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Supplementary data

Tables S1-S5, Figures S1-S5

Ancestral radiation of paenungulate mammals (Paenungulatomorpha) - new
evidence from the Paleocene of Morocco

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RH: GHEERBRANT—ANCESTRAL RADIATION OF PAENUNGULATA

Supplementary Tables S1-5

TABLE S1. Scan parameters of the studied material.

Specimen	Voltage	Current	Filter	Exposure	Voxel size (mm)
MHNM.KHG.225	130 kV	210 μ A	0.4 mm Cu	1 s	0.02733382
MHNM.KHG.226	130 kV	210 μ A	0.4 mm Cu	1 s	0.02733382
MHNM.KHG.224	140 kV	270 μ A	0.5 mm Cu	1 s	0.03821419
MHNM.KHG.227	140 kV	270 μ A	0.5 mm Cu	1 s	0.03821419

TABLE S2. Measurements (in mm) of upper teeth of *Hadrogeneios phosphaticus* gen. et sp. nov. Abbreviations: L, length; W, width.

	M1	M1	M2	M2	M3	M3
Specimen	L	W	L	W	L	W
MHNM.KHG.223	?	?	?	?	5.4	7.58
MHNM.KHG.226 R	?	?	6.5	7.6	6.1	8.3
MHNM.KHG.226 L	?	?	?	?	5.86	8.3

TABLE S3. Length of tooth row (in mm) of *Hadrogeneios phosphaticus* gen. et sp. nov.

Abbreviations: L, length; al, alveolus. *Estimated measurement.

Specimen	MHNM.KHG.225	MHNM.KHG.227	MHNM.KHG.224
L I1 (al)-M1	?	43.35	?
L C (al)-M1	?	36.8	?
L P1 (al)-M1	?	29.3	?
L P2 (al)-M1	?	21.76	?

L P3 (al)-M1	?	14. 9	?
L P4-P1 (al)	?	25. 6	?
L P3-4	?	?	9. 77
L M2-3	13. 3	?	?
Diastema C-P1	?	3.44	*4. 8
Diastema P1-2	?	4. 9	4. 5
Diastema P2-3	?	2.13	2. 13

TABLE S4. Measurements (in mm) of lower teeth of *Hadrogeneios phosphaticus* gen. et sp. nov. Abbreviations: L, length; W, width, Meas, measurements. *Estimated measurement.

		MHNT	MHNM.	MHNM.	MHNM.
Locus Meas.					
		PAL 2006.0.19	KHG.224	KHG.225	KHG.227
I1	L	?	*1.1	?	?
I1	W	?	*2	?	?
I2	L	?	*1.2	?	?
I2	W	?	*2.4	?	?
I3	L	?	*1	?	*1
I3	W	?	*1.4	?	*1
C	L	?	?	?	*4.1
C	W	?	?	?	*2.9
P1	L	?	3.27	?	2.8
P1	W	?	1.5	?	1.64
P2	L	?	*4.7	?	4.5
P2	W	?	*1.53	?	2
P3	L	?	4.16	?	*4.9 (al)
P3	W	?	2.35	?	*2.5 (al)
P4	L	?	5.44	?	5.16
P4	W	?	3.23	?	3.28
M1	L	?	?	?	5.16
M1	W	?	?	?	3.75
M2	L	?	6.13	6.45	?
M2	W	?	4.24	4.23	?
M3	L	7.6	?	6.85	7.25

M3	W	4.36	?	3.63	4.3
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TABLE S5. Measurements (in mm) of the dentary of *Hadrogonioides phosphaticus* gen. et sp. nov. *Estimated measurement.

