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

Moopen, Atashni; Matiwane, Aviwe; Viglietti, Pia A; Choiniere, Jonah N

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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

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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.

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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 Herrerasaurus 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'
	;

END;


BEGIN CHARACTERS;
	TITLE  Character_Matrix;
	DIMENSIONS  NCHAR=366;
	FORMAT DATATYPE = STANDARD RESPECTCASE GAP = - MISSING = ?
SYMBOLS = "  0 1 2 3 4 5";
	MATRIX
	Euparkeria
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Marasuchus

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Aardonyx

1101?00210002?11?11????1110?1011000??????1010??0?11010??10?1????????1?0???????????0??????1??0?0?1?0?????11?00101011001?1??????0010?011010010110 1?0000011?001100010000200000 10?100??0110000?01110?0?00?????11??????????100??00??????131?01???1?10??10??????????????????1110100010 11??10110?101?1111000011110001????????1101110?0???01?????????????01201111{0 2}0?0010?0?2??00?0???03?

Adeopapposaurus 1001100210002111?11?1101101111111000010110100011 0{0 1}1101111100100010 2101{0 1}0110010110101010110100000101 1{0 1}101010111111 10{0 1}1001110011110020001001011011011 00{0 1}0011100110000000000000010010100010000000100000000001 0010{1 2}2110001010001101111011111001100201000001000{0 1}1003100000{0 2}011011001?110010110010001101000010{1 2}10101000000011101100100111101000011101000011110000010200011000011001?

Anchisaurus

10???00??0102?1??11?????111011?110?001010?10001100111101100?10??????01?001101?1??012110??????10?10?000?100000001 01?11?0111?0011???100?100111101 1?10000?010?00110 0?000??0000000??1000?0???000?00?10?0????11{0 1}0??2?110010110 00??0??1101011?00100201000002000{0 1}1013100000?1111100010 11?00101001010110100001 0{0 1}1110?0100000111011 0?1?01?010???010111?0?0011????0?01?1?00100000100 11?

Antetonitrus

??0?{0 1}0???????????00?00?001??00{1 2}10002010121001000??1?????1??00?01100?0??0?0001??3211000{0 1}01110??????0010?31100???1010???????001003???0002010010001?????????{1 2}1101111001111111 10??10000021001010 1?????????????????121111120100?????{1 2}1200?0????{3 4}?

Barapasaurus
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000111110011??11110010???????????????????1???1?1?????????1?1???????1??????????20?????
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Blikanasaurus
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112102120000100?2?
Camelotia
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Cetiosaurus
1???11???????????????????????????
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2}11102010100??{1
2}??????20111?00100?0??011110103211001000201???????1????????????????????111103?02
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Chindesaurus
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Chromogisaurus
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Coloradisaurus

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10101?????1?10010110100 11?10001010100 01?11?0011002000100101?01100?00?001?1001100
0000000000000101????00?11000?011???0????0100101211100 11?????????????????0?1?????????
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Efraasia

100?1001?010??1?111?112?1110?10????00100100000??0?10??01?0??1??????10?000?1?????01
10100?????10010010??11?011001010100001???1?11001100100101101101000000 1??001?000
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0100010000100310001010000100000110010110100001111000010110000000000011101?001?0
11010?0??01?11100000 1??0?0?01?1?001{0 1}000010002?

Eoraptor

0001?001?01010?00111001110100100100001101000 00?10010010 10??0110000{1
2}0011??11?1?????????????????0000001 0???0?0?00?1000000001?????1100000000010?1011??0
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1}0100100200021 01??0??00?0??10?1011?10??0?0110000101100 01?00?1?0111010??1?0?00???
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'Eucnemesaurus_fortis'

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'Eucnemesaurus_entaxonis'

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112??001?{1 2}?0011000?????2?

Glacialisaurus

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Gongxianosaurus

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Guaibasaurus

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2}1002101100100000010?1011000000100100001011010??{0
1}00?0?1111110010 0?01101?0001011100000000000001?0110000000000 11?

Herrerasaurus

00000000?0101000000000000?000000000000001000000100010101010001000011010000001 0
1?0000000?1000?00000000?1000000000000000001010001000000100000?000010000011??00
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1}10000002000000100000101100100110010010 0?1110??00110000000000000012000000010000
0011011010010000020000000100000010??01?0101001000010111000101100000100001100010 0
0100100101000000011000001000000010001000000000?02?

