APPENDIX S1. List of characters used for the phylogenetic analysis and the coding for each taxon in a matrix.

1. Lingual contour at cervix of p4 in occlusal view (mod. from Orliac *et al.,* 2010, char. 52): (0) convex to straight, (1) concave.

2. Orientation of postprotocristid on p3 (Lihoreau *et al*., 2015, char. 23): (0) distal, (1) distolingual, (2) distolabial.

3. Preprotocristid mesiolingually curved on p3 (Lihoreau *et al*., 2015, char. 25): (0) no, (1) yes.

4. Mesial accessory cusp on p3 (Lihoreau *et al*., 2015, char. 26): (0) no, (1) shoulder-like structure on lateral view of preprotocristid of lower premolars, (2) complete accessory cusp.

5. Change in the orientation of the preprotocristid mesially to the junction of accessory mesiolingual crest on lower premolars (Lihoreau *et al*., 2015, char. 27): (0) no, (1) yes.

6. Entostylid on p3 (mod. from Boisserie *et al*., 2010, char. 54): (0) absent, (1) present.

7. Distolingual cingulid on p4 in lingual view (Lihoreau *et al*., 2015, char. 31): (0) forming a continuous wall lingually until the distostylid, (1) reaching the level of the distal basin and keeping being shallow until the distostylid, (2) reaching the level of distal basin and then being high when joining the distostylid (distolingual notch of cingulid).

8. Mesiolingual secondary cristid on p4 (cristid connecting lingual margin and preprotocristid) (Lihoreau *et al*., 2015, char. 33): (0) no, (1) yes.

9. Marked postprotofossid on p4 (Boisserie *et al*., 2010, char. 59): (0) absent, (1) present.

10. Hypoconid on p4 (Lihoreau *et al*., 2015, char. 37): (0) no, (1) yes (even incipient).

11. Entostylid on p4 (Boisserie *et al*., 2010, char. 60): (0) absent, (1) present.

12. Ectoprotofossid on p4 (Orliac *et al*., 2010, char. 54): (0) absent, (1) frequent.

13. Lingual cingulid on p4, eventually joining the mesiolingual cristid with the entostylid

(new char.): (0) absent, (1) present.

14. Labial cingulid on p4 (new char.): (0) present (at least on half of the tooth length), (1) absent (even if there is a slight distolingual cingulid).

15. Premetacristid on lower molars (Boisserie *et al*., 2010, char. 69): (0) strong, (1) reduced or missing.

16. Connection between premetacristid and preprotocristid on lower molars (Lihoreau *et al*., 2015, char. 42): (0) yes, (1) no.

17. Postectoprotocristid on lower molars (mod. from Boisserie *et al*., 2010, char. 67): (0) absent, (1) fully developed or reduced in the valley.

18. Postprotofossid on lower molars at least on m3 (Lihoreau *et al*., 2015, char. 44): (0) no, (1) yes.

19. Ectoprotofossid on lower molars (Boisserie *et al*., 2010, char. 66): (0) absent, (1) present.

20. Ectometafossid on lower molars (Lihoreau *et al*., 2015, char. 47): (0) yes, (1) no.

21. Endometacristid on lower molars (Lihoreau *et al*., 2015, char. 48): (0) not or slightly expressed much more like an enamel fold, (1) present.

22. Cristulids of the hypoconulid on m3 (new char.): (0) tend to join together, (1) are parallel.

23. Postectometacristid on lower molars (Boisserie *et al*., 2010, char. 71): (0) lightly marked to absent, (1) always present and well marked.

24. Premetafossid on lower molars (Orliac *et al*., 2010, char. 70): (0) present, (1) absent.

25. Preentocristid connects (mod. from Lihoreau *et al*., 2015, char. 52): (0) endohypocristid or sagittal valley, (1) prehypocristid.

26. Postectoentocristid on lower molars (mod. from Boisserie *et al*., 2010, char. 77): (0) absent, (1) present but more like a keel on the cuspid, (2) present and well individualized from the cuspid.

27. Ectoentocristid (Lihoreau *et al*., 2015, char. 54): (0) present, (1) absent.

28. Postentocristid on m1-m2 (mod. from Boisserie *et al*., 2010, char. 78): (0) absent, (1) present.

29. Prehypocristid dividing in two mesial arms on lower molars (Lihoreau *et al*., 2015, char. 56): (0) yes, (1) no.

30. Prehypocristid inflated (not salient when unworn) in transverse valley of lower molars (Lihoreau *et al*., 2015, char. 57): (0) no, (1) yes (even forming a conulid).

31. Prehypocristid invades (mod. from Lihoreau *et al*., 2015, char. 58): (0) the median part of the transverse valley (stops in the middle), (1) the lingual half of the transverse valley.

32. Main arm of prehypocristid connects (mod. from Lihoreau *et al*., 2015, char. 59): (0) trigonid distal wall (junction between cristids from metaconid and protoconid), (1) postmetafossid.

33. Posthypocristid on m1-m2 joins (Lihoreau *et al*., 2015, char. 60): (0) nothing or distostyle, (1) postentocristid, (2) postectoentocristid.

34. Endohypocristid on lower molars (Orliac *et al.*, 2010, char. 75): (0) absent, (1) present.

35. Posthypofossid on lower molars (Orliac *et al.*, 2010, char. 77): (0) absent, (1) present.

36. Entostylid on lower molars (mod. from Lihoreau *et al*., 2015, char. 63): (0) never, (1) frequently present.

37. Ectostylid on lower molars (Lihoreau *et al*., 2015, char. 64): (0) no cingulid, (1) a shallow and constant cingulid in front of the transverse valley, (2) frequently developed cingulid in a / some stylid(s) at least on m1.

38. Ectocrystilid on lower molars (Lihoreau *et al*., 2015, char. 65): (0) no, (1) yes, even if variable.

39. Ectohypocristulid on m3 (Boisserie *et al*., 2010, char. 80): (0) absent, (1) not complete, (2) present joining the summit of hypoconulid.

40. Distostylid on m1-m2 (Lihoreau *et al*., 2015, char. 68): (0) median, (1) lingual.

41. Mesial part of loop-like hypoconulid (Lihoreau & Ducrocq, 2007, char. 29): (0) open, (1) pinched.

42. Entoconulid (Gentry & Hooker, 1988, char.33): (0) no, (1) yes.

43. Centroconulid on m3 (new char.): (0) present, (1) absent.

44. Postentocristid on m3 (new char.): (0) present, (1) absent.

45. Cingulid distal to the hypoconulid on m3 (new char.): (0) absent, (1) present.

46. Unique accessory cristulid mesially directed in front of the hypoconulid (endohypocristulid) on m3 (new char.): (0) yes, (1) no.

47. Height of lingual cingulum compared to unworn protocone height on upper molars (Lihoreau *et al*., 2015, char. 101): (0) one third, (1) half, (2) no cingulum.

48. Mesiodistal development of ribs of labial cusps of upper molars (Lihoreau *et al*., 2015, char. 102): (0) almost half the molar length, (1) pinched (inferior to one third of molar length), (2) enlarged (superior to half the molar length.

49. Postectoprotocrista on upper molars (Lihoreau *et al*., 2015, char. 103): (0) absent, (1) present.

50. Postectoprotocrista on upper molars (new char.): (0) longer than postprotocrista, (1) shorter than postprotocrista.

51. Orientation of the postectoprotocrista on upper molars (new char.): (0) lingual, (1) median.

52. Protocone and metaconule junction on M1-M2 (mod. from Lihoreau *et al*., 2015, char. 105): (0) none, (1) premetacristule-postectoprotocrista, (2) premetacristule-postprotocrista.

53. Premetacristule divided in two mesial arms (Lihoreau *et al*., 2015, char. 106): (0) no, (1) yes.

54. Ectometacristule on upper molars (mod. from Boisserie *et al*., 2010, char. 48): (0) absent, (1) present at least on M1.

55. Postmetafossule (Lihoreau *et al*., 2015, char. 108): (0) absent, (1) present.

56. Secondary cristule(s) labial to metaconule, eventually an endometacristule or enamel knob(s) (Lihoreau *et al*., 2015, char. 109): (0) no, (1) yes.

57. Distostyle position on upper molars levels (Lihoreau *et al*., 2015, char. 111): (0) metaconule, (1) metacone.

58. Secondary ectometafossule lingual to ectometacristule (mod. from Boisserie *et al.,* 2010, char. 47): (0) absent or very light, (1) present mesially at least on M1 linked to ectometacristule.

59. Postparacristule extension (mod. from Gentry & Hooker, 1988, char. 17): (0) postprotocrista (the road to transverse valley is cut by the postprotocrista), (1) transverse valley.

60. Endometacrista (new char.): (0) no, (1) yes.

61. Preparacrista connects the parastyle (Lihoreau *et al*., 2015, char. 116): (0) no, separated by a groove, (1) yes, lingually, (2) yes, labially.

62. Ectocristyle (mod. from Lihoreau *et al*., 2015, char. 119): (0) present, (1) absent.

63. Premetacrista and postparacrista connection (mod. from Lihoreau *et al*., 2015, char. 120): (0) no connection or via an intercaled ectocristyle, (1) yes.

64. Form of the connection between premetacrista and postparacrista (new char.): (0) centrocrista, (1) V-shaped mesostyle, (2) loop-like mesostyle.

65. Postmetacrista connects the metastyle (new char.): (0) yes, lingually, (1) yes, labially (2) no.

66. Mesiolingual style (=protostyle) on upper molars mesial cingulum (Lihoreau & Ducrocq, 2007, char. 19): (0) no, (1) yes.

67. Entostyle on upper molars (new char.): (0) fully developed style, (1) cingulum (even slight).

68. Parastyle development (mod. from Gentry & Hooker, 1988, char. 11): (0) enamel knob or absent, (1) smaller or equal to mesostyle, (2) larger than mesostyle.

69. Mesostyle development (Lihoreau *et al*., 2015, char. 127): (0) enamel knob or absent, (1) half the size or equal to labial cusps, (2) larger than labial cusps.

70. Metastyle development (Lihoreau *et al*., 2015, char. 128): (0) enamel knob or absent, (1) fully developed (from half the size to equal to mesostyle).

71. Root fusion on upper molars (Lihoreau *et al*., 2015, char. 129): (0) four roots with occasional fusion close to cervix, the apices always remaining free, (1) fully fused lingual roots.

72. Opening of internal choanes (Lihoreau & Ducrocq, 2007, char. 51): (0) at M3, (1) nuchal to M3.

73. Symphysis morphology in sagittal section (Lihoreau & Ducrocq, 2007, char. 38): (0) elliptic, (1) dorsally concave, (2) ventrally concave.

74. Bone fusion at symphysis in adult specimens (Lihoreau & Ducrocq, 2007, char. 37): (0) no, (1) yes.

75. Transverse constriction of mandible at c-p1 diastema (Lihoreau & Ducrocq, 2007, char. 33): (0) no, (1) yes.

76. Proclination of the lower incisors (new char.): (0) yes, (1) no.

77. Crown height of lower canine in male (mod. from Lihoreau & Ducrocq, 2007, char. 7): (0) short near premolar height, (1) at least twice of premolar height, (2) prolonged growth to ever-growing.

78. Section of lower canine in male (new char.): (0) rounded to slightly elliptic, (1) laterally compressed.

79. Wear on lower canine (Lihoreau & Ducrocq, 2007, char. 5): (0) distal wear facet contact with C, (1) mesial wear facet contact with I3.

80. Cristids on lower canine (mod. from Lihoreau *et al*., 2015, char. 10): (0) none, (1) one distal, (2) two, mesial and distal.

81. Section of upper canine in male (new char.): (0) rounded to slightly elliptic, (1) laterally compressed.

82. Groove on labial side of upper canine (new char.): (0) no, (1) yes.

83. Groove on lingual side of upper canine (new char.): (0) no, (1) yes.

84. Diastema i3-c (new char.): (0) absent, (1) present.

85. Diastema c-p1 (Lihoreau & Ducrocq, 2007, char. 34): (0) absent, (1) present.

86. Diastema p1-p2 (Lihoreau & Ducrocq, 2007, char. 35): (0) absent, (1) present.

87. Diastema p2-p3 (Boisserie *et al*., 2010, char. 6): (0) present, (1) absent.

88. Diastema C-P1 (new char.): (0) absent, (1) present.

89. Diastema P1-P2 (new char.): (0) absent, (1) present.

90. Diastema P2-P3 (new char.): (0) absent, (1) present.

91. Accessory cusp on disto-lingual cingulum of P3 (mod. from Lihoreau & Ducrocq, 2007, char. 16): (0) none, (1) one cingular style.

92. Labial cingulum on P3 (new char.): (0) absent, (1) present.

93. Ectoparacrista on P3 (new char.): (0) absent, (1) present.

94. Ectoparafossa on P2 and/or P3 (new char.): (0) absent, (1) present.

95. Postparafossa on P3 (new char.): (0) present, (1) absent.

96. Orientation of the postparacrista on P3 (new char.): (0) completely labial, (1) slightly shifted medially.

97. Orientation of preparacrista on P4 (Orliac *et al*., 2010, char. 20): (0) mesial, (1) labial.

98. Postprotocrista on P4 (Lihoreau *et al*., 2015, char. 88): (0) absent, (1) present.

99. Postprotocrista on P4 joins (mod. from Lihoreau *et al*., 2015, char. 89): (0) base of paracone, (1) distostyle.

100. Preprotocrista on P4 joins (mod. from Lihoreau *et al*., 2015, char. 90): (0) mesiostyle, (1) base of the paracone then mesiostyle.

101. Postectoprotocrista on P4 (Lihoreau *et al*., 2015, char. 91): (0) absent, (1) present.

102. P4 mesial margin (Lihoreau *et al*., 2015, char. 94): (0) concave to straight, (1) convexe.

103. Strong development of distostyle on P4 (Lihoreau *et al*., 2015, char. 95): (0) no, (1) yes.

104. Lingual cingulum on P4 (new char.): (0) strong and continuous, (1) absent or weak and discontinuous.

105. Division in two of the postprotocrista on P4 (new char.): (0) no, (1) yes.

106. Postprotofossa on P4 (new char.): (0) absent, (1) present.

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APPENDIX S2. List of taxa used for the phylogenetic analysis and the coding for each taxon in a matrix.

Siamotherium krabiense from Wai Lek, Thailand, direct observations on a fragmentary skull with left I2-I3, P2-M3 and right P2-M3 (holotype, cast, UM-TF2333.1), a fragmentary juvenile skull with left DP1-M2 and right DP4-M2 (cast, UM-TF2334), two fragmentary mandibles, a right semi-mandible with c alveoli, p1 alveoli, p2-m3 and a left semi-mandible with p2, m1-m3 (casts, UM-TF2333.2), three isolated c and one isolated i (casts, UM-TF2333.2); plus, observations from the literature (Ducrocq, 1999).

Myaingtherium kenyapotamoides from Pondaung, Myanmar, observations from the literature (Tsubamoto *et al.*, 2011).

Anthracokeryx thailandicus from Wai Lek, Thailand, direct observations on a sub-complete skull with left and right P3-M3 (holotype, cast, UM-TF2638), a fragmentary left mandible with p1-m2 (UM-TF2639, cast), a right m3 (UM-TF2656); plus, observations from the literature (Ducrocq, 1999).

