

SUPPLEMENTARY INFORMATION

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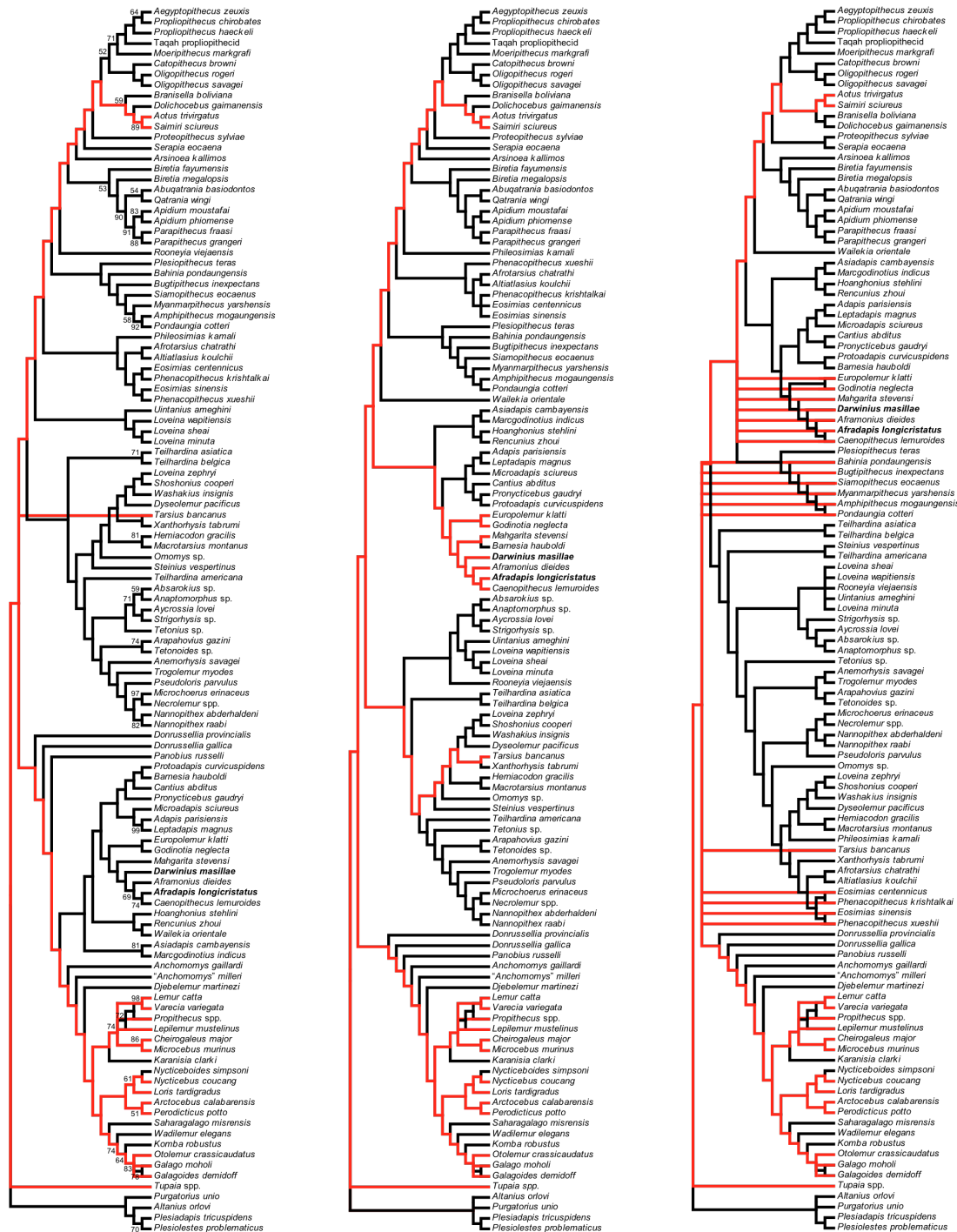
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Part I. Dental measurements of *Afradapis longicristatus*, gen. et sp. nov., in millimeters. DPC = Duke Lemur Center Division of Fossil Primates; CGM = Egyptian Geological Museum.

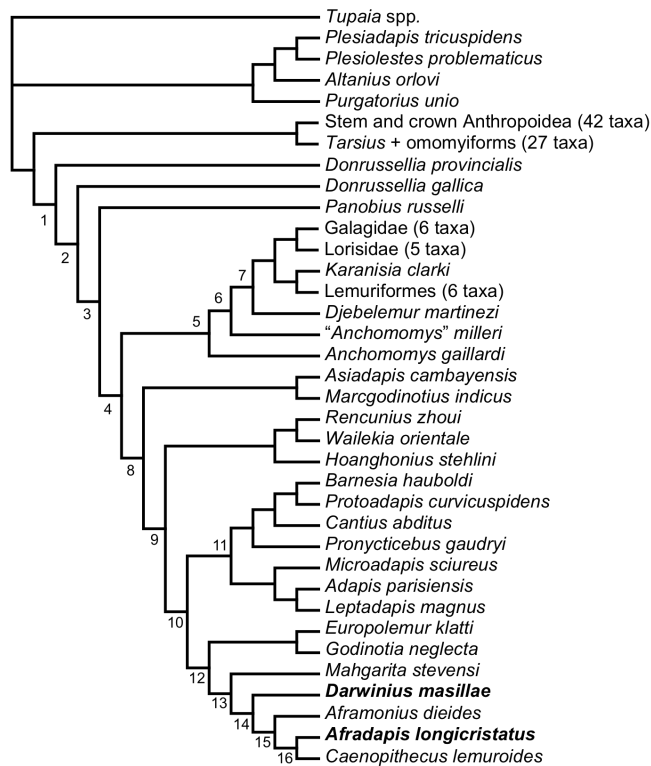
Specimen	Locus	Length	Width	Trigonid width	Talonid width
DPC 21639E	I ₁	2.5	2.35		
DPC 21639G	I ₁	2.7	3		
DPC 21456I	I ₂	2.35	3.2		
DPC 24085A	Lower canine	5.38	3.95		
DPC 21365E	Lower canine	5.39	4		
DPC 21759D	Lower canine	5.1	3.74		
DPC 21759E	Lower canine	5.2	3.96		
DPC 21759F	Lower canine	5.27	3.87		
DPC 21365E	Lower canine	5.47	4.32		
DPC 21500H	P ₃	7.35	3.55		
DPC 21500I	P ₃	8	3.6		
DPC 21500J	P ₃	7.45	3.5		
DPC 21458F	P ₃	7.5	3.6		
DPC 21487J	P ₃	7.5	3.4		
DPC 24085A	P ₃	6.9	3.55		
DPC 21548I	P ₄	6.15	3.6		
DPC 21548E	P ₄	6.2	4		
DPC 21548D	P ₄	5.95	3.7		
DPC 21458F	P ₄	5.95	3.75		
CGM 83690	P ₄	6.05	3.75		
DPC 24085A	P ₄	5.4	3.5		
DPC 21456E	M ₁	6.6		3.7	3.9
DPC 21456C	M ₁	5.7		3.5	3.55
DPC 21458F	M ₁	6.4		3.95	4.1
CGM 83690	M ₁	6.2		3.8	3.9
DPC 21366E	M ₂	6.15		3.95	4.2
DPC 21456B	M ₂	6		3.75	4
DPC 23275	M ₂	6.4		4.05	4.5
CGM 83690	M ₂	6.5		4.1	4.45
DPC 21366F	M ₃	7.2		3.95	4.05
DPC 21458C	M ₃	6.8		4	3.9
DPC 21366C	M ₃	6.8		4	3.8
DPC 23275	M ₃	6.8		4.2	4
CGM 83690	M ₃	7.6		4.2	4.1
DPC 22442K	I ¹	3.85	3.5		
DPC 21456G	I ²	2.45	3.55		
DPC 21578J	Upper canine	6.41	4.38		
DPC 21456A	P ³	4.85	4.9		
DPC 21370C	P ⁴	4.3	5.4		
DPC 21458B	M ¹	5.9	6.4		

DPC 21366A	M ¹	5.8	6.3		
DPC 21366B	M ¹	6.5	6.95		
DPC 21458A	M ²	5.65	6.5		
DPC 21370B	M ²	6.05	5.85		
DPC 21370A	M ²	6	6.5		
DPC 21458E	M ³	5.35	6		
DPC 21458D	M ³	5.2	5.3		

Part II. Full tree and tests of alternative topologies. Backbone constraint in red.



Part III. Unambiguous morphological character support for most parsimonious tree (Figure 3 of main text) and alternative topologies in Part II



Node 1

- Character 44, P₄ postprotocristid: state 0 (weak or absent) => state 1 (polymorphic; weak or absent/moderate)
- Character 58, P₄ to M₁ area: state 3 (polymorphic, >0.63, <0.72/>0.73, <0.82) => state 5 (polymorphic, >0.73, <0.82/>0.83, <0.92)
- Character 67, M₁ cristid obliqua orientation: state 2 (reaches trigonid wall at a point distolingual to protoconid) => state 3 (polymorphic, reaches trigonid wall at a point distolingual to protoconid/reaches trigonid wall at a point distal to metaconid)
- Character 68, M₁ cristid obliqua terminus: state 0 (runs to base of trigonid) => state 6 (connects with metaconid)
- Character 93, M₃ entoconid: state 0 (present and cuspidate) => state 2 (greatly reduced or absent)

Node 2

- Character 44, P₄ postprotocristid: state 1 (polymorphic; weak or absent/moderate) => state 2 (moderate)

- Character 67, M₁ cristid obliqua orientation: state 3 (polymorphic, reaches trigonid wall at a point distolingual to protoconid/reaches trigonid wall at a point distal to metaconid) => state 4 (reaches trigonid wall at a point distal to metaconid)
- Character 90, M₃ paraconid position: state 3 (mesial to metaconid but widely spaced from it) => state 1 (mesiolingual, between protoconid and metaconid)
- Character 159, M¹⁻² metaconule size: state 2 (small) => state 1 (polymorphic, small/absent)

Node 3

- Character 37, P₄ metaconid size: state 2 (small) => state 0 (absent or trace)
- Character 55, buccal cingulum on P₄: state 0 (absent or indistinct) => state 2 (present and distinct)
- Character 62, M₁ paraconid position: state 3 (mesial to metaconid but widely spaced from it) => state 1 (mesiolingual, between protoconid and metaconid)
- Character 79, M₂ cristid oblique orientation: state 1 (polymorphic, reaches trigonid wall at a point distal to protoconid/reaches trigonid wall at a point distolingual to protoconid) => state 2 (reaches trigonid wall at a point distolingual to protoconid)
- Character 91, M₃ cristid obliqua terminus: state 1 (runs to base of trigonid) => state 2 (runs part way up distal trigonid wall)
- Character 168, M² hypocone size: state 4 (absent) => state 2 (small)

Node 4

- Character 61, M₁ paraconid: state 4 (present, large) => state 2 (present, small)
- Character 69, hypoconulid position on M₁: state 4 (closer to hypoconid than to entoconid) => state 2 (central)
- Character 75, M₂ paraconid: state 4 (present, large) => state 0 (absent)
- Character 83, hypoconulid position on M₂: state 4 (closer to hypoconid than to entoconid) => state 2 (central)
- Character 89, M₃ paraconid: state 2 (present, small) => state 0 (absent)
- Character 93, M₃ entoconid: state 2 (greatly reduced or absent) => state 0 (present and cuspidate)
- Character 150, M¹ hypocone size: state 4 (absent) => state 2 (small)

Node 5

- Character 22, P₂ roots/presence: state 0 (two) => state 2 (one)
- Character 60, M₁ area: state 1 (polymorphic, 1.10-3.00mm/3.10-5.00mm) => state 0 (1.10-3.00mm)
- Character 61, M₁ paraconid: state 2 (present, small) => state 0 (absent or crestiform)
- Character 70, M₁ hypoconulid size: state 4 (small) => state 6 (absent)
- Character 84, M₂ hypoconulid size: state 4 (small) => state 6 (absent)

- Character 159, M_{1-2} metaconule size: state 1 (polymorphic, absent/small) => state 0 (absent)
- Character 172, M^{1-3} anterior cingulum: state 0 (strong, complete, long) => state 2 (strong, short)

Node 6

- Character 21, P_1 presence: state 0 (present) => state 2 (absent)
- Character 53, premolar orientation: state 0 (crown bases vertical in lateral perspective) => state 2 (slightly oblique)
- Character 56, P_4 lingual cingulum: state 0 (absent or discontinuous) => state 2 (present)
- Character 58, P_4 to M_1 area: state 5 (polymorphic, $>0.73, <0.82 / >0.83, <0.92$) => state 0 (<0.62)
- Character 64, M_1 premetacristid: state 0 (premetacristid absent or indistinct) => state 2 (premetacristid present)

Node 7

- Character 35, P_3 to P_4 area: state 6 (0.70-0.79) => state 8 (>0.80)
- Character 55, buccal cingulum on P_4 : state 2 (present and distinct) => state 0 (absent or indistinct)

Node 8

- Character 67, M_1 cristid obliqua orientation: state 4 (reaches trigonid wall at a point distal to metaconid) => state 2 (reaches trigonid wall at a point distolingual to protoconid)
- Character 68, M_1 cristid obliqua terminus: state 6 (connects with metaconid) => state 2 (runs part way up the distal trigonid wall)
- Character 90, M_3 paraconid position: state 1 (mesiolingual, between protoconid and metaconid) => state 4 (mesial to metaconid but widely spaced from it)
- Character 214, astragalar body height (lateral body height/mid-trochlear width): state 2 (100-120) => state 4 (>120)
- Character 227, relative length of posterior calcaneal facet (PCF width/PCF length): state 2 ($>50, <60$) => state 0 (<50)
- Character 258, angle of femoral neck: state 1 (polymorphic, $<60/60-70$) => state 0 (<60)
- Character 259, anteroposterior angulation of proximal femur: state 1 (bent anteriorly) => state 0 (not bent anteriorly)

Node 9

- Character 37, P_4 metaconid size: state 1 (polymorphic, absent or trace/small) => state 2 (small)
- Character 60, M_1 area: state 4 (5.10-7.00mm) => state A (9.10-11.00mm)

- Character 62, M₁ paraconid position: state 1 (mesiolingual, between protoconid and metaconid) => state 3 (mesial to metaconid but widely spaced from it)
- Character 171, M¹⁻³ lingual cingulum development: state 1 (polymorphic, absent/weak, broken) => state 3 (polymorphic, weak, broken/strong, complete)
- Character 174, M³ metacone: state 2 (moderate but smaller than paracone) => state 4 (large, equal to paracone)

Node 10

- Character 7, lower incisor crown height: state 2 (moderately high-crowned) => state 0 (low-crowned)
- Character 70, M₁ hypoconulid size: state 4 (small) => state 6 (absent)
- Character 84, M₂ hypoconulid size: state 4 (small) => state 6 (absent)
- Character 88, M₂ length/ M₃ length: state 3 (polymorphic, M₃ longer than M₂ (0.81-0.90)/ M₃ equal to M₂ (0.91-1.00) => state 2 (M₃ longer than M₂ (0.81-0.90))
- Character 118, upper canine lingual cingulum: state 0 (weak or absent) => state 2 (strong)
- Character 138, P⁴ protocone: state 0 (low relative to paracone) => state 1 (high relative to paracone)
- Character 150, M¹ hypocone size: state 2 (small) => state 0 (large)
- Character 182, mandibular depth: state 0 (shallow, less than 1.8 times as deep @ M₂ as mesiodistal length of M₂) => state 2 (deep, >1.8 times as deep @ M₂ as mesiodistal length of M₂)

Node 11

- Character 50, P₄ hypocristid shearing development: state 0 (absent) => state 2 (weak)
- Character 68, M₁ cristid obliqua terminus: state 2 (runs part way up the distal trigonid wall) => state 6 (connects with metaconid)
- Character 119, upper canine occlusion: state 2 (wears against P₂) => state 0 (wears against P₁₋₂)
- Character 217, astragalar cotylar fossa: state 0 (shallow) => state 2 (moderate)
- Character 266, gluteal tuberosity: state 2 (present, small and reduced to a thin crest) => state 1 (polymorphic, present, large/present, small and reduced to a thin crest)
- Character 308, morphology of promontory canal: state 1 (complete canal) => state 0 (open trough)

Node 12

- Character 12, lower first incisor lingual cingulum: state 2 (strong but incomplete) => state 1 (polymorphic, absent to weak/strong but incomplete)
- Character 21, P₁ presence: state 0 (present) => state 2 (absent)
- Character 24, P₂ protoconid height and shape: state 2 (not projecting, in line with P₃) => state 0 (extremely short, shorter than P₃)

- Character 34, P_{3-4} protoconid height: state 4 (P_3 equal in height to P_4) => state 6 (P_3 higher than P_4)
- Character 120, P^1 presence: state 0 (present) => state 1 (absent)
- Character 230, development of distal plantar tubercle on calcaneus: state 2 (well-developed) => state 0 (small, poorly-developed)

Node 13

- Character 22, P_2 roots/presence: state 0 (two) => state 2 (one)
- Character 117, C^1 mesial groove: state 0 (shallow or absent) => state 1 (deep)
- Character 119, upper canine occlusion: state 2 (wears against P_2) => state 4 (wears against P_{2-3})
- Character 121, P^2 root number/presence: state 1 (two) => state 2 (one)
- Character 155, M^2 prehypocrista development: state 0 (absent) => state 2 (weak)
- Character 179, mandibular symphyseal fusion: state 0 (absent) => state 2 (present)

Node 14

- Character 77, M_2 trigonid width: state 2 (width similar (<1.11 , >0.90)) => state 4 (much narrower than talonid ($=<0.90$))
- Character 172, M^{1-3} anterior cingulum: state 0 (strong, complete, long) => state 1 (polymorphic, strong, complete, long/strong, short)
- Character 337, position of infraorbital foramina: state 3 (polymorphic, above P^3 /above P^4) => state 4 (above P^4)

Node 15

- Character 8, lower incisor root orientation: state 2 (slightly procumbent) => state 1 (polymorphic, erect or vertical/slightly procumbent)
- Character 74, M_{1-2} talonid – lingual configuration: state 2 (notched lingually or closed) => state 0 (closed)
- Character 84, M_2 hypoconulid size: state 6 (absent) => state 5 (polymorphic, small/absent)
- Character 101, molar enamel crenulation: state 0 (smooth) => state 1 (polymorphic, smooth/slightly crenulated)
- Character 180, shape of the mandibular angle: state 0 (sharply hooked) => state 2 (smoothly rounded)

Node 16

- Character 31, P_3 root orientation: state 0 (mesial root placed directly mesial to distal root) => state 2 (mesial root placed lateral to distal root)
- Character 51, lower premolar crowding: state 0 (no crowding) => state 2 (slightly crowded)

- Character 70, M_1 hypoconulid size: state 6 (absent) => state 5 (polymorphic, small/absent)
- Character 101, molar enamel crenulation: state 1 (polymorphic, smooth/slightly crenulated) => state 2 (slightly crenulated)
- character 163, shape of M^2 centrocrista: state 2 (crests are more buccally oriented, meet at an angle) => state 4 (crests meet at a sharp angle or form a mesostyle)
- character 174, M^3 metacone: state 4 (large, equal to paracone) => state 3 (polymorphic, moderate but smaller than paracone/large, equal to paracone)

Unambiguous character support for adapiform-anthropoid clade in tree B of part II

- Character 5, $I_1:I_2$ proportions: state 4 (I_1 almost as large as I_2 ($=>0.83$, <1.00)) => state 2 (I_1 smaller than I_2 ($=>0.65$, <0.82))
- Character 10, first lower incisor crown shape: state 1 (pointed or lanceolate) => state 0 (spatulate)
- Character 14, female C/c area (relative to molars): state 0 (very small ($C_1/M_1 < 0.40$)) => state 2 (moderate ($=>0.4$, <0.8))
- Character 34, P_{3-4} protoconid height: state 2 (P_3 slightly lower than P_4) => state 4 (P_3 equal in height to P_4)
- Character 55, buccal cingulum on P^4 : state 0 (absent or indistinct) => state 1 (polymorphic, absent or indistinct/present and distinct)
- Character 60, M_1 area: state 2 ($3.10-5.00 \text{ mm}^2$) => state 4 ($5.10-7.00 \text{ mm}^2$)
- Character 66, M_1 trigonid height (ratio of trigonid height to talonid height): state 0 (higher than talonid ($=>1.20$)) => state 2 (slightly higher than talonid ($=>1.10$, <1.20))
- Character 75, M_2 paraconid: state 4 (present, large) => state 0 (absent)
- Character 89, M_3 paraconid: state 2 (present, small) => state 0 (absent)
- Character 102, interincisal diastema: state 0 (very broad) => state 1 (narrow)
- Character 108, I^1 crown shape: state 1 (semi-spatulate (central cusp present, but blunt with discernable mesial and distal occlusal crests)) => state 0 (spatulate (no apparent occlusal cusp, mesial and distal edges continuous and rounded))
- Character 171, M^{1-3} lingual cingulum development: state 2 (weak, broken) => state 3 (polymorphic, weak, broken/strong, complete)
- Character 185, scapular morphology (mediolateral width/inferosuperior height): state 4 (>1.5 , <1.75) => state 2 (<1.5 , >1.25)
- Character 211, nail/claw on second pedal digit: state 1 (claw present) => state 0 (nail present)
- Character 263, relative length of trochanteric fossa: state 3 (polymorphic, 110-125 (moderate)/ <110 (very short)) => state 0 (>125 (long))
- Character 288, maxillary-palatine notch: state 0 (absent) => state 1 (present)
- Character 337, position of infraorbital foramina: state 3 (polymorphic, above P^3 /above P^4) => state 1 (polymorphic, above P^2 /above P^3)

