**SUPPLEMENTARY MATERIAL**

A review of the stem amniote *Eldeceeon rolfei* from the Viséan of East Kirkton, Scotland

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**Supplementary Material S1**

List of characters used in the phylogenetic analyses.

1. Nostrils slit-like (0), round (1), elliptical and wide (2), elliptical and elongate (3)

2. Maximum diameter of nostril less wide than (0) or almost as wide as premaxilla (1).

3. Premaxilla alary process absent (0) or present (1).

4. Premaxillae more (0) or less than (1) two-thirds as wide as skull table.

5. Absence (0) or presence (1) of an obliquely orientated anterior surface of premaxilla causing the mouth to open subterminally.

6. Absence (0) or presence (1) of a shelf-like contact of the premaxilla and maxilla occurring mesial to marginal tooth row on palate and extending mesially for at least twice the width of such a row.

7. Premaxilla forms a broad (0) or point-like (1) contact margin of the choana, or is excluded by the vomer (2).

8. Absence (0) of a palatal process on the premaxilla or present and at the suture (1).

9. Septomaxilla as a detached ossification inside the nostril: no (0), yes (1).

10. Septomaxilla in contact with nasal (0) or not (1)

11. Nasals more (0) or less than (1) one-third as long as frontals.

12. Parietal/nasal length ratio less than (0) or greater than 1.45 (1).

13. Nasal-frontal suture smooth (0) or interdigitating (1).

14. Nasals contribute to narial margin: no (0), yes (1).

15. Prefrontal less than (0) or more than (1) three times longer than wide.

16. Absence (0) or presence (1) of a prefrontal/premaxilla suture.

17. Prefrontal without (0) or with (1) stout, lateral outgrowth.

18. Prefrontal entering nostril margin: no (0); yes (1).

19. Absence (0) or presence (1) of a prefrontal-maxilla suture.

20. Prefrontal contributes to more (0) or less than (1) half of orbit anteromesial margin.

21. Prefrontal extends beyond the anterior margin of the frontal: yes (0), no (1).

22. Prefrontal-postfrontal meet at a broad (0) or point-like (1) contact or no contact present (2).

23. Prefrontal-postfrontal suture posterior (0), at the same level (1), or anterior (2) relative to the mid-length of the frontal.

24. Prefrontal-postfrontal suture anterior half (0) or middle to posterior half of the orbit (1).

25. Lacrimal allowing for contact between prefrontal and jugal: no (0), yes (1).

26. Lacrimal without (0) or with (1) anteriorly directed, V-shaped emargination along its posterior margin.

27. The total length of the lacrimal is less than (0) or more than (1) two and a quarter times its maximum pre-orbital length.

28. Lacrimal contributes to the narial margin: yes (0), no (1).

29. Highest point of the maxilla in the anterior third of its length (0) or at its mid-length (1).

30. Posterior extremity of maxilla extending behind the level of the orbit’s posterior margin (0) or lying anterior to this margin (1).

31. Frontals shorter (0), longer (1), or approximately equal in length (2) to parietals.

32. Absence (0) or presence (1) of a deeply wedged anterior margin of the frontal into the nasal posterolateral margins.

33. Absence (0) or presence (1) of a parietal-tabular suture.

34. Absence (0) or presence (1) of a parietal-postorbital suture.

35. Anterior margin of the parietal lying in front of (0), level with (1), or behind (2) the orbit mid-length.

36. Parietals more (0) or less (1) than two and a half times as long as wide.

37. Parietal-squamosal suture extending in part onto the dorsal surface of skull table: no (0), yes (1).

38. Parietal-frontal suture strongly interdigitating: no (0), yes (1).

39. Parietal-postparietal suture strongly interdigitating: no (0), yes (1).

40. Absence (0) or presence (1) of lateral parietal lappets.

41. Postparietals paired (0) or unpaired (1).

42. Postparietal less than (0) or more than (1) four times wider than long.

43. Postparietals without (0) or with (1) median lappets.

44. Absence (0) or presence (1) of a postparietal-exoccipital suture.

45. Postparietals entirely on occipital surface: no (0), yes (1).

46. Posteromedial extensions of occipital flanges of postparietals projecting posteroventrally (a rearward process) absent (0) or present (1).

47. Nasals not smaller (0) or smaller (1) than postparietals.

48. Postparietal margin forms a posterior peak along the mid-line (widow’s peak): no (0), yes (1).

49. Postfrontal posterior margin lying flush with jugal posterior margin: no (0), yes (1).

50. Postfrontal is chevron-shaped: no (0), yes (1).

51. Separately ossified intertemporal: yes (0), no (1).

52. Intertemporal not interdigitating (0) or interdigitating (1) with cheek.

53. Absence (0) or presence (1) of an intertemporal-squamosal suture.

54. Intertemporal shaped like a small, sub-quadrangular bone less than half as broad as the supratemporal: no (0), yes (1).

55. Supratemporal forming entire edge of dorsal-most part (in lateral aspect) of temporal notch: no (0), yes (1).

56. Supratemporal narrow and strap-like, and at least three times as long as wide: no (0), yes (1).

57. Supratemporal-squamosal suture smooth (0) or interdigitating (1).

58. Supratemporal margin contributes to the temporal notch: no (0), yes (1).

59. Supratemporal-intertemporal margin irregular (0) or smoothly convex (1).

60. Supratemporal greatly reduced in size no (0), yes (1)

61. Separately ossified tabular: yes (0), no (1).

62. Posterolateral process (extension) of tabular absent (0); outgrowth in the form of spike-like unornamented horn (1); elongate and recurved unornamented blade projecting posteriorly (2); rectangular, unornamented plate-like process (3); conical extension of unornamented portion of posterolateral corner of tabular (4); small rectangular, ornamented plate-like process (5).

63. Absence (0) or presence (1) of a rounded, button-like posterior tabular process lying ventral to the tabular ornamented surface.

64. Tabular-squamosal suture present (0), absent (1).

65. Parietal-parietal width smaller than (0) or greater than (1) the distance between the skull table posterior margin and the orbit posterior margin, measured along skull midline.

66. Tabulars entirely on occipital surface: no (0), yes (1).

67. Tabular narrower (0) or broader (1) than the supratemporal in dorsal view.

68. Postorbital irregularly polygonal (0) or broadly crescentric, narrowing to a posterior point (1).

69. Postorbital not wider (0) or wider (1) than orbit.

70. Postorbital at least one-fourth of the width of the skull roof at the same transverse level: no (0), yes (1).

71. Anteriormost part of the postorbital mesial margin with sigmoid profile in dorsal or lateral aspect: no (0), yes (1).