Microbunodon silistrensis, direct observations, from Garo Hills, India, a right M3 (NHM19041); from Potwar Plateau, Pakistan, a right p2 (Y7421), a right m3 (Y13294), a fragmentary right m2 (Y18928), right P3-4 (Y19831), a symphysis (Y20446), a left p4 (Y20500), left m2-3 (Y21063), left m1-3 (Y21078), left M2-3 (Y24297), left m3 (Y26382), left p1(Y27697), a right P4 (Y27895), a subcomplete mandible with left i1-2, c–m3 and right i2, c, p2, p4, m2-3 (Y28194), a fragmentary left m2 (Y30507), right P3–M1 (Y30698), a right mandible with m3 (Y31564m), a right p1 (Y31838), a fragmentary left m1 (Y31990), a left m3 (Y41301), a right c (Y41524), right m2-3 (Y42274), left p4-m1 (Y45725), a symphysis (Y45833), a right p4 (Y47161), all part of the GSP collections left M3 (M12709, Chinji) at NHM; right m2-3 (B104, Hasnot) at the Geological Survey of India; mandible with right p1, p3-m3 and left p1 (AM19444, near Chinji Bungalow), a right M3 (AM94620, Kanatti), right m1-2 (AM94621, Kanatti), a right M3 (AM94625, Ramnagar) at AMNH; a right M3 (YPM20098) from the Yale Peabody Museum collection; from Sind, a fragmentary M (S-3), a left m3 (S-15), a fragmentary right M2 (S-17), a fragmentary right m3 (S-80), a right m2 (S-84), a left dP4 (S-99), a fragmentary left m3 (S-329), a fragmentary right m1 (S-355), a right M3 (S-375), a right m1 (S-377), a right p3 (S-378), a right M1 (S-379), all part of the GSP

collections (see Raza *et al.*, 1984); from Baluchistan, right m1-3 (M11059, Khumbi), left m2-3 (M12704, Chur Lundo), right m2-3 (M12705, Chur Lundo), right m2-3 (M12706, Chur Lundo), left m2-3 (M12708, Chur Lundo), right M1-3 (M12710, Chur Lundo) at NHM); plus, observations from the literature (Lihoreau *et al*., 2004).

Anthracokeryx tenuis from Pangan Formation, Myanmar, direct observations on a cranium with right I3-M3 and left P3-M3, and right i1-c, p2-m3 and left i1-2, p2-m3 (AMNH-AM20017), casts in UM of material from Pangan Formation, Myanmar, figured in Soe (2008).

Heptacodon occidentalis from South Dakota, USA, direct observations on a fragmentary maxillary with left C, P2-M3 and right P4-M3 (AMNH-AM1039), a mandible with right c, p2-m3 and left p2-3 (AMNH-AM105170), a mandible with right p2-m3 and left p3-m3 (AMNH-AM1360); plus, observations from the literature (Scott, 1940; McDonald, 1956).

Prominatherium dalmatinum from Sacel, Romania, direct observations on left P4-M3 and right M2-3 (IGG2098/UM Mo 111); plus, observations from the literature (Grandi & Bona, 2017).

Microbunodon minimum from La Milloque, France, direct observations on a subcomplete skull with left I1-M3 and right I1-I3, P2-M3 (cast; Brunet, 1968), a fragmentary mandible with left c-p1 and right i1, c-m3 (cast, UM-LM1370/MA57), plus, material from La Milloque (see Lihoreau *et al.*, 2004).

Bothriogenys orientalis from Ban Pu Dam, Thailand, direct observations on a fragmentary skull with left P1-M3 and right P2-M3 (cast, UM-TF2633), a fragmentary right mandible with p1-m3 (cast, UM-TF2634), a fragmentary left mandible with p1-m3 with broken hypoconulid (cast, UM-TF2635; see Ducrocq, 1999).

Bothriodon velaunum from the Early Oligocene of Ronzon, France, direct observations on two semi-mandibles with left c, p3-m3 and right p3-m3 (NMB-RO49), a fragmentary maxilla with left M1-M3 and right P3-M3 (NMB-RO2), a fragmentary left maxilla with P3-M3 (NMB-RO74); plus, direct observations on 142 specimens from collection of the Musée

Crozatier from Puy-en-Velay, France, and 12 specimens from the collection of the Museum d'Histoire naturelle de Toulouse.

Elomeryx borbonicus from St-André/St Henri near Marseille, France, direct observations on a fragmentary left maxilla with P1-M3 (NMB-MAR2), two fragmentary mandibles with left p4-m3 and right p2-m3 (NMB-MAR369); plus, at least 30 specimens from collection of the Faculté des Sciences de Lyon and from the Centre de Conservation of Lyon (Musée des Confluences), France.

Paenanthracotherium bergeri from La Bénissons-Dieu, France, direct observations on a complete skull with maxillae with left I2-P2, M3 and right I1-M2 (FSL-213772), a maxilla with left I1-I2, C-M3 and right I1-M3 (FSL-213773), a mandible with left i1, i3-m3 and right i1, i3-c, p2-m3 (FSL-213772), a mandible with left i1, p4-m3 and right p2-m3 (FSL-213774); a mandible with right p2-m3 and left p2, m2-3 (UM-Gar2513, Sudre 1995) from Le Garouillas, France, a mandible from Moissac p3-m3 and right p1-m2 (MHNT.PAL.MAM.2002.3; UM cast; Leymerie, 1851) and a mandible i1-c, p2-m3 (MNHN Lim161, cast UM-3520) from Lamontgie near Issoire, Puy de Dôme (Blainville 1848).

Paenanthracotherium hippoideum from Aarwangen, Switzerland, direct observations on a sub-complete right mandible with i1-m3 (NMBE-D1825), an isolated right C (NMB-UM6441), an isolated left P3 (NMB-UM6439) and from St-Menoux, France, direct observations on an isolated left m3 (FSL-212877), an isolated left P3 (FSL-212883), an isolated right P4 (FSL-212879), an isolated left M3 (FSL-212888), a fragmentary symphysis with left i1-c, p2 and right i1-i3, p1 (cast, UM-CP21), a fragmentary premaxilla and maxilla with left I1-P2 (cast, UM-CP19).

Paenanthracotherium sp. from St-Henri, France, direct observations on a fragmentary left mandible with p4-m3 (MHNM-103), an isolated left M2 (MHNM-1982.755), an isolated right M2 (MHNM-1982.755), an isolated right P4 (MHNM-1982.755).

Anthracotherium monsvialense from Monteviale, Italy, direct observations on an isolated left C (NMB-JO75), a fragmentary left maxilla with M1-M3 (NMB-IO31), a fragmentary left mandible with m2-m3 (NMB-IO32b), a fragmentary right mandible with m2-m3 (NMB-

IO32a), a fragmentary right mandible with p4-m1 (NMB-IO32c); plus, observations from the literature (Ghezzo & Giusberti, 2016).

Anthracotherium magnum from Cadibona, Italy, direct observations on a fragmentary left mandible with m2-m3 (cast, holotype, NHML-OR197), a fragmentary maxilla with left P3(broken)-M2 and right P3-M3 (cast, NHML-M7136-3), a fragmentary premaxilla and maxilla with left I1-I2 alveoli and I3-P3 and right I1-P1 (cast, NHML-M7136-1), a fragmentary left mandible with p3-m3 (cast, NHML-M7136-15), a fragmentary symphysis with right i1 alveoli, i2, i3 alveoli, c-p2 and left c-p2 (cast, NHML-M7136-22), a fragmentary left mandible with m2-m3 (NHML-M7141-1073), a fragmentary left mandible with p2-p3 (cast, NHML-M7136-17), an isolated right c (cast, NHML-M7136-16), a fragmentary right mandible with p4-m2 (cast, NHML-M7136-14), a fragmentary right maxilla with P3-P4 (cast, NHML-M7136-11), a fragmentary right maxilla with M2(broken)-M3 (cast, NHML-M7136-12), a fragmentary premaxilla and maxilla with right I1-I3 and left C-P1 (cast, NHML-M7136-2), an isolated right I2 (cast, NHML-M7136-5), an isolated right C (cast, NHML-M7136-6), an isolated right c (NHML-M7141-2220), an isolated right I1 (cast, NHML-M7136-4), an isolated left P4 (cast, NHML-M7136-10), an isolated right P1 (cast, NHML-M7136-8), an isolated left p4 (cast, NHML-M7136-18), an isolated left P3 (cast, NHML-M7136-9), a fragmentary right maxilla with M1 (NHML-M750), a fragmentary left maxilla with M1-M2 (NHML-M75), a fragmentary right maxilla with M2(broken)-M3 (NHML-OR29593), a fragmentary right mandible with m2(broken)-m3(broken) (NHML-M75), a fragmentary left premaxilla with I2-I3 (NHML-M75).

Anthracotherium sp. from Mouillac, France, direct observations on an isolated right M3 (MNHN-Qu1027), a fragmentary left mandible with p3 (broken)–m3 (MNHN-Qu4186), an isolated left m3 (FSL-7743).

Anthracotherium chaimanei from Wai Lek, Thailand, direct observations on a sub-complete skull with left C-M3 and right P1-M3 (cast, holotype, UM-TF2636), a fragmentary left mandible with p3-m3 (cast, UM-TF2637); plus, observations from the literature (Ducroq, 1999).

Paenanthracotherium strategus from Dera Bugti, Pakistan, direct observations on a fragmentary left mandible with m3 (NHML-M12029), a fragmentary left maxilla with

M2(broken)-M3 (NHML-M12694), a fragmentary right maxilla with P4-M2 (NHML-M12695), a fragmentary right juvenile mandible with m1(broken)-m2 (NHML-M12701).

Anthracotherium bugtiense from Dera Bugti, Pakistan, direct observations on a fragmentary left maxilla with M2-M3 (cast, NHML-M9572), a right lower tooth row with p4-m3(broken) (cast, NHML-M11057), an isolated right P2 (cast, NHML-M11058), an isolated left P4 (cast, NHML-M12045), an isolated left P4 (NHML-M12046), an isolated left P4 (NHML-M12047), a fragmentary right mandible with p4-m3(broken) (NHML-M12050), an isolated right m3(broken) (NHML-M12051), an isolated left M1 (NHML-M12052), a fragmentary left mandible with m3 (NHML-M12696), a fragmentary right mandible with m3 (NHML-M12697), a fragmentary right mandible with m2-m3 (NHML-M12698), an isolated right m2 (NHML-M12699), a fragmentary right mandible with m2 (NHML-M12700), two isolated right C and c (NHML-M12816), an isolated left M3 (UM-J1).

Anthracokeryx birmanicus from Than U Daw, Myanmar, direct observations on a fragmentary left mandible with p3-m3 (cast, UM-Plate 2-no number), a fragmentary right mandible with p4-m3 (cast, UM-Plate 2-no number); from Nyaung Pin Le, Myanmar, direct observations on a fragmentary right mandible with m2 (cast, UM-Plate N-33), a fragmentary right maxilla with M1-M2 (cast, UM- Plate N-32); from PK9 Sabha Pondaung, Myanmar, direct observations on a fragmentary left maxilla with broken M1-M3 (cast, UM-Plate N°5-Spg 33), a fragmentary right mandible (in two fragments, without m1) with p3, p4 (broken), m2-m3 (cast, UM-Plate N°5-Spg 34); from Paukkaung, Myanmar, direct observations on a right semi-mandible with p2 and p3 alveoli, and p4-m3 (cast, UM-Plate 1-no number); from Minthakya, Myanmar, direct observations on a left upper row (isolated teeth) with P3-M3 (cast, UM-Plate N°15-21, 22, 23, 24) and right M2-M3 (cast, UM-Plate N°15-25, 26); from Pakokku, Myanmar, direct observations on a fragmentary right mandible with p4-m3 (NHML-M13172).

Anthracothema pangan from New Locality 1, Myanmar, direct observations on a fragmentary left maxilla with P4-M2 (cast, UM-Plate B-no number), an isolated right M2 (cast, UM-Plate B-no number), an isolated left p3 (cast, UM-Plate B-no number), an isolated left m2 (cast, UM-Plate B-no number); from Paukkaung, Myanmar, direct observations on an isolated right P3 (cast, UM-Plate 7-no number); from Minthakya, Myanmar, direct observations on an isolated left m3 (cast, UM-Plate 14-Mta18); from Lema Kyitchaung,

Myanmar, direct observations on an isolated right m3 (cast, UM-Plate 4-no number); from Pakokku, Myanmar, direct observations on a fragmentary right maxilla with M1(broken)-M2 (NHML-M13169-K21/314), an isolated right M2 (NHML-M13169-K13/240), an isolated left M2 (NHML-M13169-K21/351), a fragmentary left mandible with m1(broken)-m2 (NHML-M13169-K21/369), a fragmentary right mandible with m2(broken)-m3(broken) (NHML-M13169-K21/368).

The genus *Choeropotamus* is represented by 3 species: *C. depereti* Stehlin, 1908 from Euzet, France, direct observations on an isolated right M2 or M3 (UM-EUZ3081), a fragmentary left mandible with p3-m3(broken) (UM-EUZ40), a right semi-mandible with p3(broken)-m3 (UM-EUZ3080), a maxillary with P3-M3 (FSL-6173), a right mandible with p3-m3 (FSL-6175), a left mandible with p3-m3 (FSL-6176), a fragmentary left mandible with m1-m3 (FSL-6174), a skull with C-M3 (FSL-no number, collection ENSM); *C. sudrei* Casanovas-Cladellas, 1975 from Fons 1, direct observations on a fragmentary right m3 (UM-F1-194); *C. affinis* Gervais, 1852 from Mormoiron france, a fragmentary skull (FSL-6633); plus, observations from the literature (Sudre, 1978).

The genus *Haplobunodon* is represented by the species *H. lydekkeri* Stehlin, 1908 from the Late Eocene Totland Bay Member, Headon Hill Formation, Hordle, England and the species *H. solodurense* Stehlin, 1908 from the Middle Eocene (late Lutetian) fissure fillings of Egerkingen, observations from the literature (Hooker & Thomas, 2001).

