

Table S1. Mean (m) and standard error (se) of the chemical analyses in ppm of non-digested (F) teeth and teeth extracted from pellets (P). *n*: number of analyzed teeth. IE: incisor enamel, ID: incisor dentine, MD: molar dentine, ME: molar enamel.

F		Na	Mg	S	K	Cl	Fe	Sr	Ca	P	Ca/P
IE	m	7831	1358	89	635	3871	551	391	343562	191393	1.80
n=4	se	182	142	39	199	431	95	82	17346	9414	
ID	m	5647	10905	1376	1017	1025	471	742	243821	152567	1.60
n=11	se	401	1360	189	314	279	31	94	19884	9773	
MD	m	6000	4040	2321	902	1690	476	445	192560	115805	1.66
n=9	se	449	812	237	197	536	96	98	21071	9637	
ME	m	7630	1835	320	1443	1566	443	366	267137	155138	1.72
n=7	se	466	390	271	462	519	43	114	15628	7621	
P		Na	Mg	S	K	Cl	Fe	Sr	Ca	P	Ca/P
IE	m	8220	3387	2342	528	2953	528	1241	316295	165546	1.91
n=6	se	1426	1916	873	125	515	102	325	20284	12622	
ID	m	4853	5382	2940	296	1477	400	1436	237602	135503	1.75
n=6	se	574	1315	659	62	407	91	380	35707	16312	
MD	m	7602	5201	1403	213	939	744	4890	257429	131451	1.96
n=7	se	1595	530	392	70	59	136	1572	37243	15634	
ME	m	9377	2897	515	262	3213	480	1443	345026	182140	1.89
n=9	se	846	898	152	59	183	70	300	4815	1847	

Table S2. Mann–Whitney (MW) and Kolmogorov–Smirnov (KS) statistical tests based on the elemental chemical analyses. IE: incisor enamel; ID: incisor dentine; MD: molar dentine; ME: molar enamel, S: significant test, NS: non-significant test ($\alpha = 5\%$).

Tissue	test	Na	Mg	S	K	Cl	Fe	Sr	Ca	P
IE	MW	NS	NS	NS	NS	NS	NS	NS	NS	NS
	KS	NS	NS	S	NS	NS	NS	NS	NS	NS
ID	MW	NS	S	S	NS	S	NS	NS	NS	NS
	KS	NS	S	S	NS	S	S	NS	NS	NS
MD	MW	NS	MS	S	NS	NS	NS	S	NS	NS
	KS	NS	NS	NS	NS	NS	NS	S	NS	NS
ME	MW	NS	NS	S	S	S	NS	S	S	S
	KS	NS	NS	S	S	S	NS	S	S	S

Table S3. Simplified list of factors playing a role in the quality of the preservation of regurgitation pellets.

Digestion	Prey	Predator	Post digestion	climate	soil	biological factors	others
taxa	X	X					
age	X	X	pellet size			X	
size - weight	X	X	temperature	X			
meal number		X	atmospheric humidity	X			
gastric juice pH		X	water stream				X
gastric juice enzymes		X	frost	X			
laceration		X	soil composition		X		
			soil structure		X		
			bacteria/fungi			X	
			scavengers			X	
			bioturbation			X	
			trampling		X	X	
			broken teeth			X	
			<i>in situ</i> or isolated tooth			X	
			open environment				X