Unambiguous character support for adapiform-anthropoid clade in tree C of part II

- Character 69, hypoconulid position on M_1 : state 4 (closer to hypoconid than to entoconid) => state 2 (central)
- Character 76, M_2 paraconid position: state 4 (mesial to metaconid but widely spaced from it) => state 2 (mesiolingual, between protoconid and metaconid)
- Character 150, M^1 hypocone size: state 4 (absent) => state 2 (small)

Part IV. Character-taxon matrix

#NEXUS

[MacClade 4.08 registered to Erik R. Seiffert, Stony Brook University]

BEGIN TAXA;

```

  TITLE Taxa;
  DIMENSIONS NTAX=117;
  TAXLABELS
  Absarokius_sp.
  Abuqatrania_basiodontos
  Adapis_parisiensis
  Aegyptopithecus_zeuxis
  Afradapis_longicristatus
  Aframonius_dieides
  Afrotarsius_chatrathi
  Altanius_orlovi
  Altiatlasius_koulchii
  Amphipithecus_mogaungensis
  Anaptomorphus_sp.
  Anchomomys_gaillardi
  Anchomomys_milleri
  Anemorhysis_savagei
  Aotus_trivirgatus
  Apidium_moustafai
  Apidium_phiomense
  Arapahovius_gazini
  Arctocebus_calabarensis
  Arsinoea_kallimos
  Asiadapis_cambayensis
  Aycrossia_lovei
  Bahinia_pondaungensis
  Barnesia_hauboldi
  Biretia_fayumensis
  Biretia_megalopsis
  Branisella_boliviana
  Bugtipithecus_inexpectans
  Caenopithecus_lemuroides
  Cantius_abditus
  Catopithecus_browni
  Cheirogaleus_major
  Darwinius_masillae
  Djebelemur_martinezi
  Dolichocebus_gaimanensis
  Donrussellia_gallica
  Donrussellia_provincialis
  Dyseolemur_pacificus
  Eosimias_centennicus
  Eosimias_sinensis
  Europolemur_klatti
  Galago_moholi
  Galagoides_demidoff
  Godinotia_neglecta
  Hemiacodon_gracilis
  Hoanghoniuss_stehlini
  Karanisia_clarki
  Komba_robustus
  Lemur_catta
  Lepilemur_mustelinus
  Leptadapis_magnus
  Loris_tardigradus
  Loveina_minuta
  Loveina_sheai
  Loveina_wapitiensis
  Loveina_zephyri
  Macrotrarsius_montanus
  Mahgarita_stevensi
  Marcgodinotius_indicus
  Microadapis_sciureus
  Microcebus_murinus

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Microchoerus_erinaceus
Moeripithecus_markgrafi
Myanmarpithecus_yarshensis
Nannopithecus_abderhaldeni
Nannopithecus_raabi
Necrolemur_spp.
Nycticeboides_simpsoni
Nycticebus_coucang
Oligopithecus_rogeri
Oligopithecus_savagei
Omomys_sp.
Otolemur_crassicaudatus
Panobius_russelli
Parapithecus_fraasi
Parapithecus_grangeri
Perodicticus_potto
Phenacopithecus_krishtalkai
Phenacopithecus_xueshii
Phileosimias_kamali
Plesiadapis_tricuspidens
Plesiolestes_problematicus
Plesiopithecus_teras
Pondaungia_cotteri
Pronycticebus_gaudryi
Propithecus_spp.
Propliopithecus_chirobates
Propliopithecus_haeckeli
Proteopithecus_sylviae
Protoadapis_curviuspidens
Pseudoloris_parvulus
Purgatorius_unio
Qatrania_wingi
Rencunius_zhoui
Rooneyia_viejaensis
Saharagalago_misrensis
Saimiri_sciureus
Serapia_eocaena
Shoshonius_cooperi
Siamopithecus_eocaenus
Steinius_vespertinus
Strigorhysis_sp.
Taqah_propliopithecoid
Tarsius_bancanus
Teilhardina_americana
Teilhardina_asiatica
Teilhardina_belgica
Tetonius_sp.
Tetonoides_sp.
Troglemur_myodes
Tupaia_spp.
Uintanius_ameghini
Varecia_variegata
Wadilemur_elegans
Wailekia_orientale
Washakius_insignis
Xanthorhysis_tabrumi;
END;

BEGIN CHARACTERS;
  TITLE 'Matrix in file "ADAPIFORM MATRIX.nex"';
  DIMENSIONS NCHAR=360;
  FORMAT SYMBOLS= " 0 1 2 3 4 5 6 7 8 9 A C G T" MISSING=? GAP=- INTERLEAVE ;
  CHARSTATELABELS
    1 'lower incisor number (Y46,Ri1-1,modified)' / three_two_one none,
    2 'lower incisor occlusal arrangement (Ri2-2)' /
'arcuate_battery_in_occlusal_arrangement_(U-shaped_arcade)' 'cusp_tips_staggered_(V-
shaped_arcade)',
    3 'toothcomb (Y42,Ri13-13,modified)' /
lower_canine_is_not_incorporated_into_a_toothcomb
lower_canine_is_incorporated_into_a_toothcomb,

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4 'i1:i2 proportions (ratio of i1 plus i2 area to m1 area) (Ri5-5)' /
'very_small_(=<0.69)' 'moderate_sized_(=>0.70, <=1.07)' 'large_(>1.07)',
5 'i1:i2 proportions (Ri6-6)' / 'i1_much_smaller_than_i2_(<0.65)' '0/2'
'i1_smaller_than_i2_(=>0.65, <0.82)' '2/4' 'i1_almost_as_large_as_i2_(=>0.83, <1.00)'
'4/6' 'i1_larger_than_i2_(=>1.01, <1.25)' '6/8' 'i1_much_larger_than_i2_(=>1.25)',
6 'i2 cross-sectional shape (ratio of mesiodistal length to buccolingual
breadth) (Ri8-8)' / 'rounded_oval_(=>0.64)' 'mesiodistally_compressed_(=<0.64)',
7 'lower incisor crown height (Ri9-9)' / 'low-crowned' '0/2'
'moderately_high-crowned' '2/4' 'high-crowned',
8 'lower incisor root orientation (Ri11-11)' / erect_or_vertical '0/2'
slightly_procumbent '2/4' very_procumbent,
9 'incisor crown orientation (Ri12-12)' / erect_or_vertical '0/2'
procumbent '2/4' very_procumbent,
10 'first lower incisor crown shape (Ri14-14)' / spatulate
pointed_or_lanceolate,
11 'i2 heel development (Ri15-15)' / heel_absent heel_present,
12 'lower first incisor lingual cingulum (Ri17-17)' / absent_to_weak
'0/2' strong_but_incomplete '2/4' strong_and_complete,
13 'i1 to m1 area (Ri19-18)' / 'i1_very_small_(i1<m1)' '0/2'
'moderately_enlarged_(i1<_or_=m1)' '2/4' 'grossly_enlarged_(i1>m1)',
14 'female C/c area (relative to molars) (Rc1-19)' /
'very_small_(c1/m1<0.40)' '0/2' 'moderate_(=>0.4, <0.8)' '2/4' 'large_(=>0.8, <=1.2)',
15 'C/c dimorphism (square root male c1 area/square root female c1 area)
(Rc2-20)' / 'low_(<1.07)' 'moderate_(>=1.07, <1.17)' 'high_(>=1.17)',
16 'c1 cross-sectional shape (Rc3-21)' / rounded_oval
mesiodistally_compressed buccolingually_compressed,
17 orientation_of_lower_canine_root /
oriented_in_line_with_long_axis_of_crown mesially_inflected,
18 'lower canine lingual crest development (Rc4-22)' / rounded '0/2'
sharp,
19 'canine paracristid (Rc5-23, modified)' / oblique_to_occlusal_plane
nearly_horizontal_to_occlusal_plane 'forms_part_of_cropping_mechanism_with_i1-2'
oriented_in_line_with_buccal_face_of_adjacent_incisor,
20 'lower canine height (females) (Rc6-24, modified)' / 'low, squat'
'0/2' 'narrow, short' 'tall, at_or_above_toothrow' 'high-crowned_but_very_procumbent',
21 'p1 presence (Rp1-25)' / present '0/2' absent,
22 'p2 roots/presence (modified from Rp3-27)' / two '0/2' one '2/4'
p2_absent,
23 'p2 metaconid (Kay et al., 2008, p15)' / absent_or_trace '0/2' small
'2/4' large,
24 'p2 protoconid height and shape (Rp13-34)' /
'extremely_short, shorter_than_p3' '0/2' 'not_projecting, in_line_with_p3' '2/4'
'slender, projects_above_protoconids_of_p3-4' '4/6'
'massive, projects_above_protoconids_of_p3-4',
25 'p2 buccal cingulum development (Rp28-49)' / absent '0/2'
'incomplete, broken_at_protoconid_and_hypoconid' '2/4' complete,
26 'p3 paraconid (Rp6-30, modified)' / 'present, large' '0/2'
'present, small' '2/4' negligible_or_absent,
27 p3_lingual_cingulum / present '0/2' absent,
28 'p3 metaconid size (Rp16-37)' / absent '0/2' 'present, small' '2/4'
'present, large',
29 'p3 lateral protocristid orientation (Rp22-43)' /
transversely_oriented '0/2' distally_or_distolingually_oriented '2/4' absent,
30 'p3 roots (Rp4-28, in part)' / one '0/2' two_or_more,
31 'p3 root orientation (contains information similar to Rp45-62)' /
mesial_root_placed_directly_mesial_to_distal_root '0/2'
mesial_root_placed_lateral_to_distal_root,
32 'p3 hypoconid (Rp25-46, in part)' / 'large_and_well-
defined, projects_above_other_talonid_cusps' '0/2'
'very_small, absent, or_incorporated_into_talonid_as_an_indistinct_cusp',
33 'p3 entoconid and lingual talonid crest (Rp19-40)*' / absent '0/2'
lingual_talonid_crest_present_but_an_entoconid_does_not_stand_out_above_it '2/4'
entoconid_is_a_small_discrete_cusp,
34 'p3-4 protoconid height (Rp41-58)' / p3_much_lower_than_p4 '0/2'
p3_slightly_lower_than_p4 '2/4' p3_equal_in_height_to_p4 '4/6' p3_higher_than_p4,
35 'p3 to p4 area (Rp42-59)' / '<0.45' '0/2' '0.45-0.59' '2/4' '0.60-
0.69' '4/6' '0.70-0.79' '6/8' '>0.80',
36 'p4 roots (Rp4-28 in part)' / one two,
37 'p4 metaconid size (Rp17-38)' / absent_or_trace '0/2' small '2/4'
large,

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38 'spacing of p4 metaconid and protoconid (Rp14-35)' /
close_to_protoconid '0/2' widely_spaced_from_protoconid,
39 mesiodistal_position_of_p4_metaconid_with_respect_to_protoconid /
distal '0/2' transverse,
40 'p4 paraconid (Rp7-31, modified)' / 'present, large' '0/2'
'present, small' '2/4' very_small_or_absent,
41 'p4 paraconid position (Rp9-32)' / mesial_to_protoconid
'mesiolingual, between_protoconid_and_metaconid'
'mesial_to_metaconid; widely_spaced_from_metaconid',
42 'p4 lateral protocristid morphology (contains information similar to
Rp21-42 and Rp23-44)' / protocristid_poorly_developed_or_absent '0/2'
distolingually_oriented_protocristid_present '2/4'
trenchant_and_tranversely_oriented_protocristid_present,
43 'p4 premetacristid (Rp18-39, modified)' /
premetacristid_absent_or_poorly_developed '0/2' premetacristid_present,
44 'p4 postprotocristid (Rp36-55)' / weak_or_absent '0/2' moderate '2/4'
very_strong,
45 'p4 postmetacristid (contains information similar to Rp37-56)' /
weak_or_absent '0/2' moderate '2/4' very_strong,
46 'p4 entoconid and lingual talonid crest (Rp20-41)*' /
absent_or_a_trace '0/2'
lingual_talonid_crest_present_but_an_entoconid_does_not_stand_out_above_it '2/4'
entoconid_is_a_small_discrete_cusp,
47 height_of_p4_talonid /
no_aspect_of_the_talonid_is_at_level_of_m1_trigonid_basin '0/2'
hypoconid_extends_to_level_of_m1_trigonid_basin '2/4'
entire_talonid_basin_extends_to_level_of_m1_trigonid_basin,
48 'p4 cristid obliqua development (Rp11-33)' / absent '0/2' weak '2/4'
strong,
49 'p4 hypoconid (or distal terminus of cristid obliqua) (Rp26-47,
modified)' / buccal_to_protoconid '0/2' distal_to_protoconid '2/4'
between_protoconid_and_metaconid '4/6' distal_to_metaconid,
50 'p4 hypocristid shearing development (Rp27-48)*' / absent '0/2' weak
'2/4' strong,
51 'lower premolar crowding (Rp5-29)' / no_crowding '0/2'
slightly_crowded '2/4' very_crowded,
52 'lower premolar inflation (Rp29-50)' / not_basally_inflated '0/2'
slightly_basally_inflated '2/4' very_basally_inflated,
53 'premolar orientation (Rp33-53)' /
crown_bases_vertical_in_lateral_perspective '0/2' slightly_oblique '2/4'
'strongly_oblique, projecting_mesially',
54 'p4 exodaenodonty (Rp30-51)' / not_exodaenodont slightly_exodaenodont
very_exodaenodont,
55 'buccal cingulum on p4 (Rp34-54)' / absent_or_indistinct '0/2'
present_and_distinct,
56 p4_lingual_cingulum / absent_or_discontinuous '0/2' present,
57 'p4 md length/bl width (Rp43-60)' / '<0.95' '0/2' '>0.96, <1.14' '2/4'
'>1.15, <1.20' '4/6' '>1.21, <1.35' '6/8' '>1.36, <1.46' '8/10' '>1.47',
58 'p4 to m1 area (Rp44-61)' / '<0.62' '0/2' '>0.63, <0.72' '2/4'
'>0.73, <0.82' '4/6' '>0.83, <0.92' '6/8' '>0.93, <1.02' '8/A' '>1.03',
59 'm1 length/width (Rm55-111)' / '1.0-1.15' '0/2' '1.16-1.22' '2/4'
'1.23-1.32' '4/6' '>1.33',
60 'm1 area (Rm54-110)' / '1.10-3.00_mm' '0/2' '3.10-5.00_mm' '2/4'
'5.10-7.00_mm' '4/6' '7.10-9.00_mm' '6/8' '9.10-11.00_mm' '8/A' '11.10-13.00_mm' 'A/G'
'>13.10',
61 'm1 paraconid (contains information similar to Rm20-81)' /
absent_or_crestiform '0/2' 'present, small' '2/4' 'present, large',
62 'm1 paraconid position (Rm8-69)' / mesial_to_protoconid
'mesiolingual, between_protoconid_and_metaconid' '1/3'
mesial_to_metaconid_but_widely_spaced_from_it twinned_with_metaconid,
63 'm1 parastylid (Rm11-72)' / absent '0/2' present,
64 'm1 premetacristid (contains information similar to Rm18-79)' /
premetacristid_absent_or_indistinct '0/2' premetacristid_present,
65 'm1 metaconid position (Rm19-80)' / transverse_to_protoconid '0/2'
slightly_distal_to_protoconid,
66 'm1 trigonid height (ratio of trigonid height to talonid height)
(Rm16-77)' / 'higher_than_talonid (=>1.20)' '0/2'
'slightly_higher_than_talonid (=>1.10, <1.20)' '2/4'
trigonid_and_talonid_of_similar_height,
67 'm1 cristid obliqua orientation (Rm32-93)' /
reaches_trigonid_wall_at_a_point_distal_to_protoconid '0/2'

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reaches_trigonid_wall_at_a_point_distolingual_to_protoconid '2/4'
reaches_trigonid_wall_at_a_point_distal_to_metaconid,
68 'm1 cristid obliqua terminus (Rm34-95)' / runs_to_base_of_trigonid
'0/2' runs_part_way_up_the_distal_trigonid_wall '2/4'
connects_with_protoconid_tip_or_protocristid '4/6' connects_with_metaconid,
69 'hypoconulid position on m1 (contains information similar to Rm30-91)'
/ 'twinned_with,_or_most_closely_situated_next_to,_entoconid' '0/2' central '2/4'
closer_to_hypoconid_than_to_entoconid,
70 'm1 hypoconulid size (Rm27-88)' / large '0/2' moderate '2/4' small
'4/6' absent,
71 'm1 cristid obliqua development (Rm31-92, in part)' / 'weak_(rounded)'
'0/2' 'strong_(trenchant)',
72 'm1-2 hypocristid development (Rm38-99)' / absent_or_indistinct '0/2'
weak '2/4' strong,
73 'm1-2 buccal cingulum development (Rm45-106)' / absent_to_trace '0/2'
'partial,_discontinuous' '2/4' complete,
74 'm1-2 talonid -- lingual configuration (Rm40-101)' / open '0/2'
notched_lingually_or_closed,
75 'm2 paraconid (contains information similar to Rm20-81)' / absent
'0/2' 'present,_small' '2/4' 'present,_large',
76 'm2 paraconid position (Rm9-70)' / mesial_to_protoconid '0/2'
'mesiolingual,_between_protoconid_and_metaconid' '2/4'
mesial_to_metaconid_but_widely_spaced_from_it_twinned_with_metaconid,
77 'm2 trigonid width (ratio of buccolingual breadths of trigonid and
talonid) (Rm6-67)' / 'much_wider_than_talonid_(=>1.11)' '0/2'
'width_similar_(<1.11,>0.90)' '2/4' 'much_narrower_than_talonid_(=<0.90)',
78 'm2 postprotocristid (contains information similar to Rm21-82)' /
not_directed_towards_hypoflexid_directed_towards_the_hypoflexid,
79 'm2 cristid obliqua orientation (Rm33-94)' /
reaches_trigonid_wall_at_a_point_distal_to_protoconid '0/2'
reaches_trigonid_wall_at_a_point_distolingual_to_protoconid '2/4'
reaches_trigonid_wall_at_a_point_distal_to_metaconid,
80 'm2 cristid obliqua terminus (Rm35-96)' / runs_to_base_of_trigonid
'0/2' runs_part_way_up_distal_trigonid_wall connects_to_protoconid_tip_or_protocristid
'3/5' connects_with_metaconid,
81 'm2 cristid obliqua development (Rm31-92, in part)' / 'weak_(rounded)'
'0/2' 'strong_(trenchant)',
82 'position of entoconid relative to hypoconid on m2 (contains
information similar to Rm57-113)' / mesial_to_hypoconid '0/2' transverse_to_hypoconid
'2/4' distal_to_hypoconid,
83 'hypoconulid position on m2 (contains information similar to Rm30-91)'
/ 'twinned_with,_or_most_closely_situated_next_to,_entoconid' '0/2' central '2/4'
closer_to_hypoconid_than_to_entoconid,
84 'm2 hypoconulid size (Rm28-89)' / large '0/2' moderate '2/4' small
'4/6' absent,
85 'morphology of distolingual aspect of m2 (contains information similar
to Rm26-87 and Rm41-102)' / no_postentoconid_sulcus
'hypoconulid_closely_situated_next_to_entoconid_and_postentoconid_sulcus_present,_entocon
id_confluent_with_distal_talonid_wall'
'distolingual_fovea_present,_entoconid_confluent_with_posterior_talonid_wall'
'distolingual_fovea_present,_entoconid_mesiodistally_abbreviated_and_not_confluent_with_p
osterior_talonid_wall',
86 accessory_cusps_on_distolingual_aspect_of_m2 / absent
variably_present,
87 'cusp basal inflation on m1-2 (contains information similar to Rm17-78
and Rm44-105)' / crestiform '0/2' moderate_basal_inflation '2/4' cusp_bases_bulbous,
88 'm2 length/m3 length (Rm53-109)' / 'm3_much_longer_than_m2_(0.71-
0.80)' '0/2' 'm3_longer_than_m2_(0.81-0.90)' '2/4' 'm3_equal_to_m2_(0.91-1.00)' '4/6'
'm3_smaller_than_m2_(1.01-1.12)' '6/8' 'm3_much_smaller_than_m2_(=>1.13)' '8/A'
m3_absent,
89 m3_paraconid / absent '0/2' 'present,_small' '2/4' 'present,_large',
90 'm3 paraconid position (Rm10-71)' / mesial_to_protoconid
'mesiolingual,_between_protoconid_and_metaconid' '1/3'
mesial_to_metaconid_but_widely_spaced_from_it_twinned_with_metaconid,
91 'm3 cristid obliqua terminus (Rm36-97, modified)' /
absent_or_indistinct runs_to_base_of_trigonid runs_part_way_up_distal_trigonid_wall
connects_with_protoconid_tip_or_protocristid connects_with_metaconid,
92 'm3 trigonid width (based on relative buccolingual breadths) (Rm7-68)'
/ 'much_wider_than_talonid_(=>1.20)' '0/2' 'trigonid_and_talonid_widths_similar_(=<1.20-
1.05)' '2/4' 'trigonid_narrower_than_talonid_(<1.05)',
93 m3_entoconid / present_and_cuspidate '0/2' greatly_reduced_or_absent,

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94 morphology_of_m3_hypoconulid / lobate '0/2' not_lobate,
95 position_of_hypoconulid_on_m3 / centrally_located
'twinned_with,_or_situatated_closest_to,_entoconid',
96 'm3 hypoconulid (Rm13-74)' / absent '0/2' single '2/4' double,
97 'm3 root number (Rm4-66)' / one two,
98 'molar centroconids (contains information similar to Rm37-98)' /
absent present,
99 'sulcus between metaconid and protoconid on m1-2 (contains information
similar to Rm22/23-83/84)' / absent '0/2'
'present;_protocristids_poorly_developed_or_absent',
100 'lower molar metastylids (Rm12-73)' / absent '0/2'
trenchant_postmetacristid_or_incipient_metastylid '2/4' 'present,_large',
101 'molar enamel crenulation (Rm15-76)' / smooth '0/2'
slightly_crenulated '2/4' highly_crenulated,
102 'interincisal diastema (RCr42-224)' / very_broad narrow,
103 'I1-I2 interstitial contact (RI1-114)' /
'absent,_teeth_widely_spaced' '0/2' present_as_a_narrow_contact '2/4'
'I2_tightly_packed_against_I1,_I1_paracrista_abbreviated',
104 'I1:I2 area (RI4-117)' /
'areas_approximately_equal_or_I1_smaller_than_I2_(=<1.00)' '0/2'
'I1_slightly_larger_than_I2_(>1.00,<1.40)' '2/4' 'I1_much_larger_than_I2_(>1.40)',
105 'I1-2 lingual cingulum (RI11-124)' / 'weak,_discontinuous' '0/2'
'moderate,_continuous' '2/4' strong,
106 'I1-I2 buccal cingulum (RI13-126)' / absent present,
107 'I1 occlusal shape (mesiodistal length/buccolingual breadth) (RI6-
119)' / 'rounded_oval_(<1.05)' '0/2' 'buccolingually_compressed_(>1.05,<1.30)' '2/4'
'extremely_compressed_(>1.30)',
108 'I1 crown shape (RI8-121)' /
'spatulate_(no_apparent_occlusal_cusp,_mesial_and_distal_edges_continuous_and_rounded)'
'semi-
spatulate_(central_cusp_present,_but_blunt_with_discernable_mesial_and_distal_occlusal_cr
ests)' 'central_occlusal_cusp_pointed,_occlusal_edges_steep',
109 'I1 size (I1 area:M1 area) (RI5-118)' / 'small_(=<0.50)'
'moderate_(>0.5,<0.56)' 'large_(>0.56)',
110 'I1 occlusal edge orientation (spatulate incisors only) (RI10-123)' /
occlusal_edge_orthogonal_to_long_axis_of_root
occlusal_edge_wears_at_a_steep_angle_to_long_axis_of_root
'crown_with_pronounced_mesial_asymmetry_(=mesial_process)_in_unworn_state',
111 'I1 basal lingual cusp (RI12-125)' / absent present,
112 'I2 occlusal shape (mesiodistal length/buccolingual breadth) (RI7-
120)' / 'rounded_oval_(=<1.05)' '0/2' 'slightly_buccolingually_compressed_(>1.05,<1.30)'
'2/4' 'extremely_buccolingually_compressed_(=>1.30)',
113 'I2-C diastema (RI3-116)' / present '0/2' absent,
114 'upper incisor number (Y43)' / two_in_each_quadrant
one_or_none_in_each_quadrant,
115 'upper canine shape (contains information similar to RC1-127)' /
'round_in_cross-section' '0/2' oval '2/4' strongly_compressed_buccolingually,
116 rotation_of_upper_canine /
long_axis_of_canine_oriented_in_line_with_adjacent_premolar
canine_is_slightly_rotated_internally canine_is_strongly_rotated_internally,
117 'C1 mesial groove (females) (RC3-129)' / shallow_or_absent deep,
118 'C1 lingual cingulum (RC4-130)' / weak_or_absent '0/2' strong '2/4'
very_strong,
119 'upper canine occlusion (RC2-128)' / 'wears_against_p1-2' '0/2'
wears_against_p2 '2/4' 'wears_against_p2-3' '4/6' wears_against_p3,
120 'P1 presence (contains information from Y45)' / present absent,
121 'P2 root number/presence (RP1-131, modified)' / three two one
P2_absent,
122 'P2 occlusal outline (RP6-136)' / triangular
suboval_with_the_long_axis_buccolingual_suboval_with_the_long_axis_mesiodistal_round,
123 'P2 protocone (RP12-142, modified)' / present absent,
124 'height of P2 relative to P3*' /