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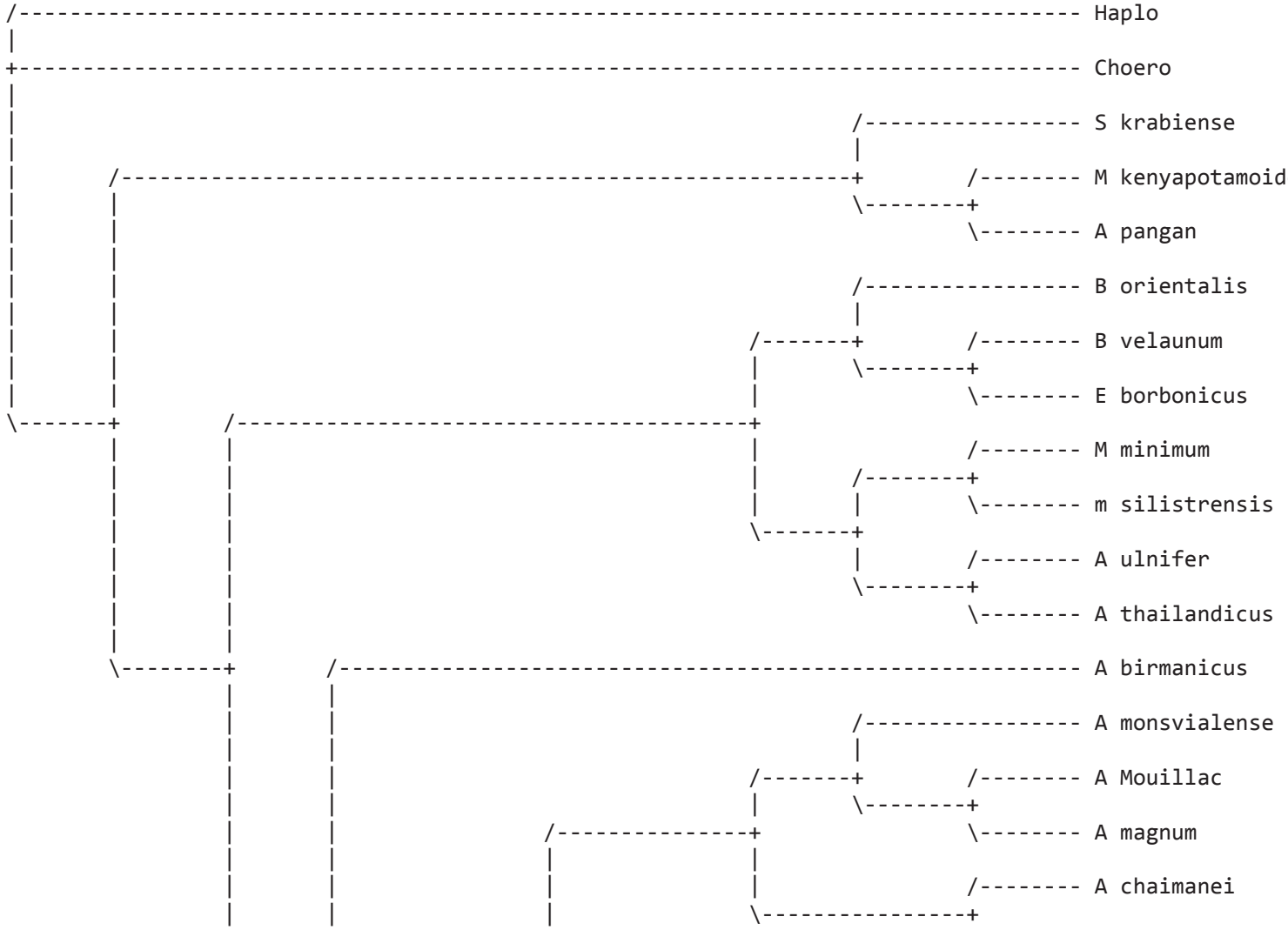
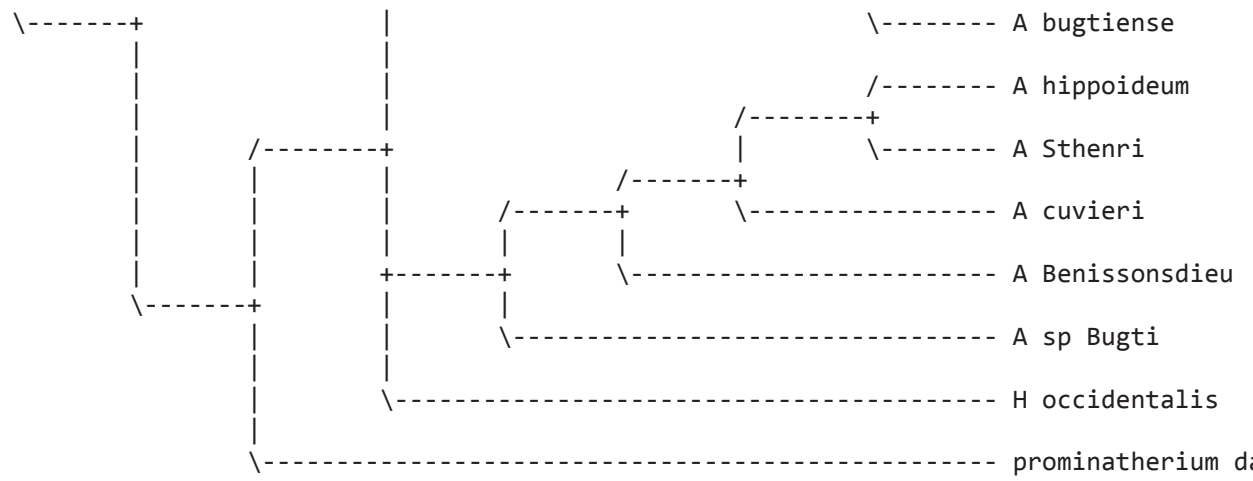
APPENDIX S3. Character-taxon matrix used for the cladistics analysis.

	1 12345	11111 67890	11112 12345	22222 67890	22223 12345	33333 67890	33334 12345	44444 67890	44445 12345	55555 67890	55556 12345	66666 67890	66667 12345	77777 67890	77778 12345	88888 67890	88889 12345	99999 67890	99990 12345	1 11111 00000 6	1 0
Haplobunodon	02000	00011	?0010	00001	0101?	00010	0000?	02000	01110	1000-	-2010	00001	10111	00111	?0???	?????	?????	?1?10	01000	11100	10010	1
Choeropotamus	00010	00010	00010	00000	0101-	00010	00000	02000	0?110	1010-	-2011	10000	00111	01011	?0000	?01?2	000?1	11?10	0????	?1110	010??	?
S. krabiense	00000	01010	01010	00000	01000	10010	00011	00020	00010	1100-	-2100	01011	10101	01000	00000	?0000	?00?0	011?0	00000	100-0	0101-	1
B. orientalis	12121	11110	10100	00010	11101	10110	00101	02111	00100	10110	11110	?0010	10011	01110	0100?	?????	????1	11110	01001	11100	00110	0
B. velaunum	10120	11010	10111	00000	11101	20010	11100	01001	10100	10110	10110	00010	21122	01120	00111	10102	10101	10110	01000	01110	01010	0
E. borbonicus	11121	10110	10111	00001	01111	20110	11200	02101	10100	10111	11101	01010	21122	01111	01201	10102	10001	11100	00001	01100	00100	0
M. minimum	01000	02000	10010	00000	11101	11010	00000	01020	00110	1010-	-2000	01010	10111	01111	00111	00112	10001	11000	01001	01100	01000	0
M. silistrensis	00000	02000	00010	00011	11101	10010	00000	00000	00110	1000-	-2000	01010	10111	01110	??111	00111	???11	11???	01001	10101	00000	0
A. tenuis	00000	0?010	00010	10001	11100	10010	00010	00020	00110	10011	1?110	01000	10111	01210	?0101	00112	10001	1011?	00001	10???	?????	?
A. birmanicus	00000	01010	00010	01110	11100	10000	00011	01020	00110	0000-	-0110	1001?	10111	01110	???0?	?1??2	?????	?1???	00000	10100	01010	0
A. thailandicus	00000	01010	00000	00000	11101	11010	00000	01020	00110	1000-	-2110	01010	10111	01111	00101	?????	????1	11??1	00001	10100	00010	0
M. kenyapothamus	00000	00011	00010	01100	01110	10010	00010	00020	01010	12211	01110	00001	01101	10000	10001	1????	???11	01???	?????	?0100	10010	1
A. pangan	?0000	0????	????0	01111	11100	00011	00010	00000	0?110	02211	02110	10011	10111	10000	?????	?01?2	?????	?????	00000	100-0	0001-	0
A. monsvialense	0???0	?0111	10110	01110	11100	20101	00011	00010	01100	10011	121??	11011	10011	10111	00010	110?0	00000	11110	1?000	11111	10001	0
A. hippoïdeum	02000	11110	10111	00001	01100	10110	01100	00010	00100	1????	?????	?????	?????	?????	??000	01000	????1	11???	01011	1????	?????	?
A. cuvieri	?????	?????	????1	10001	01110	10?10	01?10	0001?	00100	00111	10010	01000	10012	11211	0?010	11000	00001	1101?	01010	11111	00110	0
A. sp. St Henri	0???0	?1101	10110	00001	01100	10110	01100	00010	00100	10111	10010	01001	10012	10211	0????	?????	?????	?????	?????	?1111	00110	0
A. sp. Benissons	02000	10110	10110	10000	01100	10111	01110	01110	00100	00111	1011?	01000	10012	11110	00010	01000	01100	10111	01010	11111	00111	0
A. sp. Bugti	?????	?????	????0	10001	01100	10111	0101?	00010	00100	00111	12110	01010	10011	11211	0????	?????	?????	?????	?????	?1111	00010	0
A. sp. Mouillac	0???0	?0110	11110	01110	10100	20101	00101	00110	01000	10011	12110	11011	10011	11?11	0????	?????	?????	?????	?????	?????	?????	?
A. chaimanei	00000	00111	00010	01100	10100	10101	00011	10010	01010	10011	11110	11111	10111	10111	00???	?10?0	111??	?1111	?0110	?1110	10110	0
A. magnum	00000	00111	11110	01110	10100	20101	00011	01010	01001	10011	11110	11110	10011	11111	00010	01000	01000	11111	11110	11110	00000	0
A. bugtiense	0???0	?0010	00010	11101	01100	10101	00011	12010	01000	10011	12111	11011	10011	10111	0????	?1000	000??	??00?	???1?	?0111	00110	0
H. occidentalis	02000	01011	00111	00000	11100	11110	00110	00000	00101	00011	11010	11100	10012	11211	1?010	01001	00000	01000	11111	11110	10011	1
P. damaltinum	?????	?????	?????	?????	?????	?????	?????	?????	?????	?1?11	12110	10010	10111	11211	?????	?????	?????	?????	?????	?011?	1?0?0	0

```
P A U P *
Version 4.0a151 for 32-bit Microsoft Windows (built on Jan  2 2017 at 06:12:08)
Fri Jan 27 09:45:57 2017

Running on IA-32 architecture (64-bit word length)
SSE vectorization enabled
Multithreading enabled for likelihood using Pthreads

      ------------------------------NOTICE------------------------------
        This is an alpha-test version that is still changing rapidly.
        It will expire on 1 Jul 2017.

        Please report bugs to david.swofford@duke.edu
      ------------------------------------------------------------------

Processing of file "D:\DOCS-Lihoreau\RECHERCHE\article en cours\Anthracotheriinae
Laureline\170126_AMatrixZJL_FL.nex" begins...

Data matrix has 26 taxa, 106 characters
Valid character-state symbols: 0123
Missing data identified by '?'
Gaps identified by '-'

*** Skipping "NOTES" block

Processing of input file "170126_AMatrixZJL_FL.nex" completed.

paup> Delete 25;

Taxon-deletion status changed:
  1 taxon deleted
  Total number of taxa now deleted = 1
  Number of nondeleted taxa = 25

paup> Outgroup 1-3;

Outgroup status changed:
  3 taxa transferred to outgroup
  Total number of taxa now in outgroup = 3
  Number of ingroup taxa = 23

paup> HSearch;

Heuristic search settings:
  Optimality criterion = parsimony
    Character-status summary:
      Of 106 total characters:
        All characters are of type 'unord'
        All characters have equal weight
        All characters are parsimony-informative
    Gaps are treated as "missing"
    Multistate taxa interpreted as polymorphism
  Starting tree(s) obtained via stepwise addition
    Addition sequence: random
    Number of replicates = 1000
    Starting seed = generated automatically
    Number of trees held at each step = 1
  Branch-swapping algorithm: tree-bisection-reconnection (TBR) with reconnection limit = 8
    Steepest descent option not in effect
  Initial 'Maxtrees' setting = 100
  Branches collapsed (creating polytomies) if maximum branch length is zero
```

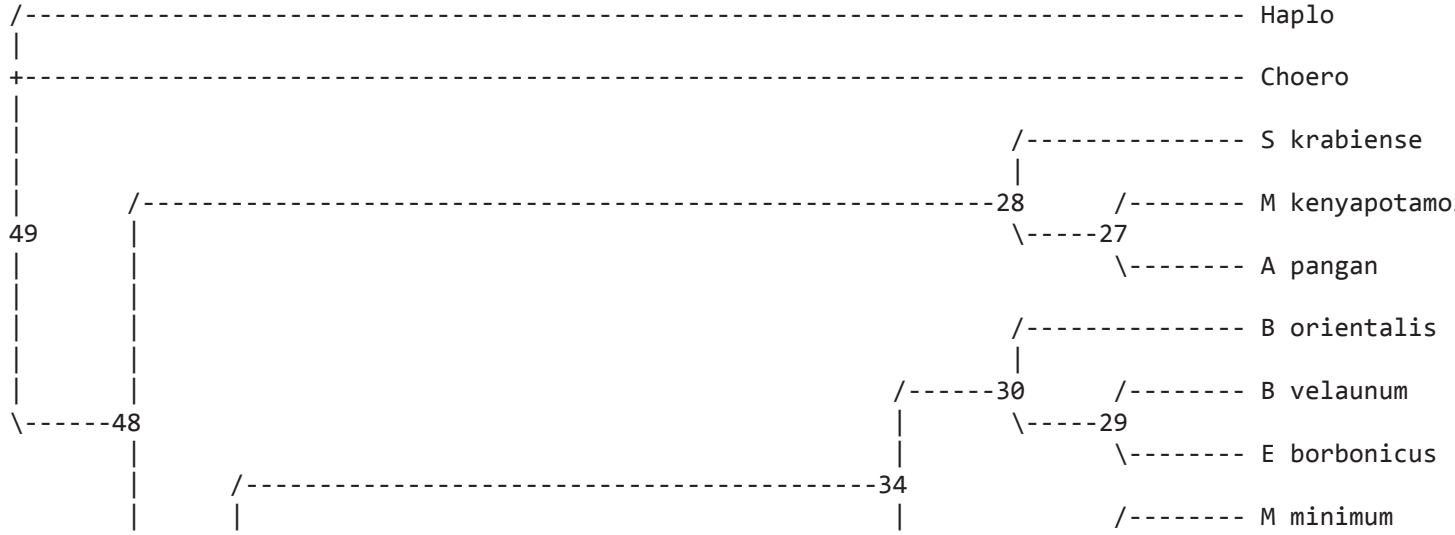
```
  'MulTrees' option in effect
  No topological constraints in effect
  Trees are unrooted

Heuristic search completed
  Total number of rearrangements tried = 100197756
  Score of best tree(s) found = 363
  Number of trees retained = 2
  Time used = 25.32 sec (CPU time = 25.32 sec)

Tree-island profile:
                    First      Last                         First    Times
Island      Size     tree      tree          Score    replicate      hit
-------------------------------------------------------------------------
     1         2         1         2            363            1     881
     2         1         -         -            364            2      90*
     3         2         -         -            365           17      18*
     4         2         -         -            369          113       8*
     5         6         -         -            369          185       2*
     6         1         -         -            374          288       1

Note(s):
    * Multiple hits on islands of unsaved trees may in fact represent different islands

paup> ConTree;

Strict consensus of 2 trees:
```

