
Char. 1236: A --> C
Char. 1238: C --> T
Char. 1245: T --> C
Char. 1250: C --> T
Char. 1269: G --> T
Char. 1271: A --> C
Char. 1328: C --> A
Char. 1421: C --> T
Char. 1475: T --> C
Char. 1499: A --> G
Char. 1526: T --> C
Char. 1532: C --> A
Char. 1550: A --> C
Char. 1571: A --> C
Char. 1592: C --> T
Char. 1601: C --> A
Char. 1604: C --> T
Char. 1625: A --> G
Char. 1643: C --> T
Char. 1652: T --> C
Char. 1658: C --> G
Char. 1660: T --> A
Char. 1667: T --> C
Char. 1703: C --> T
Char. 1709: A --> G
Char. 1725: T --> A
Char. 1726: C --> T
Char. 1733: A --> C
Char. 1760: C --> T
Char. 1763: C --> T
Char. 1772: C --> T
Char. 1801: T --> A

Char. 1808: A --> C
Char. 1814: A --> T
Char. 1815: C --> T
Char. 1817: C --> A
Char. 1841: C --> T
Char. 1844: C --> T
Char. 1847: C --> T
Char. 1853: A --> G
Char. 1856: C --> T
Char. 1880: C --> T
Char. 1898: A --> C
Char. 1901: C --> T
Char. 1922: C --> T
Char. 1928: T --> C
Char. 1955: T --> C
Char. 1974: C --> T
Char. 1976: A --> G
Char. 2006: C --> T
Char. 2009: A --> T
Char. 2019: C --> T
Char. 2024: C --> T
Char. 2057: C --> A
Char. 2066: A --> G
Char. 2070: C --> T
Char. 2072: T --> A
Char. 2086: T --> G
Char. 2087: A --> G
Char. 2093: C --> T
Char. 2094: C --> T
Char. 2099: T --> A
Char. 2114: T --> C
Char. 2135: C --> T
Char. 2138: C --> A
Char. 2141: C --> T
Char. 2178: T --> C
Char. 2182: T --> C
Char. 2186: C --> T
Char. 2187: C --> T
Char. 2193: C --> T
Char. 2198: C --> T
Char. 2207: A --> T
Char. 2223: A --> G
Char. 2225: A --> T
Char. 2353: G --> A
Char. 2430: C --> T
Char. 2449: A --> C
Char. 2627: T --> C
Char. 2665: T --> C
Char. 2692: A --> G
Char. 2740: G --> A
Char. 2798: T --> C

Char. 2875: G --> A
Char. 3061: T --> G
Char. 3066: T --> C
Char. 3067: G --> A
Char. 3280: A --> C
Char. 3325: T --> G
Char. 3376: C --> A
Char. 3845: G --> A
Char. 3885: T --> C
Char. 3928: C --> T
Char. 4090: C --> T

Node A (Fig 9): Subfamilia Caviiane

All trees:

Char. 6: 1 --> 0
Char. 12: 2 --> 0
Char. 17: 1 --> 0
Char. 37: 0 --> 1
Char. 39: 1 --> 2
Char. 41: 1 --> 0
Char. 43: 1 --> 0
Char. 46: 0 --> 2
Char. 55: 1 --> 2
Char. 119: 2 --> 1
Char. 377: T --> C
Char. 495: C --> T
Char. 608: T --> C
Char. 1025: A --> T
Char. 1130: A --> C
Char. 1520: C --> T
Char. 1754: C --> T
Char. 2229: C --> T
Char. 2339: T --> C
Char. 2373: T --> C
Char. 2397: A --> G
Char. 2780: C --> T
Char. 3635: T --> C
Char. 3799: G --> A
Char. 3832: A --> G
Char. 4132: G --> A

Node C (Fig 9B): Dolicavia, Neocavia, Microcavia, Palaeocavia, Cavia

All trees:

