

Table A: Data used in the analysis (see Table B for fossil identification)

Fossil No.	CC	Latitude	Longitude	North	East	Location	Parasites	Age (mya)	Mean Temperature	Temperature Variation	Isosd	Population Density
1	595	27	23	0	1	1	1	1.9	17.8	29	0.218223437	13
2	475	27	23	0	1	1	1	1.9	17.8	29	0.218223437	13
3	507	27	23	0	1	1	1	1.9	17.8	29	0.218223437	13
4	570	27	23	0	1	1	1	1.9	17.8	29	0.218223437	13
5	500	7	40.5	1	1	2	7	1.89	22.2	19	0.212807364	13
6	776	4	38	1	1	2	7	1.89	24.7	15	0.212807364	13
7	506.333	4	38	1	1	2	7	1.89	24.7	15	0.212807364	13
8	622.5	4	38	1	1	2	7	1.89	24.7	15	0.212807364	13
9	782.5	4	38	1	1	2	7	1.85	24.7	15	0.246603596	16
10	616	4	38	1	1	2	7	1.85	24.7	15	0.246603596	16
11	855	8	110	0	1	10	3	1.66	25.8	8	0.222701943	19
12	597	4	34	0	1	2	7	1.8	22.3	18	0.232941294	17
13	825.4	4	38	1	1	2	7	1.78	24.7	15	0.252773704	17
14	674	4	34	0	1	2	7	1.78	22.3	18	0.252773704	17
15	775	40	47	1	1	6	4	1.86	5.8	32	0.25577606	16
16	650	40	47	1	1	6	4	1.86	5.8	32	0.25577606	16
17	600	40	47	1	1	6	4	1.86	5.8	32	0.25577606	16
18	639.2	4	34	0	1	2	7	1.67	22.3	18	0.221164939	17
19	662.286	4	34	0	1	2	7	1.66	22.3	18	0.222701943	19
20	1000	7.5778	110	0	1	10	3	0.25	25.8	8	0.417855328	51
21	904.5	3.9008	38	1	1	2	7	1.6	24.7	15	0.260943995	19
22	825.667	4	38	1	1	2	7	1.57	24.7	15	0.264428076	19
23	850	7.5778	110	0	1	10	3	0.21	25.8	8	0.425454367	58
24	1070.5	4	34	0	1	2	7	1.2	22.3	18	0.309443896	28
25	779	34.2	104	1	1	9	3	1.15	6.9	41	0.301799443	29
26	800	14.8333	39.5	1	1	2	7	1	25.5	14	0.299464168	29
27	856	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
28	940	7.3667	110	0	1	10	3	0.9	25.8	8	0.29634621	30
29	792.571	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
30	900	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
31	951	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
32	1020	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
33	1300	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
34	1554.5	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
35	1499.5	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75

Fossil No.	CC	Latitude	Longitude	North	East	Location	Parasites	Age (mya)	Mean Temperature	Temperature Variation	Isosd	Population Density
36	1587.333	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
37	868.6	7.5778	110	0	1	10	3	1.25	25.8	8	0.298084327	28
38	1185	41.55	13.5	1	1	4	1	0.85	13.4	25	0.357515549	31
39	732.33	4	34	0	1	2	7	0.84	22.3	18	0.390312661	31
40	1300	35.4158	2	1	1	3	3	0.75	22.5	20	0.382977102	33
41	1650.2	45	1	1	1	4	1	0.068	10.7	24	0.402105157	77
42	1250	10.6333	40.5	1	1	2	7	0.6	22.2	19	0.368289722	38
43	1226.75	35	5.5	1	0	3	3	0.06	13.3	22	0.396490598	80
44	1581	41	68	1	1	7	1	0.06	12.1	47	0.396490598	80
45	1551	41.2	12.5	1	1	4	1	0.055	13.4	25	0.394052574	82
46	1745	33	35	1	1	6	4	0.051	19.2	26	0.388439222	82
47	1056.333	7.3833	110	0	1	10	3	0.5	25.8	8	0.411476483	38
48	1337.75	52	7	1	1	5	0	0.05	8.4	27	0.388439222	90
49	1320	49.0167	19.5	1	1	5	0	0.05	6.8	29	0.388439222	90
50	1626	42.7333	1.5	1	1	4	1	0.05	10.7	24	0.388439222	90
51	1345.25	44	0	1	1	4	1	0.05	10.7	24	0.388439222	90
52	1650	36	43.5	1	1	6	4	0.05	21.4	34	0.388439222	90
53	1550	36	43.5	1	1	6	4	0.05	21.4	34	0.388439222	90
54	1457.5	50.8	4.5	1	1	5	0	0.05	9.6	24	0.388439222	90
55	1487.4	50.8	4.5	1	1	5	0	0.05	9.6	24	0.388439222	90
56	1138.667	42.8167	1	1	1	4	1	0.4	10.7	24	0.338519963	40
57	911	35	7	1	0	3	3	0.4	17.1	20	0.338519963	40
58	1030	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
59	937.5	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
60	1220	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
61	1225	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
62	1015	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
63	1030	38	104	1	1	9	3	0.21	6.9	41	0.425454367	58
64	1305	52	0	1	1	5	0	0.14	8.4	20	0.384918654	67
65	1400	40.8167	35	1	1	6	4	0.04	19.2	26	0.383797175	93
66	1486.2	44.9833	1	1	1	4	1	0.04	10.7	24	0.383797175	93
67	850	38	104	1	1	9	3	1.8	6.9	41	0.232941294	17
68	1310	14	28	0	1	2	7	0.35	21.4	22	0.324690513	42
69	1100	3	34	0	1	2	7	0.35	22.3	18	0.324690513	42
70	1216.667	32	18	0	1	1	1	0.35	17.8	29	0.324690513	42
71	1100	32.817	104	1	1	9	3	0.35	6.9	41	0.324690513	42
72	1432	49.2983	8.5	1	1	5	0	0.3	8.4	27	0.417255655	47