'smaller_than,_or_subequal_in_height_(P2_height/P3_height_<=1.1)' '0/2'
'P2_slightly_taller_than_P3_(P2_height/P3_height_>=1.11,<1.5)' '2/4'
'P2_much_taller_than_P3_(P2_height/P3_height_>1.51)',
125 'P2 area relative to P3 area (contains information similar to that in
RP4-134)' / 'much_smaller_than_P3_(<=0.85)_(if_P2_is_absent,_taxon_is_assigned_state_0)'
'0/2' 'approximately_the_same_size,_or_only_slightly_smaller,_than_P3_(>0.85,<0.95)'
'2/4' 'much_larger_than_P3_(>=0.95)',
126 'P3 distal crown margin (RP18-148)' / smoothly_rounded '0/2'
waisted_between_buccal_and_lingual_cusps,

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127 'P3 protocone (RP9-139, modified)' / absent '0/2' 'present,_small'
'2/4' 'present,_distinct_',
128 'P3 hypocone (RP13-143, in part)' / absent '0/2' present,
129 'P3 metacone (RP20-150)' / absent '0/2' present,
130 'P3 root number (RP2-132)' / two '0/2' three,
131 'P4 parastyle (RP15-145, modified)' / present '0/2' absent,
132 'P4 metastyle (RP16-146, modified)' / absent '0/2' present,
133 'P3-4 trigon/talon proportions (RP8-138)' / 'trigon>=talon'
'trigon<talon',
134 'P3-4 buccal cingulum development (RP21-151)' / absent_or_weak '0/2'
strong,
135 'upper premolar paraconules (contains information similar to RP14-
144)' / absent_or_indistinct transverse_crest_connecting_protocone_to_paracone present,
136 'P4 lingual cingulum (contains information similar to RP19-149)' /
absent '0/2' present,
137 'P4 metacone (RP10-140)' / absent '0/2' present,
138 'P4 protocone (RP11-141)' / low_relative_to_paracone
high_relative_to_paracone,
139 'P4 hypocone (RP13-143, in part)' / absent '0/2' present,
140 'P4 pericone / absent present,
141 'P4 metaconules / absent '0/2' present,
142 'P4 postprotocrista (RP17-147, in part)' / absent '0/2' 'weak,_short'
'2/4' strong '4/6' 'strong;_secondary_postprotocrista_directed_toward_metacone',
143 'P4 occlusal outline (RP7-137)' / 'triangular suboval '1/3' squared,
144 'P4 root number (RP3-133)' / one two three,
145 'P4 area:M1 area (RP5-135)' / 'P4<M1 (<=0.66)' '0/2'
'P4<M1_(>0.66,<=0.76)' '2/4' 'P4=M1_ (0.77-1.05)' '4/6' 'P4>M1_(>1.06)',
146 'M1 pericone (RM20-170, modified)' / absent '0/2' small '2/4' large_,
147 'M1 area:M2 area (RM4-155)' / 'M1>M2_(<1.40,>1.0)' '0/2'
'M1<M2_(<=1.0)',
148 'M1_mesiobuccal_fovea_delimited_by_trenchant_parahypocrista / absent
'0/2' present,
149 'M1-2 paraconule size (RM37-180)' / absent '0/2' 'small-
moderate_(smaller_than_paracone)' '2/4' 'large_(nearly_as_large_as_protocone)',
150 'M1 hypocone size (RM10-160)' / large '0/2' small '2/4' absent,
151 'M1-2 paraconule position (RM15-165)' / attached_to_preprotocrista
'0/2' not_attached_to_preprotocrista,
152 'M1-2 hypocone position (RM12-162)' /
'distal,_slightly_lingual_to_protocone' '0/2' 'distal,_far_lingual_to_protocone',
153 'convex distal lobe for M1-2 hypocone' / absent '0/2'
'present,_distal_crown_margin_weakly_concave' '2/4'
'present,_distal_crown_margin_deeply_notched',
154 'lingual_extension_of_M1_hypocone_lobe /
lobe_does_not_extend_lingually_far_beyond_protocone '0/2'
lobe_does_extend_far_lingually_past_protocone,
155 'M2 prehypocrista development (RM13-163)' / absent '0/2' weak '2/4'
'strong_--_reaches_to_postprotocrista,_encloses_the_talon_lingually',
156 'M1-2 Nannopithec fold (RM5-156)' / absent '0/2' weak '2/4' strong_,
157 'M1-2 postprotocrista development (RM18-168)' /
'strong,_runs_to_base_of_metaconule_or_metacone' '0/2'
'strong_but_short,_does_not_reach_to_base_of_metacone' '2/4' absent,
158 'M1-2 preprotoconule (RM9-159)' / absent '0/2' weak,
159 'M1-2 metaconule size (RM16-166)' / absent '0/2' small '2/4' moderate
'4/6' large,
160 'M1-2 premetaconule cristae (RM27-173)' / absent_or_weak_strong_,
161 'M1-2 postmetaconule cristae (RM28-174)*' / absent_or_weak '0/2'
strong,
162 'M1-2 lateral posterior transverse crista development (RM19-169)' /
sharp '0/2' indistinct,
163 'shape_of_M2_centrocrista / 'straight,_aligned_with_mesiodistal_plane'
'0/2' 'crests_are_more_buccally_oriented,_meet_at_an_angle' '2/4'
crests_meet_at_a_sharp_angle_or_form_a_mesostyle,
164 'buccal cingulum on M1-2 (contains information similar to RM24-172)'
/ absent '0/2' present_but_poorly_developed '2/4' present_and_distinct '4/6'
'extensive_buccal "shelf"',
165 'M1-2 root number (RM1-152)' / 'three_or_more,_three_or_more'
'three,_two',
166 'M2 shape (bl/md) (RM3-154)' / 'very_broad_(>1.65)' '0/2'
'bread_(<1.65,>1.30)' '2/4' 'squared_(<=1.30)',
167 'M2 pericone / absent '0/2' present,
168 'M2 hypocone size (RM11-161)' / large '0/2' small '2/4' absent,

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169 M2 postmetacrista / 'short, indistinct, or absent'
 'long, trenchant, and labially extended',
 170 'M2 buccal expansion of paracone (RM33-177)' / no_expansion '0/2'
 slight_expansion '2/4' considerable_expansion,
 171 'M1-3 lingual cingulum development (RM22-171)' / absent '0/2'
 'weak, broken' '2/4' 'strong, complete',
 172 'M1-3 anterior cingulum (RM44-181)' / 'strong, complete, long' '0/2'
 'strong, short' '2/4' weak_or_absent,
 173 'molar protocone lingual inflation (RM31-176)' / not_inflated '0/2'
 slightly_inflated '2/4' very_inflated,
 174 'M3 metacone (RM34-178)' / absent_or_very_small '0/2'
 'moderate (but smaller than paracone)' '2/4' 'large (equal to paracone)',
 175 'M3 paraconule (RM30-175)' / absent '0/2' 'small-moderate' '2/4'
 large,
 176 'M3 hypocone (RM36-179)' / absent_or_very_small '0/2' small '2/4'
 large,
 177 'M3 size relative to M1 (RM46-182)' /
 'very_small (half the size of M1 or less)' '0/2' 'small (two thirds)' '2/4'
 'large (approximately as large)',
 178 'M3 root number (RM2-153)' / three '0/2' two '2/4' one,
 179 'mandibular symphyseal fusion (Y57, RCr39-221)' / absent '0/2'
 present,
 180 'shape of the mandibular angle (Y40)' / sharply_hooked '0/2'
 smoothly_rounded '2/4' rounded_but_expanded_posteriorly,
 181 shape_of_masseteric_fossa / shallow '0/2' deeply_excavated,
 182 'mandibular depth (Y39, RCr45-227)' /
 'shallow (less than 1.8 times as deep @ m2 as md length of m2)' '0/2'
 'deep (>1.8 times as deep @ m2 as md length of m2, <2.19)' '2/4'
 'very_deep (more than 2.2 times as deep @ m2 as md length of m2)',
 183 'height of coronoid process relative to condyle (RCr43-225)' /
 very_high_above_slightly_above_or_equal,
 184 'condyle height relative to toothrow (RCr44-226)' /
 at_level_of_toothrow_slightly_above_well_above_toothrow,
 185 'scapular morphology (mediolateral width/inferosuperior height)
 (contains information similar to that of Y64)' / '<1.25' '0/2' '<1.5, >1.25' '2/4'
 '>1.5, <1.75' '4/6' '>1.75',
 186 'length of scapular coracoid process (coracoid process length/glenoid
 fossa height)' / '<=.90' '0/2' '>.9, <=1.0' '2/4' '>1.0, <=1.1' '4/6' '>1.1',
 187 'relative sizes of infraspinous and supraspinous fossae (Y66)' /
 supraspinous_fossa_larger_than_infraspinous_fossa '0/2' fossae_roughly_equivalent '2/4'
 infraspinous_fossa_approximately_two_times_as_large_as_the_supraspinous_fossa '4/6'
 infraspinous_fossa_approximately_three_times_as_large_as_the_supraspinous_fossa_,
 188 position_of_humeral_head_relative_to_tubercles /
 humeral_head_is_expanded_dorsal_to_tubercles '0/2'
 humeral_head_and_tubercles_are_approximately_equal_in_height '2/4'
 tubercles_are_expanded_above_humeral_head,
 189 'morphology of deltopectoral crest (RH16-247)' / prominent '0/2' low,
 190 'shape of intertubercular sulcus (contains information similar to
 RH15-246)' / narrow_and_deep '0/2' narrow_and_shallow '2/4' shallow_and_wide,
 191 teres_major_insertion / absent_or_poorly_defined '0/2'
 'elongate_well-defined_crest' '2/4' 'well-developed tubercle',
 192 'supinator crest (Y76, contains information similar to RH13-244)' /
 prominent_low,
 193 'brachialis flange (RH14-245)' / broad '0/2' moderate '2/4' narrow,
 194 'presence/mediolateral position of entepicondylar foramen (Seiffert
 et al., 2000)' / foramen_is_placed_far_proximal_to_trochlea
 lateral_wall_of_medial_strut_defining_foramen_is_confluent_with_medial_edge_of_the_trochl
 ea '0/2'
 'foramen_more_medial, and lateral wall of medial strut defining foramen is not confluent
 with medial edge of the trochlea' absent,
 195 'dorsal placement of medial epicondyle (RH9-240)' / parallel '0/2'
 slight_dorsal_angle '2/4' large_dorsal_angle,
 196 'medial epicondyle size (RH8-239)' / reduced '0/2' prominent,
 197 'dorsoepitrochlear fossa (RH11-242)' / present '0/2' 'small, shallow'
 '2/4' absent_,
 198 'shape of humeral trochlea (contains information similar to RH1-232)'
 / 'cylindrical, distomedial aspect of trochlea is straight' '0/2'
 'conical, medial aspect of trochlea flares distally',
 199 'relative heights of medial and lateral edges of the humeral trochlea
 (RH2-233)' / subequal '0/2' medial_edge_more_flared_than_lateral_edge,

200 'shape of dorsal aspect of distal humeral articulation (contains information similar to that of RH10-241)' / no_pronounced_lips_on_dorsal_trochlear_edges '0/2' both_medial_and_lateral_edges_pronounced very_pronounced_lateral_lip,

201 'trochlear-capitular junction' / 'trochlea_and_capitulum_are_confluent,_with_no_distinct_trochleo-capitular_ridge' '0/2' lateral_aspect_of_trochlea_is_offset_from_capitulum_by_a_weak_ridge '2/4' lateral_aspect_of_trochlea_is_separated_from_capitulum_by_a_deep_gutter,

202 capitular_shape / globular '0/2' ovoid,

203 capitular_tail / elongate_and_distinct short_or_absent '1/3' proximodistally_tall_capitular_flange_is_present,

204 'relative width of capitulum (contains information similar to RH5-236)' / 'ventral articular width/capitular width >2.5' '0/2' '<2.5, >2.0' '2/4' '<2.0',

205 'olecranon fossa morphology (Y78, contains information similar to RH12-243)' / 'deep, open and unossified' '0/2' 'moderately_deep,_thinly_ossified_and_nearly_transparent_' '2/4' 'shallow,_robustly_ossified',

206 humerofemoral_index / '<59' '0/2' '60-69' '2/4' '70-79' '4/6' '80-89' '6/8' '90-100',

207 'size of centrale, orientation of centrale trapezoid facet, and articulation with hamate (modified from RW1-249)' / 'facet_faces_distally,_no_articulation_with_hamate' 'facet_faces_distoradially,_articulation_with_hamate',

208 'ulnar-pisiform articulation (modified from RW2-250)' / 'no_ulnar-pisiform_articulation' 'facet_on_pisiform_for_ulnar_styloid_process_is_smaller_than,_or_roughly_equal_in_size_to,_that_for_triquetrum' 'facet_on_pisiform_for_ulnar_styloid_process_is_much_enlarged_and_deeply_excavated',

209 'styloid process (Y80)' / no_discernable_styloid_process_present_but_only_moderately_developed 'long_and_well-developed',

210 'second digit of hand (Y81)' / of_normal_length_drastically_reduced,

211 'nail/claw on second pedal digit (Y82,RO2-283)' / nail_present claw_present,

212 'prehallux (RO3-284)' / present_absent,

213 'astragalar width/astragalar length (Gebo et al., 2001, character 6)' / '<50' '0/2' '>50,<60' '2/4' '>60,<70' '4/6' '>70',

214 'astragalar body height (lateral body height/mid-trochlear width; Gebo et al., 2001, character 4)' / '<100' '0/2' '100-120' '2/4' '>120',

215 'elevated lateral trochlear margin of astragalus (Seiffert & Simons, 2001)' / absent_present,

216 'morphology of fibular facet (RA2-270, modified)' / facet_slopes_obliquely_and_gradually_laterally 'facet_is_flat_(vertical)_and_has_a_small_pointed_process_plantarly' dorsal_aspect_of_facet_is_subvertical_and_has_a_long_ventral_process_that_projects_laterally,

217 'astragalar cotylar fossa (Seiffert & Simons, 2001)' / shallow '0/2' moderate '2/4' 'deep,_medially_projecting',

218 'shape of proximal aspect of medial tibial facet on astragalus (RA6-274, modified)' / 'dorsoventrally_deep,_extends_to_plantar_aspect_of_astragalus' '0/2' 'dorsoventrally_restricted,_confined_to_dorsal_half_of_astragalar_body',

219 'astragalar neck length (astragalar neck length/mid-trochlear width; contains information similar to that of RA5-273)' / '<100' '0/2' '>100,<120' '2/4' '>120',

220 'astragalar neck angle (Gebo et al., 2001, character 3)' / '<20_degrees' '0/2' '20-30_degrees' '2/4' '>30_degrees',

221 'relative astragalar head width / 'head_width/head_height_x_100<115' '0/2' 'head_width/head_height_x_100>115,<130' '2/4' 'head_width/head_height_x_100>130',

222 'plantarflexion of astragalar head*' / absent_present,

223 'posterior astragalar shelf (D20; contains information similar to RA4-272)' / absent '0/2' 'present,_small' '2/4' 'present,_large',

224 'position of groove for flexor fibularis (RA1-269)' / lateral_to_astragalar_trochlea_plantad_to_astragalar_trochlea,

225 'size_of_lateral_tubercle_buttressing_flexor_fibularis' / poorly_developed '0/2' small '2/4' large,

226 'calcaneal width/length' / '<35' '0/2' '>35,<40' '2/4' '>40,<45' '4/6' '>45',

227 'relative length of posterior calcaneal facet (PCF width/PCF length)' / '<50' '0/2' '>50,<60' '2/4' '>60',

228 'position of the peroneal tubercle relative to PCF (RC2-276)' / maximum_width_of_peroneal_tubercle_is_placed_distal_to_distal_terminus_of_PCF

maximum_width_of_peroneal_tubercle_is_placed_approximately_at_the_distal_terminus_of_the_PCF
 maximum_width_of_peroneal_tubercle_is_placed_proximal_to_the_distal_terminus_of_the_PCF,
 229 size_of_calcaneal_peroneal_tubercle /
 'massive, extends far laterally' very_small,
 230 development_of_distal_plantar_tubercle_on_calcaneus /
 'small, poorly_developed' '0/2' 'well-developed',
 231 orientation_of_long_axis_of_calcaneocuboid_joint / dorsoventral
 oblique mediolateral,
 232 calcaneocuboid_joint_shape / oval 'fan-shaped, notch_is_articular'
 'fan-shaped, notch_is_non-articular',
 233 'anterior calcaneal elongation (length of calcaneus distal to
 astragalocalcaneal facet/total calcaneal length x 100) (modified from RC1-275, scoring
 from D22 addendum)' / 'not_elongate (ACL_or_anterior_calcaneal_ratio<40)' '0/2'
 'moderate (ACL=>40-45)' '2/4' 'long (45-60)' '4/6' '>60',
 234 'posterior calcaneal bowing (RC3-277)' / absent present,
 235 calcaneal_sustentacular_facet_configuration /
 single_continuous_sustentacular_facet present '0/2'
 separate_anterior_and_posterior_sustentacular_facets present,
 236 'navicular length relative to width (contains information similar to
 RN1-278)' / 'short (<90)' 'moderate (100-150)' 'long (150%_longer_than_wide)',
 237 'three-pronged' distal navicular articulation' / absent present,
 238 'morphology of the naviculocuboid articulation (RN3-279)' /
 cuboid_facet_contacts_only_the_ectocuneiform
 cuboid_facet_contacts_the_ectocuneiform_and_the_mesocuneiform,
 239 'peroneal tubercle of MT1 (RMT1-286)' / very_large large small,
 240 'range of motion at entocuneiform-MT1 joint' /
 joint_configuration_does_not_allow_for_opposition_of_hallux
 opposition_of_hallux_is_possible,
 241 'shape of entocuneiform-MT1 articulation (RE1-280)' /
 dorsally_reduced_dorsal_moiety_of_joint_enlarged_relative_to_ventral_moiety
 dorsal_moiety_greatly_enlarged,
 242 'lateral process of entocuneiform (RE2-281)' / small_hypertrophied_
 243 'foot axis (R01-282)' / mesaxonic paraxonic ectaxonic,
 244 'metatarsus length (MT3 length/proximal phalanx of digit III)
 (contains information similar to that of R04-285)' / '<1.0' '0/2' '>1.01, <1.5' '2/4'
 '>1.51, <2.0' '4/6' '>2.01',
 245 'length of MT1 relative to MT3 (RMT2)' /
 less_than_70%_the_length_of_MT3 '0/2' '71-80%' '2/4' '81-90%' '4/6' '91-100%' '6/8'
 '>100%',
 246 tibial_process_for_peroneus_longus / absent_or_poorly_developed
 present_and_distinct,
 247 retroflexion_of_proximal_tibial_articulation /
 'absent, articular_surface_of_tibial_condyles_perpendicular_to_long_axis_of_tibial_shaft'
 moderate_retroflexion_present_proximal_articular_surface_is_strongly_retroflexed,
 248 'fusion of tibia and fibula (RT1-263)' / 'absent, small_articulation'
 'no_fusion, moderate_articulation' no_fusion_but_extensive_articulation fusion,
 249 'shape of distal surface of tibia (RT3-264)' / square intermediate
 triangular,
 250 'rotation of the medial malleolus (RT4-265)' / none '0/2' slight
 '2/4' strong,
 251 'shape of the medial malleolar articular surface (RT5-266)' / flat
 '0/2' 'anteriorly_convex, posteriorly_flat' '2/4' all_convex,
 252 'shape of distal tibial shaft (RT6-267)' / no_compression
 anteroposteriorly_compressed,
 253 'position of tibialis posterior groove (RT7-268)' /
 on_medial_side_of_malleolus '0/2' on_posterior_side_of_malleolus,
 254 'fovea capitis (Y75)' / small_and_insignificant '0/2'
 'present_and_well-developed',
 255 'femoral head shape (RF6-256)' / spherical semicylindrical
 cylindrical,
 256 morphology_of_femoral_head_articular_surface /
 restricted_to_femoral_head_extends_onto_back_of_femoral_neck,
 257 'length of femoral neck (RF1-251, contains information similar to
 Y71)' / '<=75' '0/2' '>75, <120' '2/4' '>120',
 258 'angle of femoral neck (RF2-252)' / '<60' '0/2' '60-70' '2/4' '>70',
 259 'anteroposterior angulation of proximal femur (contains information
 similar to RF8-258)' / bent_anteriorly_not_bent_anteriorly,
 260 'triangular depression on medial side of proximal femur (Dagosto and
 Schmid, 1996)' / absent present,
 261 'greater trochanter shape (Y72)' / 'hook-shaped' '0/2' rounded_,

262 crista_paratrochanterica / absent '0/2' present,
 263 'relative length of trochanteric fossa (RF9-259)' / '>125_(long)'
 '0/2' '110-125_(moderate)' '2/4' '<110_(very short)',
 264 'intertrochanteric crest (RF10-260)' / absent present,
 265 'angle of lesser trochanter (RF3-253)' / 'medial_(0-30_degrees)'
 '0/2' 'posterior_(>30_degrees)',
 266 'gluteal tuberosity (Y74, contains information similar to RF4-254)' /
 'present, large' '0/2' 'present, small and reduced to a thin crest' '2/4' absent,
 267 position_of_gluteal_tuberosity / proximal_to_lesser_trochanter '0/2'
 at_level_of_lesser_trochanter '2/4' distal_to_lesser_trochanter,
 268 'patellar margin asymmetry (raised and sharply defined lateral
 patellar margin) (contains information similar to RF12-262)' / absent present,
 269 'knee index (contains information similar to RF5-255)' /
 100_or_higher '90-99' '80-89' '70-79',
 270 'shape of manubrium (Y83)' / sternal_head_elongate_
 shortened_and_triangular_in_shape_,
 271 'transpedicular foramina (Y85)' / absent_present_,
 272 'number of thoraco-lumbar vertebrae' / 18 '0/2' 19 '2/4' 20 '4/6'
 21_or_more,
 273 'anticlinal vertebra (Y84)' / T10_ T11_ T12_ L1_
 no_anticlinal_vertebra_,
 274 'anterior inferior iliac spine (Y70)' / tuberosity_not_expressed
 small_tubercle_present_along_margo_acetabuli 'well-developed tuberosity present',
 275 'ilium shape (Y67)' / narrow '0/2' markedly_flared_,
 276 'ischial flaring (Y69)' / absent_present_,
 277 'ischium/ilium index (Anemone & Covert, 2000)' / '60-70' '0/2' '50-
 59' '2/4' '40-49' '4/6' '30-39',
 278 'pubic bone flaring (Y68)' / absent_present_,
 279 'tail length (Y86)' / long_tail_reduced absent,
 280 'shape of glenoid fossa (RCr40-222)' / wide_and_biconcave
 anteroposteriorly_oriented_trough,
 281 'postglenoid process (Y25)' / present_absent_,
 282 'postglenoid process-auditory bulla relationship (Y26)' /
 not_confluent_ '0/2' partially_fused_ '2/4'
 postglenoid_process_fused_to_lateral_aspect_of_bulla,
 283 position_of_postglenoid_foramen_relative_to_postglenoid_process /
 posterior_to_postglenoid_process '0/2' medial_to_postglenoid_process,
 284 'entoglenoid process (RCr41-223)' / indistinct_or_absent '0/2'
 robust,
 285 'position of pyramidal processes (RCr35-217)' / medially_placed '0/2'
 laterally_placed,
 286 'position of the anteriormost point on the palatine/maxillary suture
 of the palate (Y19)' / medial_to_space_between_M1_and_M2_ '0/2' medial_to_M1_ '2/4'
 medial_to_the_space_between_P4_and_M1_,
 287 'posterior palatine torus (RCr34-216)' / present '0/2' absent,
 288 'maxillary-palatine notch' / absent_present_,