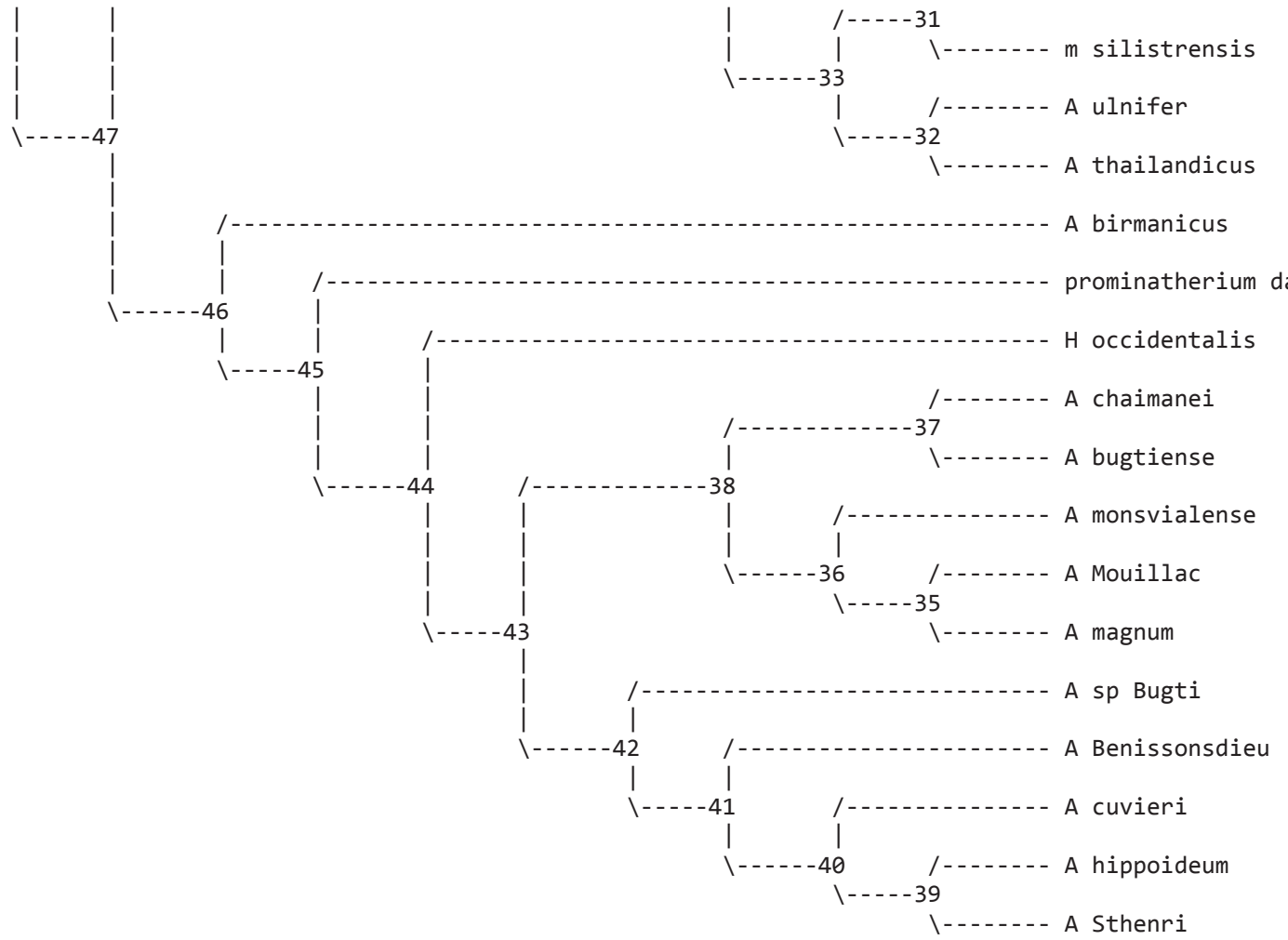





```
paup> SaveTrees file='D:\DOCS-Lihoreau\RECHERCHE\article en cours\Anthracotheriinae
Laureline\170126_AMatrixZJL_FL.tre';

2 trees saved to file "D:\DOCS-Lihoreau\RECHERCHE\article en cours\Anthracotheriinae
Laureline\170126_AMatrixZJL_FL.tre"

paup> DescribeTrees / xout=internal apoList tOrder=right;

Tree description:

  Unrooted tree(s) rooted using outgroup method
  Optimality criterion = parsimony
    Character-status summary:
      Of 106 total characters:
        All characters are of type 'unord'
        All characters have equal weight
        All characters are parsimony-informative
    Gaps are treated as "missing"
    Multistate taxa interpreted as polymorphism ("min" values for CI, RI, and RC are minimum-possible
      character lengths)
    Character-state optimization: Accelerated transformation (ACCTRAN)

Tree 1 (rooted using user-specified outgroup)

Note: Tree can not be rooted such that specified ingroup is monophyletic.

Reconstructed states for internal nodes:

                                    1         2         3         4         5         6         7
Node                       12345678901234567890123456789012345678901234567890123456789012345678901234
-------------------------------------------------------------------------------------------------------
27                         00000000110001001100011001001000010000200101012211021100001110101100001000
28                         00000010100001000000011001001000010000200001011001021100001110101010000000
29                         10121111101011100000111012011011100021011010010110111100001021122011100110
30                         10121111101011000000111011011000100021010010010110111100001010111011100110
31                         00000020000001000000111011001000000000200011010001120000101010111011100011
32                         00000010100001000000111011001000000000200011010001121100101010111011100010
33                         00000010100001000000111011001000000000200011010001121100101010111011100010
34                         00000010100001000000111011001000000000200011010001121100001010111011100010
35                         00000001111111001110101002010001100010010001001112110110111001111111000010
36                         00000001111011001110111002010001100010010001001112110110111001110111000010
37                         00000001110001001100111001010100011100100100010011121101101110011101110001
38                         00000001111011001100111001010100011000100100010011121101101110011101110001
39                         02000111101011100001011001011001100000100010010111100100100110012102110000
40                         02000111101011110001011001011001110000100010000111100100100010012112110001
41                         02000101101011010001011001011101110000100010000111101100100010012112110001
```

```
42                        0200010110101101000101100101111010100001000100001111211001010100111121100010
43                        0200000111101100000011100101111000100001000100000111211011010100111121100010
44                        0200001011001100000011100101100001000000001000001112110110101001111211000 0
45                        0200001011001100000011100101100001000000001000001112110100101011111211000 0
46                        0000001010000100000011100100100001000020001100000112110100101011110110000 0
47                        0000001010000100000011100100100001000020001101000112110000101011110110000 0
48                        0000001010000100000001100100100001000020001101000102110000101011101000000
49                        0000000010000100000001010000100000002000001101000102010000001011101011000 0

Reconstructed states for internal nodes (continued):

                                      1     1
                          8     9     0     0
Node                      4567890123456789012345 6
-------------------------------------------------
27                        1101110000001000000010 1
28                        1101110000001000000010 1
29                        0111110010010110000110 0
30                        0111110010011110000110 0
31                        0111000010011010000000 0
32                        0111111000011010000010 0
33                        0111110010011010000010 0
34                        0111110010011010000010 0
35                        0011111111110111100000 0
36                        0011111111110111110000 0
37                        0011111101101111100110 0
38                        0011111111110111110001 0
39                        0111011010111111100110 0
40                        0111011010101111100110 0
41                        0011111010101111100110 0
42                        0011111010101111100010 0
43                        0011111111110111110001 0
44                        0011110111110111101001 0
45                        0011110111110101101001 0
46                        0011110010001010000010 0
47                        0111110010001010000010 0
48                        0111110010001010000010 1
49                        0111110010001110000010 1

Tree length = 363
Consistency index (CI) = 0.3554
Homoplasy index (HI) = 0.6612
Retention index (RI) = 0.5339
Rescaled consistency index (RC) = 0.1897
```





Apomorphy lists:

Branch	Character	Steps	CI
node_49 --> Haplo 2	2 (Orientation of postprotocristid on p3)	1	0.33
	10 (Hypoconid on p4)	1	0.14
	11 (Entostylid on p4) (12)	2	0.33
	20 (Ectometafossid on lower molars) 1	1	0.12
	25 (Preentocristid connects) (01)	1	0.66
	42 (Entoconulid) 1	1	0.60
	60 (endometacrista) 1	1	0.33
	67 (Entostyle on upper molars) 0	1	0.20
	68 (Parastyle development) 1	1	0.33
	101 (Postectoprotocrista on P4) 1	1	0.16
node_49 --> Choero 1	4 (Mesial accessory cusp on p3)	1	1.00
	42 (Entoconulid) (01)	1	0.60
	48 (Mesio-distal development of ribs of labial c)	1	0.50

	1			
	55	(Postmetafossule)	1	0.33
	1			
	56	(Secondary cristule(s) labial to metaconule,)	1	0.25
	1			
	61	(Preparacrista connects the parastyle)	1	0.66
	0			
	99	(Postprotocrista on P4 joins)	1	0.33
	1			
	102	(P4 mesial margin)	1	0.20
	1			
node_49 --> node_48	7	(Distolingual cingulid on p4 in lingual view)	1	0.33
1				
	23	(Postectometacristid on lower molars)	1	0.50
	1			
	24	(Premetafossid on lower molars)	1	0.25
	0			
	26	(Postectoentocristid on lower molars)	1	0.50
	1			
	34	(Endohypocristid on lower molars)	1	0.20
	1			
	37	(Ectostylid on lower molars)	1	0.22
	0			
	39	(Ectohypocristulid on m3)	1	0.28
	2			
	53	(Premetacristule divided in two mesial arms)	1	0.25
	1			
	59	(Postparacristule extension)	1	0.20
	1			
	70	(Metastyle development)	1	0.16
	0			
	97	(Orientation of preparacrista on P4)	1	0.20
	0			
node_48 --> node_28	43	(Centroconulid on m3)	1	0.25
0				
	47	(Height of lingual cingulum compared to unwor)	1	0.66
	1			
	60	(endometacrista)	1	0.33
	1			
	64	(Form of the connection between premetacrista)	1	0.66
	0			
	69	(Mesostyle development)	1	1.00
	0			
	76	(Proclination of the lower incisors)	1	0.25
	1			
	84	(Diastema i3-c)	1	0.50
	1			
	86	(Diastema p1-p2)	1	0.50
	0			
	92	(Labial cingulum on P3)	1	0.25
	0			
	98	(Postprotocrista on P4)	1	0.50
	0			
node_28 --> S krabiense	12	(Ectoprotofossid on p4)	1	0.50
1				
	23	(Postectometacristid on lower molars)	1	0.50
	0			
	35	(Posthypofossid on lower molars)	1	0.25
	1			
	54	(Ectometacristule on upper molars)	1	0.33
	0			
	57	(Distostyle position on upper molars levels)	1	0.25

```
                                1
                                78 (Section of lower canine (in male when sexual)      1   0.500
                                0
                                80 (cristid on lower canine)                           1   0.500
                                0
                                85 (Diastema c-p1)                                     1   0.333
                                0
                                102 (P4 mesial margin)                                 1   0.200
                                1
node_28 --> node_27             7 (Distolingual cingulid on p4 in lingual view)        1   0.333
0
                                10 (Hypoconid on p4)                                   1   0.143
                                1
                                17 (Postectoprotocristid on lower molars)              1   0.333
                                1
                                18 (Postprotofossid on lower molars at least on )      1   0.333
                                1
                                42 (Entoconulid)                                       1   0.600
                                1
                                47 (Height of lingual cingulum compared to unwor)      1   0.667
                                2
                                48 (Mesio-distal development of ribs of labial c)      1   0.500
                                2
                                49 (Postectoprotocrista)                               1   0.250
                                1
                                66 (Mesiolingual style (=protostyle) on upper mo)      1   0.500
                                1
                                67 (Entostyle on upper molars)                         1   0.200
                                0
                                71 (Root fusion on upper molars)                       1   0.500
                                1
                                75 (Transverse constriction of mandible at c-p1 )      1   0.500
                                1
node_27 --> M kenyapotamoides   24 (Premetafossid on lower molars)                      1   0.25
1
                                52 (Protocone and metaconule junction on M1-M2)        1   0.250
                                1
                                59 (Postparacristule extension)                        1   0.200
                                0
                                61 (Preparacrista connects the parastyle)              1   0.667
                                0
                                62 (Ectocristyle)                                      1   0.500
                                1
                                98 (Postprotocrista on P4)                             1   0.500
                                1
                                101 (Postectoprotocrista on P4)                        1   0.167
                                1
node_27 --> A pangan            19 (Ectoprotofossid on lower molars)                   1   0.200
1
                                20 (Ectometafossid on lower molars)                    1   0.125
                                1
                                21 (Endometacristid on lower molars)                   1   0.200
                                1
                                26 (Postectoentocristid on lower molars)               1   0.500
                                0
                                30 (Prehypocristid inflated (not salient when un)      1   0.333
                                1
                                39 (Ectohypocristulid on m3)                           1   0.286
                                0
                                42 (Entoconulid)                                       1   0.600
                                (01)
                                43 (Centroconulid on m3)                               1   0.250
```

```
                                1
                                46 (Unique accessory cristulid mesially directed)      1   0.250
                                0
                                56 (Secondary cristule(s) labial to metaconule, )      1   0.250
                                1
                                64 (Form of the connection between premetacrista)      1   0.667
                                1
                                106 (postprotofossa on P4)                             1   0.333
                                0
node_48 --> node_47             21 (Endometacristid on lower molars)                   1   0.200
1
                                51 (Orientation of the postectoprotocrista on up)      1   1.000
                                1
                                68 (Parastyle development)                             1   0.333
                                1
                                106 (postprotofossa on P4)                             1   0.333
                                0
node_47 --> node_34             25 (Preentocristid connects)                           1   0.667
1
                                34 (Endohypocristid on lower molars)                   1   0.200
                                0
                                73 (Symphysis morphology in sagittal section)          1   0.667
                                1
                                75 (Transverse constriction of mandible at c-p1 )      1   0.500
                                1
                                81 (Section of upper canine (in male when sexual)      1   0.500
                                1
                                95 (Postparafossa on P3)                               1   0.250
                                1
node_34 --> node_30             1 (Lingual contour at cervix of p4 in occlusal v)      1   1.000
1
                                3 (Preprotocristid mesiolingually curved on p3)        1   1.000
                                1
                                4 (Mesial accessory cusp on p3)                        1   1.000
                                2
                                5 (Change in the orientation of the preprotocris)      1   0.500
                                1
                                6 (Entostylid on p3)                                   1   0.500
                                1
                                8 (Mesiolingual secondary cristid on p4 (cristid)      1   0.250
                                1
                                11 (Entostylid on p4)                                  1   0.333
                                1
                                13 (Lingual cingulid on p4, eventually joining t)      1   0.333
                                1
                                28 (Postentocristid on m1-m2)                          1   0.333
                                1
                                33 (Posthypocristid on m1-m2 joins)                    1   0.400
                                1
                                37 (Ectostylid on lower molars)                        1   0.222
                                2
                                38 (Ectocrystilid on lower molars)                     1   0.250
                                1
                                39 (Ectohypocristulid on m3)                           1   0.286
                                0
                                40 (Distostylid on m1-m2)                              1   1.000
                                1
                                44 (Postentocristid on m3)                             1   0.333
                                0
                                48 (Mesio-distal development of ribs of labial c)      1   0.500
                                1
                                49 (Postectoprotocrista)                               1   0.250
```

