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SUPPLEMENTARY ONLINE MATERIAL FOR

**The Interatheriinae notoungulates from the middle
Miocene Collón Curá Formation in Argentina**

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Supplementary Online Material

SOM 1. List of characters utilized in the phylogenetic analysis.

SOM 2. Data matrix.

SOM 1. List of characters utilized in the phylogenetic analysis (modified from Vera et al. 2017).

Reference: Vera, B., Cerdeño, E., and Reguero, M.A. 2017. The Interatheriinae from the Late Oligocene of Mendoza (Argentina), with comments on some Deseadan Interatheriidae. *Historical Biology* 29: 607–626.

0. Cement: 0) absent; 1) present.
1. Cheek teeth: 0) brachydont; 1) hypsodont; 2) hipselodont.
2. Order of eruption P/p4 versus M/m3: 0) P/p4 erupt before M/m3; 1) P/p4 erupt after M/m3 (milk molar are retained until after eruption of the third molar).
3. I1 development: 0) subequal or slightly different in size from I2; 1) larger than other incisors.
4. I1 section: 0) oval; 1) labiolingually compressed.
5. Upper canine: 0) C~I; 1) absent or reduced respect to incisors.
6. I2–C section: 0) oval in cross section; 1) labiolingually compressed.
7. I2–C labial sulcus: 0) absent; 1) present.
8. P1: 0) not overlapped; 1) overlapped only by C; 2) overlapped only by P2; 3) overlapped by C and P2.
9. P1 parastyle: 0) absent; 1) present.
10. P4: 0) $DLL \geq DMD$; 1) $DLL < DMD$.
11. P3–4 parastyle sulcus: 0) shallow; 1) deep.
12. P3–4 mesial cingulum: 0) present; 1) absent.
13. M1–3 mesial cingulum: 0) present; 1) absent.
14. P3–4 distal cingulum: 0) present; 1) absent.
15. P3–4: 0) premolariform; 1) molariform.
16. M1–2 distal cingulum: 0) present; 1) absent.
17. Hypocone/protocone on M1–2: 0) roughly equally developed; 1) hypocone more developed than protocone and lingually protruding; 2) protocone more developed than protocone and lingually protruding.
18. M1–2 size: 0) $DLL > DMD$ or equidimensional; 1) $DLL < DMD$, rectangular or trapezoid shape.
19. Sulcus on P3–4: 0) absent; 1) mesial; 2) lingual.
20. Sulcus dividing lophs on worn M1–2: 0) no sulcus; 1) a single sulcus; 2) a bifid sulcus.
21. $i3$: 0) $i3 \geq i2$; 1) $i3 < i2$; 2) absent.
22. $i1$ groove: 0) absent; 1) a lingual shallow groove; 2) bifid.
23. $i1$ –2 implantation: 0) not procumbent; 1) procumbent.
24. canine: 0) absent or $c \leq i$; 1) $c > i$.
25. $p1$: 0) vestigial or absent; 1) caniniform (no talonid differentiated); 2) premolariform (talonid insinuated).
26. $p1$: 0) not overlapped; 1) overlapped by c; 2) overlapped by c and $p2$.
27. Mesial cingulid on $p2$ –3: 0) present; 1) absent.
28. $p4$: 0) not molarized; 1) molarized.
29. Talonid of $p2$: 0) very small or absent; 1) not differentiated by sulcus; 2) well differentiated.
30. Labiodistally well-developed protoconid in $p2$: 0) absent; 1) present.
31. Talonid/trigonid on $p3$: 0) talonid < trigonid; 1) talonid \geq trigonid.
32. Talonid/trigonid on $p4$: 0) talonid < trigonid; 1) talonid \geq trigonid.
33. Postmetacristid on $p3$ –4: 0) absent; 1) present.
34. Talonid shape of $m1$ –2: 0) sub-circular; 1) triangular.
35. Ectoflexid on $m1$ –2: 0) does not reach the base of the crown; 1) reaches the base of the crown.
36. Lingual face on $m1$ –2: 0) trilobed, with two lingual grooves; 1) bilobed, with a trigonid–talonid groove.
37. Trigonid shape of lower molars: 0) quadrangular; 1) triangular; 2) P-shaped
38. Hypoflexid on $m3$: 0) absent; 1) moderately accentuated; 2) deep.
39. Height of the mandibular horizontal ramus: 0) approximately constant, gradually increasing forward; 1) increase forward, the $m2$ level is at least twice as high as at the incisor level.
40. Descending process of the maxilla: 0) absent; 1) small or moderately developed; 2) very prominent.
41. Root of the zygomatic arch: 0) narrow, not expanded; 1) moderately expanded; 2) well expanded.
42. Astragalar foramen: 0) present; 1) absent.
43. Fossettes on molars: 0) present with strong wear; 1) present but disappear very earlier; 2) absent
44. Spaces among $i3$, c and $p1$: 0) absent; 1) present.
45. Entepicondylar foramen of humerus: 0) present; 1) absent.
46. Supratrochlear foramen of humerus: 0) absent; 1) present
47. Maxilla: 0) forms the dorsal border of the orbit; 1) excluded from the dorsal border of the orbit.
48. Sliver of frontal anteriorly projected: 0) absent; 1) present
49. Parastyle on M1–2: 0) present and deep sulcus; 1) moderated/little evident
50. Relation on the upper molar size: 0) nearly equally sized; 1) decrease from M1 to M3.

SOM 2. Data matrix. Abbreviations: ?, missing data; A, polymorphic character (0&1).

