

Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time series
0.25	-4.90	-6.92	NA	14.75	-4.12	-7.35	1C-5	29.25	-3.22	-6.72	1C-3	43.75	-3.08	-6.57	1C-2
0.75	-3.89	-6.76	NA	15.25	-5.75	-6.74	NA	29.75	-3.80	-6.68	1C-3	44.25	-3.24	-6.32	1C-2
1.25	-4.56	-6.41	NA	15.75	-4.95	-6.34	NA	30.25	-3.31	-7.01	1C-3	44.75	-2.72	-6.37	NA
1.75	-4.48	-7.28	NA	16.25	-4.95	-7.15	NA	30.75	-3.26	-6.86	1C-3	45.25	-2.08	-6.00	NA
2.25	-5.51	-6.84	NA	16.75	-5.29	-6.99	NA	31.25	-3.29	-6.72	1C-3	45.75	0.05	-5.98	NA
2.75	-5.03	-6.72	NA	17.25	-3.75	-6.63	1915	31.75	-2.66	-7.09	1C-3	46.25	-0.55	-5.93	NA
3.25	-5.74	-6.96	NA	17.75	-2.19	-7.03	NA	32.25	-2.95	-6.92	1C-3	46.75	-0.19	-5.74	NA
3.75	-5.08	-7.32	NA	18.25	-1.37	-7.02	1C-4	32.75	-3.41	-6.78	1C-3	47.25	-1.21	-5.57	NA
4.25	-4.67	-7.28	796				1C-4	33.25	-3.07	-6.40	1C-3	47.75	-2.86	-6.68	NA
4.75	-4.41	-7.17	1C-6	19.25	-1.12	-7.18	1C-4	33.75	-3.03	-6.57	NA	48.25	-2.35	-6.48	4631
5.25	-4.26	-7.31	1C-6	19.75	-2.22	-7.06	1C-4	34.25	-3.17	-6.75	NA	48.75	-1.93	-6.64	1C-1
5.75	-4.22	-7.25	1C-6	20.25	-4.12	-6.97	1C-4	34.75	-3.03	-6.34	1C-2	49.25	-1.44	-6.33	1C-1
6.25	-4.18	-7.26	1C-6	20.75	-3.81	-6.97	1C-4	35.25	-3.08	-6.55	1C-2	49.75	-4.15	-6.76	1C-1
6.75	-2.92	-7.10	1C-6	21.25	-3.55	-6.72	1C-3	35.75	-2.92	-6.35	1C-2	50.25	-2.53	-6.69	1C-1
7.25	-4.37	-7.27	1C-6	21.75	-3.67	-6.98	1C-3	36.25	-2.93	-6.62	1C-2	50.75	-2.44	-6.85	1C-1
7.75	-4.31	-7.05	1C-6	22.25	-4.50	-6.86	2578	36.75	-2.44	-6.31	1C-2	51.25	-3.00	-7.02	1C-1
8.25	-2.88	-7.06	1C-6	22.75	-3.81	-6.89	1C-3	37.25	-2.18	-6.72	1C-2	51.75	-3.46	-7.12	1C-1
8.75	-4.24	-6.98	NA	23.25	-3.41	-6.85	1C-3	37.75	-2.79	-6.45	1C-2	52.25	-2.75	-6.70	1C-1
9.25	-4.84	-7.51	NA	23.75	-3.95	-6.84	1C-3	38.25	-3.23	-7.00	1C-2	52.75	-2.46	-6.56	1C-1
			1C-5	24.25	-3.89	-6.76	1C-3	38.75	-1.10	-6.53	1C-2	53.25	-3.18	-6.59	1C-1
10.25	-4.94	-7.43	1C-5	24.75	-3.44	-6.59	1C-3	39.25	-1.06	-6.42	1C-2	53.75	-3.48	-6.56	1C-1
10.75	-5.30	-7.34	1C-5	25.25	-2.73	-7.31	1C-3	39.75	-2.48	-6.62	1C-2	54.25	-2.97	-6.72	1C-1
11.25	-5.13	-7.40	1C-5	25.75	-1.76	-6.76	1C-3	40.25	-3.55	-6.61	1C-2	54.75	-3.27	-6.55	1C-1
11.75	-5.40	-7.28	1C-5	26.25	-2.46	-6.92	1C-3	40.75	-3.69	-6.47	1C-2	55.25	-3.56	-6.35	5116
12.25	-5.21	-7.30	1C-5	26.75	-4.01	-6.72	1C-3	41.25	-2.84	-6.52	1C-2	55.75	-4.15	-6.87	1C-1
12.75	-5.33	-6.69	1C-5	27.25	-3.99	-6.67	1C-3	41.75	-2.98	-6.30	1C-2	56.25	-4.70	-6.78	1C-1
13.25	-4.92	-7.14	1C-5	27.75	-3.96	-6.91	1C-3	42.25	-3.72	-7.08	1C-2	56.75	-4.39	-6.85	1C-1
13.75	-5.30	-7.51	1C-5	28.25	-3.47	-6.81	1C-3	42.75	-2.92	-6.52	1C-2	57.25	-5.32	-6.73	1C-1
14.25	-4.30	-7.47	1C-5	28.75	-3.67	-6.91	1C-3	43.25	-1.50	-6.64	1C-2	57.75			1C-1

Supplement 2. Summary of sample depths (measured downward from top of speleothem), stable C and O isotope values (measured from 0.5 mm drilled samples), and UV fluorescent time series (UVf). **Bold numbers** are U/Th ages shown in Figure 1. Gaps reflect either lost stable isotope samples or insufficient CO₂ evolved for analysis. NA indicates absence of UV fluorescent bands that could be measured and counted.

Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time-series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time-series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time-series	Depth (mm)	$\delta^{13}\text{C}$ (‰, vPDB)	$\delta^{18}\text{O}$ (‰, vPDB)	UVf time-series
58.25	-5.25	-6.69	1C-1				1B-3	87.25	-5.26	-6.76	1B-2	101.75	-4.49	-6.71	1B-1
58.75	-3.97	-6.58	1C-1	73.25	-6.23	-7.20	1B-3	87.75	-5.36	-6.99	NA	102.25	-3.00	-6.27	terra rossa
59.25	-3.77	-6.76	1C-1	73.75	-5.59	-6.66	1B-3	88.25	-5.88	-6.64	NA	102.75	-5.04	-6.38	NA
59.75	-3.65	-6.93	1C-1	74.25	-5.64	-7.03	1B-3	88.75	-4.58	-6.59	NA	103.25	-4.62	-6.91	NA
60.25	-3.41	-7.15	1C-1	74.75	-5.14	-6.72	1B-3	89.25	-4.48	-6.70	1B-1	103.75	-5.11	-6.92	NA
60.75	-2.67	-7.21	1C-1	75.25	-4.85	-7.02	6173	89.75	-3.50	-6.90	1B-1				
61.25	-1.93	-6.97	1C-1	75.75	-5.33	-6.94	1B-3				1B-1				
61.75	-2.47	-6.99	1C-1	76.25	-5.45	-7.05	1B-3	90.75	-2.73	-7.01	1B-1				
62.25	-2.51	-7.02	1C-1	76.75	-5.41	-7.23	NA	91.25	-1.95	-7.36	1B-1				
62.75	-2.07	-6.53	NA	77.25	-5.33	-7.26	1B-2	91.75	-1.69	-7.09	1B-1				
63.25	-2.72	-7.00	NA	77.75	-4.80	-6.83	1B-2	92.25	-1.82	-7.08	1B-1				
63.75	-2.79	-6.58	1B-3	78.25	-4.91	-7.04	1B-2	92.75	-2.86	-7.12	1B-1				
64.25	-2.95	-6.59	1B-3	78.75	-4.19	-7.20	1B-2	93.25	-2.99	-7.14	1B-1				
64.75	-2.66	-6.45	1B-3	79.25	-4.58	-7.26	1B-2	93.75	-2.66	-6.60	1B-1				
65.25	-2.82	-6.43	1B-3	79.75	-4.29	-7.07	1B-2	94.25	-2.38	-6.94	1B-1				
65.75	-3.04	-7.11	1B-3	80.25	-4.15	-7.12	1B-2	94.75	-2.58	-7.11	1B-1				
66.25	-3.68	-6.87	1B-3				1B-2	95.25	-3.03	-7.02	1B-1				
66.75	-3.29	-6.86	1B-3	81.25	-4.95	-7.10	6531	95.75	-2.44	-6.90	1B-1				
67.25	-2.52	-6.68	1B-3	81.75	-3.94	-7.04	1B-2	96.25	-2.19	-6.77	1B-1				
67.75	-3.20	-7.08	1B-3	82.25	-4.42	-7.06	1B-2	96.75	-1.74	-6.94	1B-1				
68.25	-3.59	-6.68	1B-3	82.75	-4.38	-6.86	1B-2	97.25	-1.70	-6.85	1B-1				
68.75	-3.55	-6.72	1B-3	83.25	-3.84	-6.97	1B-2	97.75	-1.55	-6.54	1B-1				
69.25	-4.00	-6.55	1B-3	83.75	-4.59	-7.05	1B-2	98.25	-1.55	-6.77	1B-1				
69.75	-3.77	-6.66	1B-3	84.25	-5.06	-7.02	1B-2	98.75	-1.43	-6.44	1B-1				
70.25	-3.06	-6.46	1B-3	84.75	-5.52	-6.90	1B-2	99.25	-1.37	-7.01	1B-1				
70.75	-4.58	-6.76	1B-3	85.25	-5.40	-6.90	1B-2	99.75	-2.30	-6.73	1B-1				
71.25	-6.18	-6.94	1B-3	85.75	-5.98	-7.01	1B-2	100.25	-1.67	-7.08	7416				
71.75	-6.02	-6.98	1B-3	86.25	-5.72	-7.06	1B-2	100.75	-3.75	-6.81	1B-1				
			1B-3	86.75	-4.97	-7.21	1B-2	101.25	-4.95	-6.68	1B-1				

Supplement 2 (cont'd).