	MHNM.KHG.2	MHNM.KHG.	MHNM.KHG.2	MHNT PAL
	24	225	27	2006.0.19
Max. Length of symphysis	27.2	?	*23.15	?
Height below M2	*13.8	10.56	15.7	14.9
Transverse width below M1	?	?	7.9	?
Transverse width below M2	?	5.6		7.5

Supplementary figures S1-5

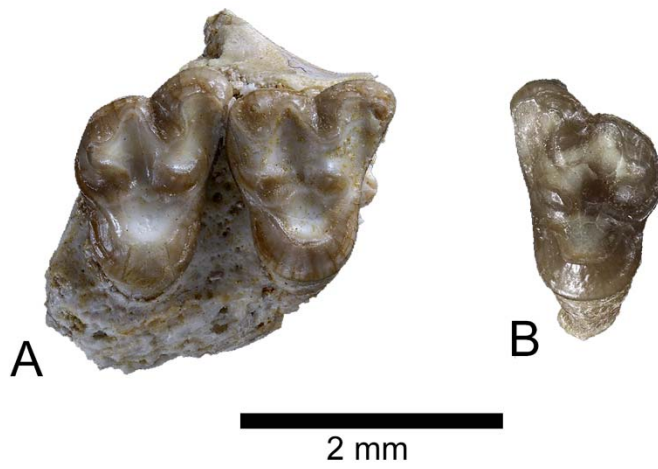


FIGURE S1. *Hadrogonioides phosphaticus* n. g., n. sp. MHNM.KHG.226. **A**, fragment of right maxillary bearing strongly worn M2-3; **B**, isolated left M3 of the same individual. Occlusal views. Scale in millimeters.

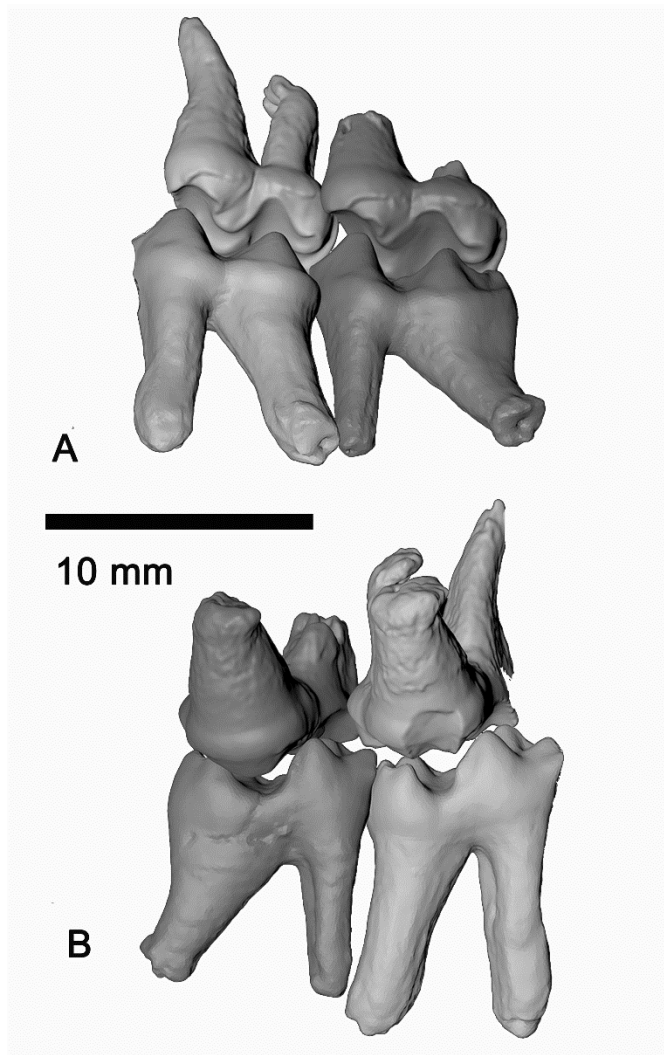


Figure S2. *Hadrogonioides phosphaticus* n. g., n. sp. Reconstruction of the molar occlusion based on the 3D digital models made from the CT scans of specimens MHNM.KHG.226 (right M2-M3 in reversed view) and MHNM.KHG.225 (left m2-3). Ventrolabial and lingual views. The specimen MHNM.KHG.226 is here enlarged by about 10% to adjust the precise molar occlusion with MHNM.KHG.225, which belongs to a slightly larger individual.

