

Supplementary material to:

A. Moopen, A. Matiwane, P.A. Viglietti & J.N. Choiniere,

Anatomy and phylogenetic relationships of a possible lessemsaurid with associated plant fossils from the lower part of the Elliot Formation

Palaeontologia africana (2023) **56**: 190–212

S1.1: Character scores used in the McPhee *et al* (2018) phylogenetic analysis with the first appearance datum (FAD) and last appearance datum (LAD) for each terminal taxon included in the analysis.

BEGIN TAXA;

TITLE Taxa;

DIMENSIONS NTAX=61;

TAXLABELS

Euparkeria Crurotarsi Marasuchus Aardonyx Adeopapposaurus Anchisaurus
Antetonitrus Barapasaurus Blikanasaurus Camelotia Cetiosaurus Chindesaurus Chromogisaurus
Coloradisaurus Efraasia Eoraptor 'Eucnemesaurus_fortis' 'Eucnemesaurus_entaxonis'
Glacialisaurus Gongxianosaurus Guaibasaurus Herrerassaurus Isanosaurus Jingshanosaurus
Ledumahadi Leonerasaurus Lessemsaurus Leyesaurus Lufengosaurus Mamenchisaurus
Massospondylus NMQR3314 NMQR1551 Mussaurus Neosauropoda Neotheropoda Omeisaurus
Ornithischia Panphagia Pantydraco Patagosaurus 'Plateosaurus_engelhardti'
'Plateosaurus_gracilis' Plateosauravus Pulanesaura 'PVL_3808' Ruehleia Sarahsaurus Saturnalia
Seitaad Shunosaurus Silesaurus Spinophorosaurus Staurikosaurus Tazoudasaurus
Thecodontosaurus Unaysaurus Vulcanodon Xingxiulong Yunnanosaurus 'BP_1_8489'

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END;

BEGIN CHARACTERS:

TITLE Character Matrix;

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DIMENSIONS NCHAR=366;
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FORMAT DATATYPE = STANDARD RESPECTCASE GAP = - MISSING = ?
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SYMBOLS = " 0 1 2 3 4 5";

MATRIX

Euparkeria

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0?0?0000??00?000?0000?011000000000010000000000?02?000??010000??1?000?10000?00
00000??0?0010??0000?0????0?00?1?100000000?000?

Crurotarsi 00000000000000?0{0 1}000000000?0001000000{0

`1}00000000000000000000010000000000000000?0000000000000000000000000000000000`

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 ???0 1}0????????????00?00?001? ?00{1
 2}10002010121001000??1?????1? ?00?01100?0? ?0?0001? ?3211000{0
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 2}11011110011111110??1000002100101010????????????????12111120100?????{1
 2}1200?0????{3 4}?

Barapasaurus

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????????????????????????????1111211????????????11????00?002??100101??00201102111120121
100?{1
2}10001?1?1?1??1???0????101?00?21??????201????????????????????????????????1111031011
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??????????2?1?????5?

Blikanasaurus

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??0000?1110111?1?01001011111011100120111100111
112102120000100?2?

Camelotia

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??1??????????0??0??001??002100000000??00?0
??????????1??0??011??
???1?????????1??00111?111011110111?1??110??00000? ?????????????????????????????
????????{1 2}??000????4?

Cetiosaurus

1??11????????????????????
????????????????????????????????2??00111101110110100100020?2001?1??1020??1{1
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2}??????20111?00100?0??011110103211001000201??????1????????????????????111103?02
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Chindesaurus

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01?????0????????????00001011100010111000?????1111100??01?110100????????????
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Chromogisaurus

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[illegible]

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1}0????1100?011111?1010????????????

Gongxianosaurus

1????0???????12??
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5?

Guaibasaurus

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??0??01??011001000000??0000
0??000000?00000?01?0??0{0
1}00??1?????110????1??0??????0????1?10??0?1?00??0?0?000?0{1
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1}00?0?1111100100?01101?000101110000000000001?011000000000011?

Herrerasaurus

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001101101001000002000000010000010??01?01010010000101110001011000001000011000100
0100100101000000011000001000000010001000000000?02?

Isanosaurus

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Jingshanosaurus

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10?4?

Ledumahadi

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Leonerasaurus

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0????????????????????????????????????11013100????????0????11??1?1???0????????????
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Lessemsaurus

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Leyesaurus

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1}0001?1???1110020001001111011????0????????????????????????0000?001????00
0??100????????????
??010?????????0?102000????0???0???

Lufengosaurus

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2}00?110111?01101000?00111001100000000000000100101?0011000000010000000001001112
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10100001021110111010001110110010011110?00001?11100{0 1}0111101010102000110000{1
2}{0 1}004?

Mamenchisaurus

11000113?11120110120000000101112??00111201010101111110121100000111221010000111?
201?00?????2?11{0
1}000010010001111111121113?00011101210010000110002?1110101010020110?01102012100
001100111211111011001?011111100032210010012001100110110001?00011?0?10?1?31?11110

31011?0011111001100110100100211112??0??010?011??21010?0??0?????1010111111?????1
120?1????2?1??2?121211102??05?

