

Supplementary information

1 – Age model for the Shungura Formation

This paper uses a revised age model for the Shungura Formation, interpolated based on the latest published absolute age data. The interpolation was carried out on the R.4.1.3 software, with the function `splinefun` (“stats” package, R Core Team, 2022) by implementing the data of the maximum cumulative thickness of sediments (Heinzelin and Haesarts, 1983) and the absolute ages known for some units of the Shungura Formation. For the Basal Member and the top of Member L, ages are interpolated by linear fit based on sedimentation rate. this age model is likely to evolve with the addition of new dating data.

Table S1. The age model for the Shungura Formation, for each stratigraphic unit as a function of the maximal cumulative thickness of units. References for known absolute age are also provided in bold. Abbreviations: Magn, magnetochronology; Rad, radiochronology. Ages are given for the top of the stratigraphic units.

Member	Unit	Maximal cumulative thickness	Interpolated age	Dating method	References
L	L-10	861.5	1.094		Linear fit based on L sedimentation rate (L-0 to L-7)
	L-9	852.5	1.137		
	L-8	847.3	1.162		
	L-7	841.95	1.188	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	L-6	835.3	1.206		
	L-5	830.5	1.215	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	L-4	824.9	1.237		
	L-3	815.9	1.295		
	L-2	808.9	1.344		
	L-1	804.1	1.371		
	Tuff L	801.5	1.383	Rad	McDougall et al., 2006
K	K-4	799.5	1.390		
	K-3	795.1	1.400		
	K-2	787.3	1.417		
	K-1	776.7	1.485	Rad	McDougall et al., 2006
	Tuff K	773.1	1.526	Rad	McDougall et al., 2012
J	J-7	769.5	1.556		
	J-6	765.1	1.577		
	J-5	755.6	1.596		
	J-4	751.6	1.607	Rad	McDougall et al., 2006
	J-3	744.6	1.647		
	J-2	740.2	1.680		
	J-1	733.8	1.727		
	Tuff J	727.8	1.760	Rad	McDougall et al., 2012
H	H-7	721.2	1.778	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	H-6	716.4	1.793		
	H-5	708.6	1.823		

	H-4	702.6	1.843	Rad	McDougall et al., 2006
	H-3	694.2	1.859		
	H-2	686.2	1.869	Rad	McDougall et al., 2006
	H-1	680.2	1.878		
	Tuff H	673.2	1.890		
Upper G	G-29	663.2	1.911		
	G-28	654.6	1.930	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	G-27	646.2	1.946		
	G-26	641.4	1.955		
	G-25	635.6	1.966		
	G-24	626.6	1.981		
	G-23	621.6	1.988		
	G-22	607.4	2.008		
	G-21	603.8	2.013		
	G-20	600.2	2.018		
	G-19	596.8	2.022		
	G-18	592.8	2.027		
	G-17	587	2.033		
	G-16	578.6	2.042		
	G-15	574.4	2.047		
G-14	564	2.057			
Lower G	G-13	558.5	2.062		
	G-12	538.5	2.081		
	G-11	525.9	2.093		
	G-10	516.3	2.102		
	G-9	510.3	2.107		
	G-8	506.7	2.111		
	G-7	499.9	2.118	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	G-6	495.5	2.123		
	G-5	488.5	2.131		
	G-4	477.5	2.146	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	G-3	458.3	2.188	Rad	McDougall and Brown, 2008
G-2	445.9	2.230			
G-1	441.1	2.247			
Tuff G	433.6	2.271	Rad	McDougall et al., 2012	
F	F-5	427.6	2.286		
	F-4	424.1	2.293		
	F-3	417.1	2.305		
	F-2	404.1	2.317		
	F-1	401.1	2.319		
	Tuff F	392.1	2.324	Rad	McDougall and Brown, 2008
E	E-5	384.9	2.328		
	E-4	371.9	2.335		
	E-3	358.9	2.347		
	E-2	352.1	2.355		

