APPENDIX 2. COMPLETE CHARACTER LIST AND SUPERMATRIX

The following is a script in Nexus format to be run in Mesquite. It includes the 815 characters described in Chapter 4. The characters are organised into two main categories: discrete characters at the beginning, and continuous characters at the end (under the partition A_Categorised_continuous). This script also includes the strict consensus of the MPTs under equal weight as described in Chapter 5.

#NEXUS

BEGIN TAXA;

       TITLE Taxa;

       DIMENSIONS NTAX=115;

       TAXLABELS

           Euparkeria CRUROTARSI Marasuchus Saltopus Asilisaurus Pisanosaurus Silesaurus Yinlong Scutellosaurus Laquintasaura Fruitadens Emausaurus Lesothosaurus Abrictosaurus Scelidosaurus Agilisaurus Eocursor Hypsilophodon Chindesaurus Liliensternus Staurikosaurus Panguraptor Eodromaeus Coelophysis Allosaurus Cryolophosaurus Zupaysaurus Ceratosaurus Herrerasaurus Tawa Dilophosaurus Eoraptor Pantydraco Thecodontosaurus Panphagia Efraasia Ohmdenosaurus Blikanasaurus Chuxiongosaurus Bagualosaurus Euskelosaurus Camelotia Nyasasaurus Pulanesaura Gryponyx Gyposaurus_sinensis Asylosaurus Lamplughsaura Aardonyx Agnosphitys Meroktenos Chromogisaurus Saturnalia Yunnanosaurus_robustus Melanorosaurus Tazoudasaurus Yimenosaurus Yunnanosaurus_youngi Buriolestes Guaibasaurus Leonerasaurus Pampadromaeus Yizhousaurus Jingshanosaurus Ledumahadi Antetonitrus Ingentia Lessemsaurus Glacialisaurus Xixiposaurus Sarahsaurus Riojasaurus Lufengosaurus Coloradisaurus Yunnanosaurus_huangi Leyesaurus M._carinatus_BPI_5241 Ngwevu Massospondylus_carinatus Adeopapposaurus Eucnemesaurus_fortis Plateosauravus Eucnemesaurus_entaxonis Ruehleia Plateosaurus_ingens Arcusaurus Unaysaurus Macrocollum Sellosaurus Jaklapallisaurus Plateosaurus Nambalia Massospondylus_kaalae Sefapanasaurus Pradhania Seitaad Ammosaurus Ignavusaurus Mussaurus Anchisaurus Xingxiulong Nebulasaurus Isanosaurus Spinophorosaurus Kotasaurus Omeisaurus Cetiosaurus Patagosaurus Vulcanodon Mamenchisaurus Shunosaurus Barapasaurus Diplodocus Camarasaurus Brachiosauridae

       ;

END;

BEGIN CHARACTERS;

       TITLE Character_Matrix;

       DIMENSIONS NCHAR=815;

       FORMAT DATATYPE = STANDARD RESPECTCASE GAP = - MISSING = ? SYMBOLS = " 0 1 2 3 4 5 6 7";

       CHARSTATELABELS

           1 'CR6. A127. Infratemporal fenestra, anterior margin, position relative to the orbit: posterior (0), ventral (1)' / posterior ventral,

           2 'CR7. A128. Infratemporal fenestra, anteroventral corner, extension below the posteroventral margin of the orbit: before the posterior half of the orbit (0), after the posterior half of the orbit (1)' / _before_posterior_half_of_the_orbit after_posterior_half_of_the_orbit,

3 'CR8. A137. Supratemporal fenestra, long axis, orientation: longitudinal (0), transverse (1)' / longitudinal transverse,

4 'CR10. A141. Sagittal crest: absent (0), present (1) ' / absent present,

5 'CR11. A142-1. Frontoparietal process: absent (0), present (1) ' / absent present,

6 'CR12. A119/A142/B83. Supratemporal fenestra, supratemporal fossa: restricted to the parietals (0), expanded onto the parietals and frontals (1), expanded onto the parietals, frontals and postorbitals (2), expanded onto parietals and postorbitals only (3)' / restricted_to_parietals expanded_onto_the_parietals_and_frontals 'expanded onto the parietals, frontals and postorbitals' expanded_onto_parietals_and_postorbital_only,

7 'CR13. Supratemporal fenestra, supratemporal fossa, scalloped margin: absent (0), present (1) - Unaysaurus',

8 'PMX1.   A4. Premaxilla, lateral side: not surpassing the lingual margin (0), expanded beyond the level of the lingual margin and over the teeth as lateral plates (1)' / not_surpassing_the_lingual_margin expanded_beyond_the_level_of_the_lingual_margin_and_over_the_teeth_as_lateral_plates,

9 'PMX3. A11. Premaxilla, anterior premaxillary foramen: absent (0), present (1)' / absent present,

10 'B25. Premaxilla, anterior premaxillary foramen, position: positioned outside of narial fossa (0), on the rim of, or inside, the narial fossa (1) ' / outside_of_the_narial_fossa 'on the rim of, or inside, the narial fossa',

11 'B13. Premaxilla, second anterior premaxillary foramen: absent (0), present (1)' / absent present,

12 'PMX4.   D11. Premaxilla, anterior half of the premaxillary body, multiple premaxillary foramina aligned parallel to the anterior margin: absent (0), present (1)' / absent present,

13 'PMX5.   A12. Premaxilla, anterodorsal margin, profile in lateral view: convex (0), concave with an inflection point at the base of the anterodorsal process (1) ' / convex concave_with_an_inflection_point_at_the_base_of_the_anterodorsal_process,

14 'PX7. A31. Premaxilla, contact with the maxilla: the premaxillary and maxillary tooth row are continuous (0), subnarial gap or diastema (1)' / the_premaxillary_and_maxillary_tooth_row_are_continuous subnarial_gap_or_diastema,

15 'PMX8. A19. Premaxilla, posterior margin: posterolateral process with a rounded margin (0), posterodorsal corner connected with the posteroventral corner by a straight margin (1) ' / posterolateral_process_withy_a_rounded_margin posterodorsal_corner_connected_with_the_posteroventral_corner_by_a_straight_margin,

16 'PMX9. A26-1. Premaxilla, posterodorsal process: extends posteriorly to the ventral border of the external naris (0), restricted to the ventral border of the external naris (1)' / extends_posteriorly_to_the_ventral_border_of_the_external_naris restricted_to_the_ventral_border_of_the_external_naris,

17 'PMX10.   A26-2. Premaxilla, posterodorsal process, relationship with the anteroventral process of the nasal: forming a suture with the nasal (0), premaxilla-nasal in point contact (1)' / forming_a_suture_with_the_nasal 'premaxilla-nasal in point contact',

18 'PMX11. A20. Premaxilla, posteroventral process: absent (0), present (1)' / absent present,

19 'B11. Premaxilla, alveolar margin, position relative to the alveolar margin of the maxilla: at the same level (0), ventrally displaced (1), dorsally displaced (2)' / at_the_same_level ventrally_displaced dorsally_displaced,

20 'B15. Diastema fossa: absent (0), present (1)' / absent present,

21 'PMX13. A21. Premaxilla, subnarial foramen: absent (0), present (1)' / absent present,

22 'PMX14. A22. Premaxilla, subnarial foramen, shape: circular (0), slot-shaped (1)' / circular 'slot-shaped',

23 'PMX15. A23. Premaxilla, subnarial foramen, internal opening: just above the tooth row below the midlength of the premaxillary body height (0), opens into the palate, at or above the midlength of the premaxillary body height (1)' / just_above_the_tooth_row_below_the_midlength_premaxillary_body_height opens_into_the_palate_at_or_above_the_midlength_of_the_premaxillary_body_height,

24 'PMX16. A24. Premaxilla, subnarial foramen, position: positioned outside of narial fossa (0), on the rim of, or inside, the narial fossa (1)' / positioned_outside_of_narial_fossa 'on the rim of, or inside, the narial fossa',

25 'PMX17. A14. Premaxilla, anterodorsal process, shape in dorsal view: distal end tapers (0), expands transversely (1)' / distal_end_tapers expands_transversely,

26 'B18. Premaxilla, narial fossa: absent (0), present (1)' / absent present,

27 'PMX18.   A25. Premaxilla, narial fossa, extension: expands into internarial bar and main body (0), restricted to internarial bar (1)' /   expands_into_internarial_bar_and_main_body restricted_to_internarial_bar,

28 'PMX19.   A27. Premaxilla, suture with the nasal: plane (0), limbous (1), schindylesis (2), denticulate (3), serrate (4). ' / plane limbous schindylesis denticulate serrate,

29 'PMX20.   A29. Premaxilla, palatal process: present (0), absent (1). ' / present absent,

30 'PMX21. A80. Premaxilla, narial fossa, anteroventral corner, position relative to the mid-length of the premaxillary body: anterior to or at (0), posterior to (1) ' / anterior_to_or_at posterior_to,

31 'EN2. A77. External naris, narial fossa, rims: absent (0), present (1) ' / absent present,

32 'EN3. A81. External naris, narial fossa, posterior margin, position relative to the anterior margin of the antorbital fenestra: lies anterior to (0), lies posterior (1) ' / lies_anterior_to lies_posterior_to,

33 'EN. A82-1. External naris, narial fossa, level of the posterior margin of external naris relative to the premaxilla-maxilla suture: anterior to or at the same level as (0), posterior to (1) ' / anterior_to_or_at_the_same_level_as posterior_to,

34 'EN5. A82-2. Narial fossa, external naris, posterior margin surpassing the premaxilla-maxilla suture: not extending beyond the midlength of the maxilla (0), extending beyond the midlength of the maxillary tooth row (1).' /   not_extending_beyond_the_midlength_of_the_maxilla extending_beyond_the_midlength_of_the_maxillary_tooth_row,

35 'AOF1. A57. Antorbital fenestra, antorbital fossa: present (0), absent (1) *' / present absent,

36 'AOF3.   A58. Antorbital fenestra, shape: the anterior margin of the external antorbital fenestra and the anterior margin of the internal antorbital fenestra are both concave (0), the anterior margin of the external antorbital fenestra is concave, whilst the anterior margin of the internal antorbital fenestra is convex (1) ' / anterior_margin_of_the_external_antorbital_fenestra_and_the_anterior_margin_of_the_internal_antorbital_

fenestra_are_both_concave 'the anterior margin of the external antorbital fenestra is concave, whilst the anterior margin of the internal antorbital fenestra is convex',

37 'MX1. A4. Maxilla, lateral plates appressed to the labial side: absent (0), present (1) ' / absent present,

38 'MX2. A33. Maxilla, anterior profile: slopes continuously towards the anterior tip (0), inflection at the base of the dorsal process, creating an anterior process(1) ' / slopes_continuously_towards_the_anterior_tip inflection_at_the_base_of_the_dorsal_process,

39 'MX3. A40/A63. Maxilla, main body, shape: alveolar margin and margin of antorbital fenestra converging posteriorly (0), alveolar margin and margin of internal antorbital fenestra diverge (1) ' / alveolar_margin_of_internal_antorbital_fenestra_converging_posteriorly alveolar_margin_and_margin_of_internal_antorbital_fenestra_diverge,

40 'MX4. A41/B31. Maxilla, promaxillary fenestra and antrum: absent (0), present (1) ' / absent present,

41 'MX5. A43/A67. Maxilla, antorbital fenestra, ventral margin of the antorbital fossa: present (0), absent (1) ' / present absent,

42 'MX6. A66-2. Maxilla, antorbital fenestra, margin on the dorsal process: absent (0), present (1) ' / absent present,

43 '4-MX7. A43-1. Maxilla, maxillary ridge: absent (0), present (1)' / absent present,

44 '4-MX8. A44. Maxilla, anterior maxillary foramen: present (0), absent (1)' / present absent,

45 '4-MX9. A48. Maxilla, neurovascular bundle, opening: entering the maxilla through a foramen on the medial or dorsal margin of the maxilla (0), after passing through a dorsally open canal on the posterior floor of the antorbital fossa (1)' / entering_the_maxilla_through_a_foramen_on_the_medial_or_dorsal_margin_of_the_maxilla after_passing_through_a_dorsally_open_canal_on_the_posterior_floor_of_the_antorbital_fossa,

46 '4-MX10. A49. Maxilla, lateral maxillary neurovascular foramina, arrangement: linear (0), irregular (1)' / linear irregular,

47 '4-MX11. A51. Maxilla, antorbital fenestra, shape of the ventral margin: sharp, compressed ridge (0), rounded-bulbous (1)' / 'sharp, compressed ridge' 'rounded-bulbous',

48 '4-MX12. A51-2. Maxilla, external antorbital fenestra, orientation of the ventral margin: laterally (0), dorsolaterally (1)' / laterally dorsolaterally,

49 '4-MX13. A55. Maxilla, anterior-most part of the maxilla, alveolar margin: straight (0), gradually upturned from an extension of more than three teeth along the alveolar margin and orienting the first maxillary alveolus anteroventrally (1), mediodorsally upturned in the anterior-most tip of the maxilla and orienting the first maxillary alveolus anteroventrally (2)' / straight upturned_from_an_extension_of_more_than_three_teeth_along_the_alveolar_margin 'mediodorsally upturned in the anterior-most tip of the maxilla and orienting the first maxillary alveolus anteroventrally',

50 '4-MX15. A54-1/A39. Maxilla, narial fossa: absent (0), present (1)' / absent present,

51 '4-MX16. A54-2. Maxilla, narial fossa, orientation of the surface: laterally (0), dorsally (1)' / laterally dorsally,

52 '4-MX17. A54-3. Maxilla, narial fossa, development: flat surface (0), concave surface (1)' / flat_surface concave_surface,

53 '4-MX18. A53. Maxilla, lacrimal contact above the antorbital fenestra: visible in lateral view (0), obscured by an overhanging portion of the nasal (1)' / visible obscured,

54 '4-MX19.   B53. Maxilla, medial interdental plates: separated (0), fused (1) ' / separated fused,

55 '4-MX20.   D54. Maxilla, medial interdental plates, alignment with the lateral plates: below, displaced ventrally (0), at the same level (1), above, displaced dorsally (2) ' / below at_the_same_level above,

56 'N1. A71. Nasal, posterolateral process, overlapping of the lacrimal: absent (0), present (1)' / absent present,

57 'N2. D72-1. Nasal, posterodorsal process: present (0), absent (1) ' / present absent,

58 'N3. A72. Nasal, posterodorsal process, conjoined nasals in dorsal view: divergent posterodorsal processes (0), convergent posterodorsal process (1)' / divergent_processes convergent_posterodorsal_process,

59 'N4. A61-1. Nasal, antorbital fossa: absent (0), present (1)' / absent present,

60 'N5. D72-2. Nasal, articulation with the frontal: planar suture (0), denticulate suture (1) NEW.' / planar_suture denticulate_suture,

61 'D73. Nasal, internarial fenestra: absent (0), present (1) NEW' / absent present,

62 'L2.   A66-1/A62. Lacrimal, antorbital fossa: present (0), absent (1)' / present absent,

63 'L3.   A68/B47. Lacrimal, lateral lamina extending over the internal antorbital fenestra: absent (0), present (1) ' / absent present,

64 'L4.   A93. Lacrimal, lateral lamina, extension: posterior corner of the antorbital fenestra and body of the lacrimal (0), restricted to the posterior corner of the antorbital fenestra (1), restricted to the body of the lacrimal (2) ' / posterior_corner_and_body_of_lacrimal restricted_to_the_posterior_corner restricted_to_the_body_of_the_lacrimal,

65 'L5.   A85. Lacrimal, anterior dorsomedial process: present (0), absent (1) ' / present absent,

66 'L6.   D85-1. Lacrimal, anterior dorsolateral process: absent (0), present (1) NEW' / absent present,

67 'L7.   D85-2. Lacrimal, anterior ventromedial process, origin: along the anterior dorsomedial process (0), at the base of the anterior dorsomedial process (1) NEW ' / along_the_anterior_DM_process at_the_base,

68 'L9.   A94. Lacrimal, ventral process, orientation relative to the anterior dorsomedial process: strongly slopping posteriorly (0), perpendicular (1), slopping anteriorly (2) ' / posteriorly perpendicular anteriorly,

69 'J1.   A101. Jugal, relationship with the lacrimal: lacrimal overlapping lateral surface of jugal (0), jugal overlapping lacrimal laterally (1)' / lacrimal_overlapping_laterally jugal_overlapping_laterally,

70 'J2.   D101-1. Jugal, relationship with the maxilla: maxilla articulates ventrolaterally (0), maxilla articulates ventrally (1). NEW ' / ventrolaterally ventrally,

71 'J3.   A102/B67. Jugal, ratio of the minimum depth of the jugal below the orbit to the distance between the anterior end of the jugal and the rostroventral corner of the infratemporal fenestra ' / 'x < 0.35' '0.35 >= x < 1.03' 'x > 1.03',

72 'J4.   B58-1. Jugal, ridge dividing the lateral surface into two planes: absent (0), present (1) ' / absent present,

73 'J5.   B58-2. Jugal, ridge dividing the lateral surface two planes: sharp (0), round (1), bulbous (2) ' / sharp round bulbous,

74 'J6. A103. Jugal, anterior process, extension: contacting only the lacrimal-maxilla articulation (0), separating the lacrimal from the maxilla (1) ' / 'contacting l-mx articulation' separating_lacrimal_and_maxilla,

75 'J7. A104/A105. Jugal, anterior process, accessory dorsal process: present (0), absent (1) ' / present absent,

76 'J8. A106. Jugal, anterior process, shape: dorsal margin meets the ventral margin in the proximal-most tip (0), distinct anterior margin separating the dorsal and ventral margin of the jugal (1) ' / dorsal_margin_meets_the_ventral_margin_in_the_proximal_tip anterior_margin,

77 'J9. B61. Jugal, anterior extent of the slot for the quadratojugal: well posterior to the posterior edge of the posterodorsal process of the jugal (0), level with or anterior to the posterior edge of the posterodorsal process of the jugal (1) ' / posterior_to_posterior_edge_of_the_pd_process_of_the_jugal level_with_or_anterior_to_the_posterior_edge_of_the_pd_of_jugal,

78 'J10. A111. Jugal, posterior termination, position relative to the posteroventral corner of the infratemporal fenestra: anterior (0), posterior (1) ' / anterior posterior,

79 'J11. A112-2. Jugal, posterodorsal process, orientation relative to the anterior process: on opposite directions (0), parallel, on the same direction (1) ' / opposite_directions parallel,

80 'PrF2. A97-1. Prefrontal, anterior process: present (0), absent (1) NEW ' / present absent,

81 'POF1. A120. Postfrontal, as a separate ossification: present (0), absent (1) ' / present absent,

82 'PO2. D114-1. Postorbital, anterodorsal process, orientation relative to the main body: the distal end of the anterodorsal process is anteromedially deflected (0), the distal end of the anterodorsal process is medially deflected (1) NEW ' / anteromedially_deflected medially_deflected,

83 'PO3. A116. Postorbital, posterodorsal process, extension: extensive, reaching the posterodorsal corner of the external infratemporal fenestra (0), not reaching the posterodorsal corner of the external infratemporal fenestra (1) ' / 'extensive, reaching pd corner of the if' not_reaching_the_pd_corner_of_the_if,

84 'PO4. A117. Postorbital, posterodorsal process, orientation relative to the main body in dorsal view: the distal tip of the posterodorsal process is medially bowed (0), the distal tip of the posterodorsal process is aligned posteriorly and at 90° from the transverse process of the postorbital main body (1), the distal tip of posterodorsal process is laterally bowed (2) ' / distal_tip_of_the_pd_medially_bowed distal_tip_of_the_pdp_aligned_posteriorly laterally_bowed,

85 'PO6. A118. Postorbital, ventral process, ventral tip: ventrally directed (0), anteriorly deflected (1) ' / ventrally_directed anteriorly_deflected,

86 'SQ2. A151-1. Squamosal, ventral process, connection: quadrate and quadratojugal (0), quadrate only (1) ' / quadrate_and_quadratojugal quadrate_only,

87 'SQ3. D151-2. Squamosal, ventral contact with the quadratojugal: point contact (0), suture (1) ' / point_contact suture,

88 'SQ4. D151-3. Squamosal, postorbital articular surface, auxiliary anteroroventral process: absent (0), present (1) ' / absent present,

89 'Q1. A152. Quadrate head, relationship with the squamosal: partially exposed laterally (0), completely covered by the squamosal (1) ' / partially_exposed completely_covered,

90 'Q2. A153. Quadrate, orientation in lateral view: posteroventral (0), ventral (1), anteroventral (2) ' / posteroventral ventral anteroventral,

91 'Q3. A156-1. Quadrate, quadrate foramen: absent (0), present (1) ' / absent present,

92 'Q4. A156-2. Quadrate, quadrate foramen, location on the posterior surface: inset into the quadrate (0), on the quadrate-quadratojugal suture (1), on the quadrate-squamosal suture (2) ' / inset_into_the_quadrate 'on the quadrate-quadratojugal suture' 'on the quadrate-squamosal suture',

93 'Q5. A157. Quadrate, posterolateral margin, orientation: sloping anterolaterally from posteromedial margin (0), slopes posteriorly (1) ' / sloping_anterolaterally_from_posteromedial_margin slopes_posteriorly,

94 'Q6. D157-1. Quadrate, distal portion, position of the lateral condyle: ventrally offset relative to the medial condyle (0), dorsally offset relative to the medial condyle (1) NEW ' / ventrally_offset_relative_to_the_medial_condyle dorsally_offset_relative_to_the_medial_condyle,

95 'QJ1. A121. Quadratojugal, articulation with the jugal: jugal articulates dorsolaterally to the quadratojugal (0), jugal articulates ventrolaterally to the quadratojugal (1), jugal articulates with the quadratojugal via two posterior processes (2) ' / jugal_articulates_dorsolaterally_to_the_quadratojugal j_articulates_VL_to_the_qj j_articulates_with_the_qj_in_two_posterior_processes,

96 'QJ2. A123-1/A122. Quadratojugal, anterior process, long axis relative position to the long axis of the dorsal process: the intersection point of the two long axes is inside the main body of the quadratojugal (0), the intersection point of the two long axes is outside the main body of the quadratojugal (1)   '   /   intersection_point_of_the_two_long_axes_inside_the_main_body intersection_point_outside_the_main_body,

97 'QJ4. A125. Quadratojugal, anterior process, shape of the anterior end: tapered, one vertex along the anterior end (0), three vertexes along the anterior end (1) ' / one_vertex_along_the_anterior_end three_vertexes_along_the_anterior_end,

98 'QJ5. A126. Quadratojugal, posteroventral process: present (0), absent (1) ' / present absent,

99 'QJ6. D126-1. Quadratojugal, posteroventral process, shape: spike-like process (0), club-like process (1), knob-like process (2) NEW ' / 'spike-like process' 'club-like process' 'knob-like process',

100 'Fr1.A131. Frontal, anterior portion, articulation, orientation: planar suture (0), limbous suture (1), denticulate suture (2) ' / planar limbous denticulate,

101 'Fr2.A132. Frontal, anterior process, orientation: anteriorly directed (0), anterolaterally directed (1) ' / anteriorly_directed anterolaterally_directed,

102 'Fr3.A133-1. Frontal, extension: contributes to the dorsal margin of the orbit (0), restricted   to   the   interior   of   the   skull   roof   (1)   '   /   contributes_to_the_orbit restricted_to_the_interior_of_the_skull_roof,

103 'Fr4.A133-2. Frontal, length of the frontal visible in lateral view relative to the maximum diameter of the orbit ',

104 'Fr5.A134. Frontal, contribution to supratemporal fossa: present (0), absent (1)' / present absent,

105 'Fr6.A135. Frontal contribution to the internal margin of the supratemporal fenestra: present   (0),   absent   (1)   (excluded   by   a   parietal-postorbital   contact)   '   /   present excluded_by_a_parietal_postorbital_contact,

106 'Fr7.A136. Frontal, frontal-parietal suture: planar (0), limbous (1), denticulate (2)' / planar limbous denticulate serrated,

107 'Fr8.D132-2. Frontal, frontoparietal foramen: absent (0), present (1) NEW' / absent present,

108 'PA1. A144. Parietals, fusion: absent (0), present (1).' /   'paired, sutured' fused_on_the_midline,

109 'PA2. A145. Parietal, depth of the occipital wing of the parietal compared to the maximum dorsoventral length of the foramen magnum.' / '< 1.5' '>= 1.5',

110 'V1. D198. Vomer, anterior-most articulation: maxilla (0), reaches the premaxilla (1) ' / maxilla reaches_pmx,

111 'PT1.   A190. Pterygoid, relationship with ectopterygoid: ectopterygoid ventral to pterygoid (0), ectopterygoid dorsal to pterygoid (1) ' / ect_ventral_to_pter ect_dorsal_to_pte,

112 'PT2.   D190-1. Pterygoid, quadrate lamina: divided into three processes (0), divided into two processes (1), one process (2) NEW ' / into_3_processes into_2_processes 1_process,

113 'PT3.   A191. Pterygoid, basisphenoid process: absent (0), present (1) ' / absent present,

114 'PT4.   A192. Pterygoid, anterior process, shape: horizontal (0), dorsally directed (1) ' / horizontal dorsally_directed,

115 'PL1.   A194. Palatine, anterior process, shape: tapered, one vertex (0), no vertex, the anterior process is lobe-shaped (1) ' / tapered no_vertex,

116 'PL2.   A193. Palatine, connection: pterygoid only (0), pterygoid and ectopterygoid (1) ' / pterygoid_only pt_and_ect,

117 'PL3.   A195. Palatine shaft, anteroposterior length relative to the maximum transverse width ',

118 'PL4.   A196. Palatine, maxillary articular surface of the palatine, position: along the lateral margin of the bone (0), restricted to the lateral process (1) ' / along_the_lateral_bone restricted_to_the_lateral_process,

119 'PL5.   A197. Palatine, ventral surface, ventromedial process: absent (0), present (1) ' / absent present,

120 'Ec1.   A186/A187. Ectopterygoid, body, pneumatic fossa on the ventral surface: present (0), absent (1) ' / present absent,

121 'Ec2.   A188. Ectopterygoid, articulation of the lateral process: to the jugal (0), to the maxilla (1) ' / to_the_jugal to_the_maxilla,

122 'Ec3.   A189/B112. Ectopterygoid, lateral process, shape: curved (0), hooked-like (1) ' / curved 'hooked-like',

123 'Ec4.   B113. Ectopterygoid, lateral process, orientation in lateral view: arcs anteriorly (0), arcs anterodorsally (1) ' / arcs_anteriorly arcs_anterodorsally,

124 'BC1. A185-1. Braincase, basal tuberae, position relative to the base of the basipterygoid process in lateral view: above the level of the base of the base of the basipterygoid process(0), below the level of the base of the basipterygoid process (1)' / above_the_level_of_the_base_of_the_basipterygoid_process below_the_level_of_the_base_of_the_basipterygoid_process,

125 'BC2. A185-2. Braincase, basal tuberae, position relative to the anteriormost point of the parabasisphenoid in lateral view: below the level of the the anteriormost point of the parabasisphenoid (0), above the level of the anteriormost point of the parabasisphenoid (1)' / below_the_level_of_the_anteriormost_point_of_the_parabasisphenoid above_the_level_of_the_anteriormost_point_of_the_parabasisphenoid,

126 'BC3. A150/A160-2. Braincase, occiput, post-temporal foramen: present (0), absent (1)' / present absent,