Isanosaurus

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Jingshanosaurus

1001?002??10211111100?0?1110111111100?102001??1?10011011100001000????0110000010 1?2
11001000??1?10110010??0110110010121100 1????111??010???????1???10100??0011100?1???0
000000000000?10???0110000000100000000?0010??12121102110?0??00??0011?31?00100?0100
0102000010031000002011001002?1100101 10?{1
2}000110100001011110??10100011101 10?12011010?00???????0120?1112?1?01?20001200000
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Ledumahadi

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Leonerasaurus

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Lessemsaurus

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1}1?0111???0110110001????????201111?????1?210{1 2}??00??????4?

Leyesaurus

?001?00?1000211??11?????1010?11110000101101?00?1001111111?00100010{0
2}0011?????????01?10?110??1?00?10110??1010?1111010{0
1}0001?1???1110020001001111011????0???????????????????????????????????0000?001????00
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Lufengosaurus

100???02???0211?1?11?1111110111100101011010000101110101100010?{0
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2}00?110111?01101000?0011100110000000000000100101?0011000000010000000001001112
1211011100011011110111310001002010001020000100311000020110110020110010110010001
10100001021110111010001110110010011110?00001?11100{0 1}0111101010102000110000{1
2}{0 1}004?

Mamenchisaurus

11000113?11120110120000000101112??001112010101011111110121100000111221010000111?
201?00?????2?11{0
1}0000100100011111111121113?00011101210010000110002?1110101010020110?01102012100
001100111211111011001?011111100032210010012001100110110001?00011?0?10?1?31?11110

31011?0011111001100110100100211112??0???010?011??21010?0??0??????1010111111??????1
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Massospondylus
1001100210002111111111211110110110000101101000110111011110001000102001001100101101010 10?101001001011010101010110{0
1}1010110011100?1110020001101111011010002001110011000000000000000101101000110000
00000000000?0100111212110111000110111101112100010121100000200001003100 0{0
1}0001101100101100101110{0 1}0?01101000010{1 2}101010{0
1}000001110110010011110100?01111100001111100?010200011000021002?

NMQR3314
1001?103100021111101?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}1110111000001110110 0100?101010000??????11011112?000?????1120000????3?

Mussaurus
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010?1?1??0111?00001110?0????0110??1011000111100?1?11?0010121001101201000 00200???0
?3100010?011??1001011??10110?1010110100001011110 1?100000{1
2}110111010011010101 0??????011011110000011200111000011003?

Neosauropoda 1100011311112011012000001010111{0 2}11101112010101011{0
1}11110121100{0 1}101122211100101111 20{0 1}200000102011100001201000{0 1}111111{0
2}12{0 1}112{0 1}00001110011?1101001100201210101 01{0 1}020111{1
2}0110201211000210001120111 11{0 1}1000{0 1}01001110003?21001{0
1}00201110001010000 0?000110001??1?3001111031021000111110011011 10{0 1}10{0
1}00211012??0???010?1111121010?010000111110101111111011??11211100??2?10?201212111
021105?

Neotheropoda 00{0 1}1{0 1}002{0 1}010201001100001{0 1}000000000000110000000010{0 1}100{0 1}01000001{0 1}0001{0 1 2}01000000101100000011100010000000001?00000000000000000101100110000001000{0 1}100001020000101011001000000100000000{1 2}1000011001000000100100001000010?11000001000010001200000?10?0001001100{1 2}010101030002111010100001111000011010001?01100010000001000{0 1}011111111002001011000001111100000??0?0000000?010000000000012?

Omeisaurus 11000113111120110120000010101 1?20100111201010101111101012110000011222111001011 1???0?00???1???1110000 1?0?0001110111112111 3??0011101200011010111002?121010101102011 0?01102012110 0?21???1?20111100100??01111010003221001000201??????0100001?00011000 1001?310111103101100011111001100111100100211012??0???010?010??210100?1?0??111?011 010?11???1????121?110??2?10?20121211102?105?

Ornithischia 0010000000000?0000000?000?10110{0 1}0100100?1000000100100001000000{0 1}000100100000000100000000010010{0 1}01{0 1}00000010011100111010000100000000000100100{0 1}0000??010000000?00?0?00?000000000000000{1 2}100000000000010000010000100111{0 2}1100000100000000000000000?000000000000000000110121000100001??000?00110000000 1000 01?0101111020000?000000{0 1}101110002?01?{0 1}10000001111000000?000?00?00?0{0 1}0000000000010?