	E-1	344.9	2.367		
	Tuff E	338.9	2.378		
D	D-5	334.9	2.387		
	D-4	322.4	2.422		
	Tuff D-3-2	316.4	2.443	Rad	McDougall and Brown, 2008
	D-3	316.4	2.443		
	D-2	305.4	2.487		
	D-1	299.4	2.511		
	Tuff D	295.2	2.526	Rad	McDougall and Brown, 2008
C	C-9	289.8	2.542		
	C-8	279.8	2.568		
	C-7	269.2	2.603	Magn	Cohen and Gibbard, 2019; Raffi et al. 2020 (Table 29.7)
	C-6	256.2	2.661		
	C-5	249.2	2.697		
	C-4	237.7	2.760		
	C-3	227.7	2.814		
	C-2	218.7	2.860		
	C-1	212.8	2.887		
Tuff C	205.2	2.918			
B	B-12	199.2	2.937		
	B-11	189.2	2.959		
	B-10	181.2	2.965	Rad	McDougall and Brown, 2008
	B-9	160.2	2.978		
	B-8	145.2	3.032	Magn	Hilgen et al., 2012; Raffi et al. 2020 (Table 29.7)
	B-7	141	3.116	Magn	Hilgen et al., 2012; Raffi et al. 2020 (Table 29.7)
	B-6	133.8	3.182		
	B-5	129.2	3.200		
	B-4	120.6	3.207	Magn	Hilgen et al., 2012; Raffi et al. 2020 (Table 29.7)
	B-3	111.6	3.218		
	B-2	107.8	3.229		
	B-1	91.8	3.330	Magn	Hilgen et al., 2012; Raffi et al., 2020 (Table 29.7)
	Tuff B- δ	82.6	3.412	Rad	McDougall et al., 2012
	Tuff B- γ	78.8	3.430		
Tuff B- β	77	3.434			
Tuff B- α	70.8	3.438	Rad	McDougall and Brown, 2008	
A	A-4	66.8	3.438		
	A-3	57.3	3.447		
	A-2	46.8	3.486		
	A-1	38.2	3.559		

	Tuff A	35.2	3.596	Rad	McDougall and Brown, 2008
Basal	BAS-5	32	3.610		Linear fit based on A sedimentation rate (A-0 to B-alpha)
	BAS-4	28.6	3.625		
	BAS-3	24.3	3.644		
	BAS-2	18.7	3.669		
	BAS-1	8.5	3.715		
		0	3.752		

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2 – Oxygen isotopic composition of crocodylian teeth

Table S2. Information and isotopic composition of the crocodylian teeth sampled in the Shungura Formation. Abbreviation: ID, tooth inventory number; Age, age of the unit in million years.