Fossil No.	CC	Latitude	Longitude	North	East	Location	Parasites	Age (mya)	Mean Temperature	Temperature Variation	Isosd	Population Density
73	1111.192	47	10	1	1	5	0	0.3	8.4	27	0.417255655	47
74	1235	10.0333	34	0	1	2	7	0.035	22.3	18	0.377070104	95
75	1266.556	40.365	22	1	1	4	1	0.325	15.4	27	0.396802573	43
76	1390	43	3.5	1	0	4	1	0.5	13.3	22	0.411476483	38
77	1125	43	3.5	1	0	4	1	0.5	13.3	22	0.411476483	38
78	1153.333	43	3.5	1	0	4	1	0.5	13.3	22	0.411476483	38
79	1249.333	23.3	70.5	1	1	8	5	0.3	23.7	34	0.417255655	47
80	1400	3.25	38	1	1	2	7	0.14	24.7	15	0.385	67
81	1012.5	31.7167	104	1	1	9	3	0.25	6.9	41	0.417855328	51
82	1160	25.7	104	1	1	9	3	0.205	6.9	41	0.432039854	59
83	1450	50.9833	11	1	1	5	0	0.203	8.4	27	0.425318887	60
84	1121.429	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
85	1266.167	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
86	1115.714	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
87	1135	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
88	1109	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
89	900	7.3833	110	0	1	10	3	0.2	25.8	8	0.414916251	61
90	1316.667	42.05	104	1	1	9	3	0.187	6.9	41	0.405555998	62
91	1334.571	47.617	19.5	1	1	5	0	0.186	9.8	32	0.407075204	63
92	1200	50.3	3	1	1	5	0	0.178	10.7	24	0.40956105	64
93	1420	45.95	0	1	1	5	0	0.16	10.7	24	0.406054306	65
94	1065	46.583	0	1	1	5	0	0.151	10.7	24	0.401801067	66
95	1280	30	26	0	1	1	1	0.279	17.8	29	0.410862309	48
96	1375	3.25	38	1	1	2	7	0.15	24.7	15	0.384918654	66
97	1550	13.15	34	1	1	2	7	0.15	26.8	27	0.384918654	66
98	1450	46.1681	16	1	1	4	1	0.13	10.9	23	0.384378768	73
99	1200	46.1681	16	1	1	4	1	0.13	10.9	23	0.384378768	73
100	1432.5	7	40.5	1	1	2	7	0.195	22.2	19	0.408297587	61
101	1283.5	3.1667	34	0	1	2	7	0.125	22.3	18	0.36220423	73
102	1305	32	7	1	0	3	3	0.3	17.1	20	0.417255655	47
103	1400	32	7	1	0	3	3	0.27	17.1	20	0.406021609	49
104	1234.333	41.9	12.5	1	1	4	1	0.1	13.4	25	0.413475128	75
105	1295	41.9	12.5	1	1	4	1	0.1	13.4	25	0.413475128	75
106	1270.5	35	35	1	1	6	4	0.1	19.2	26	0.413475128	75
107	1000	32.05	104	1	1	9	3	1.66	6.9	41	0.222701943	19
108	1000	7.24	110	0	1	10	3	0.6	25.8	8	0.368289722	38
109	995	14.6667	40.5	1	1	2	7	0.1	22.2	19	0.413475128	75