Massospondylus

1001100210002111111112111101101100001011010001101110111100010001020010011001011
0101010?1010010010110101010110{0

1}1010110011100?111002000110111101101000200111001100000000000000101101000110000
00000000000?0100111212110111000110111011121000101211000002000010031000{0

1}0001101100101100101110{0 1}0?01101000010{1 2}101010{0

1}000001110110010011110100?01111100001111100?010200011000021002?

NMQR3314

1001?1031000211111101?1110101111???1010101101011001101011?00000010220110110010??
2002010011011101?00101?1000110?10021100110?01011001?001101001011{0

1}10000001??0??100?0?0?10000000?1111001?0100?0?1??00?????1????{2

3}01100?0?1110?????0010?21000101{1 2}0?000102000010031000{0 1}0{1

2}?????????1??10110?????????????1???1101110000011?011?01?0?0?0???100111001201111
201001?2?011{1 2}000011003?

NMQR1551

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1}011010001??????????11101111001110{0

1}11101110000011101100100?101010000?????11011112?000?????1120000?????3?

Mussaurus

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010?1?1??0111?00001110?0???0110??1011000111100?1?11?001012100110120100000200???0
?3100010?011??1001011??10110?10101101000010111101?100000{1
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Neosauropoda

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1}11110121100{0 1}10112221110010111120{0 1}200000102011100001201000{0 1}111111{0

2}12{0 1}112{0 1}00001110011?110100110020121010101{0 1}020111{1

2}011020121100021000112011111{0 1}1000{0 1}01001110003?21001{0

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1}00211012??0???010?1111121010?01000011111010111111011??11211100??2?10?201212111
021105?

Neotheropoda 00{0 1}1{0 1}002{0 1}010201001100001{0
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Omeisaurus
110001131111201101200000101011?201001112010101011111010121100000112221110010111?
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0?011020121100?21???1?20111100100?01111010003221001000201?????0100001?00011000
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010?11???1???121?110??2?10?20121211102?105?

Ornithischia 0010000000000?0000000?000?10110{0
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1}0000001001110011101000010000000000100100{0
1}0000??010000000?00?0?00?00000000000000{1 2}100000000000010000010000100111{0
2}110000010000000000000000?000000000000000011012100010001??000?001100000001000
01?0101111020000?000000{0 1}101110002?01?{0 1}1000000111100000?000?00?00?0{0
1}00000000000010?

Panphagia
????????????????????0?1????????????????????0??1????????1?1?0? ??????10?1?111?????????
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0000000? ???0?00? ?0000?01000?0?0?0?0111??0?
0?1{0
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Pantyraco ?0???0????????????{0
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0101?000000001001??

Patagosaurus
11??
??????1?00001?????0?0111012111??????11001012100000110020?2001010?00201?02111120
121?00?2100011{1

2}0?01?0?100???0?111?00??2100100?201????????????????????????????1111031010000111
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1}??0??5?

'Plateosaurus_engelhardti'1001100110102011{0

1}11111211110010110000100101010110011001100011001001101101101110110001011110
01011010111110010101000011001111001100100{0

1}011011010002001110011000000000000001010100001{0 1}0000000100000000010011111{1
2}0000110001101111010111?001001010000010000100311001020010100011110010111110001
111000010110001010000111101100100110101000010111000011100000010110011000010003?

'Plateosaurus_gracilis'

?00??001?0102?110111?1??1110?101??00?10?1010?0?0?10001100??10????????????????1??
??????????0?0110?????1100101010?001?????1100?001???01101101?00?001?10011000000
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2 3}?

Plateosauravus

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2}0011?00110000000011000000?10??011??00??110??0??????0???{2
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?1000010110001?1000001110110?????0????????????????????110??0?????0??????????3?

Pulanesaura

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2}0011?00110000000011000000?10??011??00??110??0??????0???{2
1}0010?0120001000?????????2?111?011??0?0????????????????10??{1
2}0??
??000002100101??1?????????

'PVL_3808'

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?????????????????????????????????0010031100102011010001????????????10010101010010111?01010
00001110110010??

Ruehleia

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??0111001?00?001???101?0020011?0011001000001100

1????1????????????????????????????????2????????0???01???????0?10111110{1
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Staurikosaurus

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?????0000000001000?00?0000000000??????00010?????00?01001?000011?000?00000000020
000001?010?101100?001100100????1?1??0000
0200110000110?010?0010?00000100001??000?0101?000?0000001100000001????01?????????
????????????????????????????????1?

Tazoudasaurus

11??010??1????????{0
2}011???1???1????????????00?00000??0??10?111012101???000?0010120?????0002??10
0001??00200101011020121000??????21?11?111?????11?????01?22100100?{1
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0101010?1101011111?011????1?????20??????1??10?1????5?