127 'BO1. A183/A184. Basioccipital, basal tubera, ossification of the extremities: complete so that the basioccipital and the parabasisphenoid form a single rugose tuber (0), unossified with the basioccipital forming (1)' / complete_so_that_the_basioccipital_and_the_parabasisphenoid_form_a_single_rugose_tuber unossified_with_the_basioccipital_forming_a_ventrally_facing_platform,

128 'BO2. D183-1. Basioccipital, basal tubera: visible in anterior view (0), not visible in anterior view (1)' / visible not_visible,

129 'BO3. D183-2. Basioccipital, basal tubera, morphology in posterior view: club-shaped (0), knob-shaped, so that there are a spherical and a stalk component (1).' / club_shaped knob_shaped,

130 'LA1. A173. Laterosphenoid, connection: frontal and postorbital (0), postorbital only (1)' / present 'absent (head contacts postorbital only)',

131 'LA2. D172. Laterosphenoid, foramen for the maxillomandibular branches of the trigeminal nerves (V2,3): absent (0), present (1).' / absent present,

132 'LA3. D174. Laterosphenoid, contribution to the trigeminal nerve foramen (V): present (0), absent (1)' / present absent,

133 'LA4. D173. Laterosphenoid, exit foramen of trigeminal nerve (V), forming anterodorsal margin (0), forming only the dorsal margin of the foramen (1)' / anterodorsal_margin dorsal_margin,

134 'LA 5. B101. Laterosphenoid, length of the postorbital process relative to the supraoccipital process (Chapelle et al., 2019)' / '< 1.1' '>= 1.1',

135 'LA6. B102. Laterosphenoid, postorbital process, orientation: laterally (0), anterodorsally (1) (Chapelle et al., 2019)' / laterally anterodorsally,

136 'LA7. B103. Laterosphenoid, frontal process, orientation: laterally (0), anterodorsally (1) (Chapelle et al., 2019)' / laterally anterodorsally,

137 'OTO1. A165. Otoccipital, exoccipitals, connection: meeting along the midline on the floor of the endocranial cavity (0), separated by basioccipital (1)' / present separated_by_basioccipital,

138 'OTO2. A167-A170. Otoccipital, paraoccipital processes in occipital view, orientation of long axis relative to the horizontal: directed laterally (0), dorsolaterally (1), ventrolaterally (2)' / 'V-shaped' flat_occiput,

139 'OTO2. A167-A170. Otoccipital, paraoccipital processes in occipital view, orientation of long axis relative to the horizontal: directed laterally (0), dorsolaterally (1), ventrolaterally (2)' / directed_laterally_or_dorsolaterally directed_ventrolaterally,

140 'OTO3. B87. Otoccipital, paraoccipital process: expanded distally (0), distal end pendent (1)' / expanded_distally distal_end_pendent,

141 'OTO4. A168. Otoccipital, posteroventral process forming lateral margin of basal tubera: absent (0), present (1)' / absent present,

142 'OTO5. D92-1. Otoccipital, crista interfenestralis dividing the metotic foramen: absent (0), present (1) NEW.' / absent present,

143 'OTO6. D89-2. Otoccipital, crista interfenestralis, extension: expansion from the basal tuber to the ventral surface of the paraoccipital process (0), unossifed gap between the crista interfenestralis and the parabasisphenoid (1)' / present 'absent (reduced strut)',

144 'OTO7. A166. Otoccipital, exits of the hypoglossal nerve (XII), relative positions: aligned along an anteroposterior plane (0), aligned on a dorsoventral plane (1)' / aligned_in_a_near_anteroposterior_plane aligned_subvertically,

145 'OTO9. A159. Otoccipital, post-temporal foramen on occiput, position: between the parietal, the supraoccipital and the otoccipital (0), fully enclosed by the supraoccipital (1), totally enclosed within the paraoccipital process (2)' / 'between supraoccipital, parietal and otooccipital' on_the_supraoccipital totally_enclosed_within_the_paraoccipital_process,

146 'OTO10. D92-1. Otoccipital, jugular foramen and pseudorotunda foramen: absent (0), present (1) NEW.' / absent present,

147 'OTO11. D92-1. Otoccipital, metotic foramen: absent (0), present (1) NEW.' / absent present,

148 'PB1. A175. Parabasisphenoid, anterior part, depth relative to its transverse width' / 'much less than its transverse width (shallow)' 'approximatey equal to its transverse width (well developed)',

149 'PB11. B104. Parabasisphenoid, anterior tympanic recess on the lateral side of the braincase: absent (0), present (1)' / absent present,

150 'PB2. D175. Parabasisphenoid, anteroposterior length relative to the anteroposterior length of the basioccipital' / 'ap pb >= ap bo' 'ap pb < ap bo',

151 'PB3. B105. Parabasisphenoid, space between basal tubera and basipterygoid processes, transverse length relative to its width' / as_wide_as_long elongated,

152 'PB4. A178. Parabasisphenoid, contact with the basioccipital: straight line contact (0), concave, opening posteriorly' / straight concave,

153 'PB6. A181.2 Parabasisphenoid, subsellar recess: absent (0), present (1).' / absent present,

154 'PB7. A181/B100. Parabasisphenoid, basisphenoid recess, development: the recess does not reach the posterior margin of the subsellar recess and creates a wide space between both recesses (0), the recess reaches the posterior wall of the subsellar recess (1)' / recess_does_not_reach_subsellar_recess recess_reaches_the_subsellar_recess_creating_an_interbasipterygoid_lamina,

155 'PB8. D181. Parabasisphenoid, subsellar recess: closed anteriorly, so that the lateral laminae converge in the ventral face of the cultriform process forming an anterior margin (0), open anteriorly, so that the lateral laminae reduce in size until they intersect the ventral face of the cultriform process (1)' / closed_anteriorly open_anteriorly,

156 'PB9. B101. Parabasisphenoid, foramina for entrance of cerebral branches of internal carotid artery into the braincase positioned on the surface: ventral (0), lateral (1)' / ventral lateral,

157 'MA1. A199. Mandible, outline in dorsal view: the mandibular projections meet each other at an acute angle (0), the anterior ends of the dentaries curve towards each other (1)' / meet_at_an_acute_angle bow_towards_each_other,

158 'MA3. A200. Mandible, mandibular fenestra: present (0), absent (1)' / present absent,

159 'MA5. A203. Mandible, intramandibular joint: absent (0), present (1)' / absent present,

160 'MA6. A204. Mandible, splenial-angular contact, polarity of articulation: (0) splenial convex, angular concave (0), splenial concave, angular convex (1)' / splenial_convex splenial_concave,

161 'MA7. A205. Mandible, craniomandibular joint (glenoid of the mandible), position: with the level of the dorsal margin of the dentary (0), depressed well ventral of this level (1)' / levelled depressed,

162 'MA8.   D225-2. Mandible, retroarticular process, composition: with a surangular and an angular portion (0), comprised entirely by the surangular (1).' / sur_and_ang sur_only,

163 'D1. A5.Dentary, lateral plates appressed to the labial side: absent (0), present (1)' / absent present,

164 'D3. B129. Dentary, tooth row (and edentulous anterior portion) in lateral view: straight (0), anterior end downturned (1), anterior end upturned (dentary ventrally bowed) (2)' / straight anterior_and_downturned,

165 'D4. B127. Dentary, anterior half, position of the Meckelian groove: dorsoventral centre of the dentary (0), restricted to the ventral border (1)' / DV_centre_of_the_dentary ventral_border,

166 'D5. A208. Dentary, symphysis: restricted to the anterior margin of the dentary (0), expanded along the ventral border of the bone (1)' / anterior_margin_only expanded_along_the_ventral_border,

167 'D6. A209. Dentary, symphysis, form: dentary bodies are convergent to a point (0), dentary bodies are parallel to each other (1)' / convergent parallel,

168 'D7. A210. Dentary, symphysial end, orientation of ventral margin in lateral view: in line with the long axis of the dentary (0), displaced ventrally (1)' / in_line displaced_ventrally,

169 'D8. A213(A218). Dentary, posterior end, buccal emargination on the lateral surface (tooth row medially inset with a thick lateral ridge on the dentary, possibly associated with a fleshy cheek in life): absent (0), present (1)' / absent present,

170 'D9. A216. Dentary, coronoid process: absent (0), present (1)' / absent present,

171 'D11. B128. Dentary, Meckelian groove: ends before the dentary symphysis (0), through the dentary symphysis (1)' / ends_before_symphysis through_the_symphisis,

172 'SP1. A219(A220). Splenial, ventral margin, mylohyoid foramen: absent (0), present (1)' / absent present,

173 'SP2. A221. Splenial, mylohyoid foramen: enclosed (0), open anteriorly (1)' / enclosed open_anteriorly,

174 'SA2. A226. Surangular-articular, retroarticular process, shape: terminates blunt in lateral and dorsal views (0), terminates in a vertex, with a posterior tapering in lateral and dorsal views (1)' / terminates_blunt_in_lateral_and_dorsal_views terminates_in_a_vertex,

175 'SA3. A227. Surangular-articular, retroarticular process, orientation: forms nearly a right angle with the rest of the mandible (0), retroarticular is upturned at its distal end (1), retroarticular extends straight out from the caudal part of the mandible (2)' / right_angle retroarticular_upturned_at_its_distal_end retroarticular_extends_straight_out_from_the_posterior_part_of_the_mandible,

176 'SA4. A223-1. Surangular, anterior surangular foramen: present (0), absent (1)' / present absent,

177 'SA5. A223-2. Surangular, posterior surangular foramen: present (0), absent (1)' / present absent,

178 'AR1. A224. Articular, stout, triangular, medial process of the articular, behind the glenoid: present (0), absent (1)' / present absent,

179 'AR2. A228. Articular, strong medial embayment behind glenoid of the articular in dorsal view: absent (0), present (1)' / absent present,

180 'DEN1. A237. Teeth, tooth crowns on the anterior quarter of the tooth bearing areas of the upper and lower jaws relative to the heights of the crowns in the more posterior teeth' / average_height_is_similar average_height_is_significantly_larger_in_the_anterior_quarter,

181 'DEN2. A247. Teeth, occlusal wear facets: absent (0), present (1)' / absent present,

182 'DEN3. A244. Teeth, lingual concavities: absent (0), present (1)' / absent present,

183 'DEN4.   A248. Teeth, enamel surface, texture (at naked eye): smooth (0), finely wrinkled (1), extensively and coarsely wrinkled' / smooth wrinkled_in_patches extensively_wrinkled,

184 'DEN5.   A264/B181. Teeth, pterygoid teeth: present (0), absent (1)' / present absent,

185 'DEN6. B293. Teeth: inserted in discrete alveoli (0), partially fused to dentary and maxillary bones (1) (Langer and Ferigolo, 2006).' / discrete_alveoli ankylothecodonty,

186 'PMT1.   A249. Premaxillary teeth, number' / 1 2 3 4 5 6,

187 'PMT2.   A250. Premaxillary tooth 1, position: adjacent to midline (0), inset posteriorly the width of one or more crowns (1)' / adjacent_to_midline inset_posteriorly,

188 'PMT3.   A251. Premaxillary teeth, position of posteriormost tooth relative to external naris: ventral (0), anterior (1), posterior (2)' / ventral anterior posterior,

189 'PMT4. A241-5. Teeth, premaxillary teeth, serrations restricted to the apical side: absent (0), present (1) NEW (based in Pol, Powell, 2007)' / absent present,

190 'MXT4. A241-1. Maxillary teeth, tooth crowns, serrations in mesial margin: absent (0), present (1)' / absent present,

191 'MXT5. A241-2. Maxillary teeth, tooth crowns, serrations in distal margin: absent (0), present (1)' / absent present,

192 'MXT8. A234/A241. Maxillary teeth, tooth crowns, distal serrations: project perpendicular to the long axis of the crown (0), project at 45 degrees to the crown long axis (1)' / perpendicular 45_degrees parallel,

193 'MXT9. A235. Maxillary teeth, tooth crown, curvature of lingual surfaces: convex mesiodistally (0), concave mesiodistally (1)' / convex_MSD concave_MSD,

194 'MXT14.   A256. Maxillary teeth, tooth crowns, lingual surface: evenly convex (0), bearing low eminence (1)' / evenly_convex low_eminence,

195 'MXT17.   A242-1. Maxillary teeth, serrations, distribution along the mesial carina of the tooth: extend along most of the length of the crown (0), restricted to the upper half of the crown (1)' / extend_along_most_of_the_crown upper_half,

196 'MXT18.   A242-2. Maxillary teeth, serrations, distribution along the distal carina of the tooth: extend along most of the length of the crown (0), restricted to the upper half of the crown (1)' / extend_along_most_of_the_crown upper_half,

197 'MXT21.   A254/B175. Maxillary teeth, posterior maxillary teeth, distal edge: concave (0), straight (1), convex (2)' / concave straight convex,

198 'MXT1.   A259. Maxillary teeth, position of largest tooth in tooth row: anterior half (0), posterior half (1)' / anterior_half posterior_half,

199 'MXT2. A230. Maxillary teeth, crown, alignment: linearly placed so they do not overlap in lateral view (0), angled relative to the long-axis of the jaw so tooth crowns appear to overlap in lateral view (imbricated, each tooth has its mesial margin lying lingual to the distal margin of the crown immediately in front) (1)' / linearly_placed angled_relative_to_the_long_axis_of_the_jaw,

200 'MXT3. A232/B176. Maxillary teeth, tooth crowns, contact with adjacent teeth: absent (0), present (1)' / absent present,

201 'MXT4. A241-1. Maxillary teeth, tooth crowns, marginal ornamentation: absent (0), present (1).' / absent present,

202 'MXT5. A241-2. Maxillary teeth, tooth crowns, distribution of ornamentation: mesial and distal margins (0), mesial margins (1), distal margins (2)' / mesial_and_distal mesial distal,

203 'MXT6.　　A258/B169. Maxillary teeth, tooth crowns, marginal ornamentation, form: serrations (0), denticles (1)' / serrations denticles,

204 'MXT7. A233/A241. Maxillary teeth, tooth crowns, mesial serrations: project perpendicular to the long axis of the crown (0), project at 45 degrees to the crown long axis (1)' / perpendicular_to_the_long_axis 45_degrees parallel,

205 'MXT10. A238. Maxillary teeth, tooth crowns, maximum width of lanceolate tooth, position: located at the base of the crown, above the tooth-crown constriction (0), at the midpoint of crown"s height (1)' / base above_constriction midpoint,

206 'MXT11. A239/B177. Maxillary teeth, tooth crowns, basal constriction: absent (0), present (1)' / absent present,

207 'MXT12. A253. Maxillary teeth, shape of conical teeth: posteriorly curved (0), not curved (1)' / curved not_curved,

208 'MXT13.　　A255. Maxillary teeth, tooth crowns, labial surface: evenly convex (0), bearing low eminence (1)' / evenly_convex low_eminence,

209 'MXT15. A257/A231. Maxillary teeth, tooth crowns, shape: recurved (0), subtriangular (1), lanceolate (2)' / recurved subtriangular lanceolate 'leaf-shaped',

210 'MXT16. B166. Maxillary teeth, cingulum: absent (0), present (1)' / absent present,

211 'MXT19.　　A245. Maxillary teeth, longitudinal distal labial grooves: absent (0), present (1)' / absent present,

212 'MXT20.　　A246. Maxillary teeth, longitudinal mesial labial grooves: absent (0), present (1)' / absent present,

213 'MXT22.　　A254/B175. Maxillary teeth, number' / '< 9' 10 11 12 13 '14 > x < 20' '> 20',

214 'DT17. A241-3. Dentary teeth, tooth crowns, marginal ornamentation: absent (0), present (1).' / absent present,

215 'DT18. A241-4. Dentary teeth, tooth crowns, distribution of ornamentation: mesial and distal margins (0), mesial margins (1), distal margins (2)' / mesial_and_distal_margins mesial_only distal_only,

216 'DT1.　　A259. Dentary teeth, position of largest tooth in tooth row: anterior half (0), posterior half (1)' / anterior_half posterior_half,

217 'DT2. A260. Dentary teeth, number' / '> 18' 18 17 16 15 14 '< 14',

218 'DT3. A263/A215. Dentary teeth, dentary tooth 1, position: terminal (0), inset (1)' / terminal inset,

219 'DT4. B147. Dentary teeth, distribution in the dentary: present in the entire length (0), present in the posterior half only (1)' / entire_length middle_dentary anterior_and_middle_only posterior_half_only,

220 'DT5. A230/262. Dentary teeth, crown, alignment: linearly placed so they do not overlap in lateral view (0), angled relative to the long-axis of the jaw so tooth crowns appear to overlap in lateral view (imbricated, each tooth has its mesial margin lying lingual to the distal margin of the crown immediately in front) (1)' / linearly_placed angled,

221 'DT6. A257/A231. Dentary teeth, tooth crowns, shape: recurved (0), subtriangular (1), lanceolate (2), globular (3)' / recurved subtriangular lanceolate globular 'leaf-shaped',

222 'DT7.　　A232/B176. Dentary teeth, tooth crowns, contact with adjacent teeth: absent (0), present (1)' / absent present,

223 'DT10.   A235. Dentary teeth, tooth crown, curvature of lingual surfaces: convex mesiodistally (0), concave mesiodistally (1)' / convex_MSD concave_MSD,

224 'DT11.   A238. Dentary teeth, tooth crowns, maximum width of lanceolate tooth, position: located at the base of the crown, above the tooth-crown constriction (0), at the midpoint of crown?s height (1)' / base_of_the_crown above_constriction midpoint,

225 'DT12. A240/A236. Dentary teeth, tooth crowns, basal constriction: absent (0), present (1)' / absent present,

226 'DT13.   A261. Dentary teeth, dentary crowns, curvature: posteriorly curved (0), not curved (1)' / posteriorly_curved not_curved,

227 'DT14.   B166. Dentary teeth, cingulum: absent (0), present (1)' / absent present,

228 'DT8.   A233/A241. Dentary teeth, tooth crowns, mesial serrations: project perpendicular to the long axis of the crown (0), project at 45 degrees to the crown long axis (1)' / perpendicular 45_degrees parallel,

229 'DT9.   A234/A241. Dentary teeth, tooth crowns, distal serrations: project perpendicular to the long axis of the crown (0), project at 45 degrees to the crown long axis (1)' / perpendicular 45_degrees parallel,

230 'DT15.   A258/B169. Dentary teeth, tooth crowns, marginal ornamentation, form: serrations (0), denticles (1)' / serrations denticles,

231 'DT17. A241-3. Dentary teeth, tooth crowns, serrations in mesial margin: absent (0), present (1)' / absent present,

232 'DT18. A241-4. Dentary teeth, tooth crowns, serrations in distal margin: absent (0), present (1)' / absent present,

233 'DT20.   A243-1. Dentary teeth, serrations, distribution along the mesial carina of the tooth: extend along most of the length of the crown (0), restricted to the upper half of the crown (1)' / along_the_length upper_half,

234 'DT20.   A243-2. Dentary teeth, serrations, distribution along the distal carina of the tooth: extend along most of the length of the crown (0), restricted to the upper half of the crown (1)' / along_the_length upper_half,

235 'DT21.   A245. Dentary teeth, longitudinal mesial labial grooves: absent (0), present (1)' / absent present,

236 'DT22.   A246. Dentary teeth, longitudinal distal labial grooves: absent (0), present (1)' / absent present,

237 'DT23.   A255. Dentary teeth, tooth crowns, labial surface: evenly convex (0), bearing low eminence (1) ' / evenly_convex low_eminence,

238 'AT1.   A311. Atlas, atlantal neurapophysis, shallow, dorsally facing fossa bordered by a dorsally everted lateral margin in dorsal view: absent (0), present (1)' / absent present,

239 'AT2. A312. Atlas, atlantal intercentrum, length compared to that of the axial intercentrum ',

240 'AX1.   A313. Axial intercentrum, atlantal articulation facet, shape: saddle-shaped (0), concave with upturned lateral borders (1)' / 'saddle-shaped' concave,

241 'AX2.   A319. Axis, maximum width of axial intercentrum relative to the maximum width of axial centrum',

242 'AX3.   A320. Axis, centrum, height relative to its length',

243 'AX4.   A321. Axis, neural canal diameter relative to centrum diameter',

244 'AX5.   B187. Axis, dorsal margin of the neural spine: the anterior margin is at a lower level than the posterior margin (0), anterior and posterior margin are at the same level (1)' / anterior_margin_lower_level_than_the_posterior_margin same_level,

245 'AX6.   A316. Axis, distance of the prezygapophyses from the midline sagittal plane of the axis compared to that of the postzygapophyses' / prezygapophyses_and_postzygapophyses_aligned_on_the_same_planes_parallel_to_each_other postzygapophyses_expanded_laterally,

246 'AX7.   A317. Axis, anteriorly projected pedicels bearing axial prezygapophyses: (0) absent, (1) present' / absent present,

247 'AX8.   A318. Axis, axial postzygapophyses, posterior margin: extending beyond the posterior face of the axial centrum (0), flush with the posterior face of the axial centrum (1)' / extending_beyond_the_posterior_face_of_the_axial_centrum flush_with_the_posterior_face_of_the_axial_centrum,

248 'AX9.   A287-1. Axis, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

249 'AX10.   A288-1. Axis, posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

250 'AX11.   A289-1. Axis, prezygodiapophyseal lamina (prdl): absent (0), present (1)' / absent prdl,

251 'AX12.   A291-1. Axis, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

252 'AX13.   A293-1. Axis, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

253 'AX14.   A295-1. Axis, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

254 'AX15.   A297-1. Axis, intraprezygapophyseal lamina (tprl): absent (0), present (1)' / absent tprl,

255 'AX16.   A298-1. Axis, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

256 'AX17.   A299-1. Axis, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

257 'AX18.   A302-1. Axis, intrapostzygapophyseal lamina (tpol): absent (0), present (1)' / absent tpol,

258 'AX19.   A315-1. Axis, centrum, posterior articular surface: platycoelous (0), opisthocoelous (1)' / platycoelous opisthocoelous,

259 'AX20.   A314-1. Axis, lateral pneumatic fossa, rimmed: absent (0), present (1)' / absent present,

260 'ACE1.   A314-2. Anterior to middle cervicals, lateral pneumatic fossa, rimmed: absent (0), present (1)' / absent pneumatic_fossa,

261 'ACE2.   A307-1. Anterior to middle cervical vertebrae, lateral pneumatic fossa, oblique ridge dividing it: absent (0), present (1)' / absent present,

262 'ACE3.   A332. Anterior cervical vertebrae, centrum, ventral keels: present (0), absent (1)' / present absent,

627

263 'ACE4.   A332-2. Anterior cervical vertebrae, centrum, extension of the ventral keels: anterior half (0), along the whole centrum (1)' / anterior_half along_the_whole_centrum,

264 'ACE5.   A265-A266-1. Anterior to middle cervical vertebrae, neural spines: lateral walls parallel through the neural spine (0), laterally expanded tables at the dorsal surface of the neural spine (1)' / lateral_walls_parallel_through_ns laterally_expanded_tables,

265 'ACE6.   A334. Anterior to middle cervical vertebrae, neural spine, anterior spur-like projections on the anterior margin: absent (0), present (1)' / absent 'spur-like projections',

266 'ACE8.   A325/A339/B189. Anterior to middle cervical vertebrae, epipophyses, on the dorsal surface of the postzygapophyses: absent (0), present (1)' / absent epipophyses,

267 'ACE7.   A291-2/B196. Anterior to middle cervicals, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

268 'ACE29. Anterior to middle cervical vertebrae, alignment of the prezygapophyses and postzygapophyses along the coronal plane: angle less than 20 (0), between 20 and 30 (1), more than 30' / planar 20 30,

269 'ACE9.   A324/A338/A322. Anterior to middle cervical vertebrae, epipophyses: restricted to the postzygapophyses (0), overhang the rear margin of the postzygapophyses (1)' / restricted_to_poz overhanging_the_rear_margin_of_the_poz,

270 'ACE10.   B192. Anterior cervical vertebrae, third cervical vertebra, centrum length relative to the length of the axial centrum',

271 'ACE11.   A276-1. Anterior to middle cervical vertebrae, anterior surface of pedicels of cervical neural arches, centroprezygapophyseal fossa (cprf): absent (0), present (1)' / absent 'cprf (tprl, cprl, neural arch lamina)',

272 'ACE12.   A288-2. Anterior   to   middle   cervical   vertebrae,   posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

273 'ACE13.   A289-2. Anterior to middle cervicals, prezygodiapophyseal lamina (prdl): absent (0), present (1)' / absent prdl,

274 'ACE14.   A293-2. Anterior to middle cervicals, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

275 'ACE 15.   A295-2. Anterior to middle cervicals, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

276 'ACE16.   A297-2. Anterior to middle cervicals, intraprezygapophyseal lamina (tprl): absent (0), present (1)' / absent tprl,

277 'ACE17.   A298-2/B196/A281.   Anterior   to   middle   cervicals, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

278 'ACE18.   A299-2. Anterior to middle cervicals, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

279 'ACE19.   A302-2. Anterior to middle cervicals, intrapostzygapophyseal lamina (tpol): absent (0), present (1)' / absent tpol,

280 'ACE 20.   D198.   Anterior   to   middle   cervical   vertebrae,   anterior centroparapophyseal lamina (acpl): absent (0), present (1) NEW' / absent acpl,

281 'ACE 21.   D199.   Anterior   to   middle   cervical   vertebrae,   posterior centroparapophyseal lamina (pcpl): absent (0), present (1) NEW' / absent pcpl,

282 'ACE22.   A287-2. Anterior to middle cervicals, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

283 'ACE23.   A286/A280-1/A315. Anterior to middle cervical vertebrae, centrum, articulations: amphicoelous-amphiplatyan (0), opisthocoelous (i.e. a cranial hemispherical convexity articulates with a corresponding concavity on the caudal surface of the preceding cervical) (1) ' / 'amphicoelous-amphiplatyan' opisthocoelous,

284 'ACE24.   A278-1. Anterior to middle cervical vertebrae, parapophyses: smooth dorsal surface (0), dorsal excavation (1)' / smooth dorsal_excavation,

285 'ACE25.   B195. Anterior to middle cervical vertebrae, bases of the diapophysis and parapophysis: separated (0), touching (1)' / separated touching,

286 'ACE26.   A279-2. Anterior to middle cervical vertebrae, cervical ribs, shape of the shaft: posteroventrally directed (0), parallel to cervical column (1)' / posteroventrally_directed parallel,

287 'ACE27.   A306-1. Anterior to middle cervical vertebrae, ribs, position of the base of the cervical rib shaft: level with, or higher than the ventral margin of the cervical centrum (0), located below the ventral margin due to a ventrally extended parapophysis (1)' / level_with located_below_the_ventral_margin,

288 'ACE28. D307. Anterior and middle cervical vertebrae, epipophyses, become spol' / separated_from_spol continuing_and_grading_to_spol,

289 'ACE4. Anterior cervical vertebrae, CE6, length/height ratio of centrum: less than 5.0 (0), equal to or greater than 5.0 (1) - Leyesaurus',

290 'PCE5.   A278-2. Posterior cervical vertebrae, parapophyses, dorsal excavation: absent (0), present (1)' / absent present,

291 'PCE8.   A283-2. Posterior cervical vertebrae, centrodiapophyseal fossa (cdf): absent (0), present (1)' / absent cdf,