Panphagia ?????????????????????0?1???????????????????0??1????????1?1?0???????10?1?111??????????? ???????0?0?0?1010000?10?0101000000???????0010001001 11?01101?000?01???01?10000?00 0000000????0?00??0000?01000?0?0??0111???0?? 0?1{0 1}0021010?00?000??11??0?110??????????????????????0010010101 00???0100?010?0???????? ????????0???????{0 1}????????????

Pantydraco ?0???0?????????????{0 1}00?0???1??1????0001001000000 10?100001?00????????00?000?1?10??00100011?000?00?01 010??0000?1001010100001001??1100110010100110110 1?00???1????1????????????????????? ?0??1?0000100000100?????11?01?00?????????????????????????????????????0010021100001?? ???????011??10110?00???????????1?1?0000??0000010?01?001???????????????????00001110000 0101?000000001001??

Patagosaurus 11??? ??????1?00001??????0??0111012111??????110010121000001100 20?2001010?00201?02111120 121?00?2100011{1

2}0?01?0?100????0?111?00??2100100?201?????????????????????????????????1111031010000111
1100110111110010?21111??0???0011111???10100{0
1}??0???5?

'Plateosaurus_engelhardti'1001100110102011{0
1}1111121111001011000010010101011001100110001100100110110110111011110110001011110
0101101011111100101010000110011110011001001{0
1}01101101000200111001100000000000000001010100001{0 1}0000000100000000010011111{1
2}0000110001101111010111?001001010000010000100311001020010100011110010111110001
1110000101100010100001111011001001101010000101110000111000000101100110000100003?

'Plateosaurus_gracilis'
?00??001?0102?110111?1??1110?101??00?10?1010?0??0?10001100??10?????????????????1??
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1}000111100001011 0?0??10000?1??0110?????????????????????0?????????????0?0????????{
2 3}?

Plateosauravus
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2}0011?00110000000011000000?10???011??00??110??0??????0???{2
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Pulanesaura
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1}?0010?012000100?????????2?111?011???0?0?????????????10??{1
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'PVL_3808'
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000011101100 10???

Ruehleia
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0010?1000001?0?00?0110???????0100111012000111000?0100??0101110010000???0??00???001
003110000 20??1100010110?10110?1010010100001021000??10?00?111011001?0?0010100????
??????????????????????????????????3?

Sarahsaurus

10?1000?10?12?1??11?????1110111 1??0?010?0?10?0010?110?01{0
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01{0 1}01?11200?0102000?{0 1}000?1100{1 2}?

Saturnalia

10?????????????????????????1??1????00?100?0?????????????????10?????1??00???0?0??0?000
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1}000101100000000000101010001001001010000000010000000000000100 11000?000?0010?

Seitaad

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Shunosaurus

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120020???1102001100001201000111111121211 12??00011?10012?1?10010012?1100001011021
?0??01??2012100001 1??00?101?1101100 11?111?1?000222100110 0??11000?1011001??0001100
00??1?3101111031011000111 11?0110?1111001002111 12??0???000?011??21010?{0
1}1?0????110?101???1?1011??1121?110??2?00?2?12121?1021105?

Silesaurus

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0000?????1?00?0?010???0?000001000100001 0?000000000000???00100000000000101000011 0
0000000000000?100000100000?0?0????????111?111000001 0000?0?????????????????????????
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00??011?1??002???00000000?0?10???000?0011?

Spinophorosaurus

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2}00???????????1?????????????10011101 2?112?????11?110101?0?01?0002?110??01????{1

2}?11???1?12?1010?0????????{1 2}???11011?001?1??1110?03?2{1
2}0?10??{1 2}????1?1???01{1
2}?011??001??211111110?1101??0?0??20?1002??0??11?10??0?0?01?????????????????????????????
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Staurikosaurus

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000001?010?101100?001100100????1?1???0000
020011000011 0?010?0010?00000100001??000?0101?000??000001100000001????01??????????
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Tazoudasaurus

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2}011???1???1?????????????????00?00000???0??10?1111012101???000??0010120?????0002??10
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Thecodontosaurus