Thecodontosaurus

?0????????????????????1??1??1000?????0?0?0?0??000????????10?0?0?1010??0110
00??????00?11010?????1100101010000?1?????0001001010?1?01101?000001?0011000000
0000000000?0000?0101000?01000?0?00?01001120110001010001100012010001?10000101000
001010000021000001??0?000?011??01010?{0 1}000111100001011000??{0
1}0000010101100??011010100????1100?0?111??0??1??000?000?0????1?

Unaysaurus

100110011010??1?111??1??1010?1011000??????????0??00??001??000?0?10??0?10??11
0100?????010?10110?????01100101010000??0?1?????0??1?0?????????0??0?11?00?10000?0
??00000??????????0?0??010000?00?010011?1120000110?0?????1????11?0????211??0??0
??110110??011010?00?????
??0??1100?????0?0??0?????1?

Vulcanodon

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??{1
2}????????????????1?????01?11?0?00??0?0???1??2?{1 2}10?10?0{1
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2}00?0111100010111110010?111011110010011?1????{1
2}0?10021?0??11?10101101111011??111?10102?100102011110?121?05?

Xingxiulong

????????????????????1???1?1111???0?10?0???011001100110000?000101?01?00100101????
101???????0?????????001??000?????????11001111001000110?01?011010001001110011000000
000?0000110110???1110000001????00?0000??2?12??0{1
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2}0?1011002?11???0?100100011110000101101010?00000{0
1}10?110010011010?0?0?011?001101110000001?210011000021002?

Yunnanosaurus

100?1002??00??10011001??101?111???00101110?00?0?11011111001000001?01?0?00010???
?????????????000?0010???0???00010?21000?1???111100{0
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200?211{0 1}00??01??0011?21001100201000{0
1}020?0010031000000011010001?110010111?{0
1}0101101000010110101?101000110011001?011010100001111001?0?1110?0?011???11?00001
10?2?

'BP_1_8489'

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?????????????????3?

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END;

ctype ord : 8 13 19 23 40 57 69 92 102 117 121 131 134 145 148 150 151 158 163 168 171 177
184 207 210 217 226 231 239 247 255 258 271 283 304 310 318 338 351 354 356 361 365 366;

	FAD	LAD	
Euparkeria	247.2	242	
Marasuchus	236.1	233.7	
Silesaurus	236	227	
Staurikosaurus	235	221.5	
Chindesaurus	227	208.5	
Herrerasaurus	231.4	225.9	
Eoraptor	231.4	225.9	
Saturnalia	233.2	225.4	
Panphagia	231.4	225.9	
Chromogisaurus		231.4	225.9
Guaibasaurus	225.4	220	
Thecodontosaurus		208.5	201.3
Pantydraco	208.5	201.3	
Efraasia	215.56	212	
Ruehleia	227	208.5	
Unaysaurus	225.4	220	
Plateosaurus_gracilis	227		208.5
Plateosaurus_engelhardti		227	201.3
Glacialisaurus	199	182	
Coloradisaurus		220	213
Yunnanosaurus		201.3	190.8
Lufengosaurus	201.3	190.8	
Massospondylus		202.3	187.5
Adeopapposaurus		201.3	190.8
Leyesaurus	201.3	190.8	
Plateosauravus	219.6	202.3	
PVL_3808	220	213	
Eucnemesaurus_fortis	219.6		202.3
Eucnemesaurus_entaxonis		219.6	202.3
Seitaad	190.8	182.7	
Anchisaurus	201.3	190.8	
Jingshanosaurus		201.3	190.8
Xingxiulong	201.3	190.8	
Sarhsaurus	199.3	183.7	
Mussaurus	192.7	192.6	
Leoneosaurus	189	188.8	

Aardonyx	202.3	187.5
NMQR3314	202.3	187.5
NMQR1551	219.6	202.3
Lessemsaurus	220	213
Antetonitrus	202.3	187.5
Ledumahadi	202.3	187.5
Blikanasaurus	219.6	202.3
Camelotia	208.5	201.3
Pulanesaura	202.3	187.5
Gongxianosaurus	182.7	174.1
Isanosaurus	208.5	174.1
Tazoudasaurus	190.8	174.1
Vulcanodon	199.3	182.7
Shunosaurus	161	157
Spinophorosaurus	174.1	163.5
Patagosaurus	178.7	178.1
Barapasaurus	190.8	170.3
Cetiosaurus	170.3	163.5
Omeisaurus	161	157
Mamenchisaurus	163.5	152.1
BP_1_8489	220	210

S1.2: Character scores used in the Pol *et al* (2021) phylogenetic analysis with the first appearance datum (FAD) and last appearance datum (LAD) for each terminal taxon included in the analysis.