	1			
	50 (Postectoprotocrista on upper molars)	1	0.500	
	0			
	52 (Protocone and metaconule junction on M1-M2)	1	0.250	
	1			
	72 (Opening of internal choanes)	1	0.500	
	1			
	76 (Proclination of the lower incisors)	1	0.250	
	1			
	97 (Orientation of preparacrista on P4)	1	0.200	
	1			
	103 (Strong development of distostyle on P4)	1	0.250	
	1			
node_30 --> B orientalis	2 (Orientation of postprotocristid on p3)	1	0.333	
2				
	14 (Labial cingulid on p4)	1	0.500	
	0			
	19 (Ectoprotofossid on lower molars)	1	0.200	
	1			
	35 (Posthypofossid on lower molars)	1	0.250	
	1			
	39 (Ectohypocristulid on m3)	1	0.286	
	1			
	63 (Premetacrista and postparacrista connection)	1	0.333	
	0			
	73 (Symphysis morphology in sagittal section)	1	0.667	
	0			
node_30 --> node_29	15 (Premetacristid on lower molars)	1	0.250	
1				
	26 (Postectoentocristid on lower molars)	1	0.500	
	2			
	31 (Prehypocristid invades)	1	1.000	
	1			
	32 (Main arm of prehypocristid connects)	1	0.500	
	1			
	41 (Mesial part of loop-like hypoconulid)	1	1.000	
	1			
	61 (Preparacrista connects the parastyle)	1	0.667	
	2			
	62 (Ectocristyle)	1	0.500	
	1			
	64 (Form of the connection between premetacrista)	1	0.667	
	2			
	65 (Postmetacrista connects the metastyle)	1	0.333	
	2			
	96 (Orientation of the postparacrista on P3)	1	0.500	
	0			
node_29 --> B velaunum	5 (Change in the orientation of the preprotocris)	1	0.500	
0				
	8 (Mesiolingual secondary cristid on p4 (cristid)	1	0.250	
	0			
	28 (Postentocristid on m1-m2)	1	0.333	
	0			
	37 (Ectostylid on lower molars)	1	0.222	
	1			
	38 (Ectocrystilid on lower molars)	1	0.250	
	0			
	52 (Protocone and metaconule junction on M1-M2)	1	0.250	
	0			
	69 (Mesostyle development)	1	1.000	
	2			
	72 (Opening of internal choanes)	1	0.500	

	0		
	74 (Bone fusion at symphysis in adult specimens)	1	0.250
	1		
	83 (Groove on lingual side of upper canine)	1	0.333
	1		
	87 (Diastema p2-p3)	1	0.333
	0		
	95 (Postparafossa on P3)	1	0.250
	0		
	99 (Postprotocrista on P4 joins)	1	0.333
	1		
	102 (P4 mesial margin)	1	0.200
	1		
	103 (Strong development of distostyle on P4)	1	0.250
	0		
node_29 --> E borbonicus	2 (Orientation of postprotocristid on p3)	1	0.333
1			
	7 (Distolingual cingulid on p4 in lingual view)	1	0.333
	0		
	20 (Ectometafossid on lower molars)	1	0.125
	1		
	21 (Endometacristid on lower molars)	1	0.200
	0		
	24 (Premetafossid on lower molars)	1	0.250
	1		
	33 (Posthypocristid on m1-m2 joins)	1	0.400
	2		
	50 (Postectoprotocrista on upper molars)	1	0.500
	1		
	54 (Ectometacristule on upper molars)	1	0.333
	0		
	55 (Postmetafossule)	1	0.333
	1		
	57 (Distostyle position on upper molars levels)	1	0.250
	1		
	70 (Metastyle development)	1	0.167
	1		
	73 (Symphysis morphology in sagittal section)	1	0.667
	2		
	89 (Diastema P1-P2)	1	0.250
	0		
	92 (Labial cingulum on P3)	1	0.250
	0		
	104 (Lingual cingulum on P4)	1	0.333
	0		
node_34 --> node_33	57 (Distostyle position on upper molars levels)	1	0.250
1			
	79 (Wear on lower canine)	1	1.000
	1		
node_33 --> node_31	7 (Distolingual cingulid on p4 in lingual view)	1	0.333
2			
	9 (Marked postprotofossid on p4)	1	0.500
	0		
	53 (Premetacristule divided in two mesial arms)	1	0.250
	0		
	54 (Ectometacristule on upper molars)	1	0.333
	0		
	74 (Bone fusion at symphysis in adult specimens)	1	0.250
	1		
	88 (Diastema C-P1)	1	0.250
	0		
	89 (Diastema P1-P2)	1	0.250

	0			
	104 (Lingual cingulum on P4)	1	0.333	
	0			
node_31 --> M minimum	2 (Orientation of postprotocristid on p3)	1	0.333	
1				
	11 (Entostylid on p4)	1	0.333	
	1			
	27 (Ectoentocristid)	1	0.333	
	1			
	37 (Ectostylid on lower molars)	1	0.222	
	1			
	48 (Mesio-distal development of ribs of labial c)	1	0.500	
	1			
	70 (Metastyle development)	1	0.167	
	1			
	96 (Orientation of the postparacrista on P3)	1	0.500	
	0			
	97 (Orientation of preparacrista on P4)	1	0.200	
	1			
	102 (P4 mesial margin)	1	0.200	
	1			
node_31 --> m silistrensis	19 (Ectoprotofossid on lower molars)	1	0.200	
1				
	20 (Ectometafossid on lower molars)	1	0.125	
	1			
	39 (Ectohypocristulid on m3)	1	0.286	
	0			
	80 (cristid on lower canine)	1	0.500	
	1			
	84 (Diastema i3-c)	1	0.500	
	1			
	100 (Preprotocrista on P4 joins)	1	0.250	
	1			
node_33 --> node_32	90 (Diastema P2-P3)	1	0.500	
1				
	92 (Labial cingulum on P3)	1	0.250	
	0			
node_32 --> A ulnifer	16 (Connection between premetacristid and prepro)	1	0.250	
1				
	20 (Ectometafossid on lower molars)	1	0.125	
	1			
	25 (Preentocristid connects)	1	0.667	
	0			
	34 (Endohypocristid on lower molars)	1	0.200	
	1			
	49 (Postectoprotocrista)	1	0.250	
	1			
	59 (Postparacristule extension)	1	0.200	
	0			
	68 (Parastyle development)	1	0.333	
	2			
	87 (Diastema p2-p3)	1	0.333	
	0			
	90 (Diastema P2-P3)	1	0.500	
	(01)			
node_32 --> A thailandicus	14 (Labial cingulid on p4)	1	0.500	
0				
	27 (Ectoentocristid)	1	0.333	
	1			
	37 (Ectostylid on lower molars)	1	0.222	
	1			
	70 (Metastyle development)	1	0.167	

	1		
node_47 --> node_46	46 (Unique accessory cristulid mesially directed)	1	0.250
0			
	56 (Secondary cristule(s) labial to metaconule,)	1	0.250
1			
	77 (Crown height of lower canine (in male when s)	1	1.000
1			
	78 (Section of lower canine (in male when sexual)	1	0.500
0			
	85 (Diastema c-p1)	1	0.333
0			
node_46 --> A birmanicus	17 (Postectoprotocristid on lower molars)	1	0.333
1			
	18 (Postprotofossid on lower molars at least on)	1	0.333
1			
	19 (Ectoprotofossid on lower molars)	1	0.200
1			
	29 (Prehypocristid dividing in two mesial arms o)	1	0.500
0			
	35 (Posthypofossid on lower molars)	1	0.250
1			
	37 (Ectostylid on lower molars)	1	0.222
1			
	52 (Protocone and metaconule junction on M1-M2)	1	0.250
0			
	60 (endometacrista)	1	0.333
	(01)		
	102 (P4 mesial margin)	1	0.200
1			
node_46 --> node_45	2 (Orientation of postprotocristid on p3)	1	0.333
2			
	10 (Hypoconid on p4)	1	0.143
1			
	13 (Lingual cingulid on p4, eventually joining t)	1	0.333
1			
	28 (Postentocristid on m1-m2)	1	0.333
1			
	39 (Ectohypocristulid on m3)	1	0.286
0			
	44 (Postentocristid on m3)	1	0.333
0			
	49 (Postectoprotocrista)	1	0.250
1			
	66 (Mesiolingual style (=protostyle) on upper mo)	1	0.500
1			
	68 (Parastyle development)	1	0.333
2			
	70 (Metastyle development)	1	0.167
1			
	74 (Bone fusion at symphysis in adult specimens)	1	0.250
1			
	80 (cristid on lower canine)	1	0.500
0			
	91 (Accessory cusp on disto-lingual cingulum of)	1	0.500
1			
	93 (Ectoparacrista on P3)	1	0.333
1			
	94 (Ectoparafossa on P2 and/or P3)	1	0.500
1			
	99 (Postprotocrista on P4 joins)	1	0.333
1			
	101 (Postectoprotocrista on P4)	1	0.167

```
                          1
node_45 --> node_44       57 (Distostyle position on upper molars levels)      1   0.250
1
                          63 (Premetacrista and postparacrista connection)     1   0.333
0
                          97 (Orientation of preparacrista on P4)              1   0.200
1
node_44 --> node_43       7 (Distolingual cingulid on p4 in lingual view)      1   0.333
0
                          8 (Mesiolingual secondary cristid on p4 (cristid)    1   0.250
1
                          11 (Entostylid on p4)                                1   0.333
1
                          30 (Prehypocristid inflated (not salient when un)    1   0.333
1
                          39 (Ectohypocristulid on m3)                         1   0.280
1
                          90 (Diastema P2-P3)                                  1   0.500
1
                          100 (Preprotocrista on P4 joins)                     1   0.250
1
                          101 (Postectoprotocrista on P4)                      1   0.167
0
node_43 --> node_38       2 (Orientation of postprotocristid on p3)            1   0.333
0
                          17 (Postectoprotocristid on lower molars)            1   0.333
1
                          18 (Postprotofossid on lower molars at least on )    1   0.333
1
                          29 (Prehypocristid dividing in two mesial arms o)    1   0.500
0
                          35 (Posthypofossid on lower molars)                  1   0.250
1
                          42 (Entoconulid)                                     1   0.600
1
                          43 (Centroconulid on m3)                             1   0.250
0
                          46 (Unique accessory cristulid mesially directed)    1   0.250
1
                          60 (endometacrista)                                  1   0.333
1
                          67 (Entostyle on upper molars)                       1   0.200
0
                          68 (Parastyle development)                           1   0.333
1
node_38 --> node_36       19 (Ectoprotofossid on lower molars)                 1   0.200
1
                          26 (Postectoentocristid on lower molars)             1   0.500
2
                          104 (Lingual cingulum on P4)                         1   0.333
0
node_36 --> A monsvialense 43 (Centroconulid on m3)                            1   0.250
1
                          76 (Proclination of the lower incisors)              1   0.250
1
                          90 (Diastema P2-P3)                                  1   0.500
0
                          93 (Ectoparacrista on P3)                            1   0.333
0
                          94 (Ectoparafossa on P2 and/or P3)                   1   0.500
0
                          101 (Postectoprotocrista on P4)                      1   0.167
```

	1			
	105 (Division in two of the postprotocrista on P)	1	0.333	
	1			
node_36 --> node_35	12 (Ectoprotofossid on p4)	1	0.500	
1				
	22 (Cristulids of the hypoconulid on m3)	1	0.500	
	0			
	67 (Entostyle on upper molars)	1	0.200	
	1			
	82 (Groove on labial side of upper canine)	1	0.333	
	1			
	100 (Preprotocrista on P4 joins)	1	0.250	
	0			
node_35 --> A Mouillac	10 (Hypoconid on p4)	1	0.143	
0				
	33 (Posthypocristid on m1-m2 joins)	1	0.400	
	1			
	34 (Endohypocristid on lower molars)	1	0.200	
	0			
	38 (Ectocrystilid on lower molars)	1	0.250	
	1			
node_35 --> A magnum	37 (Ectostylid on lower molars)	1	0.222	
1				
	45 ("Posterostylid" and/or distal cingulid on m3)	1	0.500	
	1			
	52 (Protocone and metaconule junction on M1-M2)	1	0.250	
	1			
	58 (Secondary ectometafossule lingual to ectomet)	1	0.333	
	1			
	60 (endometacrista)	1	0.333	
	0			
node_38 --> node_37	11 (Entostylid on p4)	1	0.333	
0				
	13 (Lingual cingulid on p4, eventually joining t)	1	0.333	
	0			
	36 (Entostylid on lower molars)	1	1.000	
	1			
	92 (Labial cingulum on P3)	1	0.250	
	0			
	103 (Strong development of distostyle on P4)	1	0.250	
	1			
node_37 --> A chaimanei	22 (Cristulids of the hypoconulid on m3)	1	0.500	
0				
	44 (Postentocristid on m3)	1	0.333	
	1			
	52 (Protocone and metaconule junction on M1-M2)	1	0.250	
	1			
	58 (Secondary ectometafossule lingual to ectomet)	1	0.333	
	1			
	63 (Premetacrista and postparacrista connection)	1	0.333	
	1			
	81 (Section of upper canine (in male when sexual)	1	0.500	
	1			
	82 (Groove on labial side of upper canine)	1	0.333	
	1			
	83 (Groove on lingual side of upper canine)	1	0.333	
	1			
	100 (Preprotocrista on P4 joins)	1	0.250	
	0			
	101 (Postectoprotocrista on P4)	1	0.167	
	1			
node_37 --> A bugtiense	8 (Mesiolingual secondary cristid on p4 (cristid)	1	0.250	

```
0
                          10 (Hypoconid on p4)                                  1   0.143
0
                          16 (Connection between premetacristid and prepro)     1   0.250
1
                          20 (Ectometafossid on lower molars)                   1   0.125
1
                          21 (Endometacristid on lower molars)                  1   0.200
0
                          37 (Ectostylid on lower molars)                       1   0.222
2
                          55 (Postmetafossule)                                  1   0.333
1
                          88 (Diastema C-P1)                                    1   0.250
0
                          89 (Diastema P1-P2)                                   1   0.250
0
                          97 (Orientation of preparacrista on P4)               1   0.200
0
node_43 --> node_42       6 (Entostylid on p3)                                  1   0.500
1
                          10 (Hypoconid on p4)                                  1   0.143
0
                          16 (Connection between premetacristid and prepro)     1   0.250
1
                          20 (Ectometafossid on lower molars)                   1   0.125
1
                          21 (Endometacristid on lower molars)                  1   0.200
0
                          32 (Main arm of prehypocristid connects)              1   0.500
1
                          48 (Mesio-distal development of ribs of labial c)     1   0.500
1
                          56 (Secondary cristule(s) labial to metaconule, )     1   0.250
0
                          91 (Accessory cusp on disto-lingual cingulum of )     1   0.500
0
                          93 (Ectoparacrista on P3)                             1   0.333
0
node_42 --> node_41       33 (Posthypocristid on m1-m2 joins)                   1   0.400
1
                          52 (Protocone and metaconule junction on M1-M2)       1   0.250
0
                          59 (Postparacristule extension)                       1   0.200
0
                          65 (Postmetacrista connects the metastyle)            1   0.333
2
                          103 (Strong development of distostyle on P4)          1   0.250
1
node_41 --> node_40       7 (Distolingual cingulid on p4 in lingual view)       1   0.333
1
                          15 (Premetacristid on lower molars)                   1   0.250
1
                          30 (Prehypocristid inflated (not salient when un)     1   0.333
0
                          53 (Premetacristule divided in two mesial arms)       1   0.250
0
                          85 (Diastema c-p1)                                    1   0.333
1
                          88 (Diastema C-P1)                                    1   0.250
0
node_40 --> node_39       16 (Connection between premetacristid and prepro)     1   0.250
```

```
0
                              34 (Endohypocristid on lower molars)                1   0.200
0
                              46 (Unique accessory cristulid mesially directed)   1   0.250
1
                              60 (endometacrista)                                 1   0.333
1
                              67 (Entostyle on upper molars)                      1   0.200
0
                              74 (Bone fusion at symphysis in adult specimens)    1   0.250
0
                              95 (Postparafossa on P3)                            1   0.250
1
node_39 --> A Sthenri         9 (Marked postprotofossid on p4)                    1   0.500
0
                              10 (Hypoconid on p4)                                1   0.143
1
                              15 (Premetacristid on lower molars)                 1   0.250
0
node_40 --> A cuvieri         24 (Premetafossid on lower molars)                  1   0.250
1
                              76 (Proclination of the lower incisors)             1   0.250
1
node_41 --> A Benissonsdieu   20 (Ectometafossid on lower molars)                1   0.125
0
                              37 (Ectostylid on lower molars)                     1   0.222
1
                              38 (Ectocrystilid on lower molars)                  1   0.250
1
                              68 (Parastyle development)                          1   0.333
1
                              70 (Metastyle development)                          1   0.167
0
                              82 (Groove on labial side of upper canine)          1   0.333
1
                              83 (Groove on lingual side of upper canine)         1   0.333
1
                              87 (Diastema p2-p3)                                 1   0.333
0
                              105 (Division in two of the postprotocrista on P)   1   0.333
1
node_44 --> H occidentalis    15 (Premetacristid on lower molars)                 1   0.250
1
                              27 (Ectoentocristid)                                1   0.333
1
                              33 (Posthypocristid on m1-m2 joins)                 1   0.400
1
                              45 ("Posterostylid" and/or distal cingulid on m3)   1   0.500
1
                              52 (Protocone and metaconule junction on M1-M2)     1   0.250
1
                              53 (Premetacristule divided in two mesial arms)     1   0.250
0
                              58 (Secondary ectometafossule lingual to ectomet)   1   0.333
1
                              59 (Postparacristule extension)                     1   0.200
0
                              65 (Postmetacrista connects the metastyle)          1   0.333
2
                              71 (Root fusion on upper molars)                    1   0.500
1
                              80 (cristid on lower canine)                        1   0.500
```

```
                                1
                                86 (Diastema p1-p2)                                  1   0.500
                                0
                                88 (Diastema C-P1)                                   1   0.250
                                0
                                89 (Diastema P1-P2)                                  1   0.250
                                0
                                95 (Postparafossa on P3)                             1   0.250
                                1
                                105 (Division in two of the postprotocrista on P)    1   0.333
                                1
                                106 (postprotofossa on P4)                           1   0.333
                                1
node_45 --> prominatherium damaltinum 47 (Height of lingual cingulum compared to unwor)
0.667  0 ==> 1
                                48 (Mesio-distal development of ribs of labial c)    1   0.500
                                (01)
```

APPENDIX S5. Localities recording remains of *Paenanthracotherium* nov. gen. and *Anthracotherium* in the Oligocene of Europe and Asia.

