

A new desert-dwelling dinosaur (Theropoda, Noosaurinae) from the Cretaceous of south Brazil

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Supplementary Information

DETAILS OF THE PHYLOGENETIC ANALYSES

1 - Characters added to the phylogenetic matrix of Rauhut and Carrano (2016):

219) Ischium, proximal end: pubic articular facet dorsoventrally deeper than that for the ilium (0); iliac articular facet dorsoventrally deeper than that for the pubis (1).

220) Metatarsal IV, shaft: uncompressed (0), lateromedially compressed (1) with respect to the shaft of metatarsal III.

2 - Scorings changed from Rauhut and Carrano (2016):

Character 104: changed from (?) to (2) in *Limusaurus inextricabilis* (based on the scorings of Wang et al. 2016 for this taxon).

Characters 106, 107, 115 and 213: changed from (?) to (0) in *Limusaurus inextricabilis* (based on IVPP V15923, MDE pers. obs.).

Characters 109 and 114: changed from (?) to (1) in *Limusaurus inextricabilis* (based on IVPP V15923, MDE pers. obs.).

Characters 154: changed from (1) to (0) in *Limusaurus inextricabilis* (based on IVPP V15923, MDE pers. obs.).

Characters 195, 196 and 204: changed from (?) to (1) in *Velocisaurus unicus* (based on Egli et al. 2016).

Characters 211, 214 and 217: changed from (?) to (1) in *Velocisaurus unicus* (based on MUCPv-41).

Characters 199 and 200: changed from (?) to (1) in *Velocisaurus unicus* (based on Egli et al. 2016).

3 – Data matrix:

Herrerasaurus

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0000000000011000000000000000000000100100{01}0000000000000000?000000000000
0000000010000000000000000000100000000000000000{01}00010000000001?000000
00?000000000001100?000000000000100000000000000000000000000000000000-00
0000000000000000
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Megapnosaurus

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000001000010000000000000000000000010000000000000000000000000000000000010000
0000100000000000000000000000100000011000010001010211001010000000001001001
0000{01}000000110000000000000000110001011101101000000100010011000000100
010001?000010
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Dilophosaurus

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00000000?000000?000?0100???00020000000000?00000?000?000?0000?1000?
?????0010000000?1001000?01?0000021100{01}000010101100010011000?0000011
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1??1?0111??01110?????1110?11?1?1?0????1???11????????????1???1?????????
 ??????????11??01?0????1??????22?11?001?1???11??????1??{01}???0?0?

??111??0????????????????????????????????1?????1?????111?????0?011?1110??01?
?1?00?????1???

Elaphrosaurus
??
?????????????????????????????1{01}??????11000111001100211010111100011111?00
101??1?1?1?011111111010??10?01????1011011000011?0?0100?1101001121010
010010?????00

Eoabelisaurus
?0?????????????????0001000000{01}10020101001000?10?01??0?01?011?????00
?1?????????????????????00??0?1{12}??????221?110?0101?1010001011111011111
?1021110200??110?0000??101{01}010110111111111011?0{01}00?11?-11???0{01
{01}101101101111??000111?00

Genusaurus
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?????????????????????????????1????????2??????0??????????0???1???1?????????
???11?01??1111?????????0?0{01}201???11???
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Genyodectes
0???0???
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Ilokelesia
?1?????????????????????????????11101111010?1?????????????????????1????????
?????????????????????????????1????????222110010101210110?????1111?????????2??
112?011???
?????111???

Indosaurus
?????????????????????11?1111?111?????????????????????????????????11?????1???
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Kryptops
1????20111011???
?????????????????01100???
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Laevisuchus
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????????0???
?????????????????

Limusaurus
001?0?0???0?00000?00?000000??000?01{01}???00?0?0?0000??????00?????????
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10?00?010011011101??100101?11?{01}001110011100{01}10000?00?0?????1{12}?
00???1?1?1???10?1???00

Majungasaurus
111112011101110101111111101111110110001000111101111011111111111101111
11112111111100110110100012111111221111010101210100010111111{01}1111111

[illegible]