BEGIN TAXA;

TITLE Taxa;

DIMENSIONS NTAX=77;

TAXLABELS

Euparkeria Crurotarsi Marasuchus Ornithischia Agnosphytys Silesaurus
Neotheropoda Staurikosaurus Chindesaurus Herrerasaurus Guaibasaurus Eoraptor Saturnalia
Panphagia Chromogisaurus Buriolestes Pampadromaeus Bagualosaurus Thecodontosaurus
Pantydraco Efraasia Nambalia Jaklapalisaurus Pradhania Macrocollum Unaysaurus Ruehleia
Plateosaurus_ingens Plateosaurus_gracilis Plateosaurus_engelhardti Glacialisaurus
Coloradisaurus Lufengosaurus Xixipiosaurus Massospondylus_carinatus Adeopapposaurus
Leyesaurus Ngwevu Plateosauravus Riojasaurus Eucnemesaurus_fortis
Eucnemesaurus_entaxonis Seitaad Sarahsaurus Yunnanosaurus_huangi Xingxiulong
Jingshanosaurus Chuxiongosaurus Yizhousaurus Anchisaurus Mussaurus Leonerasaurus
Sefapanosaurus Aardonyx Irisosaurus NMQR3314 NMQR1551 Meroktenos Ingentia
Lessemsaurus Antetonitrus Ledumahadi Kholumolumo Blikanasaurus Camelotia Schleitheimia
Pulanesaura Gongxianosaurus Isanosaurus Tazoudasaurus Vulcanodon Shunosaurus
Spinophorosaurus Patagosaurus Barapasaurus Cetiosaurus 'BP/1/8489'

;

END;

BEGIN CHARACTERS;

TITLE Character_Matrix;

DIMENSIONS NCHAR=419;

FORMAT DATATYPE = STANDARD RESPECTCASE GAP = - MISSING = ?

SYMBOLS = " 0 1 2 3 4 5";

MATRIX

Euparkeria

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00?0???00?0?00?00100000??0?00?0?01010?????????0010??0???00?????????00?0?0?0000??00
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000000000000??000000100000?0?0???????111?1110000100000?????????????????????????????
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Staurikosaurus
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Guaibasaurus
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Thecodontosaurus

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Efraasia

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Nambalia

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Jaklapalisaurus

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Pradhania

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Macrocollum

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Unaysaurus

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Ruehleia

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Plateosaurus_ingens

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Plateosaurus_gracilis

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Plateosaurus_engelhardti 1001100110002011(0

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Glacialisaurus

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Coloradisaurus

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Lufengosaurus

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1)10111101101111011131001012010001020000100131100002011011002101100101100001011
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1)00410111011??00?0000100000??1????1????0010?0????????111??1????0???

2)0011?00110000000001000000??10??011??0??110??????0???(2
3)1110011110??????????1??????????????00100131100101?01??????11??10110?00001111
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Riojasaurus

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1)00000011000??0?0100112121011110011111?010111011001010001020?00100131100102011
01000110110010110010110111010110201101000000110110010011010100??011?00011100121
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Eucnemesaurus_fortis

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Eucnemesaurus_entaxonis

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1)0000010??0??0?10??0?001????????????????????0????????????????????

Sarhsaurus

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Anchisaurus

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Mussaurus

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Leonerasaurus

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Sefapanosaurus

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Aardonyx

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Irisosaurus

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1)10000001??0??100??0?0?10000000??111001??010?0?1??0????1??? (2
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Meroktenos

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Ingentia

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Lessemsaurus

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01?????1?1111??1010????????????????????????????01

Antetonitrus

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2)10001010121001000???1????100?0?01100??0?0011??311000(0
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Ledumahadi

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Kholumolumo

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Blikanasaurus

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Camelotia

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Schleitheimia

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Pulanesaura

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Gongxianosaurus

1????0????????12??
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2)111?2?????1???1101?????1?0??1???0?1?1????1?11??010???10?2?1112000020005????????
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Isanosaurus

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Tazoudasaurus

11??010??1????????(0
2)011???1???1????????????????00?00000???0??10?1111012101???000??001010?????0002??100
001??00200100011020121000????????211?1?111???11?????01?1100100?2???????010?21000
0100?0001?310?1???03101??0?111001002??11??1??1??21100111001101011?0?0010000101010
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Vulcanodon

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010120111110?121?05?1??00?11?00000????????????1???11?01?21?????????????????????
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Shunosaurus

11000113?110201101200000001011?20100111201010101001101012000011011121010001011?
1200????11020010000012010001111112121112??01011?1001?1?10010012?1100001011021?
00001?0201210000?11?00?100111011001?111?1?000211001100?11000?1011001?000110000??
1?3101111013101100011111?01100?111100100211112??0???000?01121010?01?0????110?101?
??11011??1111101002?12111?1021105???????????0?00020?00000??1?10???0??1121???0??11?
12?0???1?101??1??