Species	Locality	Country	Age	European Mammal level	References
*Paenanthracotherium bergeri**	La Bénissons-Dieu*	France	Early Olig.	MP24	Depéret (1913), Sieber (1935), Roman & Boucher (1936), Sudre (1995), Escarguel *et al*. (1997), Hugueney (1997), Scherler (2011), this study
	Digoin	France	Early Olig.	MP24	Blainville (1848), Rütimeyer (1857), Kowalevsky (1873), Teller (1886), Stehlin (1910), Depéret (1913), Roman & Boucher (1936), Sudre (1995), Escarguel *et al*. (1997), Hugueney (1997), Scherler (2011), this study
	Le Garouillas	France	Late Olig.	MP25	Hugueney & Guérin (1981), Legendre (1989, 1995), Sudre (1995), BiochroM'97 (1997), Escarguel *et al*. (1997), Scherler *et al*. (2013), this study
	Les Milles	France	Late Olig.	MP26	Brunet (1979), Hellmund (1991), Bonis (coord. 1995), Escarguel *et al*. (1997), Scherler (2011), Scherler *et al*. (2013), this study
	Pech Desse	France	Late Olig.	MP28	Remy *et al*. (1987), Bonis (coord. 1995), Biochrom'97 (1997), Engesser & Mödden (1997), Escarguel *et al*. (1997), Scherler *et al*. (2013), this study
	La Comberatière	France	Late Olig.	MP29	Brunet (1979), BiochroM'97 (1997), Lihoreau *et al*. (2004), Scherler (2011), Scherler *et al*. (2013), this study
	Moissac	France	Oligocene	?	Leymerie (1851), this study
	Lamontgie	France	Oligocene	MP23-29	Blainville (1848), Lavocat (1951), this study
	Petrosani	Romania	Oligocene	?	Scherler (2011), this study
P. hippoïdeum	Céreste	France	Early Olig.	MP22	Geraads *et al*. (1987), this study
	St-Martin-de-Briatexte	France	Early Olig.	MP23	Brunet (1979), this study
	Beuchille	Switzerland	Early Olig.	MP24	Becker *et al*. (2004), Mennecart *et al*. (2011), Scherler (2011), this study
	Seckbach	Germany	Early Olig.	MP22-24	Kinkelin (1884), Stehlin (1910), Roman & Boucher (1936), Ducrocq (1999), Berger *et al*. (2005), Lihoreau & Ducrocq (2007), Scherler (2011), this study
	St-Menoux	France	Oligocene	MP26	Gaudry (1873), Teller (1886), Stehlin (1910), Dal Piaz (1932), Roman & Boucher (1936), Sieber (1935), Hugueney & Guérin (1981), Bonis (coord. 1995), Biochrom'97 (1997), Escarguel *et al*. (1997), Hugueney (1997), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler (2011), Scherler *et al*. (2013), this study
	St-Henri/St-André	France	Late Olig.	MP26	Stehlin (1910), Brunet (1979), Van der Made (1989-90), Hellmund (1991), Biochrom'97 (1997), Escarguel *et al*. (1997), Scherler (2011), Scherler *et al*. (2013), this study
	Aarwangen	Switzerland	Oligocene	MP27	Rütimeyer (1857), Fischer-Ooster (1861), Gaudry (1873), Kowalevsky (1873), Teller (1886), Stehlin (1910), Engesser & Mayo (1987), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler (2011), Scherler *et al*. (2013), this study
E. strategus	Dera Bugti	Pakistan			Forster-Cooper (1913), this study
*A. magnum**	Cadibona*	Italy	Late Olig.	MP25	Cuvier (1822), Rütimeyer (1857), Gastaldi (1863), Gaudry (1873), Kowalevsky

					(1873), Renevier (1880), Lydekker (1885), Teller (1886), Squinabol (1890), Stehlin (1910, 1929), Dal Piaz (1932), Roman & Boucher (1936), Kotsakis (1986), Sudre (1995), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler (2011), Scherler *et al*. (2013), this study
	Aubenas les Alpes	France	Oligocene	MP25	Escarguel *et al*. (1997), Pickford (2016), this study
	La Milloque	France	Late Olig.	MP29	Engesser & Mödden (1997), Escarguel *et al*. (1997), Lihoreau *et al*. (2004), Scherler (2011), Scherler *et al*. (2013)
	Ste-Quitterie	France	Late Olig.	MP29	Escarguel *et al*. (1997), Scherler (2011), Scherler *et al*. (2013)
	Belmont	Switzerland	Late Olig.	MP29	De la Harpe (1854), Engesser & Mödden (1997), Becker *et al*. (2004), Scherler (2011), Scherler *et al*. (2013)
	Rickenbach	Switzerland	Late Olig.	MP29	Becker *et al*. (2004), Scherler (2011), Mennecart *et al*. (2012), Scherler *et al*. (2013), this study
	Rochette	Switzerland	Late Olig.	MP29	De la Harpe (1854), Rütimeyer (1857), Gaudry (1873), Kowalevsky (1873), Renevier (1880), Teller (1886), Stehlin (1910, 1929), Roman & Boucher (1936), Sudre (1995), Engesser & Mödden (1997), Ducrocq (1999), Becker *et al*. (2004), Lihoreau & Ducrocq (2007), Scherler (2011), Scherler *et al*. (2013), this study
	Mouillac	France	Oligocene	?	Scherler (2011), this study
	Huffofen	Germany	Oligocene	?	Scherler (2011), this study
	Braunkohle	Bulgaria	Oligocene	?	Scherler (2011), this study
A. monsvialense	Monteviale	Italy	Early Olig.	MP21	Teller (1886), Zigno (1888), Stehlin (1910), Dal Piaz (1932), Roman & Boucher (1936), Accordi (1951), Golpe-Posse (1971), Brunet (1979), Kotsakis (1986), Sudre (1995), Ducrocq (1999), Uhlig (1999), Lihoreau & Ducrocq (2007), Scherler (2011), this study
	Villebramar	France	Early Olig.	MP22	Brunet (1979), BiochroM'97 (1997), Escarguel *et al*. (1997), this study
	Vaulruz	Switzerland	Early Olig.	MP22	Berger (1992), Berger *et al*. (2005), this study
	Mounayne	France	Early Olig.	MP23	Sudre (1995), BiochroM'97 (1997), Escarguel *et al*. (1997), this study
	Pech Crabit	France	Early Olig.	MP23	Sudre (1995), BiochroM'97 (1997), Escarguel *et al*. (1997), Engesser & Mödden (1997), this study
	Nassiet	France	Oligocene	MP24-25	Viret (1938), Mennecart (2012), this study
	Roqueprune 2	France	Early Olig.	MP23	Bonis (1974), this study
	Pralecini Bolca	Italy	Oligocene	?	Scherler (2011), this study
A. kwablianicum	Benara	Georgia			Gabounia (1964), this study
A. bugtiense	Dera Bugti	Pakistan			Pilgrim (1907), Pilgrim & Cotter (1916), this study
A. chaimanei	Wai Lek Mine	Thailand	Late Eoc.		Ducrocq (1999), Chaimanee *et al*. (2013), this study

Doubtful species or attribution					
A. alsaticum	Lobsann	France	Early Olig.	MP22?	Cuvier (1822), Rütimeyer (1857), Kowalevsky (1873), Teller (1886), Stehlin (1910), Dal Piaz (1932), Roman & Boucher (1936), Brunet (1970, 1979), Tobien (1987), Sudre (1995), Escarguel *et al*. (1997), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler (2011)
A. bimonsvialense-magnum	Montalbán	Spain	Early Olig.	MP23	Golpe-Posse (1972), BiochroM'97 (1997), Lihoreau & Ducrocq (2007), Brunet (1979), Escarguel *et al*. (1997), this study
A.? illyricum	Trifail	Slovenia	Late Olig.	MP25	Hörnes (1876), Teller (1886), Mártonfi (1890), Stehlin (1910, 1929), Sieber (1929, 1935), Roman & Boucher (1936), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler *et al*. (2013)
A.? bumbachense	Bumbach	Switzerland	Late Olig.	MP25	Fischer-Ooster (1861), Kowalevsky (1873), Teller (1886), Renevier (1880), Stehlin (1910), Roman & Boucher (1936), Sudre (1995), Engesser & Mödden (1997), Ducrocq (1999), Lihoreau & Ducrocq (2007), Scherler (2011), Scherler *et al*. (2013)

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APPENDIX S6. Dental measurements (in millimeters) of the three species of *Paenanthracotherium* nov. gen. (*Paen*). Dental measurements (in millimeters) of species of *Anthracotherium* (*Anth*).

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
NMB-D1825	*Paen*	*hippoideum*	Aarwangen	CH	m1	29	22
UCBL-213774 L	*Paen*	*bergeri*	Benissons	FR	m1	37	26,5
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	m1	38	25
UCBL-213774 R	*Paen*	*bergeri*	Benissons	FR	m1	38	24,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m1	31	20,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m1	30,5	22,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m1	28,5	17
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m1	29,5	21
SFRM-M8383	*Anth*	*magnum*	Cadibona	IT	m1	26,5	20,5
UCBL-9590 L	*Paen*	*hippoideum*	Cereste	FR	m1	32	25
UCBL-9589 R	*Paen*	*hippoideum*	Cereste	FR	m1	32	24
MNHN–AGN109	*Paen*	*bergeri*	Comberatière	FR	m1	35	24
NHM-M11057	*Anth*	*bugtiense*	Dera Bugti	PK	m1	42,8	29,3
UM GAR2313	*Paen*	*bergeri*	Garouillas	FR	m1	32,9	25,6
UCBL-9397	*Paen*	*hippoideum*	St Henri	FR	m1	33	22,5
?	*Paen*	*hippoideum*	St Henri	FR	m1	31,5	21,5
LIM161 (UM3520)	*Paen*	*bergeri*	LaMontgie	FR	m1	33,6	25,8
NMB-Bx16	*Paen*	*hippoideum*	St Martin	FR	m1	24,5	19
UCBL9397	*Paen*	*bergeri*	Milles	FR	m1	34	22,8
MHNT.PAL.MAM.2002.3	*Paen*	*bergeri*	Moissac	FR	m1	35	25
MGP-PD27378	*Anth*	*monsvialense*	Monteviale	IT	m1	28,34	21,4
MGP-PD31482	*Anth*	*monsvialense*	Monteviale	IT	m1	28	19,6
MGP-PD31432	*Anth*	*monsvialense*	Monteviale	IT	m1	26,3	19,8
MGP-PD31493	*Anth*	*monsvialense*	Monteviale	IT	m1	28	20,8
MGP-PD31498	*Anth*	*monsvialense*	Monteviale	IT	m1	33	25,3
MGP-PD31497	*Anth*	*monsvialense*	Monteviale	IT	m1	24,2	17,5
MGP-PD27375	*Anth*	*monsvialense*	Monteviale	IT	m1	22,2	17,4
MGP-PD27379	*Anth*	*monsvialense*	Monteviale	IT	m1	23,8	
MGP-PD27384	*Anth*	*monsvialense*	Monteviale	IT	m1	26	18
MGP-PD27386	*Anth*	*monsvialense*	Monteviale	IT	m1	30,4	22,7
MGP-PD31412	*Anth*	*monsvialense*	Monteviale	IT	m1	25,2	18,8
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	m1	31	22,5
NMB-IO46	*Anth*	*monsvialense*	Monteviale	IT	m1	25	18,5
MNHN-QU4186	*Anth*	*magnum*	Mouillac	FR	m1	40,5	30,5
UCBL-7805	*Anth*	*magnum*	Mouillac	FR	m1	28,2	19,7
NMB-TO991	*Paen*	*bergeri*	Petrosani	RO	m1	41	29
SFM-M8382	*Anth*	*monsvialense*	Pralecini	IT	m1	26,5	21
UM ACQ-303	*Anth*	*monsvialense*	Quercy	FR	m1	26,4	17,8
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m1	30,5	21,5
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m1	28	18,5
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m1	28,5	20
NMB-HR3	*Anth*	*magnum*	Rickenbach	CH	m1	35	26
NMB-HR144	*Anth*	*magnum*	Rickenbach	CH	m1	39	30
MGL-082189	*Anth*	*magnum*	Rochette	CH	m1	36	26
MGL-082189	*Anth*	*magnum*	Rochette	CH	m1	38,5	29
UM ROQ2-152	*Anth*	*monsvialense*	Roqueprune	FR	m1	28,4	19,1
MHNF-19853	*Anth*	*monsvialense*	Vaulruz	CH	m1	26	19
NMB-vbr106	*Anth*	*monsvialense*	Villebramar	FR	m1	27,5	19,5
NMB-vbr105	*Anth*	*monsvialense*	Villebramar	FR	m1	21	15
TF2637	*Anth*	*chaimanei*	Wai Lek	TH	m1	24,8	19,5
TF2652	*Anth*	*chaimanei*	Wai Lek	TH	m1	25,3	17,6
TF2653	*Anth*	*chaimanei*	Wai Lek	TH	m1	25,7	18,1
UCBL-9670	*Anth*	*monsvialense*	Nassiet	FR	m1	28,1	20,8