72. Postorbital not broader than long (0) or broader than long (1).

73. Postorbital acutely triangular ventrally and forming posterior margin of the orbit: no (0), yes (1).

74. Postorbital-supratemporal contact present (0), or absent (1).

75. Quadratojugal is much larger (0) or much smaller than the squamosal (1).

76. Quadratojugal appears as an anteroposteriorly elongate and dorsoventrally narrow splinter of bone: no (0), yes (1).

77. In lateral view quadratojugal underlies jugal (0), jugal-quadratojugal suture is oriented approximately dorsoventrally (1), or jugal underlies quadratojugal (2).

78. Dorsal-most part of quadratojugal above (0) or below (1) highest point of maxilla.

79. Anterior part of squamosal lying posterior to (0) or anterior to (1) parietal mid-length.

80. Squamosal without (0) or with (1) broad, concave embayment.

81. Squamosal sutures with the supratemporal at (0), dorsal to (1) or ventral to (2) the apex of the temporal embayment.

82. Unornamented otic flange of squamosal absent (0), narrow (1), narrow dorsally and broad ventrally (2), narrow ventrally and broad dorsally (3).

83. Jugal not contributing (0) or contributing (1) to skull table ventral margin.

84. Absence (0) or presence (1) of a jugal-pterygoid contact.

85. Depth of jugal ventral to orbit greater (0) or smaller (1) than half of anteroposterior orbit diameter.

86. Jugal without (0) or with (1) V-shaped indentation of its orbital margin.

87. Jugal not extending (0) or extending (1) anterior to orbit anterior margin.

88. Quadrate without (0) or with (1) a dorsal process.

89. Absence (1) or presence (0) of a preopercular.

90. Naris size less then (0), equal to or greater than (1) 50 percent the size of the choana.

91. Naris height is greater than (0), equal to or less than (1) the distance from the naris ventral rim to jaw margin.

92. Internarial fenestra: absent (0); present (1).

93. Interorbital distance greater than (0), smaller than (1), or sub-equal to (2) half of skull table width.

94. Interorbital distance greater than (0), smaller than (1), or sub-equal to (2) maximum orbit diameter.

95. Absence (0) or presence (1) of an angle at the anteroventral corner of the orbit.

96. Orbit deeper than long: no (0), yes (1).

97. Orbit anteroposterior diameter shorter (0), longer (1), or sub-equal to (2) distance between orbit posterior margin and suspensorium anterodorsal margin.

98. Absence (0) or presence (1) of an elliptical orbit with long axis anterodorsally-posteroventrally orientated.

99. Position of midpoint of maximum anteroposterior orbit diameter closer to tip of snout than to posterior end of skull (0), at mid-length of skull (1), or closer to posterior end of skull than to tip of snout (2).

100. Absence (0) or presence (1) of antorbital vacuities.

101. Pineal foramen diameter 33% or greater than the anteroposterior length of the parietal suture: no (0), yes (1).

102. Pineal foramen occurring posterior to (0), at the level of (1), or anterior to (2) interparietal suture mid length, or absent (3).

103. Posttemporal fenestra occurring at occiput dorsolateral corner, delimited dorsally by the skull table, not bordered laterally and floored by dorsolateral extension of opisthotic (0); fossa present near occiput dorsolateral corner, delimited dorsally by occipital flanges of tabular and postparietal and bordered laterally as well as ventrally by dorsolateral extension of opisthotic meeting tabular ventromedial flange (1); small fossa present near occiput ventrolateral corner, bordered laterally by tabular ventromedial flange, delimited dorsally by dorsal portion of the lateral margin of the supraoccipital–opisthotic complex and floored by lateral extension of opisthotic (2); or absence of a fossa (3).

104. Absence (0) or presence (1) of squamosal contribution to posttemporal fenestra.

105. Distance from quadrate to temporal embayment anterior margin equal to (0), less than (1) or greater than (2) the maximum orbit width.

106. Absence (0) or presence (1) of a shallow, vertical temporal notch.

107. Postorbital region of skull table abbreviated and at least one-third wider than long: no (0), yes (1).

108. Skull longer than broad (0), as broad as long (1), or broader than long (2).

109. Absence (0) or presence (1) of bilateral embayments of skull margins.

110. Preorbital region of skull less than twice as wide as long (0) or at least twice as wide as long (1).

111. Dermal ornament of the skull is regular with star burst patterns at areas of growth (0), irregular and deep (1), irregular and shallow (2) or, partially or fully absent (3).

112. Lateral line system on skull table totally enclosed (0), mostly enclosed with short sections in grooves (1), mostly in grooves with short sections enclosed (2), entirely in grooves (3), or absent (4).

113. Mandibular canal totally enclosed (0), mostly enclosed with short sections in grooves (1), mostly in grooves with short sections enclosed (2), entirely in grooves (3), or absent (4).

114. Lower temporal fenestra delimited by postorbital squamosal and jugal; absent (0), present (1)

115. Ventral, exposed surface of vomers (excluding any areas of overlap with surrounding bones) narrow, elongate and strip-like, without extensions anterolateral and posterolateral to the choana, and two and a half to three times longer than wide: no (0), yes (1).

116. Vomer with (0) or without (1) fangs comparable in size to, or larger than, marginal teeth of either the premaxilla or maxilla.

117. Vomerine fangs noticeably smaller than other palatal fangs: no (0), yes (1).

118. Vomer without (0) or with (1) small teeth (denticles) forming continuous shagreen or discrete, patches, the basal diameter and/or height of which is less than 30% of that of adjacent marginal premaxilla or maxilla teeth and any remaining vomer teeth.

119. Vomer excluded from (0) or contributing to (1) interpterygoid vacuities.

120. Vomer forms a suture with the maxilla anterior to the choana: no (0), yes (1).

121. Vomer with (0) or without (1) toothed lateral crest.

122. Vomer with (0) or without (1) transversely orientated, anterior crest.

123. Vomers separated by the pterygoids for more (0) or less than (1) half their length or not separated at all (2).

124. Palatine with (0) or without (1) fangs comparable in size to or larger than marginal teeth (premaxillary or maxillary).