ID	Member	Unit	Morphology	Age	$\delta^{18}\text{O}_p$ (‰ V-SMOW)	Estimated $\delta^{18}\text{O}_w$ (‰ V-SMOW)	$\delta^{18}\text{O}_c$ (‰ V-PDB)
BsupA	B	B-10	Pointed	2.965	17.02	-5.17	-4.63
BsupB	B	B-10	Pointed	2.965	17.95	-4.41	-5.73
BsupC	B	B-10	Pointed	2.965	19.09	-3.47	-4.90
BsupD	B	B-10	Pointed	2.965	15.32	-6.56	-6.78
BsupE	B	B-10	Pointed	2.965	17.68	-4.64	-5.96
BsupF	B	B-10	Pointed	2.965	20.8	-2.07	-4.52
B10r1	B	B-10	Rounded	2.965	15.79	-6.18	-7.38
B10r2	B	B-10	Rounded	2.965	17.48	-4.80	-7.61
b10r3	B	B-10	Rounded	2.965	20.66	-2.19	-4.66
b10p1	B	B-10	Pointed	2.965	16.37	-5.70	-5.51
b10p2	B	B-10	Pointed	2.965	19.76	-2.93	-3.54
B10p3	B	B-10	Pointed	2.965	16.22	-5.83	-5.37
B10p4	B	B-10	Pointed	2.965	22.22	-0.91	-2.31
B10p5	B	B-10	Pointed	2.965	16.98	-5.20	-5.47
B10p6	B	B-10	Pointed	2.965	20.48	-2.34	-3.07
B10p7	B	B-10	Pointed	2.965	20.41	-2.39	-4.22
B10p8	B	B-10	Pointed	2.965	21.31	-1.65	1.18
B10p9	B	B-10	Pointed	2.965	18.29	-4.14	-6.31
B10p10	B	B-10	Pointed	2.965	17.26	-4.98	-6.04
B10p11	B	B-10	Pointed	2.965	19.53	-3.12	-3.53
B12ar1	B	B-12a	Rounded	2.937	19.53	-3.12	
B12ar2	B	B-12a	Rounded	2.937	20.2	-2.57	
B12ar3	B	B-12a	Rounded	2.937	18.36	-4.07	
B12ar4	B	B-12a	Pointed	2.937	18.73	-3.77	
B12ap1	B	B-12a	Pointed	2.937	18.82	-3.70	-3.74
B12ap2	B	B-12a	Pointed	2.937	18.6	-3.88	-4.28
B12ap6	B	B-12a	Pointed	2.937	20.89	-2.00	-3.18
B12ap7	B	B-12a	Pointed	2.937	20.35	-2.44	-2.78
B12ap8	B	B-12a	Pointed	2.937	19.27	-3.33	-3.31
B12ap9	B	B-12a	Pointed	2.937	18.04	-4.34	-4.81
B12ap10	B	B-12a	Pointed	2.937	18.4	-4.05	-8.16
B12ap11	B	B-12a	Pointed	2.937	18.78	-3.73	-5.72
B12ap12	B	B-12a	Pointed	2.937	19.43	-3.19	-5.67
B12ap13	B	B-12a	Pointed	2.937	20.08	-2.66	-3.98

B12ap14	B	B-12a	Pointed	2.937	19.01	-3.54	-5.82
B12ap15	B	B-12a	Pointed	2.937	18.4	-4.04	-5.04
B12ap16	B	B-12a	Pointed	2.937	17.92	-4.44	-5.94
B12br1	B	B-12b	Rounded	2.937	17.56	-4.73	
B12br2	B	B-12b	Rounded	2.937	17.9	-4.46	
B12br3	B	B-12b	Rounded	2.937	18.19	-4.22	
B12br4	B	B-12b	Rounded	2.937	17.86	-4.48	
B12br5	B	B-12b	Rounded	2.937	18.4	-4.04	
B12bp1	B	B-12b	Pointed	2.937	18.09	-4.30	-5.33
B12bp2	B	B-12b	Pointed	2.937	18.58	-3.89	
B12bp3	B	B-12b	Pointed	2.937	18.53	-3.94	-5.19
B12bp4	B	B-12b	Pointed	2.937	18.59	-3.88	-4.84
B12bp5	B	B-12b	Pointed	2.937	18.08	-4.30	-6.85
B12bp6	B	B-12b	Pointed	2.937	18.96	-3.59	-6.48
B12bp7	B	B-12b	Pointed	2.937	18.85	-3.67	-5.54
B12bp8	B	B-12b	Pointed	2.937	18.6	-3.88	-6.43
B12bp9	B	B-12b	Pointed	2.937	18.75	-3.76	-5.87
B12bp10	B	B-12b	Pointed	2.937	18.21	-4.20	-5.02
B12bp11	B	B-12b	Pointed	2.937	18.4	-4.04	-5.13
B12bp12	B	B-12b	Pointed	2.937	16.85	-5.31	-5.96
B12bp13	B	B-12b	Pointed	2.937	17.04	-5.16	-6.59
B12bp14	B	B-12b	Pointed	2.937	17.33	-4.92	-6.01
B12bp15	B	B-12b	Pointed	2.937	18.02	-4.35	-5.78
C2p1	C	C-2	Pointed	2.86	17.47	-4.81	-5.36
C2p2	C	C-2	Pointed	2.86	18.25	-4.16	
C2p3	C	C-2	Pointed	2.86	17.76	-4.57	
C2p4	C	C-2	Pointed	2.86	17.39	-4.87	
C2p5	C	C-2	Pointed	2.86	17.13	-5.08	
C2p6	C	C-2	Pointed	2.86	19.07	-3.49	
C2p7	C	C-2	Pointed	2.86	17.77	-4.56	
C2p8	C	C-2	Pointed	2.86	18.83	-3.69	
C2p9	C	C-2	Pointed	2.86	18.28	-4.14	
C2p10	C	C-2	Pointed	2.86	18.78	-3.73	
C2p11	C	C-2	Pointed	2.86	17.09	-5.12	
C2p12	C	C-2	Pointed	2.86	18.4	-4.04	
C2p13	C	C-2	Pointed	2.86	19.7	-2.98	
C2p14	C	C-2	Pointed	2.86	16.59	-5.53	
C2p15	C	C-2	Pointed	2.86	16.97	-5.22	
C2p16	C	C-2	Pointed	2.86	15.84	-6.14	