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Unaysaurus

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Vulcanodon

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Xingxiulong

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Yunnanosaurus

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	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		
Sarahsaurus	199.3	183.7		
Mussaurus	192.7	192.6		
Leonerasaurus	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 Agnosphitys 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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Silesaurus
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1)011011111002001011000011111000?0?000001000000000001200000?1?00?0001000111111(0
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Staurikosaurus
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Chindesaurus
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Herrerasaurus
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1)011000000??0??0?0000101?20?1???1011

Guaibasaurus
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Eoraptor

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Saturnalia

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Panphagia

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Chromogisaurus

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Pampadromaeus

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Jaklapalisaurus

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Unaysaurus

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Plateosaurus_ingens

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Plateosaurus_gracilis
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Lufengosaurus
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Adeopapposaurus
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Leyesaurus
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Riojasaurus
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Sarahsaurus
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Yunnanosaurus_huangi

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Jingshanosaurus 1001?002??00211111100???11101(0
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Yizhousaurus

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Anchisaurus
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Lessemsaurus
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Antetonitrus

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Ledumahadi

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Blikanasaurus

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Camelotia

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Pulanesaura
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Gongxianosaurus
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Isanosaurus
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Tazoudasaurus
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Shunosaurus

11000113?1102011012000000001011?201001112010101010011010120000110111210100010l1?
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Spinophorosaurus

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Patagosaurus

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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	
Pantydraco	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		
Sarahsaurus	199.3	183.7		
Yizhousaurus	201.3	190.8		
Kholumolumo	219.6	202.3		
Mussaurus	192.7	192.6		
Leonerasaurus	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		
Schleitheimia	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		