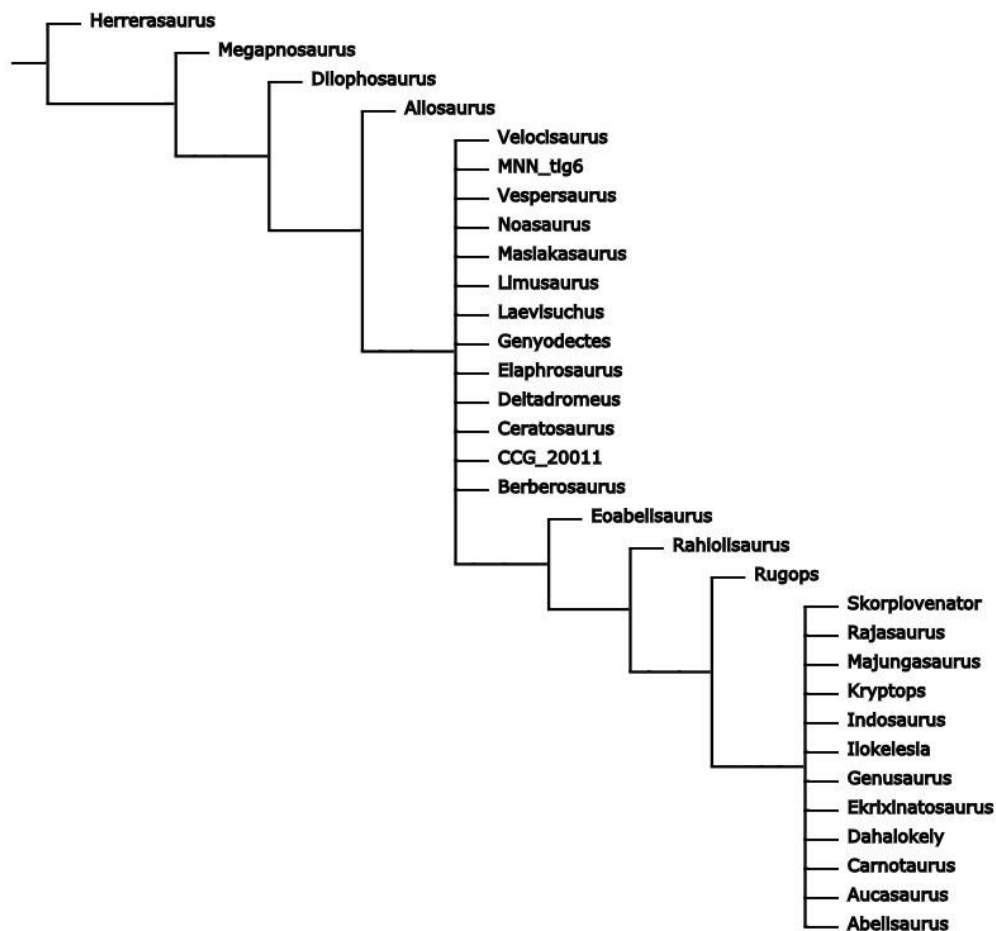
??0?11?0011?1?11111
1111??1??1

USNM 8415

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4 – Recovered topologies:

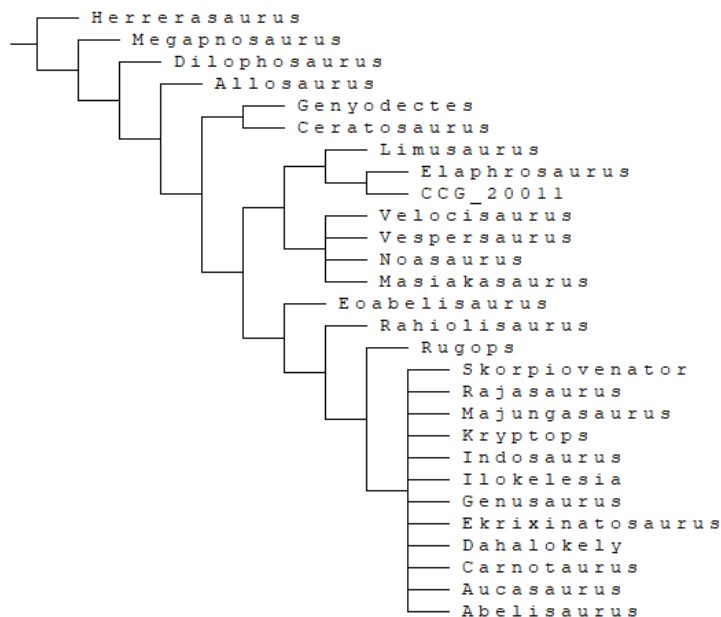
Strict consensus of 17,400 most parsimonious trees (MPTs) resulting from the analysis of the above data matrix, with the *a priori* exclusion of USNM 8415 and *Spinostropheus gautieri*.