C2p17	C	C-2	Pointed	2.86	18.26	-4.15	
C2p18	C	C-2	Pointed	2.86	19.09	-3.48	
C2p19	C	C-2	Pointed	2.86	19.22	-3.37	
C2p20	C	C-2	Pointed	2.86	16.77	-5.38	
C4r1-bisC4r6	C	C-4	Rounded	2.76	20.26	-2.52	-5.01
C4r2	C	C-4	Rounded	2.76	16.12	-5.91	-6.87
C4r4-bisC4r7	C	C-4	Rounded	2.76	17.77	-4.56	-5.32
C4r5	C	C-4	Rounded	2.76	15.87	-6.12	-6.65
C4p1	C	C-4	Pointed	2.76	18.77	-3.74	
C4p2	C	C-4	Pointed	2.76	20.17	-2.59	
C4p3	C	C-4	Pointed	2.76	19.49	-3.15	
C4p4	C	C-4	Pointed	2.76	18.66	-3.83	
C4p5	C	C-4	Pointed	2.76	17.98	-4.39	
C4p6	C	C-4	Pointed	2.76	17.22	-5.01	
C4p7	C	C-4	Pointed	2.76	20.07	-2.67	
C4p8	C	C-4	Pointed	2.76	19.08	-3.48	
C4p9	C	C-4	Pointed	2.76	17.63	-4.67	
C4p10	C	C-4	Pointed	2.76	20.11	-2.64	
C8ar1	C	C-8	Rounded	2.568	21.08	-1.84	
C8ar2	C	C-8	Rounded	2.568	18.06	-4.32	
C8ar3	C	C-8	Rounded	2.568	18.17	-4.23	
C8ar4	C	C-8	Rounded	2.568	18.3	-4.13	
C8ar5	C	C-8	Rounded	2.568	17.45	-4.82	
C8ap1	C	C-8	Pointed	2.568	16.84	-5.32	
C8ap2	C	C-8	Pointed	2.568	15.68	-6.27	
C8ap3	C	C-8	Pointed	2.568	16.94	-5.24	
C8ap4	C	C-8	Pointed	2.568	18.83	-3.69	
C8ap5	C	C-8	Pointed	2.568	18.56	-3.91	
C8rA	C	C-8	Rounded	2.568	16.69	-5.45	
C8rB	C	C-8	Rounded	2.568	20.18	-2.58	-3.72
C8rC	C	C-8	Rounded	2.568	17.18	-5.04	
C8rD	C	C-8	Rounded	2.568	17.38	-4.88	
C8rE	C	C-8	Rounded	2.568	17.72	-4.60	
C8rF	C	C-8	Rounded	2.568	19.7	-2.98	
C8rG	C	C-8	Rounded	2.568	19.33	-3.28	
C8rH	C	C-8	Rounded	2.568	20.24	-2.54	
C8rI	C	C-8	Rounded	2.568	19.93	-2.79	
C8rJ	C	C-8	Rounded	2.568	17.54	-4.75	
C8rK	C	C-8	Rounded	2.568	17.35	-4.91	