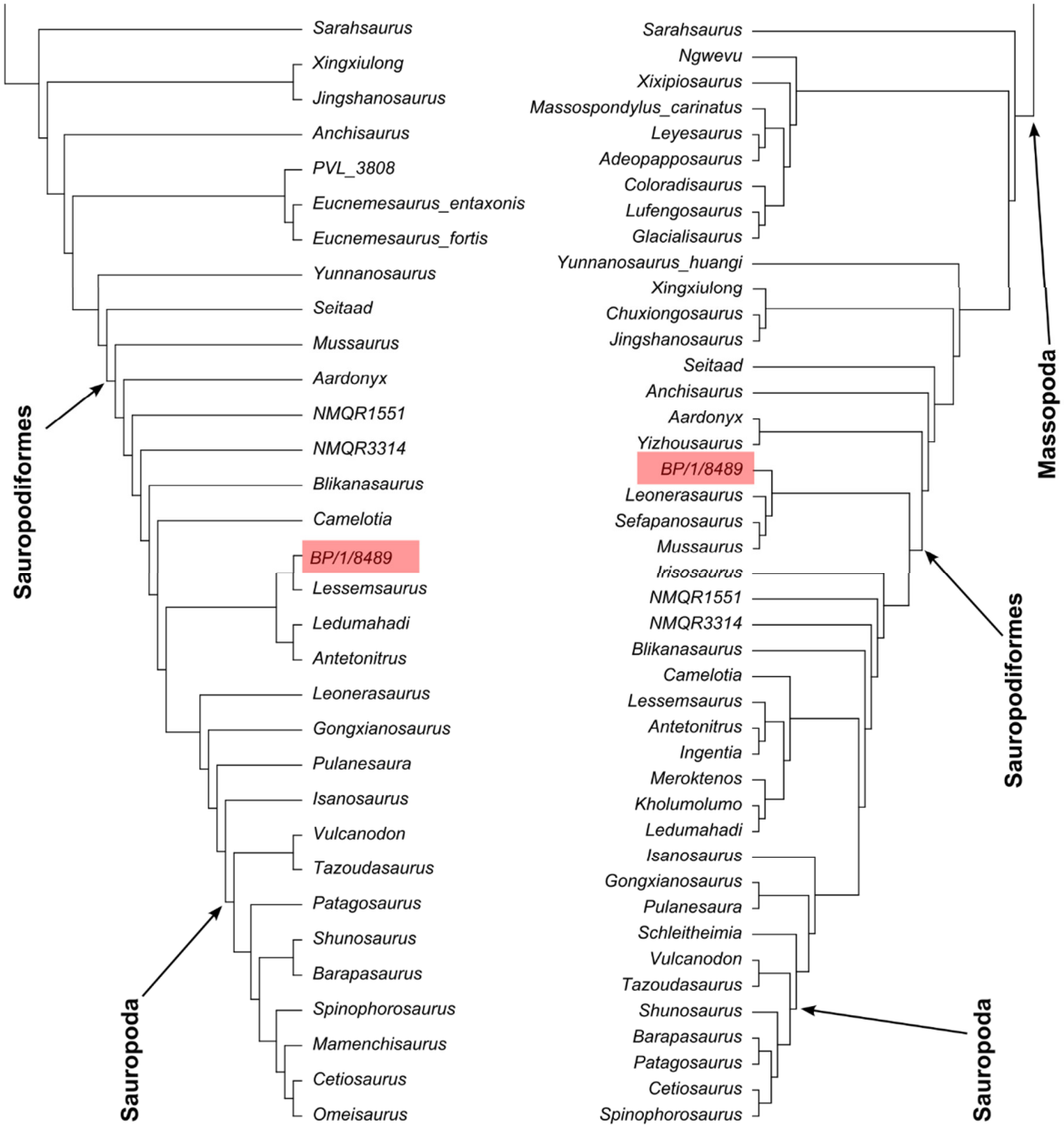


Figure S1.1: Comparison between standard-weighted parsimony trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right)

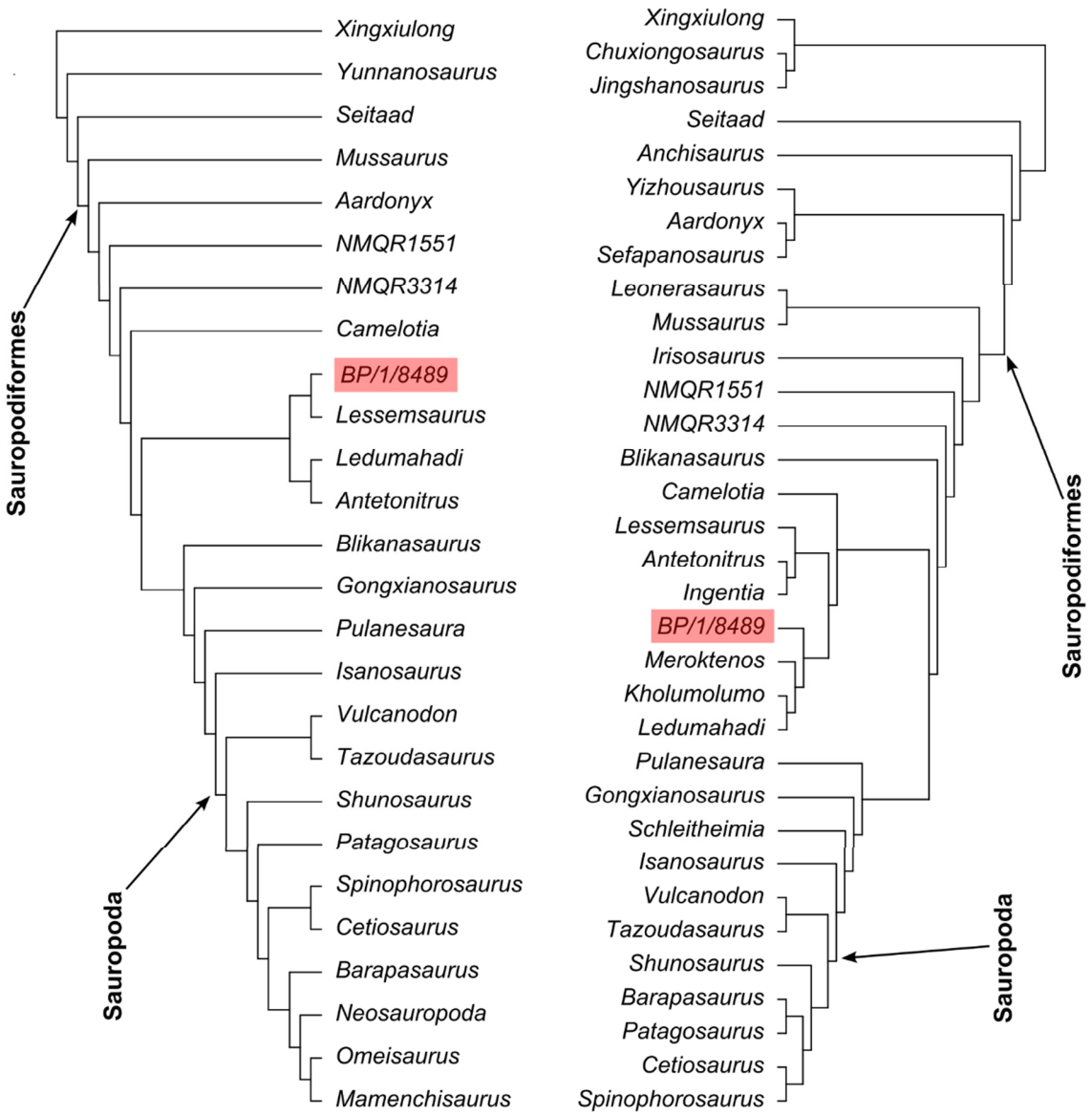


Figure S1.2: Comparison between trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right) under implied weighting with a function of k=3.