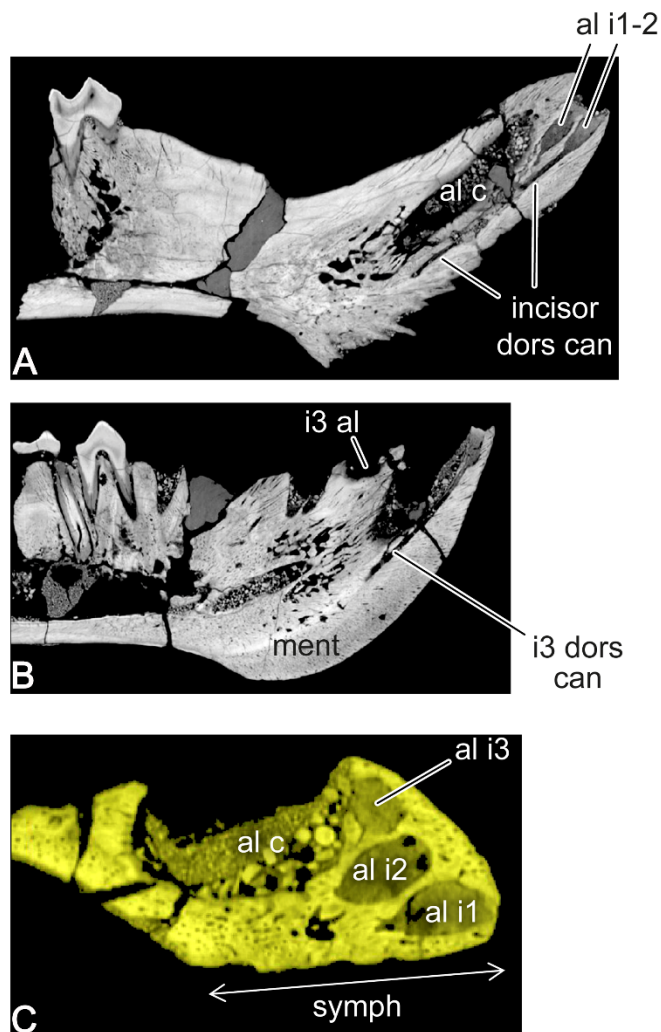


FIGURE S3. *Hadrogeneios phosphaticus* n. g., n. sp. CT scan sections of the dentary MHNH.KHG.224 showing the alveoli of the incisors and their neurovascular canaliculi. **A-B**, longitudinal (sagittal) section showing the alveoli of i1-3 and their thin dorsal canaliculus; b also shows the bifid alveolus of p1 (and posteriorly alveoli of p2, and the teeth p3 and p4). **C**, horizontal (axial) section showing the small alveoli of i1-3 and their relative position and development. **Abbreviations:** al: tooth alveolus; dors can: dorsal canaliculus; ment: mentum; symph: mandibular symphysis.