292 'PCE1.   A314-3. Posterior cervicals, lateral pneumatic fossa, rimmed: absent (0), present (1)' / absent present,

293 'PCE2.   A307-2. Posterior cervical vertebrae, lateral pneumatic fossa, oblique ridge dividing lateral pneumatic fossa: absent (0), present (1) (Y148)' / absent present,

294 'PCE3.   A332-3. Posterior cervical vertebrae, centrum, ventral keels: present (0), absent (1)' / present absent,

295 'PCE4.   A332-4. Posterior cervical vertebrae, centrum, extension of the ventral keels: anterior half (0), along the whole centrum (1). New.' / anterior_half along_the_whole_centrum,

296 'PCE6.   A265/A266-2. Posterior cervicals, neural spines, laterally expanded tables at the midlength of the distal surface of the neural spines: absent (0), present (1)' / absent present,

297 'PCE7.   A351. Posterior cervical vertebrae, diapophyses, shape of rib articulation surface: elongated transversely (0), circular (1)' / elongated_transversely circular,

298 'PCE9.   A287-3. Posterior cervicals, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

299 'PCE10.   A288-3. Posterior cervical vertebrae, posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

300 'PCE11.   A289-3. Posterior cervicals, prezygodiapophyseal lamina (prdl): absent (0), present (1) NEW.' / absent prdl,

301 'PCE12.   A291-3. Posterior cervicals, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

302 'PCE13.   A293-3. Posterior cervicals, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

303 'PCE14.   A295-3. Posterior cervicals, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

304 'PCE15.   A297-3. Posterior cervicals, intraprezygapophyseal lamina (tprl): absent (0), present (1)' / absent tprl,

305 'PCE16.   A298-3. Posterior cervicals, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

306 'PCE17.   A299-3. Posterior cervicals, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

307 'PCE18.   A302-3. Posterior cervicals, intrapostzygapophyseal lamina (tpol): absent (0), present (1)' / absent tpol,

308 'PCE19.   D291. Posterior cervicals, spinodiapophyseal lamina (spdl): absent (0), present (1)' / absent spdl,

309 'PCE20.   D293. Posterior cervicals, anterior centroparapophyseal lamina (acpl): absent (0), present (1) NEW' / absent acpl,

310 'PCE21.   D294. Posterior cervicals, posterior centroparapophyseal lamina (pcpl): absent (0), present (1) NEW' / absent pcpl,

311 'PCE22.   D295. Posterior cervicals, prezygoparapophyseal lamina (prpl): absent (0), present (1) NEW' / absent prpl,

312 'PCE23.   D296. Posterior cervicals, prespinal lamina (prsl): absent (0), present (1) NEW' / absent prsl,

313 'PCE24.   D297. Posterior cervicals, prespinal lamina (posl): absent (0), present (1) NEW' / absent posl,

314 'PCE25.   A286/A280-2/A315. Posterior cervical vertebrae, centrum, articulations: amphicoelous-amphiplatyan (0), opisthocoelous (i.e. a cranial hemispherical convexity articulates with a corresponding concavity on the caudal surface of the preceding cervical) (1)' / 'amphicoelous-amphiplatyan' opisthocoelous,

315 'PCE26.   A279-2. Posterior cervical vertebrae, cervical ribs, shape of the shaft: short and posteroventrally directed (0), longer than the length of their centra and extending parallel to cervical column (1)' / posteroventrally_directed parallel_to_the_cervical_column,

316 'PCE27.   A306-2. Posterior cervical vertebrae, ribs, position of the base of the cervical rib shaft: level with, or higher than the ventral margin of the cervical centrum (0), located below the ventral margin due to a ventrally extended parapophysis (1)' / level_with ventral_margin_due_to_extended_parapophysis,

317 'ADO2.   A314-4. Anterior dorsal vertebrae, lateral pneumatic fossa, rimmed: absent (0), present (1)' / absent present,

318 'DV1. Dorsal vertebrae, parapophyses, fussion of the parapophyses and diapophyses in the dorsal vertebrae: absent (0), present (1) NEW' / absent present,

319 'DV2. Dorsal vertebrae, fussion of the diapophyses and parapophyses: middle and posterior dorsals (0), posterior dorsals only (1) NEW' / middle_and_posterior_dorsals posterior_dorsals_only,

320 'ADO1.   A315-4/A362-1. Anterior dorsal cervical vertebrae, centra, posterior articular surface: amphicoelous-amphiplatyan (0), opisthocoelous (1)' / 'amphicoelous-amphiplatyan' opisthocoelous,

321 'ADO3.   A406. Anterior dorsal vertebrae, neural arches, separation of lateral surfaces under the diapophyses: widely spaced (0), only separated by a thin midline septum (1)' / spaced separated_by_a_thin_midline_septum,

322 'ADO4.   A407. Anterior dorsal vertebrae, neural spines, shape: lateral margins parallel in anterior view (0), transversely expanding towards dorsal end (1)' / lateral_margins_parallel_in_anterior_view transversely_expanded_towards_dorsal_end,

323 'ADO 5.   A364. Anterior dorsal vertebrae, parapophyses, location: centrum (0), neurocentral junction (1), neural arch (2)' / centrum neurocentral_junction neural_arch,

324 'ADO6.   A353-1. Anterior dorsal vertebrae, hyposphenes: absent (0), present (1)' / absent present,

325 'ADO7.   A405/A270-3. Anterior dorsal vertebrae, diapophyses, orientation: laterally (0), dorsolaterally (1)' / laterally dorsolaterally,

326 'ADO9.   A387-1. Anterior dorsal vertebrae, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

327 'ADO10.   A389-1. Anterior dorsal vertebrae, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

328 'ADO11.   A390-1. Anterior dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape at its distal end: singular (0), bifurcated (1)' / singular bifurcated,

329 'ADO18.   A379-1. Anterior dorsal vertebrae, spinodiapophyseal lamina (spdl), topology with the spinopostzygapophyseal lamina (spol): separated from spinopostzygapophyseal lamina (0), joining spinopostzygapophyseal lamina to create a composite posterolateral spinal lamina (1)' / separated_from_spol joining_spol_and_spdl,

330 'ADO12.   A391-1. Anterior dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape: rounded ridge (0), sheet-like (1)' / rounded_ridge 'sheet-like',

331 'ADO13.   A392-1. Anterior dorsal vetebrae, spinopostzygapophyseal laminae (spol): weakly developed, terminating below the summit of the spine (0), extending to the top of the spine (1)' / below_the_summit_line extending_to_the_top_of_the_spine,

332 'ADO14.   A395-1. Anterior dorsal vertebrae, intrapostzygapophyseal lamina (tpol): absent (0), present (1).' / absent tpol,

333 'ADO15.   A396-1. Anterior dorsal vertebrae, anterior centroparapophyseal lamina (acpl): absent (0), present (1)' / absent acpl,

334 'ADO16.   A399-1. Anterior dorsal vertebrae, prezygaparapophyseal lamina (prpl): absent (0), present (1)' / absent prpl,

335 'ADO17.   A400-1. Anterior dorsal vertebrae, prespinal lamina (prsl): absent (0), present (1) NEW.' / absent present,

336 'ADO19.   A381-1. Anterior dorsal vertebrae, paradiapophyseal lamina (ppdl): absent (0), present (1)' / absent ppdl,

337 'ADO20.   A380-1. Anterior dorsal vertebrae, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

338 'ADO21.   A382-1. Anterior dorsal vertebrae, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

339 'ADO22.   A369-1. Anterior dorsal vertebrae, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

340 'ADO24.   A385-1. Anterior dorsal vertebrae, intraprezygapophyseal lamina (tprl): absent (0), present (1)' / absent tprl,

341 'ADO25.   A393-1. Anterior dorsal vertebrae, medial spinopostzygapophyseal lamina (m spol): absent (0), present (1)' / absent m_spol,

342 'ADO26.   A394-1. Anterior dorsal vertebrae, lateral spinopostzygapophyseal lamina (l spol): absent (0), present (1)' / absent l_spol,

343 'ADO27.   A398-1. Anterior dorsal vertebrae, posterior centroparapophyseal lamina (pcpl): absent (0), present (1)' / absent pcpl,

344 'ADO28.   A401-1. Anterior dorsal vertebrae, postspinal lamina (posl): absent (0), present (1)' / absent posl,

345 'ADO29.   A372-1. Anterior dorsal vertebrae, centrum, lateral pneumatic fossa: acamerate (0), procamerate (1), camerate (2)' / acamarate procamerate camerate,

346 'ADO30.   A265-A266. Anterior dorsal vertebrae, vertebrae, neural spines, laterally expanded tables at the midlength of the distal surface of the neural spines: absent (0), present (1)' / absent present,

347 'ADO31.   A373-1/A367. Anterior dorsal vertebrae, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

348 'ADO32.   A374-1. Anterior dorsal vertebrae, posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

349 'ADO33.   A375-376-1. Anterior dorsal vertebrae, prezygodiapophyseal lamina (prdl) and associated triangular prezygapophyseal centrodiapophyseal fossa (prcdf): absent (0), present (1)' / absent prcdf,

350 'ADO34.   A378-1. Anterior dorsal vertebrae, spinodiapophyseal lamina (spdl): absent (0), present (1)' / absent spdl,

351 'MDO3.   A314-5. Middle dorsal vertebrae, lateral pneumatic fossa, rimmed: absent (0), present (1)' / absent present,

352 'MDO1.   A409-1. Middle dorsal vertebrae, lateral pneumatic fenestra in centrodiapophyseal fossa, opening into neural cavity: absent (0), present (1)' / absent present,

353 'MDO2.   A372-2. Middle dorsal vertebrae, centrum, lateral pneumatic fossa: acamerate (0), procamerate (1), camerate (2)' / acamerate procamarate camerate,

354 'MDO4.   A353-2. Middle dorsal vertebrae, hyposphene-hypantrum articulation: absent (0), present (1)' / absent present,

355 'MDO5.   A410. Mid-dorsal vertebrae, neural spine, shape of posterior margin in lateral view: approximately straight (0), concave with a projecting posterodorsal corner (1)' / straight concave_with_a_projecting_posterodorsal_corner,

356 'MDO6.   A270-4. Middle dorsal vertebrae, diapophyses, orientation respect to their sagittal plane: perpendicular (0), dorsally deflected (1)' / perpendicular dorsally_deflected,

357 'MDO7.   A414-2/A364. Middle dorsal vertebrae parapophyses, location: centrum (0), neurocentral junction (1), neural arch (2) (Langer, 2004).' / centrum neurocentral_junction neural_arch,

358 'MDO8.   A369-2. Middle dorsal vertebrae, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

359 'MDO9.   A373-2/A367. Middle dorsal vertebrae, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

360 'MDO10.   A373-2. Middle dorsal vertebrae, posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

361 'MDO11.   A375-376-2. Middle dorsal vertebrae, prezygodiapophyseal lamina (prdl) and associated triangular prezygapophyseal centrodiapophyseal fossa (prcdf): absent (0), present (1)' / absent prcdf,

362 'MDO12.   A378-2. Middle dorsal vertebrae, spinodiapophyseal lamina (spdl): absent (0), present (1)' / absent spdl,

363 'MDO13.   A379-2. Middle dorsal vertebrae, spinodiapophyseal lamina (spdl), topology with the spinopostzygapophyseal lamina (spol): separated from spinopostzygapophyseal lamina (0), joining spinopostzygapophyseal lamina to create a composite posterolateral spinal lamina (1)' / separated_spdl_from_spol spol_and_spdl_composite,

364 'MDO14.   A380-2. Middle dorsal vertebrae, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

365 'MDO15.   A381-2. Middle dorsal vertebrae, paradiapophyseal lamina (ppdl): absent (0), present (1)' / absent ppdl,

366 'MDO16.   A382-2. Middle dorsal vertebrae, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

367 'MDO18.   A384-2. Middle dorsal vertebrae, intrapostzygapophyseal laminae: absent (0), present (1)' / absent tpol,

368 'MDO19.   A385-2. Middle dorsal vertebrae, intraprezygapophyseal lamina (tprl): absent (0), present (1)' / absent tprl,

369 'MDO20.   A387-2. Middle dorsal vertebrae, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

370 'MDO21.   A389-2. Middle dorsal vertebrae, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

371 'MDO22.   A390-2. Middle dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape at its distal end: singular (0), bifurcated (1)' / singular bifurcated,

372 'MDO23.   A391-2. Middle dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape: rounded (0), sheet-like (1)' / rounded 'sheet-like',

373 'MDO24.   A392-2. Middle dorsal vetebrae, spinopostzygapophyseal laminae (spol): weakly developed, terminating below the summit of the spine (0), extending to the top of the spine (1)' / terminating_below_the_spine extending_to_the_top,

374 'MDO25.   A393-2. Middle dorsal vertebrae, medial spinopostzygapophyseal lamina (m spol): absent (0), present (1)' / absent m_spol,

375 'MDO26.   A394-2. Middle dorsal vertebrae, lateral spinopostzygapophyseal lamina (l spol): absent (0), present (1)' / absent l_spol,

376 'MDO28.   A396-2. Middle dorsal vertebrae, anterior centroparapophyseal lamina (acpl): absent (0), present (1)' / absent acpl,

377 'MDO29.   A398-2. Middle dorsal vertebrae, posterior centroparapophyseal lamina (pcpl): absent (0), present (1)' / absent pcpl,

378 'MDO30.   A399-2. Middle dorsal vertebrae, prezygaparapophyseal lamina: absent (0), present (1)' / absent prpl,

379 'MDO31.   A400-2. Middle dorsal vertebrae, prespinal lamina (prsl): absent (0), present (1) NEW.' / absent prsl,

380 'MDO32.   A401-2. Middle dorsal vertebrae, postspinal lamina (posl): absent (0), present (1)' / absent posl,

381 'MDO34.   A362-1. Middle dorsals, centrum, articulation: amphicoelous (0), opisthocoelous (1)' / amphicoelous opisthocoelous,

382 'PDO1.   A412. Posterior dorsal vertebrae, neural canal, shape: subcircular (0), slit-shaped (1)' / subcircular 'slit-shaped',

383 'PDO2. A413. Posterior dorsal vertebrae, neural spines, transversely expanded plate-like summits: absent (0), present (1)' / absent present,

384 'PDO3.   A373-3/A367. Posterior dorsal vertebrae, anterior centrodiapophyseal lamina (acdl): absent (0), present (1)' / absent acdl,

385 'PDO4.   A373-4. Posterior dorsal vertebrae, posterior centrodiapophyseal lamina (pcdl): absent (0), present (1)' / absent pcdl,

386 'PDO5.   A375-376-3. Posterior dorsal vertebrae, prezygodiapophyseal lamina (prdl) and associated triangular prezygapophyseal centrodiapophyseal fossa (prcdf): absent (0), present (1)' / absent prcdf,

387 'PDO6.   A378-3. Posterior dorsal vertebrae, spinodiapophyseal lamina (spdl): absent (0), present (1)' / absent spdl,

388 'PDO7.   A380-3. Posterior dorsal vertebrae, postzygodiapophyseal lamina (podl): absent (0), present (1)' / absent podl,

389 'PDO8.   A381-3. Posterior dorsal vertebrae, paradiapophyseal lamina (ppdl): absent (0), present (1)' / absent ppdl,

390 'PDO9.   A382-3. Posterior dorsal vertebrae, centroprezygapophyseal lamina (cprl): absent (0), present (1)' / absent cprl,

391 'PDO10.   A383-1. Posterior dorsal vertebrae, spinoprezygapophyseal lamina (sprl): absent (0), present (1)' / absent sprl,

392 'PDO11.   A384-3. Posterior dorsal vertebrae, intrapostzygapophyseal laminae: absent (0), present (1)' / absent tpol,

393 'PDO12.   A385-3. Posterior dorsal vertebrae, intraprezygapophyseal lamina (tprl): absent (0), present (1).' / absent tprl,

394 'PDO13.   A387-3. Posterior dorsal vertebrae, centropostzygapophyseal lamina (cpol): absent (0), present (1)' / absent cpol,

395 'PDO14.   A389-3. Posterior dorsal vertebrae, spinopostzygapophyseal lamina (spol): absent (0), present (1)' / absent spol,

396 'PDO15.   A390-3. Posterior dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape at its distal end: singular (0), bifurcated (1)' / singular bifurcated,

397 'PDO16.   A391-3. Posterior dorsal vertebrae, spinopostzygapophyseal lamina (spol), shape: rounded (0), sheet-like (1)' / rounded 'sheet-like',

398 'PDO17.   A392-3. Posterior dorsal vetebrae, spinopostzygapophyseal laminae (spol): weakly developed, terminating below the summit of the spine (0), extending to the top of the spine (1)' / below_the_summit extending_to_the_top,

399 'PDO18.   A393-3. Posterior dorsal vetebrae, medial spinopostzygapophyseal lamina (m spol): absent (0), present (1)' / absent m_spol,

400 'PDO19.   A394-3. Posterior dorsal vertebrae, lateral spinopostzygapophyseal lamina (l spol): absent (0), present (1)' / absent l_spol,

401 'PDO21.   A396-3. Posterior dorsal vertebrae, anterior centroparapophyseal lamina (acpl): absent (0), present (1)' / absent acpl,

402 'PDO22.   A398-3. Posterior dorsal vertebrae, posterior centroparapophyseal lamina (pcpl): absent (0), present (1)' / absent pcpl,

403 'PDO23.   A399-3. Posterior vertebrae, prezygaparapophyseal lamina: absent (0), present (1)' / absent prpl,

404 'PDO24.   A400-1. Posterior dorsal vertebrae, prespinal lamina (prsl): absent (0), present (1)' / absent prsl,

405 'PDO25.   A401-3. Posterior dorsal vertebrae, postspinal lamina (posl): absent (0), present (1)' / absent posl,

406 'PDO26.   A270-5. Posterior dorsal vertebrae, diapophysis, orientation respect to their sagittal plane: perpendicular (0), dorsally deflected (1)' / perpendicular dorsally_deflected,

407 'PDO29.   A353-3. Posterior dorsal vertebrae, hyposphene-hypantrum articulation: absent (0), present (1)' / absent 'hypo-hypa',

408 'PDO30.   A362-1. Posterior dorsals, centrum, articulation: amphicoelous (0), opisthocoelous (1).' / amphicoeolous opisthocoelous,

409 'PDO32.   A372-2. Posterior dorsal vertebrae, centrum, lateral pneumatic fossa: acamerate (0), procamerate (1), camerate (2).' / acamerate procamerate camerate,

410 'PDO33.   A379-3. Posterior dorsal vertebrae, spinodiapophyseal lamina (spdl), topology with the spinopostzygapophyseal lamina (spol): separated from spinopostzygapophyseal lamina (0), joining spinopostzygapophyseal lamina to create a composite posterolateral spinal lamina (1)' / spdl_separated_from_spol 'spol-spdl',

411 'PDO34.   A414-3. Posterior dorsal vertebrae, parapophyses, location: centrum (0), neurocentral junction (1), neural arch (2)' / centrum neurocentral_junction neural_arch,

412 'PDO35.   A415. Posterior dorsal vertebrae, last presacral rib, ossification: free (0), fused to vertebra (1)' / free fused_to_the_vertebrae,

413 'PDO36.   D389-1. Posterior dorsal vertebrae, centropostzygapophyseal fossa (cpol-f, accesory lamina dividing the postzygocentrodiapophyseal fossa): absent (0), present (1)' / absent 'cpol-f',

414 'DSA1. A402. Dorsosacral vertebrae: absent (0), present (1)' / absent present,

415 'DSA2. A403. Dorsosacral vertebrae: one (0), two (1)' / one two,

416 'DSA3. A404. Dorsosacral vertebrae, transverse process, anteroposterior extension of medial region relative to the central length.',

417 'DSA4. A416. Dorsosacral vertebra 1, transverse processes, contact with preacetabular process: absent (0), present (1)' / absent present,

418 'SAC6. D422. Sacral vertebrae, sacricostal yoke, shape: flat horizontally (0), bevelled ventromedially (1)' / flat_horizontally bevelled_ventromedially,

419 'SAC8. D423. Sacral vertebrae, parapophyses, position: located on a single centrum (0), shared between two centra (1)' / single_centrum shared_between_two_centra,

420 'SAC15. D428. Sacral vertebrae, neural spines, contact: fused (0), connected via fused prespinal and postspinal laminae (1)' / fused connected_via_fused_prsl_and_posl,

421 'SAC1. A417. Sacral vertebrae, width of the sacral rib relative to the width of the transverse process (and dorso-sacral if present) in dorsal view',

422 'SAC2. A419. Sacral vertebrae, primordial sacral vertebrae, length of the ribs of the two primordial sacrals relative to the medial surface of the iliac alae' / cover_the_entire_surface_of_iliac_alae shorter_than_iliac_alae,

423 'SAC4. A421. Sacral ribs, sacricostal yoke (distal ends of sacral ribs fuse together): absent (0), present (1)' / absent present,

424 'SAC5. A422. Sacral vertebrae, sacricostal yoke, contribution to the dorsal rim of the acetabulum: absent (0), present (1)' / absent present,

425 'SAC9. A424. Sacral vertebrae, first promordial sacral vertebrae, strong constriction between the sacral rib and the diapophysis of the 1ps and ds in dorsal view' / absent present,

426 'SAC10. D426. Sacral vertebrae, sacral rib 1, shape: undivided distally (0), divided distally into alar and acetabular rami (1)' / undivided_distally alar_and_acetabular_rami,

427 'SAC11. B217. Sacral vertebrae, centra: separate (0), at least partially co-ossified (1)' / separate 'co-ossified',

428 'SAC12. B218. Sacral vertebrae, prezygapophyses and complimentary postzygapophyses: separate (0), co-ossified (1)' / separate 'co-ossified',

429 'SAC13. B223. Sacral ribs: almost entirely restricted to a single sacral vertebra (0), shared between two sacral vertebrae (2) ' / restricted_to_single_sacral_vertebrae shared_between_the_two,

430 'SAC14. D428. Sacral vertebrae, timing of fusion: neurocentral fusion before interneural fusion (0), interneural fusion before neurocentral fusion (1)' / neurocentral_fusion_before_interneural_fusion interneural_fusion_before_neurocentral_fusion,

431 'SAC16. B224. First primordial sacral, articular surface of sacral rib: circular (0), C-shaped in lateral view (1), rectangular (2)' / 'C-shaped' rectangular,

432 'SAC17. A427. First and second primordial sacral vertebrae, posterior and anterior expansion of the transverse processes of the first and second primordial sacral vertebrae, respectively, partly roofing the intercostal space: absent (0), present (1)' / absent present,

433 'SAC18. A426. First primordial sacral vertebrae, iliac articular facets, shape: singular (0), divided into dorsal and ventral facets separated by a non-articulating gap (1)' / singular 'dorsal and ventral facets separated by a non-articulating gap',

434 'SACa1. A418-A430. Sacrocaudal vertebrae: absent (0), present (1)' / absent present,

435 'SACa2. A428. Sacrocaudal 1, transverse process, contact with the postacetabular process of the ilium: absent (0), present (1)' / absent present,

436 'SACa3. A429. Sacrocaudal 2, transverse process, contact with the postacetabular process of the ilium: absent (0), present (1)' / absent present,

437 'ACa6. A434-A439. Anterior caudal vertebrae, neural spines, length of base of the spines relative to the length of the neural arch' / '<0.1' _1.0,

438 'ACa3. A431/A440. Anterior caudal vertebrae, caudal I, length of the centrum relative to its height' / '> 1.0' '<= 1.0',

439 'ACa4. A433-1. Anterior caudal vertebrae, hyposphenal ridge: absent (0), present (1)' / absent present,

440 'ACa8. A441. Anterior caudal vertebrae, diapophyses, bases, depth: shallow, restricted to the neural arches (0), deep extending from the centrum to the neural arch (1)' / shallow restricted,

441 'ACa9.   A442. Anterior caudal vertebrae, neural spines, orientation of posterior margin: sloping posterodorsally (0), vertical (1)' / sloping vertical,

442 'ACa10.   A443. Anterior caudal vertebrae, postzygapophyses, position: protruding with an interpostzygapophyseal notch visible in dorsal view (0), placed on either side of the caudal end of the base of the neural spine without any interpostzygapophyseal notch (1)' / notch_visible_in_dorsal_view placed_on_either_side_of_the_caudal_end,

443 'ACa11.   A432-1. Anterior caudal vertebrae, centrum, longitudinal ventral sulcus: absent (0), present (1)' / absent present,

444 'MCa1. A433-2. Middle caudal vertebrae, hyposphenal ridge: absent (0), present (1)' / absent present,

445 'MCa3. A444. Middle caudal vertebrae, length relative to height of the anterior articular surface',

446 'MCa4. A445. Middle caudal vertebrae, chevrons, ventral slit: absent (0), present (1)' / absent present,

447 'PCa1. A433-3. Posterior caudal vertebrae, hyposphenal ridge: absent (0), present (1)' / absent present,

448 'PCa2. A448/B231. Posterior caudal vertebrae, length of posterior caudal prezygapophyses relative to the length of the preceding the centrum',

449 'PCa3. B230. Posterior caudal vertebrae, prezygapophyses: not elongated (0), elongated beyond the anterior face of the centrum (1)' / not_elongated elongated,

450 'DCa2. A449. Distal caudal vertebrae, distalmost biconvex caudal centra, length relative to it is height',

451 'DCa3. A450. Distal caudal vertebrae, distalmost biconvex caudal centra, number',

452 'DCa1. A447. Distal caudal vertebrae, centra, cross-sectional shape: oval with rounded lateral and ventral sides (0), square-shaped with flattened lateral and ventral sides (1)' / oval 'square-shaped',

453 'DCa4. A451. Distal caudal vertebrae, shape of terminal distals: unfused (0), fused (1)' / unfused fused,

454 'DCa5. A452. Distal caudal vertebrae, chevrons, anteroventral process: absent (0), present (1)' / absent present,

455 'DCa6. A453. Distal caudal vertebrae, weaponized dermal spikes: absent (0), present (1)' / absent present,

456 'Chv1.   D445. Chevrons, shape: dorsally closed (0), dorsally open with two prongs projecting dorsolaterally (1) ' / dorsally_closed dorsally_open,

457 'Chv2.   A445. Middle caudal vertebrae, chevrons, ventral slit: absent (0), present (1) ' / absent present,

458 'Chv4.   A436-A437. Chevrons, distribution forked chevrons: posterior caudal vertebrae (0), throughout middle and posterior caudal vertebrae (1)' / posterior_caudal_vertebrae throughout_middle_and_posterior_caudal_vertebrae,

459 'Chv5.   A438. Caudal vertebrae, length of the longest chevron relative to length of the preceding centrum: less than or equal to 1.0 (0), more than 1.0 but less than or equal to 2.0 (1), or greater than 2.0 (2) ' / '=< 1.0' '1.0 > x =< 2.0' '> 2.0',

460 ST1._B239._Sternal_plates / absent present,

461 'ST2. A456. Sternal plate, dorsal surface, longitudinal ridge: absent (0), present (1)' / absent present,

462 'CL1. B237. Clavicles: unossified (0), ossified elements (1)' / unossfied ossified,

463 'CL2. A478. Clavicles: separated elements (0), furcula (1)' / separated furcula,

464 'CO1.   D472. Coracoid, lateral side, number of faces divided by anteroposterior edge: one (0), dorsal and ventral (1), three (2).' / one dorsal_and_ventral three,