125. Palatine without (0) or with (1) small teeth (denticles) forming continuous shagreen or discrete patches, the basal diameter and/or height of which is less than 30% of that of adjacent marginal teeth (maxillary) and remaining vomer teeth (if present).

126. Palatine with (0) or without (1) row of 3 or more teeth comparable in size to, or greater than marginal maxillary teeth and parallel to these.

127. Presence (0) or absence (1) of a separately ossified ectopterygoid.

128. Ectopterygoid with (0) or without (1) fangs comparable in size to or larger than marginal premaxillary or maxillary teeth and any remaining ectopterygoid teeth.

129. Ectopterygoid without (0) or with (1) small teeth (denticles) forming continuous shagreen or discrete patches, the basal diameter and/or height of which is less than 30% of that of adjacent marginal premaxilla or maxilla teeth and any remaining ectopterygoid teeth.

130. Ectopterygoid longer than/as long as (0) or shorter than (1) palatine.

131. Ectopterygoid with (0) or without (1) a row of three or more teeth comparable in size to, or greater than, marginal maxilla teeth and parallel to these.

132. Ectopterygoid boarders the adductor fossa: no (0), yes (1).

133. Palatine-ectopterygoid confined to a narrow width (0) or a broad mesial exposure (1).

134. Absence (0) or presence (1) of a single row of large teeth on the anterior process of the pterygoid.

135. Transverse flange of pterygoid without transverse tooth row or with shagreen (0), with row of large teeth (1), with row of small teeth (2)

136. Transverse pterygoid flange absent (0), present as an incipient downturning [torus transiliens] (1), present as a distinct ridge (2).

137. Pterygoid without (0) or with (1) a posterolateral flange.

138. Pterygoids sutured with each other: no (0), yes (1).

139. Pterygoid without (0) or with (1) a distinct mesially directed process for basipterygoid articulation.

140. Vomer-palatine contact present (0) or prevented by the pterygoid (1).

141. Absence (0) or presence (1) of a secondary palatal shelf of the palatine and ectopterygoid.

142. Presence (0) or absence (1) of interpterygoid vacuities.

143. Interpterygoid vacuities occupy at least half of palatal width: no (0) yes (1).

144. Interpterygoid vacuities concave along their whole margins: no (0), yes (1).

145. Interpterygoid vacuities together broader than long: no (0), yes (1).

146. Anterior palatal vacuity present and single (0), present and double (1), or absent (2).

147. Absence (0) or presence (1) of ossified supraoccipital.

148. Exoccipitals enlarged, about as broad as high and forming stout occipital condyles: no (0), yes (1).

149. Basioccipital notochordal: yes (0), no (1).

150. Basioccipital articulation convex: no (0), yes (1).

151. Opisthotic forming a thickened plate fused together with the supraoccipital, preventing the exoccipitals from contacting the skull table: no (0), yes (1).

152. Occiput nearly vertical (0) or sloping anterodorsally (1).

153. Parasphenoid without (0) or with (1) elongate, strut-like cultriform process.

154. Absent (0) or presence (1) of an anterior, triangular, wedge-like, more or less distinct process immediately anterior to level of basipterygoid processes.

155. Parasphenoid without (0) or with (1) a pair of posterolaterally orientated, ventral thickenings (ridges ending in basal tubera).

156. Parasphenoid without elongate, broad posterolateral processes (0), with processes that are less than (1), or at least half as wide as (2) parasphenoid plate.

157. Parasphenoid without (0) or with (1) a single median depression.

158. Parasphenoid without (0) or with (1) paired lateral depressions.

159. Ventral cranial fissure sutured and traceable (0), or not traceable (1).

160. Parasphenoid cultriform process with shagreen (0), with patch of denticles (1), with radiating ridges and denticle rows (2), smooth (3).

161. Parasphenoid sutured to the vomers: yes (0), no (1).

162. Lower jaw shorter (0), subequal (1) or deeper (2) than the skull in lateral view.

163. Jaw articulation lying posterior to (0), level with (1), or anterior to (2) the occiput.

164. Presence (0) or absence (1) of a parasymphysial plate.

165. Parasymphysial plate without (0) or with (1) paired fangs, comparable in size with or greater than dentary teeth.

166. Parasymphysial plate without (0) or with (1) anteroposterior tooth row orientated subparallel to marginal dentary teeth and the basal diameter and/or height of which is 30% or greater than that of marginal teeth and twice or more that of denticles, if present.

167. Parasymphysial plate with (0) or without (1) small teeth (denticles) forming continuous shagreen or discrete patches and the basal diameter and/or height of which is less than 30% of that of adjacent marginal dentary teeth.

168. Dentary with (0) or without (1) accessory tooth rows.

169. Dentary with (0) or without (1) anterior fangs generally comparable in size with, or greater than, other dentary teeth and lying close to symphysial region and usually mesial to marginal dentary teeth.

170. Absence (0) or presence (1) of a sigmoid dentary.

171. Absence (0) or presence (1) of a posteriormost extension of splenial mesial lamina closer to anterior margin of adductor fossa than to anterior extremity of jaw, when the lower jaw ramus is observed in mesial aspect and in anatomical connection.

172. Absence (0) or presence (1) of a splenial-anterior coronoid suture.

173. Absence (0) or presence (1) of a splenial-middle coronoid suture.

174. Presence (0) or absence (1) of a separately ossified postsplenial.

175. Postsplenial without (0) or with (1) mesial lamina.

176. Angular without (0) or with (1) mesial lamina.

177. Angular not reaching (0) or reaching (1) lower jaw posterior end.

178. Surangular lateral exposure much smaller than angular lateral exposure: no (0), yes (1).

179. Presence (0) or absence (1) of a prearticular-splenial suture.

180. Denticulated field on the prearticular with defined edges (0), scattered patches (1) or absent (2).

181. Presence (0) or absence (1) of a separately ossified anterior coronoid.

182. Anterior coronoid with (0) or without (1) fangs comparable in size to or larger than marginal dentary teeth.

183. Anterior coronoid with (0) or without (1) small teeth (denticles) forming continuous shagreen or discrete patches and the basal diameter and/or height of which is less than 30% of that of adjacent marginal dentary teeth.

184. Anterior coronoid with (0) or without (1) a tooth row.

185. Presence (0) or absence (1) of a separately ossified middle coronoid.

186. Middle coronoid with (0) or without (1) fangs comparable in size to or larger than marginal dentary teeth.

187. Middle coronoid with (0) or without (1) small teeth (denticles) forming continuous shagreen or discrete patches and the basal diameter and/or height of which is less than 30% of that of adjacent marginal dentary teeth.