 289 'position of the posteromedial edge of the palate in relation to M3
 (Y24)' / anterior_to_M3_ '0/2' medial_to_M3_ '2/4' posterior_to_M3_,
 290 'shape of medial pterygoid plate (RCr36-218, contains information
 similar to Y22)' / 'long_medial_pterygoid_plate_extending_one-
 third_to_one_half_of_the_distance_to_the_anterior_surface_of_the_bulla' '0/2'
 short_but_distinct_from_lateral_pterygoid_plate_for_its_entire_dorsoventral_extent '2/4'
 'medial_pterygoid_plate_entirely_absent_or_reduced_to_a_low_rugosity',
 291 'lateral pterygoid-bullar overlap (RCr18-200)' / absent '0/2'
 abutting '2/4' laminar,
 292 'extent of contact between the lateral pterygoid plate and the bullar
 wall (RCr19-201)' / slight_very_extensive,
 293 'position of foramen ovale (Y28)' /
 lateral_side_of_lateral_pterygoid_ '0/2, or posterior_to_terminus_of_lateral_pterygoid'
 medial_to_lateral_pterygoid_,
 294 'central stem of basicranium (D47)' / narrow_broad,
 295 'choanal shape (D50)' / broad_peaked,
 296 'basioccipital flange (contains information similar to RCr20-202)' /
 absent_or_minimal 'present, extensive',
 297 'encroachment of auditory bulla on pterygoid fossa (RCr17-199)' /
 absent_present_and_formed_by_the_AAC present_and_formed_by_the_tympanic_cavity '1/2',
 298 'shape of external auditory meatus (D38)' / tubular '0/2'
 not_tubular,
 299 'suprameatal foramen (RCr21-203)' / absent
 'present, small, and in the posterior root of the zygomatic arch'
 'present, large, and above the external auditory meatus' '0/2',

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300 'ascending pharyngeal artery (Y52)' / if_present_is_poorly_developed_
present_and_enlarged_,
301 'vascular plexus associated with ascending pharyngeal artery (Y53)' /
absent_present_,
302 'relative size of stapedia and promontory arteries (contains
information similar to RCr11-193)' / stapedia_and_promontory_of_equal_size_
stapedial_slightly_smaller_than_promontory
stapedial_absent_or_highly_reduced_relative_to_promontory
'stapedial_and_promontory_arteries_present,_stapedial_larger_than_promontory'
stapedial_and_promontory_absent_ '1/2' '1/3',
303 'mediolateral position of posterior carotid foramen (RCr6-188)' /
medial_midline_of_bulla_lateral_,
304 'rostrorocaudal position of posterior carotid foramen with respect to
fenestra cochleae (contains information similar to RCr8-190)' /
posterior_to_fenestra_cochleae_ventral_to_fenestra_cochleae
anterior_to_fenestra_cochleae_,
305 'ventrodorsal position of posterior carotid foramen relative to
fenestra cochleae (RCr7-189)' / dorsal_ventral_,
306 'position of pathway for internal carotid artery or nerve relative to
fenestra cochleae (RCr9-191)' /
'runs_across_ventral_lip_of_fenestra_cochleae,_shielding_it_from_ventral_view'
does_not_shield_fenestra_cochleae_,
307 'presence or absence of canal for internal carotid artery or nerves
(RCr13-195)' / absent_present_,
308 'morphology of promontory canal (RCr12-194)' / open_trough
complete_canal_absent_,
309 'perbullar pathway for internal carotid artery (RCr4-186)' / absent
present_,
310 'transverse septum defining caudal wall of anterior accessory cavity
(contains information similar to RCr1-183)' / absent
'present,_forms_lateral_wall_of_AAC_pneumatized_from_tympanic_cavity'
'present,_forms_lateral_wall_of_AAC_pneumatized_from_epitympanic_recess',
311 composition_of_bulla / petrosal_entotympanic_,
312 'epitympanic crest (RCr48-230)' / absent_present_,
313 'morphology of annular bridge (RCr16-198)' /
linea_semicircularis_or_partial_annular_bridge_formed_on_an_entotympanic_bulla
linea_semicircularis_formed_on_a_petrosal_bulla_complete_annular_bridge_,
314 'position of ventral edge of tympanic bone (RCr14-196)' / intrabullar
extrabullar_,
315 'parotic fissure (RCr22-204)' / patent_closed_,
316 'pneumatization of mastoid (from epitympanic recess) (RCr3-185)' /
absent 'present, moderately_inflated' 'present, greatly_inflated',
317 'paroccipital processes (Y23)' / absent_ '0/2' 'present, small' '2/4'
'present, well-developed',
318 'emissary foramina on lateral edge of parietals (Y33)' / present_
'0/2' absent_,
319 pattern_of_sagittal_cresting / temporal_lines_converge_on_frontal
'temporal_lines_converge_on_the_parietals,_forming_short_sagittal_crest'
'temporal_lines_are_not_confluent,_no_sagittal_crest_present'
'sagittal_crest_is_extensive,_but_temporal_lines_converge_on_parietals_that_extend_far_ro
strally_between_frontal_bones' '0/2',
320 'metopic sutural fusion in adults (RCr31-213)' / absent '0/2'
present_,
321 'frontal-maxillary contact' / present_
absent_due_to_intervening_lacrimal_absent_due_to_intervening_premaxilla_,
322 'degree of orbital convergence (contains information similar to
RCr32-214)' / '>89' '0/2' '90-104' '2/4' '105-119' '4/6' '120-134' '6/8' '>135',
323 'expansion of ethmoturbinals (YIP89)' / no_anteromedial_expansion_
anterior_and_medial_expansion_,
324 'transverse lamina/ethmoturbinal recess' /
extensive_transverse_lamina_and_ethmoturbinal_recess_present
extensive_transverse_lamina_and_ethmoturbinal_recess_absent_,
325 'pronounced interorbital constriction (RCr27-209)' / absent
present_below_CN_I_,
326 'orbit size (contains information similar to RCr23-205)' / small
large_hypertrophied_,
327 'foramen rotundum (Y12,RCr29-211)' /
confluent_with_the_superior_orbital_fissure_present_,
328 'lacrimal foramen morphology (Y11)' / surrounded_by_lacrimal_bone_
'foramen_lies_on_lacrimal/maxillary_suture_'
'foramen_lies_on_the_lacrimal/maxillary_suture_but_is_primarily_surrounded_by_maxilla_',

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329 'position of lacrimal foramen (RCr30-212)' /
'on_rim,_or_outside_of,_orbit_' inside_the_orbit_,
330 'zygomatic-lacrimal contact (Y6, RCr26-208)' / present_ '0/2'
absent_,
331 'lacrimal-palatine contact (RCr28-210)' / contact_present_
'no_contact,_separated_by_a_large_fronto-
maxillary_contact_(and_in_some_taxa,_a_small_os_planum_of_the_ethmoid)'
'no_contact,_separated_by_a_large_os_planum',
332 'ethmomaxillary fissure (Y13, modified following Cartmill 1978)' /
no_complete_ethmomaxillary_fissure_present '0/2' complete_ethmomaxillary_fissure_present,
333 'anterior and posterior hiatus of ethmomaxillary fissure (Cartmill,
1978)' / anterior_hiatus_variably_present '0/2'
posterior_hiatus_at_least_variably_present '2/4' no_hiatuses_present,
334 'frontal-palatine contact (Cartmill, 1978)' / present '0/2' absent,
335 position_of_sphenopalatine_foramen / within_palatine '0/2'
on_ethmopalatine_suture,
336 'infraorbital foramina (Y2)' / one_ '0/2' two_ '2/three_foramina',
337 'position of infraorbital foramina (contains information similar to
Y3)' / above_P2 '0/2' above_P3 '2/4' above_P4 '4/6' above_M1,
338 'morphology of zygomatic portion of postorbital bar (Y18, contains
information similar to RCr24-25)' / no_postorbital_bar_ slender_and_delicate_ '1/3'
wide_and_robust_ contributes_to_postorbital_septum_,
339 'morphology of frontal segment of the postorbital bar (Y17, contains
information similar to RCr24-25)' / partial_frontal_process_but_no_postorbital_bar_
slender_and_delicate_ '1/3' wide_and_robust_ incorporated_into_postorbital_septum_,
340 zygomatic_arch_depth / slender '0/2' dorsoventrally_deep,
341 'zygomaticofacial foramen (Y16)' / absent_ '0/2' 'present,_small_'
'2/4' 'present,_large_',
342 'snout length (RCr37-219)' / long_snout short_snout,
343 'maxillary depth (RCr38-220)' / deep shallow,
344 'facial profile (Masters & Brothers, 2002)*' / straight '0/2' dished,
345 'position of anterior palatine foramina relative to incisors (Masters
& Brothers, 2002)*' / foramina_sit_behind_first_incisors '0/2'
foramina_intrude_between_first_incisors,
346 'rostral projection of premaxilla (Masters & Brothers, 2002)*' /
no_extension_of_premaxilla_beyond_anterior_incisors mild_premaxillary_projection
'considerable_projection,_forming_a_tubular_anterior_rostrum',
347 'ascending wing of premaxilla (RCr49-231)' / narrow broad,
348 'retia mirabilia of the proximal limb vessels (YIP87)' / absent_
present_,
349 'nasal morphology (Y62, contains information similar to R289)' /
lateral_cleft_between_medial_and_lateral_nasal_processes_
lateral_cleft_fused_and_rhinarium_covered_with_dry_hairy_skin_,
350 'vibrissae (Y61)' / present_ absent_,
351 'retinal fovea (Y60, R288)' / absent_ present_,
352 'tapetum lucidum (Y59, R290)' / present_ absent_,
353 'presence/absence of choriovitelline placenta (Y58, KPL4)' /
choriovitelline_placenta_no_choriovitelline_placenta_,
354 'epitheliochorial vs. hemochorial placentation (KPL1)' /
epitheliochorial 'diffuse,_hemochorial',
355 'blastocyst attachment (KPL2)' / invasive 'non-invasive',
356 'amniotic cavity (KPL3)' / primordial_cavity_absent
primordial_cavity_present,
357 'embryonic body stalk (KPL5)' / absent present,
358 'allantois development (KPL6)' / 'large,_vesicular' rudimentary,
359 vitamin_C_synthesis / absent present,
360 trabeculated_anterior_accessory_cavity / absent present
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Absarokius_sp. 10004????? ??00?00??? 2200?41042 0210212004
Abuqatrania_basiodontos ??0??????? ?????????? 22???????2 2?????12004
Adapis_pariensis 1000200000 1402?00223 0002440022 0004414204
Aegyptopithecus_zeuxis 1000202000 1102200003 24---40022 2216814224
Afradapis_longicristatus 1?01?00100 1102?00203 230--40022 2216814004
Aframoniuss_dieides 1?0????0?? ??2?00003 2200042122 0026612014
Afrotarsius_chatrathi ?????????? ?????????? ?????????? 020??1????

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Altanius_orlovi	1?0????2??	??????????	00???42022	0202612000
Altiatlasius_koulchii	??????????	??????????	??????????	??????????
Amphipithecus_mogaungensis	1?0????0??	??????????	22???22222	2006812002
Anaptomorphus_sp.	10004??0??	??20?10???	24?????022	02???12004
Anchomomys_gaillardi	1?0????2??	??????????	02???????2	0????10--4
Anchomomys_milleri	??0????4??	???2?20003	2202040022	0202610--4
Anemorhysis_savagei	11028?4??	?40?0????	220?40022	0202412002
Aotus_trivirgatus	1001400000	1002000003	2212042400	-224704224
Apidium_moustafai	1?0????00?	???2?10003	2204041242	2006812004
Apidium_phiomense	1000201000	1402200003	2204242242	2005812004
Arapahovius_gazini	1102804441	1440?20010	220204?222	0242614000
Arctocebus_calabarensis	1010414241	1200011034	2206040022	2206610--4
Arsinoea_kallimos	1001002000	1402?10003	2202040222	2024412004
Asiadapis_cambayensis	??????????	??????????	22???40022	0226811004
Aycrossia_lovei	100040?0?1	1?20?00012	22???4?022	0220212004
Bahinia_pondaungensis	1?00000000	1204?00003	22020?0022	222?810--4
Barnesia_hauboldi	??????????	??????????	??????????	??????????
Biretia_fayumensis	??????????	??????????	?????40022	02?2?12004
Biretia_megalopsis	??????????	?????0?0??	2200040022	2006813104
Branisella_boliviana	1?0???0000	1?02110?03	2202042200	-226404224
Bugtipithecus_inexpectans	??????????	??????????	??????????	?????12004
Caenopithecus_lemuroides	??0???????	??????????	2200040022	2226612004
Cantius_abditus	1000000220	1202?00?03	0002040022	0224612002
Catopithecus_browni	1000101000	1002200003	24---20022	2205714222
Cheirogaleus_major	1010414241	1200011034	2205141020	-116611004
Darwinius_masillae	1?0???0200	??0???????	22?0?0????	??????????
Djebelemur_martinezi	??????????	??????????	22???40022	022?810--4
Dolichocebus_gaimanensis	1?00?00?0??	140220?003	2202?4?220	-02?04204
Donrussellia_gallica	??????????	??????????	??????????	?????12002
Donrussellia_provincialis	??0????0??	??????????	00???42022	0202612004
Dyseolemur_pacificus	10006?20?1	??00?0000?	220?4?022	020?612002
Eosimias_centennicus	1100000000	1004?00003	2200040022	2205212002
Eosimias_sinensis	??0???????	??????????	22???????2	2????11004
Europolemur_klati	1?00000200	1002?00203	20?0042022	0206812004
Galago_moholi	1010414241	1200011034	2204042032	2204812004
Galagoidea_demidoff	1010414241	1200011034	2205030122	2215813104
Godinotia_neglecta	1?00?0202?	1?0???0?03	2???04????2	02???1?3?4
Hemiacodon_gracilis	110160?43?	1320?20?1	2200040022	0224814224
Hoanghoniush_stehlini	1?00202?0?	140???20103	2002041012	0123512004
Karanisia_clarki	??1????424?	???0?11034	22???40022	222?10--4
Komba_robustus	??????????	??????????	22???????2	2????12004
Lemur_catta	1010414241	1200011034	2205040022	2202212204
Lepilemur_mustelinus	1010414241	1200011134	2206042022	2214814004
Leptadapis_magnus	10002?0000	1402?10203	0002442222	0005814002
Loris_tardigradus	1010414241	1100011034	2206041022	2204714214
Loveina_minuta	??????????	??????????	??????????	??????????
Loveina_sheai	??????????	??????????	?????20042	0202412202
Loveina_wapitiensis	??????????	??????????	?????2?042	0202412202
Loveina_zephyri	10004?23??	??0???????	22???2?122	0202812000
Macrotarsius_montanus	1?006?22??	?22???????	22???????02	02???14220
Mahgarita_stevensi	1?0????2??	??02?00003	2200?40022	0206810--4
Marcgodinotius_indicus	1?0????2??	?????00???	00???40022	0226611004
Microadapis_sciureus	1?0????2??	???2?00?03	0002240022	0204214004
Microcebus_murinus	1010414241	1200011034	2205040020	-204810--4
Microchoerus_erinaceus	11028?4221	?440?20010	24---40020	-224814204
Moeripithecus_markgrafi	??????????	??????????	??????????	??????????
Myanmarpithecus_yarshensis	??0???????	?????00???	22020?0222	200?0000??
Nannopithecus_abderhaldeni	1102814241	1440?20000	24---40020	-200012004
Nannopithecus_raabi	1102804241	1440?20000	24---40020	-200002004
Necrolemur_spp.	11028?4241	?440?00010	24---40020	-224814204
Nycticeboides_simpsoni	??????????	??????????	2206040022	2204610--4
Nycticebus_coucang	1010414241	1200011034	2206040022	2204410--4
Oligopithecus_rogeri	??0???????	???420?003	?????0022	?206814222
Oligopithecus_savagei	??0???????	?????10003	24---20022	2206814222
Omomys_sp.	1102703221	0420?00002	2200040022	0246812004
Otolemur_crassicaudatus	1010414241	1200011034	2206042022	2206812004
Panobius_russelli	??????????	??????????	??????????	?????10--4
Parapithecus_fraasi	2-0--?000?	???2?00003	2202042242	2004612004
Parapithecus_grangeri	3-0-----	---2?00003	2202042142	2205712013
Perodicticus_potto	1010414241	1000011134	2206040031	1203311004
Phenacopithecus_krishtalkai	??????????	??????????	??????????	??????????

Phenacopithecus_xueshii	?????0????	???????????	2200240022	220??11004
Phileosimias_kamali	???????????	???????????	?????40022	?22??12002
Plesiadapis_tricuspidens	2?0--?4441	?04-----	24--?42042	0224810--4
Plesiolestes_problematicus	1101804221	0040?00002	22?2042022	0225614020
Plesiopithecus_teras	3-0-----	---2?10004	1202040022	2224611004
Pondaungia_cotteri	1?0????0??	???4?00??3	22?2042222	2006812004
Pronycticebus_gaudryi	10002?0000	1??2??????	00??40022	022?612002
Propithecus_spp.	201---424-	---0011034	24---41040	-106812004
Propliopithecus_chirobates	1000202000	1202200003	24---40022	2206814223
Propliopithecus_haekeli	???????????	???2?00?03	24---40022	2206814224
Proteopithecus_sylviae	1100200000	1402210003	2205040022	2203414224
Protoadapis_curvicaudatus	1?02??????	???2?000?3	0002?4?022	0?267120?4
Pseudoloris_parvulus	110280?4??	?40?00?1?	24---40020	-200412004
Purgatorius_unio	0?0????42??	???????????	0002042022	0220410--0
Qatrania_wingi	?00????????	???????????	22?????????	2????12004
Rencunius_zhoui	???????????	???????????	???????????	?????12004
Rooneyia_viejaensis	???????????	???????????	???????????	???????????
Saharagalago_misrensis	???????????	???????????	???????????	???????????
Saimiri_sciureus	1002200000	1004200003	2206042400	-244804224
Serapia_eocaena	?00????????	???2?10003	2204240022	2204414224
Shoshonius_cooperi	10004?00??	?00?00012	2200022202	0202712200
Siamopithecus_eocaenus	?00????0??	???4?00003	22??40022	2204812004
Steinius_vespertinus	11006?3???	???2??????	02??40022	0244812004
Strigorhysis_sp.	10014?00??	?20?0?????	22??0?0?02	02?02120?4
Taqah_propliopithecoid	?00????????	???2?100??	24---40022	2206814224
Tarsius_bancanus	2?0--?3111	?002000200	2200440020	-220211004
Teilhardina_americana	11016?74??	?10?00002	1200041022	0221{35}12002
Teilhardina_asiatica	1?0070010?	1?00?0?003	0200042022	0232612002
Teilhardina_belgica	11005?1?1?	?00?0????3	12??40002	0222512002
Tetonius_sp.	1102804441	1440?00010	2200040022	0220412003
Tetonoides_sp.	11027?4???	?20?0?????	22??00022	0222614000
Troglemur_myodes	11028?4441	?40?000?0	24---4?040	-200202002
Tupaia_spp.	0000404441	0000000003	2202042022	0202612002
Uintanius_ameghini	10005?2???	?00?0?????	22??20022	0202410--2
Varecia_variegata	1010414241	1200011034	2206041022	2224612022
Wadilemur_elegans	1?????2???	???????????	2204030022	2202810--3
Wailekia_orientale	???????????	???????????	20?????????	?????1????
Washakius_insignis	10004010?1	1400?000?1	2201022222	0202612210
Xanthorhysis_tabrumi	?00????????	???????????	22??40022	0222212004
[	50	60	70	80]
[	.	.	.	.]
Absarokius_sp.	-200020260	4432000A02	4300122044	2212252010
Abuqatrania_basiodontos	100000?260	?2?0002022	2100222110	2202222000
Adapis_parisiensis	-200044404	002022866G	0-00242405	24200-2022
Aegyptopithecus_zeuxis	-411224240	130010020G	0-01040020	11320-2100
Afradapis_longicristatus	-204030422	200020A66G	0-00222225	24300-3022
Aframomys_dieides	-202232420	000010726A	0-002235-6	24000-4024
Afrotarsius_chatrathi	?????002?0	2??12?6024	4100020024	2442422000
Altanius_orlovi	2200000220	0000002240	4300204224	2442452020
Altiaatlasius_koulchii	???????????	?????????41	41000200?4	2302422000
Amphipithecus_mogaungensis	0402034220	222000201G	21022404-6	0202252103
Anaptomorphus_sp.	-200020220	2421002644	4301222644	2412452010
Anchomomys_gaillardi	-204040420	?00020A660	0-002246-6	24220-2034
Anchomomys_milleri	-2020200-0	202022A060	0-022246-6	244?0-2023
Anemorhysis_savagei	1200040220	2240003230	43002226-6	2442452010
Aotus_trivirgatus	-422224220	0000000307	0-020304-6	22020-2003
Apidium_moustafai	-000002050	2400002337	1101222220	11120-2110
Apidium_phiomense	-000002050	140000221G	1101222020	02220-1120
Arapahovius_gazini	2202240240	0241205122	4200222634	2442452025
Arctocebus_calabarensis	-204020110	202022806?	0-002222-6	24410-2022
Arsinoea_kallimos	-200020240	4220020224	2300242?02	0202252002
Asiadapis_cambayensis	2200020220	000022A464	2100202244	2222152?02
Aycrossia_lovei	-200220240	4421002622	4320202644	2412452010
Bahinia_pondaungensis	-200020222	0000004644	4102200044	2402??????
Barnesia_hauboldi	???????????	???????????	???????????	???????????
Biretia_fayumensis	-20404?240	?2?0006?42	2102220022	22021-2001
Biretia_megalopsis	-20013?140	2200009?53	2101222222	2212121002
Branisella_boliviana	-4?02?4220	1200000006	???20404??	?2020-2?03
Bugtipithecus_inexpectans	-200424020	?200006?44	0-022402-6	2202??????

Caenopithecus_lemuroides	-202000420	220000A26G	0-002422-5	24200-2022
Cantius_abditus	1201220222	000010840G	3300213544	2432253022
Catopithecus_browni	1402234220	110000{35}318	2101040002	22010-2000
Cheirogaleus_major	-20432{13}203	1140006236	0-002403-6	24320-2?03
Darwinius_masillae	??????????	?0?0????4G	0-002220-6	24320-4020
Djebelemur_martinezi	-002020220	202002A260	0-022246-6	24220-2002
Dolichocebus_gaimanensis	-20???4?220	0???0002?2G	2102242204	02220-2003
Donrussellia_gallica	120202?122	?0?000A?62	4300204644	2432422002
Donrussellia_provincialis	-201110432	000000A662	4300203644	2412342011
Dyseolemur_pacificus	1202220222	2421202202	4120222044	2440422020
Eosimias_centennicus	0200000120	2221206460	4300202024	2422432020
Eosimias_sinensis	-2000000220	?200206040	4302200244	2422442002
Europolemur_klatti	-2020202-0	000000A66A	0-002224-6	24220-2022
Galago_moholi	-200144404	2240008642	0-022000-6	24020-2010
Galagoïdes_demidoff	-300044402	3240007350	0-022010-6	24020-2010
Godinotia_neglecta	-?2?2?22??	00000?2???	?????22-6	222?2??2??
Hemiacodon_gracilis	-402240022	2220206046	4310222124	2442444022
Hoanghoniuss_stehlini	-204330330	000020A45A	4300120240	23420-2002
Karanisia_clarki	-202020020	20?0228064	10012222-6	2432102022
Komba_robustus	-202242202	40?000A245	0-022022-6	24000-2021
Lemur_catta	-202100220	020000A66G	21022420-6	24000-4010