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
NMB-D1825	*Paen*	*hippoideum*	Aarwangen	CH	m2	34,5	25,5
UCBL-213772 L	*Paen*	*bergeri*	Benissons	FR	m2	46,5	31,5
UCBL-213774 L	*Paen*	*bergeri*	Benissons	FR	m2	45	31
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	m2	46,5	32
UCBL-213774 R	*Paen*	*bergeri*	Benissons	FR	m2	46	31,5
NHM-OR197	*Anth*	*magnum*	Cadibona	IT	m2	35,5	25,5
NHM-M75	*Anth*	*magnum*	Cadibona	IT	m2	36	25
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m2	36,5	25,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m2	36	23
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m2	35	24,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m2	37,5	25,5
SFM-M8383	*Anth*	*magnum*	Cadibona	IT	m2	34,5	25,5
SFM-TI456b	*Anth*	*magnum*	Cadibona	IT	m2	44,5	29
UCBL9591 L	*Paen*	*hippoideum*	Cereste	FR	m2	39	27,5
MNHN–AGN109	*Paen*	*bergeri*	Comberatière	FR	m2	43,5	30,5
M12701	*Paen*	*strategus*	Dera Bugti	PK	m2	42	33
NHM-M11057	*Anth*	*bugtiense*	Dera Bugti	PK	m2	54,5	37,5
NHM-M12058	*Anth*	*bugtiense*	Dera Bugti	PK	m2	57	45,5
NHM-M12698	*Anth*	*bugtiense*	Dera Bugti	PK	m2	64	44
NHM-M12699	*Anth*	*bugtiense*	Dera Bugti	PK	m2	47	37,5
NHM-M12700	*Anth*	*bugtiense*	Dera Bugti	PK	m2	59	48,5
NMB-58	*Paen*	*bergeri*	Digoin	FR	m2	46,5	31
UM GAR2313	*Paen*	*bergeri*	Garouillas	FR	m2	43,1	31,5
UCBL-9397	*Paen*	*hippoideum*	St Henri	FR	m2	37,5	27
UCBL-9397	*Paen*	*hippoideum*	St Henri	FR	m2	41,5	28,5
?	*Paen*	*hippoideum*	St Henri	FR	m2	39	27
LIM161 (UM3520)	*Paen*	*bergeri*	LaMontgie	FR	m2	41,4	33
NMB-Bx16	*Paen*	*hippoideum*	St Martin	FR	m2	31,5	22,5
UCBL9397	*Paen*	*bergeri*	Milles	FR	m2	40,1	29
MHNT.PAL.MAM.2002.3	*Paen*	*bergeri*	Moissac	FR	m2	46,5	30
MHNT.PAL.MAM.2014.1857	*Paen*	*bergeri*	Moissac	FR	m2	41,8	29,1
MGP-PD27378	*Anth*	*monsvialense*	Monteviale	IT	m2	34,5	26,3
MGP-PD31432	*Anth*	*monsvialense*	Monteviale	IT	m2	31,9	24,1
MGP-PD31493	*Anth*	*monsvialense*	Monteviale	IT	m2	34,6	27,2
MGP-PD31498	*Anth*	*monsvialense*	Monteviale	IT	m2	38	28,8
MGP-PD31497	*Anth*	*monsvialense*	Monteviale	IT	m2	31,6	20,5
MGP-PD27375	*Anth*	*monsvialense*	Monteviale	IT	m2	27,6	21,7
MGP-PD27377	*Anth*	*monsvialense*	Monteviale	IT	m2	33,9	24,3
MGP-PD27379	*Anth*	*monsvialense*	Monteviale	IT	m2	29	
MGP-PD27381	*Anth*	*monsvialense*	Monteviale	IT	m2	31,8	23,6
MGP-PD27383	*Anth*	*monsvialense*	Monteviale	IT	m2	31,5	22,3
MGP-PD31412	*Anth*	*monsvialense*	Monteviale	IT	m2	30,3	24,2
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	m2	29	22,5
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	m2	33,5	24
MNHN-QU4186	*Anth*	*magnum*	Mouillac	FR	m2	47	37,5
UCBL-7805	*Anth*	*magnum*	Mouillac	FR	m2	34,9	24,4
UM PDS-2556	*Paen*	*bergeri*	Pech Desse	FR	m2	49	38,6
UM PDS-2554	*Paen*	*bergeri*	Pech Desse	FR	m2	47,3	34,4
NMB-TO991	*Paen*	*bergeri*	Petrosani	RO	m2	49,5	36
SFM-M8382	*Anth*	*monsvialense*	Pralecini	IT	m2	34,5	27
UM ACQ-303	*Anth*	*monsvialense*	Quercy	FR	m2	31,4	21,7
UM ACQ5375	*Anth*	*monsvialense*	Quercy	FR	m2	37,1	25,3
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m2	37	26,5
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m2	34,5	24
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m2	36	27,5
MGL-082189	*Anth*	*magnum*	Rochette	CH	m2	42,5	31

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
MGL-082189	*Anth*	*magnum*	Rochette	CH	m2	44,5	35
MHNF-19853	*Anth*	*monsvialense*	Vaulruz	CH	m2	35	24
NMB-vbr106	*Anth*	*monsvialense*	Villebramar	FR	m2	34	23
NMB-vbr105	*Anth*	*monsvialense*	Villebramar	FR	m2	32	21,5
TF2637	*Anth*	*chaimanei*	Wai Lek	TH	m2	33,6	26
TF2715	*Anth*	*chaimanei*	Wai Lek	TH	m2	34,2	26,9
UCBL-9670	*Anth*	*monsvialense*	Nassiet	FR	m2	31,3	26,1
NMB-D1825	*Paen*	*hippoideum*	Aarwangen	CH	m3	55	28
3.003.270	*Anth*	*magnum*	Aubenas	FR	m3		27,7
UCBL-213774 L	*Paen*	*bergeri*	Benissons	FR	m3	70,5	37,5
UCBL-213772 L	*Paen*	*bergeri*	Benissons	FR	m3	77	34,5
UCBL-213774 R	*Paen*	*bergeri*	Benissons	FR	m3	71	38
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	m3	76,5	37,5
Gabunia X	*Anth*	*kwablianicum*	Benara	GE	m3	78	40,5
NMB-OE556 (cast)	*Anth*	*magnum*	Braunkohle	BG	m3	79	33,5
NHM-OR197	*Anth*	*magnum*	Cadibona	IT	m3	70	32
NHM-M75	*Anth*	*magnum*	Cadibona	IT	m3	58,5	29
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m3	59,5	26,5
SFM-M8383	*Anth*	*magnum*	Cadibona	IT	m3	70,5	37,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m3	57,5	31
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	m3	51	28
UCBL-9593	*Paen*	*hippoideum*	Cereste	FR	m3		31
MNHN–AGN109	*Paen*	*bergeri*	Comberatière	FR	m3	66,5	32
M12029	*Paen*	*strategus*	Dera Bugti	PK	m3	80	37
NHM-M12696	*Anth*	*bugtiense*	Dera Bugti	PK	m3	98,5	50
NHM-M12697	*Anth*	*bugtiense*	Dera Bugti	PK	m3	92	46,5
NHM-M12698	*Anth*	*bugtiense*	Dera Bugti	PK	m3	83	44
NMB-57	*Paen*	*bergeri*	Digoin	FR	m3	74	39
UM GAR2313	*Paen*	*bergeri*	Garouillas	FR	m3	66,7	33,1
UCBL-9397	*Paen*	*hippoideum*	St Henri	FR	m3	61	31
?	*Paen*	*hippoideum*	St Henri	FR	m3	59	31
LIM161 (UM3520)	*Paen*	*bergeri*	LaMontgie	FR	m3	67,2	33,5
NMB-Bx16	*Paen*	*hippoideum*	St Martin	FR	m3	50	24
UCBL212876	*Paen*	*hippoideum*	St Menoux	FR	m3	63,5	31,5
UCBL212877	*Paen*	*hippoideum*	St Menoux	FR	m3	62,5	30
UCBL212878	*Paen*	*hippoideum*	St Menoux	FR	m3	56,5	29,5
UCBL9397	*Paen*	*bergeri*	Milles	FR	m3	60,4	31,7
MHNT.PAL.MAM.2002.3	*Paen*	*bergeri*	Moissac	FR	m3	66,5	32,5
MGP-PD27378	*Anth*	*monsvialense*	Monteviale	IT	m3		28,8
MGP-PD31479	*Anth*	*monsvialense*	Monteviale	IT	m3	50,8	28,7
MGP-PD12837	*Anth*	*monsvialense*	Monteviale	IT	m3		28
MGP-PD31484	*Anth*	*monsvialense*	Monteviale	IT	m3	49,4	18,5
MGP-PD31432	*Anth*	*monsvialense*	Monteviale	IT	m3	50,2	27,3
MGP-PD31493	*Anth*	*monsvialense*	Monteviale	IT	m3	51,9	29
MGP-PD27359	*Anth*	*monsvialense*	Monteviale	IT	m3	36,3	39
MGP-PD27375	*Anth*	*monsvialense*	Monteviale	IT	m3	43,1	23,8
MGP-PD27376	*Anth*	*monsvialense*	Monteviale	IT	m3	49,8	27,2
MGP-PD27377	*Anth*	*monsvialense*	Monteviale	IT	m3	49,3	27,1
MGP-PD27379	*Anth*	*monsvialense*	Monteviale	IT	m3	48,3	26,5
MGP-PD27380	*Anth*	*monsvialense*	Monteviale	IT	m3	56,4	30,6
MGP-PD31414	*Anth*	*monsvialense*	Monteviale	IT	m3	48,6	28
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	m3	44,5	25,5
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	m3	45	25,5
MNHN-QU4186	*Anth*	*magnum*	Mouillac	FR	m3	83	42,5
UCBL-7743	*Anth*	*magnum*	Mouillac	FR	m3	83,5	40,5
UCBL-7744	*Anth*	*magnum*	Mouillac	FR	m3	53,7	27,7

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
UCBL-7804	*Anth*	*magnum*	Mouillac	FR	m3	52,3	25,9
NMB-TO991	*Paen*	*bergeri*	Petrosani	RO	m3	80,5	41,5
SFM-M8382	*Anth*	*monsvialense*	Pralecini	IT	m3	56,5	31
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m3	50,5	25
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m3	53,5	25,5
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	m3	53	27,5
MGL-082189	*Anth*	*magnum*	Rochette	CH	m3	55,5	31
MGL-082189	*Anth*	*magnum*	Rochette	CH	m3	52,5	34,5
SMF-M3962	*Paen*	*hippoideum*	Seckbach	D	m3		32,5
MHNF-19853	*Anth*	*monsvialense*	Vaulruz	CH	m3	52,5	26
NMB-vbr106	*Anth*	*monsvialense*	Villebramar	FR	m3	52	27
NMB-vbr107	*Anth*	*monsvialense*	Villebramar	FR	m3	51	24
UP vil	*Anth*	*monsvialense*	Villebramar	FR	m3	46,2	26,1
TF2637	*Anth*	*chaimanei*	Wai Lek	TH	m3	56,1	29,4
TF2669	*Anth*	*chaimanei*	Wai Lek	TH	m3	55,1	27
UCBL-9670	*Anth*	*monsvialense*	Nassiet	FR	m3		27,9
3.003.102	*Anth*	*magnum*	Aubenas	FR	M1		40
UCBL-213773 L	*Paen*	*bergeri*	Benissons	FR	M1	36,5	40
UCBL-213773 R	*Paen*	*bergeri*	Benissons	FR	M1	37,5	41
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	M1	36,5	41
NHM-M750?	*Anth*	*magnum*	Cadibona	IT	M1	30,5	33,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M1	32	32
SFM8384	*Anth*	*magnum*	Cadibona	IT	M1	27,5	31,5
NHM-M12052	*Anth*	*bugtiense*	Dera Bugti	PK	M1	47	48
NMB-Mar662	*Paen*	*hippoideum*	St Henri	FR	M1	34,5	37
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M1	35	38
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M1	36	38,5
NMB-Bx15	*Paen*	*hippoideum*	St Martin	FR	M1	29	29
UCBL212887	*Paen*	*hippoideum*	St Menoux	FR	M1	32	35
UCBL9411	*Paen*	*bergeri*	Milles	FR	M1	29,1	32,1
MGP-PD31491	*Anth*	*monsvialense*	Monteviale	IT	M1	25,6	27,7
MGP-PD31502	*Anth*	*monsvialense*	Monteviale	IT	M1	25	27,3
MGP-PD27363	*Anth*	*monsvialense*	Monteviale	IT	M1	25,8	29,6
MGP-PD27366	*Anth*	*monsvialense*	Monteviale	IT	M1	22,7	28,2
MGP-PD31411	*Anth*	*monsvialense*	Monteviale	IT	M1	28,5	30,6
NMB-IO31	*Anth*	*monsvialense*	Monteviale	IT	M1	28,5	32
IPS-1738	*Anth*	*bimons*	Montalban	ESP	M1	26,5	29
UCBL-7862	*Anth*	*magnum*	Mouillac	FR	M1	35,3	35,5
MNHN-QU1044	*Paen*	*hippoideum*	Quercy	FR	M1	29,5	33,5
UM ACQ-5385	*Anth*	*monsvialense*	Quercy	FR	M1	37,9	43,8
UM ACQ-6608 (cast)	*Anth*	*monsvialense*	Quercy	FR	M1	27	31,6
UMACQ5355	*Anth*	*monsvialense*	Quercy	FR	M1	29,2	30,9
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	M1	30	33
NMB-HR240	*Anth*	*magnum*	Rickenbach	CH	M1	32,5	33,5
MGL-082189	*Anth*	*magnum*	Rochette	CH	M1	33,5	43
MGL-082189	*Anth*	*magnum*	Rochette	CH	M1	33,5	43,5
UM ROQ2-154	*Anth*	*monsvialense*	Roqueprune	FR	M1		37,3
SMF-M3965	*Paen*	*hippoideum*	Seckbach	D	M1	31,5	35,5
TF2636r	*Anth*	*chaimanei*	Wai Lek	TH	M1	22,7	28
TF2636l	*Anth*	*chaimanei*	Wai Lek	TH	M1	23,3	28,1
TF2714	*Anth*	*chaimanei*	Wai Lek	TH	M1	25,8	28,8
TF2727	*Anth*	*chaimanei*	Wai Lek	TH	M1	24,5	29,4
3.003.226	*Anth*	*magnum*	Aubenas	FR	M2	44	
3.003.101	*Anth*	*magnum*	Aubenas	FR	M2	46	
UCBL-213773 L	*Paen*	*bergeri*	Benissons	FR	M2	43,5	50,5
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	M2	49,5	54,5