Spinophorosaurus

1????1????????????????????????????2?????????0????01?????????0??101111111(1
2)0?????????1????????????100111012?112????11?11011?0?01?0002?110?01????(1
2)?11???1?12?1010?0???????(1 2)1??11011?00?1??1110?03?(1 2)0?10??(1
2)????????????????????????????????????(1 2)???1?1???01(1
2)?011?001??21111110?1101??0?020?100??0??11?10??0?0?01?????????????????????
??1???21?0?1?010??1????1??????

Patagosaurus

11??
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21?00?0210011(1 2)00?1?0?100???0?111?00?1100100?(1
2)1????????????????????????????1111013101000011111001100111110010?211112??0???0011
111?101000??0??5?????????0????02??????1?
11???110????????????2????????????11

Barapasaurus

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Cetiosaurus

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END;

FAD	LAD		
Euparkeria	247.2	242	
Crurotarsi	247.2	145.5	
Marasuchus	236.1	233.7	
Ornithischia	231.4	145.5	
Agnosphitys	208.5	201.3	
Silesaurus	236	227	
Neotheropoda	227	145.5	
Staurikosaurus	235	221.5	
Chindesaurus	227	208.5	
Herrerasaurus	231.4	225.9	
Eoraptor	231.4	225.9	
Saturnalia	233.2	225.4	
Panphagia	231.4	225.9	
Chromogisaurus		231.4	225.9
Buriolestes	233.2	225.4	
Guaibasaurus	225.4	220	
Pampadromaeus		233.2	225.4
Bagualosaurus	233.2	225.4	
Nambalia	227	208.5	
Thecodontosaurus		208.5	201.3
Pantyraco	208.5	201.3	
Efraasia	215.56	212	
Ruehleia	227	208.5	
Jaklapalisaurus	227	208.5	
Macrocollum	225.4	220	
Unaysaurus	225.4	220	
Plateosaurus_ingens		212	205.6
Plateosaurus_gracilis		227	208.5
Plateosaurus_engelhardti		227	201.3
Pradhania	199.3	190.8	
Glacialisaurus	199	182	
Coloradisaurus	220	213	
Yunnanosaurus_huangi	201.3	190.8	
Lufengosaurus	201.3	190.8	
Xixipiosaurus	201.3	190.8	
Massospondylus_carinatus		202.3	187.5
Adeopapposaurus		201.3	190.8
Leyesaurus	201.3	190.8	

Ngwevu	191	187.5	
Plateosauravus	219.6	202.3	
Riojasaurus	220	213	
Eucnemesaurus_fortis	219.6	202.3	
Eucnemesaurus_entaxonis		219.6	202.3
Seitaad	190.8	182.7	
Anchisaurus	201.3	190.8	
Chuxiongosaurus		201.3	190.8
Jingshanosaurus		201.3	190.8
Xingxiulong	201.3	190.8	
Sarahasaurus	199.3	183.7	
Yizhousaurus	201.3	190.8	
Kholumolumo	219.6	202.3	
Mussaurus	192.7	192.6	
Leonerassaurus	189	188.8	
Sefapanosaurus	219.6	202.3	
Aardonyx	202.3	187.5	
Irisosaurus	201.5	199	
Meroktenos	219.6	202.3	
NMQR3314	202.3	187.5	
NMQR1551	219.6	202.3	
Ingentia	213	201.3	
Lessemsaurus	220	213	
Antetonitrus	202.3	187.5	
Ledumahadi	202.3	187.5	
Blikanasaurus	219.6	202.3	
Camelotia	208.5	201.3	
Schleithemia	213	208	
Pulanesaura	202.3	187.5	
Gongxianosaurus		182.7	174.1
Isanosaurus	208.5	174.1	
Tazoudasaurus	190.8	174.1	
Vulcanodon	199.3	182.7	
Shunosaurus	161	157	
Spinophorosaurus		174.1	163.5
Patagosaurus	178.7	178.1	
Barapasaurus	190.8	170.3	
Cetiosaurus	170.3	163.5	
BP/1/8489	220	210	