Lepilemur_mustelinus	-304411413	203010A068	0-00222224	24220-2012
Leptadapis_magnus	0200244404	000010886G	0-002424-6	24300-2022
Loris_tardigradus	-300130121	2110008044	0-022321-6	24120-2021
Loveina_minuta	??????????	?????????40	4300222044	2400422000
Loveina_sheai	2200000020	2141002432	4300222044	2442222000
Loveina_wapitiensis	2200000220	2241204442	4300222044	2422422020
Loveina_zephyri	2202200222	2431104441	4200222034	2432432020
Macrotaarsius_montanus	1402240222	0401203026	4320142022	2422442020
Mahgarita_stevensi	-202220220	000022A466	0-0?22?2???	24220-2023
Marcgodinotius_indicus	?200020220	000022A562	2100200024	2222122?02
Microadapis_sciureus	-200020222	000020A664	0-002246-6	24200-4023
Microcebus_murinus	-200-02020	3140202420	0-022202-6	24320-2000
Microchoerus_erinaceus	-202210022	4441202006	43002420-6	24400-2020
Moeripithecus_markgrafi	??????????	?????????0G	0-02040002	00020-210?
Myanmarpithecus_yarshensis	??????????	022?2?2?2??	?????222-6	?2020-2002
Nannopithecus_abderhaldeni	-200000220	4442006422	41002222-6	2432222000
Nannopithecus_raabi	-200220220	4442006422	40002226-6	2442222020
Necrolemur_spp.	-202220222	4441202024	43002426-6	24400-2020
Nycticeboides_simpsoni	-202020222	220002A024	0-022222-6	24020-2020
Nycticebus_coucang	-2000200?0	220002804A	0-022222-6	24020-2022
Oligopithecus_rogeri	240224?222	?20000A?4G	2000040002	23021?2000
Oligopithecus_savagei	240002?222	220000220A	2100040002	22020-2000
Omomys_sp.	-202240220	0020207444	4300220035	2422222000
Otolemur_crassicaudatus	-200244404	122000A66G	0-022011-6	24020-2011
Panobius_russelli	-202-00?2?	?2?0209?61	4100204644	2222442022
Parapithecus_fraasi	-000002040	040000462G	0-02242220	02220-0120
Parapithecus_grangeri	?0000040?0	140000140G	0-01141121	02120-1110
Perodicticus_potto	-202020110	000001A066	0-012211-6	00020-2012
Phenacopithecus_krishtalkai	??????????	???????????	?????222-6	?????222-6
Phenacopithecus_xueshii	-20012?220	?200106?52	42002?0224	2422222000
Phileosimias_kamali	220222?220	?200206?14	4100220202	2432422000
Plesiadapis_tricuspidens	-200042220	000000220G	4400204622	2422254022
Plesiolestes_problematicus	1402044424	000000A264	4300202024	2432454020
Plesiopithecus_teras	-202020020	314012A018	0-002400-6	12320-2000
Pondaungia_cotteri	-202044220	422000002G	210?240424	0222252103
Pronycticebus_gaudryi	1200040222	0000208646	23202026-6	2422224002
Propithecus_spp.	-204301434	102000A06G	42002323-6	2400122022
Propliopithecus_chiobates	1412134230	230000110G	1102040020	11120-2100
Propliopithecus_haekeli	-4002?4220	020000220G	0-02040?22	00220-210?
Proteopithecus_sylviae	-400230240	1200002006	2100020102	2412122000
Protodadapis_curvicaudatus	-20022?440	00002?6A4G	21002046-6	2422224022
Pseudoloris_parvulus	-200000220	4241217240	21002020-6	2442222020
Purgatorius_unio	1200040420	200000A260	2300202222	2422442045
Qatrania_wingi	-000002240	?2?0001022	2100222220	1022120000
Rencunius_zhoui	-20002?020	?00020A258	4300221301	13420-2021
Rooneyia_viejaensis	??????????	???????????	?????222-6	2442?222-6
Saharagalago_misrensis	??????????	?????????62	0-022224-6	2442?222-6
Saimiri_sciureus	-420244220	0000000506	1?022410-6	24220-2000
Serapia_eocaena	-400020220	2200002008	2100020002	2222222000
Shoshonius_cooperi	2202210240	2441203442	4210232624	2420432020

Siamopithecus_eocaenus	-200224220	020000020G	0-0?240?44	?2020-2003
Steinius_vespertinus	1202240220	0020206242	4300222235	2442254000
Strigorhysis_sp.	-200230242	4421002602	41002?2044	2412452010
Taqah_propiopithecoid	-402244240	240000040G	2102040402	02020-210?
Tarsius_bancanus	-202220220	4241213114	4100200025	2432422000
Teilhardina_americana	1200210240	112110{35}2	(135)1	4300202244
Teilhardina_asiatika	1200030220	0020005560	4200202044	2422452000
Teilhardina_belgica	1200040220	0020007340	4300202044	2422452000
Tetonius_sp.	1200220232	4421002502	4300202{13}44	2412452010
Tetonoides_sp.	2200220242	2240205260	4200212634	24424{13}2010
Trogolemur_myodes	1202000220	4442202220	43002026-6	2442252010
Tupaia_spp.	2200120240	000000A066	4300002004	2402442020
Uintanius_ameghini	0200000220	4422022A50	4300202044	2422222020
Varecia_variegata	1324320201	000000A26G	0-020202-6	23020-2102
Wadilemur_elegans	0200021400	204002A052	0-022022-6	240?0-2020
Wallekia_orientale	??????????	??????????	??????????	??2?0-2020
Washakius_insignis	2202200020	2441203442	4110232422	2420422020
Xanthorhysis_tabrumi	-202220220	4221208462	4100200024	2442422000

[	90	100	110	120]
[	.	.	.	.]

Absarokius_sp.	2244002424	2122021002	1?????????	??????????1
Abuqatrania_basiodontos	0120204511	0102021020	0?????????	???????????
Adapis_parisiensis	240500000-	2220021004	0?20404012	0420400400
Aegyptopithecus_zeuxis	032020330-	1202021002	01?????????	??10201261
Afradapis_longicristatus	242500020-	2200021002	21??104001	04?02?126?
Aframomius_dieides	242500010-	2300021002	1?????????	??????????1
Afrotarsius_chatrathi	2224000641	1222021000	0?????????	???????????
Altanius_orlovi	2224000024	1200021000	0?????????	???????????
Altatlasius_koulchii	22?4012???	??????020	0?????????	???????????
Amphipithecus_mogaungensis	02-600260-	3120021002	0?????????	???????????
Anaptomorphus_sp.	2244002424	3222021002	0?????????	???????????
Anchomomys_gaillardi	24-600040-	1400021002	0?????????	???????????
Anchomomys_milleri	24-6000???	??????002	0?????????	???????????
Anemorhysis_savagai	22-6002224	1220021000	0?????????	???????????
Aotus_trivirgatus	22-600060-	3222--0002	0124404020	0100100221
Apidium_moustafai	012031330-	0202021121	0?????????	???2?102?
Apidium_phiomense	002031430-	0202021120	0?????20??	??20101121
Arapahovius_gazini	2234000224	1210021002	4????30410?	???????????
Arctocebus_calabarensis	24-600030-	2200021000	0000202100	0210310221
Arsinoea_kallimos	020210240-	2002021000	0?????????	???????????
Asiadapis_cambayensis	2244000514	2400121010	0?????????	???????????
Aycrossia_lovei	2244001424	3220021002	3?????????	???2?04?1
Bahinia_pondaungensis	??????0?41	1202021000	0?????????	??00001221
Barnesia_hauboldi	???????????	???????????	???????????	???????????
Biretia_fayumensis	222220240-	3002021002	1?????????	???????????
Biretia_megalopsis	2122203411	3002021002	0?????????	???????????
Branisella_boliviana	?20500260-	0202?21002	0?????????	??????1?21
Bugtipithecus_inexpectans	??????2?0-	1420021002	0?????????	???????????
Caenopithecus_lemuroides	244400220-	2200021004	2?????????	???????????
Cantius_abditus	2345001024	3320041002	1?????????	???2200?00
Catopithecus_browni	220210150-	1202121002	0122104000	0200201061
Cheirogaleus_major	23-600050-	3322021002	2024104101	0020410021
Darwinius_masillae	22-6000???	??????003	0?????????	??0?0???
Djebelemur_martinezi	22-600040-	2220021002	0?????????	???????????
Dolichocebus_gaimanensis	0204312???	??????1002	0?2?2020?0	0???2?122?
Donrussellia_gallica	2244000?21	1220021002	0?????????	???????????
Donrussellia_provincialis	2244000123	1320021002	0?????????	???????????
Dyseolemur_pacificus	2244003021	1200021004	3?2220020-	00?00?0421
Eosimias_centennicus	2234000241	1022021000	0?????????	??????022?
Eosimias_sinensis	2044000???	??????000	0?????????	???????????
Europolemur_klati	22-600220-	2200021002	0??4004002	04?04?0?21
Galago_moholi	22-600040-	1100021000	0000000100	0020410021
Galagoides_demidoff	22-600030-	1201021001	0000001100	0110410121
Godinotia_neglecta	??????2???	??00210??	???????????	???????????
Hemiacodon_gracilis	2224002221	2200031002	4?????????	??2?2?0021
Hoanghonius_stehlini	224010030-	2200121002	0?????????	???4?0021
Karanisia_clarki	22-6001210	2310021002	0?????????	???????????
Komba_robustus	22-600020-	2200021001	0?????????	???????????
Lemur_catta	24-600140-	1402021002	0003003000	0200400021

Lepilemur_mustelinus	222430040-	2300021002	0-----	---141?021
Leptadapis_magnus	240400000-	2220021004	01?0??401?	?400401400
Loris_tardigradus	23-600030-	1200021001	0010000100	0020420021
Loveina_minuta	2244000044	1200021000	0?????????	???????????
Loveina_sheai	2244002024	1200021000	0?????????	???????????
Loveina_wapitiensis	2244002024	1200021002	0?????????	???????????
Loveina_zephyri	2235002022	12???21002	0?????????	???????????
Macrotrastus_montanus	2222002041	2400021002	2?????????	???????????
Mahgarita_stevensi	24??00020-	3200021002	0?????????	???401241
Marcgodinotius_indicus	222400040?	2200121000	0?????????	???????????
Microadapis_sciureus	24-600240-	2400021000	0?????????	???????????
Microcebus_murinus	23-600000-	1210021002	0004402100	?020410021
Microchoerus_erinaceus	22-600220-	3200?21003	402400022-	1020200261
Moeripithecus_markgrafi	0200104???	??????002	0?????????	???????????
Myanmarpithecus_yarshensis	04-600200-	3200021002	2???4020?0	0?????????
Nannopithecus_abderhaldeni	23-600200-	2220021002	0???40????	???2400061
Nannopithecus_raabi	22-6002221	3212021002	1??440?22?	?020400461
Necrolemur_spp.	22-600220-	3222021002	40240?22?	??20?0?61
Nycticeboides_simpsoni	22-600000-	1200021002	0?????????	???420021
Nycticebus_coucang	22-600250-	2002021002	0004102100	0110420021
Oligopithecus_rogeri	200210160-	120202100?	0?????????	???221???
Oligopithecus_savagei	1004100???	??????002	0????0????	???????????
Omomys_sp.	2235001221	1220021002	0?2?????0?	???0???21
Otolemur_crassicaudatus	22-600160-	2201021001	0001000100	0020420021
Panobius_russelli	2444002?31	2221021001	0?????????	???????????
Parapithecus_fraasi	022020440-	0002021022	0?????????	???????????
Parapithecus_grangeri	012120440-	0002021021	01????????	??2021?021
Perodicticus_potto	02-600280-	3112021002	0001103000	0410410021
Phenacopithecus_krishtalkai	??????????	??????????	??????????	??????????
Phenacopithecus_xueshii	2024000?21	1?22021000	0?????????	???????????
Phileosimias_kamali	2202102?21	1202121002	0?????????	???????????
Plesiadapis_tricuspidens	2222002044	1410041000	010400222-	1200????-1
Plesiolestes_problematicus	2224002043	1200041000	0?????????	???????????
Plesiopithecus_teras	02-600360-	1422021002	0?????????	???400011
Pondaungia_cotteri	022400210-	3320021002	2?2?204020	0???2?0221
Pronycticebus_gaudryi	24-600000-	1200021002	0?????????	???220???0
Propithecus_spp.	23-600240-	4202011002	1014{13}04001	0400410061
Propliopithecus_chiobates	022020310-	1202021002	0?????????	???2201461
Propliopithecus_haekeli	024230240-	?202021002	0?????????	???????????
Proteopithecus_sylviae	2102101611	1102021000	01?20040?0	??20201021
Protoadapis_curviuspidens	24-600200-	22?002100?	0?????????	???????????
Pseudoloris_parvulus	22-6000211	1200021002	0?24?0???2?	?220200261
Purgatorius_unio	2222000443	2202021002	0???00222?	1?????????
Qatrania_wingi	0020314411	0002021020	0?????????	???????????
Rencunius_zhoui	110110340-	2200021001	0?????????	???????????
Rooneyia_viejaensis	??????????	??????????	?0????????	??2020???1
Saharagalago_misrensis	???????0???	???????002	0?????????	???????????
Saimiri_sciureus	22-600180-	3002-00000	0124402020	0000101{04}21
Serapia_eocaena	200210260-	1002021000	0?????????	???????????
Shoshonius_cooperi	2224001022	1210021004	3?????????	???????????
Siamopithecus_eocaenus	024400200-	3000021002	0?????????	???????????
Steinius_vespertinus	2235000224	22?1021002	0?????????	???????????
Strigorhysis_sp.	22440?43?4	12???21002	4?????????	??2?0???1
Taqah_propliopithecoid	022220240-	3202021002	0?????????	???????????
Tarsius_bancanus	2225002241	1210021001	014441020-	0200001221
Teilhardina_americana	2245001424	2010021002	0?????????	???????????
Teilhardina_asiatica	2244002324	100002100?	0??1?0???0?	??2?0?0000
Teilhardina_belgica	2244002324	1000021001	0?????????	???????????
Tetoniuss_sp.	2244003424	1012021002	0?344?312?	0?200002?1
Tetonoides_sp.	223400222 (014)	12?0021002	0?????????	???????????
Trogolemur_myodes	22-6002024	1220021000	0?????????	???????????
Tupaia_spp.	2104000743	1002??1000	000200220-	0200200021
Uintanius_ameghini	2244002421	1200021002	0?????????	???????????
Varecia_variegata	21-600180-	2212021002	0012004002	0400400021
Wadilemur_elegans	22-600040-	1200021001	0?????????	???????????
Wailekia_orientale	?20010240-	1200?2100?	0?????????	???????????
Washakius_insignis	2222002021	2200041004	4?????????	???????????
Xanthorhysis_tabrumi	2224000441	1202021002	0?????????	???????????

[130 140 150 160]
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Absarokius_sp.	2?1?022002	1000000000	0412602024	0-0-020021
Abuqatrania_basiodontos	??????????	??????????	??????????	??????????
Adapis_parisiensis	1210200012	0002012100	0232202020	000-000000
Aegyptopithecus_zeuxis	3---004202	2001020110	0412102200	-00-100100
Afradapis_longicristatus	?????12002	2002000100	011200?020	000-400010
Aframomius_dieides	2210002002	0202000100	0412002020	000-102020
Afrotarsius_chatrathi	??????????	??????????	??????????	??????????
Altanius_orlovi	1????22002	0000000000	0012202024	0-0-020021
Altiatlasius_koulchii	??????????	??????????	?????2?024	0-0-?00030
Amphipithecus_mogaungensis	??????????	??????????	???2?2?022	?0-??????
Anaptomorphus_sp.	?????????02	0000000000	?412602024	0-0-020021
Anchomomys_gaillardi	??????????	??????????	?????02022	000-000000
Anchomomys_milleri	??????????	??????????	??????????	??????????
Anemorhysis_savagei	?????02002	0202000000	?412202?24	0-0-040020
Aotus_trivirgatus	1000304000	1000010000	0411100200	-00-400000
Apidium_moustafai	0100?04202	2000200110	0012?22020	010-004060
Apidium_phiomense	0100104202	1000200020	0012222020	020-004060
Arapahovius_gazini	221?022002	0002000000	0412002024	0-0-030041
Arctocebus_calabarensis	1212002002	2002010020	0432002010	000-200000
Arsinoea_kallimos	??????????	??????????	?????22000	-00-?00000
Asiadapis_cambayensis	?????02002	0000000000	0202402022	000-000010
Aycrossia_lovei	2212022022	000000?000	?4?2?02014	0-0-02?020
Bahinia_pondaungensis	2010000002	0002000?00	0?12202204	-00-000000
Barnesia_hauboldi	?????2002	2002000100	0412002020	000-000000
Biretia_fayumensis	010??04202	2000100020	0212?0?010	000-000040
Biretia_megalopsis	??????????	0000200020	0012?02020	000-003040
Branisella_boliviana	2??024000	0200020000	0011002000	-00-003000
Bugtipithecus_inexpectans	?????2200?	?0000?000?	?????0?200	-00-400000
Caenopithecus_lemuroides	?????000?2	0002000100	0212002020	000-200020
Cantius_abditus	1210024002	0102010101	0412202120	000-044020
Catopithecus_browni	3---022002	0001020000	0412202102	-00-000000
Cheirogaleus_major	2212000002	2000010000	0102001004	--0-003000
Darwinius_masillae	2?????????	??????????	?????2?020	000-?00000
Djebelemur_martinezi	??????????	??????????	??????????	??????????
Dolichocebus_gaimanensis	211?002200	0210020021	0011042?20	000-200200
Donrussellia_gallica	??????????	0002000000	0212?0?024	0-0-000010
Donrussellia_provincialis	??????????	0200000000	0212?02024	0-0-012020
Dyseolemur_pacificus	2310222202	0002000020	0012000022	020-023040
Eosimias_centennicus	?????2200?	0002000?00	041?02004	--0-000000
Eosimias_sinensis	??????????	??????????	??????????	??????????
Europolemur_klati	121002?002	0002000100	0412?0?020	000-000000
Galago_moholi	1212021002	0010202020	0632101020	0142100010
Galagoidea_demidoff	1212022202	0010202020	2632201020	0241200020
Godinotia_neglecta	2?10?220??	0002000100	02?2?0?022	000-000000
Hemiacodon_gracilis	2???122012	0002000000	0212012132	020-022041
Hoanghoniush_stehlini	121???0002	0001000000	0102?4?222	020-000020
Karanisia_clarki	?????22002	0002010000	0012?0?022	0020000000
Komba_robustus	??????????	2000000020	0432002020	0242100000
Lemur_catta	12101-0002	0000000000	0402231003	-20-000000
Lepilemur_mustelinus	1211212002	2001010000	0102201003	-00-002000
Leptadapis_magnus	1210004002	0012022100	0232402020	000-012000
Loris_tardigradus	1212224102	0200010010	0312002020	0131000020
Loveina_minuta	??????????	??????????	??????????	??????????
Loveina_sheai	??????????	??????????	??????????	??????????
Loveina_wapitiensis	??????????	??????????	??????????	??????????
Loveina_zephyri	??????????	0?0200?100	0412?02024	0-0-010020
Macrotaarsius_montanus	??????????	??????????	??????????	??????????
Mahgarita_stevensi	2310022002	2002220100	0412202020	000-400021
Marcgodinotius_indicus	??????????	02?????0??	?????0?222	000-000020
Microadapis_sciureus	??????????	??????????	?????0?020	000-000020
Microcebus_murinus	2211000002	1002000000	0202201002	-010100000
Microchoerus_erinaceus	3---02102	0212000020	0432202?20	200-022060
Moeripithecus_markgrafi	??????????	??????????	??????????	??????????
Myanmarpithecus_yarshensis	??????????	2200100100	0412002?22	000-002000
Nannopithecus_abderhaldeni	3---02002	2000000000	0412200024	0-0-010021
Nannopithecus_raabi	3---02002	0201000000	0412200024	0-0-020021
Necrolemur_spp.	3---04002	0212000020	0422201120	100-032040
Nycticeboides_simpsoni	221?222002	0200000000	0412002020	0222200000
Nycticebus_coucang	2214422002	0200000010	0212000020	020-200000
Oligopithecus_rogeri	?????24002	0000020?00	0412?0?203	-010000000

Oligopithecus_savagei	?????0420?	??0002??20	04????0?202	-00-?00000
Omomys_sp.	2210022002	0001000000	0012412222	000-000021
Otolemur_crassicaudatus	1212421002	1010202020	1632301010	0142100000
Panobius_russelli	??????????	??????????	?????0?024	0-0-000010
Parapithecus_fraasi	??????????	??????????	??????????	??????????
Parapithecus_grangeri	1100004002	2000200100	0412300120	200-004040
Perodicticus_potto	2214401001	2000000000	0412001012	0112100000
Phenacopithecus_krishtalkai	??????????	0002000?00	041?202004	--0-000000
Phenacopithecus_xueshii	??????????	??????????	?????0?14	0-0-?000??
Phileosimias_kamali	??????????	??????????	?????0?024	000-000040
Plesiadapis_tricuspidens	1210014012	0000202100	0212202022	000-030040
Plesiolestes_problematicus	1????20002	0001202100	0202402024	0-0-040021
Plesiopithecus_teras	2210020002	0001?00?00	0012?00004	--0-010000
Pondaungia_cotteri	23?004002	2200100?00	?412202?00	-00-202020
Pronycticebus_gaudryi	1????22002	0002000100	0012002022	020-000020
Propithecus_spp.	3---00001	0001000000	0102001010	000-402000
Propliopithecus_chiobates	3---004000	1000120100	0412002100	-00-000000
Propliopithecus_haekeli	??????????	??????????	??????????	??????????
Proteopithecus_sylviae	2010024002	0201000010	0412{13}1111	010-000010
Protoadapis_curvicaudatus	?????0?20?	2002000120	?412?0?22	020-000000
Pseudoloris_parvulus	3---22002	1002000000	041200?020	000-200041
Purgatorius_unio	??????????	0000002000	0002202222	000-020021
Qatrania_wingi	??????????	??????????	?????0?20	000-002040
Rencunius_zhoui	??????????	?002000000	020204?22	020-?00020
Rooneyia_viejaensis	231?022202	0000200120	?412002030	200-204060
Saharagalago_misrensis	??????????	??????????	?????0?020	0242?00000
Saimiri_sciureus	1112204000	2000020010	0411320100	-00-200000
Serapia_eocaena	??????????	??????????	??????????	??????????
Shoshonius_cooperi	2110024022	0002002100	0112222034	0-0-010040
Siamopithecus_eocaenus	?????02002	0000000000	0412200202	-00-400200
Steinius_vespertinus	?????22002	0202000000	0412402014	0-0-030021
Strigorhysis_sp.	2?1?022002	1000000000	0412402024	0-0-040020
Taqah_propliopithecoid	?????04002	0000120120	041?2?202	-00-400000
Tarsius_bancanus	2310020002	2002000000	0412001014	0-0-000010
Teilhardina_americana	?????22002	2002000000	0412102?24	0-0-030021
Teilhardina_asiatika	1210022002	0100000000	0212202024	0-0-000021
Teilhardina_belgica	?????22002	2000000100	021210?014	0-0-000021
Tetonius_sp.	2310022002	1001010000	0412402014	0-0-020021
Tetonoides_sp.	2????220?2	0002000000	?21210???4	0-??020021
Trogolemur_myodes	?0?0?0?0??	0000000?00	0412?0?024	0-0-040011
Tupaia_spp.	12100-0002	0201000000	0002001003	-00-002000
Uintanius_ameghini	?????22002	0000000000	0412400024	0-0-020020
Varecia_variegata	1210000002	0000000000	0302401204	--0-002000
Wadilemur_elegans	??????????	?000?0002?	0412?0?020	0240000000
Wailekia_orientale	??????????	??????????	??????????	??????????
Washakius_insignis	210?024202	0202001020	0212222032	020-022040
Xanthorhysis_tabrumi	??????????	??????????	??????????	??????????
[	170	180	190	200]
[	.	.	.	.]
Absarokius_sp.	0202000402	003210000?	?0????????	???0020202
Abuqatrania_basiodontos	??????????	??????????	0002??????	??????????
Adapis_parisiensis	0204040000	3104204024	2201???204	2033023200
Aegyptopithecus_zeuxis	000{024}021003	4221014022	0412???204	2023220202