465 'CO2.   A477. Coracoid, coracoid tubercle: present (0), absent (1)' / present absent,

466 'CO3.   A473. Coracoid, posteroventral portion, biceps ridge: absent (0), present (1).' / absent present,

467 'CO4.   A472. Coracoid, posterior process: absent (0), present (1)' / absent present,

468 'CO5.   A476. Coracoid, posterior process: not expanded beyond glenoid fossa (0), expanded beyond margin of glenoid fossa (1)' / not_expanded_beyond expanded_beyond,

469 'SC1.   B246-1. Scapula, articulation with coracoid: straight margin (0), stepped (1), inflection (2).' / straight stepped inflection,

470 'SC6.   D464. Scapula, scapular blade, distal expansion on the anterior margin: absent (0), present (1). NEW' / absent present,

471 'SC3.   A464/A462/A463. Scapula, scapular blade, distal expansion on the a posterior margin: absent (0), present (1).' / absent present,

472 'SC8.   A468. Scapula, base, cross section: flat or rectangular (0), D-shaped (1) ' / flat_or_rectangular 'D-shaped',

473 'SC9.   A469. Scapula, glenoid cavity, orientation: posterolaterally (0), directed posteroventrally (1) ' / posterolaterally posteroventrally,

474 'SC10.   C470. Scapula, posteromedial ridge: absent (0), present (1) ' / absent present,

475 'SC11.   D470-1. Scapula, posteromedial ridge, extension: before the ventral most third of the scapular blade (0), extending beyond the most ventral third of the scapular blade (1) NEW.' / before_the_ventralmost_third_of_the_scapular_blade extending_at_or_beyond_the_most_ventral_third_of_the_scapular_blade,

476 'SC12.   D460-1. Scapula, acromial ridge: absent (0), present (1) ' / absent present,

477 'SC13.   D460-2. Scapula, acromial ridge, extension: posteriorly beyond the acromial length (0), restricted to the acromial length (1)' / restricted_to_the_acr._l beyond_the_acromial_length,

478 'SC15.   A460-4. Scapula, surface posterior to acromial ridge and distal blade: is excavated (0), is flat or slightly convex (1) ' / concave flat_or_convex,

479 'H3. B257. Humerus, proximal end, relationship between the surfaces of the humeral head and the median tuberosity: continuous surface (0), separated by a groove (1)' / continuous_surface separated_by_a_groove,

480 'H4. A483/A483-1. Humerus, proximal articular surface, continuity with the deltopectoral crest: continuous convexity (0), humeral head separated by an indentation from the deltopectoral crest (1)' / continuous_convexity humeral_head_separated_by_an_indentation_from_the_deltopectoral_crest,

481 'H5. A483-2. Humerus, proximal articular surface, separation between the humeral head and the deltopectoral crest: ridge (0), edge (1), hinge (2)' / ridge edge hinge,

482 'H6. A482. Humerus, humeral head, shape of the dorsal margin in AP view: rounded in anterior-posterior view (0), flat in anterior-posterior view (1), domed, being convex/hemispherical in anterior-posterior view (2)' / rounded_in_AP_view flat_in_AP_view 'domed, hemispherical',

483 'H8. A490. Humerus, deltopectoral crest, orientation: laterally orientated (0), anterolaterally orientated (1), anteriorly orientated (2)' / laterally_orientated AL_orientated anteriorly_orientated,

484 'H10. A486. Humerus, deltopectoral crest: flange (0), ridge (1)' / flange ridge,

485 'H11. A495. Humerus, deltopectoral crest, rugose pit centrally located on the lateral surface: absent (0), present (1) (Y209)' / absent present,

486 'H12. A494. Humerus, deltopectoral crest, shape: triangular (0), polygonal with four or more vertices (1)' / triangular polygonal_with_four_or_more_vertices,

487 'H14. A496. Humerus, distal end, shape of the entepicondyle: rounded process (0) or with a flat distal-medially facing surface bounded by a sharp proximal margin (1)' / rounded_process 'flat distal-medially facing',

488 'H15. A498. Humerus, distal condyles, articular surface: restricted to distal portion of humerus (0), exposed on anterior portion of humeral shaft (1)' / restricted_to_distal_portion exposed_on_anterior_portion_of_humeral_shaft,

489 'H16. A499. Humerus, distal flexor surface, well-defined fossa: present (0), absent (1)' / present absent,

490 'H10. Humerus, deltopectoral crest, sinuous ridges for M. deltoides in medial and lateral surface: absent (0), present (1) - Unaysaurus',

491 'U1. C1/A500-1. Ulna, proximal end, shape: circular (0), quadrangular (1), triradiate (2)' / circular quadrangular triradiate,

492 'U2. C2/A500-2. Ulna, proximal end, anterolateral process: absent (0), present (1).' / absent present,

493 'U3. C3/A500-3. Ulna, proximal end: anterolateral process closer to the olecranon (0), anterolateral process equidistant or closer to the anterior process (1)' / anterolateral_process_closer_to_the_olecranon anterolateral_process_equidistant anterolateral_closer_to_the_anterior_process,

494 'U4. A501. Ulna, proximal end, curvature of the medial surface that contacts the radius: flat (0), radial fossa (1)' / flat radial_fossa,

495 'U5. A503. Ulna, olecranon process, greatly enlarged with a separate ossification forming a strongly striated proximo-anterior portion: present (0), absent (1).' / present absent,

496 'U7. A502. Ulna, olecranon process: present (0), absent (1)' / present absent,

497 'U8. B262. Ulna, anterior process (=radial tuber) on the proximal portion: absent (0), present (1)' / absent present,

498 'R2. A510. Radius, distal condyle, shape: subcircular or oval in outline (0), subrectangular with a flattened posterior margin for articulation with the ulna radius (1)' / subcircular with_edges,

499 'R3. A508. Radius, distal portion, posterior margin: rounded (0), flat (1)' / rounded flat,

500 'R5. A506. Radius, radial tuber for the M. brachialis: absent (0), present (1)' / absent present,

501 'R6. A507. Radius, radial ulnar process: triangular projection (0), rectangular lamina (1) (O2015)' / triangular_projection rectangular_lamina,

502 'R7. Radius, longitudinal ridge: absent (0), present (1)' / absent present,

503 'MC1.　　　A520. Manus, digits and metacarpals, longest: digit III, metacarpal 3 (0), digit II, metacarpal 2 (1)' / mc_III mc_II,

504 'MC2.　　　A522. Metacarpus, shape: flattened to gently curved and spreading (0), a colonnade of subparallel metacarpals tightly curved into a U-shape (1)' / flattened colonnade,

505 'MC3.　　　A536. Metacarpals I-III, base, flat intermetacarpal articular facets: absent (0), present (1).' / absent present,

506 'MC4.　　　A525. Metacarpal I, proximal width relative to the proximal width of the metacarpal II)' / 'x <= 1' 'x > 1',

507 'MC6.　　　A524. Metacarpal I, proximal end: flush with other metacarpals (0), inset into the carpus (1)' / flush_with_other_metacarpals inset_to_the_carpus,

508 'MC8.　　　A537-1. Metacarpal I, proximodorsal portion, extensor pits: symmetric depression (0), asymmetric concavity (1)' / symmetric_depression asymmetric_concavity,

509 'MC9.　　　A533. Metacarpal I, distal condyle, transverse axis orientation relative to the axis of shaft: bevelled proximodistally (0), perpendicular (1)' / bevelled_proximodistally perpendicular,

510 'MC10.　　　A530. Metacarpal I, ventromedial margin of first metacarpal: fossa (0) socket, hemispherical concavity (1)' / fossa hemispherical_concavity,

511 'MC11.　　　A538-1. Metacarpals I, distal ends, ligament pits on their extensor surface: absent (0), present (1)' / absent present,

512 'MC12.　　　A534. Metacarpal I, distal condyles, alignment relative to medial condyle: approximately aligned or slightly offset (0), lateral condyle strongly distally expanded relative to medial condyle (1)' / medial_condyle_at_level_or_offset_proximally_relative_to_lateral_condyle lateral_condyle_strongly_distally_expanded_relative_to_medial_condyle,

513 'medial edge of the proximal surface of the first metacarpal sharply tapering and curved, giving it a sublacriform outline and differing from the typical - Ledumahadi',

514 'MC13.　　　A537-2. Metacarpal II, proximodorsal portion, extensor pits: symmetric depression (0), asymmetric concavity (1)' / symmetric_depression asymmetric_concavity,

515 'MC14.　　　A541-1. Metacarpal II, distal end, shape in distal view: rectangular (0), trapezoidal with flexor rims of distal collateral ligament pits flaring beyond extensor rims (1)' / rectangular trapezoidal_with_flexor_rims_of_distal_collateral_ligament_tips_flaring_beyond_extensor_rims,

516 'MC16.　　　A538-2. Metacarpals II, distal ends, ligament pits on their extensor surface: absent (0), present (1)' / absent present,

517 'MC17.　　　A537-3. Metacarpal III, proximodorsal portion, extensor pits: symmetric depression (0), asymmetric concavity (1)' / symmetric_depression asymmetric_concavity,

518 'MC18.　　　A541-2. Metacarpal III, distal end, shape in distal view: rectangular (0), trapezoidal with flexor rims of distal collateral ligament pits flaring beyond extensor rims (1)' / rectangular trapezoidal_with_flexor_rims_of_distal_collateral_ligament_tips_flaring_beyond_extensor_rims,

519 'MC19.　　　A538-3. Metacarpals III, distal ends, ligament pits on their extensor surface: absent (0), present (1)' / absent present,

520 'MC20.   A542-1. Metacarpal IV, proximal portions, position relative to metacarpal III: lateral (0), set at the palmar surfaces (1).' / lateral set_at_the_palmar_surfaces,

521 'MC22.   A544. Metacarpals IV-V, position relative to metacarpals I-III: dorsal to metacarpals I-III (0), ventral to metacarpals I-III (1)' / 'dorsal to mc I-III' 'ventral to mc I-III',

522 'MC23.   A547. Metacarpal V, proximal end, articulation surface curvature: flat (0), convex (1)' / flat convex,

523 'MC26.   A542-2. Metacarpals V, proximal portions, position relative to metacarpal IV: lateral (0), set at the palmar surfaces (1).' / lateral set_at_the_palmar_surfaces,

524 'MC27.   A548. Metacarpal V: absent (0), present (1)' / absent present,

525 'MC28. A550. Metacarpal V, length relative to the length of the metacarpal II' / 'x < 0.25' 'x > 0.25',

526 'CAR1.   A516. Distal carpal I, transverse width relative to the transverse width of the distal carpal II' / '> 1.2' '<= 1.2',

527 'CAR2.   A513. Distal carpal I, medial end, sulcus: absent (0), present (1)' / absent present,

528 'CAR3.   A515. Distal carpal I, lateral end onto distal carpal II: abuts (0), overlaps (1) ' / abuts overlap,

529 'CAR4.   A517. Distal carpal I, transverse width relative to metacarpal I' / '>= 1.0' '< 1.0',

530 'CAR5.   A518. Distal carpal II, relationship with the proximal end of metacarpal II: covering (0), not covering (1)' / covering not_covering,

531 'CAR6.   A519. Distal carpal V, ossified: present (0), absent (1)' / present absent,

532 'MD2.   A553. Manual digit I, ventrolateral twisting of the transverse axis of the distal end of the first phalanx of manual digit one relative to its proximal end: absent (0), present (1)' / absent present,

533 'MD2.   A553. Manual digit I, ventrolateral twisting of the transverse axis of the distal end of the first phalanx of manual digit one relative to its proximal end: present proximodorsal lip aligned with dorsal margin of medial distal condyle (0), present proximodorsal lip aligned with central region of medial ligament pit of the distal condyle (1)' / proximodistal_lip_aligned_with_dorsal_margin_of_medial_distal_condyle proximodistal_lip_aligned_with_central_region_of_medial_ligament,

534 'MD3.   A562. Manual digit I, phalanx I.1, proximal heel: absent (0), present (1)' / absent present,

535 'MD5.   A557. Manual digit I, phalanx I.1, shape of the proximal articular surface: rounded (0), with an embayment on the medial side (1)' / rounded with_an_embayment_on_the_medial_side,

536 'MD6.   A561. Manual digit I, phalanx I.1, shape: subcylindrical (0), wedge-shaped (1)' / subcylindrical 'wedge-shaped',

537 'MD8.   A570/B288. Manual digit I, shape of the unguals: straight (0), curved with tips projecting well below flexor margin of proximal articular surface (1)' / straight curved_with_tips_projecting_well_below_flexor_margin_of_proximal_articular_surface,

538 'MD13.   A567. Manual digit II, ungual of manual digit II: absent (0), present (1)' / absent present,

539 'MD10.   A570/B288. Manual digit II, shape of the unguals: straight (0), curved with tips projecting well below flexor margin of proximal articular surface (1)' /   straight curved_with_tips_projecting_well_below_flexor_margin_of_proximal_articular_surface,

540 'MD11.   A570/B288. Manual digit III, shape of the unguals: straight (0), strongly curved with tips projecting well below flexor margin of proximal articular surface (1)' /   straight curved_with_tips_projecting_well_below_flexor_margin_of_proximal_articular_surface,

541 'MD19.   A574. Manual digit V, phalanges: present (0), absent (1)' /   present absent,

542 'I1. A602. Ilium, iliac blade in dorsal view: straight (0), sigmoidal (1), laterally curved (2)' / straight sigmoidal laterally_curved,

543 'I2. A599. Ilium, dorsal margin, curvature of the outline in lateral view: describes a periodic or sinusoidal curve (0), describes a polynomial curve (1).' / sinusoidal_curve polynomial_curve,

544 'I3. A599-2. Ilium, dorsal margin, position of the crest of the sinusoidal outline in lateral view: anteriorly (0), posteriorly (1)' / anteriorly posteriorly,

545 'I3. A599-2. Ilium, dorsal margin, polynomial outline in lateral view: straight (0), concave parabolic (1), convex parabolic (2), sigmoidal (3) ' / straight concave_parabolic convex_parabolic sigmoidal,

546 'I4. A608. Ilium, iliac blade, orientation of the long-axis: horizontal (0), slopes anterodorsally in lateral view (1) ' / horizontal slopes_anterodorsally_in_lateral_view,

547 'I5. D608. Ilium, iliac blade, position relative to the acetabulum: projected posteriorly (the length posterior to the acetabulum is larger than the anterior length) (0), projected anteroposteriorly (1), projected anteriorly (2) ' / projected_posteriorly projected_anteroposteriorly projected_anteriorly,

548 'I6. A578. Ilium, preactabular process, scar corresponding to the attachment of the M. iliofemoralis cranialis: absent (0), present (1) ' / absent present,

549 'I7. A579. Ilium, preacetabular process, extension relative to the anterior-most extension of the pubic peduncle: not extending anteriorly to the pubic peduncle (0), extending anteriorly to the pubic peduncle (1) ' / not_extending extending,

550 'I11. A584. Ilium, preacetabular process, iliac preacetabular ridge: absent (0), present (1) ' / absent present,

551 'I12. A616. Ilium, postacetabular process, posterodorsal margin: meets at a point with the posteroventral margin (0), is separated from the posteroventral margin by a posterior margin (1) ' / meets_at_a_point_with_the_posteroventral_margin separated_from_the_posteroventral_margin_by_a_posterior_margin,

552 'I13. A620. Ilium, postacetabular process, muscle origin areas (Mm. flexor tibialis and iliotibialis) on the posterior portion: smooth (0), strong trapezoidal rugosity extended along the whole height of the posterior third of the process (1' / smooth strong_trapezoidal_rugosity,

553 'I14. A594/A597/A596. Ilium, acetabulum, medial wall (=ventral acetabular flange): fully closing acetabulum (0), partially open acetabulum (1), open acetabulum, with the medial wall at the same level of the lateral iliac margin of the acetabulum (2) ' / fully_closing_acetabulum partially_open open_acetabulum,

554 'I15. A586/A587. Ilium, supraacetabular margin: ridge (0), well-developed crest (1) ' / ridge crest,

555 'I16. A591. Ilium, supra-acetabular crest, widest point: located halfway between the pubic and ischial contacts (0), on the pubic peduncle (1) ' /   halfway_between_pu_and_is on_the_pubic_peduncle,

642

556 'I17. A593. Ilium, supraacetabular crest, extension along the pubic peduncle: partially along the pubic peduncle (0), along the entire pubic peduncle (1) ' / partially_along_the_pup along_the_entire_pup,

557 'I18. A590/A588. Ilium, supra-acetabular crest, orientation: projects laterally (0), ventrolaterally (1), projects ventrally (2)' / laterally ventrolaterally ventrally,

558 'I20. A606. Ilium, ischiadic peduncle, posteriorly projecting "heel" at the distal end' / absent present,

559 'PU16. D632. Pubis, opening of the proximal portion of the pubic apron: absent (0), present (1)' / absent present,

560 'PU1. A625/A637. Pubis, orientation: anteroverted (0), vertical (1), retroverted (2) (Unordered)' / anteroverted vertical retroverted,

561 'PU4. A628. Pubis, proximal pubis, ambiens process: present (0), absent (1) ' / present absent,

562 'PU5. A638. Pubis, pubic tubercle, shape: rounded (0), semilunate plate (1) ' / rounded semilunate_plate,

563 'PU6. A629. Pubis, proximal anterior profile of pubis: anterior margin of pubic apron smoothly confluent with anterior margin of iliac pedicel (0), iliac pedicel set anterior to the pubic apron creating a prominent inflection in the proximal anterior profile of the pubis (1) ' / anterior_margin_of_pubic_apron_smoothly_confluent_with_a._m._iliac_pedicel 'iliac pedicel set anterior to the pubic apron, prominent inflection',

564 'PU8. A627-1. Pubis, pubic obturator foramen: absent (0), present (1)' / absent present,

565 'PU10. A626. Pubis, obturator foramen, position in anterior view: iliac pedicel right anterior to the obturator foramen (0), iliac pedicel and obturator foramen lateromedially displaced (1)' / iliac_pedicel_anterior_to_the_o_for iliac_pedicel_and_o_for_lm_displaced,

566 'PU12. A636/B347. Pubis, pubic apron: present (0), absent (1). NEW' / present absent,

567 'PU13. A633. Pubis, pubic apron, anterior fossa on the proximal region: absent (0), present (1) ' / absent present,

568 'PU14. A632. Pubis, pubic apron, shape in anterior view: straight-sided (0), concave lateral margins of the pubes producing a waisted pubic apron (1) ' / straight concave,

569 'PU15. B348. Pubis, median gap below the pubic apron: present (0), absent (1). NEW' / present absent,

570 'PU17. A642. Pubis, orientation of distal third of the blades of the pubic apron: confluent with the proximal part of the pubic apron (0), twisted posterolaterally relative to proximal section so that the anterior surface turns to face laterally (1) ' / confluent twisted,

571 'PU19. A640/B349. Pubis, anteroposterior expansion of the distal pubis: absent (0), present (1) ' / absent present,

572 'PU22. A643. Pubis, distal margin compared to the lateral margins: mediolaterally expanded (0), mediolaterally unexpanded (1)' / expanded not_expanded,

573 'PU23. B342. Pubis, prepubic process: absent (0), present (1) ' / absent present,

574 'PU24. B346-1. Pubis, pubic symphysis: present (0), absent (1).' / present absent,

575 'PU25.   B346-2. Pubis, pubic symphysis, extension: elongated (0), restricted to the distal ends (1).' / elongated restricted_to_distal_ends,

576 'PU26.   A645. Pubis, puboischial symphysis: absent (0), present (1) ' / absent present,

577 'IS3.A647. Ischium, orientation of the long axes of the transverse section of the distal ischia: meet at an angle (0), coplanar (1)' / angle coplanar,

578 'IS4.A668. Ischium, ischiadic plate, extension: more than half the length (0), restricted to its proximal third (1) ' / more_than_half_the_length restricted_to_prox_third,

579 'IS5.A660. Ischium, medial contact with antimere: restricted to the medial edge (0), extensive contact but the dorsal margins are separated (1), extensive contact and the dorsal margins contact each   other   (2)'   /   medial_edge   extensive_contact extensive_contact_and_dorsal_margins_contact_each_other,

580 'IS6.A649. Ischium, proximal ischium, longitudinal dorsolateral sulcus: absent (0), present (1)' / absent present,

581 'IS8.A655. Ischial, midshaft, medial margin at midshaft: edge suture (0), dorsoventral expansion (1).' / edge_suture DV_expansion,

582 'IS10.   A657. Ischium, antitrochanter, nonarticular acetabular margin: concave (0), notch that undercuts antitrochanter (1). ' / concave notch,

583 'IS13.   B323. Ischium, obturator process: absent (0), present (1)' / absent present,

584 'IS12.   A664. Ischium, ischial obturator plate, distal end of the proximal: abrupt and proximal to the midpoint of the ischium (0), elongate, gradually tapering distal end that reaches the midpoint of the ischium (1) ' / abrupt_and_proximal 'elongated, gradually tapering',

585 'IS20.   A651/A659/B324. Ischium, ventral margin: continuous ventral margin (0), notch present (1), abrupt change in angle between the proximal end and the shaft (2) ' / continuous notch change_in_angle,

586 'IS16.   A652. Ischium, elongate interischial fenestra: absent (0), present (1) ' / absent present,

587 'IS17.   A663. Ischium, distal end in lateral view: without an expansion (0), expanded, knob-like termination (1) ' / unexpanded 'knob-like termination',

588 'IS19.   A653. Ischium, shape of distal ischium: broad and plate-like, not distinct from obturator region (0), with a discrete rod-like distal shaft (1) ' / plate_like rod_like,

589 'IS21.   A666/A662. Ischium, distal outline of ischium in distal view: plate-like (0), roughly semicircular (1), sub-triangular (2) ' / 'plate-like' semicircular 'sub-triangular',

590 'IS22.   A646. Ischium, pubis contact: extended ventrally (0), reduced to a thin proximal contact (1)' / extended_ventrally reduced_to_a_thin_proximal_contact,

591 'Fe1. A670/A671/A722/B360/A675/A717. Femur, shape in lateral view: gently sigmoid in with the proximal end bowed posteriorly and the distal end bowed anteriorly (0), columnar and straight   (1)'   / gently_sigmoid_in_with_the_proximal_end_bowed_posteriorly_and_the_distal_end_bowed_anteriorly_ columnar_and_straight,

592 'Fe3. A681. Femur, proximal surface, transverse groove: absent (0), present (1)' / absent present,

593 'Fe4. A684. Femur, femoral head, orientation of the long axis of the femoral head compared to the shaft in anterior view and with the distal condyles aligned on a horizontal plane: projects ventromedially (0), projects medially (1), projects dorsomedially (2).' / ventromedially medially dorsomedially,

594 'Fe6. A709. Femur, posteromedial tuber: absent (0), present (1)' / absent present,

595 'Fe8. A711. Femur, posteromedial tuber, position: offset posteriorly relative to the posterior tuber (0), aligned with the posterior tuber (1)' / offset_posteriorly_to_the_posterior_tuber aligned_with_the_posterior_tuber,

596 'Fe9. A686. Femur, femoral neck: absent (0), present (1)' / absent present,

597 'Fe10. A700. Femur, lesser trochanter: present (0), absent (1)' / present absent,

598 'Fe11. A701. Femur, lesser trochanter, shape: rounded tubercle (0), conical (spike-like) (1) rod-shaped (elongate ridge, finger-like) (2), blade shape (3)' / rounded 'spike-like' 'rod-shaped' blade_shape,

599 'Fe12.   A697/B373. Femur, lesser trochanter, level of the most proximal point of the anterior trochanter relative to the level of proximal femoral head: on the femoral shaft (0), on the proximal end (1).' / on_the_femoral_shaft on_the_proximal_end,

600 'Fe13.   A699. Femur, lesser trochanter, position on the femoral shaft in anterior view: on the anterior surface (0), on the lateral margin)1=' / on_the_anterior_surface on_lateral_margin,

601 'Fe14.   A706/A707/A704. Femur, transverse trochanteric shelf: absent (0), present (1)' / absent present,

602 'Fe15.   A714. Femur, facies articularis antitrochanterica: level with the greater trochanter (0), distally descended (1)' / level_with_the_greater_trochanter distally_descended,

603 'Fe16.   B366. Femur, greater trochanter: present (0), absent (1).' / present absent,

604 'Fe17.   A690/A691. Femur, fourth trochanter, shape: mound-like (0), flange (1)' / 'mound-like' flange pendant,

605 'Fe18.   A692. Femur, fourth trochanter, position of the maximum height of the fourth trochanter along the femoral length: closer to the proximal half (0), closer to the midpoint (1)' / the_proximal_half midpoint beyond_the_midpoint,

606 'Fe21.   A696. Femur, fourth trochanter, location along the mediolateral axis: centrally located (0), on the medial margin (1)' / centrally_located on_the_medial_margin,

607 'Fe22.   B381. Femur, fourth trochanter, lateral deflection in distal section: absent (0), present (1).' / absent present,

608 'Fe26.   B386. Femur, lateral condyle, orientation in distal view: laterally (0), medially (1)' / laterally medially,

609 'T1. A727. Tibia, proximal half, fibular flange: absent (0), present (1).' / absent present,

610 'T2. A728/A733. Tibia, cnemial crest: absent (0), present (1).' / absent present,

611 'T3. A729/A730. Tibia, cnemial crest, curvature: anteriorly (0), arcs anterolaterally (1), laterally (2)' / anteriorly arcs_anterolaterally laterally,

612 'T4. A732. Tibia, cnemial crest, position of the tallest point: close to the proximal end of the crest (0), about half-way along the length of the crest, creating an anterodorsally sloping proximal margin of the crest (1)' / close_to_the_proximal_end_of_the_crest 'about half-way along the length of the crest',

613 'T5. A734. Tibia, proximal portion, alignment of the lateral (fibular) condyle relative to the medial condyle in proximal view: offset anteriorly from the medial condyle (0), level with the medial condyle at its posterior border (1), displaced posteriorly (2)' / offset_anteriorly_from_mc level_with_the_mc_at_its_posterior_border displaced_posteriorly,

614 'T6. A736. Tibia, proximal surface, curvature in lateral or medial view: convex (0), concave, the posterior condyles are separated from the cnemial crest by a concave surface (1)' / convex concave,

615 'T7. A737. Tibia, proximal articular surface, shape: ovoid (0), subcircular (1)' / elongated subcircular,

616 'T9. A741. Tibia, distal portion, posterolateral flange: absent (0), present (1)' / absent present,

617 'T10.   A744. Tibia, distal end, shape of the posterior face: rounded surface (0), distinct proximodistally oriented ridge present (1)' / rounded_surface proximodistally_oriented_ridge,

618 'T11.   A745. Tibia, distal end, relationship of the posterolateral process with the fibula: not flaring laterally and not making significant contact with the fibula (0), flaring laterally and backing the fibula (1)' / not_flaring_laterally flaring_laterally,

619 'T12.   A746. Tibia, distal end, distal posterolateral process: exceeds laterally the anterolateral corner of the distal tibia (0), protrudes laterally as far as the anterolateral corner of the distal tibia (1), set well back from the anterolateral corner of the distal tibia (2)' / exceeds_laterally_to_the_anterolateral_corner_of_the_distal_tibia protrudes_laterally_as_far_as_the_AL_corner_of_the_distal_tibia set_well_back_from_the_AL_corner,