C8rL	C	C-8	Rounded	2.568	17.52	-4.77	
C8rN	C	C-8	Rounded	2.568	16.2	-5.84	
C8rO	C	C-8	Rounded	2.568	17.65	-4.65	
C8pA	C	C-8	Pointed	2.568	18.12	-4.27	
C8pB	C	C-8	Pointed	2.568	16.25	-5.80	
C8pC	C	C-8	Pointed	2.568	16.75	-5.40	
C8pD	C	C-8	Pointed	2.568	17.23	-5.00	
C8pE	C	C-8	Pointed	2.568	17.09	-5.11	
C8pF	C	C-8	Pointed	2.568	17.71	-4.61	
C8pG	C	C-8	Pointed	2.568	17.45	-4.82	
C8pH	C	C-8	Pointed	2.568	17.24	-4.99	
C8pI	C	C-8	Pointed	2.568	20.95	-1.95	
C8pJ	C	C-8	Pointed	2.568	18.19	-4.22	
C8pK	C	C-8	Pointed	2.568	15.11	-6.74	
C8pL	C	C-8	Pointed	2.568	17.99	-4.37	
C8pM	C	C-8	Pointed	2.568	19.82	-2.88	
C8pN	C	C-8	Pointed	2.568	16.13	-5.90	
C8pO	C	C-8	Pointed	2.568	16.13	-5.90	
F1-5-r1	F	F-1	Rounded	2.319	17.57	-4.72	-4.88
F1-5-r2	F	F-1	Rounded	2.319	18.21	-4.20	-4.02
F1-5-r3	F	F-1	Rounded	2.319	18.97	-3.57	-3.48
F1-5-p1	F	F-1	Pointed	2.319	18.24	-4.17	-4.31
F1-5-p2	F	F-1	Pointed	2.319	18.95	-3.59	-4.00
F1-5-p3	F	F-1	Pointed	2.319	16.46	-5.63	-5.24
F2-1r1	F	F-2	Rounded	2.317	19.34	-3.27	-3.67
F2-1r2	F	F-2	Rounded	2.317	20.17	-2.59	
F2-1r3	F	F-2	Rounded	2.317	20.07	-2.67	-4.43
F2-1r4	F	F-2	Rounded	2.317	16.92	-5.25	-8.07
F2-1r5	F	F-2	Rounded	2.317	20.6	-2.23	-4.54
F2-1r6	F	F-2	Rounded	2.317	20.87	-2.01	-4.56
F2-1r7	F	F-2	Rounded	2.317	20.62	-2.22	
F2-1r8	F	F-2	Rounded	2.317	19.86	-2.84	-4.42
F2-1r9	F	F-2	Rounded	2.317	18.83	-3.69	
F2-1p1	F	F-2	Pointed	2.317	19.39	-3.23	
F2-1p2	F	F-2	Pointed	2.317	19.64	-3.03	
F2-1p3	F	F-2	Rounded	2.317	18.98	-3.56	-4.66
F2-1p4	F	F-2	Rounded	2.317	19.39	-3.23	
F2-1p5	F	F-2	Rounded	2.317	20.41	-2.40	-3.90
F2-1pA	F	F-2	Pointed	2.317	19.33	-3.28	