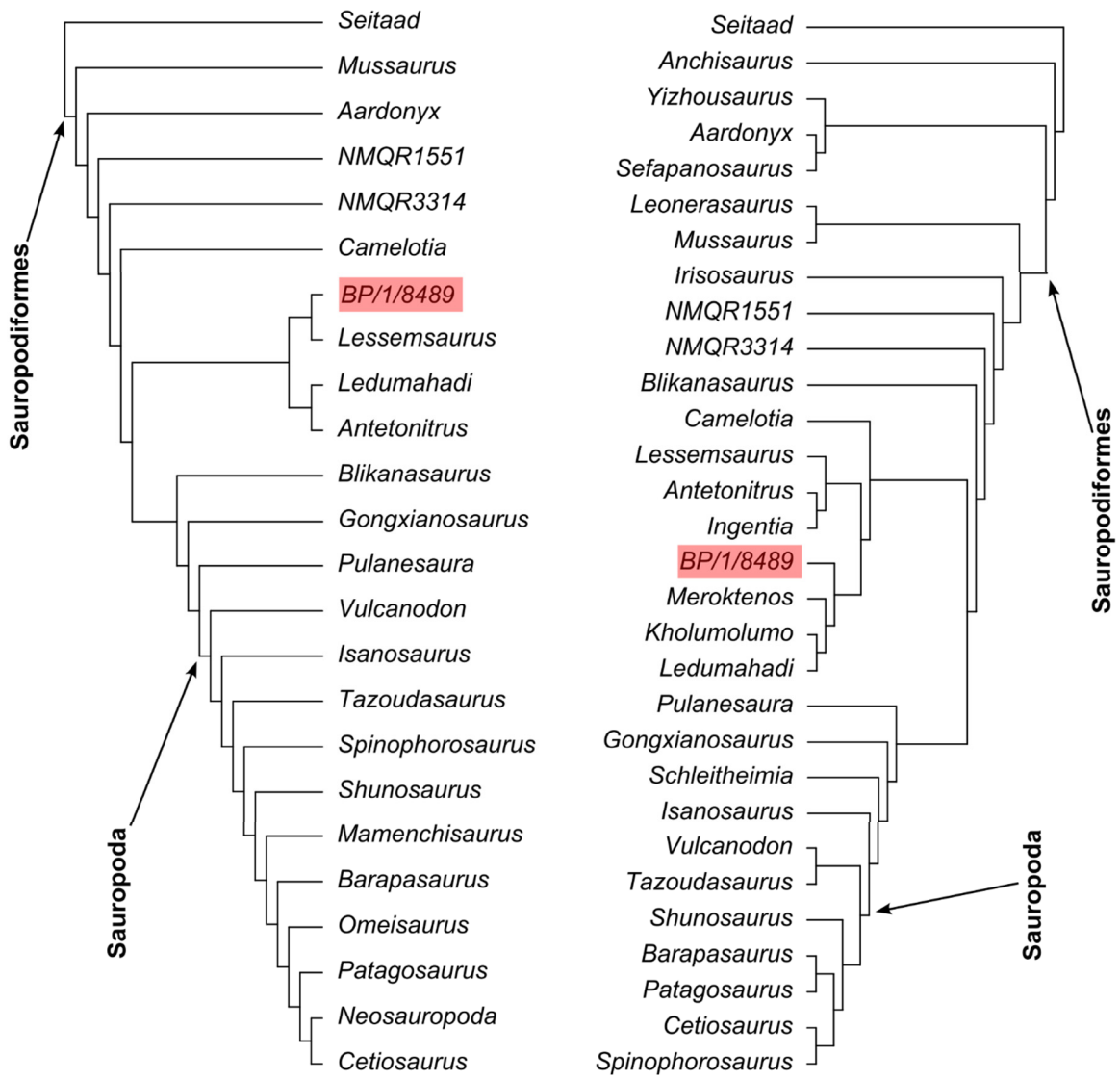


Figure S1.3: Comparison between trees of Mcphee *et al* (2018, Left) and Pol *et al* (2021, Right) under implied weighting with a function of k=6.