620 'T13.   A747. Tibia, distal end, curvature of the posterolateral corner: convex (0), concave (1)' / convex concave,

621 'T14.   A748. Tibia, distal end, shape: anteroposteriorly elongated (0), subquadrangular (1), transversely elongated (2)' / AP_elongated quadrangular transversely_elongated,

622 'T15.   A749. Tibia, distal end medial condyle of the tibia, relationship with the astragalus: extends posteroventrally to cover the astragalus in posterior view (0), is reduced, exposing the posterior fossa of the astragalus in posterior view (1)' / extends_PV_to_cover_the_astragalus_in_posterior_view reduced,

623 'T16.   A751. Tibia, distal tibia, posteromedial notch in with respective bump in the proximal astragalus: absent (0), present (1)' / absent present,

624 'T17.   A753. Tibia, distal portion, lateral surface: smooth (0), longitudinal groove (1)' / smooth longitudinal_groove,

625 'T18.   A755-2. Tibia, distal articular surface, forms an oblique angle with the long axis of the tibia in anterior and posterior views: outer malleolus extends further distally than the inner malleolus creating an oblique between the articular surface and the long axis (0), inner malleolus extends further distally (1)' / outer_malleoli_are_at_the_same_level_than_inner_malleolus inner_malleolus_extends_further_distally,

626 'T19. A754. Tibia, distal anteromedial corner, shape' / rounded_obtuse right_angle acute_angle,

627 'T21. B398. Tibia, proximodistally oriented groove on the distal end: along the middle of the mediolateral axis (0), on the lateral half of the tibia (1).' / along_the_middle_of_the_mediolateral_axis on_the_lateral_half_of_the_tibia,

628 'FI1.A762. Fibula, fibular condyle, position of the posterior end on the proximal articular surface tibia relative to the posterior margin of proximal articular surface: anterior to (0) or level with (1)' / anterior_to levelled,

629 'FI2.C758/A758. Fibula, proximal end, trigonal striated articular crest on medial surface: absent (0), present (1)' / absent present,

630 'FI4.A764. Fibula, fibular trochanter, position: on anterior surface of fibula (0), laterally facing (1), anteriorly facing but with strong lateral bulge (2)' / anterior_surface_of_fibula laterally_facing anteriorly_facing_with_strong_lateral_bulge,

631 'FI5.A765. Fibula, lateral surface, muscle scar trochanter (at mid-length): absent (0), present (1)' / absent present,

632 'FI7.B408. Fibula, distal end, shape: condylar (0) , splint-like (1)' / condylar 'splint-like',

633 'FI8.A761. Fibula, proximal portion, symmetricity in lateral view: symmetrical or nearly symmetrical (0), posterior part expanded posteriorly (1)' / symmetrical posterior_part_expanded_posteriorly,

634 'FI9.A767. Fibula, distal end, symmetricity in lateral view: angled anterodorsally (asymmetrical) (0), rounded or flat (symmetrical)' / angled_anterodorsally symmetrical,

635 'FI10.   A760. Fibula, proximal portion, shape of anterior edge: rounded (0), tapers to a point and arched anteromedially (1)' / rounded tapers_to_a_point_and_arched_anteromedially,

636 'FI11.   A759. Fibula, proximal tibial scar, development: not well-marked (0), well-marked and deepening anteriorly (1)' / 'not well-marked' deepening_anteriorly,

637 'FI12.   A766. Fibula, lateral surface, lateral trochanter: absent (0), present (1).' / absent present,

638 'AS2.   A786. Astragalus, posteromedial margin, shape in dorsal view:' / evenly_rounded_without_a_posteromedial_corner sharp_corner_of_a_quadrangular_astragalus,

639 'AS3.   A787. Astragalus, fibular facet, shape: dorsally facing horizontal shelf forming part of the fibular facet (0), largely vertical fibular facet (1) ' / fibular_facet_is_horizontal fibular_facet_is_sloped,

640 'AS4. A779. Astragalus, ascending process, posterior extent relative to the posterior margin: closer to the anterior margin(0), closer to the posterior margin (1) ' / closer_to_anterior_margin closer_to_posterior_margin central,

641 'AS5.A783. Astragalus, sharp medial margin around the depression posterior to the ascending process: absent (0), present (1)' / absent present,

642 'AS6. A775. Astragalus, ascending process, buttress dividing posterior fossa of astragalus and supporting ascending process: absent (0), present (1).' / absent present,

643 'AS7. A774. Astragalus, ascending process, depression and vascular foramina in front of the base: present (0), absent (1)' / present absent,

644 'AS8. A789. Astragalus, posterior groove: present (0), absent (1)' / present absent,

645 'AS9. A771/A784. Astragalus, ascending process: narrow ridge (0), pyramid-shaped (1).' / narrow_ridge 'pyramid-shaped',

646 'AS10. A784. Astragalus, posteromedial corner, pyramidal dorsal process: absent (0), present (1)' / absent present,

647 'AS12. B419. Astragalus, symmetry in distal view: astragalar body is fairly symmetric, medial and lateral margins are about equal in depth (0), astragalar body is strongly asymmetric, medial margin is deeper than the lateral margin (1). ' / symmetric 'asymmetric, medial deeper than lateral' 'asymmetric, lateral deeper than medial',

648 'AS17. A770. Astragalus, proximal surface: lacks a marked rimmed and elliptical fossa posterior to the anterior ascending process (0), possesses a marked rimmed and elliptical fossa posterior to the anterior ascending process (1)' / smooth fossa_posterior_to_the_anterior_ascending_process,

649 'AS18. A790. Astragalus, posterior margin, curvature: straight, or almost so, in proximal view (0), strongly convex in dorsal view (1)' / straight convex_in_dorsal_view,

650 'AS19. A781. Astragalus, mediolateral surface of distal portion: concave (0), straight (1), convex (2)' / concave straight convex,

651 'AS20.   A788. Astragalus, distal articular surface, curvature: convex (0), ' / convex roller_shaped,

652 'AS21.   A772. Astragalus, ascending process, arising in anterior view: from the medial end of the bone and slopes continuously upwards to its peak at the lateral end of the process (0), abruptly from the centre of the bone and forms a plateau or rounded summit, medial to its lateral edge (1)' / from_the_medial_end_of_the_bone_and_slopes_upwards_to_its_peak abruptly_from_the_centre_of_the_bone_and_forms_a_plateau,

653 'CA1.   A794. Calcaneum, transverse width of the calcaneum' / '> 0.3' '<= 0.3',

654 'CA2.   A795. Calcaneum, lateral surface, fossa: absent (0), present (1)' / absent present,

655 'CA3.   A796. Calcaneum, medial peg fitting into astragalus: present (0), absent (1)' / present absent,

656 'CA4.   A797. Calcaneum, calcaneal tuber: present (0), absent (1)' / present absent,

657 'CA5.   A793. Calcaneum, shape: proximodistally compressed with a short posterior projection and medial process (0), transversely compressed, with the reduction of these projections (1)' / proximodistally_compressed transversely_compressed,

658 'CA6.   A792. Calcaneum, articular surfaces for fibula and distal tarsal 4, continuity: separated by a nonarticular surface (0), continuous (1)' / separated_by_a_non_articular_surface continuous,

659 'DT1. A798/A799.Distal tarsals, ossified: present (0), absent (1) ' / present absent,

660 'DT2. A804. Distal tarsal 4, posterior prong, shape of the tip: rounded (0), pointed (1) (Y329)' / rounded pointed,

661 'DT3. A803. Distal tarsal 4, posteromedial heel, depth relative to the depth of the bone: proximodistally deepest part of the bone (0), no deeper than the rest of the bone (1)' / PD_deepest_part_of_the_bone no_deeper_than_the_rest_of_the_bone,

662 'DT4. B428. Distal tarsal 4, anteroposterior middle part, medial process: absent (0), present (1)' / absent present,

663 'MT30.   A806. Metatarsus, configuration: metatarsals diverging from ankle (0), compact metatarsus, with metatarsals II-IV tightly bunched (at least half of the length) (1)' / diverging_from_ankle compact_metatarsus,

664 'MT29.   B445. Metatarsals fused or partly fused into tarsometatarsus: 0, absent, 1, present.' / absent tarsometatarsus,

665 'MT21.   B433. Longest metatarsal: 0, metatarsal III is the longest, 1, metatarsal IV is the longest. NEW ' / mtIII mt_IV,

666 'MT25.   A808. Metatarsals, midshaft diameters: I and V subequal or greater than II-IV (0), I and V less than II-IV (1) ' / 'I, V >= II, IV' 'I > II, IV' 'V >= II, IV' 'I, V < II, IV',

667 'MT22.   B436. Metatarsal I: 0, subequal or greater in length than metatarsal II, 1, significantly shorter in length than metatarsal II. ' / 'mt I >= mt II' 'mt I < mt II',

668 'MT2.   A812. Metatarsal I, orientation of proximal articular surface: horizontal (0), sloping proximolaterally relative to the long axis of the bone (1) ' / horizontal sloping_proximolaterally,

669 'MT3.   A818. Metatarsal I, distal end, orientation of the transverse axis: horizontal (0), angled proximomedially (1) ' / horizontal angled_proximodistally,

670 'MT32.   A815. Metatarsal I, extension: reaches the proximal surface of metatarsal II (0), does not reach the proximal surface of metatarsal II and attaches onto the medial side of metatarsal II (1) ' / reaches_proximal_surface_of_mt_II not_reaching,

671 'MT34.   A817. Metatarsal I, shaft: closely appressed to metatarsal II throughout its length (0), only closely appressed proximally, with a space between metatarsals I and II distally (1)' / appressed_to_mt_II_through_its_length only_closely_appressed_proximally,

672 'MT18.   A823. Metatarsal II, proximal end: subtriangular or subquadrangular in shape (0), hourglass-shaped (1)' / subpolygonal 'hourglass-shaped' medially_concave laterally_concave,

673 'MT35.   A822. Metatarsal II, lateral extent of ventrolateral flange on plantar surface proximal aspect: neither corner appreciably more developed than the other (0), laterally flaring (1), medially flaring (2)' / neither_corner_appreciably_more_developed laterally_flaring medially_flaring,

674 'A840. Metatarsal II, plantar ventrolateral flange, well-developed facet for articulation with medial distal tarsal' / absent present,

675 'MT37.   A828. Metatarsal III, proximal outline: subtriangular with acute or rounded posterior border (0), subtrapezoidal, with posterior border broadly exposed in plantar view (1) ' / subtriangular subquadrangular,

676 'MT24.   A830. Metatarsal IV, length: longer than metatarsal II (0), subequal or shorter than to metatarsal II (1) ' / 'mt IV > mt II' 'mt IV <= mt II',

677 'MT38.   A834. Metatarsal IV, angle formed by the anterior and anteromedial borders of metatarsal IV: obtuse (0), right angle, or acute (1) ' / obtuse right_or_acute,

678 'MT26.   A831. Metatarsal IV, proximal portion, elongated lateral expansion that overlaps the anterior surface of metatarsal V: absent (0), present (1) ' / absent present,

679 'MT28.   B441. Metatarsal V: 0, present, 1, absent. ' / present absent,

680 'MT19.   A843. Metatarsal V, shape: proximal and distal ends subequal in breadth (0), triangular shaped, with wide proximal surface and pointed distal end (1)' / 'prox = distal ends' triangular_shape,

681 'A840. Metatarsal V, phalanges: absent (0), present (1) ' / absent present,

682 'PD20.   A854. Pedal digit I, ungual relative to the pedal ungual II: less than 1.0 (0), equal to or more than (1) ',

683 'PD13.   A862. Pedal digit V, phalanges' / 3 2 1,

684 'PD2.   A844/A845. Pedal phalanges, non-terminal pedal phalanges, length relative to width: all longer than wide (0), proximal-most phalanges longer than wide, more distal phalanges are as wide as long (1), all non-terminal phalanges as wide, if not wider, than long (2). ' / all_longer_than_wide 'proximal-most longer than wide, more distals as wide as long' 'all non-terminal phallanges are wide or wider than long',

685 'PD23.   B446. Pedal digit 1: 0, metatarsal I robust and well-developed, distal end of phalanx 1-1 projects beyond the distal end of metatarsal II, 1, metatarsal I reduced, end of phalanx 1-1 does not extend much beyond the end of metatarsal II if at all, 2, metatarsal I reduced to a vestigial splint or

absent, does not bear digits ' / 'mt I robust, 1.1 projects beyond distal end of mt II' 'mt I reduced, 1.1 does not extende beyond mt II if at all' mt_I_reduced_to_a_vestigial_splint,

686 'PD4.   A851. Pedal digit I, ungual, length relative to all non-terminal phalanges: less than at least some non-terminal phalanges (0), longer than the mt I (1) ' / 'less than at least some non-terminal phalanges' longer_than,

687 'PD5.   A850. Pedal digit I, ungual, shape: shallow, pointed, with convex sides and a broad ventral surface (0), deep, abruptly tapering, with flattened sides and a narrow ventral surface (1)' / 'shallow, pointed, convex sides and broad ventral surface' deep_abruptly_tapering,

688 'PD14.   A852. Pedal digit I, ungual, length relative to the other pedal unguals: shorter than other pedal unguals (0), subequal than other pedal unguals (1), longer than other pedal unguals (2) ' / shorter_than_other_pedal_unguals longer_than_the_other_pedal_unguals,

689 'PD7.   A856. Pedal digits II-III, penultimate phalanges, development: well developed (0), reduced disc-shaped elements if they are ossified at all (1) ' / 'well-developed' 'reduced to disc-shaped elements if they are ossified',

690 'PD8.   A857. Pedal digits II-III, unguals, shape: dorsoventrally deep with a proximal articulating surface that is at least as deep as it is wide (0), dorsoventrally flattened with a proximal articulating surface that is wider than deep (1) ' / DV_deep_with_a_proximal_articulating_surface_that_is_at_least_as_deep_as_it_is_wide DV_flattened,

691 'PD10.   A861. Pedal digit III, ungual, size relative to the ungual pedal digit II in all linear dimensions' / '>= 85%' '< 85%',

692 'PD11.   A862. Pedal digit IV, phalanges,' / '2-3' 4 5,

693 'PD12.   A864. Pedal digit V, phalanges: present (0), absent (1) ' / present absent,

694 'PD1.   A865. Pedal digit V, rudimentary: not weight-bearing (0), weight-bearing (1) ' / 'not weight-bearing' 'weight-bearing',

695 'PD18.   A853. Pedal digit I, ungual, length relative to the length of the phalanx I.1 and metatarsal I: less than phI.1 and mtI (0), greater than phI.1 but less than mtI (1), greater than both (2' / 'upd I < ph I.1, mt I' 'mtI < upd I < phI.1' 'upd I > phI.1, mtI',

696 'PD21.   A863. Pedal digit IV, ungual, development: subequal in size to unguals of pedal digits II and III (0), rudimentary ' / subequal_in_size_to_unguals_in_II_and_III rudimentary,

697 'PD25.   A847. Pedal unguals, compression: weakly mediolaterally compressed, (0), dorsoventrally compressed (1) ' / mediolaterally_compressed dorsoventrally_compressed 'strongly mediolaterally compressed, with',

698 'PD6.   A848. Pedal unguals, proximal articular, shape: proximally facing, visible on medial and lateral sides (0), proximomedially facing and visible only in medial view, causing medial deflection of pedal unguals in articulation (1) ' / proximally_facing visible_only_in_medial_view,

699 'V5. A273-5. Middle caudal vertebrae, number',

700 'V6. A273-6. Posterior caudal vertebrae, number',

701 'MT12.   A809. Metatarsals, area of proximal ends of metatarsals I and V relative to the areas of metatarsals II and IV',

702 'MT1.   A810. Metatarsal I, proximal width of the first metatarsal',

703 'MT11.   A816. Metatarsal I, length relative to its width',

704 'MT16.   A813. Metatarsal I, width of the midshaft relative to the width of the midshaft of the metatarsals II-IV',

650

705 'MT17.   A814. Metatarsal I, transverse width relative to that of metatarsal II',

706 'MT23.   A811. Metatarsal I, maximum proximal breadth relative to its distal breadth',

707 'MT13.   A821. Metatarsal II, length relative to its proximal width',

708 'MT14.   A825. Metatarsal III, length relative to its proximal width',

709 'MT8.   A832. Metatarsal IV, transverse width relative to the anteroposterior depth of the proximal end',

710 'MT9.   A839. Metatarsal V, transverse width of the proximal end of the metatarsal V relative to its length',

711 'MT15.   B444. Metatarsal V, length relative to the length of Metatarsal III' / longer_or_equal shorter,

712 'MT20.   A842. Metatarsal V, length relative to metatarsal IV: less than 0.7 (0), equal or more than 0.7 (1) ',

713 'PD17.   A846. Pedal phalanges, at least some pedal phalanges apart from unguals, proximodistal length compared to their transverse width',

714 'PD15.   A855. Pedal digit I, ungual, length relative to that of metatarsal I',

715 'PD16.   A860. Pedal digit III, ungual, length relative to the length of ungual on pedal digit II',

716 'PD9.   A859. Pedal digit II, ungual, length relative to the length of the ungual of pedal digit I',

717 'PD19.   A858. Pedal digit II, ungual, length relative to the length of pedal phalanx II-2',

718 'PD22.   B451. Unguals of digits II-IV: 0, deeper than broad, with curved ventral surfaces, 1, broader than deep, with flat plantar surfaces. ' / 'deeper than broad, with curved ventral curves' 'broader than deep, flat plantar surfaces',

719 'PU2.   A623. Pubis, length relative to the femoral length',

720 'PU3.   A622. Pubis, width of the conjoined pubes relative to their length',

721 'PU9.   A627-2. Pubis, pubic obturator foramen, diameter relative to the acetabulum diameter',

722 '0-CR1. A8. Skull, premaxillary-maxillary index (PMI) ' / 'x < 0.1' '0.1 <= x < 2.4' '2.4 <= x < 35' 'x >= 35',

723 '0-CR2. A8-2. Skull, premaxilla divergence angle (PMDA) ' / 'x < 10' '10 <= x < 35' '35 <= x < 42' 'x >= 45',

724 '0-CR3. A3/B3. Skull, length (from the tip of the maxilla to the base of quadratojugal) relative to the femoral length ' / 'x < 0.7' 'x >= 0.7',

725 '0-CR4. A6. Skull, height of the rostrum at the posterior margin of the naris relative to the height of the skull at the middle of the orbit ' / 'x < 0.06' '0.06 <= x < 0.19' 'x >= 0.19',

726 '0-CR5. A129. Infratemporal fenestra, proportion of infratemporal fenestra bordered by squamosal relative to the depth of the infratemporal fenestra: more than 0.5 (0), less than, or equal to 0.5 (1) (Y62).' / 'x < 0.24' '0.24 <= x < 0.85' 'x >= 0.85',

727 '0-CR9.   A138. Supratemporal region, anteroposterior length of temporal bar relative to its transverse width ',

728 '1-PMX2.   A10. Premaxilla, anterior margin of premaxilla in lateral view, angle relative to buccal margin ' / 'x < 30' '30 <= x < 42' 'x >= 42',

729 '1-PMX6.   A13. Premaxilla, main body, anteroposterior length relative to the dorsoventral length ' / ' x < 1.03' '1.03 >= x < 1.52' 'x >= 1.52',

730 '1-PMX12.   B8. Premaxilla, posterodorsal process, lateromedial width relative to its anteroposterior length' / 'x < 0.45' '0.45 >= x < 1.15' 'x >= 1.15',

731 '2-EN1. A74. External nares, maximum diameter relative to the orbital maximum anteroposterior axis length',

732 '3-AOF2.   A56. Antorbital fenestra, length between the posterior margin of the maxillary dorsal process to the posterior margin of the antorbital fenestra or fossa relative to the maximum anteroposterior length of the orbit ' / 'x <= 1.5' 'x > 1.5',

733 '4-MX14.   A34. Maxilla, length of the maxilla relative to its maximum dorsoventral depth before the base of the ascending process' / 'x <= 0.1' 'x > 0.1',

734 'L1. A84. Lacrimal, dorsoventral length relative to the width at its mid-height ' / 'x < 2.05' '2.05 > x < 3.5' '3.5 > x < 4' '4 > x < 4.71' '4.71 > x < 7.1' '7.1 > x < 10' 'x > 10',

735 'L8. A86. Lacrimal, length of the anterior dorsomedial projection of the lacrimal relative to the length of the ventral projection ' / 'x < 0.18' '0.18 >= x < 0.32' '0.32 >= x < 1.33' 'x > 1.33',

736 'PrF1.   A97. Prefrontal, dorsal anteroposterior length relative to the dorsal anteroposterior length of frontal ' / 'x < 0.39' '0.39 >= x < 0.79' '0.79 >= x < 0.95' 'x >= 0.95',

737 'PrF3.   A98. Prefrontal, maximum transverse width of the prefrontal relative to the skull transverse width at that level ' / 'x < 0.25' 'x > 0.25',

738 'PrF4.   A99. Prefrontal, ventral process, height relative to the lacrimal height ' / 'x < 0.11' '0.11 > x < 0.19' '0.19 > x < 0.53' 'x > 0.53',

739 'PO1.   A114. Postorbital, height of the postorbital part of the posterior orbital margin relative to the height of the posterior lateral process ',

740 'PO5.   A113. Postorbital, ventral process, transverse width relative to its anteroposterior width at midshaft ',

741 'SQ1.   A150. Squamosal, ventral process, length relative to the width at its base ',

742 'Q7. A158. Quadrate, proportion of the length of the quadrate that corresponds to the articulation with the pterygoid wing ',

743 'QJ3.   A124. Quadratojugal, length of the dorsal projection of the quadratojugal relative to the anterior projection ',

744 'H7. B253. Humerus, deltopectoral crest, location of the apex along the humeral length',

745 'H9. A487. Humerus, deltopectoral crest, orientation of the longitudinal axis relative to the transverse axis of the distal condyles',

746 'R4. A509. Radius, distal breadth relative to midshaft breadth',

747 'U6. A504. Ulna, proximal end, anterior condylar process, length relative to the lateral condylar process',

748 'MC15.   A539. Metacarpal II, length relative to that of metacarpal III',

749 'MC21.   A543. Metacarpal IV-V, sum of the shaft width relative to that of metacarpals I-III',

750 'MC25.   A549. Metacarpal V, length relative to the length of metacarpal III' / lateral set_at_the_palmar_surfaces,

751 'MD1.   A556. Manual digit I, length relative to the length of manual digit II',

752 'MD4.   A554. Manual digit I, phalanx I.1, length relative to that of metacarpal I',

753 'MD7.   A564. Manual digit I, length of the penultimate phalanx of manual digit I relative to the length of the metacarpal II',

754 'MD9.   A565. Manual digit III, length of the penultimate phalanx relative to the length of metacarpal III',

755 'MD18.   A568. Manual digit II, phalanx II.2, length respective to that of phalanx II.1, indicating the elongation of the penultimate phalanges in the manus',

756 'MD20.   A563/A559. Manual digit I, phalanx I.1, proximodistal length relative to its width',

757 'I8. A580. Ilium, preacetabular process, offset of the vertical curve of the anterior margin ',

758 'Fe2. A672/A685. Femur, angle between the long axis of the femoral head and the transverse axis of the distal femur in distal view',

759 'Fe7. A710. Femur, posterior tuberosity, lateromedial length, measured from the medial-most point to the lowest point of the sulcus for ligamentum captis femoris, relative to the maximum lateromedial length of the proximal end of the femur in proximal view',

760 'Fe19. Femur, fourth trochanter, distal margin, angle to the shaft',

761 'Fe 20. A693. Femur, fourth trochanter',

762 'Fe23.   A718/A719. Femur, mid-shaft, mediolateral length relative to the anteroposterior length',

763 'Fe24.   A712. Femur, basal width of the medial condyle relative to the sum of the basal widths of the tibiofibular and lateral condyles',

764 'Fe25.   A724. Femur, distal surface of tibiofibular condyle, anteroposterior depth relative to the mediolateral depth.',

765 'FI3.A763. Fibula, transverse width of the midshaft of the fibula relative of the transverse width of the midshaft of the tibia',

766 'FI6.A768. Fibula, distal condyle, breadth relative to mid-shaft breadth',

767 'AS1.   A777. Astragalus, depth of the medial end of the astragalar body in anterior view' / 'x<1' 'x>=1',

768 'MT7.   A829. Metatarsals III and IV, minimum transverse shaft diameters relative to the minimum transverse shaft diameter of the metatarsal II',

769 'MT10.   A833. Metatarsal IV, transverse width of distal articular surface of in distal view relative to the anteroposterior depth',

770 'PB10. B102. Parabasisphenoid, laterally positioned foramina for entrance of cerebral branches of internal carotid artery into the braincase: located anteriorly (0), located posteriorly (1)' / anteriorly posteriorly,

771 'MA2.   B133. Mandible, maximum depth relative to the dorsoventral height beneath the posteriormost part of the dentary tooth row' / 'x < 0.64' '0.64 >= x < 2.12' 'x 0>= 2.12',

772 'MA4. A201. Mandible, mandibular fenestra, anteroposterior length relative to the length of the mandible: less than 0.05 (0), equal to or more than 0.05 (1) (Y96).' / 'x < 0.01' '0.01 >= x < 0.3' 'x >= 0.3',

773 'D2. A207. Dentary, maximum height in the posterior half, relative to the maximum anteroposterior length of the dentary' / '< 0.11' '0.11 >= x < 0.36' 'x > 0.36',

774 'D10. A217. Dentary, coronoid process, length relative to depth of the dentary at mid length' / 'x < 0.022' '0.022 >= x < 0.09' 'x >= 0.09',

775 'SA1. A225. Surangular-articular, retroarticular process, length relative the depth of the mandible below the glenoid' / 'x < 0.41' '0.41 >= x < 2.18' 'x > 2.18',

776 'V1. A273. Cervical vertebrae, number: eight or fewer (0), 9 (1), 10 (2), 11 (3), 12 (4), 13 (5), > 13 (6) Ordered (U2007+Y2010+P2011)* (Y121) £' / '<9' 9 10 11 12 13 '> 13',

777 'V2. A273-2. Dorsal vertebrae, number' / 10 11 12 13 14 15 16,

778 'V3. A420. Sacral vertebrae, number.' / 2 3 4 5 6,

779 'V4. A273-4. Anterior caudal vertebrae, number' / '>20' '17-20' '14-16',

780 'SAC7. A423. Sacral vertebrae, primordial sacral vertebrae, depth of the iliac articular surface relative to the depth of the ilium' / '< 0.75' '>= 0.75',

781 'PU11.   B335. Pubis, pubic plate, length relative to the pubic shaft' / '< 0.4' '>= 0.4',

782 'PU18.   A639. Pubis, pubic apron, minimum transverse width relative to the width across the iliac peduncles of the ilium' / '< 0.4' '>= 0.4',

783 'PU21.   A641/A635/B350. Pubis, anteroposterior expansion of the distal pubis relative to the length of the pubis' / '> 2.0' '<= 2.0',

784 'IS1.A648/A624. Ischium, length of ischial blade relative to that of the pubis' / '< 1.0' '>= 1.0',

785 'IS2.B326. Ischium length: 0, about the same length or shorter than the dorsal margin of iliac blade, 1, longer than the dorsal margin of iliac blade ' / '< 1.0' '>= 1.0',