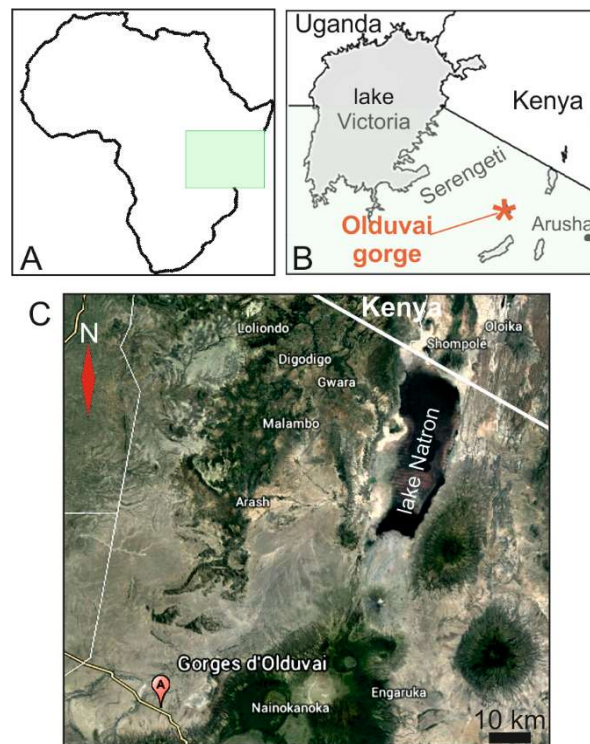


Figure S1. Maps of the location of Olduvai Gorge. (A)—Location of Tanzania in East Africa; (B)—Location of the Olduvai Gorge where pellets were collected; (C)—Location of Lake Natron.

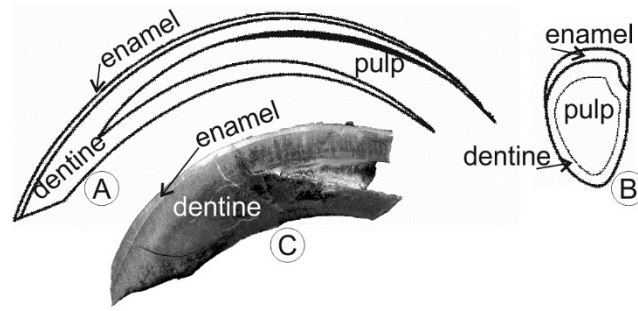


Figure S2. Ever-growing incisor of rodent showing the dentine is not fully covered by the enamel; (A)—longitudinal section. (B)—transversal section. (C)—A non-digested incisor showing enamel and dentine.

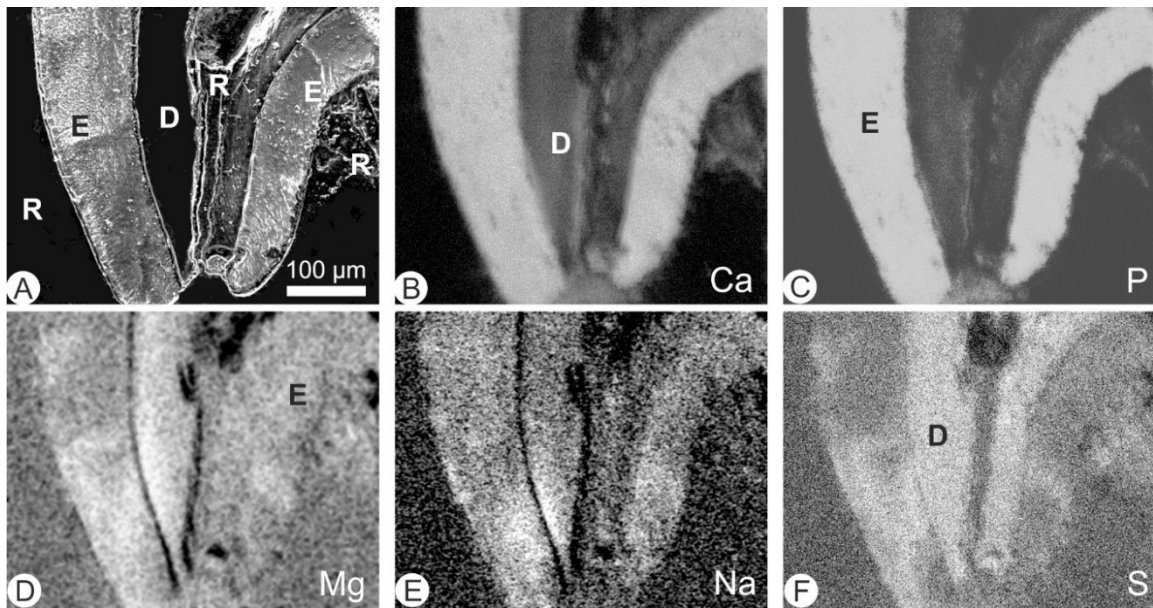


Figure S3. (A)—Location of the chemical maps done on a molar of a modern rodent. R: embedding resin, E: enamel, D: dentine. (B–F)—distribution maps of chemical elements.