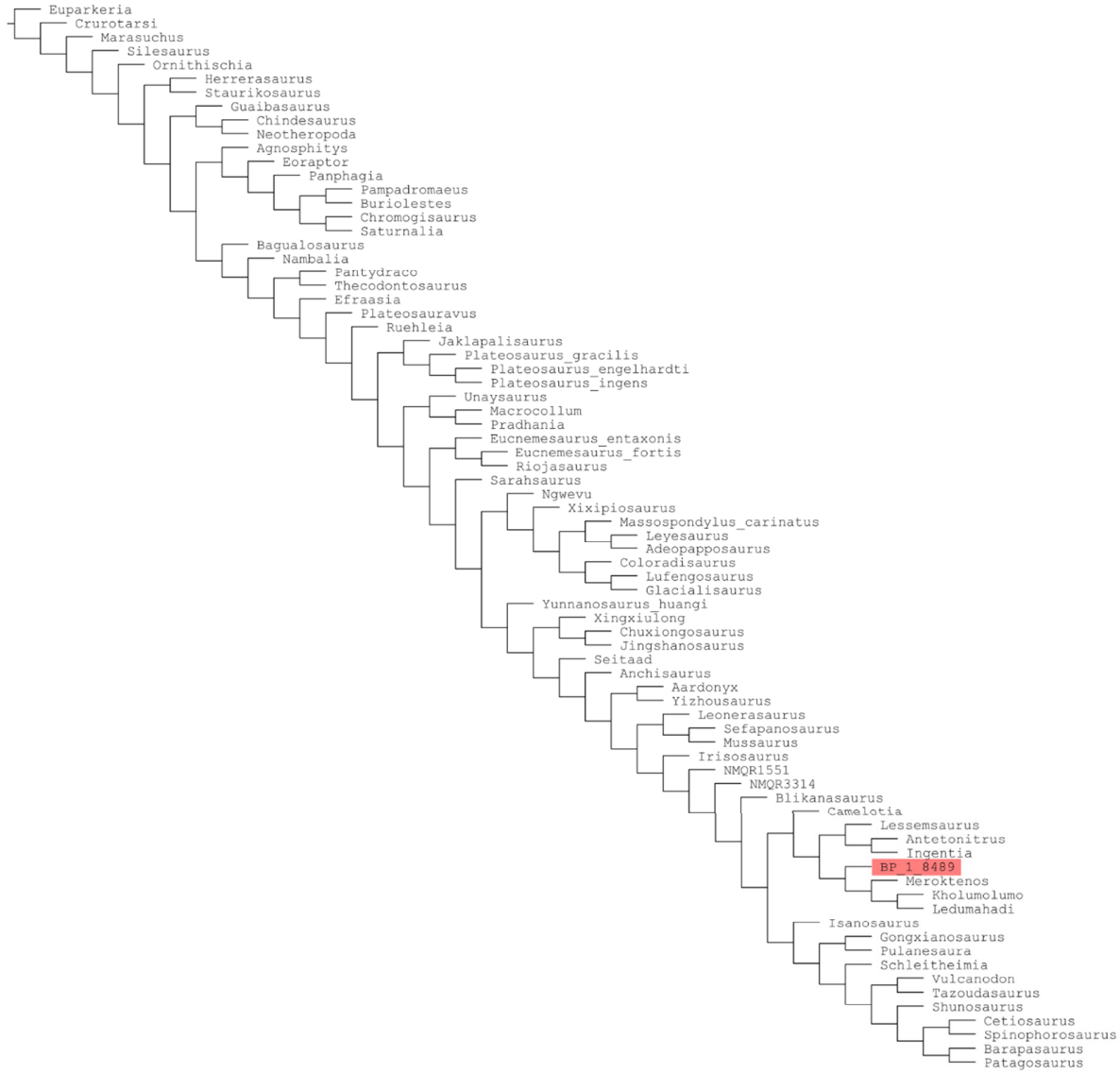


Figure S1.4: Constrained parsimony tree of Pol *et al* (2021).

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_shenzhouensis	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
Sarahsaurus_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