188. Middle coronoid with (0) or without (1) anteroposterior tooth row orientated subparallel to marginal dentary teeth and the basal diameter and/or height of which is 30% or greater than that of marginal teeth and twice or more that of denticles, if present.

189. Posterior coronoid with (0) or without (1) small teeth (denticles) forming continuous shagreen or discrete patches and the basal diameter and/or height of which is less than 30% of that of adjacent marginal dentary teeth.

190. Posterior coronoid with (0) or without (1) anteroposterior tooth row orientated subparallel to the marginal dentary teeth and the basal diameter and/or height of which is 30% or greater than that of marginal teeth and twice or more that of denticles, if present.

191. Posterior coronoid without (0) or with (1) posterodorsal process.

192. Posterior coronoid exposed in lateral view: no (0), yes (1).

193. Posterodorsal process of posterior coronoid contributing to tallest point of lateral margin of adductor fossa: no (0), yes (1).

194. Adductor fossa facing dorsally (0) or mesially (1).

195. Relatively small posterior Meckelian fenestra between prearticular and angular absent (0), present and small (1), or present and large (2).

196. Relatively small anterior Meckelian fenestra between splenial, postsplenial and prearticular absent (0), present and small (1), or present and large (2).

197. Absence (0) or presence (1) of a single, large elongate Meckelian fenestra leaving narrow mesial exposure of splenial.

198. Absence (0) or presence (1) of an anterior elongate fenestra between ventromedial anterior lamina of dentary and splenial.

199. Teeth incurved in anterior aspect: no (0), yes (1).

200. Absence (0) or presence (1) of a conspicuous peak involving one or more premaxillary teeth.

201. Absence (0) or presence (1) of a conspicuous peak involving one or more anterior maxillary teeth.

202. Dentary teeth larger than maxillary teeth: no (0), yes (1).

203. Marginal tooth crowns chisel-tipped: no (0), yes (1).

204. Number of maxillary teeth greater than 40 (0), between 30 and 40 (1), less than 30 (2).

205. Number of premaxillary teeth greater than 4 (0), equal to 4 (1), or less than 4 (2).

206. Cleithrum with (0) or without (1) postbranchial lamina.

207. Cleithrum distal end marked from a narrow stem by a notch or process, or a decrease in thickness (0) or tapering (1).

208. Cleithrum stem a flattened oval (0), complex (1) or a single concave face (2) in cross-section.

209. Clavicles meet anteriorly: yes (0), no (1).

210. Interclavicular stem absent (0), slightly elongated and subtriangular with blunt posterior end (1), elongate and rod-like and with broadened anterior portion (2), elongate and rod-like and with broadened posterior portion (3), elongate and rod-like and with midlength expansion along shaft (4), elongate and rod-like but without expansion along shaft and shaft with more or less posteromedially converging lateral margins (5)

211. Interclavicle wider than long (excluding parasternal process, if present): no (0), yes (1).

212. Interclavicle rhomboidal with posterior part longer (0) or shorter (1) than anterior part.

213. Transversely elongate grooves and ridges on central part of interclavicle ventral surface: absent (0); present (1).

214. Absence (0) or presence (1) of a separate scapular ossification.

215. Glenoid subterminal: yes (0), no (1).

216. Presence or absence of an anocleithrum.

217. Latissimus dorsi process part of a ridge (0), a distinct but low process (1) or a spike (2).

218. Latissimus dorsi process offset anteriorly relative to the ectepicondyle (0) or aligned with the latter (1).

219. Absence (0) or presence (1) of a distinct supinator process projecting anteriorly.

220. Presence (0) or absence (1) of a sharp-edged, ventral humeral ridge.

221. Presence (0) or absence (1) of an ectepicondyle foramen.

222. Presence (0) or absence (1) of a distinct ectepicondyle ridge.

223. Distal extremity of ectepicondyle ridge aligned with the ulnar condyle (0), between the ulnar and radial condyles (1), or aligned with the radial condyle (2).

224. Humerus without (0) or with (1) a waisted shaft.

225. Humerus with little torsion so ends appear in line with one another (0) or torsion offsetting ends by more than 60 degrees (1).

226. Terminal (0) or ventral (1) position of the radial condyle.

227. Humerus slender and elongate, its length being more than three times the maximum width of its distal end: no (0), yes (1).

228. Width of entepicondyle greater (0) or smaller (1) than half humeral length.

229. Portion of humeral shaft length proximal to entepicondyle smaller (0) or greater (1) than humerus head width.

230. Presence (0) or absence (1) of accessory foramina on the humerus.

231. Humerus length greater (0) or less (1) than combined length of two and a half mid-trunk vertebrae.

232. Absence (0) or presence (1) of a process ‘2’ on the humerus.

233. Presence (0) or absence (1) of entepicondylar foramen.

234. Radius longer than (0), as long as (1), or shorter than (2) the ulna.

235. Absence (0) or presence (1) of an olecranon process.

236. Absence (0) or presence (1) of a dorsal iliac process.

237. Posterior iliac process subhorizontal, stout, abbreviated posteriorly and tapering rearward in lateral aspect: no (0), yes (1).

238. Absence (0) or presence (1) of a transverse pelvic ridge or iliac shelf (2)

239. Absence (0) or presence (1) of a slender or blade-like posterior iliac process.

240. Number of pubic obturator foramina: multiple (0), single (1), or absent (2).

241. Internal trochanter raised as a distinct protuberance: no (0), yes (1).

242. Internal trochanter separated from the general surface of the femur shaft by a distinct, trough-like space: no (0) yes (1).

243. Fourth trochanter of the femur with a distinct rugose area: no (0), yes (1).

244. Proximal end of the femur adductor crest reaching midshaft length: no (0), yes (1).

245. Femur shorter than (0), as long as (1), or longer than the humerus (2).

246. Outline of the tibia medial margin shaped like a distinct, subsemicircular embayment contributing to interepipodial space and the diameter of which is less than one-third of the bone length: no (0), yes (1).