786 'IS9.A654. Ischium, ischial shaft, depth of the transverse section relative to the transverse width of the section' / '< 1.0' '=> 1.0',

787 'IS11.   A658. Ischium, antitrochanter, anteroposterior length relative to adjacent length of the articular surface for the ilium' / '> 1.0' '< 1.0',

788 'IS18.   A665. Ischium, distal end, maximum thickness relative to the minimum thickness' / '< 3.0' '>= 3.0',

789 'PD3.   A849. Pedal digit I, length of the first phalanx of pedal digit one relative to the length of the ungual of pedal digit one: greater than 1.0 (0), less than 1.0 (1) ' / '>= 1.0' '< 1.0',

790 'MT33.   A807. Metatarsus, length of longest metatarsal relative to tibial length' / '> 0.4' '0.4 <= x > 0.25' '<= 0.25',

791 'CO6. A472. Coracoid, eccentricity' / 'e < 0.33' '0.33 >= e < 0.56' 'e >= 0.56',

792 'SC2.   A457. Scapula, minimum anteroposterior length relative to its dorsoventral length' / 'x < 0.2' 'x => 0.2',

793 'SC7.   A467. Scapula, scapular blade, minimal anteroposterior breadth relative to its dorsal margin ' / 'x < 0.29' '0.29 >= x < 0.36' '0.36 >= x < 0.49' '0.49 >= x <0.68' '0.68 >= x <0.77' 'x >= 0.77',

794 'SC14.   D460-3. Scapula, scapular fossa, area that the fossa occupies in the scapular head' / 'x < 0.54' 'x >= 0.54',

795 'H1. A480. Humerus, length relative to the length of the femur' / 'x =< 0.2' '0.2 > x < 0.3' 'x >= 0.3',

796 'H2. A497. Humerus, humeral distal width relative to the length of the humerus' / 'x <= 0.2' '0.2 > x < 0.45' 'x > = 0.45',

797 'H13.   A485. Humerus, deltopectoral crest, extension relative to the humeral length from its proximal end' / 'x <= 0.35' 'x > 0.35',

798 'R1. A505. Radius, length relative to the length of the humerus' / 'x < 0.33' 'x >= 0.33',

799 'MC5.   A531. Metacarpal I, minimum transverse shaft width relative to the minimum transverse shaft width of metacarpal II' / 'x < 0.69' '0.69 >= x < 0.83' '0.83 >= x <2.23' 'x >= 2.23',

800 'MC7.   A526. Metacarpal I, proximal width of the first metacarpal relative to its length:' / 'x <= 0.65' '0.65 > x < 0.8' 'x >= 0.8',

801 'MC24.   A546. Metacarpal V, length relative to its width at the proximal end' / 'x < 0.64' '0.64 > x < 1.86' 'x > 1.86',

802 'MD12.   A566. Manual digit II, length of the ungual of manual digit II relative to the ungual of digit I' / 'x < 1.1' 'x >= 1.1',

803 'MD14.   A571-1. Manual digit II, number of phalanges' / 2 3 4 1,

804 'MD15.   A571-2. Manual digit III, number of phalanges' / 2 3 4 1,

805 'MD16.   A573/B289-1. Manual digit IV, number of phalanges' / 1 2 3 4 5,

806 'MD17.   A573/B289-2. Manual digit V, number of phalanges' / 1 2 3,

807 'I9. A581. Ilium, preacetabular process, depth relative to the depth of the ilium above the acetabulum ' / 'x < 0.3' '0.3 >= x < 0.71' '0.7 >= x < 0.851' 'x >= 0.85',

808 'I10. A582. Ilium, preacetabular process, length relative to its depth ' / 'x < 2' 'x >= 2',

809 'I19. A603. Ilium, pubic peduncle, length of the pubic peduncle relative to the anteroposterior width of its distal end ' / 'x < 0.88' '0.88 >= x < 1.29' '1.29 >= x < 1.71' '1.71 >= x < 3' '3 >= x < 4' 'x >= 4',

810 'Fe5. A689. Femur, lateromedial length of the posterior tuberosity measured from the lowest points of the sulcus for ligamentum captis femoris and the facies antitrochanterica relative to the maximum lateromedial length of the proximal end of the femur in proximal view.',

811 'T20. A725. Tibia, length of the tibia relative to the length of the femur' / 'x < 0.9' '0.9 >= x < 1.2' 'x >= 1.2',

812 'AS11. A780. Astragalus, shape of the ascending process of the astragalus, anteriorposterior depth relative to its transverse depth' / 'x<1' 'x>=1',

813 'AS14. A778. Astragalus, proximal articular facet for fibula, relative occupation of the transverse width' / 'x>0.3' 'x<=0.3',

814 'AS15. A782. Astragalus, medial condyle anteroposterior depth relative to the depth of the lateral condyle' / 'x<0.6' '0.6=>x<0.8' '0.8>=x<1.7' 'x>1.7',

815 'AS16. A776. Astragalus, anterior ascending flange (anterior process), height relative to the dorsoventral height of the posterior side of the astragalus' / 'x<0.33' '0.33>=x<0.42' '0.42>=x<0.64' 'x=>0.64' ;

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Panguraptor   0-????????????????????????11??????00?0110111??0000--???0001000120??010?0-
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Coelophysis 0-00020011000101-12?0---
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Zupaysaurus 0-?10?????????????????????????????00?011010???001???0??0010100120??211?0-
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Ceratosaurus 0-010200101000011110101101000 1?0111-
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    Herrerasaurus   0-01020010100000002010000101000000-010001010000--00--0110000??01001001000-11101001101101000110120000??0000000000?1?0?0000010010?00?00??????10100???0??0000110?100110100?00000?0-0010000000103020???00000000010000-000000500020000-00000100010000001110001000000000??0000100010110010110??011??0000??0001?0??10111110??00???????????000?10?00000??01????0?????0?0?10?0??0?0?0?1????????000???0?1?????0?10???????100???0?1????????0?0-?1???00000000000010000010010001O?11??0000?00110??0??110000110101112011O?010000-00010010000100100100011001110110??????0-1100100101?2000001011110020011000101100001011000012001210101110200110100001000100010001010100001100100000010110100?011??0111???310100000010101102000000000010000???0??1111?1??001000?100000?04?211120201201031011?2

    Tawa   0-?1010011000101-12?1--1110?11001000?11101?1??--10--???11?1?00120??01?10-11010001000001001??001000?00000??????????0???????100101?-?????1?00???0???01001???0001001?00?00000??00???0000?0201???00000000010000-000000300000000-00000100110000??????1???000000???00??0?0?100011101???????1?011?0001????0?111000??????????????????0?1?????????????????????0???-???????0????0?????0???0??00?11???00??0?1?????????10101111001211001100??????11?????001?011010000100?000-0?????1?0-0001111101?200?0?10211010001-10-000001100010?01000???????010101020101010?-0010?10?00???????1?01???0111???10?1??101?10???????0101???310?01????1?0010?-0?????0?02?10000???011121??0????0???0??0?021????????121-?????????

    Dilophosaurus   00?????01010010111210-100112?10010???10001????0010--0??00?00?0120??210?0-1011010111011-100??10?000?101?000000?????????????0?10?????????10100??0-???10001011001000?00?0?000100-11??0000103000??00000000010000-000000300020000-00000100110000??1??001000011011111110100102111111111100101010001110001?011?1?????00?110?00??0001100100000?0011111?000101011000011021101101101001000000011100000001111101100000111110100-2001?????????0????0????1??10??????0??01??????????10??01111101110-100012120011100????10100000101?010011000100111--0???????0-1100111121-20101?102111110-01-11-1---01100110?010100101101011?1010201110101001120100110102000?0?100-00101001011000110112000?????00011?1?21101?0000?00??0?-01000??02101000??-????????????????????1110?1????00?1?111000?????????-?120-103??????

    Eoraptor   0-0100001100000000001000011?00100-0000000100000011000??10000001001011001110100001010100100110110000??0000000?????0?0??0?1?01??????????????????0??????1?00?11??00101100100000?001-00??0000003000??00110000010(0   1)1(0   2)00010005??03120(0   2)-0?????????????1????0????00000000100010002001100??110110111??100?1?0001?0??0011101000102????????????0000100?---??0001100000000?011??0??1?0001?????0?00?--?0000000???01????00?00?--?0000000????????10?1???0??0??0001?1?0001?01?0?00?????0?00?0010-

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Efraasia   ???00??010000001-0001110011??1101111110000????--0100?--
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Bagualosaurus
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Nyasasaurus
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Gyposaurus_sinensis
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Asylosaurus
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Lamplughsaura   0-???00?10000?????0?????10??1????001??00101??01?0--
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Aardonyx   0000020110101001?000111001??00001000110011 0000--0100????????0??????11?0-
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Chromogisaurus
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Yunnanosaurus_robustus
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Melanorosaurus 0-00020010001001-
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Tazoudasaurus
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Yimenosaurus 00?002011110?101-0200---00-101001010?10010?000--
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Yunnanosaurus_youngi
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Pampadromaeus   00?00???10000101-1000??-01??0110100001000100?01000--
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Yizhousaurus   0000000110111001-00011101101?0100011?1000101001000--
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Jingshanosaurus   ???00000?????0?1-
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01001100100001 0?2110012010010?01010100 01??10?00110000 1001110?101?0?2???????010000?10?1??
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Ledumahadi   ??????????????????????????????????-
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Lessemsaurus
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Glacialisaurus
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Xixiposaurus   ?1?0000?0-
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Sarahsaurus   0?0102010-000001?000100000-??1101000010001?0?00101110??01-01?00-
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2110110100011221011000110010100000000010110000?1110110101100000 1110111100021-
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Riojasaurus   0000000?11001001?0001?1101??0110100?010001?0?0--
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Lufengosaurus
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Coloradisaurus   ??00000010001001-001???0111010?10000010010010--
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Yunnanosaurus_huangi   0001000110001001-00?0-?-111101001-
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Leyesaurus   100002001101000?-
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Massospondylus_carinatus   000000000-011001-0011111011?010010000100110000--
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Adeopapposaurus   0101020010110001?0001111111201?010000110100010--
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0000?1000001-0011???01011000-
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0100000000000-01011001?010110110010001000010- 01101111101 1001100001000-000110010-
10000011110--0000-110000110200110-1101011010001011000001001100101101000111000100-
20110?1???1???11?00(0   1)0?10??010000101000??? 1000?00010100010-
101011111111 22000110002001101000001011110000011011111111??????101111110001-
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1110?1001100010?011001101111110??10211010100000110000110 10001112?00010100100 1000011110
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Eucnemesaurus_entaxonis

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10001111001100021201011110000 0?1100000???0010???????????????????201-0000110211111001-

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Macrocollum   0001100?10000011-
00011100101?1101001?1010101001101010??0100010120??110?0-
00100011001100002100000000?210001300?01?1000110101-
??010300???100110011101121100000610 0
01002100110111??11000???????????????????????0??1??
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?????0??0?1?????????21101111000121????????01001010000
0?0??1??0?1001?01??????????????11?10?100101?20000010100100?01-
110000?01?00?10?21100?00?1?10?110002010101000001000001101020001 2??00?0?????110100?0???01
0??????011?????101?13000?0??????0?000000100100??
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Sellosaurus
00?????100000011000101111???110100111?00101100101 11?????????0120??11?00-
111??0?1???1???0-
1????0?11??????????0000?04?0???100110011101121100000610001002100110111??11000????0???????
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?01?00????????????00?0?00??0???0?????????????????????00011??00?00??0???0?????0?????0??1??
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?????1?0?0?0??010??1??1000001010?0???0000?0??????11110?????????????1?0011?0?10-
010???00????????????????????????????????????11-300101001111111001-
0100001001000 10?11000000110100111100100101 0000 0100??0??01?20?1??????????????1??????????0???
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Jaklapallisaurus
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Plateosaurus   000012011000000110001010011201101 00101 00111010--
01111??10111001000001000?111000010011010021100 2100?200101300??1010000011000011 1000?0001
010000000?01000001101000?0101100110010110111 0000104111??1001100111011211000006100010021
00110111??11000101010010000001101110 00-1-0010011110111111 00100010-0010-
00101111111110000000000011000010110-0010001111100000001100000112 10110-

674

1111111000000000000001101111111100000111001100-2100??1???110010100(0 1)01111?0000001010001?00000?002101011110111011110101?10001100010-0101001001001100001000100101010111?????101100100011-20010100111101000-01000010010001012110000011010111110000010110001000000101020010201000011100010000011011100000?10?0110???1101012000?01011?200101000100100???1111212510000-01100102011211?2110122110?101???

Nambalia

???1??1000010-?000100?1???000?0??21???0?000???????????????????????????1??????00210010??0000????????0101?????????????0100?0?10????01111111????1000101002?000010?1?200?01???1010100???1??0?????????????12???????1??
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Massospondylus_kaalae

???????00-01100??0010-1-011?010010000100010000--00--1?????0000100??010?0-0010???10?01?????10???????200?0?30???????0????????????????-01???????010?011????????000-10011?0?000??0-10???00010300111100110000100121 1-?000511?200021001101111011000??

Sefapanasaurus

???0-00001001?????????????0001010?1?????????????????????????????0??1???000???0?????????????????0???????0???????????00????0?????????????????00????0?????????10????0?????????????????100??1?10????
?1????0??????0010-11?0110100????1001????212110111110???11001100011?????1?1??0?1?111111???01110020000????0100??0?????????????00?0?????110111?0??100?00011000???10???????1?0??0100????????????0???0??????????????????????2???????2211?????????????

Pradhania

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Seitaad

??10??10?0?????010????0??0?0?0????0???0????0?011??11??0?1?????1010??????1?11???0?0?????0011???10101111010101??0-

1012020011000?1?110?0000?101110001101101?100101??????100?0110?0??????????????????0????????
???01000011010101 10???????????01010?110?10?00?????0?1
?100?1?101?1??1010??0?210000012??2000??
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Ammosaurus
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Ignavusaurus
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?0????????0????0??0?1??00?1?10?0???0?0??????????????????????01112???0000211010100000????0
?????0??????1???10101??????????01?2000000011110????????????????????????????????1????002100
1??00?0?1??????1010110111??????????110100??1????0?0111??011?10???????1????010???????????????
??41?????????????
???2???????????103??1?2?

Mussaurus   00?002000-001001??100-??00-1?1001000?0011101----00--0?????000??????????0-
101000111010????2??01?000?0-011110???????0???????????0???????????????????????????000-
10????0?10???0-10???0001030011110011000010012 11-
0000?????10021001101011??????????????????????????0-
010??00??0110000000010?0???0?0?0?????111???0?????????????????????1??????????????????????????
???11?1?????????0?????01????????????????
???0?????????????-21101110-01121100101001100101 1111?10011010000000111011011?????0-
111110?01????0???10201100001-
1100?1001000010?211?002011210011000 10111????0?????????2?????????00?0?????110101?1??01001
??0???0???1003101111100111010 1-1010100121-
0100???111-
1??2???????10010?03?0111221?1??0??4?01???

Anchisaurus   110000000-00000??0??1011011??1?01000?10001001?--
0100?????????01201?011?0-111??00110 11???02??01?????0-00111??????100????00?1001???-
01???10110010001110???1??000-1?0??00010?0-010010000110??01???00110???????2?1-
0000??031002?0?110??1???????1???100100000000?0?000??0101100010111?1?11??00??1000?????10?
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00101??100011000011010210111100000100?010001010000011011?????00-
1111100001?300010??201100001-
1110?010010000????????????????0?0100010101010100010000010010 21010??00?00100001?0???01010020
1????1?0?1?100310111????1010?00-
000010002100100????????????1??????1??0??01?1-
1?51???1-?????1000?121100?0?12?11031??12?

Xingxiulong   0-00000?????????????????0???????????01??1?01???????????????????1??0121??01000-
111?000110100100???0?1000?11000020???????????????????100001???????101????00??1???010???00-

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00??????????????11??01????10????????0??0001????2?1-
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0000100110100000000010011000001?0??1??0??????????????????????01110??001???0????????????1?1??0
??1???????????????01????0???????????????01????0???????0?10????0????0???????1???100011010
0??????0??0????????????21101??0-
1111110011000210100100000?0??0??010?10?10??????????????????????01-
20000110201101?0??0?1000?01????0??1?0001011??0021111001011100?001000?0??1?0??????00?0??
???110?0??0?????0???????00??10011010131000??0111211001001100100000??????????????????????????
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Nebulasaurus
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Isanosaurus
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100???0??10???????????????????????0????????????????
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Omeisaurus   011??0010-001001-0??1011011?01111101110?000001--01110??0000?01--10-(1
2)1110-1111010101?11-?1212112011-21001100001??110??1?????1010???-?????01100??0-??001010-
??100-101??00000???1-
??000112103011???101110??11??211?0011???100??????1?0?1?10????00??1??10011100001100 0110??0
1121?011111111??110?1?1000?1???01110010110??????????0-
100110?1111???11???1?11??2?111??0??0???111????????111?11??1?????1111??????? 111?11??1????????
??110????0?1?0??11?1?01??1111001111?0???0?1??11011??10011000010-0-?00-
2210000101121101100001110011000010 0??01011??????? 0-1110100021-21201000200000111-10-
100001100010?2011000001111011101---01-
?10010111??1??02??1?1???01?1????11010?11??0?????????????????10001110?2???1010???22111 1110?001
2001???11121?? ?2??1?1?0011
2????21112???0010?????1???

Cetiosaurus
??0??????????????????????????????????? ???????????
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?01101?111111111??111?1?101??0????1111111000?????????? ??110?1??00?????1?????? ??????????1??1??0
?????1???????00?????????????1????????1?????????????????11(0
1)????????????????????????1?001110?0???0??0?0??11??00010?111110100112221010010 2101?01??000?1
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212011??201100?????????????????????? ???????????1????1001001-
?11000111?????02?1??????01?? ?????????
?? ?502?????0?0????????
2?????????????102??????

Patagosaurus   ?????????-
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??1??1????00???????????112?0????????????? ??????
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?01110111010????????????110?10?0?11????1?????11??2?0?1??1?0???0?1???????0?1?11? ???????0?1??
??????1?1?11????????????110????0?1??0??1?1??1??01?100??10?0???0???0?????00111211110-
100?????1010110210110100000???????????????? ??????000??1??????????21-21201000201100111-
111000001101-10?2100000011111010?11---
011111000101??0??0??21?1???0????????????????????????011111????????????????????????????? ???????
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?0?12????????????031?????

Vulcanodon
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011000101100010121110000012 11100-
103010101110?0101??0??0??2??1??001?10??0001101001001111 1?????? 1--
?10001?0012200?0101???1?111?11?01?001??? ???????
??????????????0???????????22?1101?00111????2??????????0?????1122

Mamenchisaurus   111??00011101?01-020101101010100111-1001100001--11000??0000001-
-10-21010-0101011110010111212 11?????210?1120001?????????????1000???-
?????11110???0??00???1011????101???00??0-0-??10?112?03011---10--1011100-211000115--
000012111110-------110??1?10?10001000000000001111-001111?111111 11000 1100 11100?111-
0011101111000000011110-1011100101111010111110000110111 101101210110-
111101101000100001100111110110110100010000111102 0110?????0????0???11??1??111101011110???

011??1?0????101100??110-
1000122210000002121101?????111?011000000000011111?????????????0???21-
11201100201100?100010001?11000010?2010002011111?2110000101-
?100?0101??1??0???1????????1??????111?11??0????1???????1--
?10001010?????1010???22111110??012001??
??????????????01101622?1?1?1?000121??10???2??????30???1?2?

Shunosaurus   0?00010110101011--201011-10101101110111000 0100--011100201-00000?0??2-
????0-010000011101101101010 1020-0001011?01?1101110?0??01100101000??10110010-01?01000-
?1100-101??00000?1101??100112103010???100010??????211?0011???010??????1?0?-
?00???????00??011100000000???00??01121?011111111??110?1?1001?0???01110011000??????????0-
000111?10111??01???1?11??2?111??0??0???111????????101111??0?????1111??????101111??0????????
0?100????0?0?0??0000?01??111100011110??00111?11?11??0010-200010-10101222101001000-
111?11000110?011001010010101011?????10-00010--021-21201000201100101-11010?001101-
10?2010000011111010-100010100100?0121??0??0???1?1?????11?????101???10?0???1???????1--
?10001110?2???00101???21111101001?001???
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Barapasaurus
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?0????1100001000??????????0-
110?10?11111??11???1?000?2?111??1??0???111????????111100?01?????11?1??????111111?01????????
??10?????0?1?00?0111?01??1101?110110???0???0??1?????2110-101010-0-
111121101001021011011001111?1110010???0111?111??????????0???21-?1?01000201100-01-1111-
--
01000110?01010120101110 0??00010111110001212011012121211002?11110110010110110010110000????
??1--
?100?10???2???1????????01?1??????2001??
??????????????????????52?0?1?1?001??215?2???????????103??????

Diplodocus 1110030011001011--001011-10-010110001011110001--01110??0010??1--10-21020-
1101010100011-11210112011-2000110???0021101111010?1000?1???????111?0??00??0?1?1100?110-
101??00000?111-
00100112103011???101110??????211?0011???000??????1?0?1?11?????1010001100000001111011111-
101110?111111111001100111001111-01111111111111101111110-101(0
1)111111001111011111111020111010210021011101101101100111110000001111111111111101111111101
0202011101???0?1?0??111?01111111101110?0??(1   2)0010?0?1????0010-211110-
1001122210001102111101100011111?11100100000000 11111???????0-01100--121-
21201010201120110111001101100001010010002000211 0???1101101-
111000111101110212111112?11110111111111011??01?0211??????1--
?10001110102001 0101???21111101001 2001??
????????????????????????432?0?1?1?00112????????????0300???1?1???

Camarasaurus   1110030110101011--001110-101010110001100110001--01100120010??1-
-10-11010-010100011111010021111?011-20001?00001?2110111?010?1000?101?????1011001-
0100?1?11011110-111??00?00?110-
??100112103011???101110??????211?0011???000??????1?0?1?11????001000?100011011001011111-
101120?1111111100110110110011110-0001111111111000000011110-
10021111111101111111111112001111121012101110111111111101111100110 110111111111111101111110100
10121200110??????1?0??11???01??0?1??011101???0?????01210??0110-011110-
101111220001110211101100011101011 0010?11111110 11??????0-0110100021-21201010201120111-
11000101100001010010000000021101??1001101-
?110001101011002121111 12?111101111111110110101?0211??????????10001110 10200101 01???21111101
0012001??1012141320?1?1?0
0112?041211??02?00101031???0?

Brachiosauridae   1110000?0-001011--001011-10101011000011 0110001--01110100000??1--10-21010-1101001110011-11210112010?00001100??1021101111010?1000?1?-00???111?00-00010?1?1100?110-101??00000?111-00100112103011---101110010---211?0011???000??????1?0?1?11?????101000?100000001111011111-001100?111111111001100111001111-0011111111110000011110-1011111111011111111111101210111102111210111011111111011110?0111111?001110000111??111202011101???0?1?00??111?01111111101110?0??(1   2)0010?0??????1010-211110-10101112101011021111011000 1111?01100101111111 1101???????0-0110100021-21201010201120111-11000101100001010110002000 0110???100010111110001111010002121?112?111101111111111011??0??0211??????1--?100011101020010101???211111010012001???432?0?1?1?001122021???????0000???1?1???