Taxon / Character	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
<i>Simpsonotus praecursor</i>	0	0	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Notostylops murinus</i>	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	?
<i>Oldfieldthomasia debilitata</i>	0	0	1	0	1	0	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1
<i>Notopithecus adapinus</i>	0	0	0	0	1	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
<i>Federicoanaya sallaensis</i>	1	1	1	0	1	0	1	1	3	1	1	1	1	1	1	0	1	0	1	1	2	0	2	1	1	1
<i>Brucemacfaddenya boliviensis</i>	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	2	2	0	?	1	1	1
<i>Santiagorothia chiliensis</i>	0	1	1	0	1	0	1	1	1	?	1	1	1	1	0	0	0	1	1	2	2	0	1	1	1	2
<i>Eopachyrucos pliciferus</i>	0	1	0	?	?	?	?	?	?	?	?	?	?	1	?	?	0	0	1	?	2	?	?	?	?	?
<i>Argyrohyrax proavus</i>	1	1	1	1	1	0	1	1	3	1	1	1	1	1	0	1	0	1	1	2	2	0	1	0	1	1
<i>Progaleopithecus tournoueri</i>	1	1	?	?	?	?	?	?	?	?	1	1	1	1	1	1	1	0	1	2	1	0	2	1	1	1
<i>Archaeophylus patrius</i>	1	1	1	?	?	0	1	1	1	1	1	1	1	1	1	0	1	1	1	2	1	?	?	?	?	?
<i>Cochilius volvens</i>	1	2	1	1	1	0	1	0	2	1	1	1	1	1	1	1	1	0	1	2	2	1	1	1	0	1
<i>Interatherium robustum</i>	1	2	1	1	1	1	1	0	2	1	1	1	1	1	1	1	1	0	1	2	1	1	1	1	0	1
<i>Miocochilius anamopodus</i>	1	2	1	1	0	0	1	0	2	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	2
<i>M. federicoi</i>	1	2	?	?	?	?	?	?	?	0	0	0	1	1	1	0	1	0	1	1	1	?	?	?	?	?
<i>Protypotherium australe</i>	1	2	1	1	1	0	1	0	3	0	0	1	1	1	1	0	1	0	1	1	1	0	2	1	1	1
<i>P. endiadys</i>	1	2	1	1	1	0	1	0	0	0	0	1	1	1	1	0	1	0	1	1	1	0	0	1	1	1
<i>P. colloncurensis</i>	1	2	?	?	?	?	?	?	?	2	1	0	1	1	1	0	1	0	1	1	1	0	0	1	1	1
<i>P. sinclairi</i>	1	2	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	1
<i>P. distinctum</i>	1	2	?	?	?	?	?	?	?	?	0	1	1	1	1	0	1	0	1	1	2	?	?	?	?	?
<i>P. minutum</i>	1	2	?	?	?	?	?	?	?	?	?	0	1	1	1	1	0	1	2	1	1	1	?	?	?	?

SOM 2 (continued)

Taxon / Character	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
<i>Simpsonotus praecursor</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	?	0	0	?	?	?	?	0	0
<i>Notostylops murinus</i>	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
<i>Oldfieldthomasia debilitata</i>	0	1	0	2	0	1	1	0	0	0	0	0	1	0	0	1	?	0	0	?	?	0	0	0	0
<i>Notopithecus adapinus</i>	2	0	0	2	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0
<i>Federicoanaya sallaensis</i>	1	1	0	2	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1
<i>Brucemacfaddenya boliviensis</i>	1	1	1	2	0	0	1	0	0	1	0	0	0	0	1	1	1	1	0	?	?	?	?	0	1
<i>Santiagorothia chiliensis</i>	1	1	0	2	0	0	0	1	0	1	0	0	0	0	1	1	?	0	0	?	?	1	1	1	0
<i>Eopachyrucos pliciferus</i>	0	1	0	2	?	0	1	0	0	1	0	0	0	?	?	?	?	0	?	?	?	?	?	1	?
<i>Argyrohyrax proavus</i>	0	1	1	2	1	1	1	A	0	1	1	2	0	0	1	1	?	1	0	?	?	1	?	1	0
<i>Progaleopithecus tournoueri</i>	2	1	1	2	1	0	1	0	1	1	1	2	2	0	1	2	?	1	0	?	?	?	?	0	1
<i>Archaeophylus patrius</i>	?	1	?	?	?	0	1	?	1	1	1	1	?	?	1	1	?	1	?	?	?	?	?	1	1
<i>Cochilius volvens</i>	1	1	1	?	0	1	1	0	0	1	1	1	0	1	2	2	1	1	0	?	1	1	1	1	1
<i>Interatherium robustum</i>	0	1	1	2	0	1	1	0	0	1	1	1	1	1	2	2	1	2	0	1	0	1	1	0	0
<i>Miocochilius anomopodus</i>	0	1	0	1	0	0	0	0	1	1	1	1	2	0	1	2	1	2	1	0	1	1	1	1	0
<i>M. federicoi</i>	?	?	?	?	?	?	?	?	?	?	?	?	?	?	1	0	?	2	?	?	?	?	?	1	0
<i>Protypotherium australe</i>	1	1	0	2	0	0	0	0	1	1	1	2	1	1	1	2	1	1	0	0	0	1	1	0	0
<i>P. endiadys</i>	1	1	0	2	0	0	0	0	1	1	1	2	2	0	1	1	?	1	1	0	1	0	0	1	0
<i>P. colloncurensis</i>	0	1	0	1	0	0	0	0	1	1	1	2	2	1	1	1	?	2	1	?	?	?	?	0	1
<i>P. sinclairi</i>	0	1	0	2	0	0	0	1	1	1	1	2	0	?	?	?	?	?	?	?	?	?	?	?	?
<i>P. distinctum</i>	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	2	?	?	?	?	?	1	0
<i>P. minutum</i>	?	?	?	?	?	?	?	?	1	1	1	2	1	?	1	1	?	2	?	?	?	?	?	1	1