Fossil No.	CC	Latitude	Longitude	North	East	Location	Parasites	Age (mya)	Mean Temperature	Temperature Variation	Isosd	Population Density
110	1090	26.5	128	1	1	12	2	0.018	11.1	32	0.397247483	126
111	1090	7	34	0	1	2	7	0.2	22.3	18	0.414916251	61
112	1170	26.5	128	1	1	12	2	0.018	11.1	32	0.397247483	126
113	1280	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
114	1290	38	104	1	1	9	3	0.018	6.9	41	0.397247483	126
115	1310	44	0	1	1	4	1	0.05	10.7	24	0.388439222	90
116	1322	49	16.5	1	1	5	0	0.026	7.5	30	0.379526652	115
117	1354	45	0.5	1	0	4	1	0.0145	10.7	24	0.392478942	127
118	1370	51	6.5	1	1	5	0	0.012	8.4	27	0.39644267	132
119	1375	44	7.5	1	1	4	1	0.028	10.7	24	0.378345024	101
120	1380	38	104	1	1	9	3	0.018	6.9	41	0.397247483	126
121	1380	45	1	1	1	4	1	0.0206	10.7	24	0.39131532	117
122	1390	26.5	128	1	1	12	2	0.018	11.1	32	0.397247483	126
123	1414	44	8.5	1	1	4	1	0.0114	13.4	25	0.394097668	136
124	1420	27	31.5	1	1	13	5	0.0333	22.1	28	0.377247824	95
125	1424	44	8.5	1	1	4	1	0.0114	13.4	25	0.394097668	136
126	1430	45	4.5	1	1	4	1	0.0102	10.7	24	0.389503389	141
127	1434	45	0.5	1	1	4	1	0.012	10.7	24	0.39644267	132
128	1452	50.5	14	1	1	5	0	0.0265	7.5	30	0.379526652	110
129	1484	38	12.5	1	1	4	1	0.011	13.4	25	0.389503389	140
130	1490	44	8.5	1	1	4	1	0.0186	13.4	25	0.387277852	120
131	1500	51	6.5	1	1	5	0	0.012	8.4	27	0.39644267	132
132	1500	38	104	1	1	9	3	0.018	6.9	41	0.397247483	126
133	1500	50.5	14.5	1	1	5	0	0.035	7.5	30	0.377070104	95
134	1518	50.5	14	1	1	5	0	0.0265	7.5	30	0.379526652	110
135	1520	44	8.5	1	1	4	1	0.0114	13.4	25	0.394097668	136
136	1522	49	16.5	1	1	5	0	0.026	7.5	30	0.378345024	115
137	1531	52	8.5	1	1	5	0	0.0274	8.4	27	0.38	106
138	1531	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
139	1535	32	35	1	1	6	4	0.09	19.2	26	0.407602948	75
140	1550	42	12.5	1	1	4	1	0.057	13.4	25	0.394052574	81
141	1555	44	1.5	1	1	4	1	0.012	10.7	24	0.39644267	132
142	1555	50.5	14	1	1	5	0	0.0265	7.5	30	0.379526652	110
143	1560	38	12.5	1	1	4	1	0.011	13.4	25	0.389503389	140
144	1565	38	12.5	1	1	4	1	0.011	13.4	25	0.389503389	140
145	1569	38	12.5	1	1	4	1	0.011	13.4	25	0.389503389	140
146	1580	44	7.5	1	1	4	1	0.028	10.7	24	0.378345024	101