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
UCBL-213773 R	*Paen*	*bergeri*	Benissons	FR	M2	44,5	50,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M2	39,5	46
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M2	37	42,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M2	35,5	38
SFM8384	*Anth*	*magnum*	Cadibona	IT	M2	40,5	44
M12695	*Paen*	*strategus*	Dera Bugti	PK	M2	45	48,5
NHM-M9572	*Anth*	*bugtiense*	Dera Bugti	PK	M2	48	52,5
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M2	51,5	52,5
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M2	51	53
NMB-Bx15	*Paen*	*hippoideum*	St Martin	FR	M2	34	
UCBL212887	*Paen*	*hippoideum*	St Menoux	FR	M2	38	43
UM LMS-07AC	*Paen*	*bergeri*	Milles	FR	M2	49,9	56,8
UCBL9411	*Paen*	*bergeri*	Milles	FR	M2		42,6
MHNT.PAL.MAM.2014.1857	*Paen*	*bergeri*	Moissac	FR	M2	42,7	46,1
MGP-PD27359	*Anth*	*monsvialense*	Monteviale	IT	M2	30,6	35,7
MGP-PD31491	*Anth*	*monsvialense*	Monteviale	IT	M2	30,6	33,9
MGP-PD31492	*Anth*	*monsvialense*	Monteviale	IT	M2	30,6	33,7
MGP-PD31501	*Anth*	*monsvialense*	Monteviale	IT	M2	32,7	37,7
MGP-PD31495	*Anth*	*monsvialense*	Monteviale	IT	M2	33,6	
MGP-PD31502	*Anth*	*monsvialense*	Monteviale	IT	M2	31,6	36
MGP-PD27361L	*Anth*	*monsvialense*	Monteviale	IT	M2	26,6	27,8
MGP-PD27361R	*Anth*	*monsvialense*	Monteviale	IT	M2	26,5	26,2
MGP-PD27363	*Anth*	*monsvialense*	Monteviale	IT	M2	31,6	36,9
MGP-PD27364L	*Anth*	*monsvialense*	Monteviale	IT	M2	30,8	35
MGP-PD27364R	*Anth*	*monsvialense*	Monteviale	IT	M2	31,1	34,7
MGP-PD27366	*Anth*	*monsvialense*	Monteviale	IT	M2	29,4	34,1
MGP-PD31413	*Anth*	*monsvialense*	Monteviale	IT	M2	31,2	35,2
NMB-IO31	*Anth*	*monsvialense*	Monteviale	IT	M2	33	38
IPS-1738	*Anth*	*bimons*	Montalban	ESP	M2	36	38
UCBL-7861	*Anth*	*magnum*	Mouillac	FR	M2	38,8	43
UM PCT-1111	*Anth*	*monsvialense*	Pech Crabit	FR	M2	39,8	40
UM PDS-2550	*Paen*	*bergeri*	Pech Desse	FR	M2	54,7	
UM PDS-2558	*Paen*	*bergeri*	Pech Desse	FR	M2	50,6	57,3
MNHN-QU1044	*Paen*	*hippoideum*	Quercy	FR	M2	36,5	41
MNHN-QU4184	*Paen*	*hippoideum*	Quercy	FR	M2	35	40
UM ACQ-6608 (cast)	*Anth*	*monsvialense*	Quercy	FR	M2	38,5	33,6
UM ACQ5210	*Anth*	*monsvialense*	Quercy	FR	M2	39,4	44,7
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	M2	34	38
NMB-HR141	*Anth*	*magnum*	Rickenbach	CH	M2	52,5	59
MGL-082189	*Anth*	*magnum*	Rochette	CH	M2	49	55
MGL-082189	*Anth*	*magnum*	Rochette	CH	M2	49	55
SMF-M3958	*Paen*	*hippoideum*	Seckbach	D	M2	44	45,5
TF2636r	*Anth*	*chaimanei*	Wai Lek	TH	M2	31,5	37,1
TF2636l	*Anth*	*chaimanei*	Wai Lek	TH	M2	32,2	38,5
UCBL-9671	*Anth*	*monsvialense*	Nassiet	FR	M2	39,6	45,6
3.003.099	*Anth*	*magnum*	Aubenas	FR	M3	51	60,3
UCBL-213773 L	*Paen*	*bergeri*	Benissons	FR	M3	50	59,5
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	M3	56,5	
UCBL-213773 R	*Paen*	*bergeri*	Benissons	FR	M3	55	59,5
Gabunia X	*Anth*	*kwablianicum*	Benara	GE	M3	54	57
MJSN-BEU001-200	*Paen*	*hippoideum*	Beuchille	CH	M3	48	53
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M3	45,5	49
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	M3	49,5	56
NHM-M29593	*Anth*	*magnum*	Cadibona	IT	M3	44	48
M12694	*Paen*	*strategus*	Dera Bugti	PK	M3	50,5	58
NHM-M9572	*Anth*	*bugtiense*	Dera Bugti	PK	M3	61,5	63

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
UM DB-LCJ1-2	*Anth*	*bugtiense*	Dera Bugti	PK	M3	65,4	64
UM 1449 (cast)	*Paen*	*bergeri*	Digoin	FR	M3	50,3	52,6
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M3	59	63
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	M3	59,5	63
NMB-Bx15	*Paen*	*hippoideum*	St Martin	FR	M3	38	43
UCBL212888	*Paen*	*hippoideum*	St Menoux	FR	M3	46	54
UCBL9616	*Paen*	*bergeri*	Milles	FR	M3	48,6	47,5
MGP-PD27359	*Anth*	*monsvialense*	Monteviale	IT	M3	36,2	37,6
MGP-PD31501	*Anth*	*monsvialense*	Monteviale	IT	M3	40,2	43
MGP-PD31495	*Anth*	*monsvialense*	Monteviale	IT	M3	41,3	39,6
MGP-PD27361L	*Anth*	*monsvialense*	Monteviale	IT	M3	32,6	34
MGP-PD27361R	*Anth*	*monsvialense*	Monteviale	IT	M3	31,6	35
MGP-PD27363	*Anth*	*monsvialense*	Monteviale	IT	M3	41,8	45,6
MGP-PD27364L	*Anth*	*monsvialense*	Monteviale	IT	M3	36,5	39
MGP-PD27364r	*Anth*	*monsvialense*	Monteviale	IT	M3	35	38,7
MGP-PD27366	*Anth*	*monsvialense*	Monteviale	IT	M3	33,5	37,2
MGP-PD31410	*Anth*	*monsvialense*	Monteviale	IT	M3	35,6	40,7
MGP-PD31413	*Anth*	*monsvialense*	Monteviale	IT	M3	35,3	40
IPS-1738	*Anth*	*bimons*	Montalban	ESP	M3	39	41
MNHN-QU1027	*Anth*	*magnum*	Mouillac	FR	M3	55	65
UCBL-7861	*Anth*	*magnum*	Mouillac	FR	M3		49
UM MOU-550	*Anth*	*monsvialense*	Mounayne	FR	M3	37,9	41,7
MNHN-QU1056	*Paen*	*hippoideum*	Quercy	FR	M3	39,5	43,5
UM ACQ-5383	*Anth*	*monsvialense*	Quercy	FR	M3	42	45,6
UM ACQ-5382	*Anth*	*monsvialense*	Quercy	FR	M3	41,4	45,7
UM ACQ-6608 (cast)	*Anth*	*monsvialense*	Quercy	FR	M3	39,3	42
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	M3	40	43
NMB-UM3184	*Anth*	*magnum*	Rickenbach	CH	M3	56,5	68,5
NMB-HR188	*Anth*	*magnum*	Rickenbach	CH	M3	57,5	69
MGL-082189	*Anth*	*magnum*	Rochette	CH	M3	58,5	63,5
MGL-082189	*Anth*	*magnum*	Rochette	CH	M3	56	60,5
SMF-M3954	*Paen*	*hippoideum*	Seckbach	D	M3	50,5	54,5
UP vil	*Anth*	*monsvialense*	Villebramar	FR	M3	38,5	42,9
TF2636r	*Anth*	*chaimanei*	Wai Lek	TH	M3	37,3	42,8
TF2636l	*Anth*	*chaimanei*	Wai Lek	TH	M3	38,5	42,5
TF2646	*Anth*	*chaimanei*	Wai Lek	TH	M3	40	46,2
TF2647	*Anth*	*chaimanei*	Wai Lek	TH	M3	40	45,5
TF2716	*Anth*	*chaimanei*	Wai Lek	TH	M3	44,6	
UCBL-9671	*Anth*	*monsvialense*	Nassiet	FR	M3	43,3	51,3
NMB-D1825	*Paen*	*hippoideum*	Aarwangen	CH	p4	25,5	18,5
3.005.626	*Anth*	*magnum*	Aubenas	FR	p4		15,4
3.003.249	*Anth*	*magnum*	Aubenas	FR	p4	31,8	17,7
UCBL-213772 L	*Paen*	*bergeri*	Benissons	FR	p4	35	22
UCBL-213774 L	*Paen*	*bergeri*	Benissons	FR	p4	36	21
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	p4	38	21
UCBL-213774 R	*Paen*	*bergeri*	Benissons	FR	p4	34	22
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	p4	27,5	15,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	p4	31	19
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	p4	30	16
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	p4	28	17
SFM-M8383	*Anth*	*magnum*	Cadibona	IT	p4	24	14
MNHN–AGN109	*Paen*	*bergeri*	Comberatière	FR	p4	31,5	18,5
NHM-M11057	*Anth*	*bugtiense*	Dera Bugti	PK	p4	34	21,5
NHM-M12050	*Anth*	*bugtiense*	Dera Bugti	PK	p4	37	24,5
UM GAR2313	*Paen*	*bergeri*	Garouillas	FR	p4	32,1	20,8
UCBL-9397	*Paen*	*hippoideum*	St Henri	FR	p4	31,5	21,5

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
?	*Paen*	*hippoideum*	St Henri	FR	p4	31	19
LIM161 (UM3520)	*Paen*	*bergeri*	LaMontgie	FR	p4	32,2	20,7
NMB-Bx16	*Paen*	*hippoideum*	St Martin	FR	p4	23,5	16
UCBL9397	*Paen*	*bergeri*	Milles	FR	p4	31,5	21,4
MHNT.PAL.MAM.2002.3	*Paen*	*bergeri*	Moissac	FR	p4	33,5	20
MGP-PD31480	*Anth*	*monsvialense*	Monteviale	IT	p4	25,2	
MGP-PD31493	*Anth*	*monsvialense*	Monteviale	IT	p4	27,3	16,5
MGP-PD27375	*Anth*	*monsvialense*	Monteviale	IT	p4	21,9	14,1
MGP-PD27379	*Anth*	*monsvialense*	Monteviale	IT	p4	22,5	
MGP-PD27384	*Anth*	*monsvialense*	Monteviale	IT	p4	27,2	15
NMB-IO32	*Anth*	*monsvialense*	Monteviale	IT	p4	23	14
MNHN-QU4186	*Anth*	*magnum*	Mouillac	FR	p4	36	23
UM PDS-2555	*Paen*	*bergeri*	Pech Desse	FR	p4	42	25,2
UM PDS-1578	*Paen*	*bergeri*	Pech Desse	FR	p4	39,1	24,7
UM ACQ-303	*Anth*	*monsvialense*	Quercy	FR	p4	26,4	14,5
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	p4	27,5	17
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	p4	28,5	16
NMB-HR3	*Anth*	*magnum*	Rickenbach	CH	p4	33,5	21,5
MGL-082189	*Anth*	*magnum*	Rochette	CH	p4	25,5	17
MGL-082189	*Anth*	*magnum*	Rochette	CH	p4	27	18
MHNF-19853	*Anth*	*monsvialense*	Vaulruz	CH	p4	26	14,5
NMB-vbr106	*Anth*	*monsvialense*	Villebramar	FR	p4	25,5	14
NMB-vbr105	*Anth*	*monsvialense*	Villebramar	FR	p4	25	13,5
NMB-vbr108	*Anth*	*monsvialense*	Villebramar	FR	p4	25,5	13
TF2637	*Anth*	*chaimanei*	Wai Lek	TH	p4	26,4	16
TF2711	*Anth*	*chaimanei*	Wai Lek	TH	p4		15,1
TF2712	*Anth*	*chaimanei*	Wai Lek	TH	p4	24,6	14,4
UCBL-9670	*Anth*	*monsvialense*	Nassiet	FR	p4	26,7	16,4
3.007.731	*Anth*	*magnum*	Aubenas	FR	P4	25,3	31
3.005.625	*Anth*	*magnum*	Aubenas	FR	P4	24,8	34
3.003.277	*Anth*	*magnum*	Aubenas	FR	P4	24,7	
UCBL-213773 L	*Paen*	*bergeri*	Benissons	FR	P4	24,5	33,5
UCBL-213772 R	*Paen*	*bergeri*	Benissons	FR	P4	27	36,5
UCBL-213773 R	*Paen*	*bergeri*	Benissons	FR	P4	26	35
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	P4	22	32,5
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	P4	22	29
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	P4	23	29
NHM-M7136	*Anth*	*magnum*	Cadibona	IT	P4	22	30,5
SFM8384	*Anth*	*magnum*	Cadibona	IT	P4	22,5	31
M12695	*Paen*	*strategus*	Dera Bugti	PK	P4	28,5	35,5
NHM-M12045	*Anth*	*bugtiense*	Dera Bugti	PK	P4	26	34
NHM-M12046	*Anth*	*bugtiense*	Dera Bugti	PK	P4	30	39
NHM-M12047	*Anth*	*bugtiense*	Dera Bugti	PK	P4	31,5	32
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	P4	25,5	35,5
MNHN-OR28770	*Anth*	*magnum*	Huffhofen	D	P4	25,5	35
NMB-Bx15	*Paen*	*hippoideum*	St Martin	FR	P4	18	21,5
UCBL212882	*Paen*	*hippoideum*	St Menoux	FR	P4	20	30,5
UCBL212879	*Paen*	*hippoideum*	St Menoux	FR	P4	20,5	26,5
UCBL212880	*Paen*	*hippoideum*	St Menoux	FR	P4	20	31
UCBL212881	*Paen*	*hippoideum*	St Menoux	FR	P4	22,5	30,5
MGP-PD31486	*Anth*	*monsvialense*	Monteviale	IT	P4	21,4	27,1
MGP-PD31306a	*Anth*	*monsvialense*	Monteviale	IT	P4	25,7	28,9
MGP-PD31306b	*Anth*	*monsvialense*	Monteviale	IT	P4	20,8	25,9
MGP-PD31497	*Anth*	*monsvialense*	Monteviale	IT	P4	19,8	25,2
MGP-PD27363	*Anth*	*monsvialense*	Monteviale	IT	P4	21,3	28,6
NMB-IO31	*Anth*	*monsvialense*	Monteviale	IT	P4	21	25,5

	Gen.	Sp.	Locality	Country	Tooth	Length	Width
IPS-1738	*Anth*	*bimons*	Montalban	ESP	P4	21,5	26,5
UM PDS-2553	*Paen*	*bergeri*	Pech Desse	FR	P4	27,4	34,2
UM PDS-1609	*Paen*	*bergeri*	Pech Desse	FR	P4	27,5	35,4
UM PDS-1608	*Paen*	*bergeri*	Pech Desse	FR	P4	28,7	35,7
UM PDS-1607	*Paen*	*bergeri*	Pech Desse	FR	P4	30,2	36,3
UM PDS-2551	*Paen*	*bergeri*	Pech Desse	FR	P4	29,4	33,8
UM ACQ-6608 (cast)	*Anth*	*monsvialense*	Quercy	FR	P4	18,8	27,8
UMACQ 5378	*Anth*	*monsvialense*	Quercy	FR	P4	24,9	35,4
MNHN-?Lau	*Anth*	*monsvialense*	Quercy	FR	P4	20	26
NMO-I12/22	*Anth*	*magnum*	Rickenbach	CH	P4	28,5	39
NMO-I11/74	*Anth*	*magnum*	Rickenbach	CH	P4	30	39
NMB-UM948	*Anth*	*magnum*	Rickenbach	CH	P4	27,5	37
MGL-082189	*Anth*	*magnum*	Rochette	CH	P4	26	38
MGL-082189	*Anth*	*magnum*	Rochette	CH	P4	26	36,5
UM ROQ2-151	*Anth*	*monsvialense*	Roqueprune	FR	P4	20,4	25,8
SMF-M3957	*Paen*	*hippoideum*	Seckbach	D	P4	23,5	30
SMF-M3956	*Paen*	*hippoideum*	Seckbach	D	P4	23,5	31
TF2636r	*Anth*	*chaimanei*	Wai Lek	TH	P4	18,3	23,6
TF2636l	*Anth*	*chaimanei*	Wai Lek	TH	P4	18,6	25