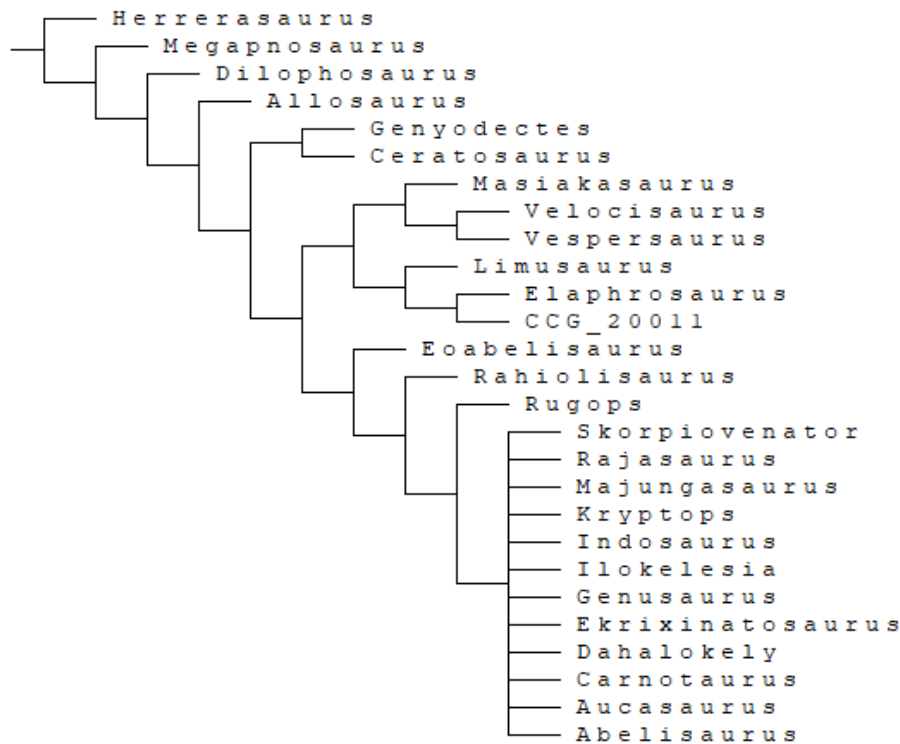
Strict consensus of 6,612 most parsimonious trees (MPTs) resulting from the analysis of the above data matrix, with the *a priori* exclusion of USNM 8415, *Spinostropheus gautieri*, and *Deltadromaeus agilis*.



Reduced Strict consensus of 6,612 most parsimonious trees (MPTs) resulting from the analysis of the above data matrix, with the *a priori* exclusion of USNM 8415, *Spinostropheus gautieri*, and *Deltadromaeus agilis*, and the *a posteriori* pruning of *Berberosaurus liassicus*, *Laevisuchus indicus*, and MNN tig6.



Reduced Strict consensus of 6,612 most parsimonious trees (MPTs) resulting from the analysis of the above data matrix, with the *a priori* exclusion of USNM 8415, *Spinostropheus gautieri*, and *Deltadromaeus agilis*, and the *a posteriori* pruning of *Berberosaurus liassicus*, *Laevisuchus indicus*, MNN tig6, and *Noasaurus leali*.



5 – References cited in this Supporting Information

- Egli, F. B., Agnolín, F. L., & Novas, F. A new specimen of *Velocisaurus unicus* (Theropoda, Abelisauroidae) from the Paso Córdoba locality (Santonian), Río Negro, Argentina. *Journal of Vertebrate Paleontology* e1119156 (2016).
- Rauhut, O. W. M., & Carrano, M. T. The theropod dinosaur *Elaphrosaurus bambergi* Janensch, 1920, from the Late Jurassic of Tendaguru, Tanzania. *Zoological Journal of the Linnean Society* **178**, 546–610 (2016).
- Wang, S., Stiegler, J., Amiot, R., Wang, X., Du, G.-H., Clark, J.M., & Xu, X. Extreme Ontogenetic Changes in a Ceratosaurian Theropod. *Cell Biology* **27**, 1–5 (2017).