247. Tibia without (0) or with (1) flange along its posterior edge

248. Fibula waisted: no (0); yes (1).

249. Absence (0) or presence (1) of a ridge near the posterior edge of fibula flexor surface.

250. Absence (0) or presence (1) of rows of tubercles near posterior edge of the fibula flexor surface.

251. L-shaped proximal tarsal element: absent (0); present (1).

252. Cervical ribs with (0) or without (1) flattened distal ends.

253. Ribs mostly straight (0) or ventrally curved (1) in at least part of the trunk.

254. Absence (0) or presence (1) of broad rectangular flanges in at least some trunk ribs.

255. Trunk ribs shorter than neural arch and centrum height (0), less than (1), or more than (2) two and a half times this height.

256. One (0) or two (1) sacral vertebrae.

257. Number of presacral vertebrae: 30 (0), 30–38 (1), more than 38 (2), 30–28 (3), or fewer than 28 (4).

258. Axis arch not fused (0) or fused (1) to axis (pleuro)centrum.

259. Atlantal pleurocentrum preventing contact between the atlantal and axial intercentra (0) or not preventing contact (1).

260. Relationship of atlantal pleurocentrum to axial intercentrum. Atlantal pleurocentrum contacts or is narrowly separated from anterior surface of axial intercentrum (0); atlantal pleurocentrum articulates with or is fused to the dorsal surface of the axial intercentrum (1).

261. Anteriorly directed, mid-ventral process of axial intercentrum. Midventral process of axial intercentrum absent (0); present (1).

262. Absence (0) or presence (1) of ossified pleurocentra.

263. Trunk pleurocentra fused midventrally: no (0), yes (1).

264. Trunk pleurocentra fused middorsally: no (0), yes (1).

265. Trunk pleurocentra and intercentra differ in height by more than 25% (0) or roughly equal in height (1).

266. Neural arches without (0) or with (1) distinct convex lateral surfaces, giving them a swollen appearance.

267. Neural arches of trunk vertebrae fused to centra: no (0), yes (1).

268. Trunk intercentra fused mid-dorsally: no (0); yes (1).

269. Tallest ossified part of neural arch in posterior trunk vertebrae aligned vertically with the posterior half of vertebral centrum: no (0), yes (1).

270. Absence (0) or presence (1) of postzygapophyses on the trunk vertebrae.

271. Height of the ossified portion of the neural arch in mid-trunk vertebrae greater (0) or smaller (1) than the distance between pre- and postzygapophyses.

272. Sacral centra distinguishable by size and shape from pre- and post-sacral centra: no (0), yes (1).

273. Manus with five (0) or four (1) digits

274. Astragalus. Tibiale, intermedium, and proximal centrale not fused to form an astragalus (0); fused in adults to form an astragalus (1).

275. Scales tapered and elongate (0) or ovoid (1).

276. Presence of: non-amniote inner ear (small cochlear recess forming small extension of the vestibule) (0) or amniote inner ear (large cochlear recess of mostly triangular shape in lateral view (1).

277. Position of cochlear recess relative to vestibule: posteriorly (0), posteroventrally (1) or ventrally (2).

278. Absence (0) or presence (1) of distinctly developed subarcuate fossa in the braincase bone(s) housing flocculus of cerebellum.

279. Otic tube (=otic canal): absent (0) or present (1).

280. Otic trough: absent (0) or present (1).

281. Semicircular canals: the entire or posteromedial section of anterior semicircular canal and the entire posterior semicircular canal have a direct course, lie in the horizontal plane and make an approximate right angle in the region of the crus commune (0) or these semicircular canals make distinct arches (1).

282. Posterolateral corner of skull table: formed entirely by tabular (0); formed entirely or nearly entirely by supratemporal (1); formed subequally by the supratemporal and tabular (2).

283. Position of the jaw articulation. At approximately the same level as the dental occlusal plane (0); below level of dental occlusal plane (1).

284. Labial parapet. Absent (0); low, where the parapet never projects higher than the bases of the cheek teeth (1); tall, where the parapet is as tall or taller than the occlusal surface of the teeth near the posterior end of the tooth row (2).

285. Degree of molarization of the largest preserved mid-series cheek teeth. Absence of molarization (0); low degree of molarization in the development of labial and lingual cusps or shoulders and transverse expansion of crowns (1); high degree of molarization in which labial and lingual cusps or shoulders are well developed and the ratio of the anteroposterior length to mediolateral width and dorsoventral height to mediolateral width of the mid-series cheek teeth are both less than 0.50 (2).

286. Processes of the atlantal neural spines. Atlantal neural spines possess large, posterodorsally directed processes(0); the atlantal neural spines possess small epipophyses (1).

287. Shape of unguals of manus and pes. Long, narrow, recurved, and pointed (0); hooflike in being short, flattened, bluntly pointed to rounded with the dorsal and ventral surfaces meeting along the lateral and distal margins in a narrow edge (1).

288. Keratinous sheath or claw of manus and pes unguals. Absent (0); present (1).

289. Iliac blade obliqueness no (0), yes (1)

290. Postorbital without distinct ventrolateral (jugal) ramus (0), with incipient ramus (1), with

well-developed and elongate ramus (2).

291. Length of postorbital region of jugal more (0) or less (1) than one-third of the length of the postorbital cheek region.

**Supplementary Material S2**

Data matrix in NEXUS format; character-states enclosed in round and curly brackets denote, respectively, polymorphic and uncertain coding.

#NEXUS

BEGIN TAXA;

DIMENSIONS NTAX=54;

TAXLABELS

Anthracosaurus Archeria Ariekanerpeton Balanerpeton Baphetes Bruktererpeton Caerorhachis Calligenethlon Captorhinus Carbonoherpeton Chroniosaurus Crassigyrinus Dendrysekos Desmatodon Diadectes\_absitus Diadectes\_sideropelicus Diasparactus Dimetrodon Discosauriscus\_austriacus Eobaphetes Pholiderpeton\_attheyi Eoherpeton Eothyris Eucritta Gephyrostegus Greererpeton Karpinskiosaurus Labidosaurus Leptoropha Limnoscelis Makowskia Megalocephalus Microphon Oedaleops Orobates Ossinodus Palaeoherpeton Paleothyris Pederpes Petrolacosaurus Pholiderpeton\_scutigerum Proterogyrinus\_pancheni Proterogyrinus\_scheelei Seymouria\_baylorensis Seymouria\_sanjuanensis Silvanerpeton Solenodonsaurus Spinarerpeton Tseajaia Utegenia Varanops Westlothiana Whatcheeria Eldeceeon

;

END;

BEGIN CHARACTERS;

DIMENSIONS NCHAR = 291;