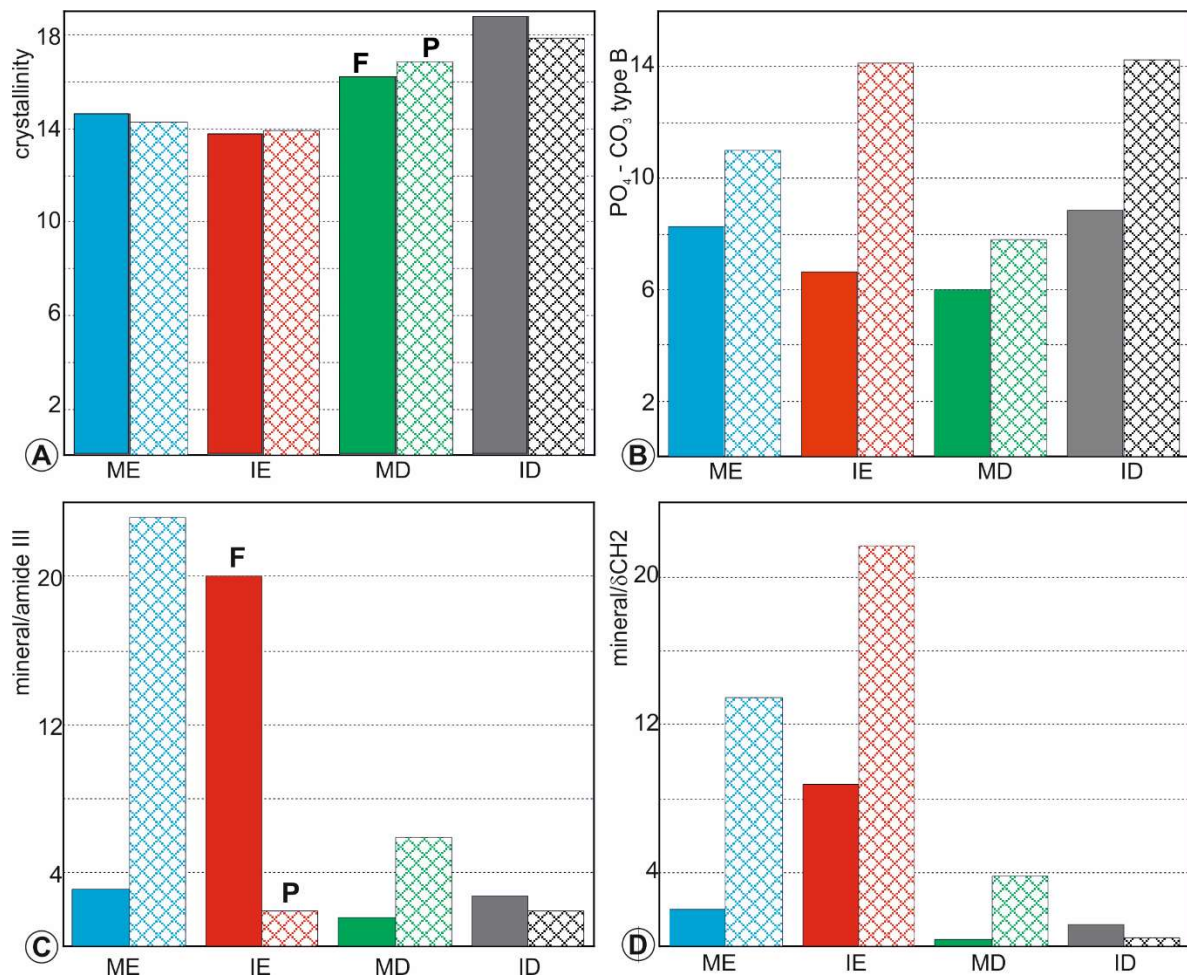


Figure S4. Comparison of the modifications of composition of digested tooth from Raman spectra. **(A)**—Crystallinity index calculated from the FWHM of the $\nu_1 PO_4^{3-}$ peak. **(B)**—Substitution of ions PO_4^{3-} (961 cm^{-1} peak) to CO_3^{2-} B type (1070 cm^{-1} peak); **(C)**—Mineral-organic ratios calculated from the surface of $\nu_1 PO_4^{3-}$ divided by the surface of amide III band. **(D)**—Mineral-organic ratios calculated from the surface of $\nu_1 PO_4^{3-}$ divided by the surface of $\delta(CH_2)$ band. P: digested teeth (extracted from regurgitation pellets); F: fresh teeth, non-digested. ME: molar enamel, IE: incisor enamel, MD: molar dentine, ID: incisor dentine.