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END;

BEGIN LABELS;

        TAXAGROUPLABEL F_Sauropodomorpha COLOR = (RGB 0.2 0.36078431 1) ;

        TAXAGROUPLABEL C_Ornithischia COLOR = (RGB 1 0.83529412 0.16862745) ;

        TAXAGROUPLABEL D_Theropoda COLOR = (RGB 1 0.13333333 0.13333333) ;

        TAXAGROUPLABEL Massospondylidae COLOR = (RGB 0.43921569 0.06666667 1) ;

        TAXAGROUPLABEL Plateosauridae COLOR = (RGB 0.14509804 0.14509804 0.43529412) ;

        TAXAGROUPLABEL Lufengosauridae COLOR = (RGB 0.26666667 0.56078431 1) ;

        TAXAGROUPLABEL Lessemsauridae COLOR = (RGB 0.30196078 0.85882353 1) ;

        TAXAGROUPLABEL T_Anchisauridae COLOR = (RGB 0.73333333 0.66666667 1) ;

        TAXAGROUPLABEL Plateosauravidae COLOR = (RGB 0.43529412 0.88627451 1) ;

        TAXAGROUPLABEL B_Dinosauriomorpha COLOR = (RGB 1 0.66666667 0.86666667) ;

        TAXAGROUPLABEL A_Archosauria COLOR = (RGB 0.23529412 1 0.38823529) ;

        TAXAGROUPLABEL U_Sauropoda COLOR = (RGB 0.36078431 0.2 1) ;

        TAXAGROUPLABEL E_Thecodontosauridae COLOR = (RGB 1 0.6 0.33333333) ;

        CHARGROUPLABEL 0._Cranium COLOR = (RGB 0.36862745 0.61960784 1) ;

        CHARGROUPLABEL 1._Premaxilla COLOR = (RGB 0.22745098 1 0.03529412) ;

        CHARGROUPLABEL 2._External_nares COLOR = (RGB 0.30196078 0.90196078 0.14901961) ;

        CHARGROUPLABEL 3._Antorbital_fossa COLOR = (RGB 0.18039216 0.8 0.02745098) ;

        CHARGROUPLABEL 4._Maxilla COLOR = (RGB 0.32156863 0.96862745 0.16078431) ;

        CHARGROUPLABEL 5._Nasal COLOR = (RGB 0.46666667 1 0.46666667) ;

        CHARGROUPLABEL 61._Femur COLOR = (RGB 0.49411765 1 0.36862745) ;

CHARGROUPLABEL 52._Humerus COLOR = (RGB 0.30196078 0.58039216 1) ;

CHARGROUPLABEL 54._Radius COLOR = (RGB 1 0.66666667 0.16862745) ;

CHARGROUPLABEL 53._Ulna COLOR = (RGB 1 0.74509804 0.36862745) ;

CHARGROUPLABEL 56._Metacarpal COLOR = (RGB 0.37254902 0.59607843 0.93333333) ;

CHARGROUPLABEL 57._Manual_digits COLOR = (RGB 0.30196078 0.85882353 1) ;

CHARGROUPLABEL 62._Tibia COLOR = (RGB 0.77254902 0.43529412 1) ;

CHARGROUPLABEL 63._Fibula COLOR = (RGB 0.57254902 1 0.46666667) ;

CHARGROUPLABEL 64._Astragalus COLOR = (RGB 1 0.61960784 0.36862745) ;

CHARGROUPLABEL A_Categorised_continuous COLOR = (RGB 0.83529412 0.14117647 0.69803922) ;

CHARGROUPLABEL 51._Scapula COLOR = (RGB 0.36862745 1 0.61960784) ;

CHARGROUPLABEL 20._Braincase COLOR = (RGB 0.23529412 0.38823529 1) ;

CHARGROUPLABEL 21._Basioccipital COLOR = (RGB 0.4 1 0.76078431) ;

CHARGROUPLABEL 22._Laterosphenoid COLOR = (RGB 0.43529412 0.65882353 1) ;

CHARGROUPLABEL 23._Otoccipital COLOR = (RGB 0.54509804 0.43529412 1) ;

CHARGROUPLABEL 24._Parabasisphenoid COLOR = (RGB 0.46666667 0.33333333 1) ;

CHARGROUPLABEL 50._Coracoid COLOR = (RGB 0.30196078 1 1) ;

CHARGROUPLABEL 58._Ilium COLOR = (RGB 0.70588235 1 0.26666667) ;

CHARGROUPLABEL 6._Lacrimal COLOR = (RGB 1 0.61176471 0.03529412) ;

CHARGROUPLABEL 7._Jugal COLOR = (RGB 1 0.80784314 0.03529412) ;

CHARGROUPLABEL 8._Prefrontal COLOR = (RGB 0.73333333 0.45490196 0.27058824) ;

CHARGROUPLABEL 9._Postfrontal COLOR = (RGB 1 0.76078431 0.4) ;

CHARGROUPLABEL 10._Postorbital COLOR = (RGB 0.90196078 0.73333333 0.05882353) ;

CHARGROUPLABEL 11._Squamosal COLOR = (RGB 0.65882353 0.43529412 1) ;

CHARGROUPLABEL 12._Quadrate COLOR = (RGB 0.76078431 0.6 1) ;

CHARGROUPLABEL 13._Quadratojugal COLOR = (RGB 0.34901961 0.02745098 0.83529412) ;

CHARGROUPLABEL 14._Frontal COLOR = (RGB 0.76862745 0.3372549 0.23137255) ;

CHARGROUPLABEL 15._Parietal COLOR = (RGB 1 0.46666667 0.33333333) ;

CHARGROUPLABEL 16._Vomer COLOR = (RGB 1 0.26666667 0.85490196) ;

CHARGROUPLABEL 17._Pterygoid COLOR = (RGB 1 0.16862745 1) ;

CHARGROUPLABEL 18._Palatine COLOR = (RGB 1 0.36862745 0.74509804) ;

CHARGROUPLABEL 19._Ectopterygoid COLOR = (RGB 1 0.26666667 0.70588235) ;

CHARGROUPLABEL 25._Mandible COLOR = (RGB 0.10196078 0.81960784 1) ;

CHARGROUPLABEL 26._Dentary COLOR = (RGB 0.2 1 1) ;

CHARGROUPLABEL 27._Splenial COLOR = (RGB 0.33333333 1 1) ;

CHARGROUPLABEL 28._Surangular COLOR = (RGB 0.46666667 1 0.89411765) ;

CHARGROUPLABEL 29._Articular COLOR = (RGB 0.2 0.66666667 0.57254902) ;

CHARGROUPLABEL 30._Dentition COLOR = (RGB 0.17647059 0.53333333 0.32156863) ;

CHARGROUPLABEL 31._Premaxillary_teeth COLOR = (RGB 0.16862745 1 0.33333333) ;

CHARGROUPLABEL 32._Maxillary_teeth COLOR = (RGB 0.16862745 1 0.16862745) ;

CHARGROUPLABEL 33._Dentary_teeth COLOR = (RGB 0.16862745 1 0.33333333) ;

CHARGROUPLABEL 34._Vertebral_column COLOR = (RGB 0.30196078 0.1254902 0.01176471) ;

CHARGROUPLABEL 35._Atlas COLOR = (RGB 1 1 0.10196078) ;

CHARGROUPLABEL 36._Axis COLOR = (RGB 0.03529412 0.80784314 1) ;

CHARGROUPLABEL '37. Anterior cervicals (postaxial)' COLOR = (RGB 0.03137255 0.90196078 0.20392157) ;

CHARGROUPLABEL 38._Posterior_cervicals COLOR = (RGB 1 0.62745098 0.06666667) ;

CHARGROUPLABEL 39._Anterior_dorsals COLOR = (RGB 0.83529412 0.57647059 0.19607843) ;

CHARGROUPLABEL 40._Middle_dorsals COLOR = (RGB 1 1 0.30196078) ;

CHARGROUPLABEL 41._Posterior_dorsals COLOR = (RGB 1 1 0.4) ;

CHARGROUPLABEL 42._Dorsosacrals COLOR = (RGB 0.63529412 0.43529412 0.93333333) ;

CHARGROUPLABEL 44._Caudosacrals COLOR = (RGB 1 0.66666667 0.16862745) ;

CHARGROUPLABEL 43._Primordial_sacrals COLOR = (RGB 0.43529412 1 0.54509804) ;

CHARGROUPLABEL 45._Anterior_caudals COLOR = (RGB 0.13333333 0.30588235 1) ;

CHARGROUPLABEL 46._Middle_caudals COLOR = (RGB 0.36862745 0.8745098 1) ;

CHARGROUPLABEL 47._Posterior_caudals COLOR = (RGB 0.33333333 0.73333333 1) ;

CHARGROUPLABEL 48._Distal_caudals COLOR = (RGB 0.66666667 1 1) ;

CHARGROUPLABEL 49._Chevrons COLOR = (RGB 0.4 1 0.76078431) ;

CHARGROUPLABEL 59._Pubis COLOR = (RGB 0.43529412 0.43529412 1) ;

CHARGROUPLABEL 60._Ischium COLOR = (RGB 0.6 0.41960784 0.30196078) ;

CHARGROUPLABEL 65._Calcaneum COLOR = (RGB 1 0.47843137 0.13333333) ;

CHARGROUPLABEL 67._Metatarsals COLOR = (RGB 0.06666667 0.25490196 1) ;

CHARGROUPLABEL 68._Pedal_digits COLOR = (RGB 0.46666667 0.57254902 1) ;

CHARGROUPLABEL 55._Distal_carpals COLOR = (RGB 1 1 0.13333333) ;

CHARGROUPLABEL 66._Distal_tarsals COLOR = (RGB 0.58039216 0.30196078 1) ;

CHARGROUPLABEL Reconstruction COLOR = (RGB 0.13333333 0.13333333 0.13333333) ;

CHARGROUPLABEL Autapomorphies COLOR = (RGB 0.90196078 0.88627451 0.87058824) ;

END;

BEGIN SETS;

TAXPARTITION * UNTITLED = A_Archosauria : 1- 3, B_Dinosauriomorpha : 4- 7, C_Ornithischia : 8- 18, D_Theropoda : 19- 32, E_Thecodontosauridae : 33- 36, F_Sauropodomorpha : 37- 64, Lessemsauridae : 65- 68, Lufengosauridae : 69- 75, Massospondylidae : 76- 80, Plateosauravidae : 81- 84, Plateosauridae : 85- 91, T_Anchisauridae : 92- 101, U_Sauropoda : 102- 115;

CHARPARTITION * UNTITLED = 0._Cranium : 1- 7, 1._Premaxilla : 8- 30, 2._External_nares : 31- 34, 3._Antorbital_fossa : 35- 36, 4._Maxilla : 37- 55, 5._Nasal : 56- 61, 6._Lacrimal : 62- 68, 7._Jugal : 69- 79, 8._Prefrontal : 80, 9._Postfrontal : 81, 10._Postorbital : 82- 85, 11._Squamosal : 86- 88, 12._Quadrate : 89- 94, 13._Quadratojugal : 95- 99, 14._Frontal : 100- 107, 15._Parietal : 108- 109, 16._Vomer : 110, 17._Pterygoid : 111- 114, 18._Palatine : 115- 119, 19._Ectopterygoid : 120- 123, 20._Braincase : 124- 126, 21._Basioccipital : 127- 129, 22._Laterosphenoid : 130- 136, 23._Otoccipital : 137- 147, 24._Parabasisphenoid : 148- 156, 25._Mandible : 157- 162, 26._Dentary : 163- 171, 27._Splenial : 172- 173, 28._Surangular : 174- 177, 29._Articular : 178- 179, 30._Dentition : 180- 185, 31._Premaxillary_teeth : 186- 189, 32._Maxillary_teeth : 190- 213, 33._Dentary_teeth : 214- 237, 35._Atlas : 238- 239, 36._Axis : 240- 259, '37. Anterior cervicals (postaxial)' : 260- 289, 38._Posterior_cervicals : 290- 316, 39._Anterior_dorsals : 317- 350, 40._Middle_dorsals : 351- 381, 41._Posterior_dorsals : 382- 413, 42._Dorsosacrals : 414- 417, 43._Primordial_sacrals : 418- 433, 44._Caudosacrals : 434- 436, 45._Anterior_caudals : 437- 443, 46._Middle_caudals : 444- 446, 47._Posterior_caudals : 447- 449, 48._Distal_caudals : 450- 455, 49._Chevrons : 456- 459, 50._Coracoid : 460- 468, 51._Scapula : 469- 478, 52._Humerus : 479- 490, 53._Ulna : 491- 497, 54._Radius : 498- 502, 56._Metacarpal : 503- 525, 57._Manual_digits : 526- 541, 58._Ilium : 542- 558, 59._Pubis : 559- 576, 60._Ischium : 577- 590, 61._Femur : 591- 608, 62._Tibia : 609- 627, 63._Fibula : 628- 637, 64._Astragalus : 638- 652, 65._Calcaneum : 653- 658, 66._Distal_tarsals : 659- 662, 67._Metatarsals : 663- 681, 68._Pedal_digits : 682- 698, A_Categorised_continuous : 699- 815;

END;

BEGIN ASSUMPTIONS;

TYPESET * UNTITLED = unord: 1- 578 580 582- 649 651- 815, ord: 579 581 650;

EXSET * UNTITLED = 190 - 197 214 - 215 290 - 291 317 351 418 - 420 450 - 451 456 682 699 - 721 728 - 769;

END;

BEGIN MESQUITECHARMODELS;

ProbModelSet * UNTITLED = 'Mk1 (est.)': 1- 815;

END;

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BEGIN TREES;

Title Trees;

ID 016f6ca823422;

LINK Taxa = Taxa;

TRANSLATE

[0]   1 Euparkeria,

[1]   2 CRUROTARSI,

[2]   3 Marasuchus,

[3]   4 Saltopus,

[4]   5 Asilisaurus,

[5]   6 Pisanosaurus,

[6]   7 Silesaurus,

[7]   8 Yinlong,

[8]   9 Scutellosaurus,

[9]   10 Laquintasaura,

[10]   11 Fruitadens,

[11]   12 Emausaurus,

[12]   13 Lesothosaurus,

[13]   14 Abrictosaurus,

[14]   15 Scelidosaurus,

[15]   16 Agilisaurus,

[16]   17 Eocursor,

[17]   18 Hypsilophodon,

[18]   19 Chindesaurus,

[19]   20 Liliensternus,

[20]   21 Staurikosaurus,

[21]   22 Panguraptor,

[22]   23 Eodromaeus,

[23]   24 Coelophysis,

[24]   25 Allosaurus,

[25]   26 Cryolophosaurus,

[26]   27 Zupaysaurus,

[27]   28 Ceratosaurus,

[28]   29 Herrerasaurus,

[29]   30 Tawa,

[30]   31 Dilophosaurus,

[31]   32 Eoraptor,

[32]   33 Pantydraco,

[33]   34 Thecodontosaurus,

[34]   35 Panphagia,

[35]   36 Efraasia,

[36]   37 Ohmdenosaurus,

[37]   38 Blikanasaurus,

[38]   39 Chuxiongosaurus,

[39]   40 Bagualosaurus,

[40]   41 Euskelosaurus,

[41]   42 Camelotia,

[42]   43 Nyasasaurus,

[43]   44 Pulanesaura,

[44]   45 Gryponyx,

[45]   46 Gyposaurus_sinensis,

[46]   47 Asylosaurus,

[47]   48 Lamplughsaura,

[48]   49 Aardonyx,

[49]   50 Agnosphitys,

[50]   51 Meroktenos,

[51]   52 Chromogisaurus,

[52]   53 Saturnalia,

[53]   54 Yunnanosaurus_robustus,

[54]   55 Melanorosaurus,

[55]   56 Tazoudasaurus,

[56]   57 Yimenosaurus,

[57]   58 Yunnanosaurus_youngi,

[58]   59 Buriolestes,

[59]   60 Guaibasaurus,

[60]   61 Leonerasaurus,

[61]   62 Pampadromaeus,

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[62]   63 Yizhousaurus,

[63]   64 Jingshanosaurus,

[64]   65 Ledumahadi,

[65]   66 Antetonitrus,

[66]   67 Ingentia,

[67]   68 Lessemsaurus,

[68]   69 Glacialisaurus,

[69]   70 Xixiposaurus,

[70]   71 Sarahsaurus,

[71]   72 Riojasaurus,

[72]   73 Lufengosaurus,

[73]   74 Coloradisaurus,

[74]   75 Yunnanosaurus_huangi,

[75]   76 Leyesaurus,

[76]   77 M._carinatus_BPI_5241,

[77]   78 Ngwevu,

[78]   79 Massospondylus_carinatus,

[79]   80 Adeopapposaurus,

[80]   81 Eucnemesaurus_fortis,

[81]   82 Plateosauravus,

[82]   83 Eucnemesaurus_entaxonis,

[83]   84 Ruehleia,

[84]   85 Plateosaurus_ingens,

[85]   86 Arcusaurus,

[86]   87 Unaysaurus,

[87]   88 Macrocollum,

[88]   89 Sellosaurus,

[89]   90 Jaklapallisaurus,

[90]   91 Plateosaurus,

[91]   92 Nambalia,

[92]   93 Massospondylus_kaalae,

[93]   94 Sefapanasaurus,

[94]   95 Pradhania,

[95]   96 Seitaad,

[96]   97 Ammosaurus,

[97]   98 Ignavusaurus,

[98]   99 Mussaurus,

[99]   100 Anchisaurus,

[100]   101 Xingxiulong,

[101]   102 Nebulasaurus,

[102]   103 Isanosaurus,

[103]   104 Spinophorosaurus,

[104]   105 Kotasaurus,

[105]   106 Omeisaurus,

[106]   107 Cetiosaurus,

[107]   108 Patagosaurus,

[108]   109 Vulcanodon,

[109]   110 Mamenchisaurus,

[110]   111 Shunosaurus,

[111]   112 Barapasaurus,

[112]   113 Diplodocus,

[113]   114 Camarasaurus,

[114]   115 Brachiosauridae;

TREE   'Default   symmetrical+'   =
(1,(2,(3,(4,(((5,(6,7)),(11,((9,(8,(17,15))),(13,(10,14,12,(18,16)))))),(53,(23,(((92,(21,29)),(60,(30,((24,(22,2
0)),(19,26,31,(27,(25,28)))))))),(32,(40,((62,(59,52)),(35,(33,(34,(((36,43,95),(47,86)),((84,((88,87),(89,91)))
,(((57,73),((71,(45,98)),(70,((93,99),(44,76,78,94,(61,63))))))),((49,(101,(96,(69,80)))),((100,(38,46)),((75,(5
4,81)),((77,79),((74,72),((68,((37,83),(66,65)Node_188))Node_182,(((58,64)Node_186,(82,90)Node_194)
Node_187,((42,55)Node_162,(51,(48,(39,56,67,112,105,108,104,109,107,103,106,111,102,(110,(114,(115,
113)))Node_202)Node_169)Node_170)Node_171)Node_163))Node_165)))))))))))))))))))));

END;

BEGIN NOTES;

      TEXT TAXON = 2 TEXT = 'Stagonalepis, Parasuchus, Erpetoshuchus, Effigia';

      TEXT TAXON = 47 TEXT = 'specimen YPM 2195, BMNH R 1542, YPM 56745, usually referred
to as Thecodontosaurus';

      TEXT TAXON = 79 TEXT = 'Neotype BP/1/4934, SAM-PK-K1314';

      TEXT TAXON = 97 TEXT = YPM_209;

TEXT TAXON = 100 TEXT = 'AM, YPM 1883, YPM208';

TEXT   TAXON = 53 CHARACTER = 37 TEXT = ?;

TEXT   TAXON = 108 CHARACTER = 471 TEXT = 'In Patagosaurus, there is evidence that the distal expansion is visible in the adults, but absent in the juveniles';

TEXT   TAXON = 114 CHARACTER = 478 TEXT = Dipl;

TEXT   CHARACTER = 506 TEXT = 'Coding by Y2007, H/Hmax*100=74.24875695, has lower entropy than gap-coding';

TEXT   CHARACTER = 508 TEXT = 'Coding by Y2007, H/Hmax*100=86.31205686, has lower entropy than gap-coding^n';

TEXT   TAXON = 47 CHARACTER = 609 TEXT = '25A-F';

TEXT   CHARACTER = 611 TEXT = 'Diagnostic of quadrupedality^n^n';

TEXT   CHARACTER = 626 TEXT = 'Use Langer (2004), Fig, 2.9 to illustrate this';

TEXT   CHARACTER = 663 TEXT = 'rigorously define a compact metatarsus as metatarsal II?IV contacting each other for at least the proximal half of the elements^n';

TEXT   CHARACTER = 800 TEXT = 'Coding by Y2007, H/Hmax*100=53.71727615, has lower entropy than gap-coding';

AN T = 17 C = 607 A = 0 DC = 2019.10.4.14.22.9 DM = 2019.10.4.14.25.25 ID = 016d96ef53781 I   =   _   TF   =   (CM This_character_is_illustrated_in_Fig._15B_where_the_pendent_trochanter_is_deflected_laterally._This_ch aracter_is_susceptible_of_deformation) ;

END;

Begin MESQUITE;

MESQUITESCRIPTVERSION 2;

TITLE AUTO;

tell ProjectCoordinator;

timeSaved 1583678922406;

getEmployee #mesquite.minimal.ManageTaxa.ManageTaxa;

tell It;

setID 0 5015872765988167700;

tell It;

setDefaultOrder 123 19 30 92 61 102 80 61 45 5 25 63 122 114 54 32 2 6 21 32 11 36 31 125 60 122 98 55 121 38 33 128 60 27 28 62 76 14 119 28 38 18 75 89 41 4 0 29 91 4 71 22 10 77 105 22 55 115 129 42 14 49 118 109 132 8 132 57 40 87 85 83 120 114 46 123 125 126 69 139 36 85 35 91 87 114 81 132 79 49 113 73 59 97 18 98 1 16 51 140 57 8 48 15 51 69 9 23 108 64 63 13 105 91 106;

attachments ;

endTell;

endTell;

getEmployee #mesquite.charMatrices.ManageCharacters.ManageCharacters;

tell It;

setID 0 7405840238697481417;

tell It;

setDefaultOrder 5 8 9 11 12 13 817 13 15 38 35 16 17 19 20 21 22 23 34 36 25 26 27 28 29 37 30 31 32 33 40 41 42 43 44 46 47 48 49 50 51 52 53 54 55 56 57 58 59 61 62 63 64 66 67 68 69 70 71 72 73 75 76 77 78 79 80 82 83 84 85 86 87 88 89 90 91 92 93 95 98 100 101 102 104 106 107 108 109 110 111 112 113 114 116 117 119 120 121 122 123 124 125 126 127 128 129 171 172 132 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 133 134 135 159 160 161 162 163 164 165 166 167 168 169 172 174 175 176 177 181 182 568 569 183 187 190 191 192 193 194 196 197 198 201 202 207 208 210 211 212 214 215 216 217 218 219 220 221 222 223 224 184 226 227 228 198 229 230 233 234 242 245 246 249 228 229 230 202 203 231 232 235 236 237 241 243 244 247 248 222 238 239 249 250 251 252 253 254 255 516 517 518 519 520 256 257 521 530 531 532 533 534 535 536 257 258 259 260 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 261 279 280 281 282 283 284 286 285 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 820 312 315 308 309 310 311 313 314 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 338 338 334 335 337 339 340 341 342 343 345 346 347 354 348 349 350 351 352 353 355 356 357 358 360 361 362 363 364 365 366 367 368 369 370 375 373 374 376 377 378 379 380 381 382 383 385 386 387 388 389 391 392 393 394 395 396 397 398 399 401 402 403 404 405 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 428 429 430 431 432 433 436 437 439 440 441 442 443 444 445 446 447 453 455 465 448 449 451 452 456 457 458 459 463 464 466 467 468 469 471 501 477 474 475 479 476 460 461 479 480 484 485 486 487 489 490 488 491 481 482 492 493 495 496 542 543 544 545 533 534 535 536 537 539 548 545 550 551 552 553 554 555 559 643 644 645 646 648 650 651 652 654 655 656 818 664 665 666 667 668 670 671 658 659 661 664 662 673 688 811 812 934 936 937 674 675 676 863 677 678 680 681 682 687 689 805 806 809 810 671 521 522 523 524 525 526 938 939 941 942 943 945 951 948 949 957 690 691 692 693 694 695 696 699 791 792 793 794 795 796 797 798 800 597 582 585 586 587 589 591 593 594 595 596 599 601 604 605 606 607 608 612 613 614 615 616 618 621 620 628 624 625 627 629 630 558 561 562 564 566 567 568 569 570 571 572 573 574 575 576 579 630 634 951 952 953 954 955 956 957 959 960 965 966 967 968 969 982 983 983 978 973 981 982 984 985 987 988 989 990 991 992 994 995 996 997 998 999 1000 1001 1002 1004 1008 1009 1010 1011 1012 699 700 701 702 703 704 747 749 752 750 737 736 728 732 729 706 707 739 741 725 742 697 744 730 744 732 734 725 737 768 716 751 772 753 754 763 756 757 781 760 761 744 766 769 774 754 551 552 720 708 718 724 725 732 721 722 715 716 723 729 772 770 771 764 774 777 587 588 594 0 1 2 3 4 9 14 18 24 39 45 60 74 81 94 96 97 99 103

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105 115 118 645 647 658 667 678 797 801 810 934 937 940 949 951 696 564 569 581 582 635 636 637 981 984 991 714 717 173 185 188 194 208 212 539 540 541 550 454 592 600 603 610 611 617 619 626 752 738 537 539 548 555 635 636 647 651 799 801 793 936 938 939 940 941 693 694 785 563 962 994 996 997 998;

attachments ;

endTell;

mqVersion 360;

checksumv 0 3 4181265052 null getNumChars 815 numChars 815 getNumTaxa 115 numTaxa 115 short true bits 127 states 127 sumSquaresStatesOnly 243769.0 sumSquares 243769.0 longCompressibleToShort false usingShortMatrix true NumFiles 1 NumMatrices 1;

mqVersion;

endTell;

getWindow;

tell It;

suppress;

setResourcesState false false 140;

setPopoutState 300;

setExplanationSize 0;

setAnnotationSize 0;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1920 1001;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

endTell;

desuppress;

endTell;

getEmployee #mesquite.minimal.ManageTaxa.ManageTaxa;

tell It;

showTaxa #5015872765988167700 #mesquite.lists.TaxonList.TaxonList;

tell It;

setTaxa #5015872765988167700;

getWindow;

tell It;

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useTargetValue off;

setTargetValue ;

newAssistant #mesquite.lists.TaxonListCurrPartition.TaxonListCurrPartition;

getTable;

tell It;

rowNamesWidth 140;

endTell;

setExplanationSize 30;

setAnnotationSize 20;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1780 929;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

setTool mesquite.lists.TaxonList.TaxonListWindow.sort;

endTell;

endTell;

showWindow;

getEmployee #mesquite.lists.ColorTaxon.ColorTaxon;

tell It;

setColor Red;

removeColor off;

endTell;

getEmployee #mesquite.lists.TaxonListAnnotPanel.TaxonListAnnotPanel;

tell It;

togglePanel off;

endTell;

endTell;

endTell;

getEmployee #mesquite.trees.BasicTreeWindowCoord.BasicTreeWindowCoord;

tell It;

makeTreeWindow #5015872765988167700 #mesquite.trees.BasicTreeWindowMaker.BasicTreeWindowMaker;

tell It;

suppressEPCResponse;

setTreeSource #mesquite.trees.StoredTrees.StoredTrees;

tell It;

setTreeBlock 1;

setTreeBlockID 016f6ca823422;

toggleUseWeights off;

endTell;

setAssignedID 1071.1578075964301.7889061916116766131;

getTreeWindow;

tell It;

setExplanationSize 30;

setAnnotationSize 20;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1780 929;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

setTool mesquite.trees.BasicTreeWindowMaker.BasicTreeWindow.arrow;

endTell;

getTreeDrawCoordinator #mesquite.trees.BasicTreeDrawCoordinator.BasicTreeDrawCoordinator;

tell It;

suppress;

setTreeDrawer #mesquite.trees.SquareLineTree.SquareLineTree;

tell It;

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setNodeLocs #mesquite.trees.NodeLocsStandard.NodeLocsStandard;

tell It;

branchLengthsToggle on;

toggleScale on;

toggleBroadScale off;

toggleCenter on;

toggleEven on;

setFixedTaxonDistance 0;

endTell;

setEdgeWidth 4;

showEdgeLines on;

orientUp;

endTell;

setBackground White;

setBranchColor Black;

showNodeNumbers off;

showBranchColors on;

labelBranchLengths off;

centerBrLenLabels on;

showBrLensUnspecified off;

showBrLenLabelsOnTerminals on;

setBrLenLabelColor 0 0 255;

setNumBrLenDecimals 6;

setSelectedTaxonHighlightMode 1;

desuppress;

getEmployee #mesquite.trees.BasicDrawTaxonNames.BasicDrawTaxonNames;

tell It;

setFontSize 12;

setColor Black;

setTaxonNameStyler #mesquite.trees.ColorTaxonByPartition.ColorTaxonByPartition;

toggleShadePartition off;

toggleShowFootnotes on;

```
                        toggleNodeLabels on;

                        toggleCenterNodeNames off;

                        toggleShowNames on;

                        namesAngle ?;

                endTell;

        endTell;

        setTreeNumber 1;

        setTree '(1,(2,(3,(4,((5,(6,7))"Node 118
(Silesaurids)",(11,((9,(8,(17,15))),(13,(10,14,12,(18,16)))))"Node 125
(Ornithischia)")Node_119,(53,((23,((92,(21,29)),(60,(30,((24,(22,20)),(19,26,31,(27,(25,28)))))))))"Node
135
(Theropoda)",(32,(40,((62,(59,52))Node_161,(35,(33,(34,((((36,43,95),(47,86))Node_145,(84,((88,87),(89,
91))"Node 195 (Plateosauridae)"))"Node 146
(Plateosauria)",(((57,73),((71,(45,98)),(70,((93,99)Node_199,(44,76,78,94,(61,63))Node_177)"Node 178
(Mussauridae)")Node_179)Node_174)Node_175,((49,(101,(96,(69,80)Node_190)Node_191)Node_192)No
de_153,((100,(38,46))"Node 158 (Anchisauridae)",((75,(54,81))"Node 185
(Yunnanosauridae)",((77,79)Node_193,((74,72)"Node 189
(Riojasauridae)",((68,((37,83),(66,65)Node_188))"Node 182
(Lessemsauridae)",(((58,64)Node_186,(82,90)Node_194)Node_187,((42,55)"Node 162
(Melanorosauridae)",(51,(48,(39,56,67,112,105,108,104,109,107,103,106,111,102,(110,(114,(115,113)))No
de_202)"Node 169 (Sauropoda)")Node_170)Node_171)Node_163)Node_164)Node_165)"Node 166
(Sauropodiformes)")"Node 167 (Massopoda)")Node_168)Node_159)"Node 154
(Anchisauria)")Node_155)Node_147)Node_148)Node_149)Node_150)Node_151)Node_152)"Node 138
(Sauropodomorpha)"))"Node 137 (Saurischia)")"Node 120 (Dinosauria)")Node_117)Node_116);';

                        setDrawingSizeMode 0;

                        toggleLegendFloat off;

                        scale 0;

                        toggleTextOnTree on;

                        togglePrintName off;

                        showWindow;

                        newAssistant
#mesquite.ancstates.TraceCharacterHistory.TraceCharacterHistory;

        tell It;

                        suspend ;

                        setDisplayMode
#mesquite.ancstates.ShadeStatesOnTree.ShadeStatesOnTree;

                tell It;

                        toggleLabels off;

                        togglePredictions off;

                        toggleGray off;

                endTell;
```