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

MATRIX

Anthracosaurus ?0010000??001110000000000010001010210000001001010001000011000101101000000000011011001110110011002020023?201000244?11?0?011?0?100000100?00?000000020010100010101?110????110?10011?0?201??????0000??00100010022????????????????????????????????????????????????????????????????????????????0000????00

Archeria 210100?0??000110000000001010011010210010001001010000000001100101001100001?000010111110101?0011001020023?000000{01}3?0????0???????0?0?000001010000000?00101000101013?00000111011101100020101010101110122000100102102110000011100102000001111021101111011200110101?20100001111001010100???????0000000101

Ariekanerpeton 2101000001000100000001110000012010210000010?0000000010000100030110110101010001101210100?1000200020000210101101{12}33010010011001101101110021?00000002?0?0??011200131211???110?1?01110?2010101010110111?010000020112021001??1?01102110000110010?1?0?????20?1???010104????1100100010?001??????0000?00121

Balanerpeton 10100010??000100000001210000001000210000000?0000000101001100000100010000100000110200100011101100201002??101000044000?11011201100101110?01000001112?010??100000130?01???10001001100120101010101???10000000100010?100000?1??0111?1100001100110001?11?020010000000040?0010000000100101??????0000000101

Baphetes 1000001000001100100000000100001000210??0000000000001011011000011000000000000101023100100110012002021001020000003?000010011201100101110?0010001???200?010000001101?00101??0???0?????2??????????????????0000010?01????????20001020100001?00??100???????00110?????04??????????0?????00??????0000????00

Bruktererpeton 3?0???{01}???0001?0?0000?????101?1010210000010?0?00?000?000001000??000???????????????????????10??????2002???01000{23}??0?00?????20??011??110???1?00?????????????????????????????????????????????????????????0?0?0101{01}2?2???1??1101102001001110121?????110120010010102????001100000010??01??????0000000???

Caerorhachis ??0???????00?1??????0001??0?00?000210110000?0?00?001?000??0000?000?100001000?0100??0????11?0?????0??0???2000??0??0?0110?111011001010?0?00100000002?0?????000101?1001???10011001100000101010101100122000?0000??????????????????????????????11010?11?1?001??10101?30?001100000010??00??????00000001??

Calligenethlon ????????????????????????????????11?10000001?0??1?00??0?0??10010?001?????????????????????????????????01???0????0{04}?????????????????????0???????1????????????????????????????????????????????????????????0?0?0?????1?11011????????1??0111?0121101111101?00100??101?1????111000(01)?101??0????????0????1??

Captorhinus 110110200?001100000002??00101110?121100001001000011???000??110??0??0000011101010?01110101?00110000100211?00010344011?00011?1?11?????10120100000002101100001110101211???010???1?110021???1???11111101000110021???151000111101102111011110021000011111200100101021411101110110111101?121001?000101120

Carbonoherpeton ??????????????0?000?1???10??11?????????????????????????????????????0??0?0?0010?0??11?11?1?????01?1?0????????0?04?0????????????000?0???????????????????????????????0???????????????????????????????????0???02????????0????????????????1?00???????1111???????1101??????1111001010???????????000??????

Chroniosaurus 30?10?????001100000002??1010002010210000000?0001001???00?110001100{01}10000101100110201101?11111200002002??00000014?0100100110010001?0110?01100000002??????011110131?0?????1??1??110?0??111010111???1????0010010???11001?????0111?1??00?1000??0001?0????1?1??0?10??40???111100101????1??????0000000120

Crassigyrinus 0000012011001100010001011000001000210??0001?01000100?0000110040100000000000000100100000011111110202000??200000113000000000001000000000?001000?0001??00??001010011200101100100001000101010101?????000100000010?01??000???110000{12}000000000000100??1111201110??102?1????0???0?0?00???0??????0000000?00

Dendrysekos 101000?1100001000000001100000000002101100101000100010000110000110001000000000011120010?111112000001002??00000004?000111?11201100101?10?01010001102?110??10000013020??????0???01100??0???0????????11000000000010?10000001??011021100001100110011111?12001??00001?4????1000000010?1?1?????10000?00100

Desmatodon ??0?00?????????????????????????????????????????????????????????????????????????????????1??????????????20??????2????????????101???????112??1?1??????????????????????1???1111??1?110021???01111111100011001?121????????????????????????????????????????????????????1?1?111??1???????????????111??????

Diadectes\_absitus 0011?0001000110000000011000001101121000111001100011???0001?000011101000000100000?11010011110200010201220111000144011?0001121010101111102?10111???2?01110001110131211???1111??1?110021???1????111110011001012110012100111?011102111000100021112011010200100101011411111111110010?01?1011102122111101

Diadectes\_sideropelicus ??011000??00110000000011000011100121000110101100001????001?000011100000000101100?1100001100000000020112011100014?011?0?01121000101111102??011????2001110001010131????????1????????????????????????????0?1?121????2?????????????????????????????????????????????1?1111????????????1???????2122111?01

Diasparactus ??????0????????????????????????????????????????????????????????????????????????????????0???????????0???????0?????0????????2?????????????????1?????????????????????1????101?????????2??????????1???001100??12110002?0011111111001110101000201120111?0100100?01?014????111?11?1101?1????????122?111??

Dimetrodon (13)101(01)00?000001(01)0000002??00?101101121?0111010110?001????10??000011011000010????10?01?00111110200000201120?01000?44111?000112111011110102211000100021011111?????13??11???10111?1?1110211111???1111110000011002211?15000011?111102?1101010002101?01111120010011102141000111?01?11?1?1?????1?2?00101120

Discosauriscus\_austriacus 2101000001000100000001110000012010210000010?01000000100001100301101100010100001112101001100011002000021000110103301001001100110110111002110001???2?0?0??011200131211???11011101110020101010101111111010000020112021001001001102110000110010112011000200100?0001040???111010001000?1??????0000000121

Eobaphetes ???1???0????1100000010011011?01010210000001?0?0?000010?0011001001010000001001?001?01?1101???100?0?2000???0100013?0????????????00??????????????????1???????????????01???110010011001201?101?10100?122000???0??????????????????????????????????????????????????????????????????????????????0000??????