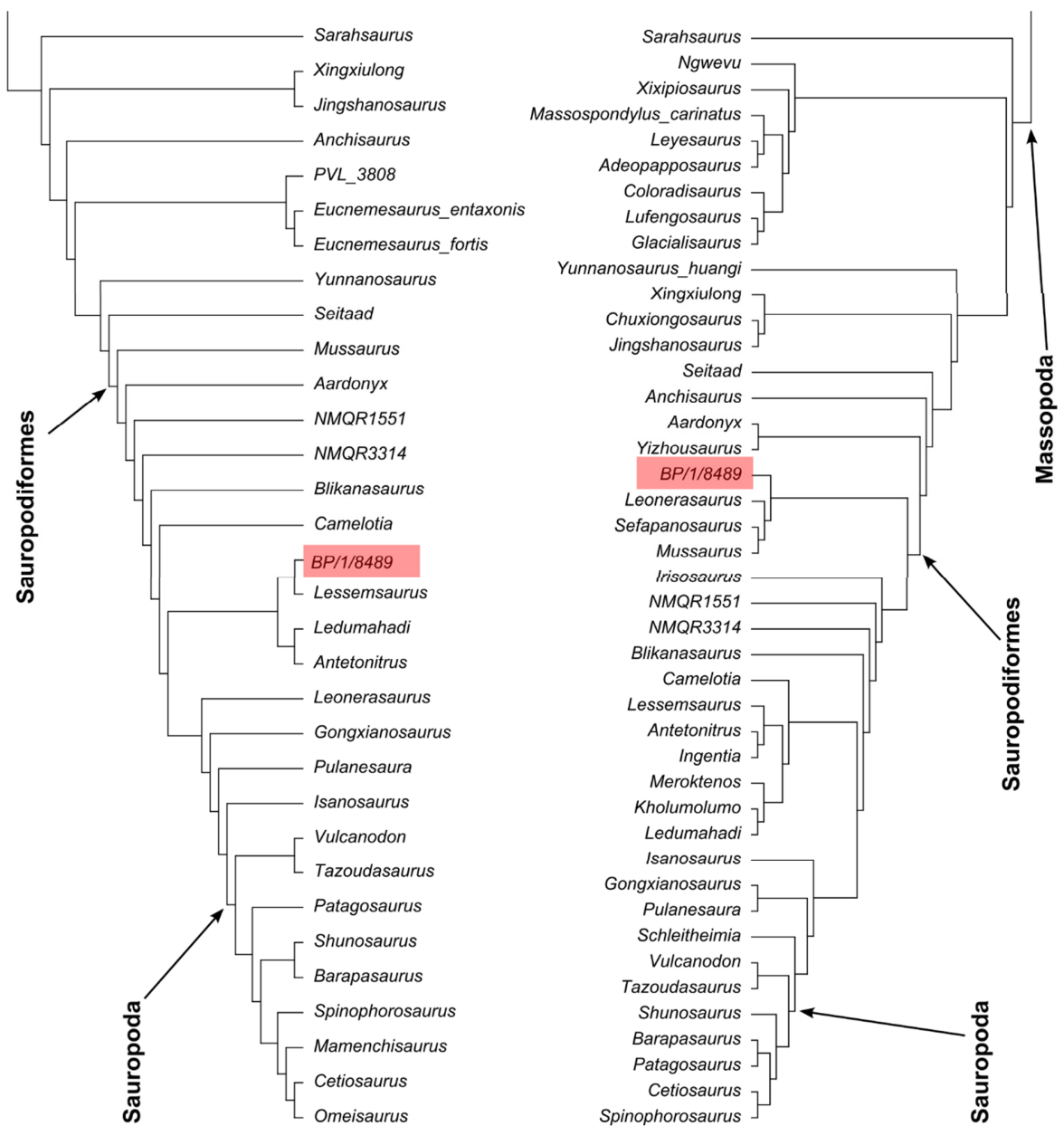


Figure S1.1: Comparison between standard-weighted parsimony trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right)