Fossil No.	CC	Latitude	Longitude	North	East	Location	Parasites	Age (mya)	Mean Temperature	Temperature Variation	Isosd	Population Density
147	1600	45	0.5	1	1	4	1	0.03	10.7	24	0.378345024	97
148	1608	50.5	14	1	1	5	0	0.0265	7.5	30	0.379526652	110
149	1620	50.5	14.5	1	1	5	0	0.035	7.5	30	0.377070104	95
150	1661	44	8.5	1	1	4	1	0.0114	13.4	25	0.394097668	136
151	1700	45	0.5	1	1	4	1	0.012	10.7	24	0.39644267	132
152	1775	44	7.5	1	1	4	1	0.028	10.7	24	0.378345024	101
153	1880	44	8.5	1	1	4	1	0.019	13.4	25	0.39131532	119
154	1006	7.3833	110	0	1	10	3	0.8	25.8	8	0.36580401	32
155	1250	43.5	7.5	1	1	4	1	0.13	10.7	24	0.384378768	73
156	1362	50.5	5.5	1	1	5	0	0.06	10.7	24	0.396490598	80
157	1400	35	5.5	1	0	3	3	0.05	13.3	22	0.388439222	90
158	1450	46.1681	16	1	1	4	1	0.13	10.9	23	0.384378768	73
159	1205	46.1681	16	1	1	4	1	0.13	10.9	23	0.384378768	73
160	1450	32	35	1	1	6	4	0.1	19.2	26	0.413475128	75
161	1450	12	40	1	1	2	7	0.16	22.2	19	0.406054306	65
162	1600	49	16.5	1	1	5	0	0.026	7.5	30	0.378345024	115
163	1500	49	16.5	1	1	5	0	0.026	7.5	30	0.378345024	115
164	1304	49	16.5	1	1	5	0	0.026	7.5	30	0.378345024	115
165	1510	29	31	0	1	1	1	0.07	17.8	29	0.40409947	76
166	1570	45	1	1	1	4	1	0.028	10.7	24	0.378345024	101
167	1590	45	0.5	1	1	4	1	0.03	10.7	24	0.378345024	97
168	1538	49	16.5	1	1	5	0	0.0275	7.5	30	0.38	105
169	1481	49	16.5	1	1	5	0	0.0275	7.5	30	0.38	105
170	1378	49	16.5	1	1	5	0	0.0275	7.5	30	0.38	105
171	1547	49	16.5	1	1	5	0	0.0275	7.5	30	0.38	105
172	1605	51.5	39	1	1	7	1	0.02	-5.1	39	0.39131532	118
173	1480	24.5	109.5	1	1	9	3	0.04	6.9	41	0.383797175	93
174	1464	56	40.5	1	1	7	1	0.024	-5.1	39	0.384102389	116
175	1390	42.05	104	1	1	9	3	0.13	6.9	41	0.384378768	73

CC = cranium capacity in cm³; latitude = absolute latitude from equator; longitude = absolute longitude from prime meridian, north: 1 = north of the equator, 0 = south of the equator; east: 1 = east of prime meridian, 0 = west of prime meridian; location = location factor for parasite calculation; parasite = number of parasites found in location; Age = age of cranium in mya; Mean temperature = mean twentieth-century temperature; Temperature variation = difference between highest monthly high temperature and lowest monthly low temperature; Isosd = standard deviation of δ¹⁸O record for 200,000 years preceding cranium's age; Population density = number of crania discovered at or outside a 30° radius from Al Mashriq, Ethiopia, at or before the time the cranium was dated (see Methods)

Table B: Fossil index

No.	Fossil
1	SK 47 (adult)
2	SK 27
3	SK 847
4	Stw 53
5	Omo L894-1
6	ER1470
7	ER1813
8	ER3732
9	ER1590 (juv. 8 year old)
10	ER1805
11	Modjokerto (adult) (Perning I, Pithecanthropus V)
12	OH24 (Olduvai hominid 24)
13	ER3733 (Koobi Fora)
14	OH7 (adult) (Olduvai hominid)
15	Dmansi 2280
16	Dmansi 2282
17	Dmansi (D2700)
18	OH16 (adult) (Olduvai hominid)
19	OH13 (adult) (Olduvai hominid)
20	Sangiran 31 (S 31)
21	KNM-WT 15000 (adult) (WT 15K) (Nariokotome)
22	ER3883 (Koobi Fora)
23	Sangiran 9 (Pithecanthropus IX)
24	OH9 (Chellean man)
25	Gongwangling 1(Lantian I, Lantian 2)
26	Buia
27	Sangiran 4 (Pithecanthropus IV) (Homo erectus IV) (S4)
28	Trinil 2 (Pithecanthropus I, Homo erectus I)
29	Sangiran 2 (Pithecanthropus II, Homo erectus II) (S2)
30	Sangiran 3 (adult) (Pithecanthropus III, Homo erectus III) (S3)
31	Sangiran 12 (Pithecanthropus VII, Homo erectus VII) (S12)
32	Sangiran 17 (Pithecanthropus VIII, Homo erectus VIII) (S17)
33	Skhul 2
34	Skhul 4
35	Skhul 5
36	Skhul 9