Pholiderpeton\_attheyi ??010?{12}0??001100000010001011001010210000001?0111000100000110010100000100100010101111111011101100002001??201000133011?0000011?100000100?00100000002??????0000101?1001???1100100110012010101010100?122000011102?0???100???????????????????????????0?0?????????1020?????111?011010??00??????0000000?00

Eoherpeton 100100????0011000000001?1010011010210000000?01010000?00000100401001?00000?0000?00100101?11?020?00020023?10000024401????????0?000?000?0?00?000?????????10?010101??2?????1?011101100000101010101?0?1?10?0000020????????01?11001010000011?1???101?1???1?00110??102??????1100000010??????????0000????00

Eothyris 31?11?????001100000002??0000?0101121?11100101101011????00??000?100?1000010110?00?00?100?1?102100202011?0?00000?441????????????????????22??0???????1???11??????????1??????0??????10????????????111??????010?2{12}?????100????????????????????????????????????????????????????????????????????1?00????20

Eucritta ??000??0??001100000000010100?020002100000?0?000000010110110000?1000100010000??002{123}1?100?11?01110100000??0000010??0?0010011101100??0?10?0?10001??????????0010101?1?0??????????????????????????????????????002??01110000?1??0?10?0000001?001110?0?????2001???00010??????????????????0??????0000?0010?

Gephyrostegus 300100?0??000100000002??0010011110210000010?010?0000?0000?1005?10001000?10000010?100100011001100202002??2010002440100100???01100111110010100000002?0?0??01?2??13?2?1???1001110000002000100010111010010000000010212000011?10110200100111002110{0 1}11??0120011010102?4000011000000101011??????0000000120

Greererpeton 10000110??110011011000000001001{01}0120011000000011001???001?0000100000110000001000000000001100100000100010100000022001?0001110?000000010?00100000001001010100001131?001011001100010002001001010111?0001001010000010001000111001010000001000210000111112001000100102000010000000100001??????0000000000

Karpinskiosaurus 2101000001011100000000110000000010210010000?010000001010010000010011000111000111{01}200100?10011000000002??00020114401001001100110?101110021?00000002?0?0??011200131201???110???0111?02??????????11111?011000020????????????????????????????????????????????????????????????????????????????0000????20

Labidosaurus 3111100100001100000102??0000?110?121010001001000011????00??11???1??0111001101110?01000101010210000100211?00010244011?000110111010111100201000000021?11001?111013?{12}01???1101??1?110021???1???11111101000100021???051??101{01}10110211101010002100{01}0100112001001?10214????11101101111?1?1210011?00?0?120

Leptoropha ??????????001?0?0??00011????0?2010210000010?0?0010000000011000?010110100000???101???10??1???20?020000210?0120103?0???????????????????0????0???????????????????????2????110????????????????????????????0?000??????????????????????????????????????????????????????????????????????????????0000????21

Limnoscelis 31111000100011000000000000001111112101011?001000001???0001?000011110000000102110?01010011110000000200220?01010344011?000112111010110001211000000020?1110001000131011???10011?1?1100200011???011?110010011102111??????11??011102111000110021112010?10100110?010?1411111110110110?00?????1?1000111120

Makowskia 2101000011011100000000110000111010210000000?0100000010000100030110110001011001111210000?10011001100002??101201{01}3?010010011000101001110021100000?02??10??011201131211???1100??01110?????????????1??????1000020112?41101?1110100?11???01?00???????11??200?????1?1??????111?10???????1??????0000?00?21

Megalocephalus 100000100000011010000000010100100021000000000000001???101100001?000000000000?010230101001100120000210010200000033000010011201100101110?0010001???00010100000011010001011001110110002011101111100?101000000010????????????????????????????????????????????????????????????????????????????0000????00

Microphon 2?0100000?000100000000100000010010210000010?0?0000001000011000001011010101100?101?10100?11?0000020000210?01201233011?10000011101100110021?000????2??????0???001???2????110???0??10?2??????????????????0000020????????????????????????????????????????????????????????????????????????????0000????21

Oedaleops 31011?????001100000002??0000?1101121?1(01)1001?1101011????00??000?10??100100011?110?0??100?1?1??100{12}0201{01}?0?00000?4?1?????????????????????????????????????1????????????????????????????????????????????????1????????51?001?111?10210?01???002100{01}0200?120?????????????????????????????????????00???120

Orobates ??010??01100110000000000001011101121010111001100001???0101?000?11101000001000110?{12}1?100?1?00000010201020?110013440????1????101010110?122000000000?10??100012101?122?????101??1?11102????????111?11001?001?12210??2?????1?11?10211?00010012111101000?20?1??1010?1411111???1??110101?100110211111110?

Ossinodus ???00?2???????0?0?????????0?0?1?00?0000000??0??0?00???00010000?1?00?????0?01????1??????00?0?2???????00??200???01??000001?0100000000100???1?0000?02??????????????1?????????????????????????????????????001?01?1010?111?0????????????????????1010?0100?01010?000???????????00??1??????????????0???0??

Palaeoherpeton ??01????0?00100000000000100000101021000000?00?01000100000110010100000000000010101110001?1?0?11002000023?20100013?0????????1????????0?0?0110??00???1???????????????0???????????????????????????????????0?1?02??????????????????????????????????????????????????0??????????????????????????0000????00

Paleothyris 110100?0??001110000002??001011101121110001001?00101???010?0100010111000?01000110?01010001000110010200011101000{23}44011?00011211????????01201000000021011000011101?121????1101??1?1100???????????????????0010010???1????01??11110211111110001100011110120010011102111110111?0101101010??????1000101120

Pederpes {01}?0?0????????100000100?0000010?000????1000000?000001101011000011100000000?00???02??0101?010?210110?0????20000021?0?0010????010001000?0?0?10000000???????0010000??20??????0????000??1?????0???????0????0?1002?0011??011??210110100000010001010?0?0000210110?0012?30???10?0000010???1??????0000?0?0?0

Petrolacosaurus 110100?0??001100000002??00?001101121100?1100100?111???000??1000111000001?1102?10?01010001??0110010200211?01010?44011?10011?11101011000120100000002101110001110111211???1101??0111002????1???1111010001001001110214100011?111102111111110021000011001200100101011411101110?10110?01???????1?00101121

Pholiderpeton\_scutigerum ??0100?0??00?10?00?0???01011011?1??10??0001001010?00?00000100101?0??0000000010?001010000110011000020003?200000233011?0001110?10000000001010??0000200101000101013120000110011101100020101010101110122000000101101?1???0001??0?0{12}?0?0111??021????????????????0102??????11110010101??1??????0000000?00