F2-1pB	F	F-2	Pointed	2.317	16.57	-5.54	
F2-1pC	F	F-2	Pointed	2.317	18.86	-3.67	
F2-1pD	F	F-2	Pointed	2.317	19.72	-2.96	
F2-1pE	F	F-2	Pointed	2.317	20.21	-2.56	
F2-1pF	F	F-2	Pointed	2.317	19.31	-3.30	
G3r1	Ginf	G-03	Rounded	2.188	16.07	-5.95	
G3p1	Ginf	G-03	Pointed	2.188	16.1	-5.93	
G3p2	Ginf	G-03	Pointed	2.188	16.63	-5.49	
G3p3	Ginf	G-03	Pointed	2.188	18.04	-4.34	
G3p4	Ginf	G-03	Pointed	2.188	16.91	-5.26	
G24r1	Gsup	G-24	Rounded	1.981	20.75	-2.12	
G24r2	Gsup	G-24	Rounded	1.981	20.29	-2.49	
G24r3	Gsup	G-24	Rounded	1.981	21.12	-1.81	
G24p1	Gsup	G-24	Pointed	1.981	20.94	-1.96	
G24p2	Gsup	G-24	Pointed	1.981	21.04	-1.88	
G24p3	Gsup	G-24	Rounded	1.981	19.4	-3.22	
G24p4	Gsup	G-24	Pointed	1.981	20.57	-2.26	
G24p5	Gsup	G-24	Pointed	1.981	20.01	-2.72	
G24p6	Gsup	G-24	Pointed	1.981	19.94	-2.78	
G24p7	Gsup	G-24	Pointed	1.981	20.89	-2.00	
G24p8	Gsup	G-24	Pointed	1.981	19.81	-2.88	
G24p9	Gsup	G-24	Pointed	1.981	19.84	-2.86	
G24p10	Gsup	G-24	Pointed	1.981	20.42	-2.38	
G24p11	Gsup	G-24	Pointed	1.981	20.21	-2.56	
G24pA	Gsup	G-24	Pointed	1.981	21.28	-1.68	
G24pB	Gsup	G-24	Pointed	1.981	19.48	-3.16	
G24pC	Gsup	G-24	Pointed	1.981	19.57	-3.08	
G24pD	Gsup	G-24	Pointed	1.981	19.72	-2.96	
G24pE	Gsup	G-24	Pointed	1.981	20.26	-2.52	
G24pF	Gsup	G-24	Pointed	1.981	20	-2.73	
Gsupr1	Gsup	G-27_G-28	Rounded	1.946	20.48	-2.34	-2.21
Gsupr2	Gsup	G-27_G-28	Rounded	1.946	16.01	-6.00	-5.96
Gsupr3	Gsup	G-27_G-28	Rounded	1.946	16.57	-5.54	-4.91
Gsupr4	Gsup	G-27_G-28	Rounded	1.946	18.82	-3.70	-3.42
Gsupp1	Gsup	G-27_G-28	Pointed	1.946	17.06	-5.14	-4.69
Gsupp2	Gsup	G-27_G-28	Pointed	1.946	19.68	-2.99	-3.26
Gsupp3	Gsup	G-27_G-28	Pointed	1.946	16.8	-5.35	-5.03
Gsupp4	Gsup	G-27_G-28	Pointed	1.946	18.69	-3.80	-3.35
Gsupp5	Gsup	G-27_G-28	Pointed	1.946	17.63	-4.67	-4.22