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setHistorySource
#mesquite.ancstates.RecAncestralStates.RecAncestralStates;

tell It;

getCharacterSource
#mesquite.charMatrices.CharSrcCoordObed.CharSrcCoordObed;

tell It;

setCharacterSource
#mesquite.charMatrices.StoredCharacters.StoredCharacters;

tell It;

setDataSet
#7405840238697481417;

endTell;

endTell;

setMethod
#mesquite.parsimony.ParsAncestralStates.ParsAncestralStates;

tell It;

setModelSource
#mesquite.parsimony.CurrentParsModels.CurrentParsModels;

toggleMPRsMode off;

endTell;

toggleShowSelectedOnly off;

endTell;

setCharacter 305;

setMapping 1;

toggleShowLegend on;

setColorMode 0;

toggleWeights on;

setInitialOffsetX 127;

setInitialOffsetY -199;

setLegendWidth 332;

setLegendHeight 132;

resume ;

endTell;

newAssistant
#mesquite.trees.TreeLegendMaker.TreeLegendMaker;

tell It;

setOffsetsX 434;

setOffsetsY 123;

getLegendsVector;

tell It;

distributeCommands;

setBounds 434 123 300 136;

setOffsetX 434;

setOffsetY 123;

endDistributeCommands;

endTell;

newLegendItemNoCalc
#mesquite.trees.TreeValueUsingMatrix.TreeValueUsingMatrix;

tell It;

getEmployee
#mesquite.parsimony.TreelengthForMatrix.TreelengthForMatrix;

tell It;

getEmployee
#mesquite.parsimony.ParsCharSteps.ParsCharSteps;

tell It;

setModelSource
#mesquite.parsimony.CurrentParsModels.CurrentParsModels;

endTell;

endTell;

getEmployee
#mesquite.charMatrices.CharMatrixCoordIndep.CharMatrixCoordIndep;

tell It;

setCharacterSource
#mesquite.charMatrices.StoredMatrices.StoredMatrices;

tell It;

setDataSet
#7405840238697481417;

endTell;

endTell;

endTell;

newLegendItemNoCalc
#mesquite.trees.TreeValueUsingMatrix.TreeValueUsingMatrix;

tell It;

getEmployee
#mesquite.parsimony.TreelengthForMatrix.TreelengthForMatrix;

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tell It;

getEmployee
#mesquite.parsimony.ParsCharSteps.ParsCharSteps;

tell It;

setModelSource
#mesquite.parsimony.CurrentParsModels.CurrentParsModels;

endTell;

endTell;

getEmployee
#mesquite.charMatrices.CharMatrixCoordIndep.CharMatrixCoordIndep;

tell It;

setCharacterSource
#mesquite.charMatrices.StoredMatrices.StoredMatrices;

tell It;

setDataSet
#7405840238697481417;

endTell;

endTell;

endTell;

newLegendItemNoCalc
#mesquite.trees.TreeValueUsingMatrix.TreeValueUsingMatrix;

tell It;

getEmployee
#mesquite.parsimony.TreelengthForMatrix.TreelengthForMatrix;

tell It;

getEmployee
#mesquite.parsimony.ParsCharSteps.ParsCharSteps;

tell It;

setModelSource
#mesquite.parsimony.CurrentParsModels.CurrentParsModels;

endTell;

endTell;

getEmployee
#mesquite.charMatrices.CharMatrixCoordIndep.CharMatrixCoordIndep;

tell It;

setCharacterSource
#mesquite.charMatrices.StoredMatrices.StoredMatrices;

tell It;

setDataSet
#7405840238697481417;

endTell;

endTell;

endTell;

calculate;

endTell;

newWindowAssistant
#mesquite.charts.NodesScattergram.NodesScattergram;

tell It;

suspend;

setChartType #mesquite.charts.Scattergram.Scattergram;

tell It;

markerSize 10;

toggleJoin off;

toggleShowDots on;

movingWindowSize 1;

sumByBlocks off;

endTell;

sameAxes;

setValues #mesquite.cont.MapContinuous.MapContinuous;

tell It;

getCharacterSource
#mesquite.charMatrices.CharSrcCoordObed.CharSrcCoordObed;

tell It;

setCharacterSource
#mesquite.stochchar.SimulatedCharacters.SimulatedCharacters;

tell It;

setSeed 1578076408410;

setCharacterSimulator
#mesquite.stochchar.EvolveContinuous.EvolveContinuous;

tell It;

setModelByName
Brownian_default;

endTell;

getTreeSource
#mesquite.trees.TreeOfContext.TreeOfContext;

tell It;

setContextID 1071.1578075964301.7889061916116766131;

endTell;

endTell;

endTell;

setCharacter 2;

setItem 0;

getEmployee #mesquite.parsimony.ParsAncestralStates.ParsAncestralStates;

tell It;

setModelSource #mesquite.parsimony.CurrentParsModels.CurrentParsModels;

tell It;

setDefaultModel 13;

endTell;

toggleMPRsMode off;

getEmployee #mesquite.parsimony.ParsimonySquared.ParsimonySquared;

tell It;

toggleWeight on;

endTell;

endTell;

endTell;

setX 1;

setY 2;

toggleTreeLabels off;

getWindow;

tell It;

setExplanationSize 30;

setAnnotationSize 20;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1780 929;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

endTell;

endTell;

endTell;

doCounts;

resume;

showWindow;

endTell;

endTell;

desuppressEPCResponse;

getEmployee #mesquite.trees.ColorBranches.ColorBranches;

tell It;

setColor Red;

removeColor off;

endTell;

getEmployee #mesquite.ornamental.BranchNotes.BranchNotes;

tell It;

setAlwaysOn off;

endTell;

getEmployee
#mesquite.ornamental.ColorTreeByPartition.ColorTreeByPartition;

tell It;

colorByPartition off;

endTell;

getEmployee
#mesquite.ornamental.DrawTreeAssocDoubles.DrawTreeAssocDoubles;

tell It;

setOn on;

toggleShow consensusFrequency;

toggleShow posteriorProbability;

toggleShow bootstrapFrequency;

toggleShow consensusFrequency;

toggleShow posteriorProbability;

toggleShow bootstrapFrequency;

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```
                        setDigits 4;

                        setThreshold ?;

                        writeAsPercentage off;

                        toggleCentred off;

                        toggleHorizontal on;

                        toggleWhiteEdges on;

                        toggleShowOnTerminals on;

                        setFontSize 10;

                        setOffset 0  0;

                endTell;

                getEmployee
#mesquite.ornamental.DrawTreeAssocStrings.DrawTreeAssocStrings;

                        tell It;

                                setOn on;

                                toggleCentred on;

                                toggleHorizontal on;

                                setFontSize 10;

                                setOffset 0  0;

                                toggleShowOnTerminals on;

                        endTell;

                        getEmployee #mesquite.trees.TreeInfoValues.TreeInfoValues;

                        tell It;

                                panelOpen false;

                        endTell;

                endTell;

        endTell;

        getEmployee  #mesquite.charMatrices.BasicDataWindowCoord.BasicDataWindowCoord;

        tell It;

                showDataWindow                              #7405840238697481417
#mesquite.charMatrices.BasicDataWindowMaker.BasicDataWindowMaker;

                tell It;

                        getWindow;

                        tell It;

                                getTable;

                                tell It;
```

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rowNamesWidth 113;

endTell;

setExplanationSize 90;

setAnnotationSize 20;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1780 869;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

setTool mesquite.charMatrices.BasicDataWindowMaker.BasicDataWindow.ibeam;

endTell;

setTool mesquite.charMatrices.BasicDataWindowMaker.BasicDataWindow.ibeam;

colorCells #mesquite.charMatrices.ColorByState.ColorByState;

tell It;

setStateLimit 9;

toggleUniformMaximum on;

endTell;

colorRowNames #mesquite.charMatrices.TaxonGroupColor.TaxonGroupColor;

colorColumnNames #mesquite.charMatrices.CharGroupColor.CharGroupColor;

colorText #mesquite.charMatrices.NoColor.NoColor;

setBackground White;

toggleShowNames on;

toggleShowTaxonNames on;

toggleTight off;

toggleThinRows off;

toggleShowChanges on;

toggleSeparateLines off;

toggleShowStates on;

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```
                toggleAutoWCharNames on;

                toggleAutoTaxonNames off;

                toggleShowDefaultCharNames off;

                toggleConstrainCW on;

                toggleBirdsEye off;

                toggleShowPaleGrid off;

                toggleShowPaleCellColors off;

                toggleShowPaleExcluded off;

                togglePaleInapplicable on;

                togglePaleMissing off;

                toggleShowBoldCellText off;

                toggleAllowAutosize on;

                toggleColorsPanel off;

                toggleDiagonal on;

                setDiagonalHeight 80;

                toggleLinkedScrolling on;

                toggleScrollLinkedTables off;

        endTell;

        showWindow;

        getWindow;

        tell It;

                forceAutosize;

        endTell;

        getEmployee #mesquite.charMatrices.AlterData.AlterData;

        tell It;

                toggleBySubmenus off;

        endTell;

        getEmployee #mesquite.charMatrices.ColorCells.ColorCells;

        tell It;

                setColor Red;

                removeColor off;

        endTell;

        getEmployee #mesquite.categ.StateNamesEditor.StateNamesEditor;

        tell It;
```

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```
makeWindow;
tell It;
        getTable;
        tell It;
                rowNamesWidth 722;
        endTell;
        setExplanationSize 90;
        setAnnotationSize 20;
        setFontIncAnnot 0;
        setFontIncExp 0;
        setSize 1780 869;
        setLocation -8 0;
        setFont SanSerif;
        setFontSize 10;
        getToolPalette;
        tell It;
                setTool
mesquite.categ.StateNamesEditor.StateNamesWindow.ibeam;
        endTell;
        rowsAreCharacters on;
        toggleConstrainChar on;
        toggleConstrainCharNum 3;
        togglePanel off;
        toggleSummaryPanel off;
    endTell;
    showWindow;
endTell;
getEmployee #mesquite.categ.StateNamesStrip.StateNamesStrip;
tell It;
    showStrip off;
endTell;
getEmployee #mesquite.charMatrices.AnnotPanel.AnnotPanel;
tell It;
    togglePanel off;
endTell;
```

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getEmployee
#mesquite.charMatrices.CharReferenceStrip.CharReferenceStrip;

tell It;

showStrip off;

endTell;

getEmployee
#mesquite.charMatrices.QuickKeySelector.QuickKeySelector;

tell It;

autotabOff;

endTell;

getEmployee
#mesquite.charMatrices.SelSummaryStrip.SelSummaryStrip;

tell It;

showStrip off;

endTell;

getEmployee
#mesquite.categ.SmallStateNamesEditor.SmallStateNamesEditor;

tell It;

panelOpen true;

endTell;

endTell;

endTell;

getEmployee #mesquite.charMatrices.ManageCharacters.ManageCharacters;

tell It;

showCharacters   #7405840238697481417
#mesquite.lists.CharacterList.CharacterList;

tell It;

setData 0;

getWindow;

tell It;

useTargetValue off;

setTargetValue ;

newAssistant
#mesquite.lists.DefaultCharOrder.DefaultCharOrder;

newAssistant
#mesquite.lists.CharListInclusion.CharListInclusion;

newAssistant #mesquite.lists.CharListPartition.CharListPartition;

newAssistant #mesquite.parsimony.CharListParsModels.CharListParsModels;

getTable;

tell It;

rowNamesWidth 817;

columnWidth 1 51;

endTell;

setExplanationSize 30;

setAnnotationSize 20;

setFontIncAnnot 0;

setFontIncExp 0;

setSize 1780 929;

setLocation -8 0;

setFont SanSerif;

setFontSize 10;

getToolPalette;

tell It;

setTool mesquite.lists.CharacterList.CharacterListWindow.arrow;

endTell;

setActive;

endTell;

showWindow;

getEmployee #mesquite.lists.CharListAnnotPanel.CharListAnnotPanel;

tell It;

togglePanel off;

endTell;

endTell;

endTell;

newAssistant #mesquite.charts.TaxonValuesChart.TaxonValuesChart;

tell It;

setTaxonSource #mesquite.minimal.StoredTaxa.StoredTaxa;

tell It;

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```
                                setTaxa #5015872765988167700;

                endTell;

                setCalculator  #mesquite.molec.PercentMissingInTaxon.PercentMissingInTaxon;

                tell It;

                        getEmployee
#mesquite.charMatrices.CharMatrixCoordIndep.CharMatrixCoordIndep;

                        tell It;

                                setCharacterSource
#mesquite.charMatrices.StoredMatrices.StoredMatrices;

                        tell It;

                                    setDataSet #7405840238697481417;

                        endTell;

                endTell;

        endTell;

        getCharter #mesquite.charts.ItemValuesChart.ItemValuesChart;

        tell It;

                getWindow;

                tell It;

                        setExplanationSize 30;

                        setAnnotationSize 20;

                        setFontIncAnnot 0;

                        setFontIncExp 0;

                        setSize 1780 929;

                        setLocation -8 0;

                        setFont SanSerif;

                        setFontSize 10;

                        getToolPalette;

                        tell It;

                        endTell;

                        toggleAutoRecalc on;

                        itemsByValues;

                        setChartType  #mesquite.charts.Histogram.Histogram;

                tell It;

                        suspend;

                        showAverageToggle on;

                                707
```

showPercentToggle off;

setCumulativeMode 0;

showAsBarChartToggle on;

showRawToggle off;

setNumberIntervals 20;

setIntervalSize 1.0;

setMovingWindowSize 5.0 1.0;

setMode 4;

resume;

endTell;

toggleColorItems on;

setNumberItems 115;

endTell;

enableCalculations;

endTell;

setChartVisible;

doCounts;

showWindow;

endTell;

newAssistant #mesquite.charts.CharacterValuesChart.CharacterValuesChart;

tell It;

setTaxa #5015872765988167700;

setCalculator #mesquite.charMatrices.PercentMissing.PercentMissing;

getCharacterSource
#mesquite.charMatrices.CharSrcCoordObed.CharSrcCoordObed;

tell It;

setCharacterSource
#mesquite.charMatrices.StoredCharacters.StoredCharacters;

tell It;

setDataSet #7405840238697481417;

endTell;

endTell;

getCharter #mesquite.charts.ItemValuesChart.ItemValuesChart;

tell It;

getWindow;

```
tell It;

        setExplanationSize 30;

        setAnnotationSize 60;

        setFontIncAnnot 0;

        setFontIncExp 0;

        setSize 1780 889;

        setLocation -8 0;

        setFont SanSerif;

        setFontSize 10;

        getToolPalette;

        tell It;

        endTell;

        toggleAutoRecalc on;

        itemsByValues;

        setChartType  #mesquite.charts.Histogram.Histogram;

tell It;

        suspend;

        showAverageToggle on;

        showPercentToggle on;

        setCumulativeMode 0;

        showAsBarChartToggle on;

        showRawToggle off;

        setNumberIntervals 20;

        setIntervalSize 1.0;

        setMovingWindowSize 5.0 1.0;

        setMode 4;

                newAssistant
#mesquite.charts.ShowMean.ShowMean;

                newAssistant
#mesquite.charts.ShowPercentile.ShowPercentile;

        tell It;

                setPercentile 0.25  5 2;

        endTell;

        resume;

endTell;
```

```
                            toggleColorItems on;

                            setNumberItems 729;

                    endTell;

                    enableCalculations;

            endTell;

            setChartVisible;

            doCounts;

            showWindow;

        endTell;

        endTell;

end;
```

APPENDIX 3. LIST OF AUTAPOMORPHIES

Autapomorphy	Taxon
AUT1. Skull, level of the posterior margin of the external naris posterior to the mid-length of the maxillary tooth row and the rostral margin of the antorbital fenestra.	*Jingshanosaurus*
AUT1. Skull, level of the posterior margin of the external naris posterior to the mid-length of the maxillary tooth row and the rostral margin of the antorbital fenestra.	*Chuxiongosaurus*
AUT2. Maxilla, anterior profile, sharply acute angle (50º) formed by the ascending process of the maxilla with the alveolar margin.	*Leyesaurus*
AUT3. Anterior caudal vertebrae, anterior articular facet deeply concave, being set back from the anterolateral margin of the centrum 4.5 cm at its deepest.	*Ledumahadi*
AUT4. Distal caudal vertebrae, dorsoventrally compressed centrum	*Arcusaurus*
AUT5. Premaxilla, posterolateral process, a ribbon-shaped bone that terminates in a pointed tongue-shaped lobe	*Eoraptor*
AUT6. Narrow premaxilla-maxilla diastema (rounded posterior margin on premaxilla, small first maxillary tooth)	*Eoraptor*
AUT7. External naris, reduced	*Yunnanosaurus huangi*
AUT8. Maxilla, dorsolateral surface of the posterior, short ridge	*Melanorosaurus*
AUT9. Maxilla, lateral surface, nutritive foramina absent	*Yunnanosaurus huangi*
AUT10. Antorbital fossa, posterior margin of the ascending process gives rise to a stout ventrally directed projection, which extends into the antorbital fossa	*Yunnanosaurus huangi*
AUT11. Maxilla, lateral surface of ascending process, distinct tuberosity.	*Lufengosaurus*
AUT12. Antorbital fossa, deep lateral nasal shelf overhanging antorbital fossa	*Eoraptor*
AUT13. Nasal, anteroventral process, tongue-shaped	*Arcusaurus*
AUT14. Nasal, posterolateral process of the nasal, elongated	*Melanorosaurus*
AUT15. Lacrimal, lateral surface of the ventral process, distinct, shallow subcircular sulcus	*Yunnanosaurus huangi*
AUT16. Jugal, anterior end of dorsoventrally expanded relative to the suborbital bar	*Melanorosaurus*
AUT17. Jugal, main body, boss on central portion of jugal at junction of the three jugal processes	*Lufengosaurus*
AUT18. Nasal, fine ridge on nasal extending from medial edge of prefrontal embayment to a point near center of bone	*Arcusaurus*

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AUT19. Postorbital, thin bony plate extending from the posterodorsal margin of the postorbital

Tazoudasaurus

AUT20. Postorbital, a lateral pit

Shunosaurus

AUT21. Quadrate, distal end, lateral pit just above the articular condyle

Anchisaurus

AUT22. Jugal, emargination of the ventral margin of the jugal/quadratojugal bar behind the tooth row

Shunosaurus

AUT23. Quadratojugal, participates in the jaw articulation

Shunosaurus

AUT24. Frontal, frontal boss

Yunnanosaurus huangi

AUT25. Frontal, frontoparietal suture, straight transversely and its central part is marked by a prominent boss of bone

Yunnanosaurus huangi

AUT26. Parietal, anterolateral process, prominent boss on dorsal surface

Lufengosaurus

AUT27. Vomer, over 30 per cent of the total skull length

Melanorosaurus

AUT28. Vomer, do not participate in the formation of the choanae

Shunosaurus

AUT29. Pterygoid-ectopterygoid, synovial joint on posterior margin of palate

Eoraptor

AUT30. Basisphenoid, basipterygoid process, not wrapped by the caudal process of the pterygoid

Shunosaurus

AUT31. Palatine, palatine peg

Plateosaurus engelhardti

AUT32. Premaxilla, base of posteromedial process expanded into a horizontal palatal shelf that protrudes medially to contact its antimere

Arcusaurus

AUT33. Basisphenoid, basipterygoid processes, elongated

Asylosaurus

AUT34. Oto-occipital, paroccipital process, conspicuous foramen from the middle of the occipital surface of the bone, at the base of the paroccipital process

Pantydraco

AUT35. Prootic, wide prootic trough

Anchisaurus

AUT36. Oto-occipital, formane magnum, vertically oriented elliptical7

Tazoudasaurus

AUT37. Parabasisphenoid, ventrally facing foramen for the internal carotid artery located in a deep lateral notch of the parabasisphenoid plate

Anchisaurus

AUT38. Parabasisphenoid, tall and thin bony laminae forming the ventrolateral margins of a deep, ventrally opening fossa

Coloradisaurus

AUT39. Parabasisphenoid, triangular bony laminae extend from the basipterygoid processes to the ventrolateral margins of the parasphenoid rostrum

Coloradisaurus

AUT40. Dentary, anterior tip, presence of a dorsally projected peg-like process immediately anterior to the first mandibular tooth

Mussaurus

AUT41. Mandible, band of dense fine pits around the alveolar margins

Aardonyx

AUT42. Dentary, single enlarged neurovascular foramen opening near the anterior tip of the lateral surface

Arcusaurus

AUT43. Dentary, lateral surface of the anterior end, strongly rugose depression bordered by a protuberance with a series of foramina in a subvertical row

Adeopapposaurus

AUT44. Mandible, low and elongated posterior end of mandibular rami (posterior to the external mandibular fenestra) with only gently sigmoid dorsal margin

Mussaurus

AUT45. Mandible, retroarticular process, tab-like medial process on the medial border

Coloradisaurus

AUT46. Replacing teeth invade the labial side of the functional teeth

Shunosaurus

AUT47. Maxillary teeth, crowns with a prominent lateral eminence or crest

Eoraptor

AUT48. Anterior cervical vertebrae, accessory prezygapophyseal process middle cervical vertebrae

Eoraptor

AUT49. Anterior cervicals, neural canal, broad, dorsoventrally shallow

Melanorosaurus

AUT50. Anterior cervical vertebrae, reduced cervical diapophyses that remain as low tubercles

Aardonyx

AUT51. Posterior cervical vertebrae, pleurocoel-like pits on the neurocentral sutures of the sixth, seventh and eighth cervical vertebrae

Pantydraco

AUT52. Posterior cervical vertebrae, neural spines, vertically oriented ligamentous furrow

Lamplughsaura

AUT53. Posterior cervical vertebrae, symmetrical, pyramid-shaped, neural spines on posterior cervicals and anterior dorsals

Cetiosaurus

AUT54. Cervical vertebrae, eleven anteroposteriorly elongated cervical vertebrae

Adeopapposaurus

AUT55. Dorsal vertebrae, neural arches taller than the respective centra

Adeopapposaurus

AUT56. Dorsal vertebrae, high neural spines comprising more than half the total height of the neural arch

Antetonitrus

AUT57. Dorsal vertebrae, neural arches more than twice as tall as associated centra

Antetonitrus

AUT58. Dorsal vertebrae, prezygapophyses mediolaterally extensive and sheet-like

Pulanesaura

AUT59. Mid-dorsals, anterior infradiapophyseal fossae showing an externally constricted, medially-tapering, pinched morphology

Pulanesaura

AUT60. Middle dorsal vertebrae possess a deep excavation on either side of the neural arch, immediately below the transverse process, which leave only a thin septum of bone on the midline

Cetiosaurus

AUT61. First primordial sacral, foramen opening ventrally at the base of the second sacral rib

Anchisaurus

AUT62. Second primordial sacral, large fenestra piercing the third sacral rib

Anchisaurus

AUT63. First primordial sacral rib, deep pit bounded by laminae penetrating the lateral suface

Melanorosaurus

AUT64. Caudosacral, attaching largely, or wholly, to the posterior surface of the second primordial sacral vertebra

Melanorosaurus

AUT65. Sacral rib 1 originates from complete length of centrum of first primordial sacral

Plateosaurus engelhardti

AUT66. Sacral rib 2 from the posterior 75% of the second primordial sacral centrum

Plateosaurus engelhardti

AUT67. Articulation of the sacral zygapophyses

Pampadromaeus

AUT68. Anterior chevrons, single articular facet

Antetonitrus

AUT69. Coracoid, long ridge extending from the anterodorsal margin of the coracoid to the coracoid foramen

Sefapanosaurus

AUT70. Scapula, distinct plate-like medial process of the scapula contributing posteriorly to glenoid surface

Seitaad

AUT71. Humerus, medial tuberosity of the humeral head reduced and slightly medially inturned

Antetonitrus

AUT72. Humerus, deltopectoral crest, paramarginal sulcus in the laterodistal margin

Antetonitrus

AUT73. Humerus, prominent deltopectoral crest offset proximally from head of humerus by distinct proximally directed hook

Seitaad

AUT74. Ulna, medially directed extension of the anterior process

Antetonitrus

AUT75. Preserved forelimb elements extremely robust, with the minimum shaft circumference of the ulna 0.57 times the total length of the bone

Ledumahadi

AUT76. Distal carpal I, proximally pointing tip on the palmar surface, giving a triangular shape in palmar view

Sefapanosaurus

AUT77. Metacarpal I, flush with the rest of the metacarpals proximally

Sarahsaurus

AUT78. Metacarpal I, proximally convex and laterally expanded proximal surface of metacarpal I

Seitaad

AUT79. Ilium, postacetabular process, subquadratic

Thecodontosaurus

AUT80. Ilium, postacetabular process is subrectangular and is bordered by a deep brevis fossa

Eucnemesaurus entaxonis

AUT81. Ilium, iliac antitrochanter, groove extending dorsoventrally along the anterior part of the iliac antitrochanter

Guiabsaurus

AUT82. Ilium, ventral margin of postacetabular process strongly concave

Xingxiulong

AUT83. Ilium, triangular hollow (bounded dorsally by a horizontal ridge) on the lateral surface of the base of the pubic process

Cetiosaurus

AUT84. Pubis, obturator foramen that occupies most of the obturator plate of the pubis

Anchisaurus

AUT85. Pubis, two foramina in the proximal region	*Sarahsaurus*
AUT86. Pubis, semicircular cross-section of pubic apron, creating a deep trough along posterior surface of pubic apron	*Coloradisaurus*
AUT87. Pubis, expanded pubic process of the ilium as wide as the pubic apron	*Ruehleia*
AUT88. Pubis, elongated proximal pubic plate relative to the pubic apron, with pubic plate approximately 40% of the total length of the pubis	*Xingxiulong*
AUT89. Femur, polygonal shape of the distal articulation of the femur	*Pampadromaeus*
AUT90. Tibia, posteromedial region of the distal surface of the tibia deflected and facing posterodistally	*Coloradisaurus*
AUT91. Fibula, anterior border, rugose scar parallel to the anterior border	*Chromogisaurus*
AUT92. Fibula, anteromedial crest of the proximal head of the fibula	*Vulcanodon*
AUT93. Fibula, anteromedial projection on the distal end of the fibula	*Sefapanosaurus*
AUT94. Astragalus, presence of a well-developed convex bulge on the caudomedial margin of astragalus	*Mussaurus*
AUT95. Astragalus, pyramidal dorsal process of the posteromedial corner of astragalus almost as high as ascending process	*Coloradisaurus*
AUT96. Astragalus, median bulge present on the dorsoposterior margin of the astragalus	*Xingxiulong*
AUT97. Metatarsal III, proximal outline, shelf-like and medially deflected	*Leyesaurus*
AUT98. Metatarsal 2, marked dorsoventral asymmetry of the distal condyles	*Chromogisaurus*
AUT99. Metatarsal III, deep extensor depression, which forms a deep, extensively scarred	*Bagualosaurus*
AUT100. Metatarsal IV, developed medial bump on the anterior surface of the proximal end	*Tazoudasaurus*