Char. 13: 1 --> 2
Char. 19: 2 --> 3
Char. 157: A --> G
Char. 159: T --> C
Char. 179: G --> A

```
          Char. 186: C --> T
          Char. 210: A --> T
          Char. 220: A --> T
          Char. 239: T --> C
          Char. 272: A --> G
          Char. 299: A --> G
          Char. 352: A --> G
          Char. 424: T --> C
          Char. 471: T --> C
          Char. 504: A --> G
          Char. 536: A --> G
          Char. 801: A --> G
          Char. 809: C --> A
          Char. 942: T --> C
          Char. 958: A --> G
          Char. 1016: A --> G
          Char. 1152: T --> C
          Char. 1205: T --> C
          Char. 1382: T --> A
          Char. 1397: A --> G
          Char. 1547: C --> T
          Char. 1613: C --> T
          Char. 1769: C --> T
          Char. 1788: A --> T
          Char. 2320: T --> C
          Char. 2396: C --> T
          Char. 2802: T --> C
          Char. 2928: G --> A
          Char. 3009: A --> C
          Char. 3656: A --> C
          Char. 3848: A --> C
          Char. 3864: T --> C
          Char. 3992: A --> C
          Char. 4054: T --> C

Node H (Fig 9B): Dolicavia, Microcavia, Neocavia
     All trees:
          Char. 42: 1 --> 0
          Char. 49: 0 --> 1
          Char. 50: 0 --> 1
          Char. 51: 12 --> 0
          Char. 53: 0 --> 1
          Char. 54: 2 --> 3
          Char. 126: 0 --> 1

Node E (Fig 9B): Neocavia depressidens, Palaeocavia, Cavia
     All trees:
          Char. 81: 2 --> 0

Node G (Fig 9B): Microcavia, Neocavia
     All trees:
```

```
        Char. 60: 1 --> 0
        Char. 118: 1 --> 0

Node I (Fig 9B): Neocavia
     All trees:
        Char. 19: 3 --> 4
     Some trees:
        Char. 46: 2 --> 1
        Char. 81: 2 --> 1
        Char. 127: 0 --> 1
        Char. 131: 2 --> 0

Node D (Fig 9B): Microcavia
     All trees:
        Char. 18: 1 --> 0
        Char. 33: 1 --> 0
        Char. 84: 01 --> 2

Node F (Fig 9B): Cavia
     All trees:
        Char. 1: 2 --> 1
        Char. 112: 1 --> 3
        Char. 117: 3 --> 2
        Char. 119: 1 --> 3

Node Cavia tschudii, Cavia aperea
     All trees:
        Char. 84: 2 --> 3

Node B (Fig 9B): Galea
     All trees:
        Char. 10: 1 --> 0
        Char. 14: 0 --> 1
        Char. 19: 2 --> 1
        Char. 30: 0 --> 2
        Char. 40: 1 --> 0
        Char. 60: 1 --> 0
        Char. 136: 2 --> 1
        Char. 162: C --> T
        Char. 166: A --> C
        Char. 202: G --> A
        Char. 281: CT --> A
        Char. 349: G --> A
        Char. 412: A --> T
        Char. 462: A --> T
        Char. 465: A --> G
        Char. 482: T --> C
        Char. 491: A --> G
        Char. 494: C --> T
        Char. 498: A --> G
        Char. 527: T --> C
```

Char. 595: A --> G
Char. 602: T --> A
Char. 731: C --> T
Char. 802: C --> T
Char. 851: G --> A
Char. 889: A --> T
Char. 941: T --> C
Char. 959: A --> G
Char. 1017: A --> T
Char. 1027: C --> A
Char. 1124: C --> T
Char. 1175: C --> A
Char. 1221: C --> T
Char. 1256: A --> T
Char. 1278: A --> C
Char. 1279: C --> T
Char. 1295: T --> A
Char. 1304: C --> T
Char. 1340: A --> C
Char. 1386: C --> A
Char. 1466: A --> C
Char. 1478: CT --> A
Char. 1577: C --> A
Char. 1578: C --> T
Char. 1619: C --> A
Char. 1668: G --> T
Char. 1778: C --> T
Char. 1797: C --> A
Char. 1838: A --> C
Char. 1868: C --> T
Char. 1883: A --> T
Char. 1910: A --> T
Char. 1919: C --> T
Char. 1946: C --> A
Char. 1952: C --> T
Char. 1958: C --> T
Char. 1988: C --> A
Char. 2000: C --> T
Char. 2030: A --> C
Char. 2146: C --> T
Char. 2150: C --> T
Char. 2192: C --> T
Char. 2212: T --> C
Char. 2216: A --> C
Char. 2265: A --> G
Char. 2280: T --> C
Char. 2284: G --> A
Char. 2328: T --> G
Char. 2385: A --> G
Char. 2391: A --> C
Char. 2392: T --> C

Char. 2446: C --> T
Char. 2447: A --> G
Char. 2619: G --> A
Char. 2636: C --> T
Char. 2637: C --> T
Char. 2673: T --> C
Char. 2694: T --> A
Char. 2737: T --> G
Char. 2766: T --> G
Char. 3031: C --> G
Char. 3037: A --> T
Char. 3055: T --> C
Char. 3086: A --> G
Char. 3148: G --> A
Char. 3178: T --> C
Char. 3180: T --> G
Char. 3206: T --> A
Char. 3274: T --> G
Char. 3314: T --> C
Char. 3393: A --> G
Char. 3521: G --> A
Char. 3638: C --> T
Char. 3682: A --> T
Char. 3695: C --> T
Char. 3699: T --> A
Char. 3750: C --> T
Char. 3869: C --> T
Char. 3932: G --> A
Char. 4055: C --> G
Char. 4096: T --> C
Char. 4115: G --> A
Char. 4129: C --> T