Afradapis_longicristatus	0144040010	310314?022	24????????	??????????
Aframomius_dieides	0124020010	1104224012	0101??????	??????????
Afrotarsius_chatrathi	??????????	??????????	?0????????	??????????
Altanius_orlovi	2204000410	000420400?	?4????????	??????????
Altiaatlasius_koulchii	0204020?10	322220?0??	??????????	??????????
Amphipithecus_mogaungensis	?0?02?02	???2?0200?	24????????	??????????
Anaptomorphus_sp.	0202000402	003210000?	??????????	??????????
Anchomomys_gaillardi	0202040200	02022040??	?10???????	??????????
Anchomomys_milleri	??????????	??????????	?0????????	??????????
Anemorhysis_savagei	02?402?4?0	202220200?	??????????	??????????
Aotus_trivirgatus	0000140002	0300020424	0412143113	1043121102
Apidium_moustafai	0201022002	42202220??	?20???????	??????????
Apidium_phiomense	0201022002	4230232022	0301???204	1031220222
Arapahovius_gazini	2204010400	202320300?	??????????	??????????
Arctocebus_calabarensis	0204030001	4201012002	0001005024	0144204202
Arsinoea_kallimos	0202022002	422000000?	?2????????	??????????

Asiadapis_cambayensis	0002020400	102220200?	??0????????	???????????
Aycrossia_lovei	0201010402	004210300?	???????????	???????????
Bahinia_pondaungensis	0004020312	420?????0?	?4?????????	???????????
Barnesia_hauboldi	0004042000	40022020??	???????????	???????????
Biretia_fayumensis	0200022002	402???????	???????????	???????????
Biretia_megalopsis	0200022002	41320020??	?2?????????	???????????
Branisella_boliviana	0200020002	442000022?	?4?????????	???????????
Bugtipithecus_inexpectans	0002040000	400???????	???????????	???????????
Caenopithecus_lemuroides	0244040210	220220402?	?2?????????	???????????
Cantius_abditus	0214020000	3002102000	2201????0?	2??302400?
Catopithecus_browni	0003021202	4222002002	0202??????	?033220202
Cheirogaleus_major	0201030400	4223002000	0001553204	4001014202
Darwinius_masillae	00?4??????	420?????20	?0022?4?0?	2?2???????
Djebelemur_martinezi	??????????	?????????0?	?0?????????	???????????
Dolichocebus_gaimanensis	0000000000	420422?2??	???????????	???????????
Donrussellia_gallica	0203020400	320???????	???????????	???????????
Donrussellia_provincialis	0202020400	010200200?	?0?????????	???????????
Dyseolemur_pacificus	0204010201	300200200?	???????????	???????????
Eosimias_centennicus	0204?0041?	400?????04	0401??????	???????????
Eosimias_sinensis	??????????	?????????0?	?0?????????	???????????
Europolemur_klatti	0004020002	300420200?	?202??????	???????????
Galago_moholi	1201020010	0402100001	0001664104	4001024202
Galagoides_demidoff	2200020010	0402201001	0001464004	2001024202
Godinotia_neglecta	00000?020?	0022?0?00?	??02????04	2003?2420?
Hemiacodon_gracilis	1204020201	000340300?	???????????	????020202
Hoanghoniuss_stehlini	0214002?00	400420?0??	?0?????????	???????????
Karanisia_clarki	0104040300	420400?00?	?2?????????	???????????
Komba_robustus	0100020011	040???????	?0?????????	???????????
Lemur_catta	0200042300	4124002000	0001663104	2020124101
Lepilemur_mustelinus	0003040410	1423002010	1001244204	1003014002
Leptadapis_magnus	0203040000	420422402?	22?1????204	2003222203
Loris_tardigradus	0102020001	{13}302121002	0001005022	0142004202
Loveina_minuta	??????????	???????????	???????????	???????????
Loveina_sheai	??????????	???????????	???????????	???????????
Loveina_wapitiensis	??????????	???????????	???????????	???????????
Loveina_zephyri	0204000412	000220400?	???????????	???????????
Macrotrarsius_montanus	??????????	?????????0?	???????????	???????????
Mahgarita_stevensi	0204040000	4004002020	2201??????	???????????
Marcgodinotius_indicus	00040?????	000220?00?	?0?????????	???????????
Microadapis_sciureus	0?04??????	202?????0?	?0?????????	???????????
Microcebus_murinus	0002020200	4213002000	0001663314	3002014002
Microchoerus_erinaceus	0204040000	0022202004	22?1????204	4000020202
Moeripithecus_markgrafi	??????????	???????????	???????????	???????????
Myanmarpithecus_yarshensis	0002040200	202400200?	?4?????0??	???????????
Nannopithecus_abderhaldeni	2204020400	0002202000	20?1??????	???????????
Nannopithecus_raabi	1204020400	00022020??	???????????	???????????
Necrolemur_spp.	0204040002	1022002004	2001??????	???????????
Nycticeboides_simpsoni	0004020000	04022020??	?4?????????	???????????
Nycticebus_coucang	0204020002	1422000002	0001006024	1141014202
Oligopithecus_rogeri	0000020300	420200????	???????????	???????????
Oligopithecus_savagei	00?00?????	440???????	?4?????????	???????????
Omomys_sp.	1203022200	400420100?	?0?????????	???????????
Otolemur_crassicaudatus	0200020002	0422001000	1201444004	4000124202
Panobius_russelli	0202020200	002200?0??	?0?????????	???????????
Parapithecus_fraasi	??????????	???????????	0??1??????	???????????
Parapithecus_grangeri	0203031002	322020102?	23?????004	?021220222
Perodicticus_potto	0000030203	1421000100	0201026004	2010013202
Phenacopithecus_krishtalkai	0204020410	400???????	???????????	???????????
Phenacopithecus_xueshii	??????????	300?00????	???????????	???????????
Phileosimias_kamali	0201?22200	312220????	???????????	???????????
Plesiadapis_tricuspidens	0204020200	0022204000	0400?0?004	2003020222
Plesiolestes_problematicus	2204000410	0022204000	?201??????	???????????
Plesiopithecus_teras	0000020400	4222?00000	2401??????	???????????
Pondaungia_cotteri	0204020002	404????200?	24?????024	2023024222
Pronycticebus_gaudryi	0224020202	002420400?	?212??????	???????????
Propithecus_spp.	0241040010	0401010003	0212226014	1020024002
Propliopithecus_chiobates	0022022001	422?????02?	?2???????04	2033220202
Propliopithecus_haeckeli	??????????	???????????	04?????????	???????????
Proteopithecus_sylviae	010{024}011002	3310000104	0201?????00	0041220212
Protoadapis_curvicaudatus	00?304?2?0	400?????0?	???????????	???????????
Pseudoloris_parvulus	2204020010	0404204000	0002??????	???????????

Purgatorius_unio	2206000210	000???????	??0???????	??????????
Qatrania_wingi	0?000????	??02??????	??22??????	??????????
Rencunius_zhoui	02?40????	400???????	??0???????	??????????
Rooneyia_viejaensis	0202020000	20224120??	??????????	??????????
Saharagalago_misrensis	00?00????	040???????	??????????	??????????
Saimiri_sciureus	0001112000	4300020422	0212225202	0042320202
Serapia_eocaena	??????????	??????????	??22??????	??????????
Shoshonius_cooperi	0224010412	100220400?	??001??204	200322020?
Siamopithecus_eocaenus	0000000202	024?02?20?	24????????	??????????
Steinius_vespertinus	2204000400	000210200?	??????????	??????????
Strigorhysis_sp.	0201000402	04421020??	??????????	??????????
Taqah_propitopithecoid	0001022202	422???????	??4???????	??????????
Tarsius_bancanus	0003020401	4014004002	0011665204	2000024202
Teilhardina_america	2204000401	202220100?	??0???????	??????????
Teilhardina_asiatika	2202000410	0022200000	??02??????	??????????
Teilhardina_belgica	2202000400	002220000?	??????????	??????????
Tetonius_sp.	2204000402	202210200?	??2???????	??????????
Tetonoides_sp.	2?240?242?	4?2210300?	??????????	??????????
Trogolemur_myodes	0202020402	2?4200300?	??????????	??????????
Tupaia_spp.	0246030310	0401000000	0001400103	0043024202
Uintanius_ameghini	0202020400	11222030??	??????????	??????????
Varecia_variegata	0200040400	4213000000	0001234204	3010224202
Wadilemur_elegans	0200020010	040???????	??????????	??????????
Wallekia_orientale	??????????	??????????	??????????	??????????
Washakius_insignis	0224012200	000240400?	??????????	??????????
Xanthorhysis_tabrumi	??????????	??????????	??????????	??????????
[	210	220	230	240]
[	.	.	.	.]
Absarokius_sp.	20024?????	??22010042	2021222010	10400?????
Abuqatrania_basiodontos	??????????	??????????	??????????	??????????
Adapis_parisiensis	01024602??	??153003004	30004{13}{13}212	10100??21
Aegyptopithecus_zeuxis	121048????	??064124244	40014?4110	120?2????21
Afradapis_longicristatus	??????????	??????????	??????????	??????????
Aframomius_dieides	??????????	??????????	??????????	??????????
Afrotarsius_chatrathi	??????????	??????????	??????????	??????????
Altanius_orlovi	??????????	??????????	??????????	??????????
Altatlasius_koulchii	??????????	??????????	??????????	??????????
Amphipithecus_mogaungensis	??????????	??????????	??????????	??????????
Anaptomorphus_sp.	??????????	??????????	??????????	??????????
Anchomomys_gaillardi	??????????	??????????	??????????	??????????
Anchomomys_milleri	??????????	??????????	??????????	??????????
Anemorhysis_savagei	??????????	??????????	??????????	??????????
Aotus_trivirgatus	2112440110	0023010244	3001164110	1230000021
Apidium_moustafai	??????????	??????????	??????????	??????????
Apidium_phiomense	121212??1?	??32011244	3001064012	122010?0?1
Arapahovius_gazini	??????????	??104010?42	002100411?	??0?0?2?001
Arctocebus_calabarensis	003216?021	1161104044	4100440212	02110?0?21
Arsinoea_kallimos	??????????	??????????	??????????	??????????
Asiadapis_cambayensis	??????????	??24000042	40404?2112	11?10?????
Aycrossia_lovei	??????????	??????????	??????????	??????????
Bahinia_pondaungensis	??????????	??????????	??????????	??????????
Barnesia_hauboldi	??????????	??????????	??????????	??????????
Biretia_fayumensis	??????????	??????????	??????????	??????????
Biretia_megalopsis	??????????	??????????	??????????	??????????
Branisella_boliviana	??????????	??????????	??????????	??????????
Bugtipithecus_inexpectans	??????????	??????????	??????????	??????????
Caenopithecus_lemuroides	??????????	??????????	??????????	??????????
Cantius_abditus	40004?????	??34002042	??040?5111?	??200??21?
Catopithecus_browni	02102?????	??44124244	40014?????	??????????
Cheirogaleus_major	4100431?10	1122003041	3020420210	1040010101
Darwinius_masillae	??0??4?2?0	0?????????	?????????110	??4?210??1
Djebelemur_martinezi	??????????	??????????	??????????	??????????
Dolichocebus_gaimanensis	??????????	??????????	??????????	??????????
Donrussellia_gallica	??????????	??????????	??????????	??????????
Donrussellia_provincialis	??????????	??????????	??????????	??????????
Dyseolemur_pacificus	??????????	??????????	??????????	??????????
Eosimias_centennicus	??????????	??22012212	40214?????	??????????
Eosimias_sinensis	??????????	??1{13}012212	4011253110	22500??2?2
Europolemur_klattii	??????????	????00004?	200??20110	1?20??????

Galago moholi	2112401110	1161000042	1020102210	1160021101
Galagoides demidoff	2000421210	1141001042	1020202210	1160021101
Godinotia neglecta	40004???	????????	????????	????????
Hemiacodon gracilis	20024???	?131010032	2021004111	2040020001
Hoanghoni stehlini	????????	????????	????????	????????
Karanisia clarki	????????	????????	????????	????????
Komba robustus	????????	????????	????????	????????
Lemur catta	3112421210	11620030{13}	4 4030432212	1020010111
Lepilemur mustelinus	4000401110	1142001043	3020402010	123?010?11
Leptadapis magnus	40024???	?1{35}3002014	40404{13}1212	10200???
Loris tardigradus	0124051021	1152103044	4100422212	0131000121
Loveina minuta	????????	????????	????????	????????
Loveina sheai	????????	????????	????????	????????
Loveina wapitiensis	????????	????????	????????	????????
Loveina zephyri	????????	????????	????????	????????
Macrotarsius montanus	????????	????????	????????	????????
Mahgarita stevensi	????????	????????	????????	????????
Marcgodinotius indicus	????????	?24000033	4040440012	111?0????
Microadapis sciureus	????????	????????	????????	????????
Microcebus murinus	3002431210	1112000042	202030221?	1020020111
Microchoerus erinaceus	20024???	????????	?????04???	?4?2????
Moeripithecus markgrafi	????????	????????	????????	????????
Myanmarpithecus yarshensis	????????	????????	????????	????????
Nannopithecus abderhaldeni	????????	?22010042	20212?4112	??0?0????
Nannopithecus raabi	????????	????????	????????	????????
Necrolemur spp.	????????	?122010043	004120401?	??610???
Nycticeboides simpsoni	????????	????????	????????	????????
Nycticebus coucang	0234261021	1144103044	4100442212	0111010121
Oligopithecus rogeri	????????	????????	????????	????????
Oligopithecus savagei	????????	????????	????????	????????
Omomys sp.	????????	?31010132	3021?0311?	?040?20??
Otolemur crassicaudatus	2001421?10	1143000041	2020402211	1160021?01
Panobius russelli	????????	????????	????????	????????
Parapithecus fraasi	????????	????????	????????	????????
Parapithecus grangeri	22122????	?32010242	?001062010	12001????
Perodicticus potto	0033461021	1142103044	4100452?12	0100000?21
Phenacopithecus krishtalkai	????????	????????	????????	????????
Phenacopithecus xueshii	????????	????????	????????	????????
Phileosimias kamali	????????	????????	????????	????????
Plesiadapis tricuspidens	221248?110	104?100004	4001460002	?000000?20
Plesiolestes problematicus	????????	????????	????????	????????
Plesiopithecus teras	????????	????????	????????	????????
Pondaungia cotteri	40004???	????????	?????2212	12?0????
Pronycticebus gaudryi	????????	????????	????????	????????
Propithecus spp.	4102421110	1142000040	2040440?12	1020000111
Propliopithecus chirobates	22103????	????????	?????22110	12?0????
Propliopithecus haeckeli	????????	????????	????????	????????
Proteopithecus sylviae	121244????	?42010224	20012????	????????
Protodapis curviuspidens	????????	????????	????????	????????
Pseudoloris parvulus	????????	????????	????????	????????
Purgatorius unio	????????	????????	????????	????????
Qatrania wingi	????????	????????	????????	????????
Rencunius zhoui	????????	????????	????????	????????
Rooneyia viejaensis	????????	????????	????????	????????
Saharagalago misrensis	????????	????????	????????	????????
Saimiri sciureus	2212160110	0032010233	300126{13}110	1230000021
Serapia eoacaena	????????	????????	????????	????????
Shoshonius cooperi	200242????	?22010043	{13}021212012	?400???
Siamopithecus eoacaenus	????????	????????	????????	????????
Steinius vespertinus	????????	????????	????????	????????
Strigorhysis sp.	????????	????????	????????	????????
Taqah propliopithecoid	????????	????????	????????	????????
Tarsius bancanus	4002400110	11100100{13}	0 2001001112	-061021011
Teilhardina americana	????????	????????	????????	????????
Teilhardina asiatica	????????	????????	????????	????????
Teilhardina belgica	????????	?2?010043	?021223012	?400????
Tetonius sp.	????????	?22010043	402120201?	?400????
Tetonoides sp.	????????	????????	????????	????????
Trogolemur myodes	????????	????????	????????	????????
Tupaia spp.	0213440100	1010112242	4001264000	1000000020
Uintanius ameghini	????????	????????	????????	????????

Varecia_variegata	3012431120	1142004044	4040430211	112?000?11
Wadilemur_elegans	??????????	??????????	??????????	??????????
Wailekia_orientale	??????????	??????????	??????????	??????????
Washakius_insignis	??????????	??22??43	0????02???	??4???????
Xanthorhysis_tabrumi	??????????	??????????	??????????	??????????
[	250	260	270	280]
[	.	.	.	.]
Absarokius_sp.	????????202	212???????	??????????	??????????
Abuqatrania_basiodontos	??????????	??????????	??????????	??????????
Adapis_parisiensis	00????01024	4021002000	012001112?	??????????0
Aegyptopithecus_zeuxis	21????????	????????010	000022402?	??????????0
Afradapis_longicristatus	??????????	??????????	??????????	??????????
Aframoniüs_dieides	??????????	??????????	??????????	??????????
Afrotarsius_chatrathi	??????????	??????????	??????????	??????????
Altanius_orlovi	??????????	??????????	??????????	??????????
Altiatlasius_koulchii	??????????	??????????	??????????	??????????
Amphipithecus_mogaungensis	??????????	??????????	??????????	??????????
Anaptomorphus_sp.	??????????	??????????	??????????	??????????
Anchomomys_gaillardi	??????????	??????????	??????????	??????????
Anchomomys_milleri	??????????	??????????	??????????	??????????
Anemorhysis_savagei	??????????	??????????	??????????	??????????
Aotus_trivirgatus	2114001101	1002003110	0110230020	05?1002000
Apidium_moustafai	??????????	??????????	??????????	??????????
Apidium_phiomense	21????01202	2022004110	110123200?	????00?????
Arapahovius_gazini	1?????????	??????????	??????????	??????????
Arctocebus_calabarensis	??20801024	4020010100	0030030031	1640006120
Arsinoea_kallimos	??????????	??????????	??????????	??????????
Asiadapis_cambayensis	??????????	??2001?000	22000240??	??????????
Aycrossia_lovei	??????????	??????????	??????????	??????????
Bahinia_pondaungensis	??????????	??????????	??????????	??????????
Barnesia_hauboldi	??????????	??????????	??????????	??????????0
Biretia_fayumensis	??????????	??????????	??????????	??????????
Biretia_megalopsis	??????????	??????????	??????????	??????????
Branisella_boliviana	??????????	??????????	??????????	??????????
Bugtipithecus_inexpectans	??????????	??????????	??????????	??????????
Caenopithecus_lemuroides	??????????	??????????	??????????	??????????
Cantius_abditus	??????????04	40????0???	0????0211?	??????????0
Catopithecus_browni	??????????	??2002{13}	10 0000204???	??????????0
Cheirogaleus_major	0022602024	4010003{13}	00 02{13}0020110	0411004000
Darwinius_masillae	??224010??	??????????	??????2???	00?20?2?0?
Djebelemur_martinezi	??????????	??????????	??????????	??????????
Dolichocebus_gaimanensis	??????????	??????????	??????????	??????????0
Donrussellia_gallica	??????????	??????????	??????????	??????????
Donrussellia_provincialis	??????????	??????????	??????????	??????????
Dyseolemur_pacificus	??????????	??????????	??????????	??????????
Eosimias_centennicus	??????????	??????????	??????????	??????????
Eosimias_sinensis	??????????	??????????	??????????	??????????
Europolemur_klati	??????????	??????????	??????????	??????????
Galago_moholi	0021812113	2002210311	2040020100	0320006000
Galagoides_demidoff	0020812013	2002210311	2040020100	0321106000
Godinotia_neglecta	??????1???	??????????	??????1???	??????????
Hemiacodon_gracilis	11?????102	21221104?1	212000010?	??????2???
Hoanghoniüs_stehlini	??????????	??????????	??????????	??????????
Karanisia_clarki	??????????	??????????	??????????	??????????
Komba_robustus	??????????	??????????	??????????	??????????
Lemur_catta	0022501014	4020003410	0010003100	0{024}22204000
Lepilemur_mustelinus	??22402024	3021002310	0130001100	0522204000
Leptadapis_magnus	00????010??	0?????????	??????????	??????????0
Loris_tardigradus	0?20801024	4022011110	0040032031	1641016120
Loveina_minuta	??????????	??????????	??????????	??????????
Loveina_sheai	??????????	??????????	??????????	??????????
Loveina_wapitiensis	??????????	??????????	??????????	??????????
Loveina_zephyri	??????????	??????????	??????????	??????????
Macrotarsius_montanus	??????????	??????????	??????????	??????????
Mahgarita_stevensi	??????????	??????????	??????????	??????????0
Marcgodinotius_indicus	??????????	??200?000	2200?24???	??????????
Microadapis_sciureus	??????????	??????????	??????????	??????????
Microcebus_murinus	0022602122	3020003301	0210020100	0?21004000
Microchoerus_erinaceus	??????????	?????????01	2?40?00???	??????????

Moeripithecus_markgrafi	??????????	??????????	??????????	??????????
Myanmarpithecus_yarshensis	??????????	??????????	??????????	??????????
Nannopithecus_abderhaldeni	??????????	??????????	??????????	??????????
Nannopithecus_raabi	??????????	??????????	??????????	??????????
Necrolemur_spp.	??????????	210?004201	200124-?0?	??????????
Nycticeboides_simpsoni	??????????	??????????	??????????	1?2?2?2?2?
Nycticebus_coucang	0020600024	4022010110	004004-031	1640016020
Oligopithecus_rogeri	??????????	??????????	??????????	??????????
Oligopithecus_savagei	??????????	??????????	??????????	??????????
Omomys_sp.	??????????	2?0?0004??	0?4?00110?	??2?10?0?2?
Otolemur_crassicaudatus	0021612023	0022210311	2030011100	0321006000
Panobius_russelli	??????????	??????????	??????????	??????????
Parapithecus_fraasi	??????????	??????????	??????????	??????????
Parapithecus_grangeri	??????????	??????????	??????????	??????????
Perodicticus_potto	0020401024	4001010110	0040022031	0540006010
Phenacopithecus_krishtalkai	??????????	??????????	??????????	??????????
Phenacopithecus_xueshii	??????????	??????????	??????????	??????????
Phileosimias_kamali	??????????	??????????	??????????	??????????
Plesiadapis_tricuspidens	01?0000000	000201201?	2240004020	?420002000