H4-H5r1	H	H-4_H-5	Rounded	1.843	17.04	-5.16	
H4-H5p1	H	H-4_H-5	Pointed	1.843	17.87	-4.48	
H4-H5p2	H	H-4_H-5	Pointed	1.843	18.48	-3.98	
H4-H5p3	H	H-4_H-5	Pointed	1.843	17.1	-5.11	
H4-H5p4	H	H-4_H-5	Pointed	1.843	20.99	-1.92	
H4-H5p5	H	H-4_H-5	Pointed	1.843	16.29	-5.77	
K4p1	K	K-4	Pointed	1.39	22.93	-0.33	
K4p2	K	K-4	Pointed	1.39	21.23	-1.72	
K4p3	K	K-4	Pointed	1.39	18.06	-4.32	
L2p1	L	L-2	Pointed	1.344	19.83	-2.87	
L2p2	L	L-2	Pointed	1.344	20	-2.73	
L2p3	L	L-2	Pointed	1.344	20.13	-2.63	
L2p4	L	L-2	Pointed	1.344	20.45	-2.36	
L2p5	L	L-2	Pointed	1.344	19.79	-2.90	
L2p6	L	L-2	Pointed	1.344	19.96	-2.77	
L2p7	L	L-2	Pointed	1.344	19.73	-2.95	
L2p8	L	L-2	Pointed	1.344	20.78	-2.09	
L2p9	L	L-2	Pointed	1.344	19.67	-3.00	
L2p10	L	L-2	Pointed	1.344	20.06	-2.68	
L2p11	L	L-2	Pointed	1.344	19.37	-3.25	
L2p12	L	L-2	Pointed	1.344	20.49	-2.33	
L2p13	L	L-2	Pointed	1.344	20.78	-2.09	
L2p14	L	L-2	Pointed	1.344	20.1	-2.65	
L4A	L	L-2	Pointed	1.344	20.6	-2.24	
L4B	L	L-2	Pointed	1.344	20.05	-2.69	
L4C	L	L-2	Pointed	1.344	20.75	-2.11	
L4D	L	L-2	Pointed	1.344	18.99	-3.56	
L4E	L	L-2	Pointed	1.344	20.35	-2.45	
L4F	L	L-2	Pointed	1.344	20.54	-2.29	
L3p1	L	L-3	Pointed	1.295	19.25	-3.35	-2.91
L3p2	L	L-3	Pointed	1.295	20.13	-2.62	-2.63
L3p3	L	L-3	Pointed	1.295	19.38	-3.24	-3.92
L3p5	L	L-3	Pointed	1.295	19.07	-3.49	-3.18
L3p6	L	L-3	Pointed	1.295	19.62	-3.04	-3.46
L4p1	L	L-4	Pointed	1.237	19.28	-3.32	-2.58
L4p2	L	L-4	Pointed	1.237	19.63	-3.03	-3.11
L4p3	L	L-4	Pointed	1.237	19.34	-3.27	-4.22
L4p4	L	L-4	Pointed	1.237	21	-1.91	-2.83
L4p5	L	L-4	Pointed	1.237	20.2	-2.57	-1.78

L9r1	L	L-9	Rounded	1.137	20.32	-2.47	-0.95
L9r2	L	L-9	Rounded	1.137	18.55	-3.92	
L9r3	L	L-9	Rounded	1.137	20.15	-2.61	-2.07
L9r4	L	L-9	Rounded	1.137	20.51	-2.31	-2.56
L9r5	L	L-9	Rounded	1.137	19.08	-3.48	-2.58
L9r6	L	L-9	Rounded	1.137	19.14	-3.44	-3.11
L9r7	L	L-9	Rounded	1.137	20.04	-2.70	-2.86
L9r8	L	L-9	Rounded	1.137	19.86	-2.84	-1.41
L9r9	L	L-9	Rounded	1.137	20.95	-1.95	-0.89

35

Table S3. Pairwise comparison of the $\delta^{18}\text{O}_p$ between units (Wilcoxon Rank Sum Tests with Holm correction – Significance: $p < 0.05$, *, $p < 0.01$, **, $p < 0.001$, *).**

Horizons	B-10	B-12a	B-12b	C-2	C-4	C-8	F-1	F-2	G-3	G-24	G-27/G-28	H-4/H-5	K-4	L-2	L-3	L-4
B-12a																
B-12b																
C-2																
C-4																
C-8																
F-1																
F-2																
G-3																
G-24		*	***	***		***	***		***							
G-27/G-28										*						
H-4/H-5																
K-4																
L-2			***	***		***	*									
L-3																
L-4				*												
L-9		*	*													

40