Proterogyrinus\_pancheni ??????????????????????????????1?10?10000001?0??0?000?0?0??1001????1??????????????1??????????????????02??????0?14?0?????????????????????????????????????????????????????1?011?01100?00101????0100?122001???1????????00?????0?????1???????????????1011?????????????????1110010010??????????00?0????00

Proterogyrinus\_scheelei 100100?0??00001000000100?0100010102100000010010100000000011001010011000000000010011110?0110011002010023?200000234011??00???011001?0000?0010?00000?00101000101013110????10011?0?100?20?000101010??12200001010010?1100000111001020110001110111011010112001101010201000011000000100001??????0000000100

Seymouria\_baylorensis 31010000110011000000001000100110102100000001010000011000110003011010000101000110121000111110200000100210201000044010010011001101101110021100000002001000011200131211???1101110111002010101010111111101001002010?03?0011111111021110001100211120100?02001???00011401001110110110100?0001110000000121

Seymouria\_sanjuanensis 31?10??0110011000000001000?0011010210000000?010000011000110003011011000001000110121?10011?10000?001002??20100004?0????????????????????02?????????????????11????31?????????????????????????????????????0?1?02??0??5??????1111102111000110021????????????1100?0011401?0111?100110100?0001110000?00?21

Silvanerpeton 21010??0??000100000001000000001010210000000?0?0000000000000001000001010000002010011?100?1?002100100002??100000{012}4?01001??11001???????10?00100?00002??10?000101010?20????1?01??01?00??????0???0100?1????0000010?0?110000????0?10?00001110002010{01}1?????2??1??0010{12}?{03}????1100000?1??001??????0000?00010

Solenodonsaurus ???1???0??0011?0000010010010?111112101110???0?01001???00111001??0011000001110?10?{12}1?100?1???1000010002???010??24?0??????????????????1?????????????????????????????0??????0???????0?2??????????????????0?0?01?1???310?0?????110211?00?110020????????????????0102?1????111001?010???????????000????{01}0

Spinarerpeton 210100001100110000000110000011201021000000100100000010000100030110110001001000111210100?10001101000002??20120103?0101100?10001010011100211?0000002?110?001120013121????1100??01110?2?????????????????11000010?12?21111?1100110?01?00010002?01?0111??2???????101?????????010????1??1??????0000????21

Tseajaia 21010?00??00110000001000001001100121110111000100001???0001000001100000000101001?021?100?10000000102010??11101034?01????01?210??????100221000000002?0101000020013110????1101??1?11002???10101011?11001?001002210?031?011???1?1021110?010002111201001120?1??0?1021411111110110110100????11?1100111100

Utegenia 210100000?001100000000010000011010210000010?0100000000000110020110110000000001100110100?1000210010100210101000231010010011001001110110021?000????2?0?0??011200121201???110???01110?201010101011001???11000020112?51001??{12}???1?????0??110?10?1{01}??????20?1???010103????0100000010?0?1??????0000000110

Varanops 3101(01)0??0000?100000002??00??01101121??011010110?001????10??0000110110000101??110?00?10111110200000201120?01000?441????????????????????????????????101111??????????01???10011?1?1110211111???1111110000011002011??5000011?111102?1101010002101?01111120010011102141010111?01?11?1?1?????1?2?00101120

Westlothiana {12}?0100?00?1001?00?000120?010011011210000000?0?0??01???000??000?110110010100000?0??1?100010002?00000002???010003??0????????1?11011?1?10?00?0000000?1?????000?101?121?????10??????10????????????????????0000010????????0??011110211?0111000211000111012011001?10211????11101101110?????????0000?00100

Whatcheeria {01}0000?{01}0??0001000000?000?0?0001100110000001001010001100011000{14}010000000101?0?0100???11??0??011111?2000102000003220?0?10????010001?0??0?0?0??0????2??????0??01013?200011100???00?0???010001101001?0000?011002000?051001?110011010000001?10?1100000??0?10101?111201????1011000010???0??????0000?00020

Eldeceeon 10?10?{01}???0011000000011?000000101021?(01)00000?0?0000000000001001?100110100001020101{01}1?100?11001111102002??100001{012}4?01????0??1?110??1??1??011000000020?????00?????0?10????1101????????????????????????????10002011??21?0???????1??00?011100?2110?12????21010000101?4????1101000111?000??????0000?00121

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END;

**Supplementary Material S3**

List of cranial and postcranial measurement ratios in *Eldeceeon*.

|  |  |
| --- | --- |
| Greatest skull width relative to total skull length | ~74.5 |
| Preorbital length relative to total skull length | ~30.5 |
| Skull roof length relative to total skull length | ~32 |
| Orbit length relative to total skull length | ~29.4 |
| Orbit width relative to orbit length | ~85.4 |
| Minimum interorbital width relative to orbit length | ~53 |
| Combined width of nasals relative to combined width of nasals | ~23 |
| Length of the humerus relative to length of the femur | ~77.5 |
| Length of the radius relative to length of the ulna | ~78 |
| Width of proximal extremity of radius relative to length of radius | ~37.3 |
| Width of distal extremity of radius relative to length of radius | ~33.8 |
| Width of shaft of radius relative to length of radius | ~16.2 |
| Width of proximal extremity of ulna relative to length of ulna | ~29 |
| Width of distal extremity of ulna relative to length of ulna | ~9 |
| Width of shaft of ulna relative to length of ulna | ~22.7 |
| Width of proximal extremity of femur relative to length of femur | ~36.8 |
| Width of distal extremity of femur relative to length of femur | ~36.8 |
| Width of shaft of femur relative to length of femur | ~16.8 |
| Length of the tibia relative to length of the femur | ~54 |
| Width of proximal extremity of tibia relative to length of tibia | ~60 |
| Width of distal extremity of tibia relative to length of tibia | ~42.5 |
| Width of shaft of tibia relative to length of tibia | ~17.7 |
| Length of the fibula relative to length of the femur | ~71.3 |
| Width of proximal extremity of fibula relative to length of fibula | ~25.6 |
| Width of distal extremity of fibula relative to length of fibula | ~35.8 |
| Width of shaft of fibula relative to length of fibula | ~14.3 |

**Supplementary Material S4**

Fifty percent majority-rule bootstrap consensus topology, with bootstrap support percentages appended to branches.

A picture containing comb

Description automatically generated

**Supplementary Material S5**

Fifty percent majority-rule jackknife consensus topology, with jackknife support percentages appended to branches.

A picture containing comb

Description automatically generated