Plesiolestes_problematicus	??????????	??????????	??????????	??????????
Plesiopithecus_teras	??????????	??????????	??????????	??????????
Pondaungia_cotteri	??????????	??????????	??????????	??????????
Pronycticebus_gaudryi	??????????	??????????	??????????	??????????
Propithecus_spp.	0022601002	0022003310	00{13}0003100	0322206101
Propliopithecus_chirobates	?????01010	202???????	??????????	??????????
Propliopithecus_haekeli	??????????	??????????	??????????	??????????
Proteopithecus_sylviae	?????01110	0022004{13}	10 020120201?	??????????
Protoadapis_curvicaudatus	??????????	??????????	??????????	??????????
Pseudoloris_parvulus	??????????	??????????	??????????	??????????
Purgatorius_unio	??????????	??????????	??????????	??????????
Qatrania_wingi	??????????	??????????	??????????	??????????
Rencunius_zhoui	??????????	??????????	??????????	??????????
Rooneyia_viejaensis	??????????	??????????	??????????	??????????
Saharagalago_misrensis	??????????	??????????	??????????	??????????
Saimiri_sciureus	2114001101	2002003110	0110131020	0420003000
Serapia_eocaena	??????????	??????????	??????????	??????????
Shoshonius_cooperi	1?2?2?2?2?	2102111301	02{13}000010?	??????????
Siamopithecus_eocaenus	??????????	??????????	??????????	??????????
Steinius_vespertinus	??????????	??????????	??????????	??????????
Strigorhysis_sp.	??????????	??????????	??????????	??????????
Taqah_propliopithecoid	??????????	??????????	??????????	??????????
Tarsius_bancanus	1122502302	2102211301	0040000100	0100006001
Teilhardina_americana	??????????	??????????	??????????	??????????
Teilhardina_asiatica	??????????	??????????	??????????	??????????
Teilhardina_belgica	??????????	??????????	??????????	??????????
Tetonius_sp.	??????????	??????????	??????????	??????????
Tetonoides_sp.	??????????	??????????	??????????	??????????
Trogolemur_myodes	??????????	??????????	??????????	??????????
Tupaia_spp.	0016001022	3001003110	01{13}0004010	0{024}02000000
Uintanius_ameghini	??????????	??????????	??????????	??????????
Varecia_variegata	0022401024	4020003110	0200122100	0?12105100
Wadilemur_elegans	??????????	????2212411	20?0?02???	??????????
Wailekia_orientale	??????????	??????????	??????????	??????????
Washakius_insignis	??????????	??????????	??????????	??????????
Xanthorhysis_tabrumi	??????????	??????????	??????????	??????????
[	290	300	310	320]
[	.	.	.	.]
Absarokius_sp.	??????????	??????????	??????????	??????????
Abuqatrania_basiodontos	??????????	??????????	??????????	??????????
Adapis_pariensis	0300220134	200100020?	?620001000	?110114031
Aegyptopithecus_zeuxis	0002111032	0-?110020?	?212111111	?0?1110?02
Afradapis_longicristatus	??????????	??????????	??????????	??????????
Aframomys_dieides	?????2010?	??????????	??????????	??????????
Afrotarsius_chatrathi	??????????	??????????	??????????	??????????
Altanius_orlovi	??????????	??????????	??????????	??????????
Altatlasius_koulchii	??????????	??????????	??????????	??????????
Amphipithecus_mogaungensis	??????????	??????????	??????????	??????????
Anaptomorphus_sp.	??????????	??????????	??????????	??????????
Anchomomys_gaillardi	??????????	??????????	??????????	??????????

Anchomomys_milleri	??????????	??????????	??????????	??????????
Anemorhysis_savagei	??????????	??????????	??????????	??????????
Aotus_trivirgatus	0020242002	0-21000200	0201111111	00?1110222
Apidium_moustafai	??????????	??????????	??????????	??????????
Apidium_phiomense	?????????10?	?????????2?	?202?1111	?0?111?02
Arapahovius_gazini	??????????	??????????	??????????	??????????
Arctocebus_calabarensis	0201221022	0-11000101	14000?0202	00?1120220
Arsinoea_kallimos	??????????	??????????	??????????	??????????
Asiadapis_cambayensis	??????????	??????????	??????????	??????????
Aycrossia_lovei	??????????	??????????	??????????	??????????
Bahinia_pondaungensis	??????????	??????????	??????????	??????????
Barnesia_hauboldi	0?1111012?	??1111111?	??????????	??????????
Biretia_fayumensis	??????????	??????????	??????????	??????????
Biretia_megalopsis	??????????	??????????	??????????	??????????
Branisella_boliviana	??????????	??????????	??????????	??????????
Bugtipithecus_inexpectans	??????????	??????????	??????????	??????????
Caenopithecus_lemuroides	?????????1?	??????????	??????????	??????????
Cantius_abditus	0?00?????2?	??1?00???	?320001000	?1??1?????
Catopithecus_browni	00022?21??	??1?0?20?	?20211????	??1111?12
Cheirogaleus_major	0101221032	2001000201	1410000200	0010101220
Darwinius_masillae	??????????	??????????	??????????	??????????
Djebellemur_martinezi	??????????	??????????	??????????	??????????
Dolichocebus_gaimanensis	?????2?2??	0??1?0020?	?202111111	?0-1110???
Donrussellia_gallica	??????????	??????????	??????????	??????????
Donrussellia_provincialis	??????????	??????????	??????????	??????????
Dyseolemur_pacificus	??????????	??????????	??????????	??????????
Eosimias_centennicus	??????????	??????????	??????????	??????????
Eosimias_sinensis	??????????	??????????	??????????	??????????
Europolemur_klati	0?????0?2?	??????????	??????????	?????????2?
Galago_moholi	0200240014	20?1000201	14000?0202	00?1120220
Galagoïdes_demidoff	0101241012	1011000201	1400000202	00?1120220
Godinotia_neglecta	??????????	??????????	??????????	??????????
Hemiacodon_gracilis	??????????	??????????	??????????	??????????
Hoanghoniush_stehlini	??????????	??????????	??????????	??????????
Karanisia_c_larki	??????????	??????????	??????????	??????????
Komba_robustus	??????????	??????????	??????????	??????????
Lemur_catta	0100220012	4001000200	0320101000	0110103122
Lepilemur_mustelinus	0201220001	2001000200	?310101000	01101032{12}0
Leptadapis_magnus	0400200134	??0100020?	?32000?000	?110114031
Loris_tardigradus	0402210032	0-21000101	1400110202	00?1110220
Loveina_minuta	??????????	??????????	??????????	??????????
Loveina_sheai	??????????	??????????	??????????	??????????
Loveina_wapitiensis	??????????	??????????	??????????	??????????
Loveina_zephyri	??????????	??????????	??????????	??????????
Macrotrarsius_montanus	??????????	??????????	??????????	??????????
Mahgarita_stevensi	04?02?0?24	41?1?0020?	?520001100	?110114?0?
Marcgodinotius_indicus	??????????	??????????	??????????	??????????
Microadapis_sciureus	??????????	??????????	??????????	??????????
Microcebus_murinus	0300220042	4001000201	1410000?00	0010100220
Microchoerus_erinaceus	??????????	??????????	??????????	?1?????????
Moeripithecus_markgrafi	??????????	??????????	??????????	??????????
Myanmarpithecus_yarshensis	??????????	??????????	??????????	??????????
Nannopithecus_abderhaldeni	?????0?04?	??????????	??????????	??????????
Nannopithecus_raabi	??????????	??????????	??????????	??????????
Necrolemur_spp.	02?20?0042	410111202?	?100011100	?120010?12
Nycticeboides_simpsoni	??????????	??????????	??????????	??????????
Nycticebus_cougang	0421221004	0-21000001	14001?0202	00?1110241
Oligopithecus_rogeri	??????????	??????????	??????????	??????????
Oligopithecus_savagei	??????????	??????????	??????????	??????????
Omomys_sp.	??????????	??????????	?000001100	?1?01?????
Otolemur_crassicaudatus	0101230012	0-11000201	1400000202	00?1120220
Panobius_russelli	??????????	??????????	??????????	??????????
Parapithecus_fraasi	??????????	??????????	??????????	??????????
Parapithecus_grangeri	0200222120	4121?0020?	?202111111	??1?10?02
Perodicticus_potto	0101221012	2011000201	14011?0202	00?1113220
Phenacopithecus_krishtalkai	??????????	??????????	??????????	??????????
Phenacopithecus_xueshii	??????????	??????????	??????????	??????????
Phileosimias_kamali	??????????	??????????	??????????	??????????
Plesiadapis_tricuspidens	0422020120	0-00?0001?	?20101000	?120002000
Plesiolestes_problematicus	??????????	??????????	??????????	??????????
Plesiopithecus_teras	0???????02	41?????????	??????????	?????????02

Pondaungia_cotteri	??????????	??????????	??????????	??????????
Pronycticebus_gaudryi	04?224012?	400101320?	??2??2???	?110104000
Propithecus_spp.	0201202012	2001000200	0320101000	0110103122
Propliopithecus_chirobates	??????????	??????????	??????????	??????????
Propliopithecus_haekeli	??????????	??????????	??????????	??????????
Proteopithecus_sylviae	0020222102	0-??0020?	??02111111	??1?1?12
Protoadapis_curvicaudus	??????????	??????????	??????????	??????????
Pseudoloris_parvulus	??????????	??????????	??????????	??????????
Purgatorius_unio	??????????	??????????	??????????	??????????
Qatrania_wingi	??????????	??????????	??????????	??????????
Rencunius_zhoui	??????????	??????????	??????????	??????????
Rooneyia_viejaensis	042022002?	411100000?	?100011100	?120?02222
Saharagalago_misrensis	??????????	??????????	??????????	??????????
Saimiri_sciureus	0010242?22	0-?1000230	0212111111	00?1110222
Serapia_eocaena	??????????	??????????	??????????	??????????
Shoshonius_cooperi	02220?0?22	410011221?	?0200?1100	?120000???
Siamopithecus_eocaenus	??????????	??????????	??????????	??????????
Steinius_vespertinus	??????????	??????????	??????????	??????????
Strigorhysis_sp.	??????????	??????????	??????????	??????????
Taqah_propliopithecoid	??????????	??????????	??????????	??????????
Tarsius_bancanus	0222020022	4100111020	0222111111	00?1000022
Teilhardina_american	??????????	??????????	??????????	??????????
Teilhardina_asiatica	??????????	??????????	??????????	??????????
Teilhardina_belgica	??????????	??????????	??????????	??????????
Tetonius_sp.	????0?0???	41??1?2???	?0??1100	?1200??2
Tetonoides_sp.	??????????	??????????	??????????	??????????
Troglemur_myodes	??????????	??????????	??????????	??????????
Tupaia_spp.	0001020040	00-1000110	0000011100	1100002011
Uintanius_ameghini	??????????	??????????	??????????	??????????
Varecia_variegata	0000240010	2001000200	0320101000	0110102221
Wadilemur_elegans	??????????	??????????	??????????	??????????
Wailekia_orientale	??????????	??????????	??????????	??????????
Washakius_insignis	??????????	??????????	??????????	??????????
Xanthorhysis_tabrumi	??????????	??????????	??????????	??????????
[	330	340	350	360]
[	.	.	.	.]
Absarokius_sp.	??????????	??????????	??????????	??????????
Abugatrania_basiodontos	??????????	??????????	??????????	??????????
Adapis_parisiensis	06?00?100	1?223332	2100001???	?????????0
Aegyptopithecus_zeuxis	08?10?112	??2?16440	2002001???	?????????1
Afradapis_longicristatus	??????????	????24???	??????????	??????????
Aframomius_dieides	????21?2??	??2?041?0	0?222222??	????2222??
Afrotarsius_chatrathi	??????????	????2222??	????2222??	????2222??
Altanius_orlovi	??????????	????2222??	????2222??	????2222??
Altiatlasius_koulchii	??????????	????2222??	????2222??	????2222??
Amphipithecus_mogaungensis	????2222??	????2222??	????2222??	????2222??
Anaptomorphus_sp.	????2222??	????2222??	????2222??	????2222??
Anchomomys_gaillardi	????2222??	????2222??	????2222??	????2222??
Anchomomys_milleri	????2222??	????2222??	????2222??	????2222??
Anemorhysis_savagei	????2222??	????2222??	????2222??	????2222??
Aotus_trivirgatus	07?111112	20?2111440	2100001?11	111?111111
Apidium_moustafai	????2222??	????2222??	????2222??	????2222??
Apidium_phiomense	?4?10?12	??2?13?4?	2?0?2222??	????2222??
Arapahovius_gazini	????2222??	????2222??	????2222??	????2222??
Arctocebus_calabarensis	0?10010102	20022{13}3311	1011210100	000?????0
Arsinoea_kallimos	?6?22222??	????2222??	????2222??	????2222??
Asiadapis_cambayensis	????2222??	????2222??	????2222??	????2222??
Aycrossia_lovei	????2222??	????2222??	????2222??	????2222??
Bahinia_pondaungensis	????0?0?02	??2?03???	2??2?1???	????2222??
Barnesia_hauboldi	????2222??	????2222??	????2222??	????2222??
Biretia_fayumensis	????2222??	????2222??	????2222??	????2222??
Biretia_megalopsis	????2222??	????2222??	????2222??	????2222??
Branisella_boliviana	????2222??	????2222??	????2222??	????2222??
Bugtipithecus_inexpectans	????2222??	????2222??	????2222??	????2222??
Caenopithecus_lemuroides	?????0?2??	??2?041?2	2??22222??	????2222??
Cantius_abditus	????01?2??	????03???	????2222??	????2222??
Catopithecus_browni	?6?210?12	??2?03440	210?001???	????2222??
Cheirogaleus_major	0200010100	1040005110	2010201?00	0000000000
Darwinius_masillae	????1?2???	????04110	0?222222??	????2222??

Djebelemur_martinezi	??????????	??????????	??????????	??????????
Dolichocebus_gaimanensis	?4????10?12	?2?????044?	?10????0???	??????????
Donrussellia_gallica	??????????	??????????	??????????	??????????
Donrussellia_provincialis	??????????	??????????	??????????	??????????
Dyseolemur_pacificus	??????????	??????????	??????????	??????????
Eosimias_centennicus	??????????	??????????	??????????	??????????
Eosimias_sinensis	??????????	??????????	??????????	??????????
Europolemur_klati	??????????	??????31?0	??????????	??????????
Galago_moholi	001011?101	2002111120	0010200000	00?????00
Galagoides_demidoff	0010110101	2002103110	1011220000	0000000000
Godinotia_neglecta	??????????	??????1??	??????????	??????????
Hemiacodon_gracilis	??????????	??????????	??????????	??????????
Hoanghoniush_stehlini	??????????	??????????	??????????	??????????
Karanisia_clarki	??????????	??????????	??????????	??????????
Komba_robustus	??????????	??????????	??????????	??????????
Lemur_catta	0300001100	0040004220	4010101000	0000000000
Lepilemur_mustelinus	01?0010201	12100{13}5320	2??0?00?00	0?????????0
Leptadapis_magnus	04????0?100	1????13332	??00201???	??????????
Loris_tardigradus	0410110202	2212114322	2012120100	000???????
Loveina_minuta	??????????	??????????	??????????	??????????
Loveina_sheai	??????????	??????????	??????????	??????????
Loveina_wapitiensis	??????????	??????????	??????????	??????????
Loveina_zephyri	??????????	??????????	??????????	??????????
Macrotarsius_montanus	??????????	??????????	??????????	??????????
Mahgarita_stevensi	0????00?002	?????03110	?10???????	??????????
Marcgodinotius_indicus	??????????	??????????	??????????	??????????
Microadapis_sciureus	??????????	??????????	??????????	??????????
Microcebus_murinus	0?0110100	2????05110	2010201?0?	??????????
Microchoerus_erinaceus	?2????????	??????11?	??????????	??????????
Moeripithecus_markgrafi	??????????	??????????	??????????	??????????
Myanmarpithecus_yarshensis	??????????	??????????	??????????	??????????
Nannopithecus_abderhaldeni	??????????	??????1??	??????????	??????????
Nannopithecus_raabi	??????????	??????????	??????????	??????????
Necrolemur_spp.	02??110202	1????1311?	?000001???	??????????
Nycticeboides_simpsoni	??????????	??????????	??????????	??????????
Nycticebus_coucang	0510110201	2201123322	2112010100	0000000000
Oligopithecus_rogeri	??????????	??????????	??????????	??????????
Oligopithecus_savagei	??????????	??????????	??????????	??????????
Omomys_sp.	?????2?0?	??????????	?0????????	??????????
Otolemur_crassicaudatus	0510110101	2012101120	0010000000	000???????
Panobius_russelli	??????????	??????????	??????????	??????????
Parapithecus_fraasi	??????????	??????????	??????????	??????????
Parapithecus_grangeri	?2??10?12	?????03440	4100000???	??????????
Perodicticus_potto	0510010201	201120{35}322	1010000100	000???????
Phenacopithecus_krishtalkai	??????????	?????04???	??0???????	??????????
Phenacopithecus_xueshii	??????????	??????????	??????????	??????????
Phileosimias_kamali	??????????	??????????	??????????	??????????
Plesiadapis_tricuspidens	00??000000	?????00002	?000001???	??????????
Plesiolestes_problematicus	??????????	??????????	??????????	??????????
Plesioptithecus_teras	?2????1?0?	?????03?10	?100??????	??????????
Pondaungia_cotteri	??????????	?????05???	?11???????	??????????
Pronycticebus_gaudryi	00??011100	10?0003110	?00?1???	??????????
Propithecus_spp.	0500000200	1000024232	2100000000	000???????
Propliopithecus_chirobates	??????????	??????????	??????????	??????????
Propliopithecus_haekeli	??????????	??????????	??????????	??????????
Proteopithecus_sylviae	?4??10?12	?????01440	?10?00???	??????????
Protoadapis_curviuspidens	??????????	??????????	??????????	??????????
Pseudoloris_parvulus	??????????	??????????	??????????	??????????
Purgatorius_unio	??????????	??????????	??????????	??????????
Qatrania_wingi	??????????	??????????	??????????	??????????
Rencunius_zhoui	??????????	??????????	??????????	??????????
Rooneyia_viejaensis	06?0101101	1????21?3?	?100?1???	??????????
Saharagalago_misrensis	??????????	??????????	??????????	??????????
Saimiri_sciureus	0701101112	2042?30440	2100000011	1111111111
Serapia_eocaena	??????????	??????????	??????????	??????????
Shoshonius_cooperi	?0??12??22	?????2111?	?1????????	??????????
Siamopithecus_eocaenus	??????????	??????????	??????????	??????????
Steinius_vespertinus	??????????	??????????	??????????	??????????
Strigorhysis_sp.	??????????	??????????	??????????	??????????
Taqah_propliopithecoid	??????????	??????????	??????????	??????????
Tarsius_bancanus	0101121102	2110?01340	0100000011	1111111110

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TeiIhardina_americana      ?????????? ?????????? ?????????? ??????????
TeiIhardina_asiatica       ?2????????? ??????01?1? ?10????????? ??????????
TeiIhardina_belgica        ?????????? ?????????? ?????????? ??????????
Tetoniuss_sp.              ?0?11?202 ?????2111? ?1????1??? ??????????
Tetonoides_sp.             ?????????? ?????????? ?????????? ??????????
Trogolemur_myodes         ?????????? ?????????? ?????????? ??????????
Tupaia_spp.                00?0000000 00????11110 4010001?00 0000000000
Uintanius_ameghini         ?????????? ?????????? ?????????? ??????????
Varecia_variegata          0200001100 ?1?0013230 4010000?0? ??????????0
Wadilemur_elegans          ?????????? ?????????? ?????????? ??????????
Wailekia_orientale         ?????????? ?????????? ?????????? ??????????
Washakius_insignis         ?????????? ?????????? ?????????? ??????????
Xanthorhysis_tabrumi       ?????????? ?????????? ?????????? ??????????
;
END;

BEGIN SETS;
    CHARSET 3state = 4 15 18 21 27 30-32 38-39 41 43 54-56 61 63-65 71 74-75 77 81
89 93-94 99 108-109 113 116 126 128-132 134 136-137 139 141 147-148 151-152 154 158 161-
162 167 174 179 181 184 189 196 198-199 202 208-209 218 228 230-231 235-236 239 241 247
249 253-255 261-262 265 274-275 279 283-285 287 293 298 303 316 318 320 326 330 332 334-
335 340 344-346;
    CHARSET 4state = 1 85 121 149 170 188 195 248 269 336;
    CHARSET 5state = 7-9 12-14 22 25-26 28 33 37 40 42 44-48 50-53 61 66-67 69 72-
73 75 77 79 82-83 87 89-90 92 96 100-101 103-105 107 112 115 118 124-125 127 146 150 153
155-157 163 166 168 171-178 182 191 193 197 201 204-205 214 217 219-221 223 225 227 250-
251 257-258 263 266-267 282 286 289-291 317 333 341;
    CHARSET 7state = 24 34 49 59 70 84 119 142 145 159 164 185-187 213 226 233 272
277;
    CHARSET 9state = 5 35 88 206 245 322;
    CHARSET 11state = 57-58;
    CHARSET 13state = 60;
END;
BEGIN ASSUMPTIONS;

    USERTYPE p1_presence_a (STEPMATRIX) = 3
    0 1 2
    [0] . 1 2
    [1] i . 1
    [2] i i .
;
    USERTYPE 'p2 roots/presence' (STEPMATRIX) = 5
    0 1 2 3 4
    [0] . 1 2 3 4
    [1] i . 1 2 3
    [2] i i . 1 2
    [3] i i i . 1
    [4] i i i i .
;
    USERTYPE P1_presence_b (STEPMATRIX) = 2
    0 1
    [0] . 1
    [1] i .
;
    USERTYPE 'P2 root number/presence' (STEPMATRIX) = 5
    0 1 2 3 4
    [0] . 1 2 3 4
    [1] i . 1 2 3
    [2] i i . 1 2
    [3] i i i . 1
    [4] i i i i .
;
    OPTIONS DEFTYPE=unord PolyTcount=MINSTEPS ;
    TYPESET default = unord: 2-3 6 10-11 16-17 19-20 23 29 36 62 68 76 78 80 86 91 95 97-98
102 106 110-111 114 117 122-123 133 135 138 140 143-144 160 165 169 180 183 190 192 194
200 203 207 210-212 215-216 222 224 229 232 234 237-238 240 242-244 246 252 256 259-260
264 268 270-271 273 276 278 280-281 288 292 294-297 299-302 304-315 319 321 323-325 327-
329 331 337-339 342-343 347-360, ord: 1 4-5 7-9 12-15 18 24-28 30-35 37-61 63-67 69-75 77
79 81-85 87-90 92-94 96 99-101 103-105 107-109 112-113 115-116 118-119 124-132 134 136-
137 139 141-142 145-159 161-164 166-168 170-179 181-182 184-189 191 193 195-199 201-202
204-206 208-209 213-214 217-221 223 225-228 230-231 233 235-236 239 241 245 247-251 253-