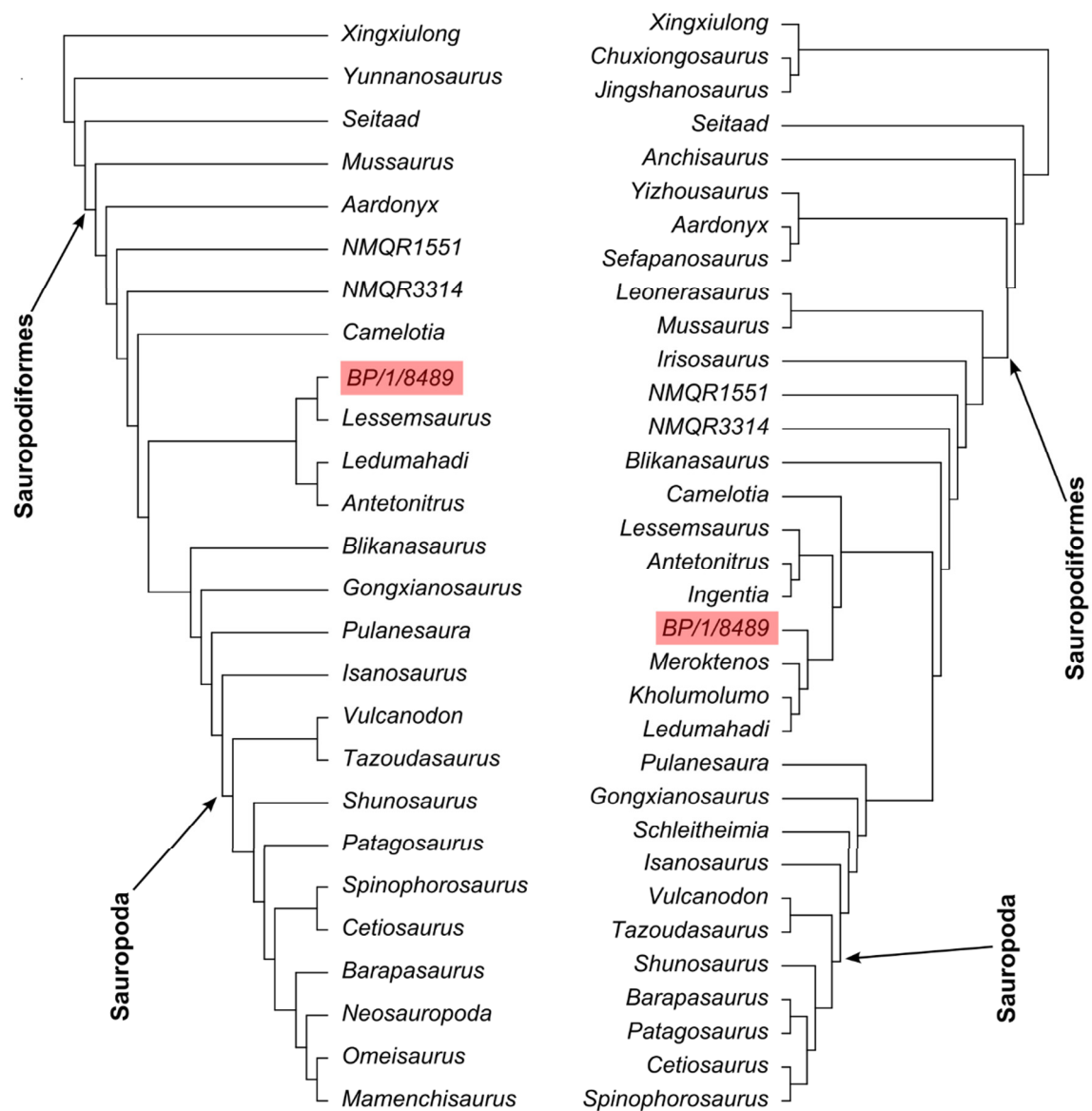


Figure S1.2: Comparison between trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right) under implied weighting with a function of $k=3$.