No.	Fossil
37	Sangiran 10 (Pithecanthropus V, VI; Homo erectus V, VI) (S10)
38	Ceprano
39	OH 12
40	Ternifine (Tighenif)
41	La Ferrassie 1
42	Bodo
43	Gibraltar 1 (Forbes' Quarry)
44	Teshik-Tash (adult)
45	Monte Circeo I
46	Amud 1
47	Sambungmacan 1
48	Neandertal 1
49	Ganovce 1
50	La Chapelle-aux-Saints
51	La Quina 5 (H5)
52	Shanidar 1
53	Shanidar 5
54	Spy 1
55	Spy 2
56	Arago 21 (XXI and XLVII)
57	Salé 1
58	Zhoukoudian D1 (II) (Sin II)
59	Zhoukoudian (III)
60	Zhoukoudian H3 (V)
61	Zhoukoudian L1 (X) (Sin X)
62	Zhoukoudian L2 (XI)(Sin XI)
63	Zhoukoudian L3 (XII) (Sin XII)
64	Swanscombe 1
65	Galilee
66	Le Moustier 1
67	Zhoukoudian (VI) (Sin VI)
68	Broken Hill 1 (Kabwe, Rhodesian)
69	Ndutu 1
70	Saldanha 1 (Elandsfontein, Hopefield)
71	Yunxian (EV9002 skull II)
72	Reilingn
73	Steinheim 1
74	Eyasi

No.	Fossil
75	Petralona 1
76	Atapuerca 4 (AT 600)
77	Atapuerca 5 (AT 700)
78	Atapuerca 6 (11-14 year old)
79	Narmada 1
80	KNM-ER3884
81	Hexian (PA 830)
82	Dali 1 (Ta-li)
83	Ehringsdorf 9
84	Solo 1 , Ngandong 1
85	Solo 5, Ngandong V,
86	Solo 6, Ngandong VI,
87	Solo 9, Ngandong IX,
88	Solo 10, Ngandong X,
89	Poloyo 1 (PL-1) Sambungmacan 3 (SM 3)
90	Jinniushan
91	Vértesszöllös 2
92	Biache
93	Fontéchevade 2
94	Suard 1, La Chaise
95	Florisbad 1
96	KNM-ES-11693 (Eliye Springs)
97	Singa 1
98	Krapina - D
99	Krapina 3 (C)
100	Omo 2, Omo-Kibish 2
101	LH 18 (Laetoli 18) Ngaloba
102	Jebel Irhoud 1 (Djebel Irhoud I) (Jebel Ighoud 1)
103	Jebel Irhoud 2 (Djebel Irhoud II) (Jebel Ighoud 2)
104	Saccopastore 1
105	Saccopastore 2
106	Tabun C1
107	Nanjing
108	Ngawi
109	Daka (BOU VP-2/66)
110	Minatogawa 4
111	Ngand 11
112	Minatogawa 2

No.	Fossil
113	Qafzeh 11
114	ZHD-UC 3
115	Quina 18
116	Dolni Vestonice 3
117	StG la R
118	Oberk 2
119	GdE5
120	ZHD-UC 2
121	Pataud1
122	Minatogawa 1
123	AC1
124	NazletKhat
125	AC2
126	Veyrier1
127	CapBlanc1
128	Predm10
129	STeodor5
130	AC1-IP
131	Oberk1
132	ZHD-UC 1
133	Mladec5
134	Predm4
135	AC4
136	Pavlov1
137	Paderborne
138	Qafzeh 9
139	Qafzeh 6
140	Guattari1
141	Bruniquel2
142	Predm9
143	STeodor3
144	STeodor1
145	STeodor2
146	GdE6
147	CM1
148	Predm3
149	Mladec1
150	AC5

No.	Fossil
151	Chancelade
152	GdE4
153	BG2
154	Sambungmacan 4
155	Lazaret
156	Engis 2
157	Gibraltar 2 (Devil's)
158	Krapina B
159	Krapina 6 (E)
160	Skhul 1
161	Herto 1/16
162	Brno I
163	Brno II
164	Brno III
165	Border Cave
166	Combe Capelle
167	Cro Magnon 3
168	Dolni Vestonice 14
169	Dolni Vestonice 18
170	Dolni Vestonice 20
171	Dolni Vestonice 21
172	Kostenki 2
173	Liujiang
174	Sungir 1
175	Yinkou