```

```
255 257-258 261-263 265-267 269 272 274-275 277 279 282-287 289-291 293 298 303 316-318
320 322 326 330 332-336 340-341 344-346, p1_presence_a: 21, 'p2 roots/presence': 22,
P1_presence_b: 120, 'P2 root number/presence': 121;
```

```
END;
```

```
BEGIN PAUP;
```

```
wtS .5 : 3state;
wtS .333 : 4state;
wtS .25 : 5state;
wtS .167 : 7state;
wtS .125 : 9state;
wtS .1 : 11state;
wtS .083 : 13state;
loadconstr asbackbone = yes;
set /increase = auto;
```

```
END;
```

Part V. Constraint tree

#NEXUS

[File saved Tue Jun 02 13:44:15 2009]

BEGIN TAXA;

DIMENSIONS NTAX = 16;

TAXLABELS

Cheirogaleus_major
Microcebus_murinus
Lepilemur_mustelinus
Propithecus_spp.
Lemur_catta
Varecia_variegata
Loris_tardigradus
Nycticebus_cougang
Arctocebus_calabarensis
Perodicticus_potto
Galago_moholi
Galagoides_demidoff
Otolemur_crassicaudatus
Tupaia_spp.
Saimiri_sciureus
Tarsius_bancanus
;

ENDBLOCK;

BEGIN TREES;

TRANSLATE

1 Cheirogaleus_major,
2 Microcebus_murinus,
3 Lepilemur_mustelinus,
4 Propithecus_spp.,
5 Lemur_catta,
6 Varecia_variegata,
7 Loris_tardigradus,
8 Nycticebus_cougang,
9 Arctocebus_calabarensis,
10 Perodicticus_potto,
11 Galago_moholi,
12 Galagoides_demidoff,
13 Otolemur_crassicaudatus,
14 Tupaia_spp.,

```
15    Saimiri_sciureus,  
16    Tarsius_bancanus  
;  
TREE * 1=  
(14, (15, 16, ((3, 4, (1, 2), (5, 6)), ((7, 8), (9, 10)), (11, 12, 13))))  
);  
ENDBLOCK;
```