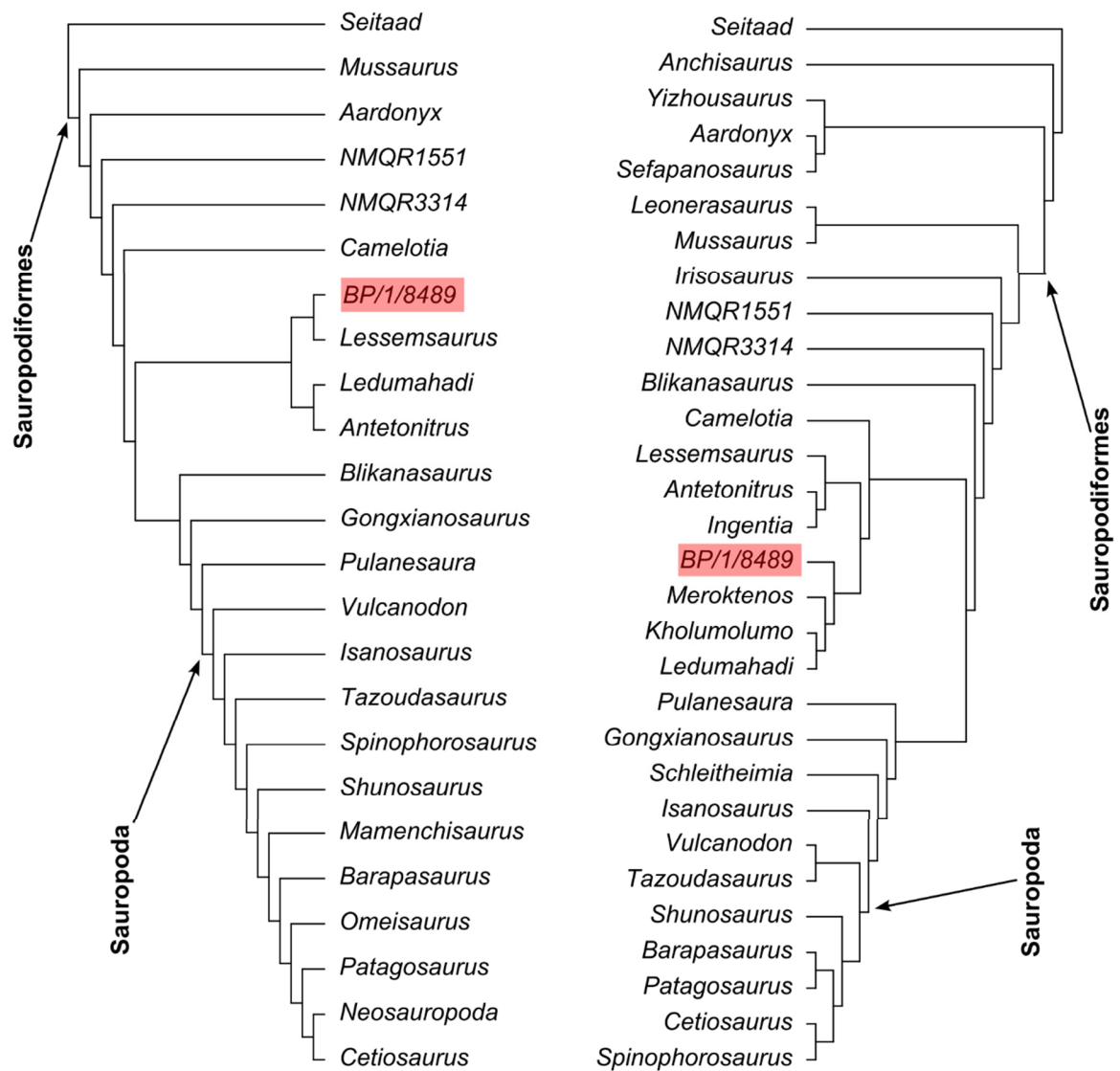


Figure S1.3: Comparison between trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right) under implied weighting with a function of $k=6$.



Figure S1.4: Constrained parsimony tree of Pol *et al* (2021).

S2: Measurements used in the linear regression analysis between the mediolateral diameter of the femur and femoral circumference.

Taxon	FC	FML	LogFC	LogFML
Amargasaurus_cazaui	505	195	2.7033	2.29
Amargatitanis_macni	510	220	2.7076	2.3424
Ampelosaurus_atacis	257	104.3	2.4099	2.0183
Antetonitrus_ingenipes	410	159	2.6128	2.2014
Apatosaurus_excelsus	740	292	2.8692	2.4654
Apatosaurus_louisae	845	332.3	2.9269	2.5215
Barosaurus_lentus	540	202	2.7324	2.3054
Brachiosaurus_altithorax	940	365	2.9731	2.5623
Camarasaurus_grandis	630	228	2.7993	2.3579
Camarasaurus_lentus	356	133	2.5514	2.1239
Cetiosauriscus_stewarti	535	195	2.7284	2.29
Chubutisaurus_insignis	710	282	2.8513	2.4502
Comahuesaurus_windhauseni	555	204	2.7443	2.3096
Dashanpusaurus_dongi	468	170	2.6702	2.2304
Diplodocus_hallorum	732	280	2.8645	2.4472
Diplodocus_hayi	590	227	2.7709	2.356
Diplodocus_longus	563	208	2.7505	2.3181
Dreadnoughtus_schrani	910	350	2.959	2.5441
Efraasia_minor	82	22	1.9138	1.3424
Elaltitan_lilloi	804	317	2.9053	2.5011
Epachthosaurus_sciuttoi	491	196	2.6911	2.2923
Euhelopus_zdanskyi	375	140	2.574	2.1461
Gobititan_shen Zhouensis	655	240	2.8162	2.3802
Haplocanthosaurus_priscus	518	207	2.7143	2.316
Huabeisaurus_allocotus	645	245	2.8096	2.3892
Isanosaurus_attavipachi	330	129	2.5185	2.1106
Jainosaurus_septentrionalis	527	206	2.7218	2.3139
Janenschia_robusta	568	222	2.7543	2.3464
Lapparentosaurus_madagascariensis	231	87	2.3636	1.9395
Lessemsaurus_sauropoides	345	122	2.5378	2.0864
Ligabuesaurus_leanzai	640	250	2.8062	2.3979
Lourinhasaurus_alenquerensis	785	300	2.8949	2.4771
Lufengosaurus_huenei	208	72	2.3181	1.8573

Lufengosaurus_magnus	365	115	2.5623	2.0607
Mamenchisaurus_youngi	419	150	2.6222	2.1761
Omeisaurus_maoianus	470	185	2.6721	2.2672
Opisthocoelicaudia_skarzynskii	680	280	2.8325	2.4472
Plateosauravus_cullingworthi	260	97	2.415	1.9868
Plateosaurus_engelhardti	263	79	2.42	1.8976
Rapetosaurus_krausei	245	91	2.3892	1.959
Rayososaurus_agrioensis	474	178	2.6758	2.2504
Riojasaurus_incertus	285	106	2.4548	2.0253
Ruyangosaurus_giganteus	905	330	2.9566	2.5185
Saltasaurus_loricatus	363	140	2.5599	2.1461
Sarhsaurus_aurifontanalis	143	43	2.1553	1.6335
Saturnalia_tupiniquim	52	14.5	1.716	1.1614
Sauroposeidon_proteles	509	204	2.7067	2.3096
Sonorasaurus_thompsoni	700	270	2.8451	2.4314
Tastavinsaurus_sanzi	550	210	2.7404	2.3222
Tornieria_africana	545	200	2.7364	2.301
Volkheimeria_chubutensis	257	89	2.4099	1.9494
Xianshanosaurus_shijiagouensis	580	192	2.7634	2.2833
Xingxiulong_chengi	266	95	2.4249	1.9777