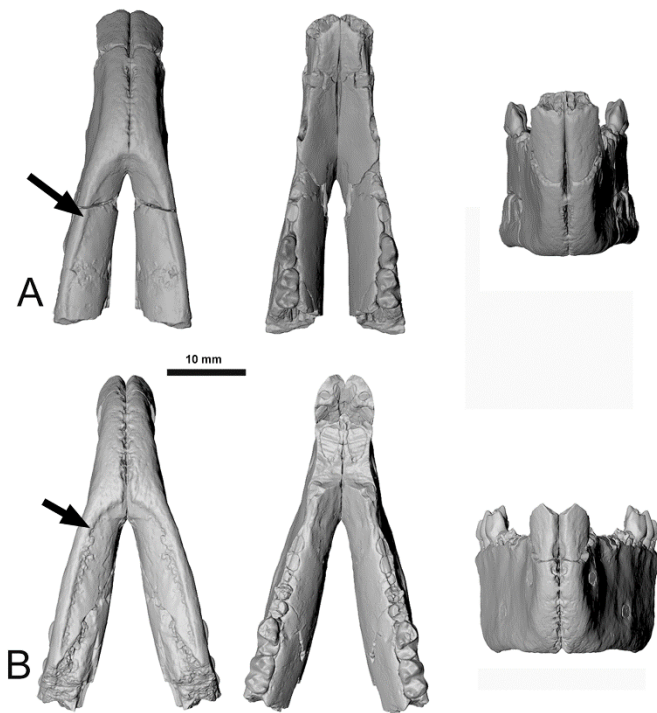


FIGURE S4. *Hadrogeneios phosphaticus* n. g., n. sp. 3D digital reconstruction by symmetrization of the mandibular symphyseal region. **A**, MHNH.KHG.224 in ventral, dorsal and anterior views. **B**, holotype MHNH.KHG.227 in ventral, dorsal and anterior views. The slight difference in the angle of the rami of MHNH.KHG.224 and MHNH.KHG.227 seen here is linked to postmortem deformation (preservation). Arrow: ventral bony crest for muscular attachment, probably for muscle genioglossus of the tongue.

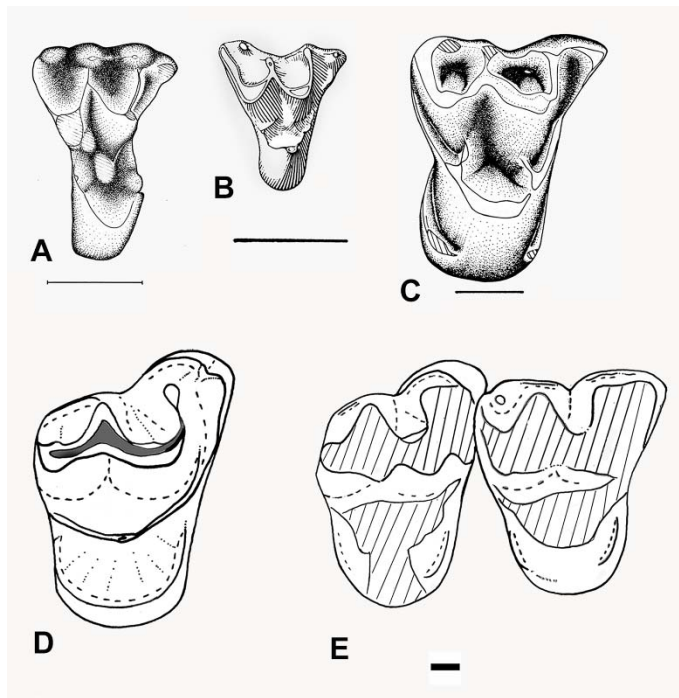


FIGURE S5. Comparison of the upper molar morphology of *Hadrogeneios phosphaticus* n. g., n. sp. with dilambdodont adapisoriculids *Garatherium* and *Remiculus*. **A**, *Garatherium* n. sp. from the Late Paleocene of Adrar Mgorn, Morocco; reversed view of THR362, M1 or M2 (fig. 12-2 in Gheerbrant, 1995). **B**, *Garatherium mahboubi* from the Ypresian of El Kohol, Algeria; holotype, M1 or M2 (fig. 1 in Crochet, 1984). **C**, *Remiculus deutschii* from the late Paleocene of Cernay-Berru, France; reversed view of holotype, M2 (fig. 12-5 in Gheerbrant, 1995). **D-E**, *Hadrogeneios phosphaticus* n. g., n. sp. D. Specimen MHNM.KHG.223, right M3. E. Specimen MHNM.KHG.226, right M2-3. Occlusal sketches made with camera lucida. Scale bar= 1 mm.

References

- Crochet, J. Y. 1984. *Garatherium mahboubii* nov. gen., nov. sp., Marsupial de l'Eocène inférieur d'El Kohol (Sud Oranais, Algérie). Annales de Paléontologie (Vertébrés-Invertébrés) 70:275–294.

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Condylarthra, ?Ungulata et *incertae sedis*). Palaeontographica A 237:39–132.